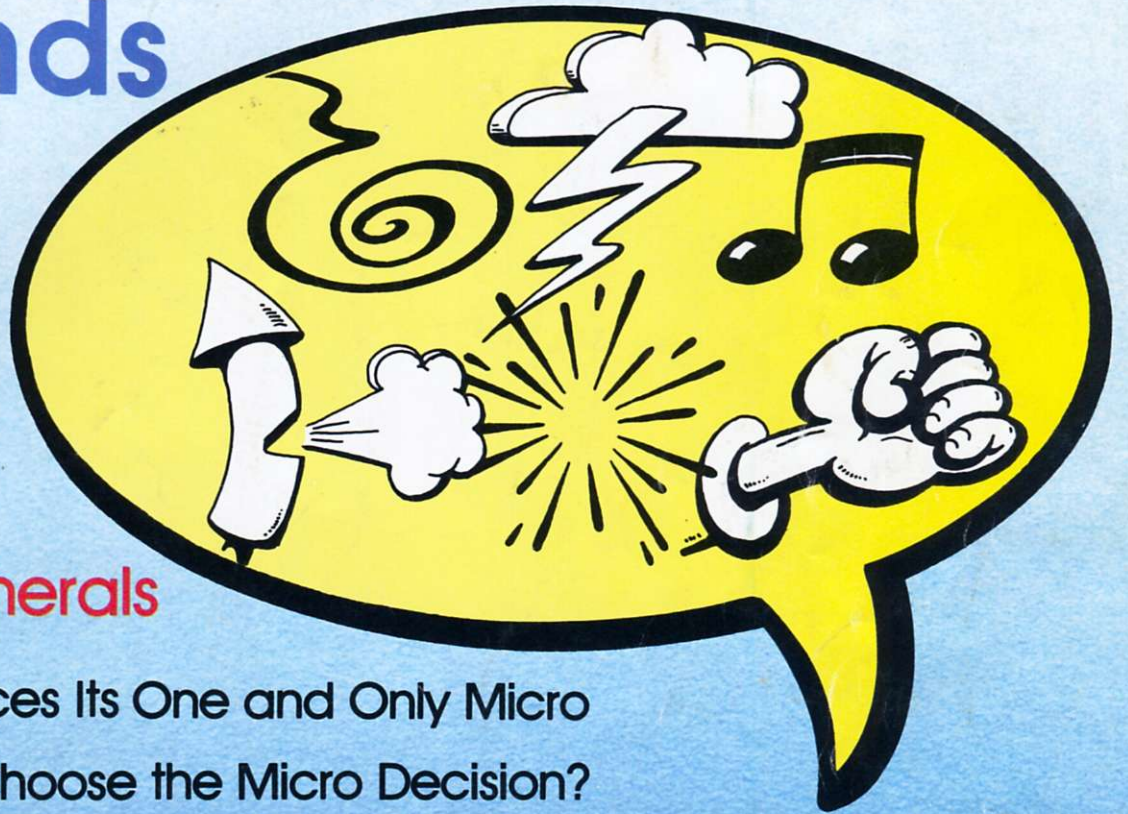


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July 1983
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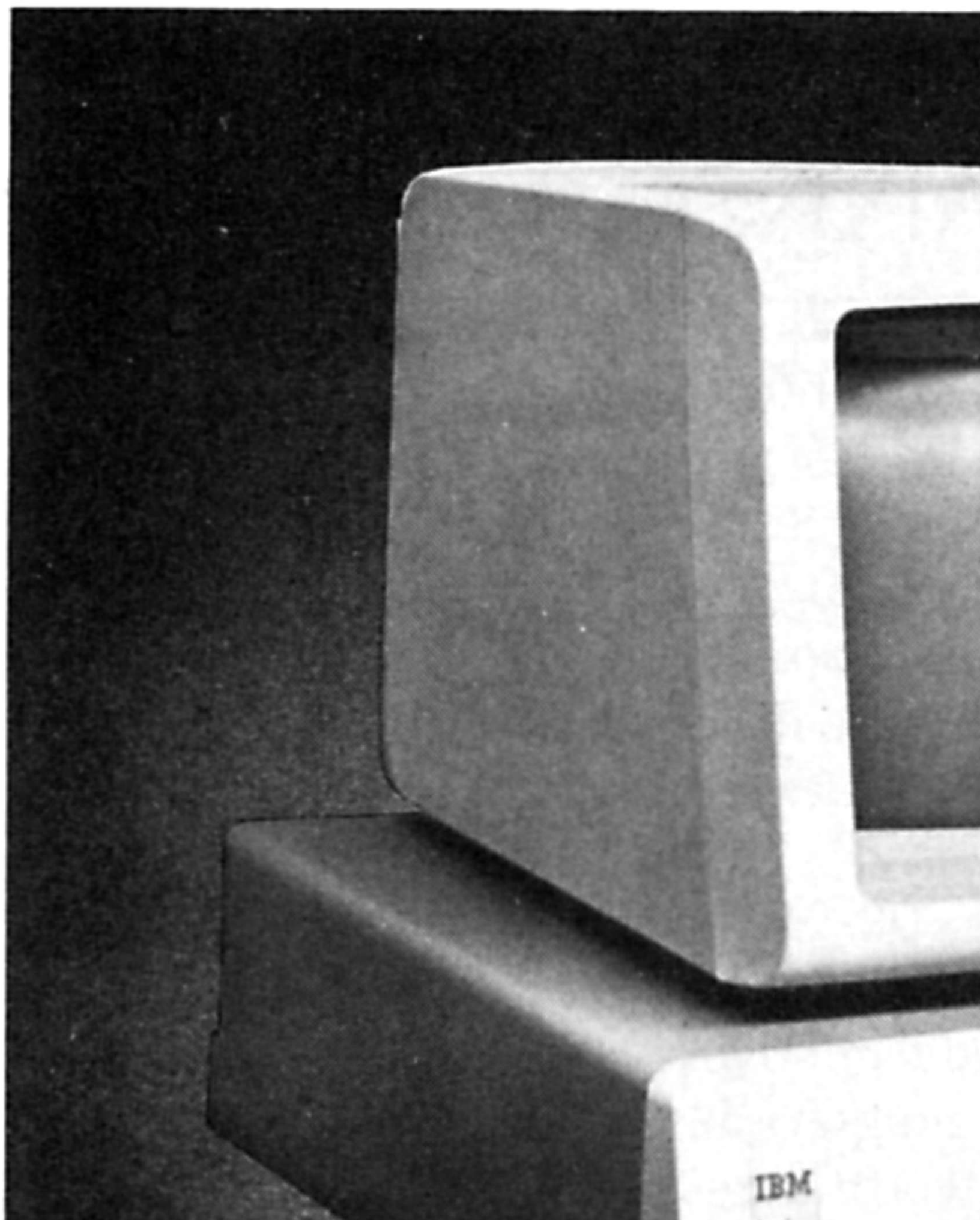
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So, Who Has Time To Read 'Em All?

Eighth Anniversary Blues

It was May 21, 1975, when I signed on an editor to get the first microcomputer magazine going. If someone had called from the future and told me that eight years hence my beloved *Byte* would have cloned out around a hundred offspring, I'd have found it almost as hard to believe as I do right now. Ten more magazines were announced at the recent West Coast Computer Faire. This is crazy.

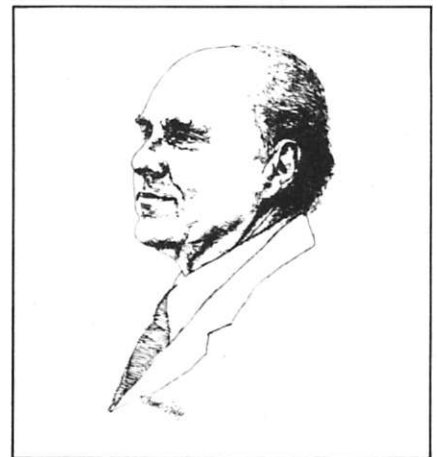
Well, I'm beginning to get into the spirit of it and figure that the five I'm publishing right now are just a start. I'm gearing up for at least a dozen new magazines next year. Why be chintzy about it? Let's roll up our sleeves and give 'em two hundred magazines to pick from. Why stop at only a hundred?

Let's see, we can get started on material for a new one aimed at the IBM PC. Why not? The ten magazines already going for that system hardly scratch the surface. Oh, we can give it a kick—perhaps we'll make it a PC-I/O magazine. I've always been partial to I/O—ever since I used that for a special microcomputer section of *73 Magazine* back in 1976.

Hey, how about a magazine for people who have both the VIC-20 and the Timex 2000? We might call that the 20/2000. It's imagination that puts you ahead in this field.

And if you think you have it tough trying to keep up with all of the computer magazines, how would you like to be a manufacturer faced with a hundred different magazines putting on the thumb screws to get you to advertise? With all that competition you can bet that some of the ad sales people are very, very aggressive. They visit, they call, they send letters, they send imaginative media packs, promising—hell, guaranteeing—anything you might be crazy enough to believe.

One of the reasons that so many magazines are managing to eke out an existence is that there are a lot of naive ad managers out there. They will bite at



"bargains." They'll actually believe circulation figures that aren't audited and spend their money on 'em. They'll throw their money around like drunken sailors and then be surprised when their firms go down the toilet. I've watched some of the biggest and most arrogant of 'em flush away, sneaking what they could out of their plant in the middle of the night before the lock went on the door for good.

I just got a promotion for a new magazine, and I laughed when I read it. They have a "whopping guaranteed circulation" promised. They say they plan to get this by sending their magazine to all of the computer stores and by making a direct mailing to 100,000 computer owners. Well la-di-da. If that will suck in the advertisers, I've got one beaut of a bridge I can help them buy. It's in Brooklyn—old, but in good shape—and absolutely ripe for a toll booth that could earn millions.

The trend today is toward system-specific magazines. When we peeled *80 Micro* out of this magazine back in 1980, we had the first magazine devoted to a specific system. Now look at the field! But as a reader you also need to keep track of the whole industry, which is where *Microcomputing* is working for you today. And

that's in addition to *80 Micro*, *inC*, *HOT CoCo* and some more in the pipe.

There was a time when a special magazine in this field was one covering software. No more. Now Apple owners want to read about Apple software and not get frustrated by seeing articles about some of the tons of great stuff out there for the Olivetti. Say, you want to hear about modern day American religious wars in action? Visit a computer club and listen to an Apple fanatic arguing with a Commodore fan. CompuServe is probably making millions letting VIC-20 owners argue via their system with Color Computer zealots. Buncha screwballs who've lost all perspective. It's like religion and politics, with loads of heat and little light.

It's easier to just put it off, of course. You can find an infinite number of rationalizations for not doing things that are different. But if you do decide to go, I guarantee that you will never forget one minute of your trip.

On visiting countries after the tour, I have a particular advantage in that as a ham operator I already have friends in virtually every country of the world. Heck, hams even get to reefs accessible only at low tide to operate if they think they might qualify as a "new" country. And I'm hard put these days to find a country where we don't have subscribers to at least two or three of my magazines. Would you believe we have subscribers to *80 Micro* in Brunei? And *Microcomputing* is on the newsstands in Singapore and Bangkok.

My trip this spring will keep me from making the fall tour, but then I'm so darned busy on these trips seeing shows, having meetings with businessmen and so on that I hardly get to talk with most of the people on the tour. Not many of them get up at 6 a.m. and jog around the cities the way I do. And I often skip those giant breakfasts—if I didn't, I'd be waddling home at the end of the tour. Those business meetings with local manufacturers often go right on until midnight for me, leaving little time to socialize. If you're into doing business in Asia, you too may have 'em lined up to talk with you.

At the dinners, where it is normal to have the food placed on a lazy Susan in the center of each table of ten people, you'll have to have a fast set of chopsticks to keep ahead of me. And watch out for Bob Chang. He'll have you chugalugging that seemingly innocuous rice wine. Or he may lead an evening expedition into the heart of Taipei, where street vendors are eviscerating large snakes and hawk-ing snake blood and ground bile. Weird—and enjoyed by the throngs of Chinese.

If you're interested in getting out of your darned shell and seeing Asia, drop a line to Commerce Tours or to me, and I'll forward your name to them.

You Don't Have the \$2500?

Now I don't want to be mean about this, but you are right in the middle of one of the biggest bonanzas in history. People are making more money from microcomputers than they pulled out of the ground in gold in California a hundred years ago. Sutter's Mill was peanuts compared to the jackpot in Silicon Valley.

Every time some venturesome soul plunks down \$85 for a VIC-20 or \$39 for a Timex-1000, you have a golden opportunity to make money. Between Timex, Commodore, Tandy, Texas Instruments, Atari, Apple and IBM, there are millions of small computers being sold. Every sin-

gle one of those millions of people buying these computers are going to be looking for accessories to use with them—programs, information, service.

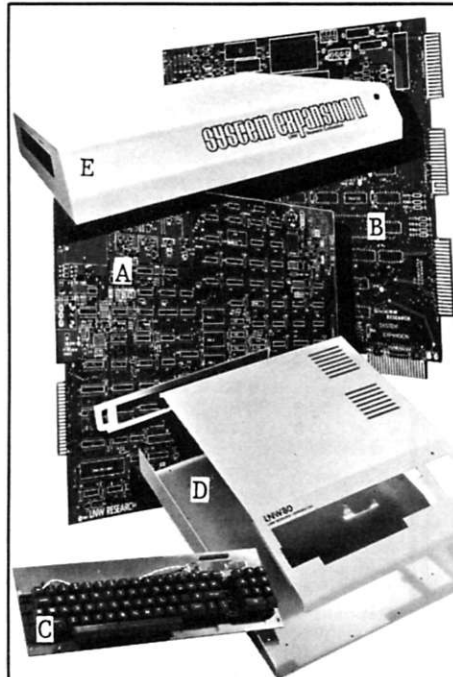
Unless you're dead asleep, the wide variety of opportunities to sell to this incredible market should have your juices going. Remember that the bigger the sales of a system, the more chances there are to sell add-ons. And with system-specific magazines springing up around every computer, you have it easy finding the customers. You're just shooting fish in a barrel.

This is why we've seen so many new millionaires in the last couple of years—and thousands of thousandaires. This is why some bookstores are selling over 3000 different books on computers and why we have nearly a hundred magazines. We have more than enough magazines now, so put your mind to programming and coming up with small accessories. How about a nice dedicated monitor for the Timex? Or a printer switch, so it can feed from several computers?

The microcomputer industry is going to keep growing for several more years as computers get into every aspect of education, business, science and the home. A piece of the action is there waiting for you . . . if you have the initiative to give it a try. And if you do get hooked on getting rich, the \$2500 for a trip to Asia will be almost nothing. □

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A Day In the Life . . .

Commodore International On the Move

Commodore Tour

Back in early April I was invited, along with Dennis Brisson, managing editor of *Microcomputing*, to a tour of Commodore's facilities in eastern Pennsylvania. We were met by Neil Harris, who's in charge of the two Commodore magazines, and Diane Ottinger, from Commodore's public relations department.

It was a pleasure to meet the faces that belong to the various voices I've come to know over the phone during these past several years.

On the day of the tour, we spent most of the morning walking through the office area in Wayne, PA, which Commodore was in the process of moving from. In fact, there was a meeting in progress in which moving plans were being discussed. With Commodore's explosive expansion rate, the company's working quarters became cramped, so the move to a new and much larger facility isn't surprising.

We got to meet quite a few interesting people during the morning. Walter Kutz, the SuperPET product manager, talked about the continuing support for the SuperPET and how it's heavily used by schools. He spends a lot of time traveling across the country talking about the SuperPET, so you may get to meet him sometime.

By the way, rumors about the demise of the SuperPET are untrue. It's still being produced and gaining more and more support daily.

We also met Jeff Hand, who works with Commodore's offerings on CompuServe. We talked a little about future enhancements and what Jeff's group is doing. One project was an on-line conference, but it seems it was a little too much for CompuServe to handle.

Commodore also plans to offer programs for sale, via CompuServe, to complement the free public-domain programs you currently can download from the system.

Impressions

I've been using the CompuServe system for several months—whenever I can get on—and I'm learning new things about the system all the time. My biggest problem is with the local CompuServe input. It seems that the local input in Cherry Hill, NJ, can handle only two users at a time. Considering the number of users in this area, it's no wonder the input is almost always busy.

We also met Myrddin Jones, vice-president of marketing, Mike Tomczyk, vice-president of the new software group, and David Rosenwald, director of education marketing.

Rosenwald talked at length about the projected 80 percent penetration for computers in the school market by 1986 and Commodore's plans to support this market. Currently, only about 10 percent of schools nationwide have computers. Of these, about 50 percent use Apples, 20 percent have TRS-80s or CBM systems, and the rest are using Atari, Texas Instruments and IBM machines, among others. Apparently, the lower grades are the fastest-growing area of computer interest, but they have the lowest penetration.

During our talk, Rosenwald pointed out that cost appears to be the major factor in selecting a system for schools, and Commodore's offerings are well-situated regarding price-to-performance ratio.

The lower grades are using the VIC-20, where the larger character size is actually a benefit. Intermediate grades are using the Commodore-64 and senior grades are using the CBM-8032 or SuperPET.

Also, a new network for the Commodore-64 is ready to be announced. The network is being designed especially for schools, but it may be of interest to a number of other areas as well. Supposedly, you'll be able to intermix PETs and Commodore-64s within the network.

Rosenwald admitted that Commodore's teacher-training needs to be improved, but his company is working on this. Various seminars are being offered, and edu-

cational resource centers are being set up across the country.

The resource centers serve as primary grassroots support systems for educators, where teachers help other teachers. The information exchanged through these centers is proving to be invaluable for educators working with computers, many for the first time—and on limited budgets.

Any school or intermediate unit may, with the approval of its school board, apply to Commodore to become an educational resource center.

According to Rosenwald, the biggest inhibitor to schools is software. In the area of education, the computer can be used in two areas—as the object of instruction in teaching about computers, or as a tool in teaching about other subjects.

As an object of instruction, the SuperPET is ideal, with its variety of languages included with the basic system. The other Commodore systems are also of value in lower grades, teaching computer awareness.

There is a great need for more software for Commodore systems, as well as for most other computer systems. Commodore recently offered a collection of more than 650 public-domain educational programs on 50 disks that schools can get for the cost of duplication.

Rumor has it that the Minnesota Educational Computing Consortium is currently working with Commodore to produce a variety of new educational programs that should be available soon. Commodore also has Logo and Pilot ready to be released for the Commodore-64. The version of Logo is super and offers more features than the version offered by Apple, written by the same company. The quick demo I saw was really impressive.

Address correspondence to Robert W. Baker, 15 Windsor Drive, Atco, NJ 08004.



Peeking at Prototypes

We also got a chance to see some of the new prototypes, including the color printer and the color monitor. Unfortunately, the new portable models were sent back to Japan and we didn't get a chance to see them. Anyway, the color monitor is nice-looking and produces a beautiful display with the Commodore-64. It's apparently made by JVC, from what I've been told. I'll try to provide more details later, as soon as I can twist someone's arm and get one to play with.

After lunch we met Joseph Heimann, manager of special projects at MOS Technology. He gave us a little presentation on how ICs are designed and manufactured and then gave us a tour through the plant. The actual silicon chips are made here in Pennsylvania, shipped to Asia for assembly and then shipped back to MOS Technology for final testing.

Later in the day we got a chance to walk through Commodore's new West Chester, PA, facilities. It was an impressive site—the building is enormous. It should give Commodore plenty of room to spread out and grow.

Unfortunately, by the time we got there it was late in the day, and the production lines were shut down. Even so, I did manage to get a full collection of new C-64 software, which I'll be reviewing in later columns.

As I said earlier, Commodore employees were in the midst of moving when we were there, but they should be settled in by now. If you need to contact Commodore, the new address is: 1200 Wilson Drive, West Chester, PA 19380, and the telephone number is 215-431-9100.

News from Commodore

The newest video game from Commodore is making dentists, parents and kids happy. *Tooth Invaders* was developed for the Commodore-64 in cooperation with the American Dental Association. It was introduced during National Dental Month and is being enthusiastically supported by dentists, according to Bill Wade, Commodore's software director.

Fighting Cavities

Tooth Invaders combines the fun of a video arcade game with the most important principles of dental care. The game incorporates recommendations of the American Dental Association and is being used by dentists as well as parents. Already, more than 2000 dentists have ordered C-64 computers and *Tooth Invaders* cartridges for use in their offices.

Even without the educational tie-in, *Tooth Invaders* has all the elements of the most popular computer games—fast action, graphics, sound effects, nine levels of difficulty, "good guys" and "bad guys" and an interesting story line.

The game's motto is: "A Clean Tooth Will Not Decay!" To prove the point, char-

acters like "D.K. Germ" and "Plaque-man" help teach the use of dental floss, proper brushing and the dangers posed by cavities and plaque buildup.

Tooth Invaders is an excellent example of how computer games can be used constructively to accomplish worthwhile goals.

Seminar Series

Commodore sponsored a 16-city seminar series between March and early May designed to help educators and administrators make better use of microcomputers in schools. The one-day seminars focused on a variety of topics, including Computer Literacy, Basic Skills, Applications, Gifted Education, Vocational Education, Funding, Telecommunications, Administrative Applications and Local Networking.

Educational computing specialists hosted the seminars, which focused on "real-world" problems and practical aspects of educational computing. The seminars provided an opportunity for educators to share their experience and swap software developed at their individual schools.

"There is a huge body of public-domain software available for Commodore computers, and we're now in the process

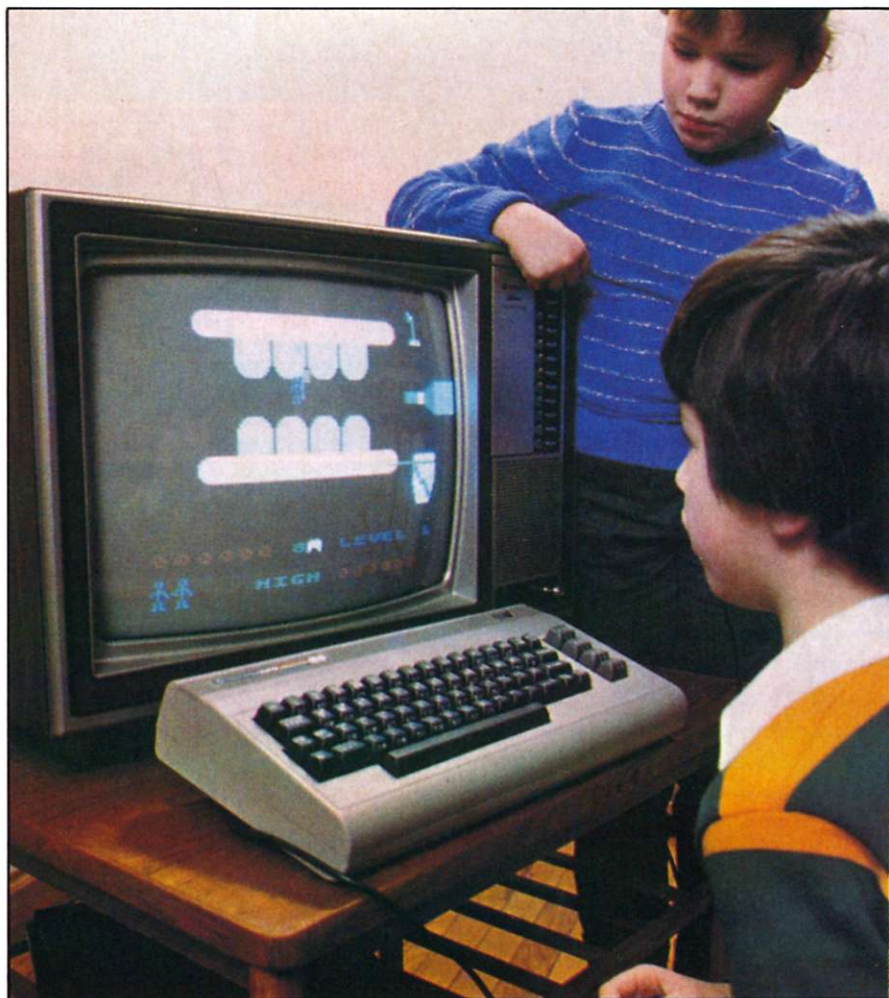
of demonstrating this software and making it available to educators who wish to use it," David Rosenwald, director of education marketing for Commodore, said.

"Often," Rosenwald continued, "excellent software in a particular area, such as mathematics or physics, will be developed by a teacher and used for several years, but not distributed to other schools, which need and want that type of software desperately.

"In addition to providing training and advice for teachers who use computers in their classrooms," Rosenwald said, "we're actively encouraging the exchange of ideas and software so developments at individual schools can be distributed more widely."

Rosenwald indicated that seminar participants were to have an opportunity on a sign-up basis to copy more than 650 public-domain software programs that Commodore has made available to educators. Attendees also received a copy of the PET Emulator program, which allows programs written for the PET/CBM computers to run on the new Commodore-64 computer.

"Most schools in the United States have been using the PET and CBM since the mid-1970s," Rosenwald explained.



Tooth Invaders, a game designed for the Commodore-64, provides youngsters not only with experience in computing, but with tips on cavity-fighting.

PRODUCTS FOR ATARI* 400/800 FROM ELCOMP

BOOKS:

ATARI BASIC – Learning by Using

An excellent book for the beginner. Many short and learning exercises. All important features of the computers are described (screen drawings, special keys, paddles, joysticks, specialized screen routines, sound applications, peeks, pokes, and special suggestions are made that challenge you to change program routines.

Order #164

Games for the ATARI Computer

This book describes advanced programming techniques: player-missile-graphics and use of the hardware. Contains many ready to run programs in BASIC called GUNFIGHT in machine language.

Order #162



"Now, many schools are acquiring the Commodore-64, and the PET Emulator allows teachers to convert their own learning software developed for the PET and CBM to the Commodore-64.

Commodore International's New Prez

Commodore International, Ltd., recently named Sigmund Hartmann president. Hartmann has more than 25 years of

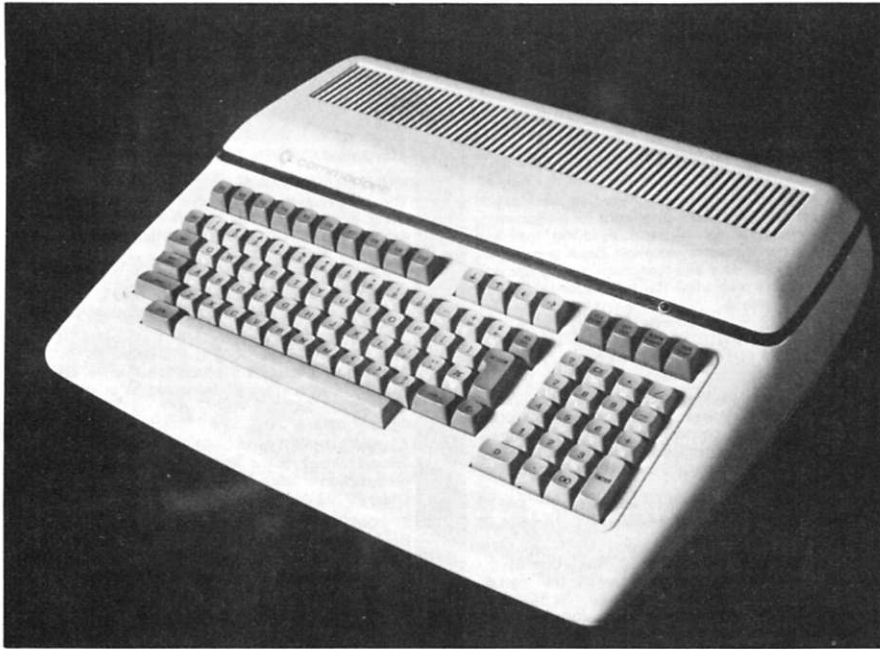
management experience in the computer hardware, software and data processing fields, coming from TRW in Los Angeles, where he held a variety of senior positions over an 18-year period. He has lectured on computer technology at various colleges and universities. He previously worked at Commodore in the early 1970's as general manager of U.S. operations.

Hartmann's immediate responsibilities involve establishing a broader nucleus of small-business, educational, home and recreational software for Commodore microcomputers, including several new models planned for introduction later this year. This represents a major commitment by Commodore to the development and marketing of software.

Broadened Philosophy

In the past, Commodore's emphasis was in computer hardware. Today, its philosophy has broadened. Commodore designs and manufactures computer systems, and that includes software as well as hardware and peripherals. It intends to be a major factor in the software business.

In 1982, Commodore sold more computers than any other company in the world, creating a huge aftermarket for software sales, which are expected to reach 20 percent of the company's hard-



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ware sales over the next 18 to 24 months.

One of the things Commodore learned in the past year is that major retail chains and computer stores prefer "one-stop" shopping for software. Merchandisers, especially, want Commodore designers to provide a complete hardware/software package. That's

Pin Number	Name	Description
1	gnd	Protect
2	TxD	Trans
3	RxD	Receiv
4	RTS	Requ
5	CTS	Clear
6	DSR	Data

Address	Write Access	Read Access
SEFF0	Fill transmitter	Read receiver
SEFF1	Reset chip	Read status register
SEFF2	Command register	Command register
SEFF3	Control register	Control register

Table 2. Addresses and accesses for ACIA.

Control Bits	Function	Data (hex)
7	number of stop bits	0-1 stop bit 1-2 stop bits
6-5	word length	0-8 bits 1-7 bits 2-6 bits 3-5 bits
3-0	baud rate select 1 of 15 available; example: 0E = 9600	06-300 bps 08-1200

Table 3. Control bits and functions for SuperPET serial port.

Command Bits	Function	Data (binary)
7-5	Parity options	xx0-no parity 001-odd parity Tx + Rx 011-even parity Tx + Rx 101-mark parity on Tx Rx disabled 111-space parity on Tx Rx disabled
4	Echo/No Echo	0-no echo (Full Duplex) 1-echo Rx (Half Duplex)
3-2	Transmit control	00-Tx disabled, no RTS 01-Tx enabled, RTS 10-Tx disabled, RTS 11-Tx disabled, RTS transmit BRK
1	Receiver interrupt	0-interrupt enabled 1-interrupt disabled
0	Data terminal ready	0-disable Rx/Tx 1-enable Rx/Tx

Table 4. Command bits and functions for SuperPET serial port.

80-column by 25-line black and white display with business graphics, using an external monitor.

There's a full upper- and lowercase keyboard with a 19-key numeric keypad and ten dedicated function keys. The internal 128K RAM memory can be externally expanded. External interfaces include parallel I/O port, RS-232C, IEEE-488, video interface and cartridge. I assume it supports all standard PET/CBM peripherals.

Bonus Packs

Owners of the Commodore-64 should be interested in the new bonus packs of-

fered by Commodore.

The Disk Bonus Pack is being offered free to anyone who buys a C-64 along with a VIC-1541 disk, or you can purchase it separately. A separate Tape Bonus Pack is also available for those without the disk. The package includes a number of utilities, graphics and sound demos, games, educational and personal programs. The tape version includes five tapes with programs that do not require the disk drive.

The utilities include:

- C-64.Menu—For easier loading of programs from disk.
- Change Disk—To change the disk de-

vice number via software.

- Copy-All64—For copying files from disk to disk.

- 1541 Disk Backup—For creating copies of entire disks with a single drive.

- Dump—Displays disk files in hexadecimal.

- Load Address—Displays the load address of any program file.

- Supermon64.V1—Is an expanded 6502 machine-language monitor.

- PET Emulator—For running existing PET programs on the C-64.

- DOS Wedge—For short-cut disk commands without using Print#.

Graphics and sound demonstrations include:

- Color Test—For adjusting your television monitor.

- Character Editor—For creating alternate character sets.

- HiRes Loaded—For high-resolution, two-color pictures.

- Sprite Editor—Creates sprites for future use with other programs.

- Organ—For a full keyboard solo or polyphonic organ.

- Songs—For sample music tunes.

- Sound Effects—Presents a wide range of sound effects.

Game programs included are:

- Arrow—A snake-type game where you try not to hit yourself.

- Joystick Demo.

- Labyrinth—A challenging maze game.

- Lemonade—Where you run a lemonade stand.

The educational and personal programs include:

- Bits & Bytes—Where you learn some fundamental computer terminology and concepts.

- Disk Commands—Teaches you to use the disk drive.

- Snoopy Math—A math game for youngsters.

- Amortization Table—Creates load-amortization tables for any type of loan.

- Calendar—Can display any particular month in any year.

- Mortgage—Calculates information essential to any mortgage.

SuperPET Serial Port

Some serial interface devices require only two connections, for the transmitted and received data, plus the corresponding grounds.

In RS-232 terms, the SuperPET is considered a Data Terminal and requires five control lines in addition to the data and ground lines. If the device connected to the SuperPET serial port, the Data Set device, cannot supply all the required control signals, then the plug at the SuperPET end needs several jumpers to function properly.

Specifically, one jumper is needed be-

Adding a printer to your computer is a no-brainer in most cases. But deciding which printer to buy is a bit tricky. Do you settle for a printer that has all the bells and whistles and an expensive price tag, or a more versatile printer that costs less? Neither choice may be the best for your computer.

Here's a refreshing option—the STX-80 printer from Star Micro. It's a \$200 printer that's whisper-quiet and is ready to run with most personal computers.

The STX-80 has deluxe features

Status Bit	Function (1 = condition true, 0 = false)
0	Parity error
1	Framing error
2	Overrun error
3	Receiver data register full
4	Transmitter data register empty
5	No data carrier
6	Data set not ready
7	Interrupt

Table 5. Status bits and functions for interrogating ACIA status.

tween pins 4 and 5, and another set of jumpers is needed between pins 6, 8 and 20 (see Table 1). These jumpers will fool the SuperPET into thinking that the serial line is connected properly and the two devices should be able to communicate.

However, there will be no handshaking to prevent data overrun, since the control lines are not really being used.

The SuperPET's serial port is controlled by a 6551 Asynchronous Communication Interface Adapter (ACIA) that features a software-controlled baud rate generator. The ACIA is "seen" by both microprocessors at the same address from SEFF0-SEFF3 or 61424-61427 decimal (see Table 2).

The control register is used to select

the operating mode, word length, number of stop bits and baud rate, among other things (see Table 3).

The command register is used to control parity generation/checking, receiver echo and transmit/receive functions (see Table 4).

The status register is a read-only register and allows you to interrogate the ACIA status (see Table 5).

The RS-232 connector for the serial port is buried inside the SuperPET cabinet. It's a standard 25-pin female sub-miniature-D-type connector.

To get to the connector, you have to remove the two screws at the bottom of the cabinet and lift the top, but please be sure the power cord is disconnected first.

The Program Sampler

I'm currently assembling a collection of sample programs—to be called The Software Sampler—from various companies.

I intend to include programs that are offered as samples or demonstrations of available products and their abilities. The programs supplied will be grouped by system type, with separate disks for the PET/CBM, Commodore-64, VIC-20 and future Commodore systems.

The Software Sampler disks will be distributed via mail at a nominal cost to cover reproduction and handling fees.

Programs will be under 16K in length to allow a reasonable number of programs on each sampler disk. If more than

Software manufacturers will have an opportunity to list programs offered as samples or demonstrations of available PET/CBM, Commodore-64, VIC-20 and future Commodore systems.

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one program is submitted by a single company, the programs will be put on separate sampler disks, whenever possible, to provide more variety on each disk.

An information package will be generated and included on each disk to indicate what is included on that particular disk and whom to contact for catalogs or more information.

The Software Sampler should provide more information on what software is available, the companies selling the software and the quality of their programs. It'll give you a chance to see a variety of programs from a number of companies, at a minimum cost.

So far, more than 175 letters have been mailed to various companies across the country, and the initial response has been overwhelming. It probably will be several months before the companies have their sample programs ready, so watch for more details on when the first disks will be ready for distribution and what will be available.

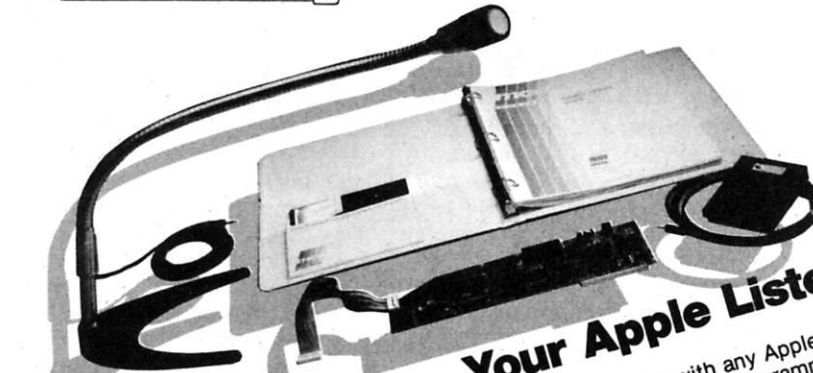
If your company would like to participate and did not receive details in the mail, please write directly to me as soon as possible. □



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Getting Personal

Well, here I am, pounding away on a KeyTronic KB5150 keyboard (courtesy of Pauline Elrod at KeyTronic, PO Box 14687, Spokane, WA 99214). I never could understand what the furor about the PC keyboard was all about. Sure, it's strange, but it has a fine feel to it, and you get used to stretching your fingers to infinity after a while.

The KB5150 (\$235), contrarily, asks you to get used to nothing. Its designers moved the Shift and Return (that's right, no more symbols—just words) back to "where they belong," and that move alone earns a cigar.

Then, they cut that large "plus" key on the keypad in half, and made the bottom half an "enter" key. Great!

Then, in a stroke of absolute genius, they gave us LEDs on Caps Lock and Num Lock. (How many times have I wished for those?)

This keyboard has a totally different feel from PC's old standby. It's lighter, the keys in the middle are flatter (the KeyTronic people would call them ergonomic) and I do believe that when I quit hitting the slash key when I mean to hit the shift key and reeducate my fingers to no torture, it's going to be a whole lot faster.

Don't tell anybody, but I even dropped it—from about three feet. When I picked it up and shook it, not a rattle—and it works fine!

I understand you can get this nice addition for about \$199 discounted, and it's worth it. (Wait until they try to get it back!)

This month, we're going to evaluate some new word processing and Calc-type programs. Then we'll look at three programs that really mean business for the business user. We'll also check out two new DBMS programs—one of them *not* called perfect but close to it and the other *called* perfect but not.

In the "other" category are two new languages, a symbolic mathematics system and one of the best copy programs I've seen. We'll conclude with "my" new graphics program, *Created.bas*, which was generated totally by the PC on the PC.

Texts and Calcs

Two new Calc-type programs are available, and you should be aware of them. From Perfect Software (702 Harrison St., Berkeley, CA 94710) comes Perfect Calc (\$295), which runs in either monochrome or in color on the 64K PC.

Perfect Calc

Perfect Calc is part of the "Perfect" series of software (including Perfect Writer, Perfect Filer and Perfect Speller) that uses the same keystrokes in an attempt at integration. (As I write this, the Writer and Speller programs have not been released; Perfect Filer is reviewed below.)

Perfect Calc has several unique features. One: it's fast. Two: it continually swaps portions not only of its own code but of the data spreadsheet in and out of memory, so you don't need to worry about memory management—even on a 64K machine. The system deals with it for you.

Three: you can have up to seven spreadsheets active at one time (although you're limited to two display windows), you can overwrite one buffer with another (for example, add "expenses" from a subsidiary to a master spreadsheet) and even link spreadsheets together in true fashion so that recalculation on one affects all the others. Also, you can define the order and type (e.g., mutual) of dependency, and in this way deal more adequately with complex calculation requirements.

All these features make Perfect Calc one of the most flexible spreadsheets around.

Unfortunately, Perfect Calc has its drawbacks, and I think they're serious. The program obviously has been written to be exportable to a lot of different computers, because it's not customized to the PC at all. Instead, it relies on control and escape-code sequences, often multiple ones, to invoke its functions.

For instance, you exit the program with <CTRL-X><CTRL-C>, a complex and unmemorable venture at best. "Home," "End," "Pg Up" and the like are not recognized either; instead, the corresponding codes needed for paging upward are <CTRL-Z>.

Even though some attention has been given to organizing these codes, <CTRL> always refers to vertical movement and ESC to horizontal; even with good on-line help, I find this command mumbo-jumbo less than satisfying. Since Perfect Calc uses no menus—instead taking the "blank screen" approach of VisiCalc—these codes are especially problematical.

Next, PC has a limited set of built-in functions (only 20 by my count), and most of them are statistical (ABS, AVG, COUNT) and mathematical (EXP, SQRT, LOG). The lone financial function, NPV, is a good one, but the program needs some expansion here.

Finally, and most seriously, you are unable to "point" to ranges in order to enter them into formulas. That is, instead of being able to write SUM(, and then point to the beginning and ending cells you're interested in, you actually have to write the cell letters and numbers into the formula.

In other regards, like number-formatting, recalculation speed and options, Perfect Calc is competent. I do wish, though, that its authors had taken the trouble to customize it to the PC. That would mean, however, that they couldn't write just one hardbound document to serve for all of its versions, as they have done.

By the way, the Lessons disk of tutorials, coupled with the ones in the manual, make this one of the better programs to learn if you'll put up with all the control/escape codes necessary. And, a reference card is provided (and needed).

EasyCalc

From Norell Data Systems (3400 Wilshire Blvd., PO Box 70127, Los Angeles, CA 90010) comes EasyCalc (\$99.95), available for mono or color and also for a minimum of 64K (more is recommended).

You would swear that Perfect Calc and EasyCalc, when run in color, are from the

Address correspondence to Thomas V. Bonoma, 45 Drum Hill Road, Concord MA 01742.

same basic Calc routine. Two reasons are that the screen colors are identical and the prompts are, identically placed. If these were papers submitted by two students, I'd call them into my office.

There are, however, important differences between the programs. EasyCalc offers neither virtual memory nor dependency spreadsheets, but it does customize itself to the PC's cursor-movement keys. And for the remainder of the commands, it uses a VisiCalc-familiar "command character plus command" sequence.

EasyCalc also has on-line help, contains a tutorial on the disk and has sample files. It has no reference card, though, and it doesn't allow cursor-pointing for formal input.

EasyText

Norell's EasyText (\$79.95) is a text post-processor in the order of Runoff.

With EasyText, you need to prepare your text before using a text editor, and to insert in it at appropriate points various "dot" formatting commands, like ".ce" for center.

When you run your unformatted text through EasyText, it displays it either on the screen or on the line printer. Post-processors, like Runoff, largely have been abandoned since it has been possible to do interactive text processing with on-screen reformatting, a la WordStar.

However, there's much to be said for post-processors—they're quick, they use a relatively limited array of commands that produce powerful effects and they're tolerant of almost any strangeness in input format, as long as the output requirements are specified.

Norell's post-processor is supplied as a ".COM" file, and thus gives the kind of speed expected from Norell products.

SuperWriter

More in the realm of current approaches is Sorcim's SuperWriter (\$295 from Sorcim Corp., 2310 Lundy Ave., San Jose, CA 95131), which I reviewed last month.

I told you I really liked the archiving, disk management and word processing routines themselves, which have all of the good and none of the bad of the old Magic Wand program.

I also told you that the program had a nasty habit of slowing down as the screen fills. I have since received an updated version of the program and had a chat with the marketing people at Sorcim.

Unfortunately, the updated version of the program doesn't fix this problem. Fortunately, the Sorcim people are aware of it; they've even named it ("screen burst") and are working at removing it. By the time you read this, the program should be bug-free, and, in that state, will be one of the more impressive word processors on the market.

If you have one of the versions with "screen burst," get on the phone and tell Sorcim that it's just not acceptable.

Finance, Graphics and Combination Programs

The big software news is Lotus Access Systems' 1-2-3 (see the May 1983 *Microcomputing*, p. 60, for a complete review). While that combination package is attracting all the attention, a few other graphics, business planning and combination software packages are worth looking into.

Micrograph

Micrograph (2Y's Associates Ltd., Box 6733, Station J, Ottawa, Ontario, Canada, K2A 3Z4; \$245), is a graphing package that offers multiple inputs and outputs, along with some statistical/pictorial manipulations in the middle.

Micrograph accepts as input VisiCalc and SuperCalc files, and it has its own in-

put editor. It will output its bar, pie or line graphs on an Epson, an HP7470A plotter or a Calcomp plotter (the plot routines require 128K RAM in your PC and an extra \$50 out of your pocket).

Program interface modules for dBase II and for TK Solver are available at extra cost, and soon 2Y's will release an optional videotext database storage module as well.

The programs themselves, supplied in compiled Basic on a single disk, seem to run well; I had no trouble with the package. The trend-line analysis program, which reports statistics and trend statistics in a line graph format, is especially useful for statistical analyses.

There is no disk-based tutorial and there's only one sample file. At \$295 for the base system, plus \$50 for each plotter

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We aren't the only ones saying that Palantir is easy to use.

In a recent review (80 *Micro*, September 1982) Palantir was compared to Select™ and Script™ 2.0. It was not surprising (to us, anyway) that the reviewer found Palantir easiest to learn and to use. (Select was third.) But even we were surprised when he also rated our tutorial highest. We, too, had believed Select's ads about typing "T" for Teach™.

Just because Palantir is easy, that doesn't mean it can't perform. The reviewer also said,

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Other word processors can't beat it for power, and they never get close on usability.

Palantir doesn't cost you an arm and a leg. You can get Palantir Word Processing, not for the \$745 of Word Star with Mail Merge™, not for the \$595 of Select, but for only \$450. For the closest thing to a dedicated word processor this side of \$10,000, that's not bad.

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module and \$70 for the dBase and other interface modules, though, there should be lots more. The documentation, while adequate, is thin, and could be better.

Micrograph is a competent system, but it's overpriced for what it delivers. For the same \$245 (but minus the statistical manipulations possible), Fast Graphs will do all that Micrograph will, and it will print or plot on anything you've got.

Bottom Line Strategist

From Ashton-Tate (10150 W. Jefferson Blvd., Culver City, CA 90230) is the Bottom Line Strategist (BLS), a decision-support utility for managers to help them determine financial and marketing strategies.

BLS (\$400) requires PC-DOS or CP/M-86, 128K of PC RAM and a color or monochrome monitor (but you must specify which when you buy the package). BLS is useful for developing business plans, evaluating investment opportunities, pricing products, determining break-even points and analyzing competition.

The system consists of a master menu, submenus and output routines (which include paper reports and graphics on the PC screen). An executive overview of the system is provided; so is a flowchart of its operation among the menu choices.

First you'll input your key business assumptions, including ones about growth (development time for new products), rate of customer acquisition and time (in months) to reach 50 percent of maximum sales. The next assumptions set includes cash outlays and asks about fixed costs, variable unit costs and other costs, as well as about pricing policies.

The third area concerns productivity; it asks about the projected inflation rate and the "experience curve." The final assumptional input area concerns some accounting variables, like book value, salvage value and accounting method in use.

Once these things are done, the results per unit input are enormous. First, the program gives you your net present value and break-evens in a four-part summary that includes a cash flow analysis. Next, you can wander around the other options, most of which have graphics, bar or line charting displays.

Your customer growth curve by month, for example, is available from option 1 as a bar graph. Press P and it's dumped on your printer. While using the screen, zoom in or out on interesting portions of the graphs as you wish.

Ashton-Tate has a reputation for producing only the best business software to be had. BLS is no disappointment in that regard. Could you emulate all this in 1-2-3, or VisiCalc? Sure you could, because, except for the zooming and such, it's all marketing/financial modeling. But if you need to write a business plan for that new software venture you have in mind, this is one of the best packages I've seen.

Execute has integrated well its word processing, spreadsheet and DBMS programs.

Execu/Bus

Executec Corp. (3868 Carsen St. S321, Torrance, CA 90503) let me get an early look at its Execu/Bus system.

Execu/Bus, a software integrator and its associated application programs, requires a 128K PC to run. Execu/Bus itself allows data-sharing among all applications supported by the system. Included on the demonstration disks were Execu/Model, Execu/File and Execu/Writer. Missing was Execu/Graph, a graphics processor.

The system, which supports mainframe communications as well as importing/exporting files to the Execu/Bus, works well. There is on-line help available, and a full utilities package (e.g., a directory), like that of the "file and disk manager" routines in 1-2-3.

The individual software packages, such as Execu/Writer, are well-integrated with the PC's function keys and environment. Moving, at least from the spreadsheet to the word processor, is not difficult; it requires an "@include" statement to incorporate the saved spreadsheet file into the memorandum being prepared.

The word processor itself seems to be the best part of the system; it's smooth and has a number of time-saving commands, like "@itemize," which can be inserted into the text to perform functions when run through the post-processor and printing routine (PowerText is a more advanced version of this concept, judging from the Execu/Bus demonstration).

Of course, it's hard to tell much from demonstration programs, where the software must be used rather than more revealingly abused. From what I've seen, though, Executec has integrated well its word processing, spreadsheet, and DBMS programs. Whether the graphics package will also work as advertised when it is released, we'll have to see.

DBMS Programs

DataEase

From Software Solutions (57-C Wedgewood Road, Stratford, CT 06490) comes DataEase, a relational DBMS written in C which runs either in color or monochrome on the PC.

DataEase, which is supplied on four single-sided floppies, requires 128K of memory, two drives and PC-DOS. It is a forms-driven system, so even the configuration tasks for different machines and printers are done on easy-to-fill-in forms.

Configuring a printer, such as the

Prism, is as easy as filling in the blanks with relevant control codes. Those forms are presupplied for Epson, NEC and Diablo printers; the one for the Prism, promised in the manual, was not.

In addition, the system supports both multiple users and multiple security levels, and maintains its control with passwords. Up to 26 different databases can be managed in this manner, each with 20 forms, 255 fields per form, 255 characters per field and 64,000 records per form. The program is not copy-protected, and it can be moved over to a hard disk for large applications.

In use, DataEase is clean, functional and fast. It's "smart" enough, for instance, to keep the most recently used disk sectors in memory to reduce the need to call in from disk. It uses B-tree indexes, automatically kept, for important fields. Full and complete menus are given for each function, and the system is

fully integrated with the PC's function keys to minimize keystrokes.

Your records (forms) can be multiple pages long, can include many field types, including a "multiple choice" one, and are easy to design and reorganize when that becomes necessary.

Perhaps the most outstanding feature of this system, though, is its report generator, which uses a "Query Report Language" (a cross between plain old English and DBMS-ese to simplify the task of pulling data from the system). In addition, full facilities for backing up, restoring and database status are supplied as utilities.

DataEase is a serious, integrated system that has been well-thought-through and well-coded for managers and hobbyists alike.

Where are the problems? Well, in a system like this one, a critic is reduced to nit-picking, so here goes: I wanted default

entry, range-checking and automatic filling options on the data entry system, but I didn't find them (only VersaForm has these features, but it has drawbacks too: see my March 1983 column).

When a manual says it has a predefined form for the Prism printer, it ought to have one. Also, the manual (although complete) has no on-disk tutorial or example files to help with what I found to be tough sledding. A quick-learning handbook, however, is supplied in addition to the reference manual.

If you buy DataEase, Software Solutions says it'll soon be releasing a fully-integrated word processing package and a graphics package for the DBMS.

Perfect Filer

Well, nothing's perfect. Or is it? Here comes Perfect Filer (Perfect Software, 702 Harrison St., Berkeley, CA 94710; \$595), which has its documentation in a

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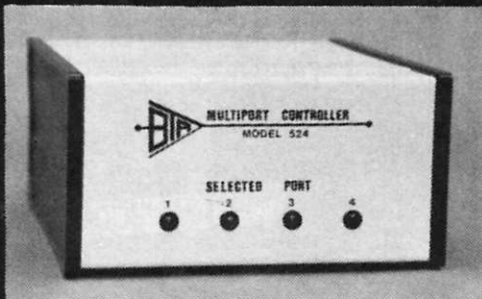
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paperback book form, according to a press release, because the authors believe in making the program perfect the first time, and not in revising.

When they start making claims like that, I start looking very, very closely.

Looking closely didn't help, however, because neither of the two copies of Perfect Filer that were sent to me would work correctly. I called Perfect Software, and on the third telephone call, I reached someone who assured me that the version of the program sent to me was the same as the one sent to dealers, and that I'd "be taken care of." I wasn't.

What follows is from the manual, 'cause I sure didn't see Perfect Filer work.

Perfect Filer is a menu-driven, color or monochrome DBMS that, like its cousin Perfect Calc, is well-written and quite extensive. The program comes with two different tutorial databases on disk (an organizational and individual one), has on-line help and nicely done tutorials in the documentation.

The filer program itself is complete and concise, containing some versatile sort routines, selective subset search and report criteria, and built-in date/time, financial and relational formats.

Data-edit forms and printer forms both can be defined on Perfect Filer, allowing you to manage data viewing and retrieval and to use the same data on the printer for

mailing labels, invoices and straight columnar reports.

Perfect Filer basically uses the same cumbersome command set as Perfect Calc (although the letters sometimes stand for different things). So, in theory, if you wade through the memorization necessary to use one of these programs, you can use all four.

Like Perfect Calc, Perfect Filer is uncus-tomized to the IBM, and it relies on all those control and escape sequences instead. I'll let you know more after I've been able to get a working version of PF, and after I've seen Perfect Writer.

Other Stuff

Microsoft (10700 Northup Way, Bellevue, WA 98004) has released its muMATH/muSIMP-80 for the IBM PC.

In case you weren't aware of these programs and language (there's a whole high-level language here, besides a full applications set), muSIMP is Microsoft's attempt to simplify and rationalize LISP (LISt Processing language) for the micro-computer. LISP is best known in applications involving artificial intelligence.

The muSIMP-80 provided by Microsoft has a full-function set, a resident editor and, generally, pretty much everything you'll need in order to learn a variant of LISP.

But you don't *want* to learn LISP? That's OK, because the muMATH portion of Microsoft's product has one of the best (and only) nonmainframe symbolic mathematics systems available. It will reduce fractions, do algebra and even differentiate and integrate functions for you. As the manual says, it's designed to take the "busy work" out of relational mathematical manipulations so that you can concentrate on learning and exploring.

muMATH is a nice package, although it's not easy for the novice user to work through, because too much time is spent in the documentation on the functions and options of the package and not enough on teaching the user. A good set of disk-based tutorials, which run in mu/SIMP, of course, are supplied with muMATH. More could have been done, however, with the education aspects of this product.

If you ever need to know how to make sense of $3 * X \uparrow 3 + 13 / X \uparrow 1 / 91 + 21 * X = Y + 2X * 3$, muMATH can tell you.

Thread

Thread (\$249 from DWB & Associates), is an interpretive threaded language that claims more understandability than its relatives, like Forth.

A threaded language usually is built from a small set of procedures, or words; other words can be defined from these.

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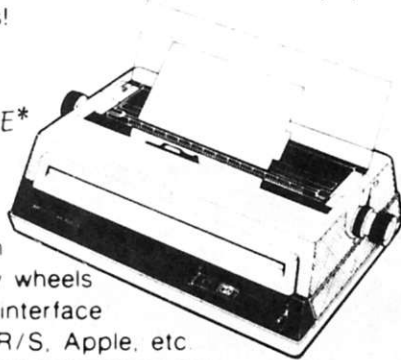
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giving the language both extensibility and compactness. Threaded languages usually, but not always, employ a stack to perform their operations.

Threaded languages are meant to produce more efficient code than higher-level languages can produce; Thread is meant to allow interpretive use (like Basic), which generates code nearly as efficiently as compiled code. The authors have gone to some lengths to adapt their creation to the PC, providing a complete cursor-control routine and even a sample game for the user.

Copy II PC (\$39.95, Central Point Software, PO Box 19730, Portland, OR 97219) is a PC copy-utility for making copies of disks, including uncopyable ones. The program requires one disk drive, 64K of memory and any display mode.

Copy III PC is functionally equivalent to Diskcopy and Diskcomp combined, and it does its job well and quickly. It has several nice additions, too; it automatically takes advantage of any extra memory you may have, giving you, for example, a disk drive speed-check routine. Additionally, there are no troublesome parameters to set or check, and operation is automatic.

I tested the program on several "uncopyable" disks with names you'd know, and it performed flawlessly each time,

causing no trouble to the source disk and producing useable copy. I do not condone and will not countenance pirates, but I do think that buying a \$1000 software package entitles you to as many back-ups as you think you need.

WordVision

Bruce & James, Inc., has introduced the Pioneer's Edition of WordVision for the PC (\$49.95 from Bruce & James, 680 Beach St., Suite 357, San Francisco, CA 94109).

WordVision starts life with two claims to fame. First, it's dirt cheap. Second, it's written by Jim Edlin, of PC magazine fame. The Pioneer's Edition is a prerelease version of WordVision, and, at this time, is incomplete (no on-line help and no centering or right justification), a little glitchy (it can mess up block moves) and not yet in final form.

However, it's a harbinger of what the final package will look like, and I state unqualifiedly that it is the best value you'll ever get for \$50, and maybe for three times that amount.

WordVision is smooth, and cursor movement is as fast as anything I've seen. The feel is great, and operation is definitely designed for folks like me, who want absolute transparency between themselves and the machine.

The program runs nicely in color and

equally well in monochrome, giving you on-screen underlining, boldfacing and other features associated with products like WordPerfect (but without the \$500 price tag). Like WordPerfect, WordVision has a phrase store/recall capability; you don't have to keep typing "WordVision"—two keys can do it for you.

The program has an outstanding disk store/recall routine, one of the best print formatting set-up routines I've seen and, generally, is well-conceptualized. When the final version hits the streets, you won't believe what you can get for \$50. But don't wait, because if you buy the Pioneer's Edition and find some buggies, B&J will refund your purchase price.

There are some things left out of this package, and I don't mean left unfinished. For example, no headers and footers are supported, the macro capability only stores five phrases at a time, and no overtyping is permitted (which is called a feature by B&J, and a problem by me). There is no spelling checker, but I'm sure one is in the works, and only the IBM/Epson printer is supported. That's nit-picking, though; I really can't say enough about this word processor.

Finally, from Banbury Books (37 West Ave., Wayne, PA 19087) comes a book and disk combination for the PC, *The IBM PC Guide* (\$29.95). Author James E. Kelley, Jr., takes the reader from power-

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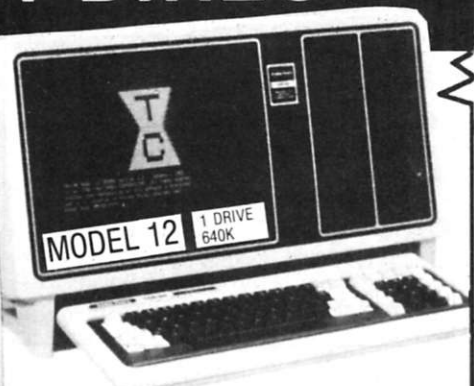
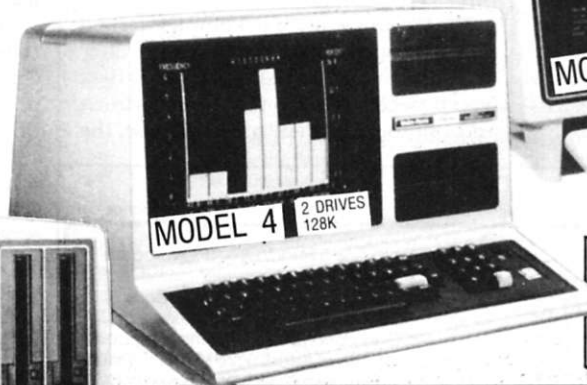
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      9.. Create A Search Module         10.. Create An Aging Module
     11.. Create A Word Processing Module 12.. Create An Ending Module
     13.. Create A Graphing Module       14.. Create A Sound Module
     15.. Create A Date Module           16.. Create An Output Module
      :
      : Program Generator :
      :
     17.. Create An Entire Program       18.. End The Program
  
```

Make A Selection, Then Press The ENTER Key: __

Fig. 1. Main menu screen of The Creator.

on through DOS boot, menus and strings; he even has a chapter on errors the PC can give you. He then devotes chapters to disk operations and file manipulation, report generation, pictures and data files. In each chapter, he clearly marks topics considered advanced, so that the beginning user can skip them or the advanced user focus on them.

The disk contains 35 files (mostly utility programs) and pictures associated with chapters and tasks given in the book. This results in an integrated package.

If you're a learner, you might want to give *The IBM PC Guide* a try.

Created.bas

This month's program was never touched by human hands. . . . Well, almost never. It was generated as four subroutines by a Basic program generator called The Creator (\$300, Software Technology for Computers, 430A Main St., Watertown, MA 02172), and is used by permission of those kind folks as an illustration of what this well-thought-

through program can do for you.

I've reproduced the main menu screen of The Creator in Fig. 1, which accompanies the listing of Created.bas (what would you call it?). Let's walk through what had to be done in order to get the listing.

The first choice I made was to generate separate subroutines, and link them later. (It's also possible to design a program from beginning to end, without leaving The Creator, if you want.)

I entered Create a Title Module, and was allowed to choose what symbol I wanted for the screen border, what I wanted to say (up to five lines per title), where I wanted to say it (from screen lines 3 to 18) and whether I wanted it said in inverse, flashing or normal text.

Then the disks would grind and grind, and finally, 30 minutes later, there would be code, right?

Not at all. I had my title subroutine in three seconds flat!

The Creator wanted to know if I wanted that code output to the printer, and, after that, whether I wanted to save it to disk (you'll need 64K, mono or color screen and one or two disk drives to use the

Creator).

So, having time on my hands, I created an instruction screen that tells you how to use "my" program (it isn't really mine—there are about two lines of original code in the listing). To do this, I pushed Instruction Module, and was faced with a serviceable line (not character) editor that allowed me to enter up to 20 lines of 78 characters each and to modify them before saving.

Code generation after entering? An awesome one second.

Still having time on my hands, I pushed Create a Graph Module. This option creates a stand-alone monochrome bar-charting program that allows you to enter up to 12 data values; it then bar-charts them as raw data, as quarterly data, as percentages and as a line chart.

This option also gives you statistics (minimum, maximum, sum and average) on your data right on the graph. Two or three little inputs later, and a total of six seconds, I had my second module. I saved it to disk.

At this point, I had three modules on the disk and no program. I had planned to make one, though, so I told The Creator to generate code for each module with different line numbers, suitable for merging in Basic. I loaded GRAPH.DTA, merged in TITLE.DTA and then INSTRUCT.DTA, and *voilà!*: the program in Listing 1!

Well, not quite. I got to playing with the Created.bas program, and I thought it was awfully quiet. So I reran The Creator, called Create a Sound Module and was allowed to test my sound as to notes and durations until I found one I liked. The result is merged into the listing as subroutine 7000.

All that remained was to add the appropriate gosubs (The Creator supplied the returns) for the sound routine, and we were done.

Total time investment for this useful, finished program? Fourteen minutes. The total time for me to code that little devil without some help? Three to six hours.

I've not shared with you some of the other modules, which are far more useful than the ones I illustrate here.

The Input Routine Module, for example, makes the setting up of random access or sequential data files a snap; it also does a marvelous job of organizing your prompt screens, establishing data ranges for valid input, and even default values to be input if no entry is made. The Output Module routine is also nicely done, allowing mailing list or columnar report output to be sent to screen or printer.

The search, delete, view, sort and change modules are useful for manipulating and updating disk records. The aging module finds days between dates, and the invoice module generates a program to bill folks for your time. Even the word processing module, which produces a stand-alone line editor for your

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MACRO II - \$100, An improved version of Macro I with expanded linking capabilities and more listing options. Also internal code has been greatly improved for faster more reliable operation.

MACRO III - \$150, An enhanced version of Macro II. Internal buffers have been increased to achieve a significant improvement in speed of assembly. Additional features include line numbers, cross reference, compressed PRN files, form feeds, page parity, additional pseudo-ops, internal setting of time and date, and expanded assembly-time data entry.

DEVELOPER I
Includes: MACRO I (\$80), DEBUG I (\$80), ZEDIT (\$50), TOP I (\$80), BASIC I (\$50) and BASIC II (\$100)
NOW \$150
\$440 Value

DEVELOPER II
Includes: MACRO II (\$100), MACRO III (\$150), LINKER (\$80), DEBUG I (\$80), DEBUG II (\$100), BUSINESS BASIC (\$200), QED (\$150), TOP II (\$100), ZDDT (\$40), ZAPPLE SOURCE (\$80), MODEM SOURCE (\$40), ZTEL (\$80), and DISASSEMBLER (\$80).
NOW \$350
\$1280 Value

DEVELOPER III
Includes: QSAL (\$200), QED (\$150), BUSINESS BASIC (\$200), ZTEL (\$80) and TOP II (\$100)
NOW \$300
\$730 Value

COMBO
Includes: DEVELOPER II (\$1280), ACCOUNTING PACKAGE (\$300), QSAL (\$200) and 6502X (\$150)
NOW \$500
\$1930 Value

LINKER - \$80 A linking loader for handling the linkable modules created by the above assemblers.

DEBUG I - \$80, A tool for debugging Z80 or 8080 code. Disassembles to CDL/TDL mnemonics compatible with above assemblers. Traces code even through ROM. Commands include Calculate, Display, Examine, Fill, Goto, List, Mode, Open File, Put, Set Wait, Trace, and Search.

DEBUG II - \$100, A superset of Debug I. Adds Instruction Interpreter, Radix change, Set Trap/Conditional display, Trace options, and Zap FCB.

6502X - \$150, A 6502 cross assembler. Runs on the Z80 but assembles 6502 instructions into 6502 object code! Similar features as our Macro assemblers.

QSAL - \$200, A SUPER FAST Z80 assembler. Up to 10 times faster than conventional assemblers. Directly generates code into memory in one pass but also to offset for execution in its own memory space. Pascal like structures repeat, until if, then, else while do begin end, case of, Multiple statements per line, special register handling expressions, long symbol names, auto and modular assembly, and more! This one uses ZILOG Mnemonics.

QED - \$150, A screen editor which is both FAST and easy to learn. Commands include block delete, copy, and move to a named file or within text, repeat previous command, change, locate, find at start of line, and numerous cursor and window movement functions. Works with any CRT having clear screen, addressable cursor, clear to end of line, clear to end of screen, and 80X24.

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8XD	8" CDL Extended Density (1024 bytes/8 sectors/77 tracks) 616K
5SD	5.25" Single Density (TRS80 Model I, Versafloppy I, Tarbell I)
5EP	5.25" Epson Double Density
5PC	5.25" IBM PC Double Density
5XE	5.25" Xerox 820 Single Density
5OS	5.25" Osborne Single Density
5ZA	5.25" Z80 Apple (Softcard compatible)

TPM INFO When ordering TPM I or II, in addition to Disk Format, please specify one of the following codes:

CODE	DESCRIPTION
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NSSD/Z	North Star Single Density for Zapple I/O
NSDD/H	North Star Double Density for Horizon I/O
NSDD/Z	North Star Double Density for Zapple I/O
TRS80-I	TRS-80 Model I (4200H Offset)
TRS80-II	TRS-80 Model II
VI8	Versafloppy I 8"
VI5	Versafloppy I 5.25"
TPM-II:	
VI8	Versafloppy II 8" (XD)
VI5	Versafloppy II 5.25"
TRS80-II	TRS-80 Model II (XD)

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ZTEL - \$80, An extensive text editing language and editor modelled after DEC's TECO.

ZEDIT - \$50, A mini text editor. Character/line oriented. Works well with hardcopy terminals and is easy to use. Includes macro command capability.

TOP I - \$80, A Text Output Processor for formatting manuals, documents, etc. Interprets commands which are entered into the text by an editor. Commands include justify, page number, heading, subheading, centering, and more.

TOP II - \$100, A superset of TOP I. Adds: embedded control characters in the file page at a time printing, selected portion printing, include/merge files, form feed/CRLF option for paging, instant start up, and final page ejection.

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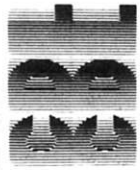


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use and/or incorporation into another program, is well-done within the limits of Basic and the constraint that you have to edit whole lines. à la Runoff.

The Create a Whole Program option automatically manages the interleaving of line numbers and merging of all the modules into one grand program, so that you don't have to do it. But it isn't hard, even when done by hand.

The most outstanding feature of the Creator, in my opinion, is its speed. It takes just seconds to generate most code and minutes to generate most programs.

There are things The Creator is not suited for, and you can deduce them from the menu. You wouldn't, for example, want to try to generate color graphics with this system...it can't be done. And, although the designers claim otherwise, I sure wouldn't want to write a text adventure on it. But for utility and business programming, within the limits of most users, it's just fantastic.

Oh, I should mention that you can do anything you'd like with the finished code—sell it, give it away or even publish it in a magazine! □

Listing 1. Created.bas graphics program.

```

Time: 15:23:09 Date: 03-03-1983

"CREATED.BAS"...A machine-generated graphics program!

Generated by THE CREATOR

with a little help from T. Bonoma

10 'A Program to Generate Bar Graphs...Itself Machine-Generated!
20 'USED BY PERMISSION OF SOFTWARE TECHNOLOGY FOR COMPUTERS
30 ' 430A Main Street, Watertown, MA 02172
40 ' (617) 923-4334
50 'The following lines were not totally machine-generated:
60 ' - all lines preceding 100
70 ' - the subroutine call in line 250
80 ' - the "return" in line 4200
100 CLS:WIDTH 80:A1$="": FOR T=1 TO 78: A1$=A1$+"":NEXT:LOCATE 1,1:PRINT A1$
110 FOR I =2 TO 23:LOCATE I,1:PRINT "":TAB(79);"":NEXT
120 LOCATE 3, 31:COLOR 0,7: PRINT "A CREATOR SAMPLER": COLOR 15,0
130 LOCATE 5, 10:COLOR 0,7: PRINT "TITLE MODULE INSTRUCTIONAL MODULE AND GRAPHIN
G MODULE MERGED": COLOR 15,0
140 LOCATE 7, 12:COLOR 0,7: PRINT "USED BY PERMISSION OF SOFTWARE TECHNOLOGY FOR
COMPUTERS": COLOR 15,0
150 LOCATE 9, 27:COLOR 0,7: PRINT "GENERATED BY T. V. BONOMA": COLOR 15,0
160 LOCATE 20,23:PRINT "... Press Any Key To Continue ..."
165 GOSUB 7000 'gosub SOUND...a module I created and linked in later.
170 LOCATE 23,1:PRINT A1$
180 PT$=INKEY$:IF PT$="" THEN 180
190 CLS
200 REM - END OF TITLE ROUTINE
250 GOSUB 4000 'I added this line my little ole' self...TVB
500 REM - Graphing Program -- Bar, Dtr, % and Scattergram
505 GOSUB 7000 'another call to subroutine sound...
510 CLS:KEY OFF:WIDTH 80
520 DIM A(12),B$(12),A$(12),D(12)
530 LOCATE 1,30:COLOR 0,7:PRINT " Graph Program ":COLOR 15,0
540 LOCATE 3,1:INPUT "Title For Graph (46 Char. max):",TL$:IF LEN(TL$)=0 THEN 5
40
550 IF LEN(TL$)>46 THEN 540
560 B3=INT(((62-LEN(TL$))/2))+8
570 LOCATE 5,1:INPUT "Vertical Axis Title (6 Char. Max):",VT$:IF LEN(VT$)<1 OR L
EN(VT$)>6 THEN 570
580 PP$=STRING$(4,219):TA$=STRING$(63,196):PB$=STRING$(4,223)
590 LOCATE 7,1:INPUT "Bottom Title (46 Char. max):",BE$:IF LEN(BE$)=0 THEN B4=1:
GOTO 620
600 IF LEN(BE$)>46 THEN 590
610 B4=INT(((62-LEN(BE$))/2))+8
620 CLS
630 DATA "Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sep","Oct"
640 DATA "Nov","Dec"
650 FOR J=1 TO 12:READ B$(J):NEXT
660 TT=0:HN=0:TP=0:LN=0
670 LOCATE 1,28:COLOR 0,7:PRINT " Data Entry ":COLOR 15,0:PRINT :FOR M
=1 TO 12
680 YY=CSRLIN:XX=POS(0)
690 LOCATE YY,XX:PRINT "Data For "B$(M):INPUT "":A$(M):A(M)=VAL (A$(M)):IF LEN(
A$(M))=0 THEN 690
700 TT=TT+A(M):IF M=1 THEN LN=A(M):HN=A(M):GOTO 730
710 IF A(M)<=LN THEN LN=A(M)
720 IF A(M) >=HN THEN HN=A(M)
730 NEXT M
740 TP=TT/12:SC=INT(HN/10):FOR I=1 TO 10:R(I)=(11-I)*SC:NEXT
750 CLS
760 VT=HN:LT=LN:AV=TP
770 GOSUB 780:GOTO 790
780 LOCATE 25,B4:PRINT BE$:RETURN
790 FOR J=1 TO 12:LOCATE 23,10+(J-1)*5:PRINT B$(J):NEXT
800 GOSUB 810:GOTO 890
810 LOCATE 1,1:PRINT VT$:TAB(B3):TL$
820 LOCATE 1,69:PRINT CHR$(218)LEFT$(TA$,11):FOR F=2 TO 16:LOCATE F,69:PRINT CHR
$(179):NEXT :LOCATE 17,69:PRINT CHR$(192)
830 LOCATE 2,70:COLOR 1,0:PRINT " Legend ":COLOR 15,0
840 LOCATE 4,71:COLOR 1,0:PRINT "Max. Value":COLOR 15,0:LOCATE 5,71:PRINT USING
"#####.###":VT
850 LOCATE 7,71:COLOR 1,0:PRINT "Min. Value":COLOR 15,0:LOCATE 8,71:PRINT USING
"#####.###":LT

```

More →

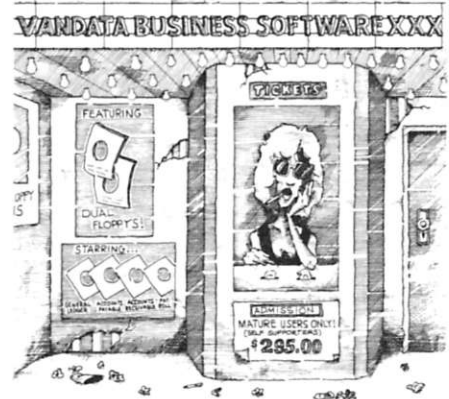
Listing continued.

```

860 LOCATE 10,73:COLOR 1,0:PRINT "Average":COLOR 15,0:LOCATE 11,71:PRINT USING "
#####.###":AV
870 LOCATE 13,73:COLOR 1,0:PRINT " Total ":COLOR 15,0:LOCATE 14,71:PRINT USING "
#####.###":TT
880 LOCATE 16,73:PRINT LEFT$(PP$,1);" graph":LOCATE 17,70:PRINT LEFT$(TA$,1):RE
TURN
890 GOSUB 900:GOTO 910
900 FOR J=2 TO 22:LOCATE J,8:PRINT CHR$(179);NEXT :RETURN
910 GOSUB 920:GOTO 960
920 FOR J=2 TO 20 STEP 2:LOCATE J,1:PRINT USING "#####":R(J/2):LOCATE J,7:PRINT
CHR$(196);NEXT
930 LOCATE 22,8:PRINT TA$
940 LOCATE 22,8:PRINT CHR$(192);:REM This draws the corner
950 RETURN
960 FOR M=1 TO 12:J=(A(M)/HN)*9:IF J=0 THEN 1000
970 FOR K=21 TO 21-INT(2*J) STEP -1
980 LOCATE K,10+(M-1)*5:PRINT PP$;NEXT K
990 LOCATE 22,10+(M-1)*5:PRINT PB$;
1000 NEXT M
1010 S$=INKEY$:IF S$="" THEN 1010
1020 CLS
1030 Q(1)=A(1)+A(2)+A(3):Q(2)=A(4)+A(5)+A(6):Q(3)=A(7)+A(8)+A(9):Q(4)=A(10)+A(11
)+A(12)
1040 C$(1)="QTR-1":C$(2)="QTR-2":C$(3)="QTR-3":C$(4)="QTR-4"
1050 QT=Q(1):QL=Q(1):FOR T=1 TO 4:IF Q(T)<QL THEN QL=Q(T)
1060 IF Q(T)>QT THEN QT=Q(T)
1070 NEXT T:OV=(Q(1)+Q(2)+Q(3)+Q(4))/4:VT=QT:LT=QL:AV=OV:GOSUB 780
1080 FOR J= 1 TO 4:LOCATE 23,14+(J-1)*15:PRINT C$(J):NEXT
1090 REM - Do quarter graph
1100 GOSUB 810:GOSUB 900:PRINT
1110 SD=INT(QT/10):FOR T=1 TO 10:RQ(T)=(11-T)*SD:NEXT :FOR J=2 TO 20 STEP 2:LOCA
TE J,1:PRINT USING "#####":RQ(J/2):LOCATE J,7:PRINT CHR$(196);NEXT
1120 LOCATE 22,8:PRINT TA$:LOCATE 22,8:PRINT CHR$(192);:REM - corner
1130 FOR G=1 TO 4:J=(Q(G)/QT)*9:IF J=0 THEN 1170
1140 FOR K=21 TO 21-INT(2*J) STEP -1
1150 LOCATE K,10+(G-1)*15:PRINT PP$PP$PP$;NEXT K
1160 LOCATE 22,10+(G-1)*15:PRINT PB$PB$PB$;
1170 NEXT G
1180 S$=INKEY$:IF S$="" THEN 1180
1190 CLS:VT=HN:LT=LN:AV=TP
1200 GOSUB 780:FOR J=1 TO 12:LOCATE 23,10+(J-1)*5:PRINT B$(J):NEXT
1210 GOSUB 810:GOSUB 900:FS=INT((HN/TT)*100):FOR T=1 TO 10:D(T)=FS-(T-1)*(FS/1
0):NEXT T
1220 FOR J=2 TO 20 STEP 2:LOCATE J,1:PRINT USING " ###_%":D(J/2):LOCATE J,7:PRIN
T CHR$(196);NEXT
1230 GOSUB 930:FOR M=1 TO 12:J=((A(M)*100)/TT)/FS*10:IF J=0 THEN 1270
1240 FOR K=21 TO 22-INT(2*J) STEP -1
1250 LOCATE K,10+(M-1)*5:PRINT PP$;NEXT K
1260 LOCATE 22,10+(M-1)*5:PRINT PB$;
1270 NEXT M
1280 S$=INKEY$:IF S$="" THEN 1280
1290 CLS
1300 VT=HN:LT=LN:AV=TP:GOSUB 780:FOR J=1 TO 12:LOCATE 23,10+(J-1)*5:PRINT B$(J)
:NEXT
1310 GOSUB 810:GOSUB 900:FOR J=2 TO 20 STEP 2:LOCATE J,1:PRINT USING "#####":
R(J/2):LOCATE J,7:PRINT CHR$(196);NEXT
1320 GOSUB 930:FOR M=1 TO 12:J=22-INT((A(M)/HN)*20)
1330 LOCATE J,11+(M-1)*5:PRINT CHR$(248)
1340 NEXT M
1350 S$=INKEY$:IF S$="" THEN 1350
1360 CLS:LOCATE 1,33:PRINT "Ending Routine"
1370 LOCATE 3,10:PRINT "1.. Run Again With The Same Data"
1380 LOCATE 6,10:PRINT "2.. Enter New Data"
1390 LOCATE 9,10:PRINT "3.. End The Program"
1400 LOCATE 15,23:INPUT "Enter Your Selection Number (1-3):",W$:W=VAL(W$):IF W<1
OR W>3 THEN 1400
1410 CLS
1420 IF W=1 THEN 750
1430 IF W=2 THEN CLS:CLEAR:GOTO 520
1440 END
1450 REM - End of Graph Program. Generated by THE CREATOR on 01-01-1980 at 00:01
:03.
4000 CLS
4010 PRINT "This program accepts data input for 12 values. It then generates so
me"
4020 PRINT "rudimentary univariate statistics and presents the user with several
"
4030 PRINT "graphic representations of his/her data. The program automatically"
4040 PRINT "generates a bar chart of the frequencies entered; when you push the
space"
4050 PRINT "bar it regenerates the data as quarterly (e.g. month 1 plus month 2
plus 3)"
4060 PRINT "data and redisplay it. Press the space bar again and your data wil
l"
4070 PRINT "be redisplayed as percentages of the yearly total."
4080 PRINT "Press the space bar one final time and the data are transformed from
a "
4090 PRINT "bar graph into a point graph. Finally you'll be given the options t
o"
4100 PRINT "do it all again with the same data. Or you can input new data. Or
you"
4110 PRINT "can end the program."
4120 PRINT
4130 LOCATE 22,23:PRINT "... Press Any Key To Continue ..."
4140 PT$=INKEY$:IF PT$="" THEN 4140
4150 CLS
4160 REM - End Of The Instruction Routine.
4200 RETURN "I also had the wisdom to put this little line in...TVB
7000 REM - This Is A Sound Subroutine. It Should Be Called From Your Main Progra
m As A Subroutine.
7010 FOR T =1 TO 3
7020 SOUND RND*1000+37,2:SOUND RND*1000+37,2:SOUND RND*1000+37,2:SOUND RND*1000+
37,2:SOUND RND*1000+37,2:NEXT T
7030 RETURN
7040 REM - End Of The Sound Subroutine, Go Back To Your Main Program.

```

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What's Next For Printers?

Move Aside, Ink Jets And Lasers

It's our job here in the Overview section to spot trends and to keep you advised on the course of the microcomputer industry so you can make the best hardware and software investments.

This month, we'll be hardware-oriented. We'll look at new developments in printers, another internal modem for the IBM PC and a unique communications device that gives even an acoustic modem an auto-answer and autodial capability.

Pursuing Pretty Printing

Dot matrix printers are fast, reliable and economical. But for most of us, they're also a compromise. The quality of typical dot matrix printing isn't really what we want, but we sacrifice print quality for cost.

We want what has come to be called "letter quality." That is, we want the finished page to look like it was typed on an office typewriter. Usually, the print

produced by the IBM Selectric typewriter is the real (but unstated) standard of quality.

The letter-quality "look" comes from either a type ball, a thimble, or a daisy wheel striking the paper. But these kinds of devices are complex, and complex mechanical devices that operate fast either are prone to frequent failure or are expensive.

Bring Out the Daisy Wheels

The industry has responded to this situation in two ways: first, slow but inexpensive daisy wheel printers were brought out; second, the quality of dot matrix print was improved.

The first successful low-cost daisy wheel was the Smith-Corona TP-I. This American-made product has been popular with people who are sure they want the finest in print quality, but don't want to pay the price usually commanded by the daisy wheel and thimble machines.

The TP-I prints at about 12 characters per second. This is more than twice as

fast as most of us can type, but it seems like a snail's pace compared to the other 45-55 cps letter-quality machines.

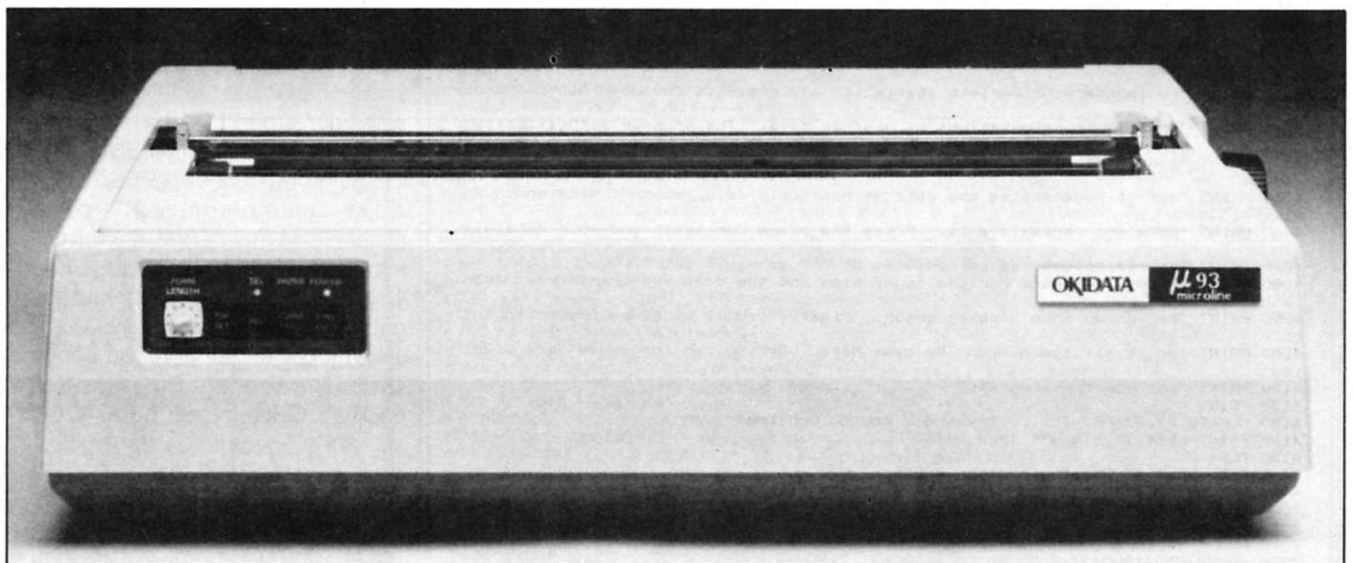
The TP-I also has been slow to be integrated with a form-feed mechanism. The need to stop and insert a new sheet of paper for each page makes the whole printing process comparatively slow.

As this article reaches print, Smith-Corona should be announcing a new TP-II printer. This machine is supposed to be quieter, faster, stronger and able to handle a good form-feed mechanism.

So if you really need the finest in letter-quality printing, but you don't want to pay the highest price, the TP-II should be a good investment. I'll tell you more after I have had my hands on one.

Over on the dot matrix side of the house, things have been moving fast. The Japanese are the pioneers in dot

Address correspondence to Frank J. Derfler, Jr., PO Box 691, Herndon, VA 22070.



The Microline 93 is one of two printers recently released by Okidata. This high-speed printer produces 160 characters per

second, but can also produce correspondence-quality printing at about 40 cps.

matrix technology; they were driven to that position by their own need for printers that can handle the ideographic and other character sets associated with non-European languages. They consistently have been making dot matrix printers that go faster and can produce well-formed and flexible character sets.

Microline 93

I have been using a new Okidata Microline 93 for several months, and I'm impressed with the machine.

The ML 93 is one of two new printers released by Okidata. The ML 92 has a carriage able to take only standard-size paper; the ML 93 can accept paper up to 16 inches wide. Otherwise, the printers are identical. Both are fast (160 cps), flexible and inexpensive.

The feature of the Microline family I enjoy most is the ability to produce impressive-looking "correspondence-quality" print at about 40 cps.

"Correspondence quality" is a phrase invented by a marketing person to describe print that is probably good enough to use in business documents and certainly good enough to use in letters to your friends, but not quite as good as "letter quality."

Correspondence-quality printing is created by using two passes of the print-head over the line and moving the paper slightly between passes. My analogy is that it looks as if it were typed on a portable typewriter using a cloth ribbon.

The Microline 93 and 92 printers both have solid cast-metal bases and weigh about 30 pounds. They use a nine-pin printhead that has large cooling fins to help it radiate the heat that this fast-moving part can build up. The ribbon winds and unwinds between two good old reliable (and inexpensive!) spools.

The 160 cps bidirectional printing capability of the Microline printers produces an output quickly. This speed of printing has changed my writing habits and increased my consumption of paper considerably.

I have proven to myself that I'll never proofread from a CRT as well as I do from a piece of paper. I don't quite understand why this is true, but according to some discussions on CompuServe's Authors' Special Interest Group, others seem to have the same problem. I can turn out a better article or chapter if I pull off a printed copy and rework it on paper.

The Okidata Microline has made this much easier to do. I can pull off a normal dot matrix copy of ten double-spaced pages of text in about two minutes. Then, after I have made my changes and corrections, I can enter one control code and get a correspondence-quality copy of the text that will please the poor editors and proofreaders who have to read the stuff I send in.

The Okidata ML 92 has a suggested retail price of \$699. The ML 93 has a sug-

gested retail price of \$1249. Aside from the ability to go out to 136 columns of regular-size print, the ML 93 also has the ability to reproduce 64 block graphics shapes. You do, however, have to write the software to send the printer the codes necessary to use these graphics shapes.

Controlling the Printer

Speaking of codes, there is a standardization problem in the printer industry. No two manufacturers use the same control codes to designate the various kinds of printing. They do use a wide variety of commands for printhead positioning and graphics printing.

Since IBM adopted the Epson printer for use with the IBM PC, many software manufacturers have integrated the Epson coding scheme into their graphics packages. The Okidata printers have the ability to produce graphics, but their command set is not the same as the Epson's, and the resolution is not as fine.

If you try to create a graph on an Okidata printer using the graphics software with the Epson commands, you'll get some very strange output. If you want to use an Okidata with a software package designed for some other printer, you have two choices: you can either modify the software to produce the proper output codes, or install a translator in your operating system.

Modifying the software to produce the proper output can be simple. Some software packages have utility programs allowing you to patch the main program. Other programs allow direct entry of control and escape codes through the keyboard.

If you're using WordStar under CP/M, for example, you can patch the program with the installation utility to allow full

underlining, various print fonts and expanded and emphasized print with the Okidata printers. You signal the printer through the use of the control-P codes in WordStar. (Table 1 provides the values to insert into the WordStar installation program, as well as some of the control-P codes to use.)

An approach to use with programs specifically designed for a different printer is to have the operating system catch the graphics commands and translate them into something the Okidata understands properly.

Application Techniques, Inc., markets an EP2OKI (Epson to Oki) translation program for the IBM PC. You can obtain different versions of this program—versions that integrate themselves into either PC DOS or CP/M 86 and catch and translate the commands for the different fonts and sizes of print as they go out the printer port. EP2OKI costs only \$50 and it's simple to use. You can call the program from a batch command file when you boot a disk. (I don't know about you, but between the memory check for 412K of RAM and a list of about five programs in my batch file, I can turn on my IBM PC, go cut the lawn, take a shower and sit down at the machine just as the disk stops turning. Well, it *seems* that long!)

EP2OKI will not allow your Okidata printer to use all of the Epson graphics codes but it's useful for word processing and other programs that may contain only the Epson commands for underlining, overstrike and other special functions.

Applications Techniques expects to have other translation and screen-capture programs for the Okidata and IDS printers available soon. If you need this kind of software, you can contact Appli-

Label	Description	Value
PSOMTH	Printer Overstrike	FF
BLDSTR	Bold Face	03
DBLSTR	Doublestrike	02
PSCRLF	CR + LF	02.0D.0A
PBACKS	Backspace	00
PSHALF	Half LF	00
ROLUP	Superscript	02.1B.4A
ROLDOW	Subscript	02.1B.4C
RIBBON	Correspondence Mode	02.1B.31
RIBOFF	Data Processing Mode	02.1B.30
PALT	Alternate Pitch (10CPI)	01.1E
PSTD	Standard Pitch (10CPI)	01.1E
USER1	12.0 CPI	01.1C
USER2	17.0 CPI	01.1D
USER3	Double Width Print	01.1F
USER4	Continuous Underline	01.1B.1F

For continuous underlining, use control-P RC to begin the underline and control-P RD to end.

Table 1. Installation codes used to customize WordStar for the Okidata series of printers. See p. 3-9 in the Installation section of the WordStar manual for instructions on how to use the installation labels and addresses. This table is valid only for CP/M versions of WordStar.

cations Techniques, Inc., 80 Townsend St., Pepperell, MA. Phone them at 617-433-9934.

The Okidata ML 92 and ML 93 are fine machines and they represent the state-of-the-art in dot matrix printers in this price range. But one question that this column always tries to answer is, "Where are we going?"

Haven't we pushed dot matrix to look about as good as it can look? Can we ever improve on mechanical designs so they are less expensive and more reliable?

Soothsaying

In the case of printers, I have a favorite prediction: the Japanese and Americans have a technology that they understand well, but they haven't hooked it to a micro...yet. That technology is photocopying.

Many photocopying technologies are available, but almost all modern methods make good-looking copies on plain paper at high speeds, particularly if you measure their output in cps. Many of the photocopying methods are able to interface with electronic characters and graphics generators.

I predict that the next real progress in printers will come from devices descended from copying machines rather than typewriters. Sure, ink jet printers and laser printers will be on the market, but

the winning technology will involve using photocopying techniques.

The output from these devices looks excellent, the text can be rotated, blown up or reduced, the costs are reasonable and the technology is off the shelf.

Do you want to make a million bucks? Buy the photocopying product from a major manufacturer, do the integration and market it with great fanfare. I only want one percent.

Ven-Tel PC Modem Plus

A few months ago I reviewed the Cactus Technology internal modem for the IBM PC. At that time, I predicted that Cactus Tech would have a lot of competition.

Now, Ven-Tel, an old and established firm in the commercial modem market, has released an integrated modem and software package that plugs into the IBM PC and gives complete auto-answer and autodial features with one of my favorite terminal emulation software packages: Crosstalk.

The Ven-Tel PC Modem Plus is contained on one full-length (13½-inch) IBM PC accessory card. The card includes both the modem and a separate serial port.

The modem itself is normally addressed as Comm 1 by PC communica-

tions software, although it can become Comm 2 by changing a jumper. The serial port on the card is always addressed as Comm 2, if it is turned on. If you have another serial port in the system, you can arrange the ports in various combinations, but you cannot have two ports at the same address at the same time.

Installing the Ven-Tel board includes the attaching of a jumper wire to the PC's speaker. This jumper allows you to listen to the telephone line so you can hear possible busy signals and the sound of the modem dialing. The addition of the jumper does not interfere with the normal uses of the speaker when the modem is not activated.

I wish, however, that Ven-Tel had put a volume control on the board for the speaker. Different telephone installations have different levels and different people have different tolerances for the sound of dial tones and modem squeals. A small volume control would be a nice-to-have feature on this modem.

Built for Expansion

The modem card itself is built for expansion. A separate plug strip on the board is designed to accept a piggyback 1200-baud expansion board using the Bell 212 signaling scheme.

The basic PC Plus is a 300-baud Bell 103 modem, but the \$360 Speed Adapter

Circle 53 on Reader Service card.



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turns it into a complete modem, capable of 1200- and 300-baud service. The Crosstalk software can handle speeds well in excess of 1200 baud.

PC Modem Plus sells for \$389. The combined PC Modem Plus and PC Modem Speed Adapter package retails for \$749.

Because it is a direct-connect modem, the PC Plus simply plugs into the telephone line through a standard RJ-11 wall jack. Two jacks are included on the modem board so you can connect the modem to the wall and then connect a standard phone to the modem for normal voice use.

The outstanding feature of the Ven-Tel PC Plus is that it responds to the same commands used by the Hayes Smart-Modem. The success of the Hayes stand-alone modem has made its command set the most widely used in the industry. Certainly, more software is available to support the Hayes modem control codes than those of any other hardware.

Microstuf's Crosstalk program is packaged with the PC Plus, but any program that will interface with the Hayes Smart-Modem will also work with the PC Plus.

Crosstalk Talk

Crosstalk, as readers of this column know by now, is a program that has extensive help functions, operates capably

**If you want
reliable and almost
"invisible" performance,
then the Ven-Tel PC Plus
provides an answer.**

at high speeds and has flexible file-capture and file-transmission features for use with information utilities and electronic message systems. It also has a special protocol file transmission scheme for highly accurate file exchanges between Crosstalk-equipped systems.

Additionally, the Crosstalk transmission protocol is used by Transporter, an automated message-exchange system marketed by Microstuf. Transporter can use the Ven-Tel PC Plus modem to dial telephone numbers automatically at pre-selected times, establish contact with other Crosstalk or Transporter systems, exchange files and sign off.

Transporter also can receive calls and exchange files without operator attention. The Ven-Tel PC Plus package does not include Transporter, but the software can be used with the modem without

modification.

The advantage of this kind of integrated modem over a stand-alone device is that it does not need extra cables and connectors, it does not take up extra room and it is less expensive. The only real disadvantage is that you cannot see the flashing lights indicating that data is coming and going.

If you want reliable and almost "invisible" performance, then the Ven-Tel PC Plus provides an answer. The complete package includes the modem board with the speaker jumper, a nice manual in an IBM PC style binder and a copy of Crosstalk. The list price is \$389.

For more information, write to Ven-Tel at 2342 Walsh Ave., Santa Clara, CA 95051, or call them at 408-727-5721.

Flexibility from TNW

Let's suppose you have any kind of modem and any kind of computer or terminal. Let's also suppose that your budget is limited but that you want to have auto-answer and autodial capabilities. Your modem may be only an acoustically coupled device, but it works fine as a modem and you don't see why you should buy a new one. The folks at TNW have a new device for you.

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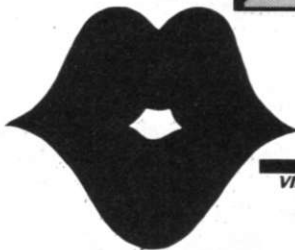
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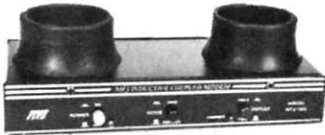
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MODEM \$129⁹⁵

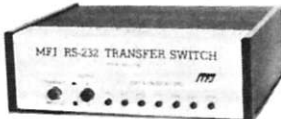
No other acoustic modem gives you all these features at this low price.



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Apple II, II Plus: software and cable for modem, MFJ-1231, \$39.95. Plugs into game port. No serial board needed.



It's like having an extra port

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with microcomputers for a number of years. Those of you with Commodore systems probably know that TNW was one of the first to help PET owners to communicate. Its new release, Operator, is an intelligent device that connects between your computer, your modem and the telephone line. It responds to ASCII commands from your computer or terminal and automatically dials outgoing calls or answers a ringing phone line.

Operator monitors the line and listens for the carrier tones coming from the distant end. If these tones fail or drop off, Operator hangs up the line.

Operator is easy to use, but its command set is unique. It does not respond to the same commands as the Hayes Smart-Modems or other "smart" devices. This means that software designed with the Hayes command set will not work with Operator without modification.

Because of its internal programming and its function as a line monitor, Operator will function only with Bell 103 type modems. That means it can be used only at speeds up to 300 baud. It will not function at higher baud rates.

Operator can provide a unique alternative for you if you want autodial and auto-answer service without paying the price for a complete new modem.

If you have an acoustic modem such as the Novation Cat, you would install Operator by plugging it in series with the modem in the RS-232 line. Attach Operator to the telephone line and plug a standard telephone instrument into Operator's second PL-11 jack. Turn on the modem, put the telephone handset in the

modem's cups and turn to the keyboard.

You can use any terminal program to type instructions out to Operator. It can dial using either tones or dial pulses. When Operator or the modem do not detect a modem carrier on the telephone line, Operator simply sits and waits for your command. You can tell it to dial simply by typing DIAL.

After Operator dials the call, it leaves the job of generating modem tones and exchanging information up to your local modem. If you want to get Operator's attention while it is on line, you send it an "@ " sign.

TNW's Operator fills a unique slot in the data communications community. If you want automatic capability, but don't want your old modem to gather dust on a shelf, call for the Operator.

TNW Corp. is located at 3444 Hancock St., San Diego, CA 92110. (phone 619-296-2115).

Nifty Styling

I usually don't introduce you to products that I haven't personally seen or used, but VoiceStation, the Sydis integrated workstation, is such a good-looking device that I just had to mention it.

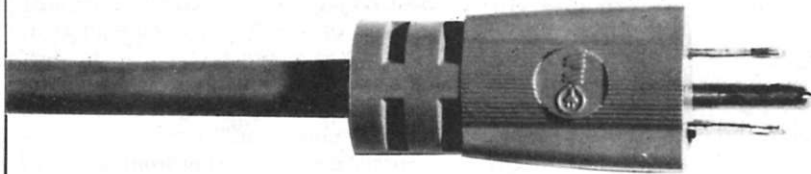
VoiceStation isn't a microcomputer, but rather a terminal for use with computer systems. It combines a telephone, a mouse for data entry and a full-function keyboard.

The styling of this unit is outstanding and I know I'd like to have one on my desk. □



VoiceStation, developed by Sydis, Inc., of San Jose, CA, is a uniquely packaged office workstation integrating voice, text and graphics. Note the use of a mouse and touch keys around the screen for manipulating data. For more information, contact Sydis, Inc., 4340 Stevens Creek Blvd., San Jose, CA 95129 408-243-8430.

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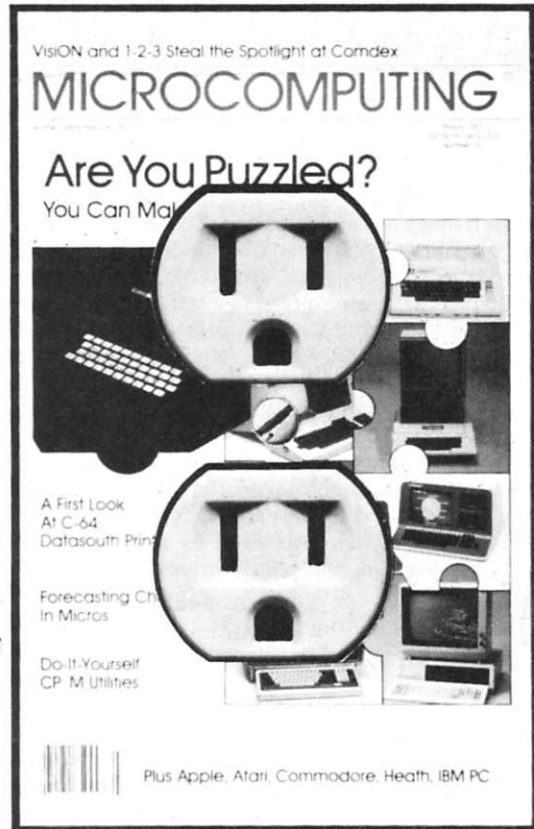
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LETTERS TO THE EDITOR

QX-10 Article Convincing

Jim Hansen's article on the Epson QX-10 ("The Quintessential Computer," April *Microcomputing*, p. 66) confirmed my interest in the computer. However, it was the article on the Valdocs operating system ("Vive la Difference! Valdocs," May *Microcomputing*, p. 86) that finally convinced me to purchase the QX-10.

I must congratulate Mr. Hansen on the articles. They were well-written and addressed all the questions a potential purchaser would ask. They were convincing, not as a clever sales pitch, but as an honest appraisal without vested interest.

Silvio A. Bedini
Washington, DC

Two 1-2-3 Corrections

Thank you for publishing my review of 1-2-3 (May *Microcomputing*, p. 62). There are, however, a couple of small points that ought to be corrected.

First, the main subheading under the title claims that 1-2-3 is capable of word processing. It is *not*, at least in this version.

Second, there is an omission in Table 1 (p. 63), which compares 1-2-3 to the MBA. Specifically, under the word processing row, the MBA should be credited with its good but still first-generation word processing capabilities. That is to say, this entry for the MBA should read "Rudimentary. Heads, page numbers, and other features supported. Suitable for short documents."

Thomas V. Bonoma
Concord, MA

Is That a Quote?

I have been trying to enter Russell King's File Manager program ("A Small Wonder," March *Microcomputing*, p. 72) into my Timex-Sinclair 1000 computer.

There seems to be a hangup in line 8275 of the program. My computer will not enter unless I make the line read 8275 Let AS=AS+ " ". In fact, trying to print the original (with one quotation mark) blew the program, but I had been saving by tape, so I didn't lose it all.

What should line 8275 be?

Donald Bauerle
Radnor, OH

Reply:

An ending quote is required in line 8275. It is easy to miss in the listing, because there are 20 blanks between the quotes. These blanks are there to ensure that old label fields will be entirely erased when new field descriptions are entered.

Russell King
Regina, Sask.

Yes, It Will

I would like to thank you and Thomas Bonoma for the review of VersaForm you published in the March 1983 issue (p. 10) of *Microcomputing*. I would like, however, to correct an error of fact in that review.

Table 1 (p. 12) stated that when doing a report, VersaForm would not select forms on the basis of column items. If it were true, this would indeed be a major restriction, but, in fact, VersaForm *will* select items on the basis of its column items, or indeed any item in a form.

This is one of VersaForm's major strengths, and it is the feature that

enables a user to obtain a report, for instance, of sales by product from a file of invoices.

Joseph R. Landau
President
Applied Software Technology
Los Gatos, CA

Put It in Writing

I would like to comment on the sudden purchases of low-cost computers and the actual use of the devices. I think it would be interesting to observe how many of these are sitting on a shelf collecting dust because of the awful documentation. With rare exceptions, I have yet to see a home computer sold that can answer the question of, "Well, I completed the user's manual—now what?"

Surely we are passing from the days when only hobbyists work these things. Now the general consumer is interested, responding to the ads and the promises. However, there is a genuine frustration on his part as he attempts to reason, "Is this a '0' or an 'O'? Do they mean, 'I' or '1'?"

I am mentioning the above to demonstrate a case in point. The low-cost computer's hardware and software is excellent. The documentation is terrible.

Obviously, I come from a noncomputer background. Due to poor documentation, I am unable to use my Commodore disk drive to its full potential; I still do not understand how to put a VIC-20 into its advertised high-resolution graphics, despite the fact that I read articles constantly praising its capability in this regard. Even the articles are too technical, generally written for engineers.

I read the other day that the Apple II manuals were written, reviewed and revised months before the product was made available. If this is true, it is about time. We need more of such professionalism.

But unless someone can convince me otherwise, I believe the home-computer industry is leaving its supporters abandoned with lousy paper material.

My main point is that the general non-hobbyist consumer will not subscribe to ten computer magazines, cruise the bookstores and travel miles to user's group meetings to see the "Wonders of Recipe Files" when the Rotoflex is still quicker.

I would love to hear Bill Cosby do an album on home computers. Recall his car repair story about the A-frame needing replacement. His response was, "Riiight! What's an A-frame?!" The principle is the same in computers. Disk drive

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manuals throw one immediately into the terminology—"Riiight! What's a sector?"

Larry Rymal
Joaquin, TX

Computers in Real Estate: A Sleeping Giant

I believe that the use of computers in the real estate industry is a sleeping giant about to awaken.

I plan to publish listings of available real estate software. The listing will show what the program will do, the language it will operate on, the type of hardware it will run on, the price and the name and address of the source. There will be no charge for the listing.

I would appreciate receiving information from all sources outlining the information they would like to have included. I need everything and every program related to the real estate industry.

J. Don Shields
Drawer 758
Shelby, NC 28150

Everybody Has a Dream

Heroes, motivation, dreams! These are the things that make life worth living.

You start with a hero figure, someone to look up to, to respect and admire. Then you pick a dream. You combine thoughts of heroes with thoughts of dreams and you get motivation—a burning desire to accomplish, to create, to achieve.

However, these three jewels of life need a fourth for completion. They need guidance and perseverance. Guidance is the better of the two, because it would obviously make things easier. But with enough dreaming, perseverance can begin to take root and grow.

Wayne Green, you are the hero—one of the keys, one of the jewels. You, and all the other men and women who put dreams, hopes and ideas into the mind's of others, plant the seeds for future successes.

Even if I never succeed, Mr. Green, you've given me something to pass on to others: the love of accomplishment and the satisfaction gained from reading about the joy you obtain from your success—financially, intellectually and emotionally.

But for now you are my inspiration and motivation, so please don't ever listen to anyone who tells you he's turned off by words of business strategy or dreams of other accomplishments for yourself or others.

I'm waiting for your first book on how you started your magazines!

Bryan Greifinger
New Hyde Park, NY

Do you owe us any money?

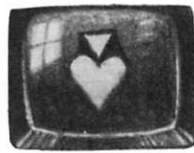
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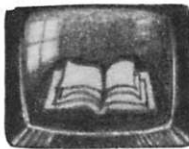
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The C-64 Sounds Off!

The C-64 contains a truly sophisticated sound effects synthesizer. The author gives you a comprehensive look at its music-making capabilities and introduces you to other sound effects it can generate.

By Richard F. Daley

When it comes to sound, no other computer on the market can hold a candle to the Commodore-64.

The C-64 replaces the simple tone generator that's found in many computers with a true three-voice sound synthesizer. This synthesizer is of musical instrument quality. Furthermore, the programmer has control over a large number of parameters: Waveform, Frequency, Volume, At-

tack/Decay and Sustain/Release. This allows the programmer to design each note's tone color and to shape the envelope.

Music-Making Machine

However, sound generation is of considerable complexity. You'll need to learn all about the Poke command, which involves a long list of memory locations, as well as the values you

should Poke into those locations. It also means that any complex sounds or musical scores may well be quite slow.

To generate a sound on the C-64, you need to do several things:

1. *Initialize synthesizer*—You need to set such parameters as Volume, Waveform, Attack/Decay and Sustain/Release. These parameters can be constants, unless your sound effect needs to change them.

2. *Sound note*—The frequency of the note is set and the delay parameter, if any, is handled.

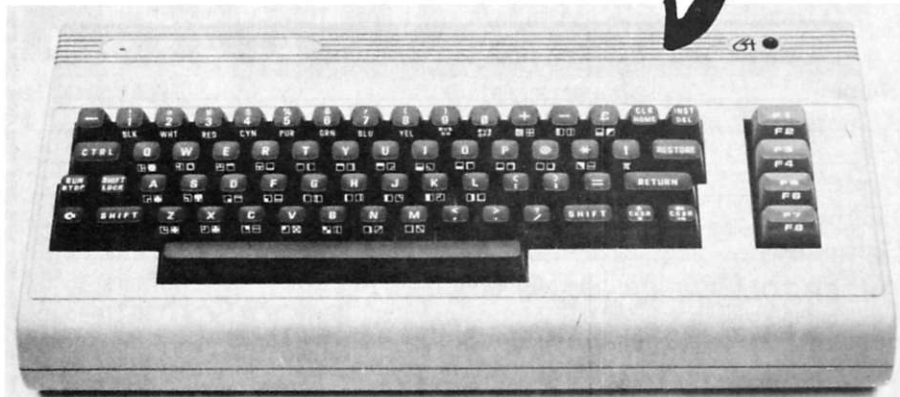
3. *Quit*—This will take care of the shutting down of the synthesizer. Usually, this can be accomplished by setting the Volume, Attack/Decay and Sustain/Release to zero.

Before we proceed any further, let's define some of the terms associated with the generation of sound effects on the C-64.

- *Volume*—Entering a volume between zero and 15 will set all three synthesizers to the same volume level. A volume of 15 is standard.

- *Waveform*—The waveform is the shape of the output frequency from the computer. Each voice has its own waveform and can be set independently. There are four waveforms, and each sounds different from the others. These waveforms are Triangle, Sawtooth, Pulse (or Square) and Noise.

This parameter also is called the Control Setting. When it is properly set, the ADSR (Attack/Decay/Sustain/Release) feature also is activated.



Address correspondence to Richard F. Daley, Tamarack Software, PO Box 247, Darby, MT 59829.

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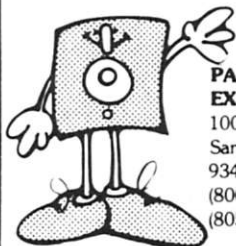
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Variable	Function
#A	Contains value for Attack/Decay
#F	Screen location of last note
#H	High part of frequency
#L	Low part of frequency
#P	Low part of pulse duty cycle
#R	High part of pulse duty cycle
#S	Value for Sustain/Release
#T	Screen location of current note
#W	Waveform for current note

Table 1. List of variables used in Listing 1.

● **Attack/Decay**—Think of the Attack as the rate at which the note or sound rises to its maximum value. The Decay is the rate at which the note or sound falls from its highest volume to zero.

There are four rates of Attack and four rates of Decay. These correspond to the eight bits of the byte used by the synthesizer to define the rates of Attack and Decay.

The following diagram might help you understand this:

Attack			
High	Medium	Low	Lowest
128	64	32	16
Decay			
High	Medium	Low	Lowest
8	4	2	1

You can combine Attack and Decay settings by adding up the values above. The highest Attack rate would be 240 (128 + 64 + 32 + 16). The lowest Attack rate would be 16. Highest

Attack with Medium Decay would be 244.

Oboes and Xylophones

Different settings can sound like different instruments. For example, a triangle waveform with an Attack/Decay value of 96 sounds like a flute, while a value of 9 sounds more like a xylophone, and a value of 190 sounds like an oboe or clarinet.

● **Sustain/Release**—The Sustain value will determine how long a note or sound will stay at its maximum volume. The Release value will determine the rate at which the volume of a note is cut off.

There are four rates of Sustain and four rates of Release. These are determined just like the Attack/Decay values.

Sustain			
High	Medium	Low	Lowest
128	64	32	16

Listing 1. Example of sound generation on the Commodore-64. Program is written in Vanilla Pilot from Tamarack Software.

```

100 R : ** CLEAR THE SCREEN AND SET
110 R : ** BACKGROUND AND BORDER COLORS
120 R :
130 S : C
140 S : B0,0
150 S : R8
160 S : 05
170 T : COMMODORE-64 PIANO
180 S : S2
190 T :
200 S : R7
210 T : BY TAMARACK SOFTWARE
220 S : 015
230 R : *** INSTRUCTIONS ***
240 T : THIS PROGRAM WILL SIMULATE SEVERAL
250 T : DIFFERENT INSTRUMENTS. THESE ARE THE
260 T : PIANO, HARPSICORD AND ORGAN. YOU
270 T : PLAY THE INSTRUMENT IN THE KEYBOARD.
280 T : THE KEYS YOU USE TO PLAY THE NOTES ARE:
290 S : 04
300 T : Q W E R T Y U I O P @ *
310 S : 05
320 T : PRESS ANY KEY TO CONTINUE.
330 W : #
340 S : 015
350 S : C
    
```

More →

Listing continued

```

360 T :IN ADDITION, THERE ARE SEVERAL OTHER
370 T :IMPORTANT KEYS: THE S KEY WILL END THE
380 T :PROGRAM. THE NUMBER KEYS 1, 2, 3 AND 4
390 T :WILL CHANGE TO A DIFFERENT INSTRUMENT.
400 S :04
410 T :PRESS ANY KEY TO CONTINUE.
420 W :#
430 S :0
440 S :B12,12
450 S :01
460 S :D4
470 S :R5
480 T :A A## B C C## D D## E F F## G G##
490 C :W=65
500 C :P=0
510 C :R=255
520 C :A=9
530 C :S=0
540 S :H
550 T :PIANO
560 R :** CHECK FOR KEY PRESSED AND PROCESS
570 R :** IT. IF A NEW NOTE THEN SOUND IT.
580 R :** OTHERWISE NO SOUND.
590 R :
600 *NXTNOTE W :*
610 M :1,2,3,4
620 UY:STVOICE
630 M :Q,W,E,R,T,Y,U,I,O,P,@,*S
640 JN:NXTNOTE
650 M :S
660 JY:END
670 B :
680 U :MATCH
690 JN:NXTNOTE
700 B :V1,M15,W#W,A#A,S#S,P#P,R#R,H#H,L#L
710 S :02
720 S :H
730 S :D5
740 S :R#F
750 T :
760 S :H
770 S :D5
780 S :R#T
790 T :*
800 C :F=T
810 R :** SET THE PARAMETERS FOR EACH
820 R :** THE VOICES.
830 R :
840 J :NXTNOTE
850 *END B :
860 E :
870 *STVOICE C :P=0
880 C :R=0
890 M :1
900 CY:W=17
910 CY:A=0
920 CY:S=240
930 SY:01
940 SY:H
950 TY:ORGAN
960 EY:
970 M :2
980 CY:W=33
990 CY:A=9
1000 CY:S=0
1010 SY:011
1020 SY:H
1030 TY:HARPSICHORD
1040 EY:
1050 M :3
1060 CY:W=65
1070 CY:A=9
1080 CY:S=0
1090 CY:P=0
1100 CY:R=255
1110 SY:01

```

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Release
High Medium Low Lowest
8 4 2 1

The maximum value of Sustain (240) will cause a note to play indefinitely, much like an electronic organ.

● *High/Low Frequency*—Each note requires two values for each frequency. These values can be calculated by the following equation:

$$\text{Value} = \frac{\text{Frequency}}{0.0596}$$

$$\text{High} = \frac{\text{Value}}{256}$$

$$\text{Low} = \text{Value} - (\text{High} \times 256)$$

It is important that you take only the integer of each value. For example, the High and Low for a frequency of 440 Hz is calculated:

$$\text{Value} = \frac{440}{0.0596} = 7382$$

$$\text{High} = \frac{7382}{256} = 28$$

$$\text{Low} = 7382 - (28 \times 256) = 214$$

Simple Sample

The following example will create a single note on the C-64:

```
100 POKE 54296,15
110 POKE 54277,190
120 POKE 54278,248
130 POKE 54273,17: POKE 54272,37
140 POKE 54276,33
150 FOR DELAY = 1 TO 300: NEXT DELAY
160 POKE 54276,0: POKE 54277,0:
    POKE 54278,0
```

Let's look at this program in some detail. Note that each of the parameters (except the volume) is for voice 1.

Line 100—Sets the volume of the sound effect to the maximum value.

Line 110—Sets the Attack/Decay value. Here you can have a number between 0 and 255. The Attack/Decay value sets the slope to define how fast a note rises and falls from its peak volume.

Line 120—Sets the Sustain/Release value. Sustain/Release will determine how long the note will stay at a certain volume before releasing it.

Line 130—Frequency determination. The value can be calculated from the above equations or taken from Appendix M of the C-64 user's guide. Here the note is a Middle C.

Line 140—Chooses one of the four wave forms. Here we are using a sawtooth waveform.

Line 150—A timing loop that sets the duration of the note.

Listing continued.

```
1120 SY:H
1130 TY:PIANO
1140 EY:
1150 C :W=129
1160 C :A=9
1170 C :S=0
1180 S :011
1190 S :H
1200 T :NOISE
1210 E :
1220 R :** SET THE PARAMETERS FOR THE
1230 R :** THE VARIOUS NOTES.
1240 R :
1250 *MATCH
1260 M :Q
1270 CY:H=14
1280 CY:L=107
1290 CY:T=5
1300 EY:
1310 M :W
1320 CY:H=15
1330 CY:L=70
1340 CY:T=8
1350 EY:
1360 M :E
1370 CY:H=16
1380 CY:L=47
1390 CY:T=11
1400 EY:
1410 M :R
1420 CY:H=17
1430 CY:L=37
1440 CY:T=14
1450 EY:
1460 M :T
1470 CY:H=18
1480 CY:L=42
1490 CY:T=17
1500 EY:
1510 M :Y
1520 CY:H=19
1530 CY:L=63
1540 CY:T=20
1550 EY:
1560 M :U
1570 CY:H=20
1580 CY:L=100
1590 CY:T=23
1600 EY:
1610 M :I
1620 CY:H=21
1630 CY:L=154
1640 CY:T=26
1650 EY:
1660 M :O
1670 CY:H=22
1680 CY:L=227
1690 CY:T=29
1700 EY:
1710 M :P
1720 CY:H=24
1730 CY:L=63
1740 CY:T=32
1750 EY:
1760 M :@
1770 CY:H=25
1780 CY:L=177
1790 CY:T=35
1800 EY:
1810 M :*
1820 CY:H=27
1830 CY:L=56
1840 CY:T=38
1850 EY:
1860 E :
```


Line 160—Turns off the Waveform control, Attack/Decay and Sustain/Release settings.

(Phew! Can you imagine programming a complex sound?)

To be fair, some of these parameters are set at the beginning of the program and then left alone.

Vanilla Pilot

Tamarack Software has made the process of generating sound on the C-64 much simpler.

For instance, Vanilla Pilot is an interpreter with commands that make generating a sound effect easy. The Basic program we just looked at would appear in Vanilla Pilot as

```
100 B:V1,M15,W33,A190,S248,L37,H17,D30
```

In Pilot, a command is given by a single letter, followed by a colon, which is, in turn, followed by the appropriate list of parameters. In this case, the B: (beep or sound command) tells the computer that what follows is a list of parameters to transfer to the sound synthesizer.

Let's look at each of these parameters. They act much like the poke commands in the Basic program, except that you don't need to remember all the addresses for the pokes.

●V—Selects the voice to be used by the sound. Can be either 1, 2, or 3.

●M—Sets the volume at the maximum value.

●W—Selects the waveform; in this case, the sawtooth.

●A—Sets the attack/decay parameter.

●S—Sets the sustain/release parameter.

●L,H—The low and high bytes of the frequency of the sound.

●D—Delay parameter in units of 1/60 of a second. Thus, the sound, in our example, will continue for about .5 seconds.

By varying the frequency of the synthesizer, the waveform and the ADSR parameters, you can easily duplicate the sound of almost any instrument. Indeed, an organ, electric piano or harpsichord can be available with the computer keyboard used to make music. Plug the computer into a good stereo sound system and you'll be certain that it's the equal of a synthesizer costing many times the computer's modest price.

Sounds—Other Than Music

Of course, the capabilities to make music can be used to make realistic sound effects as well. A gunshot sound can be synthesized in Basic like this:

```
100 FOR VOLUME = 15 TO 0 STEP -1
110 POKE 54296,VOLUME
```

```
120 POKE 54276,129
130 POKE 54277,15
140 POKE 54273,200: POKE 54272,40
150 NEXT VOLUME
160 POKE 54296,0:POKE 54277,0
```

The same sound can be made in Pilot like this:

```
100 C:I=15
110 C:E=0
120 *SHOOT B:V1,W129,A15,H40,
          L200,M#1
130 P:2
140 C:I=I-1
150 C:$=I
160 M:#E
170 JN:*SHOOT
180 B:
190 E:
```

Following are explanations of the seven Pilot statements in this short program.

●C—Compute. This means that following the colon, there are some arithmetical expressions that need to be evaluated.

●B—Beep. This was discussed earlier. Note that the volume here (M) is a variable in line 120. And note that a beep without parameters, as in line 180, will turn off the synthesizer.

●P—Pause. This will delay the execution of the program for intervals of .021 seconds.

●M—Match. Match the contents of the answer field with whatever follows the colon. In this case, we wish to match variable I with variable E. If there is a match, then we set a flag to Yes; otherwise, it's set to No.

●J—Jump. This transfers control of the program to the label following Jump. In this case, it's conditional; the jump command will be executed *only* if the variable I does not equal variable E.

●E—End. This is optional in most cases in Pilot. It simply says this is the end of this program.

Listing 1 provides a more complete musical instrument program written in Pilot. The program is a simple, one-octave synthesizer with the organ, electric piano, harpsichord and shooting sound. If you have a C-64 and a copy of Vanilla Pilot, type it in and try it. Otherwise, study the listing; it demonstrates several useful techniques for C-64 sound effects. ■

For more on the C-64's sound-making capabilities, see the March 1983 Microcomputing, pp. 102-104, "Commodore Launches a Winner," by Robert Baker.

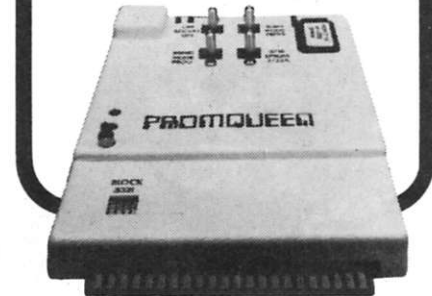
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By Frank J. Derfler and Doug Ferrata



The complete system—computer with two disk drives, 12-inch monitor and detached keyboard.

Morrow Designs, Inc., an old-time manufacturer of disk drives and microcomputer component boards, recently entered the low-cost microcomputer market. Its new system, Micro Decision, is a Z-80A-based unit with 64K of RAM and 2K of EPROM.

The Micro Decision can be purchased by itself, with either one or two disk drives, or as a complete system with its own terminal. The complete system, with two single-sided drives, sells for \$1990.

Like the Osborne 1 and Kaypro II, it comes with its own set of software packages for word processing, spreadsheet applications, Basic programming, and data management. A menu-driven software package designed to guide the inexperienced user through the most commonly used options of CP/M is included.

The Micro Decision talks to the outside world via two RS-232C serial ports on the back—one for the terminal and one for a printer or modem. In addition, there's an auxiliary RS-232C serial printer port on the back of the monitor. There is, however, no parallel port and, like the Osborne and Kaypro, no expansion capability.

Morrow's offering has basically the same capabilities as other Z-80 systems in the same price range, but there are a few interesting features

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that make it unique.

The Disk Drives

The Micro Decision has room in its case for two 5¼-inch, double-density, soft-sector disk drives and an expansion port on the back for two more. The drives used are either single-sided Shugart or double-sided Qume, with capacities of 200K and 400K (formatted), respectively. Two software packages used with the disks, foreign-drive-emulation and virtual disk capability give the Micro Decision capabilities that set it apart from most other small computers.

Foreign-drive-emulation lets users overcome one of the biggest problems in the world of microcomputers—the jungle of disk drive formats. (Emulate, in this case, means the capability to read and write on disks that have been formatted on other systems.) The Micro Decision can emulate disk formats from three other micros: Osborne 1, Xerox 820 and IBM PC under CP/M-86.

To change format, simply run one of the disk-emulation programs provided (OSB.COM, XER.COM or IBM.COM). For example, to make drive B an IBM drive, enter IBM B: after the CP/M prompt. The system will respond:

"Disk Drive B: is now an IBM drive." To return the drives back to Morrow format, either execute MORROW.COM or press the reset button. Morrow is working on additional conversion programs, including the Osborne and Kaypro double-density formats.

The second unique feature of these drives, virtual drive capability, allows you to simulate the use of up to 26 disk drives at the same time. If you select a drive other than those physically connected, the system will reassign drive A as the new drive. For instance, if you ask for drive E, the system will pause and display the message: "Your left-hand drive is being reassigned as drive E. Exchange diskettes and press Return."

While this feature would be useful especially for single-drive systems, it can come in handy regardless of the number of drives attached.

An example in the manual best illustrates this. Suppose you are in WordStar and are about to save a document, but you're not sure if there is enough room on the disk to store it. Since WordStar does not allow you to swap disks without returning to the starting menu, the text you have created would normally be in jeopardy.

With the virtual disk capability, though, you have an alternative. You can mark the top and bottom of the

A Capsule Look At Micro Decision

Manufacturer

Morrow Designs, 600 McCormick St., San Leandro, CA 94577.

List Price

\$1990 (for complete system, with two single-sided drives).

Standard Features

Twelve-inch green phosphor screen, which displays 7×11 dot matrix within 9×12 dot field; 92-key keyboard, including a 14-key calculator keypad, eight cursor-control keys, seven programmable function keys and four editing keys; Z-80A microprocessor, 64K of RAM, 2K EPROM; two RS-232C serial ports (one for the terminal and one for a printer or modem); auxiliary RS-232C serial printer port; CP/M operating system; floppy disk drive controller for up to four drives.

Software

(Supplied with system) CP/M 2.2, Microsoft Basic, WordStar, Correct-It, LogiCalc, BaZic, Personal Pearl, Pilot.

Documentation

User's guide; separate guides for each software package supplied with system.

Circle 351 on Reader Service card.

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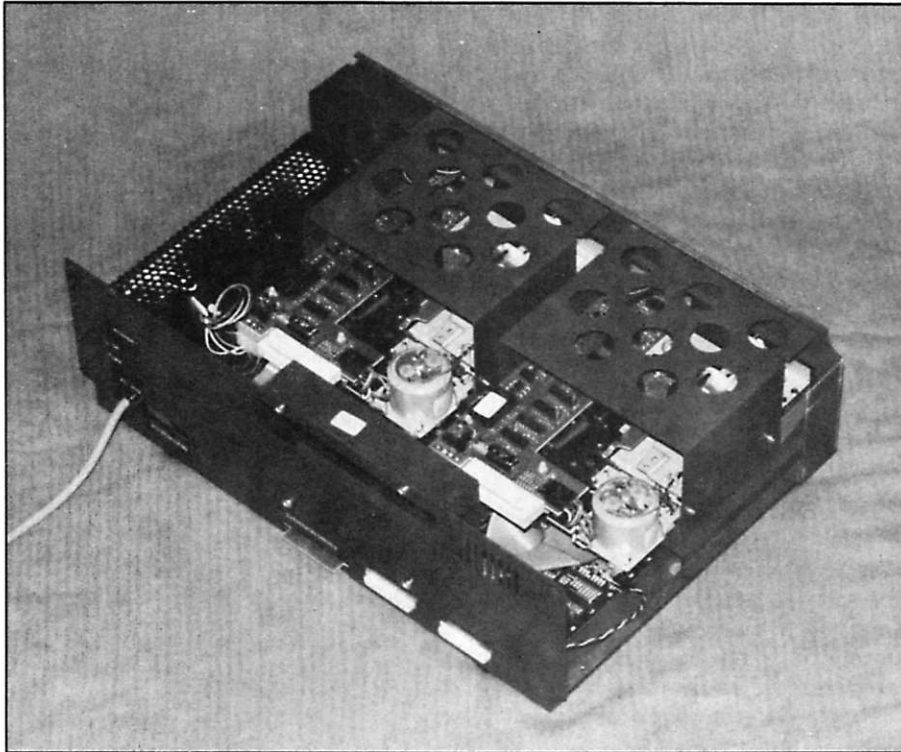
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Inside view of the computer shows two disk drives and the power supply. Processor and memory are below the drives.

document (ctrl KB/ctrl KK), execute the Block Write command (ctrl KW), enter the document name on a non-existent drive (ex: E:Document), wait for the message, load a new disk into drive A, then press return. The document would be saved on the new disk.

You also can combine the virtual disk and disk-emulation capabilities. The entry XER C: would make drive A: emulate a Xerox drive in the virtual mode.

The Terminal: A Lear-Siegler ADM-20

The terminal that comes with the Micro Decision is a Lear-Siegler ADM-20, and it's supported only by Morrow Designs. (Note: Due to higher-than-anticipated demand, some Micro Decisions have been shipped with the Freedom 100 terminal in lieu of the ADM-20.)

The ADM-20 consists of a monitor with an easy-to-read, 12-inch, non-glare, green phosphor screen and a detached keyboard. Characters are generated using a 7x11 dot matrix within a 9x12 dot field; they include true lowercase descenders.

Monitor controls include a brightness knob and an on/off switch. The keyboard, an IBM Selectric-type, is connected to the monitor with a six-foot coil cord.

The keyboard's 92 keys include a

14-key calculator keypad, eight cursor-control keys, seven programmable function keys and four editing keys. All keys have autorepeat capability at 15 cps. A built-in self-test function is automatically initiated whenever the terminal is powered up.

Features of the monitor include dual-intensity, reverse video, underlining and blinking. The cursor can be set either as a block or an underline, and can be made either steady or blinking.

These features are controlled by two keys—Set-Up and Save. Set-Up gets you into the configuration mode by displaying 36 set-up bits in nine groups of four each, plus an equal sign on the 25th line at the bottom of the screen. The 37 switches control fea-

tures such as baud rate, terminal emulation, key click and parity.

These switches are modified by moving the cursor down the row (using the right or left arrows) and pressing the up arrow to change state. Once the desired functions have been selected, press the save key to complete the setup. Set-Up and Save can be used at any time, even while you are running an application program. This enables you to reconfigure on the fly.

Although the terminal has many desirable features, some are not as convenient to use as they could be. This is because of the way they are set up and invoked.

For instance, the reverse video, blinking and underline features all are invoked with the same programmatic input. Therefore, you can't use different features at different locations on the screen at the same time. Use either all of the features that have been set up or none.

Another problem concerns the bell; it can be used only if you have set up the margin bell feature. It can be a little distracting, however, since the margin bell beeps every time the cursor passes through column 73.

The terminal can be put into normal, graphics and monitor modes, but Morrow does not advertise the graphics mode because it is inconvenient to use.

The problem lies in the fact that, while you can enter the graphics mode by sending programmed commands from the computer to the terminal, you cannot get out of it the same way. The only way to get back to normal is to turn the power off or hit the reset button; both of these actions force you to end any program that happens to be running at the time.

On terminals that have serial numbers greater than 25220000, the edit keys (character insert/delete and line



The keyboard is full-size and has 92 keys.

insert/delete) have been configured to transmit the appropriate WordStar codes. This could be an advantage if you intend to do some serious word processing.

If you've already bought a Micro Decision and would like to have the WordStar feature, there is hope. Terminals with serial numbers between 25110000 and 25220000 can be modified to add this capability.

One of the advantages that results from the Micro Decision's design to be used with a smart terminal is that the terminal has its own screen memory. This means that the 2K needed for the display does not come out of the 64K of RAM in the computer. When you load Microsoft Basic, for instance, you have 32,824 bytes of memory available.

Software

The Micro Decision, like the Osborne 1, which started the trend, comes with its own set of software packages. In this case, the packages include CP/M 2.2, Microsoft Basic, WordStar, Correct-It, LogiCalc, BaZic, Personal Pearl and Pilot.

The first three are standards and need no explanation. The remainders, on the other hand, are not as well-known, and probably need an introduction.

Correct-It is a spelling checker, designed to work not only with WordStar files, but with any ASCII file. It comes with a 36,000-word main dictionary and a program to modify that dictionary or build auxiliary ones. Users can interactively correct errors after they have been detected.

LogiCalc is a spreadsheet pro-

gram—similar to CalcStar—with up to 32,385 memory locations (255 rows by 127 columns). It's menu-driven and has a handy help function for quick reference.

BaZic is a NorthStar-compatible, high-level Basic interpreter that allows execution of NorthStar Basic programs without modification. The manual claims that it has much faster execution times than Basic and increased power through the addition of new statements and functions. These include user-defined functions, commands to determine the status of input/output devices, and a Print@ command for direct cursor-addressing.

Personal Pearl is an information manager that allows the user to design forms, store and retrieve data and produce reports. Output from this package can be read by LogiCalc and WordStar.

Pilot is a programming language designed for teaching; it's used by Morrow to create its CP/M "Micro Menus." These menus are designed for the microcomputer user who is still confused by the secrets of the operating system.

To use the Micro Menu, load the CP/M system disk into drive A and boot the system. On the first screen, you'll be presented with The Micro Decision Micro Menu, a listing of the most commonly used CP/M options.

If you select any of the options, you'll be presented with a second menu, which further explains how to use the command. The initial versions of these menus lacked sufficient error-checking, and they produced errors if the input was not correct. Morrow

says these problems have been corrected in version 1.5; owners of previous versions should contact their dealer for the new release.

The menus are booted automatically through the use of an autostart program (AUTO.COM). Any program can be set up to boot automatically by loading the appropriate disk, entering "Auto filename," then hitting return.

The name could also be that of a CP/M submit file to initiate a sequence of events upon boot-up, or a WordStar-prepared documentation file that would give instructions to the user. Both would be useful in developing a custom turnkey application.

To eliminate the autostart, simply enter "Auto," then return. The experienced CP/M user might consider this to turn off the menus.

Documentation

The looseleaf user's guide contains all of the instructions needed to get the system up and running. It's clear, easy to understand and designed for the individual who knows little about computers. Instructions are detailed enough for the novice and organized enough for any user to find what he needs easily.

The guide also contains instructions for LogiCalc, Correct-It and BaZic. Documentation for CP/M, Microsoft Basic, WordStar and Personal Pearl are contained in separate paperback books.

The Pilot reference manual currently is being written and is expected to be released shortly. Units sold prior to mid-January 1983 did not include a reference manual for the terminal. Only a limited sheet of set-up instructions was included. This omission was corrected with the release of a new manual in January. Owners who did not get a copy should contact their dealer.

Winding Up

The Micro Decision has several significant strengths: its price, the professional capabilities of the terminal, the bundled software and the disk-drive emulation.

The software that comes with the computer makes it an excellent buy. Foreign-drive emulation and the virtual disk function give it capabilities that few others have, and the display is of high quality.

Overall, the Micro Decision is an ideal system for small-business and personal computing and text and data processing applications. ■

```
THE MICRO DECISION MICRO MENU

This menu is your road map through the CP/M operating system. To
perform these functions, just enter the appropriate number after
the OPTION prompt below, then follow the instructions given.

0  CREATE A WORKING DISKETTE
1  RUN A PROGRAM
2  DISPLAY A DISKETTE DIRECTORY (DIR)
3  VIEW OR PRINT A FILE (TYPE, PIP)
4  COPY A FILE (PIP)
5  FORMAT A DISKETTE (FORMAT)
6  MAKE A BACKUP DISKETTE (FORMAT, BACKUP)
7  CHECK DISKETTE AND FILE SIZE (STAT)
8  OTHER OPTIONS (REN, ERA, STAT)
9  EXECUTE A CP/M COMMAND
ESC EXIT TO CP/M

OPTION : █

Current File: CPMENU.PIL          Current Drive: A:
```

The main menu of the micro menus shows the CP/M functions covered.

Zorba the Portable

The Zorba portable computer lets you experience the joie de vivre of computing while filling the need for compatibility, transferability and transportability.

By Kenniston Lord

The expansion of the portable computer marketplace has been spectacular. By and large, the marketplace was created by the Osborne 1, and the pages of this and other magazines document a steady parade of new items of equipment and facility.

The market does not yet seem saturated, and each potential entrant seems to try to do its predecessor one better in hardware, software or both. Bit by bit, the price of everything will come down to the point of reason.

The public, spurred by the aggressive advertising of a few of the players, continues to purchase microcomputers simply to have them. A second microcomputer market is emerging, one that has portability as a predominant feature.

While the desire for portability is large, the need for compatibility, transferability or at least transportability may be larger. Telcon Industries'

Zorba provides these capabilities.

Processor and Software

The Zorba, otherwise a standard Z-80 CP/M offering, provides a unique disk transportability feature—disks that can be read by a number of other CP/M machines.

While Telcon has a bit to learn about useable and workable documentation, the hardware, priced at \$1995, is worth considering. Although it costs slightly more than other portable computers, the difference in price is insignificant when compared to the advances Telcon has made in capability.

The Zorba is more of a CP/M assembler programmer's machine than a user's machine. And it appears that Telcon has structured the system's documentation with this in mind.

The unit uses a Z-80A (eight-bit, 4 MHz, no wait-state) and has 64K of

RAM. The package includes the CP/M operating system, WordStar, CalcStar, MailMerge, M-80 utilities and communications software.

A decision has not been made, as of this writing, about offering MBasic. SpellStar and InfoStar are available for an additional fee.

Computer in a Bucket

The Zorba is built into a vinyl bucket; when complete, the package is watertight, compact and lightweight (22 pounds). The bucket has two folding-pedestal legs (attached to one side) that will slant the unit (sans keyboard) upward for ease of viewing.

Ports for the attachment of printers, communications devices and additional peripherals are easily reached at the rear of the unit (which is the top of the closed package, near the carrying handle, but recessed and covered). This means that it's not necessary to cope with printer cables draping over the top or threading beneath the unit.

A caution: Telcon has made what may be a critical mistake. All female cable sockets are identical, making connection of the printer cable to a source of high voltage (such as the communication port) possible. It happened to me, and the resulting destruction cost \$150.

I should have known better, but what about the purchaser who has little technical knowledge? Telcon has been advised of the problem and has indicated that notification will accompany the machine. A more suitable solution would be the differentiation of the port connections.

Punching Keys

The keyboard is the bottom of the



Telcon's Zorba has a 95-key keyboard packed in a 22-pound folding case.

Address correspondence to Kenniston Lord, 45 School St., Winchendon, MA 01475.

closed package and lies flat when disengaged. It has a nice touch and can handle speed typing. There are 19 independently programmed function keys (capable of up to 55 user-programmed functions). One of those keys is enlarged for ease of location; three are lighted and are used as toggles (e.g., to keep track of the status of the communication port).

The WordStar package, which accompanies the computer, does not use the function keys directly, but the function keys may be assigned to WordStar. Telcon plans to provide templates for WordStar and other software packages, giving the user the option to determine how best to use the function keys.

The keyboard has the standard features—the typewriter board, the numeric keypad, the cursor arrows. . . The control characters are nicely grouped, largely at the left side of the keyboard. (The keyboard supplied by Telcon for review differs slightly from the photo, an early release.)

On the unit itself, the escape, caps lock, return, backspace and shift keys are white. In view of the fact that WordStar makes such heavy use of

the control key, changing that key to white would also be a wise move by Telcon. There's no doubt as to the location of the return key. It's clearly marked and of a unique shape.

Looking at the Screen

Zorba has a seven-inch etched, non-reflective green phosphor screen with high resolution. It conveys 25 lines of 80 characters in high relief (adjustable with the on/off switch).

The system is also capable of line graphics of at least two densities. The screen and the disk drives are mounted in the face of the unit, recessed into the bucket. The on/off/contrast and reset buttons are near the screen.

The unit is fan-cooled. Air intakes surround the screen; air is circulated around the disk drives and then blown from the unit by the fan, which exhausts at the right side of the unit. I find the movement of air to be a little disconcerting. Telcon should consider installing a slanted louver at the fan exhaust to push heated air away from the user.

Disk Storage

The disk storage and format capabil-

ities are the most unusual characteristics of the Zorba. Each disk unit is rated to provide 400K of nonvolatile, single- or double-density memory.

Zorba is 40-track capable. Nomis, another of Telcon's machines, uses the same equipment in an 80-track capability. Telcon has recognized the need for transportability to be designed into the system, providing formatting capabilities that will prepare disks to work with a variety of other microcomputers.

As of this writing, disk emulation is available for Telcon double density (DD), DEC VT18X, Xerox 820 single density (SD), Cromemco 520 (SD), Xerox 820 II (DD), Kaypro (DD), Osborne (SD), IBM PC (CP/M-86) and Televideo. Terminal emulation for these systems, as well as for the Zenith H-19, is also provided. And software to emulate 12 other terminals is available from Telcon.

All this is done within the confines of the CP/M operating system, which allows Telcon to address much of the computing market. As of this moment, Telcon has chosen not to address the MSDOS market.

The disk drives are quiet enough, and Telcon's choice of pressure-re-

A Capsule Look At Telcon's Zorba

Manufacturer

Telcon Industries, Inc., 1401 N.W. 69th St., Fort Lauderdale, FL 33309-1186; phone 305-971-2250.

Base List Price

\$1995.

Standard Features

Unit is self-contained in folding case; Z-80A microprocessor; 64K RAM and 16K ROM; two 400K single- and double-density floppy disks; detachable 95-key keyboard; 19 independent function keys; communication, printer, IEEE and eight-bit parallel ports; high-resolution, seven-inch 80x25 green display.

Proportions

System weighs 22 pounds and measures 17.5x9x16 inches.

Popular Options

Centronics parallel cable with connector; softcover case; composite video option.

Systems Software

CP/M 2.2 operating system, including utilities; M80, (including L80, LIB80 and CREF80); source code of the Bios plus any other Telcon-supplied utilities; data communication set-up package; modem communication package.

Applications Software

CBasic, WordStar, MailMerge, CalcStar.

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