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May 1990

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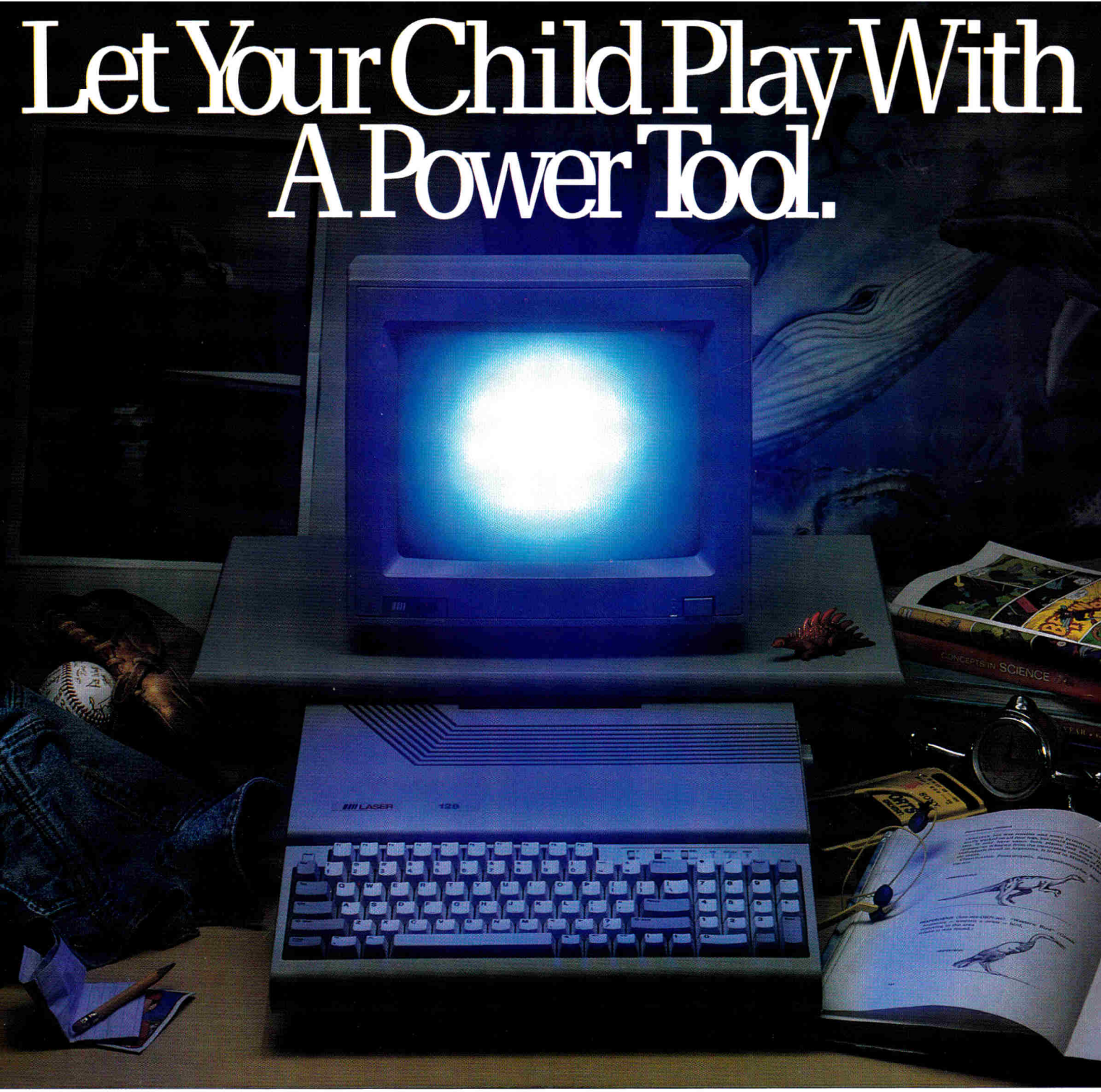

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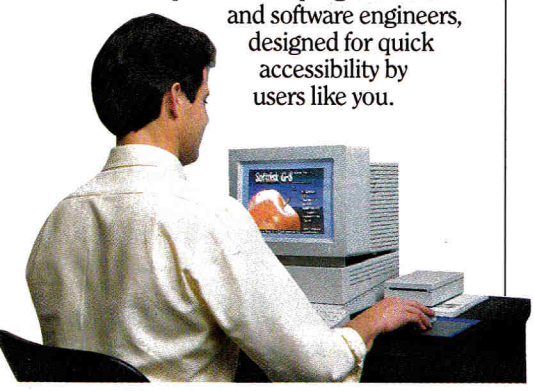

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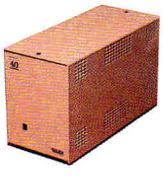

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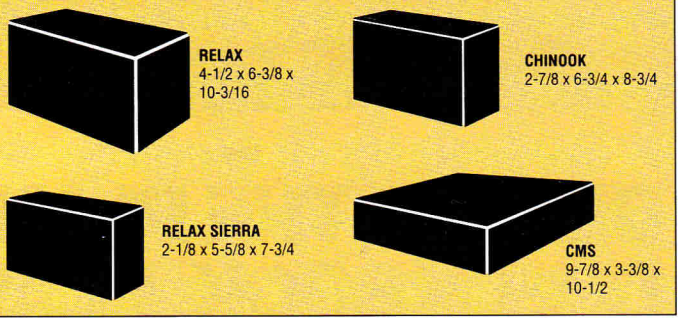

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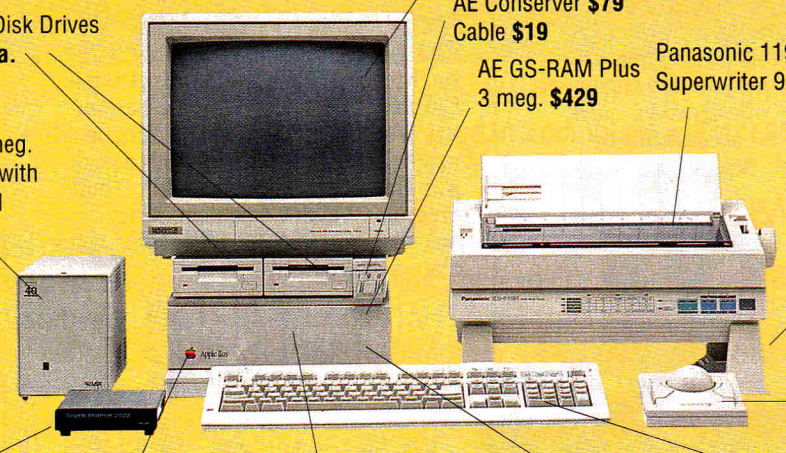

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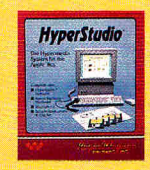

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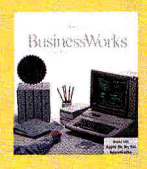

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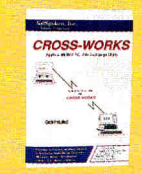

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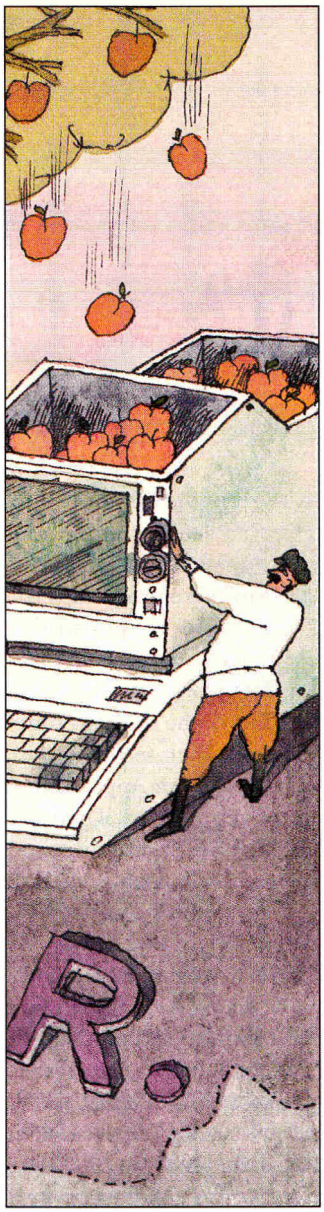

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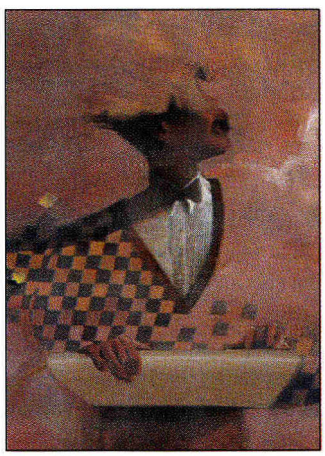

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45 Desktop Video: Making Movies with Your Apple II Part 2

And the envelope, please.... In this second installment of a two-part series, *inCider* shows you how to use the equipment described last month to its fullest and presents some basic guidelines for creating professional-looking video productions. Lights, camera....

50 Link Up with Telecommunications Software

From commercial database services to user-group bulletin boards to electronic mail sent across town or around the globe, the world of shared information depends on fast, efficient telecommunications software. *inCider* analyzes seven current Apple II programs, offering a number of standard functions that make life easier for today's on-line navigator.

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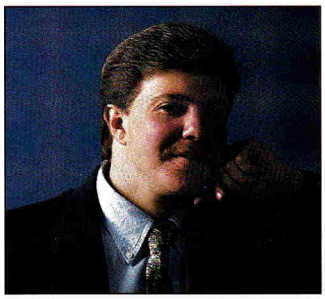

INCIDER'S VIEW

WHAT'S THE DEAL?

By DAN MUSE * EDITOR IN CHIEF

I'm not saying don't trust your Apple dealer, but I'd hate to see you rely on trust.

DO YOU REMEMBER WHAT IT WAS LIKE to buy a car 20 years ago? I remember my father always bought Fords, and he always bought them from the same dealership. The amazing thing (of course I didn't realize it was amazing then) was that every time we went back, the same salesman was there.

Today you're lucky if the person who sold you the car is still there when you bring it back for its 5000-mile checkup. Buying a new car isn't fun anymore — because no matter how much faith you have in people, you have to be tough when you walk onto the showroom floor. You have to be willing to play on their level, because a car salesperson's job, to use the words of the philosopher Thomas Hobbes, is "nasty, brutish, and short."

Now when I go into a dealership I'm prepared. My wife and I actually rehearse our roles — sort of a good-spouse/bad-spouse approach. Things have come to that.

I hate to compare car dealers with computer dealers, but I can't help it. The letters and phone calls I've received lately make me wonder whether dealing with Apple dealers is becoming as difficult as the automotive scene. If you sell computers, I'm not saying you're as loathsome as a reptilian car salesperson, but I wonder how knowledgeable and courteous you are. I also have to doubt your common sense.

I can handle the car salesperson, because once I sign the papers our relationship is over. But when you buy a computer, you have to rely on your dealer for upgrades, peripherals, software, and advice. Most people trust the salesperson to tell them how much memory they need, or whether or not they need a hard-disk drive. And you have to count on your dealership to provide the free upgrades Apple says it has to provide.

Recently a reader from Pennsylvania told us that several dealers refused to upgrade his GS to ROM version 01 because he bought the computer in Alabama. Another reader scolded us for writing about the new version of GS/OS (System Disk 5.02); his dealer told him he didn't need it because it was only for "techies." We've heard of dealers who refuse to copy the new GS system disk to a blank floppy—preferring to get the $49.95 price for disk and manuals whenever possible. Stories such as these make you wonder if Floyd, the smiling Studebaker salesman, has gone high-tech.

I'm not saying don't trust your Apple dealer, but I'd hate to see you rely on trust. There are some excellent computer dealers out there and some smart, conscientious salespeople. (In fact, some of my closest friends sell computers—really.) It's just a matter of finding them.

If you're planning on buying a new computer soon, start visiting dealers now. Prepare some questions to test their knowledge. For example, ask them to describe the benefits of an accelerator versus extra memory for a RAM disk.

If you buy your Apple in one store and then move to another area, find out who the Apple dealers are right away. Any salesperson with business sense will welcome you to town — you're new business. Let him or her know that you may soon need a hard-disk drive, a printer, a modem, or some other peripheral. Also let the salespeople know that support after the purchase is important to you.

As far as upgrades go, we'll keep you posted on what dealers have to provide for no or a nominal fee. (See "Get What You Paid For," September 1989, p. 64.) If you have problems with a dealer, let us know. We can't promise immediate results; if a certain issue seems endemic among all Apple dealers, however, or if certain dealers prove to be especially uncooperative, we'll try to get some results for you.

We don't want you to be cynical (that's what journalists are for) and distrust every computer salesperson in the world. But, just as in buying a car, it pays to do your homework. Apple takes a lot of pride in its dealer network. So if your dealer doesn't deliver, be a squeaky wheel. □

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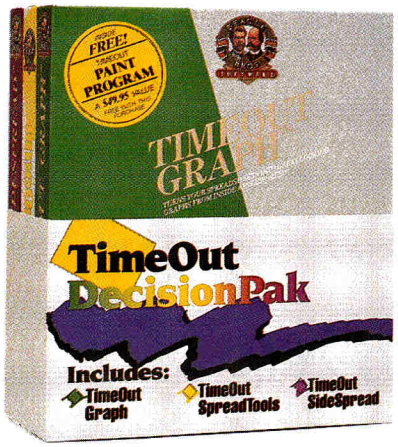

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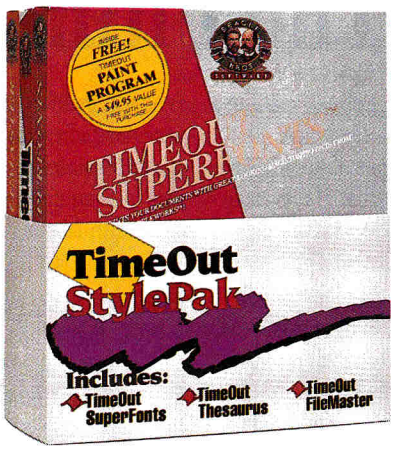

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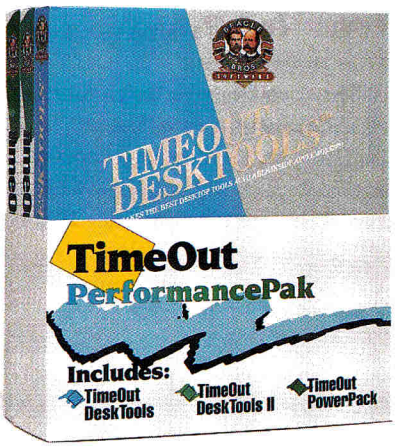

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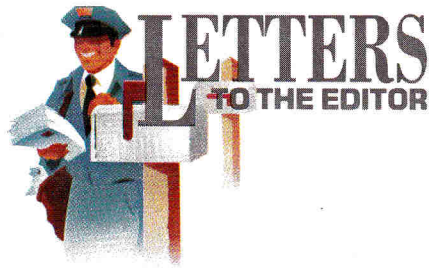

Easy Mac/II Switch

I'd like to add a few examples to Owen Linzmayer's article about sharing Apple II and Macintosh technology ("The II/Mac Connection: Bit by Bit," January 1990, p. 64). My Apple IIGS and Mac SE sit on adjacent desks and share peripherals via switch boxes. The first box connects the two computers to an ImageWriter II printer; a flip of the switch directs printing from one computer to another.

In the article, Linzmayer mentions SyQuest 44-megabyte removable drives and their use in the Mac community. My second switch box connects a SyQuest drive to the Mac (which has a built-in SCSI port) and to the GS (with an Apple SCSI card, revision C). When I need to use the GS, I remove the Mac cartridge, insert the GS cartridge, and boot into GS/OS in a flash. On the disk I have HyperStudio, AppleWorks Classic and GS, The Print Shop GS, and so on, which all work fine. It's unfortunate that both computers can't use the drive simultaneously without networking software, but with the cost savings of my setup, I'll survive.

Preparing the cartridge for use with the GS was easy, though time-consuming. It comes Mac-formatted from the manufacturer, so it must be reformatted and partitioned for ProDOS. I followed the directions that came with the utilities Disk Timer and SCSI Hacker by Joe Jaworski (available on line and from So What Software, 10221 Slater Avenue, Suite 103, Fountain Valley, CA 92708) to put a low-level format on the disk, then used Advanced Disk Utilities and Hard Disk Partition from GS/OS to partition and put a high-level format on the disk.

A little-known fact is that the two systems can share graphics. For example, I've transferred images used in my HyperCard stacks to the GS for use in HyperStudio, effectively developing my stacks on both machines. Apple users who want detailed directions on exactly how to transfer graphics between the GS and the Mac can download my instructions posted on the GEnie BBS. The filename is MACGS .TRANS.BXY for the Apple II (file number 9282 in the ProDOS.16/Graphics library; unpack with ShrinkIt 2.1) or GRAFX.XFER.SIT for the Mac (file number 15771 in the MacPaint library; unpack with StuffIt).

The directions list all software needed; all files are present on GEnie. The Mac version also includes the FileType Changer program mentioned in the directions. Users without access to GEnie can contact me and I'll send a hardcopy version of the directions for $1.

Bob L. Allen
Eat-a-Bug Software
22916 Via Pimiento
Mission Viejo, CA 92691

Not A Vulcan Fan

Your review of the Vulcan hard drive (January 1990, p. 30) hit the mark in all aspects but one. The Vulcan comes with a cooling fan that is so cheaply constructed that its noise quickly becomes not only distracting but irritating. Calls to Applied Engineering brought the response, "We know it's a problem; loosen the fan screws to see if that helps."

Two friends who bought Applied Ingenuity's internal hard drive have had no problems with fan noise. The reason is obvious. AI installed a well-built fan, while the Vulcan's is cheap plastic. The Vulcan is more expensive; it seems that AE was penny wise and pound foolish in not maintaining a high standard for all its equipment parts. At this point I'm trying to find out who supplies AI fans to see if I can put one in my Vulcan and never mind the warranty.

Elias Drobotij
Box 6102 c/o Aramco
Dhahran 31311, Saudi Arabia

Look for a head-to-head comparative review of the Vulcan and the Inner Drive in an upcoming issue. —*eds.*

Never Too Old

Thank you for your insightful editorial, "Journalist, Teach Thyself" (January 1990, p. 8). After months of waiting for a Laser 128EX/2 with 3.5-inch drive, despair drove me to consider IBM compatibles with cheap hard-disk drives. Your magazine snatched me from the flames once again.

Old technology? Yes. Antiquated functionality? No; the Apple II is perfect for my limited office work and educational help for my kids. (It's fun, too!) Advertising hype and mass prejudice do not a good report make.

George Hutto
505 South Main Street
Madrid, IA 50156

Bring on the Bridge

Please make "The II/Mac Connection" (January 1990, p. 64) a permanent feature of *inCider*. Like many of my collegues here at the University of Southwestern Louisiana, I use an Apple II at ►

home and a Mac at the office (simply because I need its foreign-language and formatting capabilities). I think the time for a bridge machine has come; we applaud *inCider*'s efforts to show Apple the way.

Carl A. Brasseaux
Humanities Department
University of Southwestern Lousiana
Lafayette, LA 70501

Meeting the Challenge

I've read your magazine for almost a year and have been impressed with its content. My daughter Melissa and I are Apple IIe users. Melissa is physically handicapped and uses a single-switch system to access her Apple, along with a scanning-technique/adaptive-firmware card and compatible software. It would be great if you could publish information on how the handicapped can use software with the adaptive aids available to them.

Perhaps when you review software you can also tell your readers whether the program can be used by the handicapped and what adaptive aids it requires.

Vicki Pepper
8 Colwell Circle
Litchfield, NH 03051

Look for an article on special-needs products in our September 1990 issue. In addition, see "Partners in Special Achievement," April 1989, p. 54, for a discussion of adaptive hardware and software. —*eds.*

Update

In "Make the ADB Connection" (February 1990) we state on p. 52 that "even Applied Engineering's PC Transporter — a plug-in board that lets your Apple II run MS-DOS programs — requires a custom input-device driver to take advantage of the IBM features of these ADB keyboards. Applied Engineering reports that it currently has no plans to write such a driver."

According to Tom Milks at Applied Engineering, the company does indeed now have a new version of the PC Transporter system software that will support the features of the extended keyboards available from Apple and the other manufacturers mentioned in the article.

Corrections

In column 3, p. 70, of January 1990's AppleWorks in Action ("One for the Money"), the second paragraph should begin, "Now type RM and press Return. Type .3 [not 3] and hit Return again."

The program listing for "Decision Maker" (January 1990, p. 112) contains a minor error; to print the string, line 550 should include quotation marks after the word *criteria*. In the program "Domino Puzzle" (February 1990, p. 92), line 180 should state as follows:

```
180 N=INT(RND(1)*9+1):M(X,Y,2)
=N:IF X<NX THEN M(X+1,Y,4)=N
```

Compu-Teach's phone number is incorrect as it appears on p. 94 of the March 1990 Reviews section. The correct number is (203) 777-7738.

inCider welcomes readers' comments. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters, *inCider*, 80 Elm Street, Peterborough, NH 03458.

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WHAT'S NEW

edited by Paul Statt

BLOW UP

"First of all," assures the *Apple IIc Owner's Manual*, "computer blow-ups and smoke-outs are a thing of a past."

Young Kevin Butts of Atlanta, Georgia, disagrees. According to his attorney, Gilbert Deitch, Butts "is 100 percent certain that he did nothing unusual" to his Apple IIc—he was running a BASIC "Hello" program—when the Apple-brand color monitor "exploded and/or imploded" in his face. Butts filed suit in Fulton County Superior Court for damages against Apple and Hitachi, the manufacturer of the monitor, in January.

Yolanda Davis, coordinator for public affairs at Apple, says that "Apple considers the case without merit. Based on the opinions of our experts who have looked into the case, we believe that some external force must have caused the problem." Deitch, on the othe hand, says he suspects a "stress fracture in the picture tube."

Jim Nystrom, another attorney for Butts, notes that Apple's statement in the IIc manual at least implies that blow-ups are a possibility, and that "implosion-protection devices are installed on TVs and computer monitors, according to our research; implosion is recognized as a problem by the industry."

Attorney Deitch says that Apple has "strict liability": "If a product is defective, it isn't necessary to prove negligence" in court. He claims that Apple may not have been aware of the problem, but is still responsible.

Deitch admits that "there have been no other reported cases of this sort of thing." No exploding monitor has ever been reported to *inCider*. But "statistics don't prove anything," says Deitch. "If it's happened to others, it would certainly give credibility to our case." If it's happened to you, you can contact Gilbert H. Deitch at Bauer, Deitch, and Raines PC, 6111 Peachtree-Dunwoody Road, Atlanta, GA 30328, (408) 974-5193. ***—P.S.***

CHEAP PAINT —AND EVEN CHEAPER

If your meager artistic abilities—or your pocketbook—just can't justify dropping 50 bucks on a GS paint program that may not work on the next version of the machine anyway, consider **Cheap Paint**, from the Public Domain Exchange, for half that price.

Despite the low price tag, Earl Gehr's super-hi-res program includes almost all features the higher-priced programs have. Basic drawing tools are available in a number of sizes and shapes; tools for drawing lines, circles, rectangles, arcs, and patterns are all here. You can fill or draw with any of 16 colors or 16 patterns you create.

SOFTWARE

The color-cycling feature simulates animation; you can enlarge any part of a screen for detail work, too. You can even work on two screens at once. We could say more, but why not try it yourself? Cheap Paint is available from PDE for $9 plus $4 shipping. If you like it and want to keep it, send a $10 shareware payment to Earl Gehr.

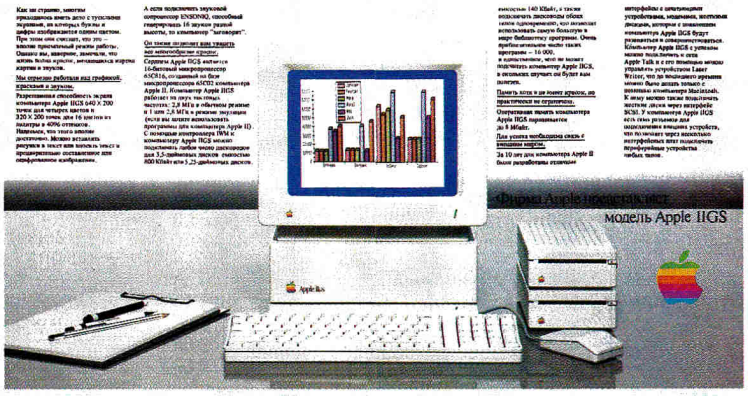
If you're really just a doodler, try **Desk Top Painter**, a public-domain new desk accessory (NDA) for the Apple IIGS, also by Earl Gehr.

It doesn't have all the features of Cheap Paint, but it's still cheaper and accessible at lightning speed from any other application.

Desk Top Painter costs $9 plus $4 shipping, from PDE, 2078C Walsh Avenue, Santa Clara, CA 95050, (408) 496-0624, or dial (800) 331-8125 with your order. For more information, circle number 352 on the Reader Service card. ***—P.S.***

GS INVASION

МОЩНЫЙ И МН ОГОКРАСОЧНЫЙ

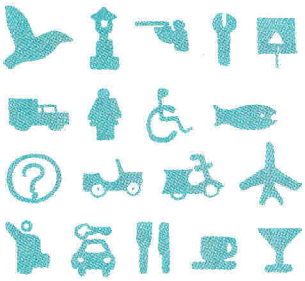


Apple promised last year to advertise the GS, and so it did. In the April and May issues of *MIR PC*, the Soviet Union's biggest computer magazine, we noted a two-page color spread touting the advantages of the IIgs. The ad is in Russian; the program on screen is in French. Translations are welcome. ("Powerful but multi-colored" is our best attempt at the ad—anybody have a better one?)

FOREIGN FONTS

SOFTWARE

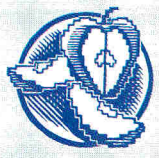
Apple II users who want to produce text in foreign languages that use non-Roman characters can try **Fontrix 1.55** for quick and easy multilingual typesetting.



Fontrix 1.55 addresses many of the problems inherent in Apple II typesetting. It lets you place special punctuation and diacritical marks over characters as needed, thanks to a special overlay mode, for instance. The program also lets you mix an unlimited number of fonts on a single printed page, a feature sure to appeal to language teachers. Most importantly, the Fontrix 1.55 package includes a number of standard fonts; in addition, its Font Editor program lets you draw your own if you need to.

Fontrix 1.55 also incorporates a number of drawing and painting features for graphics creation. It works with almost any printer (it supports 120 models) and sells for $95, from Data Transforms, 616 Washington Street, Denver, CO 80203, (303) 832-1501. For more information, circle number 351 on the Reader Service card.

—P.S.



APPLE BITS

■The Computer Musician Coalition (3010 North Sterling Avenue, Peoria, IL 61604, 309-685-4843) is looking for a thousand new members in its Campaign for Advancement. Join now at the special low fee of $100 and you'll never pay more than $100 a year in dues. You get a button, a t-shirt and $75 off any purchase from the *CMC Computer Musician's Source Book*. Sounds great, but will it play . . . ?

HOW FAST IS THE VULCAN?

HARDWARE

Many readers have asked, "How fast is Applied Engineering's Vulcan internal hard-disk drive?" (See *inCider*'s review in January 1990, p. 30.)

The speed at which any hard-disk drive runs depends on three aspects of your system.

First, the size of your Vulcan makes an important difference: The 100-megabyte model uses a higher-quality seeking mechanism than the smaller-capacity units, which means that the 100-megabyte drive can access files faster.

Second, the Apple IIGS operates faster than an Apple IIe or II Plus; a Vulcan in a GS runs faster than one in a II Plus.

Zip Chip and TransWarp accelerators help you achieve top speed; the Rocket Chip, used in a IIe, makes it possible to "cache" the data on your Vulcan, resulting in even faster performance.

(Be sure to back up frequently if you cache your hard drive; a power failure could lose information you may think is on your hard disk, but is only cached.)

The Apple IIGS operating system GS/OS offers an additional advantage: its ability to use a custom device driver such as the one Applied Engineering supplies for the Vulcan. It results in faster performance.

Finally, the speed of any hard-disk drive depends on the way you use your drive: If you have a large number of files in a single directory on your desktop, it's simply going to take GS/OS a while to display them all.

After you've used a hard drive for a time, its memory will become fragmented; that is, not every part of a given file will be physically near all the other parts of the file on the disk.

You can remedy a fragmented hard drive with the help of a special utility program; ProSel 16 (Glen Bredon, 521 State Road, Princeton, NJ 08540) and EasyDrive (Quality Computers, 15102 Charlevoix, Grosse Pointe, MI 48230, 313-331-0700), for example, both offer defragmenters.

My January review was of the 100-megabyte Vulcan on an original Apple IIGS (ROM 01) with a TransWarp GS accelerator and 1.75 megabytes of RAM (random-access memory). I used 32K of that memory as a cache.

I filled approximately 75 megabytes of the Vulcan hard disk: Using subdirectories, I organized more than 4000 files in a tree structure several levels deep. I loaded most of these files at one time; thus, they were probably not badly fragmented.

But that caveat aside, I found that the 100-megabyte Vulcan had an average access time of 30 milliseconds; with a TransWarp GS installed, the average access time was 15 milliseconds.

A 30-millisecond access means that the Finder loads in about 15 seconds and AppleWorks GS in about 10 seconds—which makes the 100-megabyte Vulcan hard drive almost as fast as loading programs from RAM or ROM (read-only memory).

—Joe Abernathy

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Education

☐ **GS147 Tonight's Sky:** find your lucky star & learn about astronomy **$9**

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☐ ***NEW* GS152 Find.It NDA** file finder, Key Caps, plus 41 DAs, (WORKS WITH SYSTEM 5.02) **$9**

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☐ **GS146 Photonix:** fast disk copying utility & anti-virus, verify, format **$9**
☐ **GS124** Font.Edit.8 & Font.Doctor: create custom fonts, change existing ones **$9**
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† The author requests a specified donation if you decide to use the program.

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☐ **894 Tonight's Sky** Astronomy for the star gazer . **$5**

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WHAT'S NEW

WHERE WERE WE?

SOFTWARE

As a part of its long-term campaign to improve the geographic knowledge of Americans, who lag behind their peers in international surveys, the National Geographic Society has joined Apple Computer, Lucasfilm, and the California State Department of Education in an innovative new project: production of a computer and videodisc program for social-studies instruction in grades 5–12. It's called **GTV: A Geographic Perspective on American History**, and it's the National Geographic Society's first venture into interactive multimedia—combining video and computer technologies to give the user complete control over visual, auditory, and text information.

A Geographic Perspective on American History, the introductory unit, combines images from *National Geographic* magazine with custom Apple IIGS software in an overview of American history. The videodisc holds two hours of moving pictures, divided into 40 segments. The advantage of multimedia over videotape is that the students or teacher can rearrange the pictures as they choose, creating a lesson or researching a topic.

In addition to the motion pictures, the video material includes 1600 still images and 200 maps. Using the accompanying GS software, a teacher or student can use a detailed index of captions to search for a particular image.

"GTV is designed to engage and entertain, as well as to educate," says George Peterson, director of educational media at the Society. "The material tells the story of American history in ways that capture the imagination of even the most jaded or 'tuned-out' students." The biggest turn-on for tuned-out kids will probably be the "Map Rap," a hip-hopping history of the acquisition of United States territory.

You can see GTV at the California Computer Using Educators Conference in Palm Springs, California (May 11–12), or at the National Educational Computing Conference in Nashville, Tennessee (June 25–27).

GTV requires an Apple IIGS, two 3½-inch drives, and a videodisc player (Pioneer LD-V2000, LD-V4200, LD-V6000, or LD-V6000A, or any Sony model LDP-1000 and up). Including two videodiscs, two disks of software, a cable to connect computer and videodisc player, a teacher's guide, a quick-reference guide, and library catalog cards, the package costs $650.

For more information, write to Sherrie Smith, Educational Services, National Geographic Society, Washington, DC 20036, or circle number 353 on the Reader Service card. Orders only, call (800) 368-2728.

Circle 269 on Reader Service Card.

MASTERS OF DB MASTER

SOFTWARE

Programmers and developers who use DB Master Professional now have two more relational-database management tools to work with. Stone Edge Technologies has introduced the *DB Master BASIC Programmer's Pak* and the *DB Master Developer's Pak*. "DB Master brought the power of a database manager to Apple II users," notes Barney Stone, president of Stone Edge and developer of DB Master. "These programs open the DB Master system to programmers, developers, and consultants who wish to develop and market their own custom programs."

The BASIC Programmer's Pak lets you use simple BASIC commands to find, edit, and delete files. The program can work on more than one DB Master file at a time; it also interacts with ProDOS 8 text files.

The Developer's Pak provides custom menu screens, functions, and automated operations. It also includes a run-time version of DB Master Professional, which can automatically import and export data between files and handle bookkeeping.

Stone Edge first shipped DB Master in November 1980. DB Master Professional made its debut in 1987. It's the only relational database-management system for the Apple II.

The Developer's Pak costs $295, which includes a license for the run-time program. The BASIC Programmer's Pak is priced at $129. Distribution licenses are available from Stone Edge Technologies, P.O. Box 3200, Maple Glen, PA 19002, (215) 641-1825. For more information, circle number 350 on the Reader Service card. ***—J.F.***

COLOR LASER

Laser 128 Color System—the right computer at the right price. System includes Laser 128 computer with 128K of RAM, built-in disk drive, serial port (IIe/c compatible), 14-inch color monitor, Copy II Plus, and other software—all for $699. Still too expensive? Monochrome system is $599, from Laser Computer, 800 North Church St., Lake Zurich, IL 60047, (708) 540-8086.

Seatbelts Suggested

Buckle your seatbelts for TransWarp III. More than eight times as fast as the IIe's native speed, with upgradeability to more than twelve times as fast! Frankly, we're obsessed with keeping your Apple II going at maximum speed and TransWarp III for the Apple IIe, II+ and II is the latest result.

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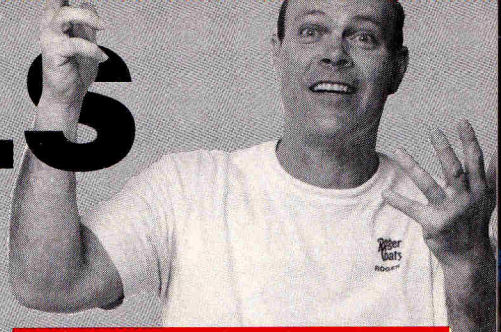

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MODIFYING PAINTWORKS

Let Paintworks Gold out of the doghouse—a simple program helps you get around its hunger for memory.

By WILLIAM P. KENNEDY, Ph.D.

PAINT THE TOWN GOLD

IN "THE YEAR IN REVIEW" (December 1989, p. 70), *inCider* put Activision's Paintworks Gold in the doghouse because it isn't compatible with GS/OS versions 4 and 5. I, too, have found the situation quite disappointing, because launching Paintworks Gold from a 3½-inch disk is so much slower than from my hard-disk drive, on which most of my applications are stored and work fine with GS/OS v.5.

With GS/OS v.4, you can make Paintworks Gold work as long as it's the first application launched in a session. If not, I found that executing Purge.Mem, a ProSel-16 utility, before launching Paintworks Gold, helped.

Unfortunately, neither method worked when I booted into GS/OS v.5. I gave up and called Activision. Apparently, Paintworks Gold needs a lot of "page 0" memory. There's a place in the program code you can change to satisfy that hunger for memory: Using a block read/write utility such as ProSel's Block.Warden or Copy II Plus, search for the hex sequence C9 08 00 D0 CE. Replace the *08* with *7F*. That's it.

The only quirk I've found is that it slows the mouse speed. I certainly can't guarantee there won't be other problems, but so far so good.

Mark Ruskin
London, England

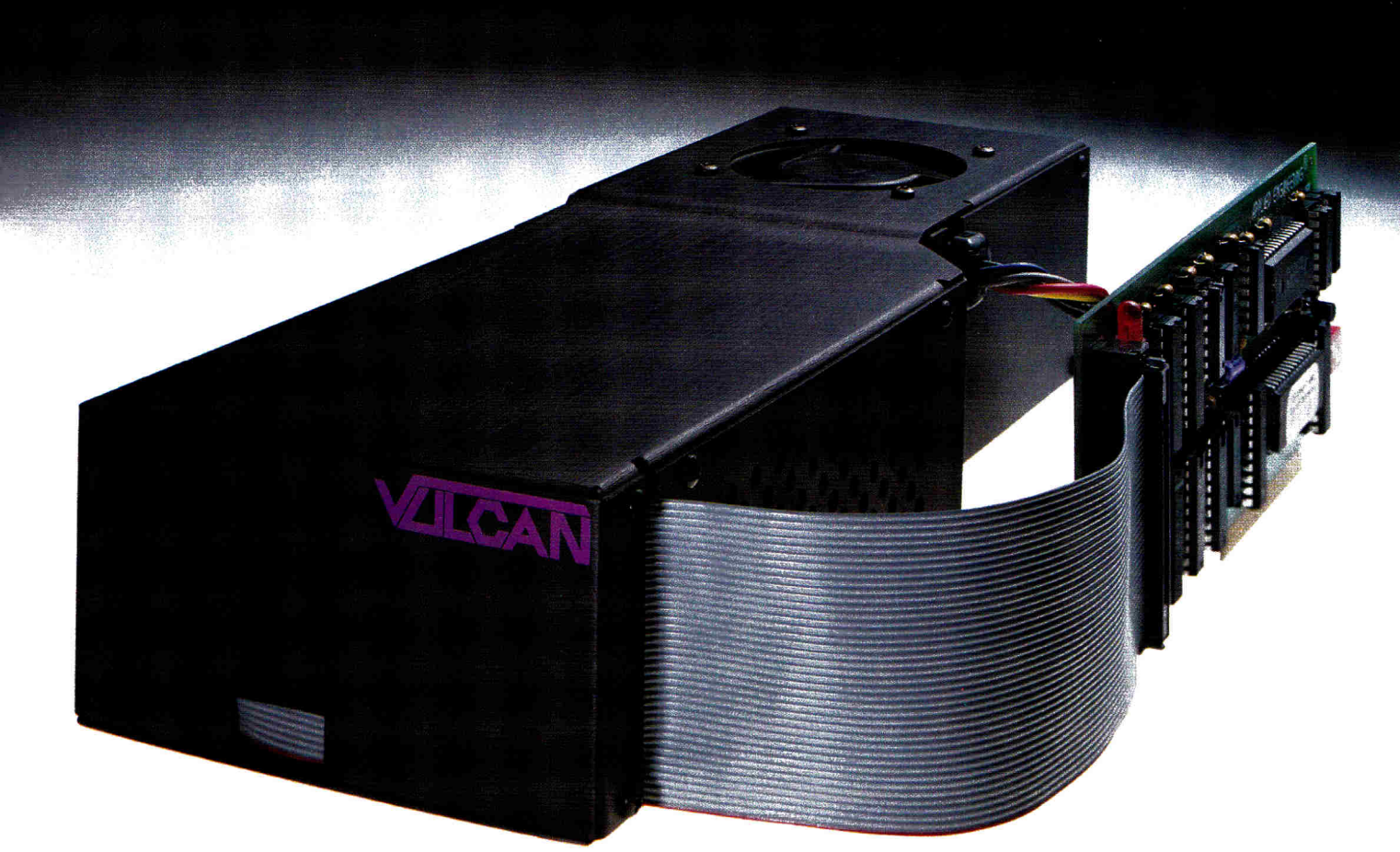
Great tip, Mark. Thanks for pursuing this one to a satisfactory end. But I don't want to know about your phone bill.

We've found several other ProDOS-16 programs that aren't compatible with GS/OS. You can't blame the publishers too much for their reluctance to update the software, given Apple's history of changing the operating system every six months or so. Nonetheless, many won't even attempt to solve the problem. Kudos for Activision.

Those of you who don't have a block read/write utility or are afraid to use it (and rightfully so, because you really do need an excellent understanding of GS/OS or ProDOS to figure out what's going on), I've identified where that ►

Program listing. Paintworks Gold modification.

```
10  REM  Modifies Paintworks Gold for use with  [7379]
20 REM  GS/OS Version 5.0  [3753]
30  REM  by Dr. Bill  [2165]
40  REM  Copyright 1990, inCider  [4946]
50 N$ = "/PAINT.GOLD/PAINTWORKS.GOLD"  [5981]
60 D$ =  CHR$ (4)  [799]
70  ONERR  GOTO 200  [687]
80  PRINT D$;"BLOAD";N$;",A$2000,B$1FFDF,L5,T$B3"  [7669]
90  FOR I = 0 TO 4: READ N: REM  Test byte sequence  [5146]
100  IF  PEEK (8192 + I) <  > N THEN 210  [1670]
110  NEXT I  [511]
120  POKE 8193,127: REM  Make modification  [3578]
130  PRINT D$;"BSAVE";N$;",A8193,B$1FFE0,L1,T$B3"  [2627]
140  PRINT D$;"PR#3"  [1020]
150  PRINT "Modification successful!": END  [1870]
200 A$ = "Cannot find Paintworks Gold program!": GOTO
    220  [3806]
210 A$ = "Incorrect sequence of bytes!"  [2411]
220  PRINT D$;"PR#3"  [684]
230  PRINT A$: PRINT "Modification not completed."  [6094]
240  PRINT "Insert the Paintworks program disk: ": PRINT
    N$  [3524]
250  PRINT "into a disk drive, or"  [1894]
260  PRINT "change line 50 to correct pathname."  [7253]
270  PRINT "Then re-RUN this program."  [5268]
280  END  [178]
300  DATA  201,8,0,208,206  [2634]
```



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sequence of bytes Mark mentioned occurs in the Paintworks Gold program and have written a short BASIC program that'll make the modification for you.

Type in the accompanying BASIC ***Program listing*** *and SAVE it as PWG.Mod. Then insert a non-write-protected* backup *copy of your Paintworks Gold disk into a drive and RUN the modification program. The program's pathname is set in line 50. If you're using a hard-disk copy of Paintworks Gold, change that pathname to the correct location.*

INITIALIZING DISKS

CAN I INITIALIZE 3½-INCH DISKS just as I do my 5¼-inch ones? I want to use them for BASIC programming.

Kenny Caudell
Richmond, KS

Yes and no, Kenny. Yes, initialize your 3½-inch 800K disk just as you might 5¼-inch disks under ProDOS. No, you can't simply INIT the 3½-inch disk under DOS 3.3 as you do the 5¼-inch one.

Rather, to use your 3½-inch disks under DOS 3.3, consider purchasing UniDOS *for $49.95 from MicroSparc, 52 Domino Drive, Concord, MA 01742;* AmDOS 3.5 *for $20 from Gary Little, 3304 Plateau Drive, Belmont, CA 94002; or* Profix *for $49.95 from Nordic Software, 3939 North 48th Street, Lincoln, NE 68504. The first two packages are modified versions of DOS 3.3 that initialize and partition your 800K disks into two 400K volumes that are accessed as drives 1 and 3, respectively. Profix allows multiple DOS volumes of 143K–400K each.*

To use your 3½-inch disk drive as a BASIC program disk under DOS 3.3, you needn't do anything special; all the appropriate disk-management software is automatically appended when it's initialized.

Under ProDOS, you also needn't do anything special if you're using the disk only to store your BASIC programs and data. If you want to use that disk to boot (start up) your Apple, however, copy these files to it from your ProDOS System Disk or equivalent source: PRODOS and BASIC.SYSTEM. Those of you with GSes, copy the file named P8 (instead of PRODOS) in the SYSTEM subdirectory or folder on your GS SYSTEM.DISK and rename it to PRODOS on your 3½-inch disk BASIC startup disk.

HI-RES GRAPHICS DUMP

I'D LIKE TO PRINT MY HI-RES graphics from Applesoft BASIC on my ImageWriter I. I've been using the ImageWriter Toolkit, but that requires I stop my own program, execute the utility, then restart my program. There's got to be an easier way.

Fulton Farquhar
Stuart, FL

There are several utilities available from a number of sources, including freeware from any bulletin-board system, that you can incorporate into your own BASIC programs to "dump" high-resolution graphics to an ImageWriter printer.

You can obtain one of the most versatile graphics-dump routines commercially—Triple-Dump from Beagle Bros (6215 Ferris Square, Suite 100, San Diego, CA 92121, 619-452-5500, $39.95). You can execute this collection of machine-language routines directly from the distributed disk or incorporate them into your own BASIC programs and execute them with a simple CALL. Besides the full range of graphics and text-mode dumps, Triple-Dump also includes special-effects options that'll rotate, inverse, and magnify your graphics printouts. And Triple-Dump supports a variety of printers, not just the ImageWriter.

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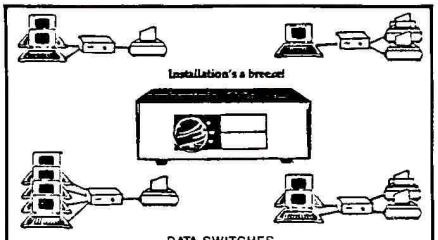

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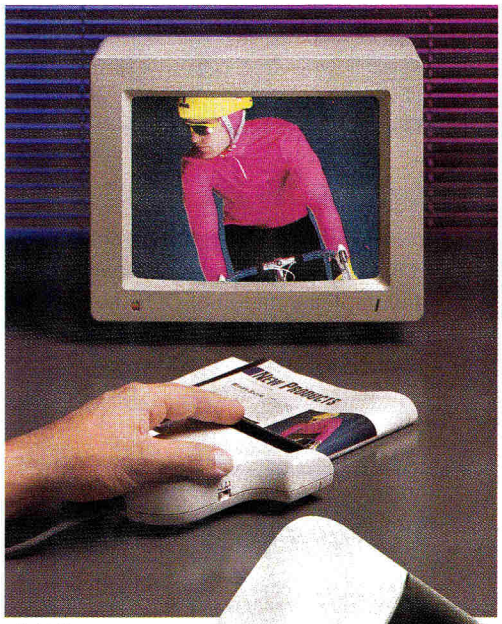

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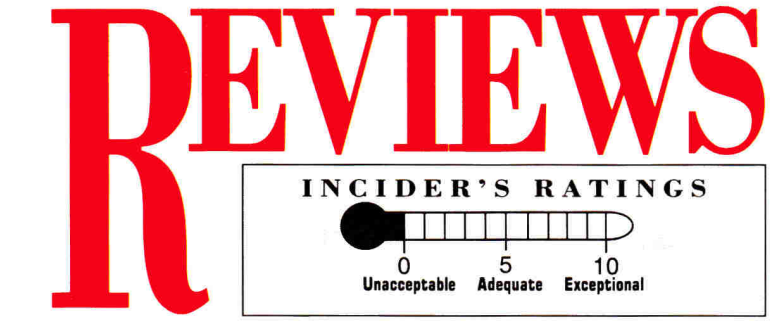

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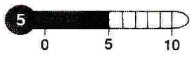

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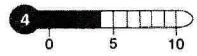

Here is further evidence that object-oriented programming is on the way for the Apple IIGS—TML Pascal II. TML Systems' hurry to set the pace, however, may have hurt the product. This language compiler has a history of reliability problems and weak support. If TML makes the necessary corrections, though, TML Pascal II could play an important role in steering the IIGS toward the future of object-oriented programming.

Object-oriented programming (OOP) is a building-block approach that brings programming within reach of more people. You can concentrate on the creative process rather than the mechanics of programming. TML Pascal II isn't necessarily a full implementation of OOP, but it contains small subsets that could help lay a foundation.

ROUND TWO

TML Pascal II is actually an update anticipated some two years ago. Is TML Pascal II a ground-breaking product, or a quick raid aimed at capitalizing on a lag in the marketplace? Time will tell, but we can get an idea now by looking at its strengths and weaknesses.

The major improvement is the resource editor, which lets you design the screen elements of your program's desktop interface with a mouse. This should be a big time saver and make programming easier, but the implementation brings these benefits into question.

Elements of the language itself have been improved and compare favorably against the competing Orca/Pascal. TML Pascal II has also adopted Apple's new standard Pascal Toolbox interface files.

The development environment was rewritten from scratch and remains fast and convenient. Any number of windows can now be open, but the program crashes frequently, and there are oversights such as a missing bottom scroll bar on the text editor. You have to break up long lines to edit them.

File-management utilities are next to nonexistent, and there is still no debugger. The six (yes, six) source-code examples included on disk are inadequate. Only by buying Source Code Library II can you begin to grasp the compiler's capabilities.

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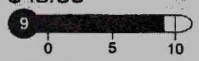
AT A GLANCE

Revolution '76 (April 1990, p. 30, by Jim Trunzo), Britannica Software, 345 Fourth Street, San Francisco, CA 94107, (800) 572-2272, (415) 546-1866; Apple IIgs with 1.2 megabytes; two 3½-inch drives recommended; $49.95

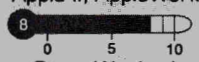


The Second Continental Congress is in session as Revolution '76 begins, and you must immediately appoint the head of the treasury, the foreign-affairs department, the army, and the navy.

You must also make decisions and establish policies to shape your emerging government: when to declare independence from England, how to deal with the slave population, what economic reforms to implement, and how to establish an executive branch to facilitate the governing process.

Revolution '76 succeeds on all counts. It challenges your military, economic, and diplomatic savvy, and it's aesthetically pleasing as it takes full advantage of the GS's graphics and sound capabilities.

StoryWorks (April 1990, p. 32, by Carol Holzberg), Teachers' Idea and Information Exchange, P.O. Box 6229, Lincoln, NE 68506, (402) 483-6987; 128K Apple II, AppleWorks; $49.95



StoryWorks is a hypertext-style construction kit consisting of eight AppleWorks word-processor files. It lets you create branching worksheets, tests, quizzes, seating charts, or stories complete with sound effects. When students read a StoryWorks file, they can select an embedded button for immediate access to related topics, glossaries, bibliographies, and so on.

The beauty of StoryWorks is twofold: First, it's a program that operates on an Apple II with as little as 64K; second, it builds on what is probably the most popular Apple II program ever developed—AppleWorks Classic.

software. The idea is to relieve you of the burden of designing the complex templates necessary to use the desktop interface. Actually, resources are the first step toward object-oriented programming, although no one has yet referred to them that way.

Ultimately, you should be able to click on a screen element, associate it with a standard action—such as printing or saving—and so disregard many of the programming details. The new TML resource editor is half the picture. It lets you design objects that will appear on screen, but the compiler generates the underlying source code.

If the resource editor was a full implementation of OOP, it would also let you associate your finished resources with standard operations to automate designing applications. This capability is missing, but that isn't a condemnation of TML Pascal II. Because OOP is radically different from the programming to which Apple II users are accustomed, it will require a commitment from Apple to be fully realized.

TML managed to get through the entire user manual without once giving a coherent description of what resources are or how to use them. Beginners will probably be lost, and knowledgeable programmers will have to crack open some other books (such as the *GS/OS Reference* and the *Toolbox Reference*, available from the Apple Programmers and Developers Association).

PASCAL PERFORMANCE

TML has always offered a fast, convenient development environment, and TML Pascal II is no exception. One unique capability of TML Pascal II is support of Tool Startup resources. Overall, however, it doesn't really inspire confidence, and it doesn't compare with the power of APW or Orca.

The new environment has a much-improved editor, although the missing horizontal scroll bar is a real pain. It doesn't take much time to compile a program, test it, and return to the environment, although it frequently crashes when doing so. A crash upon exiting TML II is virtually guaranteed.

A new graphics command turns on the full hi-res screen in 320 or 640 mode. You can use standard text input/output commands in conjunction with the graphics screen and compile programs as new desk accessories or classic desk accessories.

Previously, both TML and The Byte Works used proprietary toolbox interface files; it was quite difficult to exchange TML and Orca source-code files. TML now uses standard header files developed by Apple. This means you'll have to bring your old TML programs up to date, but the compatibility will be worth it.

The only file-management utilities are Rename and Delete. The competing Orca environment has dozens of utilities and lets you add your own, but the price you pay is a steeper learning curve. While comparing the two, you might also note that Orca also supports mixing languages within a program, and a debugger is built into its desktop.

I found problems with three elements of the Pascal implementation itself. Members of sets aren't properly recognized; string-to-character type conversion fails; and the case statement doesn't recognize some valid values. It took three tries to come up with an old-fashioned menu loop that could recognize its input.

SOURCE CODE, TOO

Computer programming is something you learn by following examples and by doing. To supplement the six sparse examples included with TML Pascal II, you can purchase 13 extra demo programs in Source Code Library II for $50. These, however, are not without problems.

Nearly everyone sells sets of source-code disks, but first they include enough examples with the compiler to demonstrate its features thoroughly. In the case of TML, you'll need this "extra" disk, so count it as part of the cost of the compiler.

Other available sets of source-code disks are usually full sets. Thirteen examples on one lonely disk with no documentation is not really a value at $50. Also, while all the examples compiled without error, there are problems: a Pong game with a disappearing paddle; missing buttons; operating-system example calls that fail; and a telecommunications program that demonstrates only that the language isn't fast enough to handle telecommunications. ►

On the other hand, there's a fully working desktop text editor; digitized sound and note-synthesizer demos; the new PopUp scrolling menus; graphics; and a text file and picture printer. All the programs include both a source-code file and a resource file.

Even though there are only 13 titles in the library, it's a well-planned collection. You could even defend the bugs, considering that few collections of programming examples are thoroughly debugged.

ALMOST THERE

TML Systems has returned to the Apple II language marketplace with a stylish product. TML Pascal II is a good idea, and parts of the implementation are well done. Is TML really trying to make a contribution, though? The signs indicate otherwise. This version is unreliable. TML has hired an Apple II product manager, but it has withdrawn on-line support and doesn't respond to technical calls and letters.

Games require marginal support. A reliable word processor or utility can chug along for years. A publisher's commitment to language software, however, is all-important. Compilers are the most complex packages on the market, and without proper maintenance they quickly become a costly mistake for the programmer.

Programmers who want to stay ahead of the game will be interested in TML Pascal II so that they can become more familiar with resources. It isn't yet reliable enough, however, for serious program development.

Current owners of TML Pascal can upgrade for $49.95. The upgrade for the Source Code Library is $29.95. The TML Speech Toolkit is $69, or $15 for the upgrade, which was unavailable at press time. At one point, TML also sold a version of its Pascal that ran under the APW shell. It remains unclear whether this product will be renewed.

TML Pascal II received a rating of 5 despite its unreliable nature; it gives the IIGS a tangible tie to the leading edge of programming. The Source Code Library II received only a 4, because it is in fact a hidden cost associated with the compiler.

Joe Abernathy
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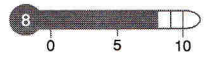
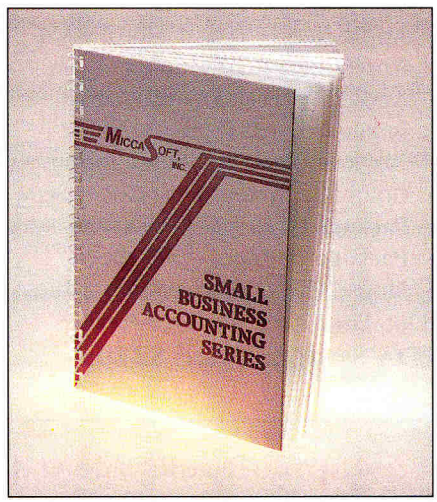


Running a small business with your Apple II calls for a number of tasks—generating invoices, sending out bills, and keeping track of your inventory. MiccaSoft's Small Business Accounting Series is an integrated package for doing just that; it produces invoices, charges customers in accounts receivable, and deducts anything sold from the inventory-tracking module.

Getting started with the Small Business Accounting Series (SBAS) is a matter of working through a series of menus where you indicate the standard "defaults" you'd like for your business, such as the terms of sale your company offers, who pays the freight on what you're selling, whether you generally charge sales tax, whether you want to work with an open-item or balance-forward system, and so on. What all these options mean is explained in detail, both in the manual and on screen.



All the basics in an integrated package.

You can indicate that you normally charge sales tax, but when you invoice, you can then choose whether or not to add sales tax to each individual line item as you create your customer's bill. This is necessary if your business sells both taxable (such as material) and nontaxable (such as labor) items.

The system also lets you implement what it calls a *price factor*, which means if something you sell retails for $100 per thousand, and you're invoicing 500 of these items, the program will automatically do all the calculations to show this sale at $50. However, the price factor is applied to all your prices, so if you sell a mixture of products, this feature won't be too useful.

You're allowed up to 1024 customer accounts and as many as 1024 inventory items and billing rates. A *billing rate* is the labor rate per hour you charge for the services your company provides. By letting you use both products and billing rates as part of your "inventory," SBAS lets you enter either the item number or billing rate code, and both the description and price will be printed automatically on your invoice. This billing-rate feature is especially nice if you sell both products and services, as it gives you the flexibility to invoice everything you sell using the same type of entry.

The program provides two user-defined *smart keys* (which operate like macros for things like city, state, and zip code information) to speed up data entry. You can also specify preprinted or blank forms, and SBAS will adjust its printouts to what you're using.

One of the nice things about the Small Business Accounting Series overall is that in each section, you can display a listing of your accounts, billing rates, and inventory item numbers at any time, just by entering a ? in the item field. SBAS sorts your customer accounts (by account number or by name), and your inventory and billing rates (either numerically or by description), so it's easy to find what you need.

If you have an earlier version (2.1 or 2.2) of the Invoicer or the Invoicer with Accounts Receivable, this latest version will work with your existing data files, provided they're updated with a program such as Copy II Plus. The DOS 3.3-to-ProDOS conversion program won't be

Continued on p. 78

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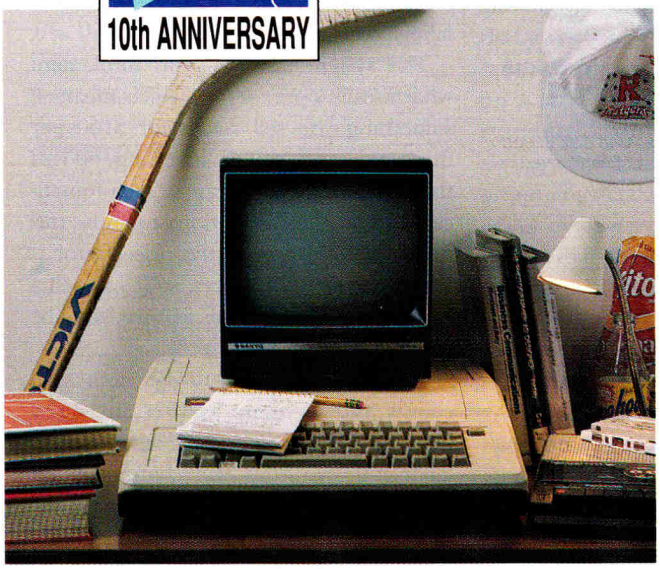

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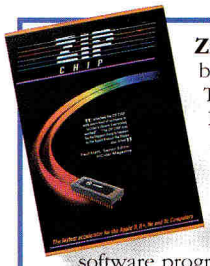

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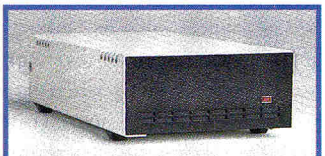

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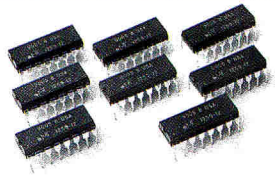

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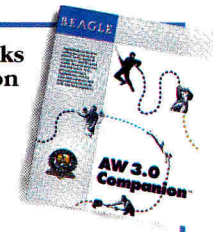

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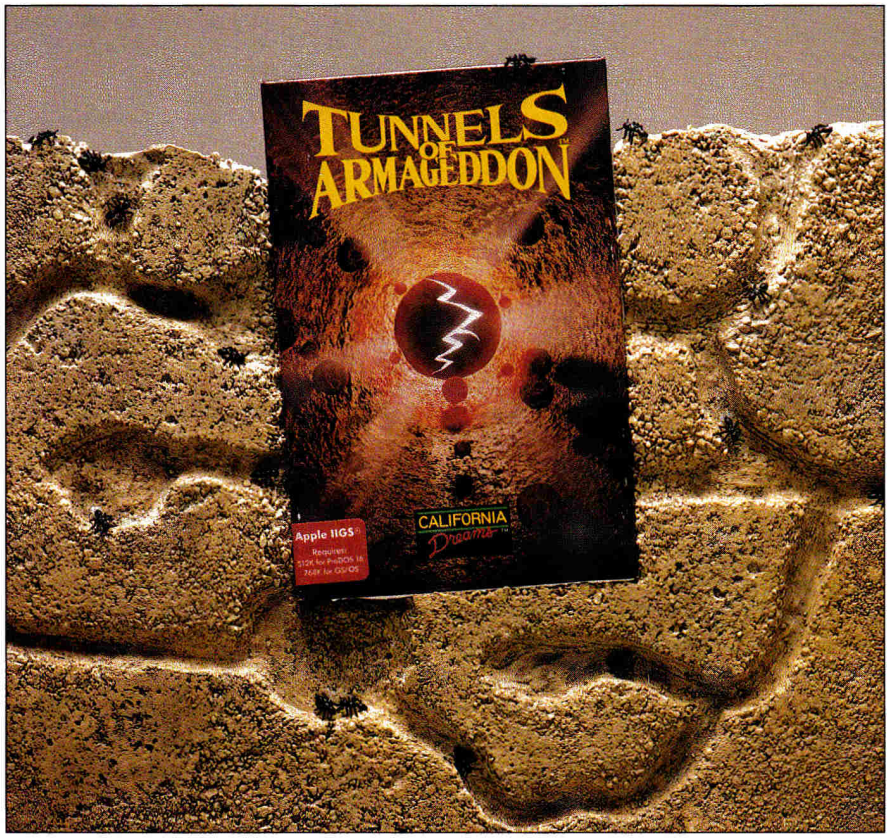

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Tunnels of Armageddon is an ominous title, but you're faced with an ominous task. Scientists have discovered that some ancient alien race has constructed a labyrinth of tunnels beneath the continent of Antarctica and will provide humans with the secrets of hyperspace travel if a chosen pilot can negotiate the tunnels within a given period of time. If the pilot doesn't finish in time, the aliens have judged that we're not mature enough as a society to possess those secrets, and they'll destroy Earth. So guess who gets elected?

Once you start down the first tunnel, the alarm signal that will trigger the detonation sequence is released. It's traveling almost as fast as your craft; you know what happens if it gets there first.

You can slow the signal down by taking out the generators along the way, and you can acquire some extra goodies (better ammunition, invisibility shields, energy boosters, and so on) if you're a good shot. Banging into the tunnel walls when you miss a turn will eventually destroy your craft, but, worse yet, it loses you precious time.

The graphics screens are incredible. I liked the music and sound effects as well, but what always stands out about California Dreams games are the fantastic images. From the pilot's seat of your HERMES (Hypervelocity Extraterrestrial Reconnaissance and Magnetically Elevated Scoutcraft) Mark I, there's a lavishly detailed view of your cockpit, including gauges showing your ship's vital signs. You'll also see the tunnels unfolding before your eyes at a dizzying rate.

Never before has a game caused me to make as many unnecessary physical gestures in some futile attempt to facilitate what I was doing on screen. Tunnels of Armageddon gives you an unbelievable feeling of warp-speed motion. I wouldn't recommend playing it with a hangover.

A race to the finish at warp speed.

Lafe Low
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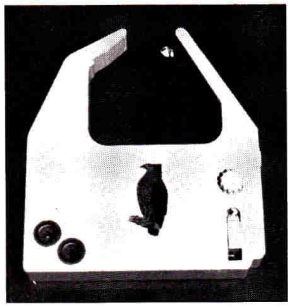

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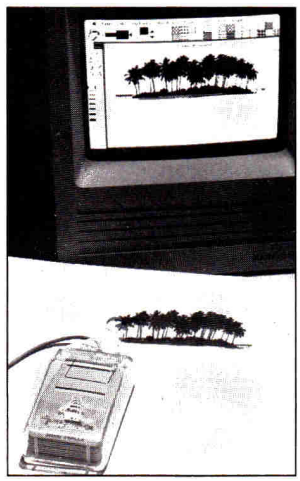

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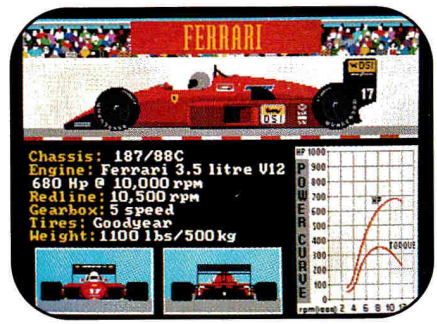

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Remember, as tough as it can be to handle one of these simulated cars, when you're in a race nine other cars will be out there, all trying to get ahead of you. Every time I entered a race, however, my competitors were too far ahead for me to study their tactics.

Lafe Low
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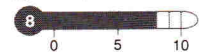
ORBIZONE

Pangea Software,
10918 Kirwick, Houston, TX 77024

Arcade action;
512K Apple IIGS; $5 shareware fee



If you've been playing arcade games and computer games since the dawn of time (or at least since the dawn of arcade and computer games), you recognize the classics—Pong, Space Invaders, and a handful of other timeless titles. Orbizone is basically the same thing as Asteroids: You control a ship in the center of the screen, which you rotate in all directions to clear the screen of "asteroids."

You'll need a joystick to play Orbizone. One fire button shoots at whichever critter you're pointing at, and the other thrusts you forward. Whenever you see a bubble on screen after you've hit something, run it over by thrusting forward and you'll be protected by a force field for a short while.

What you're shooting at is a fleet of multicolored animated blobs that float all over the screen and break down into smaller and smaller pieces each time you hit one of them. When you collide with an asteroid, you vanish in a dazzling explosion. For such a simple game, its fluid animation and crisp graphics are captivating.

Dazzling Asteroids-style action.

The guys who developed Orbizone should be well known to game fanatics: After seeing Orbizone, Senseless Violence, and Xenocide, I can safely say that the graphics screens in Brian Greenstone and Dave Triplett's games are second to none. Sure, Orbizone resembles Asteroids' game play closely, but that old monochrome standby never looked like this.

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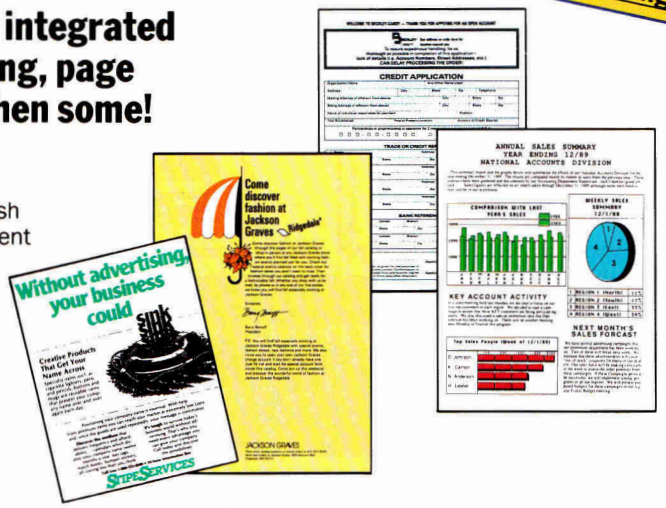

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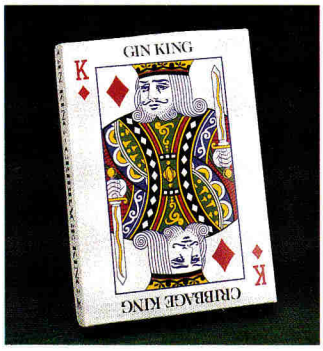

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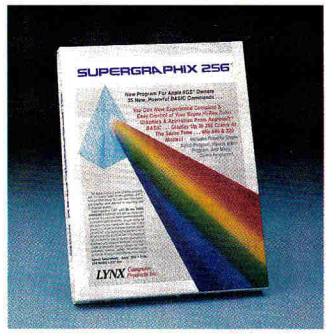

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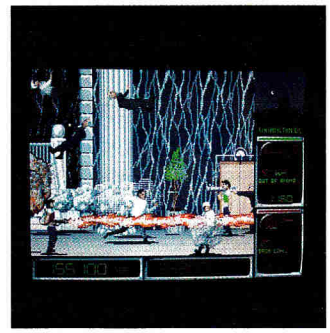

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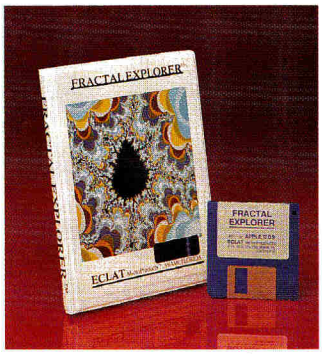

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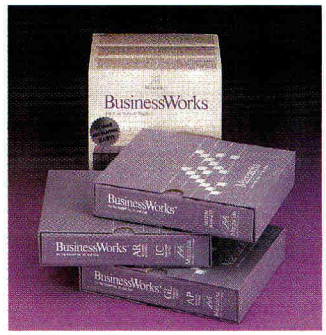

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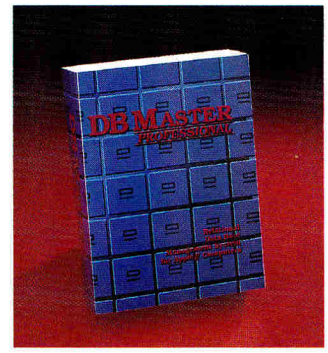

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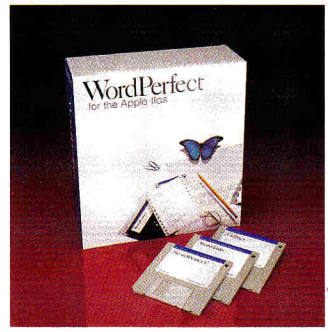

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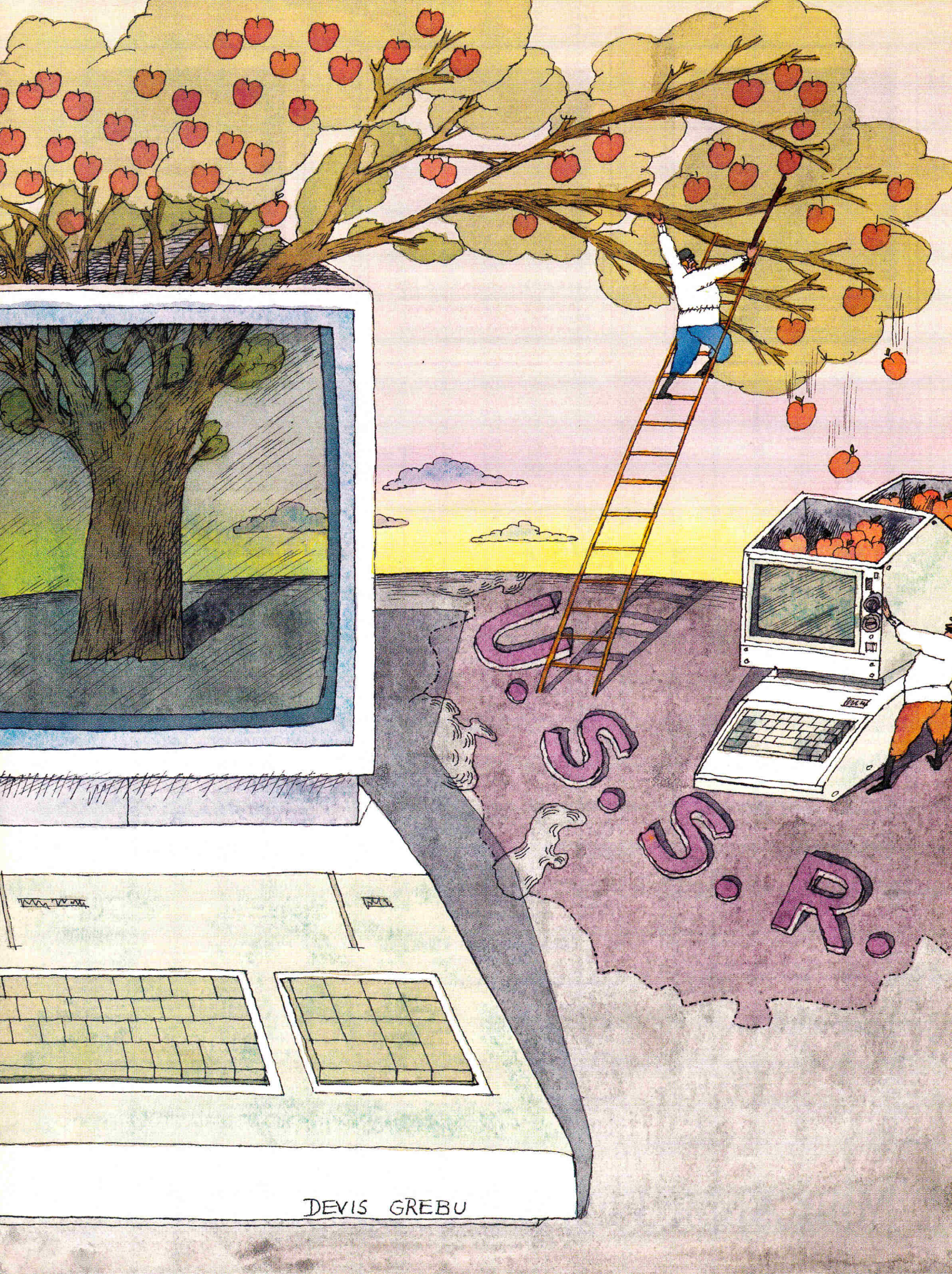
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RED HOT APPLES

. . . or How We Learned to Stop Worrying and Love the Pravetz

JUST OUTSIDE THE ANCIENT CARAVAN city of Tashkent stands a late-20th-century symbol of the changing face of East-West relations. Where trade routes once crisscrossed the desert, technological equipment and know-how are now bartered: Half a world away from Silicon Valley, a Soviet computer plant is assembling a machine called the *Pravetz*—an Apple IIe clone.

The company, known as Variant, is a joint venture between Bulgaria and the U.S.S.R. At the factory in Tashkent, some four hours by Aeroflot jet south of Moscow in the Soviet republic of Uzbekistan, computer parts shipped in from Bulgaria are assembled, tested, packed, and sent out in groups of ten to schools across the Soviet Union. The computers are purchased by the Ministries of Education in the various Soviet republics.

Variant offers schools an entire array of services—instruction (there's a classroom where students and teachers can learn to use their machines), support, software development and distribution, repairs, and a seven-year warranty.

Variant rents the top floor of a three-story building that was planned as offices, and workers must make do with the limited space available. The interior is shabby and drab; the only bright spots are the omnipresent posters of Lenin exhorting his people to greater efforts and Soviet glory. There's no assembly line; workers move computers from room to room by hand, resulting in much congestion and frustration. The desks of Variant's software developers are littered with glasses of tea and mineral water; almost everyone smokes cigarettes, and they smoke everywhere.

ACROSS THE BLACK SEA

For Bulgaria and the Soviet Union, former enemies now joined in the uneasy alliance of the Eastern bloc, the bureaucratic problems involved in sharing technology were indeed formidable. Today's Pravetz computer has been eight years in the making. ►

By ALAN R. MARTIN

Illustration • Devis Grebu

Left to right: Vladimir Fedorov of Lidar; author Al Martin; Jacob Tastkin, software-products director; and Inna Grebneva, Martin's interpreter in Uzbekistan.

Variant's screen logo—Cyrillic version, of course. The Pravetz also supports the Roman alphabet.

In 1982 the only decent personal computer available anywhere behind the Iron Curtain was an Apple II Plus clone. The Bulgarian Academy of Science Institute for Robotics and Cybernetics then developed a IIe clone that supported the Cyrillic alphabet and named it the *Pravetz*, after a small village where one of Bulgaria's presidents was born. Some 10,000 units of the Pravetz 82 were built (without benefit of a license from Apple).

In 1984 the leaders of the Bulgarian military decided to computerize the management of the armed forces. Using the utility programs Copy II and BugByter—and no documentation—a 17-year-old soldier from the nuclear-physics department of Sofia University figured out in just six months how to adapt AppleWorks 1.0 for the Bulgarian language and the Cyrillic alphabet. United States copyright law was ignored—the usual practice in the Eastern bloc.

With the help of five friends in Moscow, Vladimir Fedorov, a physicist at the U.S.S.R. Academy of Sciences, learned how to use the Pravetz to run his laser-based pollution-tracking system. The success of his project led to the formation of Lidar, a for-profit research and equipment vendor set up by the Academy of Sciences.

Camping Out in the U.S.S.R.

Holly Jobe, coordinator of technology services for Montgomery County, Pennsylvania, and five American students returned recently from six weeks at a Soviet computer camp located 2½ hours by jet north of Moscow. She reported at the Florida Educational Technology Conference in February that "there are very few computers in the U.S.S.R.," but that we Americans "are not necessarily 'ahead.' We do have better hardware and software—but we also have a lot to learn from the way [the Soviets] do things."

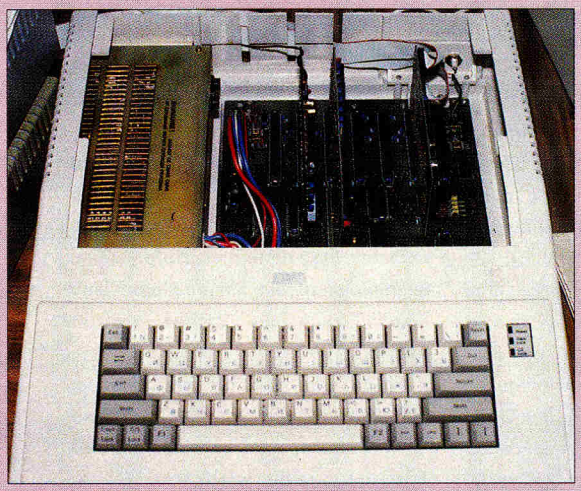
Perhaps because of a lack of equipment, students at the International Computer Camp's "Robotland" spent "a tremendous amount of time *off* the computer," despite the name of the camp, Jobe says. "The focus was not on the technology, but on problem solving" using computers, she adds. The young American and Soviet campers worked on algorithms for the Knight's Move, the Towers of Hanoi, the Ferryman's Dilemma, and Black Boxes—all classic problems in logic and mathematics.

The "game" of Black Boxes, for instance—creating a mathematical function that converts one number (the input) to another (the output)—revealed to Jobe an interesting difference in the styles of the Soviet and American students. Shown a sample black box that changes 2 to 4, 3 to 6, and 12 to 24, "the Soviet children mimicked what they had seen," creating black boxes that also multiplied the input by a constant. The Americans, Jobe says, "were more creative."

But Jobe's Soviet experience made her think that "sometimes we [Americans] have too much—we become enamored of our gadgets. We could take a page from [the Soviets'] book and focus back on the curriculum, and identify where technology fits well."

Jobe encourages everyone to visit the Soviet Union. "This is an especially vital time there," she notes, "and the Soviets also have a great deal to teach us about using computers in schools." For information about the Robotland project, Jobe suggests writing Director A. Alimazon, Academy of Sciences Institute of Software Development, International Computer Camp, Peresalvli-Valesky, U.S.S.R.□

—Paul Statt



A look inside the Pravetz, the only II clone that features built-in slots like the Apple II.

In the "Variant Classroom of Tomorrow" in Tashkent, the ratio of students to computers is 2 to 1—a far cry from the ratio in the rest of the Soviet Union (or the U.S., for that matter).

Abram Magarshak, Lidar's director general, estimated that the company could make a profit by selling just ten computers a year at a total price of 800,000 rubles (approximately $128,000 U.S., although there's no official exchange rate). The Pravetz, however, was available only in Bulgaria; that country's currency, the *lev*, isn't convertible. The Bulgarians refused to fill such a small order. Because the Pravetz was necessary to fulfill the contracts, Magarshak offered to purchase the ten computers at greatly inflated prices, with the payment to be made from the profits of the contracts. The Bulgarians turned down that offer, too.

To pay for the computers, Lidar's director then proposed to form Variant, an organization that would assemble the Bulgarian parts in Tashkent in Central Asia, for sale to schools throughout the U.S.S.R. The Bulgarians would invest the parts, and Lidar would pay the salaries of the workers, locate the space, and take care of all assembly, distribution, and education through Variant. Fedorov jokingly calls it "a screwdriver plant—we screw the product together. We sew the label on the product."

Proposing such an organization was easy. Making it work wasn't. A whole array of logistical, political, and bureaucratic hurdles blocked Variant's path. For example, various Soviet ministries, including trade and education, blocked the incoming supply of computers; they didn't want to jeopardize their relationships with computer suppliers in Czechoslovakia and Poland, even though those computers were of inferior quality.

Another problem was that Variant needed permission to do business from the same ministers who had blocked the importation of the computers in the first place and had even tried to prevent the establishment of the company. Variant was closely associated with Lidar, however, and Lidar's roots are deep in the U.S.S.R. Academy of Sciences, an institution with a great deal of power and authority. As in the United States, knowing the right people can open many doors. Despite its problems getting off the ground, Variant showed a profit after one year and established a model-education project in Tashkent—a "Variant Classroom of Tomorrow," so to speak.

The Pravetz is now facing some stiff competition, however. Fedorov says 15,000 Pravetz computers are used in Soviet schools, although "that's a small drop" among the 2 to 3 million machines needed. Although Tashkent, a city of two million people, is the capital of the republic of Uzbekistan and the industrial center of Soviet Central Asia, Variant was able to get permission to put its computers into Uzbek schools because the area is considered provincial, according to Fedorov. In Moscow, Leningrad, and Kiev, he says, IBM clones are in demand for schools and businesses. In addition, says Dmitrii A. Koryagin, head of the Department of Physical and Mathematical Sciences at the U.S.S.R. Academy of Sciences and a member of the International Computer Club (ICC), developers in the U.S.S.R. have also produced Soviet computers that use their own operating systems and hardware.

OPEN WINDOW ON THE WEST

Trade with the Soviet Union can be extremely profitable if U.S. companies keep in mind the problems of nonconvertible currency, the restrictions imposed by that nation's immense bureaucracy, and language and cultural differences. One difficulty the Soviets are addressing currently is the issue of copyright. Variant and other new joint ventures in the Soviet Union now adhere strictly to U.S. copyright laws; for that reason, the Russian version of AppleWorks isn't distributed. Throughout the Soviet Union, however, a thriving black market deals in many products, including pirated software from the West, although such programs are often plagued with viruses.

As Mihail V. Mishustin, an official with the International Computer Club, explains, "We want to show our people, especially professional people, the power of modern Western technology. The problem is it's difficult for us to deal ►

Better Red Than Dead?

What's the first North American Apple II software developer to sell products in the Soviet Union?

Claris? Wrong—although pirated copies of AppleWorks abound. Beagle Bros? Good guess, but wrong again. It's not Broderbund, Scholastic, Davidson & Associates, or Timeworks, either. In fact, this company isn't even based in the United States.

Give up?

It's Micol Systems, the Toronto-based publisher of programming languages for the Apple II line. Micol may not be a household word to the average Apple II user, but the small company—even by Apple II market standards—is no newcomer to the II world. Formed more than seven years ago by Steven Brunier, president, and Ron Lewin, marketing director, Micol Systems has emerged as the BASIC-language leader for both 8-bit and 16-bit Apples.

According to Lewin, a Russian edition of Micol Advanced BASIC (the Apple IIe/IIc version) should be available in the Soviet Union by early September.

Lewin and Brunier are working with Vladimir Fedorov of Lidar, the company that will produce the Russian version of Micol Advanced BASIC. Acting as a "middleman" of sorts is the International Computer Club (ICC), which Fedorov describes as "a big consulting firm" for both Soviet and foreign companies. Fedorov is a founding member of the ICC and president of Lidar, a company that makes environmental monitoring systems that use the Pravetz computer, an Apple II clone manufactured in Bulgaria and Uzbekistan by Variant. (See the accompanying story.)

Lewin says he expects the price of Micol Advanced BASIC to be 125 rubles (approximately $20 U.S.); the final decision is Lidar's, however. One difference in the way software is sold in the Soviet Union is that the 125-ruble price tag is final for everyone—no discounting. "What's called 'business' in the United States is called 'speculation' in Russia and is illegal," Lewin notes.

Selling software in the Soviet Union is no simple proposition, so what problems do Lewin and Micol Systems expect? "I don't know," says Lewin. "I honestly don't know. The conversion to the Cyrillic alphabet isn't hard. Translating the manual isn't hard. I imagine the biggest problem is the bureaucracy. It's tough to get paper and disks, and it can take months to get anything printed."

Even if Micol Advanced BASIC leaves them dancing in Red Square, there's still a problem: What does a Canadian company do with all those rubles? Unlike other currencies, such as the dollar, the franc, the yen, and so on, the ruble is worthless outside the Soviet Union.

"You can convert rubles to dollars," Lewin says. "However, the Soviet government sets the exchange rate, which isn't realistic or favorable." The government inflates the ruble to make the Soviet economy seem more stable to the rest of the world, he explains.

Micol doesn't necessarily want to take the rubles out of Russia, however. "We're thinking of hiring Russian programmers to produce software for future projects," says Lewin. The pool of programming talent in the Soviet Union is reportedly deep. As Fedorov explains, the problem with information technology in the Soviet Union isn't "how to"—it's "what to do with it."

That's why one of the priorities for Fedorov and the ICC's Mihail V. Mishustin, who recently visited Toronto along with Dmitrii A. Koryagin, a professor of physical and mathematical sciences at the U.S.S.R. Academy of Sciences, is to help companies such as Micol reach Soviet consumers, as well as educate Soviet citizens on the possibilities of information technology. For example, Mishustin and the ICC run a twice-monthly television show designed to teach children about computers.

Fedorov and Mishustin are laying the groundwork for U.S. and other foreign companies to reach the Soviet market through activities such as the International Computer Forum scheduled for June 14–17. (See "Moscow Nights," What's New, April 1990, p. 19.) So far, Atari, Commodore, Digital Equipment Corporation, and the Software Publishers Assocation are among the companies signed up for the conference. You can even expect to see an *inCider* editor or two wandering around Moscow.

A Bulgarian Apple II clone—a Russian version of Micol Advanced BASIC—a thirst for Apple II software. Maybe it's time for Apple II enthusiasts to head East.□ *—Dan Muse*

with software, because we don't have the laws about copyright. To prepare the Soviet people for computer technology, the ICC has to teach them about copyright." Fedorov says the ICC has asked the Soviet government to adopt piracy laws. (For more on the ICC, see the accompanying sidebar "Better Red Than Dead?" plus "Red Apples," What's New, November 1989, p. 16, and "Moscow Nights," What's New, April 1990, p. 19.)

What happens next? Will the Soviet Union's talented programmers and technical experts become a valuable source of new Apple II software and hardware design? The answer to that question may become increasingly important to the 5 million II owners in the U.S. who are fed up with Apple's indifference and the shrinking number of Apple II software developers in this country. The U.S.S.R. has opened a window, and East and West are taking a fresh look at the technological opportunities that lie ahead.□

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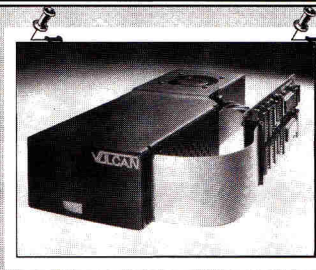

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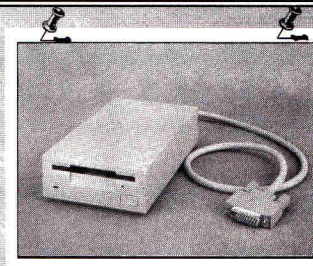

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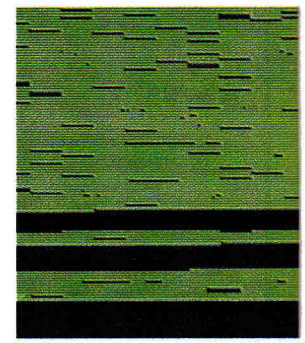
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MAKING MOVIES WITH YOUR APPLE II

And the envelope, please. . . . Follow these simple guidelines to create professional-looking video productions. In this second installment of a two-part series, we'll show you how to use the equipment described last month to its fullest. Lights, camera. . . .

By WILLIAM P. KENNEDY, Ph.D. * GUY WRIGHT

YOU'VE PROBABLY HEARD THE term *desktop video* bandied about in the media, at work, or maybe even at parties. Those fancy graphics, titles, and credits that spin around on your television screen during your favorite program, particularly sports broadcasts, were probably made using an elaborate computer-based video system. So it's not surprising that any mention of desktop video evokes visions of expensive computers and highly trained media professionals.

Don't be misled. You can perform rather elaborate desktop-video productions right in your own den or classroom using equipment you probably already own or can easily borrow: a camcorder, a videocassette recorder, and an Apple II. With today's equipment, you don't need a degree to produce desktop videos. However, it takes more than stringing together a lot of not-necessarily-related scenes and then throwing in some titles to create a masterpiece. Those 8-mm family films transferred to videotape are famous for being so visually disorganized and uninteresting that viewing them even once is challenging.

Last month, you discovered what equipment you need to get your videos rolling. This month, you'll learn how to go about creating an Apple II-based desktop video. Whether you choose to adapt our family-history video for your own project or not, our production experiences, from preparing a script through the final edit, should help you tackle your first video.

The easiest part of a video project usually is deciding on a topic. You may, for example, have hours of family or classroom activities on videotape. A simple project to start with is editing those down to one tape or arranging them according to general topics such as "Johnny's Birthdays" or "Spelling Bees." While you're at it, why not add titles to document the tapes? That's desktop video in its simplest form—one quite easily performed using your Apple II.

We've chosen to be a bit more adventurous with our desktop-video project: *Family Interviews*. Producing a family interview ►

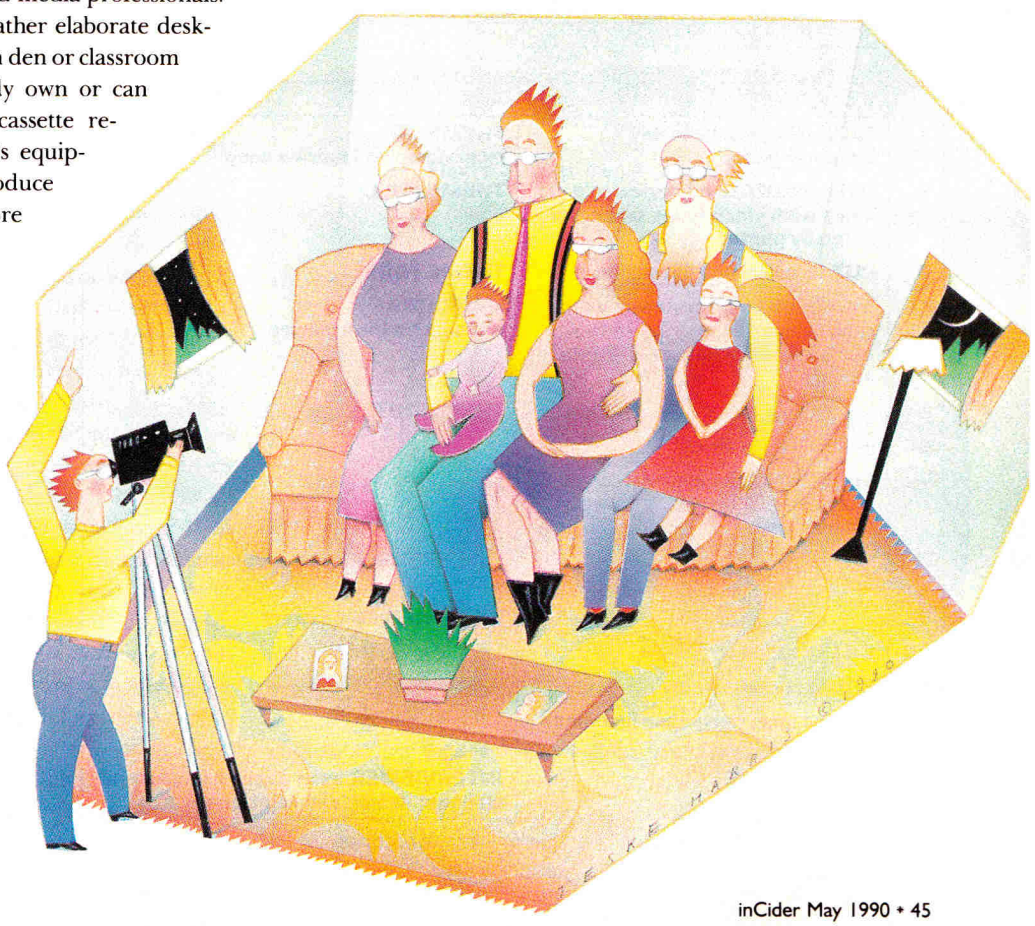

Illustration * Diane Teske-Harris

entails considerably more than simple titling; the project is designed to demonstrate the variety of desktop-video enhancements you can perform with your Apple II. But it can be more than just a demonstration project. It can be a great asset for your family, or, with a minor change in the title, your business or school.

Most families trace their past by saving photographs and remembering stories told to them by their elders. With time, though, artifacts and verbal histories tend to be lost or forgotten: Shoeboxes full of old photographs get tossed out from the attic; stories are forgotten; people pass away.

Video lets you assemble and record artifacts and verbal information onto an organized, compact, and relatively secure medium. But, more importantly, a video interview offers what other forms of recorded history can't: both the sight and sound of your ancestors.

So much of what a person relates to others is nonverbal; video best captures the complete moment. That's why you should use Apple II-based desktop-video enhancements to preserve videotaped interviews with family members or important members of your organization.

THE SCRIPT

The most important rule for any video project is: Get Organized. Even the relatively simple task of editing videotapes together can be a nightmare if you haven't first decided which scene goes before or after another, where to start and stop a scene, and whether you have enough room on the new tape to accommodate all the scenes you want in your video. And that's just for starters. Desktop-video enhancements generated by your Apple II are usually recorded first, then inserted or merged with other recordings. Don't try to keep track of all those scenes and edits in your head.

The first step in getting organized is using an Apple II word processor to write a script. We've put together a sample script that generally describes a video interview with a family member. A portion of that script is shown in **Figure 1**.

A fair degree of detail in the video script is important; it forces you to think through and "visualize" beforehand how a scene or sequence of scenes might look. This will help you keep better track of all the scenes you'll need before you start to edit them. You don't want to forget a scene or discover that you forgot to ask a particular question in the interview, because you might not be able to ask the question later.

A detailed script helps you explore where your Apple II might enhance the production. For example, the sample script describes a scene in which personal statistics are displayed as text merged with a still photo of the interviewee.

Master Script: Family Interviews
Conversation with _____ **Date/Time:** _____
Place: _____

	Video	Audio
1	FADE IN to title overlay on family photo	THEME UP interviewee's favorite song
2	WIPE RIGHT to interviewee's name with video focus on person in family photo	THEME FULL
3	CUT to interview date/time	THEME FADE
4	DISSOLVE to interviewee photo with statistics overlay (name, birth date, birthplace, parents' names)	NARRATOR introduces interviewee
5		THEME OUT
6	FADE OUT to black	
7	MEDIUM LIVE camera over shoulder of interviewer toward interviewee	
8		INTERVIEWER asks about where and when born
9		INTERVIEWEE answers
10	CUT to LS map	
11	ZOOM to region/city	
12	CUT to local newpaper headline (birth date)	
13	MEDIUM LIVE	INTERVIEWER asks about parents and siblings; names and relationships

Figure 1. Portion of interview script.

DON'T GET OBSESSED

However helpful a detailed script might be, don't get too involved with scripting. There's a point of diminishing returns, particularly when you haven't yet recorded the live scenes.

Except for tightly controlled shots (interviews certainly aren't), portions of live-recorded sequences will often beg for some desktop-video enhancement. Pencil in those details "on the fly" while you're recording live scenes as we've done in our sample script. For example, our interviewee mentioned his parents' origins and how they had to travel by ship from the "old country" to the United States. Viewers would certainly enjoy an animation showing that emigration on a realistic map (see **Figure 2**). Don't be afraid to ad lib such a feature.

TAKE 1

Script in hand, you're now ready to produce your video. Production is usually divided into four basic steps: live recording, desktop enhancements, video editing, and audio editing.

Live videotape recordings are made using a camcorder or camera and microphone attached to a videocassette

recorder. Live recordings are usually done first because you can't predict what will happen and, therefore, it's difficult to know which desktop-video enhancements will be appropriate. For example, you might not know beforehand where an interviewee was born, making it impossible to prepare the personal-statistics scene or maps.

There are a number of rules and tricks to live audio/video recordings. However, two techniques in particular should be observed without fail, because both are important later when you edit the tapes: Make sure there's plenty of light, even with low LUX-rated cameras, and keep a log detailing the scenes and their locations on tape.

Plenty of light means a better video, electronically. With each generation or electronic transfer of tape segment to another tape, the video quality is reduced by up to 20 or 30 percent. If you begin with a poor recording, most often because of poor lighting, you might not notice a problem at first, but you can end up with a lot of color bleeding after the requisite editing.

The need for a log is obvious. You can write vital information onto the script, or you may want to record the tape number and location in a small notebook, which you can carry conveniently your back pocket. Later, when you go to edit the tapes, you don't have to turn your studio upside-down and waste hours fast-forwarding through tapes looking for the right scene.

And, finally, let the camera "linger" on your live scenes so that you have plenty of extra recording for editing.

BACK AT THE STUDIO

Now that you've collected most of the live video footage, it's time for the fun part—preparing desktop-video enhancements.

Part 1 of this article (see April 1990, p. 44), described the various audio/video equipment and Apple II hardware and software you can use for desktop enhancements. Our system (see Figure 1 in last month's article) includes a camcorder ("slave" deck) connected to the video input of an Apple II Video Overlay Card (VOC) installed in a IIGS (you can also use a IIe), and a VCR ("master") connected to the VOC's video output. The VCR uses a VHS format and contains "flying" erase heads, an essential feature for "clean" editing. The VOC is necessary not only for special effects—overlaying the Apple's video, text, and graphics output with taped background (see below)—but also to obtain a better video signal than that available from the monitor jack on the back of your Apple II. A National Television Standards Committee color monitor is also attached to the video output of the VCR while recording or to the video-out connector of the VOC when creating desktop-video scenes. This is helpful because the RGB monitor connected to the IIGS, while useful for editing and reviewing desktop-video scenes, doesn't give a true picture of the actual recorded results.

You can insert your desktop videos directly into your final or master production. However, except for the simplest desktop enhancements, you'll find it's easier to prerecord the

Figure 2. Animated map showing emigration route.

Figure 3. First frame of introductory sequence, created with paint and titling software.

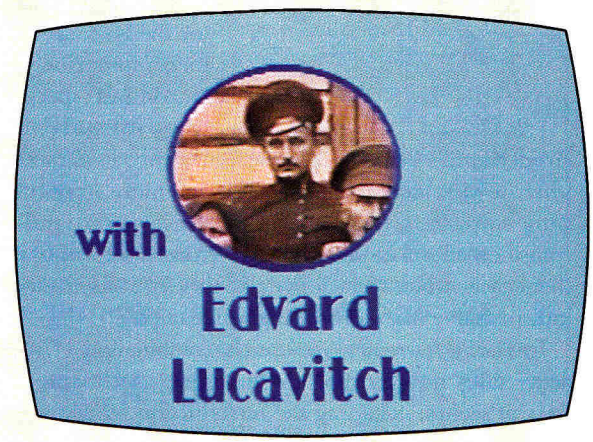

Figure 4. Second frame of introductory sequence.

scenes, perhaps more than once, and then edit them along with the other recordings onto your master video. You should make those "slave" recordings longer in duration than you think you'll need. It's always better to start with too much material and then edit down.

The first desktop-video enhancement we tackled for our project was titling—the graphics and text frames that document the proceedings. There are several ways to insert titles into your videos: *static* versus *active* and *graphics-only* versus *overlay* frames.

Static frames are simple, nonmoving graphics or text screens created on your Apple II. They're usually the easiest and most readable of the video enhancements.

Active titles are visually more appealing that static ones, particularly when using a series of title frames. That's because you can incorporate a variety of special effects while displaying a title. You can also use interesting frame-to-frame transitions when transposing to the next title frame. Active titles are more difficult to prepare and record than static ones—timing the special effects and transitions is critical—but the results are clearly more appealing.

The use of *graphics-only* versus *overlay titles* depends on whether or not you have the VOC. As mentioned in Part 1 of this article, you can superimpose (overlay) Apple-generated displays onto live or videotaped scenes in both static and active modes using a VOC. Without it, you simply can't merge the two different video sources.

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You have to be careful when creating graphics for videotaping, whether static or active, particularly those containing title text. Generally, paint programs for the Apple II, especially for the IIGS, are designed for computer-only display. In contrast, specialized titling software, such as Broderbund's **VCR Companion**, is designed to minimize computer-to-videotape problems. Perhaps more importantly, titling software's variety of interesting special and frame-transition effects as well as the structure to let you implement them easily when recording make this type of software almost indispensable when producing active titles.

In *Family Interviews*, we used a combination of static and active titles and incorporated the overlay technique for a variety of scenes, including the introduction sequence, parts of which are shown in **Figures 3** and **4**. All were composed using paint and titling software.

For example, the introduction to our video is actually made up of three basic frames: The first, shown in **Figure 3**, is the project title superimposed on a family portrait. A second frame (**Figure 4**) contains the interviewee's name superimposed on that same family portrait but with the person's picture emphasized; it's followed by the date and time when the interview was conducted (not shown).

To create the individual frames, we started by drawing the colored boxes that surround the respective photographs using Broderbund's **Dazzle Draw**.

Those boxes were correctly sized and positioned by simultaneously displaying the appropriate photograph on screen using the camcorder and VOC. We then imported the boxes into VCR Companion and used it to compose the introduction sequence, including the text, special effects, transition between frames, and length of time the frames were displayed. Finally, we videotaped the sequence two or three times for later editing into our master video.

Our introduction sequence starts with the family portrait on screen. The project title is then superimposed over that portrait in a left-to-right wipe transition, and a "highlight up" special effect is activated while the frame remains on screen for about five seconds.

An "iris-in" transition then overlays the last frame with the colored box that focuses on the interviewee in the portrait, and a "stars" special effect highlights the person's name. Finally, a static title showing the time and date of the interview is "spiraled" onto the screen.

You can use a variety of software to create other desktop enhancements for your video. We used Epyx's **Art & Film Director** and a "live" video of a world map, for instance, to create the emigration video shown in **Figure 2:** an animated sequence showing a boat traveling from Lithuania to New York.

LET THE EDITING BEGIN

The next step toward creating your video masterpiece is video editing. Start by reviewing each recorded scene. Pay close attention to the audio track when deciding the length of those scenes, particularly when inserting a desktop-video enhancement. For instance, we want to match the boat animation with the audio description of its travels by our interviewee.

Now's also a good time to update your script, incorporating all the changes you may have made while collecting the live scenes and preparing the desktop-video enhancements. Remember to annotate that revised script with your log entries as well as scene durations while you review those sequences.

Again, you must be well organized. Inserting a missed scene or altering the length of one already recorded on the master is nearly impossible without rerecording portions of the master itself. Each generation costs dearly in video quality, so you must minimize your errors or you'll end up with a lot of snow, "exploding" reds, fuzzy images, and nonexistent greens.

When performing the actual video editing, our equipment fortunately included a video editor/controller device. It's programmed to automatically cue up, start, and stop videotape segments on the slave (source) deck for transfer to the master tape. Editing is much easier with such a device, but it's not

impossible without one. Without a controller, you simply have to press the record pause/continue button on the master deck and manually cue up and play the transfer segments from the slave.

IT'S A WRAP

The final stage of editing involves the audio portion of your production. The focus of this two-part article has been on desktop video, so we haven't said much about sound or sound effects. Not that audio isn't important. Technically, however, audio is the least worrisome. And, unlike video, you probably already have a number of audio sources, such as a microphone, cassette recorder, record player, or compact-disc player. If you're interested in desktop audio, you should use a commercially available audio-expansion board rather than the II's generic sound system or even the IIGS's.

Audio editing is much easier if you have access to an audio mixer and an audio "dubbing" option on your master video deck. The mixer lets you connect several audio sources simultaneously and adjust their individual volumes for control and special effects. The "voice over" narration introducing the interviewee, for example (see script lines 1–5), is mixed with the interviewee's favorite song. Audio dubbing eliminates the need for another video generation; you record a new sound track without changing the video.

The only really tricky part of audio editing, particularly when dubbing, is adding sound effects or music to an original sound track. For example, we might want to add background music to some portion of our interview. Dubbing that background music requires that we rerecord the sound track from the original onto the master. If we don't cue up that original tape on the slave exactly, the interviewee's words won't match the picture; out-of-sync lips will get a laugh where it probably isn't intended. It's best in such cases to mix the extra audio while editing the video.

HITTING IT BIG

There you have it, Apple II owners. Your computer is a more-than-competent video partner. Now after this two-part article you can join the ranks of the great directors: Fellini, Scorcese, DePalma, Kennedy, Wright—especially the last two.

You don't need a lot of expensive equipment: just a IIe or IIGS, a video source, and some software. Of course, if you have a camcorder, a Video Overlay Card, a titling program, and a few other electronic niceties, your productions will be that much better. In fact, if your plans are at all ambitious, you're going to want a system comparable to the one described here. Take a bow, and say hello to Hollywood.□

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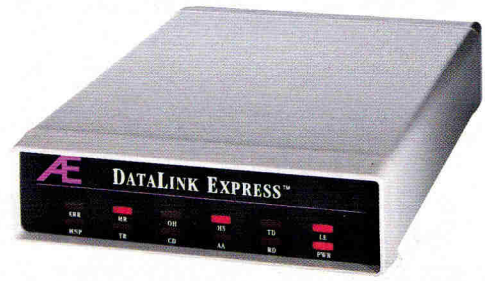

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Waited long enough for an upgradeable, full-featured modem? Introducing the new DataLink Express™ from Applied Engineering. With the *first* comprehensive status light array. The *first* Line Engage indicator. The *first* upgradeable design allowing for the addition of send-Fax capability and MNP error correction. And the *first* to offer these features affordably.

DataLink Express' exclusive Line Engage light indicates whether the phone line is free or in use, before you log on, to help line-sharing users save transmissions from time-wasting interruptions.

DataLink Express incorporates a perfectly matched Apple-platinum case, along with both Apple-type serial port input (Mini-8) and a DB-25 connector for use with PCs. It's fully Hayes compatible and operates at 300, 1200 or 2400 baud. DataLink Express even has non-volatile configuration memory with synchronous and asynchronous communication and separate line and phone connectors for line sharing.

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Unlike other modems, you don't have to shop for separate software. Comprehensive communications software for Apple II, Macintosh and MS-DOS computers is included.

Made by the Apple enhancement experts

Best of all, DataLink Express was designed and built by Applied Engineering, long the leader in Apple enhancement products. AE brings ten years' experience to producing feature-laden peripherals that set the standard for quality and reliability.

DataLink Express modem $249
MNP option $89

Order today!

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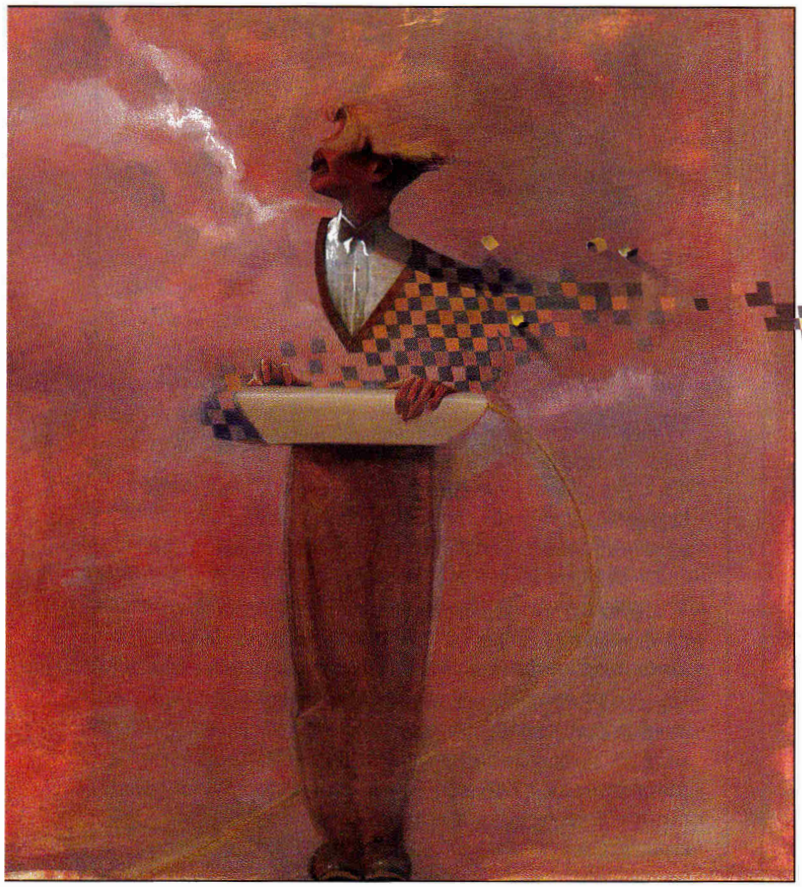


LINK UP

WITH TELECOMMUNICATIONS SOFTWARE

By SETH ITZKAHN

From commercial database services to user-group bulletin boards to electronic mail sent across town or around the globe, the world of shared information depends on fast, efficient communications programs.

BOOT UP your Apple II and at the press of a key a universe of information and entertainment opens—a whole new generation of high-performance telecommunications software is ready to speed you on your electronic voyage. Shop around—you'll see options such as multiple-transmission protocols, built-in full-screen editors, powerful macro languages, scrollable review buffers, and complete AppleWorks compatibility. Let's review the current packages (see the accompanying boxes), and look more closely at some of the features you'll be watching for.

MODEM TO MODEM

Transmission protocols are the methods by which files are sent between computers—various agreed-upon rates of transmission (number of bits per second), frequency of error checking between computers, and so on. Standard protocols form the keystone of telecommunications: For a file transfer to be successful, each computer must be using the same protocol; if so, communication should be successful regardless of different hardware and operating systems.

The two main protocol standards are *ASCII* and *Xmodem*, accounting for the vast majority of data communications between computers. Certain faster, more accurate, and more specialized transmission protocols have recently become available, as well. See the accompanying sidebar ("What's in a Protocol?") for details.

APPLEWORKS COMPATIBILITY

AppleWorks is the dominant word processor in the Apple II world; most text files sent via Apple II are in this format. Some communications programs now offer AppleWorks-to-ASCII and ASCII-to-AppleWorks conversion capabilities that let you edit and send AppleWorks text files while still in AppleWorks format; if you're a regular AppleWorks user, you'll find this feature indispensable.

STREAMLINE IT

Many people think of cumbersome programming procedures when they think of macros. For others, macros are the lifeblood of their work, facilitating on-line correspondence, research, and so on.

Macro programs are command procedures that give you "cruise control," letting you, for example, call an on-line service, check a stock's price, download files, and send electronic mail to your

Illustration • Trish Burgio

broker telling him or her to buy or sell—all while you're sleeping.

There are two kinds of macros: *Autolearn* macros are created by recording your keystrokes during a procedure. Once you do that, the macro retypes that sequence whenever you want—useful for automating log-on procedures and dialing phone numbers. While simple to create, they're limited in function.

Macro programming languages let you write more powerful macros with advanced capabilities. Similar to BASIC and Pascal, these languages support decision making, comparisons, branching, even string manipulation. Some languages contain hundreds of commands, while less complex ones contain only a dozen. You can create them with a macro editor or a standard word processor. High-end macro languages offer a *link* feature, as well, enabling one macro to execute another. A simple language is sufficient for most applications such as checking electronic mail and downloading text. (See "The Making of a Macro," June 1988, p. 66, for details.)

REVIEWING THE RESULTS

Almost every telecommunications package today offers some kind of simple word processor to save you from the expense of on-line editing and the hassle of switching back and forth between applications. Although no one expects these editors to compete with full-scale word processors, they're adequate for most on-line correspondence, like sending electronic mail and posting to bulletin boards.

The ability to copy and paste selected text into an on-line session is an essential editing feature. Many programs also let you copy text to a printer or a disk.

Almost all of today's communications products provide a scrollable *review buffer*, ▶

What's in a Protocol?

Whether you're a newcomer to telecommunications or an old hand, you've probably noticed the growing selection of file-transmission protocols. To further complicate matters, a single protocol may have several different names, and some names mean different things to different people. The following glossary should help clear up the confusion.

ASCII. Also called *text*, ASCII transfers let you send text files quickly, without error checking. Because text files are relatively unaffected by line noise, ASCII's lack of error checking isn't a major problem. ASCII is unacceptable, however, for other programs or files that rely on error checking and may be rendered useless if any bytes are corrupted.

Xmodem. Standard for binary files. Ensures integrity by sending files in packets, each of which is checked and resent if needed.

Christensen. Another name for *Xmodem*. Named after Ward Christensen, inventor of Xmodem.

Xmodem Checksum. Error-checking algorithm used by Xmodem.

Xmodem 128. Another name for *Xmodem*. Data are grouped in 128-byte packets.

Xmodem 1K. Quicker version of *Xmodem*, using 1K packets.

Xmodem 2K. Even faster version of *Xmodem*, using 2K packets.

4Modem. Quickest version of *Xmodem*, using 4K packets.

Xmodem CRC. Cyclic redundancy checking. This improvement over *checksum* lets you send larger packets virtually error-free.

Xmodem DOS. Also known as *ASCII Express*, this method transmits DOS 3.3 file information (size, type, date, and so on).

Xmodem ProDOS. Transmits ProDOS information.

Turbo Xmodem. A super-quick download method. Used only when lines are free of noise. It doesn't check for errors until after transfer is complete. If there are errors, the whole file may have to be retransmitted.

Ymodem. Technical definition calls for the following specifications: data packets of 1K, CRC, *batch* files, machine-specific file information (size, type, and so on). Not always implemented, however. May be used synonymously with *Xmodem 1K*; may not support *batch* transfers. Some documentation uses the term *Ymodem 1K* or *Ymodem CRC*.

Ymodem batch. Ymodem with multiple-file capability. Sends many files in a single transfer. Preserves filename and other machine-specific information.

Zmodem. A modern protocol used to help facilitate transfers over packet-switched networks and to mainframe computers. Called a "full streaming protocol," Zmodem speeds up operations by sending off blocks of data without first waiting for acknowledgment from the host computer. Previous blocks of data can be retransmitted at the host's request.

Kermit. Communications protocol common to mini- and mainframe computers with 7-bit communications environments.

Batch mode. Sending many files at the same time. Usually applies to *Ymodem*.

Binary II. File composed of other files packed together by the program *Binary Library Utility* (BLU). Like an envelope containing ProDOS files and machine-specific information. For text files, these data aren't so important, but for executable programs they're crucial. You can pack and unpack Binary II files with BLU, and transmit them with any error-checking protocol. Binary II is a file type, not a transmission protocol.

Auto Binary II. Ability to pack and unpack a *Binary II* file during transfer. Eliminates running BLU as a separate procedure. Sometimes confused with *Ymodem batch*; both appear to send multiple files while preserving machine-specific characteristics. Auto Binary II, however, doesn't actually send files; it packs them into one Binary II file, which your software then transmits.

Binary Library Utility. Program that can pack and unpack ProDOS files into or from a *Binary II* file. BLU maintains packed files' auxiliary machine-specific information, essential for proper execution.

Cyclic redundancy check. Advanced error-checking method using 2-byte-packet comparison value. Common with *Ymodem*; you can also use it with *Xmodem*. More reliable than *checksum*, which uses a 1-byte error-checking value. —*S.I.*

as well, which lets you retrace your steps and look back on what has crossed your screen during the on-line session. Review buffers are a safety net, letting you review what has passed by at your convenience. By default, it's always on. A capture buffer, however, is activated only when you want to save specific text for future use.

STRIPPING RETURNS

We're *not* talking about a risqué nightclub act here. Stripping is an essential feature if you download text files to your word processor. Many downloaded documents are plagued with carriage returns; without an automatic procedure to remove them, reformatting is a nightmare. You can also remove line feeds from your document. Some programs offer an auxiliary feature that automatically strips line feeds and carriage returns from an entire text document.

IN CONFERENCE

If you've ever taken part in a real-time conference, you know how annoying it can be to have your comments interrupted by someone else's typed message. Split-screen conferencing mode sets aside a portion of the display, letting you prepare two or three lines of text while the rest of the screen shows the main message. You can send this text when the other person has finished typing his or her message.

DIRECTORY ASSISTANCE

Dialing directories have long been a standard feature of telecommunications programs; they let you set up a listing of on-line services with telephone numbers—just select a name and press Return to call. Some directories alphabetize the list; others let you assign log-on macros.

REMOTE SITES

Most on-line services support straight ASCII or TTY (teletype) modes for *terminal emulation*—the ability to make your computer mimic another kind of system when communicating with a remote machine. If you've ever accessed a private IBM or DEC computer, however, you ▶

Program by Program

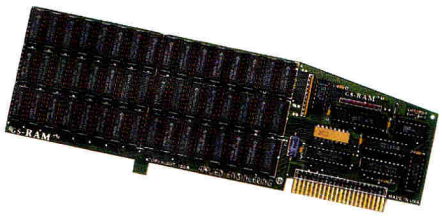
PROTERM, Checkmate Technology, 509 South Rockford Drive, Tempe, AZ 85281, (602) 966-5802
Overall grade: A
Notable features: Can autosave captured text into blocks of predetermined size, from 2K to 32K. Has state-of-the-art Zmodem and rotating dial list that skips busy numbers. Powerful macro language. Full AppleWorks compatibility.
Missing links: Doesn't recognize Apple IIe/IIc memory-expansion cards or Applied Engineering's RamFactor (except as a RAM disk). Other cards recognized.
Comments: Extremely easy to use, powerful, and flexible. Has every desirable feature. The all-around favorite.
Transmission protocols: ASCII, Zmodem, Xmodem (ProDOS, DOS, CRC), Ymodem, Kermit, Transit, batch modes.
Editor: Powerful; more than 30 commands, many similar to AppleWorks. AppleWorks files load as easily as text files; saves files in either format and strips them of control characters. Changes text to upper-, lower-, and mixed cases.
Macros: Extensive; you can call all ProTerm commands with macros, which are easy to use and edit; you can use them to call other macros.
Auto-learn macros: Yes.
Review buffer: Scroll and edit, including cut and paste into on-line sessions.
Capture buffer: Toggled without disk access.
AppleWorks compatibility: Extensive. You can print, display, edit, transmit AppleWorks files as ASCII.
Binary II: Yes; automatic packing and unpacking.
File compression: No.
LF and CR stripping: Yes.
Conference mode: Yes; three lines.
Operating-system commands: Extensive: copy, delete, rename, create directory, format, catalog, print file, view file.
Host mode: Yes.
Disk access: Minimal; none for capture or editor modes.
Machines: IIGS,IIe, IIc, IIc Plus, Laser 128.
Memory: 64K
Price: $129

POINT-TO-POINT, Beagle Bros, 6215 Ferris Square, Suite 100, San Diego, CA 92121, (619) 452-5500, (800) 345-1750
Overall grade: B+
Notable features: Full AppleWorks compatibility. Converts text files to AppleWorks format and strips out line feeds and carriage returns.
Missing links: 16-line limit on macro routines. Poor macro editor.
Comments: Good program, easy to navigate.
Transmission protocols: ASCII, Xmodem, Xmodem ProDOS.
Editor: Loads AppleWorks files as text files. Cut and paste to modem. Doesn't require disk access.
Macro language: Simple; 20 commands. Macro procedures limited to 16 lines. Can't execute other macros.
Auto-learn macros: No.
Review buffer: Scrollable, easy access.
Capture buffer: Toggled without disk access.
AppleWorks compatibility: Yes; edit, print, transmit AppleWorks files as text.
Binary II: Yes; automatic packing and unpacking.
File compression: No.
LF and CR stripping: Yes, once file is saved to disk.
Conference mode: No.
Terminal emulation: TTY, VT52.
Operating-system commands: Catalog, load, save, rename, delete, create directory.
Host mode: No.
Disk access: Minimal.
Machines: IIGS, IIe, IIc, IIc Plus.
Memory: 128K
Price: $99.95

Three ways to grow a IIGS.

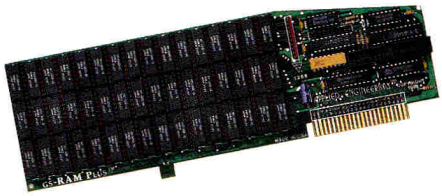
Applied Engineering makes three different memory cards for the IIGS because every IIGS owner is different. Each card was designed to suit specific needs:

1. **GS-RAM.™** Start with as little as 256K of memory and grow in affordable 256K increments to 1.5 MEG (an amount that once sounded large, but is now considered a moderate amount of memory expansion.) Incorporates 256K x 1 chips.



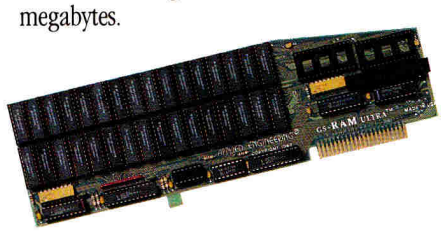
GS-RAM w/256K	**$154**
1 MEG	**$259**
1.5 MEG	**$329**

2. **GS-RAM Plus.™** Expands from 1 to 6 MEG in 1 MEG increments. Originally designed for power-users requiring a great deal of internal memory, this card has recently found favor with many moderate users. MEG-sized jumps in memory have now become practical for many users because of the enormous memory requirements of today's software titles. Incorporates 1 MEG x 1 chips.



GS-RAM Plus w/1 MEG	**$319**
2 MEG	**$459**
3-6 MEG	**CALL**

3. **GS-RAM Ultra.™** AE's newest memory card incorporates a new chip - the 256K x 4, which has four times the density of 256K x 1 chips. GS-RAM Ultra offers incremental expansion like the GS-RAM and ultimate size like the GS-RAM Plus. It's expandable from 256K to 4 MEG in 256K increments, so you can start small and still grow to a massive 4 megabytes.



GS-RAM Ultra 256K	**$214**
512K	**$249**
768K-4 MEG	**CALL**

We've also added ROM sockets to the GS-RAM Ultra. ROM sockets allow hardware-based applications to be loaded permanently into EPROMs...an increasingly important feature when applications become available from Applied Engineering and others.

Consider your needs.

Need a moderate amount of memory? **GS-RAM** lets you start small and takes you up to 1.5 MEG. Need lots of memory right away? **GS-RAM Plus** is your best bet. Want to start small and leave open the possibility of a huge internal memory? **GS-RAM Ultra** is your card. And our **GS Expander™** piggyback card adds up to 2 MEG to any of the three cards. Call AE for prices.

Talk to us.

Your decision should be based on anticipated maximum memory need and growth path. Initially, it's less expensive to add 256K than 1 MEG, but buying a MEG at a time could save you money over the long haul. Call us. We'll be happy to discuss your particular applications.

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All three of our GS memory cards are fully DMA compatible (and they're the ONLY large-format cards that are), so they not only run all GS software, they also support *current and future* DMA peripherals.

Installation couldn't be easier, the cards just plug in. And all three cards feature Applied Engineering's meticulous craftsmanship, along with our 5-year warranty, our 15-day money-back guarantee* and our American-made pride.

Still more:

Each of our GS memory cards comes with many other exclusive features, *disk caching* that tremendously speeds up many programs, including AppleWorks, by virtually eliminating disk access. Our *diagnostic utility* feature graphically detects the presence of bad or improperly installed chips and tests for CAS before RAS chips. And our *AppleWorks enhancement* package dramatically increases AppleWorks' word processor lines (from 7,250 to 22,500), database records (from 6,350 to 22,500), clipboard capacity (from 255 lines to 2,042) and more.

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know that TTY is often inadequate. To access your company computer from home, for example, make sure your telecommunications software provides the proper terminal emulation.

THE GOOD HOST

You might find it helpful to be able to call your home computer from work and download a file remotely. You can do that if your communications program offers *host mode*. Depending on your package, host mode may support a variety of protocols and a range of security measures. It's not the same as answer mode, which merely lets the modem answer automatically.

OPERATING ROOM

Your telecommunications program will be particularly useful if it lets you access operating-system commands—instructions such as *catalog*, *delete*, *format*, and *create subdirectory*.

Speaking of access, there's one kind you should try to *avoid*: excessive disk access. ▶

TIMEOUT TELECOMM, Beagle Bros, 6215 Ferris Square, Suite 100, San Diego, CA 92121, (619) 452-5500, (800) 345-1750
Overall grade: B+
Notable features: Works within AppleWorks (version 2.0 and above). Includes Auto Binary II. Extensive terminal emulation. Can be executed by TimeOut UltraMacros.
Missing links: Scant macro language.
Comments: Excellent for use within AppleWorks.
Transmission protocols: Xmodem, Xmodem CRC, Xmodem 1K CRC, Xmodem 4K CRC, ProDOS.
Editor: Uses AppleWorks.
Macros: Limited; roughly 12 commands. Associated only with auto-dial routines.
Auto-learn macro: No.
Review buffer: Can copy to modem, printer, and AppleWorks desktop.
Capture buffer: Toggled without disk access.
AppleWorks compatibility: Complete.
Binary II: Automatic.
File compression: No.
LF and CR stripping: Yes, within the review buffer.
Conference mode: Yes; one line.
Terminal emulation: Adam 31, Adam 3a, Apple 80-column, C, VT52, Heath 19, IBM 3101, TTY, Televideo 912.
Operating-system commands: Minimal; save.
Host mode: No.
Disk access: None.
Machines: IIGS, IIe, IIc, IIc Plus.
Memory: 128K
Price: $69.95

TALK IS CHEAP (TIC), Carolina Systems Software, 3207 Berkeley Forest Drive, Columbia, SC 29209-4111
Overall grade: B+
Notable features: Ymodem transfer and Turbo Xmodem download capability. Includes Binary II auto-unpacking and Squeeze file-compression utility. Extensive macro language and terminal-emulation options. AppleWorks files can be transmitted as text files.
Missing links: No built-in dialing directory, although you can download one as a macro from TIC BBS. No line-feed or carriage-return stripping. Editor requires much disk access. Can't cut and paste into on-line session or edit AppleWorks files.
Comments: Powerful no-frills program for the experienced user. At $40, a best buy.
Transmission protocols: ASCII, Xmodem, Xmodem 1K, Xmodem, Xmodem 4K, Turbo Xmodem downloading, ProDOS, CRC.
Editor: Strong, yet slow in loading and returning to TIC.
Macros: Comprehensive macro language; more than 70 commands.
Auto-learn macro: No.
Review buffer: Scrollable; accessed by single keystroke.
Capture buffer: Toggled without disk access.
AppleWorks compatibility: Some; can send AppleWorks files as text files; can't edit or display them.
Binary II: Yes; auto-unpacking, Binary Library Utility included with disk.
File compression: Yes, with Squeeze utility included with disk.
LF and CR stripping: No.
Conference mode: No.
Terminal emulation: Extensive; includes Adam, Apple, Datamedia, Dow Jones, Heath, IBM 3101, Tandy, VT52, Wyse. Also create your own.
Operating-system commands: Delete, catalog, save, display (view a text file), print (using display while printer is on).
Host mode: Yes.
Disk access: Minimal except for editor.
Machines: IIGS, IIe, IIc, IIc Plus.
Memory: 128K
Price: $40

READYLINK, Applied Engineering, P.O. Box 5100, Carrollton, TX 75011, (214) 241-0055
Overall grade: B
Notable features: Windows capability for IIe and IIc computers, works with or without mouse. Extremely comprehensive macro language. Three-line conferencing mode. Comes with ShrinkIt file-compression program.
Missing links: No AppleWorks compatibility. No LF or CR stripping. No review buffer. Slow in moving in and out of capture mode. Awkward access to ProDOS commands.
Comments: A powerful program that seems to have forgotten its users. Ease of use is enhanced with mouse, and hindered without it. Extensive windowing and macro features can create customized sessions. Should be attractive to programmers and telecommunications consultants.
Transmission protocols: ASCII, Xmodem, Xmodem/ProDOS,

BACK UP!

If you have a hard drive then backing up should be a ritual for you. But like most of us, you probably seldom think about it until it is too late. Why? Because it tends to be a real pain in the neck. If there were just a convenient way to backup without costing too much you could save yourself a lot of grief.

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Some programs zip in and out of the editor or toggle the capture buffer without first going to disk. Others must access the disk every time you activate the capture buffer or enter the editor. Disk spinning is time-consuming and annoying; steer clear of a product that can't function without excessive disk access.

CAST OFF

As you navigate your way through today's telecommunications applications, keep these features in mind. They do more than reduce the time and effort it takes to call another computer: They increase your power to take full advantage of your system's communications capabilities.□

WRITE TO SETH ITZKAHN AT 308 COMMONWEALTH AVENUE, BOSTON, MA 02115.

Xmodem 1K, Xmodem CRC, Ymodem.
Editor: Moderate; can cut and paste to printer and modem. Requires disk access.
Macros: Extensive; nearly 100 commands; you must compile some of them first.
Auto-learn macros: Yes.
Review buffer: No.
Capture buffer: Can be scrolled and edited. Requires disk access when toggled.
AppleWorks compatibility: No.
Binary II: Yes, with ShrinkIt utility. No Auto Binary II.
File compression: Yes, comes with ShrinkIt compression program.
LF and CR stripping: No.
Conference mode: Yes; three lines.
Terminal emulation: TTY, VT52, VT100.
Operating-system commands: Rename, delete, print file, create directory, catalog, append.
Host mode: Yes.
Disk access: Often.
Machines: IIGS, IIe, IIc, IIc Plus.
Memory: 128K
Price: $99

APPLEWORKS GS TELECOMMUNICATIONS, Claris Corporation, 440 Clyde Avenue, Mountain View, CA 94043, (415) 960-1500, (800) 544-8554
Overall grade: B–
Notable features: Part of AppleWorks GS. Text can be pulled from one window to another. Communications window doubles as scrollable review buffer. Easy-to-use batch sending and receiving feature.
Missing links: No macro capability. No LF or CR stripping, no terminal emulation.
Comments: Decent tool for use within AppleWorks GS. Serious telecommunications users will want more.
Transmission protocols: ASCII, Xmodem, Ymodem, batch mode.
Editor: Limited; use AppleWorks GS word processor.
Macros: None.
Auto-learn macros: No.
Review buffer: Doubles as communications window.
Capture buffer: Requires disk access.
AppleWorks compatibility: Yes.
Binary II: Yes, with auto-packing and unpacking.
File compression: No.
LF and CR stripping: No.
Conference mode: Yes, one line.
Terminal emulation: No.
Operating-system commands: Delete, open, save, import file.
Host mode: No.
Disk access: Often.
Machines: IIGS.
Memory: 1.2M
Price: $299 (entire 6-module AppleWorks GS package)

TELEWORKS +, Activision Presentation Tools, 3885 Bohannon Drive, Menlo Park, CA 94025, (415) 329-0500
Overall grade: B
Notable features: Auto-learn macros allow for branching, simplify macro-writing process. Communications window doubles as review buffer. Supports Apple LaserWriter.
Missing links: No AppleWorks compatibility. No line-feed or carriage-return stripping. No terminal emulation. Documents must be in the editor before they can be viewed or printed.
Comments: Sufficient is some areas, lacking in others. An easy program with a friendly interface and moderate macro language.
Transmission protocols: ASCII, Xmodem, Xmodem TeleWorks (proprietary), Ymodem (batch).
Editor: Simple; 8 commands, can paste into on-line session.
Macros: Moderate; 40 commands, can link macros together.
Auto-learn macros: Yes.
Review buffer: Yes, doubles as communications window.
Capture buffer: Toggled on and off without disk access.
AppleWorks compatibility: No.
Binary II: Yes, as an auxiliary function; no Auto Binary II.
File compression: No.
LF and CR stripping: No.
Conference mode: No.
Terminal emulation: No.
Operating-system commands: Save, save as, open, disk (catalog).
Host mode: No.
Disk access: Minimal.
Machines: IIGS.
Memory: 768K
Price: $99.95

Funny, They look and perform alike..., but InnerDrive costs a lot less.

InnerDrive20	**$475**
InnerDrive40	**$575**
OverDrive20	**$399**
OverDrive40	**$499**

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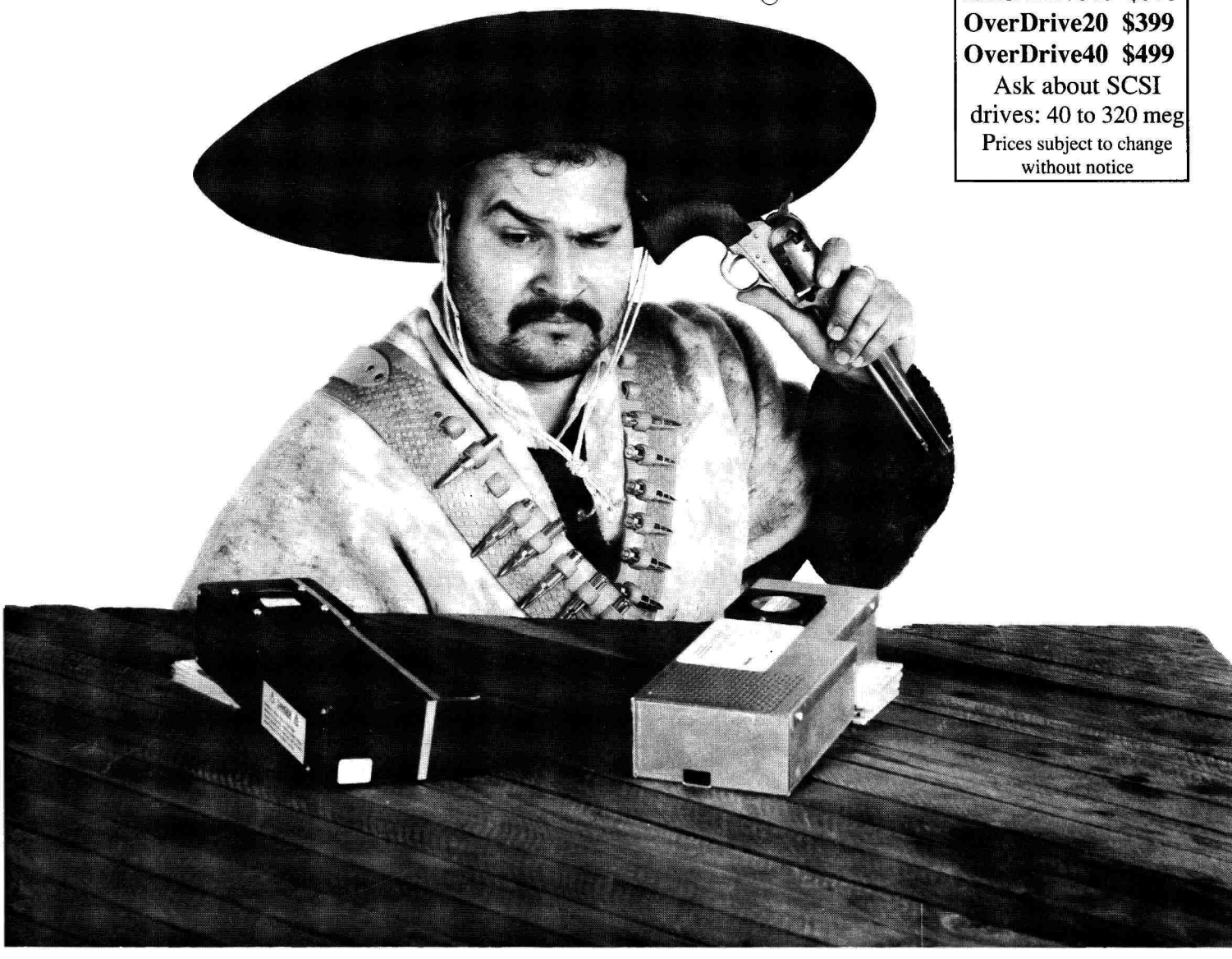

You can't get around it-there are always a few people who are willing to pay for a name. Although the InnerDrive is the original internal hard drive for the IIgs, an imitator now has a look alike (only black) at a much higher price. As the reviews show you won't get more-you'll just pay more. After all, our track record, (thousands of units shipped and close to 2 years of service) is proof of InnerDrive's quality and performance.

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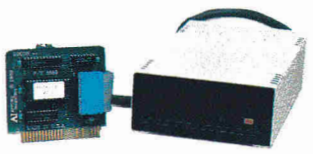

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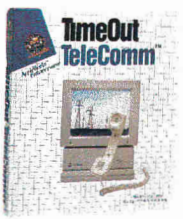

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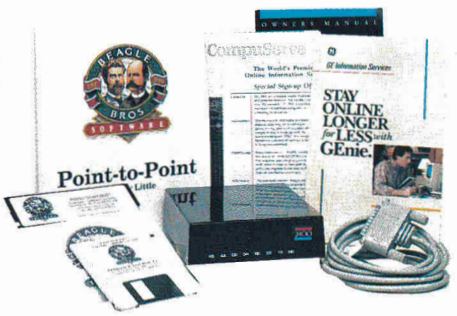

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SPREADSHEET SHENANIGANS

Streamline your accounts: AppleWorks calculates discount eligibility automatically, with some handy tricks you can adapt for your own invoices.

By RUTH K. WITKIN

SHENANIGAN COMES FROM *SIONnach*, the Irish word for *fox*, considered to be a clever and cunning animal. There's no better word to describe the tricks and techniques you'll find in this month's column.

Figure 1 shows a small spreadsheet that pretends to be a page from an accounts-receivable ledger. Its mild demeanor belies the activity behind the scenes. Each column contains something of interest, something you may never have tried before. Let's get started.

A SPREADSHEET FROM SCRATCH

Load the AppleWorks program and create a new spreadsheet file named **RECEIVABLES**. Referring to **Figure 1**, follow these instructions to set up the spreadsheet:

•**Lines.** Use an equal sign or minus sign to enter the long lines in rows 2, 4, and 12. With the cursor in column A, type quotation marks first, hold down the sign key until the cursor reaches the right edge of column G, and hit Return. Use the same technique to extend the line into column H.

•**Column width.** Each column is now nine characters wide. Use Open apple-L (OA-L), *Columns*, and *Column width* to change these column widths: Column A to 7 characters, B to 6 characters, C to 3 characters, D to 2 characters, E to 20 characters, F to 11 characters, G to 13 characters, and H to 12 characters.

•**Labels.** Enter the spreadsheet title in E1, the labels in row 3 only, and the word *Totals* in E13. You'll be entering everything else shortly as this piece progresses.

•**Formats.** Use OA-V to set a standard *Value format* of *Commas* with two decimal places, then use OA-L and *Value format* to show entries in C5 through C11 as *Commas* with no decimal places. Use OA-L and *Label format* to center the labels in F3 through H3. When you finish, press OA-S to store the spreadsheet on disk.

COLUMN A: INVOICE NUMBERS

Numbers, such as the invoice numbers in column A or model numbers, are often used as labels for noncalculation purposes. Each time you type a number-as-label, you need to alert AppleWorks by typing quotation marks first. That's a drag. It's a good idea to structure your numbering system to begin with a letter. Referring to **Figure 1**, enter the invoice numbers in A5 through A11.

COLUMN B: DATES YOU CAN SORT

Looking at the invoice dates in **Figure 1**, you'd never guess there was anything unusual about them—they're just your typical month/day/year dates. So what's the big deal? The column letters at the top reveal that the invoice dates are actually two sets of entries, one in column B and the other in column C.

This separation, plus the fact that months and days always contain two digits (*03*, not *3* alone), lets you sort entries into perfect chronological sequence every time—even when years differ, which is where AppleWorks draws the line when you use single-entry dates.

Referring to **Figure 1**, enter the invoice month and day in B5 through B11. For example, in B5, type quotation marks to tell AppleWorks the entry is a label, type **12/03/**, and move the cursor to the next cell down. Remember, type quotation marks first and end with a slash. After typing the last entry in B11, press Return.

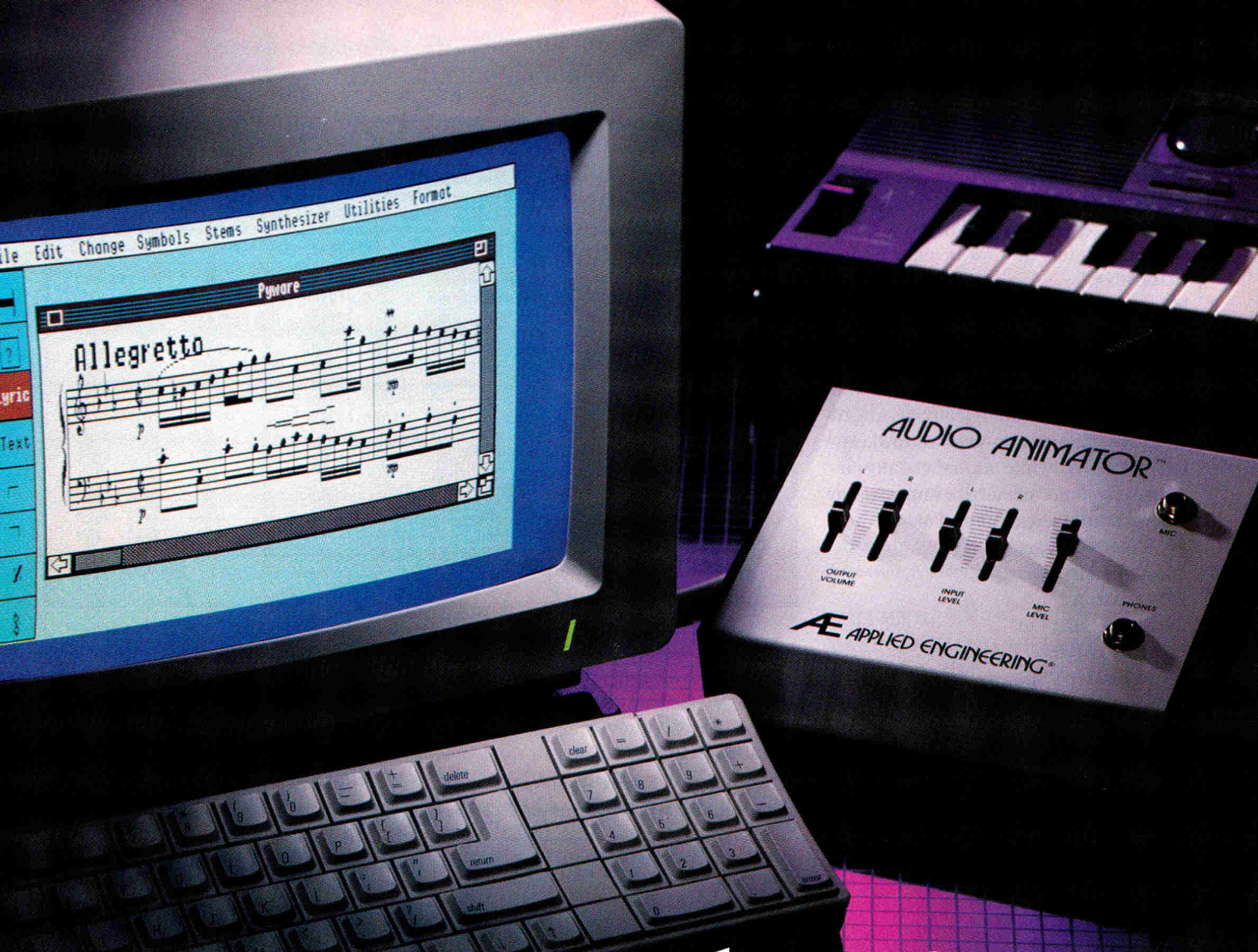
COLUMN C: DATES YOU CAN SORT (CONTINUED)

Referring to **Figure 1**, enter the invoice years in C5 through C11. For example, in C5, type **89** and move the cursor to the next cell down. After the last entry in C11, press Return.

ENTIRE SPREADSHEET: SORTING DATES

Here's how to get the perfect sort: Place the cursor on B5 and press OA-A to start the *Arrange* command. Press OA-8 to highlight rows 5 through 11, and hit Return. Remember, these entries are labels, so hit Return to confirm *Labels from A to Z*.

Now for the year sort: Place the cursor on C5 and press OA-A. Again, press OA-8 and hit Return. This time, type **3** to select *Values from 0 to 9* and hit Return again. AppleWorks arranges the dates and the spreadsheet returns. Need I say it? Perfect. ►



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COLUMN D: THE BUFFER ZONE

Column D, only two characters wide, is a clever ploy to keep right-justified numbers (column C) and left-justified labels (column E) from bumping into each other.

COLUMN E: MEANINGFUL RELATIONSHIPS

Spreadsheets are always easier to understand when entries are arranged in a meaningful order, not randomly as you enter them. Chronologically arranged dates are important in some recordkeeping activities, while alphabetically arranged customer names are important in others. Enter these customer names:

E5: Shamrock Togs
E6: Alpha Menswear
E7: Le Baron
E8: Smart Shirt Ltd
E9: Shirt-O-Rama
E10: The Men's Shoppe
E11: Benny's Boutique

It's just as easy to arrange these names as it was the invoice dates: Leave the cursor on E11 and press OA-A. Press OA-4 to highlight rows 11 through 5, and hit Return. Hit Return to confirm *Labels from A to Z*. Your spreadsheet should look more and more like the one in **Figure 1**.

Figure 1. Page from accounts-receivable ledger.

```
File: RECEIVABLES                    EDITING MODE        Escape: Review/Add/Change
=======A=====B====C=D==========E==============F===========G===========H======
  1|                    ACCOUNTS RECEIVABLE LEDGER
  2|=====================================================================
  3|Inv#   Inv Date   Customer              Purchase    Discount       Due
  4|---------------------------------------------------------------------
  5|A183   12/03/89   Alpha Menswear          250.00  NO DISCOUNT [1]   250.00 [2]
  6|B806   02/31/90   Benny's Boutique      8,910.00       445.50     8,464.50
  7|A155   01/02/90   Le Baron                567.00        11.34       555.66
  8|C512   11/27/89   Shamrock Togs           786.42        15.73       770.69
  9|A232   02/01/90   Shirt-O-Rama          2,001.00       100.05     1,900.95
 10|A176   01/17/90   Smart Shirt Ltd         434.78  NO DISCOUNT       434.78
 11|A204   02/16/90   The Men's Shoppe      1,234.00        24.68     1,209.32
 12|---------------------------------------------------------------------
 13|                   Totals               14,183.20 [3]    597.30    13,585.90
 14|
 15|
 16|
 17|
 18|
---------------------------------------------------------------------------
G5: (Value, Protect-N) @IF(F5<500," NO DISCOUNT",@IF(@AND(F5)=500,F5<2000),.02*
@IF(F5<500," NO DISCOUNT",@IF(@AND(F5)=500,F5<2000),.02*F5,.05*F5))
Type entry or use @ commands                                   1027K Avail.
```

COLUMN F: PURCHASES

Referring to **Figure 1**, enter the purchase amounts in F5 through F11. Because of the formatting, there's no need to type commas in large numbers or zeros in decimal places.

COLUMN G: NESTED IF FORMULA WITH TEXT STRING

The formulas in column G are nested IF formulas—one IF formula contained in another. (You can see the entire formula on the edit line in **Figure 1**.) Nesting allows IF formulas to produce one of three possible answers, compared with traditional IF formulas, which can produce only two possible answers.

The syntax of a traditional IF formula is *@IF(Test,Then,Else)*. The Test statement uses a comparison operator to establish a condition that can be true or false. If the test proves true (is met), the Then statement produces the answer. If the test proves false (fails), the Else statement produces the answer. Comparison operators used in the Test statement can be < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), = (equal to), and <> (not equal to).

The syntax of the nested IF formula in column G is *@IF(Test, Then,@IF (Test,Then,Else))*. But that's only half the story. These formulas also use the AND function in the nested IF and a text string in the first Then statement, letting the formula communicate with you in plain English.

The formulas calculate discounts based on a single purchase of men's shirts. Based

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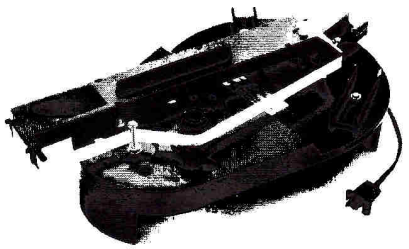

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Figure 2. Ledger with two more entry rows added.

```
File: RECEIVABLES              REVIEW/ADD/CHANGE              Escape: Main Menu
========A=====B====C=D==========E==============F==========G==========H======
   1|                    ACCOUNTS RECEIVABLE LEDGER
   2|=================================================================
   3|Inv#   Inv Date   Customer              Purchase    Discount       Due
   4|-----------------------------------------------------------------
   5|A183   12/03/89   Alpha Menswear          250.00  NO DISCOUNT      250.00
   6|B806   02/31/90   Benny's Boutique      8,910.00       445.50    8,464.50
   7|A155   01/02/90   Le Baron                567.00        11.34      555.66
   8|C512   11/27/89   Shamrock Togs           786.42        15.73      770.69
   9|A232   02/01/90   Shirt-O-Rama         2,001.00       100.05    1,900.95
  10|A176   01/17/90   Smart Shirt Ltd        434.78  NO DISCOUNT      434.78
  11|A204   02/16/90   The Men's Shoppe     1,234.00        24.68    1,209.32
  12|                                                     0.00
  13|                                                     0.00
  14|-----------------------------------------------------------------
  15|                   Totals              14,183.20       597.30   13,585.90
  16|
  17|
  18|
-------------------------------------------------------------------------------
H12: (Value, Protect-N) @IF(F12-G12>0,F12-G12,"")

Type entry or use @ commands                                  @-? for Help
```

on the dollar amount, each formula produces one of three answers: the words *NO DISCOUNT*, a 2 percent discount for purchases between $500 and $2000, or a 5 percent discount for purchases over $2000. Here's how it works.

In G5, for example, the Test statement checks the amount in F5 to see if it's less than 500. If this is true (that is, the cell contains any number or zero), the Then statement enters *NO DISCOUNT* in G5. If the amount in F5 is 500 or greater, the formula evaluates its Else statement—the nested IF formula.

The Test statement in the nested IF formula and the AND function let you establish more than one test condition, here setting the lower and upper limits for the 2 percent discount. Both tests must be met for the Then statement to produce the answer. If either fails, the Else statement produces the answer. Therefore, if F5 contains an amount greater than or equal to 500, yet less than 2000, the Then statement multiplies the amount in F5 by *.02*. If F5 contains 2000 or more, the Else statement multiplies the amount in F5 by *.05*. If F5 is empty, the formula produces zeros in G5.

Cell location: G5

Formula: @IF(F5<500,"NO DISCOUNT",@IF(@AND(F5>=500,F5<2000),.02*F5,.05*F5))

The AppleWorks entry line lacks room for all these characters, so entering this formula the traditional way is impossible. You can squeeze in more characters, however, by using editing mode instead.

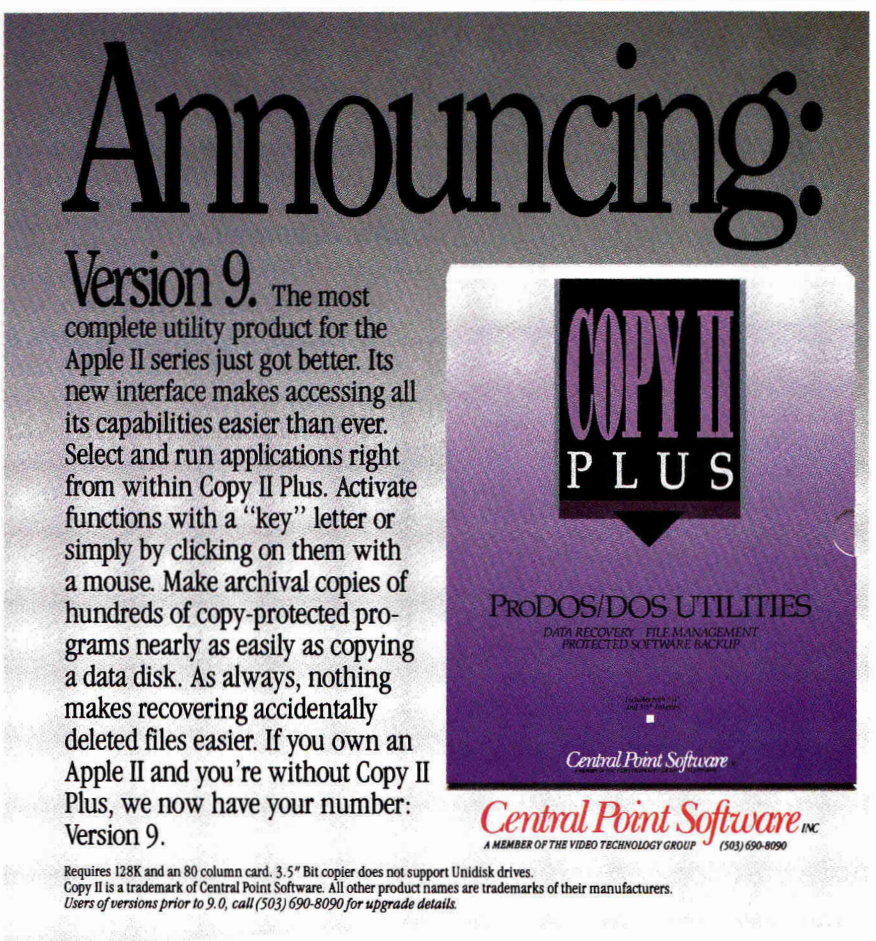
First give AppleWorks something to edit: With the cursor on G5, type **1** and hit Return. Now press OA-U to enter edit mode, and hit OA-Y to erase the *1* on the edit line. (You can still see *1* in G5.) Type the entire formula, leaving a space after the quotation marks before *NO DISCOUNT*. That space shifts the text one character to the right, producing a smooth right alignment with the numbers generated by the formula in the cells below.

When the formula's complete, compare each character on your screen with the way it appears here. If everything agrees, press Return (and *NO DISCOUNT* pops in). If something's amiss, press the escape key and start again.

Now protect the formula from any change: With the cursor on G5, press OA-L to start the *Layout* command. Hit Return to confirm *Entry*, then type **PN** (for *Protection Nothing*).

COLUMN H: MAKING A CELL LOOK EMPTY

The formulas in column H are traditional either/or IF formulas, but hardly run-of-the-mill. One of the answers is a calculation, and the other makes its own cell look as if it were empty. Here's how it works. ►



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In H5, the Test statement subtracts the discount from the purchase amount. If the result is greater than zero—meaning that F5 contains a number and the formula in G5 has done its calculations—the Then statement subtracts the discount amount from the purchase amount and enters the result in H5.

If, on the other hand, that subtraction results in a zero or less, the Else statement—double quotes with no text between—makes the formula disappear! This new AppleWorks 3.0 capability lets you create spreadsheets without extraneous zeros cluttering up the columns.

Cell location: H5

Formula: @IF(F5−G5>0,F5−G5,"")

Now protect this formula from change: With the cursor on H5, press OA-L, hit Return, and type **PN**.

COLUMNS G AND H: COPYING BOTH FORMULAS

Copy both IF formulas to the cells below, a procedure that also copies their protection: Place the cursor on G5 and press OA-C to start the *Copy* command. Hit Return, press the right-arrow key to reach H5, and hit Return again. Press Down Arrow, type a period, move the cursor to G11, and hit Return again. To tell AppleWorks that all cell references are *Relative*, press OA-R once. Your formula results should match those in **Figure 1**.

ROW 13: FORMULA WITH A WIDE RANGE

If you're a regular reader of this column, this one's old hat. If you're not, this trick can save you from redoing formulas unnecessarily.

Each SUM formula in row 13 (F13, G13, and H13) adds the numbers in the column above it. Each formula also includes one cell before and after the list. In this case, both cells contain a line. No matter.

This technique creates a cohesive range of cells from one line to the other. You can insert new rows anywhere in that range and AppleWorks will adjust the SUM formulas to account for the new entries.

Cell location: F13

Formula: @SUM(F12.F4)

Protect this formula: With the cursor on F13, press OA-L, hit Return, and type **PN**.

Now copy it to the other cells: Leave the cursor on F13, press OA-C, and hit Return twice. Press Right Arrow, type a period, press Right Arrow again, and hit Return. Press OA-R once. Now press OA-S to store the spreadsheet on disk.

ENTIRE SPREADSHEET: INSERTING ROWS

When you want to insert rows for more entries, the easy approach is to copy an existing row to the clipboard, then copy it into the spreadsheet as many times as you want, along with all formats and formulas.

Let's suppose you want to insert two more rows, as shown in **Figure 2**. Place the cursor on F11 (it could easily be any other cell in row 11), press OA-C, and type **T** to select *To clipboard*. Hit Return to confirm *Rows*, then hit Return again.

The entire row is now on the clipboard. Leave the cursor on F11, press OA-C and type **F** (for *From clipboard*). Hit Return to confirm *Formulas and values*. Do the same thing again: The cursor is still on F11, so press OA-C, type **F**, and hit Return. And here's another row.

Now blank out the unnecessary entries in the new rows: Place the cursor on F12 and press OA-B to start the *Blank* command. Type **B** (for *Block*), press Down Arrow, then OA-Left Arrow to highlight the entries to column A, and hit Return. Your spreadsheet should look like the one in **Figure 2**.

Now move the cursor to H12. Sure enough, without a purchase amount to work with, the formula in the cell made itself invisible. Remarkable. Press OA-S to store the spreadsheet on disk.

COMING ATTRACTIONS

"Spreadsheet Shenanigans" is the second in a tutorial trilogy that started with "Database Doings" (July 1989, p. 62, and August 1989, p. 68). Stay tuned for "Word-Processing Wonders," coming to your small screen in the not-too-distant future.

And with summer vacations coming up, many of you will be motoring to new and exciting places. Next month's column presents a spreadsheet that shows how much your car costs to run.□

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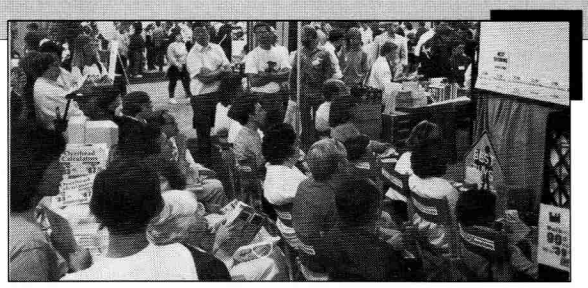

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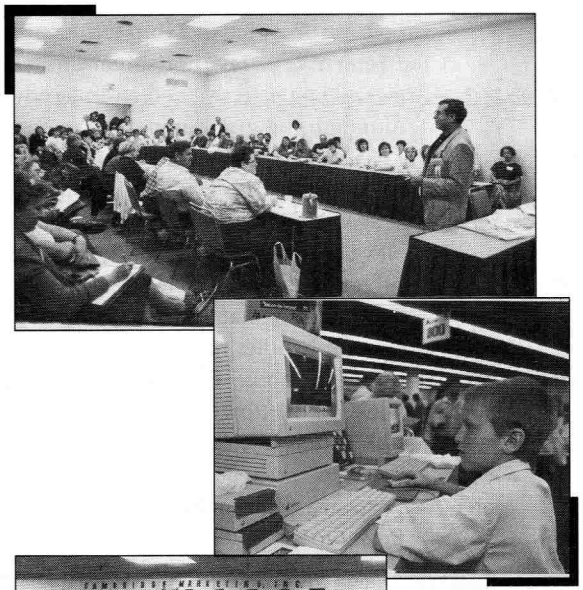

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SQUARING OFF

Whether you're plotting data or designing a needlepoint pattern, Publish It! graph paper helps you keep it all straight.

By CYNTHIA E. FIELD, Ph.D.

NEARLY EVERYONE, IT SEEMS, USES printed grids of one kind or another. To the scientist they're graphs. To the business owner or accountant they're ledgers. To a teacher they're gradebooks. To the needleworker they're patterns. No matter how you employ these organized arrays of vertical and horizontal lines, it's a cinch to set them up with a page-layout program such as **Publish It! 2**.

This month, let's create two types of grids: a graph-paper template (**Figure 1**) and a gradebook form (**Figure 2**). Complete this practice session and you'll be ready to design a variety of custom grids for business, school, and home.

THE LINEUP

Start up Publish It! 2 and work in *Size to Fit* mode (Special menu or Open apple-4). This month's projects are also compatible with both the original version of Publish It! and its newest incarnation, **Publish It! 3**.

Select the line tool by clicking on the sixth icon from the top of the Publish It! toolbox at the left-hand side of the screen. Pull down the Objects menu. Select the *Set line weight* option and choose the narrowest thickness. Pull down the Objects menu again and choose *Set pen pattern* and the solid black color.

Move the line tool onto the drawing page and "rubber-band" a horizontal line *roughly* seven inches long. Use screen rulers to guide you. Rubber-banding an object is a snap. (Excuse the pun.) Just press the mouse button, drag the mouse, and release the button. If you've participated in previous Press Room projects, you know that when we say "roughly" what we mean is this: Don't get eyestrain trying to be precise—use the specifications listed in **Table 1** (more on that below).

Make sure the line you just drew is selected. (It should have "handles" at either end.) If it isn't, swap the line tool for the pointer. Drag the pointer onto the work area, point to the line you just drew, and click on it; handles should appear.

In *Size to Fit* mode, clicking on small objects such as thin lines can test the patience of a saint. Switch to a larger viewing mode, such as *Show double size* (Special menu or Open apple-2), and try clicking on the magnified line. Switch back to *Size to Fit* (Open Apple-4) when you're done.

With the line selected, pull down the Objects menu and select *Show specifications*, or press Open apple-M, one of Publish It!'s handiest Quick Key commands and one that's well worth memorizing.

When the object's specifications window opens, you'll see the precise dimensions of the line you drew. Edit these specs to make them comply with the ones we used. First, place the cursor at the end of each value (by clicking at this location). Use the delete key to erase the inaccurate value. Now type the correct value listed in **Table 1**.

Continue with this procedure until the *Left start*, *Top start*, and *Width* values agree with those provided in **Table 1**, then press the return key. The horizontal line you drew will be perfectly sized and placed.

Although the graph paper we're creating has some 27 horizontal and 31 vertical lines, you can finish this template without ever again touching the line tool: Just make copies of the original line and tell Publish It! where to place them. Here's how.

Select the line if it isn't already selected. (Check for handles.) Pull down the Objects menu and choose *Copy*, or press Open apple-C. Pull down the Objects menu again and select *Paste*, or press Open apple-V. A facsimile of the original line appears in a different location.

Press Open apple-M (the *Show specifications* Quick Key command, remember?) and edit the values shown in line 2's specifications window. Press the return key. Line 2 snaps into place, perfectly parallel to line 1 and exactly a quarter inch below it.

Continue with this procedure (Open apple-V followed by Open apple-M) to paste additional replicas of the original horizontal line on the page. Don't forget to save your template-in-progress on a formatted data disk. Use Publish It! 2's *Save as* command (File menu or Open apple-A). Name the template whatever you like; we call ours *GRID.25*.

This graph paper is the size that's typically used by students, scientists, and businesspeople—four squares to the inch. Mathematically, one inch divided by four ►

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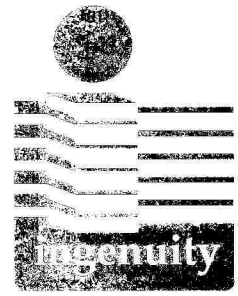

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squares equals a quarter inch per square, the offset from one line to the next in our template. Glance down **Table 1** and you'll see that all lines are the same width and begin a half inch to the right of the left-hand margin, but the lines are positioned from the top of the page in increments of a quarter inch (0.25 if you prefer).

Our graph paper's 31 vertical lines are designed in similar fashion, with each succeeding line a quarter inch to the right of the previous one.

Select the line tool and rubber-band a single vertical line that's 6½ inches long, give or take a bit. Use the *Show specifications* window to position and dimension the line.

Select the line, copy it, and paste it. Check its specifications and edit them according to the values listed in **Table 1** for vertical lines. Paste additional copies (Open apple-V) and check their specs (Open apple-M).

Notice that we didn't make our grid large enough to take up a whole page. And for good reason: We couldn't! Publish It! 2 limits you to some five dozen objects on a given page; with the 58 lines required for this template we approached that limit. (Pull down the Apple menu and check *Status* whenever you want to find out the number of objects you can fit on a page.)

We originally hoped to have an 8-inch-wide by 10-inch-high template, but calculated that such a design would require 74 objects: 8 inches across divided by a quarter inch per square equals 32 vertical lines; 10 inches down divided by a quarter inch per square equals 40 horizontal lines. We'd also need "starter" vertical and horizontal lines; those would increase the total to 74 objects—a Publish It! no-no. We had two options: Scale up the size of each square or scale down the size of our grid. We chose the latter because the four-squares-per-inch graph size was important. If you prefer graphs with larger half-inch squares, you can create a full-page graph-paper template easily.

One unanticipated benefit of this design is plenty of room on the page for adding a piece of clip art or some text. Standard graph paper from stationery or office-supply stores often leaves little room for x- and y-axis labels, let alone figure titles or legends. With the design presented

Table 1. Graph-paper specs (inches).

Object	Left Start	Top Start	Width	Height
Horizontal Lines	0.500	1.000	7.500	n/a
	0.500	1.250	7.500	n/a
	0.500	1.500	7.500	n/a
	0.500	1.750	7.500	n/a
	0.500	2.000	7.500	n/a
	0.500	2.250	7.500	n/a
	0.500	2.500	7.500	n/a
	0.500	2.750	7.500	n/a
	0.500	3.000	7.500	n/a
	0.500	3.250	7.500	n/a
	0.500	3.500	7.500	n/a
	0.500	3.750	7.500	n/a
	0.500	4.000	7.500	n/a
	0.500	4.250	7.500	n/a
	0.500	4.500	7.500	n/a
	0.500	4.750	7.500	n/a
	0.500	5.000	7.500	n/a
	0.500	5.250	7.500	n/a
	0.500	5.500	7.500	n/a
	0.500	5.750	7.500	n/a
	0.500	6.000	7.500	n/a
	0.500	6.250	7.500	n/a
	0.500	6.500	7.500	n/a
	0.500	6.750	7.500	n/a
	0.500	7.000	7.500	n/a
	0.500	7.250	7.500	n/a
	0.500	7.500	7.500	n/a
Vertical Lines	0.500	1.000	n/a	6.500
	0.750	1.000	n/a	6.500
	1.000	1.000	n/a	6.500
	1.250	1.000	n/a	6.500
	1.500	1.000	n/a	6.500
	1.750	1.000	n/a	6.500
	2.000	1.000	n/a	6.500
	2.250	1.000	n/a	6.500
	2.500	1.000	n/a	6.500
	2.750	1.000	n/a	6.500
	3.000	1.000	n/a	6.500
	3.250	1.000	n/a	6.500
	3.500	1.000	n/a	6.500
	3.750	1.000	n/a	6.500
	4.000	1.000	n/a	6.500
	4.250	1.000	n/a	6.500
	4.500	1.000	n/a	6.500
	4.750	1.000	n/a	6.500
	5.000	1.000	n/a	6.500
	5.250	1.000	n/a	6.500
	5.500	1.000	n/a	6.500
	5.750	1.000	n/a	6.500
	6.000	1.000	n/a	6.500
	6.250	1.000	n/a	6.500
	6.500	1.000	n/a	6.500
	6.750	1.000	n/a	6.500
	7.000	1.000	n/a	6.500
	7.250	1.000	n/a	6.500
	7.500	1.000	n/a	6.500
	7.750	1.000	n/a	6.500
	7.988	1.000	n/a	6.500

Table 2. Gradebook specs (inches).

Object	Left Start	Top Start	Width	Height
Text Area	0.230	0.129	2.047	0.555
Horizontal Lines	0.250	0.750	8.000	n/a
	0.250	1.000	8.000	n/a
	0.250	1.250	8.000	n/a
	0.250	1.500	8.000	n/a
	0.250	1.750	8.000	n/a
	0.250	2.000	8.000	n/a
	0.250	2.250	8.000	n/a
	0.250	2.500	8.000	n/a
	0.250	2.750	8.000	n/a
	0.250	3.000	8.000	n/a
	0.250	3.250	8.000	n/a
	0.250	3.500	8.000	n/a
	0.250	3.750	8.000	n/a
	0.250	4.000	8.000	n/a
	0.250	4.250	8.000	n/a
	0.250	4.500	8.000	n/a
	0.250	4.750	8.000	n/a
	0.250	5.000	8.000	n/a
	0.250	5.250	8.000	n/a
	0.250	5.500	8.000	n/a
	0.250	5.750	8.000	n/a
	0.250	6.000	8.000	n/a
	0.250	6.250	8.000	n/a
	0.250	6.500	8.000	n/a
	0.250	6.750	8.000	n/a
	0.250	7.000	8.000	n/a
	0.250	7.250	8.000	n/a
	0.250	7.500	8.000	n/a
	0.250	7.750	8.000	n/a
	0.250	8.000	8.000	n/a
	0.250	8.250	8.000	n/a
	0.250	8.500	8.000	n/a
	0.250	8.750	8.000	n/a
	0.250	9.000	8.000	n/a
	0.250	9.250	8.000	n/a
	0.250	9.500	8.000	n/a
	0.250	9.750	8.000	n/a
	0.250	10.000	8.000	n/a
	0.250	10.250	8.000	n/a
	0.250	10.500	8.000	n/a
Vertical Lines	2.500	0.500	n/a	10.000
	3.000	0.500	n/a	10.000
	3.500	0.500	n/a	10.000
	4.000	0.500	n/a	10.000
	4.500	0.500	n/a	10.000
	5.000	0.500	n/a	10.000
	5.500	0.500	n/a	10.000
	6.000	0.500	n/a	10.000
	6.500	0.500	n/a	10.000
	7.000	0.500	n/a	10.000
	7.500	0.500	n/a	10.000
	7.975	0.500	n/a	10.000

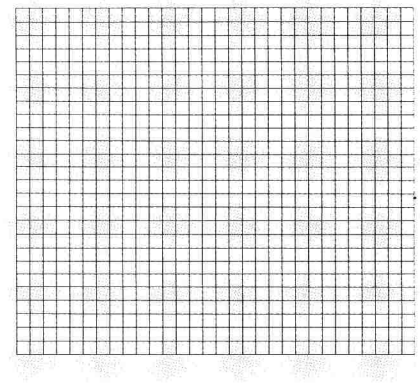

Figure 1. Graph-paper template.

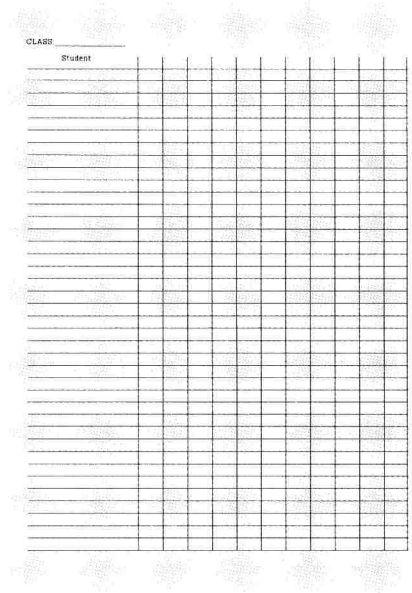

Figure 2. Gradebook template.

here you can create more stylish graph paper than is otherwise available.

Teachers can use the template, for example, to create an assortment of instructional handouts. Print the blank grid at the top of the page and a table of data below; ask students to label the graph, plot the data, and give the figure a title. Even better, ask students to collect actual data by performing simple science experiments or taking surveys in class. Use inexpensive pH paper to test the acidity of household liquids, or cook up some experiments with Broderbund's **Science Toolkit** or Sunburst Communications' **Playing with Science: Temperature**.

A business owner could import a completed graph of last quarter's sales results, say, from **Graph It!** in the form of a Publish ►

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It! 2 picture and then manually chart weekly sales results for the current quarter on the blank grid just created. At-a-glance comparisons like these can help you respond more quickly to emerging trends.

Creative folks who enjoy needle or wood crafts can play "what if" to their heart's content with designs sketched on custom-drawn grids.

GRADE CROSSING

Once you're familiar with rubber-banding, copying, pasting, and "specing" lines, there's no limit to the kinds of forms you can create. In an upcoming Press Room we'll design business forms, but for now let's put together a simple gradebook.

This form was "requisitioned" by an English professor at the Community College of Rhode Island. If it hasn't happened to you yet, it will: That 40th birthday mysteriously diminishes your visual acuity to the extent that those small "squares" in off-the-shelf gradebooks seem even smaller. The teacher was looking for a gradebook that's 8½ by 11 inches with room on each page for about 35 registered students and the two or three more who add courses after the first week of classes. Her handwriting is small, but she needed at least 2¼ inches for each student's name. Most important, data-entry areas had to be at least a half inch wide to accommodate the numeric grading system the teacher uses.

The gradebook form presented here (**Figure 2**) has one text area with the word *CLASS* at the top and *Student* placed above the column where names will be listed. The main template consists of 40 horizontal lines spaced a quarter inch apart, and 12 vertical lines spaced a half inch apart. All specifications for the gradebook form are shown in **Table 2**.

We printed the master and photocopied it onto pastel-colored paper—blue for Composition 1 class, green for Introduction to Literature, and yellow for Oral Communications. (You can also use labeled transparent plastic tabs.) We collated the gradebook forms, added sturdy front and back covers, and bound the package with a **Personal VeloBinder**.

After a semester's field testing, the gradebook has held up well. The teacher uses an electronic gradebook program to store grades and to generate midterm and final reports, but she carries her desktop-published gradebook to class each day and enters grades manually after she corrects each assignment.

She already plans one time-saving "revision" for next semester, though. In most classes she gives more than 11 assignments (the maximum number we could fit on this gradebook page). Instead of binding the gradebook prior to the first day of class, we'll hold off a week or so until all names have been recorded. Then we'll photocopy the forms and bind them. That way there will be no need to transfer names manually onto additional pages as the semester progresses.

Next time you think about desktop publishing, don't limit yourself to text and graphics frames. Consider instead the nearly limitless kinds of forms you can create with just one simple object: the straight line.□

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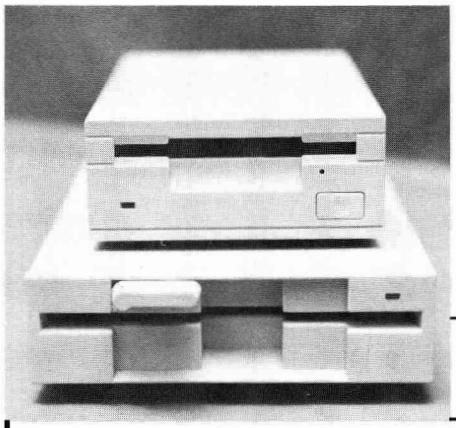

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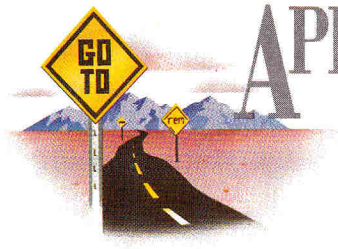

APPLESOFT ADVISER

DRAW IT IN BASIC

The first in a series on graphics programming focuses on the highlights of lo-res Apple screens.

By DAN BISHOP

GRAPHICS! A CRUCIAL ELEMENT IN every type of modern computer software. No longer restricted to paint and draw programs, graphics has found its way into word-processing, spreadsheet, database, and even accounting programs. The user interface has gone graphics forever. There are icon-oriented menu screens; "elevator" sidebars to show where you are in your document; and pictographs of file folders, calandars, calculators, and system components, to name a few. Understanding the basics of graphics programming is now an essential part of the programming experience.

Commercial applications usually use machine language to achieve the greatest possible speed. However, many of the concepts and principles of graphics programming are the same regardless of the language used. If you're studying BASIC as your first programming language, Applesoft's built-in graphics commands and your Apple's capabilities can give you valuable experience in dealing with graphics programming.

Over the next few months, this column will help you through graphics programming on your Apple. This month we'll start with low-resolution graphics. My next column will deal with animated graphics displays. Later, I'll cover the basic elements of high-resolution graphics, including screen switching, a high-resolution character set, and Applesoft's shape tables. If you follow these articles, you should be well on your way to programming any graphics effects your Apple can produce.

Special note: If you're testing a graphics program and it ends, leaving you in graphics mode, enter the TEXT command to get your screen back to normal text mode. Enter the HOME command to clear the screen.

LOW-RESOLUTION PAGES

The most common method of handling the computer's monitor, or cathode-ray tube (CRT), is to store the information to be displayed in a special block of RAM—the same random-access memory your program and data use. These blocks of RAM are called graphics "pages." The computer automatically scans the information stored in these pages many times per second and transmits it to the CRT. In this process, the computer converts the codes stored in RAM to dots on screen.

Applesoft BASIC reserves four sections of memory for graphics display, enabling storage of four separate graphics screens. Two are used for high-resolution graphics. The remaining two are known as *low-resolution graphics pages 1 and 2*.

The low-resolution graphics screen is a 40-by-48 matrix, like graph paper with 40 columns and 48 rows (1920 squares in all). Each square is a graphics point or *pixel*. Applesoft stores low-resolution information as two pixels per byte of RAM. This is possible because a byte can represent values from 0 to 255; the only graphics-information value needed is color.

Because each pixel can be one of 16 colors—including black and white—the range of combined values for two such points is 0 to 255 (16 * 16 = 256 values). Thus, 960 bytes minimum (40 * 48 divided by 2) are required for each low-resolution graphics page. Apple uses two 1024-byte blocks of RAM, since 1024 is a power of 2.

Every byte in RAM has a unique address. Page 1 of low-resolution graphics begins at address 1024 and extends through 2047. Page 2 begins at 2048 and extends through 3071. This is important because Applesoft uses these same two blocks for storing text. When you're in text mode, the information for your screen display is stored between addresses 1024 and 2047. Low-resolution graphics page 1 and text page 1 use the same storage area. The commands *GR* ("Switch to low-resolution graphics mode") and *TEXT* ("Switch to text mode") merely tell your Apple how it should interpret the information it finds in this area of RAM. If byte 1024 contains the value 129, the letter *A* appears in the top left corner of the text screen. In GR mode, two blocks appear, stacked vertically in the same place. The top block is displayed in color 1, the bottom in color 4.

Each RAM location corresponds to an exact location on the CRT. For page 1 low-resolution graphics, RAM location 1024 maps to the upper left corner. Address ►

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Program listing. Boxes, boxes, boxes.

```
5  HOME   [151]
10  INVERSE : PRINT "BOXES, BOXES, BOXES": NORMAL   [2368]
11  FOR I = 1 TO 500: NEXT I  [1667]
12  GR   [144]
13  GOTO 25  [488]
15 ER$ = "": INPUT "ERASE PREVIOUS DRAWING? (Y/N): "
    ;ER$  [3695]
20  IF ER$ <  > "Y" AND ER$ <  > "N" THEN 15  [2707]
21  IF ER$ = "Y" THEN  GR   [1294]
25  INPUT "BORDER COLOR (1 TO 15; 0 TO END): ";CB  [7898]
30  IF CB < 0 OR CB > 15 THEN 25  [2068]
35  IF CB = 0 THEN  TEXT : HOME : END   [1337]
40  INPUT "INTERIOR COLOR (0 TO 15): ";CI  [6516]
45  INPUT "BOX WIDTH (3 TO 40): ";W  [4725]
50  IF W < 3 OR W > 40 THEN 45  [1712]
55  INPUT "BOX HEIGHT (3 TO 40): ";H  [5708]
60  IF H < 3 OR H > 40 THEN 55  [1716]
65 TX = 40 - W:TY = 40 - H  [1753]
70  PRINT "LEFT CORNER'S X POSITION (0 TO "TX"): ";:
     INPUT X  [8942]
75  IF X < 0 OR X > TX THEN 70  [1801]
80  PRINT "UPPER CORNER'S Y POSITION (0 TO "TY"): ";
    : INPUT Y  [8101]
85  IF Y < 0 OR Y > TY THEN 80  [1807]
90  GOSUB 500  [1009]
100  HOME : INPUT "PRESS <RETURN> TO CONTINUE...";X$
      [2672]
105  GOTO 15  [740]
500  COLOR= CB  [436]
505  HLIN X,X + W - 1 AT Y  [1331]
510  HLIN X,X + W - 1 AT Y + H - 1  [1949]
515  VLIN Y + 1,Y + H - 2 AT X  [1366]
520  VLIN Y + 1,Y + H - 2 AT X + W - 1  [1957]
525  COLOR= CI  [591]
530  FOR I = Y + 1 TO Y + H - 2  [1612]
535  HLIN X + 1,X + W - 2 AT I  [1350]
540  NEXT I  [399]
550  RETURN   [193]
```

Table. Lo-res color code values.

Color	Code	Color	Code
black	0	brown	8
magenta	1	orange	9
dark blue	2	grey	10
purple	3	pink	11
dark green	4	green	12
grey	5	yellow	13
medium blue	6	aqua	14
light blue	7	white	15

1025 maps to the two vertically stacked points to the right of this first pair. There are 40 points in each row, and addresses 1024 to 1063 map directly to the first two rows of graphics points (two stacked points per byte).

Now comes an odd twist. Addresses 1064 to 1103 also map to two rows of low-resolution points on the CRT, but not to rows 3 and 4. They map to rows 17 and 18. And the next 40 RAM addresses, 1104 to 1143, map to rows 33 and 34. If you fill the first 120 RAM addresses with graphics code, the computer displays those codes as graphics points in three distinct bands of two rows each, separated by one-third of the CRT screen.

The next three groups of RAM addresses, 1152 to 1191, 1192 to 1231, and 1232 to 1271, map to CRT rows 3 and 4, 19 and 20, and 35 and 36, respectively. In each case, your Apple plots the pairs of rows directly beneath the three bands displayed by the first three groups of RAM addresses. And what about addresses 1144 to 1151? These 8 bytes aren't used by graphics at all. Because Applesoft reserves a block of 1024 bytes for the low-resolution graphics page but only needs 960 bytes, 64 bytes aren't used. We just found 8 of them. Some programs use these bytes for special control purposes. Applesoft handles mapping to the rest of the video page through the same systematic process. A RAM page is divided into eight 128-byte segments, with the last 8 bytes in each segment ignored. The other 120 bytes in each segment map to three pairs of graphics rows separated from each other by one-third of the CRT screen.

CREATING GRAPHICS

You can create graphics images with your BASIC programs in two distinct ways. You can use the Applesoft BASIC commands for low-resolution drawing to plot points and draw horizontal and vertical lines, or you can define graphics codes with DATA statements and POKE those codes into RAM addresses between 1024 and 2047. This procedure displays a stacked pair of points on screen. The first method is simple to use; the second is faster, but it requires more programming effort and you must be familiar with decimal/binary conversions. (We'll save it for next time.)

Applesoft BASIC gives you only seven commands for low-resolution graphics; however, this is enough. Suppose you're writing code to create a graphics image. The first command you must use—GR—clears the RAM block between 1024 and 2047 and switches the code interpreter to graphics mode. GR effectively erases any text information that appeared on screen. After GR the computer interprets all codes placed in this block of RAM as graphics code until it encounters the TEXT comand.

TEXT should be the final command in your graphics sequence; it returns you to text mode. Unlike GR, TEXT doesn't clear the RAM block. Your computer will then interpret the graphics codes as text characters. The screen will show normal, blinking, and inverse characters wherever a graphics point has been placed. To erase the screen, follow the TEXT command immediately with the HOME command.

GR has one other nuance. It switches graphics mode for rows 0 to 39 only. Rows 40 to 47 remain in text mode, giving you four rows of text at the bottom of the screen. GR places the cursor in this area, so any PRINT command prints text there. Because you can't simply PRINT in the low-resolution graphics window, you may want to use this text window as part of your display.

If you want to devote the entire display to graphics, follow the GR command with the command POKE−16302, 0. This opens the entire screen to graphics—all 48 rows. POKE−16301, 0 accomplishes the reverse, going from a 48-row screen to a 40-row screen. Once you're in graphics mode, you must select the color of the points you want to plot. The command for this is COLOR=XX, where *XX* is a number from 0 to 15. The accompanying **Table** lists low-resolution colors and their values; some monochrome monitors give shading effects for colors. GR automatically sets color to 0 (black), so if you forget the COLOR command you'll plot black points on a black screen.

You can change colors anytime in graphics mode by issuing another COLOR command. Those points already plotted retain their original colors. Because you can use a variable in the COLOR=XX command, you can set color equal to a loop variable, changing color each time your program cycles through its ►

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loop. Or you can set color equal to a randomization expression, such as COLOR=INT(RND(1)*15+1). This lets the computer choose a random color between 1 and 15.

DRAWING OBJECTS

A computer image is a collection of colored points that resemble an object. To plot a single point on screen, use the command PLOT X,Y, where X is a number, variable, or expression with a value between 0 and 39 and Y has a value between 0 and 39 (for a 40-by-40 display) or 0 and 47 (for a 40-by-48 display). Counting begins with column 0, row 0 (square 0,0) in the upper left corner of the screen.

HLIN and VLIN are the Applesoft BASIC commands for plotting horizontal and vertical lines. The syntax for these commands follows:

```
HLIN X1,X2 AT Y
VLIN Y1,Y2 AT X
```

In the first case, the computer draws a horizontal line along the row specified by Y, starting at column X1 and ending at column X2. In the second case, it draws a vertical line along the column specified by X, starting at row Y1 and ending at row Y2. For example, the following program draws a giant letter *T* across the entire display:

```
10 GR
20 COLOR=13
30 HLIN 0,39 AT 0
40 VLIN 0,39 AT 20
50 INPUT "PRESS <RETURN> TO END"; X$
60 TEXT: HOME
70 END
```

If you want to draw diagonal lines, you must use the PLOT command and either plot each point individually or place PLOT in a FOR/NEXT loop. You must calculate new values for column and row each time through the loop. For example:

```
10 GR
20 FOR I=0 to 39
30     COLOR=INT(RND(1)*15+1)
40     PLOT 1,1
50     COLOR=INT(RND(1)*15+1)
60     PLOT 39-1,1
70 NEXT 1
80 INPUT "PRESS <RETURN> TO END"; X$
90 TEXT:HOME
100 END
```

This simple program plots 80 points, making two crossing diagonal lines with randomly selected colors. The first PLOT command paints points at (0,0), (1,1), (2,2), and so on. The second PLOT command paints points at (39,0), (38,1), (37,2), and so on.

THE SCRN COMMAND

The last low-resolution graphics command is the SCRN function, which is followed by a column/row address in parentheses. SCRN returns a value between 0 and 15 that corresponds to the color of the specified square. For example, C=SCRN (8,12) sets the variable *C* to the current color at column 8, row 12.

This function has a number of practical uses. In a game program, you might have a moving projectile shooting toward a moving target. If the background is black and the target is green, you can use SCRN to test the next square the projectile will occupy before drawing it. If SCRN returns 4 (dark green) for that square, the program knows that the projectile has hit the target.

Another use is in animation. As a moving object crosses the screen, the program must change the color of the square behind it to the object's color. When the object moves on, the square must return to its original color. By testing the square with SCRN and saving the color value before drawing the object, the program knows what value to restore the square to.

OBJECT SUBROUTINES

Subroutines come in very handy with graphics programs. You should place the code for each item you want to draw in a subroutine that appears only once in your program. A simple GOSUB command lets you draw the item several times. Furthermore, you can easily retype or "merge" a subroutine into another program, so you don't have to redesign the same subroutine every time you write a new program.

If you design your subroutines carefully, you can extend one subroutine to handle a variety of different situations. For example, you might want to write a subroutine that will print large colored squares. However, if you program the subroutine to provide a colored border for the square, you have a routine that's more versatile than the original. By giving the border and interior colors the same value before calling the subroutine, you'll achieve your first objective. With the expanded routine, you can also draw box outlines (using 0 for the interior color) as well as bordered boxes. If you give the height and width of the box different dimensions, your subroutine can handle rectangles as well as squares.

First, decide what variables you need to define before calling the subroutine—the variables used within the subroutine for the drawing parameters. In the example above, you need to specify where the box is to be drawn. Giving the column and row values for the upper left corner of the box should be enough. Next, define the width and height of the box—*W* and *H*. (An alternative approach would define the box size by giving the column and row values of the box's lower right corner.) Finally, you must give the values for the border and interior colors—*CB* and *CI*.

The subroutine beginning at line 500 in the accompanying **Program listing** uses these variables to create and display bordered boxes. The main program (lines 5–105) gives you the opportunity to test this subroutine with interactive data input and simple error checking. If you choose not to erase the screen between box displays, you can draw as many boxes on screen as you like. Drawing boxes within boxes, overlapping boxes to create designs, and drawing box frames around other objects is a very simple matter with this subroutine.

And what about low-resolution graphics page 2? Well, I'll save that story for my next column.□

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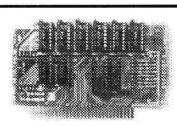

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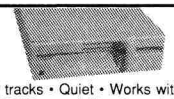

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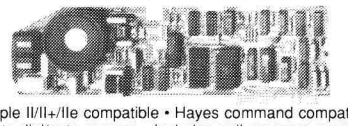

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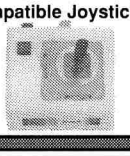

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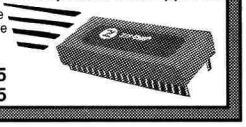

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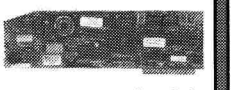

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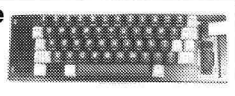

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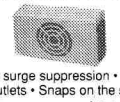

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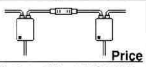

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Continued from p. 27

able to convert earlier Invoicer files to ProDOS, however.

INVOICING

The heart of SBAS is its invoicing section, which can work with either preprinted or blank forms. Once you've entered your customer names, inventory item descriptions, and billing-rate information, creating an invoice is easy. Type in the customer's account number and the account will appear on your screen with the invoice number generated automatically.

You can make any changes in the default fields such as freight, shipping address, and so on. You'll then see an invoice detail area where you enter the code number for an inventory item or billing rate. Enter the code and the program fills in the price and description.

When you enter any quantity, SBAS does the math for you. When you're done, the program will subtotal, calculate tax on those items you've indicated as taxable, total the invoice, and print it. It also posts the information to the customer's account and deducts any products you sold from the inventory-tracking module.

While you're creating invoices, SBAS can print a *posting report*, which is a line-by-line summary of each item on every invoice. This provides a hardcopy of everything you've entered, which will help if you need to track any mistakes.

The program can also create and send an invoice to someone who isn't on your customer-account list; this is a worthwhile capability, as it lets you invoice those people you don't want to add to your accounts-receivable list. Likewise, you can also record sales (perhaps cash transactions, where no invoice was required) without having to go through the process of creating and printing an invoice.

You can view a customer's account or print the details of sales for which you've created invoices at any time. The invoicing section of SBAS also allows a free-format entry, which lets you sell things that aren't in your normal inventory selection—again, a nice touch. You can also use this part of the system to print shipping and mailing labels or Rolodex cards.

When you're done invoicing, the program displays (and will print, if you like) a summary report of everything you've just entered, including name, number of items, and average price.

ACCOUNTS RECEIVABLE

The accounts-receivable section of the Small Business Accounting Series has a couple of weaknesses, but they may not pertain to your business.

If you're working with an open-invoice format—where payments are assigned to specific invoices before they're cleared from the customer's account—you must enter the same invoice number for the payment that you used when you charged the item(s).

When the same number is used for both the sale and the payment, however, it can get confusing when you have to retrieve printed copies of your paperwork. In most businesses, payments and credits are on different forms with their own numbering sequences.

If you use the balance-forward format—where all charges and payments are combined at the end of each month into a balance-forward amount—the program can't calculate and add finance charges. If you want to add finance charges, you must figure and post them manually. The balance-forward approach also ages only current transactions, so once you close out a month, there's no way of knowing how old the balance-forward amount is.

For this reason, most businesses will probably select the open-item method for accounts receivable to get automatic finance charges and complete aging information. As the SBAS manual notes, the open-item approach takes a bit more work than balance-forward, but it also supplies more detailed information.

Other than these two weaknessess (which may not affect your business), the accounts-receivable module of SBAS is effective. It will print monthly statements and past-due notices, provide a current sales-activity report so you can see who's buying what, and provide an aging report that tells you how long it's been since someone charged something.

SALES TRACKING/INVENTORY

The third module of the Small Business Accounting Series keeps track of your inventory—what you buy and when it's sold. As with general sales, you don't have to create an invoice to post an inventory transaction. And like the accounts-receivable module, you can request a posting report, which gives you a hardcopy of your purchases as they're entered.

This section of the program provides a number of reports, including what you have in stock and its value, a price list, monthly sales reports that let you know what your monthly and year-to-date sales are, as well as a printout that shows you which items have dropped below their reorder level. This module can also print working sheets that show what you've sold without the pricing.

Both the accounts-receivable and the sales-tracking/inventory sections have year-end routines that zero out all the monthly totals to make room for new purchases and sales.

QUIRKS AND QUESTIONS

The Small Business Accounting Series isn't perfect. There's a lot of disk access, so with a floppy-drive system you'll spend some time waiting as the program retrieves and saves your information. A flowchart showing how all parts of the system link to one another would be useful.

There are several typos in the manual, but only one is cause for concern: The "$" is left out of a print-control sequence. Also, not all the date fields check for proper entries.

For instance, when you enter an inventory item description, one field asks for the last order date, and it's happy to accept an entry such as *14/14/14*. If you try to enter a month as *14* in the sales posting area, the program won't accept it. It will, however, accept an entry such as *1//1//1/*.

The program comes on three disks, but it doesn't keep track of which programs are where. When the system can't find a module you're trying to access on the disk in drive 1, it beeps and lets you know the program it's looking for is somewhere else, but you've got to try the other disks to find the right one.

All this disk swapping is eliminated, of course, if you install SBAS on a system with a hard drive or RAM disk. The SBAS program disks are copyable, and because the system runs under ProDOS, it's really

designed to be used with a hard disk.

If you ask SBAS to print something but forget to turn on your printer, the data are displayed on your screen, as if the program thinks it's printing there. Even when your printer is on line, you often see bits and pieces of what's being printed flash by. These are minor imperfections, however, in what is otherwise a decent system.

The SBAS package comes with a 97-page manual that includes both tutorial and reference sections.

MiccaSoft provides free customer service. It will also do custom program modifications so the system will better fit your business.

SBAS doesn't have all the bells and whistles that many accounting programs have, but often a small business needs just what the Small Business Accounting Series provides—a way to create invoices, verify how much each customer owes your company, and keep track of what's been sold during each month of the year.

Gregory Glau
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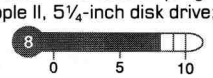

It doesn't take a degree in psychology to understand the benefits of positive reinforcement, either as an incentive to do well or as a reward for having done well. In either case, the effects of receiving some tangible form of praise for having accomplished a task are usually noticeable and long-lasting.

Schools have used the idea of positive reinforcement—especially at the elementary level—for quite some time. This practice has evolved into the use of "contracts," a system in which a parent or teacher and a child enter into an agreement that promises to reward certain behavior.

The contract system thoroughly encompasses the idea of positive reinforcement. Like any other procedure designed to change or enhance behavior, however, it ▶

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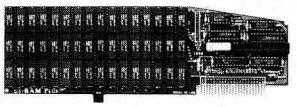

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requires time and effort to create the contract, track the behavior, and monitor the results. Enter Thomas Software and its new program, Positively Rewarding.

Positively Rewarding is a non-copy-protected program that lets a teacher or parent implement a contract system with relative ease. The program is designed to take most of the time-consuming tasks inherent in a contract out of the hands of the teacher or parent and give them to the computer.

POSITIVELY SIMPLE

Positively Rewarding covers all the bases. It lets you construct contracts quickly and easily; it employs a simple interface so young children can use the program without constant adult monitoring; it keeps track of all the tasks; and it offers animated, personalized messages as motivational on-screen rewards. It also does all the necessary paperwork, such as progress reports, daily tracking charts, and various personalized certificates.

The process is straightforward. The two-disk program contains a Teacher's/Parent's Disk and a Child's Disk. The Teacher's Disk contains the portion of the program that lets you create individual

Behavioral-contract management for young people.

contracts, set up passwords to ensure privacy, select desired behaviors and assign each behavior point totals, choose appropriate messages, and insert Surprise Screens. The Child's Disk lets the child log in his or her entries and earn appropriate rewards.

I created a file for my nine-year-old daughter, Jenna, by selecting *Add Children* from the menu. Next, I looked through the *Standard Lists*. From *Behaviors*, I selected "I cleaned my room" and "I did my homework." From *Contracts*, I decided on "When ( ) earns ( ) points, then ( ) will go to the zoo." From *Messages*, I chose "Surprise ( ), you get a stuffed animal on your desk!"

You can modify the selections from the *Standard Lists*, so I changed the contract to "will go to Pizza Hut" and changed the message to "Surprise ( ), you get to take a friend with you. You're halfway to your goal and I'm proud of you."

Now it was simply a matter of determining how many points Jenna needed to earn before the reward kicked in. I decided she should earn 24 points to reach her goal. I assigned "I did my homework" a one-point value and "I cleaned my room" a three-point value, because it's easier to get her to do her homework than to clean her room.

Finally, I added a *Surprise Screen*. I chose a picture of a frog, jumping toward the words "Jump to Your Goals!" I had ►

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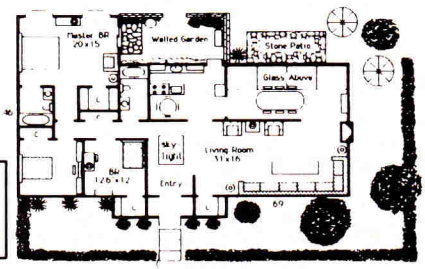

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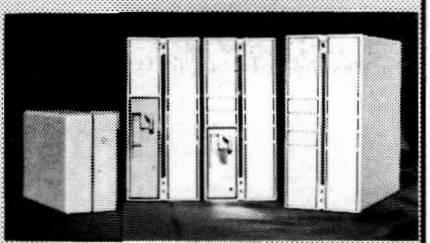

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Positively Rewarding present the screen after Jenna had earned 12 points.

For the most part, my work was done. I showed Jenna how to work the program and use the Child's Disk to enter her daily points. All she had to do was select her name, read the *Welcome* screen that showed her goal and the number of points she had earned thus far, and press the spacebar once to see her contract and again to bring up the behaviors.

As each behavior was displayed, Jenna simply pressed the spacebar once to answer yes to the behavior or twice to answer no. Pressing the Return key logged her answers, calculated the number of points she earned, and started the positive-reinforcement segment.

POSITIVE ENCOURAGEMENT

Positively Rewarding offers encouragement in a number of ways. In the positive-reinforcement portion of the program, the goal screen appears first. This shows a mountain range with a stick figure on top of one of the levels, depicting how far the child has progressed toward his or her goal and stating the number of points earned on a given day.

Next, you can have the program print a personalized certificate praising the child. Then, if he or she has earned enough points, the child will see a Surprise Screen; finally, when the child has reached his or her goal, a *Congratulations* screen will appear automatically.

Positively Rewarding works equally well with an individual child or an entire classroom. Printed reports on each child make it easy for a parent or teacher to monitor progress over a period of time and see which behaviors are being adhered to and which need more attention.

Another useful feature—especially for classroom use—is a daily behavior chart you can use in conjunction with stars or stickers to help motivate students further by providing a nonthreatening competitive element.

A final feature of Positively Rewarding that deserves mention involves toggling the active status of a child on or off. This lets a teacher designate a student as inactive in the event of illness, thus keeping his or her daily chart accurate and current.

POSITIVE CONCLUSIONS

Positively Rewarding has only a few minor drawbacks; some are faults of the program and some are the result of disk limitations.

While the graphics reinforcements provided by the *Surprise Screens* are valuable, there are only three pictures available. Anything repeated too frequently will lose its effectiveness, so there should be a greater variety of graphics made available. Also, it would be nice to be able to modify the text that accompanies each picture.

When you're using the date feature for any reason (daily input, predetermined time allotment to tasks, and so on), you must enter the date in three steps, hitting Return after the month, day, and year. This is somewhat annoying.

Disk limitations—obviously not the fault of Positively Rewarding—determine the number of children you can place on each disk as well as the number of charts you can keep for each child. The documentation suggests making a Child's Disk for every group of four to ten students. With

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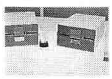

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four students on a disk, you can maintain at least six charts for each student; the average chart lasts approximately one week.

Thomas Software, recognizing the above limitations, offers step-by-step instructions for maintaining individual histories, creating continuously running daily records, and clearing unwanted data without having to re-enter names and other information. However, the inability to use the program with a mass-storage device calls for careful planning and maintenance of records.

Positively Rewarding—despite some caveats and the fact that it will appeal to a limited audience—fills a valuable educational/parenting need. The program is well thought out and thorough in its approach to the subject matter. Anyone who wants to improve behavior at home or in school while increasing a child's confidence and self-esteem will find Thomas Software's offering positively rewarding.

James Trunzo
Leechburg, PA

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The childproof menu appears automatically when you boot the disk. Rather than expecting children to choose a response, the computer says, "Press the keyboard now and I will..." for each option. If children have made no choice by the end of the list, the menu begins again with the first choice until they make a selection.

STORY TIME

Children just beginning to read should choose the first option, which has the computer read the entire story. The story appears page-by-page with both text and pictures—just as if it were a book. As the computer reads, each word is highlighted, and the illustrations move back and forth in simple animation.

A menu at the bottom of each page lets children page forward or backward once they've heard the entire story, or stop and restart the story. At certain points, children will also be able to decide what should happen next in the story. For example, they must decide whether the Ugly Duckling will flee to a pond or to the woods.

Once children begin to read for themselves, they can choose the *Read & Wait* option. This will have the computer read a word and then pause to let the child repeat it.

The *Wait & Read* option is appropriate once young readers have learned most of the words. The computer pauses to let children say a word. Then, when they press a key, the computer says the word. Thus, if their reading was less than perfect, ►

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the computer uncritically supplies the correct word or pronunciation. If they did read the word correctly, they're reinforced immediately by the correct pronunciation.

Finally, children can choose the *No Sound* mode, which lets them read the entire story to you by themselves, showing you their new and impressive reading skills.

You can further your child's reading activities by printing a copy of the storybook. Most dot-matrix printers can print an outline-only, coloring-book version of the book. If you have an ImageWriter II, you can print the book in color.

Youngsters will enjoy seeing the familiar screens turn first into drawings and then into a book. The book will give them something to show off at grandma's house or other computerless locations.

STORIES FOR SOMEDAY

The Storyteller programs aren't necessarily ones that children will use every day. They'll probably listen to each story a few times when they receive it. Months later, when their reading skills have improved, they may pull the disk back out and work on it a little more at a different level. Once they're close to mastering the story, they may read it incessantly for a few days. When they succeed, you can print the book as a reward.

The Storyteller series is an excellent means of building reading interest and skills. I would particularly recommend it for a classroom or library setting, where the program can be used over and over by many different children.

I was disappointed, however, by this rendition of Hans Christian Andersen's fairy tale. Technically, it's well-executed—artistically, less so. The narrator's voice can make a story exciting. This narration is lackluster.

The animated illustrations contain some charming details, such as a duckling staring a caterpillar in the eye, and the title screens are striking with gold and gray on black. A beautiful silhouette of a rocking chair is the background to the options screen.

Once the story began, however, I found myself staring at a mud-brown duck on a washed-out blue sky and chartreuse grass.

Circle 105 on Reader Service Card.

This unappealing color combination continues throughout most of the story. Also, all the drawings are medium or long shots. A close-up or two might have helped develop the hero's character better.

THE PLOT THICKENS

What The Byte Works' version of *The Ugly Duckling* lacks most, though, is plot development. Because the original story is difficult for contemporary youngsters to understand and is much too long for a talking computer format, The Byte Works essentially had to rewrite it.

When you have fewer than two dozen screens to work with, you have to build drama quickly. In The Byte Works' version, the ugly duckling hasn't even hatched until the fourth frame. His mother takes three frames to teach him how to swim and then walk him back to the barnyard. Then, with 12 frames to go, the plot begins.

The barnyard inhabitants drive the duckling away because he's so ugly. We're told nothing of his wanderings or aching loneliness. Instead, fall arrives immediately and the duckling sees flocks of swans flying south. He yearns to be beautiful like the swans. Then it's winter. We learn that the duckling is cold, but feel nothing of the agony of the original.

Andersen's duckling swims desparately round and round as his hole in the ice becomes smaller and smaller, nearly freezing him into the pond. The finale of The Byte Works' version has the duckling learn his true identity and think, "I am so happy to learn that being different can be very special." Andersen's climax is much more dramatic. The lonely outcast is finally welcomed into a group—the flock of swans—and people on shore praise his loveliness and grace.

It's unfortunate that such a well-designed program should be flawed by a poor adaptation. Nevertheless, as The Byte Works points out in the instruction booklet, the more interest you show in the story, the more interest your children will show. If you sustain their interest in the story, The Ugly Duckling can help encourage children to grow from listeners into readers.□

Jeanne Dietsch
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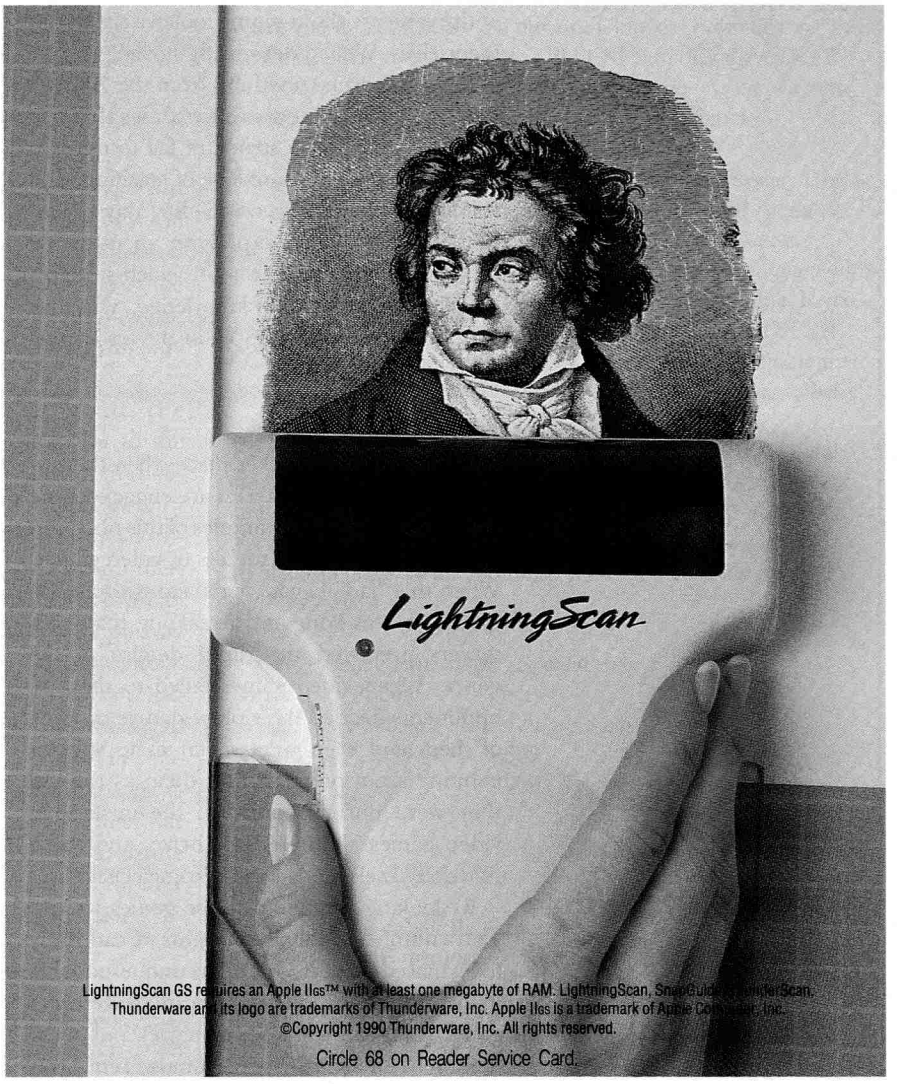

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LEARNING CURVE

MOTIVATING FORCES

By DAVID D. THORNBURG, Ph.D.

Are test scores what education is all about? Where does wonder fit in, or true understanding?

THE WORD *EDUCATION*, TO MANY people, conjures up images of a place called school, and for many people that's a place of hard wooden seats and harsh fluorescent lighting. It's difficult to imagine education as an engaging activity in a place like that.

Now add the teacher, someone who's presented as the font of all wisdom—otherwise known as the curriculum, designed by administrators and legislators who may spend an entire career without setting foot in a classroom themselves. What a depressing image!

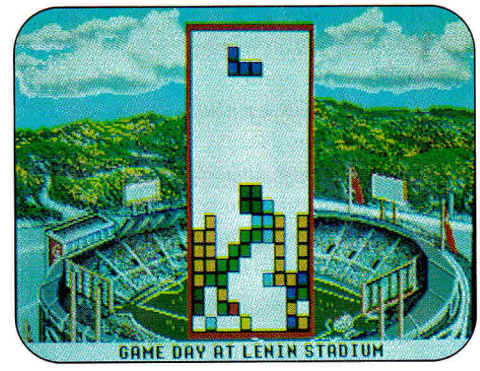
If we've learned anything from the 700,000 students who drop out each year, it's that our schools by their very structure fail to develop or reinforce that natural love of learning each child seems to express on the first day of kindergarten. Perhaps exploring an informal learning environment, one in which students appropriate their own knowledge, will give us some ideas we can apply in the traditional classroom.

VIDEO MATH

The best learning takes place when the student's attention and interest are engaged. One of the most stunning examples of this phenomenon is the continued success of video games. When this "fad" began years ago with arcade games such as Pong and Breakout, many observers predicted the rapid demise of the genre. When video games failed to die out, opponents decried the violent nature of some of them and even went so far as to suggest banning them or restricting them as though they were pornographic. In the meantime, video games continued to thrive, and some nonviolent selections have become classics.

By looking at some of these games we can gain a number of valuable insights we can apply to formal education. One of the unquestionably great products of the past decade is **Tetris**, a game of abstract geometry that grew out of the designer's interest in pentominos. Tetris was created by Alexey Pajitnov, a mathematician and researcher in artificial intelligence and speech recognition at the U.S.S.R. Academy of Sciences. In addition to the arcade version of the game, Spectrum Holobyte has also published Apple II editions for the 64K, 128K, and GS platforms (Editors' Choice, October 1988, p. 120).

The principle of the game is simple. The player is presented with a falling game piece composed of four squares arranged in one of six randomly chosen patterns. You can rotate this piece and move it horizontally as it drops to the bottom of the screen. The object is to place the pieces so that they fill a horizontal row. As you fill each row, it disappears from screen, making room for more layers of pieces. The game is over when pieces pile up to the top of the screen. At each level of play the speed of descent increases, requiring faster decision making.



The Soviet puzzle game Tetris captivates and challenges as it reveals the beauty of geometry and makes an abstract subject real.

This game, which has been called "the Rubik's Cube of software," engages thousands of players who, according to their teachers, "can't concentrate on math." High-school students who struggle through math in school may go to the arcade and score consistently in the top ten as they play this math puzzle, based ►

on logic and perception of spatial relations, for hours on end.

It's interesting to note the depth of these students' problem-solving and logical-thinking abilities. They create complex strategies to deal with various game situations and must recall these strategies and act on them quickly. Development and testing of hypotheses are critical components of mathematical thinking, and they're common among Tetris players.

Another way to think about engagement is to think in terms of intrinsic motivation. It's central to lifelong learning—you'll need it to master any subject in a meaningful way. Choosing to pit yourself against a video game contrasts sharply with challenges imposed from the outside. In the first case, the student's mind is fully engaged; in the second, it's likely to shut down with fear or boredom.

You might argue that Tetris' "instructional content" isn't relevant. Nevertheless, the fact remains that many students who in the eyes of their teachers have no grasp of math are quite proficient when they can approach it on their own terms.

CLASSROOM REVISITED

One of the major applications of educational computing for "at risk" students is the *integrated learning system*—lab-based rows of computers at which students bask in the dim glow of monitor light while their brains are crammed full of piecemeal knowledge via techniques that would have George Orwell doing cartwheels in his grave.

Of course, the purveyors of integrated learning systems say that students using their material do increase their test scores. But is that what education is all about? Where does wonder fit in, or true understanding? What is the benefit of being able to identify a verb if you can't see the beauty in a Dylan Thomas poem? Tetris may or may not improve a student's performance on a math test, but in its own way it reveals a bit of the beauty of geometry.

Every subject taught in school has at its base relevance and beauty. Teachers who can't give immediate examples of that to their students have no business in the profession. If the teacher says only, "You need to know this because it will be on the test," or "This will help you later in life," he or she has failed the student by saying in effect, "I'm teaching this only because it's my job."

On the other hand, the teacher who can point to the relevance or beauty of the subject can engage students in their personal quest for knowledge. The desktop computer, with its almost limitless capacity to create models and portray microworlds, is the perfect tool.

We need more educational-software developers willing to bring the same level of fascination and engagement to curriculum-based programs that game designers bring to arcade products. After all, a computer is a terrible thing to waste.□

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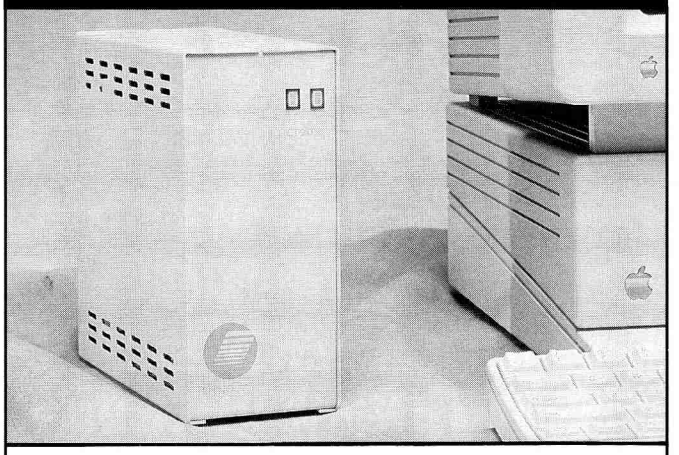

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AppleWorks Power

Apple users know there's always an easier way to get the job done. A shortcut here, an elegant twist there—that's what Hints & Techniques is all about. It's an information swap for readers who want to share their programming pointers, hardware secrets, AppleWorks applications, and all kinds of other insights.

ProDOS Conversion

By Debra G. Warner

LOYAL FANS WILL AGREE THAT AppleWorks is the program of choice for II users everywhere—its simple interface brings success even to beginners. But as beginners try their wings, they sometimes fly smack into a wall: ProDOS pathnames.

In this case the wall is just another step in the AppleWorks learning curve. Such a sticking point is characteristic of programs that are easy to learn in the early stages. Some users stay at the lower level, but most try to get over the wall. Here are a few suggestions, with two examples: converting ASCII files downloaded from a communications package and spreadsheet files from VisiCalc.

ASCII Express Professional is a DOS 3.3-based program. Its command set includes automatic downloading of text captured from a host computer to a disk file. This feature is popular with librarians and other on-line professionals who want to capture portions of distant databases and edit them later before giving a printout to a requestor.

After you've downloaded the text to disk, you must convert the file to ProDOS before using AppleWorks. It's easy enough with ProDOS' utilities—but thinking about the steps involved will shed some light on the pathname problem.

ProDOS' conversion utility asks whether the name of the volume or disk is *Okay* and also asks permission to destroy its contents. You may figure that */blank27* is just as good a volume name as any other—but it makes more sense to pick an easy name such as *data*, because this volume name plays a part in the conversion process.

Once the new ProDOS disk is ready, it becomes the data disk for AppleWorks. Most beginners know the AppleWorks menus well enough to get through the following steps: *Add files to the Desktop*; *Make a new file for the word processor*; *From a text (ASCII) file*. AppleWorks then asks for the *Path*. Give the volume or disk name, then the name of the file under which the text is stored: */data/filename*. This procedure gives AppleWorks directions to the text file so that it can pick it up and convert it to an AppleWorks file. You can also change the filename if you like.

By the way, there's another method of helping AppleWorks identify the sought-after file. From the AppleWorks main menu's *Other Activities* selection, you can *List all files on the current disk drive*. Under this option you can identify disk names as well as filenames. If you know the correct pathname, however, it's quicker to avoid this longer process.

Converting a spreadsheet poses a similar problem. Moving VisiCalc files to AppleWorks seems simple enough: First convert from DOS 3.3 to ProDOS, and use the *VisiCalc* option from the AppleWorks spreadsheet. But that's where you can run into the same wall. The ProDOS pathname again must have the */volume/filename* to complete the conversion from VisiCalc to AppleWorks. Once you've accomplished that, the files perform perfectly, saving you from the tedium of rekeying your spreadsheets.

Even if you've been trained on an IBM hard drive, you may never realize that the disk itself needs a name. AppleWorks' overall friendliness leads you to believe that such an MS-DOS-style requirement wouldn't exist in Apple country. But once over the pathname wall, AppleWorks novices will soon be using all the features this integrated program has to offer. Remember—today's beginners are tomorrow's experts.

Write to Debra G. Warner at P.O. Box 1153, Auburn, ME 04210.

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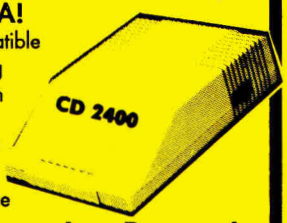

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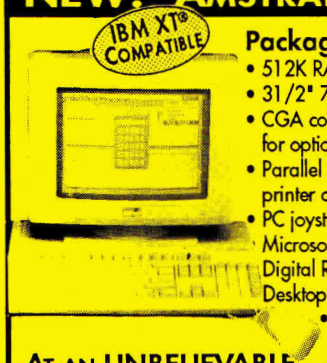

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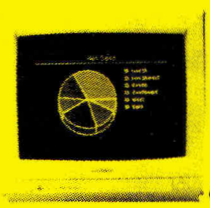

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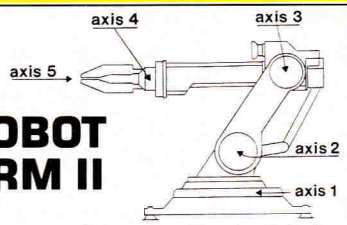

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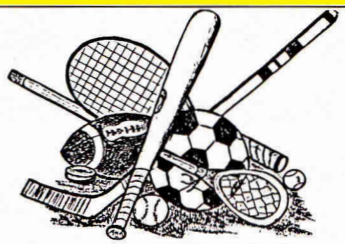

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EDITORS' CHOICE

Hyperware is the buzzword these days — packages that let you design multimedia applications without knowing any programming. You can link text screens with other text or graphics screens, add sound effects or music, or work with images from a videodisc player. Explore all the screens in your stack in order, or jump around, go backwards, move to another stack, or return to the equivalent of a main menu — the home screen. Those features make hyperware applications fun to explore, yet effective as teaching tools. Now from Scholastic comes a flexible, challenging new addition to the Apple II family of hyperware — **Hyperscreen** — and you can do it all in 128K.

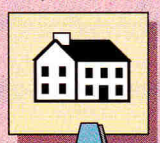
Each individual screen can have up to 15 "buttons" that activate a pop-up text box, sound effects, or music. A button can also bring you back to the home screen, or to another screen or stack altogether. Buttons let you navigate through a "stack" of Hyperscreen "screens" — they're your compass and your transportation put together.

HOME **VIDEODISC** **GRAPHIC**

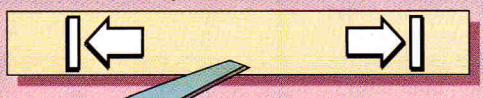
ON THE BUTTON

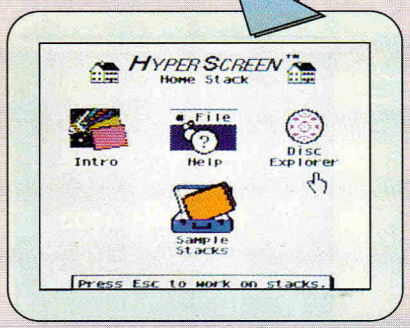
Using a Pioneer LD-V 4200 Laserdisc player, you can incorporate still images or segments from any videodisc into a screen or series of screens. Hyperscreen lets you choose any single frame to display as a graphics screen, or set beginning and ending frames for a sequence. Laserdisc control with Hyperscreen is that simple.

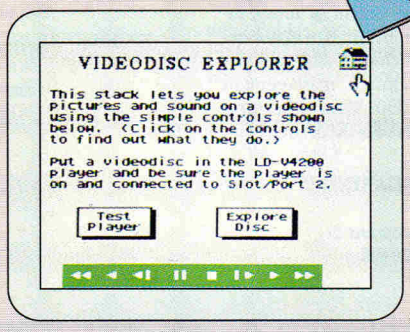
Hyperscreen comes with a collection of backgrounds and clip art you can use to create graphics screens. You can also import artwork from other paint and graphics programs, or design your own with Hyperscreen's drawing tools. The program also offers a whole slew of special effects to use as transitions between screens — dissolve, wipe, block-by-block disappearance, and fade to black, for starters.

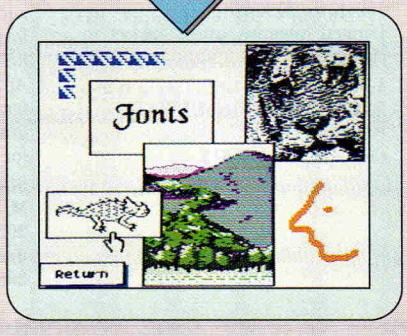


You can use Hyperscreen with a 128K Apple IIe, IIc, IIc Plus, or GS. It's a whole lot easier if you have a second drive, but it works with just one. You should also have some stack disks formatted before taking off with Hyperscreen. The package sells for $99.95. It includes three 5.25-inch disks or one 3.5-inch disk, a *User's Guide*, and a *Teacher's Guide*. AppleTalk and Corvus network versions are available for $499.95, from Scholastic, Inc., 730 Broadway, New York, NY 10003, (212) 505-3000.









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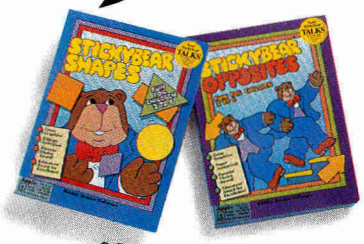

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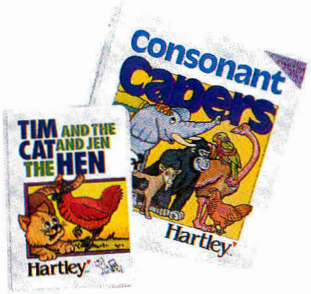

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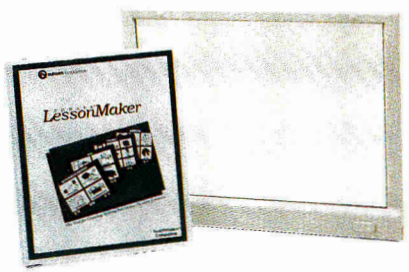

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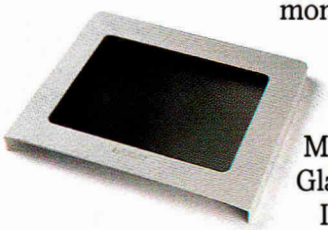

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