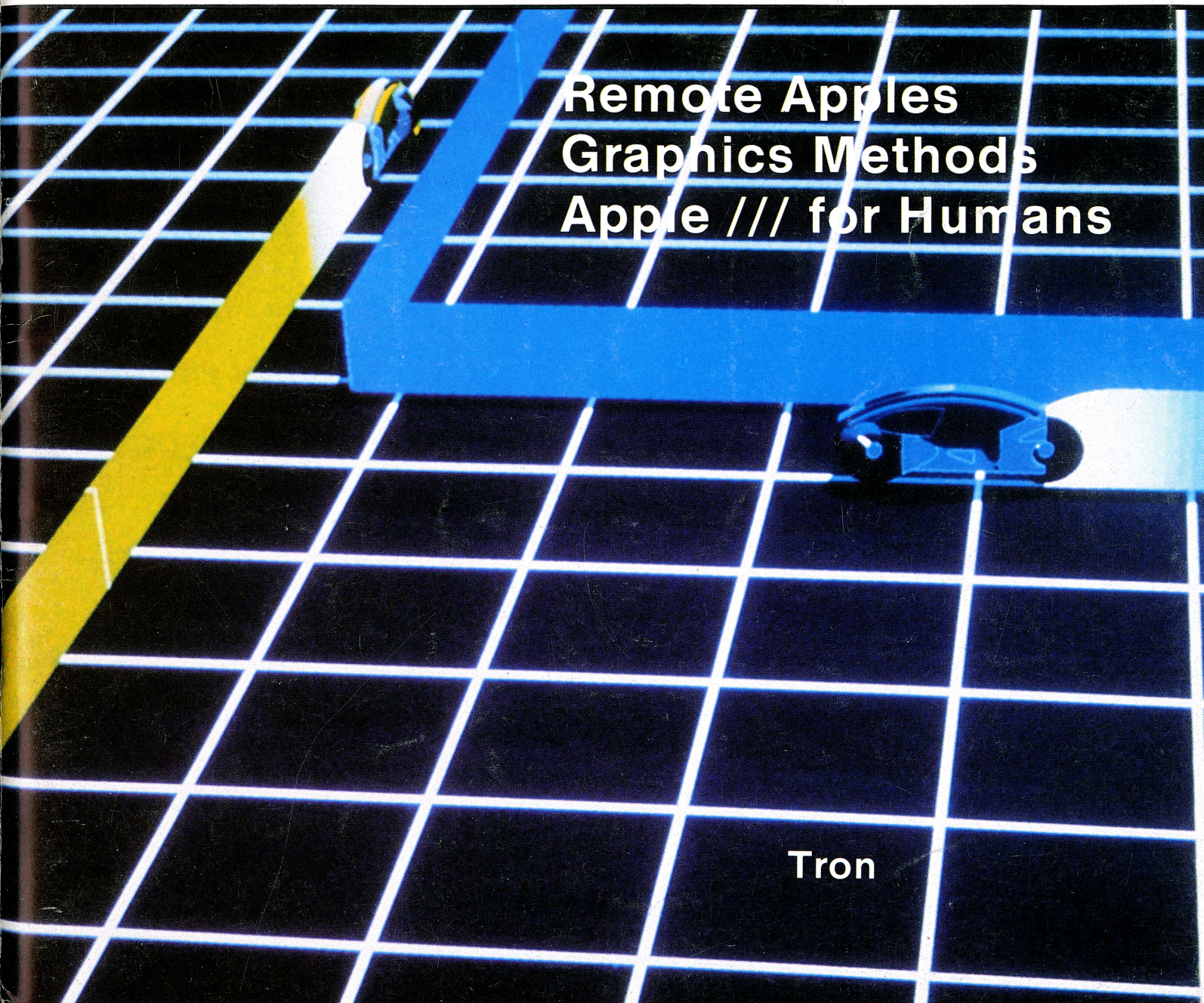
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Apple Orchard

The Premier Magazine for Apple Computer Users ™

VOLUME 3 NUMBER 4 SEPTEMBER - OCTOBER 1982 $3.25



THE PROWRITER COMETH.

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PROWRITER: High-resolution graphics features, fine for bar graphs, smooth curves, thin lines, intricate details, etc.

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WARRANTY

MX-80: 90 days, from Epson.
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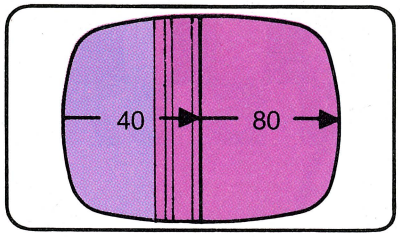
Heh, heh.

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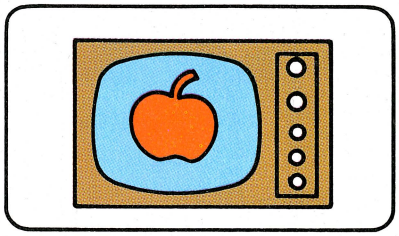
For a free poster of "Ace" (Prowriter's pilot) doing his thing, please write us.

Apple polishers.



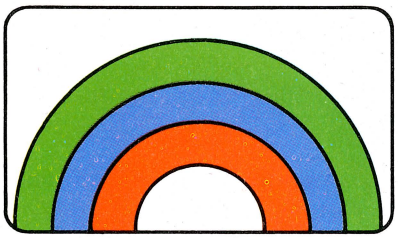
Apple II with 80 column display.

It's yours with M&R's SUP'R TERMINAL, an easily installed circuit that doubles the display size of your Apple II.



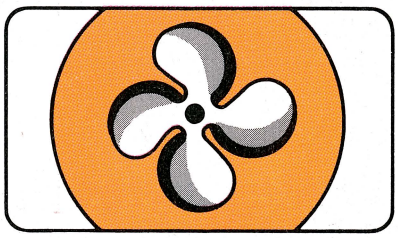
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Apple owners can use their TV sets for a display with our SUP'R MOD family of adaptors.



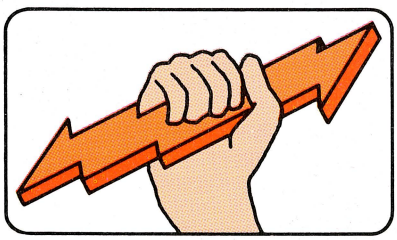
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Yes, with our interface your Apple III can talk with an RGB color monitor.



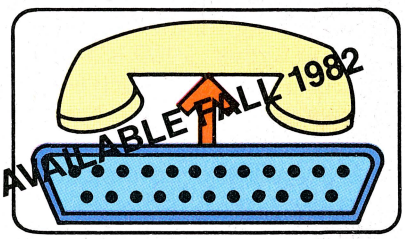
Want to reduce service problems?

Heat is the leading cause of component failures. M&R's SUP'R FAN is a heat reducing insurance policy that fits snugly inside your Apple II.



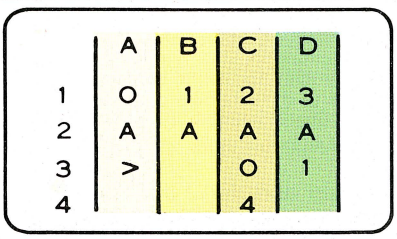
Need more power?

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7 x (RS-232) + 1200 BAUD = Sup'R Access-1

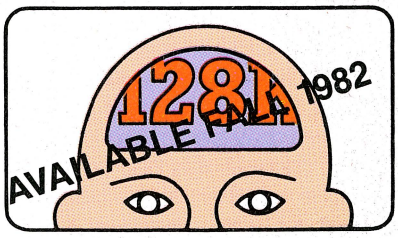
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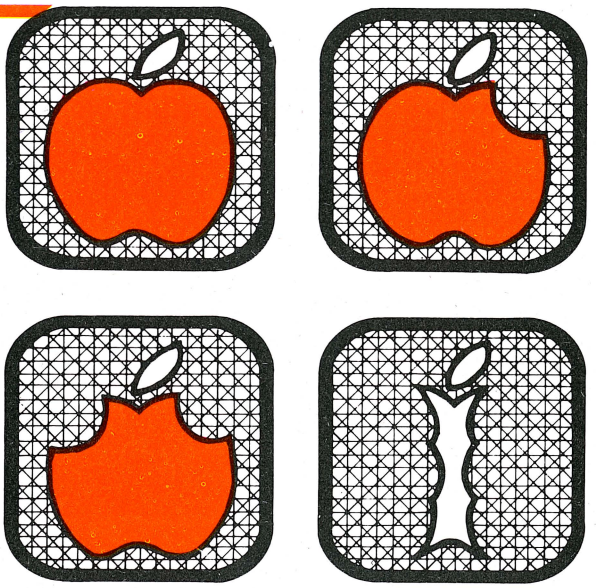
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Take a bite...

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Cover: A Scene from Tron. © 1982 Walt Disney Productions.

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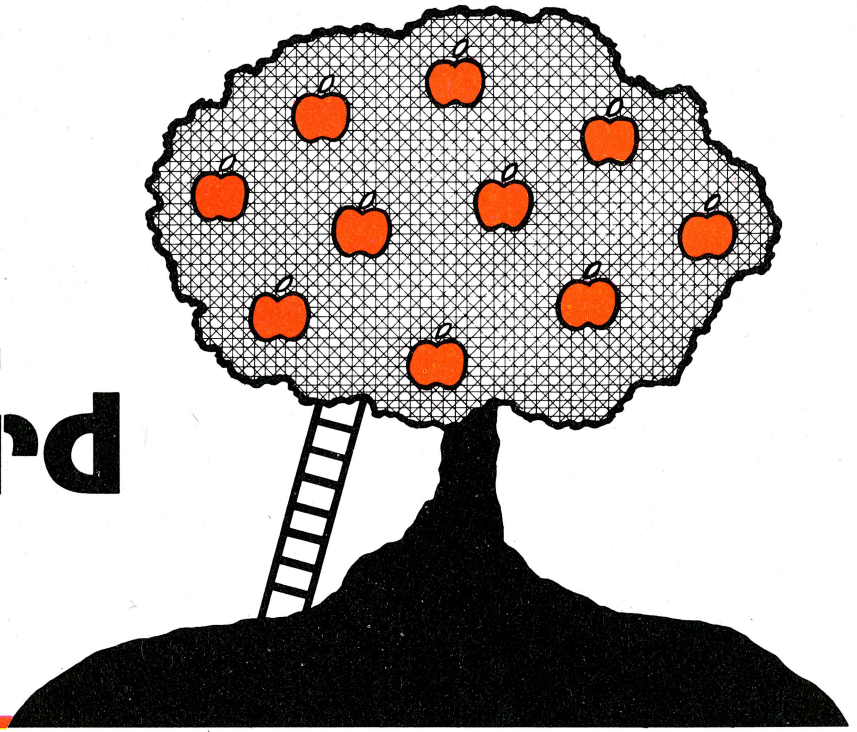
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Apple Orchard



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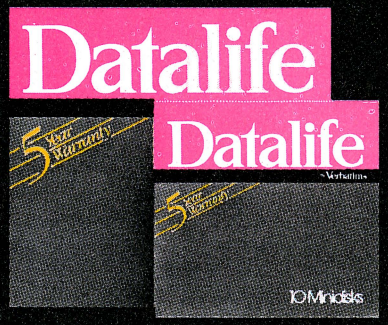
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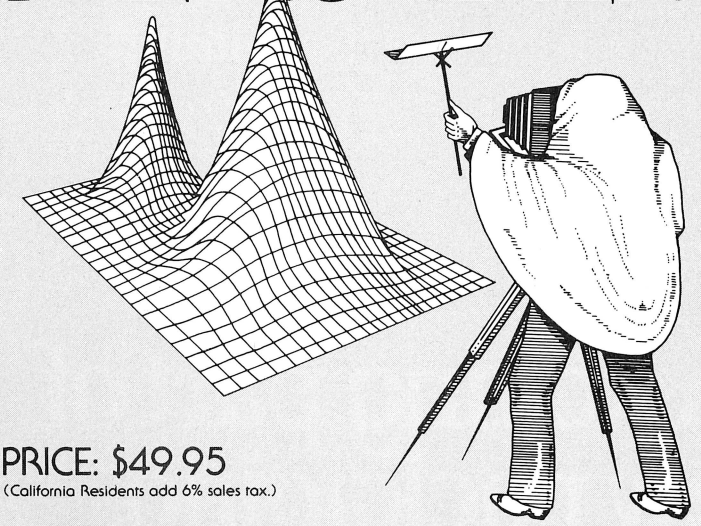
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TEXTFILE

Your response to **Apple Orchard** has made possible a larger issue, which is indicative of the expanding Apple world. Long-time readers will notice a greater emphasis on product reviews, a category of article which we have been expanding.

Morgan P. Caffery covers the ANIX operating system, and Clark Congleton reviews a Universal Boot initializer. These are two products which show the capability of the Apple to go beyond the original projected operations of Apple the Company, and which are a tribute to the original Apple designers' efforts.

We take great pride in presenting the first in a series of articles on arcade graphics by William Harvey. As you will see, the "secrets" of Apple graphics work, once mastered, are capable of providing immense creative rewards.

Also, Joseph Sobel and Barry Bayer continue their series on VisiCalc, this time considering the options available in printing and storing your templates and data.

Another product at the frontier of Apple-related technology is the Remote Operating System; we're indebted to Allen Rogers of the Chula Vista (CA) school system for a first hand look at this new method of multiple access to data storage facilities.

Neil Lipson, having covered the Diablo printer in our May-June issue, switches from daisy wheel to dot matrix for this issue, taking on the popular Epson printers and the PKASO interface card for graphics.

Apple /// owners aren't forgotten either, as the redoubtable Alan Anderson provides for us a look at the basics of driver interfacing by humans. For the more advanced Apple /// tinkerer, the "Unlocking Apple ///" series continues, up to and including a beginning interpreter. This series, by the way, continues to lead the field in terms of providing independent help for the owners of the "big one".

The release by Walt Disney Productions of a movie called *Tron* prompted a somewhat unusual review by a rural correspondent. We hasten to add that the film is particularly enjoyable to computer-literate people from large cities as well. In fact, Walt Disney's heirs may have, with this new computer-generated animation, done for our children what the original *Fantasia* and subsequent works did for us (or for our parents). *Tron* is a clear signpost to the future of moviemaking.

We also note with regret that our Circulation Manager, Karen Vanikiotis, has departed our company with the avowed intention of commiting matrimony. Karen's many contributions to the **Apple Orchard** during our first six months of operation here in Santa Clara are much appreciated, and will not be forgotten. All of us wish her well.

But the most important person to the **Apple Orchard** is, as always, you. This publication, more than any other, depends on your input and suggestions for subject matter; we'll try our best to answer your questions and to make you aware of information which will help you squeeze more from your Apple. We also welcome the opportunity to help you share information which you have come by, with others.

Let us know what you think.

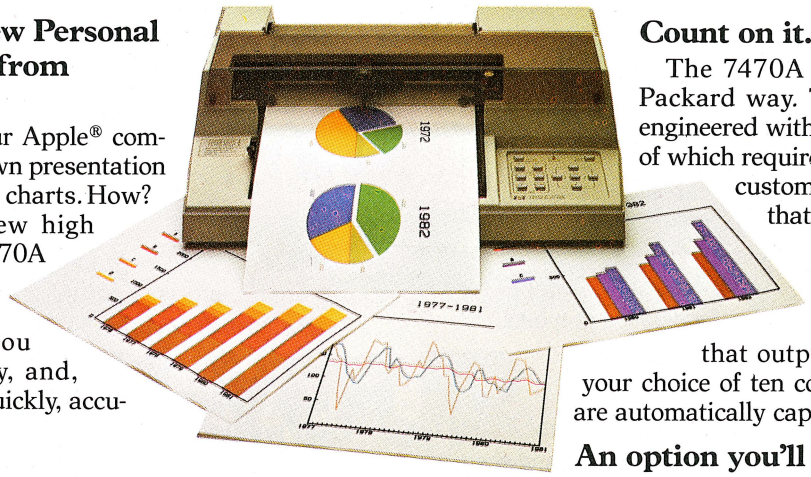
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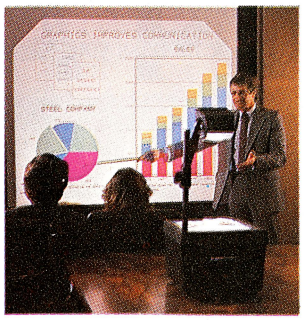
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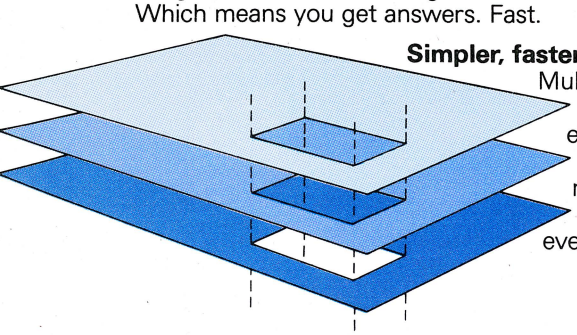
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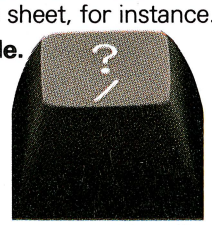


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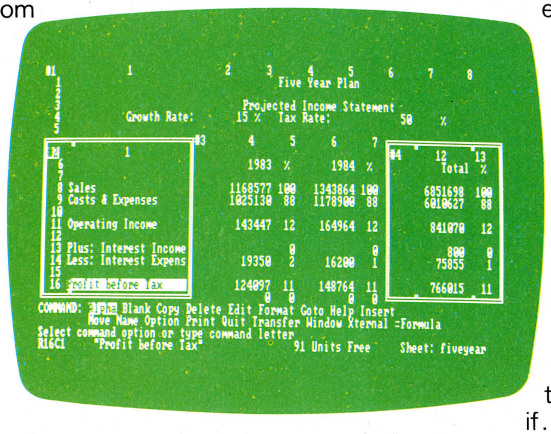
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Fast answers to some of the in business.

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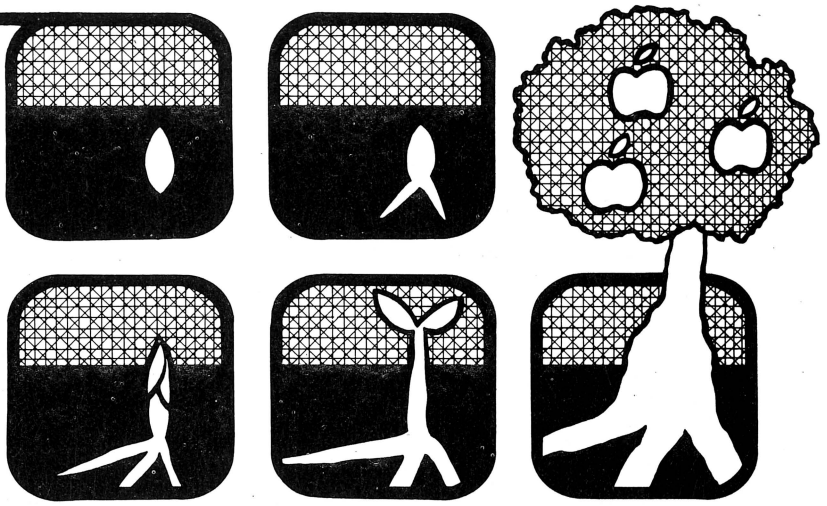
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Planting a seed...





The Smiling Consultants

A cynic once said that a consultant is a fellow who borrows your watch to tell you what time it is, and then keeps the watch.

A couple of weeks ago, representatives from a High School visited the offices of this publication. They were in search of information about computerized typesetting, which we have been using, interfacing Apple II's and ///'s to ITEK typesetting equipment). During the conversation, they indicated that they had had a quotation from a consultant to develop the necessary "custom software" for such an interface; price about $5,000. Meanwhile, we had discovered that the interface required very little custom work, mostly a character translation table for typesetter codes. A realistic price would have been more like $250; five hours at $50 per hour. (All right, $100 per hour . . . that's still only $500.)

Unfortunately, that's only one example. There are many horror stories about excessive fees for what, essentially, was the assembly of commercial components into a so-called "custom" system, or of two hours spent reworking a $295 package (mostly the title and menu headers) and charging $1,000. No wonder many people are suspicious of the microcomputer field and its denizens.

Now, some of this writer's best friends are consultants; indeed, my own resume shows considerable experience in that field, for some first-class outfits. The situation outlined above can only be described as (a) the "consultant" being ignorant of the requirements and building in enough time to learn the job at the client's expense; or (b) a plot with larcenous overtones.

Most consultants are honest, but everybody suffers from the sizzling trail blazed by a well-remembered few. The most unfortunate result is that business people become suspicious of *all* consultants and their fees, however legitimate. The honest consultant then finds himself having to justify a reasonable level of fees, including those "time and material" situations which are in fact necessary to determine the actual scope of a customer's needs. Which change. It tends to develop thick skins all around.

Of course, the consultants exist because of yawning gaps in information. Manufacturers by and large blame the customer's trouble on somebody else's product. Documentation is Byzantine in organization, with incomprehensible syntax. The dealers (with too few exceptions) know little more than the customers; if our mail is any indication, "service support" is a joke to many. The *real* expertise lies in the brains of those who studied the machines, "hacked" at them, and, after some time spent helping others *gratis*, began to charge for the service.

It shouldn't come as a surprise that many of these knowledgeable people got that way through membership in one of the IAC member User Groups, which provide an ideal forum for interchange of information about what works, what doesn't, and how you have to tweak something else to make it work.

If you feel the need for "consulting" services, or a "second opinion" on an expensive fix to your problem, or even a desire to get to know your Apple a little better, check out a User Group near you.

Because this channel for information is available to any Apple owner, the blunt fact is that if a user gets taken by a rapacious "consultant", the user must share the blame. We have heard the shortsighted cry, "I'm a user, I shouldn't have to learn anything about the Apple to use it, and I'm not happy." (Quite often, this extends to not even reading the manual.) Folks, these aren't toasters. A small investment in time and dues can prevent folly and recriminations later.

Yes, we'd like to see the avaricious consultant put out of business, through making knowledge more available. But we have little sympathy for those who willfully resist the absorption of information into their beings.

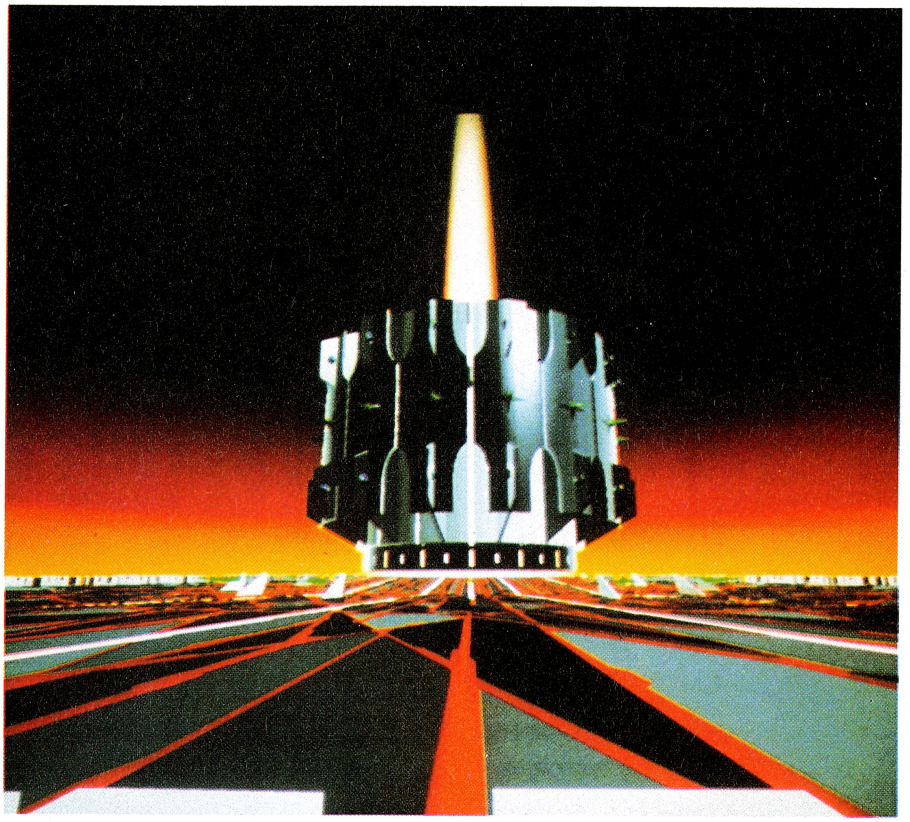
The APPLE ORCHARD exists to provide information, as do other publications. There is, however, no substitute for the "one-on-one" access to shared knowledge in a User Group.



Movie Review:

Opening Night at TRON

Alan B. Fid



Photos Copyright © 1982 Walt Disney Productions

LAST Tuesday I got a call from Frank Crabtree. Frank's an old buddy of mine, lives in the Big City. Last time he came by this way for supper we went down to the basement so he could look over my Apple II. Frank knew I was kinda interested in how that confuter worked. Anyhow, Frank was all excited on the telephone 'cause he'd just talked to a professor friend of his over at State where they teach all about computers. It seems Frank'd told this professor all about me. Well, it turned out the professor had six tickets to opening night at this new Disney movie called ***TRON***, and would we all like to go?

Frank explained that the movie was an adventure with computers and I might learn something. I figured that anything was worth a shot, and since the movie was by Walt Disney, it couldn't offend Betsy-Ann. So I said OK, the two of us would meet him and the professor at Darryl's on Friday night up in the Big City before the show.

The professor turned out to be not what I'd expected for a Professor being from the University and all. He was this tallish feller with black hair, a beard, wearing blue jeans and sandals. Betsy-Ann wondered how in Heaven's name they let him teach *students*? She couldn't see how he could know anything at all about computers, much less teach them. But when the doc started off dinner saying "As I look back on the history of civilization . . .", we found out that looks can fool you. All I can say is that he'd better clean up his act before he ever comes down to Lizard Lick. Jeb and the boys would run him out of town before he ever knew he'd been in it.

Anyway, the professor explained that the movie was supposed to be about this guy who gets trapped inside a computer and all his adventures there. I thought this was kind of interesting, cause that's what I feel like when I try to get my word processor to work. The computer was controlled by this Master Control Program that ran everything and made life hard for the poor guy running around inside. The Master Control Program sounded a lot like DOS. Frank didn't know what any of this meant, so the professor and I spent a while explaining it to him.

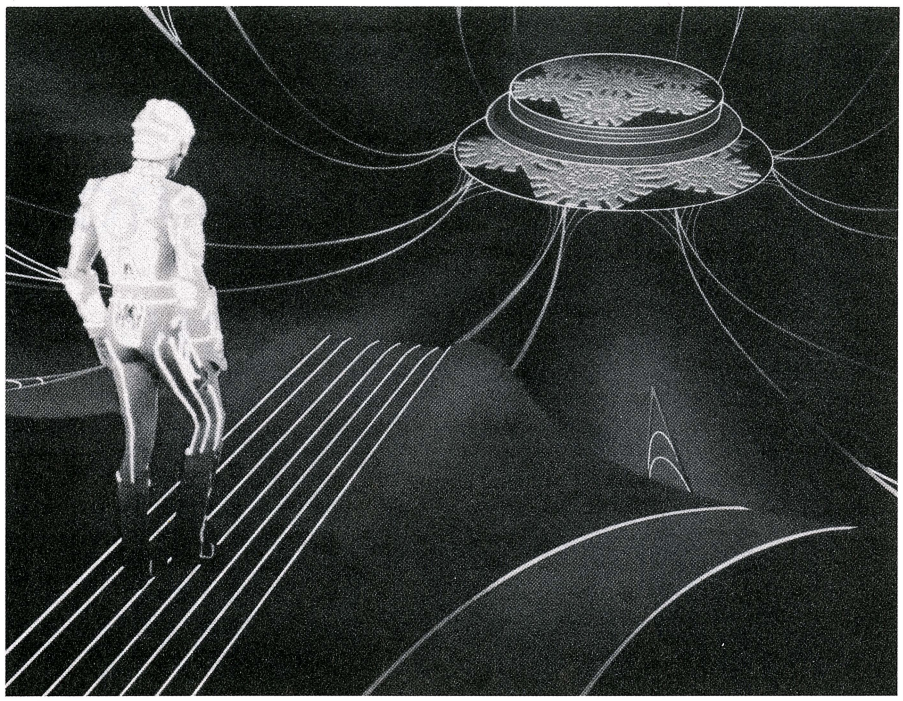
By then it was time to go off to the movie. Since it was opening night, the theater put on a big wing-ding for us all. They had all kinds of free beer and pizza. Pizza gives Betsy-Ann gas and besides she don't like tomatoes, so she stuck with the popcorn. We met these two guys in the crowd called Gene and Paul from a user group who seemed real nice. They said that their group might help me so I said that I might go to their meeting next month. Then we all went into the movie.

The movie started out with this guy trying to write a program to beat the Master Control Program (MCP). Like I said already, this is like dealing with DOS. The MCP was trying to take over the world and Our Hero was trying to stop it. At least he had an Apple /// to help him. Gene and Paul gave a big cheer when they saw that. I had a hard time figuring out that this fella really was the hero cause he looked a bit like the professor. Flakey, if you know what I mean. Well anyway the MCP didn't like anyone fooling around, so it took the poor guy apart with a laser gun and stored him in its memory banks.

Somehow when this happened the guy got turned into a program. Disney might be on to something there, cause that looks like a pretty easy way to program a computer, even if the programmers don't like getting taken apart by laser guns.

Once inside the computer, the Hero program meets two other programs who are also on the MCP's black list. These programs believe in Computer Users, which the MCP is trying to get everybody to forget about. The other two programs are called Tron and Ram. I always thought RAM was a computer

Tron approaches the tower to communicate with the User, in a world ruled by the MCP.



part, not a program. Oh well, this'll give me something to talk to the professor about. Tron and Ram team up with Hero to try to mess up the MCP. The rest of the movie is kind of like a computer version of *Star Wars* as those three go about fighting for the cause of good and justice.

The inside of the computer didn't look anything like I'd expected. Last time I looked in my Apple II there were all kinds of bug-like things called chips plugged into sockets all over it. Then there were lots of tiny wires running all over the board, connecting all the bugs like termite tunnels. That was before the screwdriver fell out into the Apple so I had to send it back to the repair shop. I haven't had the nerve to look inside since. Anyway, the inside of the MCP's computer doesn't look anything like the inside of *my* computer. Instead, the inside of the MCP's computer looks more like the pictures of an arcade game.

I thought the movie was lots of fun even if I didn't understand quite all of it. Maybe I can get the user group to explain it to me. The special effects were worth the movie, anyway, even without the free beer and pizza. Betsy-Ann said she didn't have a clue as to what the movie was all about. Well I expected that from Betsy-Ann, but Frank said the same thing. I guess you have to know a little bit about computers to figure out anything in the movie, but it helps even more if you know a lot. The professor, Gene, and Paul sure liked it.

Alan B. Fid is a forty-five year old tobacco farmer who lives in Lizard Lick, North Carolina. He graduated from Eugene A. Jackson High School in 1955, where he majored in shop. After attending North Carolina State College in Raleigh for a year, he dropped out to take over his father's farm. Alan won an Apple II in a contest two years ago run by his local radio station, KJHB-FM. He's been trying to figure out what to do with it ever since.

Tron deflects a computer light pellet.

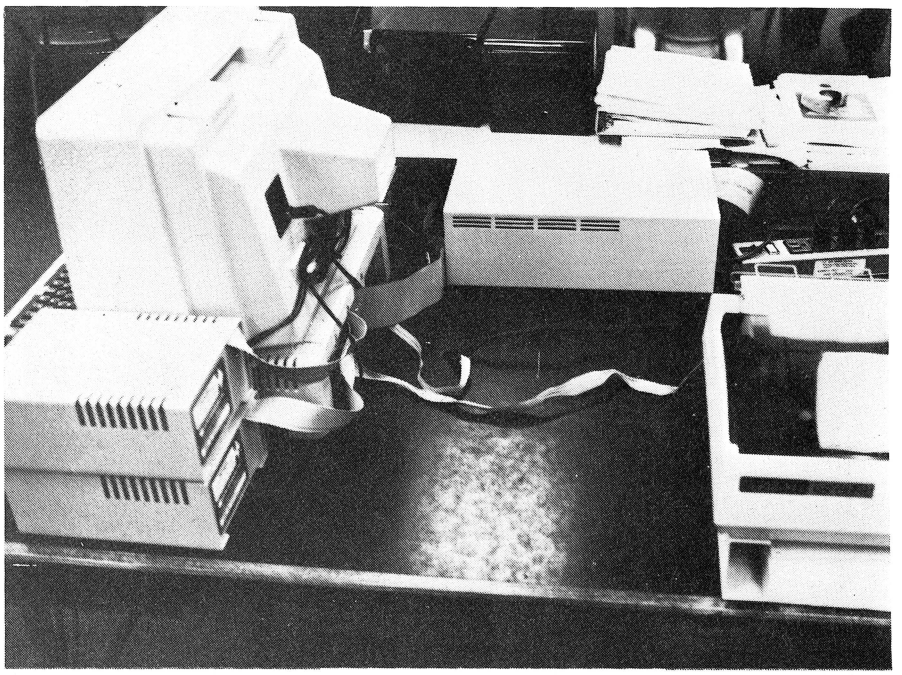


APPLES and an ROS

FOR THE TEACHER

Allan L. Rogers





How do you get the most effective computing power for your $50,000? That was the happy question facing us last June when we received notice from the Chula Vista City School District that our application for a Federal grant had been approved and funded.

Our story began in 1979 when Tiffany Elementary School was directed by the School District to develop a plan for a "Magnet School". This would be part of Chula Vista's plan to implement voluntary integration by attracting children of all backgrounds to various special programs in the community: fine arts, remedial reading, special programs for gifted children, bi-lingual programs, etc. Tiffany School had been using computers since we soldered together our first S-100 kit in 1976. We had acquired five Commodore Pets in 1978, and had been teaching computer literacy and programming to children in grades 4 to 6 for some time. Consequently, it seemed natural that Tiffany should develop a plan for a "Computer Magnet School".

Federal funds were available through the Emergency School Aid Act (ESAA) to help school districts in their efforts to integrate schools, and so we wrote an application for a grant. Using the best strategies, we "shot for the moon". After re-writing and re-submitting the proposal under two separate categories in 1980, we were hopeful that from our "Cadillac" proposal we might receive enough funds to at least equip us with a "sub-compact" computer center.

Finally, in June 1981, we learned that we had received funding. As expected, the grant request had been pared down. But as we *didn't* expect, both categories were approved, and we had our "Cadillac". Not only did we receive $50,000 for the computer center, but my salary for the next year as well, so that I could devote full time to setting up and developing the magnet school program. What a happy hacker I was!

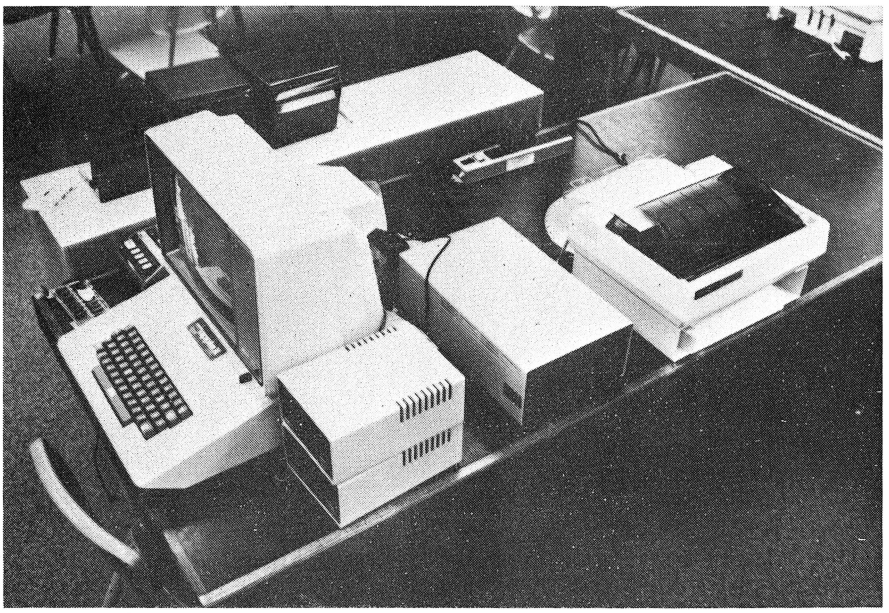
Program Outline

Where to begin? First was the selection of a computer. Tiffany Elementary School serves Kindergarten through Sixth Grade. Whatever we chose needed to be compatible with that range of children. We needed a durable, reliable computer, capable of producing color and sound, with plenty of readily available educational software. We wanted one with enough flexibility to easily add a variety of peripheral equipment, such as graphics tablet, light pens, joysticks, printers, and eventually a hard disk system. And we wanted a system expandable to 64K of RAM and able to run Pascal, Pilot, and the "new" computing language for children, Logo. Finally, we wanted a computer which would be compatible with our older CP/M system. When we wrote the specifications for competitive bid, only the Apple met all of our criteria.

Since we wanted to create a computer center which housed all 21 Apples together, we realized we had more than one choice regarding disk storage. Although we could have purchased a Disk II for each computer, there were several problems with that approach. Expense, the need for multiple copies of disks, the security of disks, the carelessness of young children, and all those mechanical devices waiting to break, were factors which intimidated us. The available local-network systems seemed very attractive to us, and with the number of satellites we had, we hoped they would be cost-effective; what we purchased could cost no more than the cost of 19 or 20 Disk II's, or about $11,000.

Nestar and Corvus seemed to be the only contenders in the Summer of 1981 as we were exploring our options. Nestar and the Corvus Omninet were both too expensive for our budget, but the Corvus Constellation seemed a good bet. It allowed up to 64 satellite computers to share the resources of the Corvus Winchester disk which was integral to the system. It promised the best of both worlds; disk capability without the problems we faced with individual disk drives. However, a major flaw we saw with such a system was its total dependence on the single Winchester drive. What would we do if it failed? Would the system be useless until it was repaired? How reliable were hard disks? How fast was the turn-around on repair? These were crucial questions we felt needed answers before we could make such an expensive commitment.

Consequently, when we ordered 20 Apple II Plus computers in October



1981, the issue of disk drives went unresolved while we studied these questions. I proceeded to scrounge all of the old, crusty, cassette tape recorders I could find around the school district, and when our computers arrived in November, I jumped into teaching computer literacy beginning with Third Grade classes. Although the children loved coming to the computer center, we *all* grew frustrated with the limitations imposed on us by the cassette players. Obtaining disk capability rapidly became a high priority.

Meanwhile, a small article titled "The Diskless Apple" in the October 5 issue of *InfoWorld* had given us our first clue to the existence of an inexpensive local network for the Apple. It was described as a low-cost alternative to the sharing of disk drives by up to 128 Apples. Eureka!! Well, maybe. The system was what we were looking for, but what we couldn't find was the *manufacturer*. The name "Softworks" was mentioned, along with a cryptic reference to "ROS",but there was no clue as to their location.

We were frustrated because we felt that we couldn't make a decision until we evaluated this new product. We finally discovered that there was a "Softworks" in Phoenix; a call to 602 - 555 - 1212 gave us a phone number, and we made our first call regarding the "Remote Operating System" (aha!).

Bob Gabriel and Bob Benton of Softworks helpfully answered my questions and, at my request, sent a system manual for ROS to help me in my evaluation of the network. The manual proved to be attractive, simple, and informative. It even had an index and a glossary of computer terms in the back, presumably for people who were new to the computing business.

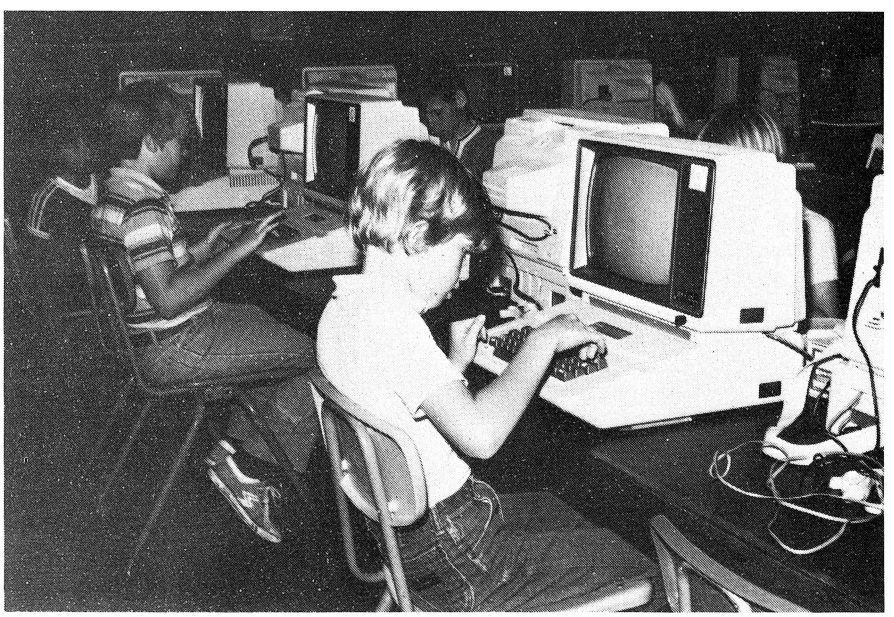
The ROS System

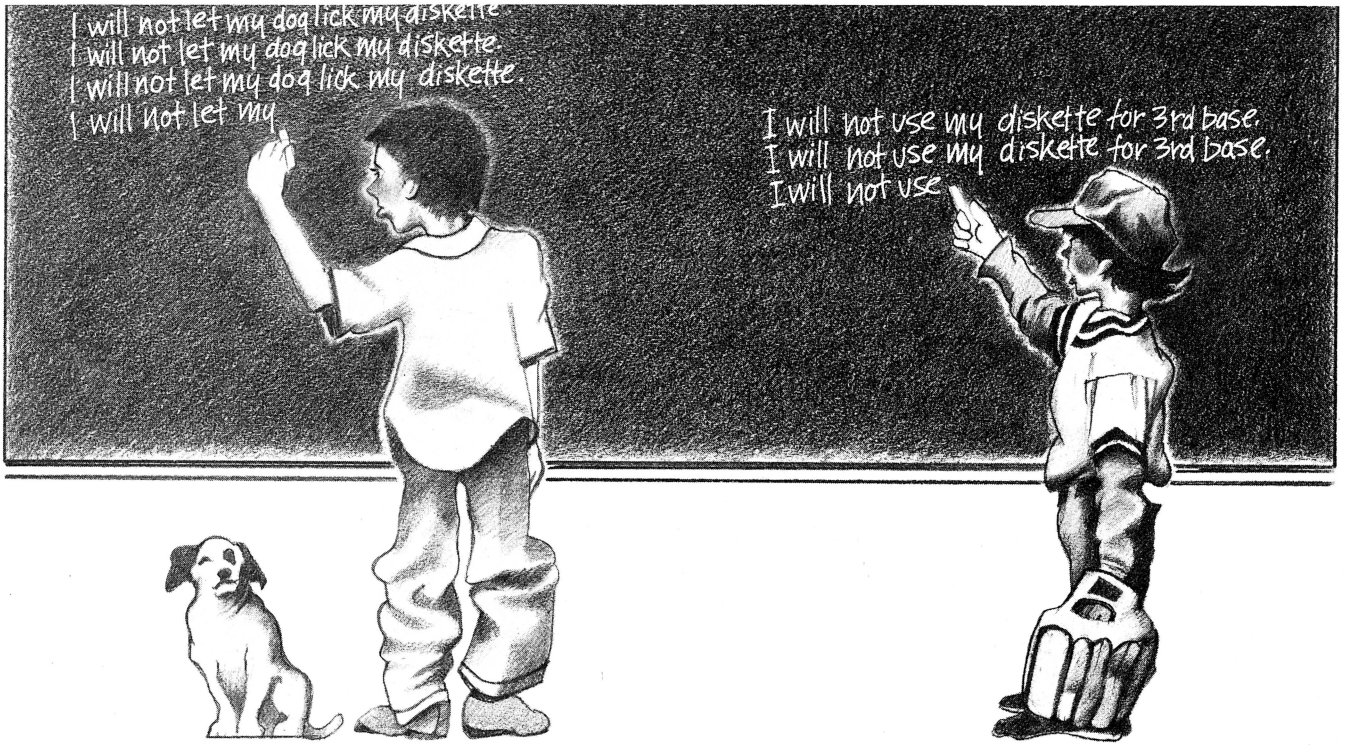
ROS seemed to be a well-designed concept. There are two kinds of interface boards required for the network: one "Central" board, and as many "Remote" boards as are needed for the remaining Apple computers. The Central board is installed in Slot 2 of the "Central" Apple. This Apple acts as the "host" computer, performing all of the physical disk accesses and arbitrating the demands for disk use among all of the "remote" computers. During periods of intense activity, the Central unit would be a dedicated host. At other times it can be used for other purposes and even, if needed, be disconnected from the network.

A Remote card is installed in Slot 7 of each remote Apple. The remotes are connected serially to one another by 10-wire ribbon cables in a "daisy chain", with only one connection made to the central unit. ROS is described as an active network; unlike passive networks, if the power at a remote is off or a cable is removed, the physical link between central and all remotes beyond the bad link will be lost.

Installation and connections appeared simple and straightforward. The documentation clearly illustrates the proper installation, and with the ribbon cable connectors fixed to ensure proper orientation of pins and sockets, the process looked simple and foolproof.

Each of the interface boards uses a simple design consisting of only seven integrated circuits, one of which is the bootstrap ROM. It seemed that troubleshooting and repair would be simple. With several identical boards and so few IC's, a malfunctioning IC could be discovered easily by swapping chips with a good board. We felt that hardware problems would be negligible.





To punish or not to punish . . .

If detention was made the "industry standard" punishment for mishandling diskettes, there would be a lot of adult computer professionals staying after work. Any way you look at it, bad disk care is expensive. Floppy diskettes are expensive from the start, and their value grows as information is added to them. Disk drive problems can make your computer expensive in maintenance and loss of valuable programs.

Alternatives. There is now a way to network Apple][computers so that the only workstation requiring a drive can be placed on the instructor's desk. Networking has long been a term associated with very large and advanced computer systems. The term refers to the interconnection of multiple display terminals to a central intelligence or host. These same features are now scaled down to the personal computer level.

At a cost way below that of individual disk drives, the Remote Operating System from Softworks allows up to 127 users to utilize disk storage from one central computer. The central Apple can accommodate from one to eight floppy diskette drives, or various popular hard disk drives made for the Apple.

For the Instructor, life is made easier by allowing all system utilities and configurations to be performed from the central computer. You can simply use the central Apple and its disk storage to handle all requirements for loading, saving and running programs. Running only one diskette provides more program control as compared to loading multiple copies into each separate system. And your main Apple can either monitor activity, or be cleared for normal operation with two keystrokes.

The central computer contains a 3″ × 5″ circuit card through which the Remote Operating System is loaded and transferred to the remotes. The remotes, each containing a Remote Circuit card, are connected to the central Apple in a daisy chain via cables.

For the Student, remote computers have access to Applesoft, Logo, Machine Languages, Integer programs and data files at the central computer using standard DOS commands. Soon the popular languages of CP/M®, Pascal and FORTH will also be added.

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Logging on to the remote system requires entering a User Password which enables access to the network, determines what part of the system's data storage will be available to that station, and triggers a Turnkey Command which automatically runs the first program. Simultaneous access attempts are handled by a wait mode until the disk becomes available, or the user cancels his command.

Students enjoy full access to standard DOS commands (with the exception of INIT) plus additional commands and utilities unique to ROS:

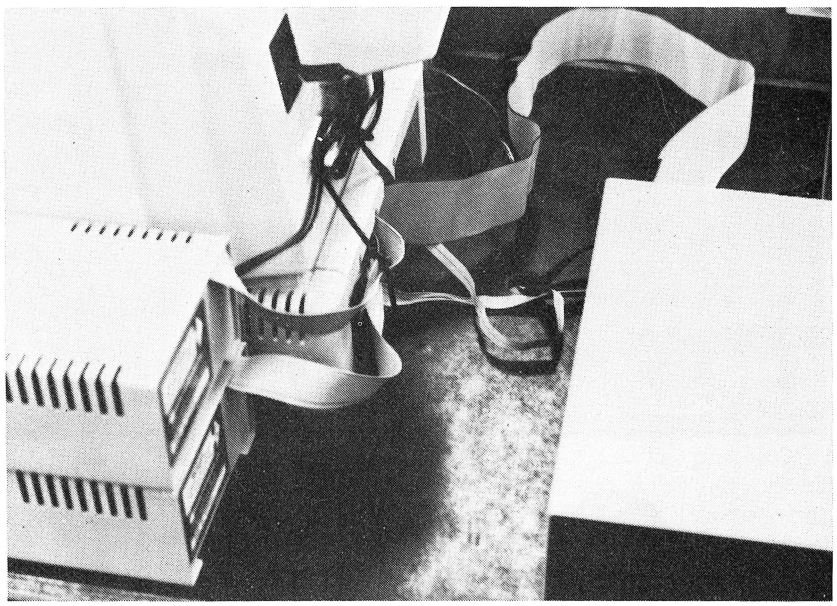
- FEED for mass loading one program to multiple remotes simultaneously.
- A simulated "in-use light" signals disk activity or wait mode status so the user can tell what is happening even when the disk drive is out of sight.
- All standard DOS error messages and recovery are implemented plus special messages unique to the network.
- A system utility program called SPEED which makes access to data on floppy diskettes almost as fast as a hard disk. This also reduces wear and tear on fragile disk drives.

For everyone, set-up software is provided with the system software. Among the other advantages are that the future expansion of system capabilities can be made through software only, and that printer output is not restricted to the host Apple, but rather is available from both the central and remote computer.

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An important consideration was cost. "Inexpensive" was the word used in the magazine article. The Central board with system software lists at $309, while the remotes list at $189 each. With the 5 per cent discount Softworks offers for multiple purchases, we were looking at a complete local network for 21 computers for less than $4000. ROS was designed to use standard Apple II disk drives, so they could be replaced easily in case of trouble. Further, ROS was designed to be compatible with several hard disk drives; additional storage could be added later. Things were looking better all the time.

Of course, one consideration not to be overlooked was performance. The manual we received described Softworks' claims for ROS. But what did they *actually* deliver? In January, George Wright (Tiffany's Principal) and I attended a conference at Arizona State University, and experimented with the ROS system. To make a long story short, we placed an order for a central and 20 remotes.

When we installed ROS in January of this year, we found that installation was indeed simple. The system operated almost perfectly from the beginning. Of 21 cards, we found one which failed to operate. A few minutes of chip-swapping revealed an IC which had one pin folded under. A quick straightening and re-insertion gave us a 100 per cent functioning system. It has so far proven to be reliable.

In February we added an XCOMP ten-megabyte Winchester hard disk to the system. Installation of the hard disk consisted of plugging the controller card into an empty slot, running a simple configuration program, and loading some of our software onto it. When we fired up ROS, it didn't mind in the least if we were reading or writing to a floppy or the hard disk. Of course, response time with the hard disk is considerably faster.

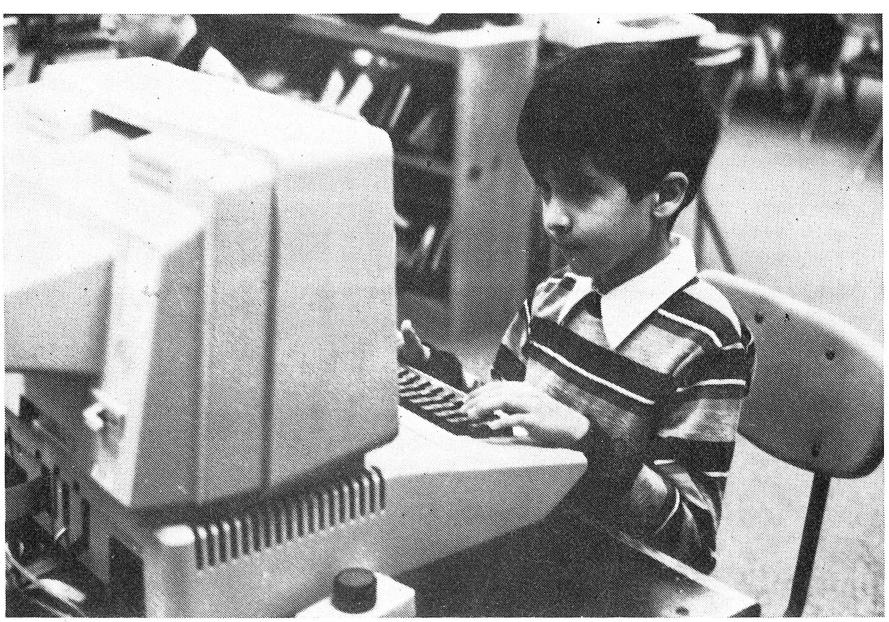
Advanced Software

Softworks has improved the operating system; they now call it AROS, the A for "advanced". We've been using AROS Version 2.02+ since March, and are even happier with it.

AROS permits each remote to access the central disk with virtually every standard DOS command, either in immediate execution mode or as a command imbedded in a program. The only exception, for good reason, is **INIT**; the remotes neither need to (or should!) initialize a disk. We have had children running programs which use almost all of the DOS commands, and each has functioned perfectly. *(That may not be a valid test, as many adults have discovered after being amazed by skillful youngsters —PCW).*

Additional commands provided by AROS include **KAT**, **FEED** and **BYE**. **KAT** displays the most recent catalog, which has been stored in memory, and prevents duplicate disk access. **FEED** permits the central system to send a single program simultaneously to two or more remote computers. **BYE** releases the remote from the network, protecting users from unauthorized use of their accounts by others.

Passwords, "tags", and "drive configurations" are used to allow the system operator to maintain file security and assign various levels of access to remote users. The **pass-**



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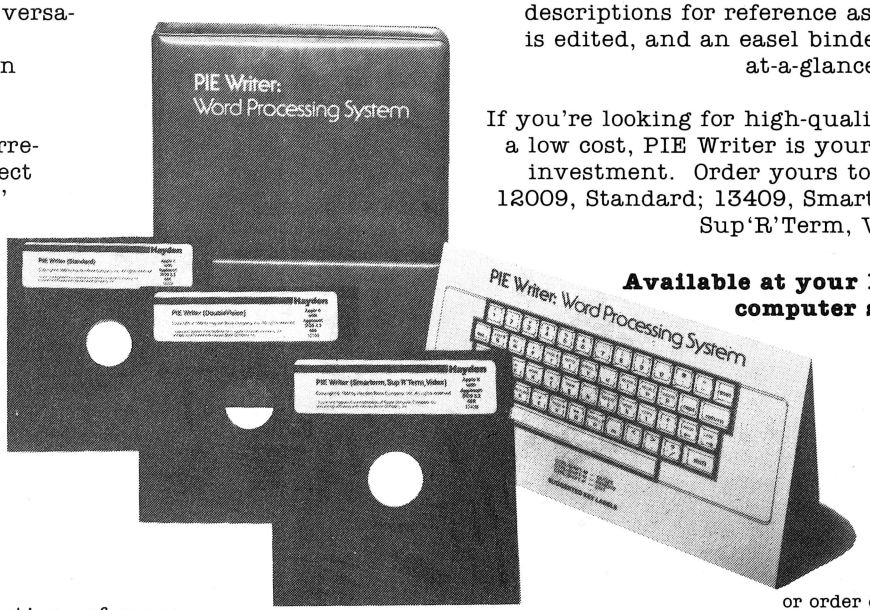
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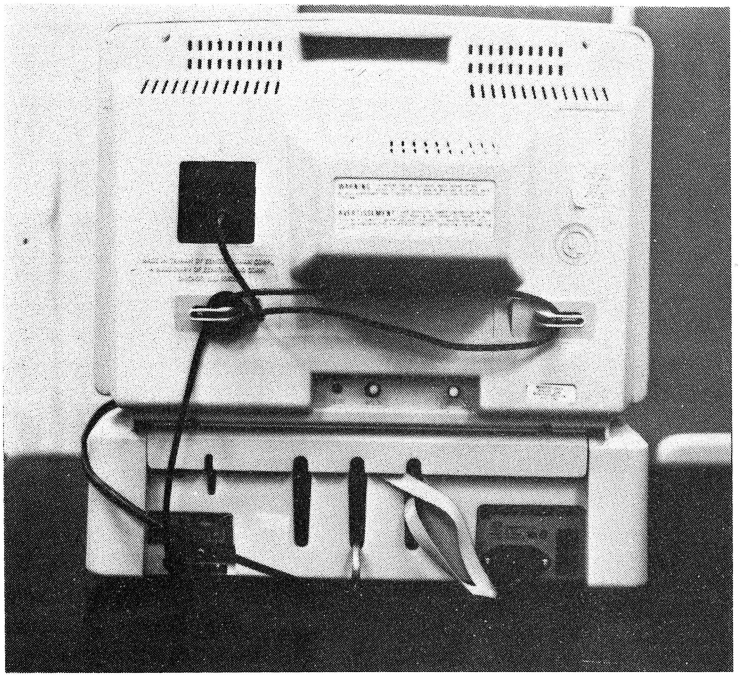
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word, which a remote user enters when he boots into AROS, prevents unauthorized use of the network. It consists of up to eight characters and is unique for each separate user. The **tag** is a unique three-letter combination which is used to identify the owner of user files or programs saved on a disk. The tag is automatically appended to a remote user's catalog entry when the file is written to the disk. When the remote user catalogs a disk or volume, he can see, load or modify only those files which have his unique tag. Although he may be physically sharing a disk with an entire class, the other users' files will be invisible to him. Of course, the central unit can see and access every file.

The **drive configuration tables** permit the central operator to control access to the disk drives and hard disk volumes. A remote user may be granted or denied access to a variety of floppy disk and hard disk volumes, and any volumes can be protected from remote access. The configurations are maintained by the AROS Password utility, and can include name and reference number of each user along with class, period or section.

Operation

The central computer operates on an interrupt basis. When a remote accesses AROS, the central computer halts its processing and services the request. If several concurrent requests occur, it serves each in turn on a "round robin" polled basis. If remote disk requests during any given time are not too frequent, the central system can be used as a non-dedicated terminal to perform other processing tasks, such as print spooling, word processing, and program entry. When a request for service from a remote arrives, processing halts at the central to serve the remote. It is also possible to disconnect the central system from the network temporarily so that certain jobs can be completed without danger of interruption from a remote computer.

For those times when there is more intensive disk access occurring, AROS includes a utility called SPEED, which buffers up to 96 sectors of data in the Central memory. If a remote requests a sector so buffered, the request is answered from RAM, without accessing a disk. The screen displays the number of requests answered from RAM and from disk, which helps to select the most frequently-used sectors for RAM storage. This feature demonstrated to us the importance of such buffering in a classroom environment where numbers of children may be working on identical or similar activities. We have often found that more than half of the requests are handled from RAM, thus reducing disk drive wear and tear, and greatly improving data transfer time.

Under AROS, each user has access to both "public" and his own private files (those saved with the user's unique three-letter tag). A public file (including program, text and binary files) can be loaded and used by all users sharing that disk or volume. In order to protect everybody, the remote user may not execute the DOS commands **DELETE, RENAME, SAVE, BSAVE, LOCK** or **UNLOCK** on any public file. Public text files can be written to, however. AROS has a lockout feature to prevent simultaneous writing to the same text file; the first user to write to a text file retains exclusive read/write access until he closes that file.

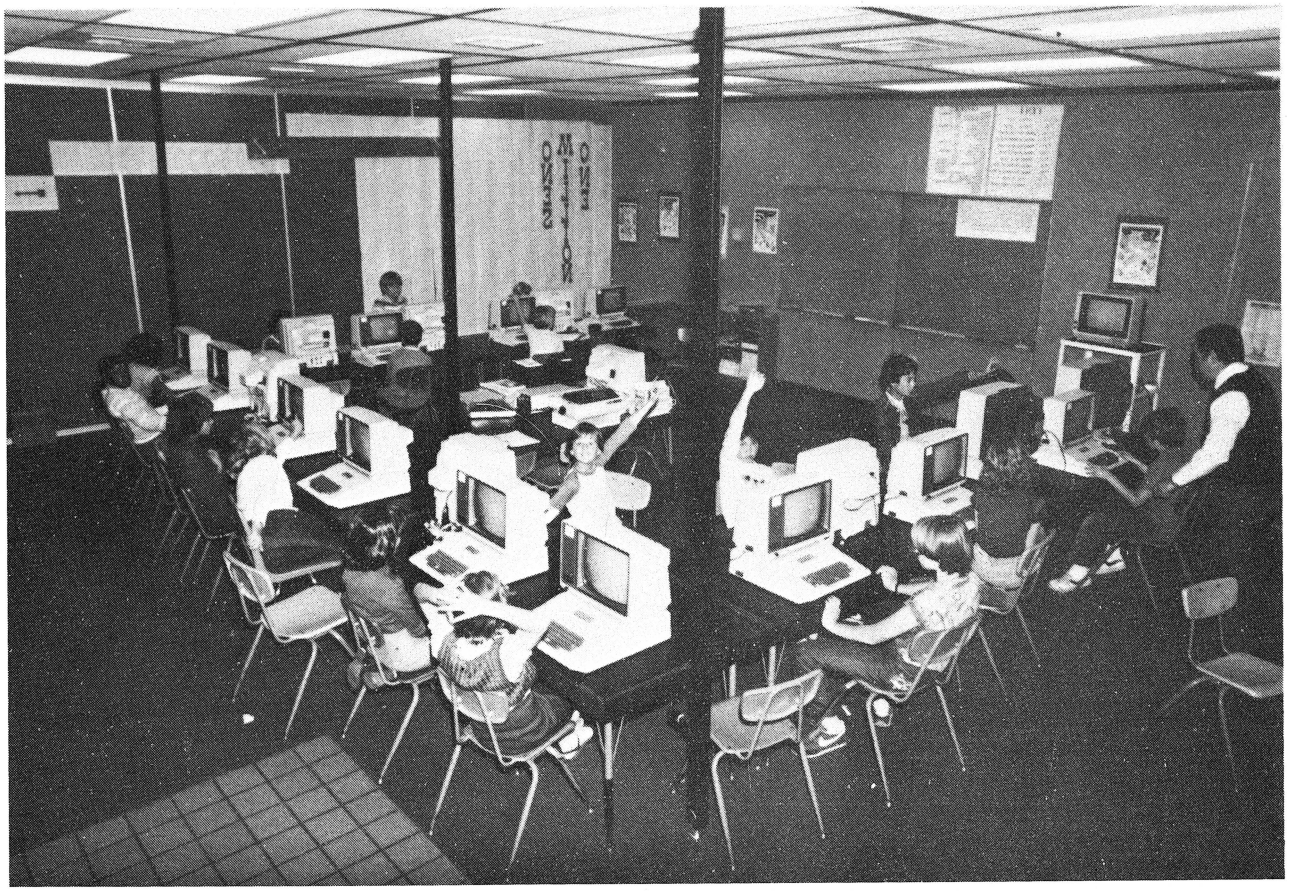
The FEED utility and TURNKEY command are also useful. FEED allows the operator to send the same program simultaneously to two or more remotes. TURNKEY allows the central operator to designate what will happen automatically after a remote logs in. A selected program may be RUN or BRUN, a catalog may be sent, or Integer or Applesoft BASIC may be loaded automatically after the password is entered.

Although we have been pleased with AROS and have found it to function reliably and well, the rose is not without a few thorns. As would be the case with any network consisting of 20 or more remotes sharing a central disk system, highly disk-intensive sessions can result in noticeable delays at each remote. This has not been a problem except with very young children who do not have the patience or understanding to wait quietly while the central computer is servicing all of the requests.



Perhaps the biggest problem at this time is that because of their recent appearance, networks have not yet become a widely recognized commodity in the software industry. ROS, as well as the other networks, require the standard Apple DOS format to function. The increasingly common copy-protected disks, which use non-standard DOS, will not work on ROS at this time. Softworks informs us, however, that they are receiving inquiries from software producers regarding ROS, and are working with some vendors toward compatibility. As more and more institutions acquire networks as an alternative to disk drive capacity, there will surely be more licensing agreements for some of the better or more popular software. *(The survivors are likely to be the vendors who are least greedy; one objection to networks by software people is that fewer copies of a program will be purchased for a network than for a group of standalone systems. —PCW).*

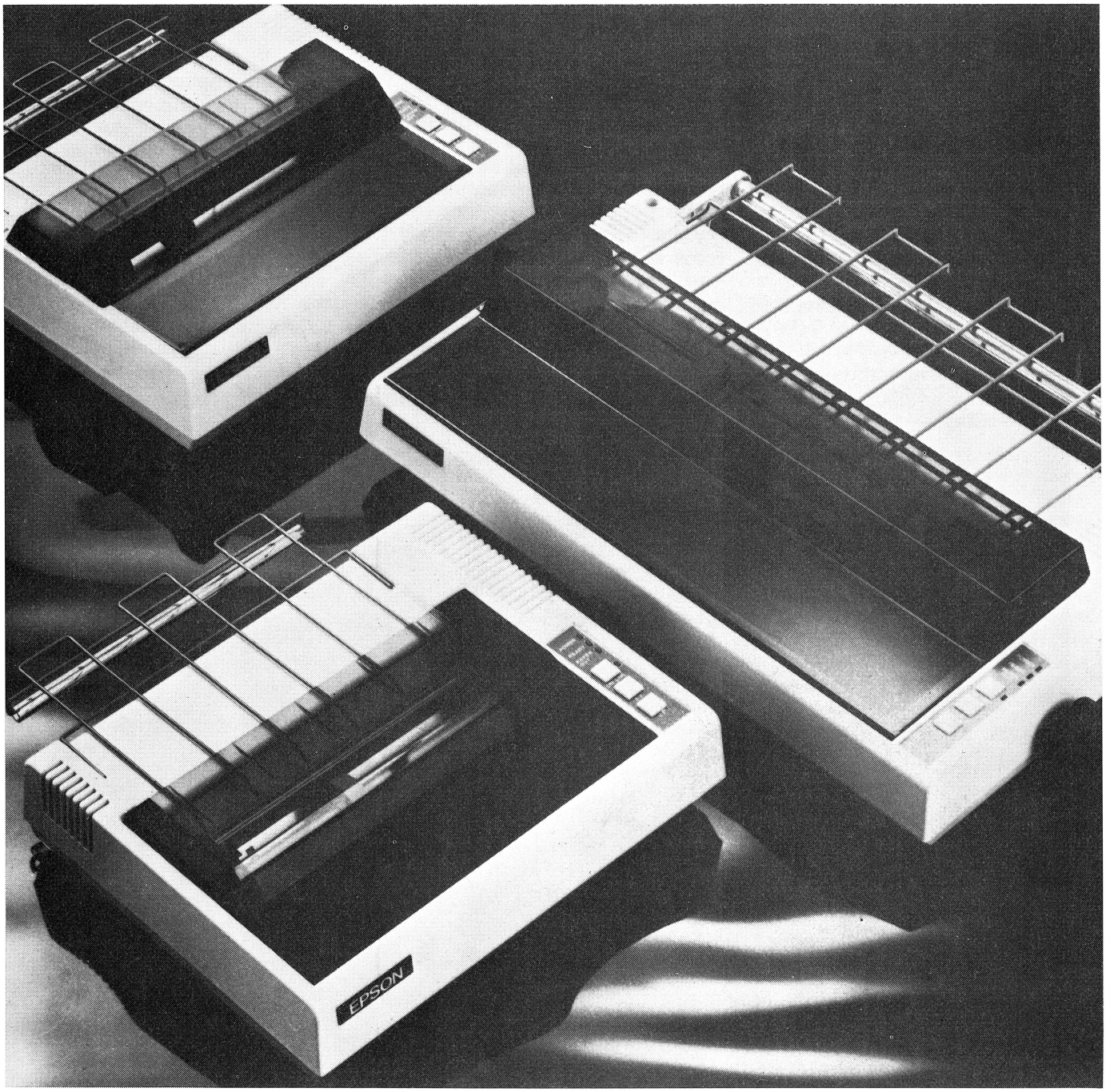
In the several months during which we have been using AROS, we have had the opportunity to put it through its paces. As a budget saving alternative to individual disk drives, it effectively lives up to its claims. Of course, as with every other decision in the purchase of computers and peripherals, no single approach meets every situation or need. Each decision involves tradeoffs of capabilities *vs.* limitations. Numerous factors need to be considered in making the decision to use a local network as opposed to separate disk drives. However, if you're considering a network, certainly the Remote Operating System from Softworks deserves to be among the systems which you evaluate to meet your needs.



Graphics with the Epson Printer

Using the Interactive Structures PKASO card.

Neil D. Lipson



A FEW months ago, we covered interfacing the Diablo to the Apple, and how to get maximum use of that letter-quality printer, if you can afford it. However, many Apple users look for a more economical dot-matrix alternative, not only for fast printing, but also for some fancy graphics. The daisy-wheel printers, while the first choice for letter-quality work, are outclassed by the dot-matrix machines for graphics work. A popular choice has been the Epson line of three different dot-matrix printers, the MX-70, MX-80, and MX-100. The MX-80FT also is available; it has a friction feed arrangement which you may prefer. These printers provide excellent quality at quite reasonable prices.

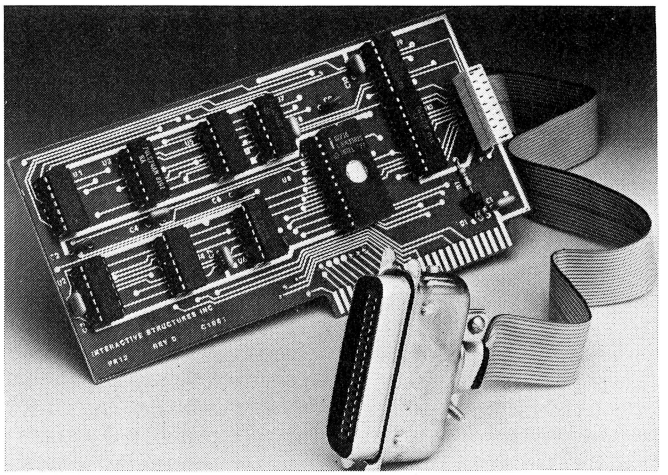
First, some history. Epson developed the MX-70 and the MX-80 at about the same time. The MX-70 has a smaller dot matrix size for printing than the MX-80; it is a budget printer with high value for the money. The MX-80 has the larger 9 x 9 dot matrix head which gives it very good print quality for a reasonable price. The MX-100 is much like the MX-80, but it takes paper up to 14 inches wide, and the MX-100 is a little more rugged. For example, the MX-100 has a fan. The MX-80 is a bit delicate; for example, you must take care not to turn the paper advance on the MX-80 with the power on; if you do, you run the risk of stripping these gears (turning it works against the stepper motor).

Now for a brief description of the Graftrax-Plus ROMs. First, for those of you that have the old Graftrax-80 ROMs, the Plus will do special international symbols, skip over page perforations, subscript and superscript print modes, underline, print line drawing graphics, reset the printer from software, provide adjustable right margins and true backspace. In addition, it has next-dot position and automatic homing of the head for faster printing after mode changes. This is above and beyond what the old ROMs did, which includes bi-directional printing, logical seeking function, line spacing to $n/216$, programmable form length, programmable horizontal tabs, 96 ASCII characters, Italic character fonts, normal, emphasized, double-strike and double/emphasized print modes, 5, 8.58, 10 and 17.16 characters per inch, and bit image 60 and 120 D. P. I. (dots per inch).

The original Graftrax was first updated to the Graftrax-80 and then to the Graftrax-Plus. This article will be concerned only with the Graftrax-Plus ROMs which come with the new machines (MX-80 and 100 series). The power of the new Graftrax-Plus and the PKASO card is awesome. It can do just about anything you can imagine, and I'll try to cover most of these uses here, and to provide some new ideas.

However, the Epson parallel interface card does not include the routines to do graphics dumps; you must load these in every time you want to use them. Even then, there are still some things that you can't do. One answer to this is the Interactive Structures PKASO card. This card is made for most of the other popular printers, so most of my discussion on this card will apply to the other printers to some degree. Interactive Structures has grown rapidly as a company with an expanding line of products. One of their strong points is their customer support, for which I have great admiration. They have even developed the PKASO card for the new IDS Prism Printer for spectacular color dumps (but I'll leave that to a future article).

This PKASO card is a vital part of the Epson printer combination along with the new Graftrax-plus ROMs. The card will work with the MX-80 and MX-100 (PKASO EP-12/80,100)



and the MX-70 (EP-12/70). The PKASO card was the first graphics dump card available, and comes with some powerful software to expand its use even more.

Some of the features include doing Hi-Res dumps from Pages 1 or 2, two different image sizes for the MX-80 and three for the MX-100, rotation of the dump to fill a full 8 ½ x 11-inch paper, centering on the page, and normal or inverse printing of the dump. You can do instantaneous dumps of the text screen, which is nice. In addition, it can also do Lo-Res graphic dumps in 8 different modes. There is full compatibility with all of the popular operating systems, including Pascal and CP/M. Tabs are built in for easy use. One excellent feature is the screen signal to tell you when you forgot to turn on the printer. In addition, there are many other features like halftone gray scale printing, Super-Res Dot graphics, and last but not least, special font generation for some fancy printouts. This feature can let you print in any font that you like. Demos of this appear with this article.

We shall see how this combination of the Plus ROMs and the PKASO card give us immense power.

First, it is assumed that you have the correct ROMs installed in your machine. The Epson manual is excellent in every respect in walking you through the use of their printer (my compliments to David Lien at Epson). One tip not mentioned is that if you must do a lot of printing, give the printer a break every 20 minutes or so to let the print head cool off. The heat it generates is destructive and continuous printing could fry the head. However, one wonderful feature of the printer is that the printhead is easily replaceable (the operation is extremely easy). For the price of the printhead, you could even abuse it and not worry. However, it will last 100,000,000 characters. I will leave the calculation of the number of pages printed as an exercise to the reader (didn't you feel like doing homework?).

Now a few words on maintenance (applies to the printer only). The ribbon will last about 3 million characters, so when you go through about 33 ribbons (approximate, depending on the print quality at the time), it's time to change the head. You can change just the ribbon itself (by reusing the old ribbon holder), and I know that a few places sell either "recycled" ribbons, or just the ribbon insert in a few colors (Apple Power in the New York area, or American Ink Products in San Francisco, for example). The ribbon only is about $4, and the entire cartridge is about $14. The cartridge lasts about 3 or 4 reloads, and has an exchange circle tab to mark when you change a ribbon.

Lubrication should be done every 6 months, or after printing one million lines. See the reference manual on how to do this operation. Other than that, maintenance is minimal. The

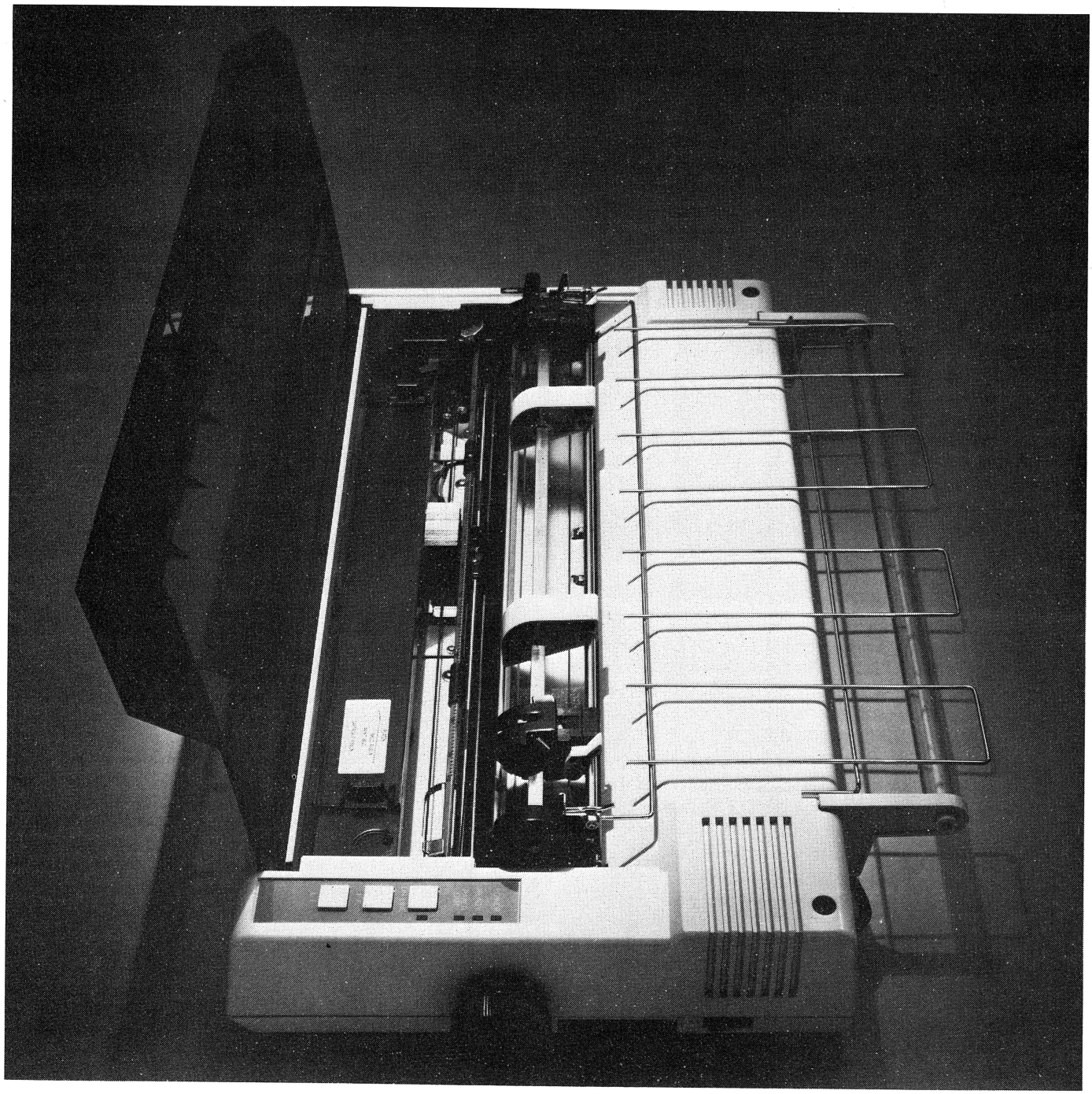
PKASO card requires no maintenance (and especially no lubrication).

The DIP (dual inline pin) switches can be set to a variety of modes, as discussed in the printer manual, but I have a few suggestions. First select the slashed zero; do not select the italic (can be done through software); do not select the 1 inch skip if you own the fancy listing programs like Utility City by Beagle Bros.; leave the line feed off, as the PKASO card provides this. Other than that, you choose the other functions as you like.

Set up the paper so it does not feed back into the printer after it is printed; that causes a tightening-up effect which is startling the first time, and best cured with a razor blade. The custom printer stands are great for this, but are not cheap. If you aren't careful, the paper will re-feed through and bring everything to a grinding halt. (Use the razor blade on the *paper*, Harry.)

The diagnostics will print for a few seconds and then stop, which the old ROMs did not do, so you don't have to turn off the printer to stop the diagnostics. Also, don't forget to set the top of form before you turn on the printer. Turning the paper advance by hand with the printer on will mess up your form feed, and possibly mess up the gears too. The printer will take a lot of punishment, but don't push it too far.

The PKASO card has some distinct advantages over the other graphics cards on the market (with no increase in price). For example, it has gray scale and Lo-Res graphics dump modes. Another tremendous advantage is the ability, with the special software provided, to create and draw your own characters. The dumps from most of the other cards are squashed vertically, and the PKASO card gives an excellent aspect ratio in the Hi-Res dump. The **F** command is very helpful in controlling the character size. The card has an ID byte to tell you which printer you are dealing with.





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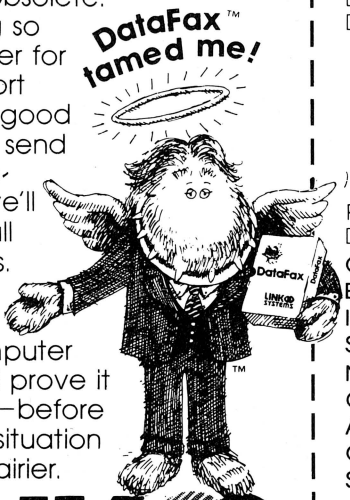
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Let's now consider some of the fine details of the exotic software and features of the PKASO card. To design or modify a character set, there are numerous programs on the disk supplied to accomplish almost anything that you want to do. For example, there's a program to convert the Apple DOS Tool Kit fonts to those needed for the card. You can then modify these even further if you like.

The procedure to make these modifications is so easy that even someone as slow as myself had no problem. For example, you merely run "PKASO CHAR DESIGN". This allows you to select a character by number, and then display and edit it on the screen. It uses the familiar cursor movements of W, E, R, D, C, X, Z, S which make a square (almost) on the keyboard. To draw, you have another square on the right hand side, but instead it is U, I, O, K, comma, M, N, J (the comma key is part of the square). Needless to say, creating your own fonts can be a pleasure. The saving routines are already built in, and a special driver is on the EPROM on the card.

The printer will take a few more passes to print the special characters, but the speed decrease is compensated for by the results. You can make drawings by combining fonts if you like with the character set. The DOS Tool Kit must have at least 15 fonts to start out with, and there are at least another 20 or 30 out there in the public domain, which I remember from about 4 years back (it was on a DOS 3.1 disk!). I will display a few examples of some custom characters that I developed (the first few) along with the ones supplied on the diskette.

The special character program will then print out the entire font set, the number of the font and its designated shape, along with the byte point information. An example follows, on Page

The fonts can be quite long (almost 3 times the size of a normal font if you wish). This makes doing custom symbols or whatever that much easier. One nice use of this is to create your own special labels with your company's symbol (initials, trademark or whatever) on them. Once the fonts are created, put in a roll of labels and turn it loose.

It must be mentioned here that you must have the Graftrax-Plus ROMs in your Epson to do most of these fancy things correctly. The commands are somewhat different for the Graftrax-80 ROMs, so it is essential to update your machine. It is unfortunate that Epson will not let you exchange the Graftrax-80 for the Plus ROMs, or let you pay the difference. Hopefully, they'll reconsider this policy so you don't have to pay the $65 for the new set. A new manual is provided with the Plus ROMs, however to the best of my knowledge, Epson does not plan to sell this separately. Maybe by the time this hits the stands things may change.

One interesting idea is to get the printer to print in more than one color. The idea is simple; if you're drawing a graph, create the regular graph, make a light pencil alignment mark on the paper to show the top of the graph, and first print it with a black ribbon. Then create another part of the graph (just the data part in the second color), turn off the printer and rewind the paper,

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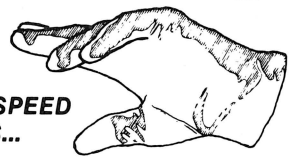
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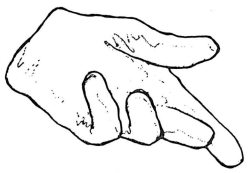
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by Bob Nacon



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Goto to variable	Print w/o word break	

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```
xxx PRINT "PLEASE ENTER THE DATE. ";  :  &  INPUT,DATE$
```

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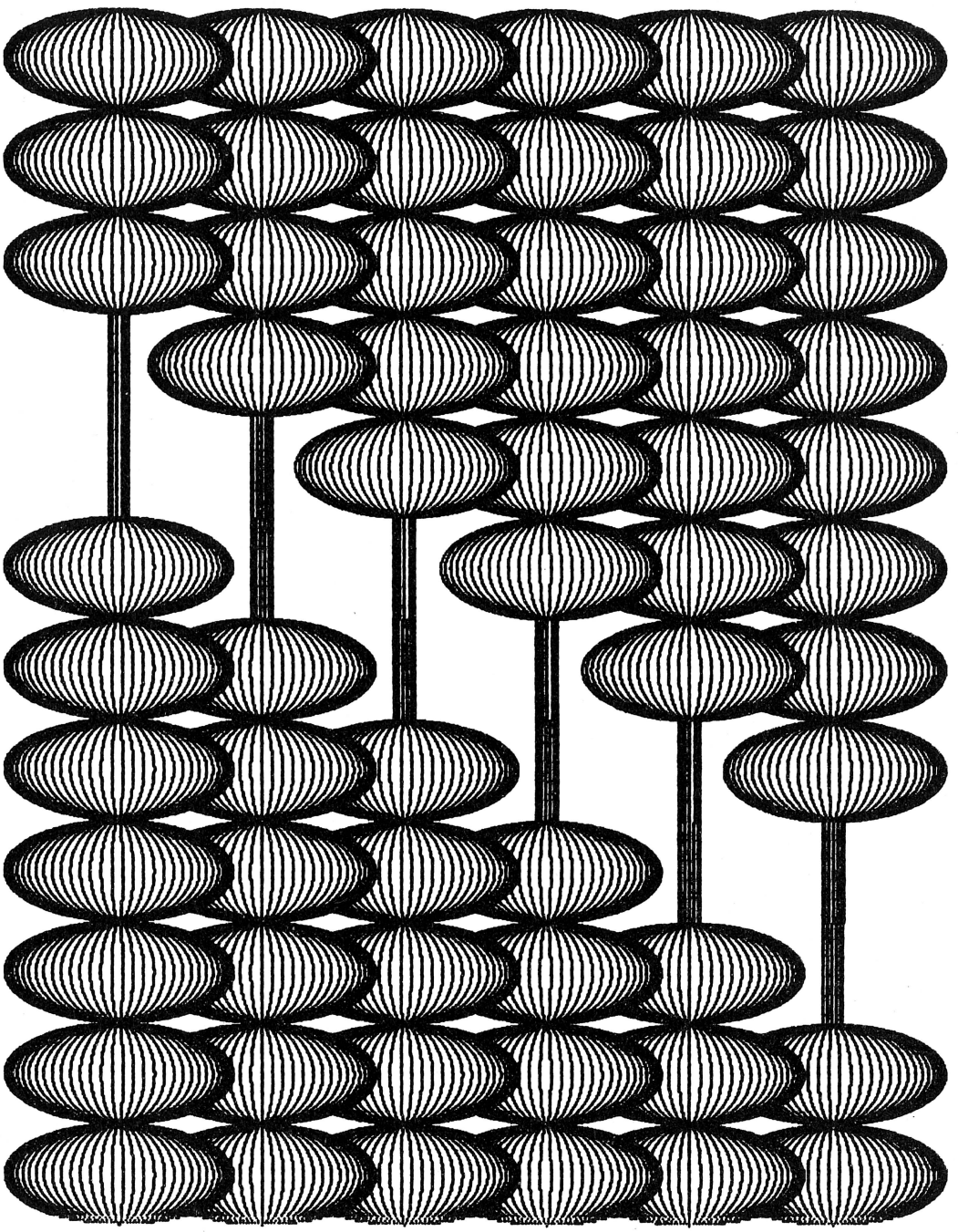
51 CHARS.



```
1:    =   NL    16,255,255,192,96,48,24,12,6,255,255,3,3,3,3,3,Ø,
2:    !=  IAC   2Ø,129,255,129,Ø,1,6,3Ø,1Ø2,134,1Ø2,3Ø,6,1,Ø,126,129,129,129,66,Ø
,
3:    "=  JL    1Ø,195,195,255,255,Ø,255,255,195,195,Ø,
4:    #=        17,1,3,3,3,5,5,5,9,9,17,37,73,134,2ØØ,8Ø,32,Ø,
5:    $=        12,192,48,44,35,33,97,33,35,44,48,192,Ø,
6:    %=        21,1,2,4,2,4,8,16,8,4,8,16,32,64,128,64,32,16,8,16,Ø,Ø,
7:    &=        18,255,255,255,Ø,255,Ø,255,255,Ø,255,Ø,255,255,255,Ø,255,254,Ø,
8:    '=        7,16,16,19,2Ø,24,Ø,Ø,
9:    (=        7,1Ø,21,21,21,1Ø,Ø,Ø,
1Ø:   )=        7,8,21,21,21,14,Ø,Ø,
11:   *=        7,14,17,17,17,14,Ø,Ø,
12:   +=        7,Ø,136,248,8,Ø,Ø,Ø,
13:   ,=        7,24,168,168,168,72,Ø,Ø,
14:   -=        7,136,168,168,8Ø,Ø,Ø,Ø,
15:   .=        7,16,48,8Ø,248,16,Ø,Ø,
16:   /=        7,232,168,168,168,16,Ø,Ø,
17:   Ø=        7,112,168,168,168,16,Ø,Ø,
18:   1=        7,128,128,152,16Ø,192,Ø,Ø,
19:   2=        7,8Ø,168,168,168,8Ø,Ø,Ø,
2Ø:   3=        7,64,168,168,168,112,Ø,Ø,
21:   4=        7,112,136,136,136,112,Ø,Ø,
22:   5=        9,6Ø,66,153,165,165,129,66,6Ø,Ø,
23:   6=        9,1,62,2,2,2,6Ø,2,Ø,Ø,
24:   7=        9,2,62,64,64,64,62,2,Ø,Ø,
25:   8=        9,28,34,2,12,2,34,28,Ø,Ø,
26:   9=        9,2,6,1Ø,18,1Ø,6,2,Ø,Ø,
27:   :=        9,64,32,62,32,62,32,16,Ø,Ø,
28:   ;=        9,96,144,144,96,Ø,Ø,Ø,Ø,Ø,
29:   <=        9,28,162,161,97,17,33,45,18,Ø,
3Ø:   ==  ±     9,Ø,34,34,25Ø,34,34,Ø,Ø,Ø,
31:   >=  ●     9,6Ø,126,255,255,255,126,6Ø,Ø,Ø,
32:   ?=  ✪     9,6Ø,126,231,195,231,126,6Ø,Ø,Ø,
33:   @=  —     9,8,8,8,8,8,8,8,8,Ø,
34:   A=  TM    9,128,248,128,31,8,4,8,31,Ø,
35:   B=  CTRL  19,248,136,136,Ø,64,124,64,Ø,62,36,36,26,1,31,1,1,49,48,Ø,
36:   C=  ®     9,6Ø,66,191,169,169,151,66,6Ø,Ø,
37:   D=  ≤     9,Ø,17,41,41,69,69,Ø,Ø,Ø,
38:   E=  ≥     9,Ø,69,69,41,41,17,Ø,Ø,Ø,
39:   F=  ≠     9,Ø,21,22,28,52,84,Ø,Ø,Ø,
4Ø:   G=  ~     9,8,16,16,8,4,4,8,Ø,Ø,
41:   H=  ≈     9,36,72,72,36,18,18,36,Ø,Ø,
42:   I=  √     9,4,2,1,6,12Ø,64,64,64,Ø,
43:   J=  ∫     9,Ø,1,1,62,64,64,Ø,Ø,Ø,
44:   K=  ∮     9,Ø,2,5,5,58,64,64,Ø,Ø,
45:   L=  λ     9,64,65,38,24,4,2,1,Ø,Ø,
46:   M=  σ     9,14,17,33,49,46,32,32,32,Ø,
47:   N=  ε     9,14,21,21,17,Ø,Ø,Ø,Ø,Ø,
48:   O=  Σ     9,65,99,85,73,65,65,Ø,Ø,Ø,
49:   P=  ¯     9,Ø,32,32,32,32,Ø,Ø,Ø,Ø,
5Ø:   Q=  _     9,Ø,4,4,4,4,Ø,Ø,Ø,Ø,
51:   R=  ∂     9,Ø,6,25,42,76,48,Ø,Ø,Ø,
```

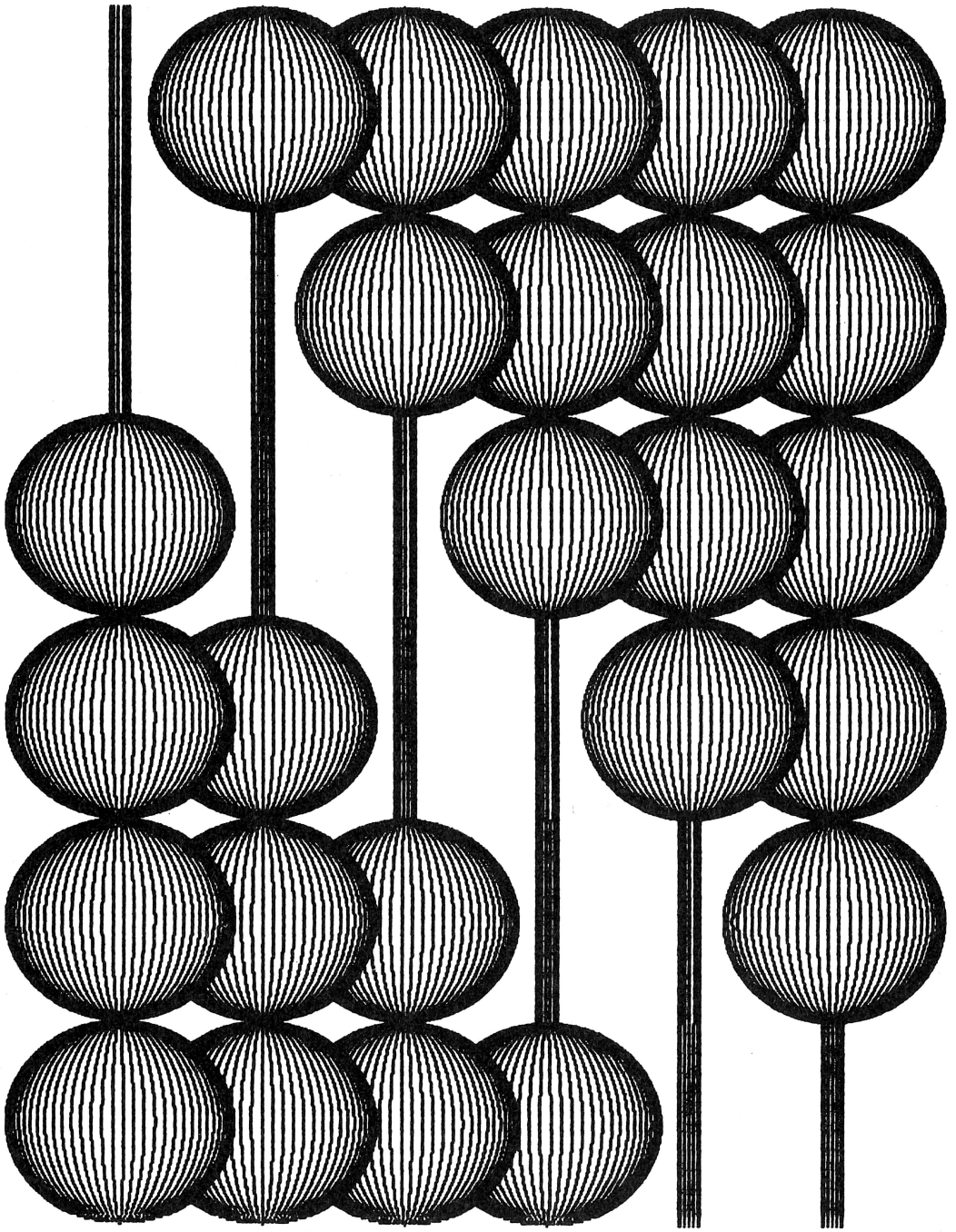
```
100 X2 =  - 1 + (A + A) * X - 2 *  INT (A * X):Y2 =  - 1 + (B + B) * Y - 2 *  INT (B * Y)
101 Y2 =  SIN (Y2 * PQ)
102 Z = ( INT (B * Y) * OP +  SQR (1 - X2 * X2) * (Y2)) / B
103 FH =  INT (A * X) -  INT (B * Y): IF FH <  = 1 AND FH >  = 0 THEN Z = ( INT (B * Y) * OP) / B + (Y2) * .03:Y1 = Y1 + DY *
    4
105  IF CI THEN R = X * X + Y * Y: IF R > P2 THEN 170
```

A = 6, B = 3, DX = 4E-03, DY = .01



```
100 X2 =  - 1 + (A + A) * X - 2 *  INT (A * X):Y2 =  - 1 + (B + B) * Y - 2 *  INT (B * Y)
101 Y2 =  SIN (Y2 * PQ)
102 Z = ( INT (B * Y) * OP +  SQR (1 - X2 * X2) * (Y2)) / B
103 FH =  INT (A * X) -  INT (B * Y): IF FH <  = 1 AND FH >  = 0 THEN Z = ( INT (B * Y) * OP) / B + (Y2) * .03:Y1 = Y1 + DY *
    4
105  IF CI THEN R = X * X + Y * Y: IF R > P2 THEN 170
```

A = 3, B = 3, DX = 4E-03, DY = .01



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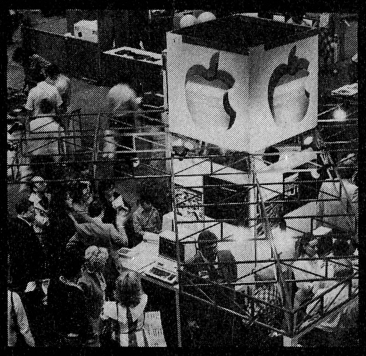
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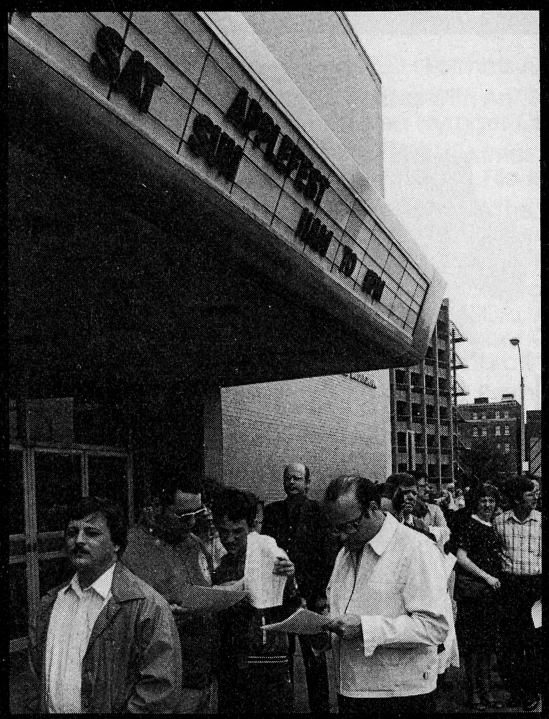
These are some of the things people are saying about Applefest, the world's largest exposition of Apples and Apple compatible products.



At Applefest, you can see and try out everything new for your Apple. Software for every conceivable application from arcade games to investment programs, music to machine language, teaching systems to accounting packages, word processors to graphics processors. Hundreds of peripherals, including printers, hard disks, modems, memory cards, video displays and synthesizers, plus accessories, publications, support services and more! Over 5,000 products are displayed and available for purchase at super show prices.



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change the ribbon to the second color, and print the second graph on top of the first graph. You can get excellent results. Because ribbons can be purchased in quite a few colors, the limitation is your own imagination and desire. This isn't something that you would do all the time, but when you have an application for it, it can be very useful (for graphics dumps and dark printouts use a fresh ribbon).

Another point that should be mentioned is that good air circulation is necessary for long print head life. Therefore, for extended printing, it's a good idea to open the cover so that the print head can keep cool. This isn't necessary for normal printing, but when you have a lot of printing and you can't give the printer a rest every so often, then leave the cover open (only during operation to avoid dust settlement) to provide some cooling.

The type of paper to use is worth mentioning here. 20 pound paper is much nicer to work with than 15 pound. True, you only get 2500 sheets in a box instead of 3200, but I feel it is worth the difference. (*Or try the "compromise" 18-pound paper. —PCW*).

You may wonder if the MX-80FT is worth the extra money over the regular MX-80. If you do a lot of printing on stationery and envelopes it may be worth it, but here is a tip to those with the MX-80. Many office supply stores will put your stationery and envelopes onto pinfeed paper for a nominal fee. If you shop around, it's not that expensive. You then can do massive letter printing without the need for inserting the paper one sheet at a time. The somewhat extra expense is worth it in the time saved (by far). If you are doing something like this, you are probably in some type of business, and then time is money. You may not need the FT version at all if you use this procedure.

By having the stationery on one sheet and the envelope on the next sheet, you can have your software print out the envelope automatically after printing out the letter. This is super convenient for many businesses. By the way, I know of no single sheet feeder for the Epson printer line (who would pay $1000 for a sheet feeder for a $600 printer!)

Listed below is a summary of most of the commands for the PKASO card, to give you an idea of the actions you can take. When using the **Ctrl-I**, use the CHR$(9) designation instead of the actual Control-I, otherwise you'll never see it in the listing. The commands are shown in Table 1.

Table 1: Control Commands

Ctrl InB - Send binary code *n* to printer
Ctrl ID - Text print dump, Screen # 1
Ctrl I10D - Lo-Res print, full graphics in 16 gray levels
Ctrl I14D - Lo-Res print, mixed graphics and text
Ctrl IE - Top of form
Ctrl InF - Set character width
Ctrl InG - Grey scale mode
Ctrl IH - Standard Hi-Res print: direct, small, centered, Screen # 1
Ctrl I1H - Screen # 2 Hi-Res print
Ctrl I2H - Medium Size Hi-Res print
Ctrl I8H - 90 degrees rotated Hi-Res print
Ctrl I16H - Left-justified print
Ctrl I32H - Inverse, White on Black print
Ctrl II - Turn video screen on, line length to 40
Ctrl IK - Turn off auto line feed
Ctrl IM - Set Epson Printer Modes
Ctrl InN - Set line length to *n* characters per line
Ctrl InS - Switch to Special Characters
Ctrl IS - Switch back to standard character set
Ctrl InT - Tab over to column *n*
Ctrl IT - Tab to the next even multiple of 8 columns
Ctrl InX - Switch to Special Characters using external driver
Ctrl I Ctrl C - Change the command character from Ctrl I to Ctrl C

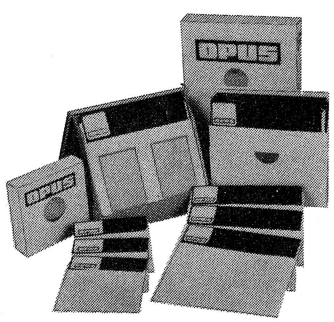
By the way, those commands were taken directly from the PKASO manual, so those of you that have the card already know them. In addition, there is one other command, POKE 1145, ASC("c") to change the command character to character "c" which is printable (or whatever character you want).

What else can we expect from Interactive Structures soon? Well, they are coming out with a buffer card available from 8K to 64K. It will have a button to clear the buffer in case of a jam, which most of the other buffers don't have. It will also have a compression scheme to optimize memory.

I have just scratched the surface of this card and printer combination, and there appears to be an endless source of new and interesting applications possible for it, mostly due to the PKASO card and Graftrax-Plus combination. Let us know what you come up with.

Last but not least, I would like to thank Bob Diaz at Epson for his help and technical support, and Interactive Structures, especially Mickey Kindt, Joe Willson, Dave Turner and Joan Hayden for their tolerance of my persistent questioning and interrogation in my quest to "go where no man has gone before."

OPUS



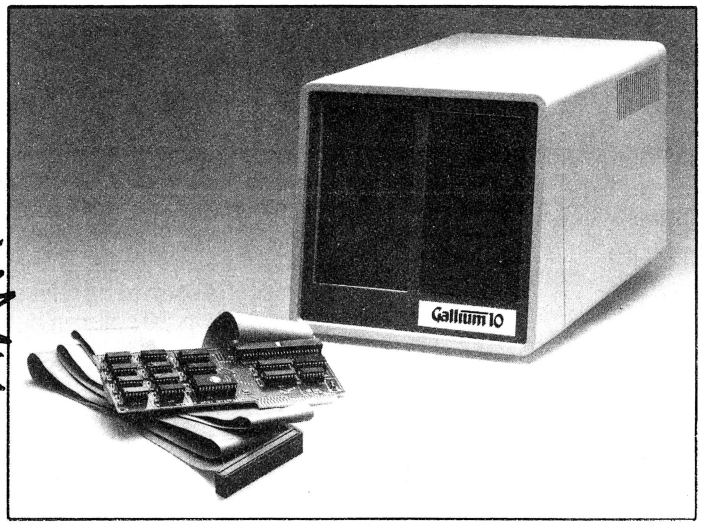
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- Number 3
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- Volume Initer ..... Initializes With An "EMPTY" File A Given Number Of Volumes
- File Finder ..... Finds All Volumes On Which Any Given File Is Resident
- File Runner ..... Finds & Runs The Given File From The First Volume On Which It Is Resident
- Partition ..... Partitions The Disk For DOS 3.3, CPM & PASCAL Allocating The Required Number Of Sectors For Each Given Operating System
- CPM Boot ..... Permits Booting In CPM Operating System
- PASCAL Boot ..... Permits Booting In PASCAL
- Connect ..... Connects Gallium To DOS If Booted From Floppy Disk

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Software Review:

The ANIX Operating System

by Morgan P. Caffrey

REVIEW: ANIX Version 1.0
A UNIX-like Operating System for the Apple II
from: Lazer Microsystems, Inc. ($49.95)
Randy Hyde

Reviewed by Morgan P. Caffrey

Just what we all need: another operating system. Well, as a matter of fact, yes. This low-cost package provides a number of nice utilitarian features and a more coherent view of general input/output activities, in a system which remains completely at home with the Apple II directory system.

I have been expecting for some time that someone would marry the richer facilities of a better operating system with my Apple II. I had one major goal: to maintain compatibility with my present file storage technique.

Not that there is a shortage of operating systems. Let me list these:

Apple II DOS 3.3 (The Native Tongue);
CP/M (CBASIC, MBASIC, Assembler, utilities);
APEX (Previously known as FFS with XPLO—language XPLO, Assembler, utilities);
Apple II Pascal (Pascal language, assembler, utilities);
FORTH (a language which in several instances has jettisoned the DOS 3.3 directory method and which, in my mind, qualifies as a member of the Operating System class);

There may be other operating systems; these are the ones on my shelf. The problem is that while each of these systems shares access to diskette storage through the Read/Write Track Sector (RWTS) routines, none share a common directory, file storage protocol, etc. Convert from DOS 3.3 to any of these systems and (unless you are a fanatic RWTS hacker), you mostly lose the data you have built up before. And, when you finally can translate the data, the file access techniques of the new system are substantially different from those used to originate the data. You have to change your working habits every time you change operating systems.

For me, history has favored DOS 3.3. As my hobbyist beginnings broadened to more professional applications, the most usable software always worked with DOS 3.3 files. My word processor, and the mail list handler which links with it, work with DOS 3.3 The word processor reads and nicely processes VisiCalc (DOS 3.3) files when I want to make special arrangements for printing. Most importantly, many of my working habits are alighed with DOS 3.3 file names, disk commands, etc. I'm carefully preparing to amend these work habits in order to work with Pascal and FORTH, but I have yet to change my important data files over to those fascinating strangers.

Enough digression. With ANIX, Randy Hyde has added operating system power to my repertoire and has managed to maintain total access to my other programs, utilities, habits, etc. The price is nice. A future version will be more expensive and will have a number of additional features. ANIX source code (!) may be purchased for $100. Lazer-Pascal is soon to be released. While ANIX doesn't work with any known 80-column boards, nothing is hidden; it can be done.

The *name,* however . . . what would Randy call it if he released a version for the Pet? Oh well; let's examine the features.

Features

The ANIX equivalent of CATALOG is:
1. **DIR** (previously selected drive)
2. **DIR D2:** (specified drive)
3. **DIR D2:** ># (output to specified port)

That third DIR command example does a standard DOS 3.3 CATALOG command, directs the output to the device in Slot 1, and then returns to the video display. It will just as easily direct the output to a disk file, thus:

DIR D2: CATALOG DIRECTORY

. . . which will channel the CATALOG command's output to become a text file. If you wanted to create a master file of all catalog contents you would catalog each diskette to the disk but in a slightly different way:

DIR D2: >> CATALOG DIRECTORY

When output is to disk files,

" > filename " means start a new file;
" >> filename " means append to existing file.

In the above examples, "D2:" meant Drive 2. Legal drives under ANIX are:

D1: = Slot 6, Drive 1
D2: = Slot 6, Drive 2
D3: = Slot 5, Drive 1
D4: = Slot 5, Drive 2

Many of the commands in DOS 3.3 are honored. The following shows the available commands and equivalents:

DIR Dn: . . . . . CATALOG, Dn
RENAME Dn: filename . . . RENAME (ANIX-style)
DREN Dn: filename . . . RENAME (DOS-style)
LOCK Dn: filename . . . . . LOCK
UNLOCK Dn: filename . . . . . UNLOCK
VERIFY Dn: filename . . . . . VERIFY
DELETE Dn: filename . . . . . DELETE
LOAD Dn: filename . . . . . LOAD

SAVE Dn: filename ..... SAVE
(LOAD allows, and SAVE requires, hex start and length parameters)
EXEC Dn: filename ..... EXEC

Super EXEC

The ANIZ's EXEC facility makes the DOS 3.3 version looke like a poor relation. Up to nine parameters may be passed along with the EXEC command, which increases the flexibility of the EXEC command tremendously. Thus:

EXEC showfile D3: D4:

If "showfile" contains the following:

DIR%1
DIR%2

The above would cause a CATALOG of Drives S5,D1 and S5,D2. The "%" sign says to take a parameter from the command line; the number says which command to use (1-9).

We're not done with EXEC yet. There are additional levels of "switches" which may be set.

KBD — take next instructions from keyboard
EXC — (from keyboard) go back to EXEC file
QX — (from keyboard) quit EXEC
IFE — if error then quit
SUBMIT — performs next EXEC command, then takes input from keyboard.

The EXEC extras allow you to control a sequence of programs from EXEC level, lets an operator answer program questions, quit the EXEC process if an error is detected, quit from the keyboard, etc. If you have attempted any kind of sophistication with the Apple II EXEC function, you know that it can get out of hand and can require the system to be turned off to stop the EXEC process.

Extrinsics — Program Utilities

From the "COMMAND:" prompt, the following EXTRINSIC programs are accessible on the master diskette:

ADU — ANIX Disk Utility; RWTS, READ, WRITE, EDIT, DISPLAY
DUPDISK — Disk sector-by-sector copy
COPY — File Copy (types I, A, B, T, L, R)
UNDEL — Restores a deleted file
EXPUNGE — Remove DOS for more data sectors
PUTDOS — Save new copy of ANIX DOS without INIT procedure
TYPE — Keyboard/file viewing utility
PRINT — Flexible file display utility
ED — Rudimentary but pleasant Editor
FIND — Find/display search pattern
WC — Get word count of text file
LC — Get line count of text file
STAT — VTOC information quickly interpreted
BUILD — Small EXEC command file builder
MAKE — Create an empty file of any legal size
INIT — Format disk, save copy of ANIX
BTOT — BINARY to TEXT file conversion
SETPRINT — Set printer slot (#1 normal)

Other EXTRINSICS relate to use of upper/lower case adapters and the use of clock cards, and patch for Apple Pie and the Liza Assembler.

Documentation

The documentation is formatted 6" x 9"; typeset heads are mixed with impact character word processing. There are several TABLEs of CONTENTS and some slightly confusing pagination. In a few instances the same information is presented twice, but the redundancy feels appropriate and useful. There is no master table of contents, nor is there an index. The general organization of the document is as follows:

1. A conceptual description of the features, DOS similarities, examples of rudimentary I/O facilities, screen editor commands, disk duplication utility, upper and lower case requirements.

2. General review of facilities and usage examples.

3. Program Interface Guide, a good review of the DOS file manager routines, which explains alterations and correction of differences from Apple DOS 3.3.

4. ANIX Software Utilities Manual; describes EXTRINSICS and known "bugs" and dangers.

Drawbacks

Naturally, there have to be a few drawbacks. They are:

Shorter legal file titles: Maximum file title length is 18 characters; this leaves room for the date.

Fewer legal file title characters: File titles consist of ("A..Z", "0..9", ".", "." only. Requires a bunch of renaming, doesn't it? See DREN.

Mostly an Assembler programmer's environment: Doesn't support Applesoft or Integer BASIC (but does support the disk files they create).

The user's document makes it very clear that this release is not appropriate for the professional programmer. The manual expresses higher hopes for the Version 2.0 release which is already planned. I have had the system up since the first day (including booting with the DOS 3.3 master to get a DOS copy and BRUNning the adapter program. There may be, certainly the documentation expects there will be, bugs. I haven't had occasion to find them yet.

Overall, a VERY GOOD rating, for a useful addition to my programming environment.

An Apple ///

Guide for Humans

Alan Anderson

Apple's official company line about the Apple /// is that the /// is the most powerful personal computer in its class. The truth, of course, is that the Apple /// is the most powerful personal computer in its class. But if you've just bought an Apple /// for your business, how is that power translated into benefits that you can see? While it's true that the /// has something called a Sophisticated Operating System, or SOS, what does that mean in the real world?

In many ways, the Apple /// is not remarkably different from the personal computers which came before it. It still runs the traditional high-level languages, BASIC and Pascal. It still talks to you via a screen or printer, and it is still talked to with a typewriter keyboard. However, those sneaky folks at Apple hid the real power of this thing deep inside. The most significant real advantage of the Apple /// is the way the computer manages its resources, that is, the operating system. Don't discount the importance of that one point, though. It can make all the difference in the world, and that's what this article is about.

One of the single most important things that SOS does is make it easier for programmers to create more sophisticated, easier to use software. This becomes more obvious as the programmer gets closer to the computer itself (*i.e.*, Assembly language), and is less obvious in the high level languages, such as Pascal and BASIC. Since not very many folks have poked around in Assembly language on the ///, the significance of SOS in simplifying programming has not been all that well-reported.

Does SOS have any importance if you're not interested in doing any programming at all, just in using off-the-shelf software? The answer to that is an emphatic "Yes!" In addition to making life easier for programmers, SOS does a number of things to increase the applications software user's control over the system. These things fall mainly into two categories: configurability and device independence.

Now that I've thrown out a couple of buzzwords, let's work on translating them into English. The first is configurability. This simply means that you have the ability to add new devices, change others, and all the time (this is the significant part) retain compatibility with your software. What does that mean? It means that, in general, more software will work with more hardware. The Apple ///'s SOS lets you plug in devices like printers, mass storage devices, modems, and anything else, and handles much of the necessary translation between the computer and the external device, so the software author doesn't have to worry about it.

Does this system work? Yes, it does. As an example, consider the release last fall of the ProFile hard disk drive. As soon as this drive was released, it was instantly usable for data files by virtually all Apple /// software. While this may not seem terribly remarkable if you haven't been around this business for a long time, the fact is that the release of a new disk drive generally requires some "patches" or modifications to the applications software before it can be used. A living example of this is the IBM Personal Computer's recent introduction of larger-capacity disk drives. While the drives are there, the software can't do anything with them until it is rewritten.

The reason SOS is able to perform this feat is through the magic of complex little programs called device drivers. A device driver is a sort of translator between the device itself and the application program. As an example, the device driver for the floppy disk drives translates your request to load your budget file into VisiCalc into the proper series of head movements and motor controls feeded to retrieve the information. This means that almost any device can be connected to the Apple ///, if a device driver is written for it.

The other important end-user benefit of SOS is something called device independence. This item is related somewhat to configurability, but it moves one step further. Device independence means that all the things plugged into the Apple ///, such as keyboard, screen, disk drives, printers, modems, voice synthesizers, magnetic card readers, and anything else real or imagined, are all treated equally under one big umbrella called devices.

What does that do for you? Let's say you're about to print out your VisiCalc budget. You give VisiCalc the "/**P**" command, and it says "Print: File or Printer". Normally, you just press **P** for printer, and the report shows up at the printer, but what happens if you choose the other option, File? Since SOS treats all devices equally, you can also "print" your budget somewhere else — like to a file on disk, for example. Think about this for a minute. When you print your file, all that happens is that each character to be printed is shipped off, one by one, to the designated device. That device then processes it however it wishes. If the device is a printer, the process involves making the printer create the character on a piece of paper; if it's a disk drive, it stores that character in a disk file; if it's a modem, it sends the character across the phone line; if it's a voice synthesizer, it speaks the character; you get the idea.

The reason this becomes useful is that it allows you to create on the disk an exact "picture" of a VisiCalc report that you can then load into your favorite word processor and edit, enhance, or add a report to. It's not just VisiCalc files, of course. Almost any program which prints reports and lets you specify where the report is going can be used the same way: Quickfile and PFS, for example, can do the same thing.

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The Path to Success

I've discussed the fact that the Apple ///'s SOS presents you with a world of devices: disk drives, printers, modems, and more. In order to get the most out of your system, it's important to know how to communicate with all these guys. The fundamental rule is simple: all devices have a name, and in order to cause information to come from or go to a certain device, you need only know its name. In this section, we'll talk about those names, where they come from, and how to use them.

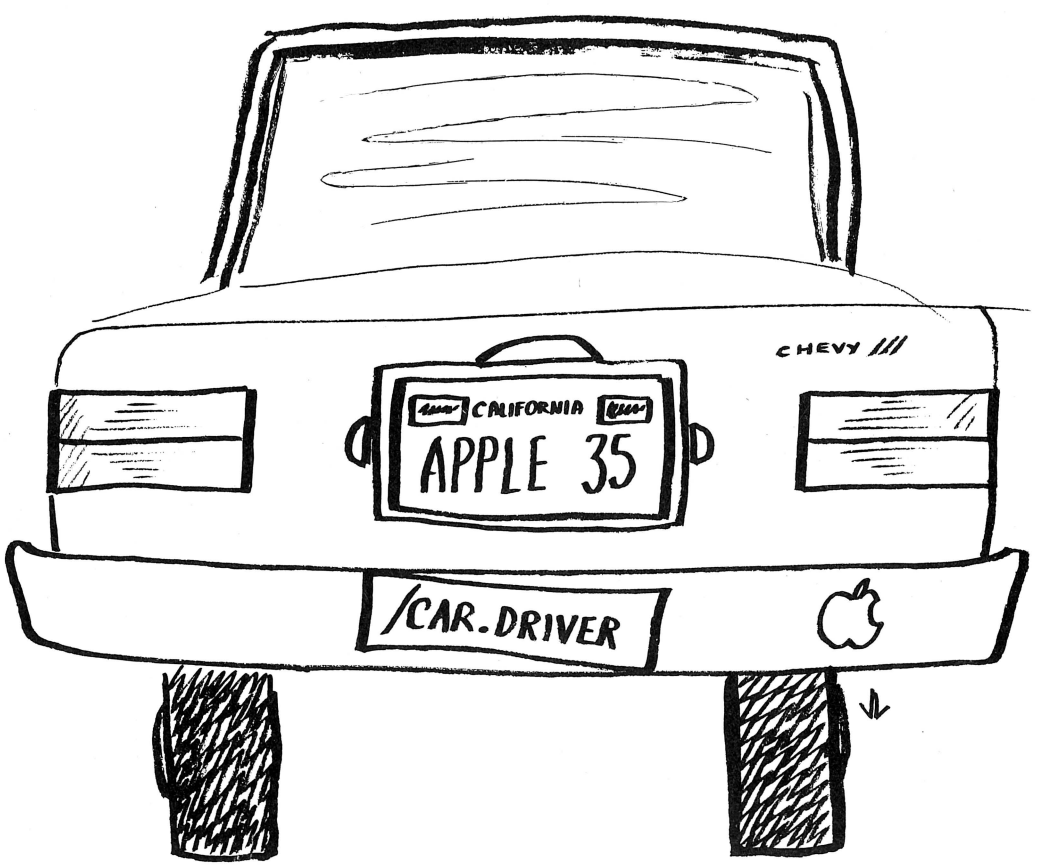
Earlier, I mentioned that every device is associated with a program called a device driver. This is the source of the device's name. The name is written into the driver and can be changed with the System Configuration Program (SCP) on the System Utilities diskette. There are a few rules for these names: they must begin with a "." (called "dot" and not "period" in the jargon); the dot must be followed by one to 14 more characters (so the whole name is between two and 15 characters long); the second character must be alphabetic, and the remaining characters must be alphabetic or numeric.

The Apple /// has a few special devices, special mainly because of their importance. These include: **.D1**, **.D2**, **.D3**, and **.D4**, which are the drivers for the four possible floppy disk drives; **.CONSOLE**, which drives the keyboard and screen as one device; **.PRINTER**, which drives a printer through the built-in RS-232 interface; **.GRAFIX**, which drives the graphics screen, treated as a separate device from the .CONSOLE screen, which displays text; **.RS232**, which is the driver for a modem hooked up through the built-in RS-232 port; and **.AUDIO**, which is the driver for the speaker.

The driver for the Silentype printer is usually called **.SILENTYPE**. I say "usually" because, as noted earlier, you can change device names with the System Configuration Program. So, **.SILENTYPE** may occasionally be called **.PRINTER**, as it is in VisiCalc ///, for example. How do you know what's going on? You must rely on the documentation or your local dealer, or you must investigate with SCP to see which driver is really which. Actually, this problem isn't as bad as it sounds, since most device drivers hold on to their standard names all the time. About the only confusion that exists is with different printer drivers acquiring the .PRINTER name. If you have only one printer, you should probably name it .PRINTER, and you'll never have to worry.

Some devices, like printers, modems, and the console, either take in or put out one character at a time. These devices are called **character devices** (clever name). There is another group of devices, however, which can handle (1) large chunks of information at one time, and (2) many different groups of information, or files, at one time. These are called **block devices**, and they are, of course, disk drives. This distinction is important because, when referring to the printer, **.PRINTER** tells the data where to go. But if you want to record your VisiCalc printout on the disk, just entering **.D1** or **.PROFILE** won't do; you must add a File Name to the device name.

Let's talk about file names. Their rules are similar to device names, but without the dot: one to 15 characters long, the first character must be alphabetic, the rest must be alphabetic, numeric, or dots. So, when you want VisiCalc to print a report to a disk file, you could direct it to **.D1/REPORT**. The "slash" character separates the device name from the file name. The entire specification for a file, any file, is called a



pathname, since it specifies the path that must be taken to get to the file.

Every diskette has a name, too. The rules for diskette names are exactly the same as file names: one to 15 characters long, the first character must be alphabetic, the rest must be alphabetic, numeric, or dots. Actually, these are not called diskette names, but are more correctly called **volume names** (think of disk *volumes* as in a *library*), since the name applies to any medium in a block device, such as a hard disk drive, tape drive, or even a high-speed cassette drive. This name is assigned by the System Utilities diskette when the volume is formatted, and can be changed with the RENAME command the same way a file name is changed.

Let's review some of what we've gone over so far: every physical device has a name, like **.PRINTER**, **.PROFILE**, or **.D1**; every mass storage volume has a name; and every mass storage volume can have many files, each with its own name. If you have a diskette named "ROGER" and you place it in the built-in disk drive, do you address it as .D1 or ROGER? You can use *either* name. Note that if you address ROGER, the Apple will valiantly search for a volume called ROGER, wherever it may be. If you use .D1, the computer will go to the built-in drive, no matter what diskette is there, as long as it's a valid SOS diskette.

One phenomenon that occurs when using a hard disk drive like ProFile is that it begins to accumulate a remarkable number of files, just like you used to accumulate diskettes before you had the ProFile. Under most operating systems, having a few hundred files on a hard disk drive was a massive organizational pain. However, SOS provides for something called subdirectories, which are ways to carve your ProFile up into smaller, more manageable pieces, each piece with a name, just like any other file. Actually, subdirectories can be built on any mass storage volume, but they're most practical and important on ProFile. For example, you could have one subdirectory called **VC.FILES** for all your VisiCalc spreadsheets; one called **BG.FILES** for your Business Graphics data, and so on.

These files are addressed simply by adding the name of the subdirectory to the pathname. For example, if we wanted to store our VisiCalc report in a subdirectory called VC.FILES on the ProFile, we could use a pathname of **.PROFILE/VC.FILES/REPORT**, with the slashes separating each level of the pathname.

You can see that entering an entire pathname for a file in a subdirectory can be tedious — the above pathname, for example, is 24 characters long. Once again, SOS provides us with a tool to make it easier: the Prefix. The prefix is part of a pathname that specifies a default path for disk files. For example, we could set the prefix to read .PROFILE/VC.FILES. If we then specified file names such as REPORT, SOS would automatically add the prefix to the front of REPORT, giving the full pathname. This is especially handy when using a number of files in the same subdirectory or on the same volume.

How do you set the Prefix? Most applications programs and language systems provide a way to do it. In BASIC, the prefix is contained in a variable called PREFIX$. In Pascal and in the System Utilities program, it's set in the Filer. VisiCalc sets the prefix implicitly based on the last pathname you used. AppleWriter /// has a menu option to set the prefix.

One other point crops up when talking about addressing files in the Apple ///. What happens if the prefix is set to address the ProFile and you want to save a file onto a floppy disk? How can you cause the prefix to be temporarily ignored so that you can address a file somewhere else? The rule is this: if the pathname you enter starts with a dot or a slash, the prefix will not be used. That means that if the prefix is set for the ProFile and you want to save a file on Drive 1, all you have to do is specify **.D1/FILENAME** and the prefix will be ignored because of the leading dot. Similarly, if you wanted to save a file on the floppy disk called ROGER and the prefix was set for the ProFile, you would specify a path of /ROGER/FILENAME and again the prefix would be ignored, this time because of the leading slash.

Please note that the slash has two separate and distinct functions: one is to separate the levels in a pathname, and the other is to suppress the prefix when it is the first character in a pathname. Not realizing that this character has two meanings has caused an awful lot of confusion in the Apple /// world.

Congratulations! You now know an awful lot about how to use your Apple /// system to its fullest power. If everything didn't catch on, try re-reading this article and see if that helps. With some practice, I hope you'll see that the Apple /// and SOS provide power not just for programmers, but for regular humans, too.

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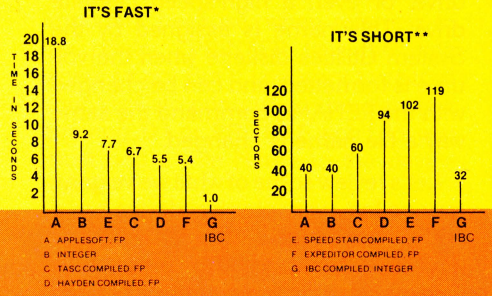
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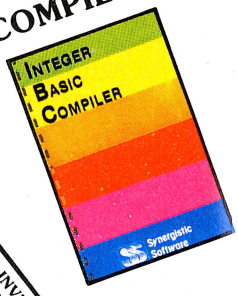
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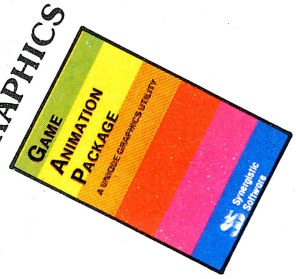
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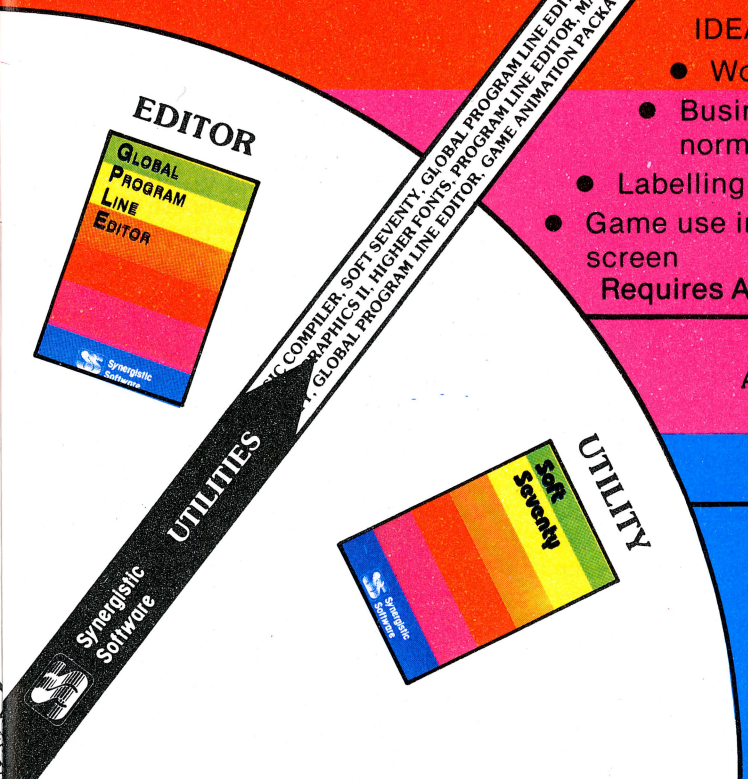
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Unlocking Apple /// - Part 3

Alan Anderson

Hacker's Haven

Welcome back! This issue's discussion of the ever-less mysterious Apple /// will deal with Everything You Ever Wanted to Know about Writing Assembly Language (But Couldn't Find Anybody to Ask). This time, I'll discuss the two different ways of creating Assembly language programs for the ///, and in addition, we'll get into head-spinning detail on how to use a few important SOS calls, integral knowledge for most any Assembly language application. Also, we'll create a real, working, good-for-fun interpreter!

To Boot

As you know if you've read your Apple /// manuals (and who hasn't?), in order for a SOS diskette to boot, it has to have three files: **SOS.KERNEL**, **SOS.INTERP**, and **SOS.DRIVER**. **SOS.DRIVER** files are created by the System Configuration Program, which is documented in the *Standard Device Drivers Manual*. **SOS.KERNEL** is the operating system itself, supplied by Apple Computer, and not modified unless you want to disassemble it yourself (have fun and send me the source code, please). The **SOS.INTERP** file contains a machine language "control" program; that is, when the diskette is booted, the program in **SOS.INTERP** is executed after all the operating system stuff is installed. Some examples of **SOS.INTERP** files are Business BASIC, Pascal, Apple Writer ///, and VisiCalc ///. Note, however, that no matter what the true nature of this file (*i.e.* BASIC, VisiCalc, etc.), it must be called **SOS.INTERP**. Let's summarize the SOS booting process:

1. Powering on the Apple /// or pressing **Ctrl-{RESET}** causes a jump to the computer's only ROM: a small self-diagnostic program and diskette boot routine.
2. The diskette boot routine from the ROM then reads in a small chunk of code from the diskette in the built-in disk drive. Along the way, the ROM manages to be mapped out of memory, giving the Apple nothing but wide open RAM.
3. The code read from the diskette then reads in the directory of that diskette. It looks for our friend **SOS.KERNEL** and reads it in if found or issues an error message if not found.
4. **SOS.KERNEL** then proceeds to read in and relocate **SOS.INTERP** and **SOS.DRIVER**. After doing so, it finishes up the boot process by executing **SOS.INTERP**.

So, from this little scenario, it is obvious that one way to implement Assembly language programs on the Apple /// is by making them **SOS.INTERP** files. How practical is this? Well, in the case of large, independent applications like languages, VisiCalc, and Apple Writer, this is the ideal method. You share control of the machine only with the operating system and you don't have to worry about any non-essential code hanging around. On the other hand, if you want your Assembly language programs to coexist with BASIC or Pascal, remember that there can only be one **SOS.INTERP** per diskette. That means that making your program an INTERP file is not the way to go if you want a high-level language around.

The Module Squad

Is all hope lost? Of course not! As regular readers of this series know, there is a second method for implementing Assembly language software on the Apple ///. This method, in which the programs are called modules, is used to link the Assembly language code with Pascal or BASIC programs. The Assembly language thingie called Restart which we've been playing around with in the last two installments is an example of a module. A module is simply an Assembly language program which is loaded, relocated, and generally baby-sat by Pascal or BASIC.

There are a few rules to writing modules, and just about all of them are covered in the *Apple /// Pascal Program Preparation Tools Manual* (I keep telling you to read those!). The rules are pretty much the same as those which govern the use of Assembly language routines in Apple II Pascal. In fact, many parts of SOS appear to be descended from the Apple II Pascal Operating System, so a knowledge of that system doesn't hurt when you're working with the ///.

On the other hand, making a **SOS.INTERP** has thus far been documented only in the information received in Apple's OEM class for the ///. Basically, the syntactical rules for writing interpreters are quite simple, and I'll give them to you right here.

An interpreter (which becomes a **SOS.INTERP** file) is an Assembly language codefile with a few identifying items attached to the front. Specifically, these items are:

1. The eight ASCII characters "**SOS NTRP**", which is SOS INTERP with the

vowels removed. (Note the blank between the second 'S' and the 'N'.)

2. Two bytes giving the length of an optional header information block. This block can be used for a copyright notice. The optional header block (if used) follows these two bytes.

3. Two bytes giving the loading address of the interpreter. An interpreter is not relocatable. SOS will automatically load the interpreter at the address given here. Since the interpreter is not relocatable, the source text must contain the **.ABSOLUTE** command.

4. Two bytes giving the length of the code part (everything but this header stuff). The interpreter should be constructed so that it does not use any memory beyond $B7FF.

Could You Interpret That For Me?

If you've read the previous installments of this column, you've already experienced the wondrous thrill of creating and using a module in Pascal and BASIC. Well, in this very magazine, we're going to make an interpreter. But not yet! (Awwwww.) First, we're going to delve into a few essential housekeeping calls to the operating system: SOS calls. For all my noise about SOS calls in this series, I've only documented two, and boy, have I heard it from you folks! So, let's move on into some real SOSsy stuff.

Omniam SOSam in quartes partes divisus est

There are four distinct groups of SOS calls. They are the File System calls, the Device System calls, the Memory System calls, and the Utility System calls. The file calls are probably the most commonly used. They're the ones that let you create, open, close, read from, write to, delete, rename, and otherwise manage files on devices in the system.

The device calls are related to the file calls since files are physically implemented on devices. Device calls let you modify the way the device does something, inquire about the status of devices, and do some other things.

The memory system calls allow SOS to reserve sections of memory for a program's use, and they also allow the programmer to get information about the current use of memory in the Apple.

The utility calls manage some miscellaneous resources in the Apple ///, such as the joysticks and the system date and time.

I'd like to introduce a standard format for SOS call information. To recap briefly, a SOS call is performed with an Assembly language BRK, followed by a byte indicating the call number, followed by a self-relative pointer to a parameter list. It looks like Listing 1.

This chunk of code, called the *Call Block*, is placed in your program just like any other instructions. When SOS sees the BRK it finds the parameter list and attempts to execute the call. An error code is returned in the accumulator. If no error has occurred, the accumulator contains a zero. For a list of possible errors which the calls in this article can produce, see Table 1.

The information which is essential to making SOS calls is the call number and a description of its *parameters*. Parameters come in four flavors: value, result, value/result, and pointer:

Value: Data passed to SOS from the calling program's parameter list. This data is not modified by SOS. Values are 1, 2, or 4 bytes, as specified.

Result: Data passed to the calling program's parameter list from SOS. SOS puts this data in a specified location in the parameter list. Results are 1, 2, or 4 bytes, as specified.

Value/result: Data passed to SOS from the calling program's parameter list. SOS receives this data and passes back a modified value in the same location. This is basically a value parameter and a result parameter which share the same location in the parameter list.

Pointer: a 2-byte address pointing to an area into which SOS places data (for example, in a read from a file), or from which SOS takes data (for example, when writing to a file).

The first parameter in a SOS call's parameter list is always (always, always) a value which gives the number of parameters in the list. For example, if a SOS call has 3 parameters (as does our first example below), the parameter list will begin with a byte containing a 3. In practice, it looks like Listing 2.

Table 1

Possible errors
(returned in the accumulator):

01	Bad system call number
02	Bad caller zero page
03	Bad pointer extend byte
04	Bad system call parameter count
05	System call pointer out of bounds
27	I/O error
2A	Checksum error
2B	Volume is write protected
40	Invalid pathname syntax
41	Too many open character files
42	Too many open block files, or too many block devices
43	Invalid reference number
44	Path not found
45	Volume not found
46	File not found
47	Duplicate file name
48	Not enough room on volume (disk full)
49	Directory full
4A	Incompatible file format
4B	File storage type is neither 1 nor D
4C	End of file has occurred
4D	Position out of range
4E	Access not allowed
4F	Buffer too small
50	File already open, access denied
51	Directory structure has been damaged
52	Not a SOS volume
53	Invalid value in list parameter
54	Out of memory
55	Buffer table full
56	Invalid system buffer parameter
57	Duplicate volume error
58	Not a block device
59	Bad file level
5A	Invalid bit map address

```
BRK             ;Software interrupt triggers SOS call
.BYTE Callnum       ;Each call has an i.d. number
.WORD Params        ;Each call has a parameter list
```

Listing 1

```
PARAMS      .BYTE 03        ;Three parameters to come
        (first param)
        (second param)
        (third param)
```

Listing 2

When describing a SOS call, I will give the call's number (always one hexadecimal byte) and a description of its parameters. This description will give the order of the parameters, the name and type of each one, description of its use, and any other relevant information. I will also give an example of each SOS call. This reserves my place in documentors' heaven. However, please note that my examples will not contain any error checking, so beware.

Other notes of interest: some SOS calls have parameters that are optional; that is, the call can be made with or without these parameters. In these cases the call will have two special required parameters: a pointer to the optional parameter list, and a value which tells the number of optional parameters used. You can tell SOS you have zero optional parameters, in which case the pointer to the list is ignored. If this sounds a bit confusing now, it will probably become clear when you see it used in a SOS call.

Often a SOS call parameter will be a pathname, device name, or volume name. Whenever this occurs, a standard mechanism for the name is used. The parameter list will have a pointer to the name, and the name itself will consist of a byte giving the length of the name, followed by an ASCII representation of the name itself. In source code, it looks like Listing 3.

Those are the fundamentals, so let's get right into it!

File These Away for Reference

The first group of calls I'll present come from the file system. Some file calls work on closed files and some work on open files; none work on both. The trick to making a closed file into an open file is the OPEN call; the way to make an open file closed is with the (I can hear your mind racing) CLOSE call. We'll deal with some calls for closed files first.

CREATE

This call creates a new file on a block device, *i.e.*, a disk drive. Actually, it doesn't actually work with a closed file — it makes a new one.

call number: $C0

parameters: 3

1. Pathname pointer (2 bytes). The pathname of the file to be created.
2. Optionlist pointer (2 bytes). Points to the optional parameter list, if the Length (see next parameter) is between 1 and 8; otherwise, ignored.
3. Length value (1 byte). Length of the optional parameter list. Range is 0 through 8. Meaning:
   0 No optional parameters used
   1 or 2 File type parameter used
   3 File type and Aux type parameters used
   4..7 File type, Aux type, and Stor type parameters used
   8 File type, Aux type, Stor type, and Eof parameters used

Optional parameters:

File type value (1 byte)
This byte tells the file's type. Range is 0 through FF.
Meaning: (the last column shows how the file is reported by the System Utilities filer)

```
00  typeless or unknown file (Unknown)
01  file containing bad blocks (Badfile)
02  Pascal or Assembly code file (Codefile)
03  Pascal text file (Textfile)
04  BASIC text or Pascal ASCII file (ASCIIfile)
05  Pascal data file (Datafile)
06  General binary file (Datafile)
07  Font file (character set) (Fontfile)
08  Screen image file (Fotofile)
09  BASIC program file (Basicprog)
0A  BASIC data file (Basicdata)
0B  Reserved (WPfile) ???
0C  SOS system file (SOSfile)
0D  Reserved (Datafile)
0E  Reserved (Datafile)
0F  Directory file (Directory)
10 - FF: Reserved (Datafile)
```

The file type defaults to 00 (unknown) if this optional parameter is not used.

Aux type value (2 bytes)
An auxiliary type identifier for the file. Used to store further information about the file. For example, BASIC uses this byte to store the record size of data files. Range is 0 through FFFF. The default is 0.

Stor type value (1 byte)
Indicates whether the file is a subdirectory (Stor type = D) or not (Stor type = 1). These are the only legal values. The default is 1.

Eof value (4 bytes)
Gives an amount of space in blocks to preallocate for a file. Files can grow and shrink dynamically, but if a file is known to be very large at creation type, using this parameter can help make access to it faster since the file will be contiguous. The range is 0 through FFFFFF. The default is 0.

An Example: (Listing 4)

Create a file named ASPHALT on the volume called MORK. The file will be used to contain a font.

```
                .WORD PATHNAME      ;Pointer to the name

PATHNAME      .BYTE 09              ;Length of the name itself
              .S095ASCIIs100 "/JOE/FRED"   ;Pathname is /JOE/FRED
```

Listing 3

```
        BRK             ;SOS call
        .BYTE 0C0         ;CREATE
        .WORD CR_PARAMS     ;pointer to parameters

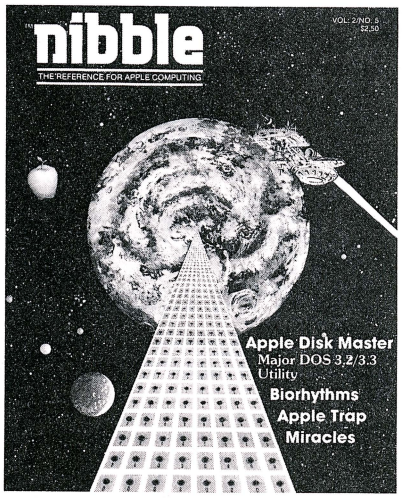
CR_PARAMS     .BYTE 03          ;3 parameters
        .WORD CR_PATH       ;pointer to file pathname
        .WORD CR_OPTNS      ;pointer to optional params
        .BYTE 01          ;use File_type optional param

CR_PATH       .BYTE 0D          ;length of name
        .S095ASCIIs100 "/MORK/ASPHALT" ;pathname

CR_OPTNS      .BYTE 07          ;font file
```

Listing 4

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DESTROY

As long as we're creating 'em, we might as well destroy some, too. This call deletes a file from a block device.

call number: $C1

parameters: 1

1. Pathname pointer (2 bytes)
   The pathname of the file to be destroyed.

An Example (Listing 5).

Delete a file called LENDER in a subdirectory called HAPPY.TIMES on a volume named THURSDAY.

OPEN

Before we can read from or write to a file, we have to open it. This is call that performs that function.

call number: $C8

parameters: 4

1. Pathname pointer (2 bytes)
   The pathname of the file to be opened.
2. Refnum result (1 byte)
   When a file is opened, SOS assigns it a reference number (refnum). This number is then used in subsequent reads and writes with that file.
3. Optionlist pointer (2 bytes)
   Points to the optional parameters list, if the Length (see next parameter) is between 1 and 3; otherwise, ignored.
4. Length Value (1 byte)
   Length of optional parameter list. Meaning:

   0 No optional parameters used
   1 . . 3 Req access parameter used

Optional Parameters:

Req access value (1 byte)
Allows the file to be opened only for reading or only for writing. Range is 0 through 3.

Meaning:

00 open for as much access as permitted
01 open for reading only
02 open for writing only
03 open for reading and writing

The access defaults to 0 (open for as much access as permitted) if this optional parameter is not used.

An Example (Listing 6).

Open the file we created earlier (/MORK/ASPHALT).

After this file is opened, we would use the result returned at location OPENREF to refer to this file in read and write calls (read on!).

WRITE

This is the call you use to transfer information from a buffer to a file.

call number: $CB

parameters: 3

1. Refnum value (1 byte)
   The Refnum assigned to the file when it was opened.
2. Buf pointer (2 bytes)
   Points to a buffer area where the information to be sent comes from.
3. Bytes value (2 bytes)
   The number of bytes to be written.

An Example (Listing 7).

Write 10 bytes to the file we opened earlier (/MORK/ASPHALT).

Executing this call after using the preceding OPEN to open the file and get the Refnum would cause the 10 bytes listed above to be written to the file. Remember that when we created this file, we gave it a 'Type' parameter indicating that it was to contain a font. However, when dealing with files at the SOS call level, SOS doesn't really care what a file contains or is supposed to contain — it simply reads and writes data.

```
        BRK             ;SOS call (but you knew that already)
        .BYTE 0C1         ;DESTROY's i.d. number
        .WORD DES_PARAMS     ;pointer to parameters

DES_PARAMS    .BYTE 01          ;1 parameter
        .WORD DES_PATH      ;pointer to file pathname

DES_PATH     .BYTE 1C          ;length of name
        .s095ASCIIs100 "/THURSDAY/HAPPY.TIMES/LENDER" ;pathname
```

Listing 5

```
        BRK          ;Guess what (have you been reading along?)
        .BYTE 0C8         ;I.D. number for OPEN
        .WORD OPEN_PARAMS     ;pointer to parameteters

OPEN_PARAMS    .BYTE 04          ;4 parameters
        .WORD OPEN_PATH      ;pointer to file's name
OPEN_REF     .BLOCK 1          ;reserve 1 block for Refnum result
        .WORD 0000         ;we're not using any optional params...
        .BYTE 00          ;...so we make these all zeroes

OPEN_PATH     .BYTE            ;length of name
        .s095ASCIIs100 "/MORK/ASPHALT" ;the pathname itself
```

Listing 6

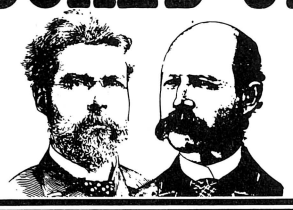
```
        LDA OPEN_REF       ;move the Refnum we obtained earlier
        STA WRITE_REF       ;into WRITE's parameter list
        BRK             ;call up SOS (hello, SOS?)
        .BYTE 0CB         ;call i.d. number
        .WORD WRIT_PARAMS     ;pointer to parameters

WRIT_PARAMS    .BYTE 03          ;3 parameters
WRIT_REF     .BLOCK 1          ;the above STA puts the proper Refnum
                    ;value in this byte
        .WORD DATA_BUF      ;pointer to our data buffer
        .WORD 000A         ;write 10 decimal (0A hex) bytes

DATA_BUF     .BYTE 01,23,45,67,89,AB,CD,EF,FF,FF ;10 randomly
chosen data
```

Listing 7

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READ

This call attempts to transfer a given number of bytes from a file to a specified buffer. The other half of the world-famous read/write team!

call number: $CA

parameters: 4

1. Refnum value (1 byte)
   The Refnum assigned to the file when it was opened (as in the WRITE call).
2. Buf pointer (2 bytes)
   Points to a buffer area where the information will be placed after it is read (again, note the symmetry with the WRITE call).
3. Bytes value (2 bytes)
   The number of bytes to be read.
4. Bytes-read result (2 bytes)
   SOS returns the number of bytes actually read in these locations.

An Example (Listing 8):

Attempt to read 10 bytes from the file we opened earlier, named (/MORK/ASPHALT).

Where's **DATA-BUF**? Remember, we defined it in the WRITE call. Can this buffer area be reused? Sure! In fact, that's one of the benefits of SOS's system of parameter lists and pointers. You can use the same area in memory as a read and write buffer.

If you executed this call after just having written to the file earlier (as we have done in this article), you would get an error #4C, End of file. Wait a minute, you may say — we just wrote 10 bytes of data, so why won't they be read? The answer lies in the fact that whenever SOS reads from or writes to a file, it maintains a pointer, or mark, into that file, kind of like a book marker, so that it knows where to read from or write to next. After we wrote the 10 bytes out (with our example WRITE call), that marker was pointing to the end of file. When the subsequent READ came up, there was nothing left to read.

What do you do if you want to move the mark without reading or writing anything? Why, there just happen to be a couple of SOS calls (GET-MARK and SET-MARK) that let you look at and modify the mark. I won't go into them in depth here, but be advised of their existence.

CLOSE

This is the call to use to finish up the use of an open file.

call number: $CC

parameters: 1 (this is a simple one)

1. Refnum value (1 byte)
   The Refnum assigned to the file when it was opened.

An Example (Listing 9).

Close the file we've been working with.

You now have the basic tools necessary to work with SOS's file system. **CREATE** makes the files, **OPEN** gets them ready for reading and writing, **READ** and **WRITE** perform the actual transfer of data to and from the files, **CLOSE** finishes the reading and writing process, and **DESTROY** gets rid of the files.

I Promised You an Interpreter

Yes, I did, way back at the beginning of this article, say that we'd create a real, working interpreter before we were done, and we're about to do just that. Just as our first SOS call and module examples were simple, we'll begin with a fairly mindless interpreter. This one will simply print a welcoming message on the screen and then sit there. Not terribly exciting, I admit, but we need a place to start! (We'll get fancy later).

As noted earlier, **SOS.INTERP** files start with a special header block, then get right into the code. Well, our code will consist of three things:

1. OPENing the .CONSOLE device (so that we can print on the screen).
2. WRITing the message to the .CONSOLE.
3. Looping infinitely.

Since the how-to of all this stuff has been explained, let's proceed with the source text listing, Listing 10.

```
        LDA OPEN_REF       ;move the Refnum we obtained earlier
        STA READ_REF       ;into READ's parameter list
        BRK             ;now call SOS
        .BYTE 0CA          ;call i.d. number
        .WORD READ_PARAMS     ;pointer to parameters

READ_PARAMS   .BYTE 04          ;4 parameters
READ_REF    .BLOCK 1          ;our STA instruction above loads this
;byte with the proper Refnum value
        .WORD DATA_BUF      ;pointer to the buffer where data read
                  ;will go
        .WORD 000A         ;0A hex is 10 decimal; read 10 bytes
BYTES_READ   .BLOCK 2          ;reserve two bytes for SOS to put the
;number of bytes actually read
```

Listing 8

```
         LDA OPEN_REF       ;as we did with READ and WRITE,
         STA CLOSE_REF       ;bring in the desired Refnum
         BRK             ;then do the SOS call itself
         .BYTE 0CC          ;CLOSE call i.d. number
         .WORD CLOSE_PARAMS    ;parameter list

CLOSE       .BYTE 01          ;one parameter only
CLOSE_REF     .BLOCK 1          ;reserve a space for the Refnum
```

Listing 9

```
;first, some administrative stuff

        .ABSOLUTE          ;required for interpreters
        .PROC MYINTERP      ;this is the title (clever, huh?)

START       .EQU 0B000        ;code will load here
        .ORG START-0E       ;move back 14 bytes for header

;required header follows

HEADER      .ASCII "SOS NTRP"    ;required header information
        .WORD 0000          ;no optional header block (length 0)
        .WORD START         ;loading address
        .WORD CODELENG      ;length of code

;this is the working program

        BRK             ;the code itself: OPEN call
        .BYTE 0C8
        .WORD OP_LIST

        LDA OP_REF          ;put file's Refnum in WRITE's
        STA WR_REF          ;parameter list

        BRK             ;WRITE call
        .BYTE 0CB
        .WORD WR_LIST

LOOP        JMP LOOP        ;run around in circles forever

;parameter lists come next

OP_LIST     .BYTE 04        ;OPEN has four parameters
        .WORD CONS_PATH     ;pointer to the pathname to open
OP_REF      .BLOCK 1        ;reserve a place for SOS to put Refnum
        .WORD 0000          ;no optional parameters needed...
        .BYTE 00            ;...so these are zeroes

CONS_PATH   .BYTE 08        ;length of pathname
        .ASCII ".CONSOLE"   ;the file to open

WR_LIST     .BYTE 03        ;three parameters for WRITE
WR_REF      .BLOCK 1        ;save space for Refnum
        .WORD WR_BUF        ;pointer to our data
        .WORD 001F          ;length of our message

;the greeting message

WR_BUF      .ASCII "Hi, I'm Irving the interpreter!"

;close up shop

CODELENG    .EQU *-START        ;figures length of code for header

        .END            ;all done
```

Listing 10

```
program interp_maker;  { By Alan Anderson; from Apple Orchard }

  var
   infile, outfile : file;
   inname, outname : string;
   data : packed array [1..512] of 0..255;
   block_num, count : integer;


begin
  write ('Enter the pathname of the codefile to be converted
-->');
  readln (inname);
  write ('Enter the pathname for the output file -->');
  readln (outname);
  reset (infile, inname);
  rewrite (outfile, outname);
  count := blockread (infile, data, 1);
   while not eof (infile) do
     begin
      count := blockread (infile, data, 1);
      count := blockwrite (outfile, data, count);
     end;
  close (infile);
  close (outfile, lock);
end.
```

Listing 11

That's it! Type Listing 10 in the Pascal Editor and assemble it and . . .you're almost there. There's one more item to consider: When the Pascal assembler writes a codefile, it writes a single block of information which is placed at the front of the codefile. However, although the assembler always writes this block, the information therein is useful only for modules, and this block must be removed from the front of interpreter files. The ideal solution to this situation would be a pseudo-op (called, perhaps, .MAKEINTERP), which would generate files without the information block. The current solution, though, is to have a Pascal program to rewrite the file without the information block.

When the *Apple /// SOS Reference Manual* is distributed, Apple plans to include a program to perform this function. Until then, here is a program, Listing 11, (without any error checking) to accomplish the same purpose.

After you've assembled the interpreter listed above, enter and compile this program, then execute it and convert the codefile. The final product is now a real, live, almost useful interpreter. What do you have to do to use it? Just format a diskette and put **SOS.KERNEL** and **SOS.DRIVER** on it. Then copy the converted codefile from our interpreter maker to the new disk and call it (naturally enough) **SOS.INTERP**. If you've done everything right and the stars are smiling upon you, you should then be able to boot the diskette and have it say "Hi" to you! All right!

You have just created an Assembly language program which executes all by itself, without BASIC or Pascal or any other high level language hanging around. Although it performs no useful function other than as a demonstration, it allows you to view the basic structure needed to write your own interpreters.

I hope all these goodies about interpreters and SOS calls will be enough to keep you going until next time. If not, please write to me. I can be had at:

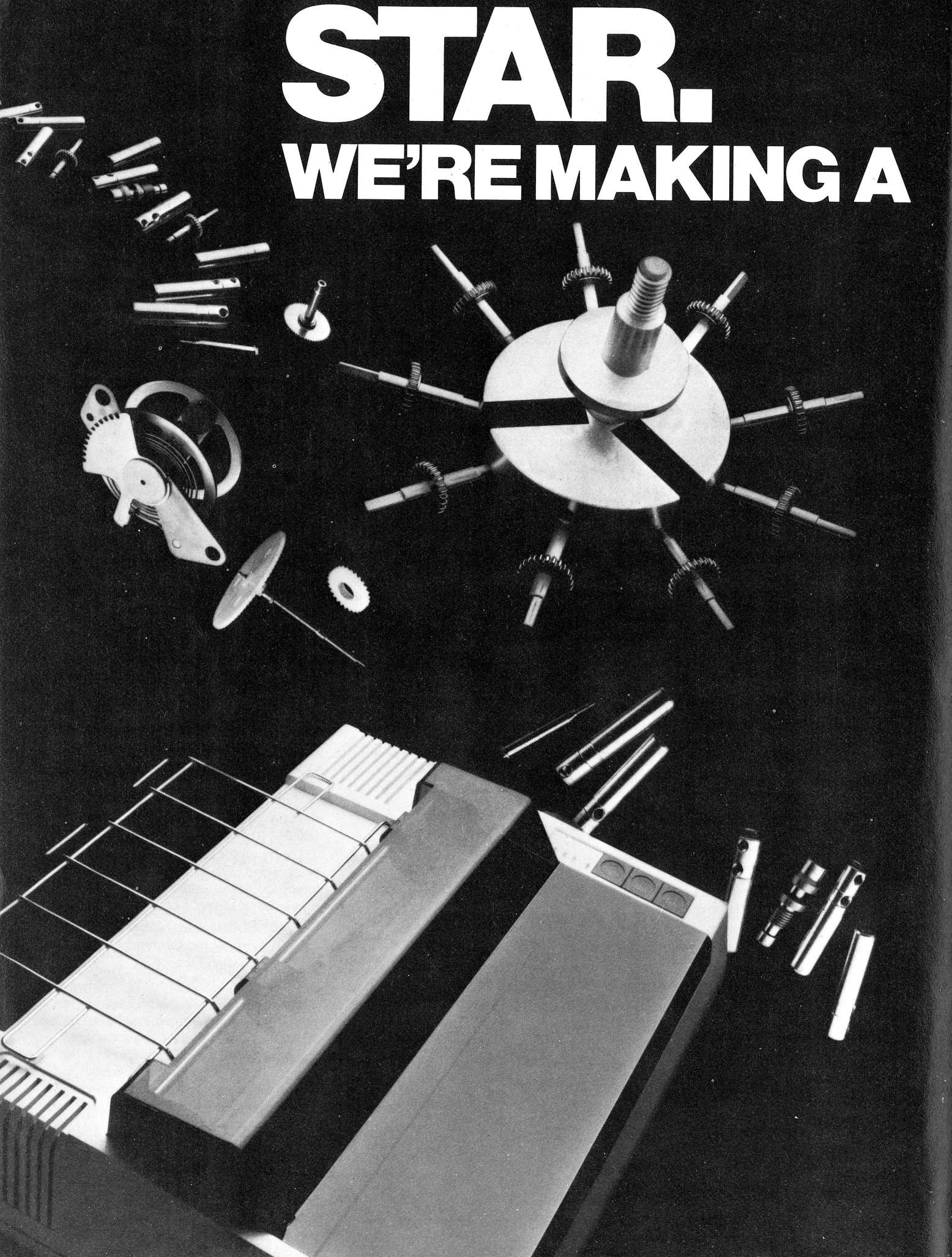
Alan Anderson
c/o **Apple Orchard**
910 A George St
Santa Clara, CA 95050

Next time, I'll probably present some more tools for programming the bejeebers out of the Apple ///, probably in the form of more SOS calls and ways to exploit all the power in the .CONSOLE driver. However, this is changable according to your whims, so let me know what you want.

Okay, everybody. . .

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Review:

Starting Off on the Right Boot

Clark L. Congleton

SYNOPSIS

Product: Universal Boot Initializer (VERSION 4.0)

Offered by : S & H Software
Box 5
Manvel, ND 58256
(701) 696 - 2574

Function: Creates boot disks for Apple DOS 3.2.1 or 3.3 which will provide compatibility with several different Apple II configurations.

Requirements: 48K Apple II or Apple II Plus ROM, RAM, or Language Card
Plus ROM, RAM or Language Card;
Apple DOS 3.3 or DOS 3.2.1;
One or two disk drives

Languages: Utility written in machine-language, Support provided for Applesoft and Integer BASIC

Documentation: Forty-page instruction manual and training disk.

Price: $69.95

THERE is now a number of different hardware/firmware/ software configurations of the Apple II computer in the field. These multiple configurations are the result of variations in:

- BASIC language interpreters, including Applesoft (Floating Point) and Integer BASIC.
- Memory capacity, including 16K, 32K and 48K models.
- Operating Systems, including DOS 3.2.1 and DOS 3.3
- The number of sectors per disk track, including the original 13-sector format and the newer 16-sector format.
- "Add-on" cards, including the Applesoft ROM card, the Integer BASIC ROM card, and other RAM cards.

Due to these variables, there is a also a variety of booting procedures necessary to bring up the different configurations of the Apple. To the software author/vendor who desires to create an easy-to-use turnkey application written in one of the two BASICs, this can present a definite problem.

The Universal Boot Initializer 4.0 (UBI 4.0) is a solution to this problem. The UBI 4.0 utility permits the creation of boot disks which can boot on most Apple II systems, regardless of configuration. UBI 4.0 uses an "intelligent" boot routine which is capable of determining which type of environment it has been started on, then performing a booting operation tailored to the current system. A universal boot disk will have both FPBASIC (Applesoft) and INTBASIC (Integer) stored on it in case it needs to load one of them into a RAM card. It will be a 13-sector disk, so it will boot directly on systems running under DOS 3.2.1, but it will also boot directly on systems with DOS 3.3, instead of requiring the normal two-step procedure utilizing the BASICS disk.

There are also some options available to the user who is creating the boot disk. For example, if it is known that the boot disk will always be used with systems equipped with the ROM Applesoft, the FPBASIC need not take up room on the boot disk. Also, if the boot disk will always be used with DOS 3.3, it can be configured as a 16-sector disk to allow greater storage capacity.

Features

The following is a summary of the operating features of the Universal Boot Initializer 4.0 utility:

- UBI can create a DOS 3.2.1 disk that will boot directly on either DOS 3.2.1 or DOS 3.3 systems. Alternately, a DOS 3.3 disk can be created to boot only on DOS 3.3 systems.
- The created boot disk can automatically load either "missing" BASIC to a RAM card. A "quick-load" feature is used that accomplishes this load in less than 2 seconds.
- The created boot disk will execute a greeting program in either BASIC, Binary, or EXEC foreat, and need not not be on the same disk drive as the boot disk.
- When creating a boot disk, the user can specify the boot disk's Volume number, the name and format of the greeting program, and the Drive on which to look for the greeting program.

In addition to these features which were also available with earlier versions of the UBI utility, there are some new features which are available only with version 4.0:

- "The DOS Enhancer (TDE)", a modification to DOS 3.3 which decreases the amount of time required to perform **LOAD** and **RUN** operations on Applesoft, Integer, and Binary modules. Speed increases of up to 550% are possible, with larger loads showing the most improvement... where it is most needed. For example, a 100-sector program can be loaded in about 7 seconds with TDE - enhanced DOS, rather than the 40 seconds normally required.
- A new "FREE" command replaces the DOS 3.3 "INIT" command which is disabled on DOS 3.3 UBI 4.0 formatted disks. This command places the available free disk space counter into a memory location which can be PEEKed at by the user.
- Included in the package is a Support Disk containing a demonstration of the quick-load feature for Hi-Res screens, and three for modification of boot disks after creation.

Limitations

There are a few limitations related to the useful functions which UBI 4.0 performs:

- The UBI utility disk itself must be booted on an Apple II system which has 48K and the availability of both versions of BASIC. That means a ROM, RAM, or language card.
- When UBI 4.0 creates a boot disk for DOS 3.3, it is a 48K slave disk. That

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means UBI cannot create DOS 3.3 boot disks for systems with either 16K or 32K of memory. The rationale given in the instruction manual is that since memory prices have fallen to as low as $30 per 16K block, it is reasonable to assume that the user has made a memory update to the 48K level.

- The universal disk created by UBI 4.0 does not have a great deal of available space since it is a 13-sector disk and has both BASICs stored on it. This is a limitation imposed by the nature of the problem and not by UBI 4.0.

User Interface

The Universal Boot Initializer utility conducts a dialogue with the user through a series of screens. Each screen asks the user to answer a single question, and normally displays the results of all previous questions. For each question, there is a default answer documented in the instruction manual. Each screen in the dialogue also contains a key to the proper location in the manual where the currently requested parameter is discussed.

The result of this type of dialogue is an excellent user interface in which the user can see where he/she has been, what is currently required, and where to look for help in the instruction manual. A single minor improvement would be to display the default answer on each screen along with the question.

Documentation

The documentation which is provided as a part of the UBI 4.0 package includes a 40-page instruction manual and a training disk.

The instruction manual is very well-written, and leaves nothing to the imagination. It is well-suited to almost any audience. After an introduction to the problem of multiple Apple II computer configurations, and explanation of basic features, it launches into a set of instructions concerning the question/answer screens. A sample of each screen is reproduced as a part of the manual. There are also several examples of UBI 4.0 runs explained in a later section of the manual. The features which are new with Version 4.0 are attached to the rear of the manual as a supplement, but this organization does not detract from the usefulness of the manual.

The training disk, which is keyed to specific examples in the instruction manual, provides the user with initial demonstrations of the typical dialogues conducted by UBI 4.0.

Conclusions

Earlier versions of the Universal Boot Initializer have had a marketplace limited to those people who have wanted to develop universal boot disks, as the package name indicates. While this is still the primary marketplace for UBI 4.0, the quick-load capabilities of the resulting boot disks will make this package attractive to anyone who spends alot of time at the keyboard.

The performance of the package during review testing was totally without fault. The resulting boot disks were tried out on several Apple II configurations and also performed without error. The price for UBI 4.0 seems a little high, but it is assumed that this is due, at least in part, to the license fees which S & H Software must pay to Apple for use of the copyrighted DOS and BASIC software.

By the way, the vendors of this package practice what they preach. The AMPER-SORT/MERGE package is also from S & H Software, and it uses disks created by UBI 4.0 to provide compatibility for the Applesoft BASIC portions of its software.

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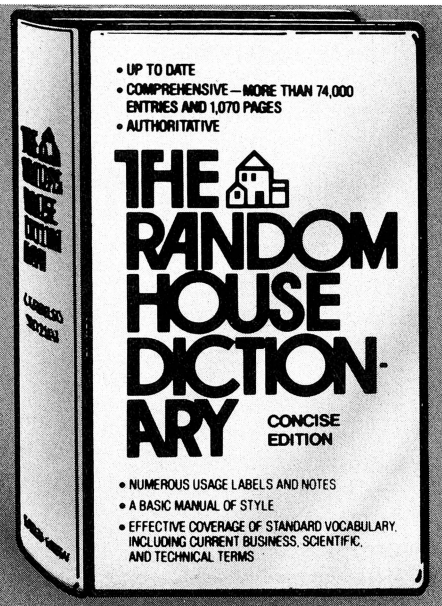
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Review:
Locksmith and The Inspector

Woody Liswood

From:
Omega Microware, Inc.
222 S. Riverside Plaza
Chicago, Il 60606

LOCKSMITH

A review of *Locksmith?* Are you *kidding?* Well, why not? There has been much controversy about Locksmith and other "nibble copy" programs, which purport to copy virtually all disks, even "copy protected" disks. You may have been at some meetings, User Group and otherwise, where the merits of these programs have been debated. There are two widely divergent opinions on the merits of these programs. One, usually espoused by "professional programmers," is that these programs should be suppressed at all costs. In fact, a few publications do not accept advertisements for these programs, having been "bullied" by advertisers, or themselves connected with software houses. The other viewpoint, usually expressed by owners of copy protected programs, is that they need back-up copies for their own use and, in fact, have the right to make those copies. This group of people insists that they have never, never, never made a copy of a protected, or unprotected program to give to a friend. Both sides are "right." But the nibble copy programs didn't bring about the unauthorized copy problem; those with the necessary technical skills had been making the necessary moves all along. The nibble copiers merely made it possble for the "non-elite" to do the same thing.

My purpose in having a nibble copier is for back-up of business software which I use in my day-to-day life. I have an aversion to paying $30 for a back-up disk; however, there is a more serious reason why having Locksmith increases my feeling of security. Let's say that a software manufacturer goes out of business, as one pioneer "biggie" just did. Do you own, or use, any of their software? If you use it in your business, you should make some back-up copies immediately, because you can't get them from the company any more. That's why business users are very much against the locking of programs.

But the controversy seems to be moving off center stage. Like the tide,nibble copiers are here and will not go away. So let's look at the latest version of the one that started it all, and see if it's worth having.

My biggest surprise, upon booting Locksmith, was to find that there is an 11-item menu, not just a single copy program:

(1) is the copy routine;

2) is a quickscan;

(3) is a modify parameters routine;

(4) is an interface to the Inspector disk utility;

(5) is a erase/degauss routine;

(6) is a nibble-editor;

(7) is a disk surface certify routine;

(8) is a HiRes disk speed test;

(9) is a self-patch;

(:) allows you to clear the copy status display; and

(;) lets you dump the copy status display to your printer.

The Copy Routine

I checked the program out with some of my protected disks. And, sure enough, it copied some of them. Others, it did not copy. This is where the parameter section of the menu is important. You are able to modify different parameters that the copy protection routines used in "locking" the disks. Therefore, theoretically, you could use the nibble editor, or the Inspector, to determine what the copy protected disk's tracks look like, set the parameter file to accept those items; and then copy the disk. That is, you could do this if you have the time, and knowledge, to read and understand the displays.

Since, for this review, I was interested in how they worked, I cheated a little bit. On The Source, there are some private information magazines, and one of those, maintained by the Omega folks, is devoted to dispensing the parameter routines for various

programs, after other individuals have taken the time, and trouble, to determine them. I tried some of those parameter ideas on some of my protected software, and they worked. But, I also noticed that some of the parameters were wrong, at least as far as my experimentation was concerned. One reason for this is said to be that manufacturers use different protection schemes on the same program, at various times.

Do I sound vague? Yes, I do. I don't feel that it is the purpose of this review to mention specific programs I could or could not copy, and what the parameters were for those files.

Figure 1 shows a copy of the status display. This copy was developed using the quickscan menu item. The "0" shows a track that had no errors during a copy or a quickscan. The "2" shows tracks that did not read reliably. The two lines show the original track plus the 'half track.'

The Inspector Interface

The Inspector interface allows you to access the Inspector EPROM or booted program. The Inspector is a disk utility that modifies a copy of your System Master disk to automatically load during the booting process. So, if you are going to use the Inspector to save parameter and patcher changes to a disk, you would boot your modified System Master, then boot Locksmith. In looking at this part of the program, I did not try to save any patches or parameters to a disk, but since I couldn't find any other problems with the program, I assume that the features work as advertised.

Erase/Degauss

The Erase/Degauss disk is an interesting menu option. You can erase a range of tracks or the entire disk. There is a note in the manual which states that the degauss mode is "also excellent for cleaning disk drives, if the user has a cleaning diskette. Simply put the cleaning diskette in the drive, and select the degauss. The head will step very quickly, and the back-and-forth motion aids in cleaning the read/write head." It works.

Disk Surface Certify

This item is used to check the disk surface for errors. It is a good feature to have if you use the back sides of your disks. As we all have been told time after time, the back side of a single-sided disk has never been tested by the manufacturer, or, "Horrors," tested out badly. I use the backs of disks for bulk storage and back-up copies of working files. After using backs of at least 50-60 disks, I have only found one bad side. Warning: if you use the Surface Certify function, you will destroy all of the data on the disk.

HiRes Disk Speed Test

This is another good feature to have. Many of the problems associated with disks are caused by speed variations between two disk drives. If you move your drives around a lot, as I do, then you should probably time them after each move; certainly before you start writing to them. I used to use Disco Drive Timer for my timing. I have a hole drilled in the back right hand side of each of my drives so that I can access the potentiometer that controls disk speed without taking off the drive covers. That makes fixing speed problems very easy. (*This procedure was described in the Winter 1981* ***Apple Orchard****; back copies are available.*) DDT says that disk speed should be 300 RPM. Locksmith isn't specific, but I found the Locksmith display to be a few RPM's slower than where DDT says the drives should be timed. I don't have an answer, but it's a good feature.

Self Patch

I didn't test out the self-patch section of the program. This, again, is for special problems in copying protected disks, and I had no disks that need the patches I found on The Source.

Is it easy to use? Yes and No. Depends on how sophisticated you are about nibbles, disks, tracks, etc.

Is the program useful? Yes.

Would I recommend it? Yes.

The INSPECTOR

The Inspector is a general disk utility from the same people who publish Locksmith. In fact, Locksmith 4.1 has a menu interface with The Inspector which will allow the owner of both programs to use them in conjunction with each other. If you are familiar with GDU, or Disk Fixer, then you will have no trouble using The Inspector.

The program is available as firmware or software. With an Apple II Plus, I tested the software version. If you don't run a RAM board of some

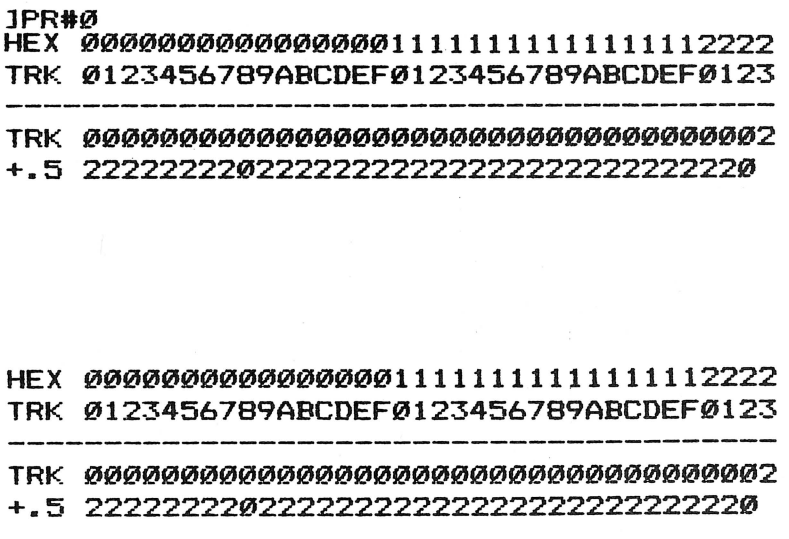


Figure 1

kind, you can get The Inspector on a EPROM that locates in the D8 socket of the motherboard, or the D8 socket on the Integer card (if you have an Apple II Plus with an Integer card).

The most fascinating feature, to me, was the method of booting the program. You make a copy (which you should have done already, anyway) of your DOS 3.3 System Master. Then you RUN "The Inspector." You will then have a modified copy of your System Master which, when booted, will load The Inspector at the same time. Omega also supplies some labels to put on this modified disk so that you will know which one it is. Because of this loading, the program is always in memory and ready for use.

Here's how to call it up (there are different sequences depending on how you have your computer configured). I have an Apple II Plus so the sequence is, if in Integer: **CALL-10240** <**RTN**>; from the Monitor: **C080** <**RTN**> - **D800G** <**RTN**>; or from Applesoft: **CAll-151** <**RTN**> -**C080** <**RTN**> -**D800G** <**RTN**>. After you've done this once, you can then get to the Inspector with an "**&**" from Applesoft, a **CALL-10240** from Integer or a **Ctrl-Y** from the Monitor.

Commands

There are a number of commands used by the Inspector.

V toggles between DOS versions;

P lets you set the slot for the drive;

D toggles between drives 1 and 2;

T selects the track you wish to read;

S selects the sector you are after;

R reads the track and sector;

; (+) scans forward one sector. At C on a 13 or F on a 16 sector disk, **;** will automatically to the next higher track. **—** scans backward one sector;

A toggles between ASCII and Hexadecimal. (If you didn't have this feature, you would need to read hex as a second language. For me, I always look up hex when I need to know something, although I do, now, recognize certain hex numbers as having special significance for DOS).

X exchanges flashing and inverse ASCII characters with normal ASCII characters. This also, is a must feature for me. If you've ever tried to read a display with various letters flashing at you, and the flashing appears to have no special significance, you will know what I'm talking about, if not, then you have one of the great pleasures of disk editing still awaiting your discovery;

E enters the Edit mode that lets you change, insert or delete information;

Ctrl-W writes the buffer to the track and sector you have selected;

B lets you set the buffer location in memory where you want a sector to be loaded. This is a useful feature if you need to look at a disk and do some work without destroying a program that you already have in memory;

Ctrl-I increments sector and buffer sequentially;

M is a map which shows the used and unused display;

N gives you two displays, a nibble read and a HiRes graphics display;

H is a hex or ASCII memory dump;

F lets you search all of memory (including the ROM'S, so says the instruction manual) for either a Hex or an ASCII string;

L lets you locate a hex or ASCII string on a disk;

Ctrl-Z jumps to any subroutine that you may have written that starts at location $0300;

Ctrl-C gives you back to the BASIC you were using before you called upon the Inspector for help.

Well, does all this work? Seems to. I couldn't get it to crash.

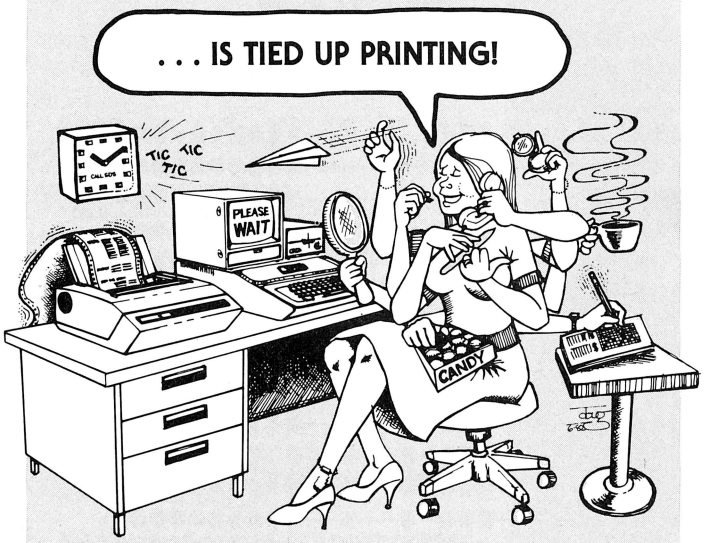
There is a section of tips for the user as part of the documentation. I tried one of the tips, which was to load a screen dump routine in part of DOS that is normally unused, then load that screen dump at the $0300 location that is accessed with a **Ctrl-Z** to get hard copy of the various screens. Here's how it worked. I set the track and sector to Track 2 Sector F, as instructed in the manual. Then, rather

```
TRACK Ø2   SECTOR F      SLOT 6   DRIVE 1
           BUFFER Ø3ØØ   DOS 16
=========================================

     Ø 1 2 3  4 5 6 7  8 9 A B  C D E F
   ---------------------------------------
ØØ-  A9Ø12Ø95 FE2Ø8EFD A9FF2ØA8 FCA2ØØ8A
1Ø-  2ØC1FBA5 288510A5 298511AØ ØØB11ØC9
2Ø-  AØBØØ469 4ØDØF82Ø 3AØ3C8CØ 28DØEE2Ø
3Ø-  8EFDE8EØ 18DØD84C 93FE48A9 ØØ8524A9
4Ø-  Ø12Ø5BFB 684CEDFD ØØØØØØØØ ØØØØØØØØ
5Ø-  ØØØØØØØØ ØØØØFFFF ØØØØFFFF ØØØØFFFF
6Ø-  ØØØØFFFF ØØØØFFFF ØØØØFFFF ØØØ1FFFF
7Ø-  Ø2Ø3FFØ4 Ø5Ø6FFFF ØØØØFFFF Ø7Ø8FFØ1
8Ø-  ØØØ9ØAØB ØCØDFFFF ØEØF1Ø11 1213FF14
9Ø-  15161718 191AFFFF ØØØØFFFF ØØØØFFFF
AØ-  ØØ1BFF1C 1D1EFFFF ØØ1FFFFF 2Ø21FF22
BØ-  23242526 2728FFFF ØØØØFF29 2A2BFF2C
CØ-  2D2E2F3Ø 3132FFFF 33343536 3738FF39
DØ-  4CBF9D4C 849D4CFD AA4CB5B7 ADØF9DAC
EØ-  ØE9D6ØAD C2AAACC1 AA6Ø4C51 A8EAEA4C
FØ-  59FABF9D 384CED Ø2 4CED Ø24C 65FF65FF
```

Figure 2. Sector Screen Display.

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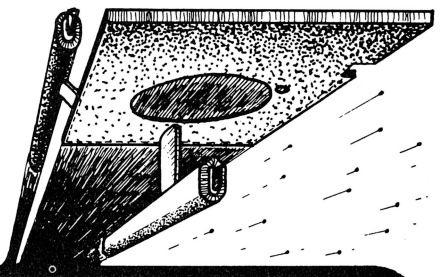
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than entering the Monitor and entering the data as the manual suggested, I decided to use the editing features of the Inspector to change that area directly. I then set the buffer to $0300. Then I used the **E** for Edit command to start with 0300. I then entered the values shown in Exhibit A. I did this by entering and A9 then I pressed space. This entered the A9 into the buffer and incremented the display to 0301. I did this up to 0348. That's found at the FD before all the 00's shown in Figure 2.

Then I pressed **Ctrl-W** to save this print routine to the System Master disk that I had already modified to contain the Inspector. To get this routine available at boot-up, I would enter the Inspector, set the buffer to $0300, then read Track 2 Sector F into memory. Then I would reset the buffer to some other number. The default is $0800. Then, whenever I needed a screen dump, I could hit a **Ctrl-Z** and there it is.

I also tried the screen dump on the Map portion of the program. Figure 3 is the result. The "#"s show that the sector is used and the "-"s show that the sector is unused.

I also dumped a nibble read screen. This is the HiRes display that purports to tell how much data is on a disk. The manual says that "at first this display may appear confusing, but with a little practice, it is possible to distinguish between 13 and 16 sector disks or to tell how much data is on a disk." I guess I need more practice.

Oh, the graphics dump is not part of the package. I used my Grappler board and its on board firmware to get the picture. It was easy. I left the Inspector with a **Ctrl-C**, and sent a **Ctrl-I G** to the parallel card.

Other things you can do with the Inspector are: transfer a good DOS to a disk where you have blown the DOS. You can add or eliminate control characters in filenames, undelete programs, and, much to my pleasure, there was even instruction in editing BASIC programs so that you can add in illegal line numbers and other goodies to bewilder your friends and create wonderment among other programmers.

```
TRACK 11   SECTOR Ø      SLOT 6  DRIVE 1
           BUFFER Ø8ØØ   DOS 16
=======================================

   ØØØØØØØØØØØØØØØØ1111111111111111222
   Ø123456789ABCDEFØ123456789ABCDEFØ12

Ø  ###-####-------###-------##########
1  ###-####-------###-------##########
2  ###-####-------###-------##########
3  ###-####-------###-------##########
4  ###-####-------###-------##########
5  ###-####-------###-------##########
6  ###-####-------###-------##########
7  ###-####-------###-------##########
8  ###-####-------###-------##########
9  ###-####-------###-------##########
A  ###-####-------###-#--#--##########
B  ###-#####------###-#--#--##########
C  ###-#####------###-#--#--##########
D  ###-#####------###-#--#--##########
E  ###-#####------###-#--#--##########
F  ###--####------###-#--#--##########
```

Figure 3. Screen Map Display.

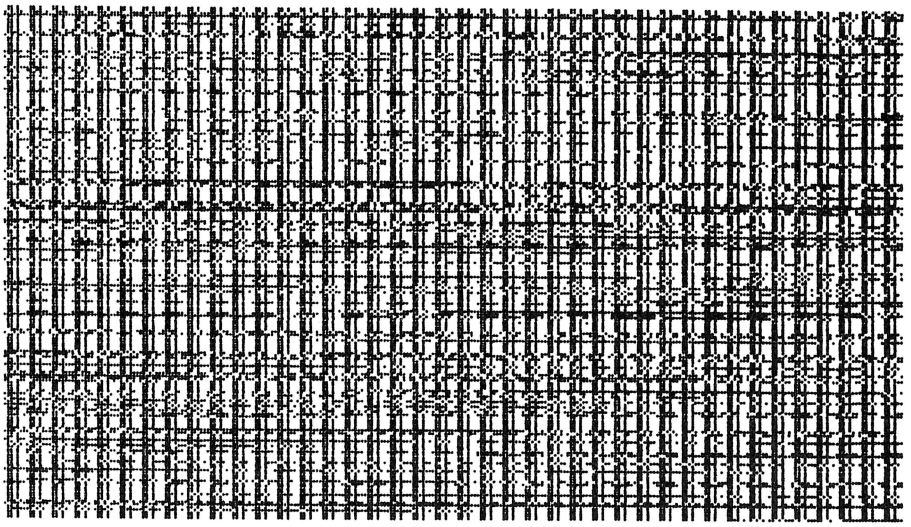


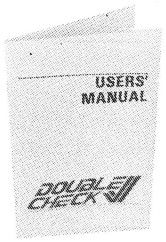
Figure 4. Nibble Read Display.

There even a fix to DOS and the language card in there so that you can always save your language when you do a PR#, and not have to wait until the other language gets booted. I'll let you buy the Inspector to find out the fix.

How well did the program work? Great.

Is it useful? Completely.

Would I recommend it? Yep, no reservations.



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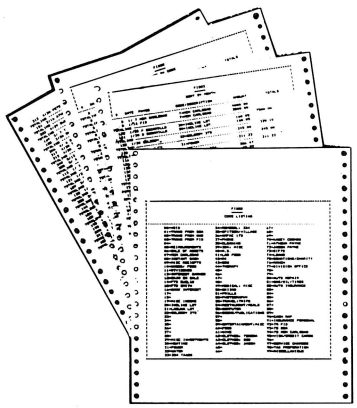
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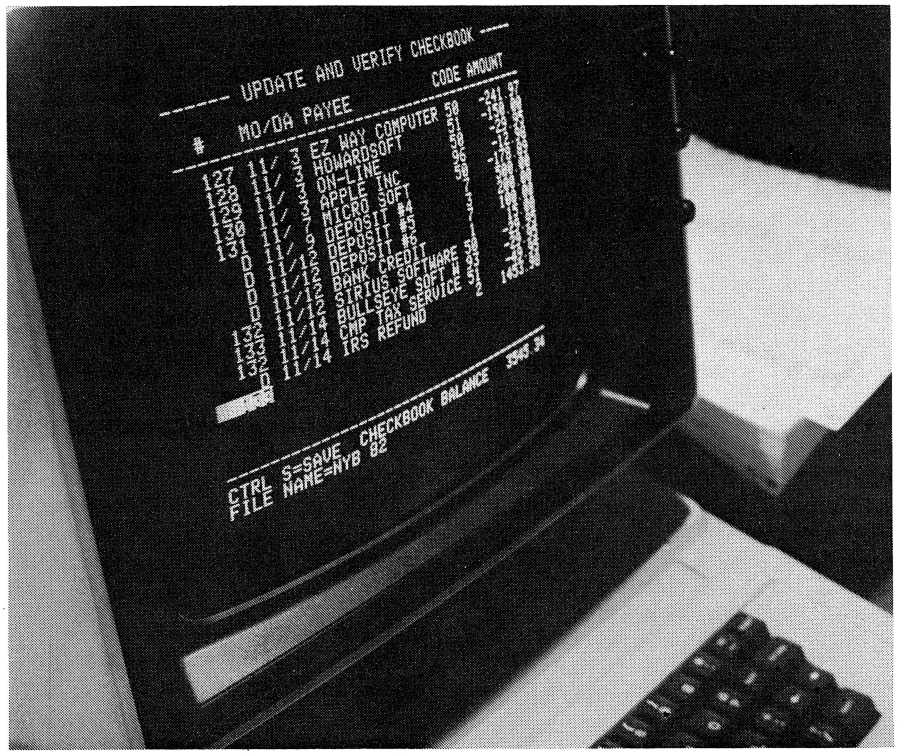
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"I want it even more fun".

"How?", we said. "It's got a hundred user-defined categories. Why..."

"I'm rewriting in machine language. That's real fun!"

"Okay, wise guy", we said. "What's so fun about machine language?"

"It's super fast! Things just zap onto the screen. That gives you power. You get instant answers... date, amounts, categories, payees, totals! Everything instantly! That's what I call fun!"

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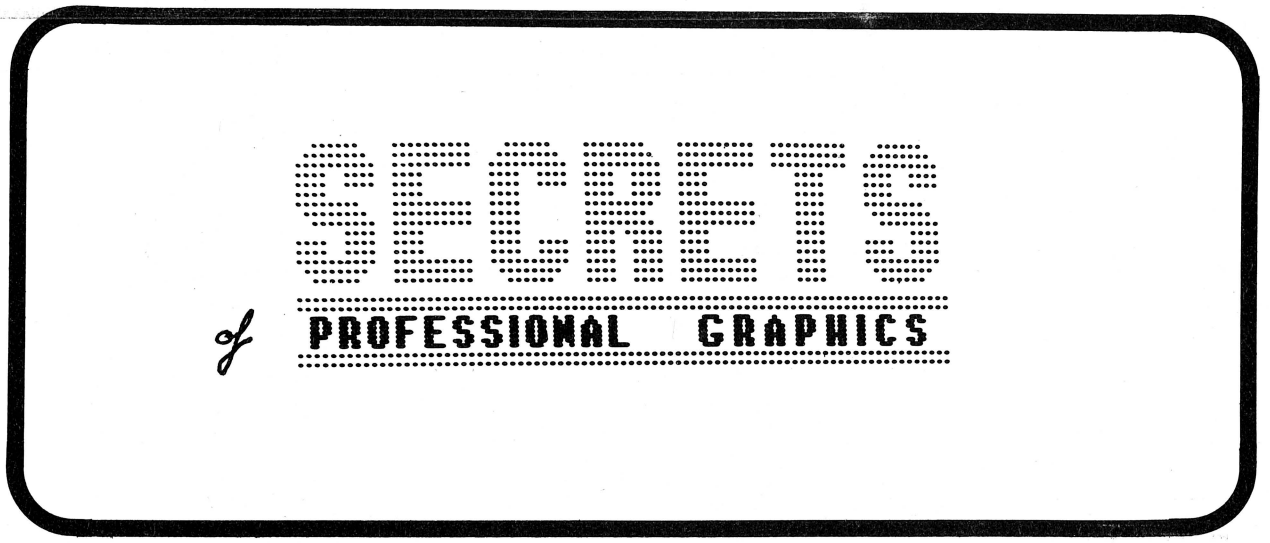
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In this issue, we begin a milestone three-part series on Apple Graphics. Anyone who has been exposed to the computer game phenomenon can't help but be impressed by the fast-moving and colorful graphics which characterize the best of these games. Yet, knowledge of the methods, which are far beyond the elementary "shape table" approach outlined in the Apple manuals, has not heretofore been widely distributed. Analogies to (commercial) sorcerers jealously guarding their "secret" methods have been drawn by some frustrated Apple users. In this **APPLE ORCHARD** *series, William Harvey carefully guides us through the processes and procedures by which those dazzling Hi-Res graphics are created. We expect that the result will be a more widespread use of better graphics, not only for games, but for all purposes where they might be useful.*

In this first of three articles, Mr. Harvey covers the underlying basics. The second article will include a graphics editor program, and the third will cover animation in greater detail. You will not want to miss any of these issues; please insure that you will receive them. —PCW.

PART I - BEHIND THE SCENES

Introduction

Fast action arcade games require graphics routines that are much faster than anything you would expect to find in the Apple. To make fast action games you must make your own lighting-fast routines. So do away with the old HPLOT, HCOLOR, DRAW, and XDRAW. Prepare to create and utilize the graphics routines which animate the Gorgons, the ghosts, the Gobblers, and yes, even the gaudy Gamma Goblins.

The catch: Fast graphics routines only come in machine language, which the Apple executes with blinding speed compared to higher-level languages. But don't panic; machine language fluency is not a prerequisite. The routines provided are simple and easy to follow. For some arcade games, you don't even have to know machine language. You do, however, have to understand the basic relationship between graphic display and memory.

The Basics: BIT, NIBBLE, BYTE, ADDRESS, HEX

Memory nomenclature is very easy to remember because the terms are so clever. Who would have guessed that a highly technical term meaning four binary digits would be called a "**nibble**". Clearly, a nibble is related to a **byte** and a **bit**. And common sense suggests that a **nibble** is a few bits *bigger* than a little **bit** and a few bits *smaller* than a

whole **byte**. However you choose to memorize computer words, the important ones dealing with memory are "**bit**", "**nibble**", "**byte**", and "**address**".

The **bit** (BInary digiT) is the smallest unit of memory. It is either on or off, represented by a one or zero respectively. Four of these bits comprise a **nibble**. Eight of them comprise a **byte**. A nibble can thus represent any decimal number from zero to fifteen (sixteen possible combinations of the four "on-off" bits), and a byte can represent any decimal number from zero to 255. But the computer doesn't work in Base 10; It works in Base 2, or the binary system.

In Base 2, each of the bits in a nibble or a byte is a digit of the binary number that the nibble or byte represents. Think not of decimal digits, though. These are *binary* digits. They can be only zeros or ones; not numbers from zero to nine. The place values of binary digits, therefore, are sequential powers of 2, not of 10.

Recall the years when you learned addition. There were the ones place, the tens place, and the hundreds place (all powers of 10). It's all the same in binary except that there is a ones place, a twos place, and a fours place (all powers of 2). The biggest three digit decimal (Base 10) number was nine ones plus nine tens plus nine hundreds:a total of 999. The highest three digit binary (Base 2) number is one one, one two, and one four, a total of seven. By adding one more power of 2 to the number, you can reason why a four bit nibble can be any number from zero to fifteen. Similarly, you can reason why an eight bit byte can be a number from zero to 255.

The **byte** is the standard unit of memory. There are 49,152 of them in the 48K Apple's memory. Typically, "*K*" stands for one thousand. Here it stands for 1024 because, of course, 1024 is a convenient power of 2, the tenth power. The 48K of your Apple refers to (48 * 1024) bytes: 49,152. The location in memory of any byte is its **address**. To store the addresses themselves in memory requires two bytes, for a total of sixteen bits and a number from zero to 65,535. 49,152 just won't fit in one byte.

Hexadecimal, or hex, is simply Base 16. Nearly everything done in machine language is in hexadecimal, while nearly everything done in BASIC is in decimal. Again, this is because sixteen is a convenient power of 2 (better for the Apple),and ten is not (although it's better for humans). Since there are only ten familiar single digit numbers, six more had to be invented. They turned out to be the letters A through F. So counting in hexadecimal goes, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, 10 ,11, 12, 13, 14....

In machine language, the Apple has to display the contents of memory locations (bytes). Since it would be inefficient and impractical for the Apple to display all bits of every byte, it displays them in hex. You can reason that it would take only two hexadecimal digits to display a number up to 255. To avoid confusion, when hexadecimal numbers are written, they are usually preceded by a dollar sign. But any time you come across letters from A through F where there should be numbers, there is a good chance that it's in hexadecimal.

The Three Modes of Display

The letters on the text screen, the blocks of the *Pong* game, and even the balls in *Raster Blaster* are all just memory. In fact, the entire screen is memory. Depending on what numbers are stored in that memory, you will see different characters, blocks, or dots on the screen. The mode (*i.e.*, text, low-resolution graphics, high resolution-graphics) determines the way in which the memory is expressed. Several memory locations called "soft switches" switch the three modes on and off. You select any particular mode by toggling the appropriate soft switch. Toggle (switch from 'on' to 'off' or from 'off' to 'on') a soft switch by accessing its memory address.

There are two commands in BASIC which do this, and numerous commands in machine language. The BASIC commands are PEEK (address) and POKE address,number. Incidentally, PEEK returns the decimal number (from zero to 255; it is a byte, remember) from the specified address. POKE does just the opposite; it stores a given number in the address. The analogous machine language commands are LDA $address and STA $address, which load and store the contents of the accumulator from and to the specified address.

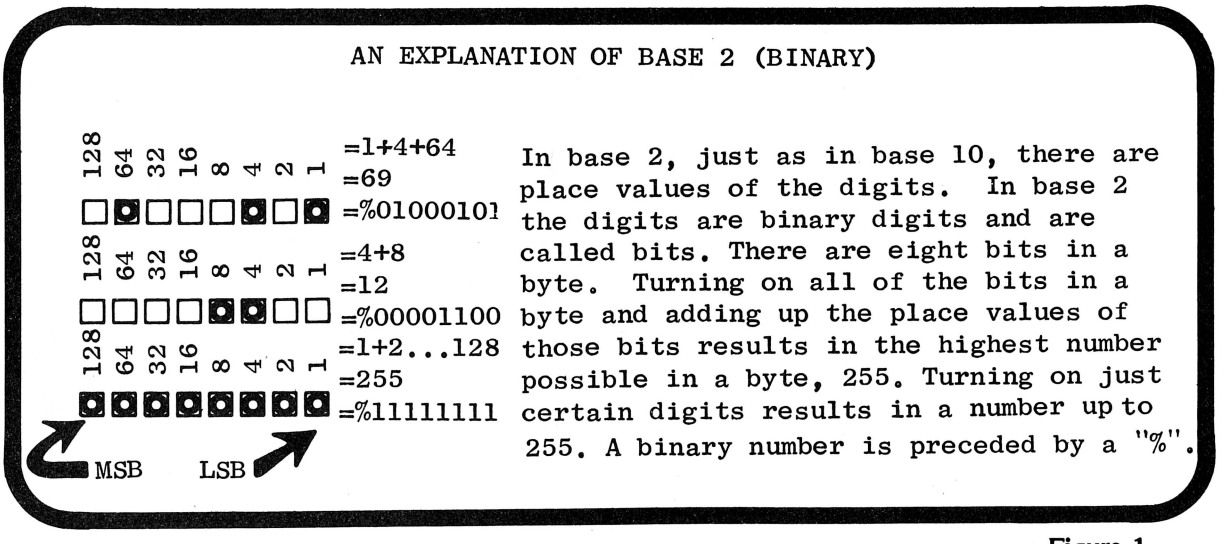


Figure 1

The address which turns on the text mode is -16303 in decimal and $C051 in hexadecimal. The address which sets the graphics mode is -16304 or $C050. Two more addresses determine whether the Apple will display Lo-Res or Hi-Res when it is displaying graphics: -16298 or $C056 for Lo-Res, and -16297 or $C057 for Hi-Res. There are four more soft switches which relate to graphics. They are discussed later on. At this point, experiment with the above four. In BASIC, type either **PRINT PEEK(address)** or **POKE address,0**. The significance here is accessing the memory. The number returned from a PEEK statement and the number poked with the POKE statement don't matter.

The TEXT Mode

Text is the most basic of the three modes. Memory in the text mode corresponds to characters (letters, numbers, symbols). One byte is equivalent to one character. There are 960 spaces for characters on the screen, forty wide by twenty-four high. Therefore, the screen memory should be 960 bytes long. Peculiarly, it's not! It is 1024 bytes long. The sixty-four extra bytes relate to the I/O cards in the back of the Apple - not too pertinent to graphics, so they will not be discussed here.

There are ninety-six letters in the ASCII alphabet, but you should recall that there are 256 different numbers possible in a byte. If there is a direct correspondence between bytes in memory and the letters on the screen, what becomes of the other 160 numbers? Inverse and flashing letters! The entire 256 letter character set is listed on Page Fifteen of the Apple Reference Manual.

The memory region which corresponds to text is from 1024 to 2048 or $400 to $800. Using the POKE command to poke numbers into that range of memory, you can make letters appear on the screen. Choose a letter and look up the ASCII code number that corresponds to it in the reference manual. Then either randomly pick an address from 1024 to 2048 or look again at the reference manual, this time at Page Sixteen, to find the address corresponding to a particular position on the screen. (You can see by now that the Apple Reference Manual is a pretty handy book to have around.) Next, simply POKE the number of the letter into the address and watch the letter appear on the screen. You can experiment similarly with the PEEK command to find which letters are in what locations on the screen.

You might just notice, when you are looking at the memory map in the reference manual, that the memory increases sequentially across the screen horizontally. Vertically, however, it doesn't increase by a consistent number, which you would expect to be forty. It increases by 128 for seven positions, then drops by 856, and then repeats that sequence two more times. This makes it rather difficult to calculate the base address of the Y coordinate of a letter somewhere on the screen. The memory has to be this way, however, because of the way the TV and monitor screens send out the picture in thirds to prevent dimming on the bottom of the screen.

The Lo-Res Graphics Mode

Enough of text. Now for the more exciting Lo-Res graphics. In this mode, bytes correspond to blocks on the screen instead of letters. There are sixteen possible colors of blocks. Since a nibble can store sixteen different numbers, from zero to fifteen, and since there are two nibbles in a byte, one byte can correspond to two blocks: a one-to-two correspondence. It follows that there are twice as many blocks in Lo-Res graphics as there are letters in text, all in the same amount of memory. The startling fact: It is the same range of memory. The -16304 ($C051 in hexadecimal) and -16303 ($C050) soft switches determine when this range is displayed as text and when it is displayed as graphics. The BASIC command **GR** switches to the graphics mode, clears the screen, and sets the text window to the bottom four lines of the screen. This prevents what you type from interfering with a picture in the upper twenty lines (forty-block rows) of the screen.

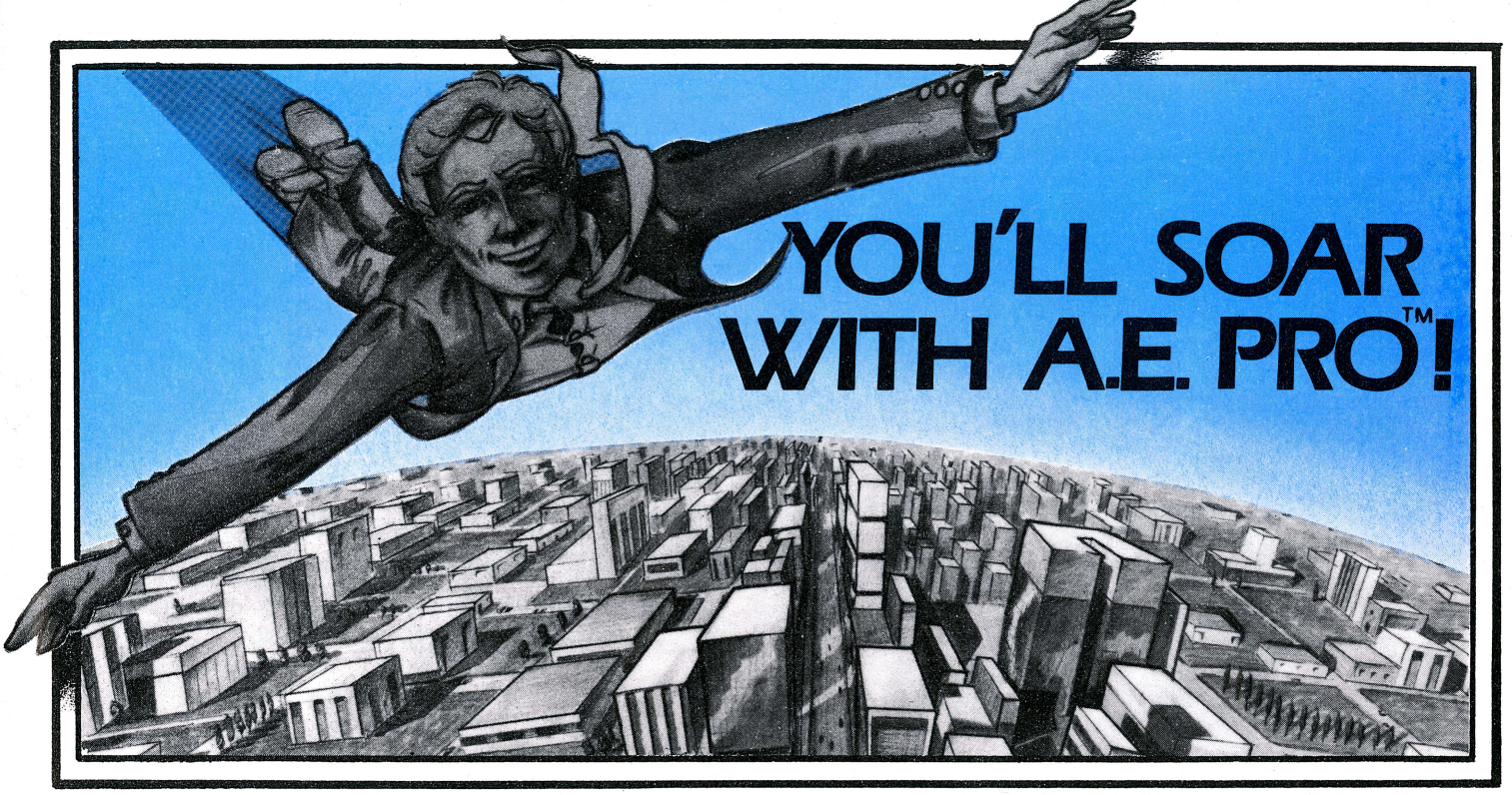
The four text lines at the bottom of the graphics screen are optional. Two more soft switches, -16302 ($C052) and -16361 ($C053), turn on and off the four lines of text. The former switch turns the text on and the latter turns it off. Since the memory of the Lo-Res screen and that of the text screen are the same, if you plot a block while displaying text, you will put a letter on the screen. Conversely, letters on the graphics part of the screen produce colored blocks. Incidentally, the Lo-Res command SCRN, which returns a number from zero through fifteen corresponding to the color of a block on the graphics screen, will also return 'half' (a nibble, that is) of the number corresponding to a letter on the text screen. This is how many of the fancy menu programs find the names of the files on the disk. You can experiment with the POKE command in Lo-Res graphics as you did in text, with the same range of memory. Also, by switching the soft switches, you can see how different letters correspond to different colored blocks. To clear the graphics screen, type the BASIC command, GR.

The last two soft switches are the most useful and yet most complicated of all of the soft switches. Their primary function is page flipping in Hi-Res graphics. You cannot page flip in Lo-Res or text, but you can do some interesting things such as displaying Page Two while drawing on Page One, or transferring one to the other and vice-versa.

Secretly, there is a second range of memory that can be displayed as text or Lo-Res graphics. This range is called Page Two text or Page Two Lo-Res graphics. The Apple can display either Page One or Page Two. These last two soft switches determine which one. The -16300 ($C054) soft switch tells the Apple to display the primary or Page One screen. The -16299 ($C055) soft switch tells it to display Page Two.

The range of memory for Page Two text and Lo-Res graphics is 2048 to 3072 in decimal or $800 to $C00 in hexadecimal. Incidentally, when you type in a program in BASIC, it usually also starts at 2048. So if you want to experiment with the POKE command, be sure that you are not destroying a program as you do so.

There is no simple way of plotting blocks or printing letters on Page Two of Lo-Res or text. This severely cripples the usefulness of a second Lo-Res or text screen, because there is no way of page flipping, that is, displaying one screen while drawing on the other and then drawing on the former while displaying the latter. Some of the fancy things you can do in Lo-Res or text, however, include transferring Page One to Page Two and vice-versa, or displaying Page



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Two while drawing on Page One (resembles page flipping but only half of it, aye?), or POKEing letters on the Page Two text screen. The question arises: "Well, why would anyone want to POKE or transfer letters from Page One to Page Two?" The answer is he probably wouldn't. But in a few instances, like when he is displaying Hi-Res Page Two and has the four lines of Page Two text on the bottom, he just might.

The Hi-Res Graphics Mode

At last, finished with text and Lo-Res graphics, and ready to move on to the Big Time: Hi-Res graphics. The Hi-Res graphics mode truly is much more exciting. The basic principles are very similar, but they are much more complicated. The results, however, are well worth the trouble, and that's why there are so many fantastic Hi-Res games on the market.

In high resolution graphics, each phosphor dot on the screen is considered as a unit, a memory location. Since there are no different types of dots except on and off, the memory correspondence is one-to-one, one dot to one bit. All fine and dandy, but there are only seven dots to a byte, and each byte contains eight bits. The mysterious extra bit is related to a shifting of the other seven dots. Actually, this shift is only a half shift to the right and is hardly noticeable on a black and white monitor. On a color monitor or TV set, however, the dots change color! This generalization holds true in almost all cases: a dot's color is determined by virtue of its position.

Fine. This leads to four colors: on-regular, on-shifted, off-regular, and off-shifted. (The latter two are both black and are virtually indistinguishable.) You may have heard that there are eight colors — which leaves four more to go.

Two of these four colors arise from the fact that all dots with odd horizontal coordinates appear one color, while all dots with even horizontal coordinates appear another color. The final two colors are both whites. Whenever two dots are adjacent to one another they will both turn white, regardless of the mysterious eighth bit. The whites do have a tint, either pinkish or bluish, which results from the eighth bit's being on or off, respectively. In summary, here are all the dot positions and the corresponding colors:

Positions and Colors of Dots

ON/OFF	X COORDINATE	ADJACENT	SHIFT	COLOR (FP BASIC)	HCOLOR NO.
on	even	no	yes	blue	6
on	even	no	no	violet	2
on	odd	no	yes	orange	5
on	odd	no	no	green	1
on	even or odd	yes	yes	white(pink)	7
on	even or odd	yes	no	white(blue)	3
off	even or odd	yes or no	yes	black	0
off	even or odd	yes or no	no	black	4

These four factors, odd/even, on/off, shift/no shift, and adjacent/not adjacent combine to make a quite ambiguous horizontal resolution (number of dots across the screen). All of the reference books will tell you that there are 280 dots across the screen. But the resolution drops by half when you want only one color or another because of the odd/even factor, resulting in a 140 resolution. (There is a secret way of achieving 280 color resolution to be divulged in "Part III - The Technique of Animation".)

Making things more ambiguous, there really is a 560 resolution due to the half-shifting of the high bit. There are restrictions to the 560 resolution in that there is only 560 resolution for one dot in each byte, *i.e.*, you cannot have one dot shifted and another not shifted if they are in the same byte. You can use the 560 resolution for lines and graphs, but in general it is not all that useful.

There are forty bytes across the Hi-Res screen, the same amount as in text or Lo-Res. You recall that each byte corresponds to seven dots and a "mystery dot". Forty bytes of seven dots each makes 280 dots. Needless to say, the screen display has to be many more than the forty dots high used in Lo-Res because if there were not, the dots would be very tall and skinny. It turns out that there are 192 dots vertically, which makes each dot relatively square, but not quite. And since they are not quite square, if you were to draw a shape on graph paper and then draw it on the screen as well, it would turn out oblong. To remedy this problem, you must use skewed graph paper or a skewed TV set. The

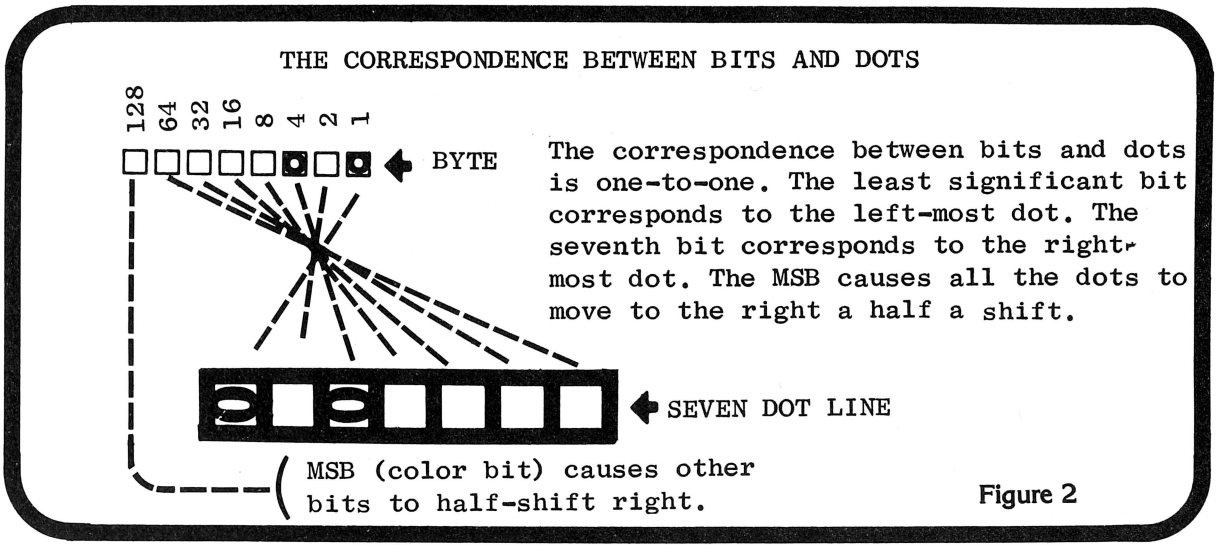
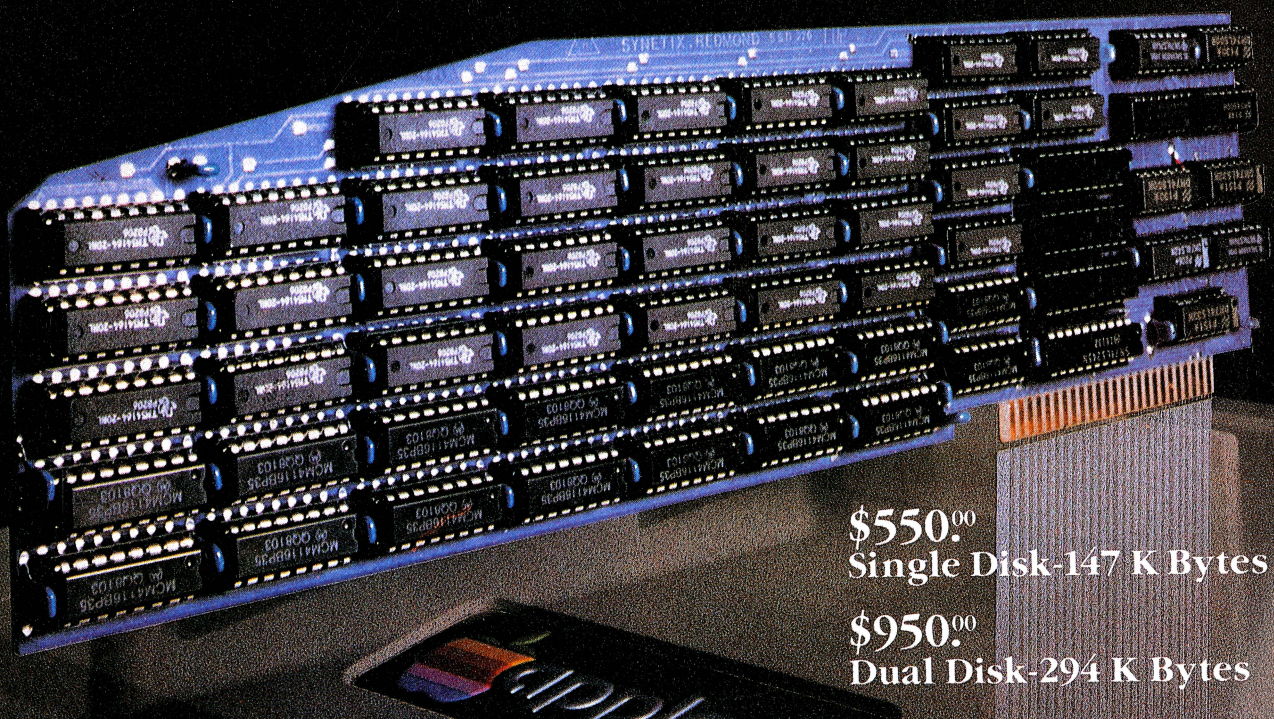


Figure 2

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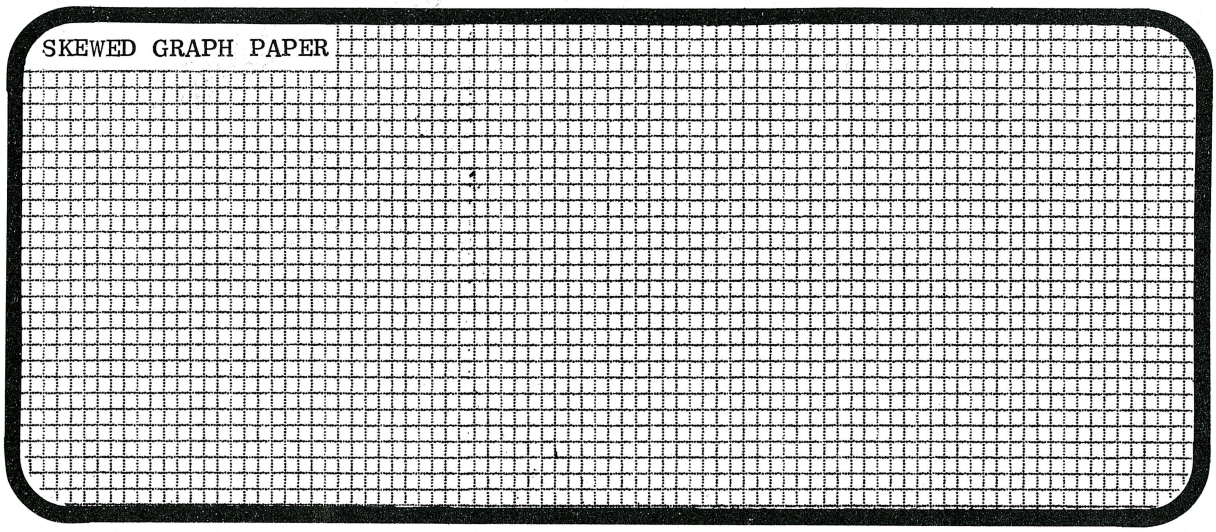
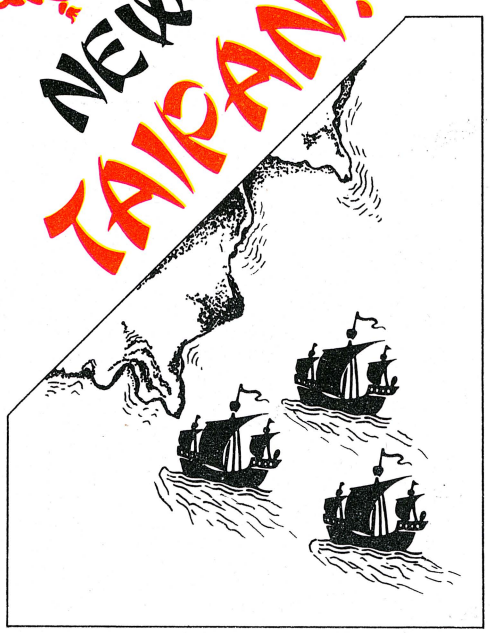


Figure 3

graph paper you can copy out of the back of this article or make yourself by printing a graph on the high resolution screen and then "dumping" it out on your printer. The TV set? Well, stick to the graph paper.

The memory locations of the Hi-Res screen are from 8192 to 16384, or $2000 to $4000. (The dollar sign indicates a hexadecimal or Base 16 number, remember?) The memory increases sequentially moving across the screen, but as in text, it follows a peculiar pattern vertically, and for the same reason. There is also a secondary page of Hi-Res graphics located between 16384 and 24574 or $4000 and $6000. You can display either Page One or Page Two using the appropriate soft switches. You can also draw on either screen at any time, even on the screen that is not

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on display. This leads to a technique called "page flipping" with which you can produce incredibly smooth animation with none of the "flicker" that often appears in fast-action games when shapes intersect. (Ever run the spaceship in Gorgon through the mountains? That's the flicker. Oh . . . sorry, Nasir.) Page flipping will be described in detail in "Part III – The Technique of Animation", the third article in this series.

You can practice with POKEing dots on the Hi-Res screen. But the process is a little bit more complicated than it is with the blocks of Lo-Res graphics or the letters of text. Each byte corresponds to seven dots and one mystery dot. More specifically, the eight bits in a byte correspond to those dots. Thus, in order to turn on a dot, you have to turn on the bit which corresponds to it. Here is a way of figuring it all out:

Think of one byte on the screen, represented by seven dots lined up to make a little horizontal line. If you were to POKE 255 into the address of that byte, you would turn on all seven dots plus the mystery dot, creating a little white line. If you POKEed a 0 into the address, you would get a black line. Moving from left to right, the seven dots correspond to the bit in a byte moving from the lowest LSB (least significant bit) to the seventh bit. The mystery dot corresponds to the eighth bit, or MSB (most significant bit). The MSB, remember, causes that half-shift to the right in all the other bits. For example, if you POKEd 8192,1 you would get a little dot on the leftmost edge of the screen. If you POKEd a two, the dot would move over one space to the right. If you POKEd a four it would move one more space to the right. And if you POKEd a seven you would get a small three-dot line from the left-most side of the screen. Refer to Figure 2.

If you use the PEEKs and POKEs to experiment, be careful to use the memory range between 8192 and 24574. Also, you may destroy the end of a program if it is very long and extends into the Hi-Res screens.

A Taste of Routines to Come

The forthcoming machine language graphics routines are fast. Very fast. But they are rather long in code, so it takes a little while to type them in. It isn't so much in the long and complicated programs that the length of the routines bothers a programmer, but in the short and simple programs. To make a long and complicated graphics program, you have to type in almost nothing more for graphics routines than you would to make a simple graphics program. And so, in the simple and short program, the graphics routines look inordinately long and cumbersome to type in. (Can you see through this extravagant circumlocution? The following demonstration is a short and simple program, but you have a lot of typing ahead of you. We'll salvage some of your typing in the next article, along with a more complete explanation.

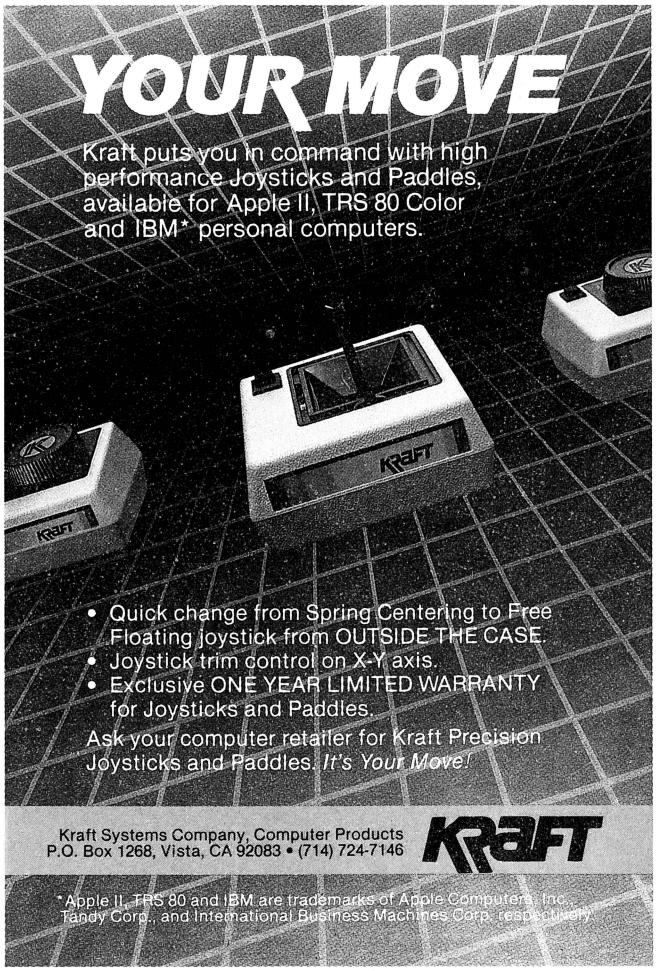
So, this demonstration is for those of you who are too eager to wait for the next issue of APPLE ORCHARD, for those who can disassemble the code for their own programs, for those who have a long and lazy afternoon to spare, and for those who truly get a thrill out of typing 1,440 numbers into a computer.

Before you decide to type in (or not type in) this demonstration, this is what it does: it displays a little space ship in the middle of the screen, and moves this shape around in a figure-eight pattern. The smoothness of the graphic motion and the speed are exemplary of the routines in the next issue. After all, this demo contains routines from the next issue, but in a less readable form.

So . . . you've decided to type it in? What we've presented is a "Hex Dump", a listing of a portion of the computer's memory and its contents. Any hex dump can be typed into the computer, where a **BRUN** command makes it operate; it's a machine language program. It operates, that is, if it was typed in correctly.

From BASIC, type "**CALL-151**" and press **RETURN**. You will be prompted by a "*" and the flashing cursor. Then type the first four-digit number from the hex dump listing followed by the eight two-digit numbers to the right of it. Press **RETURN**. Do this for the entire list. To save the program after you've typed it, type "**Ctrl-D BSAVE DEMO, A$800,L$800**". You are still in the Monitor, not in BASIC. Run the program by typing "**A70G**" and pressing RETURN. To return to BASIC, type "**3D0G**" (that's **3 - D - zero - G**) and pressing **RETURN**. Later, when you want to show someone what you did, type "**BRUN DEMO**" to rerun the program.

(In the second article of this series, Mr. Harvey presents a method of creating shapes which "puts it all together" Part 2 will appear in the November-December **APPLE ORCHARD**.)



Hex Dump - Graphics Demo

```
*800.B6F

0800- 4C 70 0A 20 24 28 2C 30
0808- 34 38 3C 20 24 28 2C 30
0810- 34 38 3C 21 25 29 2D 31
0818- 35 39 3D 21 25 29 2D 31
0820- 35 39 3D 22 26 2A 2E 32
0828- 36 3A 3E 22 26 2A 2E 32
0830- 36 3A 3E 23 27 2B 2F 33
0838- 37 3B 3F 23 27 2B 2F 33
0840- 37 3B 3F 20 24 28 2C 30
0848- 34 38 3C 20 24 28 2C 30
0850- 34 38 3C 21 25 29 2D 31
0858- 35 39 3D 21 25 29 2D 31
0860- 35 39 3D 22 26 2A 2E 32
0868- 36 3A 3E 22 26 2A 2E 32
0870- 36 3A 3E 23 27 2B 2F 33
0878- 37 3B 3F 23 27 2B 2F 33
0880- 37 3B 3F 20 24 28 2C 30
0888- 34 38 3C 20 24 28 2C 30
0890- 34 38 3C 21 25 29 2D 31
0898- 35 39 3D 21 25 29 2D 31
08A0- 35 39 3D 22 26 2A 2E 32
08A8- 36 3A 3E 22 26 2A 2E 32
08B0- 36 3A 3E 23 27 2B 2F 33
08B8- 37 3B 3F 23 27 2B 2F 33
08C0- 37 3B 3F 20 24 28 2C 30
08C8- 34 38 3C 20 24 28 2C 30
08D0- 34 38 3C 21 25 29 2D 31
08D8- 35 39 3D 21 25 29 2D 31
08E0- 35 39 3D 22 26 2A 2E 32
08E8- 36 3A 3E 22 26 2A 2E 32
08F0- 36 3A 3E 23 27 2B 2F 33
08F8- 37 3B 3F 23 27 2B 2F 33
0900- 37 3B 3F 00 00 00 00 00
0908- 00 00 00 80 80 80 80 80
0910- 80 80 80 00 00 00 00 00
0918- 00 00 00 80 80 80 80 80
0920- 80 80 80 00 00 00 00 00
0928- 00 00 00 80 80 80 80 80
0930- 80 80 80 00 00 00 00 00
0938- 00 00 00 80 80 80 80 80
0940- 80 80 80 28 28 28 28 28
0948- 28 28 28 A8 A8 A8 A8 A8
0950- A8 A8 A8 28 28 28 28 28
0958- 28 28 28 A8 A8 A8 A8 A8
0960- A8 A8 A8 28 28 28 28 28
0968- 28 28 28 A8 A8 A8 A8 A8
0970- A8 A8 A8 28 28 28 28 28
0978- 28 28 28 A8 A8 A8 A8 A8
0980- A8 A8 A8 50 50 50 50 50
0988- 50 50 50 D0 D0 D0 D0 D0
0990- D0 D0 D0 50 50 50 50 50
0998- 50 50 50 D0 D0 D0 D0 D0
09A0- D0 D0 D0 50 50 50 50 50
09A8- 50 50 50 D0 D0 D0 D0 D0
09B0- D0 D0 D0 50 50 50 50 50
09B8- 50 50 50 D0 D0 D0 D0 D0
09C0- D0 D0 D0 48 98 48 A0 00
09C8- C8 EA EA EA EA D0 F9 68
09D0- A8 68 60 48 98 48 A9 00
09D8- 85 FE A9 20 85 FF A0 00
09E0- A9 00 91 FE E6 FE D0 FA
09E8- E6 FF A5 FF C9 40 F0 05
09F0- A9 00 4C E2 09 68 A8 68
09F8- 60 48 8A 48 A2 08 AD 02
0A00- 03 8D 01 03 AD 03 03 0E
0A08- 01 03 2A CD 00 03 90 06
0A10- ED 00 03 EE 01 03 CA D0
0A18- EE 8D 09 03 68 AA 68 60
0A20- 8A 48 98 48 AD 05 03 AA
0A28- 18 6D 08 03 8D 07 03 A0
0A30- 00 BD 03 09 18 6D 04 03
0A38- 85 F8 BD 03 08 85 F9 B1
0A40- FA 91 F8 C8 B1 FA 91 F8
0A48- C8 B1 FA 91 F8 C8 B1 FA
0A50- 91 F8 C8 B1 FA 91 F8 18
0A58- A5 FA 69 05 85 FA A5 FB
0A60- 69 00 85 FB E8 EC 07 03
0A68- D0 C5 68 A8 68 AA 60 EA
0A70- 20 D3 09 A9 12 8D 08 03
0A78- AD 50 C0 AD 57 C0 AD 52
0A80- C0 A9 03 8D 0B 03 A9 60
0A88- 8D 05 03 A9 80 8D 06 03
0A90- A9 00 85 FC 8D 10 03 A9
0A98- 5A 8D 11 03 A9 B4 8D 12
0AA0- 03 A9 0E 8D 13 03 A9 68
0AA8- 8D 14 03 A9 C2 8D 15 03
0AB0- A9 1C 8D 16 03 A9 0C 8D
0AB8- 18 03 8D 19 03 8D 1A 03
0AC0- A9 0D 8D 1B 03 8D 1C 03
0AC8- 8D 1D 03 A9 0E 8D 1E 03
0AD0- A9 0F 85 FD A0 00 B1 FC
0AD8- 29 10 F0 0E B1 FC 29 03
0AE0- 18 6D 06 03 8D 06 03 4C
0AE8- FB 0A B1 FC 29 03 8D 07
0AF0- 03 AD 06 03 38 ED 07 03
0AF8- 8D 06 03 B1 FC 29 20 D0
0B00- 10 B1 FC 29 0C 4A 4A 18
0B08- 6D 05 03 8D 05 03 4C 24
0B10- 0B B1 FC 29 0C 4A 4A 8D
0B18- 07 03 AD 05 03 38 ED 07
0B20- 03 8D 05 03 AD 06 03 8D
0B28- 02 03 A9 00 8D 03 03 A9
0B30- 07 8D 00 03 20 F9 09 AD
0B38- 01 03 8D 04 03 AE 09 03
0B40- BD 10 03 85 FA BD 18 03
0B48- 85 FB 20 20 0A E6 FC A5
0B50- FC C9 40 D0 04 A9 00 85
0B58- FC AC 0B 03 20 C3 09 20
0B60- C3 09 20 C3 09 88 D0 F4
0B68- 4C D4 0A FF FF FF FF FF

*C00.E7F

0C00- 00 00 00 00 00 00 00 00
0C08- 00 00 00 00 00 00 00 00
0C10- 1C 1C 00 00 00 2A 36 00
0C18- 00 00 6A 35 00 00 00 2C
0C20- 1D 00 00 00 30 05 00 00
0C28- 00 20 03 00 00 00 4E 39
0C30- 00 00 00 1F 7C 00 00 00
0C38- 1F 7C 00 00 00 0E 38 00
0C40- 00 00 0E 38 00 00 00 04
0C48- 10 00 00 00 00 00 00 00
0C50- 00 00 00 00 00 00 00 00
0C58- 00 00 00 00 00 00 00 00
0C60- 00 00 00 00 00 00 00 00
0C68- 00 00 38 38 00 00 00 54
0C70- 6C 00 00 00 54 6B 00 00
0C78- 00 58 3A 00 00 00 60 0A
0C80- 00 00 00 40 06 00 00 00
0C88- 1C 73 00 00 00 3E 78 01
0C90- 00 00 3E 78 01 00 00 1C
0C98- 70 00 00 00 1C 70 00 00
0CA0- 00 08 20 00 00 00 00 00
0CA8- 00 00 00 00 00 00 00 00
0CB0- 00 00 00 00 00 00 00 00
0CB8- 00 00 00 00 00 00 00 00
0CC0- 00 00 00 00 70 70 00 00
0CC8- 00 28 59 01 00 00 28 57
0CD0- 01 00 00 30 75 00 00 00
0CD8- 40 15 00 00 00 00 0D 00
0CE0- 00 00 38 66 01 00 00 7C
0CE8- 70 03 00 00 7C 70 03 00
0CF0- 00 38 60 01 00 00 38 60
0CF8- 01 00 00 10 40 00 00 00
0D00- 00 00 00 00 00 00 00 00
0D08- 00 00 00 00 00 00 00 00
0D10- 00 00 00 00 00 00 00 00
0D18- 00 00 00 00 00 00 60 61
0D20- 01 00 00 50 32 03 00 00
0D28- 50 2E 03 00 00 60 6A 01
0D30- 00 00 00 2B 00 00 00 00
0D38- 1A 00 00 00 70 4C 03 00
0D40- 00 78 61 07 00 00 78 61
0D48- 07 00 00 70 40 03 00 00
0D50- 70 40 03 00 00 20 00 01
0D58- 00 00 00 00 00 00 00 00
0D60- 00 00 00 00 00 00 00 00
0D68- 00 00 00 00 00 00 00 00
0D70- 00 00 00 00 00 00 00 00
0D78- 40 43 03 00 00 20 65 06
0D80- 00 00 20 5D 06 00 00 40
0D88- 55 03 00 00 00 56 00 00
0D90- 00 00 34 00 00 00 60 19
0D98- 07 00 00 70 43 0F 00 00
0DA0- 70 43 0F 00 00 60 01 07
0DA8- 00 00 60 01 07 00 00 40
0DB0- 00 02 00 00 00 00 00 00
0DB8- 00 00 00 00 00 00 00 00
0DC0- 00 00 00 00 00 00 00 00
0DC8- 00 00 00 00 00 00 00 00
0DD0- 00 00 00 07 07 00 00 40
0DD8- 4A 0D 00 00 40 3A 0D 00
0DE0- 00 00 2B 07 00 00 00 2C
0DE8- 01 00 00 00 68 00 00 00
0DF0- 40 33 0E 00 00 60 07 1F
0DF8- 00 00 60 07 1F 00 00 40
0E00- 03 0E 00 00 40 03 0E 00
0E08- 00 00 01 04 00 00 00 00
0E10- 00 00 00 00 00 00 00 00
0E18- 00 00 00 00 00 00 00 00
0E20- 00 00 00 00 00 00 00 00
0E28- 00 00 00 00 00 0E 0E 00
0E30- 00 00 15 1B 00 00 00 75
0E38- 1A 00 00 00 56 0E 00 00
0E40- 00 58 02 00 00 00 50 01
0E48- 00 00 00 67 1C 00 00 40
0E50- 0F 3E 00 00 40 0F 3E 00
0E58- 00 00 07 1C 00 00 00 07
0E60- 1C 00 00 00 02 08 00 00
0E68- 00 00 00 00 00 00 00 00
0E70- 00 00 00 00 00 00 00 00
0E78- 00 00 00 00 00 00 00 00

*F00.F40

0F00- 39 39 39 35 35 35 36 36
0F08- 36 12 12 12 16 16 15 15
0F10- 15 04 15 04 15 04 04 05
0F18- 04 05 04 05 05 05 05 06
0F20- 06 07 27 2A 2A 2A 2A 25
0F28- 25 26 26 02 06 06 09 0C
0F30- 0C 0C 19 19 16 12 35 39
0F38- 39 28 29 29 28 35 35 11
0F40- B9
```

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VisiCalc Tips and Techniques

Part 2: Printing, Saving and Enhancements

Joseph J. Sobel and Barry D. Bayer

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IN OUR LAST article we explored some of the ways you could enhance your use of VisiCalc. These included tips on planning your worksheet to make it more efficient and tips on how to increase your own efficiency in preparing the Templates. Now we'll go on to the next steps, saving and printing the results of our efforts. We'll also look at some of the available hardware and software that can make VisiCalc easier to use and improve the appearance of your reports.

First, let's explore the techniques involved in saving and printing your Templates. In a sense, these are similar Functions, which can place VisiCalc data, in one form or another, onto either paper or disk.

VisiCalc's **Printing** Function is initiated with a **/P** Command. **/P** directs the "printing" of the labels and calculated values in a user defined rectangular area. The printed data looks very much like that shown on the VisiCalc screen display. The **Saving** Function is initiated with a **/SS** Command. **/SS** directs the "saving" of the contents of each Cell of the entire VisiCalc Template. Although each Cell's format, if any, is saved, the label, value or formula is saved just as you typed it rather than as it appears on the screen.

The *DIF* Function, which is initiated by the **/S#S** Command, actually saves a rectangular area, similar to that stored on disk by the Print to Disk Command, but it saves the *values* resulting from the Formulas contained in each Cell within the defined area.

Printing to the Printer (/PP).

This Command will print a rectangular portion of the Template just as you see it on the screen. It will show all labels, to the extent of the Global Column Width which has been set, values contained within Cells and the values which result from the formulas contained within Cells. To print a Template, place the Cursor on the Cell in the upper left corner of the area you wish to print. Now, type in the print Command, **/PP**, or **/P<RETURN>**, depending upon the type of printer and interface that you have. Type in the Coordinate location of the lower right Cell of the area to be printed, or move the Cursor to that location, and then hit <RETURN>.

If VisiCalc doesn't recognize your printer interface card (Mountain Computer's CPS Multifunction card, for example) you may have to type your slot number instead of the second "P". (If the interface card is in Slot 1, the Command would be **/P1**.) The balance of the Command sequence should remain the same.

If you require a software driver to run your printer from the game I/O port, or from the "nonfirmware" alternate on your SSM AIO card, to give two examples, VisiCalc just can't handle it, directly. (But, see the section on interfacing word processors to VisiCalc, below, for a partial answer to your problems.)

Some printers require "setup strings" such as **Ctrl-I80N** or **Ctrl-I132N** to tell the interface card to print a line 80 or 132 characters long before issuing a line feed. As shown in the VisiCalc manual, Control characters in setup strings should not be entered by holding down the Control key. Instead, the character to be designated as the Control character should be preceded by "^C". Therefore, **^CI** is a "Control-I". Similarly, Escape characters are preceded by a "^E" rather than "ESC", Carriage Returns are entered as **^R**, a Linefeed as **^L** and a single ASCII character may be entered by preceding its hexadecimal number with "**^H**".

To illustrate, the setup string **^CI80N^E4^H7** would translate as "Control-I80N, Escape 4, ASCII character 7". According to the VisiCalc manual, the setup string required for your particular printer and interface card must be entered each time that you print a report, but some printers and interface cards will "remember" a setup string until another one replaces it, or until the printer is turned off. Experiment, and you may be able to save yourself some bother when printing a series of reports.

If the printed report is to be double or triple spaced, or if the entire report prints on a single line, you will have to use the "**-**" or" **&**" characters before you type the lower right Cell Coordinate to be printed. The interface card you are using may be inserting one or more Linefeeds after the <RETURN> (Control-M) found at the end of each line of a VisiCalc Template. And your printer may be inserting another Linefeed after it sees the VisiCalc Carriage Return. This combination would result in triple spacing, at least. The "-" entered prior to

the lower right Cell Coordinate will suppress the Linefeed that VisiCalc inserts. You may have to suppress the other Linefeeds manually on the printer or the interface card.

If you require a Linefeed so your entire report does not appear on one line, (making it quite difficult to read), you may instruct VisiCalc to issue another Linefeed after the Carriage Return at the end of each line by entering "**&**" before you enter the lower right Cell Coordinate. The "**-**" and "**&**" are "sticky" and will be remembered by VisiCalc until you turn the computer off or reboot the program. Therefore, this Command will only have to be entered the first time you print a report during each session. The manuals that came with your printer and interface card will prove to be an invaluable aid in determining the Setup you require.

Printing to Disk,(/PD) Printing to File (/PF).

/PD or **/PF** may be used interchangeably, and will print the rectangle specified by the upper left and lower right Coordinates, in a form just as printed on a printer, *i.e.*, showing values calculated from the formulas rather than the formulas themselves, with the set Column width for each Column. Each line is stored on disk as a separate string, or record, terminated by a Carriage Return (Control-M). The file will be saved as a standard Apple text file and will not contain "Go To Coordinate" Commands with each Cell's values or labels. This will allow further manipulation of the file with other programs such as Context Connector, VU#3, etc. Furthermore, you can edit the data with a text editor or word processor and then print your reports using the editor or word processor.

It's always a good idea to have one or more blank disks on hand in the event that you encounter a Disk Full error while you are printing a file to disk. If the disk has been initialized, you can reprint the file to the new disk. If you do not have a blank initialized disk, you may initialize a blank disk with the **/SI** (Initialize) Command in VisiCalc and then reprint the file to this new disk.

Saving to Disk (/SS)

This Command is the basic VisiCalc "save" and will store the file on disk as a text file. However, the **/SS** text file differs from the text file saved by the Print to Disk Command discussed above. The file created using the Storage Save Function will contain "leading Command characters" at the beginning of each record which tell VisiCalc in which Cell the data is to be stored. It also contains the formats, labels, values or formulas themselves, just as they were typed in by the user. The leading characters correspond to the VisiCalc "Go To Coordinate" Command and the Format Commands which format the calculated values for Cell or screen display. For example:

>B24:/F$@SUM(B10 . . . B22)

This indicates that Cell B24 has been set with a local format to display two decimal places and the Cell contains the formula to add the values of Cells B10 through B22 inclusive.

Whenever you are "saving" anything, have a blank initialized disk on hand in the event that you encounter a Disk Full error as discussed above in connection with the Print to Disk Command. If you want to update an existing file you can record over it. After pressing **/SS**, keep hitting the right arrow key until the name of the file you wish to save appears on the Edit Line. When you reach the desired filename, press **<RETURN>**. You will then be prompted to press **Y** to confirm that you do want to replace the existing file. A **Y** will finish the saving process; anything else will cancel the Command, and clear the prompt line.

If you wish to save the latest version of your Template without eliminating the old one, "right arrow" through the catalog again, until you get to the correct file name, and append a **.1** to it, and then press **<RETURN>**. The result will be a new file saved under a slightly different file name, which will show the relationship of the two. This method eliminates recording unnecessary files due to typing errors. It may also eliminate the confusion of having several files with similar names and not knowing which is the latest version.

Saving to Printer (/SS,SSlotnumber)

With VisiCalc versions 193B0 and later (the Apple II 16 sector versions) the formulas in each Cell may be printed on your printer directly from VisiCalc using the Storage Save Command (**/SS**). This is accomplished by typing **,S1** when prompted for a file name, where "S1" is the slot number of the printer card. This Command may be difficult to find in the documentation as it is located under the heading of "Saving" rather than "Printing". Notice that your Template formulas will be printed upside down and backwards, starting with the lowest and rightmost Cell of the Template, proceeding toward the left of the Template, then up to the rightmost Cell of the next highest Row and so on until the contents of the upper left Cell have been printed.

After the formula, or other Cell contents of the upper left Cell have been printed, several additional lines of data will be printed. At first these lines may appear to be garbage, but upon closer examination you will see that these lines resemble VisiCalc Commands. Sure enough, the end of the printout shows the Global Commands you have set for the sheet, or the Global default Commands for those you did not change. These lines and their related explanations may appear as follows:

Printout	Explanation
/W1	First window data
/GOC	Order of Recalculation set to Columnar
/GRM	Recalculation set to Manual
/GF$	Global Dollar display format, *i.e.*, 2 decimal places displayed
/XV21	Cursor set for second window vertically at absolute screen position 21
/GC13	Global Column width of 13 characters
/X->A1:>D1:;/GC7	Data applicable to the second window: X represents the Cursor. The - is the Cursor direction. The first Coordinate is the Cell in the upper left of the screen. The second Coordinate is the last location of the Cursor. The ; indicates that the Cursor was left in this window and the Global Column width of this window is then shown.
/X->F1:>H14	This is data applicable to the second window and contains data relative to Cursor position and screen display similar to that shown above.

Saving a file in the Data Interchange Format, (DIF files,/S#S).

DIF files are saved in a special format which can be read and used by programs such as DeskTop Plan, VisiPlot/VisiTrend DB Master, and others. The VisiCalc manual contains information sufficient to permit the experienced Applesoft programmer to generate a DIF file for loading into a VisiCalc Template, or to read and manipulate a DIF file written by VisiCalc. For example, one could write an Applesoft program to enter data in a "user friendly" manner, sort the data, and then reload the data to a VisiCalc Template for further manipulation.

DIF files may also be reloaded into another VisiCalc Template or into the same Template in another location. A major advantage of this type of file is that it need contain only a portion of the entire Template, and may be saved and/or reloaded beginning at any location on a Template. A DIF Save or Load will begin at the location of the Cursor at the time the file is saved or loaded. The data in Columns may be saved in Row order, or by Columns, and may then be reloaded by Columns or Rows, thus changing the orientation of the data. Obviously, care must be taken in planning the saving and reloading of such files in order to avoid unwanted results from improperly reloading the data.

But that's not the complete DIF story. A DIF save (**/S#S**) converts old formulas to the then calculated value of the formula, in effect "pounding" each Cell, thus making the values in the Cells impervious to new recalculations. This is extremely useful for transmitting data from one Template to another, for example, in "rolling" last month's total into this month's results, or to consolidate the results of a "divisional" Template into one for the entire company.

It's a good idea to designate files saved with the DIF Command with a suffix such as "**.DIF**". You may also want to use an additional suffix to indicate whether the file was saved by Rows or by Columns. The right arrow technique discussed above may also be used when saving or loading DIF files. You can cursor through the directory to the name of the Template you are working on and then type **.DIF**. The data will then be saved with this "modified" filename which will allow you to readily identify the file.

Whenever you wish to print a portion of your Template (**/PP**), you must set your Cursor at the upper lefthand corner of the area to be printed. Here's how to insert some useful information in this Cell to aid in the printing of your reports. Assuming that there is a label and not a value in the upper lefthand Cell, retype or edit the data that is contained there, but type enough "blank" trailing spaces as may be necessary to fill the balance of the Cell's width. Then continue to type, inserting the lower right Cell number to which you will print, *e.g.*, "L45". When you place the Cursor at this upper left Cell to begin printing, you will see the Coordinate location to be printed through displayed on the entry contents line. However, it is not displayed in the Cell Cursor printed on the Template itself. The following is an example of how the contents of a 9 character wide Cell might appear:

Contents of Cell: **INCOME ST**
Contents of Entry Line: **INCOME ST LOWER RIGHT L45**

In cases where your Template is too large to print as one sheet, or in instances where you want separate reports printed from a single Template, you can use this labeling technique at the upper left Cell of each report that will be printed.

To determine the maximum number of Columns that may be printed in a VisiCalc Template, first check the size of your

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type font, and the width of your paper. Standard 10 pitch type can print 80 columns on 8 ½ inch wide paper, and 132 columns on 15inch paper. 16.5 pitch type (the usual "condensed" print on dot matrix printers, these days) can handle 132 columns on 8-½ inch, and 232 on 15 inch paper. Once you have the maximum number of spaces per line that your printer and paper can handle, you need only divide that number (you can use VisiCalc, of course) by the Globally set Column width, to determine the number of Columns possible. But even if you do all this, it's still a good idea to "test print" one or two lines before printing your report, just to make sure.

If the Template is too wide for a single sheet, you may print as many Columns as you can fit on the width of the page, leaving a small margin on the right side of the sheet. Be sure you begin printing at the top of the form. Reset the printer to top of form on a new page and begin printing the balance of the sheet starting with the first Column which was not printed on the previous pass. These consecutive prints may be done as many times as necessary until the entire width of the Template is printed. You may now "paste up" your report. This can be done by gluing, taping or pasting the individual portions of the report together and overlapping the margins you left on the right side of each sheet.

IMPORTANT!!! Remember to always begin printing each portion of the Template at the same top of form position and always begin the printing with the Cursor located on the same VisiCalc Row number. This will allow for proper alignment of the finished product.

Another helpful printing tip to remember is to set your printer for "automatic boundary skip" in order to avoid losing some data at the perforation between pages. If your printer doesn't have this feature, or if you'd rather insert the boundary skip exactly where you want it, do this by including blank lines in the Template at the appropriate positions so that a boundary skip is "embedded" in the Template itself. We suggest that these blank lines may be inserted *after* the Template is saved to disk, and just before printing. (There's also an automatic way to do this, which we'll discuss, below.)

You can also print several distinct reports, each beginning at the top of a new page, even though all of the reports are contained on a single Template. This is accomplished by merely printing the portion of the Template you wish and then moving to the top of the next form (page) before beginning to print the next report. Remember, when the Template is printed, only the "report" portion of the sheet needs to be printed for your formal presentation. The "calculations" and "input" sections of your report need not be printed.

Other Products

We hope to have simplified the saving and printing of your Templates and reports. Now, let's explore some of the products which will make VisiCalc easier to use, and more powerful.

There are many programs on the market to manipulate VisiCalc files. These include:

A. VersaCalc 16
B. VU#3 (VisiCalc Utility #3)
   and its predecessors VU#1 and VU#2.
C. Visi-Caids
D. Context Connector
E. The Consolidator
F. Visiblend

These VisiCalc add ons perform various feats of magic with VisiCalc files.

VersaCalc 16 provides you with instructions on using an otherwise undocumented feature of VisiCalc which enables the user to create a disk file of executable commands, similar to Apple's EXEC files, using VisiCalc's "Print to Disk" Command.

To create such a file, enter (a series of) Commands into VisiCalc Cells as right-justified labels. Each "Command" must be preceded by an instruction to "Go To" a given Cell (**>Cellname**), and a "**:**". In fact, you'll find that these commands look very much like an **/SS,S**slotnumber printout. For example, the following might be entered in a blank VisiCalc Template:

```
>A30:IR
>A30:IR
>G10:DC
>G10:/SL NEXTFILE
```

When these Commands are Printed to Disk (**/PF** or **/PD**) and then Loaded with the **/SL** Command, the Cell data are handled as if they were keystrokes entered directly at the keyboard. When the four lines listed above are Loaded (**/SL**) into the Template you wish to modify, they will move the Cursor to Cell A30, and insert two Rows, move the Cursor to Cell G10, delete a Column, and finally load NEXTFILE on top of the existing Template.

The "page break" Rows spoken of above can be automated by saving the following file to disk:

```
>A64:/IR
>A64:/IR
>A64:/IR
>A64:/IR
>A130:/IR
>A130:/IR
>A130:/IR
>A130:/IR
```

When you are ready to print your multipage report, (after saving the final version to disk with a **/SS**(ave Command, simply **/SL**(oad the print to disk file, and you will find two, four line page breaks automatically inserted into the file.

When thinking about a VisEXEC file, you should also review the "/" language sequences at the end of your /SS, SSlotnumber printouts. Because just about anything in those printouts (including windowing, titles, Column widths, and formatting) can be included in a VisEXEC file, and be used to automatically handle your VisiCalc calculation files.

VersaCalc 16 includes a tutorial, which fully explains the use of this EXEC feature, and a Utility Disk containing VisiCalc files which can be used to simplify the building of these Print to Disk files. VersaCalc 16 also includes an Applesoft program which will take the data from a VisiCalc Print to Disk file and sort the items in ascending or descending order. The data can be a Row or Column of VisiCalc labels or numbers, but the data from only one Row or Column may be sorted. VersaCalc then prepares a new file containing a series of Go to Coordinate and Move Commands which moves these Columns or Rows within a VisiCalc Template into the proper order right before your very eyes.

Context Connector will allow you to reform Print to Disk text files from one set Column width to several Columns of another

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specified width, *e.g.*, dividing one 36 character column into four 9 character Columns or vice-versa. You can also take standard Apple text files, even those downloaded from another computer, and transform them into standard VisiCalc text files which will reload into a VisiCalc Template beginning at the Coordinate location you specify. The package contains a communication program as well to allow you to access another computer for the data.

VU #3 (VisiCalc Utility #3) will allow you to relocate Rows or Columns of data from one area of a Template to another area. You may also write a single VisiCalc file comprised of several files and vice-versa.

Visi-Caids will allow you to print a Template comprised of Columns having different widths. For example, Column A could be 3 characters wide, Column B could be 20 characters, Columns C through H might be 12 characters each and Column I might be 4 characters wide.

The Consolidator and Visiblend each enable automatic rolling and consolidation of VisiCalc Templates, useful and necessary functions which were very difficult to do prior to DIF and VisEXEC files, but which can now be done with VisiCalc, itself. These programs perform their functions automatically, however, and a bit easier than "doing it yourself with VisiCalc."

Each of these programs allows you to perform other functions in addition to those described here, and most contain functions common to the other programs as well. A thorough reading of the documentation or product reviews in this magazine, or in magazines with columns specializing in VisiCalc matters (*Nibble, Softalk*, and *Desktop Computing*, to name three) is advisable in order to provide you with enough information so that you may select the one(s) most appropriate for your application. And of course, the value of a friendly and knowledgeable computer store salesman cannot be over-estimated. These programs may not only assist you in accomplishing what you want to do, but may help you to understand much more about VisiCalc itself. The techniques which you will learn from these programs can provide you with the means to further your own abilities with VisiCalc.

Possibly the most significant advance for the VisiCalc user has been the development of 32K, 64K and 128K RAM Expansion Boards manufactured by Saturn Systems and others. These RAM expansion boards in conjunction with a software package such as Saturn's VC-EXPAND, will modify VisiCalc, in RAM, to allow it to utilize these memory boards in order to increase the size of your available workspace. With Saturn's products you may use multiple RAM boards and obtain up to 176K of usable space which can be saved on multiple diskettes in consecutively numbered files. Incredible as it sounds, it really works. In addition, if you have a Videx Videoterm 80 Column Board, VC-EXPAND/80 will allow you to use VisiCalc in 80 column mode with your Apple II as well as utilizing the memory available on the Saturn RAM Boards. For those of you who do not require the added memory, but are in need of the 80 column display, VC/80 at a lower price will do just fine.

A numeric keypad will speed up data entry significantly. In addition to the normal ten numeric keys and a decimal point key, a good keypad for use with VisiCalc should have at least the following keys: +, -, <, >, <RETURN>, <ESCAPE> and <SPACE>. I have worked with keypads that have these keys and some that have additional keys such as (,), * and /. The latter is far more versatile with VisiCalc, but the former will do nicely. However, a ten (or eleven) key keypad without the additional function keys is inadequate since you will find yourself moving between the keypad and the keyboard in order to enter data, move the Cursor and change the Cursor direction.

A relatively new product is CalcPad, which is not a keypad, but instead a pad of specially printed 11 by 17 sheets of paper. CalcPad is, in effect, a VisiCalc coding sheet, with space for showing Replications, report areas, Global formats, Template overlays, and all of the other things we have been discussing in these articles. Intended to be used both beforehand for Template design, and afterwards for Template documentation, CalcPad will remind you of the decisions you have to make when designing a Template, and will certainly save you a lot of time in the design of a Template of even moderate complexity. (*That is, once you get past the irony of using a paper pad to help with a device that eliminates paper pads. —PCW.*)

Now for one of those OOHS!! and AAHS!! VisiCalc 3.3 will store both upper and lower case and printouts may be obtained in upper and lower case. With a Videx Keyboard Enhancer or Enhancer II, or possibly another type of lower case adapter, you may enter and store upper and lower case characters. This adds a totally different look to a final report. The Reset and Shift Reset Commands of the Enhancer work just as they do in other programs. Unfortunately, even with a modified Monitor ROM, which does not convert everything to upper case, VisiCalc itself will convert everything to upper case for screen display. This is corrected when you use VC-EXPAND/80 in conjunction with the Enhancer and the Videx Videoterm. This combination will provide you with upper and lower case display on the 80 column screen.

Additional hardware and software enhancements for use with VisiCalc are entering the marketplace quite regularly. The addition of selected hardware and software enhancements to VisiCalc and the printing and file saving techniques described above should add even more to your ability to design and present meaningful reports with a professional appearance.

Remember, you are the one person that knows your application and its requirements better than anyone else. Therefore, take the time to plan your work and you'll save time in the long run. It will also be quicker and more efficient in the long run if you work the kinks out yourself. The learning experience will provide the basis for you to enhance your own abilities with VisiCalc and to increase your understanding of VisiCalc's abilities and limitations.

Now that we have planned, constructed and printed some simple Templates, and have explored saving, printing and VisEXEC files, and have resolved to document our Templates with CalcPad, we are ready for some advanced VisiCalc techniques. We'll explore some in the next article which will lead to more efficient VisiCalc Template design, and they will demonstrate the ability to design VisiCalc applications you never thought possible.

(The articles in this series are taken, in part, from "The Key to VisiCalc", a book written by Messrs. Bayer and Sobel, to be published this winter by Dow Jones-Irwin.)

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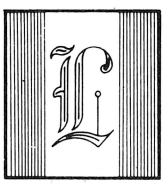
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Some Notes

from the

Chairman of the Board

Bernie Urban

The International Apple Core - The name to me conveys both pretention and whimsy - pretention because of its aspirations to be global in scope and whimsy for its substiution of "Core" for the more traditional "Corps". Yet it is fitting if only because of the presence of Canadian, Australian, Japanese, European, and South American member clubs, not to mention foreign U.S. clubs (I hate that word . . . it's foreign to me). Fitting also because we are an organization created ultimately for the edification of the individual Apple owner, concerning the potential for both serious use and sheer fun.

Our original purpose for formation of the IAC was to spread the word about anything which dealt with Apple computers. The clubs we represented at that initial meeting in October 1979 in San Francisco had voracious appetites for news, information and software - good, mediocre and even bad. So we rolled up our sleeves and started. Drawing heavily upon the larger, more experienced clubs and Apple Computer, Inc., we improved existing procedures for exchanging software, newsletters and information. We initiated the publication of the **Apple Orchard**. We sent out *ApNotes* to our members as fast as they were received. Quality was not necessarily our watchword. Remember, we were faced with an information-hungry membership. But with each passing month, other sources of information appeared. Mimeographed newsletters metamorphosed into magnificent magazines. Commercial ventures sprouted forth into veritable fountains of knowledge. And we improved.

However, we must now rethink our role and methods. Our purpose remains the same - we are organized to provide information and knowledge to our member clubs concerning the Apple computer and its use.

Through our past efforts the IAC Board and Officers have prepared and approved a comprehensive set of goals and objectives (5 major goals and more than 50 objectives within them). While this may seem too grandiose and too comprehensive, the present set was condensed from a list twice as long. But we are a volunteer organization. We have sponsoring members, but not to the extent of those which supported the old line SHARE, USE and other computer user organizations. We function within a budget which draws from funds derived from Club membership fees, subscriptions and ads for the **Apple Orchard**, and other up-till-now lesser fund raising activities.

Our goals and objectives remain as a basis for future activities and services, and they will change as we grow, but it is now time for me to address what is of most concern to you. If I were to put on your hat, the first question I would ask is, "What's in it for my club?" This immediately suggests a horde of others. "Why should we support the IAC? What has it done for us lately? How come we don't have an easy way to influence its policies? Who are our Directors and when have they helped us? SIGs (Special Interest Groups)- what SIGs?"

I have concluded from the beginning that the IAC should not become the equivalent of a local club except for size. We, in my opinion, should not be duplicating the services and functions which are best performed at the local level. Rather, we should be involved with matters which cannot be readily dealt with by the typical member club. For example, if the majority of our members call upon us to convey their disapproval of Apple Computer, Inc.'s policy on mail order purchase of Apple products, we should do so. Standards are both necessary and difficult to formulate; we're working on them. Perhaps we should become microcomputer activists and prepare testimony for presentation on Capitol Hill concerning the billing of long distance and local phone calls on the basis of distance, and its potential negative impact of computerists who frequently access data systems and who exchange information and software by modems. (To do that we would need to make major modification to our By-laws and perhaps lose our not-for-profit status.) Should we intervene on behalf of our membership when a significant number of our clubs experience difficulty with a particular software or hardware vendor, and what form should that intervention take?

You have probably noticed that I have not answered directly the questions which surely concern you. I have hinted at possible answers and have implied services which I shall propose to members of the Board. But there is more to be said.

Communication is a two-way process. We get our share of gripes concerning tardy or non-delivery of diskettes of the month, foulups on **Apple Orchard** subscriptions, and the like. We strive to improve on these matters. We also welcome constructive comments. I will propose to the Board the following which should help the process:

1. Seek out and implement as soon as we possibly can the best ABBS currently available as a service to our membership. Responsiblity for this function can conceivably reside with an individual or member club with all reasonable costs defrayed by the IAC. (See the President's Message, this issue.)

2. Each Director should solicit information from the member clubs within his jurisdiction concerning projects and activities which the clubs deem to be of potential interest internationally. This information should be made available through the pages of the **Apple Orchard**.

3. Clubs should be invited to initiate projects which could result in special purpose publications, software or hardware. IAC should give these activities prominent publicity and appropriate support.

Surely there are individuals and clubs out there who are willing to become responsible for passing on this knowledge to others. Others who share this interest can be encouraged to make their contributions, with the assurance of proper recognition of their worth.

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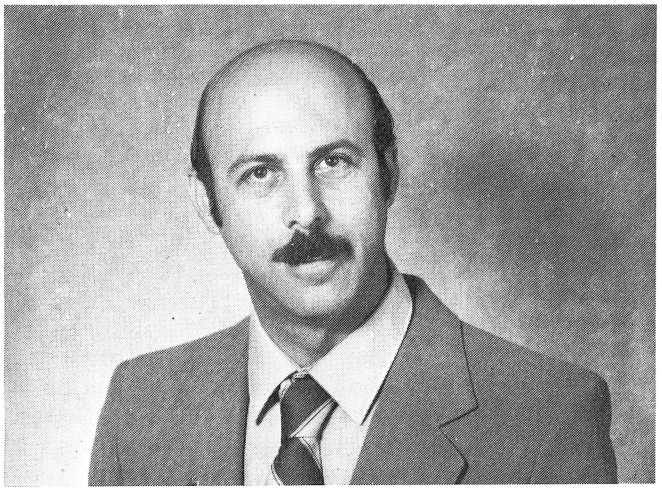
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President's Message

Ken Silverman
President, International Apple Core



At a recent meeting of the IAC Officers in Santa Clara, preparing the 1982-83 budget, much discussion was held on the question of club participation.

This included general input from clubs, and *response input* from letters and questionnaires sent to member clubs. The Officers, and for that matter, the Board of Directors, were concerned at the small response from members dealing with such important subjects as Director nominations, elections, and voting on IAC matters. The IAC receives complaints from clubs stating that they did not receive the information, but our records show that it was mailed.

It was felt that if there were an IAC *designated liaison* in each club, more information would be passed on to the club's membership. The IAC will be mailing to each member club a form for them to designate such a person. This person would be the individual who receives all IAC mailing and correspondence and then passes on the information to the correct person in the club, *i.e.*, disks to the Librarian.

In addition, when nominations, elections, and important voting matters are required, they will be sent to the designated liaison, Return Receipt Requested.

On another topic, your club should have received, or soon will receive, the Club Copy of *Apple Tech Notes* from the IAC. If any of the membership is interested in obtaining his/her own copy, they can be purchased at your local Apple dealer. If you are a member of an IAC club, the club has access to discount coupons and you should request a coupon if you are planning to purchase a copy.

It's now in operation: the IAC PMS (People's Message System). Call 312-295-6926 (modem).

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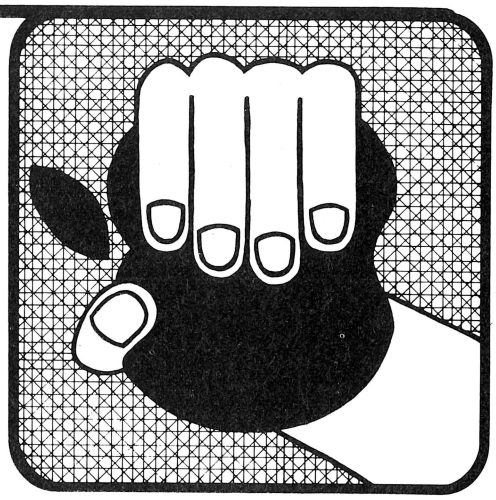
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Forbidden Fruit



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Edited by
Mark L. Crosby

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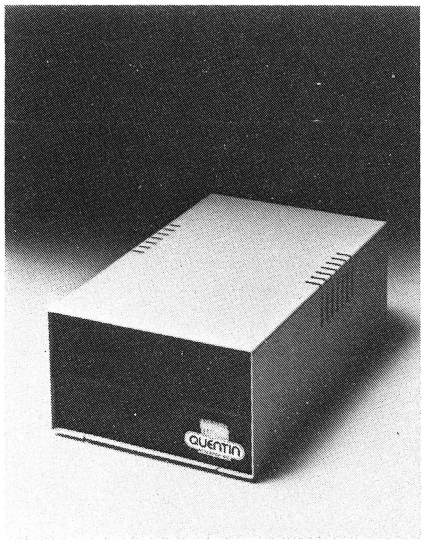
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HARDWARE

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The **Apple-Mate 5 ¼" Floppy Disk Drive** has been introduced by Quentin Research, Inc. Apple-Mate is fully software transparent with Apple's DOS 3.3 and 3.2.1 operating systems, as well as Pascal and CP/M in full and half track operation. The apple-beige unit is built around a highly realiable Siemens system with more than 10,000 lifetime hours. A shielded connecting cable is also attached. Apple-Mate features On Track Head Seek. A precision lead screw positions the head onto the correct track. Retries and disk-to-disk copying errors are virtually eliminated. It also assures longer diskette lifetime without realignment. Apple-Mate has a faster Track to Track Access Time at 25 MS than Disk II (40 M), and a faster Average Access Time at 298 MS (Disk II



at 463 MS). MTBF (Mean Time Between Failures) is a dependable 8500 power-on hours, and the unit has a one-year warranty. Apple-Mate also features a Diskette Protection System, 40 Track Capability, Redundant Write Protection and Automatic Power Down. Quentin Research, Inc., is offering the Apple-Mate at a special introductory price of $335. Quentin Research, Inc., 19355 Business Center Drive, Northridge, CA 91324 (213) 701-1006).

This new **RGB video interface board** for the Apple II provides red, green, blue and composite sync signals to be used with an RGB video monitor. Displays of color graphics or text are significantly superior in resolution and color quality as compared to the standard composite video display available from the Apple II. The board may be used with the 80 character Videx card, so that both color graphics and 80 column text may displayed on one RGB monitor. Modifications of the computer or software are not required. A text page may be displayed in any one of eight colors. Board size is 4 ¼" x 2 ¾" with gold edge contacts. Complete with 5 feet of 6 conductor ribbon cable for signal output. Output signals are + TTL, composite sync is − TTL. Price is $179. Delivery is from stock. European version is also available from stock. Video Marketing, Inc., 780 Lorraine Drive, P.O. Box 339, Warrington, PA 18976 (215) 343-3000.

The **Burtronix Protocard III** is a new interface card for the Apple /// computer. The Protocard III uses proven circuitry to interface a parallel interface chip (6522) to the Apple /// hardware bus, and allows the user to put custom circuits right on the board and connect them to the 6522. No knowledge of the Apple /// hardware bus is necessary. Room is provided on the board for either a 26-pin ribbon connector (supplied) or a 25-pin D-type connector (also supplied) for external connections. A software driver on disk is provided to link the Protocard III to Business BASIC, Pascal, or any other software that uses the SOS Drivers (Part of the Apple /// operating system). All communication with the Protocard III is handled by printing and reading simple strings from Pascal or BASIC. No knowledge of machine language is needed. Complete instructions with examples are also provided, including specifications of the 6522 chip. $195 plus tax and shipping. Elcom Systems Peripherals, 429 Harrison Street, Suite A, Corona, CA 91729 (714) 734-8220.

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BOUNTY HUNTER is an entertaining board style game with outstanding graphics and realistic sounds. One to four players become Bounty Hunters, tracking criminals and collecting rewards. The criminals are hidden, but make noise as they move. Herein lies the challenge. Each Bounty Hunter must deduce, from a string of clues, just exactly where the hidden criminal must be. Retails for..... **$24.95**

THE LIST.

THE LIST is a simple to use, efficient program which greatly simplify any mailing list task. The List can store up to 1200 addresses per data disk, a vast improvment over contemporary mailing list programs. The List features: Easy Entry and Editing, Two double level sorts, and selective code printing. Loads, sorts and print 1200 addresses in 1 to 2 hours, depending on the speed of the printer. Written in fast machine language. Retails for..... **$49.95**

BLACKJACK VEGAS STYLE

BLACKJACK, VEGAS STYLE is one of the fastest selling blackjack simulations around. Cards are excellently displayed on the Hi-Res screen and are easy to read and look good. But there's more, Blackjack, Vegas Style allows the user to enter almost any card counting method into the computer. This makes Blackjack, Vegas Style a valuable card counting teacher. For learning to count cards, or just having fun, Blackjack, Vegas Style is a fast seller. Retails for..... **$23.95**

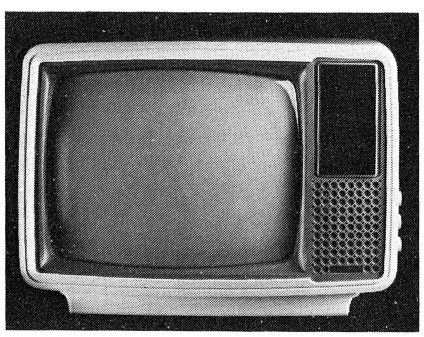
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Novation announces its new **212 Apple-Cat II** large scale integrated (LSI) direct connect 1200 baud full duplex modem. The 212 Apple-Cat II allows rapid communication with any Bell 212A compatible data set. It consists of Novation's 212 Upgrade Module installed in an Apple II along with Novation's Apple-Cat II, and occupies only two card slots. The primary difference is the addition of the full duplex, 1200 bps mode as a new option. However, all Apple-Cat II operational characteristics and optional features are retained including: automatic dialing (pulse or tone), redialing; auto-answering and disconnect; alternate voice operations; file transfer and printer interfacing functions; and deaf terminal mode. They also include a touch tone receiver, cassette recorder, and BSR home appliance controllers and interfaces. Additionally, configuration options, such as character length and disconnect mode; self-test and loopback commands can be ordered through the software. Adding a 212 Apple-Cat II to an Apple II computer will significantly increase the operational speed of many applications. For example, with systems programmed for just the full duplex mode, the 212 addition will mean a 4 to 1 improvement in data throughput. The 212 Apple-Cat II is available through your local dealer at the manufacturer's suggested retail price of $725, and the 212 Apple-Cat Upgrade option added to an existing Apple-Cat II carries a manufacturer's suggested retail price of $389. Novation, Inc., 18664 Oxnard Street, Tarzana, CA 91356 (213) 996-5060.

Leading Edge has introduced a new **12-inch green screen monitor** at a suggested retail of $99. Dubbed "Mean Green", the 13 pound CRT boasts a composite video signal and a display format of 1920 characters (80 characters by 24 lines). The dimensions are 40 cm x 28.5 cm x 32 cm. The manufacturer offers a one year, no questions asked, return/replacement plan should the unit fail. This is the ideal monitor for the very small business or the at-home user who doesn't want to tie up his television set. For further information contact Leading Edge Products, 225 Turnpike Street, Canton, MA 02021 (617) 828-8150 or toll-free (800) 343-6833.



Softworks, Inc., manufacturer of the **Remote Operating System (R.O.S.)** Disk Access Card, has announced the f3interface to hard diskf1 subsystems which may be used with R.O.S. Hard disk subsystems for which an Interface Kit are available include the X-Comp, Corona Data Systems, Lobo, Cameo, Konan, and soon for Corvus. The interface kit includes a PROM for the Central circuit card and AROS V2.04H operating system software. Kit cost is $100 per hard disk network system. R.O.S. is a low-cost local network ($189 per remote computer) allowing up to 127 Apple II computers to share access to both floppy and hard disk programs, data, and operating systems hosted by the central computer (also an Apple II), without the costs of individual drives and programs for each computer. Softworks Inc., 14805 N. 73rd Street, Suite J, Scottsdale, AZ 85026 (602) 998-3986.

Printers/Plotters

Now you can have full color printouts of text and graphics for IDS Color Prism Printers. This new **printer interface, the PKASO ID12-Color** is compatible with both Apple II and Apple ///, and offers all the features of the PKASO interfaces for black and white matrix printers. These include full snapshot dump of any text or graphics screen image, 16 level gray scale printing, user created or software defined printing characters, and Super-Res graphics using the full dot resolution of the printer. Added to these and specific for color are: Hi-Res and Lo-Res screen prints using accurate screen colors, Quick commands to swap and rearrange the color set for maximum readability, quick commands to change printing colors, even within word processor text, quick commands to create and print with definable sets of colors. Compatible with most popular languages such as BASIC, Pascal, and CP/M. An Apple /// package is available making full use of the Apple ///'s expanded graphics and changeable character fonts. Complete with cable, instructional diskette, and comprehensive manual. Apple II - $195, Apple /// - $225. Interactive Structures, Inc., 146 Montgomery Avenue, Bala Cynwyd, PA 19004 (215) 667-1713.

VisiTran™
a utility program for VisiCalc® Users

VisiTran now allows you to transfer data from an Applesoft BASIC program directly into a VisiCalc® model.

VisiTran was recently reviewed by InfoWorld.

InfoWorld *
Software Report Card

VisiTran

	Poor	Fair	Good	Excellent
Performance	☐	☐	☑	☐
Documentation	☐	☐	☑	☐
Ease of Use	☐	☐	☑	☐
Error Handling	☐	☐	☑	☐

System Requirements

- Apple II or II Plus
- DOS 3.3
- 48K RAM
- Disk drive with controller

Price: ***$99***

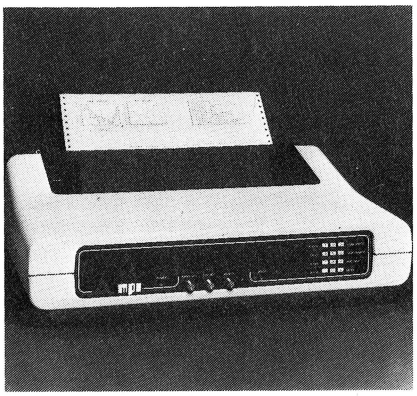
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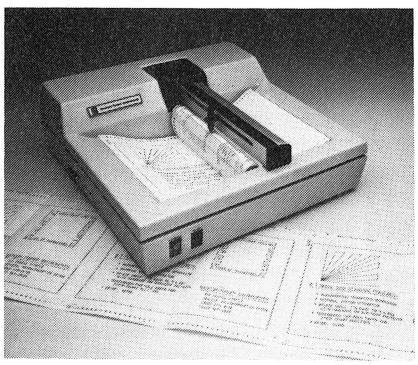
VisiCalc is a registered trademark of VisiCorp, Inc.
VisiTran™ is a product of ADC Associates and is in no way associated with VisiCorp.
Apple II, and Applesoft are registered trademarks of Apple Computer, Inc.
* Copyright 1982 by Popular Computing, Inc. a subsidiary of CW Communications, Inc., Reprinted from InfoWorld.

The **TRIX I interface** will convert the Olivetti PRAXIS 30/35 electronic typewriter into a versatile letter quality printer. The TRIX I in conjunction with the 30/35 offers the following features: interface disconnects in seconds; easily connects underneath typewriter; typewriter portability maintained; no external power supply; removable computer cable included; user installed; typewriter function unimpaired; user definable control codes; half space justification; user mapped keyboard; Apple interface card and Atari interface module not required; static protected; installation and operation manuals included $215. XBOOT card features electrically alterable PROM, user defined codes, three output lines, one input line, other uses as protected memory $40. Actek, 12225 S.W. 2nd-Suite 200, P.O. Box CCC, Beaverton, OR 97075 (503) 643-4020.

The new **MPI Model MP150 printer** is the latest addition to a rapidly expanding matrix printer line. It is the first of a series of wide carriage units designed specifically for mini and micro business systems. The heavy duty printhead is rated for continuous duty and has an expected lifetime of more than 100,000,000 characters. It forms characters bidirectionally in a logic seeking mode to optimize system throughput. Has true descenders and underlining capability. It can print a full 136 character line at 10 characters per inch or, by selecting either the 12 or 17 character per inch density, up to 226 columns may be printed. This allows full 136 column printouts to be condensed to fit on standard 8.5 inch wide paper. Double wide characters can be software selected in any of the character densities to give a total of six different CPI densities. A 7 x 9 matrix font is used for high speed data printing while an 11 x 9 serif style matrix font is used for applications requiring a high quality correspondence printout. A standard 96 character USACII set with three additional strap selectable foreign fonts are standard in each unit. Special fonts may be either down-line loaded into RAM memory, or permanently located in ROM memory. High resolution dot addressable graphics capability is included for those applications requiring plotting, printing of screen graphics, drawing of illustrations, and producing special characters or identification marks. The horizontal aspect ratio for the graphics printout can be varied through selection of one of four horizontal dot densities. Alphanumerics may be overprinted into the graphics area for labeling of graphics and illustrations. The standard 1K buffer can be expanded to 8K for appdications requirang additional character buffering. A Centronics type interface can accept parallel TTL level data at a transfer rate in excess of 1000 characters per second. An optional RS-232C serial interface can be added and will accept data at any one of seven strapable baud rates up to 9600. Both X-ON/X-OFF ETX/STX protocols are supported with an IEEE-488 Bus output through an optional IEEE to Centronics interface adapter card. MPI, 4426 South Century Drive, Salt Lake City, UT 84107 (801) 263-3081.



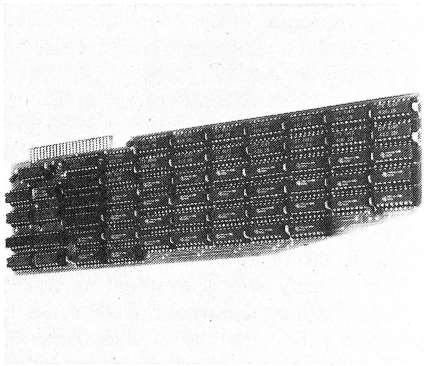
Intelligent graphics plotter is microprocessor based and provides graphics output for any computer system with an RS-232C port. Standard features include single frame or strip chart plotting modes, 11" x 8 ½" format, an ASCII character generator with size and rotation control, and an internal vector generator. These built-in features make the Model 1100 plotter convenient for applications in scientific, industrial, business and personal computing. The graphics plotter uses X and Y stepping motors, has a resolution of 0.005 in. (0.127 mm), repeatability of 0,002 in. (0.06 mm), and a plotting speed of 2.5 in/sec (64.1 mm/sec). It uses continuous fanfold paper, disposable fiber tip pens, and is available in 115V/50Hz or 230V/50Hz. Introductory price is $1,195. Bascom-Turner Instruments, 111 Chapel Street, Newton, MA 02158 (617) 964-3434.



The new **Grappler Plus** replaces the popular Grappler as a leading **Apple printer interface.** The Grappler Plus combines on-board firmware for Apple Hi-Res graphics with many new features, including Apple /// compatibility, an on-board DIP switch for printer selection, and Orange Micro's exclusive Dual Hi-Res Graphics. More than 23 software commands are available through the keyboard or user program. The new Grappler Plus is the first universal graphics interface, because one card works with all popular printers available. No longer is it necessary to match the proper card and printer - a setting of the Grappler Plus's DIP switch is all that's needed. A single Grappler Plus interface is compatible with the NEC 8023, Centronics 739, C. Itoh Prowriter, Anadex, Okidata, Datasouth DS-180 and the full line of Epson printers (A second board is available for the IDS Paper Tiger). The Grappler Plus is now Apple hardware compatible, making it possible to utilize the Grappler Plus's full range of control commands with virtually all software. Also, the Grappler Plus is 100% Apple Pascal, CP/M, and LOGO compatible. Simple control commands enable the Grappler Plus to print graphics inversed, centered, doublesized, and rotated 90 degrees. Block graphic capability is available on the Epson MX-80 and MX-80/FT, as well as the Okidata 82A and 83A. Text commands include screen dumps, setting of margins and page lengths, auto-skip-over perforation, and word wrap-around with breakpoint at the nearest space. Comes with a five foot cable and a comprehensive operations manual. At your local dealer or contact Orange Micro, Inc., 3150 E. La Palma, Suite G, Anaheim, CA 92806 (714) 630-3620.

Memory

A single board **Solid State Disk Emulator (SSD)** for the Apple II or Apple II Plus, from Synetix Industries, Inc. Available as either a Single Disk version (147K bytes) or Dual Disk (294K bytes). The SSD plugs directly into any Apple I/O Slot (1 through 7) and requires no external power. The SSD is software compatible with Apple DOS 3.3, Apple Pascal, and CP/M operating systems. Program operating speeds may increase up to 1000% depending on the type of program and operation. Up to seven SSD cards may be installed in the Apple, depending upon the Apple power supply and other peripheral equipment in use. Either version is available immediately. The units are priced competitively with mechanical drives. The Single Disk suggested list price is $550 and $950 for the Dual Disk. Quantity discounts are available. Contact Micro-Computer Products Marketing, Synetix Industries, Inc., 15050 N.E. 95th, Redmond, WA 98052 (206) 885-4125 or (800) 426-7412.



of EPROM. It also accommodates extended addressing of upto 16 Mbytes of memory, allowing it to support larger 16-bit systems and multi-user applications. SSM Microcomputer Products, Inc., 2190 Paragon Drive, San Jose, CA 95131 (408) 946-7400.

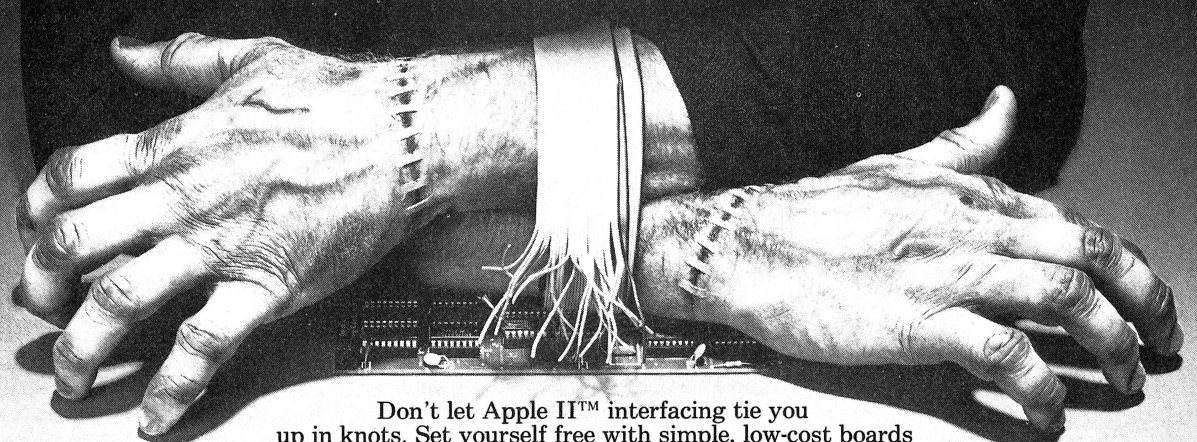
Music

SSM Microcomputer Products, Inc., has reduced the price of its **64K memory board, the MB64**. The MB64 is now $599, reflecting a 20% reduction from the previous $749 price. SSM also has initiated a new warranty policy covering all of its Apple II and S-100 board-level products. The new warranty covers these products for a period of two years, double the previous coverage. SSM also announced the immediate availability of the MB32, a 32 Kbyte version of the MB64. The boards are identical, except for the difference in RAM. Users can upgrade the MB32 to a maximum of 64K by simply plugging in additional 2K chips. The board is priced at $425. The MB64, which can operate at up to 6MHz, comes configured with two 32 Kbyte blocks of RAM and up to 8 Kbytes

ALF Products, Inc. offers **music synthesizers and ear training software** for the music lover in you. Their nine voice synthesizer allows direct input via Hi-Res graphics display of a music stave using the game paddles and keyboard. Software is available to modify and edit your compositions and pre-written music is available for sale. 9-voice synthesizer - $195. Three voice synthesizer permits more detailed definition of the sounds produced. Two channels can be set to variable pulse width mode with frequency controlled by the third channel - $245. Ear Training Skills for use with the 3-voice card covers pitch training, intervals drill, chords, and scales $49.95. ALF Products, Inc., 1448 Estes, Denver CO 80215 (303) 234-0871.

METATRAK 16-track digital synthesizer recording system goes beyond conventional recording methods. At an affordable price, musicians, composers and synthesists have the power, flexibility and control of an all-digital synthesizer/recorder. Syntauri even offers a 17th track: the METATRAK recording system uses the alphaSyntauri keyboard, which is always live and separately controlled. For only $1,995.00 - for the Syntauri synthesizer with METATRAK - plus an Apple II computer system, a composer has both a dynamic performance instrument and a low-cost portable studio. METATRAK is available only for the STUDIO PRO five octave alphaSyntauri fully programmable 8-voice synthesizer. From one to all 16 tracks can be sequenced together for repeating bass lines or background rhythm patterns. Independent per track control over volume, instrument, and vibrato as well as a built-in click track are especially useful options. With expandable storage, a composer may record and store an orchestral piece of 30 to 60 minutes duration. METATRAK is available with the alphaSyntauri STUDIO PRO 5-octave synthesizer for $1,995.00 from selected music and computer dealers worldwide. Requires an Apple II with 64K, one disk drive, analog controllers, and video monitor, retailing for under $2,500.00. Contact Syntauri Corporation, 3506 Waverly Street, Palo Alto, CA 94306 (415) 494-6267.

Apple™ interfacing doesn't have to be a monstrous hassle.



Don't let Apple II™ interfacing tie you up in knots. Set yourself free with simple, low-cost boards from SSM to connect printers, modems and other peripherals. We offer serial, parallel, multi-function interfaces, IEEE 488 controllers, clock cards and more. Just plug in and go. Two-year warranty and money-back guarantee if not satisfied. Call us or your dealer and ask about the hassle-free interfaces from SSM.

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The Transformation People.

SSM

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(408) 946-7400, Telex: 171171

Miscellaneous

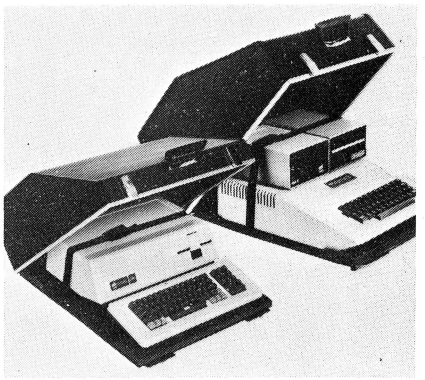
The Acolyte shows the inner workings of the Apple for all to see, with hardware control of Apple memory and program flow. You can read and write to memory, trace program execution, interrupt and alter program flow, slow execution to a crawl or halt on any program access to a specific address. All this without stopping the program and without the program's knowledge or co-operation. Features address and data lights showing current address and the data located there, or location currently being executed by the program. Single stepping, cycle stepping, trap mode and DMA are standard options. $349 from Access Memory, 1701 West End Dr., Philadelphia, PA 19151.

Mini-Media is a new design in visual display message systems that gives you the most effective economical way of delivering your messages . . . inside or out. Time display is a standard feature, and can be programmed in your message sequence at the option of the operator. Single- or double-stroke letters give you even greater visual impact. Low energy consumption. Mini-Media reaches your customers on your premises. The video screen guides you with simple program instructions, and a movable cursor points the way to enter, change or delete any portion of the messages. You can preview, on the video screen, before you show the message. Comes in a nominal 8, 12 or 16 foot length with 12 inch letter height. Simple plug-in assembly of components. Slim profile allows incorporation into existing signs. Capacity of up to 255 lines of copy in a change mode. Available options at additional cost: Temperature in Fahrenheit and Celsius, Cassette message storage, Remote sign operation via telephone lines, custom graphics, plug-in modules for system expansion. Contact Rank Electro-Media Ltd., 1437 - 47 Avenue N.E., Calgary, Alberta, Canada T2E 6N7 (403) 276-3533.

The **APPLE-VERTER** is the first known **high VHF-band, tunable modulator** specifically designed for the Apple II computer. Installs in seconds in the Apple II with adhesive-backed Velcro. Comes complete with 10-foot direct-connect antenna cable. By operating above normal computer harmonics, in the high VHF band (tunable channels 7-10) the APX-800 exhibits unusually high stability as compared to some UHF units thus making it more ideally suited for use on non-tunable, quartz-locked TV receivers. A built-in 5 Volt regulator allows the modulator to also be used on other computer systems with power sources anywhere between 8 and 24 VDC. Custom cable connectors as well as other frequency ranges available upon request - $29.75. ATV Research, 13th & Broadway, Dakota City, NE 68731 (402) 987-3771.

A new hardware **board for programming EPROMS** on an Apple computer has been developed, combining ease of use with some interesting hobby and construction projects. You can program two EPROMS simultaneously and you don't have to be familiar with the Apple's addresses to use this hardware. Programs 2K, 2716 5V EPROMs from keyboard, disk, Prom, or ROM. No programming knowledge is required to get full use out of the PROM Programmer. Full instructions included - $99.95. Word-Power, P.O. Box 736, El Toro, CA 92630.

The growing family of **Fiberbilt computer cases** now includes one for the Apple ///. Like the Apple II case, the Apple /// case features a foam padded cover and base, a removable locking cover that allows for cables to exit the case with the cover closed and locked, non-metallic hold down strap, rubber no-slip bumpers, sturdy ABS plastic end-cap construction and is stocked in brown. The Apple /// case is available for $100 and the Apple II case for $64 (UPS delivery included for both cases) from Fiberbilt, 601 West 26th Street, NY 10001-1199 (212) 675-5820.



Because Read Only Memory (ROM) will never forget a firmware program, it will still be there when the Apple is turned off and on again. The **ROM Board System** provides a ROM board and many firmware options including: Applesoft Utility ROM system which provides auto line numbering, program list control, revive lost program, alphabetize a catalog directory, and expunge DOS - $59.95. **Format ROM** system adds word processing capabilities for Applesoft print statements and versatile print using commands - $64.95. **Sort ROM** system has machine language sorting routines for string, integer, real, multidimension arrays, and record keeping arrays - $59.95. Applesoft Renumber/Merge ROM System renumbers all or part of a program or merges two programs together - $59.95. Applesoft **Edit ROM** System permits you to easily and conveniently search, change, or remove any variable, string, or basic command in a program - $59.95. **Disk Copy ROM** system offers disk backup which is easy and convenient to use - $59.95. **Catalog Command ROM** system gives one key control of disk files to delete, lock, run, load, etc. Also displays a map of a disk's used and unused sectors. Ideal for Hello programs - $59.95. The ROM Board (without a ROM) is $29.95 and has built-in I/O and device select lines. Will accept 2716 EPROMS or 2316 ROMS. Please add $3 for shipping. Soft CTRL Systems, P.O. Box 599, West Milford, NJ 07480 (201) 728-8750.

Legend Introduces a product for your Apple II called **Slot 8**. This product is just what the name reveals; slot number 8 for your Apple computer. Slot 8 is a card that plugs into slot seven and provides two (2) slots for peripheral use. Instead of slots 0-7, you now have slots 0-8! Most of the peripheral cards for the Apple will work in slot 8, and this device is really a space saver. Contact Legend Industries, Ltd., 2220 Scott Lake Road, Pontiac, MI 48054 (313) 674-0953.

SOFTWARE

Business

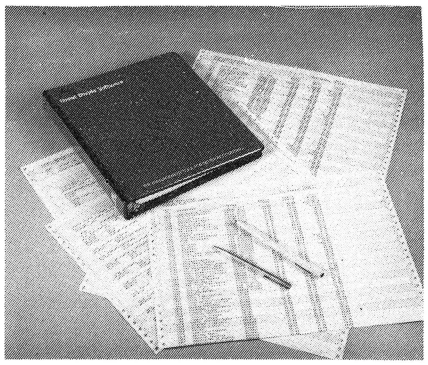
Decision Support Software announces the release of **utility programs** to complement **The Accountant** Finance Data Base System. The Accountant is a double entry system that permits those not familiar with accounting terminology to reap the benefits of the double entry process. This financial management tool is designed for the owner of a small business; it requires an Apple II computer with 48K of RAM and can operate with either one or two disk drives. The **Reconcile** utility program sets a new standard for flexibility and completeness in reconciling checking and credit card accounts. Users can 'mark' as cleared, those transactions that

have cleared the bank or credit card company computers. A tally of all cleared transactions will identify any discrepancy between the user's computerized records and those of the bank or credit card company. Also included are tallies of all outstanding transactions as well as tallies for transactions cleared during the session. Several modes are provided to search and examine transactions for the account being reconciled. Mistakes are easily identified and corrected. Audible feedback is provided to prevent oversights in situations where the user is likely to be looking at the bank statement instead of the screen. The other utility programs complement The Accountant's interactive query capabilities by providing for the generation of lengthy reports with a minimal amount of user input. Direct inquiries to Decision Support Software, 1438 Ironwood Drive, McLean, VA 22101 (703) 241-8316.

Bond Yielder makes calculations that are invaluable to brokers, insurance companies and financial institutions. Until now, these calculations were only easily available using large computers or with a $1,200 dedicated desk-top calculator. Bond Yielder utilizes the Apple computer and turns it into a sophisticated bond analysis tool It allows the user to compute Munis, Corps, Agencies, Treasuries, Warrants, Notes, CD's and Discounts. It works quickly, and allows you to see all information you have entered on the screen, the entire time. In addition, Bond Yielder will print out copy through an attached printer for filing or presentation to clients. It also allows you to experiment by checking results with different variables such as from YTM to Basis Price; Basis Price to YTM; from Yield After Tax to YTM and Basis Price or from Bond Equivalent Yield to discount and price. Bond Yielder has a comprehensive, easy to understand owners manual in a loose leaf vinyl binder. CE Software offers a second back up or safety disk free of charge to purchasers. Bond Yielder retails for $149.95 and is available at local Apple computer retail stores. CE Software, 801 73rd Street, Des Moines, IA 50312 (515) 224-1995.

Data Perfect for the Apple II and Apple II Plus computer, written in machine language, requires no disk swapping, and is fully interactive with the LJK word processor, Letter Perfect. This user friendly program allows the operator to design his own screen mask, in either 40 or 80 columns. The single-load program, which is menu driven, has incorporated into it a utilities section, as well as a report generator and a mailing label generator. Multiple searches and sorts are allowed. Complete formula operations, as well as mathematical operations, may be performed on and between fields. The program supports 1 or 2 disk drives, and requires a minimum of 32K memory. Use with any printer is allowed. The introductory cost for the program is $99.95. LJK Enterprises, Inc., P.O. Box 10827, St. Louis, MO 63129 (314) 846-6124.

Great Divide Software, Inc., has introduced **GL-Plus**, a general ledger accounting system for use on the Apple ///. The "Plus" is a built-in accounts receivable and accounts payable capacity. Features include: 1) Simple operations; 2) User specified charts of accounts; 3) Instant update of all accounts as each transaction is entered; 4) Large variety of reports; 5) Reports always as current as the last entry; 6) Built-in Accounts Receivable and Accounts Payable; 7) Can be used with a two disk drive system or with a hard disk drive - $495. A printer with at least a 132 column



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Professional Trader
(contains #1, 3, 4, 5, 6, 8, 9, 12, 14, 15, 16, 17, 18) . . . 699.00

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27. **CSR 8: Reference Deviation System 79.95**
28. **CSR 9: Trend-Countertrend Hybrid . . 79.95**
29. **CSR 10: High-Low Moving Average Breakout 79.95**

Send $5 (credited to your first purchase) for a demonstration disk (if you don't have an Apple, any dealer will run it for you). Mastercard and Visa holders order toll-free, 1-800-835-2246. *(Demo not available through 800 number.)*

OMEGA MICROWARE, INC.™
222 SO. RIVERSIDE PLAZA
CHICAGO, IL 60606
312-648-1904

Software by
Orion Management, Inc.

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capability is recommended, however, slightly abbreviated reports can be displayed on the screen, printed on an 80 column printer or on the Apple Silentype printer. Available from Apple Computer Dealers or Great Divide Software, Inc., 8060 W. Woodard Drive, Lakewood, CO 80227 (303) 337-0383.

The **KM Systems general ledger system** was designed to provide a flexible method for keeping sets of books for multiple accounting entities. Each entity can use a separate chart of accounts, and user-formatted financial statements are produced on a separate or consolidated basis. Account codes are verified during data entry. Account analyses for any combination of account, sub-account, or cost center may be extracted with balance forward totals or in detail. The system is menu driven with user-friendly prompts for all functions. Copyable source code is furnished with complete system documentation and user manual. Requires 48K Applesoft, 1 disk drive, DOS 3.3 and printer - $39.95. KM Systems, 7955 E. 50th Street, Suite F-1006, Tulsa, OK 74145.

Get the facts about your stock market investments with the **Stock Portfolio System** and an Apple computer. Easy to use - menu driven plus simple step by step documentation. Buy stocks or options, cash or margin, and control your money market account. Shows current portfolio status by position, total funds balances, short and long term, plus much more. Gives advance notice of stocks going long term; dividends coming due; and options expiring. Complete records include profit and loss statement; dividend income and more . . . all year to date, for tax reporting - $149.95 plus $2 shipping. California residents add 6% sales tax. Smith Micro Software, P.O. Box 604, Sunset Beach, CA 90742 (213) 592-1032.

Trader computes moving averages and saves you hours in calculations. Saves your hide and alerts you to moves. Use Trader for financial instruments, metals, grains, and agricultural and building products. Gives you signals in up and down-trending markets. Simple, user-tested. No prior computer knowledge needed. Complete, easy-to-follow directions included. Requires Apple II, monitor, 1 disk drive. Disk includes programs to calculate system parameters, relative strength index, creation/updating of data files and display of contents, action indicator, daily summary of each investment's equity, and total for diversified portfolio. Enter your daily data quickly, and run it! $185 postpaid or send $5 for more information - refundable with your order. Chemron Systems, Inc., 8934 L Street., Omaha, NE 68127.

This complete **depreciable asset record management system** permits easy entry of old depreciated records. Up to 10 user named base files. Does all methods of depreciation, investment credit and special first year depreciation. Figures recap invest credit, capital G/L, and remaining book value of junked, sold or traded assets. Prints or displays individual Depreciation schedules with details of any disposition made. Optional 132 column print capability of yearly asset listings and sum providing data for income tax and financial statement preparation. Requires 48K Apple II or Apple II Plus, 2 disk drives and DOS 3.3, 80 column printer. $140 prepaid. Contact your local dealer or Salba Software, 206 E. Cypress, Elmwood, IL 61529 (309) 742-8123.

No-Load Trader includes a unique optimization system that provides you with optimized signals for trading no-load mutual funds in your IRA and KEOGH plans. The telephone switch privilege offered by many fund groups enables you to maximize investment return. For further details, contact: Flanagan & Associates, 235 Montgomery Street #115, San Francisco, CA (415) 421-4151.

MicroGANNT is now available for CP/M-equipped Apple computers. MicroGANNT uses Critical Path Method (CPM) techniques to determine task dependencies and project completion dates. The user creates a project by defining tasks and task dependencies and by assigning costs. The program immediately displays a Gantt chart which gives a graphic representation of the project. Tasks can be displayed on a time scale of days, weeks, months, quarters or years. The time scale of the charts can be varied at any time to present more or less detail. MicroGANTT accommodates an unlimited number of tasks in a single project through the use of composite tasks. A composite task is an entire project with up to forty tasks which can be included in a larger project. In this way very large projects can be modeled in minute detail by having several layers of composite tasks and summary projects. It also permits a task to be dependent on the partial completion of another task, and allocation of fractional manpower to a task. Project assumptions are easily modified at any time to make 'What if?' analyses. When tasks are modified the project plan is immediately redisplayed to reflect the new project schedule. MicroGANTT has simple single key-stroke commands to page through the defined tasks and the calendar of events on the Gantt chart. Also, single key-strokes switch the computer display from Gantt chart to labor time summary to financial summary. The system includes a comprehensive printing facility which will print all charts, reports and plans. $395 for the system and documentation. Contact Westico, 25 Van Zant Street, Norwalk, CT 06855 (203) 853-6880.

The TCS AGENT data base provides for fast data access under CP/M, MP/M and DBOS operating systems. What takes most accounting systems hours to manipulate, now takes only a few minutes with the aid of AGENT. AGENT aids the user in calling and storing information in a manner which facilitates easy retrieval and analysis. As information is added or changed, AGENT cross references the new data, automatically updating all indexes to reflect the new entries. AGENT allows instant reporting or retrieval of data base information without the need for time consuming sorts. AGENT works with the TCS Total Accounting System and the SIMPLE Filing System to allow for fast and easy data retrieval. In addition, special features of AGENT include: Up to eight sorting indexes for each file; fast data access; number of records limited only by available disk space; increased speed for most programs that need keyed access to data files. TCS Software, Inc., 3209 Fondren Road, Houston, TX 77063 (713) 977-7505.

Critical Path Scheduling System for the Apple /// is an aid in scheduling complex projects such as those in construction, aerospace, and many other industries. It is a powerful tool for analyzing and scheduling all the tasks required to complete any multi-level project on time and at the lowest cost. Its features include: Simple operation; Large project capacity (over 2000 tasks); Easy update of project status; Large variety of reports; Graphical project presentation; Provision for manpower planning; Can be used with a one or two disk drive system or with a hard disk drive. Many desired features such as automatic start and finish dates option, display of 'float' time. Flexible reports generation, sort and test option, etc. $495 suggested retail price. Contact your local Apple Computer Dealer or Great Divide Software, Inc., 8060 W. Woodward Drive, Lakewood, CO 80227 (303) 337-0383.

High Technology Software Products announces the availability of an **accounting package for oil and gas well operators**. The package automates joint interest billing and revenue distribution. It calculates revenue distriution from production runs for each revenue owner, joint interest statements for all working-interest owners, and A.F.E reports. The package also generates well payout reports and tracks the balances of revenue and working-interest owners. Invoices from and payments to vendors are also tracked. Additional reports provided include 1099 Reports, List of Expense Categories, List of Vendors and Vendors' Invoices, and the package prints checks.

Gusher is offered at a suggested retail price of $995. Requires a 48K Apple II with the Apple Pascal system, two disk drives, and a printer with interface; another version requires any one of several computers which can use UCSD 4.0 Pascal and an IBM 8" Single-Density format. For more information, please contact your local computer dealer or High Technology Software Products, Inc., P.O. Box 14665, 2201 N.E. 63rd Street, Oklahoma City, OK 73113 (405) 478-2105.

The **QUAD, Version 1.1** is a new relational data management tool. This allows end-users and programmers to easily design and implement complete financial accounting and management applications without having to program. QTRC has developed the QUAD for computers with CP/M or CP/M compatible operating systems. The QUAD can be used to devleop an application as simple as a Mail List or as complex as an Inventory Control system or General Ledger. Without generating additional program code, the QUAD user can easily build various integrated applications using the relational capabilities of the software. The QUAD also allows users to take advantage of their hardware devices. Terminals which support video attributes such as reverse video, half intensity, underlining and others, can take advantage of these capabilities with the QUAD. Printers which support various types of printing formats can utilize these features as well. Programmers who wish to use their own custom written programs in conjunction with the QUAD, may do so and access them directly from the QUAD. Complete with an Accounts Receivable application - $495. QuanTechna Research Corp., 6902 220th Southwest, Mountlake Terrace, WA 98043 (206) 771-2488, (206) 364-6940.

The **VersaForm Business Form Processor** for the Apple /// supports the Apple /// Profile and Corvus Hard Disk Subsystems. VersaForm is a powerful and flexible set of user-friendly procedures which allow a non-programmer to set-up business forms on the Apple computer, to store them as files, and to generate analyses and management reports from their data. A rich set of automatic filing, data entry checking, and calculation options may be chosen to enhance accuracy and speed input. A data base reporting system produces detail summaries of any data items contained within a file of forms. Can format printed output to match a pre-printed form as though it were manually typewritten. Common applications of VersaForm include invoicing/accounts receivable, purchase order generation/operations management; professional time and billing; estimating/job costing, and personnel records/ benefit accrual reporting. The hard disk versions of VersaForm, which now include both Apple II and Apple ///, allow file sizes of up to 4 Mbytes. This ability to create large files without tedious and complex 'volume swapping' has been requested by a large number of users of many Apple II programs with hard disk subsystems running Apple DOS 3.x. VersaForm may be installed on Apple systems using ProFile, Corvus, and other hard disks supporting the Pascal operating system. Data disks may be interchanged between Apple II and Apple /// systems, allowing users to add Apple ///'s to their existing Apple II networks without having to cope with data incompatabilities and conversions. The Apple /// version of VersaForm retails for $495, and is available at your local dealer. Contact Applied Software Technology, 14126 Capri Drive, Los Gatos, CA 95030 (408) 370-2662.

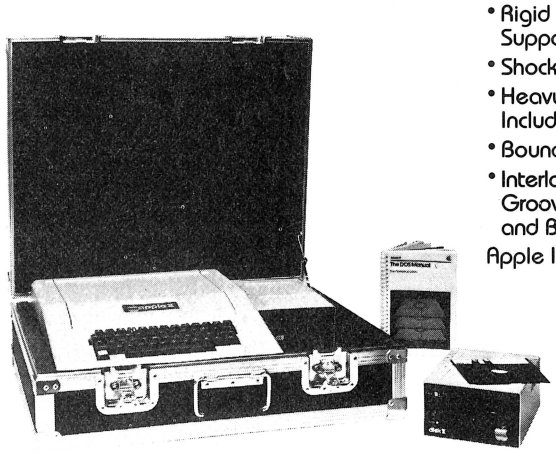
Factor Analysis supports a multivariate, statistical technique widely used by researchers, teachers and practitioners in the pure and applied social sciences. Heretofore, programs have been available only for large main-frames. Factor analysis is available in two versions: Applesoft (series FAIV) and Compiler (series FACV). The faster-running Compiler version can handle a 35 x 100 data-set, can extract up to 10 factors, can perform up to 10 refactorings. The slower, Applesoft version's capacity is limited only by available memory. Pair-by-pair rotations are performed with graphic displays of factor-loadings. Mathematical Software Co., P.O. Box 12349, El Cajon, CA 92022.

Market Analyst, for the stock market investor, features three major sections - **Technical Analyst** for computerized charting, **Portfolio Manager** to monitor holdings and **News, Views & Quotes** for on-line information access. Technical Analyst automatically charts high-low-close bar charts and volume histograms, and calculates and charts such technical studies as on-balance volume, accumulation/ distribution, volume indicators, moving averages, oscillators and even user-specified custom formulae. Portfolio Manager keeps track of multiple portfolios, making the holdings available for current gain/ loss evaluations, yield calculations, short term flags, and market appraisals. News, Views & Quotes is the teleprocessing section which provides access to many remote database services for timely news, current quotes, fundamental data and market commentary. It stores up to thirty pages of text for leisurely off-line review and selective printing. Requires an Apple II/II Plus with 16K RAM card, DOS 3.3 and monitor. Supports D.C. Hayes Micromodem (or Communications Card with modem). The $395 package comes with complete user documentation oriented to the non-computerist, and a sample historical data disk. Anidata, 613 Jaeger Court, Sicklerville, NJ 08081 (609) 228-3034.

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Sales Order Entry /// is a software package designed for the Apple ///. It provides a complete, easy, and accurate method to enter and maintain sales order records. Manufacturers can keep track of who ordered products, when it was ordered, if it was shipped, if the item was billed, how much it cost, and much more. Wholesalers can use it to help improve delivery, see which products are selling better, and help to calculate commission payments for sales people. Sales Repesentatives can keep tab on who ordered what from where. He can determine what has been shipped, what commissions have been paid to him, and what commissions he is due. Written in plain English, without any assumptions of the end user's knowledge of computers. Program is unprotected and help is available if you want to modify the program. Upgrades will be available to all bonafide owners of earlier versions at low or no cost. Plain and Simple Software, 9003 Lexington N.E., Albuquerque, NM 87112 (505) 293-2448.

The **Agricultural Economics** Department at Oklahoma State University has completed translating many of its fifteen programs to run on the Apple II Plus. The programs, written on an IBM 370 and TRS-80 Model I over the past fifteen years, provide farmers and ranchers assistance in record-keeping, livestock feeding and least cost feed formulation. Some of the programs include feeding simulations for beef cattle, food ration evaluation, cow ration evaluator, income and expense farm record, grain storage costs, record management programs, projection analyses, etc. Information may be obtained from: Department of Agricultural Economics, 513 Ag Hall, Oklahoma State University, Stillwater, OK 74074.

Three new interactive graphics analysis programs for the financial Investor/Analyst are user-friendly and incorporate menu-driven operations, superb graphics with auto-scaling, statistics, cursor with data readout, and provisions for hard copies (printer/card dependent). Complete utilities for editing/updating and a comprehensive instruction manual are also included. **Market Illustrator** displays ratios and differences of broad market data. Features split screen for comparing data with program generated indicators. A complete weekly Historical Data Base, comprising more than130 statistics compiled from *Barron's* (from September 1980), is included - $195. **Market Analyzer** provides the analyst with total manipulative capability to create and compare the most complex indicators (Data Base included). Keystroke functions include exponential smoothing, arithmetic averaging, ratios, sums, differences, transforms, de-trends, and time-lag analyses - $295. **Stock Analyzer** incorporates all major technical analysis functions for the study of individual stocks. Capabilities include high-low-close-volume displays with linear or semi-log auto-scaling, price-volume indicators, relative strengths, momentums, smoothing, averaging, and Point & Figure charting. Auto-modem or manual updating - $295. N-Squared Computing, P.O. Box 264, Silverton, Oregon 97381 (503) 873-5906.

Communications

Transcend 3, the latest member of SSM's data communications software family, offers many hardware support capabilities to business users, including 80-column video boards and 1200 baud modems (Novation, Ventel or any 212-compatible). Hard disk support will also be available. Advanced software features include verified file transfer and data compression/decompression, as well as complete data privacy with Transcend 3's exclusive Private Mail feature which permits users to create confidential disks which can be transmitted with total security, yet restricts viewing to only those familiar with a predetermined password. Combined with Transcend 3's new Detached MailBox option, Private Mail disks can be created and addressed on any Apple system without the need to purchase additional Transcend packages. Features a full function editor, maintains a user designed list of telephone numbers, and it can automatically transmit information to as many as 100 Apples and 10,000 addressees. With its clock and calendar features, Transcend 3 can receive and file incoming mail without an operator present and can be preset to transmit user files, personal information, or business data to any remote location. It also maintains a personal "tickler" file to flag important messages and appointments. SSM Microcomputer Products, Inc., 2190 Paragon Drive, San Jose, CA 95131 (408) 946-7400.

'Hello Central!' puts the Apple microcomputer in direct communication with other computer systems - mainframes, minis and micros. It also taps into the wealth of information available from any of the hundreds of data-base services such as Dow Jones and The Source. 'Hello Central!' changes the Apple II or Apple II Plus into a highly-versatile communications center. Messages or whole files can be uploaded and downloaded using a text buffer of up to 180,000 characters using the disk for temporary storage. 'Hello Central!' can also be used as an automatic telephone dialer. 'Hello Central!' an Apple and a modem will handle unattended computer hookups by answering the phone, sending out a greeting, and saving the incoming message to disk. Includes several text handling operations that let the user retrieve, edit, manipulate and print text files with the built-in editor. Contact Advanced Operating Systems, 450 St. John Road, Michigan City, IN 46360 (219) 879-4693.

MICRO/Terminal will let Apple II, Apple /// or IBM personal computer users interactively exchange information with other microcomputers, mini-and mainframe computers, information services, timesharing services and bulletin board systems. Contains built-in editor and menus for ease of operation. Macro facility provides automatic series of seuences that will improve and speed interactions with other systems. MICRO/Terminal observes flow control protocols used by The Source and other timesharing systems to improve data transfer reliability. Keyboard 'mapping' capability allows users to redefine keys to match other, larger systems. A help feature displays a list of available commands. Upper and lower case characters and an 80-column board, standard on the Apple ///, are supported by MICRO/Terminal on the Apple ///. Introductory price of $84.95 for the Apple II version and $99.95 for the Apple /// and IBM versions. At your local dealer or contact Microcom, 1400A Providence Highway, Norwood, MA 02062 (617) 762-9310.

WINDOW

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WINDOW is a magazine without pages — an electronic magazine on a floppy disk! For the first time, you can learn about computing directly from your computer. Whether you're a student, a teacher or a parent, whether you've had your computer for three years or three days, Window gives you a totally new view on the world of educational computing.

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Window is the work of two pioneers in the world of education and personal computing. Henry Olds (Ed.D., Harvard) is Editor of Classroom Computer News and has spent twenty years training teachers, publishing, and developing curriculum materials. He has researched, developed, and extensively reviewed educational software. John Richards (Ph.D., SUNY-Buffalo) has spent sixteen years teaching philosophy and education and conducting research in mathematics education. He is now with the Division for Study and Research in Education at M.I.T. They have assembled a rich group of editorial, educational and programming talent from all over the country to create this exciting new magazine for you.

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Education

A new **Placement Test** for PAL reading education programs evaluates a child's reading ability and recommends which PAL grade level package (Grades 2 through 6) is most appropriate for the child. The test takes an average of 20 minutes and indicates how well the child has mastered each of the four goal areas covered by PAL: phonics, vocabulary/ structural analysis, comprehension, and study skills. The PAL Placement Test runs on the Apple II with Applesoft, 48K RAM, and one disk drive. The test is available for $29.95, and includes a $10.00 coupon toward the purchase of any PAL Master Disk or Reading Curriculum package. Contact Universal Systems for Education, Inc., 2120 Academy Circle, Suite E, Colorado Springs, CO 80909 (303) 574-4575.

Keyboard is an interactive animated, Hi-Res graphics program designed to assist the unskilled typist in memorizing the location of the keys and learning the correct finger motion for each keystroke. Utilizing the graphics capabilities of the Apple Computer, this program draws an image of the Apple keyboard on the screen. As each key is pressed, the appropriate letter is animated while the words appear below in a "ticker-tape" display. This immediate reinforcement helps the user retain eye contact with the screen while learning the key locations. An optional typewriter sound effect is provided. The program is recommended for all ages. Suggested drill activities for both adults and the child who is totally unfamiliar with the keyboard. There are no prerequisite skills. Retail price is $19.95 with one year warranty. Requires DOS 3.3, Applesoft. Contact SoftArt Software, 86 Green Street, P.O. Box 417, Carver, MA 02330 (617) 866-2103.

Using VisiCalc . . . a "hands on" Approach is an audio cassette training program containing two 120-minute cassette tapes, one data disk (for Apple II, Apple ///, or IBM PC) and instructions. The second product **The Powersharing Series** is a quality tape series (VHS or BETA) made in conjunction with the Emmy Award winning firm of Martha Stuart Communications. The series consists of 5 video tapes (including Volume V - Taking A Trip Through VisiCalc - 38 minutes). The cost of the audio series is $59.95 and of the video series is $1,000 with individual volumes selling for $250. Contact McMullen & McMullen, Inc., P.O. Box 230, Jefferson Valley, NY 10535 (914) 245-2734.

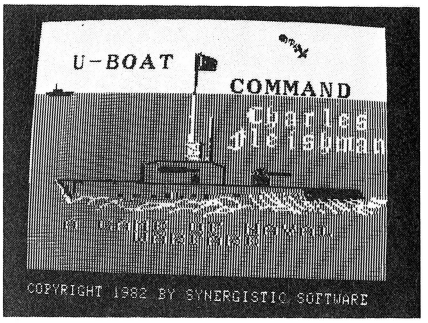
The Metric System Tutor is designed for students in Junior High through High school. A placement test is administered at the start of the program. After analyzing the student's score, the computer will send them to the tutor areas in which they need help. Students work at their own pace. They are skipped over areas they understand. The computer acts as the teacher and interacts in a personal way. Works entirely with metric units and thus avoids confusion caused by converting English units to metric units. Maintains high student interest by utilizing: High Resolution color graphics, Musical sounds, Counters that keep track of student score, and a sense of humor to add zest. Consists of four tutor programs that are tied together as a series - Introduction to Metric Tutor, Converting Kilo to Milli Tutor, Converting Milli to Atto Tutor, Converting Exa to Kilo Tutor. Requires an Apple II microcomputer with 48K RAM and Applesoft ROM with DOS 3.2 or 3.3 (specify DOS version desired). Complete series - $66. Contact Cygnus Software, 8002 E. Culver, Mesa, AZ 85207.

Games

TAIPAN! is an exciting strategy-adventure game featuring the China trade of the 1800's. As a fortune-seeking taipan, the player braves the perilous seas between the ports of Hong Kong, Nagasaki, Singapore, Manila, Shanghai, Saigon, and Batavia, trading profitable silk, arms, opium, and other cargos. The goal is to build a trading empire and amass a million dollars, despite ever-present danger. Greedy pirates lie in wait to pounce upon well-laden ships and seize their booty. Corrupt customs officials confiscate illegal (but profitable!) cargos and impose severe fines. Warehouses containing speculative commodities are subject to robberies and fires. Avalanche Productions, Inc., 2460 Embarcadero Way, Palo Alto, CA 94303 (415) 856-4881.

Millionaire is a stock market simulation game that both teaches and entertains. Have you experienced the thrill of earning $20,000 in a single day as your stocks rise wildly; or perhaps watched in terror as your life savings disappeared in front of your eyes? Anyone can play; the tutorial manual will take you through the basics. The game includes margin accounts, call and put options, stock and industry graphs, news reports, volume indicators, company histories, buy and sell transaction reports, and much more. Requires Apple II with 48K and DOS 3.3 This package with manual costs only $49.95. MICRO-Z Applications, 22704 Ventura Blvd., Suite 141, Woodland Hills, CA 91364 (800) 835-2246 EXT 101 in CA (805) 583-8645.

U-Boat Command is a new strategic, action war game, for the Apple II or Apple II Plus computer. This colorful Hi-Res game combines sound effects, arcade-like action, and real-time strategy into one challenging computer game. Players of U-Boat Command must defend their submarine against attacking destroyers and enemy aircraft. Survey the surface through a periscope; fire torpedos as necessary. If fuel or ammunition runs too low, players must be resupplied from friendly supply ships. Written in machine language - $29.95, requires 48K and DOS 3.3 with game paddles or joystick. At your local dealer or contact Synergistic Software, 830 North Riverside Drive, Suite 201, Renton, WA 98055 (206) 226-3216.



Escape From Rungistan. You awake with the worst headache of your life in a dank, sleepy jail cell deep in the mid-African nation of Rungistan. You overhear the guards saying you'll be shot at sunrise. There is one thing to do - break out of jail and escape from Rungistan. It's a long and treacherous journey; deadly snakes, bears, cannibals and guerilla warriors bar your way. Some vacation! Challenging fun, action and adventure, imaginative music and animation. Written in machine language and BASIC requires a 64K APPLE II (16K RAM card) with disk or an APPLE II Plus with disk. At your local dealer or contact Sirius Software, Inc., 10364 Rockingham Drive, Sacramento, CA 95827 (916) 366-1195.

Alibi is a whodunit: the player becomes a super sleuth in pursuit of a murderer, one of five suspects. The suspects must be questioned to determine who has the phony alibi. The player's savvy as a detective is tested by how he or she attempts to solve key mysteries surrounding the murder. The murder took place on the hour, but it is not known what hour; the body was carried from the

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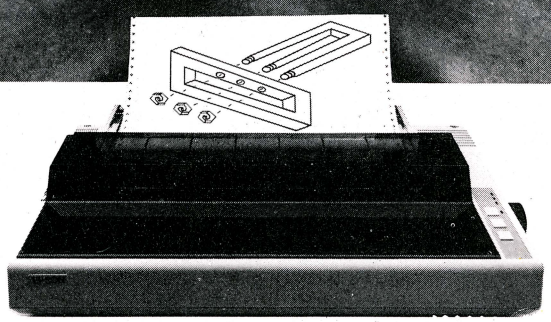
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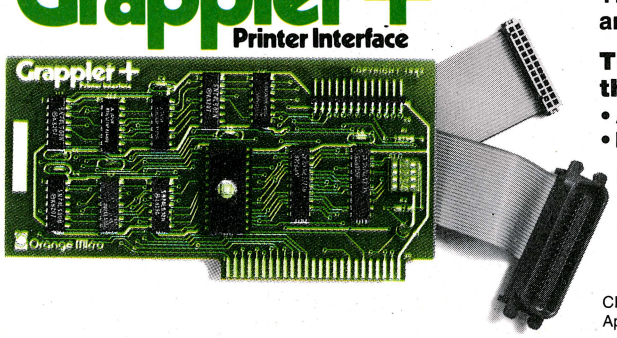
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With The Grappler™+ Printer Interface



The Grappler+ Features:
• Dual Hi-Res Graphics • Printer Selector Dip Switch • Apple III Compatible* • Graphics Screen Dump • Inverse Graphics • Emphasized Graphics • Double Size Picture • 90° Rotation • Center Graphics • Chart Recorder Mode • Block Graphics • Bell Control • Skip-over-perf • Left and Right Margins • Variable Line Length • Text Screen Dumps.

The Grappler+ works with Pascal and CPM.

The Grappler+ interfaces with the following printers:
• Anadex • Centronics • Datasouth • Epson** • IDS • NEC • C-Itoh • Okidata**

Orange Micro Inc.
3150 E. La Palma, Suite G
Anaheim, California 92806
(714) 630-3620

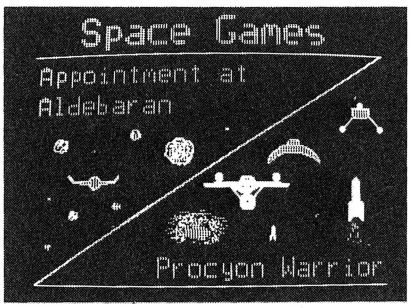
CPM is a registered trademark of Digital Research, Inc.
Apple is a registered trademark of Apple Computer, Inc.

Foreign Dealer Inquiries Welcome TX183511 CSMA

country house to the conservatory, but it is not known what room he was murdered in. The game provides six levels of playing difficulty: Detective Constable, Detective Sergeant, Detective Inspector, Detective Chief Inspector, Detective Superintendent and Detective Chief Superintendent. If the player's final deduction proves correct, the player will be promoted to the next level of super sleuthing and be assigned a tougher case in the next game. Requires Apple II with Applesoft and 48K - $14.15. Hayden Book Company, Inc., 50 Essex Street, Rochelle Park, NJ 07662 (800) 631-0856.

SSI's new **Guadalcanal Campaign**. is a 40 to 80-hour long simulation of America's most devastatang conflict with Japan. The game starts on August 7, 1942 and ends on December 31, 1942. Each day is divided into AM and PM turns - 194 turns in all. Every Japanese and American warship that historically participated in the campaign is included and rated for speed, cargo/plane carrying capacity, damage points, and number of main guns, secondary anti-aircraft guns and torpedo tubes. In spite of the game's complexity, this is an easy game to play. The computer provides a colorful search map and allows for realistic battle conditions, such as hidden movement, limited intelligence, and inaccurate ship sightings. During tactical battle, it resolves every combat down to the last ship and plane. When a long game is neither feasible or desirable, players may choose one of the shorter scenarios. There is a 184-turn game that lets you bypass preparatory details and jump right into the heat of battle. There are also four mini-games that range from four to twelve turns, one of which is the Battle of Coral Sea. These games can be played in two to four hours. Finally, there is a solitaire game in which the computer takes on the role of the Japanese. (*ponder the implications of that for a while! — PCW*)This game is designed for the 48K Apple II Plus, Apple ///, or Apple II with Applesoft ROM Card. Comes complete with diskette, rule book, map and player aid card for $59.95. Strategic Simulations, Inc., 465 Fairchild Drive, Suite 108, Mountain View, CA 94043 (415) 964-1353.

Two new arcade games, **Procyon Warrior** and the 3-D game **Appointment at Aldebaran**, come on one diskette. Both combine high-resolution color graphics, sound effects, and arcade action. In Procyon Warrior the player must defend the space station Procyon against the deadly United Galactic Earth Federation. A variety of drones and a formidable mother ship are fought off with plasma bombs and nutrino missiles. Depending on his success, the player is promoted or demoted in rank. In Appointment at Aldebaran, the new 3-D graphics has the player dodging asteroids and marauding space pirates. Even if successful at this stage, the player must still perform a tricky landing on the Aldebaran planet in order to deliver a life-saving serum. Procyon Warrior is machine language, $24.95, and requires a 48K Apple II or Apple II Plus, DOS 3.3, and joystick or paddles (joystick preferred). Contact your local dealer or Synergistic Software, 830 North Riverside Drive, Suite 201, Renton, WA 98055 (206) 226-3216.



Klondike 2000 is a space adventure game that captures the spirit, excitement and risk of a 'Gold Rush' on Mars in the year 2000. Klondike 2000 allows each player to be a member of a team exploring the Mare caves guard the gold. Each player must befriend the robots by feeding them crystal chips that grow in the cave's ceiling. The player who gains the allegiance of the most robots will harvest the most gold and win the game. The game features sound effects, a different game each time and three levels of play. Requires an Apple II disk with 32K - $24.95. Hayden Book Company, Inc., 50 Essex Street, Rochelle Park, NJ 07662 (800) 631-0856.

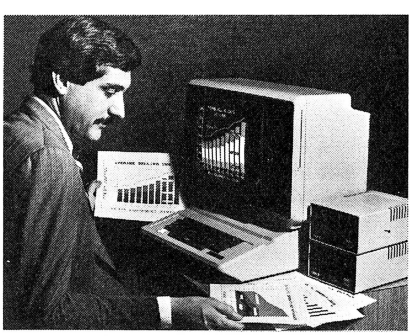
Visualize a figure in **Free Fall** through four different dream-like diversions. In each, imagine guiding this apparition past a deadly variety of Needles, Bip-Bops, Girders and Bombs. Envision the frantic figure clutching moving girders and sinking through black holes, leading onward to yet another nightmare. Playing Free Fall is no fantasy. It's best to be wide awake and ready for anything when you begin this journey into the unknown. Written in Assembly language for the Apple II or II Plus with 48K. At your local dealer on contact Sirius Software, Inc., 10364 Rockingham Drive, Sacramento, CA 95827 (916) 366-1195.

Graphics

Create slide show presentations for a variety of uses with the **Slide Show**, utilizing high-resolution graphics and 20 different specially created transitions between slides. For business presentations, educators, exhibits, lectures and other uses, the program features include automatic advance, time settings, slide advance mix option, the 20 transitions, and can contain up to 75 slides which can be repeated. The Slide Show works with one or two disk drives, a 48K Apple in DOS 3.3, and is not copy protected. It is compatible with NTSC TV signal processing hardware. $49.95 from C&H Video, 110 West Caracas Avenue, Hershey, PA 17033 (717) 533-8480.

Designer's Toolkit is a flexible collection of design tools to generate graphics for mapping, architecture, drafting - anything you once used a drafting table for. Emulating pen, pencil and brush on paper, Designer's Toolkit and the Apple, II Graphics Tablet let you work with a variety of artistic techniques. You can choose, for instance, from 10 different pen and brush styles permanently built into the program, or you can create and work with any set of as many as 10 of your own "brush" techniques, including, if you like, symbols for mechanical or electrical blueprints. In addition, Designer's Toolkit lets you draw from a palette of colors that can produce more than 300 color combinations. Working with the two high-resolution pages in Designer's Toolkit, you'll also be able to quickly transfer part of one drawing to another, magnify sections to add fine detail, invert, even label your illustrations. The Designer's Toolkit menu is on a special Graphics Tablet overlay; you touch the appropriate box to switch color, technique, or shape. To label drawings, you also can choose from 15 fonts, in three sizes, that have been built into the program. There's also room for you to design up to 10 of your own fonts, symbols, or text pictures. Designer's Toolkit is written in Applesoft BASIC. With the package you'll receive a master diskette and a backup disk, a demonstration disk and instruction manual with the overlay for the Graphics Tablet. Apple Computer, Inc., at your local Apple dealer.

Now, no matter how you plan to present them, you can get the graphics you need from your Apple II computer. **Target**





Turn your Apple into the world's most versatile personal computer.

The SoftCard™ Solution. SoftCard turns your Apple into two computers. A Z-80 and a 6502. By adding a Z-80 microprocessor and CP/M to your Apple, SoftCard turns your Apple into a CP/M based machine. That means you can access the single largest body of microcomputer software in existence. Two computers in one. And, the advantages of both.

Plug and go. The SoftCard system starts with a Z-80 based circuit card. Just plug it into any slot (except 0) of your Apple. No modifications required. SoftCard supports most of your Apple peripherals, and, in 6502-mode, your Apple is still your Apple.

CP/M for your Apple. You get CP/M on disk with the SoftCard package. It's a powerful and simple-to-use operating system. It supports more software than any other microcomputer operating system. And that's the key to the versatility of the SoftCard/Apple.

BASIC included. A powerful tool, BASIC-80 is included in the SoftCard package. Running under CP/M, ANSI Standard BASIC-80 is the most powerful microcomputer BASIC available. It includes extensive disk I/O statements, error trapping, integer variables, 16-digit precision, extensive EDIT commands and string functions, high and low-res Apple graphics, PRINT USING, CHAIN and COMMON, plus many additional commands. And, it's a BASIC you can compile with Microsoft's BASIC Compiler.

More languages. With SoftCard and CP/M, you can add Microsoft's ANSI Standard COBOL, and FORTRAN, or Basic Compiler and Assembly Language Development System. All, more powerful tools for your Apple.

Seeing is believing. See the SoftCard in operation at your Microsoft or Apple dealer. We think you'll agree that the SoftCard turns your Apple into the world's most versatile personal computer.

Complete information? It's at your dealer's now. Or, we'll send it to you and include a dealer list. Write us. Call us. Or, circle the reader service card number below.

SoftCard is a trademark of Microsoft. Apple II and Apple II Plus are registered trademarks of Apple Computer. Z-80 is a registered trademark of Zilog, Inc. CP/M is a registered trademark of Digital Research, Inc.

MICROSOFT
CONSUMER PRODUCTS

Microsoft Consumer Products, 400 108th Ave. N.E.,
Bellevue, WA 98004. (206) 454-1315

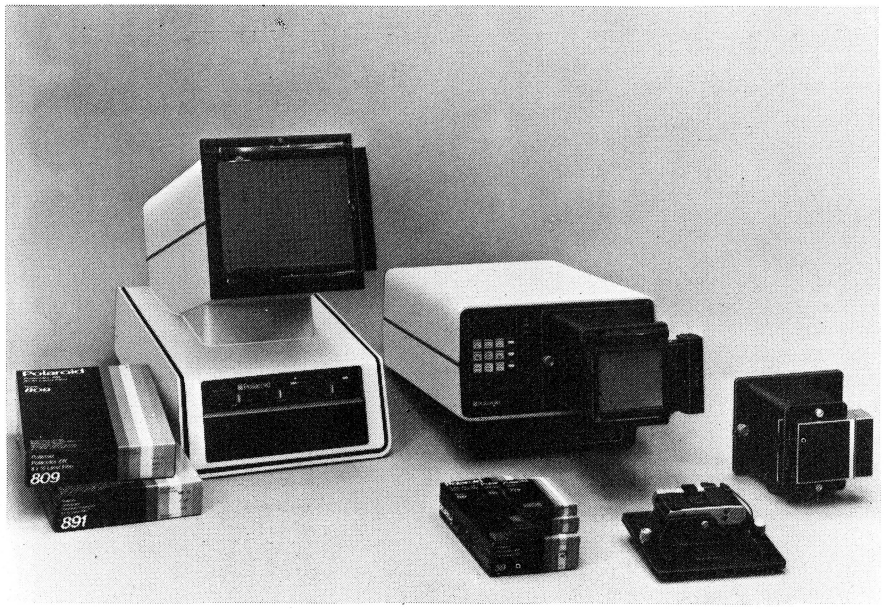
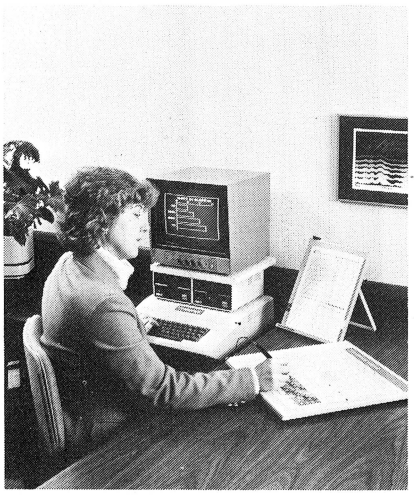


Image Maker makes it easy to produce charts and graphics in your choice of presentation mediums: color slides, color overheads, color paper copies, from your chart or graph with your Apple Plot or Apple II Business Graphics software, then transmit your image, via phone modem, to your production center. Within 48 hours - or overnight if necessary - your graphics will be on their way, shipped to meet your schedule. Cost is $175 for the Target Image Maker software and $10 or less per graphic. For the location of the dealer nearest you or to obtain information about bulk sales agreements, call or write Comshare Target Software, 1935 Cliff Valley Way, Atlanta, GA 30329 (404) 634-9535.

The **VideoPrinter Model 8 color film recorder** transforms "soft copy" video signals into full color instant photographic hard copy. The 8 x 10 instant color film recorder offers the photographic capabilities of digital image processing at a price comparable to analog devices. The microprocessor controlled display driven system produces detailed continuous-tone Polaroid 8 x 10-inch instant color overhead transparencies and prints of computer or video images. Designed as a desktop unit, the Polaroid VideoPrinter is compact and lightweight, measuring 24 x 16 x 25 inches, and weighing 50 pounds. The system delivers virtually distortion-free, accurate color copies and features controls to minimize raster lines. It produces hard copy superior in quality to images directly photggraphed from the screen, and frequently better than the video image itself. It is expected to have a retail price of $6,000. Polaroid, 575 Technology Square, Cambridge, MA 02139 (617) 577-2000.

TEKALIKE turns the Apple II into an intelligent graphics workstation communicating with host computers. Features a Tektronix 4010 Simulator, Upper and Lower Case, Local Plotter Support, Local Zooming, Picture Save & Restore, Customizable Interface, Fast Communications. Compatible with Tellagraf & Disspla, DI 3000 & Grafmaker, Plot10, etc., All software for the Tektronix 401x family, HiPlot DMP, DC Hayes & Apple Communications Card, CCS 7710A. Requires Apple II Plus or Apple II with 48K, DOS 3.3. $195 from Mesa Graphics, P.O. Box 506, Los Alamos, NM 87544.

The **Micromedia Slide Composition System** allows an Apple II computer to be used as a graphic design station. A basic system costs about the same as a standard office copying machine. With this system, Apple II owners can create pie charts, bar charts, line graphics and text for high-resolution, 35mm color slides for sales meetings, training programs and other business presentations. The system consists of a program on a floppy disk, a mylar overlay sheet for the Apple II Graphics Tablet, and an instruction manual containing easy-to-follow directions. A special 16K memory expansion board provides a basic Apple II system with computer graphics capability and a selection of 64 different colors. In order to fully utilize its capabilities, the system should be configured to include the following standard components : an Apple II Plus 48K RAM or Apple II with autostart ROM package; an Apple Graphics Tablet; two floppy disk drives; DOS 3.3 with two disk drives; a video monitor; and one Novation Apple-Cat phone modem. Graphics created on the Micromedia system are recorded onto a disk and sent by phone to a local service bureau for output on a DICOMED D148S Color Slide System. DICOMED Corporation, 9700 Newton Avenue South, Minneapolis, MN 55431-2592 (612) 887-7100.



Videoslide 35 is a system designed to record video images onto 35mm color film. The new product can be used with most color raster graphics terminals, and is aimed primarily at the personal computer market. The single unit price of approximately $2,500 is expected to appeal to users and makers of slide presentations, particularly where extensive use of charts and text is employed. Videoslide 35 accepts video inputs in most forms, including RS-170 RGB (Red, Green, Blue), TTL RGB, NTSC, or others specified at the time of ordering. The system is connected to the video output, or in parallel with the monitor used by the operator. Controls consist of an on-off switch, color balance control switches (factory set for Ektachrome 64) and an exposure start control. Additional software is not required for the system's operation, nor is special operator training needed. Videoslide 35 accepts conventional 35mm film, and developing may be performed by any commercial photographic processor. The table-top unit measures approximately 12" x 10" x 25"; weight under 20 lbs. The electronics and power supply are housed within the same package, with standard interconnecting cables to plug into the generating system and the 117V power outlet. Lang Systems, Inc., 1392 Borregas Avenue, Sunnyvale, CA 94086 (408) 734-3332.

The **AP PAK** product line consists of hardware and software products designed specifically for each computer system. This initial release is the Apple Ap Pak for the Apple II. Contains an Auto Plot Printer Control Card, interface cable, MPI developed software programs and instruction

V new for Apple II™

I. APPLEsurance II. . .

DUAL AUTOMATIC DIAGNOSTIC AND ASSURANCE SYSTEM

The only double-safe system now available for insuring the reliability, integrity, and dependability of your Apple II and peripherals. Identify problems before you lose time and data. APPLEsurance II includes:

(1) A standard disk controller card which also automatically runs sophisticated diagnostic routines on basic system hardware each time you power-up. Descriptive error messages indicate any problem areas and, in some cases, the specific chip or component that's responsible.

(2) Disk based diagnostic and assurance tests for further and more extensive checks of the basic hardware plus elaborate standard and optional analysis of peripheral cards and sub-systems.

APPLEsurance II suggested list prices:

Complete System with Disk Controller Card and Disk Based Software **$150.00**

Disk Controller Card with Power-Up Diagnostics only **$125.00**

Disk Based Software only **$50.00**

II. GRAPHITTI. . .

GRAPHICS/PARALLEL PRINTER CARD

Sophisticated text and graphic routines available via simple keyboard commands. Avoid "squashed" printouts. GRAPHITTI on-board firmware lets you utilize the Apple high resolution graphic screens – circles are printed as circles. Use with most of today's popular dot-matrix printers. Graphic support for Epson, Okidata, NEC 8023, C-Itoh Prowriter, and IDS Prism. Compatible with most software packages including PFS:Graph,™ CP/M,™ and Apple Pascal.™

Firmware 'text' features include: Set Line width via standard ^InN format, Enable or Disable Line Feed after Carriage Return, Set Lines per Page, Set Left Margin, Set or Clear 8th Bit. Print High Resolution Page 1 and/or 2, Double Size, Emphasized Mode, Inverse Mode, Rotate 90 Degrees, Specify Left Margin . . . and more.

GRAPHITTI Graphics/Parallel Printer Interface Suggested list **$125.00**

III. VERSAbox. . .

THE ONLY INTELLIGENT SPOOLER/BUFFER WITH AN OPTIONAL REAL TIME CLOCK INTERFACE DISPLAY

For use with all Centronics parallel and RS-232C INPUT/OUTPUT interfaces. VERSAbox's high-speed input combined with up to 60K buffer (more with character compression) frees up your computer from the slow job of printing. Modems and other compatible devices can also be buffered. Multiple software selectable outputs permit you to choose between two or more VERSAbox outputs or use them simultaneously. You can buffer multiple inputs simultaneously too.

Add the optional REAL TIME CLOCK to VERSAbox and you get a six digit LED numeric time display. Your computer can read the time via the RS-232C port. Another useful option is the SWITCHED 120V SOCKET that can turn external devices on and off by clock control.

Cabinet is 11"W, 8"D, 8"H. VERSAbox suggested list price with 16K buffer **$249.00** Options extra.

IV. VERSAcard. . .

FOUR CARDS ON ONE + TWO NEW OPTIONS

NOW! The four separate card functions – with true simultaneous operation – that made VERSAcard the preferred multifunction card for Apple II – (1) Serial Input/Output Interface (2) Parallel Output Interface, (3) Precision Clock Calendar, and (4) BSR Control – PLUS NEW OPTIONS: Screen Dump Graphics ROM and BSR Time and Event Program.

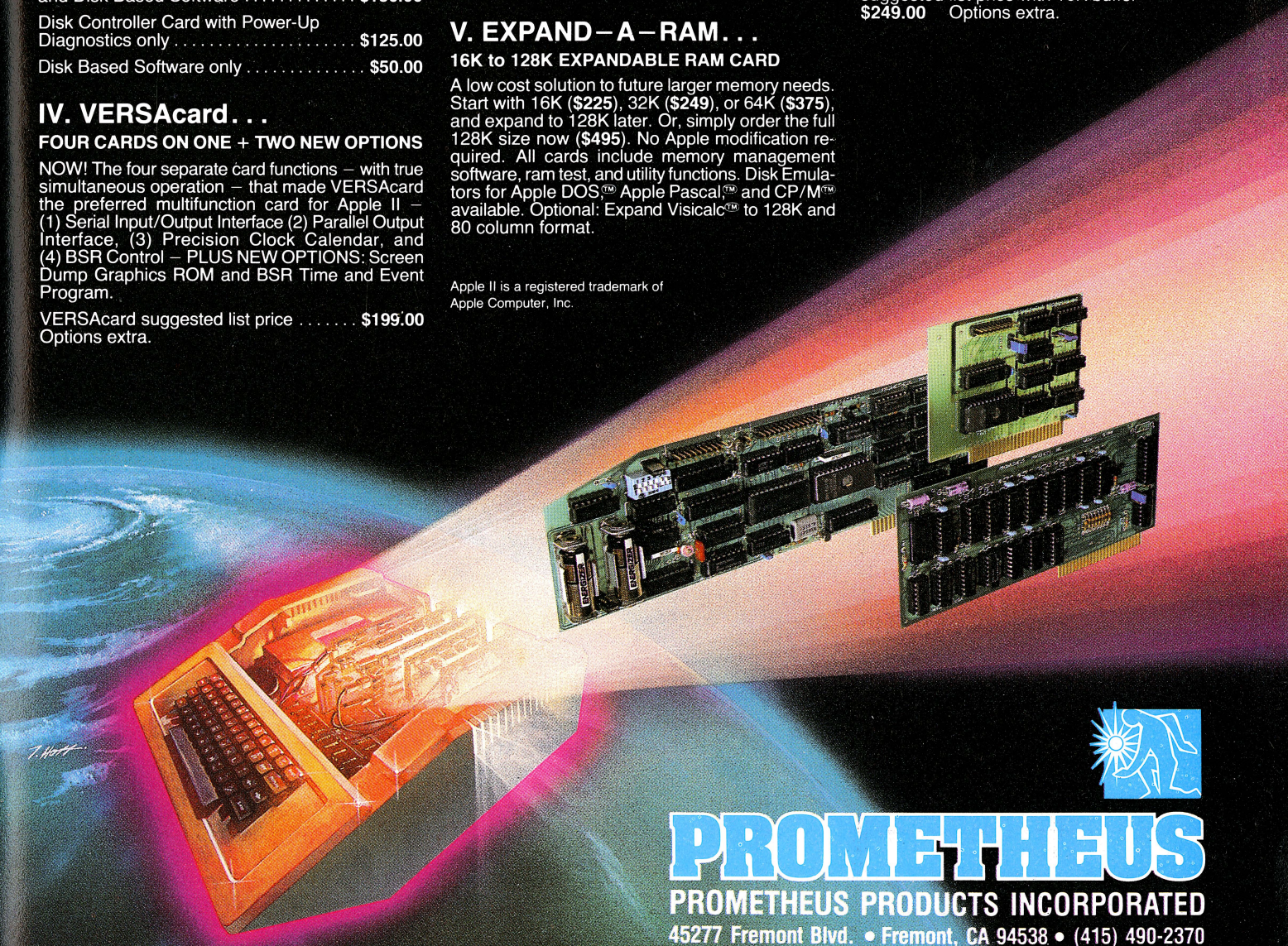
VERSAcard suggested list price . . . . . **$199.00** Options extra.

V. EXPAND–A–RAM. . .

16K to 128K EXPANDABLE RAM CARD

A low cost solution to future larger memory needs. Start with 16K (**$225**), 32K (**$249**), or 64K (**$375**), and expand to 128K later. Or, simply order the full 128K size now (**$495**). No Apple modification required. All cards include memory management software, ram test, and utility functions. Disk Emulators for Apple DOS,™ Apple Pascal,™ and CP/M™ available. Optional: Expand Visicalc™ to 128K and 80 column format.

Apple II is a registered trademark of Apple Computer, Inc.



PROMETHEUS

PROMETHEUS PRODUCTS INCORPORATED

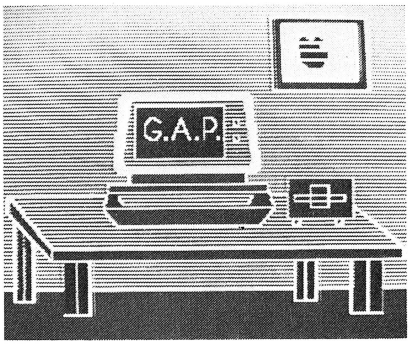
45277 Fremont Blvd. • Fremont, CA 94538 • (415) 490-2370

manuals. The Apple owner can use all the graphic capabilities of his MPI 88 or 99 graphics printer. Print an unlimited number of character fonts, large headlines, intermix type fonts on a line, do graphic dumps of Hi-Res files, automatically generate individualized computer letters and many more. The card can print the Hi-Res display in any of three heights or twelve widths, indented, rotated 90 degrees, or even print two separate graphic files side by side. Font Writer is a software package developed to allow an unlimited choice of fonts when using the popular AppleWriter Text Editing System sold by Apple Inc.

Letter Post facilitates the computer generation of individually printed letters to specified names from a mailing list. It is designed to use name files from Apple's Apple Post and Synergistic Software's Mailing List Database programs. Apple Ap Pak also contains a series of demonstration programs that illustrate the versatility and usefulness of graphic printing for the Apple user. Complete with instruction manuals - $145. MPI, 4426 South Century Drive, Salt Lake City, UT 84107 (801) 263-3081.

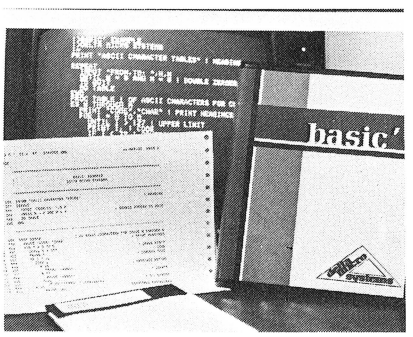


The **Game Animation Package** allows Applesoft programmers to create complex and detailed full color pictures on their Apple computers. This is the type of program used to create high resolution graphics and arcade games. The Game Animation Package has several features. Bit mapped graphics are available for professional quality arcade games. Vector graphics and full screen creation allow the user to make full screen pictures as used in adventure games for logos, maps, gameboards, etc. The complete color fill option allows the user to create beautiful Hi-Res pictures. Requires Applesoft, DOS 3.3. Synergistic Software, 830 North Riverside Drive, Suite 201, Renton, WA 98055 (800) 426-6505.



Languages (Programming)

Basic Prime is a powerful, completely structured extension of the BASIC language. Blocks of code are indicated by a unique indentation convention, eliminating the need for extraneous statements (such as BEGIN & END) and statement numbers. The BASIC translation is then debugged using the BASIC interpreter on your microcomputer. Since the bulk of software development time is spent debugging code, this debugging environment is helpful. Basic Prime provides full documentation and a program disk in a handy binder format. Available for the Apple at $129 (plus postage, handling and applicable sales tax) from Delta Micro Systems, P.O. Box 15952, New Orleans, LA 70175 (800) 535-1814.



A second **Utilities disk** is now available **for C. O. R. P.** which permits on-screen calculations, *e.g.*, stock value calculated from quantity and unit price; Field updating facilities: enter in one field and save the result cumulatively to another field; Definitions of inclusions at Print Program run time rather than Generation time. Up to two fields can be nominated for inclusion or exclusion by specific values or within a range of values. The price of the C.O.R.P. Utilities Disk II is 29 Pounds Sterling complete with manual. Contact your local dealer or MicroSystems ltd., Summerfield House, Vale, Guernsey, Channel Islands, Europe - GB Telephone: (0481) 47377.

Personal

The **Stamp Collector** and the **Coin Collector** are two powerful Data Base programs for philatelists (stamp collectors) or numismatists (coin collectors). Each consists of six programs in which collection information can be entered, deleted, changed, searched, sorted and printed in multiple formats. Will catalog your foreign or domestic lists by denomination, country, description, year, value, source, etc. There are multiple report modes. Meeting list allows you to sort, and select meetings by date and location. Sources list gives sources for stamps (or coins), supplies and information on trades and liquidations. A useful want list. Create your own Data Base list - your own words or titles. File transfer ability permits transmitting data to other disks over the telephone. This disk can be copied for back-up purposes. It is user definable and programs can be listed for your own modifications. A detailed manual is included. Requires Apple II with Applesoft ROM, 1 disk drive with DOS 3.2 or 3.3 and optional printer. Each is $49.00. Andent, Inc., 1000 North Avenue, Waukegan, IL 60085.

Football Compu-Stat is a program for analyzing the National Football League. Compu-Stat provides information on won - lost records and margin of victory both in "on field" and point spread performance. Displays are presented in graphic or printed form. Breakdowns of performance are further classified by division, by conference and by inter-conference opponents. Analyses segmented into combinations of "home/visitor - favorite/underdog" are callable and graphable. Statistical data is available and comparable on a team vs. team basis. All box score statistics are considered, eliminating the need to hoard clippings and newspaper articles. The program is complete with manual and can be updated by the user or by statistical disk ($25/week). For more information contact Interactive Sports Systems, 1022 Harmony Street, P.O. Box 15952, New Orleans, LA 70175 (504) 895-1481.

Personal Money Manager (PMM) is a full-featured interactive budget manager. PMM consists of: Omnifile, a powerful file manager and report generator; Omnitrend, a sophisticated multiple regression and statistical analysis program; and Omnigraph, a data plotting program. PMM allows full checkbook management as well as management of cash transactions, charge accounts, savings ac-

OUR GAMES REALLY GRAB YOU!



We're Advanced Operating Systems. And that's exactly what our games are. Advanced! We have the most exciting, full-color, high-resolution graphics games around. Games that take hold and won't let you go. But our games do more than just entertain. They challenge! And stretch your abilities to the limit.

VOYAGE OF THE VALKYRIE requires the sharpest coordination plus a good memory and the mapping skills of history's greatest explorers. As pilot of the attack ship VALKYRIE, your mission is to wrestle the island Fugløy from the grasp of an army of laser-wielding war birds and secure the golden treasures hidden within the walls of the 10 island castles. If you can! VALKYRIE combines the skills of an adventure game with the excitement of the best arcade games to bring you hours of thrills and challenge.

CAVES OF OLYMPUS is the most difficult adventure game currently available. It forces you to explore the very limits of your logic and reasoning powers. As you enter the caves, your eyes are assaulted by an onslaught of explosive color and high-res graphics. The odds are overwhelmingly against you. Can you beat the odds and find your way through the treacherous caverns, to locate the escape vessel which will carry you to safety?

There's treasure in the CAVES!

We're so sure that CAVES will have you running in circles that we're offering some additional incentives. **Send us a complete listing of all correct moves plus a screen photo showing the 100% efficiency rating and you'll be eligible to win the following:**

First Prize: A.O.S. Apple Library including THE PROGRAMMER, HELLO CENTRAL!, APPLE-AIDS, PENPAL AND PDQ (Worth over $750)

Second Prize: Copy of THE PROGRAMMER ($495 Value)

Third Prize: Your choice of 2 from: PDQ, PENPAL, APPLE-AIDS and HELLO CENTRAL! (Worth up to $165)

Note: Cash prizes will be awarded to the first *3* correct entries received. $250 to the first, $150 and $100 to the second and third. How does that grab you? Entries will be accepted through June 30, 1983.*

Special introductory offer!

If you order direct, *now,* you'll save 20% on the prices listed below. Call (800) 348-8558 to order. Indiana residents call (219) 879-4693. MasterCard and VISA accepted.

VOYAGE OF THE VALKYRIE

TRS-80 Model I®	Tape	$34.95
TRS-80 Model I or III®	Disk	$39.95
Apple II® or II Plus®	Disk	$39.95

CAVES OF OLYMPUS

Apple II or II Plus	Disk	$39.95

ADVANCED OPERATING SYSTEMS

450 St. John Road
Michigan City, IN 46360

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*A.O.S. employees, advertising agency personnel and their families are not allowed to enter. Contact A.O.S. for listing of winners after July 15, 1983.

counts, etc. An interactive budget module provides full 'what if' capabilities, and the unique budget monitoring system allows budget status to be checked at any time - even in the middle of a month. $59.95 plus$2 shipping per program. VISA or Mastercard accepted. Educational Computing Systems, Inc., 106 Fairbanks Plaza, Oak Ridge, TN 37830 (615) 483-4915.

The new **Fallout Prediction and Shelter Sizing System** is a design tool to: 1) predict the fallout radiation environment from a nuclear explosion for user specified bomb size, range and wind speed, 2) compute protective shelter roof and wall thickness requirements to shield external radiation level to user specified internal (to shelter) safe radiation dose levels and 3) assist planned egress from shelter by computing the expected exposure dose one would receive during egress, for user specified time of departure and duration outside the shelter. The program is a user oriented, interactive design tool, with fallout tutorial information included on the diskette. Written in Applesoft BASIC, the program can be used by anyone that knows how to boot the system. The program is available on diskette. Minimum system requirements include Apple II Plus, 16K, single disk drive, DOS 3.3 - $13. Southwest Technical Software, P.O. Box 2251, Mission Viejo, CA 92690.

The **Menu II** from C&H Video is a new menu planning program. Create and store recipes, plan meals for up to 1,295 people, and create shopping lists which combine like ingredients for maximum economic efficiency. Up to 24 ingredients per recipe, longer comments and recipe names, and quantities in standard, cookbook style fractions. Produces a printed copy of the full menu, and an alphabetized shopping list, which includes a section for non-food items. Plan menus for up to 2 full weeks at one time or 42 meals. Works with one or two disk drives, a 48K Apple and a printer. $39.95 C&H Video, 110 West Caracas Avenue, Hershey, PA 17033 (717) 533-8480.

Utilities

Disc Utility for Apple DOS 3.3 can recover that accidentally deleted program. Also it can reorganize a disk, inform you of the remaining space available, and patch any sector. Menu driven and easy for the novice while still efficient for the professional. Compatible with the M&R Sup'R'Term. The PATCH section gives full-screen editing capability in both Hex and ASCII. License of $50 includes purchase cost. Anser Corporation, 502A North Second Avenue, Sandpoint, ID 83864 (208) 263-1213.

The **Integer Fix**, for the Apple II Plus, makes it easy to convert disks containing programs written in Integer BASIC so they may be run on the Apple II Plus which will normally only run programs written in Applesoft BASIC. The DOS 3.3 software will operate with one or two disk drives. The program will make the necessary changes and additions to the disk software to allow operating both Integer and Applesoft programs without concern for language availability. Any existing menu programs or inter-program communications, will not be affected by the conversion, even if the programs are in different versions of BASIC. Extensive error trapping.Suggested retail price is $20. Contact Barrington Educational Computer Cooperative, P.O. Box 863, Barrington, IL 60010 (312) 658-4710.

DATALOK software protection for the Apple II computer makes available the Data Encryption Standard (DES) Algorithm for complete and absolute data protection. By storing data on disks in encrypted form, DATALOK prevents unauthorized individuals from gaining

Supercharge Your APPLE II*



The Axlon RAMDISK™ 320K Memory System for the Apple II and Apple II Plus* provides access speeds never before available. The Axlon memory system is designed to interact with Apple DOS 3.3* and Apple Pascal 1.1* like two standard floppy disk drives while delivering the lightning fast access speeds of RAM memory. This also leaves 32K of RAM for advanced programming techniques. The interface board is slot independent and draws no power from your Apple. The rechargeable battery system built into the unit provides three hours of backup in the event of a power loss. Drop by your local Apple dealer or contact Axlon, Inc. for more information.

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- Rechargeable battery system built-in to provide 3 hours of auxiliary power
- Slot independent interface board - draws no power from your Apple
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access to data. Absolutely no user programming is required for system operation. DATALOK provides two basic utilities for the user: 1) The ability to encrypt and decrypt any type file created under Apple DOS; 2) The ability to render a disk inaccessible and unbootable to an unauthorized user. Provided also is a diagnostic program enabling the user to verify the system's operation while providing expertise on DES for the inexperienced user - $349. Requires an Apple II, 48K RAM, one disk drive, DOS 3.2 or 3.3 and Applesoft ROM. Atlantis Computers, 31-14 Broadway, Astoria, NY 11106 (212) 728-6700.

For Apple II users who work under Apple Pascal and/or Fortran, Stellation Two has released a revised version of their **Pascal Speed Up System**. The system, which runs under The Mill 6809 Coprocessor Board, now includes a software printer spooler, a floating point capability, and speed up software all on the same disk. Suggested retail is $295. Contact Stellation Two, The Lobaro Bldg., P.O. Box 2342, Santa Barbara, CA 93120 (805) 966-1140.

TranScribe is a spooler designed for use with the Apple /// and a hard disk such as the Profile or Corvus hard disk. When the spooler is used, printer output is sent to TranScribe rather than directly to the printer. TranScribe writes the output onto the hard disk (generally a fairly fast operation). Once the entire report has been put on disk, control is returned to you. You can then continue using the computer for other tasks. TranScribe will send the output from the disk to the printer without interrupting you. TranScribe works with any printer connected to the serial port (if it uses the .PRINTER driver). It also works with printers connected via Apple's Universal Parallel Interface Card. The Spoolstatus screen tells you the number of reports in the spooler queue. It also gives you an opportunity to edit the contents of the spooler queue. You can delete any report from the queue - even the report currently being printed. It is also possible to restart the printout of the current report in case the printer jams. TranScribe uses 9K of memory (5K if the Spoolstatus driver is not installed). Suggested list of TranScribe is $125. Quark Engineering, 1435 Williams, Suite 1102, Denver, CO 80218 (303) 399-1096.

The new **Busywork** package of programmer's aids has many programs and program routines for programmers developing business oriented applications in Applesoft BASIC. Included in the package is a disk (DOS 3.3) of programs and an extensive manual detailing use of the programs and routines. Also included on the diskette is a series of DEMO programs. Some of the programs available are Greeting - a title page generator that is the basis for a turnkey operational program package; Main Menu for multiple program packages includes the ability to specify a system user for packages where more than one set of data is involved. Update System Parameters creates a file of system hardware being used for use by other programs in the package. Busywork includes many routines that handle most of the "busywork" involved in writing a business program. Included are such routines as: Input Routine, Dollar Format, Data Disk, Master Disk, Menu Routine, Center Print, Printer/Screen, Screen Hold, Printer Heading, Input Date, # Day of Year, Valid Date, System Setup, System User, Term Edit, Printer Online, Right Justify, Initialize File, Main Menu and Error Handling. Contact Datam Consultants, 1641 State Street, P.O. Box 238, Dekalb, IL 60115 (815) 758-1505.

Central Point Software, Inc., announces **The FILER**, an Apple disk utility system for 35, 40, and 70 track drives. The FILER package contains a disk drive speed check, disk drive test, fast copy program (35 seconds) and a sophisticated file manager. Options include: Catalog with space on disk, Copy Files, Copy Disk, Copy DOS, Delete Lock and Unlock Files, and Change Booting Program (name and file type). Suggested retail is $19.95 at your local dealer or contact: Central Point Software, Inc., P.O. Box 19730-#203, Portland, OR 97219 (503) 244-5782.

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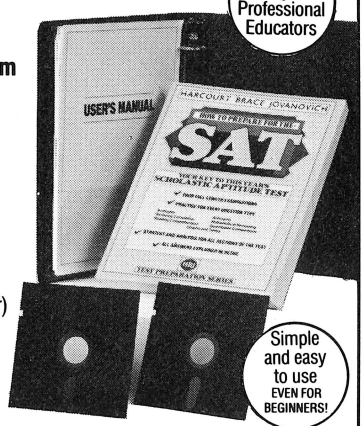
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Data Base Management System
Release 2.0

A DBMS for the Apple Computer that has been designed with simplicity in mind. SUPER FILE CABINET is fast becoming the chosen DBMS in colleges, high schools, libraries, small businesses, and for personal use — both in the U.S. and internationally. It offers all the features of the more expensive data managers, at a fraction of their price.

1. Includes 4 programs: SUPER FILE CABINET, REPORT GENERATOR, DATA BASE ADMINISTRATION and BIG FILE CABINET.
2. Distributed on standard DOS 3.3 diskettes.
3. Complete comprehensive user manual with helpful hints as well as instructions describing how to modify the programs.
4. Files entered with the Apple Contributed FILE CABINET program and the SFC Release 1 programs can be used directly.
5. Requires Applesoft Basic, 48K RAM, and single disk drive. Supports almost any printer.

System features include the following:

- power "boolean" selection criteria and "wildcards".
- completely menu driven for ease of use.
- ability to define data base edits, default values, and date stamps.
- powerful report generator supports sub-totals, mailing labels, user titles, page numbering, and much more.
- mass change and mass delete functions.
- utility functions to copy an entire data base and to add/delete fields without re-entering the data.
- ability to support data bases that are bigger than RAM memory.
- multilevel sorting.

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They also use your Apple III's controller and power, saving an expansion slot and no AC power cord. And they can be mixed in any combination on the daisy-chain. At 572 KBytes, the A143 makes a truly viable backup device for the ProFile Hard Disk.



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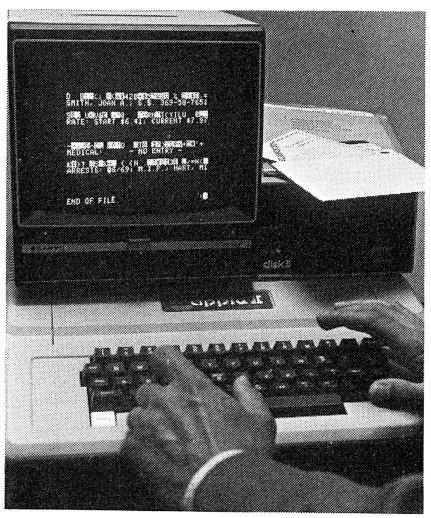
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The Global Program Line Editor is a new utility software program for the Apple II computer in both Integer and Applesoft BASIC. The GPLE has several important new features. These include global editing with search and replace, search and display, and search and edit. With GPLE the escape functions are edited without running a separate program and programmers can control listing by line or page. GPLE automatically uses a language card if one is available and works with most 80 column boards. This program also has a system enhancement with type ahead buffer and DOS mover. These features are combined with the standard features of the previously released PLE which include programmable cursor control, lower case entry from the keyboard, and line editing including character insert/delete, pack, find, insert control characters, etc. The versatile escape functions allow you to assign any sequence of characters to any key on the keyboard. Requires a 48K Apple II or II Plus, DOS 3.3 and $64.95. Contact Synergistic Software, 830 North Riverside Drive, Suite 201, Renton, WA 98055 (800) 426-6505.

CLASSIFIED encrypts and decrypts the information stored in any standard DOS 3.3 diskette file. The use of personal computers to store confidential information is a brand new application brought about by the introduction of low-cost encryption software. For example, selected phone numbers can be kept private by storing them in an encrypted file. Other prime candidates for file encryption are financial data files, such as those created by VisiCalc, and program files contaiers, numbers, or symbols. The encryption manual supplied with CLASSIFIED helps the user to encrypt a file within ten minutes of first opening it. Works on an Apple II or II Plus or the Apple /// (in emulation mode). CLASSIFIED is now available for $39.50 from Passage Research, 945 Turquoise Street, Suite G, San Diego, CA 92109 (714) 488-5358.



MicroLIB is a CP/M and MP/M disk file 'librarian' that allows the user to store many disk files into a single larger file. Once a file is saved into the larger file, or library, it is managed, updated, and retrieved through simple commands. MicroLIB reduces the amount of space required to hold disk-resident files, while still providing almost immediate access to the files. This is possible because of the CP/M and MP/M disk space allocation algorithms and MicroLIB's use of compacting routines wherever possible. The system provides users with two levels of security for files placed in the library: password protection and password plus data encryption. In the latter case, without the password the data is totally unintelligible. Users can establish relationships between groups of files, then process an entire group with a single command. An optional feature date stamps entries as they are added to a library and each time they are processed, thus providing even more user control. MicroLIB's comprehensive reports describe the contents of a library, displaying all information stored in the library directory in a professional format. MicroLIB retails for $295 with multi-copy discounts available. Contact Advanced Micro Techniques, 1291 E. Hillsdale Blvd., Suite 209, Foster City, CA 94404 (415) 349-9336.

Word Processors

The "**Metatext**" package comes on a single master disc, giving the user many Apple II system options that altogether would cost several hundred dollars if done with conventional add-on circuit boards. Features of the package include: full ASCII 80-column software-packed alphanumerics, 40-column option for enhanced readability, creation routines allowing user to make custom fonts, a text formatter, and various line-oriented text editors. The package includes a serial output program which will drive most RS232 printers from the existing Game I/O connector. The Metatext package, purchased as a single disc master along with a 40-page users manual, sells for $79.00. Contact Metaresearch, Inc., 1100 SE Woodward St., Portland, OR 97202 (503) 232-1712.

The **Gutenberg Word Processor** features High and low resolution text editing modes, split-screen text editing with text transfers across files or diskettes, second character sets that are user definable, text block moves with Mark/Save/Transfer command, Delete functions for single letters, words, screen lines, top of screen, bottom of screen, entire screen or text blocks. File size is limited only by the disk capacity. Full word wrap-around is maintained in all editing modes. Also featured are: Search and display function for more than one character string simultaneously, each capable of up to eight different masks; Automatic and manual search and replace with 6-digit counter; Stop code for search and replace; search count function; user programmable code insertion and programmable keys with save and recall option; user selectable forward and reverse scrolling by screen lines, sentence or paragraphs; single key positioning to start or end of document; secretarial shift and electronic shift lock. The Composition Print Program provides fully professional and complex printing of graphics, text, running head and running foot, tabular composition with any number of tab columns; allows arithmetic computations and printing of the result in the text stream; single or double underlining; supports ghost hyphenations; handles form letters; takes four different input sources simultaneously, etc. Contact Micromation Limited, 1 Yorkdale Road, Suite 406, Toronto, Ontario, Canada M6A 3A1 (416) 781-6675.

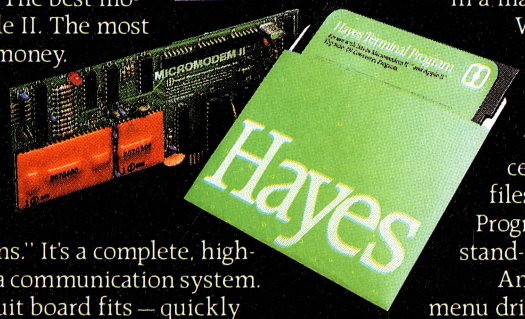
The **PIE Writer** Word Processing System comprising the PIE text editor and FORMAT text formatting program is now available from Hayden Book Company. PIE is a free-form, screen-oriented editor for entering and modifying text. FORMAT uses simple codes imbedded in the text to control the formatting of letters, manuals, and other documents. The optional PRO/FORMAT program supports many 'specialty printer' features, including: Multiple Fonts, including Elongation, Proportional and Incremental right justification, both Superscripts and Subscripts, Underlining of any font, including subscripts and superscripts. Fonts can be changed in the middle of filled text, and right justification remains automatic: no manual line length adjustments required. Made for the standard 40 column board or an 80 column board. A machine buffer has been added so text can be entered as the machine is scrolling. Multiple tabbing capabilities allow the cursor to stop at the beginning of each word, not only at set stops. The formatter, used to determine how the printed text will appear, now has incremental spacing. This benefit allows fractions of a character space to be added so the left margin can appear as even as the right margin. The formatted output can now also be saved on a file disk. PIE Writer also has improved documentation, with index. Hayden Book Co., 50 Essex St., Rochelle Park, NJ 07662.

Lexicheck, a spelling checker for the Apple ///, is accessed from the Word Juggler word processor with a single keystroke (actually, 'Closed Apple - 7' on the keypad). A dictionary of 30,395 words

More Apple II owners choose Hayes Micromodem II than any other modem in the world. Compare these features before you buy. You should. It's your money. Thousands of other Apple II owners have already compared, considered, and are now communicating — all over the U.S.A. — with Micromodem II. The best modem for the Apple II. The most modem for your money.

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And because it's menu driven, you can choose from a wide variety of options to set your communication parameters — as well as change hardware configuration — directly from the keyboard. It even allows you to generate ASCII characters that are normally not available from Apple keyboards, further extending your capabilities. Incoming data can be printed (on serial or parallel printers) as it's displayed on your screen.

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comes with Lexicheck. It is specially compressed and uses up only 75,000 bytes of disk space (a little more than half a disk). By adding your own dictionaries for specialized terms, Lexicheck's vocabulary can be expanded almost indefinitely (a blank diskette can hold almost 14,000 words with an average word length of 9 characters). A legal dictionary which adds 8,000 legal terms to the basic 30,000 word dictionary is available separately. When you check a document, Lexicheck will display each word it doesn't recognize on the screen in the context in which it first occurs. You may either skip over the word, replace it with the correct spelling or add it to your own personal dictionary. Lexicheck normally displays unrecognized words in document order, but you can have them displayed in alphabetical order if you prefer. Lexicheck is $195, The Legal Dictionary is $85. Quark Engineering, 1433 Williams, Suite 1102, Denver, CO 80218 (303) 399-1096.

BOOKS

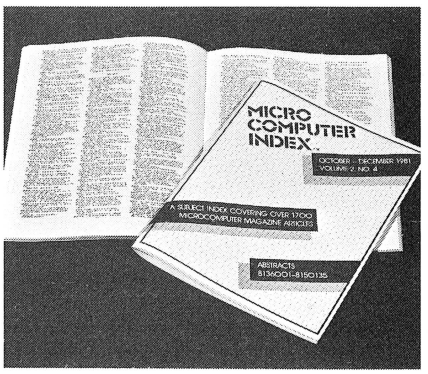
A **VisiCalc users book**, written by people who use VisiCalc for the people who use VisiCalc, has been released. It is culled from thousands of hours of on-line experience, trials, tribulations and triumphs of the users of VisiCalc themselves. This digest contains a full year of programs, tips, hints, and how-to articles, representing the best material culled from *Spreadsheet*, the newsletter of InterCalc (formerly VisiGroup). The reader gets programmed templates and 20 VisiTips - tips that work and make VisiCalc programming easier, efficient and more effective. The book has material for both the beginner and the pro. $10 from Intercalc Users Group, P.O. Box 4289, Stamford, CT 06907 (203) 329-9821.

The **Investor's Computer Handbook** is a guide to investment management for the personal computer owner and requires no previous microcomputer or investment experience. Written by Rod Packer, the 168-page book is divided into two sections that explain microcomputer systems and the various types of investing that can be done on a microcomputer. The first section of the book provides information on selecting a microcomputer system best suited for particular investment applications and explains the various hardware, software, peripherals and a list of required and recommended components. The second part of the book provides details on the variety of investing that can be done with a microcomputer. The book also explains how strategies and programs used for the stock market can be applied to commodity futures and options, bonds and treasury bills. Included are four demonstration programs in Microsoft BASIC, one for each type of investment application with a step-by-step analysis of each module. Several case histories of actual investors, their systems and how they use them are also presented in this book. Paper, 168 pp., 1982 $10.95, Hayden Book Company, Inc., 50 Essex Street, Rochelle Park, NJ 07662 (800) 631-0856 in NJ (201) 843-0550.

Future Mind: The Microcomputer, by Edward J. Lias. Within the past decade, the development of the microcomputer and other electronic media has affected nearly every aspect of modern culture, transforming the very environment of the human mind. Applying the theories of Marshall McLuhan to the ever-widening computer sphere, Future Mind demonstrates how the computer has become our single, most revolutionary media manipulator. Twenty chapters include: What are Computers Doing to Us?; Computers and Filing Cabinets: The Database Future; Computers and Money: Electronic Money; Is Privacy Obsolete?; What if We Become Like Computers?; Computers and the Centralization of Power. Future Mind is complete with end-of-chapter bibliographies, a comprehensive index, and two appendices of media case studies. Little, Brown and Company Publishers, Customer Service Department, 200 West Street, Waltham, MA 02154 (617) 890-0250.

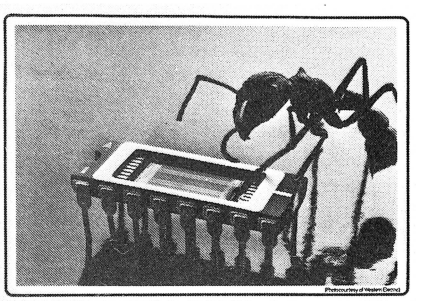
A new publication, The **Logo and Educational Computing Journal**, has been announced by the Interactive Education Foundation, a non-profit research organization. The L&ECJ is aimed at teachers currently using microcomputers in the classroom, professional educators engaged in creating and using educational software and both parents and children seriously committed to the use of educational computer products in the home. The editors of The L&ECJ are Prof. Ludwig Braun, (SUNY at Stony Brook), and Prof. Joseph Raben, (Queens College, CUNY). Special editorial attention will be devoted to reporting classroom experience with all versions of the Logo language and the latest instructional software. Charter subscriptions are available for $20 a year. Logo and Educational Computing Journal, Suite 219, 1320 Stony Brook Road, Stony Brook, NY 11790 (516) 751-5139.

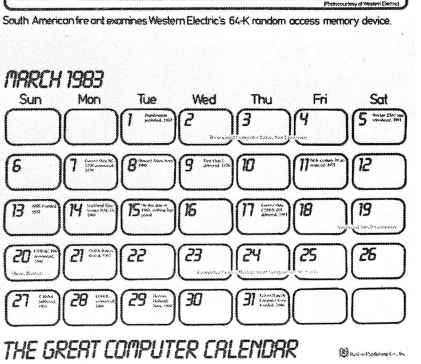
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MISCELLANEOUS

Here's a new **Computer Calendar** for 1983. Beautiful color photographs depict various things about computers, and important dates for computerists are recorded - West Coast Computer Faire, Computer Center Management Symposium, etc. Historical information is also given - especially pertaining to computing and computers. To get yours contact Reston Publishing Company, Inc., 11480 Sunset Hills Road, Reston, VA 22090 (703) 437-8900.


South American fire ant examines Western Electric's 64-K random access memory device.



IT'S TIME KIDS STARTED USING STRONG LANGUAGE.



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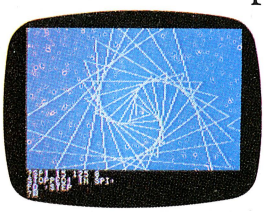
Because now the most powerful educational language is available on the Apple Personal Computer.

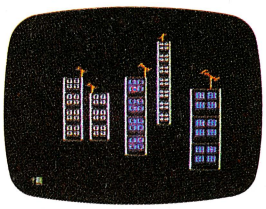
Presenting Apple Logo.

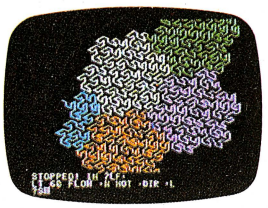
It's not just a programming language for computers, but a learning language for people.

Enough so that anyone, working with Apple Logo, can easily learn the programming principles once reserved for college courses.

Apple Logo encourages you to break problems into small steps, and then shows you how to make those steps automatic.







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