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The Magazine For You & Your Computer

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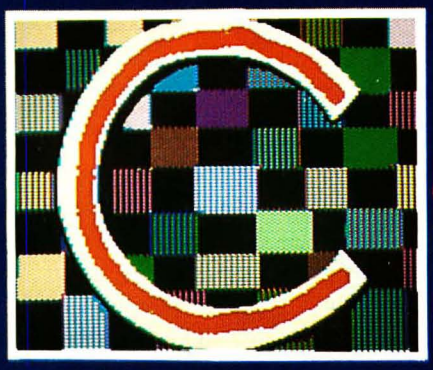

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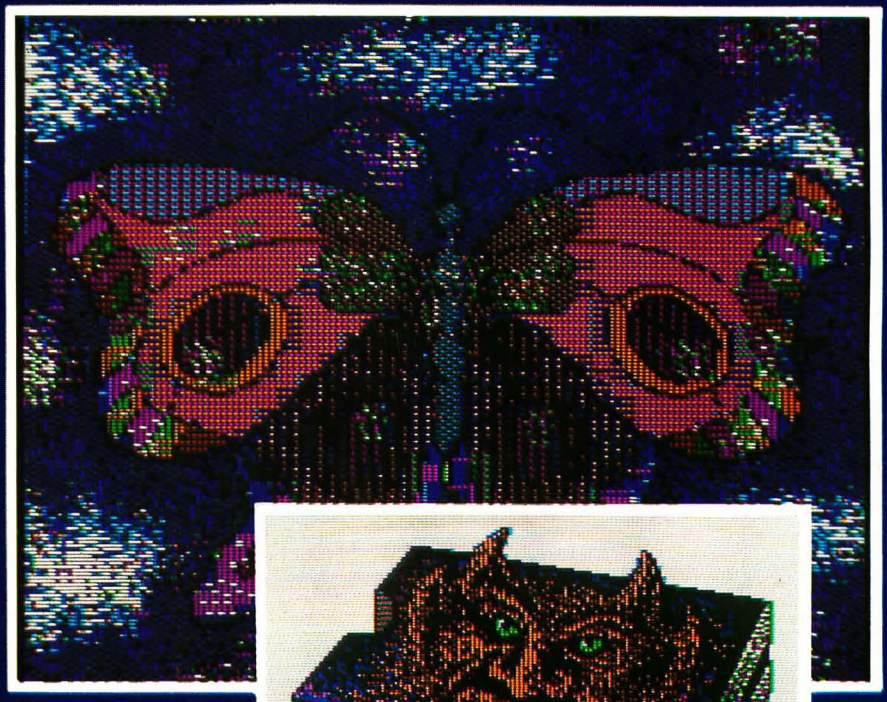

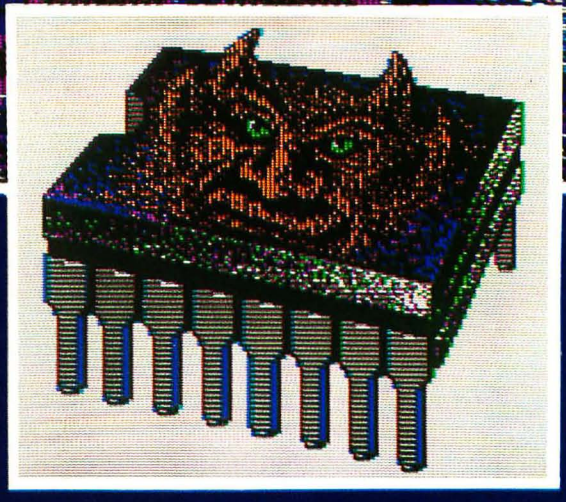

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An Artist's Reaction

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Saul Bernstein Analyzes Old Masters By Computer

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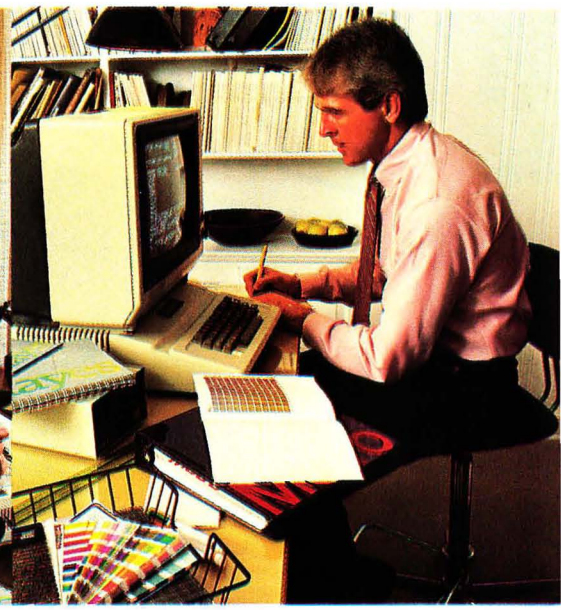

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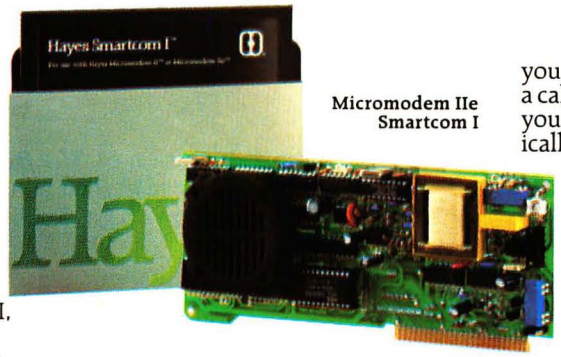

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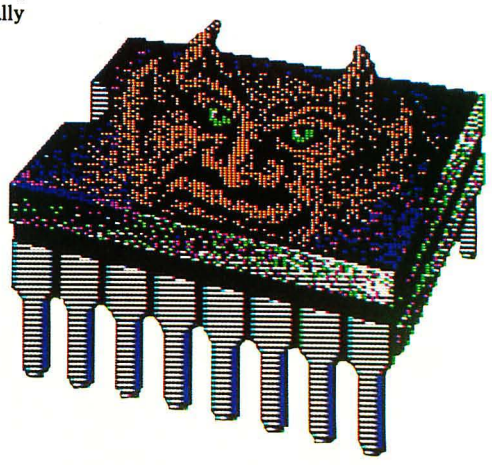
Cover Illustrations: Computer Graphics is begining to evolve into a new art form. ***SoftSide*** is especially pleased to promote and encourage artists working in this field with our first Computer Art Show in *The SoftSide Gallery.* Guest Editor Ame Flynn has assembled a colorful, eclectic show, demonstrating the breadth of styles artists have already developed. Still more examples festoon this issue from cover to cover. On our front cover we have included an example of Lauretta Jones' typographic designs, as well as her "Devil Chip" which was commissioned by Herman Associates, Inc. on behalf of their client, The Chubb Group of Insurance Companies. The "Butterfly Graphic" was created by Roberta Schwartz. The reviews in this issue focus on products which you can use to create your own computer art. We hope to see *your work* in a future show at *The SoftSide Gallery.*



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Editorial

Personal Fashions By Computer

Digital portrait by Tom Flynn

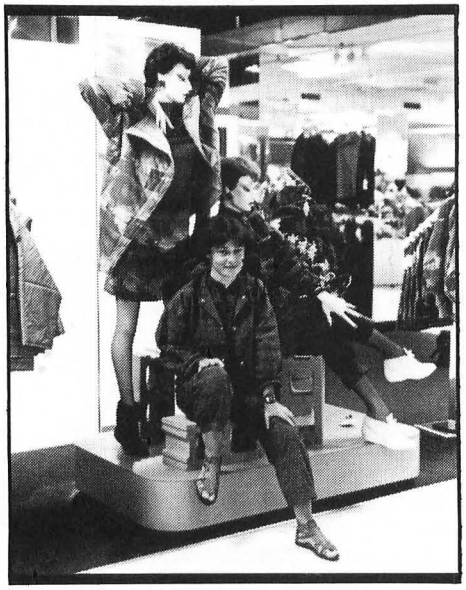
The computer revolution is quietly moving its battle front into new frontiers every day. Newsbits in the daily paper often hint of the tip of the iceberg as "Computer analysis of quail eggs saves rare breed from extinction," or "Dentist uses computer to help prevent cavities." Just such headlines have brought an incredulous look to my face more than once.

As we prepared for the interview with fashion designer Elisabeth de Senneville in this issue, thoughts of computers in the fashion industry danced in my head. The potential for revolution in this age old industry is staggering. My primary worry is that the "high priests" who have worked their magic of fabric and thread may feel their domain too threatened to promote or utilize the new technology properly, as it becomes available to them.

Fashion is a very personal matter. If you don't believe me, take a stroll down any major metropolitan thoroughfare and note the differences in the way people dress. Some of us care little for appearance and use comfort as our primary criterion in choosing what we wear. Others will sacrifice comfort to look as good as we think possible, even if it means waddling down the street to do so. In most cases, however, we strike a balance between comfort and appearance to construct the style of dress best for our individual tastes. As the computer moves into the clothing field, those individual tastes will become easier and easier to serve.

The key point to remember in this new front for the computer revolution is that all clothing, no matter how plain or chic, is constructed according to a very complex mathematical formula, using the wearer's (or assumed wearer's) measurements as the raw data to determine its outcome. A tailor may work from as many as fifty of these measurements for a single client to construct a custom garment that best fits his or her body. At this point, the commercial fashion industry requires that we all work limited parts of this complex formula in reverse, matching our own current sleeve length or inseam to that of the mythical "standard" to find clothing that fits. The computer can allow each of us to maintain a profile of our own complex set of measurements, change the profile as our weight or bodies change, and make sure our clothing is constructed to fit the profile.

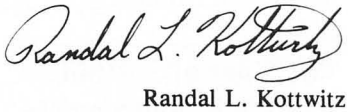
The point at which the computer gets involved in the process will be determined primarily by the marketplace. Potentially, the home sewing hobby, currently depressed



by a number of factors, could regain its advantage over "off the rack" clothing by allowing its practitioners to construct custom clothing. A customer could choose the design he/she wishes to construct and enter the measurements of its wearer into the computer at the fabric store. The store's computer, interfaced with a laser cutting machine, could cut and mark the chosen fabric right there, adjusting the pattern's formula to match that of the future wearer. The time consuming job of altering paper patterns and cutting fabric would be eliminated.

In the commercial clothing store, the customization allowed by the computer could be staggering. Not only could you have a garment constructed according to your measurements, but in your choice of fabric and color, with design accents (collars, pockets, etc.) chosen according to your individual style. The possible combinations could, of course, become ridiculous (an evening gown with a Peter Pan collar is a real possibility), so designers could limit the combinations to only those their experience has proven to be credible. However, this system could allow all of us to express our taste and style of dress much more effectively. The designs created by this system would still require custom construction, in the store or at a factory, so the economies of mass production would not make custom clothing available for the prices you'd pay at K-Mart. However, it could make the cost of designer originals (even if you're the designer) more affordable for a much higher percentage of the population, and in a custom fit never before possible.

To my knowledge, no piece of this system or any like it is on its way to your local department store. However, an industry serving our basic need of clothing cannot be ignoring the potential the computer is bringing to its doorstep. Elisabeth de Senneville is using the computer to design prints on her fabric today. Next year, she may be roughing out the design of a complete outfit on a computer, changing its elements until it fits her criteria, and sending the finished design via trans-Atlantic cable from Paris to New York to one of the major department store chains. Who knows what might happen from there. Elisabeth may run into an American tourist on the streets of Paris wearing a de Senneville design that de Senneville never saw before.



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Output

Ame Choate Flynn Special Projects Editor for Graphics

A Special Projects Editor at ***SoftSide*** specializes in a particular area of information, and makes sure everything we publish in that field is as accurate, complete and up-to-date as possible. At least once a year, he or she comes to ***SoftSide's*** offices to be our "Guest Editor in Residence" for an issue on a theme within his/her specialty. Dr. Peter Favaro, Special Projects Editor for Education, was our first guest editor for Issue #43, Microcomputers in Education. This time, we welcomed Ame Choate Flynn, Special Projects Editor for Graphics, into our offices to prepare our Annual Special Anniversary Issue on Computer Graphics.

As owner/operator of TechniGraphics in New York City, Ame is a "working artist" in the microcomputer field. Her background in the fine arts includes twelve years of formal education, culminating at the Rhode Island School of Design. She is a member of the faculty at The New School in New York, teaching various courses in microcomputer graphics, and chairman of the graphics group of the Big Apple Users Group, also in New York. She has spoken at many computer graphics seminars throughout the US. Her clients at TechniGraphics have included such prestigious companies as McGraw Hill and Merrill Lynch.

As Special Projects Editor for Graphics, Ame brings all of her experience and expertise to ***SoftSide's*** pages. During her visit to prepare this issue, her wry humor and sparkling personality were pleasant relief from the tension of a monthly schedule of deadlines and the extra pressures of a special issue. We thank her for her talent, her hard work, and her friendship.

THE DATA STACK

Compiled by Steve Birchall

Networked Community

Imagine a community of 6,000 inhabitants which is completely wired together through a computer network. Word processors, database managers, electronic mail, bulletin boards, interactive videodiscs (to help repair appliances and vehicles), medical data for every person — all this and more has been realized in a functioning system. The intriguing thing is that this "town of the future" exists today — aboard a nuclear-powered aircraft carrier, the USS Carl Vinson. During construction and outfitting, the Navy used a Wang computer to track progress. As they used the system, they found more and more uses for the computer and its networking capabilities. Eventually it became a permanent, integral part of the ship's management system, and with a radio link, provides instant communications, while at sea, to home port or even the Pentagon.

Getting the carrier underway is a complex process, extending over several days, resembling the countdown for a space launch. With the Wang computers, they have tight control over the sequence of events. The time saved with this management approach enabled them to deliver the ship ahead of schedule and now lets them take on extra projects. Information and commands flow easily from one officer to another by e-mail. Such things as personnel records, inventories, and electronic mail are transferred back and forth between ship and shore. Replacement personnel know all the details of their job before the carrier docks.

According to Captain Richard L. Martin, "It was a bootstrap effort from the first day of developing the concepts and building the initial elements of planning and control. What we have done is engineer a complete system into the ship. We don't really think about it too much anymore — it's like having electric lights or telephones around. It's a way of life once you get into it, where you become more efficient and have that as an extra tool."

Digital Equipment Corporation displayed a mobile army command post at their recent (closed-to-the-public) national sales convention. Inside an armor-plated semi-trailer truck are terminals networked together and to the outside world, providing word processing, databases and e-mail for the field commanders. The day may be approaching when every soldier will be issued his own personal computer. That could be another good reason for the federal government to provide funding to put micros in the schools.

Personal Financial Software

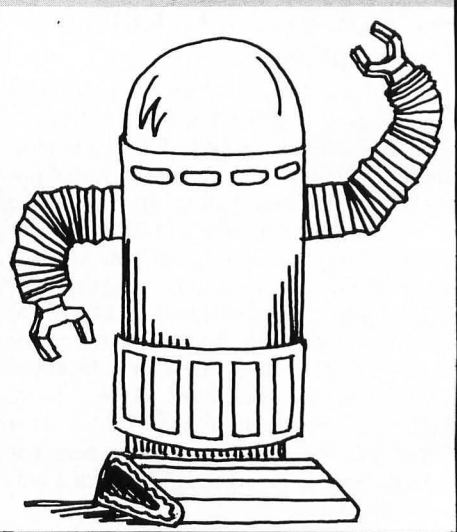
The American Association of Individual Investors, 612 North Michigan Ave., Chicago, IL 60611, reports that 33 percent of its members who have computers use them for investment analysis. VisiCalc® is the most common program, and the Dow Jones Market Analyzer is the preferred investment analysis software. Apple®, TRS-80®, and IBM® are the three most popular computers. The AAII also publishes a newsletter.

The SOURCE™ has a new service called *Stockcheck*, a faster, more efficient method of retrieving prices on stocks, gold and currency. Lotus has modified its *1-2-3* ™ to access the databases of the Wharton Econometric Forecasting Associates. After downloading the information, you can use the spreadsheet module or graphics features to analyze your data.

Robot Conference

The First International Personal Robotics Congress will be held at the Albuquerque, NM Convention Center April 13 — 15, 1984. For further information, contact the IPRC at 1547 South Owens St. #46, Lakewood, CO 80226, or call (303) 278-0662.

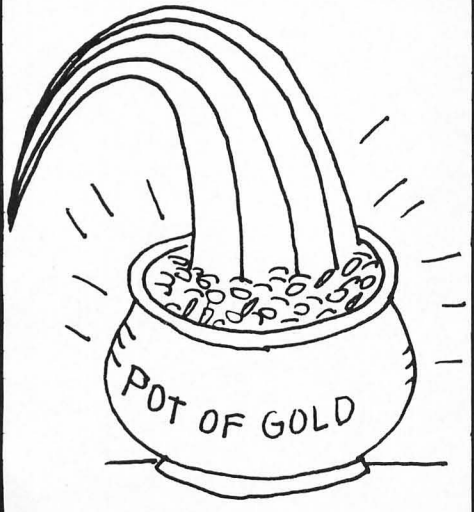
Anyone with an interest in the subject is welcome to join the recently-established Robotics Society of America. A bimonthly journal and local chapter meetings are the principal activities. For more information, write to Dr. Walter Turnick, Executive Director, Robotics Society of America, 200 California Ave. Suite 215, Palo Alto, CA 94306, or call (415) 326-6095.



THE DATA STACK

Rainbows at the Treasury

Recent news reports have revealed that Secretary of the Treasury Donald Regan uses a personal computer to track the value of the dollar on the world's currency exchanges. Intrigued, we checked with them to find out more. According to Richard Shriver, Assistant Secretary of the Treasury for Electronic Systems and Information Technology, they are just beginning to use personal computers. The main system is a DEC mini with 150 terminals. Presumably the DEC personal computers are being used as smart terminals. Shriver emphasized the point that Regan comes from a background where such systems are common for tracking data which change constantly. The Treasury system can access economic information from various services, such as the Dow Jones line. Other uses are for electronic mail and events calendars. However, when we asked what software they use to *analyze* the mass of incoming data, he said they have none. Their software, which was written in-house, simply posts and reports prices without analysis. The department's mainframes do all the analysis. Does anyone have a spare copy of a spreadsheet or a portfolio analysis package they would like to donate to the government?



High Tech Fortune Supports Arts

In support of his belief that citizens should give back to their communities a portion of what they receive, Dr. An Wang and his family have given $4 million to Boston's performing arts center, which has been renamed the Wang Center for the Performing Arts. The gift is not a corporate contribution, but comes from the Wang family directly. According to Dr. Wang, "The entire Route 128 phenomenon never would have occurred without the unique environment provided by the Greater Boston area. And so it is with a spirit of reciprocity that we offer this gift to help restore the Center for use by performing artists and for the enjoyment of the community." The grant provides $1 million for immediate repairs and renovations, plus $3 million in matching funds, plus $2.4 million (in the form of reduced indebtedness) from the area's four largest banks, bringing the total to more than $9.4 million.

Boston, the "Athens of America," has enjoyed a long history of support of the arts by local individuals and corporations. One result has been to attract, and stimulate the growth of, the region's high technology industry. The Wang gift may prove to be as important to the cultural life of the city as Henry Higginson's initial funding of the Boston Symphony. Another recent large gift was Leo Beranek's $1 million contribution to the Boston Symphony (the largest in their history) during their Centennial. Dr. Beranek is one of the founders of the famed acoustical consulting firm of Bolt, Beranek and Newman.

Pirate Paranoia

A tantalizing concept in copy protection comes from Fogle Computing Corporation. Their *P-COM* software, which interfaces a user with the Post Office's E-COM service has a subroutine embedded in the code. Every two years, it transmits a letter to Fogle with only the user's return address. If the sender is not a registered owner, he may expect a call from Fogle.

Apples For Community Action

Apple Computer, Inc. has a program to donate computers to community groups. The purpose is to establish database networks which give people information on jobs, housing, environmental concerns and similar subjects. In the last group of grants, each worth more than $140,000, 29 communities received equipment and training. Corollary grants of software and other assistance came from VisiCorp and Tymshare., Inc.

In Rhode Island, the Computerized Job Bank will serve disadvantaged people and minorities seeking job training programs and employment. The Inter-Agency Housing Network will help the elderly and disabled, as well as low-income, and single-parent families to find suitable housing. Apple began the program in response to the large number of requests they receive for charitable donations. They are committed to the idea and believe that networking through community organizations is an effective way of reaching out to help large numbers of people. Interested groups may write to Apple's Office of Community Affairs, 20525 Mariani Ave., Cupertino, CA 95014, for guidelines and an application. Completed applications are reviewed on a quarterly basis, and the services are reviewed periodically for effectiveness.

BUSINESS

The new fall catalog describes ULTRA PLOT ($70.00), our top selling business graphics program, now available for the IBM PC as well as Apple. It will be easy to see why so many people rely on this special software. You'll also discover the BUDGET MASTER—the streamlined home accountant. Input only the data necessary to monitor your personal budget. No printer required.

Dial (503) 345-5202 to reach our special StarSprite information recording.
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HAVE YOU SEEN IT?

It's Avant-Garde's new Fall catalog, filled with our best selling software and a good number of NEW products! This year Avant-Garde has sky rocketed in size allowing us to serve you better than ever before. If you haven't seen this catalog, you haven't experienced the new Avant-Garde.

EDUCATION

Avant-Garde has been recognized as an excellent software source for all grade levels. For example, there's the MATH ADVENTURE SERIES (formerly Maths Invaders), from ARITHMETIC DRILL & PRACTICE ($15.95) to LOGIC & EUCLIDEAN GEOMETRY ($29.95). You'll also find such titles as SENTENCE DIAGRAMMING ($29.95) and THE ELECTRONIC FLASHCARD ($29.95). Teachers will be pleased to find the popular AEN GRADING SYSTEM ($70.00) and the ZES AUTHORING SYSTEM ($250.00) which enables the user to create his/her own courseware.

SPRITEWARE™

Unquestionably, the SUPERSPRITE BOARD from Synetix and Avant-Garde's SPRITEWARE™ are creating a revolution in Apple graphics and sound. The system consists of Sprite graphics, 16 Hi-Res colors, 35 video planes, Apple and Sprite graphics together, extended sound effects, music, and voice from Street Electronics (Echo). The remarkable STARSPRITE SYSTEM by Don Fudge and the Spriteware line, including CHOPPER CHASE, LETTERSPRITE and NUMBERSPRITE are detailed in this catalog. Here's true arcade quality at your fingertips.

SuperSprite is a trademark of Synetix Systems, Inc.

GAMES

For fun and excitement, you'll love Avant-Garde's NEWEST addition—TROMPERS ($29.95). If you're looking for a tricky action game, try JUMP JET ($29.95). For sports fans there's HI-RES COMPUTER GOLF 2 ($34.95), called the "best golf simulation on the market" by Computer Gaming World, and "Outstanding," by Creative Computing. You'll see LAZER MAZE ($19.95 to $29.95) and loads of other games in this section of the catalog.

Avant-Garde is developing a line of COMPUTER-CRAFTS™ for the whole family. DOT & DRAW ($29.95) includes the old favorite Follow the Dots, and offers computer-drawing and coloring fun for both children and adults.

PROGRAMMER AIDS

Avant-Garde's reputation for quality originated with its programmer utilities, tutorials and aids. Look for the extremely popular HI-RES SECRETS ($125.00), GRAPHICS APPLICATIONS SYSTEM ($75.00), HI-RES ELECTRONIC DESIGN ($29.95) and HI-RES ARCHITECTURAL DESIGN ($29.95). Don't miss the brand new AMPERFINESSE ($79.95), an advanced, yet simple to use Applesoft enhancement. You'll see why Avant-Garde's programmer aids are so popular.

APPLE, IBM PC, ATARI, COMMODORE 64, VIC20 and TI99-4A

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Input

Pokey Player Blues

Dear *SoftSide,*

I have the complete *Pokey Player* system and like it a lot, but I have had little success entering music. In many cases I have failed to grasp the full potential of the system, although I believe I understand it reasonably well. ***SoftSide*** should make available a number of *Pokey Player* source files to its subscribers, perhaps on a future DV. All of us out here would like to hear what some of our more musical or creative brothers on Atari have created. I look forward eagerly to a machine language version of the editor/compiler. But in the meantime, the system is an able one for Atari users everywhere.

Keep up the good work.

Dale Lutz
Holden, AB Canada

Reply: No doubt about it, *Pokey Player* has been one of *SoftSide's* most popular programs ever. Many readers have shared similar experiences and expressed their desire for additional files. Watch for more *Pokey Player* music in future issues of *SoftSide* CV and DV for the Atari.

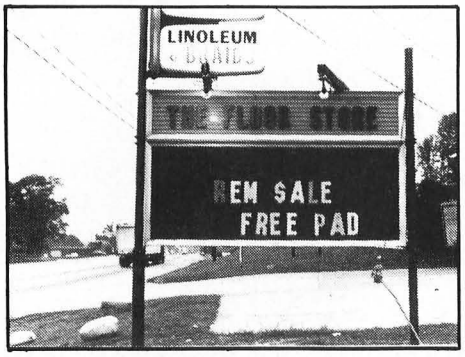
Bar Code Reader for Micros

Dear *SoftSide,*

After reading your CES report in *SoftSide* #43, I would like to find out more about bar code readers. In the article, you mentioned one called OSCAR. I would appreciate it if you would provide the address of the company that produces this item and any other information concerning bar code readers and companies that produce them.

Ken Kemp, Cook High School
Adel, GA

Reply: Thanks for your interest in bar codes. You can get more information on OSCAR from Databar Corp., 10202 Crosstown Circle, Eden Prairie, MN 55344. Also, be sure to subscribe to *Bar Code News,* 174 Concord St., Peterborough, NH 03458 (it's free and excellent). Let us know what applications you develop.



Next Week: a two-for-one sale on GOSUBS?

IBM Color Graphics Adapter

Dear *SoftSide,*

In the *SoftSide Selections* introduction, you indicate that the necessary hardware is listed with each program. However, none of them has listed a color/graphics card. When I started to type in *Solitaire,* I found Paint, Draw, etc., to which my monochrome display and equipment do not respond. *Solitare* will not work unless I can figure out how to draw the cards with my monochrome card and screen.

I am principally a computer user. I do little programming, and would rather do less. I play few games, and infrequently at that. I use my computer principally for applications such as: checkbook balancing, books and ledgers, W2s, 1099s, word processing, data management, school assignments, genealogy, family reunions, mailing lists, and so on. I have enough challenge and fun using commercial software without having to learn more about programming. However, I enjoyed *Solitare* enough on my son's Apple to want an IBM version — if I could get a listing that would work. I think it would improve my programming skills a little, too. I may even consider the disk version.

I hope you will have more programs for the monochrome IBM PC and I also hope someone will fix *Solitare* for me and the others in the same boat.

Nancy MacKay
Provo, UT

Reply: Having spent more hours than I care to admit playing *SoftSide's* IBM *Solitaire,* I have some idea of the fun you are missing, and I wish I could help. The following IBM programs we have published do *not* require the color graphic adapter: *Microtext 2.0, Personal Finance,* all the *Adventures of the Month,* and *Financial Operating System.* Unfortunately, the IBM, unlike many other systems, does not permit interchangeability between color and monochrome programs. When I inquired about modifying *Solitaire* for IBM PCs without the adapter, I learned that a complete rewrite would be necessary — not likely, at the moment. So, for now, continue to enjoy the game on your son's Apple. If any readers want to tackle the job, we would be happy to publish the revised listing.

An American in Venice

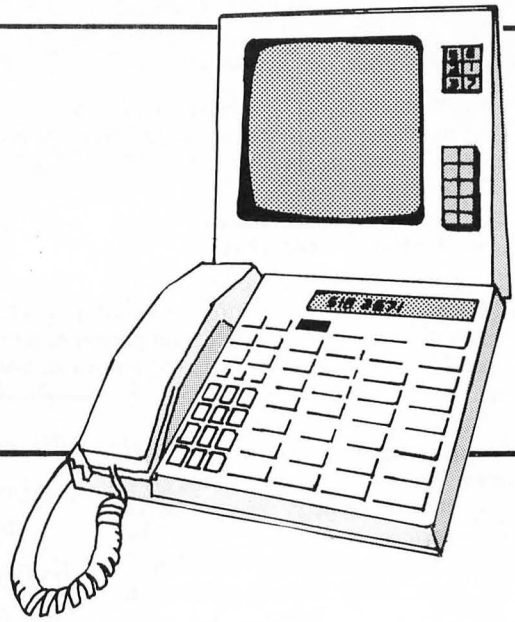
Dear *SoftSide,*

```
Program Italy;
BEGIN
 While tour do
  BEGIN
  RIDE(BUS);
  LISTEN(GUIDE);
  If not boring then TIP;
  Independently — see(CITY);
  WRITE(Postcard);
 END;
END.
```

Fred Condo, Software Editor
Venice, Italy

Entertainment Tomorrow

by Allen L. Wold



The Futurephone: A Broader View, Part II

The technological speculation in which I and other authors indulge can have serious weaknesses — especially when compared with what actually comes to pass in the real world. I chose that most common of electronic devices, the telephone, as the subject of my explorations, simply as an example. After briefly surveying some of the technologies which may change the telephone and how we use it, I permitted myself the kind of speculation I frequently find inadequate. This time, I will carry that speculation further, concentrating only on the positive aspects. What comes next is harder — examining some of the problems implied, but not fully analyzed, in such wishful thinking.

Remember, the futurephone is "just" a telephone, not a computer or a television. Though I have not discussed either of these two devices in this series, I expect the computer and the television receiver also will evolve (not completely independently of each other), and become as sophisticated as my hypothetical futurephone. While all three might communicate with each other, and even share certain functions, my assumption here is that the television, the computer and the futurephone will remain distinct, each with its own uses. The alternative assumption, that the three might merge into one device, would lead to quite different results.

As technology progresses, your phone could display color images, and be as large as you'd like it. Indeed, we're seeing developments along this line even today. With high rates of use, the cost of a phone call, even to the other side of the world, will go down. Your futurephone could handle routine calls, both receiving and sending, without your having to be on-line yourself. Operating in connection with the TV and computer, the futurephone will make electronic banking and shopping, as well as the computerized home office, a reality. But technology does not exist in a vacuum. It interacts with other technology, and more importantly with society, which will undergo profound changes, some of which we can only guess at.

Instant, Low-Cost Data

The largest part of the cost of information transmission, prior to the computer age, has been the cost of the medium on which the information is stored. Letters, books, music recordings, and pictures, all have to be committed to some physical medium. These have weight — and moving the weight, with energy consuming vehicles over land converted to roads, is what costs. Constructing the media themselves — making paper, printing, pressing records, and so on, increases the cost. It's like paying a dollar for a bottle to get five cents worth of contents. On the futurephone, information will be sent as cheaply as a voice over today's telephone. Publishing overhead will be reduced drastically.

In other words, information will become cheap. Right now, if you buy a book for $10, you incur several costs:

- Going to the bookstore or paying postage for mail order
- Author's royalties (about a dollar)
- The cost of editing (another dollar)

Most of the cost is in printing, binding, storage, distribution and advertising. Without the need for a physical medium, this eight dollar overhead could be a dollar or less, since all but the editing is reduced to a bare minimum. Book prices could be reduced by about 75 percent. With electronic distribution, all books would always be in stock and in print. No one would need to remain ignorant when the answer, in brief or in detail, to any question is available to all at nominal cost. If I want to know who my county commissioners are or how they've voted, I would need only to make a call to an information center, and the data would come to me at once.

Television today provides headlines of current news. The papers carry more detail. Television's news function in the future would become more important, and more concise, headlining

more stories more briefly. Then, by phone, I could call for the full story, in as much detail as I desired. Thus, every citizen could be informed and up to date, on any subject.

Privacy, Politics and Data

Implicit in this is free access to information. The first and most obvious effect of having a well-informed society is better government. When someone keeps a secret, that person controls the processes relating to that secret, a fact well-known in both government and industry. But if nobody has any secrets, nobody can control anybody else. If you have complete knowledge of what government and business are doing, you can deal with those agencies and companies from an informed standpoint. When the people know what the politicians are doing, they can make better choices at election time.

Of course, this implies that business and government will know more about *you.* As long as the access to information, including the knowledge of what is done with it, is free both ways, no problem exists. Every person, company or agency would have a file on themselves, stored in their phones, and updated regularly. The file would be accessible to anyone who cares to ask. This may sound frightening at first, but think about it a minute.

The first and most obvious effect of having a well-informed society is better government. When someone keeps a secret, that person controls the processes relating to that secret.

A government can perform services for the people only if it knows what the people need and want. Today we have the decennial census, costly (and many times inadequate) polls, and the like. If the government has access to certain personal information, instantly and at any time, it can perform its function much more easily and reliably. And if government fails to perform well, your freedom to find out what information the government has acquired, and what it has done with it, will tell you that at once, and you can vote the scoundrels out of office.

In the same way, manufacturers of products and suppliers of services or entertainment can know, instantly, how well they are meeting the needs and desire of the consumer. Failure to comply with public demand results in failure of profits. More than that, if someone takes a poll, for determining school taxes or the flavor of toothpaste, you have access to the results of that poll, and the responsiveness of the poll-taker. Several communities today already are experimenting with home polling, using computers and phone lines. People who take information from you and misuse it will be discovered at once, and appropriately dealt with, in the way that hurts most — loss of profits or office.

With this kind of immediate and direct deterrence to misuse of personal information, regulations concerning agencies and companies which use that information will become unnecessary. With free access to information, public response will provide all the regulation needed, and the size of government can be reduced.

Education and Data Access

Free access to information would have a profound effect on our educational system. Children would no longer have to be sent, sometimes on long bus rides, to a classroom. Live teachers or artificially intelligent programs could be accessed through the phone. A child would progress through any subject at his own pace. Special interests could be satisfied, not depending on the physical availability of specially qualified teachers, without adding a financial burden to those who did not share the interest.

In one sense, education would never cease. Whenever we needed — or wanted — to know something, a quick call would provide us with the answer. Those who showed an interest in, or a talent for, a particular discipline could study as intensely as they wanted, whenever they wanted, and eventually provide new information or insights for other people to study. By phone. The whole process of learning would not be perceived as a tedious thing done somewhere else at special times, but as a satisfying of curiosity whenever you wanted, wherever you were. Thus, people would be better educated, though each individual's scope of knowledge might be unique, and perhaps markedly different from anybody else's.

Because most if not all office work could be done at home, we would need to travel less. Long trips and recreational or social visits are one thing, but the daily grind of commuting would be over. Cities would be more decentralized, cleaner, less pressured. Many roads, and most parking lots, could be torn up. With fewer automobiles, we would have less pollution. Many people might not live in cities at all, while still participating in a busy and sophisticated political and economic society. By phone.

But reduced local travel would not necessarily produce a parochial population. Since you could talk with, and see, anyone anywhere in the world, you would become more acquainted with the customs and attitudes of people from other countries and societies. This frequent, safe, and casual exposure would promote a greater understanding among peoples. In some cases, it would be a necessity, if a number of different people around the globe all worked, from their homes, for the same company or agency.

A common language would possibly develop, not replacing but supplementing your native tongue. Forced into communication by the desire to do business with each other, we would all have to learn some language, any language, to permit global communications.

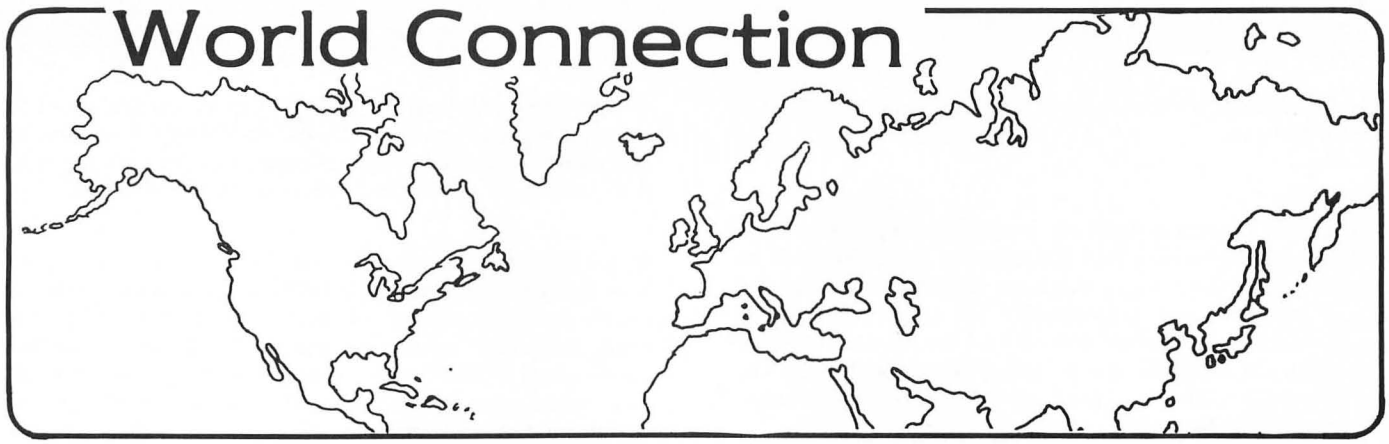
As rosy as this all too brief picture seems, the chances of it happening that way, or at all are slim. Much more remains for us to consider. The utopian scenario above has many errors of omission, some of them inadvertent, some deliberate, so that I could discuss them separately below.

Problems in Utopia

Such visions as those who are pro-technology are prone to produce are not always well received by the public, in large part because of our failure to take other things into account. The response is: "That's fine as far as it goes, but what about ... and you haven't considered ... and what would happen if ...?" Not all objections are because of inherent dangers, or problems of implementation. Most are because of the narrowness of the view. Even retaining a completely optimistic perspective, I could have produced any number of different utopias, starting from the same assumptions. And if I vary the assumptions, as well I might, the number of possibilities becomes limitless.

Other objections to this kind of speculation are because of flaws in its development. These may be minor, or fatal. In either case, once he detects a flaw, real or imaginary, the reader tends to discount the whole concept.

Something seemingly as beneficial and harmless as an improved telephone system presents many questions which are all too often not considered. Rather than waiting for criticisms to appear in the letters column, I'll try to anticipate a few of the less obvious ones here in the next two issues.



Establishing Your Own Bulletin Board Service

by Tim Knight

A BBS, as you might remember, is a computerized Bulletin Board Service. These services, naturally, cannot run by themselves — they require human operators. These people, called system operators, or SYSOPs, are an important part of the growing "world connection."

If you have ever wondered whether you could be a system operator yourself, you should know a few things about SYSOPing before undertaking the task. First of all, you need access to some basic equipment, including:

- A computer with disk drives
- 48K of memory or more
- A printer
- An auto-answer modem
- BBS software

A computer with disk drives is important for speed and efficiency, while a relatively large amount of memory is needed for storing your bulletin board software. Your modem must be an automatic-answering type, since you probably don't want to sit by the telephone, waiting for someone to call your bulletin board service, spending your time picking up the phone to connect them to your board. Lastly, a printer is helpful since users can leave short messages to you on the printer, and the printer's buzzer can signal you whenever a board user wants to chat.

BBS software is not difficult to find if you happen to have a TRS-80, since several BBS programs are available for that computer. Apple and Atari users might have to dig deeper to find BBS software. The reason this software is not so commonly available as games, is that relatively few people buy this type of program. Software makers tend not to advertise products that sell in small quantities. Also, because of the low volume, BBS software is characteristically expensive, usually costing about $150 or more.

To give you an idea of what is available, here are some BBS packages for the TRS-80 and Apple systems. I won't give the prices, since they vary from store to store, so look in ***SoftSide's*** ads for mail order software distrubutors; or, call your local computer shop if you are interested in finding out the prices for these packages.

Connection-80

This bulletin board from BT Enterprises works on the TRS-80 Model I and Model III. Over 100 of these systems are in operation around the country, and some abroad, since it is one of the most popular BBS programs. The *"Conn-80"* has many features, including facilities for bulletins, uploading and downloading programs, electronic mail and electronic shopping, and chatting with the SYSOP. You can customize the software package to meet your individual needs, which is an attractive aspect for SYSOPs who are also good programmers.

Forum-80

This is a bulletin board designed to run with the NEWDOS/80 operating system. Although the original version wasn't impressive, the latest revisions have made *Forum-80* an exciting and popular board. It has many of the features of *Connection-80,* along with the capacity to store the records on 512 users in its memory. In addition, the Forum-80 has an "obscene filter" which removes all of the nasty messages users may try to leave behind. Although this is one of the more expensive

systems, it is an excellent package if you need and utilize all of its powerful features.

Bullet-80

My personal favorite is *Bullet-80,* probably because of its speed and features. It works on a TRS-80 computer, and offers such extras as electronic shopping, a magazine section (for articles and items of interest), and expandability for other features you yourself would like to include in the BBS. I always have been impressed with the *Bullet-80* system, and if anyone with a TRS-80 asked me which software I would use for a BBS, I would most likely recommend *Bullet-80.*

ABBS

ABBS stands for Apple Bulletin Board Service. This program is one of the oldest and best-known, and requires only one disk drive along with an Apple II and a modem. Software Sorcery, the maker of this package, can't claim to have the BBS with the most features, but *ABBS* does offer all the standard bulletin board functions, along with a powerful "conferencing" feature, which allows a group of people to leave messages pertaining to nearly any subject they desire in a message base. This makes telecommunications more interesting for the users of the system, since some of the discussions within a subject category can get lengthy.

People's Message System

The *PMS* is an Apple-based bulletin board service requiring two disk drives. A fine Apple system, it includes functions such as files for bulletins, sections for club news, sections for advertising, an obscenity filter, and account numbers for frequent board users. Although *PMS* usually is more expensive than *ABBS,* the features make it a worthwhile investment.

These are only a few of the boards available. Some others include *Rat's Nest* for the TRS-80, and the *Matchmaker* board which, as you might guess, matches users of bulletin board systems with one another, perhaps for the purpose of dating. Unless you live in a large metropolitan area with localized matchmaking services, you may find such relationships to be strictly digital, since dating a person 3,000 miles away can be a bit of a problem. Another problem with matching users of a BBS is that a large percentage of the users are male, making male-female matches difficult. Suffice it to say that "Matchmaker" boards are a lot of fun, even if they're not altogether satisfying.

Why be a SYSOP?

If you have all the necessary equipment and have found a software package to suit your computer system and your wallet, and which has the features you want, your next question might be, "Why be a SYSOP at all?" True, a big investment in a computer with all the "trimmings" necessary for a BBS might seem wasted when other people get to use it more than you do. However, being a SYSOP has a number of advantages. Here are three for you to think about:

- Meeting new people: This is a general benefit of participating in the World Connection — using your bulletin board exposes you to a large number of people with interesting ideas. Also, you are the center of attention since you are the owner and controller of the board people are using.

- New knowledge gained: You will learn a great deal about computers, computer communications, and people when you have run a BBS for awhile. The experience and exposure pay off, so your investment in time and money often is worthwhile.

- A BBS can be a money-maker: Even though you might not have thought of this before, a BBS is a fine way to sell products, usually computer-related, to users of your system. This "electronic mail-order" marketing approach is popular among the entrepreneurial SYSOPs, and you may find this an excellent way to make some extra money, or at least to pay for the computer equipment and software.

Of course, being a SYSOP isn't always a wonderful experience. You must maintain the system, repair equipment which is in constant use by people accessing your free service, chat with people when they would like to chat, update and maintain the files of the system, and make sure no idiots try to break into your system and erase all your files. Most of the SYSOPs I have talked with, though, find SYSOPing rewarding, and continue to keep their boards up and running.

Here are three questions you might want to ask yourself before trying to become a SYSOP. Answer them for yourself honestly, and if you can say "yes" to all of them, you most likely would enjoy being a SYSOP:

- Do I have the money to buy the computer hardware and software to create and maintain a BBS?

- Can I afford the time to chat with people and maintain my system properly?

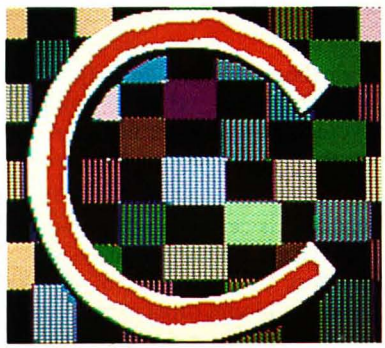
- Am I willing to give up some of my energy and free time to make my BBS enjoyable for other users?

Being a SYSOP is a great way to play a part in *The World Connection.* I hope I've inspired some of you to set up your own system, and perhaps even write your own software for it. I'm sure you'll find the job exciting as well as rewarding.

SoftTakes

Silicon Fashion in Paris

A Conversation With Elisabeth de Senneville, Randal L. Kottwitz and Steve Birchall

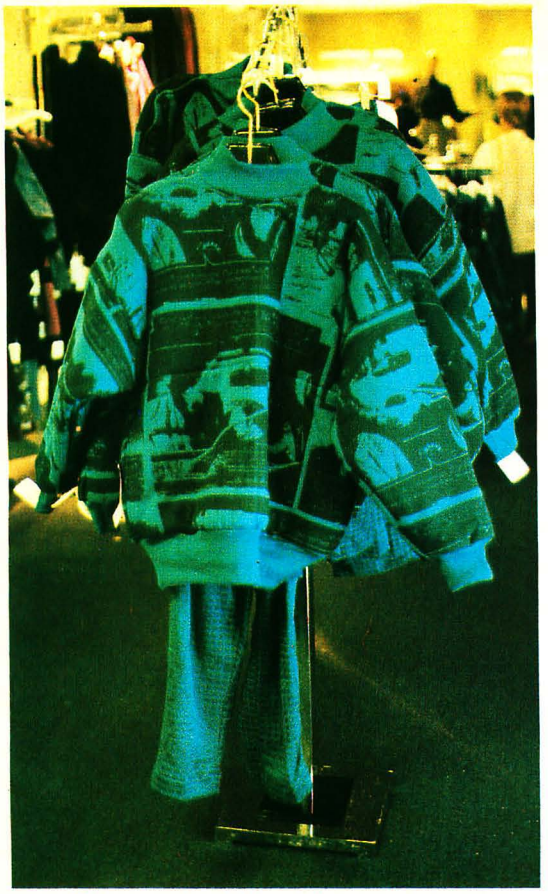


Laurella Jones

Computers have invaded the world of fashion. Recently, ***SoftSide's*** Publisher, Randal L. Kottwitz, and Technical Editor, Steve Birchall, had an opportunity to talk with Paris designer, Elisabeth de Senneville. On a whirlwind tour of the US, she was in Boston to present her new line, which includes computer-designed fashions. Filene's department store graciously arranged for us to talk with her after her presentation. Despite the rigors of the day, her pleasant, informal humanity was delightfully infectious. Joining in the conversation was her American agent, Susan Johnson, representing Murjani International, the company which introduced Gloria Vanderbilt jeans to the market.

Visual puns and allusions to punk and New Wave styles enliven the designs of Elisabeth de Senneville.

Randal L. Kottwitz: How much importance will the computer have in your future work? Are you working on more computer designs? Do you plan to use the computer more exclusively, or will it always be a special, separate aspect of your work?



The genesis of this stylish sweatshirt, produced with a special photographic process, was a computerized T-shirt portrait on Times Square in 1979.

Silicon Fashion in Paris, ***continued***

Elisabeth de Senneville: No, I think it always will be a separate area. For the moment, I just use two processes, but I want to make more print patterns as well as work more extensively with the computer. Now I have a more advanced computer to work on than I did at the beginning.

RK: What computer do you use?

ES: I don't know the name — it's very simple, with a camera.

RK: Is it only a digitizing system, or can you manipulate the image after you input the camera shot?

ES: Oh yes! You can do lots of things. It's very simple to use — no problem. If you need to learn, it is very simple.

RK: At what point does the computer enter into your design process? Do you think about the pattern before you know the fabric it will go on? For example, did you start with the idea for a garment — like the sweatshirts — and then put computer prints on them, or did you want a place to put your computer prints, and then found that the sweatshirts were the best "canvas" for them?

ES: Yes, I wanted to make computer prints on sweatshirts. I've made fabrics through a jacquard weaving process controlled by a computer — nice fabrics, dainty fabrics. I will send you some samples. The results are very impressive. I wanted the computer to be a part of the art. I wanted to show this part of our lives in my fashions. This tends to be very important to me as an artist

RK: It sounds as if you really treat your fabrics like a canvas.

ES: Yes, maybe, yes.

RK: Why did you want to use the computer in the first place? What did it offer creatively?

ES: It's a new art — a new kind of art.

RK: Did you find that it could do some things that you could not obtain any other way?

ES: Just the art; just the technique; a new technique of the picture. I think it's a fascinating new art that can go very far.

RK: What do you use for what we would call an input device? A light pen, a graphics tablet, or just a keyboard?

ES: I use just the keyboard.

RK: Are you considering moving on to the other types of input devices — things that would be closer to what you're used to working with as artistic media?

ES: Yes, I want to use a more advanced computer with a little more flexibility, or with more colors.

RK: Have you seen a graphics tablet? Sometimes it's called a digitizer tablet. It's a flat board that sits beside the computer and you draw on it with a stylus the way you would use pen and ink to draw.

ES: They're great. I've never worked with one. I went to a factory once where they had one and I was so fascinated by it, because you can change from small to big, and manipulate the image in so many ways — it's incredible.

RK: Is that where this all started? What I am hungry to know is how you started with the computer. Where? What capability of the computer snagged you? What experience with it attracted your interest? What piece of art did you see?

ES: Well, the first experience was in Times Square — I had my portrait made on a T-shirt.

RK: AAHH!!

ES: After I took it home I started to work on very small pieces of it. Then I went to a computer in Paris and worked on it, because I thought you could make something else with it. It's ridiculous just to make portraits! So that's how I began.

RK: When did you start working on computers?

ES: In 1979.

RK: And the first product you brought to market....

ES: A print, yes. I've been printing on Tyvek....

RK: We use it a lot at ***SoftSide.*** You're using Tyvek in your clothing?

ES: Yes I made a whole line of evening clothes on Tyvek using computer-generated prints.

RK: Wonderful! Could I get a sample of what you did?

ES: Oh yes.

RK: Our readers know Tyvek very well, because most of the sleeves for disks are made of Tyvek.

ES: Yes?

RK: It's an antistatic material, as well as waterproof and tough, so it works beautifully.

ES: Yes. Tyvek clothes!

Steve Birchall: It's a wonderful material. You can print anything you want on it.

ES: You can print anything. Of course...

RK: Do you find the computer limiting, or are the limits it places on you exhilarating?

ES: For me it's creative because I am not a specialist. The limits don't bother me because I am not aware of all the potential. When I take the time to go ahead and learn more about the computer, I think it will be unlimited.

RK: Which is more attractive to you — working on a print that later goes on the fabric or getting into the fabric itself and its weaves?

ES: Well, I do both. I don't do only the prints. I do solid things — very thin woven patterns. I would like to explore new directions with computers and fabrics. It's more exciting.

RK: The jacquard is certainly complicated to work on. We are taking an interesting turn here because in the history of computers, the jacquard loom often is regarded as the first computer. It was programmed with punched cards.

ES: Yes, it's amazing to see the same technology used in computers and looms. What do you recommend? Do you recommend the Apple computer?

RK: I always advise people to select the software first. If you have an application for a computer, figure out what that application is and what software will do it. Then find the hardware that it will run on.

SB: I know of a school — Drexel University in Philadelphia — that teaches fashion design with computers and they now require every student to buy a computer when they enter.

ES (to SJ): Will I be going there?

Susan Johnson: No, but she's going to speak to a group of young students at the Fashion Institute in San Francisco.

RK: Fashion students? They probably are very interested in computer assisted design.

SB: CAD/CAM (linking a design computer with a manufacturing robot) has a direct application to fashion design. Some systems are available that enable you to move things around on the screen until you have exactly the design you want. Then you ask another computer to take that information and make the garment for you. It can cut each garment to exact size for each particular person. If you were going to make a limited edition of 1,000 dresses, you could cut each one to the exact measurements of the woman who is going to buy it.

RK: Imagine the world of the future. You might have a card encoded with all your sizes and measurements, favorite colors, and so on in your purse. You could walk into Filenes, plug the card into a terminal which reads all the information, and take your time shopping for your clothing. Elsewhere in the store, a CAM robot cuts the fabric precisely to your size with lasers and sews it together perfectly, following the designer's instructions exactly.

SJ: There's a trend toward that nowadays. In Macy's, they have a computerized shopping service to help you select gifts. Many large department stores have terminals with a complete directory to help you find the location of the department you want. I'm sure you're aware of the computerized bridal registries. Little by little it's affecting all areas.

RK: Another interesting aspect of the new technology is the videotaped fashion show you are taking with you. Customers could watch such a tape on cable in their own homes. If a customer sees something she likes, she would simply punch in the catalog number. Filenes would already have her file in their computer, so the robot machinery would make her garment, and the store would ship it to her. She never has to leave her home. It's going to change the whole world of retailing.

ES: They can do that with the laser discs. You choose what you like and simply order it from the store...

RK: Sears is bringing out their catalog on videodisc. Avon has purchased 50,000 players for their representatives to carry with them. Each month, they just send out another videodisc to update the catalog. They're wonderful. Eventually ***SoftSide*** will publish a videodisc edition. The magazine of the future will be an interactive videodisc. But what are your future plans? Where do you go from here with the computer? Do you have specific goals or do you just let the hardware lead you to new ideas?

ES: I don't have plans because I don't know everything I want to know. I'm a beginner right now, but I really want to go further in exploring what computers can do.

RK: You said earlier that you don't want to use the computer other than as an additional art medium. Why?

Randal Kottwitz and Elisabeth de Senneville discuss her new line, displayed at Filene's in Boston. Her fashions reflect a casual, relaxed lifestyle.

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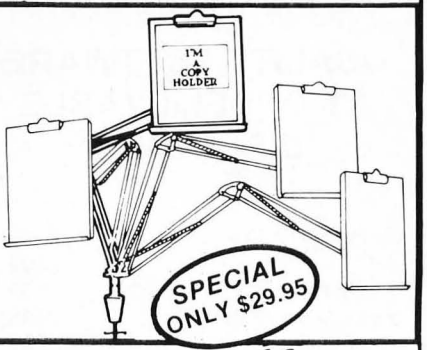

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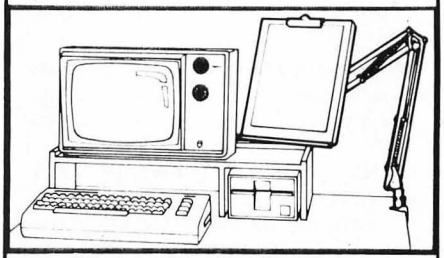

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Silicon Fashion in Paris, *continued*

ES: Because it's not my work. My work is to do fashion, to do art, but it's not to do programming. The factory where I work will use it, but not me.

RK: Not as a design tool?

ES: No. I want to keep that for my head and my hands.

RK: I understand. I am not a programmer myself. ***SoftSide*** used to be entirely about programming. I had to maintain a certain level of naivete so that I wouldn't get taken over by the technology. It sounds like you're doing the same thing.

ES: You can be overwhelmed by technology.

RK: There's no reason why the computer can't be used as a humanistic tool.

ES: Oh yes, of course.

SB: At the same time that many people are shying away from computerization, the computer is moving towards people and becoming much easier to use. Very often, it solves problems and saves people a lot of time so that using the computer is not only an advantage, but a necessity. Now we are beginning to see software that anybody can use. You don't need special instruction. I'll bet that someday, you'll change your mind. You may want to use a computer.

ES: Actually, I do make lots of sketches with the computer.

RK: It can become just like pencil and paper and the rest of your creative mind can flow just as freely as before. I think it will come to a point that it's as comfortable as sitting down with a piece of charcoal and a big drawing pad. You said earlier that American customers are more accepting of this style than French customers. Do you mean French specifically or Europeans in general?

ES: No, European.

RK: What about your fellow designers. How are they reacting to your use of the computer?

ES: In France I had a big success with the press. All the TV people came and all the press was very excited, but the consumers were bored.

RK: Do the other clothing designers in France use computers?

ES: The other designers don't use them at all. I'm the only one. They make "very chic" fashions.

RK: Do they feel put off by your easy style?

ES: They all want to make very chic but conservative fashions. They don't have any interest in computer-generated designs at all — nobody does at the moment. But I will be copied someday.

SB: I like the sense of play in your designs — that sense of humor, the fun.

ES: Thank you.

RK: But what about the consumers? I wonder if you've faced any negative reactions from consumers who are afraid of the computer?

ES: Not at all.

SB: Or did they come because of the computer?

SJ: I think they are intrigued. They've never heard of it being done before. While the whole collection was not done via computer, when you say, "This is a computer print," customers respond, "Oh, really. How do you do that?"

ES: Yes, they're very interested in the way it's done. They want to know how it's made and they want to know why. They see the computer as something very terrific. In France, though, they see it as something very futuristic, but in America they see it as something very real.

RK: It's fascinating to hear you say that, because our perception of computer implementation in France is that they are eons ahead of us. How many homes have the videotex terminal instead of a phone book?

ES: Not very many. I'd love to have one, but it was just a small experiment.

SB: Boston, with its high tech industry on Route 128, is a center of computer activity. Have you found any difference between customer reactions in Boston and New York?

ES: Yes I have. Boston seems a little more conservative — I don't know if I am wrong because I have only spent one day in Boston.

RK: New York is used to being the gateway to the world and seeing everything new the moment it comes through the door.

SB: Boston has a polished, elegant kind of attitude. On the surface, it appears to be more conservative than it sometimes is.

RK (to SJ): You said earlier that they are anxious to talk to Elisabeth at the Fashion Institute in San Francisco. What about other professional designers in this country — not students, but people who are working in fashion design? Have you had any inquiries? Have you noticed a desire on the part of the big name designers in this country to get involved with this technology?

SJ: To give you an example, yesterday we had shows at Saks in New York, and we spotted two manufacturers holding her designs up and discussing them. We can on-

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ly assume that they were interested — they were talking very animatedly.

RK: How do you feel about the possibility of this becoming a consumer tool? Consumers conceivably could design print patterns themselves, and take their disk to a silk screen shop and have that fabric produced.

ES: If people could do that themselves, that would be great. Could the computer print directly on fabric?

RK: I don't think home printers will ever be able to print on fabric, but in any major city such as Boston, several firms might offer such a service to individuals. Also, with telecommunications, you could transmit the design by phone.

SB: We could transmit designs instantly from Paris to New York.

SJ: Wouldn't that be something?

ES: In France, the government makes identity cards with computers. Even the photos go into the computer.

SB: Telecommunications going in the other direction is intriguing too. Customers could commission you to design a particular dress. They can tell you what style, colors and materials they would like, and transmit their order to Paris. You would send sketches back, and your customer, after looking at them on the television screen, would tell you what changes to make. When you are finished, you simply transmit the final design and manufacturing instructions to a robot in a store in Houston, or Tokyo or Buenos Aires. The computer charges the customer's bank amount, and transmits the fee back to you in Paris. Instantly, the customer has an Elisabeth de Senneville original. Or, a department store could license from you a complete line of your fashions, and start producing them in large quantities.

ES: Oh yes, that's a wonderful idea!

RK: So much for import duties. Actually, that is becoming an important legal question. Computer data is intangible property, and is not protected by most of the current laws. Obviously the copyright laws protect your designs — at least when they are in the form of garments or drawings. But during transmission from computer to computer, or while in storage in a computer or on a disk, ownership is less certain. Massashusetts recently enacted a new law that says data is considered stolen if it is taken in transmittal.

SB: But on the other hand, this provides a whole new way to gather commissions because you could design a thousand different dresses and collect commissions from all over the world through the communications network. They will collect the money for you just by charging people on their phone bill.

ES: Wonderful!

RK: And transmit it to your bank account — never any cash, never any checks, just data moving around. Many questions are beginning to be asked about what will happen to the world economy when money is transmuted into data.

SB: It has been already.

RK: What is that money worth when it's nothing but ones and zeros? How do you value it? People like you who are taking it back to the human tactile arts are really showing us that the computer is not a threat to our society. It's a friendly tool. And like any other tool it can be used.

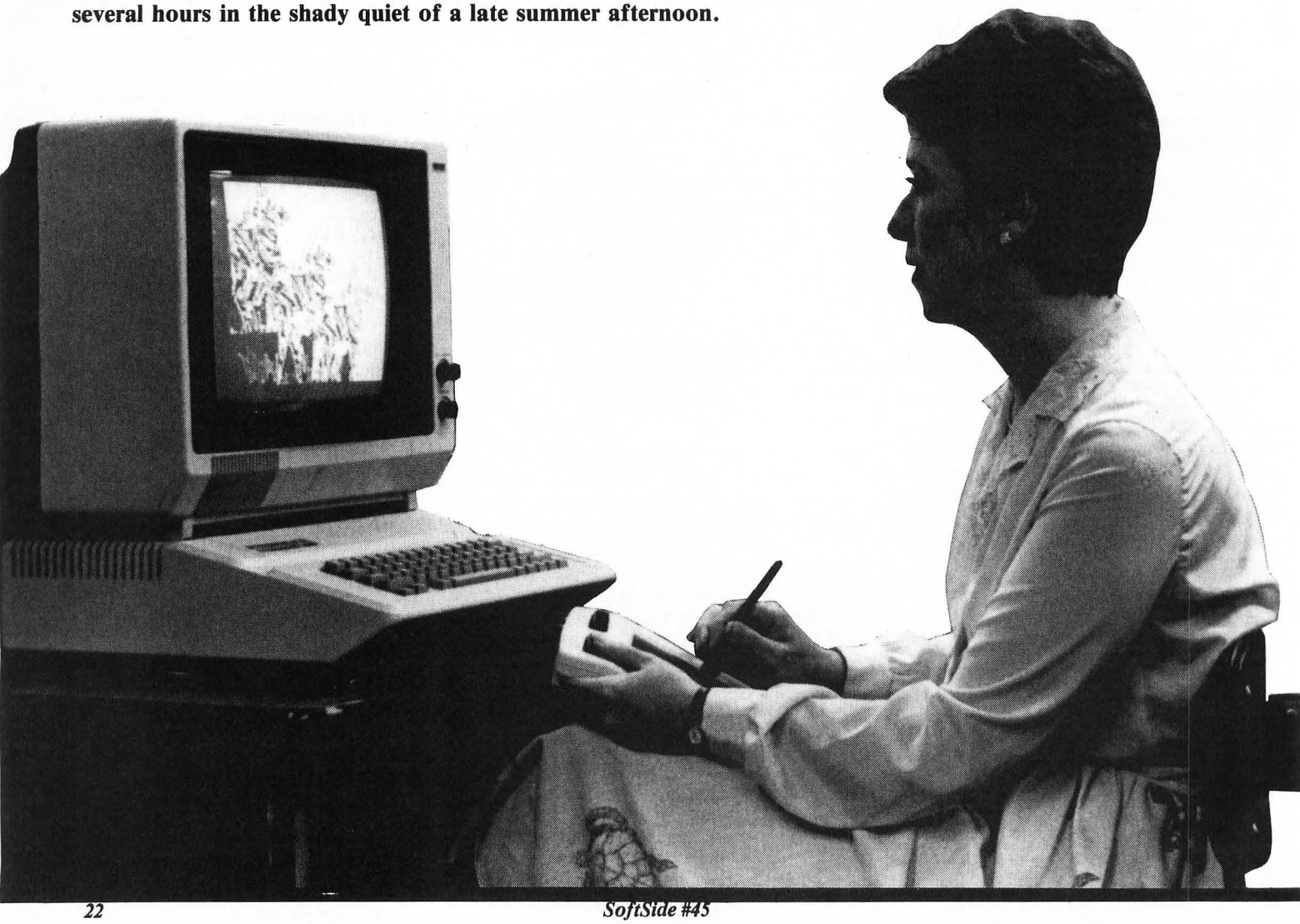
SB: The wonderful thing is that it enables you to make those beautiful designs.

RK: Have you faced any fright of the computer? Sometimes I find that when I talk to people and I show them an outstanding piece of computer art, they can't accept it as art because the machine was involved in the process.

ES: But on the computer, you can change many things as you work....

THE STATE OF COMPUTER ART: A Conversation

During one of Ame Flynn's visits to *SoftSide* to work with us on the Graphics Issue, she started telling us so much about computer art that we wanted to share it with our readers. We strolled down to Emerson Park in Milford, N.H., turned on the tape recorder and talked for several hours in the shady quiet of a late summer afternoon.



What important trends do you see in computer graphics?

The larger, more powerful computer graphics systems seem to be getting cheaper. The new generations of minis, and micros with graphics co-processors, are providing artists with more colors and higher resolution. Advances are being made with monitors, LCD displays, projection systems, color printers, and the various methods of making slides.

Which of the larger computers do you have in mind? I know Saul Bernstein has become fascinated with the Hewlett-Packard computers and likes the fine detail he can get from them.

I haven't been able to get my hands on the HP. The systems I have been able to play with (and only for fairly short lengths of time) have been broadcast systems such as the MCI/Qantel Paintbox. This is a British venture which has much more resolution, but it's only a paint system. They're just getting around to putting in animation. Everything done on the system is pre-planned. You don't sit down and program. However, they have wonderful ways of inputting an image from a television camera. You can freeze a frame and then begin to alter it. Other large graphics generators are reserved for effects — playing around with an image that already exists. Still other systems are intended for TV engineers to use for constructing short animation sequences — the little promos the network may want to put together without going to an outside special effects house. These systems cost about $150,000 right now.

With Ame Choate Flynn and Steve Birchall

No home should be without one! What new products are available in lower-cost graphics computers?

In the last year or so I have seen the NEC 7220 graphics chip used in micros, and peripheral graphics processors. The Vectrix and the Number Nine graphics boards, for the IBM and Apple, are good examples. So you use your own computer as an entryway into a realm of higher resolution and more color.

It's an effective way of doing it. If chips are cheap, the answer is to use more of them, rather than bigger, more expensive microprocessors.

Yes. It's a compromise. But after you've had your computer for awhile, and if you're trying to do professional artwork, the amount of hardware just grows. I have an NTSC board (it takes up half of my Apple), a television camera and its board, two printers (a color printer and an Epson workhorse), all sorts of different input devices from the graphics tablet to paddles and joysticks and a trackball or two, and the Koala Pad. So adding one of these graphics processors to get the elusive red and yellow, plus higher resolution, seems a natural progression. Some software for the new boards is beginning to appear. One of the nicest surprises at SIGGRAPH was seeing a friend from a conference in Los Angeles last November. He showed up with software he had written for the Number Nine graphics board. It was easy to learn, and I started to sketch with it right in the booth. Because of its higher resolution, it demands a high resolution monitor.

What degree of resolution can you get with the Number Nine?

In two colors, it produces 1024 by 1024 pixels, which is as good as most print ads. Usually, the more colors, the lower the resolution, but it's always better than what any micro can do alone. For the standard 512 by 512 video screen, you can have sixteen colors out of a palette of more than 4000. They have software for several different peripherals, including a driver for the IDS color printer. So, the time is fast approaching when an artist can sit down at one of these systems and use it to put together a complete illustration. I hope to review these new systems within the year. I think many other companies will start to go into this area. The concept of using a micro as a controller for these sophisticated graphics processors is quite sound, and it should bring the cost down to a practical range for individual artists. Disks are a problem, because all these systems require one or more disks to save one picture. And the process is not terribly fast, because you're dealing with a lot of information.

We have similar problems in music. A microcomputer alone just doesn't have enough computing power, memory and storage to deal with the problems, so outboard processors are the answer. All the composers I've been talking to seem to be working on mainframes at universities. Very few of them are working with micros, but a few systems are beginning to appear that an individual could afford to own.

One of the big issues for computer artists is what to charge for their work. Despite what we've been saying about the relatively "low cost" of the newly-emerging equipment, an artist has a substantial investment in hardware and software. Often, you have to write (or commission) special software for a project. The fees must pay for this overhead and for expendable supplies, as well as your time and effort.

Are you finding that some clients are unwilling to pay what a graphic is worth?

It's so subjective. Sometimes they're not. A lot of times they don't know the field, and have little comprehension of the amount of work that can go into a production.

Yes, and they think the computer does all the work.

Absolutely. I know at least ten people working in the field, who may use ten different ways of getting information onto that screen, depending on the amount of memory remaining, how many graphics they want, and how much room the program itself takes up. An artist in my Apple Graphics Group called a meeting of the Graphic Artists Guild to discuss the parameters for computer graphics contracts. Quite a few people showed up, but it turned out that he was the only one who actually was *working* in the field. The others came to *learn about* computer graphics. So he left, promising to give a presentation on computer graphics in the future.

Perhaps the artists themselves will have to set a rate and stick to it. That's the only way it will work.

First you have to get the artists together. Computer art tends to be a fairly solitary activity. Artists often are solitary by nature

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The reason I got the Apple in the first place was because it had the tablet. It's so direct. You can get an image into the computer with familiar tools and methods — almost like working with pencil and paper.

anyway. With the computer, you usually have all your tools at hand. You don't need to run out for stretchers and canvas, or paint and brushes. You can just sit down and create your own brush.

All you need is more disks.

And software. The prices of software are astronomical. I have a lovely tablet package called "The Designers Toolkit." But I think it costs $225, so not everyone can afford it.

When you add a couple of those together and a couple of boards...

And this is all part of your overhead. Again, it leads directly back to what you charge and how you justify it. Charging for an animation is one of the hardest things to do.

I wonder why? The rate precedents in film and video are not exactly cheap.

The concepts are difficult to explain to clients. They may be used to working with artists, but not computers — or programmers, but not artists. We can charge somewhat higher rates for animation, but clients still resist. On the other hand, the large special effects studios get about $2,000 per second. Admittedly, they produce marvelous things. We who work on micros are not in the same ball park.

What can a micro artist expect to charge for an animation sequence?

For a fairly complex animation I charge more than for a still graphic, but a lot of programming work as well as artistic work goes along with that. Often I may hire outside help, especially if the project requires special programming. I consider myself more an art director than a programmer. I have to be able to talk programming to people working with it, but I'm only good for about ten lines of code.

Do computer artists tend to specialize in one machine, and not talk to colleagues working on other systems?

That used to be the case, but now they're starting to cut across specific computer lines. Our local Apple club holds an annual Fair, but this year, we joined forces with the IBM group and held a joint Fair for two days in September at the United Nations International School. We had seminars, tutorials and exhibits — people worked very hard on it.

The lines of communication are beginning to open up...

It's incredible. I talked to the Penguin people (that sounds funny), and they are translating their Apple graphics programs for Atari, IBM and, I think, the Commodore. They should be out by the end of this year. Several new tablets are coming out for the other micros, and together with software common to all those systems, it will be feasible to transfer your skills to another computer easily. You may have to learn a different operating system, but working with familiar software helps to ease the way.

You mentioned tablets and that raised a question about the way an artist interfaces with the computer and how he controls what it does. Do you find the tablet a useful input device, or would you rather use something else.

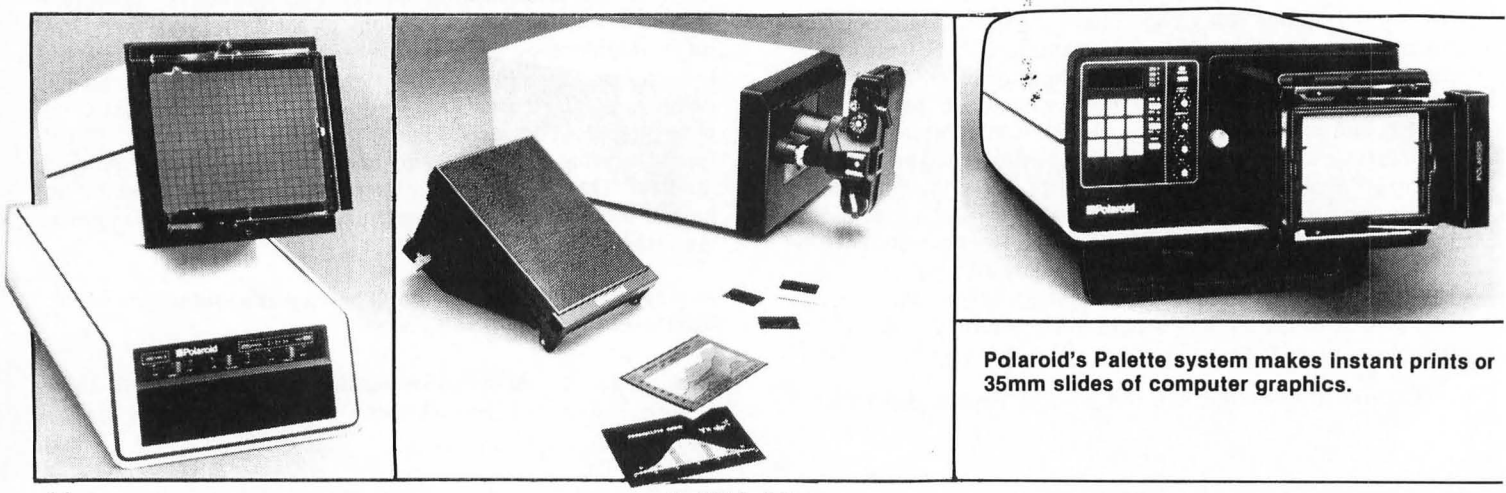
I'd much rather use the tablet. I've often said the reason I got the Apple in the first place was because it had the tablet. It's so direct. You can get an image into the computer with familiar tools and methods — almost like working with pencil and paper. Then you can manipulate it with software. In our classes, the tablet was used heavily, and was down more than it was up. So the students had to work mostly with paddles and joysticks. Their work was all the more admirable, considering how they had to do it. I've heard rumors that Apple will release the tablet again in December. If you're serious, and come from a traditional art background, you have to have it.

You said earlier that you can get brush strokes with the tablet, if you have the right software. Can you select from a variety of brush strokes?

You can. They are prepared for you, or in several pieces of software you can design your own. You can simulate airbrush strokes, or even create imaginary effects, such as little rubber stamp characters. The sampling rate — how many times a mark occurs — affects the amount of detail. It's illusory because, unlike crosshatching with a drawing pencil — putting one stroke over another — the line doesn't get darker where the two strokes meet. "Paint" doesn't form an impasto. It's not raised above the surface, so you can't make depth effects or tiny shadows by putting lines against each other.

That's the nature of the medium. You have to use it for what it is. Oils can do one thing and computers can do another. Can you simulate things like charcoal and pastels?

On larger systems, yes, but not yet on smaller micros. I don't think they have the power. With the 16-bit micros the line is get-



Polaroid's Palette system makes instant prints or 35mm slides of computer graphics.

ting fuzzier between minis and micros. On a large system such as the Qantel you not only have different kinds of marks (chalk or airbrush) but also a wonderful pressure sensitive tablet. The lighter you draw, the more transparent the line is — the more pressure you use, the darker the line.

You mentioned joysticks and paddles. How about light pens?

I personally don't have one, but I admire the work done with them. The animation software for the Gibson Light Pen has a lot of promise.

I think so too. Are light pens able to simulate brush strokes?

That depends on the supporting software. If you can define and draw with different cursor shapes, you can have a variety of brush strokes. That's all a computer brush is — a shape.

Do you find any difference between working with a light pen and a tablet?

With the light pen, you also must work with the keyboard. To do a brush up command (not draw), you hit a key, then another key to draw, and still another key to choose the color. You're always shifting your attention between the keyboard and the screen. This might have been changed since I last saw it. On the tablet, you input most of your commands through a special menu area on the tablet, which has little boxes for commands. You touch one and it beeps. Then you press the stylus against the surface and draw a line; pick it up and it stops. It's fairly simple and almost like pen and ink. When you're drawing, you want to move speedily, jump from here to there, and start working on another area of the graphic. With the light pen, if you don't remember to press those two keys — pen up and back down again — all of a sudden you have a line where you don't want one. The Koala Pad (which I think is going to be semi-revolutionary) has two pushbuttons. The pad is small enough for you to reach them easily while drawing. However, you have to go back to another menu to make any changes in your brushes, colors, and other commands.

Much human engineering work remains to be done on the software, then. Probably they won't know what the best solutions are until some artists start using it.

One of my primary interests is artist-testing of hardware and software. How well does it mesh with the way that we tend to do things? Everyone has his own style. One of the things I find fascinating is that people tend to keep their own style even on the computer. It's just another way of expressing ideas, another medium to use. In our courses at the New School, we start with *Micro-Painter* in the first class and we give the students black and white outline "drawings" to fill with color. By the end of the first class, each set of people at each computer has worked through these drawings. They've learned what a pixel is, what colors are available, and what a screen is. But every finished image looks quite different from the others. I've often said that we should make copies of all these different renditions that start from the same place. I think it would be interesting...

...Just to show that individuality is still the same no matter what the medium.

The reaction from some artists I talked to when I began working in this field was, "Oh no! It's going to take over my job." I don't think that will ever come about. I can't see *how* it could. Little by little more traditional fields are starting to look at computer graphics. Progress will be slow, but once the machines have adequate resolution, it will really take off.

Have you done any work with the process of taking an image from a camera, freezing it, then distorting it, and manipulating it with the computer?

A little bit — not heavy on the distortion. I'll be more interested in doing that when I get higher resolution. With resolution of 280 by 192, the image is distorted to begin with. I just did a cover for a magazine, and I started with a slide they sent me of a hillside scene in Pittsburgh. The art director had wanted block pixels like that picturesque image of Lincoln in *Scientific American* which gets fuzzier and fuzzier (they did an experiment to see how fuzzy it could get before people could not recognize it). I tried to explain to him that simply putting it into the computer makes it blocky. I had a print made from a slide, and shot the slide. It should have been black and white, but it was color. The colors all registered about the same on the computer, so I had to correct them by hand. At least I had blocks that were approximately the same size, but the image had to be more vertical than horizontal, so I turned my monitor and tablet on their sides, so I could see it directly. So far the monitor is still working.

All the pixels fell out!

Right! I worked hard to sharpen the image to make it more recognizable. It worked out reasonably well. As with everything in the publishing and advertising business the deadline was too soon. I spent a long time coaxing my color printer to print it out. It was particularly obstreperous that weekend. When you run through three $20 color ribbons trying to get one good print, and add them to your project costs, you wonder if you will ever break even. That's another problem — how to get your image out of the computer. I would like to try the Polaroid Palette. It makes instant color slides or prints of the image.

That should be very helpful — especially because you know immediately what it looks like on the side.

The nice thing about a color printer is that with its magenta, blue and yellow ribbons, you can re-designate colors on your Apple graphics with software. You could say, "On the printout, I want orange to be red and whatever I have on my design that's green, to be yellow." It's not so much distorted as it is transformed. I tend to work more from graphics I input myself, rather than with camera images.

What I was thinking of was something along the lines of the work of John Whitney and his sons — inputting a real image and manipulating it, or something visually analogous to *musique concrete,* or Nam June Paik's work with video synthesizers. Once you have the image stored electronically you can make changes to generate something completely new.

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Tom Porett at the Philadelphia College of Art does productions with those techniques. The images on the screens in the ads for Amdek monitors are his. Computer art is full of people who are approaching this area in a lot of different ways. That's one of the exciting things about this field — taking essentially the same piece of hardware and running with it in your own style. Some people start out with mixed media. In one corner of the picture you might have something done with a light pen and in another corner, paddles and joysticks.

That's fascinating. Do they have noticeably different qualities?

Slightly. I know the Koala Pad (and I think maybe the light pen) makes much heavier lines. I can't wait to work with the tablet on the Atari, because it has such different capabilities from the Apple.

The Atari graphics, coupled with the Steve Gibson Light Pen, ought to be able to do some pretty interesting things.

Yes, I think so.

I don't know much about their new graphics tablet.

I don't, either. I'm confused by what's happening with Atari right now. As soon as I figure that this is the model I should use, they come out with another one. One of the more lucrative markets is illustrations for software and we need a standard development system. Well, it's not the 800 anymore, or is it? As an innocent bystander, I tend to sit back and take a look. We have an IBM lab in the New School. I know that a couple of different paint programs have been written for it, but some of them need a specific color board to get sixteen colors.

The graphics for the IBM have been a little slow to come. But it seems to take longer to write graphics software.

I also think it's the nature of the beast — it's a business machine and the graphics capabilities which have been developed tend to be for business applications. Eventually the applications trickle down to artists. The nice thing about the Apple is the slots for extra boards. The Commodore 64, I hear, has great graphics capabilities. I'm looking at all of these systems, because I want to see what people can do with them. I hope our readers send in printouts or slides of their graphics so that we can make *The SoftSide Gallery* an ongoing feature.

We intend to make that an important aspect of *SoftSide*.

Beautiful graphics add a lot of texture to any magazine or piece of software.

***SoftSide* wants to promote the work of computer artists, and to demonstrate the power and capabilities of the medium. We hope *The SoftSide Gallery* will encourage people to develop computer graphics to the fullest extent.**

Absolutely!

When I was talking with the people at the Rochester Institute of Technology, they said they had 300 DEC color terminals on campus. I don't know exactly what they are doing with them but it sounds like an ambitious effort.

I'm aware of a few schools that are starting to teach computer art and design. It's all just starting to develop. Art is funny — traditional art, that is. Photography waited a long time to be accepted.

That it did. And now they're teaching computer art at a school known for its photography program. Consider what an asset computers are for photographic layouts. Another place that comes to mind — Drexel University has a department of fashion design and they are beginning to use micros in their courses. In fact, they require their students to buy computers.

I know the Fashion Institute of Technology has a computer department. They work mostly in textile design. It's interesting that we are returning to textile design with computers, because that's where it all started.

It's a natural development. As a matter of fact, the first water-powered loom in this country was built in nearby New Ipswich, NH.

We should go and pay homage. The whole field is on a roller coaster. Things are moving so quickly, no one can keep up with new developments. It's bad enough trying to follow one micro. Even Cray (a million-dollar system) had a booth at SIGGRAPH. Everybody was very nice, but I don't think they had many customers.

What is the biggest problem computer artists face?

One is how to show your wares. Does the image belong only on the screen? What about printouts and slides as computer art? In the future, wall-sized LCD displays might be practical. With an oil painting, you can just roll it up and tuck it under your arm. That's a bit different from carrying a computer, a monitor, a disk drive and software. You always have the various interface cards with cables trailing behind you.

Welcome to the world of electronics. Musicians with amplifiers and speakers have faced that problem for a long time. It's new for the visual arts.

Aside from size and weight, another problem is compatibility. I saw Mike Callery (a friend and associate) running an Apple program on an IBM using a Quadram board. To see the IBM come up with Apple graphics was a bit strange. It seemed to have somewhat higher resolution. One of the things about the SIGGRAPH conference is that you see such a huge melange of different technologies. In the film and video show, one minute

Maybe we should establish two different levels of computer art — one for the large, sophisticated systems, and another one for microcomputers.

you're applauding a molecular transformation or a Saturn fly-by. The next moment you're seeing a computer graphic TV commercial. All the work in flight simulation, the automotive industry, and in CAD/CAM has contributed to computer art. We benefit from all of the work which has, over the years, trickled down to computer artists.

The computer-processed images from the planetary probes and the Mars landers are amazing. They must use mainframes with extremely sophisticated software to obtain such excellent pictures.

I was especially intrigued to learn that before the actual fly-by, they mapped out the planets with the kind of terrain they expected to find (based on telescope photos and other data). One man was responsible for inputting all this information, and extrapolating it into hypothetical photos. When the images started coming back from Voyager, they enhanced them partly by comparing them to the imaginary photos of the planet, or moon, which he had already created. In some cases he wasn't far wrong. Of course, transmission can garble a number somewhere and you may wind up with a pink sky on Mars.

That actually happened. They corrected it by referencing the image to the red in the American flag.

It's incredible.

It really is. All of that expertise can be applied to micros — and some of it already is.

Being able to take an image (such as the inverted butterfly in *The SoftSide Gallery)* and transform it with software really makes you think about the untapped possibilities in computer art. One of the most enjoyable aspects of the computer graphics class is just going into the "tricks module" and hitting a key or two. You can take little pieces of one picture and put them into another one — or use pieces of different pictures to form a completely new image.

That's really what I had in mind when I mentioned distorting images with the computer.

Stretching images or packing them down and stringing them together are only the beginning of the interesting techniques which the computer makes possible. Or you could start with one image, delineate it, string it together with others, or throw them into inverse. The freedom exists, once you learn how to manipulate the computer and the software.

And it opens up a lot of possibilities that aren't available in other media.

Once you learn to save your graphics in several steps, one wrong brush stroke isn't going to do you in totally. A lot of times, working with oils, you can wind up destroying the piece. You could even ruin a drawing with just one line — just one excess line. On the computer, correction is easy, because you can go in and clean up simply by drawing over the mistake with the background color.

Just like word processors.

Yes, delete, delete. Move this item here and move that one over there. I'm glancing through the SIGGRAPH film and video catalog to refresh my memory. Most of the films and video pieces were done with minis. Many artists started with computer graphics and then used television special effects and editing systems to manipulate the image further. Interactive Picture Systems used an Atari, with their *Moviemaker* software for their film presentation. It was great to see something like that done on a micro. SIGGRAPH also had a showing of films by people whose work had been rejected for the regular SIGGRAPH film show — an echo of the *Refuse* group (Impressionist painters in Paris around the turn of the century, whose work was considered unacceptable the time). Maybe we should establish two different levels of computer art — one for the large, sophisticated systems, and another one for microcomputers.

I think that distinction already exists. We see it with audio and video equipment for home and professional use. And they really aren't compatible with each other.

I think the quality of the microcomputer art stands up, but it's just not as slick as the things made on a large computer.

Some day it will get there, I'm sure of that.

I think so. I saw a nice animated laser presentation that was performed live. A dancing ballerina was one of the images, and it was projected in very, very pure colors — red, yellow, blue, green — an exceptionally pretty statement. It really knocks you out to see these things.

What lies ahead, and where is all this going?

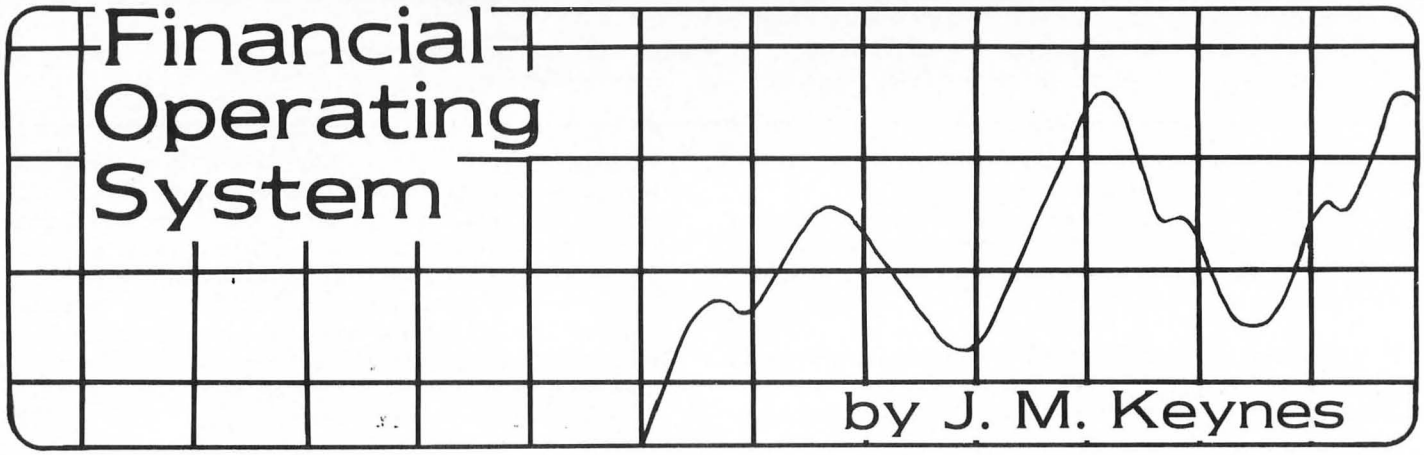
I have no idea. So many different conferences and conventions are held all over the world that you can't attend them all. SIGGRAPH has chapters in quite a few cities around the country: Philadelphia, Los Angeles, Minneapolis, Princeton, Boston — each one may put on its own smaller conference. Also, the National Computer Graphics Association has state chapters that meet about once a month and they too have a national convention. It's going to be in Anaheim next spring. There's one called DIGICON in Toronto, which I will have to miss. Several European conferences, a couple of Japanese conferences — they're everywhere.

The Boston Computer Society has over two dozen special interest groups, but none on graphics, now that I think about it. They don't have one on music, either.

What it takes is somebody to take charge and do all the work. Every micro has different protocols for graphics and sound. The Big Apple Users Group and a couple of other groups split off from the Amateur Computer Society in New York and now they are separate entities, with their own subgroups. The next SIGGRAPH convention will be in Minneapolis, July 23-27, 1984. The Co-Chairs are Richard M. Mueller of Control Data Corporation and Richard Weinberg from Cray Research, so it should be an especially good conference.

They have all the resources of the Walker Arts Center and the Minneapolis College of Art and Design to help them out. Both institutions have a strong interest in computer art.

Everybody should go. In the meantime, let us know what you're doing, so we can have another show in *The SoftSide Gallery* soon.



Explore Your Options

On Friday June 10, 1983, you could buy Texas Instruments (TXN) July 120 PUTS for 1/16. (A PUT is an option to sell 100 shares of a stock.) You could have cashed in an investment of $6,250 the following Tuesday for over $1,500,000! That's right, over $500,000 profit in two market trading days. This is one of the most dramatic moves I have ever seen. It happened when TXN announced some shocking earnings projections and the common stock dropped from 157 to 107 in two trading days. "Lemme at 'em. That's my kinda deal!" you think, as you begin to bet money with both hands. Actually, it does seem easy when you guess right. The lure of quick riches and *greed* separate thousands of investors from their money every market day. To be sure, some catch the brass ring and make a fortune, but most folks wind up poorer and *no wiser.*

Understand Your Options

Before I let you in on a few tactics, you should understand the options market. First of all, I'm sure the options market was invented by brokerage firms because it allows those with small bankrolls to gamble. (Even if you lose, you may find solace knowing your broker made plenty.) However, if you insist on playing the game, here are the rules:

- An option is the right to buy or sell 100 shares of stock at a set price called the STRIKING PRICE. All listed options have an expiration date. At any time before the expiration date they may be bought and sold each market day. All options expire at 3PM E.S.T. on the third Friday of the expiration month.

- A CALL is an option to buy 100 shares of the stock, and, as I said above, a PUT is an option to sell 100 shares of the stock.

- EXERCISE means to convert an option to the actual stock. The option holder (buyer) can convert to the stock at any time, provided he has the money to pay for it. For example: You bought a Nov 30 call on XYZ last June for 2. Today, XYZ is at $37/share and you want to get the stock. Your option plus $3,000 plus commission gets you 100 shares of the stock. You have exercised your option. In practice, few options are exercised. Most investers who own the XYZ Nov 30 would sell in the market for about 7. They invested $200 and got back $700.

- IN THE MONEY refers to an option, like the XYZ above, which has some tangible value. That is, the stock is above the STRIKING PRICE.

- OUT OF THE MONEY is an option with no tangible value; that is, the current stock price is below the STRIKING PRICE. The price it commands will depend on how much time is left before expiration and how close the stock price is to the exercise price.

- COVERED is what you are when you sell an option on a stock you own. This is the least risky to invest in the market. You are also covered if you are properly spread. I'll get into that later.

- NAKED is what you are when you sell an option on stock you don't own. If the holder exercises it, you must buy the stock at the current market price in order to deliver to the option holder. Being naked implies unlimited risk. If you sell an option on ASA with a striking price of 30, and ASA goes to 90, you are stuck. Of course, if you have any judgement, you will have covered your naked position by buying the option back.

Playing the Game

The strategy of simply buying an option is obvious. If you think a stock is going up you buy a CALL. If you are bearish you buy a PUT. Listing 2 will assist you in determining if an option is over or under priced.

There are other strategies you may employ to your advantage. One is SPREADING. This is when you buy one option and sell another on the same stock.

- VERTICAL SPREADS. XYZ is at 23. You think it will go to, perhaps, 30 by February. You may buy the Feb 25 outright for about 2 ($200/option), and concurrently sell the Feb 30 for about 3/4. You put up the same $200 for the Feb 25, but you get

back $75 from the sale of the Feb 30, making your net risk 1 1/4. In many cases I prefer spreads. It is true that one gives up the potential for an enormous move in a short time; but, over many years, I have determined that few stocks rise more than 33 percent in any 90 day period. I prefer the spread because I think the odds favor it. Listing 1 clearly shows the vast advantage spreading has for even a 45 percent up move in the stock. Should the stock remain under 25, both calls will expire worthless. If you are considering buying a call that is way out of the money (buying a 50 call on a stock that is now at 40), the vertical spread portion of Listing 2 will make spreading a compelling strategy.

● CALENDAR SPREADS. You sell a Feb (nearby), and buy a May (deferred) option. This strategy requires the least investment. Even as I write, this can be done on over 25 stocks for under 1/2 or $50 per spread. For example: Today you could buy the Mesa Petroleum Jan 20 and sell the MSA Oct 20 for a debit of only 1/4 or $25 per spread. MSA closed today at 14 1/2. The risk is what you put up as the January option must always be worth more than the October. Should MSA be at 20 on the third Friday of October, the option you sold would expire *worthless,* while the one you bought has 90 days to go, and would be worth about 2 to 2 1/4....a profit of perhaps 1,000 percent! Even if MSA is only at 17, the Jan 20 should be worth at least 1/2 for a 100 percent profit. If MSA is unchanged at 14 it is likely you will be able to recover most of your investment. The program in Listing 1 tells you what the option would be worth with 90 days to go if the stock is unchanged.

Zero Risk?

Several times each year a situation develops which can provide the clever investor (thank you, thank you) with an opportunity for big profits with essentially *zero risk!* Before you begin laughing hysterically, read on. Examine the following illustration. In the summer of 1982 TELEDYNE (TDY) sold for 75. For a brief period one could have bought one Oct 90 and one Oct 110 and sold *two* Oct 100 for a net credit of 3/8. That is, the proceeds from the sale of the two Oct 100 calls paid in full for the Oct 90 and 110 with 3/8 left over which about paid the commission. The investor puts up nothing. (Note: One of the Oct 100 calls is uncovered and requires margin money; or, if one has any marginable securities in his account, they will stand good for the margin required.) Check out this arithmetic (heh,heh). If on the third friday of October, TDY is selling for less than 90, all the options expire worthless. The investor lost nothing. If TDY is between 90 and 110, the investor profits. The maximum profit is achieved at 100 for then the 100 and the 110 options are worthless and the 90 is worth 10 or $1,000. If TDY is above 110, the investor loses only a commission as the combined value of the 90 and 110 will equal the value of two 100 options. You're not laughing now! The order to the broker was, "TDY, Buy calls, 1 Oct 90 and 1 Oct 110 and sell calls, 2 Oct 100 at 3/8 credit." Your broker will be surprised that such opportunities exist....but...uh...I have never suggested that being bright was a prerequsite for becoming a stockbroker.

Here is another strategy which you may employ to gain an advantage. As this is written Walter Communications (WCI) is at 27 1/2. There is a WARRANT (which may be viewed simply as an option to buy the stock) that, when accompanied by $55 (the EXERCISE PRICE) will get you one share of WCI common stock. The warrant expires on April 1, 1986. If the common stock does not rise above 55 the warrant will expire worthless. The warrant closed at 9 3/4! The more conservative investor might consider buying the stock and selling (shorting) the warrant. You put up the difference (17 3/4). As long as WCI is above about 18, you can't lose. Anything above that is profit. Maximum profit occurs at 55 or above.

If you want to buy a stock which has listed options, you may be able to create artificially (so to speak) the stock by using options, and, in the process, save money. In August, 1982, Teledyne TDY was at 79. The Apr 80 Call and the Put were selling for 12. If you were going to buy 1,000 shares of TDY, rather than put up $79,000, you could have bought 10 Apr 80 calls and sold 10 Apr 80 Puts. You have essentially all of the profit potential and risk of owning the stock. The difference is that you put up no money. Your $79,000 can be earning interest for the next eight months (about $6,300). At expiration, if you still want to own the stock, you can excercise your call option and buy it for 80 even though it may be at 110 (would you believe 130??). If you chose to sell the call you must pay capital gains taxes. There is no tax if you exercise. TDY goes on your books at 80 with a purchase date the same as the exercise date. If TDY declines below 80 (what a ghastly thought), you are obliged to buy the stock at 80....but...that is what you were going to do in the first place. In any case you would be many thousands ahead by using the above strategy. Such Put/Call combinations are available on most optionable stocks. Have you noticed that your broker is amazed at your new found expertise in the markets? Just continue to give him that smug look. I'll never tell that you learned it from reading ***SoftSide.***

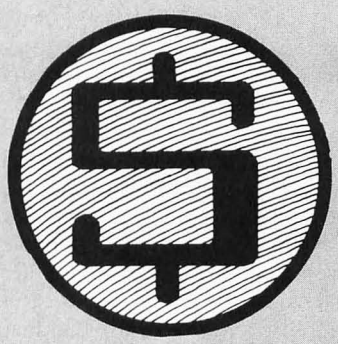
Having and Eating Your Cake

You will find one advanced strategy hard to believe...IT DOESN'T MATTER IF THE MARKET GOES UP OR DOWN! Pay attention. Buy $10,000 worth of options on a group of stocks which are likely to out-perform the averages; and, concurrently, sell $10,000 worth of options on a group which is likely to underperform the market. If the market rises, the options you bought will rise faster than the options you sold. Should the market decline, all the options will probably expire worthless. By using the same strategy with Puts, one may profit regardless of market direction. This strategy is most useful to those who have marginable securities in their account which will meet the margin requirements for the naked options. The key is knowing which options will outperform the market and which will be the laggards. There is a complicated system which ranks all options from 1 to 5. The options ranked 1 have *always* vastly outperformed those ranked 5. The computations are updated weekly. If you want a current printout, send a S.A.S.E. to Box 3332, Tequesta, FL 33458.

The program in Listing 1 deals with vertical and calendar spreads. The program in Listing 2 deals only with vertical spreads. I included it because it gives a more detailed picture of the results. (Send a SASE and $1 to ***SoftSide*** Publications, 10 Northern Blvd., Amherst, NH 03031, for copies of the listings.)

I have not covered all the strategies in options — that would fill a book — but I hope you find this column helpful. If you have suggestions for future columns write to me at the above address. Send any critical letters directly to the editor.

Effective immediately the Financial Operating System will discontinue its BBS. As you may or may not know, J. M. Keynes is the **nom de plum** *of one of the most successful brokers in the country. Compliance with regulatory agency requirements preclude his making "public" investment recommendations through such a service because he has no way to determine the "suitability" of investments for potential investers who access the BBS.* **SoftSide** *plans to revive the FOS BBS in another, equally helpful form in the near future.*



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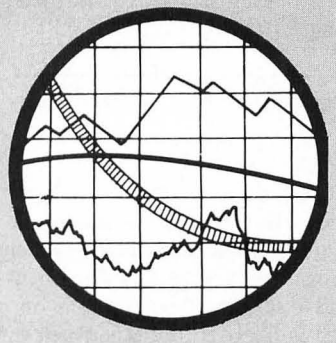

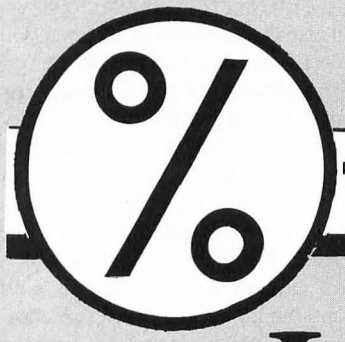

by David Peters

The VisiCalc® Spreadsheet Comes Home

Looking it up — and Getting it Right!

Had a letter the other day from a reader, who, in addition to being kind enough to say that she enjoyed the column, pointed out something that maybe you should all share. She told me that she doesn't use VisiCalc, but one of the other "VisiClones." She said, however, that she found the stuff we write useful as it all worked in her software package, too. It is true that most of the general techniques we discuss will run on most of the others. This is, of course, because most spreadsheet programs work in roughly the same way, comparing and recalculating the locations within the grid. There will be some differences, however, since they do not all have the same function capabilities, and sometimes implement them slightly differently.

One such function, the LOOKUP feature of VisiCalc, is handled in different ways by different programs. We will analyze a problem that the VisiCalc method has, and a solution for it. If you use a different spreadsheet program, however, we are sure that our method will work with yours, too.

When VisiCalc goes to an @LOOKUP table it seeks a match. If it finds none, instead of telling you so, it assumes that the next best thing is an approximate match, and returns a value that is the "next best lower" match. In many cases, this is fine, and knowing how it works you can design your tables to work to suit your project. But, what about when you need an accurate match, and nothing else is acceptable? We have a way to do that.

Just to set the scene, let's review the @LOOKUP function. The following (table 1) is a simple @LOOKUP table:

Table 1:

	FIND	MATCH	VALUE
Enter here--►	5	1	100
		3	200
Value--►	300	5	300
		7	400
		9	500

We have set up a situation in which we can enter a value to search for, and see VisiCalc retrieve a corresponding value beneath it. We asked for the value of five and got back correctly 300. The "formula" in the Value location was simply: @LOOKUP the value sought in the column that stretches from the top of the table to the bottom, and bring back the corresponding value that you'll find opposite it. In VisiCalc terms, it would have been something like @LOOKUP (B2, C2...C6).

When an exact match is found everything is fine; but if we entered a number that is not in the table the following happens (Table 2):

Table 2:

	FIND	MATCH	VALUE
Enter here--►	6	1	100
		3	200
Value--►	300	5	300
		7	400
		9	500

We entered six and VisiCalc ran down the column until the number it was seeking was exceeded, and then dropped back one and gave us the preceding value.

@LOOKUP tables may be constructed vertically or horizontally, must always have the "to be returned values" in the next adjacent cell to the match value, and the match values must always be in strict ascending order.

So what about the times when an exact match is required, and nothing else is acceptable? We want VisiCalc to tell us that it could not find a match, rather than coming back with an inaccurate figure. We are going to use a business type application to illustrate, but you will be able to adapt the technique easily to any model you design.

In Figure 1 you'll see the components of a complete spreadsheet, with all the applicable columns for the work. The "situation" is the production of a pricing estimate (in columns E through H) to be prepared by inexpert clerks, prone to keying errors. They will load the part numbers from the inventory, with the quantity required, and the model will prepare an estimate for printout. Each inventory stock number will be @LOOK-ed up, the right price brought back, and if the stock number is not there (it's not available, or perhaps the stock number was incorrectly typed), it will warn with NA — not available.

Figure 1: The Complete Demo Model.

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2												
3	DO NOT USE A		ENTER DATA		PRINT FROM F4							
4	OR B - USED BY		HERE C&D							LISTS USED BY MODEL		
5	MODEL.											
6						PROPOSAL FOR MR. SMITH				STOCK	STOCK	
7										#	#	PRICE
8	STEP 1	STEP 2	ITEM	QTY	ITEM	PRICE	QTY	TOTAL				
9			#			EACH				1101	1101	3.66
10	----------									2010	2010	4.22
11	1101	0	1101	1	1101	3.66	1	3.06		3145	3145	3.55
12	2010	0	2010	2	2010	4.22	2	8.44		4222	4222	1.89
13	3145	0	3145	3	3145	3.55	3	10.65		5442	5442	34.56
14	4222	0	4222	4	4222	1.89	4	7.56		6751	6751	45.78
15	5442	0	5442	5	5442	34.56	5	172.80		7998	7998	2.55
16	6751	0	6751	6	6751	45.78	6	274.68		8005	8005	4.85
17	7998	0	7998	5	7998	2.55	5	12.75		9567	9567	9.99
18	8005	0	8005	4	8005	4.85	4	19.40		10101	10101	10.00
19	9567	0	9567	3	9567	9.99	3	29.97		11999	11999	11.00
20	9567	433	10000	5	0	NA	5	NA		12765	12765	12.00
21	10101	899	11000	2	0	NA	2	NA		13564	13564	13.00
22	11999	1	12000	6	0	NA	6	NA				

							TOTAL:	NA				

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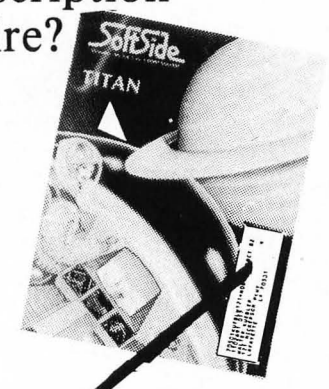


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Calc Side, ***continued***

First look over to the right, at the @LOOKUP columns. If a usual @LOOKUP was used, with only one match column and one value column, the entry of, for instance 3144, (if the clerk mistyped 3155) would return $4.22 — as, in fact, would any number entered between 2011 and 3144. Not satisfactory. We /Replicate the list again, in an inserted column next to the values to be returned.

Now look at the other side in the main model. The clerk is instructed to ignore the Step 1 and Step 2 columns. The entries are made in the C and D columns reserved for this purpose. The actual Proposal form, which will eventually be printed out, is Cols E to H — VC does all the work to create this.

As each stock number is entered in Col C, Col A (Labelled Step 1) picks it up and @LOOKUPS it in the first (J) column of the list. It returns the value opposite as usual, or the one before, which is, of course, also a Stock #. Column B (Step 2) subtracts the original entry in Col C from the value brought back to Col A. Then in the Proposal form (Col E), the formula in the Item Ordered column returns the correct number, or zero if it is not in the list.

In Col F, a regular @LOOKUP uses the second Stock # list (Col K), returning either the value Price or NA, as the @LOOKUP table does not include zero (see the last three items). Incidentally, the Steps 1 and 2 columns are on the left as anywhere else requires a !Recalc; and, in this case, we want an instant response to catch the NAs.

The key formulae, working across Row 11, are as follows:

Col A	@LOOKUP (C11,J9...J21)
Col B	(C11 − A11)
Col C	Entry
Col D	Entry
Col E	+C11*(1+@MAX(−B11,−1)) (MAGIC!)
Col F	@LOOKUP (E11,K9...K21)
Col G	(D11)
Col H	(G11*F11)
Col J	List of actual numbers
Col K	/Replicated Col J
Col L	Actual price per unit

Here is what is happening: When the subtraction in Col B produces zero, meaning that the entry is found in the list, then the "magic" formula in Column E @MAXes B, zero is larger than −1, 1 + 0 = 1, and 1 × Col C passes on the right number.

However, if there is a value in B, meaning that the number is not in the table, the formula converts it to a negative value, which is larger than −1. Since 1 + −1 = 0, zero times any value is zero, and if you @LOOKUP zero you get NA.

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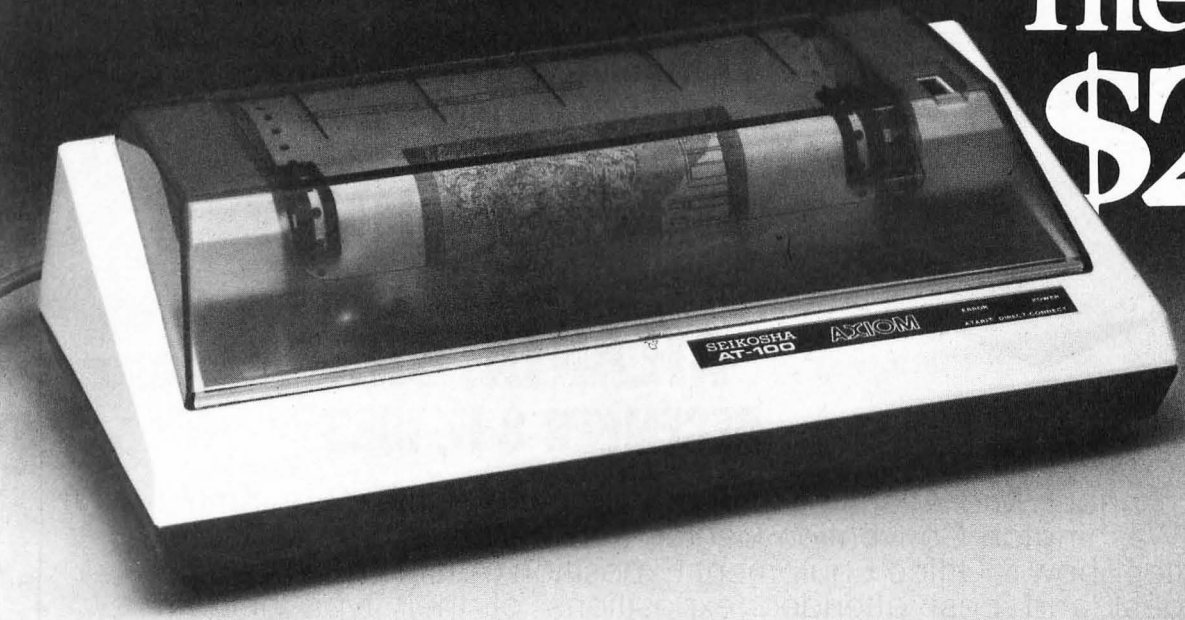

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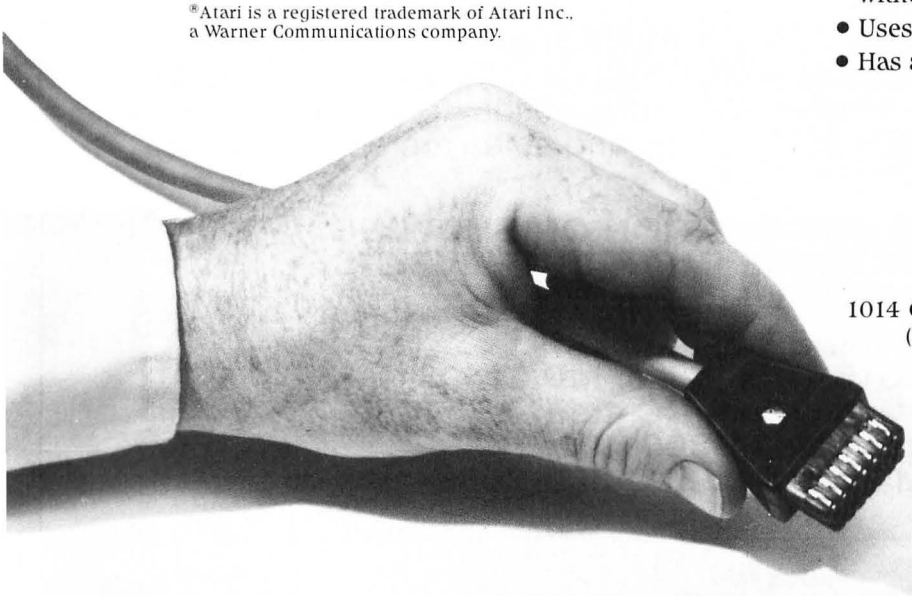

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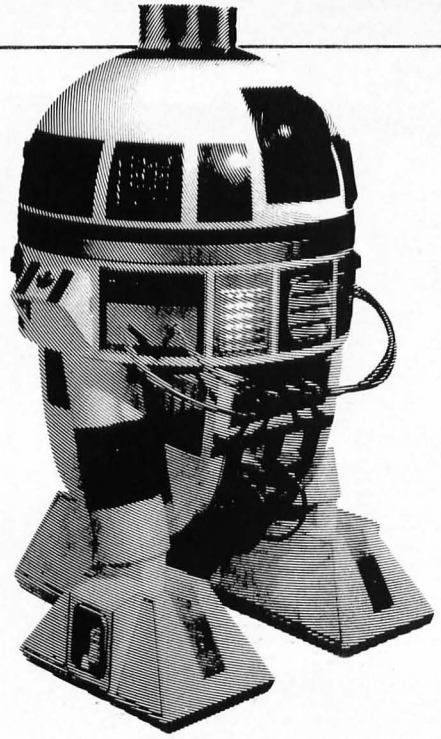

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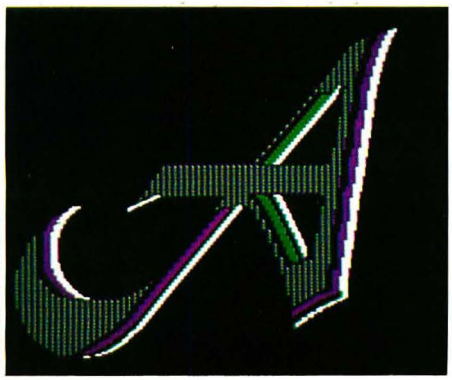
Working in the Field: A Look at Art and Artists at SIGGRAPH '83

The IEEE Special Interest Group for Graphics Conference

Reported by Lisa Gillham



Lauretta Jones

As a visual artist interested in using the potential of the computer to make art, my main interest in attending my first computer graphics conference, was to see pictures. However, I was looking for a certain kind. I wasn't looking for dazzling special-effects advertising, featuring bold letters with meteor-like tails shooting through hyper-space. Nor was I looking for exquisitely articulated simulations of natural phenomena, executed with complex algorithms. I do not mean to imply that these kinds of images are not completely worthy and exciting in their own fields. I saw and enjoyed a great many of both. What I was searching for has different qualities. What those qualities are has been the subject of about as much argument as the existence of God; so, for the sake of brevity, let's call what I was looking for fine art. Whether it is even possible to create fine art using the computer is the focus of hot controversy in the artistic community, and I was out to find proof.

I found some proof at *SIGGRAPH 83*. This art show has built up a reputation for quality over the course of the conference's ten-year history. This year, 84 artists exhibited 91 pieces, including installations and video. These 91 works were culled from well over 1000 entries. Following the conference the show began touring extensively in Japan and Europe, and will tour North America this fall.

According to the *SIGGRAPH 83* art show catalog, "These selections represent a concern that an artist's work should transcend technique, realize the full potential of the chosen medium, and reflect a consistency in the overall body of work." To what extent these objectives were realized by the show is debatable. I was somewhat disappointed. Too many of the pieces were comprised of empty patterning or cute effects, with little awareness of plastic form or effective use of color. Much of the work was of spindly substance.

One of the most reliable criteria for identifying art, whatever the work's particular characteristics may be, is the ability of the work to truly engage the viewer's interest. The work should invite the viewer to spend time with it. This quality indicates the presence of other visual attributes, and it is lacking in the *SIGGRAPH 83* exhibition, which is, in large part, a fast show. However, some images in the show clearly do transcend technique and achieve artistic excellence.

Inviting Samples

Some of the most interesting work in the show came from Margot Lovejoy. Margot says she is very curious and interested in technology. She feels that her background in printmaking leads her to be process oriented, since making a print involves a great deal of meticulous technical procedure. She also has worked extensively in Xerography.

At *SIGGRAPH 83* she showed three interesting and diverse pieces. One is a long, accordion fold-out piece called "Cloud Book." (Fig. 1) Its folded pages give a filmic linear impression,

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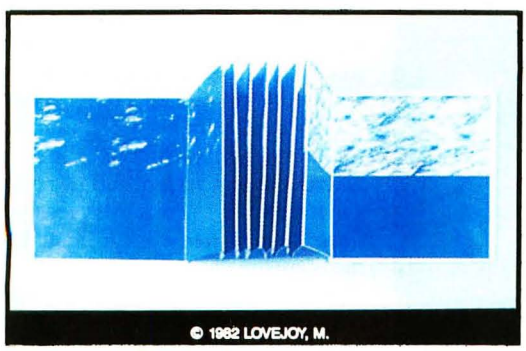

Figure 1. "Cloud Book"

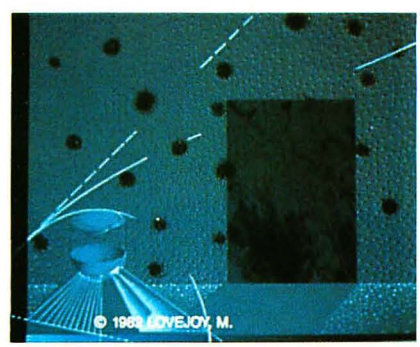

Figure 2. "Flux I"

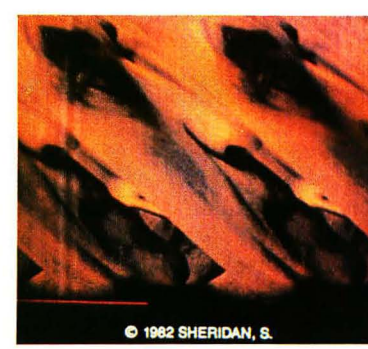

Figure 3. "Stretching Jim In Time"

Figure 4. Untitled

Figure 5. "A Bird In Hand"

SIGGRAPH, ***continued***

yet all the "frames" can be seen at the same time. There is a minimal change in the progression as the lower half of the page remains an unchanged, deep indigo, while the top half, which is an all over cloud pattern, fades from dark to light in the manner of Xerox degeneration. It is an austere transformation, calling to mind music in which the note stays the same, but the timbre changes. "Cloud Book" is a color Xerox. The hardware used was the IBM 370, with an Amdahl line printer output.

Another of her works is "Flux I." (Fig. 2) "Flux I" looks like an alchemical mix of art and technology. It seems part geometric graph and part still life in elegant, cool grays and silvers. In this still life the "objects" are the various patterns and textures. This work was also done on an IBM 370 with Amdahl line printer output.

One of the things Margot Lovejoy hopes for in the computer is an intellectual tool for the synthesis of the diverse references and materials which feed into an artist's work. She hopes to be able to enter text, diagrams, maps and other materials into the computer's memory, and incorporate all these influences into a single tool. She dreams of making works which intereact with the viewer to create environments.

Several artists, like Francis Olschafskie and Sonia Sheridan, come to the computer as a logical extension of their work in photographic manipulation.

Sheridan, a vanguard Xerography artist, employs image manipulation in the graceful, lyrical print, "Stretching Jim in Time." (Fig. 3) What appear to be gently nondescript, dancing, figure-like shapes, upon closer inspection, become a series of diagonal repetitions of an elongated face. It is a face which is stretched — and frozen — in time. Sheridan achieves sensitive use of color in her 3M Positive Match Print. The hardware she used was a Cromenco Z-2D CAT 400, and the software was EASEL.

Francis Olschafskie, who was first a painter, then a photographer, finds that, in working with the computer, he is dealing with the same "photo-mechanical processes."

His untitled work (Fig. 4) combines a painterly approach with photo-electronic effects to produce a haunting presence. Faces literally masked by clouds are distorted and echoed to create the pattern and form of the image in this well structured work. The piece is a Cibachrome print, created with the Graphics Design Workbench.

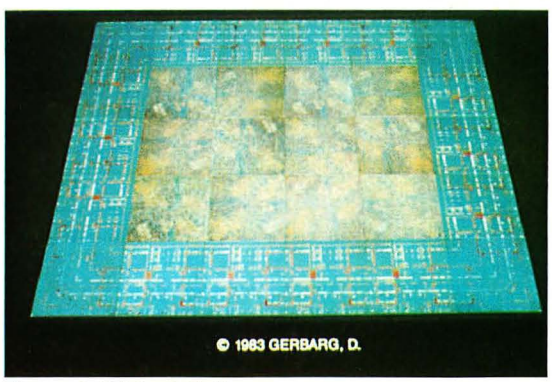

Figure 6. "Orientalia"

Olschafskie doesn't think the computer offers him more than he had using conventional photographic techniques. However, he says it does get him out of the darkroom. In his earlier work, before the computer, all of the complex manipulations took place in the darkroom using a series of enlargers and a sheet of white photographic paper — which, of course, remained blank throughout the entire procedure. There was an element of surprise involved in developing the image to see if what he thought he had created was, in fact, what was on the paper. Use of the computer allows his creative process to be more spontaneous. He is able to assess the work at all stages of its development, and, in that respect, has greater control.

Computers and Artistic Tradition

Copper Giloth, Chairperson of the *SIGGRAPH 83* exhibition committee, also feels that the use of the computer is a logical extension of her previous artwork. Copper feels a strong connection between her work with computer generated images, and the traditions of textile art and Egyptian drawing. Both have a profound effect on her work. To her, the flatness inherent in these traditions is compatible with the capabilities of the computer. She studied sculpture in Egypt, and her experiences there are important to her and to her work.

The piece she exhibited called "A Bird in Hand" (Fig. 5) shows some of these influences at play. The serial image has a poster-like flatness. She worked with a series of photographs of her face and her hand closing. These four images are key frames in the movement, which she digitalized, and then added the digitalized cardinal and pyramids. "A Bird in Hand" is a plotter drawing done on a Datamax UV-1 computer, and a Hewlett Packard 7580-A plotter. The software she used was the UV-1 paint system, and Z-grass, a graphics language. Z-grass was designed by the people who have since formed Real Time Design, Inc. in Chicago, where Giloth herself works.

Giloth exhibits her work in many different areas, including some places where it is not recognized as computer-generated art. For this reason, she doesn't think her work is limited by the medium she chose.

Another exhibiting artist, Darcy Gerbarg, who teaches at New York University, agrees. She says that now it is possible to identify the work of a particular

artist beyond the type of system they were using. The artist is no longer tied to hardware.

She is also very clear about the fact that more is needed to create art than a familiarity with the machine and its systems. She says that computers are "facilitators," but that traditional training in art is absolutely necessary. Gerbarg has a formalist painter's background, and also has experience in ceramics, silkscreen, lithography and etching.

Her contribution to the *SIGGRAPH 83* show was a large ceramic tile piece called "Orientalia." (Fig. 6) The images had been screened onto the tiles, and the pieces were assembled into a low "table."

Gerbarg has done a great deal of experimenting with different paint programs. One of the advantages she sees in this kind of work is being able to add and subtract elements in the image, and change the colors at the end, as she chooses.

However, she feels that paint programs are limited. One of the problems she sees is that artists are usually working on systems that were designed for some other purpose. Another problem is the search for an effective way to transfer the image from the CRT to some medium whereby it can be exhibited. Gerbarg says the physical medium on which the computer image is displayed must enhance the work, not merely document it.

> "...friendships and collaborations...can begin to alleviate what is probably the major problem facing an artist interested in working with computers: access to the machines."

To Paint Or Not To Paint

Paint programs vary widely in their capabilities. Most incorporate a wide range of color choices, a variety of "brushes" of different widths and textures, and several possibilities for color application. Some have a "watercolor" or "air brush" effect. Some allow you to create an image and then use that image as a "brush," or more clearly, as you would use a rubber stamp.

Turner Whitted, a computer engineer, formerly working in research at Bell Labs, developed a paint program which was used in experimentation at the Labs. Whitted says one of the biggest problems confronting him, when designing the program, was trying to "guess what an artist wants." Also the system must be easy for the artist to use without specific instruction. Lillian Schwartz, a pioneer computer artist and filmmaker, tried out Turner's program. He says when she sat down before the CRT, she spent the first ten minutes objecting to certain limitations, the second ten minutes asking specific questions about what she wanted to do, and after that she just painted.

Whitted feels that the computer has advantages for the artist. It is a compact new tool that offers speed and a wide range of colors that are easy to blend and reproduce. Also, as Lillian Schwartz commented, "There's no clean-up." The fact that most paint programs do not require the artist to have programming skills also makes them more accessible. However, Whitted stresses that a knowledge of programming enriches the artist's range.

Artist Meets Programmer

There is also the possibility of collaboration between artist and programmer, in which the two can integrate their areas of expertise. This has proved to be a strong combination, as the works of the ground-breaking team of Lillian Schwartz and Ken Knowlton, and now David Em and Jim Blinn, will attest. Vibeke Sorensen, a computer artist, said to those in attendance at a *SIGGRAPH 83* course on the artist and computer graphics, "I want every artist in the room to make friends with a programmer today, and I want every programmer to make friends with an artist today."

These kinds of friendships and collaborations can help enormously in the development of computer art. They can begin to alleviate what is probably the major problem facing an artist interested in working with the computer: access to the machines.

Owning a large, high-resolution system with sophisticated capabilities is simply beyond the wildest expectations of most artists. The smaller, potentially affordable systems are quite limited. Large corporations and universities have high-powered systems, but how can the artist gain access to them? "Sign up," is what artist Francis Olschafskie says. By that he means one could become employed by or affiliated with one of these institutions. Employees of big companies can sometimes use their systems after hours. Faculty members and students can use university equipment. However, not everyone is in a position to "sign up," and even these convenient situations have limits.

Some artists approach corporations, and ask to make arrangements to use their systems. Not all companies, however, are open to this. Also, as Turner Whitted points out, a research corporation, such as Bell Labs, may not have graphics programs available. Artists tend to assume that because the hardware is there and has the capabilities, they could walk in and use it to make art. The fact is, in the case of a research situation, where art and graphics are not priorities, the software needed to produce anything beyond the most basic graphics simply may not exist. If artists cannot create their own software for the systems, it is not likely that the research scientists, because of other pressing priorities, will be able to do it for them.

On the positive side, Copper Giloth said that she was encouraged by the fact that about one third of the artists entering work in the *SIGGRAPH 83* art show were "independent." Either they owned their own equipment, or they are only loosely associated with corporations or universities.

She feels that computer tools are being incorporated into the artist's studio, and computer generated artwork is being integrated into the art world.

Computer art has not yet developed to the point where it can make the most of the qualities that are uniquely its own. What will the art look like which fully exploits the potential of the electronic image? Copper Giloth thinks that this unique development may involve real time animation and sound — things which could not exist without a microcomputer.

Much of current computer art resembles work done in more traditional media. This development is a natural process though, and it takes time. Photography in its early stages copied popular styles of painting until it came into its own as an art form. As John Cage says, "Cars were carts before they were cars."

Even though computer generated art has not reached its stride, it seems clear that serious work of artistic excellence is being made. Once more artists begin to understand the computer, they will be able to take greater advantage of this revolutionary medium. Exhibits like *SIGGRAPH 83* will help to foster this understanding. Because artists learn best from other artists, a sense of community is important in promoting interest in this unfamiliar medium. We need to see the work of artists already working in the field. The more quality work is seen by artists, the more ideas will branch and flower until computer art achieves its own identity.

THE EPSON HX-20

-A True Portable

Reviewed by Robert J. Hennessey

If you need a machine that can fit in your briefcase, give you computing power on the go and free you from the power line, then consider the *Epson HX-20 Notebook Computer.* It is, in my opinion, one of the best, truly portable computers with sufficient memory capacity on the market today.

Small But Mighty

The *HX-20* comes in a package 11.3 by 8.5 by 1.75 inches and weighs in at a mere three pounds, thirteen ounces. The basic machine has 32K of ROM and 16K of RAM. A built-in 24 column, five by seven dot matrix printer is standard with the unit. You can use an external tape recorder for program and data storage, but the plug-in micro-cassette recorder option is much more convenient as it becomes part of the basic package without changing the dimensions. An acoustic modem is available, and other external components — disk drives, TV monitor and printer — are in the works. A display controller is necessary for connection to a monitor.

Contained within the basic package are RS-232 and Serial connectors, power input connection for charging the batteries, a plug for a Bar Code Reader and connections for an external tape recorder and a 40-pin bus connection.

This little beauty has a full size, 68-key keyboard with some unique features. A key labeled "NUM" converts a group of letter keys into a calculator-like key pad. Another key, labeled "GRAPH," converts most of the letter keys to graphic symbols which are displayable on the LCD screen, as well as printable on the built-in dot matrix printer.

The LCD screen displays four lines of twenty characters at a time, but this is only a small part of the real screen size. The screen is scrollable vertically as well as horizontally. The horizontal size is limited to 255 characters. The screen is also dot addressable in a 120 by 32 matrix for graphic displays. You can adjust the screen viewing angle to compensate for your position in relation to the computer, or to offset glare.

The 40-pin bus connection allows for the use of a memory expansion unit. This unit comes with 16K of RAM and sockets for an additional 32K of ROM. This package has twelve (12) possible configurations when all chips are installed. The additional ROM is bank-switched with the ROM in the basic computer as some of the addresses used are the same. Also, you can utilize several different types of ROM's in this unit. If this isn't enough, there is space inside the bottom of the main case for an 8K ROM.

Operation

The language is Microsoft BASIC. The 129 commands available include "FIX", "HEX$", "OCT$" and many others. Logical operators include "IF", "THEN", "ELSE", "AND", "OR", "NOT", "XOR", "IMP" and "EQV". Full string functions are also available, and there are even commands for use with color monitors.

Computing with the *HX-20* is pure joy. It is comfortable to use in almost any position — on a desktop, in your lap, or just about any imaginable place. The keyboard has a nice feel and a positive response.

There are five function keys programmable by the user for a total of ten functions. They are set at the factory, but it is easy to change them. A built-in, real-time clock is available which you can access to get time of day, current date and the day of the week.

Variable names may be any length; however, only the first sixteen characters are significant. I have always liked the idea of variable names that indicate the function being performed, as opposed to one or two letter names. This feature was a pleasant surprise in a portable machine.

Another unique feature of the *HX-20* is RAM Files. These are an area of memory you can set aside and protect for data storage. You access the files using the "PUT" and "GET" commands. Offsets can be specified so that one large RAM file can contain data for several different programs. One caution; each program accessing the RAM file area must clear the same amount of file space or data will be lost.

Four NiCad batteries power the *HX-20.* They give approximately 50 hours of operation on a full charge. The system warns you when the batteries are low by interrupting whatever is in progress, and flashing "Charge Batteries" on the screen for one minute. After this, the power switches off to save memory until recharging is completed. The AC adapter is not designed to power the unit in place of the batteries.

Comparing the Competition

Comparisons between similar computers are inevitable — so it is with the *HX-20* and TRS-80® Model 100. The two systems have much in common, and I won't dwell on the similarities. Instead, I will point out some differences with the help of the following chart.

From Epson America, Inc., 3415 Kashiwa Street, Torrance, CA 90505. Suggested retail price: $795.

HX-20

Model 100

FEATURE	MODEL 100	HX-20
LANGUAGE	MicrosoftBASIC	Epson BASIC V-1.0 (Microsoft & Epson)
SCREEN	LCD; 8 lines; 40 columns; 15,360 pixels; adjustable viewing angle.	LCD; 4 lines; 20 columns; 3,840 pixels; adjustable viewing angle.
PRINTER OPTION	None built-in. External via built-in parallel port.	Built-in 24 column with graphics. External via serial port.
DATA STORAGE	External cassette; RAM file.	Plug-in microcassette; external cassette; RAM file (drive-like I/O); Disk drives via controller.
SOUND	5 octave range in half steps.	4 octave range in half step.
COMMUNICATIONS	RS-232 with communications program built-in; can even dial phone numbers.	RS-232 built-in; no terminal program.
COMMANDS		
MAX FILES	Limits no. of files open at one time.	No comparable command
IPL	Defines a BASIC program to be run on power up.	"
ON TIME$ GO SUB	Reads Time$ and executes a program.	"
POWER OFF	Power off immediately.	"
POWER OFF, RESUME	Power off immediately; on power up; resumes at line number following off.	"
PRICE	$799	$749

Except for the unusual commands and screen formatting, programs written for either computer should run on both systems. Although I found the *HX-20* a better unit for my purposes, I would have liked a terminal program as well as the ability to run from the AC powerline at home or in the office. However, battery life seems adequate so far.

In my opinion, Epson's most serious omission is their failure to provide a parallel printer connection instead of a serial connection. Here is the manufacturer of one of the best and most widely used printer lines in the country, a large percentage of which (if not a majority) are parallel connected, and they do not provide for it.

I have no doubt that both computers will find their place in the market. Those who need printed output on the go will opt for the *HX-20,* while those who have a greater need for communications capability will probably purchase the Model 100.

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TRANSTAR

-An Affordable

Reviewed by Kenneth S. Close

Interested in getting started in microcomputers via word processing? Hesitant to send business correspondence to customers and clients that is full of "dots?" Discouraged by the high cost of "letter quality" printers? Well, an economical option is now available for producing letter quality printing at a "dot-matrix" price.

The *Transtar* letter quality printer is a relatively new piece of hardware that bridges the gap between the lower-cost dot-matrix printer and the more expensive letter-quality printers. For little more than the price of a dot-matrix printer, you can have a device that looks just a little bigger, hooks up like a dot-matrix, operates like a dot-matrix, and yet produces fully-formed, "letter-quality" letters.

Dots Versus Daisy Wheels

There's no free lunch, of course, and you sacrifice a few things to get all of this for such a low price. The *Transtar* will not print at the same rate as some of its more costly competitors. The speed rate may not, however, make much difference, especially if the alternative is doing without "letter-quality" printing.

Additionally, you give up some printing flexibility. For example, on a dot-matrix printer, character spacing can be changed instantly, "on the fly," using control codes buried in the middle of the text. With a letter-quality printer, you must stop and change the print wheel in order to get different character fonts or spacing or both. You can do this, but only with a loss in output.

From Transtar, Bellevue, WA 98009. Suggested retail price: $895 (parallel). The Transtar with serial interface and 2K buffer retails for $950.

How does the *Transtar* really stack up? Is it worth the price? What can it really do? The rest of this article tackles these questions, and suggests an alternative to the typical dot-matrix printer.

The Operator's Manual

The unit tested is the *Transtar 130,* equipped for seventeen-inch wide paper. It comes ruggedly packed, and while a little bulky, is not difficult to unpack. The Operator's Manual is well laid out on quality paper and looks quite professional. It is, however, sparse. This becomes, when all is said and done, the weakest part of this product. The Manual (how typical this comment is of so many microcomputer products) is incomplete, almost dangerously so. Further, it leaves some of the printer's capabilities unexplained and thus lost to the user (more on this later).

During my initial explorations, a slip of paper, labeled "Caution," fell out of the manual. This caught my eye, and I found out that there are several "hold-down" devices that must be removed before starting the printer. The gadgets — a plastic brace and a hold-down strap, insure against damage during shipping, but would cause a burned out motor if you started the printer without removing them. The simple warning sheet is inadequate — there is always the chance of its not being included or of the user overlooking it.

The instructions on installing the print wheel are well written and well illustrated, but the editor overlooked the user's point of view here. To install the print wheel, you must first remove the ribbon cartridge. The instructions for doing this come after those of installing the print wheel.

All other instructions for hooking the printer to a microcomputer are complete and easily understood. It only takes ten minutes to get ready for the first printing. The standard *Transtar* comes equipped to handle single sheets of paper, but an optional attachment adds a tractor assembly to allow the use of continuous form paper. Handling single sheets is a breeze because of a unique "AutoLoad" feature built into the printer.

Because of the slanted Paper Feed Tray on the back of the unit, the sheet sits squarely against the platen, ready to feed. To feed the sheet, pull the AutoLoad lever forward; the paper then feeds to one of four positions, depending on how you set a pair of switches under the main cover. You can feed the paper to the first line on the paper, or to 1 inch, 1.5 inch, or 2 inches from the top of the form. The paper feeds squarely into the machine, and the loading process only takes a few seconds.

Connecting the printer to the computer involves the standard procedure. You need a parallel interface card and you plug the long flat cable into a standard receptacle on the back of the printer. After that, you start up the word processing package and type away. As mentioned above, you don't have as many printing options available with a daisy-wheel printer because the spacing between the letters is set by the installed print wheel.

Nonetheless, there are still 26 different control codes that cause the printer to perform a variety of useful tasks. These commands are typically "ESC" codes. That is, the computer sends the "ESC" character followed by a letter or a number to cause the printer to carry out the particular operation.

For example, you can use a variety of tabbing and margin setting commands. Although most word processing programs handle this from within the program, you need these codes when you write your own custom programs. More useful are the common Form Feed and Line Feed codes, as well as the backspace command. (Many

Letter Quality Printer

dot-matrix printers lack backspacing capability, but not so with the *Transtar.*) You underline by sending a backspace character followed by an underline character to the printer.

Another handy set of commands are the half line feed forward and backward. If you place these commands correctly, it is easy to print the formula for water as H_20, for example. Finally, you can adjust the vertical spacing of lines, although the default setting of 66 lines per page (six lines per inch), is fine for most applications.

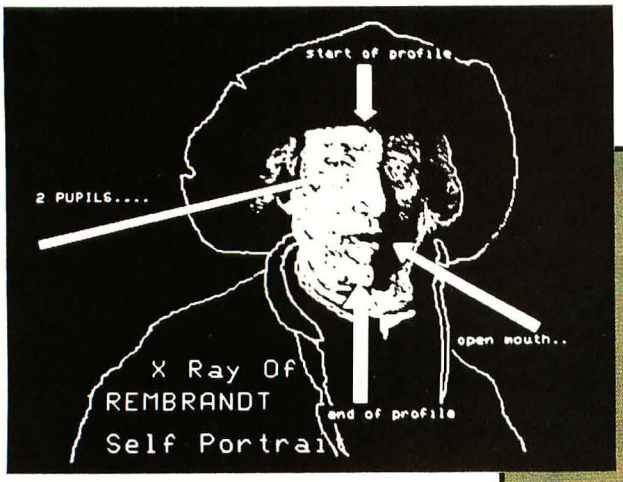
My last comment about the manual is, unfortunately, a common one. The manual has been written by technical types who have no concept of the "new user." There are few examples of how to format the codes to be sent to the printer. The code requirements are all stated in hexadecimal notation — something the average newcomer will know nothing about. Reference is made to a chart to help the user "convert" the required decimal number to hexadecimal in order to use the code (example, if you want the carriage to tab 30 spaces to the right, 30 has to be converted to hexadecimal); however, the chart is incorrect! At this point, turn to a friend, your dealer or a textbook on computer numbering systems for help.

There's another complete chart of ASCII characters (these are standard codes of letters, numbers, and symbols), and their hex and binary code representations. So what! The newcomer will go bonkers trying to decide how this chart helps to format a special form letter on the printer. Last, the printer has some capability that even an experienced user may not be able to figure out. The manual indicates that there is a "graphics mode" that can be energized with a simple "ESC 3". This might be a powerful feature, but there is not one word on how to use the graphics mode on the *Transtar.* Oh, well...

Print Quality and Speed

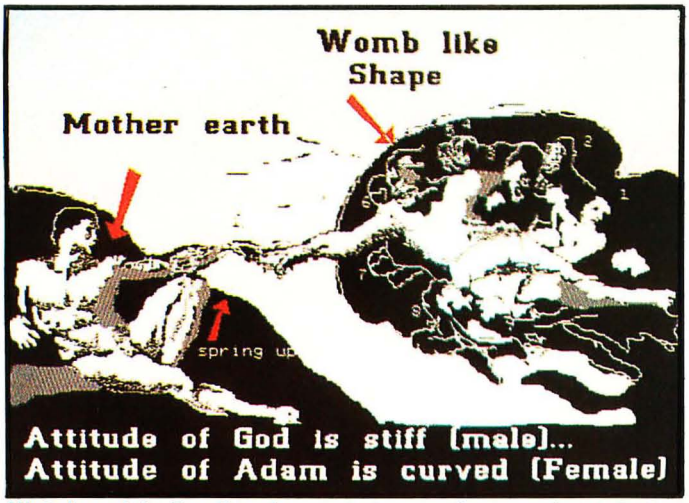
Finally, how does the printer print? In two words: very well. The quality of the print is the same as the best IBM® Selectric or the most expensive Wang WP System. Print speed is reasonable. While I was not able to compare the *Transtar* to the other daisy-wheel printers on the market, I did compare it to the C. Itoh *Prowriter,* one of the best dot-matrix printers around. The *Transtar* produced this review in fourteen minutes compared to five minutes for the dot-matrix. The overall print time actually included thirteen minutes and ten seconds of actual printing and 50 seconds handling and changing sheets. The AutoLoad feature made this time much less than it might have been. The average printing speed is about 13.5 characters/second for the *Transtar,* and about 36.5 for the dot-matrix. Surprisingly, with the dot-matrix printer set for "Bold" (to improve the appearance of the print), the "effective" printing speed is only three times that of the *Transtar.* Comparing the advertised rates of 16 and 120 characters/second, you might conclude that the dot-matrix is really much faster. However, the published rate does not include time for carriage movement and page advance, which drastically reduced total speed.

Overall, the *Transtar* is a very good buy. The printer is well built, and works well with several popular word processing packages on the market today. The instructions are sparse, but there's not that much you really need to know to be up and running. If you're looking for low-cost, high-quality printing, ask your dealer for a demonstration of the *Transtar.*



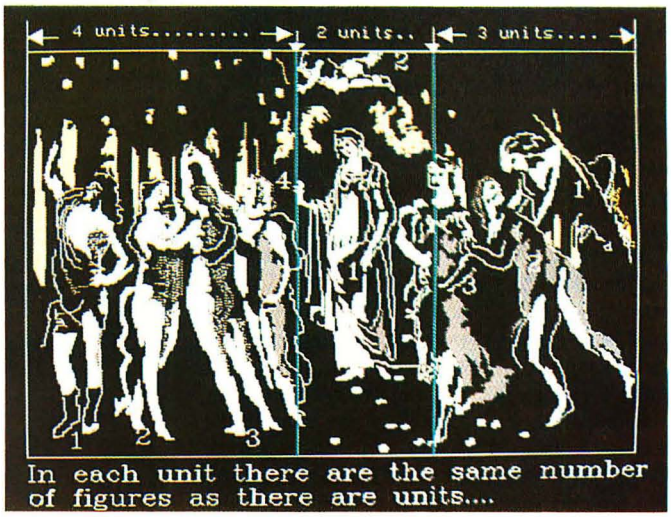
Through X-ray analysis of Rembrandt's Self Portrait, scholars have found many successive layers of preliminary sketches and overlaid corrections. Multiple pupils and open mouths show how Rembrandt experimented with various positions and expressions, until he found the right combination. This quasi-animated approach gives the painting a feeling of life.

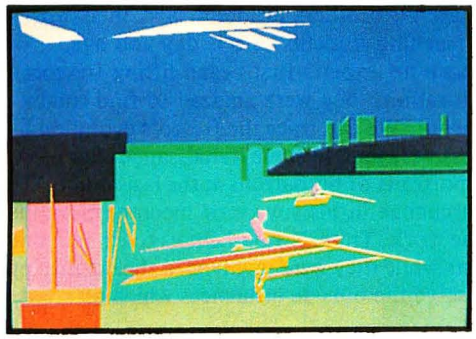
A WINDOW ON THE PAST:

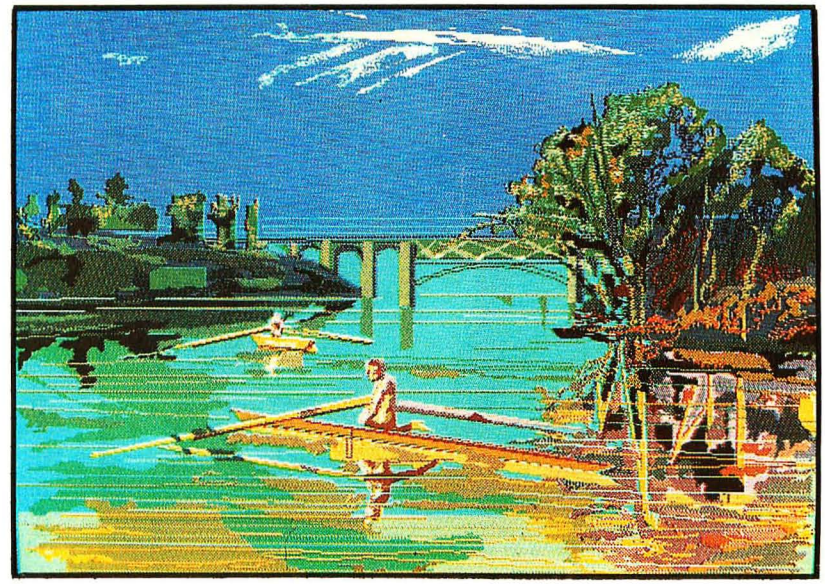


Michelangelo's Creation demonstrates another prominent design principle: binary division (in this case, the difference between Heaven and Earth). He highlights the duality further by giving God and Adam opposite posture characteristics. The energy bolt between the fingertips reminds us that God and His creations are one and the same, which evokes the mystery of the Holy Spirit and completes the Trinity. Not surprisingly, he depicts nine angels.

Botticelli uses the mysticism of the number three, representing the Trinity, by dividing the painting into three unequal parts. However, each segment occupies a space proportional to the number of figures it contains, and the number of figures (four plus two plus three) adds up to nine, a Trinity of Trinities.







The color wheel is useful for organizing the location and size of color blocks. In the painting at the bottom, the yellow sky is not natural, but the color sequence is logical, according to the color wheel. As you scan downward, the colors green and orange are next in order, followed by light blue, and finally a band of dark blue at the bottom. At the left is an abstraction of the shapes in a Thomas Eakins painting, which helps to clarify the spheres of influence of the various colors. Above, the final version of the painting has tight organization because of the attention given to colors.

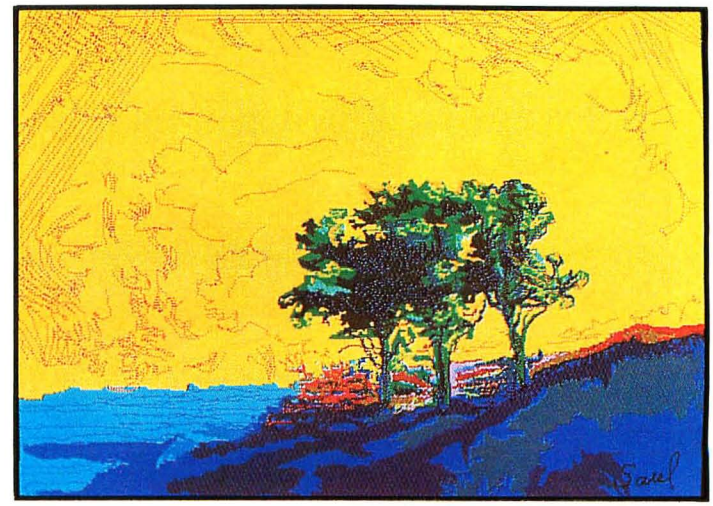
A Computer Analysis of Classic Paintings

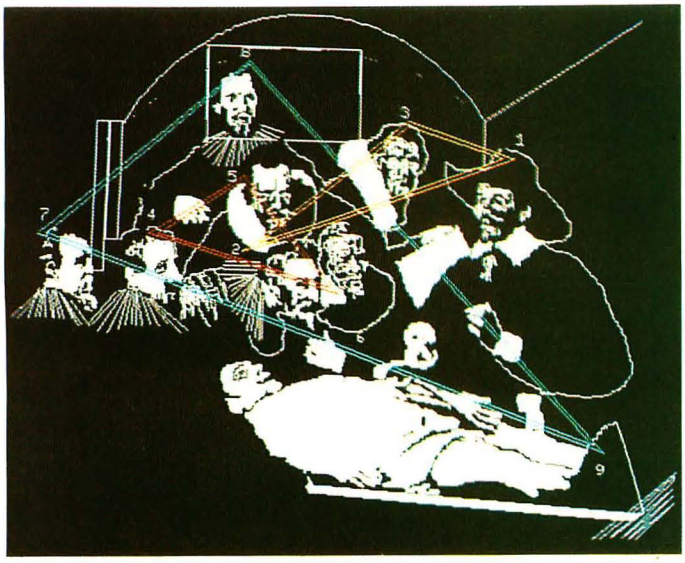
By Saul Bernstein and Ame Choate Flynn

Lauretta Jones

y using technology, we can gain a deeper understanding of the creative processes used by the great artists of the past. X-rays of paintings often reveal several layers of preliminary sketches showing how the original concept evolved into the finished painting we know today. Ideas and the cast of characters often changed in midstream, as the artist worked and refined his concept. He may have approached his work from an entirely different angle when beginning it, and the final painting may bear little resemblance to the first drawing.

The artists who have achieved lasting fame have been teachers in the highest sense. They teach us how to see, by isolating and idealizing human experience, just as great composers have taught





The Anatomy Lesson is a clear example of Rembrandt's use of nines and threes as structural elements. The computer (a Hewlett-Packard 2700) can show the triple triangles clearly with different colors for each. The HP also can present a closeup view of one triangle (top photo) or a combination of a detail and explanatory text (middle photo). Notice how the triangular facial shape of the goateed man (bottom right of the detail) becomes much more obvious in the closeup.

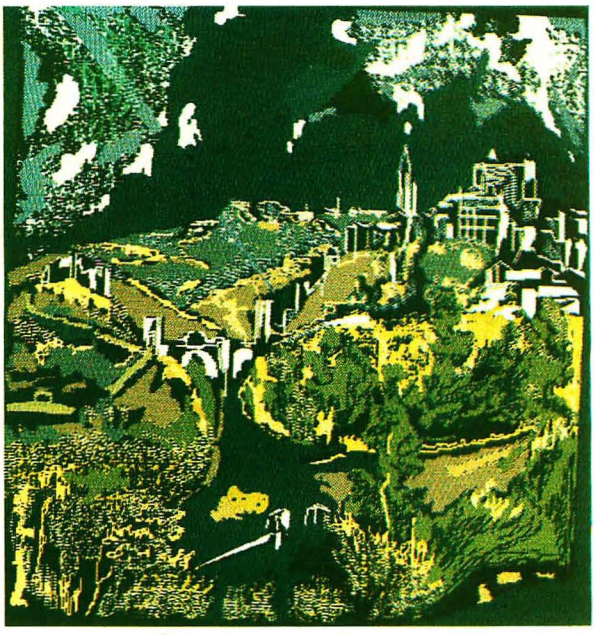
A Window On The Past, ***continued***

us how to hear. Profound statements in all the arts have communicated on many levels. Beethoven, Rembrandt and Shakespeare are all brothers in intent, and their works still are valuable for teaching students of this day and age.

When Vatican art experts first began lifting frescoes from the walls for restoration, they were amazed to find totally different drawings beneath. We can trace the fresco's evolution by looking at these successive layers. In some Renaissance altar pieces, the artist included portraits of his patrons at the last minute. This usually reflected a change in his source of income, more than in the concept of the work. Thus, X-rays help us to explain the thinking of many artists while they were involved in the creative process, as well as to observe the outside influences which affected the work in progress.

When you realize that many of these artists (i.e. Michelangelo and Leonardo da Vinci) were engineers and architects as well, you are not surprised to see deliberate use of mathematical principles to control the two-dimensional surface of a painting. Geometrical relationships guide the viewer's eye across the painting, so it lingers at the most significant point. All this results from the traditional processes of developing a painting, which are still used today. First, the artist made a sketch, then he analyzed and corrected the geometrical relationships to produce the working drawing. When the structure was right, he could add the colors.

Another important influence on the structure of paintings was



Michelangelo used another geometrical shape, the circle, to organize elements in The Holy Family. In this case, the outer circular boundary leads to the symbolic imagery of the center cross. The Holy Family is enclosed in an inner circle.

numerical relationships. Numbers, and their interrelationships, had theological, if not supernatural, significance to the early artists, and added a rich layer of symbolic meanings to the paintings.

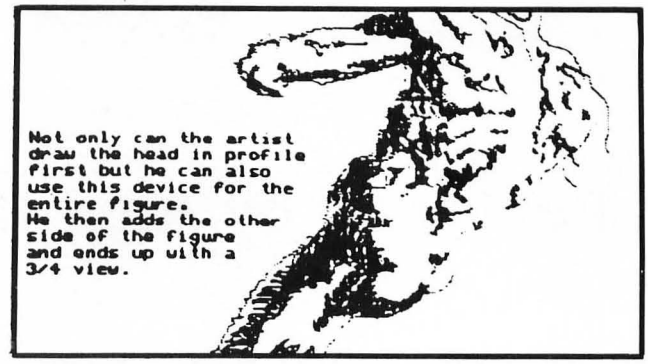
Microcomputer Analysis

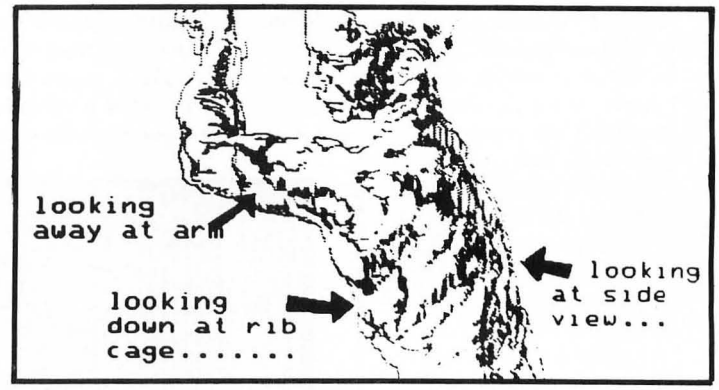
The computer is proving to be an invaluable tool in deciphering these ways of working. After entering information in the form of drawings into the computer, you can manipulate this information in various ways. Thus, you create an "artistic database," and can look for relationships not only in a single piece of art, but also between artists and styles, and across centuries. With the computer, you can highlight certain areas, enlarge or reduce them, or delete details, so you can understand the information in new ways. Using computer overlays, you can trace geometric outlines on top of the painting, to see the working structure and the final product simultaneously, without altering the original image.

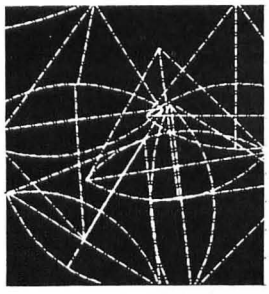
We start our investigation with Rembrandt's "Anatomy Lesson" and find that, even at this late date, he uses the Medieval symbology of the number nine. Since nine is a compound of three, a Trinity of Trinities, it was an extremely mystical and holy number in those days. Its use was not subconscious; it was quite deliberate. Triangles and compounds of triangles form structural elements with great strength and rigidity, so they are powerful organizing tools for a painting. For the same reason, Buckminster Fuller used triangles as the structural element for his geodesic dome concept. Music in the Middle Ages used triple meter exclusively until the *Ars Nova* at the beginning of the Fifteenth Century. Then, the theorists started calling triple meter "*tempus perfectum*" and duple meter "*tempus imperfectum.*" The power of the number three was strong enough that several centuries passed before duple meter was completely acceptable for sacred music.

This series of screen images and captions shows how I have used the computer to analyze art of the past using these concepts.

The computer can rotate the image to provide other perspectives and present closeup views to increase understanding. A teacher can insert explanatory text or annotative sketches to enhance a lesson.







El Greco's View of Toledo is an extremely complex design. For three dimensional perspective, the triangle expands to a cone or pyramid. These interlocking cones organize the elements effectively. To make this more apparent, you can draw the outlines over the image on the screen, and then view the structural framework separately, or switch between the two, or eliminate the triangles entirely to view the original image.

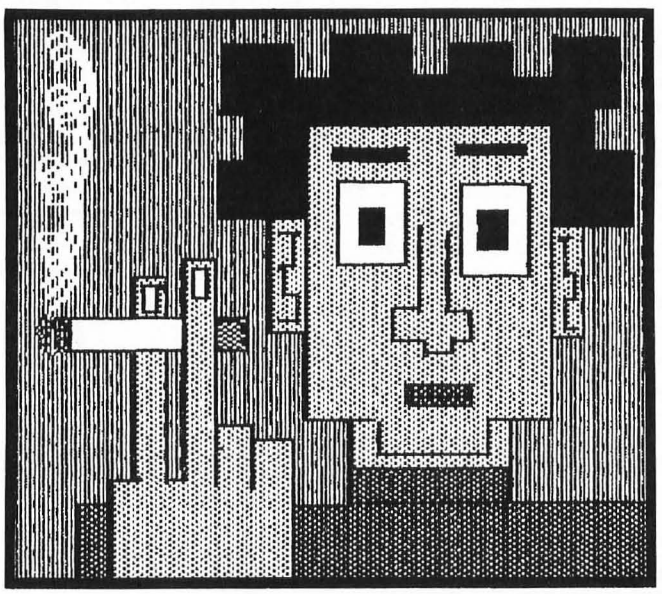
Koala Pad™

Reviewed by Ame Choate Flynn

It's a cute name, *KoalaPad*...makes one think of funny, furry little "bears" flying around on Qantas Airlines. Seems to have nothing to do with computers or computer graphics, but the technology behind the *KoalaPad* bodes most interestingly for computer input devices and...well, isn't "mouse" a cute name also?

When I decided to get into computer graphics, I looked for a device that would make it easy to translate a free-hand stroke into a line on the computer. The only "humanistic" means of input at the time was the Apple Graphics Tablet, so I wound up specializing in Apple computer graphics. I am not terribly fond of drawing with a joystick or paddles. It can be done, but it isn't easy. I much prefer a method that emulates what I learned in art school.

The good thing about paddles and joysticks, however, was the amount of software available for them. Graphics and games all wound up being plugged into the little paddle port inside the computer. Occasionally, a good graphics program would be modified to take tablet input at a more expensive price, but I'd be switching back and forth between tablet and paddle, joystick and tablet, depending on what I wanted to do to a graphic.



"Man with Cigarette" A graphic by Carl Van Brunt with the KoalaPad .

More problems with input devices surfaced when the FCC discovered that the tablet functioned as a small transmitting station and took the Apple graphics tablet off the market. There are rumors that it will be re-released, but no one knows exactly when and where. How much is another issue. The tablet costs between $600 to $800 dollars, which doesn't fit into the budget of an artist who's just getting started in computer graphics.

From Koala Technologies, 4962 El Camino Real, Ste. 125, Los Altos, CA 94022. System requirements: the Apple® II family with 48K and Applesoft, one disk drive, DOS 3.3 and color TV or video monitor. Also available for the IBM® PC, Atari® 400/800 and Commodore® 64. Suggested retail price: $125.

Eureka!

The *KoalaPad* may provide a sensible solution to this dilemma. The *KoalaPad* is a state of the art position sensing device that connects to the game port in the Apple computer. The tablet is rather small, 6 × 8 × 1 inches, and you can hold it easily in your lap. Two prominent black buttons, located at the top of the pad, activate the paddle 0 or paddle 1 buttons.

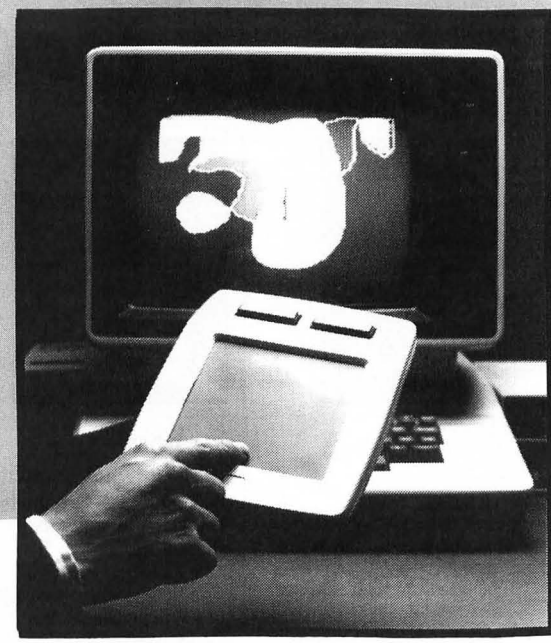
Koala is not revealing the exact nature of the pad's innards, but it seems likely that when you press a spot on the tablet surface you change the capacitance of that location. This sends a signal in which coordinates are fed into the game port of the computer (Apple, at least) and are translated into locations on the High Resolution page. Depending on the software, the signals can be lines, circles, boxes or a command to shoot down a Space Egg or alien invader.

The Micro Illustrator

The *KoalaPad* comes out of its box with a hard rubber stylus (pencil shaped) and a box containing the Micro Illustrator, a graphics package by Steve Dompier of Island Graphics. Manuals on both the tablet and the graphics package are included. After you plug it into the computer's game port, it's ready to use.

When booted, the Micro Illustrator

Touch Tablet



The user draws on the Koala Pad with finger or stylus, creating an image that appears on the computer's visual display.

runs off a graphically illustrated menu as the first page. Each command is given not only in English, but is also drawn as an icon. This should make the tablet easy for young children to use, (under some supervision, of course). When you move your finger, stylus or drawing instrument to the tablet's surface, a cursor — a small flashing crosshair of light — appears, giving you your location on the screen. As you move your finger around, the cursor follows it on the complementary portion of the screen. You literally point to an area that corresponds to a box on the screen, press a button, and the text box above the command is highlighted, telling you that the desired function is active.

Creating With The *KoalaPad*

If you take the default commands, you will be DRAWING (freehand) in NORMAL size, with the regular cursor (which leaves a narrow line) and the color GREEN. (Normally, I'd draw with a white line on a black background, but everyone has his quirks.) Move the cursor down off the screen and press the button, and you are ready to begin. Changing these beginning parameters is as easy as pointing to another choice of mode and pressing a button at the top again.

When you begin to draw, if you press button 0 (the left hand button) you are drawing for as long as you hold down the button. If you push button 1 (on the right side of the pad) your line continues as long as you hold your finger or drawing instrument to the surface and don't press another button. A button press without an object on the pad, or a cursor on the screen, results in a trip back to the main menu to choose another function.

Other selections include POINT — one dot at a time; LINE — select the endpoints and it draws the line between them; LINES — all lines are connected to each other (good for triangles), and RAYS — in which a series of lines are drawn, all emanating from a single point.

You can have variety by using a FILL to color in a bounded area. FILL can be fun on a rather tangled line — watch the computer rush to try to fill everything at once. You can stop FILL by hitting the space bar to get "stripey" effects. These can be effective backgrounds for pictures.

FRAME is an unfilled, or open, rectangle. FRAME, and some other commands in the Koala software, use the principle of "rubber band" lines. To draw a frame, you pick where you want your beginning side of the rectangle, and press the button. Then, keeping your finger on the pad, move it around and watch a pseudo-frame being drawn to your specifications. When the frame is the correct size and shape, press the button again, and you have your rectangle. This method of graphic design is called "rubber banding" because the frame stretches as if it were made of rubber. It is much easier to do this than to describe it, but it has been a standard in large computer graphic systems for years.

BOX lets you draw a filled rectangle the same way you draw a frame. The box is solid and colored in whatever the active color happens to be.

CIRCLE and DISK are like FRAME and BOX in that the circle is open and the disk is solid. Rubber-banding is again active, and once you choose your midpoint, you can "see" the size of your possible circle until you give the command to make it that size. The circle gets larger or smaller depending on how close your finger is to the center point.

ERASE lets you use another menu. With ERASE, you can clear up a screen full of garbage, and choose what background you want to draw on next. If you erase the screen to a dark blue, for instance, dark blue will be your next background. You can erase smaller areas of your pictures by drawing over them, or you can make a box over them in the background color.

COLOR lets you choose your line or fill color. For the Apple version, we have both color sets, containing the usual black1, white1, green, purple, orange, blue, white2 and black2. Each of the colors is shaded in terms of *light,* i.e. mixed with white, or *dark,* i.e., mixed with black. If you choose to draw with white or black, they are "fixed," or totally white or black lines. Apple's usual white or black contains other colors, and also makes a thinner line. This gives the impression of smoother lines, and also lets you draw more detailed pictures. A possible problem with "unfixed" or smaller lines is that when you fill an area and the boundary lines are not fixed, the fill may leak through to other parts of the picture. Koala uses a totally white or black line to try to eliminate this problem, but I'd rather have the old non-fixed lines back.

STORAGE gives you your usual disk functions — Save, Catalog and Load, plus an extra added attraction — disk utilities. With one of these, you can format a disk in mid-stream. This has

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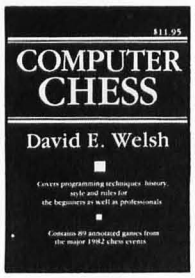

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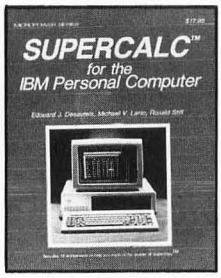

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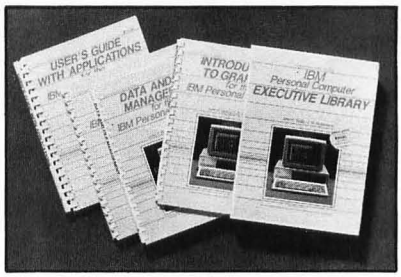

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by John P. Grillo and J. D. Robertson
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Koala Pad, *continued*

already come in handy for me. If I'm working on a picture and have no space to save it, it will be lost when I take time out to format or initialize a new disk. Now, after initialization, I can go back to working on the picture and have a place to save it to (too?). All storage functions can be accessed with one or two drives.

One thing I don't like, however, is the prefix that it puts on a graphic saved with the Micro Illustrator. I already have PIC.(name) pictures created with the Apple Graphics Tablet and other programs; Penguin pictures are entitled (name).PIC. Now, we have another way of naming graphics; the PICTR.(name) picture. Please, folks, we need a bit of standardization on the graphics front.

Stepping down from my soapbox and back to the menu, we find MAGNIFY. This enlarges the picture so you can get at that pixel which insists on existing where you don't want it. When you switch to the drawing page, you will see your drawing in normal size, but as soon as you touch the pad, everything is enlarged seven times. This comes in handy when you want to make absolutely sure that a fill won't leak through an enclosed space. Choosing the NORMAL function brings you back to the real world, and you can toggle between the two using the semi-colon (;) key.

All cursors are not created equal. The flashing cross-hair that you start off with has been modified, and you now have a choice of BRUSHES. These brushes act like different pen-points and include one dot, two dots, lines pointing at different angles, and even a diamond shape. If you make a frame using the two-dot brush, you find it has nicely mitered corners.

The manual is well written and provides several hints on how to use the functions in more interesting and effective ways. One thing I would like to stress is that while drawing with a finger, do not put any other part of your hand or finger on the pad surface. This confuses the reading of signals, and you are likely to get screen output that you did not want to input.

Working with a pre-release version of a product often reveals bugs that haven't been worked out. With the *KoalaPad,* if I drew very fast, I often found lines spiking up to the top left hand corner appearing at random points on my picture. In the worst case, the cursor would hang at the upper left and refuse to move at all. Koala tells me that this is being corrected.

An Important Tool

The *KoalaPad* is an important product for two distinct reasons. Input is so easy that children should be able to use it. Software, with different overlays that fit on the pad surface, is in the works. This feature should make it a fine educational tool. Fifteen software titles are being planned by Koala for release later this year. In addition, *KoalaPad* versions for the Atari, Vic-20®, IBM PC and Commodore 64 should be available when this issue goes to press.

The only problem I found with playing a fast-paced game is that I wore out my nail polish on my index finger. Ah, may all your problems be little ones, too! I am glad to see the *KoalaPad* take up the slack in the graphics input section, not only for the Apple, but for other personal and home computer systems, as well.

Editor's Note: Koala Technologies informed us shortly before press time that, although the software for each system version of the *KoalaPad* is similar, there are some notable differences. For specific information on the *KoalaPad* for the Atari, IBM PC or Commodore 64, contact your local dealer.

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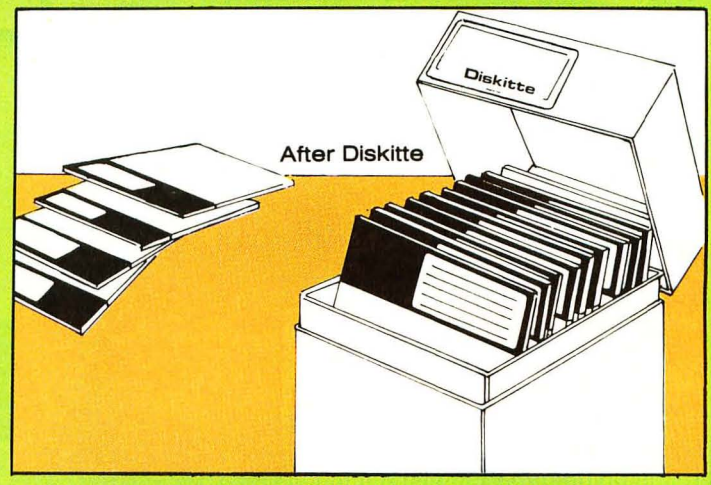

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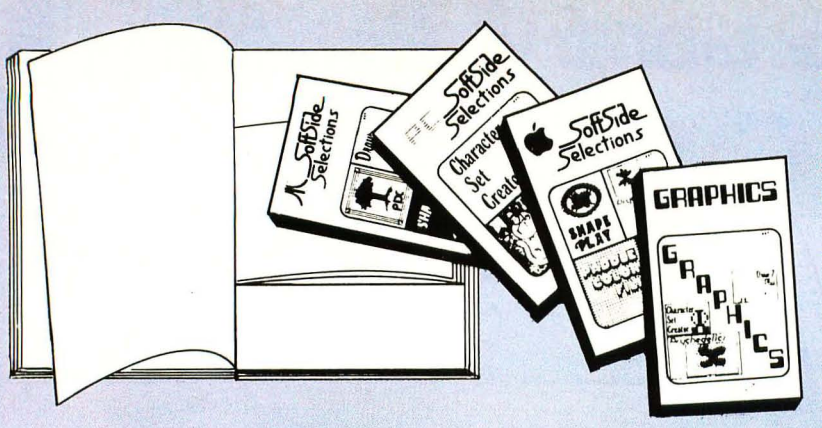
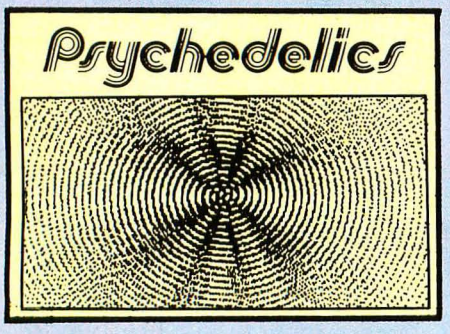
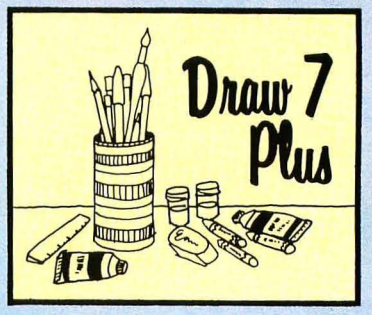


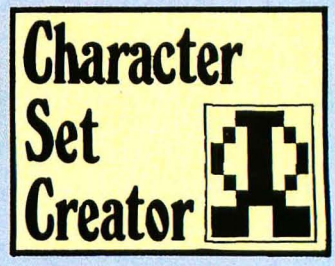
The Front Runner booklet bound in the center of this issue's SoftSide Gallery contains all the instructions, listings, documentation and SWAT Tables you will need. Also available are the ***SoftSide*** Disk and Cassette versions (see the bind-in cards and ads elswhere in this issue for more information).

- **Apple: *Psychedelics*** uses special video techniques to produce bizarre, moving displays.
- **Atari: *Draw 7+*** helps you make video graphics displays in mode 7.
- **IBM PC: *Character Set Generator*** creates exciting character sets of your own design — from Sanscrit to Greek alphabets, to scientific symbols.

GRAPHICS







SOFTSIDE SELECTIONS

FRONT RUNNER

Character Set Creator **for IBM PC**
by Kerry Shetline

Draw 7+ **for the Atari**
by Steven Chanin

Psychedelics **for the Apple**
by Matt Clark

ATARI® VERSION

STOMP
by Alan J. Zett

PIX ..... Disk Version Bonus
by Peter J. Favaro

Sharkey ..... Program
by Dale Thoms

APPLE® VERSION

STOMP
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Paddle Color Fill ..... Disk Version Bonus
by Matt Clark and Doug Green

Shape Play ..... Program
by Steve Koleszar

The Apple Gallery
by Ame Flynn

IBM® PC VERSION

STOMP
by Kerry Shetline (Generator program by Kerry Shetline and Fred Condo)

Worm..... Program
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TRS-80® VERSION

STOMP
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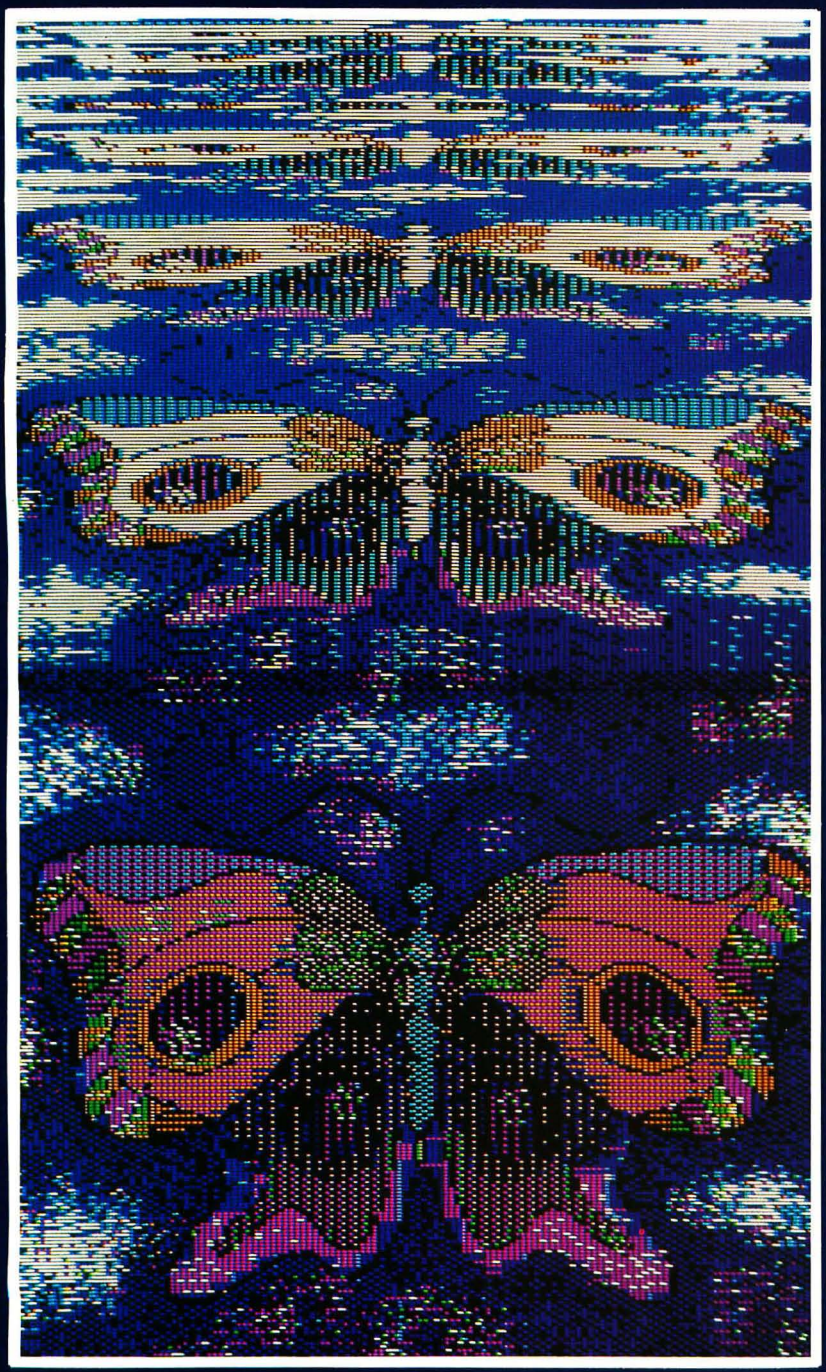
The SoftSide Gallery

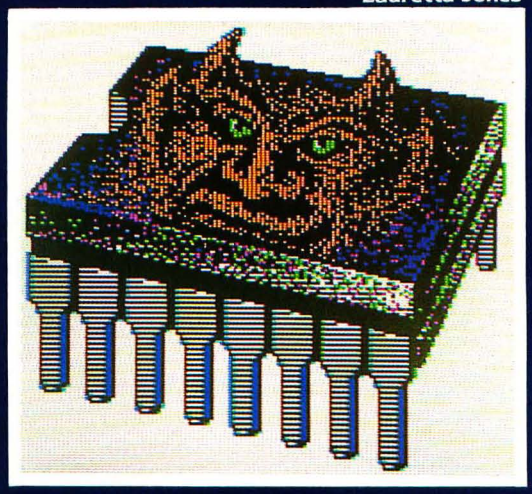


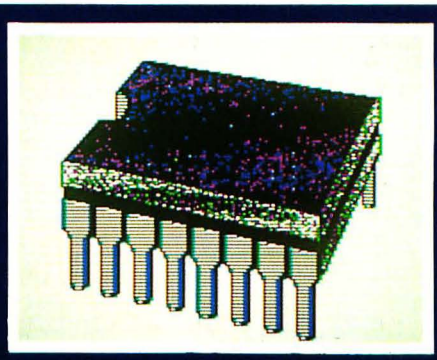
Roberta Schwartz

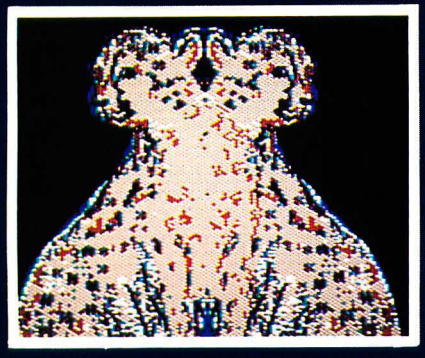
The SoftSide Gallery shows results of the interaction of artist and computer. Artists Roberta Schwartz, Lauretta Jones, Carl Van Brunt, Ame Flynn, Saul Bernstein, Spyder Webb, Tom Porett, Steve Sullivan and Lorene Lavora use their computers to produce work for both commercial and fine art applications.

We have tried to show the range of styles and themes that can be achieved with computer graphics. Since the work is saved in stages, you can see the evolution of a graphic (i.e. before and ↪

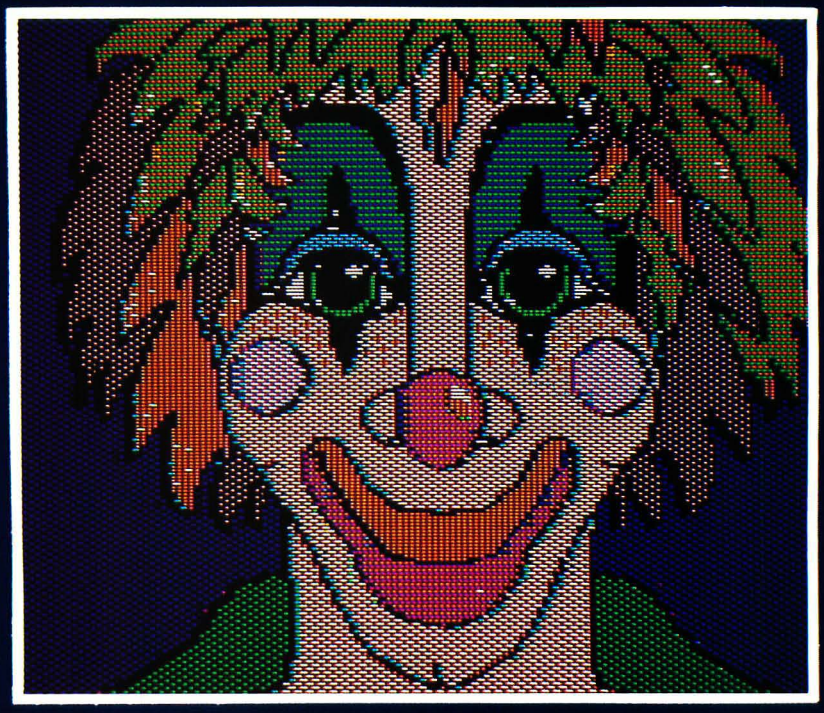
Lauretta Jones







Ame Flynn

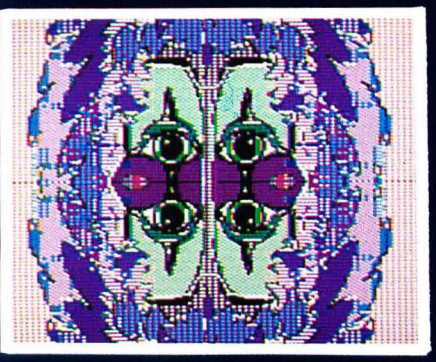


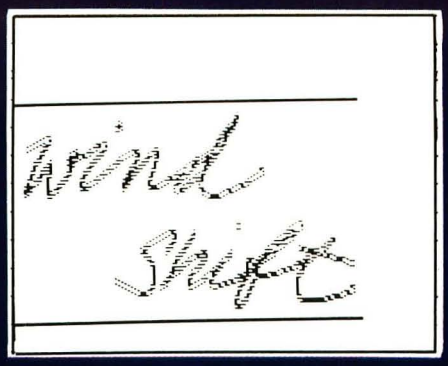
Roberta Schwartz

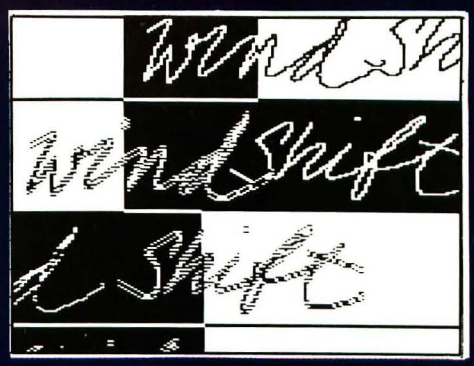
after a color fill), distortion of a graphic as compared with its original, or the use of one image for different purposes.

The computers used to create these works are: Apple II Plus, Atari and Hewlett-Packard. Input methods or peripherals include the VersaWriter, Photo-Caster Camera System, Koala Pad, Apple Graphics Tablet, paddles and joysticks. Some of the software used with these systems are: *Designers Toolkit*, *Complete Graphics System*, *Special Effects*, *Micro-Painter*, *Fontrix*, *Edu-Paint* and the *Micro-Illustrator*.

Roberta Schwartz



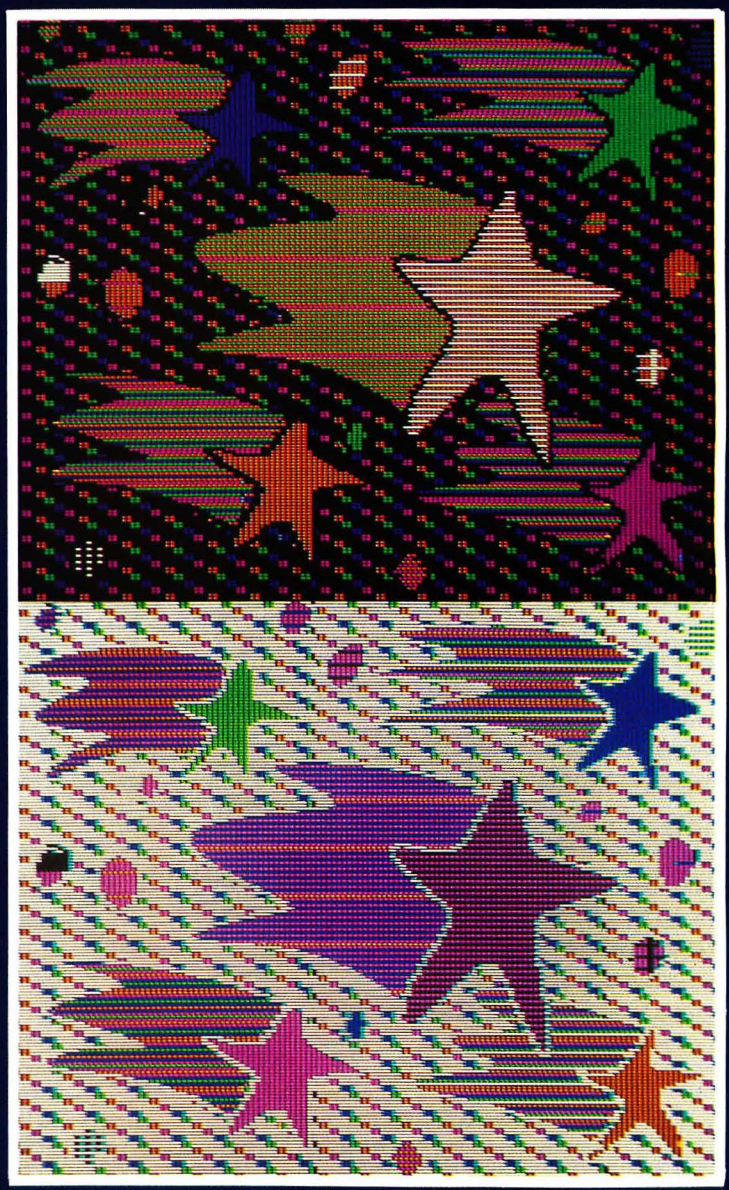




Lorene Lavora

Output methods include slides from disks, slides from direct photography, painted acetate from a black and white printout, and an interesting "mistake" from an IDS color printer.

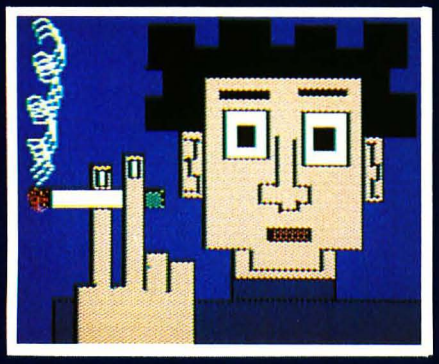
No two artists work alike, but we feel you will enjoy seeing the diversity of works created by a few artists working with computers. This is a small sampling of work, we will bring you more artists and computers in the future.

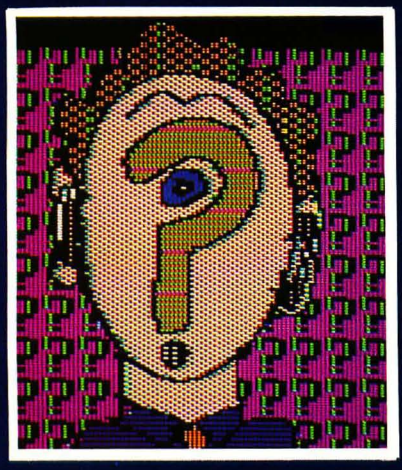


Carl Van Brunt

SoftSide wishes to thank *Visual Horizons* of Rochester NY for their excellent service converting many of these 4/color graphics from diskette to 35mm slide.

Carl Van Brunt

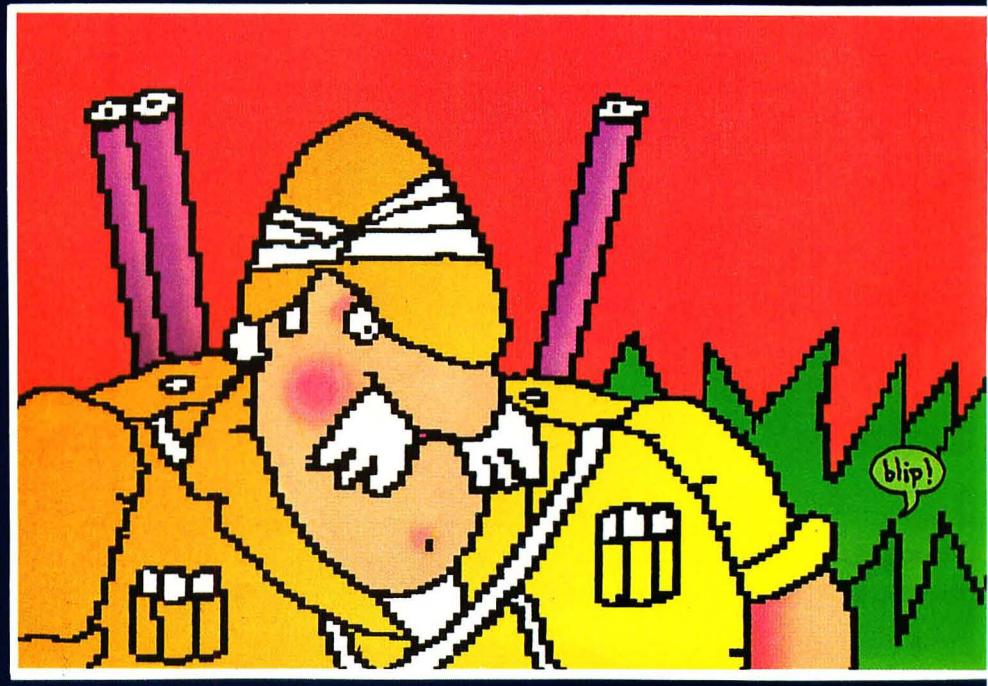


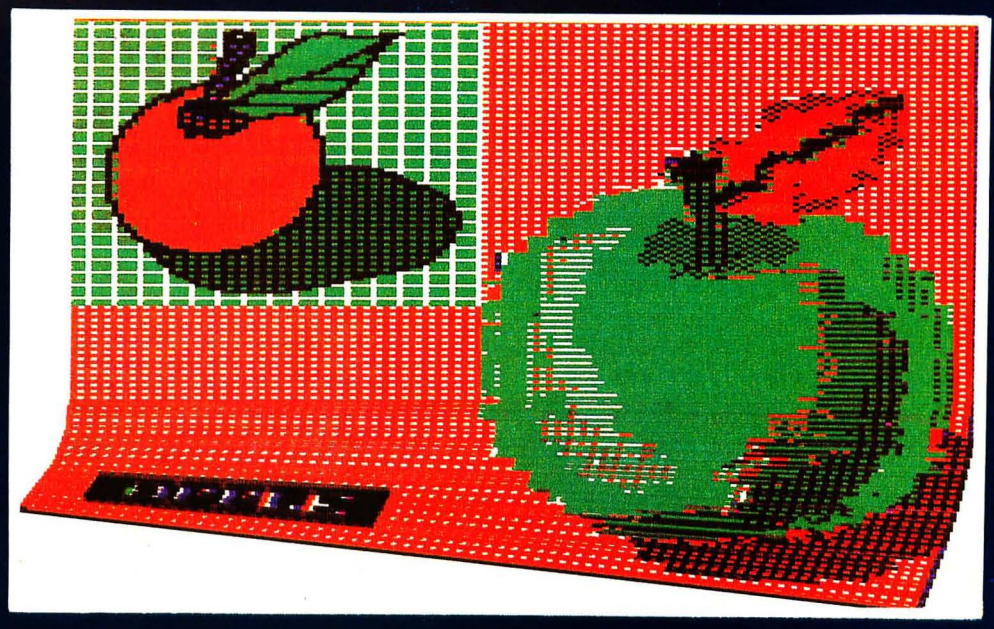


Lauretta Jones

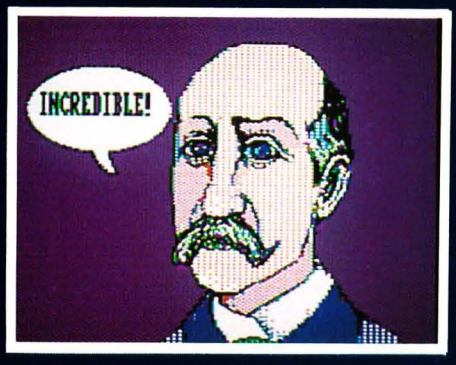
Spyder Webb

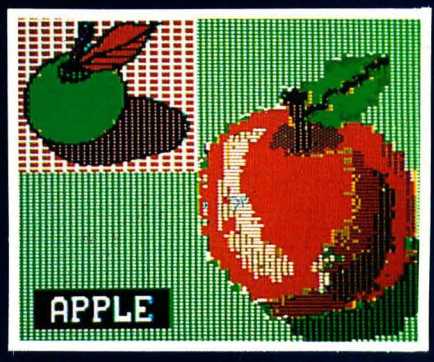
Steve Sullivan





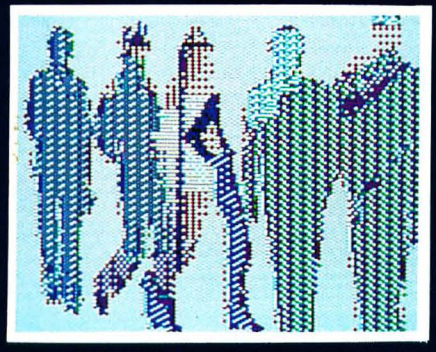
Roberta Schwartz

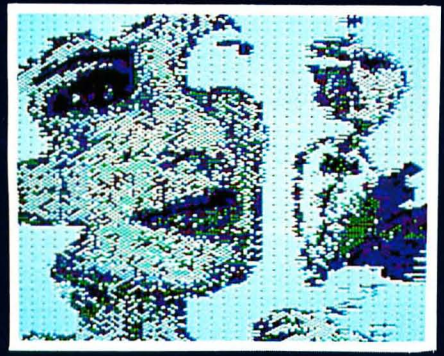




Carl Van Brunt

Tom Porett

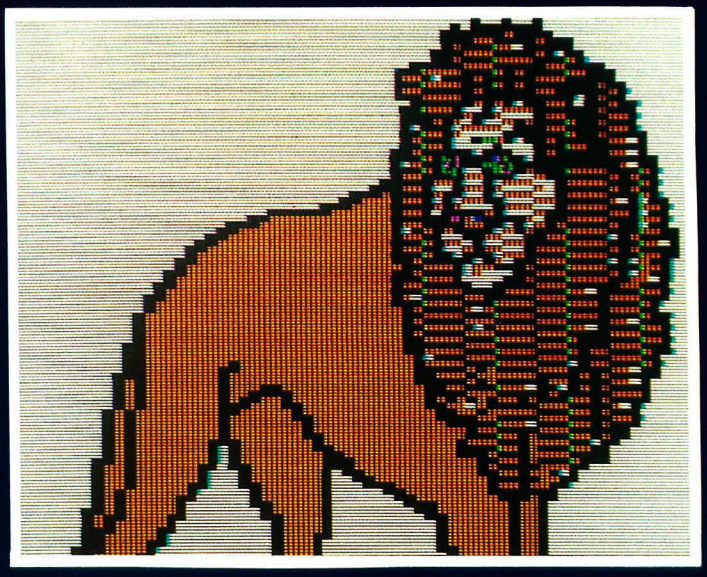




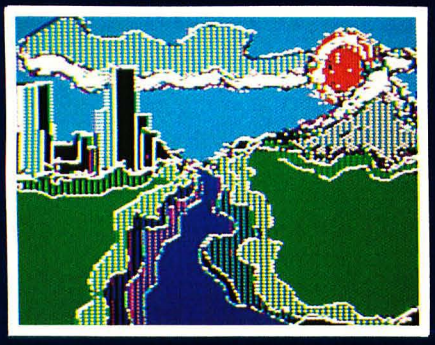
Ame Flynn

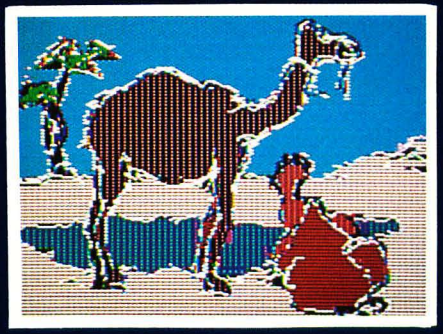
Saul Bernstein

Ame Flynn



Roberta Schwartz



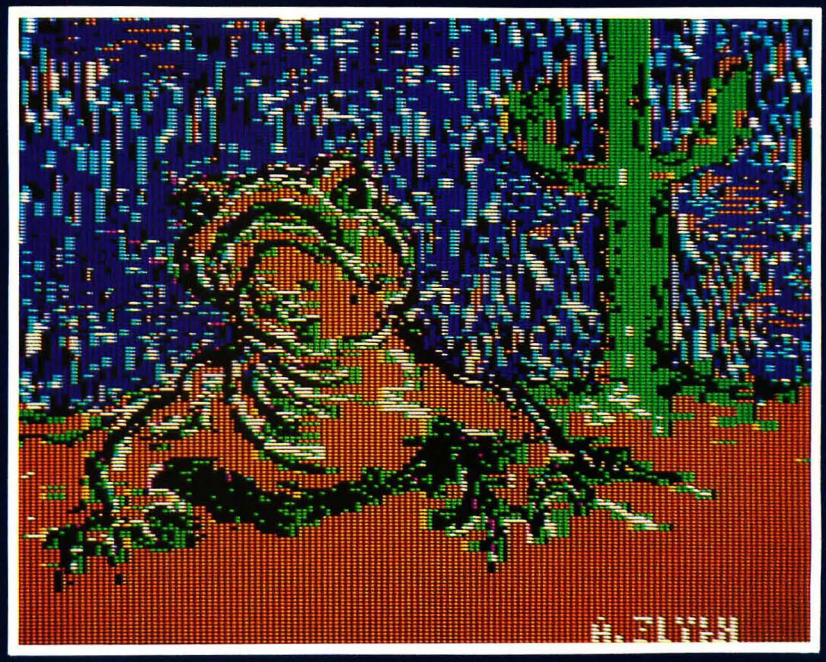


Ame Flynn

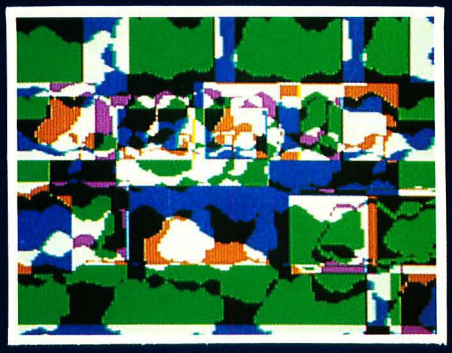
Lauretta Jones

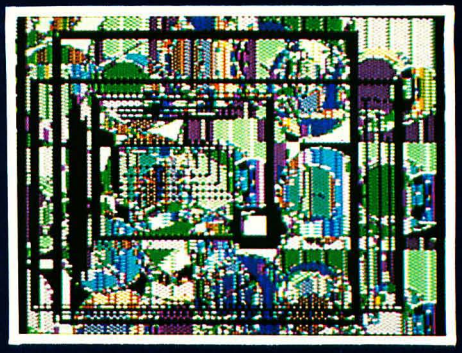
Carl Van Brunt

Ame Flynn



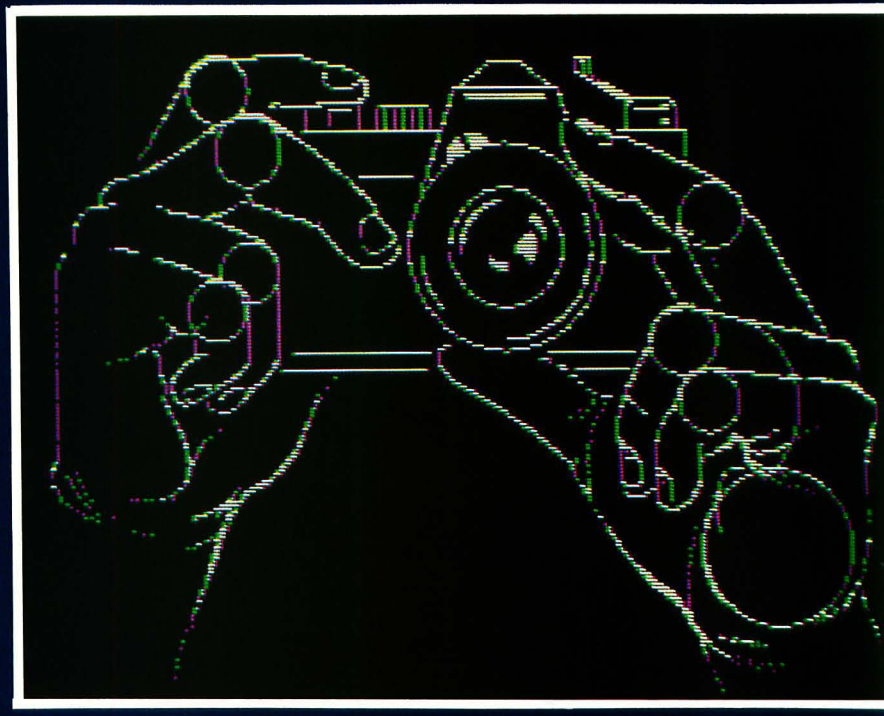
Steve Sullivan



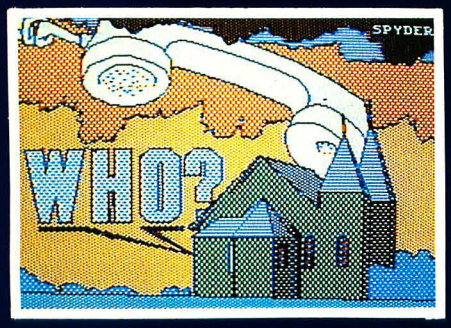


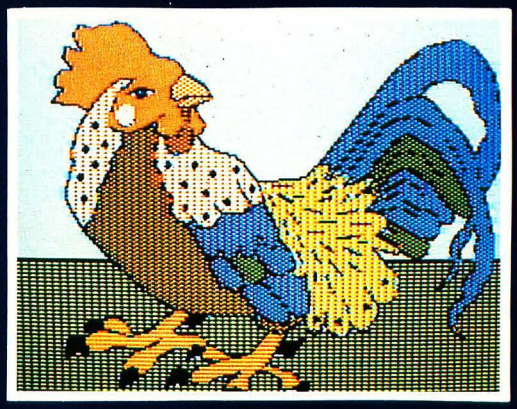
Lorene Lavora

Lauretta Jones

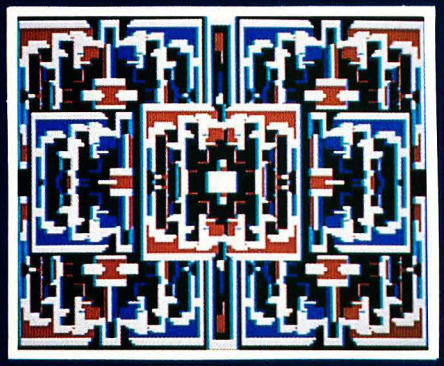


Spyder Webb





Lauretta Jones



Roberta Schwartz

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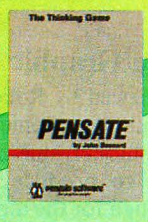
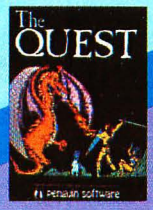
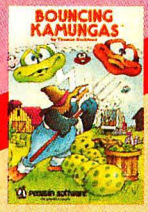
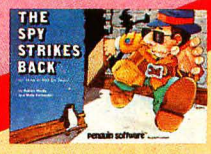


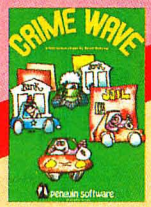
Exciting Adventures

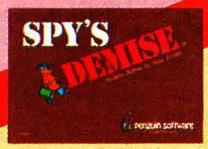


Arcade Fun









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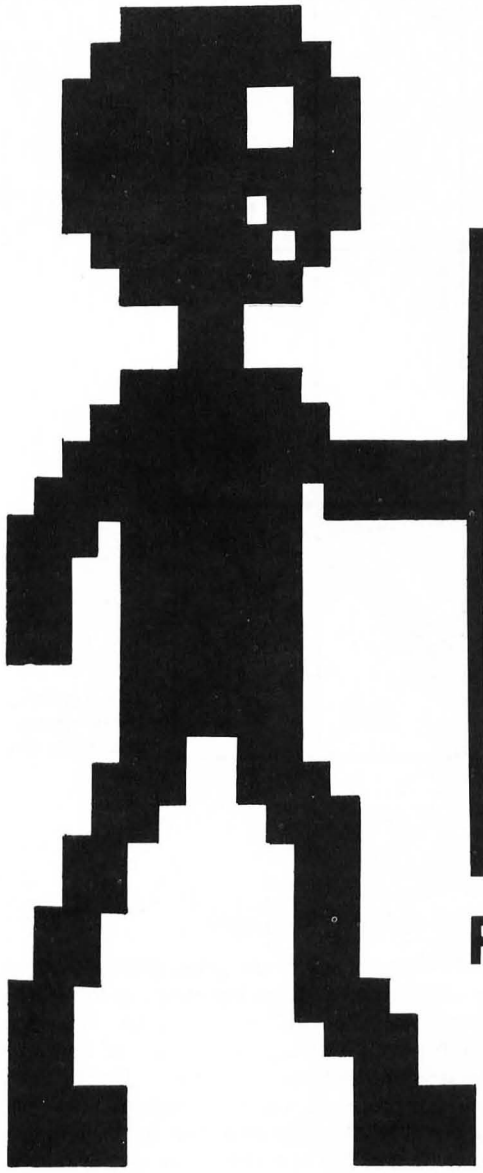


Graphics Utility and Joypaint for the IBM PC

Reviewed by Michael Callery

The two packages reviewed here are quite different in their purposes. *Graphics Utility* is a shape utility which facilitates the use of IBM BASIC's PUT and GET commands. *Joypaint* is a paint system to allow the creation of full page graphics images. Both, however, simplify tedious tasks.

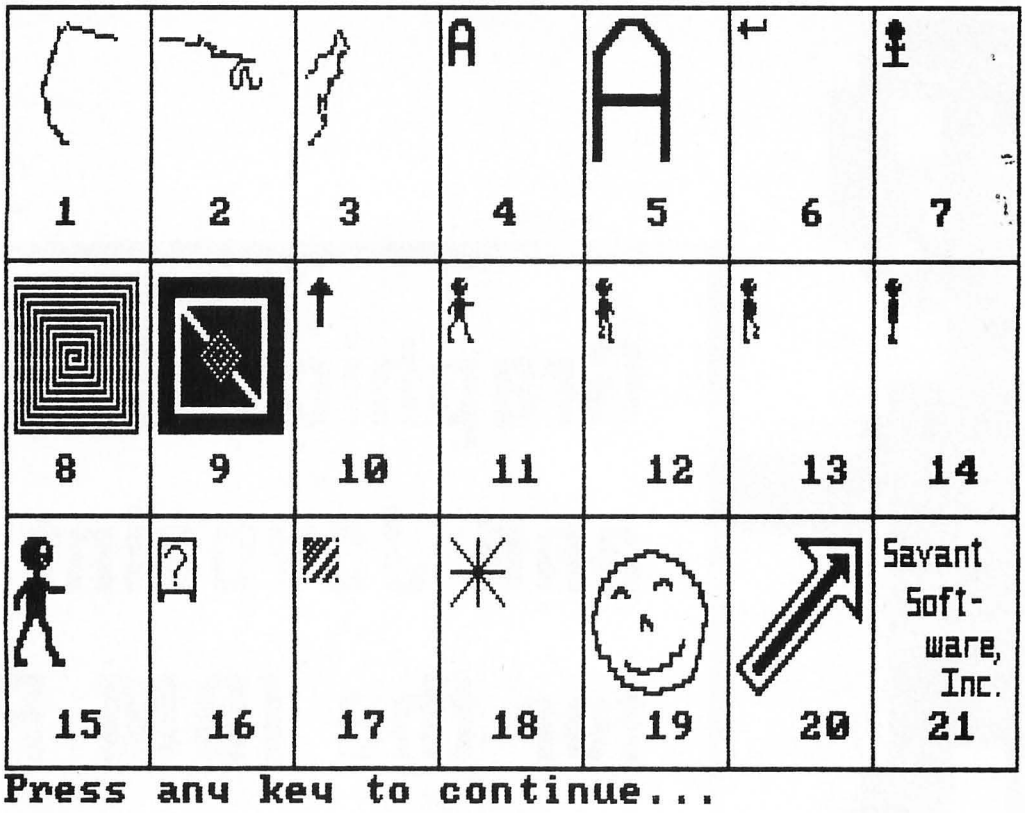
Graphics Utility from Savant Software, PO Box 440278, Houston, TX 77244. System requirements: IBM PC with 64K memory, disk drive and color graphics adaptor. Retail price: $55.

Joypaint 1.1 from Pcomputer Pictures, 53 Sherman Ave., Rockville Centre, NY 11570. System requirements: IBM PC with 64K, disk drive, DOS 1.1, color graphics adaptor, game adaptor and two button joystick. Retail price: $49.95.

Graphics Utility

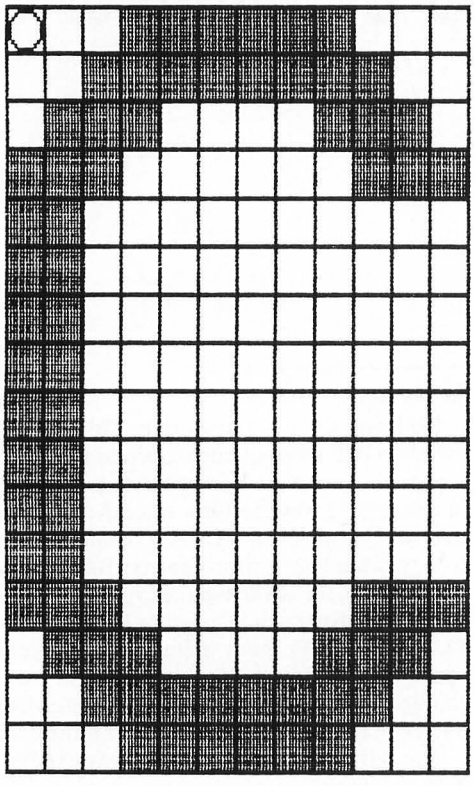
PUT and GET are among the IBM PC's most useful commands. GET allows you to decode a portion of the graphics screen into an array. You can then put this array on the screen in a variety of ways to allow smooth animation. PUT is similar in effect to Applesoft's DRAW command (although technically very different). Unfortunately, BASIC cannot PUT figures fast enough for arcade-game-type animation: The hordes of advancing aliens would creep rather than attack. Nonetheless, PUT is useful for many animation applications, especially for educational software. You can also use PUT to display large characters in decorative fonts. *Graphics Utility* includes one relatively pedestrian character set on the distribution disk.

The rub lies in designing the array. The usual method is to draw the figure on graph paper, then translate it into BASIC



The Graphics Utility demo character set.

When designing a figure with Graphics Utility, the display shows a large grid in which you move a flashing circle cursor.



Graphics Utility and Joypaint, ***continued***

commands. If it's wrong, back to the graph paper! *Graphics Utility* provides an interactive editor, allowing you to see what the figure will look like when PUT to the screen. The editor creates the array for you, and any changes in the figure are reflected immediately in the array. You may still need graph paper, but the design process is much less tedious.

The editor, CHARDRAW, can create up to 50 figures or blocks, each up to 39 dots tall and 39 dots wide. The editor is simple to use and makes good use of the PC keyboard. When you are designing a figure, the display shows a large grid in which you move a flashing circle cursor. As you lay down or remove plots, you see the figure in true-screen size at the right of the grid. This is necessary since the aspect ratio of the pixel can result in a few surprises. However, you only see the figure you are designing; no others. For animation especially, it is useful to be able to view several frames (or figures) at once. In order to see the other characters, you must stop editing, return to the editor menu, and request to see the whole set. This is a minor quibble with an excellent editor.

Once you have designed a figure or group of figures, they are saved as on the disk to be read into your program. Savant includes four subroutines on the distribution disk to aid your programming efforts. You, however, have to do the bulk of the work to incorporate the characters or figures successfully into a program. Each subroutine contains extensive REM statements to aid your effort, but they are no substitute for a thorough knowledge of PC BASIC.

Graphics Utility also provides several other programs to facilitate working with PUT/GET blocks. CHARANIM

Map produced by six blocks from Graphics Utility demo set in CHARGRUP program.

allows you to animate your figures, CHARGRUP allows you to group your figures to make a full page picture, and CHARDISP allows you to view your grouped figures. These are more difficult to use than the editor but provide necessary capabilities. It would be nice to have these capabilities within the editor, but apparently these programs are too large.

The program comes on an unprotected disk and you are urged to work from a backup. I commend Savant for this. Further, since their programs are written in BASIC and saved in an unprotected form, you can study them to gain useful insights into programming. Programs are well-protected against user errors. You have a chance to abort all potentially destructive acts. The system does not work under DOS 2.0, although you can transfer and use the files created with *Graphics Utility* under the new DOS and BASIC.

Graphics Utility comes with a 36 page manual which clearly describes how to operate the programs in this utility. A tutorial on PUT and GET would have been a nice addendum. Savant suggests that you can find further information on PUT and GET in the IBM BASIC manual — difficult going at best.

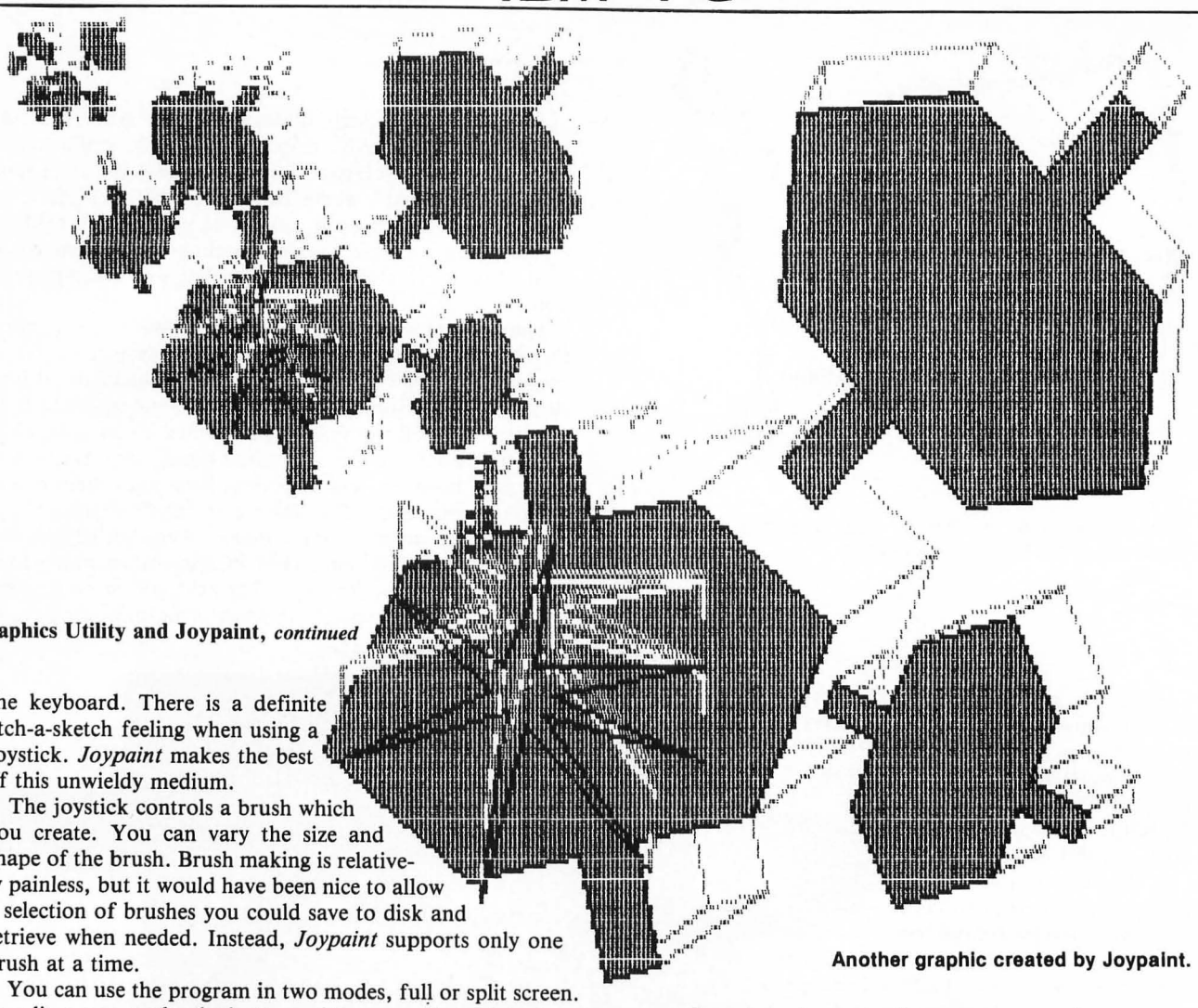
For programmers, then, *Graphics Utility* eases the creation of PUT and GET graphics. However, nonprogrammers won't reap the full benefits of this utility.

Joypaint

Joypaint is an entirely different animal. After the initial fascination with BASIC graphic commands, you'll long to create a detailed full-page image without tons of program overhead, and that's where *Joypaint* comes in. With it, you can store this image on a disk to be retrieved (BLOADED) by your program when needed. Nonprogrammers can use this kind of utility to create images for slide-show type presentations.

The problem with a program like this is getting the image into the computer. The keyboard, fine as it may be for word processing, is not satisfactory for entering graphics data. It is too slow and cumbersome. A bit pad (graphic tablet) or light pen are ideal. Both allow the analog movement of an artist's hand to be translated into the computer's digital data. Bit pads are expensive, however, and light pens have not achieved much market penetration. (The latest entry in this type of input device — the mouse — may make a very big impact here. However, right now, most IBM PCs are rodent free.) Many PCs, however, have joysticks. Joysticks are, at best, clumsy for entering graphic data, but they are a big improvement over

Graphic illustrating the capabilities of Joypaint.



Another graphic created by Joypaint.

Graphics Utility and Joypaint, ***continued***

the keyboard. There is a definite etch-a-sketch feeling when using a joystick. *Joypaint* makes the best of this unwieldy medium.

The joystick controls a brush which you create. You can vary the size and shape of the brush. Brush making is relatively painless, but it would have been nice to allow a selection of brushes you could save to disk and retrieve when needed. Instead, *Joypaint* supports only one brush at a time.

You can use the program in two modes, full or split screen. In split screen mode, the bottom of the screen is used to show the current palette, brush and messages. You can toggle this off to allow creation and display of full screen pictures.

Joypaint allows sixteen colors in the palette. These colors include IBM's pure colors, as well as mixed colors. Mixed colors display as patterns on monochrome or RGB displays. This trick, called artifacting, is used on Apples® and Ataris® to produce more than the standard colors. While not as pleasing as mixing true colors, it does provide the artist with a more extensive range of colors and tones. Used creatively, these mixed colors can be quite effective. *Joypaint* allows you to create a palette and save it to the disk. You can create favorite palettes and maintain them in a library for future use.

You use the function keys to determine painting mode. In addition to normal painting, where any brushstrokes draw over the background, *Joypaint* also supports negative, AND, OR and XOR drawing modes. These allow a great deal of flexibility in painting, as well as some interesting special effects.

The program also allows you to reduce the image to 1/4 or 1/16 screen size and to flip the image vertically, horizontally, or both. These are useful and powerful commands. The most useful special effect, however, is not included in the current release of *Joypaint:* Magnify. Magnify allows you to touch up small areas, a necessity with programs using joysticks. I hope that Pcomputer Pictures will include such a command in their next release.

Joypaint, of course, allows you to save pictures to your disk or to load a standard IBM color image into the program. You can use these images in any program.

When *Joypaint* is booted, the initial menu requests that you select *Joypaint* itself, a Slide-Show Program, or Personalize. The last selection is most interesting and necessary, since different brands of joysticks operate differently. Personalize allows you to calibrate the program to the range of numbers your joystick presents to the computer. It also allows you to determine which button is which. Since the two buttons have different functions within the program, it is useful to know which the program considers button A and which it considers button B. Button B does the selection of colors and brushes, while button A instructs the program to start painting.

Joypaint comes on an unprotected disk and the instructions sternly warn you that you may make only one backup. The instructions consist of eleven typewritten pages that adequately describe the program and its functions. However, it should have included instructions on displaying pictures without *Joypaint.* Not everyone has waded through the BASIC manual's commands.

Joypaint, then, is a decent program, reasonably executed. In the absence of a bit pad, light pen, or mouse, it provides fun, as well as a great deal of utility, for artistically-minded PC users.

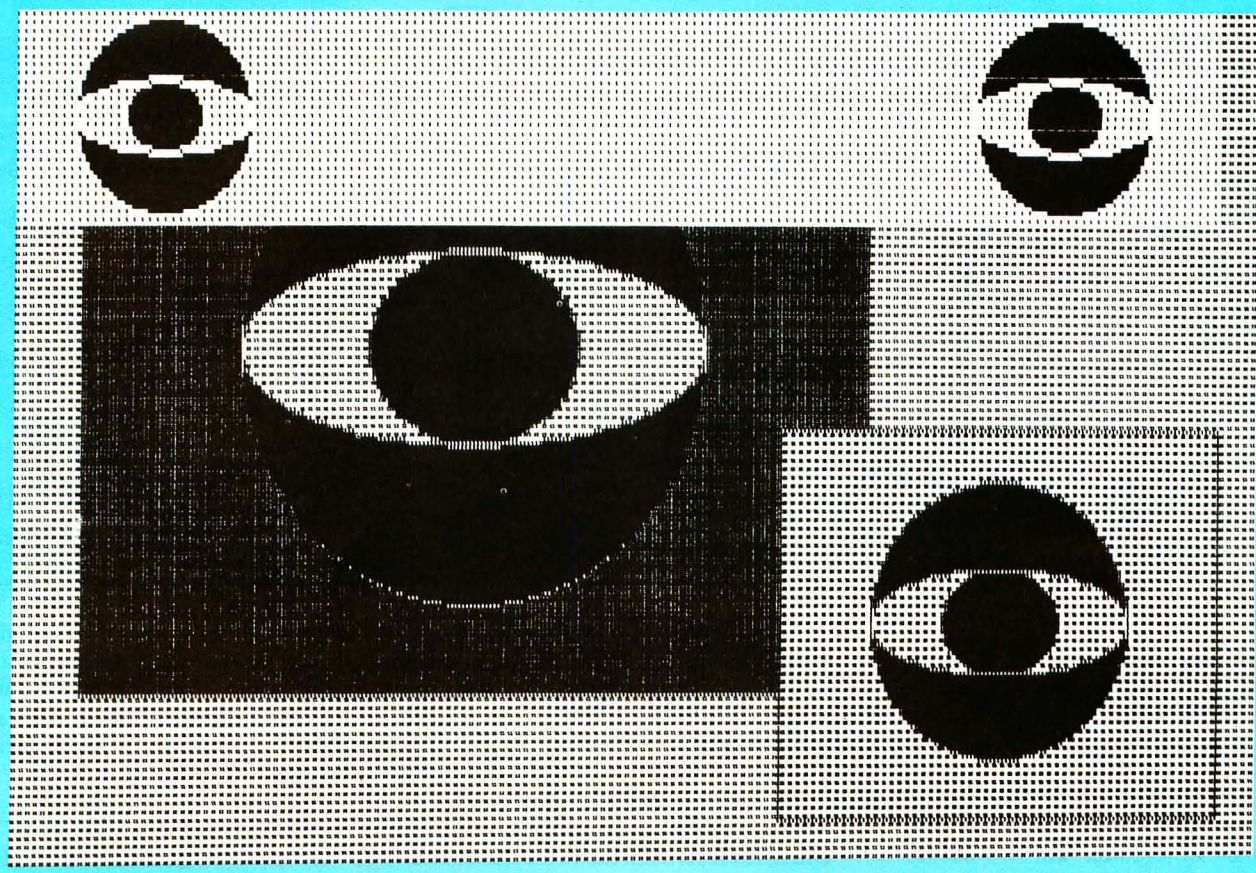


Fig. 1.
The finished graphic. One subroutine drew all of the CBS eyes, after being called with different WINDOWs and VIEWports. The patterned backgrounds were accomplished by PAINT tiling.

PC BASIC A2.0

Reviewed by Michael Callery

With the release of the IBM PC XT, IBM had no choice but to upgrade its disk operating system. DOS 1.1 could not, without modification, handle the XT's hard disk. However the usefulness of some new DOS 2.0 capabilities with a floppy disk system is dubious. It increases floppy disk capacity to 180K (single sided) or 260K (double sided) and adds new batch capabilities. The filter utilities (SORT and FIND) are wonderful. There was no good reason to modify PC BASIC.

BASIC A2.0 is included in the DOS 2.0 package. System requirements: an IBM PC with 96K, color graphics adaptor and disk drive. It is available from IBM Corp., Boca Raton, FL 33432, for $60.

Surprise. Along with DOS 2.0 comes BASIC A2.0 and some substantial changes in graphic capabilities. This review focuses on these changes, but remember: none of these changes invalidate graphics programs written in the older BASIC. They should all run unchanged under the new BASIC; the revised BASIC only *adds* capability. The changes are in the DRAW, LINE, PAINT and POINT commands; other commands are unchanged.

Painting With Style

LINE and PAINT now include an optional parameter called style in LINE and paint in PAINT. The new syntax follows:

LINE [(x1,y1)] – (x2,y2)[,[color] [,B[F]] [,style]].

Style represents a bit mask in the form of a 16-bit integer, and allows the creation

↪

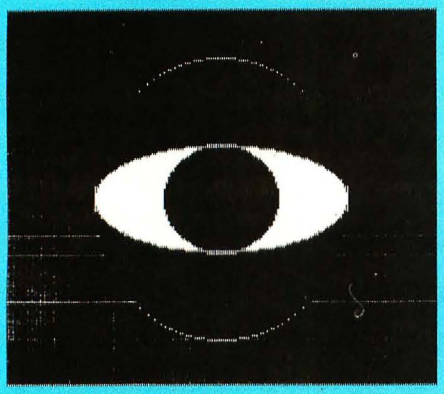


Fig. 2.
The initial eye. This is drawn with a full screen WINDOW, but a reduced viewport, so that it could be colored in without affecting the whole screen. The eye is drawn with ellipses.

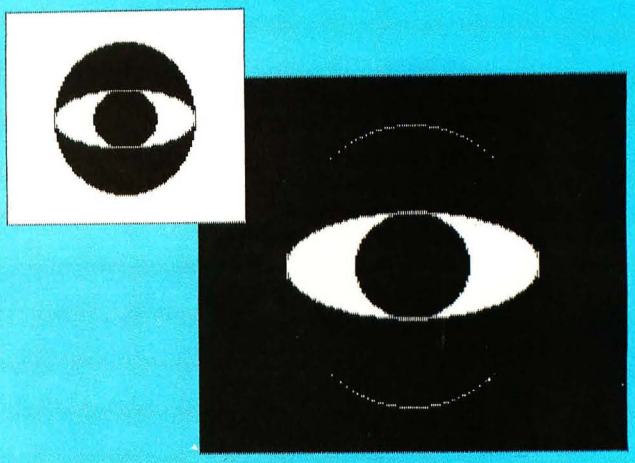


Fig. 3.
A second viewport has been established in conjunction with a reduced WINDOW. The X and Y coordinates of the center of the eye are adjusted so that the eye is centered in the new viewport. The window is about 2/3 of the original size (200 horizontal dots rather than 320) so the eye is about 2/3 smaller.

PC BASIC A2.0, ***continued***

of dotted and dashed lines. Sound complicated? It isn't, really, but you must be able to perform binary to hexadecimal conversations to design a style mask. For example: Suppose you want a dotted line. For the dots, substitute a 1; for the spaces between the dots, substitute a 0. This makes the 16-bit word: 01010101 01010101. Next, chop each byte in half (0101), and convert to hexadecimal: 5. IBM includes a new table in the appendices to the BASIC manual to simplify this. Since this is a uniform mask, the style parameter is simple: &H5555. For example,

```
LINE (10,10)-(310,190),2,B,&H555
```

draws a box with dotted lines. The style for a dashed line would be &HF0F0 representing the mask 1111000011110000. Obviously, you must spend some time creating these masks, but they add much power to the LINE instruction. Unfortunately, the style parameter generates a Syntax Error when used with filled boxes (the BF parameter), but the box is created in the (solid) foreground color. (solid) foreground color.

How can you fill a box with a pattern? Draw a box made of solid lines, then use the new paint parameter in the PAINT command. The new syntax for the paint command is:

```
PAINT (x,y) [[,paint] [,boundary] [,background]]
```

In BASIC 1, a figure drawn in the boundary color fills with the paint color. BASIC 2, however, accepts a new kind of expression for the paint color, a string expression. This string expression defines a tile which fills the area enclosed by the boundary color. While tiles may seem similar to line styles, two important distinctions apply: Paint tiles are only one byte rather than the two bytes of line styles; and, tiles are two dimensional. However, the method of creating tiles is similar. Design your tile as on/off bits and convert them to hex. Place this hex number, as a string, in the paint position in the PAINT statement. To fill with little dots, the tile's byte is:

```
01010101
10101010
```

which translates into 55 for the top line and AA for the bottom line. The paint command, then becomes:

```
PAINT (100,100),CHR$(&H55)+
CHR$(HAA),1
```

This works fine in high resolution mode. However, in medium resolution mode, each tile byte describes only four pixels; there isn't a one-to-one relationship between bits and pixels. The tile masks become a little more complicated. In medium resolution mode an 01 describes color 0, a 10 describes color 1, and 11 describes color 2 (00 is the background color). Keeping this in mind, our colored polka-dot tile becomes:

```
10001000      01000100      11001100
00000000  or  00000000  or  00000000
```

depending on the dot color desired. These translate into hex 88, 44, and CC respectively. Omit the blank row from the tile and you'll get vertical stripes. This little program demonstrates these dotted tiles:

```
10 CLS:SCREEN 1:KEY OFF
20 FOR X = 50 TO 250 STEP 100
30 CIRCLE (X,100),40,1
40 PAINT (50,100),CHR$(&H88)+
CHR$(&H0),1
50 PAINT (50,100),CHR$(&H44)+
CHR$(&H0),1
60 PAINT (50,100),CHR$(&HCC)+
CHR$(&H0),1
```

Tiles, of course, can be used to draw more recognizable figures. The BASIC Manual update demonstrates how to fill an area with x's in high resolution but avoids the same example for medium resolution mode. With only half the number of pixels per tile such a task is not really possible. (Does anyone feel challenged?)

More Colors

This tiling capability provides a means to increase the number of colors available with the standard IBM color graphics adaptor. The normal color selection for graphics is limited; however, by creating tiles of alternating colored dots the IBM BASIC programmer can create new colors from patterns. These colors are useful only on composite monitors or television sets; on RGB monitors the dot patterns are too visible. Nonetheless, Apple and Atari

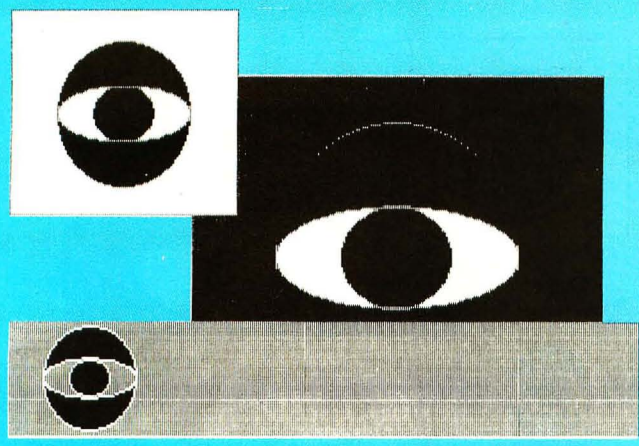


Fig. 4.
A third viewport is now created at the bottom of the screen and the window is dramatically enlarged (to 800 dots). The X and Y coordinates are adjusted to bring the eye into the viewport. Because of the greatly enlarged window, the eyes are very small. This viewport has also been filled.

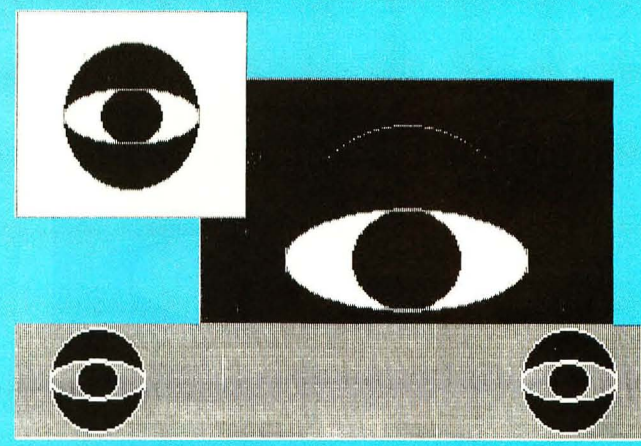


Fig. 5.
The fourth eye is drawn in the third viewport merely by adjusting the X coordinate (from 100 to 700 within the 800 dot wide window).

programmers have been using this trick for years, using assembly language routines. IBM people can do it from BASIC!

There is a rub with tiling, if you want to erase or refill an area that has been painted. Therefore, BASIC 2 provides a fourth parameter: background. This is also a string expression. The background expression is much more limited than the tile design expression: it can be only one byte long. This byte describes the tile byte that contains the same color as previous fill. For example, to fill a white circle with our dotted white tile creates a problem. The paint command looks at the screen, computes that it is already white, and stops. With the background byte, you can do it. Add the following lines to the program above to demonstrate this:

```
70 CIRCLE (150,50),40,1
80 PAINT (150,50),3,1 ' Paint in color 3 - white or yellow
90 PAINT (150,50),CHR$(&HCC)+CHR$(&H00),1,CHR$(&HCC)
```

The background byte tells BASIC that, while the circle is white (or yellow depending on the palette), the actual background is &HCC, not pure white, and fills anyway.

This is pretty heady stuff, but also quite powerful. Once an area has been tiled, you may or may not be able to refill it, depending on the tile colors. The tile routine follows the normal paint rules — stop when the border color is reached.

Enhanced DRAW

DRAW surely is one of PC BASIC's most powerful features. With it, the PC can draw a complicated figure fast. As with the other instructions, DRAW has only been enhanced. There are two new commands in the "graphics definition language" that can be used in the DRAW strings:

↪

Listing 1.

```
1 ' This program demonstrates the new
2 ' graphics commands of BASIC A2.0
3 '
4 ' The CBS eye is a trademark of the
5 ' Columbia Broadcasting System
6 '
7 ' C0 ... C2 color numbers
8 ' X & Y location of eye
9 '
10 SCREEN 1,4:KEY OFF:CLS
20 C0=0:C1=1:C2=2
30 GOTO 1000
99 ' main subroutine draw elipses
100 FOR I = -21 TO -11
110     CIRCLE (X,Y),60,,,,I/8
120 NEXT
130 CIRCLE (X,Y),60,,,,0/8
140 FOR I =  1 TO 16 STEP 2
150     CIRCLE (X,Y),60,,,,16/I
160 NEXT
170 FOR I = 6/6 TO 6/16 STEP -.01
180     CIRCLE (X,Y),60,,,,I
190 NEXT
200 CIRCLE (X,Y),60,C1,,,6/16
210 PAINT (X,Y),C0,C1
220 CIRCLE (X,Y),27,C1
240 PAINT (X,Y),,C1
250 CIRCLE (X,Y),60,C1,,,6/16
260 CIRCLE (X,Y),60,C1,,,6/6
270 RETURN
999 ' main program alters window & view
1000 X=100:Y=80
1010 VIEW (100,40)-(300,198),C2,C1
1020 COLOR 1,1:GOSUB 100
1030 X=200:Y=120
1040 VIEW (10,10)-(120,100),C0,C1
1050 WINDOW SCREEN (100,40)-(300,198)
1060 COLOR 14,0:GOSUB 100
1070 VIEW (10,150)-(319,198),C1,C1
1080 WINDOW SCREEN(0,0)-(800,800)
1090 X=100:Y=400
1100 C1=0:C0=1
1110 COLOR 4:GOSUB 100
1120 X=700
1130 GOSUB 100
1999 ' dress it up with tile painting
2000 VIEW:WINDOW:COLOR 1,1
2010 PAINT (200,10),CHR$(&H88)+CHR$(&H0),1
2020 PAINT (240,110),CHR$(&H88)+CHR$(&H0),1
2030 PAINT (170,110),CHR$(&H88)+CHR$(&H0),1
2040 PAINT (50,20),CHR$(&HCC)+CHR$(&H0),1
2050 PAINT (80,50),CHR$(&HCC)+CHR$(&H0),1
2060 PAINT (50,50),CHR$(&HCC)+CHR$(&H0),1
2070 LINE (9,149)-(319,199),0,B
2080 PAINT (200,170),CHR$(&H44)+CHR$(&H0),0,CHR$(&H44)
2090 PAINT (265,175),CHR$(&H44)+CHR$(&H0),0,CHR$(&H44)
2100 PAINT (295,175),CHR$(&H44)+CHR$(&H0),0,CHR$(&H44)
2110 PAINT (30,175),CHR$(&H44)+CHR$(&H0),0,CHR$(&H44)
2120 PAINT (65,175),CHR$(&H44)+CHR$(&H0),0,CHR$(&H44)
```

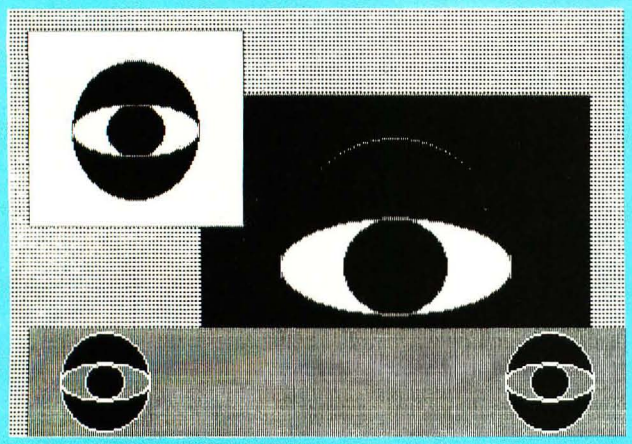


Fig. 6.
Paint tiling fills up the background with magenta dots. The painting is directed to stop at a border of color 1, which happens to border all the viewports. The title pattern is described in the accompanying article.

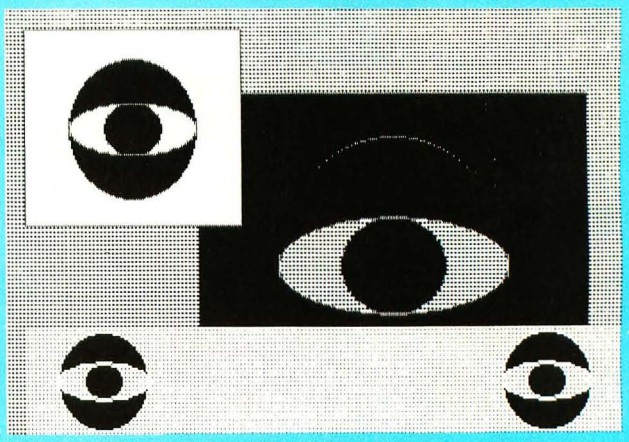


Fig. 7.
The third viewport is filled with tiles. This time, however, the viewport had been filled with color 1. Therefore, a box (using the LINE instruction) was drawn around the viewport before the PAINT instruction. PAINT was told to stop at the color of the box.

PC BASIC A2.0, ***continued***

- TA n, turn angle where n can range from −360 to +360 degrees (the old A command for 90 degree turns is unchanged).
- P paint, boundary, to fill an enclosed area. Tiling is not supported. (For people interested in music, the PLAY command has also been enhanced.)

The other deviation from BASIC 1 is in the POINT command, but to understand this change it is necessary to examine BASIC 2's new graphics instructions, WINDOW and VIEW. These instructions are the most powerful graphics instructions I have ever seen in a microcomputer BASIC, and may give some insights into IBM's future graphics plans. VIEW allows you to create a viewport onto the graphics screen. Subsequent graphics commands are executed only within this viewport. The syntax of the command resembles the LINE instruction:

```
VIEW [[SCREEN] [(x1,y1)-(x2,y2)
[,[color] [,[boundary]]]] ]
```

The simplest way to use the VIEW command is: VIEW. This defines the entire screen as a viewport, and is how any program written in BASIC 1, but run under BASIC 2, will act.

With the VIEW command, you are defining a box with a colored boundary, which you can fill with a color. Interestingly, if you reverse the order of the x's and y's, putting the larger x and y first and the smaller second, BASIC exchanges them so that a box is defined anyway. The optional SCREEN instruction determines how the graphics points are interpreted. Without the SCREEN instruction, BASIC maps the viewport so that the top left of the box becomes 0,0 and all graphics commands are executed in the viewport normally, but relative to this new origin. To demonstrate this, add the following line to Listing 1, your tiling demo program:

```
5 VIEW (0,50)-(319,150),0,1
```

The program draws three semi-circles because the circles go out of the viewport and are clipped. The fourth circle appears in the center of the new viewport because its center (150,50) lies 50 dots down from the top of the screen. The screen has now been reduced to a viewport 100 dots deep. Thus, the coordinates in the VIEW command refer to physical screen coordinates. Coordinates in all the graphics commands, following a VIEW instruction, refer to viewport coordinates, NOT screen coordinates. This includes CLS! Palette colors, unfortunately, still hold for the whole physical screen, not just the viewport.

The optional SCREEN instruction produces slightly different results. Edit line 5 to read:

```
5 VIEW SCREEN (0,50)-
(319,150),0,1
```

The program now draws the circles at the physical screen coordinates; anything outside the viewport is clipped. This is an amazing amount of power and flexibility packed into one command. But hold your hats — there's more! WINDOW is VIEW's logical companion for redefining the screen coordinates. Many scientific users complain about the screen coordinates on nearly every microcomputer: 0,0 should be located in the lower left corner, not the upper right corner. No problem with WINDOW, just redefine the screen to meet your expectations:

```
WINDOW (0,0)-(320,199)
```

Done! Like VIEW, the simplest form of WINDOW is WINDOW, which defines the normal IBM graphics screen, and is how all BASIC 1 programs operate. But with BASIC 2 we can do some pyrotechnics. Add this to your tile demo program:

```
7 WINDOW (10,10)-(110,110)
```

and re-edit line 5 to read

```
5 VIEW (0,50)-(319,150),0,1
```

and RUN the program. One gigantic, clipped semicircle appears. The VIEW statement provided the clipping, since it defines that part of the screen that will be viewed, but the WINDOW statement provided the enlargement. Line 9 redefined the coordinates of the viewport to range from 10 to 110 in both the x and y directions. The circle we see is drawn at (50,100), and is 80 dots in diameter in normal PC pixels. Because the window has been made smaller, the plotted pixels are drawn as if the drawing were larger.

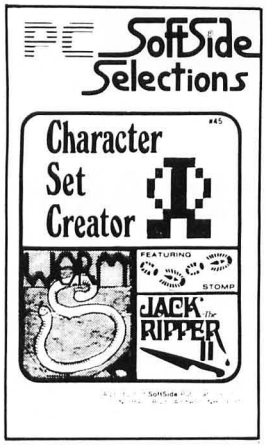
The reverse happens if we make a large window:

```
9 WINDOW (10,10)-(610,610)
```

In this case, the window is about twice as big as the normal screen so the drawing is about half as big.

PC SoftSide Selections

The Magazine Especially For Your IBM® PC Computer



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The optional SCREEN instruction prevents the WINDOW instruction from inverting the axes. Reediting line 9 to include the SCREEN statement demonstrates this:

```
9 WINDOW SCREEN (10,10)-
(610,610)
```

(You did notice that the circles were upside down, didn't you?)

POINT had to be changed to reflect this topsy-turvy world of viewports and windows. The old POINT command POINT (x,y) still works, but a new form of POINT: POINT (n) where n may be 0,1,2, or 3, returns the physical or world (window) x or y coordinate. Note the difference between this and the former use of POINT, where POINT (x,y) delivers the color of a pixel. This instruction is accompanied by another new instruction: PMAP (x,n) where x is the coordinate of a point, and n represents whether it is an x or y and whether you want the physical or world coordinates. If you are using windows and viewports, you may need the new POINT or PMAP instruction to retrieve the physical coordinates so that the old POINT can be used.

Confused? So am I. Such power is unexpected, and requires a lot of trial-and-error to nail down just how to configure these commands to accomplish your purpose.

System Utilities

Among the system programs on the new DOS 2.0 disk is a new graphics dump program. This program must be loaded explicitly by keying GRAPHICS at the DOS command level (A>), and it will take up some of your system memory. However, this new graphics dump provides a double-sized printout with the aspect ratio difference between the Epson pixels and the CRT pixels corrected. The color translation algorithm also seems improved. I spent $40 for a program to allow my Apple to do this. This utility supports only the IBM graphics printer (which is to say any Epson MX with Graftrax or Graftrax + or the new FX-80 and 100).

With WINDOW, VIEW and PAINT tiling, IBM BASIC programmers now have an incredible assembly of tools. All that is lacking is a reasonable color palette and, perhaps, better resolution. These will more than likely be solved with IBM's new color display adaptor (if IBM ever chooses to release it). With WINDOW and VIEW there should be no problem moving applications between various resolutions. Maybe IBM is tipping its hand here. Third party hardware vendors already have display adaptors with greater resolutions than IBM's. If I were producing such a board, I'd get ready to throw in the towel.

It should be noted here that while I have been referring to IBM BASIC, Microsoft has been implementing these commands in other MS DOS BASICs and even in some of their 8-bit BASICs.

These latest additions to PC BASIC partially compensate for the IBM's astonishing scarcity of graphics utility software. DOS 2.0 was released about two months after I bought my PC, and I griped — along with everyone else. I was outdated almost before I started. Rumors abounded: Don't buy it if you're not getting a hard disk. If you're interested in graphics programming on the IBM PC, the $60 cost of this package is just about the best investment you can make right now.

Spritemaster

Reviewed by Sharon Zardetto Aker

To the uninitiated, *Spritemaster* might sound like a woodland adventure game. Those familiar with Commodore 64 graphics, however, will realize that here is a program intended to help you design and utilize that wonderful computer graphic invention, the sprite.

Commodore's sprites (generically speaking, MOBs — Moveable Object Blocks) are figures of 24 by 21 pixels that you can move around the screen, passing them in front of and behind one another and the background. They can be expanded automatically to twice their original size vertically, horizontally, or in both directions; the computer can register both sprite-to-sprite and sprite-to-background collisions. In short, sprites are a programmer's dream. Unfortunately, the binary coding necessary for their design has a nightmarish quality.

Spritemaster makes sprite design child's play. In fact, it is recommended for ages eight to adult, although, as much as eight- to ten-year-olds might enjoy using it, I doubt that they could do so unaided.

Mastering the Sprites

Choosing the build option from *Spritemaster's* main menu gives a large 21 by 24 grid on which to draw your sprite, using either a joystick or the keyboard for direction control. The function keys switch the drawing mode to and from previously chosen colors, or background (for erasures). As you draw on the grid, your picture appears, in true sprite size, in the corner of the screen.

Then the fun begins. The COPY option puts your first drawing into a second area of memory; then, using MODIFY, you can change a few lines to begin an animation sequence. COPYing each modified picture into the next area for further changes gives you a set of animation frames in no time. There are ten sections in the program, each containing sixteen areas in which to store a drawing — more space than you'll use in any one sitting.

The ANIMATE routine lets you see your art in motion. After specifying the sequence of the areas to be used, you can choose manual or automatic animation. In the manual mode, pressing a key switches the sprite to the next view; for automatic, all you need to do is enter the time that should elapse between frames. In both modes, you can control forward/reverse frame viewing, four-directional screen movement, and overall speed.

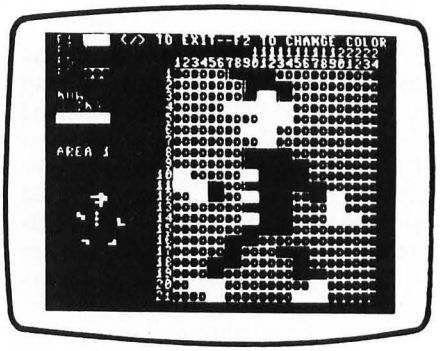
As if this were not sufficient manipulative power, there is also a VIEW option — a sort of "what if" routine wherein you can do test changes in certain parameters of your sprites without affecting the already stored data. First, you can shrink any sprite to half its size, vertically, horizontally or overall. This is convenient because on most of *Spritemaster's* screens, the sprite appears in the expanded view — twice the size it would normally appear in a Commodore program. Sprite, background and border colors can be changed to test for different effects, or, more practically, to help avoid the "smear" that plagues some of the Commodore color combinations.

If you aren't pleased with your original animation sequence, VIEW also lets you put any three sprites on the screen at a time and move them around to study various relationships. You can then try a sequential display — the ANIMATE routine — with your new sequence choice.

Saving Your Sprites

Spritemaster would be a wonderful program even if its capabilities stopped

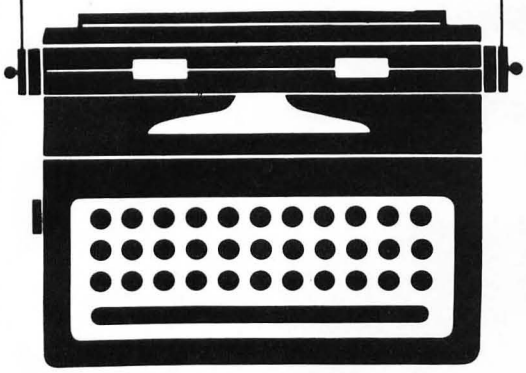
A Spritemaster screen showing the available commands.



The build option gives you a 21 by 24 grid on which to draw your sprite.

From Access Software, 990 East 900 South, Salt Lake City, UT 84105. System requirements: Commodore 64, Datassette or disk drive, joystick optional. Suggested retail price: $35.95 for disk or tape.

ATTENTION AUTHORS



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COMMODORE®

right there; just creating animated sprites within the *Spritemaster* program is fascinating enough to make it a worthwhile addition to your software collection. But, there's more!

The main menu has three options connected to sprite data storage: LOAD, SAVE and TRANSFER. The LOAD command, predictably, loads sprite data from disk or tape. It will be the first option you use to see the demonstration sprites in the program. The tape version has a walking man and a flying bird; the disk version has these, plus a waving flag and a marvelous rotating geometric figure. After you've designed your own pictures, you can use the SAVE command to store them on another tape/disk.

The TRANSFER routine actually adds sprite data, in the form of line-numbered data statements, onto a program that you've written. It accomplishes this by juggling the normal starting address of the Commodore's programming area to create a temporary storage area for the sprite data. You can load, or directly enter a sprite-use program, and direct the computer to add the necessary data statements to the end of your listing.

You will probably be a little disappointed in the animation of the sprites in your own program compared to the sequences tested in *Spritemaster.* Because *Spritemaster* animation is done in machine code, it is done more quickly, and therefore more smoothly, than anything you can accomplish in BASIC.

Documentation

The 25 page book that comes with *Spritemaster* is clear and thorough. Unlike the documentation that accompanies many software programs, it neither assumes you have a Master's degree in computer science, nor talks down to you in an isn't-this-easy, this-is-so-much-fun manner. It assumes that, while the reader may have no *knowledge* of sprite graphics, he still has *intelligence;* it is a near-perfect blend of information and informality. The section on sprite programming — not design, but programming — is not quite as easy to follow as the rest of the manual. However, *Spritemaster* is meant to be a design tool, not a programming tutor. The manual rightly, if unfortunately, refers the reader back to the Commodore user's manual, although it then continues with an informative section on the Commodore's video display chip. The authors seem aware of the deficiencies of both manuals: "We suggest that you read both Chapter 6 of the User's Guide and this chapter of the *Spritemaster* instruction manual at least three or four times. Each time you will understand better and retain more of what you need."

Except for the programming section, you may never need the manual after a first, cursory reading, because the program itself is so well designed. Clear menus, well-placed prompts, and "second chances" — double checks before any delete or purge operations — add up to the tried-but-true phrase "user-friendly."

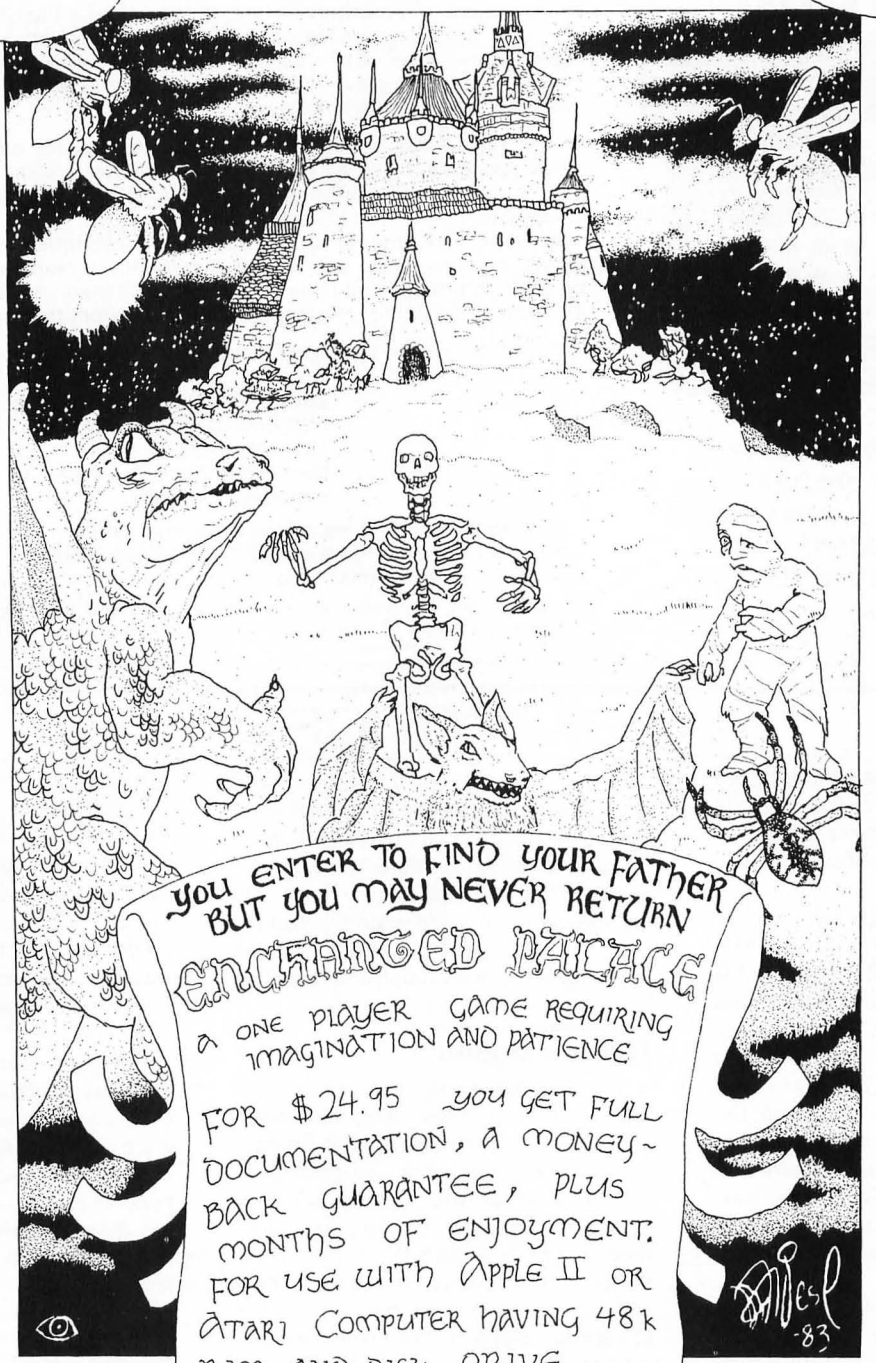
Summing It Up

There must be something missing from *Spritemaster,* but I have no idea what it is. When it comes to sprite graphics, it does everything it claims; it does everything you need — it just does everything. This is not the kind of comment that should get back to Access Software, but *Spritemaster* is easily worth twice the price!

ENCHANTED PALACE

by

TRUMAN HALL — UNICORN SOFTWARE



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CEEMAC

A Visual Composition System for Apple II computers

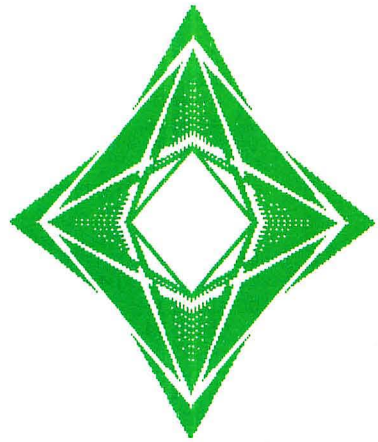
Reviewed by Andre Schklowsky

CEEMAC is a language for creating dynamic, interactive, animated and abstract visual compositions called "scores." This unique software package already has a highly involved group of users. The unprotected floppy comes with a substantial (70 packed pages) manual and a twelve page tutorial.

I discovered CEEMAC in November, 1981, at the Small Computers In The Arts Conference in Philadelphia. Actually, it hadn't become CEEMAC at that time. During the conference breaks, Eric Podietz, one of the conference's organizers, would boot the CEEMAC demo disk, called "Vagabondo," and we would all sit back in awe, asking, "How can you do this?" We were treated to a little recital of very fast, animated video. What we were witnessing was the expression of a new art form that was unique to personal computers and especially the Apple, with its marvelous graphic capabilities. Vagabondo was free (and still is) for copying. So I made myself a copy. A few months later CEEMAC was advertised, and I became, as I later learned, one of the first 100 addicts.

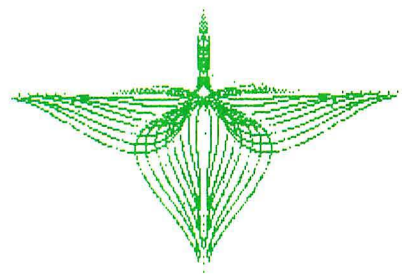
When CEEMAC is booted, three distinct programs are loaded in memory: the editor, the proof reader and the interpreter. The fourth part is missing. That is the DOS interface — more on that later. ↪

By Brooke W. Boering (Vagabondo Enterprises, 1300 E. Algonquin — 3G, Schaumburg, IL 60195.) System requirements: 48K Apple II with disk drive and game paddles. Prices: CEEMAC $75; Maestro $45; Vagabondo (demo disk) free to copy at your Apple users group.



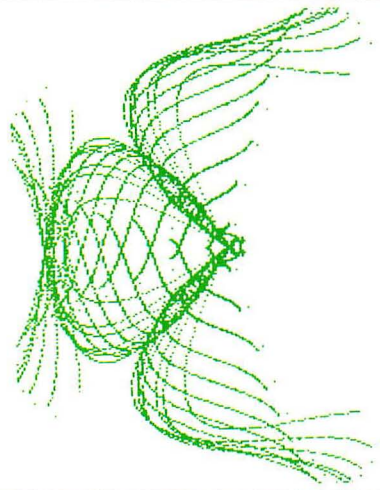
```
SCORE: DIAMOND DAZZLER
  CLEAR [0;0]
SETASP [2;0]
V1 = 0
SPEED [0;0]
F
XY1 = $80;RANDOM
XY2 = Y1;$80
V1 = V1 + 1
FOR $20
  BLINE [0;7]
Y1 = Y1 - V1
X2 = X2 + V1
BRASE [$20;0]
AGAIN
CEEMAC  REL 1.1
```

Diamond Dazzler by Brooke W. Boering.



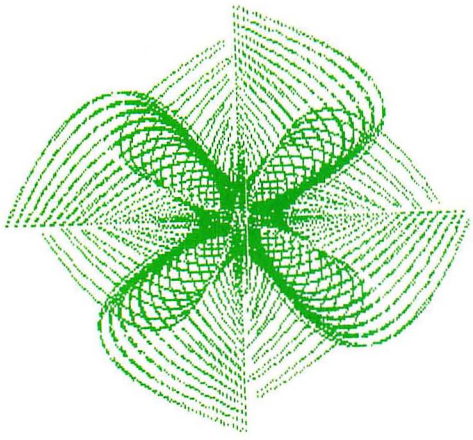
```
SCORE: TAKE OFF
  1
CLEAR [0;0]
SPEED [$FF;$FF]
V1 = $80
V2 = $80
V3 = $FF
V4 = $80
FORCE1 = 2:17
DENSTY = $FF
COLOR = $FF
SKY [$80;0]
FORCE2 = 11:29
DO TIL V2 > $E0
  X1 = V1
Y1 = V2
X2 = V3
Y2 = V4
SPLINE [0;2]
PULSE [0;1]
SPRASE [0;0]
V2 = V2 + 5
V3 = V3 - 5
AGAIN
GOTO 1
CEEMAC  REL 1.1
```

Take-Off by Andre Schklowsky.



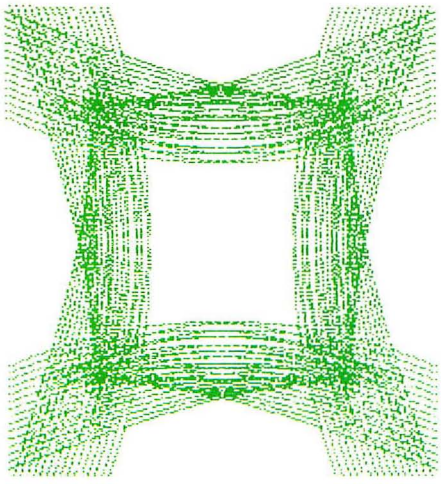
```
SCORE: SPLINES#2
  SPEED [0;$FF]
CLEAR [0;0]
X1 = $80
Y1 = $80
FORCE2 = 5:15
FORCE1 = 8:31
DENSTY = $FF
COLOR = $FF
FOR $20
  Y2 = LIST1 , X2
: NOTE SYMMETRY OF 3
SPLINE [0;3]
X2 = X2 + 7
AGAIN
A
GOTO A
CEEMAC  REL 1.1
```

Splines #2 by Andre Schklowsky.



```
SCORE: SPLINES#4
  1
CLEAR [0;0]
SPEED [$FF;$FF]
V1 = $80
V2 = $80
V3 = $FF
V4 = $80
FORCE1 = 2:17
DENSTY = $FF
COLOR = $FF
SKY [0;0]
FORCE2 = 3:45
DO TIL 1 = 3
  X1 = V1
Y1 = V2
X2 = V3
Y2 = V4
SPLINE [0;9]
SPRASE [$40;0]
V2 = V2 + 5
V3 = V3 - 5
AGAIN
GOTO 1
CEEMAC  REL 1.1
```

Splines #4 by Andre Schklowsky.



```
SCORE: SPLINES/JACKSON
  CLEAR [0;0]
SPEED [$FF;0]
XY1 = 0;0
V1 = V1 - 5
V2 = V2 + 1
V4 = 7
DENSTY = $80
FOR $FF
  V1 = V1 - 1
V2 = V2 + 1
FORCE1 = V2
FORCE2 = V1
XY0 = X1;Y1
X0 = X0 % 5
Y0 = Y0 % $17
X1 = X1 % 4
Y2 = Y2 % 4
SPLINE [0;$0F]
SPRASE [$40;0]
AGAIN
CEEMAC  REL 1.1
```


Commands and Error Traps

The editor and proof reader actually are one program from the user's point of view. It is a well-designed line editor for creating animated graphics "scores." You need to remember very few keys, and none of the editing keys are control keys. Once you have used it a few times you remember it for quite a while. The proof reader is there when you need it — if you enter an incorrect instruction, a bell rings to force you to correct the syntax. This editor also is very forgiving. For instance, if you enter v1 + 1, it will translate it into V1 = V1 + 1. When a macro requires two parameters, and you enter only the first, it enters a default for the second one, and establishes the correct syntax itself. The choice for the keys to move up and down in the "score" is judicious: the hyphen to go up, the RETURN to go down. They are closest to the repeat key. To insert a line, press I. To delete one, press D.

Pressing CTRL A switches from editor to interpreter. Testing is easy because the editor remembers where it left the cursor so you can make small changes and try them out immediately.

Some errors are not syntax errors, and the proof reader may not spot them. If you want to GOTO a non-existent label, the proof reader won't warn you in advance. But when the interpreter fails to find the label, it sends you back to the editor and prints an error message at the bottom of the screen. Actually, few programming errors are left when the program starts, since the proof reader catches most of them at entry time. This is one of the most important lessons we have learned (starting with on-line time-sharing systems). When less time elapses between writing a faulty instruction and knowing about it, you can correct it more easily and proceed. The old timers may remember batch jobs with their two or three hours turn-around time — not the easiest way to debug a program. This kind of immediacy, learned from video games, is one of the most exciting aspects of personal computers and will have a considerable impact on how we will learn in the future.

CEEMAC Features

Look at some of the scores I have included in this review, and you will notice that this language looks more like Pascal than BASIC. CEEMAC offers a rich choice for sequence controls, such as:

- For x1
- Skip if x1 > x2
- Do unless v1 < v2
- Exit if x1 odd
- Again while x1 < $80
- Gosub chc (goto subroutine chc)

The choice of mathematical and logical operators is impressive. In addition to the four arithmetical functions, you have "mod", "and", "or", "eor" and the weird but powerful "%." It is positive until it encounters overflow. Then it reverses to negative until underflow. This is useful when you want to control bouncing at the edges of the screen. Another weird one is "+or−", which provides a random "+" or a "−". A few math functions are missing, particularly the trigonometric functions, but the tables included take care of these.

CEEMAC has many variable types, such as:

- Free variables: v1,...vf
- Variables for coordinates: x0,y0,...x3,y3 can be combined, as in xy0 $20 40, a short cut for x0 = $20, y0 = $40
- Random variables: The palette of randomly generated variables is one of CEEMAC'S outstanding features.
- "Finger" variables allow the program to get input from the keyboard, the paddles or the push buttons.

Macros are the built-in routines for creating the visual display with a minimum of programming. BASIC, for instance, has four such macros: HGR (clear screen), HPLOT (draw a line or just a dot), DRAW (draw a shape), and XDRAW (erase a shape). CEEMAC has CLEAR, BLINE, ADOT and SHAPE, in addition to the following:

- ABOX (to draw a four-sided figure, filled or not)
- SPLINE (to draw a Jordan curve). This is my favorite drawing macro. I frequently use it with different symmetry codes. It produces a more organic kind of display that most people do not associate with computers.
- SKY (fill the screen with stars)
- GRID
- PULSE uses the Apple color scheme to shift the screen color phase — a nice effect.

In addition to these macros, CEEMAC has several utilities. A symmetry parameter gives a choice of twelve different symmetries. On a figure, imagine drawing a dot (or a line, spline or shape) at a #, and without any further programming getting the same dot at all the other #s. Some macros have an automatic stack erase feature. For instance, BRASE 8 erases the eight latest lines created with BLINE. Similarly, SPRASE erases the n oldest splines. This feature is essential when you consider the dynamic quality of your display. Without it the screen would soon fill up completely.

In addition to the graphic macros, you may use:

- SWAP to exchange the content of two variables.
- SPEED to alter the speed of execution.
- TRACE to print the value of a given variable.
- PAUSE to wait for a keypress.
- STEP (trace plus pause) for debugging.

↪

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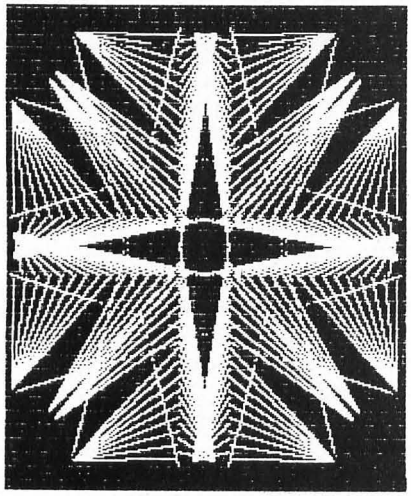
CEEMAC, ***continued***



Key 4 on the Vagabondo demo.

```
SCORE: K4-ICE
  :
: INITIALIZE
:
CLEAR [0;0]
SPEED [0;0]
COLOR = $FF
:         FF = WHITE
:
V1 = $10
:   V1 IS LOOP FOR PATTERN DISPLAY
:      NOTE: $10 IS HALF OF THE
:            ERASE DELAY.
:            THIS WILL GIVE TWO
:            PATTERNS WITH THIRD
:            BEING DRAWN AS FIRST
:            IS BEING ERASED.
:
V4 = 7
:   V4 SETS SYMMETRY
:      NOTE: 7 GIVES MAXIMUM MOVEMENT
:            ON THE SCREEN.
:
F
:
: SET PATTERN VARIABLES
:
XY1 = RANDOM;RANDOM
X2 = $90
:   NOTE: 90 FORCES OFFSET OF CENTER
:
: DISPLAY PATTERN; ERASE PRIOR
FOR V1
  BLINE [0;V4]
BRASE [$20;0]
Y2 = Y2 + 8
: SEE FOOT 1
AGAIN
:
: FOOT 1:
:       CONTINIOUS INCR. OF Y2
:       WILL CAUSE WRAPAROUND OF
:       PATTERN AT SCREEN LIMIT,
:       THUS A MORE COMPLEX IMAGE.
:
CEEMAC  REL 1.1
```

```
SCORE: SPLINES#3
  SPEED [0;$FF]
CLEAR [0;0]
X1 = $80
Y1 = $80
FORCE2 = 5:15
FORCE1 = 8:31
DENSTY = $FF
COLOR = $FF
FOR $20
  Y2 = LIST1 , X2
: NOTE SYMMETRY OF 5
SPLINE [0;5]
X2 = X2 + 7
AGAIN
A
GOTO A
CEEMAC  REL 1.1
```

Shapes

The shape facility is one of the most intriguing and frustrating in CEEMAC. It is rich in possibilities, and using the supplied shapes is fairly easy. Unfortunately, creating new shapes is very difficult. CEEMAC comes with several shape tables, but only one is loaded. Using them is easy, once you have learned to match a code with the corresponding shape, and to realize that drawing a shape depends on a number of parameters. To use a shape you have to set:

- ROTATE (scaled on a 256 point compass).
- SIZE (one of eight sizes).
- XSCALE and YSCALE (horizontal and vertical multipliers).

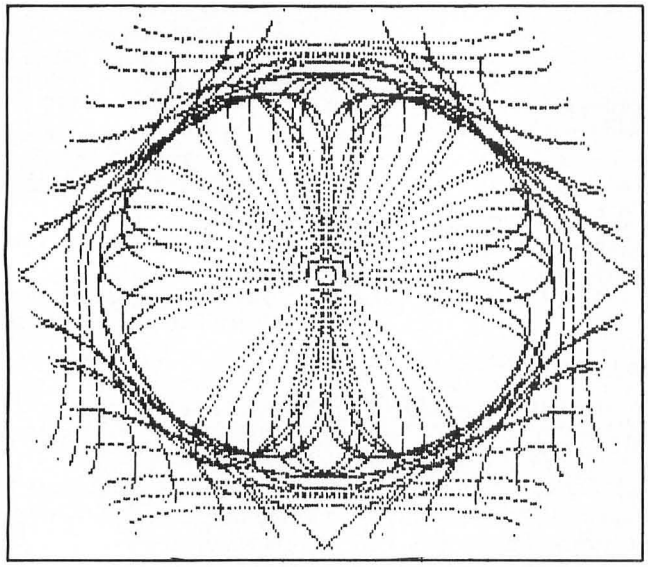
Lists and Tables

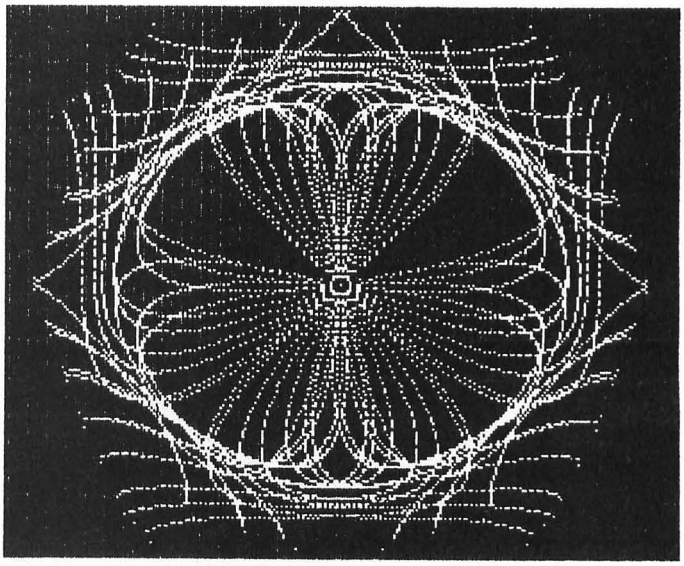
A list is a collection of 256 constants brought in from the disk. Two of these tables are loaded with CEEMAC. You may create more tables on your own and load up to four of them in memory. The LISTn variable gives you access to one of the elements of the nth table. For instance, in the expression x1 = list1, v1 will return in x1 the v1th element of the first list. With some basic programming you could create these tables and since the CEEMAC floppy is not protected, you may modify the Hello program to load your own tables.

Additional Features

Printing your scores is simple: While you are in the editor, just press shift-1 (for printer in slot 1), shift 5 (for slot 5).

Splines #3 by Andre Schklowsky.





Through the cassette "in" port you may "read" music and synchronize your "visual" score with the incoming pitch. You can use the ANOTE macro to create a sound on the Apple speaker and to the cassette "out" port. I met a CEEMAC user who used this to synchronize the frame advance of an 8mm camera to film some of his scores.

You may add text to your displays through the use of a shape table provided on the CEEMAC floppy (but not loaded by the Hello program). I altered the Hello program to use the "t-shape" table in a score that translated any key to a letter shape. My three-year-old son used this program, called "Big Letters," to become familiar with the keyboard. He could change the size of the letters with one paddle and their orientation with the second one.

Throughout CEEMAC, the default numerical notation is hexadecimal. You may use decimal as input but it will be translated into hex. This may turn off some users. In fact, it is just a convention, and since the numbers go only from 0 to 255 (sorry — 0 to $FF), the hardship is minimal.

CEEMAC's DOS interface is limited. An Apple "hacker" accustomed to BLOADs, RENAMEs and BSAVEs will have no problem. To play a score, simply BLOAD it and call 2048. To create a new one, use an old one. First delete all its lines, write the new score, try it out, and amend it until you are satisfied. Then press CTRL/C to exit from CEEMAC, and BSAVE the score you just created. You have to reenter that line from the keyboard; or, as a hacker would, use the ESC J and I and the arrow keys to overwrite the line and issue the command. Imagine what a beginner goes through to learn CEEMAC's *modus operandi.* It may not be everyone's cup of tea, but CEEMAC was designed more for the programmer with a flair for creating exciting visual displays, than for the non-computer artist who wants to learn a programming language and become a "score" composer.

Saving HIRES Pictures

Very often, as you sit back and watch a score, you may want to save the picture on a floppy to show as a fixed image at a later date. Theoretically it is very simple:

- Stop the score by pressing the space bar;
- Press CTRL/A, then CTRL/C;
- BSAVE picture name, A$2000, L$1ff8.

In the first release of CEEMAC you had to contend with a memory conflict between where it saves the score and where it creates the picture. In the latest release the problem is solved. Thank you, Mr. Boering!

Documentation

The personal computer is a versatile tool for creative people who want to bridge the gap between the arts and science. But, to use and enjoy it, you must learn some of the conventions of operating the Apple II. With CEEMAC, Brooke Boering has pushed the Apple II to some of its limits. To see what he does with the next generation of HIRES machines, based on Motorola's 68000 16-bit microprocessor and NEC's 7220 graphics chip, will be interesting. For the time being, I'll enjoy CEEMAC on my faithful Apple II.

The 70-page manual, and the twelve-page tutorial are thorough, although I don't like the exclusive use of upper case letters. The index is very useful. I have not used the tutorial to get acquainted with CEEMAC because it did not exist for the original version. It looks well-written and should get most people started. The CEEMAC floppy contains many sample scores. Newcomers and old hands should read them, modify them, and of course, show them.

Utilities For CEEMAC

I have been using computers as a programmer since 1967 and have used many computer languages, from machine language to a fourth generation language called Admins, and since I own an Apple II, BASIC, Logo, GraForth and 6502 assembly language. CEEMAC is another one. Like any other language, you have to use it to learn it, and the author insists on the learning-by-trying aspect in the tutorial. When I purchased CEEMAC it did not have a tutorial, so I decided to read one of the "scores" and compare it line-by-line with the manual to understand the instructions. I modified the score in various ways to see what would happen, learning a great deal about CEEMAC in the process.

With *Maestro,* the visual album maker, Boering and Vagabondo have given us not only a tool to create individual scores, but also a means to package them together. After a few months of playing with CEEMAC, you may have become an addict, and want to create an album of your own. To show your CEEMAC work, you must keep switching between the program and DOS, and issue many catalog and BLOAD commands. I mentioned earlier that the Vagabondo demo disk is a collection of scores, each of which can be executed by pressing a key. *Maestro* is a utility program to read one or more of your CEEMAC floppies and help you compose an album similar to the demo disk. It is designed for experienced CEEMAC users, who already have a collection of scores to package.

Maestro works well, provided you do some preparation before starting.

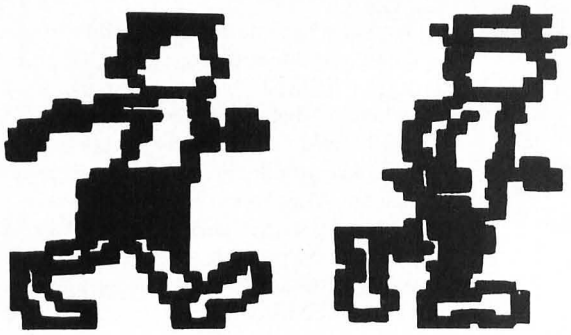
- Review your CEEMAC scores carefully before you start if you want to skip the "work-in-progress" scores.
- Have your *Maestro* and CEEMAC data floppies handy. The first one must have at least one list table and one shape table.
- Make a copy of *Maestro's* second side. The program will record the album on this disk.

As *Maestro* goes through your scores, write down the letter associated with each one. That helps if you want to modify subsequent versions of this album. Several albums can fit on one floppy. Unfortunately, here again the DOS interface is limited. *Maestro* recognizes only the file names it expects: one for the scores, one for the comments and one for the HIRES picture (the album cover). Unless you want to do a lot of last minute RENAMEs, keep it simple and stick to the "one floppy/one album" scheme.

The documentation is not as thorough as CEEMAC's. The assumption may be that this product is directed toward the CEEMAC aficionado, who will get the idea quickly and work out the problems on his own.

CEEMAC Newsletter

Independently of Vagabondo Enterprises, Ken Sherwood publishes (a few times a year) a newsletter full of information about CEEMAC and related subjects. The focus is on scores, and it has become a forum for CEEMAC users to share their work. Some of the scores shown here come from, or are adapted from, scores in the newsletter. To subscribe, write to: Ken Sherwood 117 N. 25th St. Reading, PA 19606. Suscriptions are $15 a year.



THE GRAPHIC SOLUTION

Reviewed by Roberta Schwartz

When paint and canvas were my chosen media for artistic expression, the most difficult moment was at the beginning of each new painting. I would stare at the blank canvas, somewhat intimidated by the fact that the tools at hand, paint and brushes, had limitless potential and it was up to me to explore, discover and create. The challenge was awesome.

This familiar feeling returned when I received *The Graphic Solution (TGS).* This package seems to say there are no limitations; take your time and strive for a masterpiece. It enables you to do something unique and explore new horizons.

What is *TGS?*

TGS is, as defined by its creators, an editor and animation system for combining graphics and text in a manner similar to working on movie film. The "actors" are state-of-the-art bit map shapes that you build with simple keyboard commands. Basically, *TGS* allows you to draw shapes and make them move. Your animation is done frame-by-frame just as if you were making a film. You can include text as frames. A frame series is saved as a sequence and these sequences are shown via a "projector." You may save your sequences and the projector on your own disks and access them with a simple Applesoft program.

TGS is not an animation package for creating arcade-type games, nor is it for someone who wants to master a new piece of software in a few hours. *TGS* takes time, concentration and planning. If you are a business person, an educator or an artist who wants to create dynamic animated presentations, product demonstrations, title pages, menus, graphs or tutorials, then do read on.

From Accent Software, Inc., 3750 Wright Place, Palo Alto, CA 94306. System requirements: Apple II with 48K, Applesoft, DOS 3.3 and disk drive. Suggested retail price: $149.95.

A Masterful Manual

TGS comes with two disks, a vinyl-covered looseleaf manual, and a reference card. One glance at the 175 page manual tells you that this is not a package to be mastered overnight. The table of contents is three pages long! The manual is done masterfully. Heavy stock dividers separate the chapters, and every page has large bold headings describing its contents at the top, and newly introduced commands at the bottom. The manual assumes no prior knowledge on the part of the user, and reading it is like having a private tutor at your side.

Part one is the *TGS* tutorial, which takes you step by step through the basics from lesson one to lesson eight. Part two, the advanced section, covers such topics as multiple shape animation, 2-D and 3-D graphs and charts, editing character sets, animation on colored backgrounds, hidden-line animation and more. Part three covers the projector, and parts four and five contain appendices and a reference section. I cannot think of any question you may have about *TGS* and its applications that are not covered in the manual.

Both disks are double-sided. One side of each contains a protected version of *TGS,* while the alternate side of one is an unprotected demo and the alternate side of the other is an unprotected sequence disk. You can back up the demo and sequences, use one of the original disks as your working disk and put the other away as a backup. Accent's replacement policy is reasonable — within 30 days a damaged disk will be replaced free; after that, a replacement is $10.00.

The demo disk contains excellent animation sequences (See Figures 1 and 2). A figure called "Adam" is most impressive as he saunters, arms swinging, across the screen. He displays the most detailed, fluid motion I have ever seen in Apple graphics. Analysis of the sequence shows that Adam is made up of ten different shapes, and 90 separate frames set him walking.

The sequences disk has a complete step-by-step tutorial to demonstrate all of the commands in *TGS.* The eight lessons are clear, concise and very helpful, and these same tutorials are included in the manual for further reference. This disk also contains a features section that tutors you on the use of the projector.

TGS is compatible with any input device and software that allows you to save the hi-res screen as a standard DOS 3.3 file. This means you can create your drawings with a graphics tablet, light pens or any of your favorite graphics utilities, and then load the drawing into *TGS* to be used as a background or a source for your shapes.

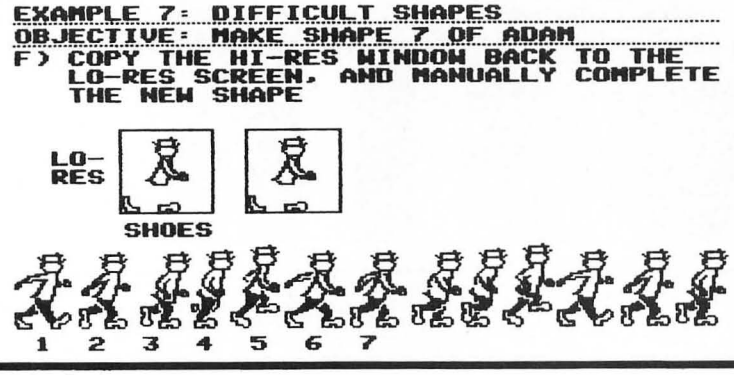
How *TGS* Works

You can "lift" shapes off the screen or create them in the Lo-res mode. (If you have worked with *Accu-Shapes,* also by Accent Software, you will feel right at home in this mode). Simple cursor moves enable you to plot individual pixels, erase pixels, and move without affecting the pixels. You can also expand the shape horizontally or vertically, contract the shape horizontally or vertically, scroll the shape horizontally or vertically, complement the color of the pixels and, as an added bonus, create a mirror-image of the shape. If you have ever plotted out a shape tediously, only to find that you wished you had made it a little taller or a little wider, you will appreciate these editing capabilities.

One key stroke takes you from the Lo-res mode to the Hi-res mode where a window replaces the cursor. When you copy your image from Lo-res into this window, the fun really begins.

Space limitations don't allow me to enumerate of all the commands

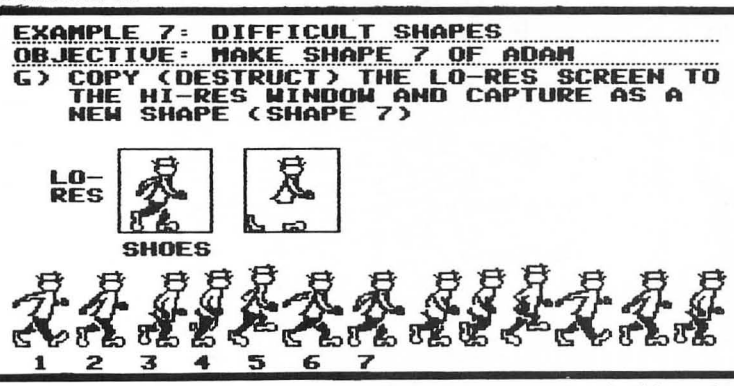
Figure 1.



The Graphic Solution

A printout of part of the tutorial demo screen. The tutorials are very helpful, but they run at a fast speed. I found it very helpful to do screen dumps of the ones I was most interested in.

Figure 2.



available, but I will list some of the major options:

- Plot the image, erasing anything under it.
- Plot the image, retaining everything under it.
- Move the image anywhere on the screen.
- Return to Lo-res and edit the image.
- Use the image as part of the background.
- Turn the image into a shape that can be animated.
- Save the shapes to a table and then select any shape, at any time, to plot or animate.
- Create individual frames.
- Put the frames together and make a film!

Yes, a film! You can use anything in the window as one frame in a film (called a sequence) made up of many frames; and this is where *TGS* excels! You put a shape in the window and "shoot" the frame. Move the shape a bit and shoot another frame. Move, shoot, move, shoot — go into the SHOW mode, press M, sit back and enjoy your film. To give you an idea of disk use with *TGS,* I timed the full demo disk. The demo contains a variety of sequences and it runs for three minutes.

There are many extras in this package. It is certain that the creators kept retesting it and asking themselves, "What might a user appreciate that isn't already here?" Then they included it. Some of these very welcome extras include:

- Macros — You can save any series of steps as a macro, (e.g.,"move up, shoot a frame, move right, shoot a frame..."). Then press "R" and your steps are carried out. It works perfectly, every time.
- Erase a shape, add a shape — any one at any time without having to redo the entire shape table.
- Erase a frame, add a frame — any one at any time.
- See your film one frame at a time, backward or forward — great for editing.
- Control speed of projection — enables wonderful effects.
- Save sequences to disk — allows you to accumulate a sequence file for use in later projects.
- Erase an entire sequence — allowed with caution. You are warned by auditory signals before anything is erased. It is nice to know that a thoughtless key press won't undo hours of work.
- Save the Hi-res screen to disk.
- Print the screen. Want to save the screen as hard-copy? Press a few keys and before you know it your printer is at work. I have the PKASO interface with an Epson printer, and my printouts were perfect. You can get a printout of the screen at any time without saving the screen to disk first and without having to worry about losing the work in progress. Make your printout and one key returns you to the point at which you stopped. Simple and elegant.
- Add text — enter text directly from the keyboard and it is appended to your film sequence.
- Circle mode — Need a circle for your shape or in the background? You don't have to quit *TGS* and insert another graphic utility. Just return to the main menu and enter the circle mode.
- Line mode — In the Hi-res mode, you can plot points or lines and with the help of the Macro capability you'd be surprised at what you can draw.

I must include here my only criticism of *TGS.* The program accesses only one disk drive so there is a great deal of disk swapping. It seems incredible that, in a program with such consideration for the user, there is no provision for a second drive. I would expect this to be remedied shortly.

The makers of *The Graphic Solution* have interesting plans for the future: A *TGS* newsletter will be published to share applications possible with *TGS.* A special version of *TGS* is in the works for Apples with memory expansion cards. Further enhancements will include recursive macros, direct text input, and *TGS* compatibility with The Gibson Light Pen. Sequences disks containing anything from special character sets to animated sequences that you can use with your own graphics presentations will be sold at a nominal cost.

Editor's Note: Shortly before this issue went to press, we learned that the 64K update and the *Gibson Light Pen* compatible version of *The Graphic Solution* are now available. We plan to review these in depth in a future issue.

A Professional Package

If you need a professional-application animation system and you are willing to spend the time it takes to create something very special, do purchase *The Graphic Solution* by Accent Software. As their advertisements say, "You won't be sorry."

GraFORTH

Reviewed by Tom Flynn

Picture a white bat (Fledermaus) flying against a black sky with a full moon upper left. The bat starts off quite small and flies in three dimensions across the moon and toward you. The wings move up and down and the body turns as the bat slowly approaches. The definition is quite good (eyes. ears, etc.) but the shocker is seeing the bat in proportion, even through its twists and turns. As frosting on the cake, the white bat turns black when it crosses the moon, and all of the action is repeated in reverse color before the end of the demonstration.

The paragraph above describes one of the spectacular demo programs on the *GraFORTH* disk. *GraFORTH,* developed by Paul Lutus, is one of the few computer languages that allows the hobbyist or professional ease and versatility in programming along with true color and high animation speed. The *Gra* is obvious and the *FORTH* is tacked on because it is a FORTH-like language. The *GraFORTH* language uses Reverse Polish Notation (RPN) and a stack structure similar to other FORTH versions but, as Lutus says, it is only a loose relationship.

With proper programming, you can create an animated three-dimensional game with musical background and Old English subtitles with *GraFORTH.* The language was created using integer mathematics in order to provide enough speed to cram all of the above smoothly together.

A Comprehensive Manual

The four part *GraFORTH* manual is comprehensive and suggests ways to use the manual for students at different levels of expertise. Part One gives the

From Insoft, 10175 Barbor Blvd., Suite 202B, Portland, OR 97219. System requirements: the Apple family with 48K RAM and one disk drive. Suggested retail price: $75.

Page # × 1000	48K Applesoft BASIC w/DOS	48K GraFORTH	64K GraFORTH (Language or Expansion) Card w/DOS
.4	Systems, Pointers, Buffers	Buffers, Pointers	Buffers, Pointers
.8	Text & LoRes Graphics	& Text Screen	& Text Screen
1	6K User Space	3K User Space	3K User Space
2		Graphics & Stacks	Graphics & Stacks
3	Graphics Page 1 or User Space	Graphics Screen #0	Graphics Screen #0
4			
5	Graphics Page 2 or User Space	Graphics Screen #1	Graphics Screen #1
6			
7	14K User Space	GraFORTH System and Library	GraFORTH System and Library
8			
8.8			
9			
9.6	String Storage		11.5K Text Editor File Area
9.A	HIMEM		
10			
11	DOS 3.3	DOS 3.3	
12			Text Editor
13	Apple II Hardware I/O	Apple II Hardware I/O	Apple II Hardware I/O
14	Applesoft BASIC and Monitor ROM	Applesoft BASIC and Monitor ROM	Apple II ROM DOS 3.3 and Monitor
15			

Figure 1.

reader an excellent overview and a description of the system requirements in two chapters. The author is forthright (no pun intended) in recommending other sources of reference. If you can, you should read these two chapters before buying the system.

The manual stresses the importance of making a back-up copy. It's easy to do as the disk is not locked. The author suggests Apple's CopyA and I found it worked quite well. The reason for the warning and the suggestion to salt the master away in Fort Knox is that error trapping is minimal. As I went through the practice programs in the book, my oversight and carelessness locked up my Apple to the point where only a power-down would set it free. I could just as easily have damaged the master.

The next seven chapters of the manual take the reader carefully and expertly through the theory and use of *GraFORTH.* As the book claims, Chapter Three has an excellent description of FORTH. Reverse Polish Notation (RPN) is foreign to those of us brought up on algebraic methods. Like flavored medicine, the author makes the information go down almost easily, but a little concentration and some change of habit are still necessary.

After three complete chapters dealing with the "How To" of programming in *GraFORTH,* we finally get to the graphics. At this point I remind you once more that learning *GraFORTH* is not a trivial undertaking. You should be prepared to put in the time and effort required to gain the enjoyment and facility that the author claims for the language.

The next three chapters deal with:

- Two Dimensional Graphics in *GraFORTH* Graphics and turtle-graphics.

- Block Graphics for both the character sets included on the disk and a character editor for making up your own character sets. In this chapter you see how block characters, in color, may be placed together to form a helicopter, and moved around the screen.

- Finally, the text explains and demonstrates the creation of full three dimensional color objects. In order to see, manipulate and change your objects, an Imageditor is provided for creation; a Profile display editor is given as a sort of graphics lathe to generate images that are cylindrical in nature; a Play routine shows you your objects as they move and turn (at your direction) through the three dimensions (X,Y and Z axes). You can also do scaling and transformations. When things look right, just write down the coordinates and incorporate them in your program.

The above may seem a bit confusing if you have not had some experience in computer graphics, Pascal "Turtle-graphics," or other three-dimensional graphics systems. Although, as the author states, it is possible to go through the handbook step-by-step and adequately demonstrate the language abilities, you must read further to understand fully not only what you are achieving by demonstration but also how to amplify and progress with your own graphics.

Last, but by no means least, is the production of music using *GraFORTH* words. Lutus isn't trying to compete with alphaSyntauri, but the music generator is amusing and probably sufficient for the background to any game.

Cons And Pros

After this admittedly brief description, lets look at the overall system. I'll hit the drawbacks first.

Insoft does not stress the fact that this is an advanced game package. If you buy *GraFORTH,* you should want to create a game that is competitive with those made by professionals.

Secondly, the serious programmer should consider getting a language card or other 16K expansion card. Because of the size of the total *GraFORTH* system, an ordinary 48K leaves little room for program development. Other dedicated languages such as C and LISP have the same drawback. Figure 1 represents three memory maps comparing graphics usage on an Apple configured with a) Applesoft only; b) 48K *GraFORTH,* and c) 64K *GraFORTH.* The shaded areas compare the available "user RAM" area, and graphically demonstrate the advantage of the added RAM card. Incidentally, the use of graphics memory maps instead of strings of location numbers gives me a much better idea of where things are and keeps my programs from bumping into each other.

Next, *GraFORTH's* large memory size not only strains the active memory of a 64K Apple, but also pushes the disk capacity of a single drive. So, after you purchase the expansion board, you should start saving up for the other drive you've always wanted. I can compare *GraFORTH* in this respect to Apple's Pascal. Sure, you can run it on one drive, but make sure you have solid reservations for the Funny Farm afterwards.

The DOS used on the *GraFORTH* disk, although compatible with DOS 3.3, is not really DOS 3.3. On "booting up," it senses the presence of an expansion card and boots the DOS upstairs onto the Language Card, leaving more room in the user area. Its disadvantage is that it is the only DOS with which the *GraFORTH* system will work. Like some other game authors, Mr. Lutus is saying "either play in my ballfield, or don't play at all." I find this kind of lock a disadvantage.

To increase speed, The *GraFORTH* screen is smaller than the normal Apple screen. The small size of the Apple screen is already a detraction, and going further in this direction is a mistake.

All these objections, however, could be addressed with the increase in memory size of the new computer generation. Perhaps a rewritten *GraFORTH* that took advantage of the increased memory space would be a "worldbeater."

Now for the bright side. Since each "word" in *GraFORTH* is actually a call to a specific machine language subroutine, you have the advantages of both an interpreter and a compiler. It is better than an interpreter, however, because it doesn't wait until you've said "RUN" before it tells you something's wrong in the middle of a long keyboard-input program.

It also beats a straight compiler where you must enter all your source code, then compile, then find out you're wrong. *GraFORTH* compiles line by line as you go. If you want to see how you are doing and how things look, just hit "RUN".

GraFORTH outperforms other graphics packages in handling ease. You don't need to be a mathematical wizard to achieve startling results. More importantly, the language actually does all that it claims. In the present software world, that is no small achievement.

I have left out many advantages of *GraFORTH,* but if I had mentioned all its attributes I would have rewritten the manual, leaving nothing left for you to savor. *GraFORTH* is a worthwhile graphics package. You will, at the very least, get many hours of enjoyment, and perhaps adopt *GraFORTH* as your main programming language.

FONTRIX

Reviewed by Roberta Schwartz

Fontrix is a character generator, a graphics dump, and a hi-res graphics utility with fonts and pattern that can be used anywhere on the hi-res page. Did I say page? I meant pages! With *Fontrix,* you can make graphics that are sixteen times larger than the Apple screen.

How *Fontrix* Works

Fontrix creates extended screen graphics files, called graffiles, and dumps them to your printer. They can be printed normal or inverse, magnified from one to 25 times, left justified, centered, right justified and/or vertically centered. You may choose to print a single page graphic or an entire graffile.

The package comes with one unprotected disk. There is an interesting update policy — updates will be sent to the software dealers who will be instructed to make copies for customers who have purchased *Fontrix.* In addition, Data Transforms will mail updates upon receipt of the original disk plus $10.00 to defray the cost. There is a fully-illustrated looseleaf manual and a reference card of commands. All of the illustrations and charts in the manual were created with the *Fontrix* Graphic Writer and printed with the *Fontrix* Graphics Dump. The manual's 125 pages contain a table of contents, tutorials, appendices, an index and an excellent trouble-shooting section.

From Data Transforms, Inc., 616 Washington St., Suite 106, Denver, CO 80203. System requirements: Apple II+/IIe with Applesoft® in ROM and 48K RAM, at least one disk drive and DOS 3.3. Suggested retail price: $75.

With Fontrix, you can make graphics that are sixteen times larger than the Apple screen.

The *Fontrix* disk is menu-oriented. When you boot the disk the first time, you see a tutorial demonstration of the program. The authors, realizing that you would not want to see a demo everytime you use a program, programmed the disk so that once it has been configured by the owner, the demo runs only when selected from the menu.

The first thing you do is configure your disk. This is a simple one-time procedure that tells *Fontrix* what hardware (printer, interface, etc.) you will use. The choices are mind-boggling. *Fontrix* works with one or more disk drives. (I strongly recommend at least two, for when you are using different fonts and graphics there will be lots of disk-swapping. Three would be ideal!). *Fontrix* recognizes cursor movement input from paddles, joysticks, tablets, mice and the keyboard. The dump works with over 20 printers, 21 parallel and five serial interface cards. The Tymac, Wizard and Pkaso interface cards have been added to the original compatibility list in the manual. Anytime you change hardware, you can easily reconfigure the disk. You won't forget, because your chosen hardware list is displayed whenever the main menu appears on the screen.

From the main menu, you may:

- Access a disk — This welcome utility allows you to catalog the disk, see available free space on the disk, lock, unlock, rename and delete a file. I have worked with other graphics programs and attempted to alter and resave a picture, only to be informed that the file is locked and there is no more room on the disk. What a time and frustration saver this utility is!
- Edit a Font — The font editor is incredibly easy to use and allows

continued on page 84

THE FONTRIX REVIEW

Demonstration GRAFFILE created by Roberta Schwartz - 1983

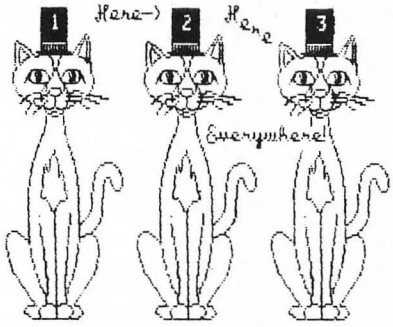
FEATURES

FONT EDITOR
CHARACTER GENERATOR
11 FONTS
DISK ACCESS
WILD CARD SEARCH
GRAFFILES
GRAPHIC LOAD & SAVE
GRAFFILE OPEN & CLOSE
GRAPHICS DUMP
GRAFFILE DUMP
32 TEXTURES
INVERSE OR NORMAL WINDOW
HELP SCREEN
32 BACKGROUND COLORS
32 FOREGROUND COLORS
COMPATIBLE WITH OVER 20 PRINTERS
ACCEPTS MULTIFLE GRAPHIC INPUT DEVICES
ILLUSTRATED MANUAL
REFERENCE CARD
UNPROTECTED DISK

USES

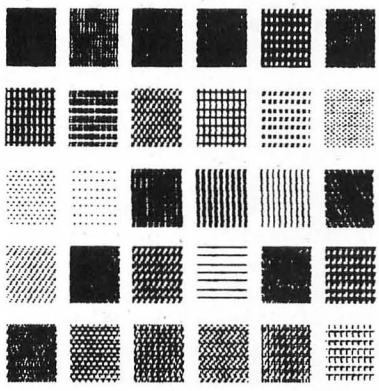
BUSINESS
HOME
EDUCATION
NEWSLETTERS
FLYERS
BULLETINS
PROMOTIONALS
FLOWCHARTS
LAYOUTS
BOOKLETS
CORRESPONDENCE
ADVERTISING
DIAGRAMS

Graphics may be inserted anywhere on the screens. Text may then be added anywhere



PALETTE

Patterns may be used anywhere

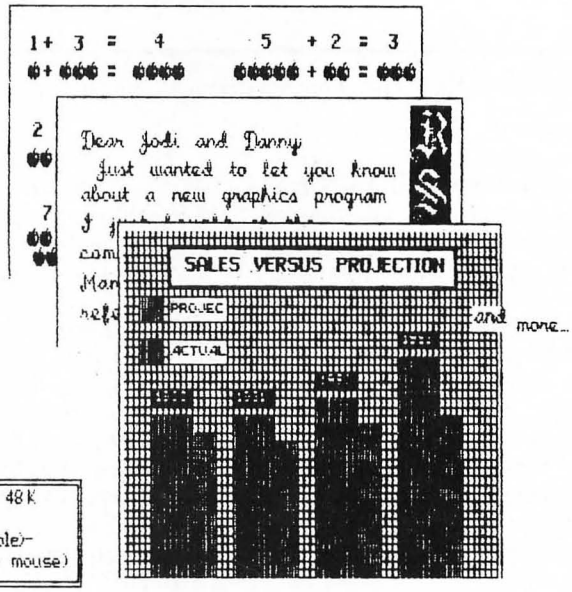


FONTS

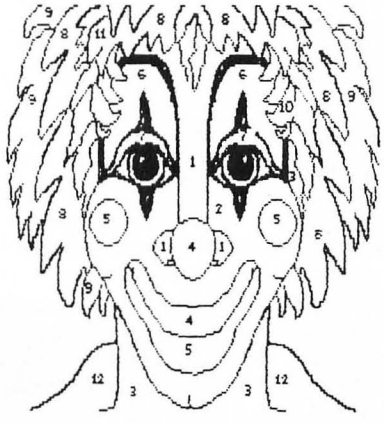
Old English
Roman Headline
Roman
Ascii Bold
Ascii
Primer
Algebra
Greek
Script
Italics
Small

...and you may design your own

APPLICATIONS



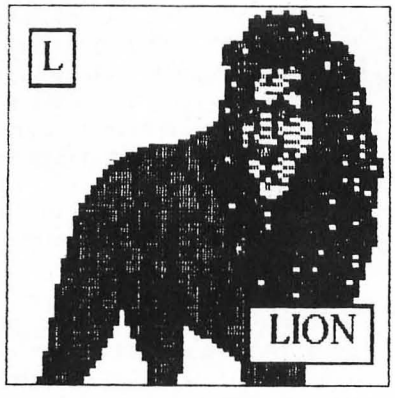
REQUIRED HARDWARE- An Apple I+ or Apple //e. 48K
DOS 3.3 - Applesoft in ROM - One disk drive.
OPTIONAL HARDWARE- Printer (over 20 compatible)-
Graphic input device (joystick, paddle, tablet or mouse)



COLOR ME

1. LIGHT ORANGE
2. MED. ORANGE
3. DARK ORANGE
4. RED ORANGE
5. RED
6. LIGHT BLUE
7. LIGHT GREEN
8. ORANGE
9. BROWN
10. YELLOW
11. OCHRE
12. BLUE

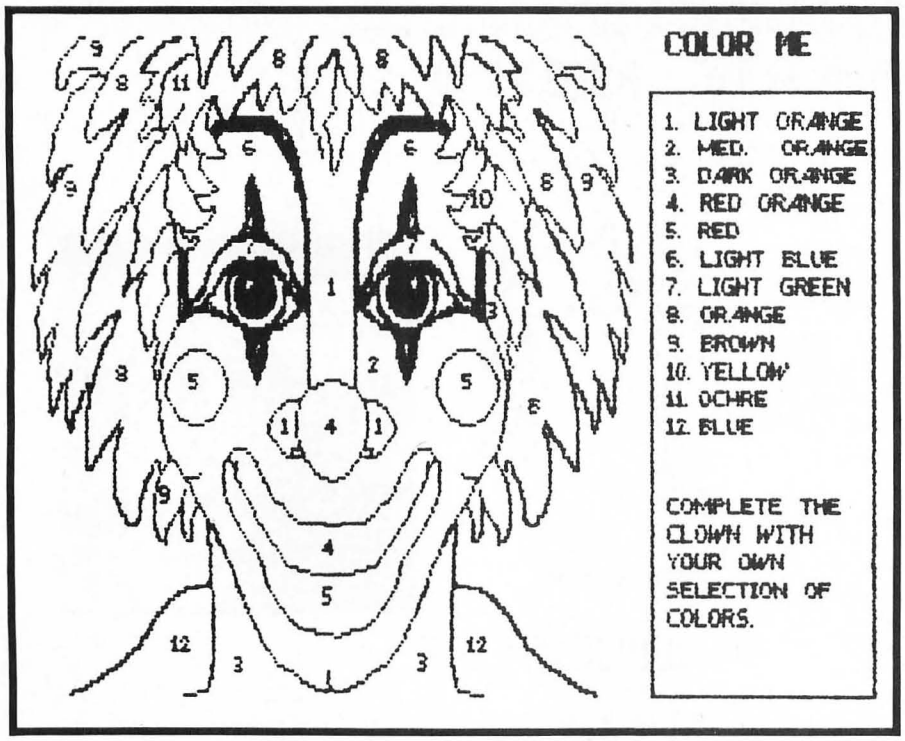
COMPLETE THE CLOWN WITH YOUR OWN SELECTION OF COLORS.



Note:

This graffile is 18 sectors wide (3 1/2 screens) and 24 sectors high (equivalent to 4 screens.

It was made with an Apple I+plus using Fontrix by DataTransforms, and it was printed on an Epson MX-80 with Graftrax. I used the PKASO interface from Interactive Structures.



A close-up of "Color Me" Clown from the demonstration graffile on the preceding page.

Fontrix, ***continued***

characters as large as 32 × 32 pixels. Compare this to the normal Apple type face of 5 × 7. An elegant Old English font provided on the disk exemplifies how detailed and effective a character can be with such freedom in size (See Figure 1.) You can create, edit, copy and overlay characters. As if this were not enough, the authors thoughtfully added another bonus. In the manual there is a keyboard layout chart which you are encouraged to remove and duplicate. By indicating which keys you assigned to your new characters, you always have a ready-reference for all the character sets you design.

● The Graphic Writer — This and The Graphics Dump are the heart and soul of *Fontrix.* The former allows you to create graphics and graffiles; the latter allows you to print your creations.

The Heart And Soul Of *Fontrix*

Enter the Graphic Writer and you wade through a sea of screens. A first glance at the Help screen, listing 27 commands, may intimidate the person who likes to test the water first with his toes, but do dive in. Before long, the commands become second nature and the handy reference card, plus the always available help screen, ease the plunge.

Your first decision in the Graphic Writer is whether or not to open a graffile. All graphics programs let you work with a standard hi-res screen, but only *Fontrix* allows you to open a graffile! Start by inputting its size defined in sectors — horizontal times vertical. The normal Apple hi-res screen occupies 34 sectors (5 × 6 plus a few extra for catalog information). The graffile can be up to 80 sectors horizontally and up to 96 sectors vertically for a total of up to 480 sectors. Thus, you may create a file that is 15 × 18 or 25 × 9, etc. Once you set the parameters, you select "Write on a graphic" from the menu and begin to create.

Like a typesetter, you select fonts and load graphics, place them anywhere, select patterns, add, erase, add, change. While working on a graffile, you can return to the menu anytime to load a different font or graphic and then return to your graffile.

As you move the cursor off the edge of the visible screen, the screen scrolls one sector to the new position in your file. One sector goes out of view and is written to disk while another sector is read from the disk and appears on the screen. The scroll of one sector is equivalent to 1/5 of a screen horizontally and 1/6 of a screen vertically. Depending on the sige of you graffile, you can scroll and scroll and find you still have loads of space ahead of you.

Since this concept may be difficult to grasp, I have designed a graffile for this article (see page 83). On the Epson MX-80, three screen widths is maximum for a printout. Each picture, e.g. the clown, is one full page hi-res graphic. For the most part, I loaded the graphics in and then placed the text around them. This graffile took approximately four minutes to print and demonstrates the enormous potential of this software.

There are many "extras" in the program that make it extremely easy to handle, such as two wildcard characters that can be used for disk access. Also, it is reassuring to know that the program always remembers which drive the graffile disk is in and reminds you to put it there when needed.

Some Comments

I have discussed most of the comments included here with the people at Data Transforms and they assured me they are already working on the improvements where possible. Additionally, future plans call for *Fontrix* companion volumes containing new character sets to be released periodically. The authors invite program users to submit their original fonts and offer $100 for every font they publish. There is also a color driver in the works.

● There is a window set that allows you to work within a confined area for greater accuracy. However, when you return to the menu to load a font or graphic, the window setting defaults to no set. Work would be simplified if you could retain the window setting until reset.

● Pressing the return key returns you to the far left sector of your graffile. This is usually very convenient but sometimes, when working over on the third screen, I inadvertently pressed the return key while typing in copy. It is quite frustrating to hear the drive whirr and see your graffile go whizzing by. You can get back to where you were with no harm done, but it is a frustrating waste of time. Perhaps a two-key command would be better for such an action, while the return key alone could be used to return to the left of the screen you are working on. (By the way, if you set a window, the return key will keep the cursor within the confines of the window as long as it is not set too far to the edges of the visible screen.)

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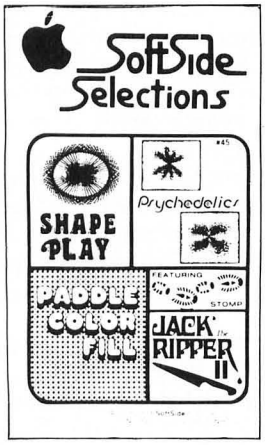
The Magazine *Especially* For Your Apple® Computer



DV
$19.95

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Bound into the center of this issue, you'll find ***SoftSide Selections,*** the handy, pull-out booklet with program listings for your computer. If you bought your copy of ***SoftSide*** at a store or newsstand, your booklet contains this issue's Front Runner, ***Psychedelics.***

This issue, ***SoftSide Selections*** for the Apple II family features:

- ***Psychedelics*** — Special video techniques give you the power to create bizarre effects on your Apple's high-resolution screens.
- ***Shape Play*** — Use some simple Apple shape tables to create your own abstract video designs.

Enhanced Disk Version

If you don't like typing, you need the ***SoftSide*** Disk Version (DV). ***SoftSide*** DV has all the programs in ***SoftSide Selections,*** plus the latest installment of the ***SoftSide*** Adventure Series and a *bonus program.* You get all this, and the benefits that only a disk can offer: speed, reliability and versatility.

- ***Apple DV Bonus Program: Paddle Color Fill***

Use this powerful graphics utility to create beautiful, high-resolution graphics displays. With just a pair of game paddles, you can paint and fill in areas in a multitude of colors.

- ***The SoftSide Adventure Series***

This issue's Adventure: ***Jack The Ripper II,*** by Peter Kirsch.

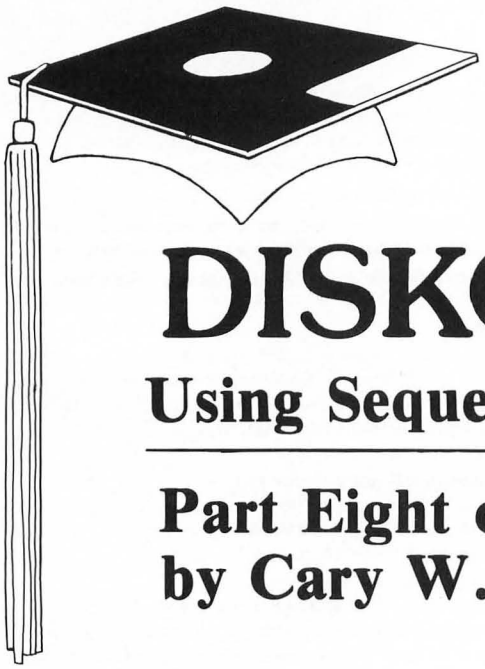
Your grandfather chased the evil Ripper to a watery death in the River Thames, or so he thought. Now it seems that the Ripper lives again...

To order your copy of this issue's Disk Version, or to subscribe to the ***SoftSide*** Disk Version, see the bind-in cards opposite page 34.

Figure 1.

- It would be wonderful if graphics could be cropped in some way. In other words, if the window setting stayed fixed you could load just part of the graphic into the specified window area. Presently the entire graphic is loaded and takes up one full screen (30 sectors).
- A move routine would be very helpful. Once you have put a graphic or area of copy down, you cannot shift it. The authors assured me they hope to effect this in future issues.
- After going to the menu to load a font or graphic, you are returned to your area of the graffile with the cursor in the home position. It would be more practical to have the cursor stay where you left it. You may have planned carefully just where the text should go, stopped to load the font, and find you have to move the cursor around to the proper position again.
- The manual, although beautifully done and quite clear overall, lacks organization. Also, the index is incomplete. The beauty of an index, unlike a table of contents, is that you may look up key words and find the page that references them. A search for "uppercase" or "lowercase" in this index reveals nothing. You must search through the manual for the section on fonts and then search again for the information required. This is true for other items, as well.
- There are no limits mentioned as to how large a file a particular printer can print. I worked on a graffile that was five screens across, only to print it out and find two screens lopped off. When I mentioned this to the authors they told me that they had intended to include a chart of specifications for all the printers compatible with *Fontrix,* but it wasn't ready when the package was released. Plans are to include this in the next update.
- Rotation capabilities in the graphics dump would be most welcome. This would allow more freedom in designing graffiles.

In spite of this lengthy list of comments, I do not wish to imply that this is an incomplete package. My suggestions come under the category of "wishful thinking." *Fontrix,* as it is, is an excellent package. I recommend it strongly to anyone who wants to explore the graphics capabilities of his or her computer. *Fontrix* will let you do what no other graphics software lets you do. What's more, you will enjoy doing it. Who can ask for anything more?



APPLE DISKOURSE

Using Sequential Disk Files

Part Eight of a Series by Cary W. Bradley

This is the second Diskourse article intended for those learning to use DOS files in Applesoft™ BASIC programs. In this installment we will look at a program that uses a sequential file, and discuss the design of the program and the file. I assume you have some knowledge of the DOS file commands, but not a lot of experience using them within programs. Refer to the DOS Manual for basic information on the commands. Some elementary techniques for handling data in sequential files were covered in Part Seven of this series.

The Sample Program

I chose a fairly simple program for this illustration, so we can concentrate more on the use of the file than on the inner workings of the program. The two are not easily separable, and you must consider both when writing programs. Even if you don't think you'll use this specific program, it has some value if you're interested in learning to use files. Follow its development, and you will see the general pattern to follow in your own programming.

SCORESAVER actually is a subroutine for a game program. It maintains a file of the ten highest scores achieved in the game, along with the initials of the players who made each of the scores — similar to many arcade games. The short routine at the beginning of the program is to be replaced by your game — more about that later. The SCORESAVER subroutine itself is numbered, beginning with line 62000, so you can tack it onto the end of your program.

The objective is to define the type of data needed, and develop the file structure to handle the job. We'll also look at one way to minimize the potential for lost data in the event of a power loss or other problem while the file is open.

Analyze the Problem

The first step is to define the type of data to be stored, and then the nature of the file to hold it. The ten scores and ten sets of initials can be stored in two arrays — an arithmetic and a string array. The section of the program that displays the scores allows eight digits. You can change it if it's not enough. Although this input routine does not verify that the score is a whole number, it should be, since the display routine was not designed with decimal places in mind.

The file structure is straightforward — ten pairs of values, arranged as "initials, score, initials, score,...." The file contains a fixed amount of data, one of the situations covered previously. Choosing to use a file of a fixed, known length simplifies the process of reading the file.

A sequential file is a good choice for this application, because the data has a natural sequence (the ranking of the scores), and we don't need to jump around in the file and change selected items. Also, the amount of data is small. When you have a small amount of data to put in a file, using a sequential file is more convenient, regardless of what the data looks like. In this case, the entire file is rewritten whenever new data is added to the file; it's simple, and quick.

A major consideration for determining the file structure is how the program uses the data. At the end of the game, the routine reads the high score file (HISCORE), and compares the player's score (SC) to each score in the file. As soon as it encounters a score lower than the one just made, it knows the new score belongs in the top ten, gets the player's initials and places the information in the high score listing. If it gets all the way through the file without finding a score lower than the current one, the player has not made the top ten, and it just prints the current high scores on the screen.

Examining the Loopholes

This sounds like a workable scheme, but what about loopholes? In this case, the most obvious problem is a tie. Often you may not have the flexibility to make your own rules, but in this case my arbitrary decision is to list tie scores in chronological order. If a player ties the tenth highest score, he won't make the list.

Our file design calls for a fixed amount of data. The program (Listing 1) expects to find a file with exactly ten initials and ten scores. So what happens the first ten times the game is played? To solve this problem, generate a dummy file with null strings for initials and zeroes for scores. That keeps the subroutine happy by providing it with the data as it needs, while telling it that these dummy entries do not represent valid scores, and should not be displayed as such.

Since null strings have a special meaning to the program, it was necessary to make sure that a player can't enter a null string for his own initials. Spaces for initials are also not allowed, because a sequence of characters consisting solely of spaces will be interpreted by INPUT as a null string. The input routine for the initials is an example of how to assure that your file receives only the proper kind of data. It accepts nothing but letters, and the string must be either two or three characters long. With some thought, you can make your programs ignore anything but the kind of data they need.

The short program MAKEFILE, which generates the dummy, actually has two purposes. Primarily, it provides an empty file for the subroutine to use when the game is brand new. To the programmer, it provides a way of generating a blank file to begin testing

again if he alters the high score subroutine.

All these preliminaries may seem simple — in this case they are extremely so, but this is where beginning programmers make their most costly mistakes. By skipping this simple part, you actually make the rest of your programming job harder. The best advice to beginning programmers is to take the time to iron out the details *before* you begin to write code. If you don't, you'll have problems you never anticipated, and may spend twice as much time writing the program as you should have.

MAKEFILE Program

```
100 D$ =  CHR$ (4):IN$ = "":HS =
    0
110  PRINT D$"OPENHISCORES"
120  PRINT D$"CLOSEHISCORES"
130  PRINT D$"DELETEHISCORES"
140  PRINT D$"OPENHISCORES"
150  PRINT D$"WRITEHISCORES"
160  FOR N = 1 TO 10: PRINT IN$: PRINT
    HS: NEXT
170  PRINT D$"CLOSEHISCORES"
180  END
```

Stubs and Dummy Data

The toughest part of the project that involves the high score subroutine is writing the game. Sorry, but you'll have to do that yourself. In place of the game, I've provided a simple routine that allows you to type in a score which you decide to receive in a hypothetical game. This is a common programming technique. Such a routine is often called a "stub," and is used to feed known values to a subroutine to test its validity under as many different circumstances as you can imagine. Even if you had written the entire game program prior to the high score subroutine, writing a stub to test the high score routine is useful. If you don't, you might never create that one situation that exposes a fatal bug. Stubs permit you to build a program in modules, test each module thoroughly, and then join them together in one good program.

Protecting Your Data Files

If you've read your DOS manual, you know that when you open a sequential file and write to it, any data already in the file is written over. Thus, never write information back into the same sequential file. If you do, a power loss or other unexpected error could result in the loss of valuable data. This may not be so important in the case of our high game scores — it certainly wouldn't be the end of the world if the file were accidentally clobbered. But if your file contains your company's inventory records for the last six months and you have a serious problem while updating the file, you could have big trouble.

To reduce the chance of losing data, use the following technique whenever possible. Before writing anything into the file, first create a backup copy by renaming the original file. Then rewrite the original file from scratch, using the values read from the original version (now the backup) along with the values being added to the file. If something should go wrong during this process, rename the backup file manually with the original name, and try again. All that is lost is the score you were attempting to add to the file.

If an application requires so much disk space that it is not practical to store two copies of the file, you should create backups more frequently on a separate disk. Remember, also, that the ongoing backup procedure used in this program does not eliminate the need to back up your files on a separate disk.

Summary

Even a short example like this teaches a lot, if you work through it carefully. As your programming projects become more ambitious, you'll discover that these same basic techniques and ideas still work. The main points to keep in mind are these:

- Plan your data structures and files carefully before starting to write the program. Know how your program puts information into the file, and how it retrieves data for later use. Try to anticipate any exceptional conditions that could cause your file scheme to go awry.
- Coordinate your program carefully with the file structure, so the kind of data you write into your file is exactly what is expected when the file is read.
- Avoid writing information into the same file that is being read. If you must rewrite the file that you read from, use a scheme like the one discussed to make sure that a copy of the original file is intact at all times (disk space permitting).
- Get into the habit of creating backup copies of important disk files, especially when your work disk has only one copy of the file, and the information changes frequently.
- In this program, the small amount of data in the file makes it practical to rewrite the entire file when adding new information. In some applications, however, this could take an unacceptable amount of time, or require more disk space than you have. If you have a lot of data that needs to be changed frequently, random access files might be a better way handle your information. We'll look at them in the next issue.

SCORESAVER Variables

A$: GET variable (Y or N).
CH: ASCII value of key pressed during input of player's initials.
D$: CTRL-D (DOS command prefix).
G$: CTRL-G (Bell).
H$: Right-justified string equivalent of a game score.
HS(*): The high score array.
IN$(*): The players' initials array.
L$(*): Array of characters used during input of a player's initials.
N: A counter (miscellaneous uses).
NP: Subscript of new score placed in high score array.
P: Loop variable.
SC: Score player earned in the game. (This is the only variable that must be supplied to the subroutine by your game.)

Listing 1: SCORESAVER

```
100  DIM HS(10),IN$(10),L$(4)
110 D$ =  CHR$ (4):G$ =  CHR$ (7)

120  TEXT : HOME : VTAB 8
130  INVERSE : PRINT " TEST ROUTI
     NE FOR HIGH SCORE PROGRAM ":
      NORMAL : PRINT
140  PRINT "(REPLACE THIS PORTION
      OF THE PROGRAM    WITH YOUR
      GAME)": PRINT
150  INPUT "TYPE IN A SAMPLE SCOR
     E: ";SC: PRINT
160  GOSUB 62000
170  VTAB 23: HTAB 4: PRINT "DO Y
     OU WANT TO PLAY AGAIN? (Y/N)
      ";: GET A$
180  IF A$ = "Y" THEN 120
190  IF A$ <  > "N" THEN 170
200  END
62000  PRINT D$"OPENHISCORES"
```

ATARI®

Designs From Your with Atari® Graphics

Reviewed by Scott Berfield

Designs From Your Mind With Atari Graphics is a wonderful book, no doubt about it. I firmly believe that every new Atari owner should receive a copy with his computer. It presents clear and concise information on all the graphics modes, Player-Missile Graphics, character sets and animation. Presented along with this technical information is a wonderful explanation of design and composition. There is an attitude throughout the book of a childlike wonder and joy in creativity. The author sees the computer as a tool (not unlike a box of crayons!) which allows us to play with our creative talents.

By Tom Rowley (Reston Publishing Company, Inc., Reston, VA 22090). Retail price: $12.95.

The Basics And More

The book consists of two parts. Part one is an introduction to shapes, colors, screen design and the basics of the Atari graphics system. It is geared to the novice. Part two examines more advanced techniques, including character sets and Player-Missile Graphics, and requires more familiarity with the inner workings of the machine. Both parts are set up as tutorials with "challenges" every few pages to allow you to practice what you've learned. Questions are scattered throughout the book which quiz your understanding, and every chapter concludes with a review test.

APPLE®

Apple Diskourse, ***continued***

```
62010  PRINT D$"READHISCORES"
62020  FOR N = 1 TO 10
62030  INPUT IN$(N),HS(N)
62040  NEXT N
62050  PRINT D$"CLOSEHISCORES"
62100  HOME :NP = 0
62110  FOR N = 1 TO 10
62120  IF SC <  = HS(N) THEN 6215
     0
62130 NP = N: VTAB 10: HTAB 11: INVERSE
62140  PRINT G$;G$;G$;" CONGRATUL
     ATIONS... ": PRINT :N = 10
62150  NEXT N
62160  IF NP = 0 THEN 62600
62170  HTAB 6: IF NP = 1 THEN  PRINT
     " YOUR SCORE IS A NEW RECORD
     ! ": GOTO 62190
62180  PRINT " YOUR SCORE IS IN T
     HE TOP TEN. "
62190  FOR N = 10 TO NP + 1 STEP
      - 1
62200 HS(N) = HS(N - 1):IN$(N) =
     IN$(N - 1): NEXT N:HS(NP) =
     SC
62300  FOR N = 1 TO 4:L$(N) = " "
     : NEXT
62310 N = 1: VTAB 15: NORMAL : PRINT
      TAB( 5)"PLEASE ENTER YOUR I
     NITIALS: ";
62320  HTAB 33: FOR P = 1 TO 4: IF
     N = P THEN  FLASH
62330  PRINT L$(P);: NORMAL : NEXT
62340  POKE  - 16368,0: HTAB 32 +
     N
62350  IF  PEEK ( - 16384) < 128 THEN
     62350
62360 CH =  PEEK ( - 16384) - 128
     : POKE  - 16368,0
62370  IF CH = 13 THEN 62460
62380  IF CH = 8 THEN 62420
62390  IF CH = 21 THEN 62440
62400  IF CH < 65 OR CH > 90 OR N
      > 3 THEN 62320
62410 L$(N) =  CHR$ (CH):N = N +
     1: GOTO 62320
62420  IF N > 1 THEN N = N - 1
62430  GOTO 62320
62440  IF N < 4 AND L$(N) > " " THEN
     N = N + 1
62450  GOTO 62320
62460  IF L$(2) = " " THEN 62320
62470 IN$(NP) = L$(1) + L$(2) + L
     $(3): HTAB 33: PRINT IN$(NP)
      " "
62500  PRINT : PRINT D$"OPENHISCO
     RES.B"
62510  PRINT D$"CLOSEHISCORES.B"
62520  PRINT D$"DELETEHISCORES.B"
62530  PRINT D$"RENAMEHISCORES,HI
     SCORES.B"
62540  PRINT D$"OPENHISCORES"
62550  PRINT D$"WRITEHISCORES"
62560  FOR N = 1 TO 10
62570  PRINT IN$(N): PRINT HS(N)
62580  NEXT
62590  PRINT D$"CLOSEHISCORES"
62600  HOME : VTAB 7: HTAB 11
62610  INVERSE : PRINT " *** HIGH
      SCORES *** ": NORMAL : PRINT
62620  FOR N = 1 TO 10
62630  IF IN$(N) = "" THEN IN$(N)
     = "---"
62640  IF HS(N) = 0 THEN H$ = "--
     ------": GOTO 62660
62650 H$ =  RIGHT$ ("      " +  STR$
     (HS(N)),6)
62660  PRINT  TAB( 14)IN$(N); TAB(
     21)H$
62670  NEXT N
62680  RETURN
```

Mind

This book is about an exciting feeling from within.
This book is about a stimulation of your visual sense.
This book is about a sense of satisfaction.
This book is about the opportunity to unleash your creative talents.

— from the Introduction, *Designs From Your Mind With Atari Graphics*

Part one starts out with very clear explanations of all the BASIC graphics commands. This includes an unusually cogent definition of the relationship between setcolor and color. Chapter two continues this with examples of the various graphics modes and their capabilities.

Something Special

Chapter three is what makes this book special for me. Titled "Colors and Contrasts," it begins with the following paragraph:

> In chapter 2 we learned to control the colors displayed on the TV screen. But color video graphics is much more than a display of varying screen colors. Just as the artist can express himself with colors on a canvas, so must the video composer be able to express a variety of feelings with the colors on the TV screen.

The chapter proceeds to present something I have never seen in a computer text: an explanation of color theory and composition. Using a short program to display bars of color, the author demonstrates the various effects of contrasting hue, contrasting luminance, contrasting temperatures and feelings (Yes, colors have or at least invoke temperature and feelings of all types). He explores the relationships between complementary colors, and the relative weight of colors when balancing a composition. All of the above is part of basic design and should be considered in every color composition, no matter the medium. Has anyone talked about them in relation to computer graphics lately?

Chapter four is an explanation of one and two point perspective, and how to use them. The example used draws a sidewalk and shades it to enhance the apparent depth.

The last section of Part One pulls all of the preceding information together to create a picture on the screen. The process followed is to: "Translate a story into a picture. Project various visual sensations. Design a video artpiece." According to the author, "Imagining is the first and most important part of video graphics design." Toward this end, the chapter starts out with an evocative little story to form a picture in your mind. Colors are then selected and, in a very nice introduction to structured programming, the image is built up, element by element.

Part two swings into a more technical mode with explanations of raster video, custom display lists (including writing to the screen), player/missile graphics, custom character sets, and finally animation techniques, which range from color manipulation to moving PM images. There is little here that is not covered in more depth elsewhere, but as an introduction to the special Atari capabilities you won't find a better text anywhere. All information is presented in a clear, logical fashion and I only wish I had had this book two years ago when I bought my computer.

Express Yourself

This book would be valuable even if all it contained was an introduction to Atari graphics. Including the fundamentals of design and color theory make it invaluable. The whole book is dedicated to creative expression. As the computer enters every facet of our lives, it can be a great tool for personal expression, with the right approach. I wholeheartedly recommend this book, even to those familiar with the Atari and programming. After you read it, you might find yourself seeing things differently.

The Versa Writer

Reviewed by Spyder Webb

If you've ever hoped you could turn your Atari into one of those magnificent *Tron* style graphics machines, forget it. There is this nifty little graphics tablet made out in California, however, that might have you rubbing your hands in anticipation as you see its possibilities unfold before you. Whether you want to "Sunday Paint" or use it as a serious professional tool, the *VersaWriter* offers an impressive array of capabilities.

Colors, Colors, Everywhere!

First, you have a choice of four colors in the familiar graphics 7 mode (160 × 80 split screen, 160 × 96 full screen), which Versa calls medium-res. Then you have a choice of sixty-four (64!) colors in graphics 8, called high-res (320 × 160 split screen, 320 × 192 full screen). When I say colors, I'm using the term loosely. There are a few colors and many patterns made up of those colors. Still, you can accomplish much, given the choices. You can have another set of colors to choose from, if, while in the "fill" mode (more about that later) you press I to reverse ("Invert") the picture. White and black reverse, but so do the colors. You'll have to do a lot of experimenting, or build your own inverse color chart and photograph the screen, before you know what your color choice will actually look like — the color test area, you see, remains in the "normal" mode even though the picture is reversed.

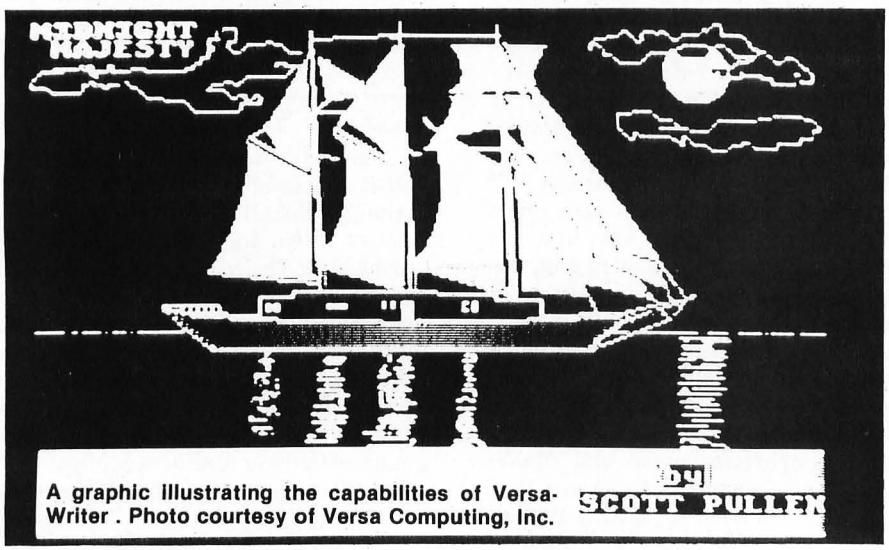
From Versa Computing, Inc., 887 Conestoga Circle, Newbury Park, CA 91320. System requirements: Atari 400/800 with 32K RAM, disk drive and BASIC cartridge. Also available in slightly different versions for the Apple® and IBM® PC. Suggested retail price: $299.

Creating With *VersaWriter*

The *VersaWriter* is a lightweight plastic tablet measuring 13½ × 12 inches. It is held comfortably in the lap or used on a desk or drafting table. You draw by holding a clear plastic disk at the end of what looks like a tinkertoy robot arm arrangement. The arm lifts very slightly. In order to lift your pencil to a new position without drawing through everything in between, the manual tells you to push P. Then, when you're ready to draw again, you push the number corresponding to the color you're using. Since I often draw with color 1, this constant back and forth is maddening (1 and P are at different ends of the keyboard). Fortunately, the RETURN key and the space bar perform a similar function, allowing you to keep your eyes on your work. If you push the space bar twice, however, it draws a straight line between the point where it was first pushed and the point where it was last pushed. A very handy feature, but *only* when you want it.

I have drawn some unwanted straight lines through pictures using the above method, and I strongly recommend saving your screens often as you work — it's not worth the heartbreak of starting over. Versa makes it fairly easy to save and load screens, as well as to put pictures into your own programs.

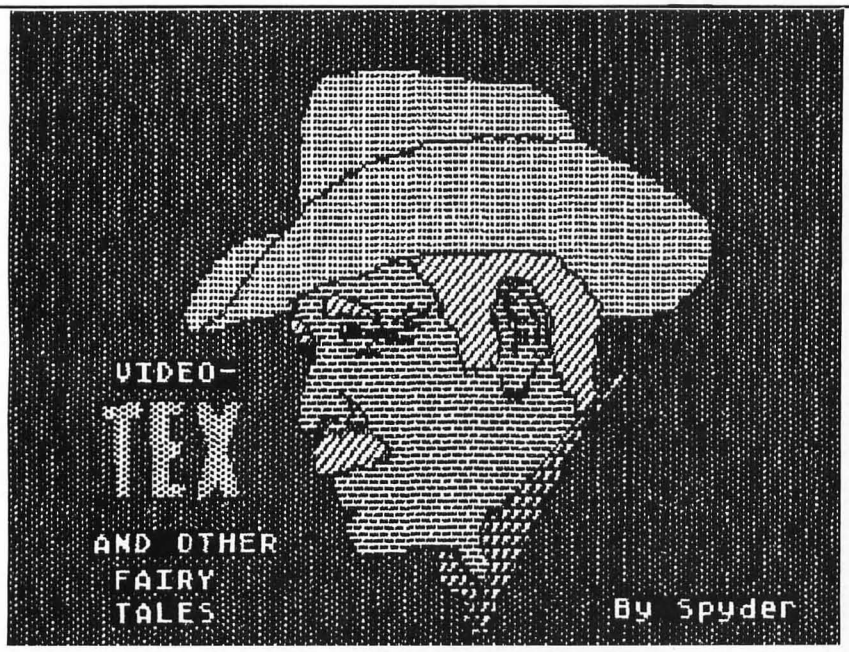
A sheet of transparent acetate, taped at the top edge, covers the drawing area itself. You place whatever (if anything) you want to trace underneath the acetate and trace the line you want with the pointer (an inscribed mark in the center of the clear plastic disk). It takes a little practice, but the motion is smooth.



A graphic illustrating the capabilities of VersaWriter. Photo courtesy of Versa Computing, Inc.

A Command Sampler

Not wanting to spoil our fun, the folks at Versa Computing have put a few little surprises in the package for us to discover on our own. Should you be stuck for an answer, though, the Versa people are extremely helpful and responsive. There are 25 separate commands each in the high-res and medium-res modes, more than space allows me to cover individually, but I'll hit the high points.



With VersaWriter, you can mix text and graphics on the same screen.

You can draw in one of four colors (including the background color) in either mode, but the high-res functions a bit awkwardly. Colors one and zero (white and black) work perfectly. You have to draw slowly in colors two and three, or the line breaks up into a series of dots, with the space between them proportional to the speed of the cursor.

This, by the way, is very much like the "airbrush" feature, which allows you some control over shading. This is a potentially beautiful and subtle feature, but I have found it difficult to control. Unlike tracing, shading is an activity in which you *must* be looking at the shape you are shading *and* the immediate results of the shading simultaneously and in real time. I don't see how anything other than a light pen can accomplish this, but perhaps others will find this command feature useful in its present form.

The "fill" commands are real time savers, but again there is a difference between the high-res and medium-res modes. The medium-res apparently uses the standard Atari method of filling. It stops frequently, and cannot fill around odd shapes. For the high-res, however, Versa has written an entirely new fill program, and it works like a dream. Position the cursor where you want it. As long as your drawing is bounded by solid lines or the screen edge, it will fill every bit of it. Caution: Any small break in the outline will result in the color "spilling" out and filling whatever shape it finds next. In medium-res, a push of the "ESC" key puts an end to this dismaying spectacle. Unfortunately, high-res insists that you watch the process through to its miserable conclusion or do a system reset, type RUN, then repair the damage or reload the picture. (You've been saving screens frequently as you worked, right?).

Although the Atari version of the *VersaWriter* currently lacks a "zoom" command, it has a useful command which allows you to change the X and Y scaling from four times larger to four times smaller by typing in the scale change from 0.25 to 4.0. The two axes are independently controllable, thus allowing for straight enlargement or reduction from your normal scale, or any degree of horizontal or vertical distortion. Note: This command only functions when you are putting the image on the screen for the first time — once you've got it on the screen, that's the way it stays.

The ability to erase or edit is crucial, and with a choice of five brush widths in any of the four drawing colors (both high and medium-resolution) Versa has met that need. The drawback here is the agonizing lag between hand movement and brush movement. Keep it slow if you want to know where you're going.

Be careful when you use the "smoothing" feature. This allows you to choose from five degrees of smoothing, thus permitting long, flowing lines (They still have the "jaggies," but they're minimal). This program eliminates those slight shakes from the hand motion as you move the cursor around. Unfortunately, you have to proceed slowly, particularly as you increase the smoothing, if you want to preserve the lines in your original tracing. It's fine for graceful freehand lines, but you may see some odd things happening to your drawings if you try to trace something accurately.

A complete shape maker program allows you to take images from any part or all of the screen, call them back from memory, and print them anywhere on the screen. You can unprint them from a background, overprint them onto an existing graphic, and more.

All This, And Text Too

Fine, you say. I've got the pictures, but what about text? Of course — wherever you want it on the screen. There is standard Atari style text, a fancy, stylish modification of that, computer-style type (such as the magnetic printing on the bottom of checks), and Greek. Yes, it's really Greek. I'm told a lot of engineers use this.

Which leads me to my list of gripes. I wish a few features had been left out, and others added. I could really use a program to draw circles and ellipses (some non-Atari versions have this). As an artist, I wish the Greek had been eliminated and the disk space used for other things. As a matter of fact, I wish the whole medium-res mode had been left off, and the ability to zoom, rotate, specify color fade-outs and fade-ins, and pick up and move irregular shapes (not just rectangles) had been added.

Without a light pen, the airbrush feature should have been left out. I would love to be able to save an image from the "fill" mode without having to "quit" the mode first, save, then reenter. This is easy to do, but time-consuming and frustrating if you're working on a complex picture and want to save the screen often. The temptation is not to save the screen and avoid breaking the creative flow — a dangerous way to live! I'd also like a quick way to stop a high-res fill gone wrong. The drawing arm arrangement is a little clumsy, but certainly not impossible. The software is not write protected, so you can make backups, and if you care to, modifications of your own to custom tailor the software to your needs. Versa is updating and improving the software constantly, so the documentation will not always match the software. That's not an insurmountable problem, and it's a price I'm willing to pay.

And there, I think, is the whole point of the *VersaWriter*. For the money, it is an extraordinarily powerful and useful general purpose artist's tool. It's not the ultimate in computer graphics, but it takes the Atari closer than I thought possible toward that elusive goal.

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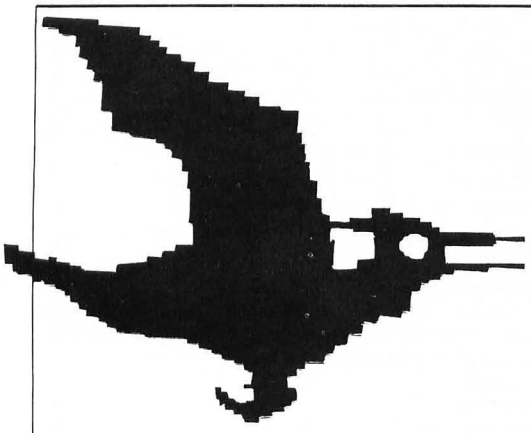


PM animator

Reviewed by Carl M. Firman

I just had a green dragon in my house. He had a white knight on his back. The knight was holding a yellow light saber, so he was obviously a good guy. He walked across my TV screen with a delicate stomp-stomp-stomp. A most delightful creature — I found him in the demo program on the *PM Animator* disk from Don't Ask Software.

This dragon moved across my screen because he was a *player missile* and walked because he was *animated.* The ability to move player missiles is built into your Atari; animation is not. With *PM Animator,* however, you can add animation to your Atari and do it all from BASIC.

Animation And Motion

Good player missile (PM) animation and motion require some sophisticated machine language routines. *PM Animator* provides these routines and allows you to use them without knowledge of machine language. We will talk about these in depth later — keep reading.

Simple animation consists of two different pictures of the same subject shown in rapid succession. If you draw two different frames (pictures) of the green dragon with his legs in different positions, and flip rapidly between the two frames, his legs appear to move. This is called two step animation, which can be rather jerky or create the impression of moving quite rapidly. Smooth animation requires more dragons. You have to flip through a series of different frames, each frame showing the dragon's legs in a slightly different position. You need about five different frames to create smooth animation.

From Don't Ask Computer Software, 2265 Westwood Blvd., Suite B-150, Los Angeles, CA 90064. System requirements: Atari 400/800 with 32K, BASIC and disk drive. Suggested retail price: $44.95.

Drawing five different frames for each of your Atari's four PM'S with pencil and paper would be a difficult task. Enter *PM Animator's* two main utility programs — the Grafix Editor and the File Editor. These two programs make a difficult job easier.

The Grafix Editor

The Grafix Editor is an all-purpose frame drawing, editing and animation tool. It allows you to animate frames, in any sequence, as you draw them. You can also design animated figures in three colors. With this tool, you can see and perfect your animations before they are transferred into a program.

The Grafix Editor screen is divided into two parts. The right side of the screen displays a command menu containing sixteen options. The left side of the screen contains two graphics windows.

The command menu functions select what you want the editor to do. Some of them call up sub menus. Whatever your option choice, you are prompted by written messages on the screen — you don't have to keep referring to the manual. The available functions cover everything from drawing with the joystick or keyboard to viewing animation. Also included are functions to LOAD and SAVE your animation frames, plus a sub menu of the most needed DOS functions.

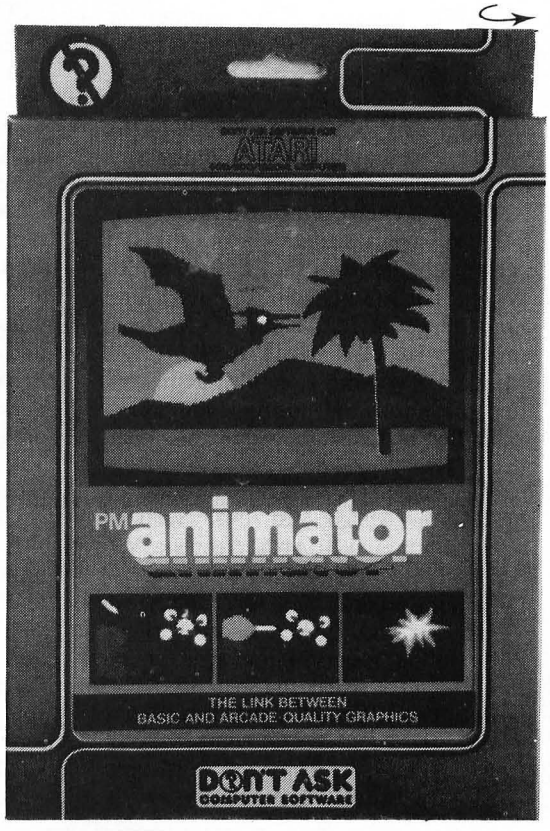
You draw your frames in a large editing window on the top left of the screen, and view animation in a smaller window below the editing window. You can draw up to sixteen frames at one time. If you need more than one set of sixteen animation frames, you must save the first set of frames to disk. You may then draw and save a second set of frames.

The File Editor

Once you have created a series of "frame files" you may want to append one file to another, or change the sequence of frames in a file. These are the functions of the file editor, which can reorganize and create animation files of up to 50 frames. In effect, the file editor is the "film cutting room" for your animation frames — it's the final step before using animation in your program.

Using Animation

Those machine language (ML) routines I mentioned earlier make incorporating PM animation and motion into your own program easy. These ML routines are on the *PM Animator* disk under the file name TOTAL.LST, and



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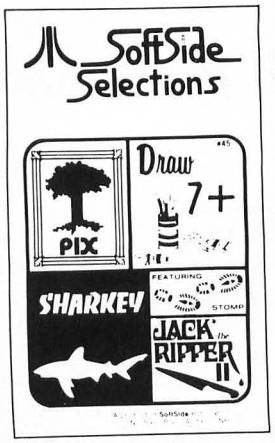

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This issue, ***SoftSide Selections*** for the Atari features:

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- ***DV and CV Bonus: The SoftSide Adventure Series***

This issue's Adventure: ***Jack The Ripper II,*** by Peter Kirsch

Your grandfather chased the evil Ripper to a watery death in the River Thames, or so he thought. Now it seems that the Ripper lives again...

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PM Animator, *continued*

they are all accessible from BASIC via the USR function. The routines in TOTAL.LST do everything from moving a PM to animating multiple PM's as one PM. TOTAL.LST even sets up all the necessary PEEKs and POKEs to enable PM graphics and initializes all variables necessary to use animation.

To move your PM around the screen, you use the horizontal position (HP) register built into the PM graphics system. All you need do to move a PM horizontally is POKE the HP register (memory locations 53248 to 53251, one for each PM) with a number representing the horizontal position you want. Your PM instantly moves to this location. The Atari doesn't have a VP register, but TOTAL.LST contains an ML routine called VBLANK (vertical blank routine). VBLANK creates a VP register that your computer checks every 1/60th of a second. Now you can poke a VP register and get high speed vertical PM motion. To make things even easier, *PM Animator* stores the memory locations of the HP and VP registers in two variables (HP and VP, of course). Your BASIC program can now move players vertically and horizontally with statements like "POKE VP,100" or "POKE HP,90".

If you just want to move your PM, you only need VBLANK. However, if you have a series of PM frames to animate, you will need ROT$, CLER$, LD$ and possibly SUMOVE$, which are other ML routines found in TOTAL.LST.

ROT$ does the actual animation by rapidly moving your different frames from a storage area in memory to the PM area of memory. (It is the PM area that is visible on your screen.) This routine does not destroy frames in memory; it simply moves them around. It can move slightly different frames so fast that your dragon's legs seem to move. You use VBLANK and ROT$ together, one to move and the other to animate.

CLER$ clears an area of memory at ML speed, and is useful if PM characters are changed fast. Let's assume you want to change the dragon to a knight. CLER$ would clear the dragon data out of the PM area and ROT$ could then move the knight data into the PM memory area. If you didn't use CLER$, you might have some dragon parts mixed up with your knight.

You use LD$ to load files of animation data into your program at ML speeds. In fact, this routine will load *any* ATASCII file whether or not it contains animation data. All you need to tell LD$ is the number of bytes to load and where in memory to put them.

SUMOVE$ is called the supermover routine. It moves all four PM's together as one large detailed PM or as one or two three-color PM's. It is used to animate the dragon in the demo program. Not only does it move all four players as one, but it is the first routine I have seen that does it without jerkiness.

The Last Move

PM Animator comes with an excellent 80 page manual that explains everything; it even includes a "Player Missile Tutorial" and a section on "Creating Animation."

PM Animator almost completely does away with graph paper and frazzled nerves. It will improve the quality of your animation work and significantly reduce the amount of time spent by about 90 percent. It's one heck of a buy for the money. You can do a great frame up job with *PM Animator* — happy moves.

Having the DOSPLUS 3.5 operating system up on my computer is like having a private key to my favorite computer shop.

DOSPLUS 3.5

Reviewed by Robert C. Kyle

Trying to describe the *DOSPLUS 3.5* operating system is like trying to describe a custom Rolls-Royce to a covered wagon owner. The features that would make me give up food, drink and "that too," for a computer, might just give you heartburn. The best way to put it is to say that *DOSPLUS 3.5* puts the TRS-80 Model I and III in league with the "big boys."

I cut my teeth on DOSPLUS 3.3 and the Model III back in 1981, when everyone who had the system used either the extended version or the tiny TDOS system. DOSPLUS 3.4 added little, in my opinion, except for much improved documentation. But with *DOSPLUS 3.5,* the Model III has finally grown up!

Documentation for the 3.5 version is very impressive — a far cry from the 3.3 high school notebook version, and heads above the 3.4 manual. The explanations of the patches and filters are shallow — some of them are not explained at all; but if you list the file, usually you can figure out what it is supposed to do.

From Micro-Systems Software, Inc., 4301-18 Oak Circle, Boca Raton, FL 33431. System requirements: TRS-80 Model I/III, 32K, one disk drive. Suggested retail price: $149.95.

The master disk is not meant to be your final SYSTEMS disk. First, make a couple of backups of the master disk. Then hack away at all the "unusable" files until you get a disk with enough space to suit you. You can configure the system to your needs with the SAVE function or by creating CONFIGURATION files. The files are run when the DOS is booted. You can create several files on the same disk. This means that different users of the same machine can have their own exclusive system by accessing their own configuration file.

The Versatile Command Set

My first love is the COPY command with its wild-mask copy feature. With this feature, you can tell the computer to copy all files that have a common extension (/BAS or /TXT, etc.) or just a letter in common (like all files beginning with T or S) from one disk to another. You simply type COPY and then use the "*" symbol as the wild-mask. For example, to copy all files on DRIVE:1 with the /BAS extension over to DRIVE:0 merely type "COPY */BAS:1 :0 (E)" and hit the ENTER key. The (E) is the "echo" parameter which means that as each file is copied, its file name is displayed on the screen. KILL is another unique parameter. This KILLs the source file *after* it has been copied over (talk about confidence), but I have yet to see it fail. The QUERY parameter asks you whether you want to copy a particular file or not. Also included are OVERWRITE, PROMPT, PASSWORD, INVISIBLE, NEW and OLD parameters. The NEW and OLD parameters are handy when you have two disks and one has a few files on it the other doesn't have. Just type "COPY */*:1 :0 (N,Q) and hit the ENTER key. This command goes through the directory on DRIVE:1 and compares it with DRIVE:0. When it finds a file that isn't on DRIVE:0 it asks you if you want to copy it (the "Q" parameter) or not. Typing "Y" copies the file.

Those familiar with sophisticated DOS's will appreciate the ability of *DOSPLUS 3.5* to COPY to a printer as well as to another disk. The system has assigned "devicespecs" to each device — @PR for the printer, @DO for the video and @KI for the keyboard.

Want a hardcopy of a file? *DOSPLUS 3.5* offers two ways to achieve this. One way is with the COPY command: "COPY filespec to @PR". You can ↪

DOSPLUS 3.5, *continued*

also use the LIST command: "LIST 'filespec' @PR".

A Powerful Disk BASIC

The disk BASIC included with the system is a powerful one. I know of no other DOS BASIC that incorporates more features. For the BASIC program hacker there is the "LABEL" feature. If you do considerable rough-draft programming at the computer, this feature is a godsend. Instead of trying to determine the proper line number ahead of time in GOTO and GOSUB statements, just use a label instead of the line number. For example, suppose you have this hot game program just beginning to bloom on the screen...

```
100 FOR X=1 TO 30
110 A(X)=RND(27)
120 IF A(X)*/13 THEN GOSUB FIND
130 NEXT X
..
.. REST OF PROGRAM
250 NAME FIND
.. REST OF SUBROUTINE
..
280 RETURN
```

In line 120, you don't have to worry about where to put the subroutine. Just put it at a place convenient to your line numbering system and give it the keyword NAME and the label. (The label cannot contain any BASIC reserved words.) When you renumber the program with the RENUMBER utility, all labels are ignored and only line numbers are changed.

"Aha!" you say. "I want to sell this program gem, but only owners of *DOSPLUS 3.5* can use my masterpiece." Have no fear. MicroSystems included a small utility called "LABEL" which is a label resolver. This little workhorse changes all label names after GOTOs and GOSUBs to the line numbers having the associated NAME keyword and label, and deletes the label names and the NAME keyword in those line numbers where they appear. So you won't feel bad about losing your original program, it also writes the resolved program to disk under its own file name (user defined). Another nice point is that a labeled line can contain multiple statements. Line 250 could be NAME FIND:ON A(X) GOTO ASTRA,OBIT.

Another feature of the BASIC (first introduced in DOSPLUS 3.3) are the DI and DU commands. DI deletes a program line and inserts it where you want it. For example, DI 120,300 deletes line 120 and inserts it at line 300. The DU command duplicates the program line at the position you name. For example, DU 120,300 duplicates line 120 at line 300. This is a handy command for writing programs which have several routines with identical lines.

Unlike TRSDOS and earlier versions of DOSPLUS, entering BASIC from DOS automatically specifies one file buffer. You must specify any additional file buffers you use, up to a limit of fifteen.

The 3.5 includes TBASIC and, though it doesn't come right out and say so, the manual does indicate the necessary files required for a minimum system (TDOS). But the files not required for normal operation contain the real power of *DOSPLUS 3.5*. Kill those and all you have is TDOS 3.4.

The CMD"0" BASIC array sort has been improved. Unlike earlier versions, you can now sort on up to ten key arrays

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- ***DV and CV Bonus: The SoftSide Adventure Series***

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  Your grandfather chased the evil Ripper to a watery death in the River Thames, or so he thought. Now it seems that the Ripper lives again...

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and have 20 "Tag" arrays as well. This means that if you sort a mailing list by a zip code array, the name and address arrays are automatically sorted along with it if they have been named as Tag arrays.

The quantum leap from "personal" computer to "sophisticated" computer is the inclusion of a JOB CONTROL LANGUAGE routine. The documentation on how to use the language is very clear. The utility features seventeen JCL commands and JCL variable names can contain from one to eight characters. One JCL program can call other JCL programs, allowing you to write complex routines.

The *3.5* has more patches than a hobo's suit, though the manual doesn't mention them. They only become apparent when you list the directory of the master disk. It appears that MicroSystems has gathered all past and present DOSPLUS patches and put them on the MASTER disk. To find out what they do, just list the file and read the introductory notes.

If you don't like Radio Shack's ROM drivers, *DOSPLUS 3.5* has a few of its own. The KEYBOARD driver has a programmable key function. You just ASSIGN the driver to the keyboard (loads into high memory), give it the name of your programmed key file and you're all set. Up to 240 characters can be programmed onto each key. The CLEAR key is the "control" key. If you want to clear the screen you hit it twice.

The PRINTER driver has the spooler, serial printer set-up, pagination and indentation. I haven't used this driver yet, because my Microline 83A functions quite well with the Model III driver.

One new feature of *DOSPLUS 3.5* that I have not seen on any other DOS is the CURSOR-ORIENTED DIRECTORY routine. This routine displays the directory on the screen as four columns of file names. A pair of cursors appear on each side of a file name which you can move to other file names with the arrow keys. Then you can list, copy, rename, kill, print, run, modify, load or clear that file by typing a single letter command. Can't find a particular file (too many on the screen)? Just type */S*/ and enter the file name (or part of it) or the extension (or part of it) and it searches the entire directory. If it finds it, the cursors spot themselves on both sides of the file name, awaiting your next command.

The *.5* has what I call the TRSDOS 1.3 emulator. On booting the DOS you can have it ask you for the date and the time before you do anything else. Or you can have it ask you for just the date, just the time, or ask for nothing at all! *DOSPLUS 3.5* can handle any input of time or date using any non-alphanumeric delimiter. If you type DATE while in DOS, you get the day of the week, the month, day, year, and the Julian date. For example, you type 6-19.1983 in response to the "Date" question. Then when you type DATE, Sun — Jun 19, 1983 — 170 is shown on the screen. I wish the manual gave instructions on how to get this information into a string so you could use it in a BASIC program. As it now stands, TIME$ gives the usual numeric data — i.e. 06/19/83 05:30:45.

Password Protection

One important change is the password protection on the *DOSPLUS 3.5* files. In the past all DOSPLUS files had the password .XANTH. Now, the password of each DOSPLUS file is the extension of that file. In other words, a CMD file has the extension and password /CMD.CMD. A driver file has the password /DVR.DVR. So, if you delete a file and then want it back again, you can always copy it over from the master disk and not be bothered about remembering odd passwords.

Not For The Neophyte

I would not recommend *DOSPLUS 3.5* for someone just starting out with a disk system. DOSPLUS 3.4 is still available and is an excellent system to find out about disks and DOS's. After the user has gained confidence using the system and getting the feel of what a powerful DOS can do, he can upgrade. Giving *DOSPLUS 3.5* to a beginner is like giving a Jaguar XL to a kid just out of driver training school. He may know what to do with it, but can he handle all the power?

I have not described all of *DOSPLUS 3.5's* fantastic features, but this magazine could publish four different reviews of *DOSPLUS 3.5* and no two would be alike. Having the *DOSPLUS 3.5* operating system up on my computer is like having a private key to my favorite computer shop. If you want your MODEL III to "hang tough" with the "other guys," *DOSPLUS 3.5* gives you all the muscle you need to "kick sand" in their faces.

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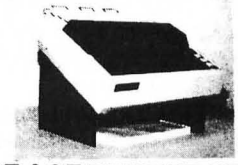

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NEWBASIC 2.0

Reviewed by Mark E. Renne

"Compute, Daddy, compute," called my two-year-old daughter, Karen. She loves to use my TRS-80, but I seldom have time to write any programs. Even when I do have time, the programs I create have slow graphics and no sound — not very exciting fare for a toddling tyro.

The TRS-80 Models I and III have low-resolution graphics. There are only 128 points across and 48 points down for graphics plotting. The computer isn't sold as a "graphics machine," and only two graphics commands, SET/RESET, are included in standard disk BASIC. *NEWBASIC 2.0* solves the graphic dilemma by adding a number of color computer-like commands to make a programmer's life much easier.

SoftSide readers might recognize the name *NEWBASIC 2.0* because Version 1.0 was released as a DV in the September, 1981 issue. The improved version 2.0 is available to previous ***SoftSide*** DV purchasers for $27.50, plus shipping charges. You must send in your original disk for proof of purchase. (Ed. Be sure to copy your other files from the September, 1981 TRS-80 DV before returning it.)

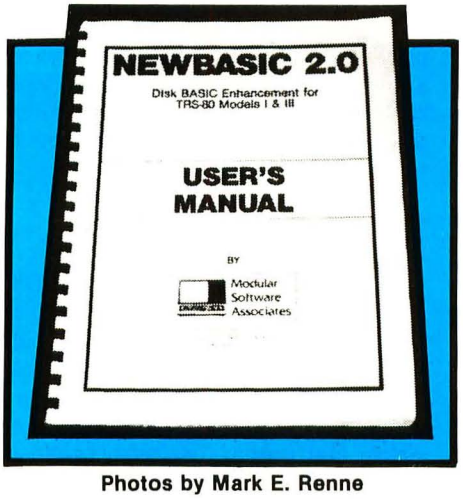
Exciting New Graphics Commands

NEWBASIC 2.0 adds 50 new keywords to the existing Disk BASIC and operates under DOSPLUS, NEWDOS, LDOS and TRSDOS. I can't cover all the new commands in this space, but I'll go over my favorites.

The LINE command allows you to draw a line, instantly, from any point to any other point. You can also use this command to create boxes or to fill in a drawn box. The drawing speed is impressive and much faster than the standard SET command. Imagine the time you can save when drawing many lines.

If you have a rounder imagination, the CIRCLE command should interest you. By specifying a starting point and a radius, you can draw a circle. You can also use this command to draw an ellipse or an arc. A circle is drawn much faster than an ellipse, but both are faster than standard BASIC. CIRCLE also allows you to rotate the shape at an angle, making animation easier.

From Modular Software Associates, 209 18th Street, Huntington Beach, CA 92648 (714) 960-6668. System requirements: TRS-80 Model I/III with 48K, two disk drives. Suggested retail price: $39.95.



Photos by Mark E. Renne

The DRAW command is probably the most versatile of the graphics commands. You start from any point on the screen and DRAW from there. You can move in any of eight directions with or without drawing a line. Also, you can scale DRAWs to allow different sizes of the same object. A sample program included on the disk uses the DRAW command to create giant letters.

Other graphic commands allow you to move or copy objects drawn on one area of the screen, to other areas of the screen, quickly. This allows you to animate your program easily with flicker-free images. Commands are also available to save graphic creations to disk or to load them from disk.

Sound Effects Made Easy

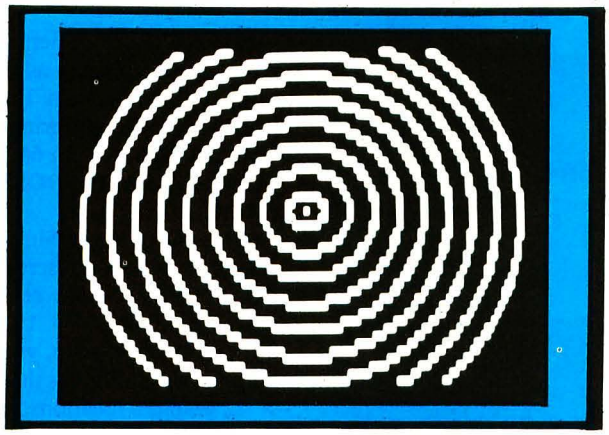
But what about sound? Sound effects are simple with *NEWBASIC 2.0* and the SOUND command. You simply request a frequency and duration; sound is then output through the cassette port (requires an additional amplifier). You can specify an entire range of frequencies and step through them if you wish. A SOUND SET command is used to determine the "real-time" of a duration unit. In other words, you can change tempo simply by changing the SOUND SET value.

Other Handy Features

NEWBASIC 2.0 also shines in areas other than graphics. It includes a Spooler/Despooler to allow files to print while you continue to work on your program. A CONVert command accepts a value and then displays it in five different formats including hexadecimal, alphanumeric, most significant byte and least significant byte (in decimal), integer value, and the positive decimal value — handy for lots of PEEKing and POKEing! Also for hackers, *NEWBASIC 2.0* allows double byte DPEEKs/DPOKEs and execution of machine language programs with the CALL command.

One of the most frustrating aspects of Disk BASIC is the RESTORE command. This command sets the DATA pointer back to the first line of DATA statements. Sometimes, however, you don't want to READ data from the first line of DATA; you want the second line. *NEWBASIC 2.0* solves this problem with the REST command which restores the DATA pointer to any line you wish.

Frustrated by the TRACE command in BASIC? NTRON, *NEWBASIC 2.0's* new TRACE facility, is a great improvement over the Microsoft version. This command allows you to trace a certain variable for a certain range of line numbers. For example, "NTRON (100:200),A$" traces the value of A$ for lines 100 through 200. This is a good im-



An example of a figure generated from NEWBASIC with less than six lines of code.

plementation of what a trace function should be.

A couple of special programming functions are thrown into *NEWBASIC 2.0* just for good measure. You can label lines with names for use with the GTO and GSUB commands. A line might have the name "#QUIT"; a GTO #QUIT would transfer program control to the line labeled #QUIT. This is handy for subroutines that you use in many programs. It also helps to make the program structure clearer. An additional loop procedure, DO..UNTIL, allows a series of lines to be repeated until a certain condition becomes true.

Error detection is enhanced in *NEWBASIC 2.0.* When *NEWBASIC* finds an error, it automatically displays the line containing the error. If an error is found in a multi-statement line, *NEWBASIC 2.0* displays the part of the line where the error appears. (Standard BASIC displays the entire line.) This one feature can save many hours searching through packed lines for an offending command.

A special feature of *NEWBASIC 2.0* is the UNNEW command. If you've ever typed NEW and deleted a program by accident, you'll appreciate this command. It renews a "newed" program, saving many hours of re-typing.

NEWBASIC 2.0 also makes serial port input/output easier. Data is sent to the port using simple LPRINT commands and input from the port using LINEINPUT.

Thirty eight pre-defined user keys provide for one keystroke entry of a number of keywords. *NEWBASIC* also allows you to define any ten keys for your own purposes and you can save these definitions to disk.

NEWBASIC 2.0, with all its commands, takes up about 11K of memory. This isn't too bad for graphics programs, since you save lots of code. But what if you're not using graphics and want to take advantage of the very fast memory transfer facilities of *NEWBASIC 2.0?* The CREATOR program included with *NEWBASIC 2.0* allows you, the user, to decide which commands will be included in your *NEWBASIC 2.0* module. You can create as many *NEWBASIC 2.0* modules as you desire, each with its own set of commands. This saves memory for long programs and "custom fits" *NEWBASIC 2.0* to your needs.

Four sample programs are included on the 35 track single density disk. These programs demonstrate the sound, graphic, animation and drawing ability of *NEWBASIC 2.0.* There is no copy protection on the disk.

Documentation consists of 70 pages of straightforward command explanations. It explains the command syntax and provides short example programs for each. The user's manual is well done and provides all the information needed to get started with *NEWBASIC 2.0.* A quick reference card to keep near your computer is also included.

Try It; You'll Like It

If you use graphics and find Disk BASIC lacking in commands, *NEWBASIC 2.0* is definitely for you. It is an excellent product that works flawlessly. The fifty commands *NEWBASIC 2.0* adds are a welcome addition to Disk BASIC and the CREATOR command is a perfect way to pick just the commands you want. I give *NEWBASIC 2.0* my highest recommendation and congratulate Modular Software Associates on a fine product.

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DOCUMENTER

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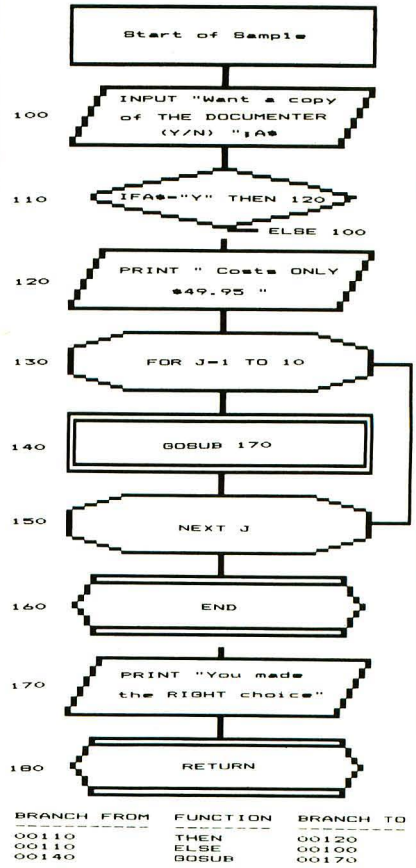

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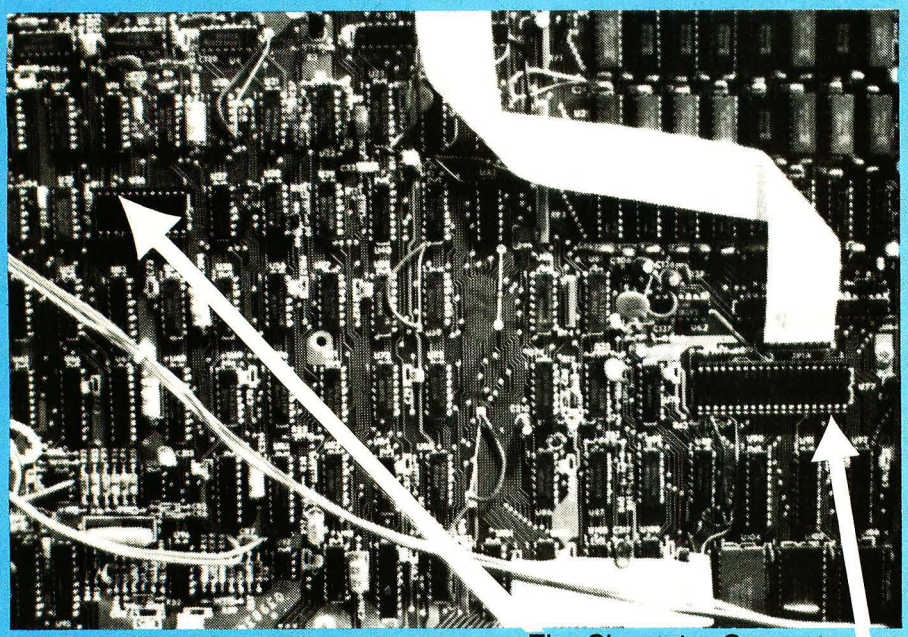
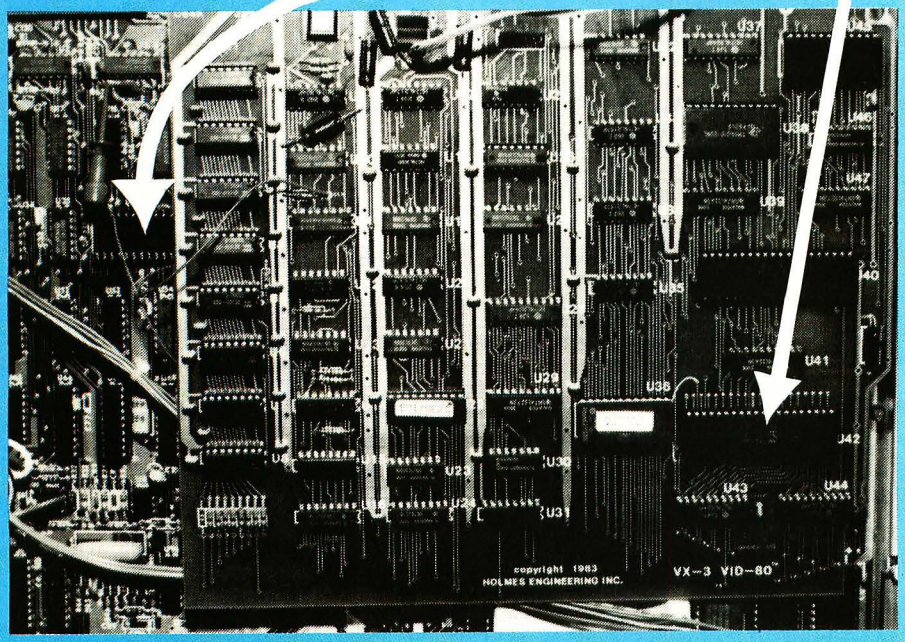
VID-80

Reviewed by Mark E. Renne





Installing the VID-80 is fairly easy. Two chips are removed; the Character Generator (left pointers), and the Z-80 (right pointers). The VID-80 (see lower photo) is then installed in the empty Z-80 socket. (Photos by Mark E. Renne).

Now, TRS-80 owners can have the same graphic display as the rest of the computer world with this new board from Holmes Engineering. *VID-80* converts the display from 64 × 16 to 80 × 24 under both TRSDOS and optional CP/M.

What is 80 × 24? Simply put, it's 80 characters across the screen and 24 lines down. An 80 × 24 screen has 896 more characters than a 64 × 16 screen; almost 88 percent more! Also, you get increased graphics resolution, as there are now 160 × 72 graphics locations vs. 128 × 48 in the standard TRS-80.

Painless Installation

Installation of the *VID-80* board requires no permanent modification to your TRS-80 and involves no trace cuts. You remove the cover of the Model III as well as the RF shield covering the CPU board on the back of the computer. You take the two IC's, the character generator and the Z-80, from the computer board and place them on the *VID-80*. Two solderless jumpers attach to the TRS-80 board and the entire *VID-80* board fits into the Z-80 socket.

The last part of the installation requires the removal of two chords, power and video, from the main board and their transfer to the *VID-80*. If all goes well to this point, you power up and check the screen alignment. My installation required no further adjustment, but Holmes provides further instructions if you need them. After you replace the case, your TRS-80 is now a dual personality computer.

With the *VID-80* installed, your TRS-80 automatically boots in the 80 character mode. However, you can still execute the standard 64 character mode by holding down the 6 key during reset. The 64 character mode allows the TRS-80 to operate exactly as it did before the modification.

Model I owners must purchase an additional expansion interface system starting at $99.50 to install the *VID-80*. Holmes also offers a CP/M option for the *VID-80* at $120. This is an exciting option and makes good use of the 80 × 24 modification. If you're interested in

From Holmes Engineering, Inc., 5175 Green Pine Drive, Salt Lake City, UT 84107. System requirements: TRS-80 Model I or III with 16K. Suggested retail price: $379.45 (Model I); $279.95 (Model III).

more memory for CP/M, there's an additional 64K available for $125.

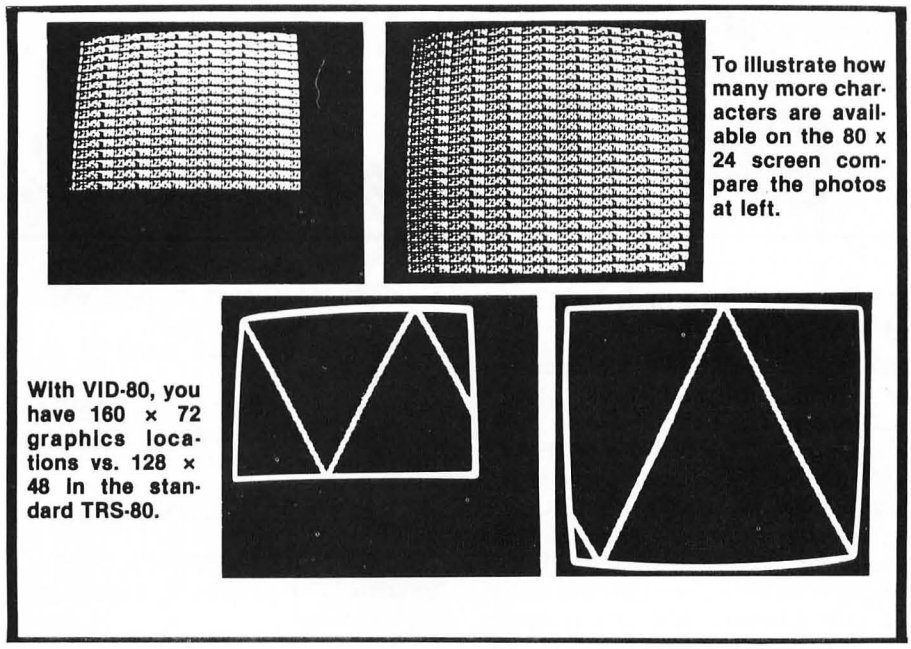
What Works With *VID-80?*

Now that you have the *VID-80* in the computer, you can run any program that uses the standard video ROM calls. Unfortunately, Scripsit®, VisiCalc® and most commercially available machine language programs won't run on the *VID-80,* since they use their own video routines and not the ROMs. Holmes is working on patches, but makes no promises as to when they'll be ready.

What will work are BASIC programs or new programs you develop. Holmes has changed ROM BASIC so that you now have 1,920 "PRINT @" locations instead of 1,024. They've also changed the SET, RESET and POINT commands to work with the *VID-80* and its 160 × 72 coordinates. These commands allow you to make full use of the *VID-80* in your BASIC programming. The board also works easily with CP/M programs in the 80 × 24 mode.

Documentation includes a seventeen page installation/user's manual. It's very clear and provides all the information you need to install and use the *VID-80.* Holmes also maintains a computer bulletin board for updates and feedback, and covers the board with a one year warranty.

To my knowledge, the *VID-80* is the only 80 × 24 board that works in *both* CP/M and TRSDOS mode. It's very difficult to make a board compatible with ROM BASIC as well as CP/M. Holmes has met the challenge, however, and has given TRS-80 owners a chance to expand their screen size and horizons.



To illustrate how many more characters are available on the 80 x 24 screen compare the photos at left.

With VID-80, you have 160 × 72 graphics locations vs. 128 × 48 in the standard TRS-80.

HOTLINE

Every Wednesday, from 7PM to 9PM Eastern Daylight Time, the SoftSide programmers will answer your questions about SoftSide programs. Call (603) 882-2555.

The Hotline can:

- Tell you the fix for any known program bugs, or mail you the long ones.
- Explain program instructions.
- Check out bugs you may have found.

The Hotline cannot:

- Answer subscription or editorial questions.
- Give programming advice.
- Accept collect calls.

When you call, follow these simple rules:

1. Write it down and, if possible, sit next to your computer when you call. This is a certain shortcut to your point when you are calling long distance.
2. Be specific. It betters our chance to zero in on your problem quickly. The first thing we'll want to know is what program you're inquiring about and what computer you're using.
3. Be brief. There are 50,000 of you and five programmers...
4. Before calling, **SWAT** the program, if we published a **SWAT** table with it. Most "bugs" are hidden typos. **SWAT** will find them and may save you a call.

Remember: The **Hotline** will give a fast response to the short questions. We will deal with long questions in writing.

(Programmers will be available to answer questions only during **Hotline** hours. Please don't call at any other time with your software questions.)

Hints & Enhancements

IBM BSAVE Bug in BASIC and BASICA 1.10

"The use of the BSAVE command can cause intermittent Syntax errors." That's what IBM says, but it's not the whole truth. The truth is that the first use of BSAVE usually destroys the program in memory by writing garbage over it. When BASIC tries to execute this garbage, it prints an error message, usually "Syntax error." The following is adapted from IBM's information, and, although IBM says it always works, it *does* work only on PC's with 96K or more RAM. ***SoftSide*** is hounding IBM for a better correction, but the great blue giant is very slow. If you have a smaller memory size and you wish to use a program containing the BSAVE command, first issue a dummy BSAVE command. Subsequent BSAVE commands will work. For example:

```
BSAVE "FOO.TMP"
KILL "FOO.TMP"
NEW
```

Use the procedure described below to update your Disk BASIC 1.10 and Advanced BASICA 1.10. This procedure is probably too complicated for the average user who wants only to have a good, working BASIC. If you are such a user, you should try to get a fixed copy of BASIC and BASICA from your IBM dealer, then make sure it works on *your* PC. If you can't get a good copy, let IBM hear about it.

Update Procedure

The following is a "script" of the procedure to update your BASIC files on the DOS disk. This procedure will be used to update Disk BASIC and Advanced BASIC release 1.10. Follow it carefully. If you make a mistake, don't panic — just start again.

First you will make an exact copy of Disk BASIC and Advanced BASIC using the DOS COPY program. You need a blank formatted disk. Put your DOS disk in Drive A and the blank formatted disk in Drive B. You must use the DOS COPY program to make an exact copy of your Disk BASIC and Advanced BASIC. All you are to input is underlined. [Enter] indicates when you must press the Enter key.

You must insert the MASTER copy of the DOS disk in drive A. Anything else will not work. Then copy the file BASIC.COM to a blank formatted disk on drive B using the following command

A >COPY BASIC.COM B:[Enter]

Now copy the file BASICA.COM to the formatted disk on drive B using the following command

A >COPY BASICA.COM B:[Enter]

Place your DOS disk back in drive A. You now have an exact copy of BASIC.COM and BASICA.COM in drive B.

Using DEBUG to update Your Disk

The DEBUG prompt is "-". All the things that you type will be after the "-" or after the ":". Immediately after entering the hex digits following the ":" prompts, you must press the space bar to move to the next byte. The places that you must press the Enter key are indicated by [Enter]. Note that the "xxxx" in the data displayed will be filled with the appropriate memory address.

Updating BASIC.COM

The following procedure will update the file BASIC.COM. Remember that the DOS disk should be in drive A and the exact copy of BASIC.COM should be in drive B.

If at any time you do not see the data exactly as it appears on this procedure, you did something wrong and you should start again. You can start again by typing Q followed by Enter. This returns you to DOS.

```
A)DEBUG B:BASIC.COM[Enter]
-EDS:27E9[Enter]
XXXX:27E9 BE.BF 80.00[Enter]
-EDS:27EC[Enter]
XXXX:27EC BF.B9 F7.0E 01.04 B9.33
XXXX:27F0 50.C0 00.FC FC.F3 F3.AB A4.8C B8.C8 00.8E F6.D8
XXXX:27F8 8E.BE D8.80 8E.00 9A.BF 06.F7 BF.01 00.B9 00.80
XXXX:2800 B9.00 8E.F3 00.A4 FC.B8 F3.00 A4.F6 8C.8E C0.D8
XXXX:2808 8E.BE D8.9A 8C.06 0E.BF 02.00 07.00 E8.B9 44.8E
XXXX:2810 02.00 BF.F3 3F.A4 07.06 B9.1F 6F.8C 00.0E 33.02
XXXX:2818 C0.07 FC.E8 F3.39 AB.82[Enter]
-W[Enter]
Writing 2C80 bytes
-Q[Enter]
```

Updating BASICA.COM

The following procedure will update the file BASICA.COM. Remember that the DOS disk should be in drive A and the exact copy of BASICA.COM should be in drive B.

If at any time you do not see the data exactly as it appears on this procedure, you did something wrong and you should start again. You can start again by typing Q followed by Enter. This returns you to DOS.

```
A)DEBUG B:BASICA.COM[Enter]
-EDS:3C4E[Enter]
XXXX:3C4E BE.BF 80.00
XXXX:3C50 00.00 BF.B9 F7.53 01.04 B9.33 50.C0 00.FC FC.F3
XXXX:3C58 F3.AB A4.8C B8.C8 00.8E F6.D8 8E.BE D8.80 8E.00
XXXX:3C60 9A.BF 06.F7 BF.01 00.B9 00.80 B9.00 8E.F3 00.A4
XXXX:3C68 FC.B8 F3.00 A4.F6 8C.8E C0.D8 8E.BE D8.9A 8C.06
XXXX:3C70 0E.BF 02.00 07.00 E8.B9 BD.8E 02.00 BF.F3 3F.A4
XXXX:3C78 07.06 B9.1F 6F.8C 00.0E 33.02 C0.07 FC.E8 F3.B2
XXXX:3C80 AB.82[Enter]
-W[Enter]
Writing 4180 bytes
-Q[Enter]
```

Atari® *Minigolf* Joystick Modification

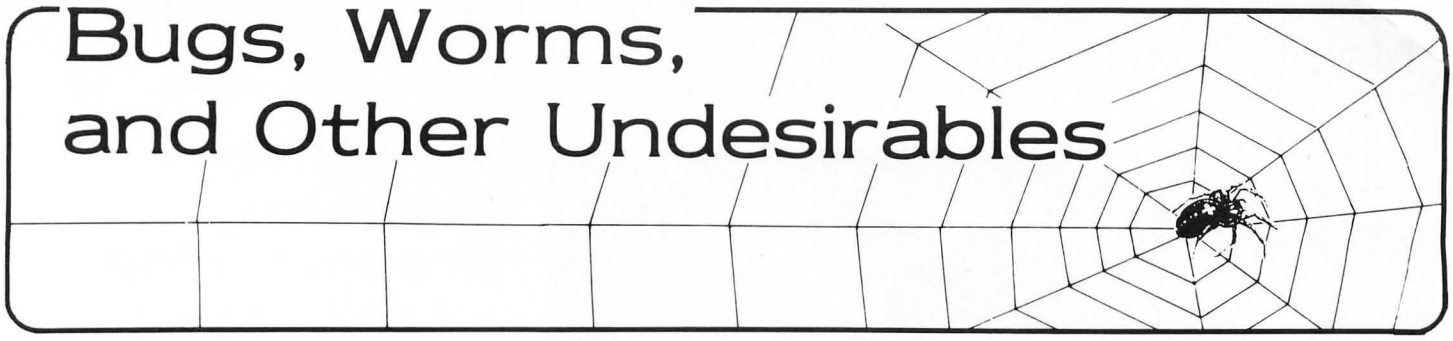
The listing below is a modification to the Atari version of *Minigolf* (Issue 40). It converts play to joystick control. This should enhance multiplayer games.

After you enter the names of the players, you can play the remainder of the game using only a joystick in port 0. Moving the joystick left and right positions the "club," and moving it up and down selects the force of the swing. Pushing the fire button swings. The button also gets you from the scorecard to the next hole.

To make the modification, change or add the lines below. Alternatively, you can type these lines in, then LIST them to tape or disk, and merge them with the original program.

```
11 Z=5
42 ? :? CHR$(28);"HIT FIRE BUTTON";:IF
 STRIG(0)=0 THEN Z=5:GRAPHICS 5:POKE 7
52,1:POKE 708,0:POKE 712,58:RETURN
43 GOTO 42
50 IF STRIG(0)=0 THEN HH=Z*11:HM=0:VM=
0:COLOR A:PLOT C1,C2:GOTO 200
51 ? :? CHR$(28);"FORCE OF SWING:";Z;
```

Bugs, Worms, and Other Undesirables



Apple *Quest* *(The Best of SoftSide)*

Line 945 of *Quest* has an error due to a parsing quirk of Applesoft. The correct line appears below. Note that this correction changes one line in the *SWAT* table for *Quest*.

```
945 P1 =  INT ((P1 * 2 + A) / 3):
      IF A >  = P1 THEN 941
```

SWAT TABLE

LINES	SWAT CODE	LENGTH
945 - 955	KF	229

Apple *Best of SoftSide* Page Numbering

Some of the pages in the Apple version of ***The Best of SoftSide*** were misnumbered. You should read them in this order: ...9, 10, 13, 14, 11, 12, 15, 16...

Hints & Enhancements *continued*

```
52 IF STICK(0)=14 THEN FOR Q7=1 TO 90:
NEXT Q7:Z=Z+1:IF Z=10 THEN Z=1
53 IF STICK(0)=13 THEN FOR Q7=1 TO 90:
NEXT Q7:Z=Z-1:IF Z=0 THEN Z=9
60 IF STICK(0)<>7 THEN 70
70 IF STICK(0)<>11 THEN 50
152 ? :? CHR$(28);"A HOLE IN ONE!!!!!!
":FOR A=1 TO 5:FOR B=1 TO 59:SETCOLOR
4,B/4+1,14:SOUND 0,B,0,10:NEXT B:NEXT
A
156 ? :? CHR$(28);"THAT TOOK YOU ";S;"
 STROKES":FOR A=1 TO 50:SOUND 0,A,10,1
0:NEXT A:FOR A=49 TO 2 STEP -1
```

Chuck Creevy
Chicago, IL

TRS-80 *Microtext 2.0* (Issue 42)

When saving a file, the user was to press "D" to save onto disk, but this did not work. Pressing any other key did. Also, it was not possible to delete the first line on the screen. The lines below correct these errors. Load the program, type the lines below, then save the program again.

```
1490 IFC<>68THEN1430
2730 IFC=10THEN2780ELSEIFC=CLTHENRETURNELSEIFC=68THEN2830ELSEIFC
=88THEN2880ELSEIFC=RTTHEN2960ELSEIFC=70THEN3240ELSEIFC<>91THEN27
00
2830 IFLN=2THENPRINT@128,CHR$(30);:LN=1:L$(1)="":RETURNELSEFORJ=
ELTOLN-1:L$(J)=L$(J+1):NEXT:L$(LN)=""
2915 IFEL=1THENPRINT@128,CHR$(31);:LN=1:L$(1)="":RETURN
```

Apple *Battlefield* *(The Best of SoftSide)*

The *SWAT* table for *Battlefield* is erroneous. The correct table appears below.

SWAT TABLE

LINES	SWAT CODE	LENGTH
40 - 150	PO	273
160 - 1100	TJ	330
1110 - 1220	TW	537
1230 - 2080	VG	272
2090 - 2200	DL	287
2210 - 3000	CT	248
3010 - 4020	BU	312
4030 - 4140	ZP	264
4150 - 5050	MN	296
5060 - 6020	KI	410
6030 - 6140	HT	204
6150 - 7050	ME	274
7060 - 7170	GJ	375
7180 - 8060	OL	336
8070 - 9020	UN	253
9030 - 9140	QL	296
9150 - 10070	YL	211
10080 - 10190	CD	322
10200 - 11080	ZW	261
11090 - 12060	NW	235
12070 - 13000	EP	424
13010 - 13120	YY	361
13130 - 13140	WW	12

Apple *Super Quest* (Issue 38 DV)

Several readers reported to us a mysterious error in *Super Quest*. Their heroes had earned so many experience points that the program could no longer handle the numbers. Fortunately, the correction for this problem is simple.

Start up your Apple with a DOS 3.3 master or equivalent. Replace this disk with the ***SoftSide*** disk for Issue 38. Type

UNLOCK HHS
LOAD HHS

Now type the following three lines.

```
620  FOR I = 1 TO EE%:QQ = Q(I): GOSUB
     810: NEXT I


660 QQ = Q(I): GOSUB 810


880  PRINT  TAB( 19);"(";SP$(I);"
     )"; TAB( 25);RC$(I); TAB( 34
      + (QQ < 100000) + (QQ < 100
     00) + (QQ < 1000) + (QQ < 10
     0) + (QQ < 10));QQ
```

Now type

SAVE HHS

An Aid To Graphics Programming

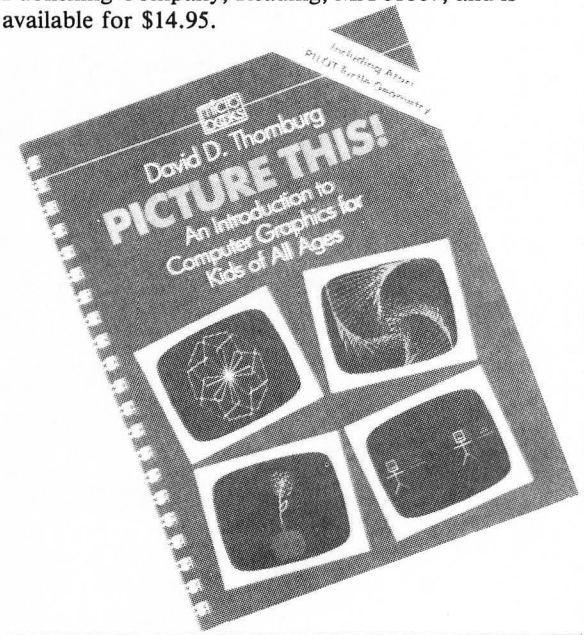
GRAPH-FIX makes graphics programming a breeze. This programmer's aid consists of peel-and-stick graphics symbols to update your Atari keyboard. You apply the 29 plastic-coated labels to the front face of each key, thus making the Control Key Graphics readily available, saving you time and improving your accuracy.

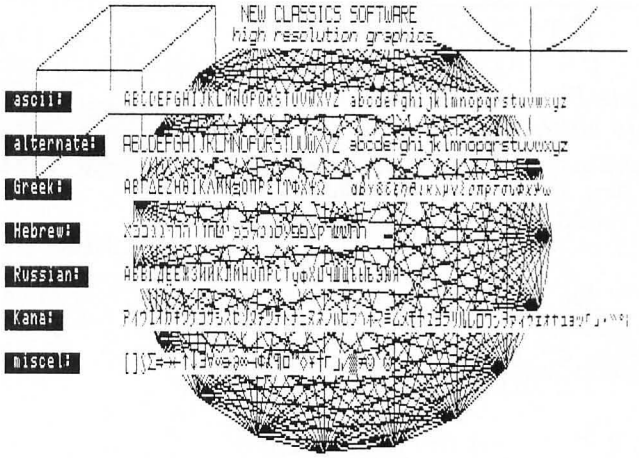
GRAPH-FIX is available from Atari® dealers, or directly from Dovestar Creative Concepts, P.O. Box 2109, Dept. 4113N, Nederland, TX 77627 (409)727-5978. The retail price is $5.95.

Bringing Kids And Turtles Together

Picture This!, by David D. Thornburg, explores the wonderful possibilities of teaching kids (from ages six to 60) how to use the home computer. It shows them how the combination of PILOT, a powerful computer language, and Turtle Geometry makes it possible to create pictures in full color with a myriad of designs. Featuring a step-by-step approach which integrates projects throughout, it provides constant learning reinforcement. It takes the student from the first flick of the Atari switch, to hands-on computing, to painting flowers and shapes of all types.

Picture This! is published by Addison-Wesley Publishing Company, Reading, MA 01867, and is available for $14.95.

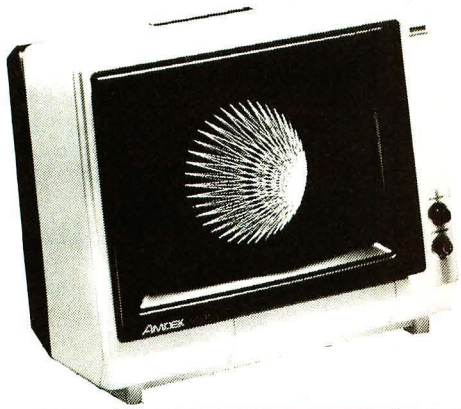




Hi-Res Graphics On The TRS-80® ?

Now, TRS-80 Model III and IV owners can add hi-res graphics to their programs with the introduction of New Classics Software's *High Resolution Graphics Package.* This package includes a set of simple graphics routines, Pascal turtle graphics routines, a character generator, printer routines and demonstration programs. You can use all the parts of the package at the same time, so it's possible to mix turtle and regular graphics on the same screen with mathematical formulas and mixed language texts in both regular and inverse video.

The package requires Pascal 80 and the Radio Shack high resolution graphics board. It is available, for $39.95, directly from New Classics Software, 239 Fox Hill Road, Denville, NJ 07834.



Hi-Res Colors For IBMs® and Apples®

The *Color II Plus* from Amdek Corporation is a new, portable, high-resolution color monitor designed with a switchable color weighting matrix to most accurately display the sixteen colors presented by the IBM PC and Apple computers. It provides true color capability by using three color sets programmed in a programmable logic array. The color sets provide full compatibility with the PC's color graphics adapter card, and the Apple II and IIe, interfaced with the appropriate card.

The *Color II Plus* is available, through your local dealer, for a retail price of $559.00.

Death To The Dragon

A vengeful dragon is terrorizing the southern provinces of the kingdom of Balema. The land is in ruin — harvests are burned and the villages ravaged. As King Galt's newest advisor, you, accompanied by the King's champion Gorn, must search out and destroy this fearsome beast.

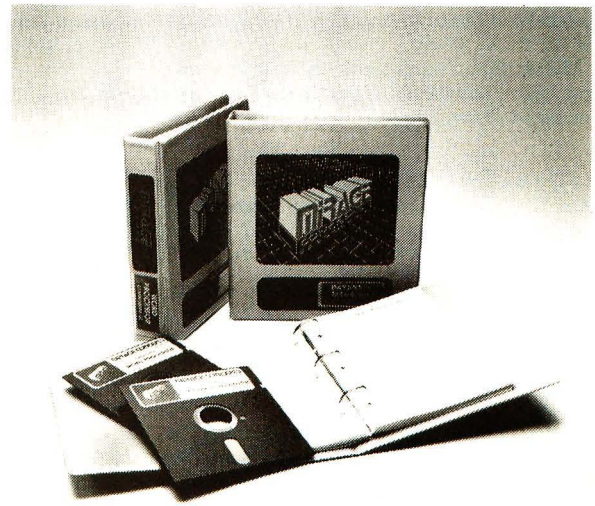
So begins a new Apple® adventure called *The Quest,* which features impressive high-res graphics, over 200 locations and a parser that accepts full and multiple sentence instructions. The game's unique aspect is that there are many ways to arrive at the game's solution, and even when you reach the end of your search, you can continue to explore the kingdom and discover new paths to your final destination.

The Quest requires a 48K Apple with disk drive. It is available, for $19.95, at your nearby computer store, or directly from Penguin Software, P.O. Box 311, Geneva, IL 60134 (312)232-1984.

Commodore® Word And File Scramblers Introduced

Two new products for the Commodore 64, the *DATABASE MANAGER* and the *WORD PROCESSOR,* are general purpose, 100 per cent machine language programs with an unlimited number of possible applications. The *DATABASE MANAGER* instantly and accurately does just about anything you want to do with your information — store, search, sort, retrieve, display, calculate, and print reports, lists, and even mailing labels. The *WORD PROCESSOR* is the only word processor available for the Commodore 64 which produces an 80 column screen display without any additional hardware. You may format the text displayed on the screen exactly as it will appear on the printed page. It also features true word wrap, printed page/line/character counters, over 70 single keystroke commands, search and replace operations, block functions, and the ability to interface with many different printers. The programs interface easily with one another.

DATABASE MANAGER and *WORD PROCESSOR* (from Mirage Concepts, Inc., 2519 W. Shaw, No. 106, Fresno, CA 93711) list for $99.95 each. They are available at computer and software dealers nationwide.



MicroLog: Resources Received

Compiled by Margaret Fritz

IBM® PC

APPLICATIONS

The Final Word from Mark of the Unicorn, Inc., Arlington, MA. System requirements: IBM PC with 64K, 2 disk drives, DOS 1.1 disk, a blank, double-sided (320K) disk. Price: $300.

An integrated word processing package featuring split-screen editing that enables the user to edit more than one document at the same time.

Reports by Example. From SBX, Boston, MA. System requirements: IBM PC with 2 drives, 128K memory, and a printer. Price: $199

Designed to expand the capabilities of VisiCalc, this program lets you produce high quality financial reports from your present software.

TK! Solver from Software Arts, Inc. Wellesley, MA. System requirements: IBM PC. Price: $299.

This program's problem-solving ability is powerful and versatile enough to apply to many fields, from financial planning to architectural design to chemical analysis.

GRAPHICS

The Drafts Man from Starware, Washington, DC. System requirements: IBM PC/PC DOS

The most powerful and versatile color graphics package available for the IBM PC.

COMMODORE®

EDUCATION

Fundamentals of Mathematics by G. Craig & J. Wells. From Sterling Swift Publishing Co., Austin, TX. System requirements: Commodore 64. Price: $249.95 (6-disk set)

Mathematics tutorial designed for grade levels three through twelve tested for three years in a large Texas school district.

GAMES

Cyberchess from Cyber Enterprises, Ceritos, CA. System requirements: Commodore C64 with single disk drive.

A powerful and effective method for improving one's strength in the royal game of chess.

GRAPHICS

The Banner Machine from Virginia Micro Systems, Woodbridge, VA. System requirements: Commodore 64, EPSon MX-80, MX-80 F/T, MX-100, RX-80 or FX-80 printers. Price: $49.95

This program allows you to create in minutes, at minimum expense, signs that would otherwise be time consuming or expensive, if not both.

Sprite Builder from Main Menu Computer Programs, Seattle, WA. System requirements: Commodore 64. Price: $24.95

This program makes it fun and easy to create single and multi-color sprite graphic figures for the Commodore 64 personal computer.

TRS-80®

BOOKS

Games and Graphics for the TRS-80 by Tom Dempsey. From IJG Inc., Upland, CA. System requirements: TRS-80 Models I & III. Price $16.95.

If you enjoy computer games and watching good graphics, or, if you would like to learn a few programming tricks, then this book is for you.

Battlestar BASIC for the TRS-80 by David H. Dasenbrock. From Howard W. Sams & Company, Inc., Indianapolis, IN. System requirements: TRS-80 Model I, III or 4. Price: $12.95

The purpose of this book is to teach BASIC through the creation of a video game in which aliens attempt to land and conquer the earth.

ATARI®

GAMES

Devil's Dare from Jay Gee Programming Company, San Jose, CA. System requirements: Atari 400/800/1200 with 16K RAM and joysticks. Price: $19.95

In this game of skill and strategy players race against time to get five tokens in a row,before the computer does.

Snokie by Y. Lempereur. From Funsoft, Agoura, CA. System requirements: Atari 400/800/1200 with 32K. Price: $34.95

Join a young sno-bird named Snokie in his rescue attempt to save is girlfriend, Cara from evil "grodies" who have captured her and are holding her prisoner deep in a snow cave.

GRAPHICS

MegaFont by R. Dellinger & R. Rognie. From Xlent Software Springfield, VA. System requirements: Atari 400/800. Price: $19.95

This program allows you to list your Atari programs out to the printer, displaying all inverse and special characters, or it can be used to create fancy fonts and dump graphics.

OPERATING SYSTEM

OS/A+ from Optimized Systems Software, Inc., San Jose, CA. System requirements: Atari 400/800

OS/A+ provides a way for your Atari computer to communicate with your disk drives, printer or other computer products.

APPLE®

GAMES

Master Match by Greg Robbins. From Computer-Advanced Ideas Inc., Berkeley, CA. System requirements: Apple II, II+, IIe or Apple III. Price: $39.95

Master Match's quiz show emcee invites you to find logical matches in images and words under numbered mystery squares.

The Quest by Dallas Snell, Joe Toler, and Joel Ellis Rea from Penguin Software, Geneva, IL. System requirements: Apple II, II+, IIe with 48K disk. Price: $19.95

You, as the king's newest advisor, must accompany his champion, Gorn, on a mission to rid the kingdom of a vengeful dragon terrorizing the southern provinces.

Bermuda Race from Howard W. Sams & Co., Inc. Indianapolis, IN. System requirements: Apple II compatible systems (48K), Applesoft in ROM, 1 disk drive. Price: $29.95

A challenging simulation of the race from Newport, RI, to Bermuda.

EDUCATION

Homework Helper Elementary Mathematics from Colorado Cyphernetics, Inc., Boulder, CO. System requirements: Apple II+, IIe, DOS 3.3. Price: $24.95

Works with whole numbers or decimals!

BOOK

Apple II BASIC Programs in Minutes by Stanley R. Trost. From Sybex Inc., Berkeley, CA. System requirements: Apple II or IIe. Price: $9.95

This book contains more than 65 practical programs and subroutines that are fully tested and ready to run; they provide a wide variety of business, personal and educational applications.

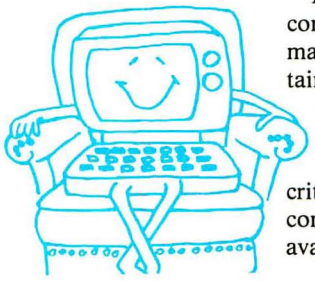
The Survival Kit for Apple Computer Games by Ray Spangenburg/Diane Moser. From Wadsworth Electronic Publishing Co., Belmont, CA. System requirements: Apple. Price: $9.95

This book is designed to be your companion in adventure through two dozen of the most challenging and exciting home computer games available today.

COMING NEXT ISSUE

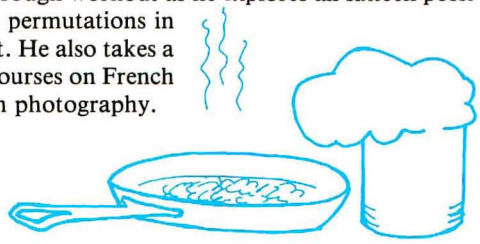
A Buyer's Guide to games

Jam-packed with reviews of the latest games for Apple, Atari, IBM, TRS-80 and Commodore 64, Issue #46 will help you separate the wheat from the chaff, and maximize your fun. ***Donkey Kong, Preppie II, Pentapus, Thunderbombs, Space Sentinel, Master Miner, Major League Baseball, Clash, Devil's Tower*** — all these and more are reviewed in the next issue of ***SoftSide.***



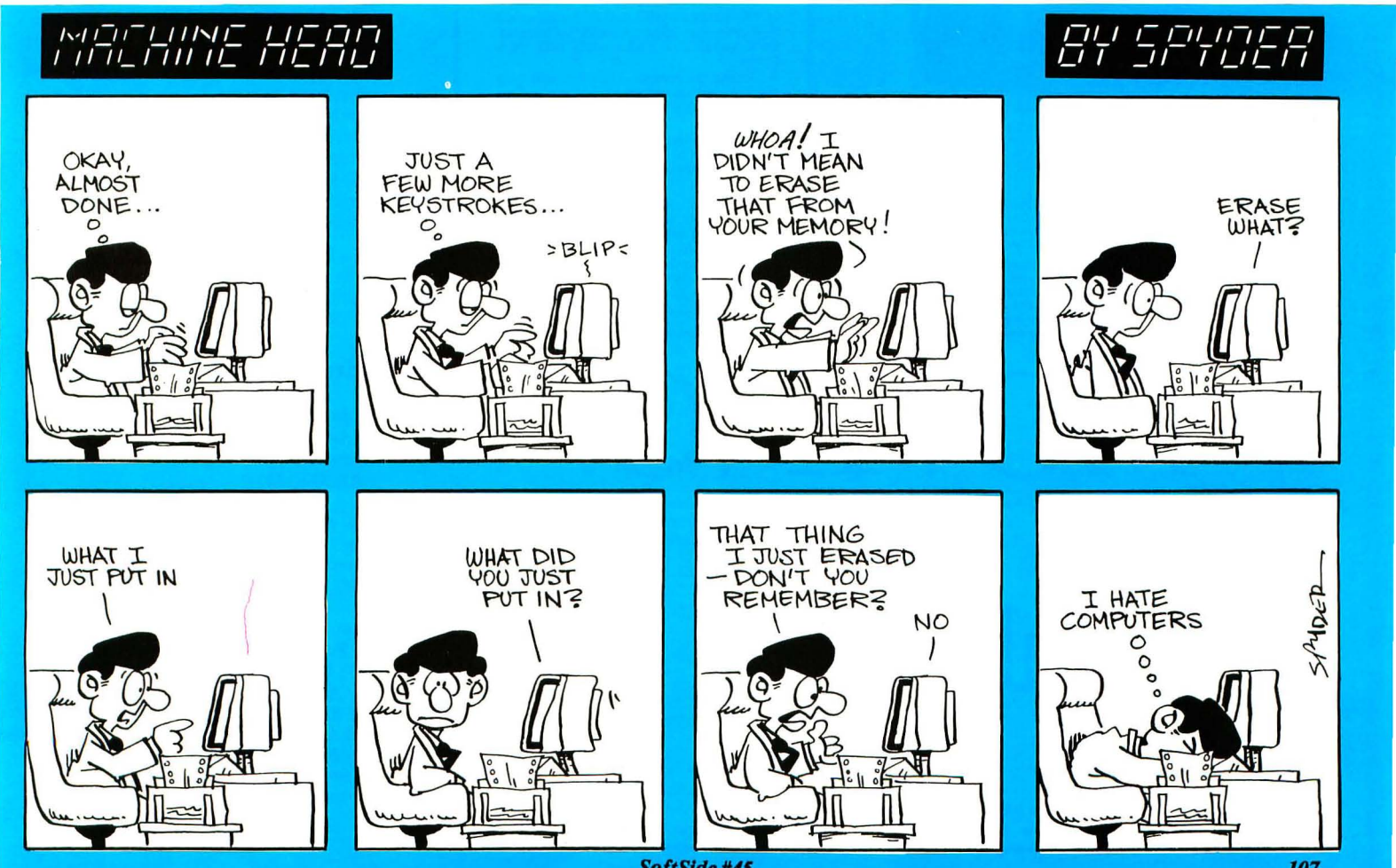
Looking for a place to put that new computer you got for Christmas? Or maybe you're aggravated by the mountain of disorganized disks, padded manuals and greenbar accumulating near your system. An article by Steve Birchall examines the criteria for good human engineering in computer furniture, and surveys the available items.

The newest concept in games is the interactive videodisc. Our Publisher and intrepid private eye, Randal L. Kottwitz, gives ***The Mystery Disc*** a thorough workout as he explores all sixteen possible plots and their permutations in search of whodunit. He also takes a look at videodisc courses on French cooking and 35mm photography.



"Computers and Culture" was the theme of a conference sponsored by the New York Academy of Sciences. Peter J. Favaro (Special Projects Editor) and Arthur Fink (organizer of the "Computers and Human Values" conference) offer two divergent evaluations.

Peter Kirsch's *Adventure of the Month* is ***Death World.*** Experience unearthly terror while mining valuable minerals on a strange planet when suddenly you are attacked by an alien monster. Your only companion on this lonely outpost is a warm fuzzy little creature called Nikki.



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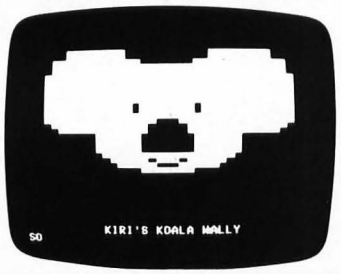

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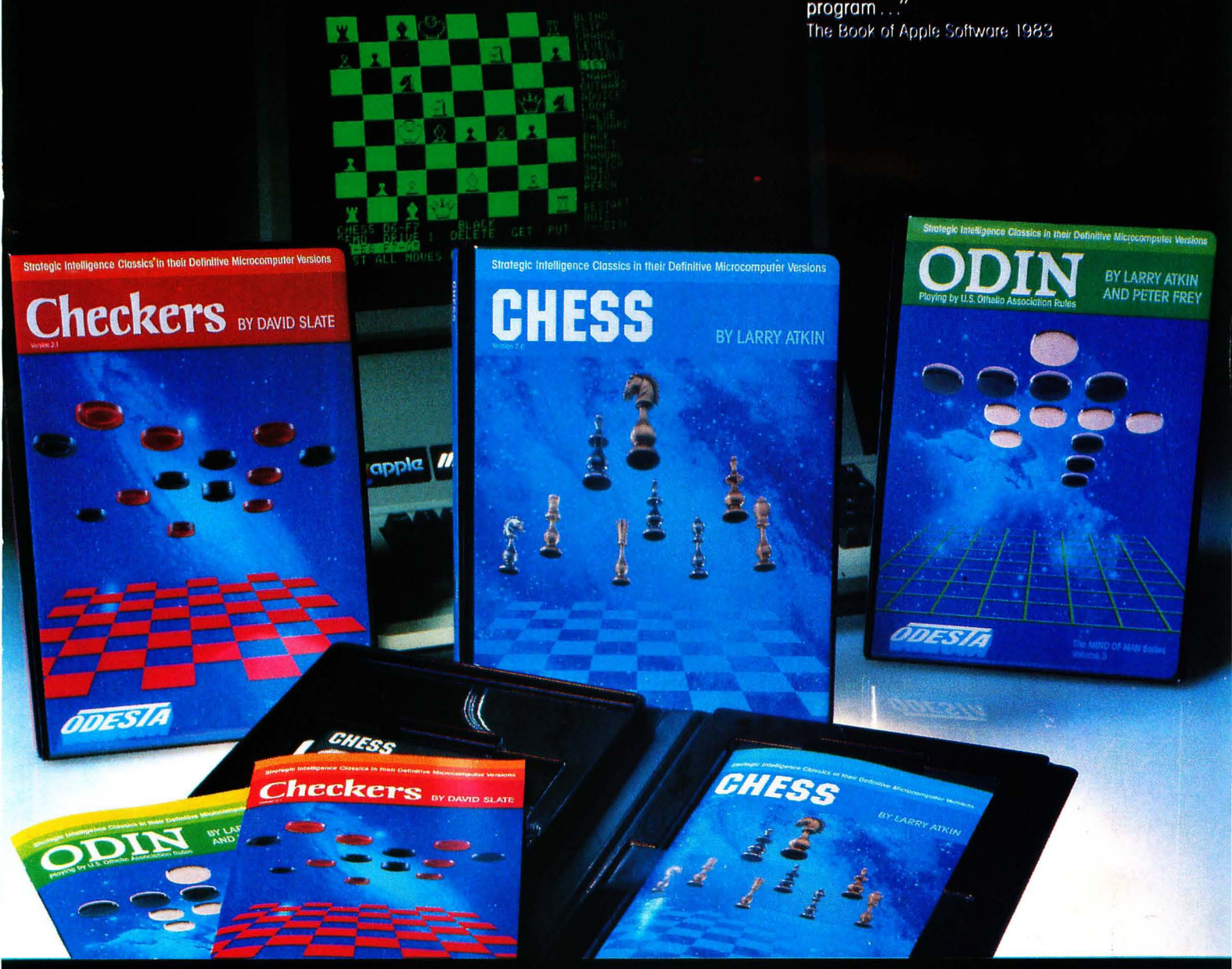
"Odin is the definitive Othello program..." The Book of Apple Software 1983



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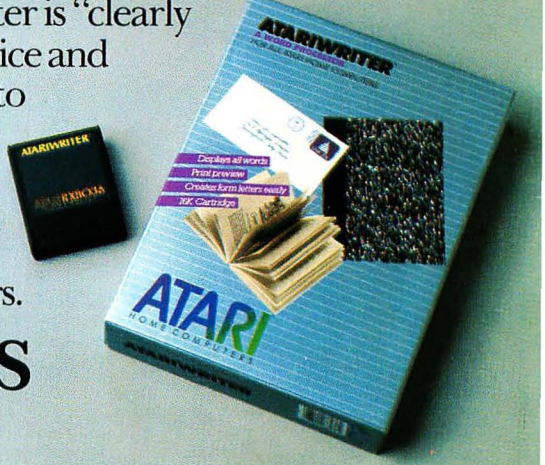

ATARI® HOME COMPUTERS

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