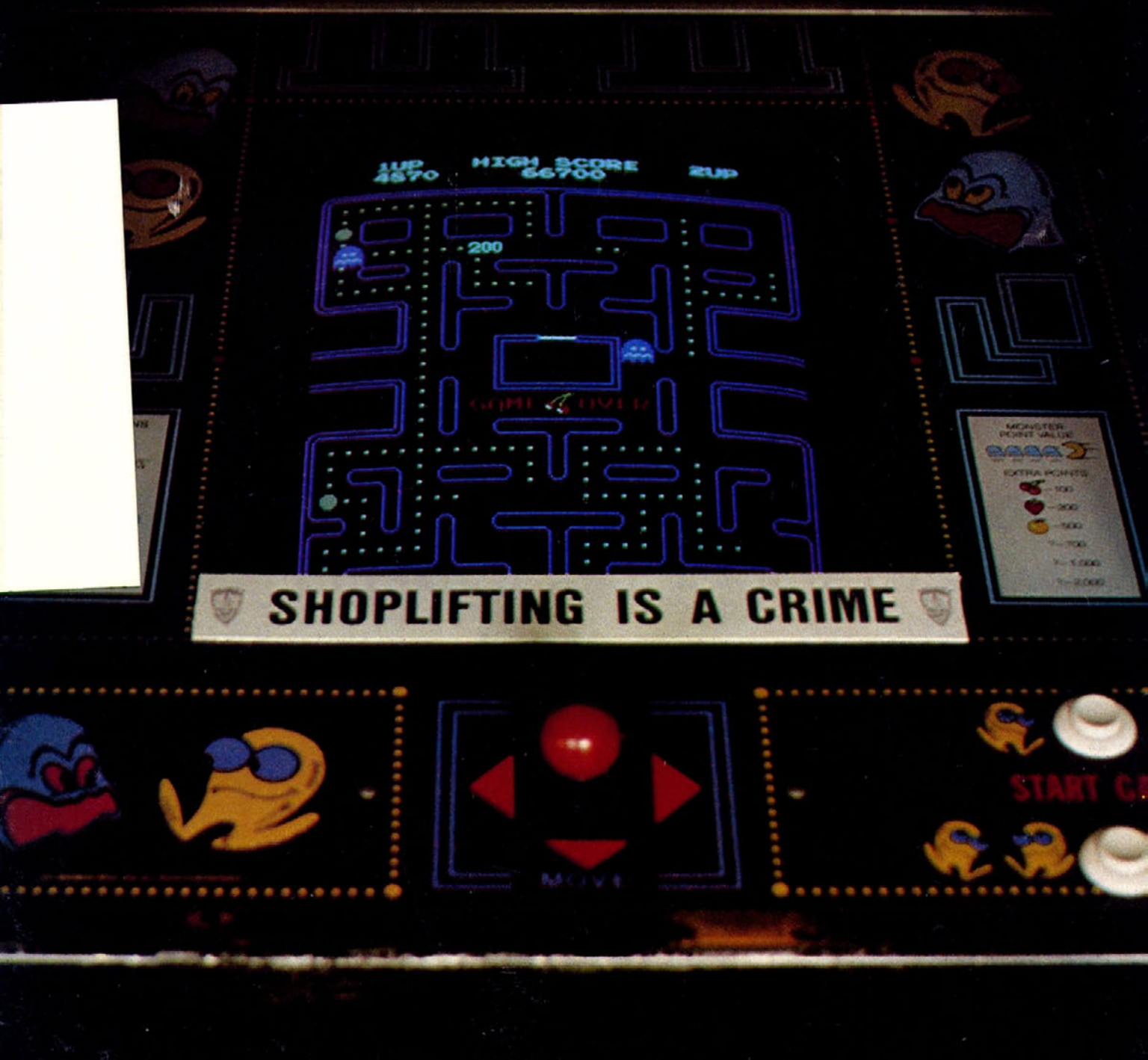
# SOFTLINE

VOLUME 1 JANUARY 1982 $1.50



# penguin software

The Leader in Apple Graphics

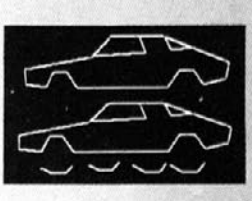
## The Graphics Magician

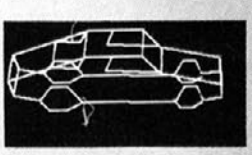
by Chris Jochumson,
Mark Pelczarski, and friend

This is the graphics package for which every programmer has been waiting. Written by three of the "wizards" of Apple graphics, it contains the same machine language animation routines that have been used to create some of the finest Apple arcade games. It also gives you the power to create 108-color screen images and graphic objects the way professionals do for adventure games and other programs that require dozens of pictures and objects to be quickly accessible from a minimum of space. Add to that new, "super shape tables"; a new approach to saving shapes that allows multiple colors, preservation of angles on scaling and rotation, and taking less space than standard shapes stored on the Apple. Extensive documentation and the same user-friendly approach of all Penguin Software products make the "Magician" incredibly easy to use.

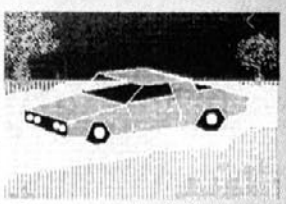
## THE COMPLETE GRAPHICS SYSTEM

by Mark Pelczarski





Contains everything you need for designing 2-dimensional and 3-dimensional graphics with the Apple, previously available only on expensive graphics computers. Create color screen images with lines, circles, ellipses, automatic 108-color filling, and "paintbrushes". Use high-resolution text anywhere on the screen in dozens of colors. Create and edit shape tables, and shrink pictures for multiple displays. Amazing 3-D routines let you draw the parts of 3-D objects on the screen, then assemble, rotate, and edit them visually in true 3-D perspective. All the software is easy to use, even for the novice. Programmers can use the graphics, and even our machine language routines, in their own software. This one package gives you more than most other graphics software packages combined. Find out why *The Complete Graphics System* is top rated in Apple graphics.

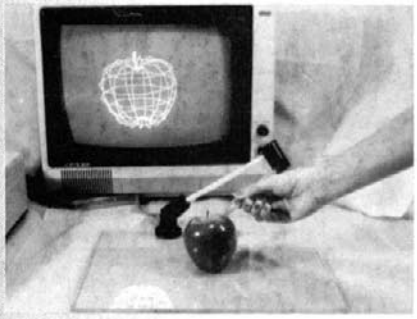


Development of a 3-D image using The Complete Graphics System.

## Add a New Dimension to your Apple! with THE SPACE TABLET

MCS micro control systems, inc.

a 3-D Graphics Tablet



This incredible new device produced by Micro Control Systems, Inc. functions as a standard graphics tablet in two dimensions, until you decide to expand to real-world 3-dimensional input. Now you can trace 3-D objects, either real or imaginary, then view and modify them in 3-D perspective with your Apple computer. The 16"x13" tablet comes with a customized version of *The Complete Graphics System*, specifically designed to accept input from three dimensions. In addition, the *Space Tablet* includes machine language software that allows you to design your own programs using 3-D input. This unique hardware/software package also comes at a very palatable price -- half the cost of most standard graphics tablets. See your Penguin Software dealer today!

## Special Effects

by Mark Pelczarski

Like nothing else on the market, this unique software package allows you to escape the "coloring book" approach to computer graphics, giving you a palette of 108 colors and 96 different brushes for creating or enhancing color computer images. Also included is a magnifying mode that lets you magnify images 2 or 4 times and edit them point-by-point, a "picture packer" that lets you store images in a fraction of the space normally taken, and a set of tricks that allow you to reverse colors, perform mirror images, and move parts of screen images around and to other pictures. *Special Effects* is great as a stand-alone package -- or the perfect complement to *The Complete Graphics System*.

The Complete Graphics System
paddle/joystick version $59.95
Apple Tablet or Hi-Pad version $119.95

Additional Fonts and Character Sets
for The Complete Graphics System
(50 fonts on two disks) $19.95

The Graphics Magician
paddle/joystick version $59.95

Special Effects
paddle/joystick version $39.95
Apple Tablet or Hi-Pad version $69.95

The Space Tablet, with custom version of
The Complete Graphics System $395

All products require an Apple II with Applesoft, 48K, and a disk drive.

See your dealer, or contact us.

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# Directline

**Baccarat, Anyone?**

I have owned and enjoyed my Apple II computer for eighteen months, but I have one software void perhaps you could help me with: I have been unable to find a casino-type baccarat game for the Apple.

James D. Aho
Dracut, MA

**Which One's the Ultimate?**

In reading your magazine, I came upon the review of *Ultima* by John Williams. As I read the review, I came upon his mentioning of *Wizardry* and then his declaration of *Ultima* as the best of the fantasy/role playing games. I might inquire whether Williams has actually played *Wizardry* or the others he mentioned. I myself have played both *Ultima* and *Wizardry*, the latter more extensively, but by choice, not by necessity. There is no question in my mind as to the better of the two. *Wizardry* is much more enjoyable and likely to give satisfaction for years with the additional scenarios being produced by SirTech.

Marty Geil
Annapolis, MD

**Packing Pictures, Saving Shapes**

How does one get so many pictures onto one disk, such as in *The Wizard and the Princess*, where On-Line has more than two-hundred pictures, with a program for the adventure on top of that? I read about picture packing from Penguin Software where they can get sixteen to fifty pictures on a disk, but that isn't enough.

Brian Fargo
Newport Beach, CA

Your series of articles on Apple II graphics has been very good and informative, especially since Apple didn't do a very good job of addressing themselves to the details of graphics. I hope Ken Williams will get into the use of shape tables with disk. I have found nothing in my Apple manuals on how to save and load shape tables to and from disk other than a vague reference to the fact that it can be done.

Mike Cooper
San Diego, CA

**Hear! Hear!**

I am an avid game lover, so the suggestion of a magazine specializing in computer games and simulations is enticing to me.

I would question, though, if computer games are "frivolous" and something one "indulges" in, as your advertisement in *Softalk* suggests. Computer games can challenge the limits of computer, programmer, and player—just look at

# BEZ-MX

Two virtually identical countries share a common boundary. A Strategic Arms Limitation Treaty had made war a thing of the past. A major stipulation in this treaty, however, forbade any transportation of weaponry across the mutual boundary between these countries. As fate would dictate, a minor electronic malfunction in one of the highly sophisticated BEZ-1 Bombers caused a simple training mission to turn into war.

BEZ-MX is a STRATEGY-ACTION simulation of that war. You control the entire Military-Industrial might of one of these two countries in one of three battle simulations, Solitaire, two player Basic and Advanced versions. Enter your strategy, then watch the battle unfold in HIRES Color and Sound. The action options of BEZ-MX let you control certain aspects of the battle in realtime.

Complete with a twenty-four page instruction book, BEZ-MX requires an Apple II Plus with 48K and one 13 or 16 sector disc drive. $29.95

*Apple II Plus is a Trademark of Apple Computers, Inc.*

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some of the more complex real-time simulations. Also, many games contribute to the education of the player, even if that is not their primary intention. The gamester can improve both mentally (deductive and associative reasoning in puzzle solving, strategy planning) and physically (hand/eye coordination). And all of this can happen while having fun! If these are the results of frivolity and indulgence, then let's have more of them, and I salute any magazine that supports this state of affairs.

Richard Langer
Amherst, MA

**High Scores and a Bug**

I am astonished to find such high scores printed in your Volume 1, Number 2. How does one get 17,735,500 with *Alien Rain*? How long does it take? What is the technique? Same questions with *Raster Blaster*. Perhaps you can publish an article on these secrets.

T. Krier
Poughkeepsie, NY

I have received my second issue of *Softline* (November) and find your magazine very interesting. Centering on gaming, it provides a unique view and explores a different aspect of the personal computer. I enjoy the articles and reviews very much, and I especially like comparing my personal high scores with those printed in the magazine (and perhaps even contributing a few of my own).

Additional note: Aren't *Apple Galaxian* and *Alien Rain* the same game? If so, why are both listed in the column of high scores (as two separate games)?

William Tung
Towson, Maryland

*Yes,* Apple Galaxian *and* Alien Rain *are indeed the same game. Our thanks to you and other readers who called this double entry to our attention.*

**On-Line Responds**

I have just read Mr. Hodgson's letter in the November issue regarding holding both the runoff and editor features of our *Superscribe II* in memory at one time.

In the forthcoming release of *Superscribe II*, Version 4.0, this has been done. As of this version, runoff and editor will reside in memory at one time, thus allowing swift transition from edit to print modes. Various other modifications suggested to us by users have also been incorporated into Version 4.0.

It is through the continued suggestions, comments, gripes, and recommendations of users such as Mr. Hodgson that we here at On-Line can attempt to continue to upgrade our products to reflect the needs and desires, as well as the demands, of the user's market. We applaud those users who aid us in this effort.

Kris Neely
On-Line Systems
Coarsegold, CA

**Computer Heaven**

After reading your articles on serious game programmers like Mark Turmell, Bill Budge, Jun Wada, Tony Suzuki and others, I asked myself what it would be like if all of these brilliant programmers, plus the scores of others who write great games for the TRS-80 and Apple, had their computers taken away from them and were each given an Atari to program all their games on.

It would be computer game heaven on earth.

Oh, well, back to *Eastern Front* . . .

John W. Jamison
Houston, TX

**Programmers' Futures?**

I really liked the article with Bill Budge. I have one question, though—how old is Tony Suzuki? From the picture, he looks to be about eighteen. If he is only eighteen and can write programs as well as he does, I think he has a great future in programming ahead of him.

What other sorts of projects does Bill Budge have in store for us? You mentioned another word processor, but I was wondering if he was working on any more games. I could understand if he isn't; it would be quite hard to top *Raster Blaster*. After all, that is one of the best games ever written for any personal computer.

John D. Gerlach
Fridley, MN

*Send your letters to Directline, Softline, 11021 Magnolia Boulevard, North Hollywood, CA 91601.* SL

# New Players

## GEBELLI SOFTWARE

Nasir Gebelli already had a number of games to his credit by the time he decided to form his own software company. Gebelli Software (Sacramento, CA) was built primarily on the reputation received from such favorites as *Space Eggs*, *Cyber Strike*, and *Gorgon*, all of which were produced under the Sirius Software label.

The royalties from those games helped open the doors to Gebelli Software last August. Now that he's on his own, what keeps Nasir's new business booming and those games coming?

Gebelli Software employs several programmers as well as three full-time and part-time people in the business office. Plans are already underway to double the staff. In its first few months of existence, Gebelli Software seems out to prove just how prolific a new company can be. They've already produced *Firebird*, and on the way are several new games for the Atari, including *Match Racer*, a one or two player road race game, and *Pathfinder*, an action adventure game that puts you in a maze with no easy way out.

For the Apple owner, *Horizon V* will be released soon. This is an arcade game that the company describes as a three-dimensional *Gorgon*. Programmers Allen Merrell and Eric Knopp have teamed up to produce *Russki Duck*, an animated, real-time adventure.

The main thrust of Gebelli Software has been the production of quality entertainment software, with an emphasis on animation. Nasir's goal since leaving Sirius has been to achieve better and better animation. His willingness to cooperate with other programmers and his love of animation has caused other people to want to get involved, according to some of his co-workers.

Phil Knopp, general manager of Gebelli, says one of the keys of the company's success so far has been the cooperative spirit among programmers. Knowing what other people are doing is extremely important, according to Knopp. If a game is not original, or doesn't excite the game player, it might not be successful.

Taking his cue from the record industry, Knopp believes in testing the product thoroughly and flooding the marketplace with plenty of promotion. "Ultimately, software is much different from records. Computer games must appeal to the eyes, the ears, and the gaming senses."

In the future, Knopp expects to see better animation and more realistic three-dimensional movement. And the Gebelli label should figure prominently in the market.

## Turnkey Software

It should come as no surprise that young industries attract the youthful in mind and body. In the early days of Hollywood filmmaking, there were a few outstanding oldsters, but there were many more sparkling teenagers and people in their early twenties shaping the industry. A few years ago the small computer industry was rocked by two youths and their design of the Apple computer.

Nowadays, some of the finest innovations and industry-shaping practices are coming from baby-faced kids barely out of high school. The fast-paced action game *Ceiling Zero* may not exactly be industry-shaping, but its author definitely falls into the category of youthful and sparkling. Stephen Warady is the twenty-one-year-old author of *Ceiling Zero* and the president of his own company, Ram Software.

A resident of Simi Valley, California, Warady got hooked on computers after he took a class in Basic during his junior year in high school. In his senior year, Warady took up machine language and caught on very fast; soon he was doing multiplication programs and memory checking routines. Next, Warady attended Moorpark College in Moorpark, California, and studied data processing.

For Christmas 1980, Warady got an Apple II from his parents; he started working at it right away. First he took over the books and records for his father's publishing business. This was a snap and left him wanting more, so Warady decided to follow up on an idea that had been fermenting for quite a while. He had always been interested in video games and graphics and decided to try writing a game for the Apple II.

This was seven months ago. Warady spent two months mastering assembly language for his purposes; he credits Roger Wagner's Assembly Lines column in *Softalk* with turning on a few lights, particularly when it came to indirect addressing modes. After overcoming certain barriers, he found things easy going. Once he'd finished writing the game, Warady was ready to market it; this decision lead to the formation of Turnkey Software.

With all his accomplishments, Warady did not have the business experience to market the game properly; he turned to Jim Leitzke and Drew Clausen, the proprietors of Computerland of West Los Angeles. They formed Turnkey Software to serve as the marketing and packaging arm of Ram Software, using their knowledge of the microcomputer business to complement Warady's programming skills.

Warady wants Ram Software to remain a developing firm, and since straightening out his father's business was so easy and satisfying, he plans to create business software in the future.

Not to worry, though. Warady has a new game nearly finished. It's another fast action game like *Ceiling Zero*, but will allow for either one or two players. The game is untitled as of this writing, and a release date has not yet been set. Warady, showing more wisdom than his years, is a firm believer in doing the job right and not rushing through it just to make a fast buck.

Wisdom and a good eye for opportunity have lead Warady to adapting *Ceiling Zero* for the new IBM personal computer. He is familiarizing himself with the machine first and hopes to have the IBM version ready early this year.

Just turned twenty-one, Warady has no other job and is looking at the prospect of becoming a very successful programmer. This is good, because he candidly admits to not being able to hold down a regular job. His mind keeps wandering back to computers.

Stephen Warady has benefitted from the youthfulness of the microcomputer industry, and in the years to come we should all benefit from this young man's contributions.

# Chess Championship: Machines Play, People Watch

*by CRAIG STINSON*

*The winner: Ken Thompson, programmer of* Belle, *accepts first-place trophy from tournament organizer Monroe Newborn.*

The news at the twelfth annual North American Computer Chess Championship, held this past November in Los Angeles, was not who won, but who very nearly did.

The tournament, sponsored by the Association for Computing Machinery, was held in conjunction with that organization's annual meeting. On three successive days, a crowd of a couple hundred chess and computer enthusiasts gathered in a Bonaventure Hotel ballroom to watch the world's leading programs battle it out.

**Competitors and Commentary.** The competitors hailed from distant parts—one from Germany, one from England, four from Canada, and ten from various places in the United States—and played on everything from 6502s and Z-80s to massive mainframes. The micros showed up in person, so to speak, but the big guns mostly rumbled from afar, sending in moves to their human seconds via modem. In at least one sense, the winner of the event was Ma Bell.

Lined up along the front end of the ballroom were eight tables where the players' human representatives sat with their terminals, modems, chess boards, clocks, and other gear. Overhead projectors at each table displayed the eight games as they unfolded.

Tournament director Mike Valvo, who holds the chess rank of international master, strolled along from one screen to the next, offering commentary and analysis of the games and fielding questions from onlookers. From time to time, certain of the computers added their own commentary—assessments of their advantage or disadvantage in a certain position, for example, or predictions concerning their opponents' probable line of play.

At one point, for example, Bell Laboratories' *Belle* predicted that its game with Northwestern University's *Nuchess* would terminate in a draw by repetition; after *Nuchess* made its next move, however, *Belle* reconsidered and announced that it was refusing the draw because it considered itself to be ahead by three hundredths of a pawn.

**Close, But No Stogie.** The tournament was expected to produce a photo finish between *Belle*, who had won two of the last three of these events, and *Cray Blitz*, a program that recently had achieved a United States Chess Federation rating higher than *Belle*'s, based on competition against human players. Both *Belle* and *Cray Blitz* had been playing at the master level—a USCF rank held currently by less than 4 percent of rated players.

*Nuchess*, on the other hand, a rewritten descendant of Northwestern University's *Chess 4.9*, had been rated at the expert level—still better than at least 90 percent of human players, but a notch behind *Belle* and *Cray Blitz*. Untried as yet against the best computer competition, *Nuchess* surprised a few people by holding on to draw against *Belle* and by finishing the match in second place, only half a point out of first.

*Belle* collected 3.5 points in the four-game Swiss-style tournament, which means it won its other three games outright (in chess tournaments, full points are awarded for victories and half points for draws). *Nuchess* was even in points with *Belle* going into round four, but it blundered in its final game—with Duke University's *Duchess*—and had to settle for a draw and an overall score of 3.0.

Finishing directly behind *Belle* and *Nuchess* were *Cray Blitz* and *Bebe*, in that order. Both of these programs

matched *Nuchess*'s final 3.0 score; their positions in the final standings were determined by comparing the final point totals of the programs they beat.

**Exhausting the Possibilities.** Practically all chess programs operate on the principle of brute-force exhaustive search. They look at an enormous number of potential positions and pick the move that leads to the position they evaluate to be most advantageous. Programs differ chiefly in terms of the depth of their search capacities and the sophistication of their evaluation functions.

Most programs do best in sharp tactical situations, where the positional outcomes of different lines of play can be evaluated fairly reliably in terms of material gain or loss. They tend to be weakest in the area of positional evaluation, because the gains or losses that may eventuate from subtle changes in position are hard to evaluate by conventional algorithms. The best human players are likely to outplay the best computer programs in games where long-range positional considerations predominate over tactical struggles.

Good human players usually develop, through experience, an intuitive understanding about positional values and can usually recognize quickly which of the many moves available to them at a given moment are worthy of consideration and which are not. Such values, however, are extremely difficult to quantify or to translate into an algorithm, and hence, most chess programs need to rely on the sort of things that computers do effectively: exhaustive, methodical consideration of every position, whether promising or disastrous, that may result from every legal move available.

Naturally, there are limits to how far ahead a computer can see and how many positions it can evaluate. The number of possible positions in a chess game is astronomical—larger than the number of atoms in the known universe—so an ideally played, perfect chess game between two computers is not a possibility in the foreseeable future.

On the other hand, *Belle* is capable of looking at and evaluating an astonishing 130,000 positions per second. The program—written by Ken Thompson, who is also the name most closely associated with Bell Laboratories' Unix operating system—runs on a DEC LSI/11 with special hardware running alongside; for sheer brute force, there's nothing in the world of computer chess to match it.

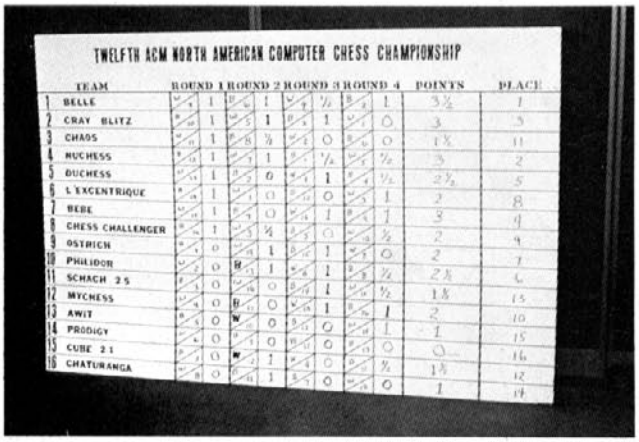
**AI Gains on ES.** What was remarkable about *Nuchess*'s success in battle with *Belle* was that *Nuchess* uses certain selective search criteria, rather than relying entirely on brute force. Its strength is puny compared to *Belle*'s; it examines a mere 2,200 positions per second, compared to *Belle*'s 130,000, and its library of programmed standard opening positions numbers only 5,700, compared to *Belle*'s 350,000. Yet *Nuchess* held its own.

The fact that *Nuchess* did as well as it did should offer some encouragement to computer scientists working in the area of artificial intelligence. The AI approach, which attempts to emulate human thinking processes, has not yet proved to be an effective way to program chess-playing computers. The one entrant in this tournament programmed entirely by AI methods, the University of Alberta's *AWIT*, finished a dismal fifteenth in the field of sixteen.

Three microcomputer-based programs participated in this tournament and did rather respectably. The English program *Philidor*, by David Levy and Kevin O'Connell, came up best of the three, finishing in sixth place with a score of 2.5. Dan and Kathe Spracklen's *Chess Challenger Experimental* and David Kittinger's *Mychess* ended neck and neck in ninth and tenth places, respectively.

The Spracklens are authors of *Sargon II*, a popular chess program for the Apple. Their entry in this tournament was an advanced version—running on a souped-up 6502 at four megahertz—of Fidelity Electronics's standalone *Chess Challenger*. Kittinger's *Mychess* was likewise an experimental model of a commercial product; his runs on CP/M-based computers—including the Apple with SoftCard—under the name *Mychess* and is also available as a standalone, under the name *Novag Savant*.

**Evaluations, Predictions.** So how strong are computer chess programs? The best of them now appear to be better than most human players. Tournament director Valvo, who


TWELFTH ACM NORTH AMERICAN COMPUTER CHESS CHAMPIONSHIP

| TEAM | ROUND 1 | ROUND 2 | ROUND 3 | ROUND 4 | POINTS | PLACE |
|---|---|---|---|---|---|---|
| 1 BELLE | | | | | 3½ | 1 |
| 2 CRAY BLITZ | | | | | 3 | 3 |
| 3 CHAOS | | | | | 1½ | 11 |
| 4 NUCHESS | | | | | 3 | 2 |
| 5 DUCHESS | | | | | 2½ | 5 |
| 6 L'EXCENTRIQUE | | | | | 2 | 8 |
| 7 BEBE | | | | | 3 | 4 |
| 8 CHESS CHALLENGER | | | | | 2 | 9 |
| 9 OSTRICH | | | | | 2 | 7 |
| 10 PHILIDOR | | | | | 2½ | 6 |
| 11 SCHACH 2.5 | | | | | 1½ | 13 |
| 12 MYCHESS | | | | | 2 | 10 |
| 13 AWIT | | | | | 1 | 15 |
| 14 PRODIGY | | | | | 0 | 16 |
| 15 CUBE 2.1 | | | | | 1½ | 12 |
| 16 CHATURANGA | | | | | 1 | 14 |

*The picture that tells the story—in this case, the results of the twelfth annual North American Computer Chess Championship. The column on the right indicates final standings.*

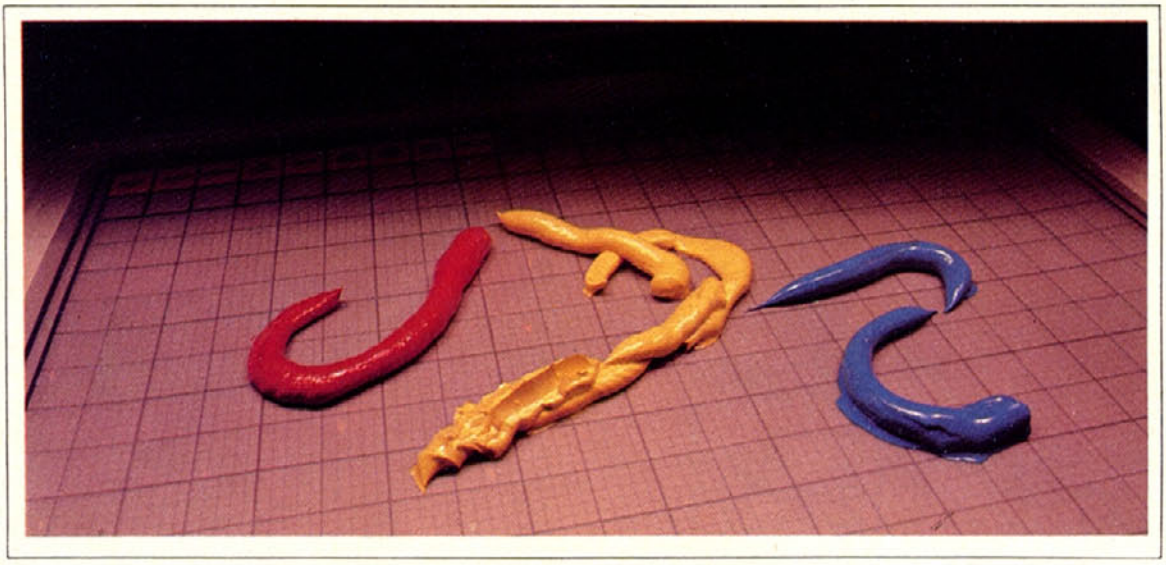
is rated by the USCF a couple hundred points above *Cray Blitz*, says he fears the computers.

A good human player, according to Valvo, may be troubled by a tendency to overextend against a powerful computer opponent, because the latter doesn't get emotionally involved in the game. A human player who is used to a certain amount of emotional interplay with his opponent may try too hard to intimidate a computer—to get it to show some "respect"—and thereby bring about his own demise.

On the evening of the last round, there was some discussion amongst tournament participants about when or whether a computer program might become chess champion of the world. Monroe Newborn, programmer of McGill University's *Ostrich*, predicted it could happen within five years. Valvo thought it would be more like ten, and the Spracklens were betting on fifteen years. Thompson thought it would be more than twenty years before a program could be written that would beat all comers, and a few others said it would never happen.

The most widely held view, however, was that a computer program would become world champion by or shortly after the year 2000. Considering both the complexity of the game and the complexity of the human mind, that seems like a remarkably positive outlook on the future of computing. SL

# Apple II Graphics: Peculiarities of the Hi-Res Screen



*by KEN WILLIAMS*

Welcome to part three of our series on Apple II graphics. In previous installments we learned about working from the Apple's Monitor, using the hexadecimal numbering system, and memory mapping. In addition, we discussed what a screen mode is, looked briefly at each of the possible screen modes, and explored how the soft switches work to tell the Apple which screen mode to use.

This time we will begin exploring your Apple's hi-res screen, making use of the knowledge acquired during prior lessons. If you missed the two previous issues of *Softline* you may wish to see about obtaining copies of the earlier articles for reference.

**An Experiment.** Enter the following program:

```
10  HGR
15  HCOLOR = 2
20  FOR I = 0 TO 100
30  HPLOT I,0
40  NEXT
50  REM
60  REM NOW LET'S TURN THEM OFF
70  REM
75  HCOLOR = 0
80  FOR I = 0 TO 100 STEP 2
90  HPLOT I,0
100  NEXT
```

After examining this program, you're likely to conclude that what it will do when run is draw a blue horizontal line consisting of one hundred dots and then turn off every other dot. Based on the program listing, this is certainly what you'd expect to see. Now run the program.

Surprise! You should have seen the line draw and then erase completely. This occurs because of the way the memory map inside your Apple is organized. Let's digress for a moment to account for this unexpected arrangement.

In hi-res mode your Apple is able to display six colors: black, white, orange, blue, green and violet. In order to allow for any of the 280 by 192 (or 53,760) possible dots on the hi-res screen to be any of the possible six colors, mapping the hi-res screen would require at least 20,160 bytes of memory.

To see how this number was arrived at, recall from the first article in this series our discussions of binary numbers. As you know, the Apple's memory is really just a big collection of on/off switches. If you have three on/off switches, they can be set in two to the third (eight) possible combinations.

For purposes of convenience, your Apple's memory has been broken into 65,536 separate sets of eight on/off switches (bits). Each of these groupings is known as a byte. Since each byte contains eight on/off switches, a byte can have two to the eighth possible settings (two hundred fifty six in all). Representing all six hi-res colors would call for

at least three bits (on/off switches). Multiplying three times 53,760—the number of dots on the hi-res screen—gives us 161,280—the number of bits it would take to represent all dots. If we then divide by eight to convert to bytes we'll get my estimate of 20,160.

If this number were the true amount of memory used by hi-res graphics, programming on the Apple would be limited at best. For you see, only 32,000 of the 65,536 bytes are available after Applesoft, the Monitor, and DOS take their chunks of memory. Subtract another 20,160 and no room would be left for meaningful programs.

Luckily, the Apple has developed a technique for displaying 280 by 192 dots using only 8,192 bytes of memory. This method of looking at memory may seem confusing at first, but it really isn't bad once you get used to it. Certainly, it's preferable to the alternative—having graphics but no memory for programming.

Briefly stated: If any two horizontally adjacent dots are "on," they will appear to be white. If a dot is "on," is surrounded by two "off" dots, and is on an even x-coordinate, it will be either violet or blue. If a dot is "on," is surrounded by two "off" dots, and is on an odd x-coordinate, it will appear green or orange. Any two "off" dots in a row will appear as black.

After studying the statements above, you will be able to deduce the following rules:

1. Any dot falling on an even x-coordinate must be black, violet, blue or white.

2 Any dot falling on an odd x-coordinate must be black, green, orange or white.

We never talked about how the determination is made of whether a dot on an even x-coordinate will be violet or blue (or about how it's decided whether a dot falling on an odd x-coordinate will be green or orange). We'll look at these things now.

**Understanding the Memory Map.** In your Apple's memory, each byte within the area mapped onto the hi-res screen contains eight bits. Seven of these bits correspond to dots that appear on your monitor or television screen; the bit that remains specifies what color lonely "on" dots are to be. Let's look at another example.

Enter and run the following program:

```
10  HGR
20  HCOLOR = 3
30  HPLOT 0,0 TO 0,100
```

Running this program should have drawn a vertical white line (according to the Applesoft manual hcolor = 3 should be color white1). Instead you were greeted by a vertical green line. Now add the following lines to the program and run it again.

```
35  HCOLOR = 4
40  FOR I = 0 TO 100
50  HPLOT 1,I
60  NEXT
```

Lines 35 through 60 simply set the color to black2 and draw a vertical black line at x-coordinate 1. Since this col-

umn was black already, it would seem that the program should have run the same way with or without lines 35 through 60. But watch closely; you'll see that a vertical green line is drawn and then slowly, starting at the top and proceeding to the bottom, becomes orange.

This occurs because of that extra undisplayed bit in each byte. Notice that column 0 and column 1 of the hi-res screen are in the same byte in memory. When we plot black2 in a byte it turns on the color bit, causing any other displayed bits in the byte to switch colors. If line 35 in the program above had said hcolor = 0 then the original green line would have stayed green; no color change would have occurred.

| Decimal | Hex | Binary |
|---|---|---|
| | | 7 6 5 4 3 2 1 0 |
| 1 | $ 1 | 0 0 0 0 0 0 0 1 |
| 2 | 2 | 0 0 0 0 0 0 1 0 |
| 4 | 4 | 0 0 0 0 0 1 0 0 |
| 8 | 8 | 0 0 0 0 1 0 0 0 |
| 16 | 10 | 0 0 0 1 0 0 0 0 |
| 32 | 20 | 0 0 1 0 0 0 0 0 |
| 64 | 40 | 0 1 0 0 0 0 0 0 |
| 129 | 81 | 1 0 0 0 0 0 0 1 |
| 130 | 82 | 1 0 0 0 0 0 1 0 |
| 132 | 84 | 1 0 0 0 0 1 0 0 |
| 136 | 88 | 1 0 0 0 1 0 0 0 |
| 144 | 90 | 1 0 0 1 0 0 0 0 |
| 160 | A0 | 1 0 1 0 0 0 0 0 |
| 192 | C0 | 1 1 0 0 0 0 0 0 |

**Backward Bits.** The chart shows the decimal, hexadecimal and binary representations of bytes with one bit in each of the right seven bits turned on. Now watch what happens when these values are poked into the hi-res screen. From Applesoft enter the following lines without line numbers:

```
HGR
POKE 8192,1
```

8192 happens to be the machine address of the first byte of the memory mapped area for hi-res graphics. When you enter the above statements, a single dot will appear in the upper left-hand corner of the screen. This dot will be in the same place as if you had entered:

```
HGR
HCOLOR=3
HPLOT 0,0
```

What's peculiar is that you poked a one into memory location 8192 (00000001). One is the rightmost bit in the byte and yet you turned on the leftmost dot. Now let's poke 8192 with a two (00000010):

```
POKE 8192,2
```

Note that even though we poked a byte with the second bit from the right on, it turned on the screen dot that's second from the left. Also note that the dot appears to be green. This is because the leftmost bit in the byte (the color bit) is off and the dot turned on now appears on x-coordinate 1. To turn the dot orange, all we have to do is poke 130 (10000010) into memory, which has the same dot turned on but also has the color bit on.

To summarize: Within each byte are eight bits, the rightmost seven of which are used to light a dot on the screen. The leftmost bit (bit seven, remembering that bits are numbered from zero to seven) controls the color of a solitary bit, with any two bits on in a row representing white.

**Left to Right Once Again.** Enter the following program:

```
10  HGR
20  HOME
30  VTAB 22
40  PRINT "THIS IS POKING"
50  FOR I = 8192 T0 8231
60  POKE I,1
70  POKE I,2
80  POKE I,4
90  POKE I,8
100  POKE I,16
110  POKE I,32
120  POKE I,64
130  POKE I,0
140  NEXT
150  HOME
160  VTAB 22
170  PRINT "THIS IS HPLOTTING"
180  FOR I = 0 TO 279
190  HCOLOR = 3
200  HPLOT I,0
210  HCOLOR = 0
220  HPLOT I,0
230  NEXT
```

Lines 50 to 140 of this program represent a loop varying I from 8192 (the first byte of the hi-res screen) through 8231 (the end of the first line of the hi-res screen). Within the loop are eight poke statements that poke into memory bytes with bits on in each screen dot position. Lines 180 through 230 simply hplot and then remove a dot from each possible x-coordinate.

When you run this program, you should see a dot move rapidly from the left side of the screen to the right and then begin again on the left—making the same trip as before, but more slowly. What we've begun to experiment with here is *byte move animation*, a technique we'll devote a great deal of time time to later on. As you can see, much greater speed is possible with byte move animation than can be achieved through hplot statements. It's a variation of this technique that makes possible games like *Raster Blaster* and *Threshold.*

**Where's the First Line?** By now you should all be fairly comfortable with poking things into line 0 of the hi-res screen. If you think back to the November issue, you'll recall that hi-res screen memory is not contiguous. There's no easy way we know of to calculate the addresses of successive lines.

on the hi-res screen. Therefore, most authors we know of use tables to point to the first byte of each screen line. For example:

```
10  HGR
15  DIM A%(23), B%(7), C%(191)
17  HOME: VTAB 22: PRINT "LOAD TABLES"
20  FOR I = 0 TO 23
30  READ A%(I)
40  NEXT
50  FOR I = 0 TO 7
60  READ B%(I)
70  NEXT
80  REM NOW COMPUTE ADDRESSES
90  FOR I = 0 TO 191
100   W = INT(I/8)
110   C%(I) = A%(W) + B%(I - (8*W))
120   NEXT
200   REM
210   REM NOW DRAW A LINE
220   REM
230   FOR I = 0 TO 191
240   POKE C%(I),1
250   NEXT
300   REM
310   REM DO IT THE OLD WAY
320   REM
322   HGR
323   HCOLOR = 3
325   HOME: VTAB 22: PRINT "HPLOTTING"
330   FOR I = 0 TO 191
340   HPLOT 0,I
350   NEXT
1000  DATA 8192,8320,8448,8576,8704,8832,8960,
      9088,8232,8360,8488,8616,8744,8872,9000,9128,
      8272,8400,8528,8656,8784,8912,9040,9168
1010  DATA 0,1024,2048,3072,4096,5120,6144,7168.
```

Lines 20 through 70 load the screen line addresses that are found on page 21 of the *Apple II Reference Manual* into the tables A% and B%. Lines 80 through 120 compute the addresses of all 192 lines on the hi-res screen. Lines 230 through 250 poke a dot into the first byte of each screen line and lines 330 through 350 hplot a dot.

When you run this program, you'll notice that poking seems to be no faster than hplotting. In fact, it's substantially slower than hplotting because of the overhead incurred by loading tables. Don't worry; in discussions to come we'll return to this example and show how to use these tables to our advantage.

**And in Conclusion.** Next time we'll delve even deeper into the wonders of hi-res graphics on the Apple. In particular we'll look more closely at how color is produced, as well as at how products that claim to produce more than the standard six Apple hi-res colors work. SL

# *Things To Come*

# *Ultra-Res*

Steve Boker, founder of Data Transforms in Denver, Colorado, is a graphics person who sees far into the future of the integration of games and graphics. He sees new directions in graphics—those that have been explored already and those that are still to be explored—as opening totally new frontiers in potential game concepts and methodology. Data Transforms's *Ultra-Res*, this month's preview product, promises to take major steps into these frontiers, making possible an interaction of human being and computer barely imagined.

**Picture This.** Graphics is a natural area of concentration for Boker, who admits to having thought primarily in pictures throughout his life. *Ultra-Res* represents a natural extension of this thought.

"When I talk, it seems that I translate pictures into words. It has long been a dream of mine to be able to communicate directly in pictures. *Ultra-Res* has turned into an expression of that dream. It will be a tool for communicating in images. We are working to create a bridge between words and images that will feel intuitive to people."

The company originally intended to release *Ultra-Res* by this past Christmas. But as they developed the product, it became apparent to Boker and his associates that what they were creating was not merely another graphics package, but an entirely new language for the computer—a graphics language based around the coding mechanisms the human brain uses to interpret visual images. Now release is targeted for this coming June.

To begin to understand *Ultra-Res*, it's necessary to know a little about the principles that underlie the brain's coding mechanisms for images and to understand how our eyes and mind work together to grasp what we see.

According to Boker, we primarily see the differences or changes in our visual field. The most prominent differences our eyes catch are the sharp edges or boundaries of the sort that exist between different colors or degrees of illumination. We see the whole picture, but it seems that our minds focus on the differences. It is these differences, not entire objects or pictures, that our minds store.

As an example, Boker cites the case of a coffee cup. If you see a coffee cup, your mind stores not the entire image of the coffee cup, but, rather, the differences between that particular coffee cup and a more generalized coffee cup image. This method of image storage takes less memory than would be needed to store whole objects or images; consider what a difference this would make when dealing with a limited amount of memory, such as has our friend Apple.

Thus, the mind breaks down visual experience into objects defined by their edges and by the patterns that fill the space between the edges. Now here's the additional element that makes it all come together. As it happens, motion in the visual field seems to break down in much the same way as the image of the coffee cup does. This means, then, that animation can be seen as sets of edges and patterns in four dimensions and that animated movement on a video screen can be described as if it were a four-dimensional object.

**Breaking Away.** Current computer graphics are still based on the mechanical arm concepts of vector graphics systems. The image-handling methodology Boker wanted to implement could not be served by these systems and concepts.

Boker began the search for a new system by looking at all the elements of the tasks that needed to be implemented, functions like creating a line drawing, filling it in with a pattern or color, and placing it within a visual field. He also examined animation functions like zooming, rotating, and moving within the visual field. Next, he considered possible ways of storing the information that would be needed to perform these functions. Two kinds of information would need to be stored: the first, a list of items or quantities; the second, the connections or relations between those items.

Boker was on the brink of the discovery that would enable him to create a link between language and image. Boker's thought at this juncture was influenced by the work of Dr. J. Jack McArdle of the University of Denver whose RAM (Reticular Action Modeling) theory of psychometric path analysis required some of the same information storage techniques. Boker realized that both the visual images he wanted to store and the graphic functions he was trying to program would fit well within the same data structure—a structure from graph theory known as a *star topology*. If the visual images were labeled with nouns and the methods of creating them were labeled with verbs or modifiers, the result would be a system in which visual images were the link between programming language and human language; the visually based programming language was dubbed STAR.

Here, then, is Boker's description—in essence—of what *Ultra-Res* is all about.

What you're seeing when you look at Apple's hi-res graphics is a portion of your Apple's memory being displayed on the screen bit-by-bit. Inherent in this method is the limitation of any graphic image to a size the Apple can display on the screen. *Ultra-Res*, by contrast, doesn't create or store its visual images bit-by-bit; instead, it creates and

stores them as a star topologic graph of differences from classes of edges, patterns, and motions.

The STAR method of storage is extraordinarily compact; it also allows you to build new images out of old. For instance, once you've created the image of a tree, it can be modified and reused; then the modifications can be modified, and soon you can have a forest of individual but similar trees, using a minimum of storage space. Because *Ultra-Res* stores images by their essential components, you'll be able to see all of your graphic from a distance or zoom in for a detailed closeup of any particular portion of it.

When you dump your graphic—any *Graphtrix*-compatible dot matrix printer will do the trick—you'll find that your hard copy shows much higher resolution than the Apple hi-res screen can display. An area thirteen hundred pixels by sixteen hundred pixels will be addressable on the Epson MX-100, for instance.

**Think of the Fun.** As to animation, that's where this preview is apt to begin to sound like sci-fi, because the concepts and structure of *Ultra-Res* graphics open the door to complex interactive animation.

You've seen video cartoons that respond to the game player's reactions; arcade and home-arcade games are simple forms of interactive animation. But imagine playing an adventure game in which you move smoothly through a fantasy world, a world in which you create your own characters and then see your characters move in that world; a drama in which the script is dependent upon the response of the audience.

*Ultra-Res* will enable the game author to define a complete field or background in which a game is to be played. This can be a continuous visual image, much larger than the visual screen, of which the player sees only a small portion at a time, according to the conditions defined by the author.

Characters and objects defined within the field will be available for the player to move, use, or alter. Since motions will be word-definable, the player will be able to affect the actual animated motion in the game world. For example, a player might come upon a box. He could lift it, turn it over or around, move it within the visual field—even zoom in for a closer look at it.

There'll be a five minute pause while your mind leaps and bounds with possibilities for games you'd like to see—or create.

Steve Boker of Data Transforms is looking even beyond *Ultra-Res*. He looks to video cassette recorders as the next possible interface with *Ultra-Res*, enabling Apple users to create complex animated frames and to view them as a faster and smoother sequence than the speed of the 6502 allows. This animation capability can also be applied to games—video cassette Apple games.

Boker is also excited about the new generation of co-processors, such as the 8088 and 68000, that promise to give lightning speed to graphic animation. *Ultra-Res* is already scheduled to interface with those boards.

*Ultra-Res* looks like it is truly the future today—uh, that is, in June. SL

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# SOFTLINE
## *Gameline Reviews*

**Crossfire**
By Jay Sullivan.

*Crossfire* is a blight on the hallowed number 6502. It's clearly designed to bring apoplexy-prone people to their knees and to induce gentle persons to mutter under-their-breath oaths.

The macho man will be temporarily gratified by the thought that it's a two-fisted game until he realizes that with one fist he'll be manipulating the E-S-D-F pyramid and with the other he'll have to cope with the I-J-K-L pyramid.

Confronted with such complexities, the natural inclination of the dedicated home-arcade gamer is to get on to *Falcons, Bez Man, Snack Attack,* or some other more playable game.

On the other hand, *Crossfire* is a new twist at arcade games with delightfully colorful beasties and smooth animation. So there's a tendency to try again and again to bring the game to heel.

This is no easy task. The left-hand pyramid controls firing your ship. Shooting up, left, and right represent no difficulty. But trying to get those devils that sneak up behind you is nearly an impossibility early on. Manipulating the right-hand pyramid for movement presents a similar difficulty: left, right, and up are relatively controllable; going down seems to require a third, supercoordinated appendage.

Equally as frustrating is that your enemy has no intention of making it easy for you. You begin the game surrounded on three sides. Each time you shoot a critter he metamorphoses into a more vengeful adversary. And after you've been killed for the third or fourth time by a reincarnation of a foe you just shot, you'll again forsake this torture for the relative pleasures of *Genetic Drift, Red Alert,* or *Firebird.*

Naturally, you'll eventually take another stab at it. The first time you clear a screen of all the creatures—several playing hours after you boot up the game for the first time—is cause for a celebratory libation. The nagging problems are twofold: there's a provision for getting an extra ship each five thousand points and there's room for six figures on the scoreboard.

Because you get three ships to begin with, it'll only take you a few dozen hours before you get skilled enough to withstand the alien onslaughts long enough to earn your first bonus ship.

From that point on, it's a matter of testing strategy to find the method that works best for you.

Author Jay Sullivan has provided a game that offers hours of challenge and enjoyment for the dedicated and persevering gamester. It's a well thought out game that's only marred by the lack of a pause button. Once you get really skilled, a game will take as long as thirty minutes or more. There are few times other than the middle of the night when one can get that kind of uninterrupted time. In games that will play that long, a pause button is not just a thoughtful addition, it's mandatory. **ART**

Apple II, Apple II Plus, Apple III (emulation mode); 48K, disk. $29.95 from On-Line Systems, 36575 Mudge Ranch Road, Coarsegold, CA; (209) 683-6858.

**Dark Forest**
By Jerry W. Jewell and Tom Mornini.

The booklet says there's a solitaire mode, but the Gruds don't know it. Or, at least, if they do know it, they also know a sucker when they see one, and a person playing solitaire fits the description, for all the time he'll last against a country full of the little nasties.

*Dark Forest* is a light-hearted, colorful version of a take-over-the-world war game. Here you need only take over an imaginary country peopled by the opponents you choose and nasty, grungy, green Gruds. You and the Gruds have a mutual enemy, a serpent who likes to eat armies—any flavor. You can't fight the pesky serpents, so you're stuck with Gruds.

Gruds are easy to hate. If the serpent pops up in one of your territories and eats all your troops there, well, you expect that kind of thing of a serpent. But when the Gruds immediately and automatically occupy the territory, even

though all the surrounding territories are yours and how the heck did they get in anyway?—it's not hard to enjoy doing them in.

Actually, you don't even have to take over the whole country. It's just that three treasures intended for your character have been hidden in three of the castles. You have to find yours before the other players find theirs and before you get wiped out. Since you can't even search a castle without five troops in it—and then only on a turn when you can get away with doing nothing else—you may nearly have to take over the country to achieve the goal of finding your treasures. Or maybe not. Strategy?

Choose from maps of Transylvania, Grudonia, Freedonia, and Lower Slobovia; each is colorfully bright and cartoonily fun, and, in essence, they're all the same anyway. They all have the same number of castles, the same number of territories of each color, and three dark forest territories. They differ mostly in placement of rivers and castled islands.

Each player names a character, chooses a castle and then distributes several troops. Any territories or castles not claimed by players are taken by Gruds, and the Gruds get to play first. No fair! No fair! But lots of fun.

At the end of each turn, you're granted as many new troops as you have territories that are not cut off by others' territories from your castle. Of course, if you lose your only castle, you don't get any new troops.

The Gruds will fight any territory adjacent to one of theirs that has less troops in it than they have in that one. They tend to fight dirty.

You and the Gruds are not alone in the land. Heaven and hell reside there too, just to make life interesting. There's a flaky wizard who occasionally makes himself available to help. You lose the messenger you send to request the wizard's help, but if the wizard grants you five or ten extra troops or a boat with which to avoid the trolls that prey on people crossing bridges, losing a messenger doesn't matter.

Of course, the wizard may be out to lunch with the serpent, or he may choose to give your territory to an opponent. Or, he may turn you into a Grud for a turn, in which case the Gruds get an extra round of Grud troops that you must distribute.

The serpent is much more predictable. He eats people, especially troops. He is impartial, however, and finds Gruds just as tasty as your troops or those of your opponents.

In each territory is kept a tally of the number of troops and the player to whom they belong—except in the three territories of the dark forest. Here, owners must keep track of troops—with difficulty, since the wizard may add or the serpent take away and you won't know which of the three territories is affected. And woe to the player who occupies a territory adjacent to a dark forest without knowing how many enemy troops lurk there just waiting for a good fight.

*Dark Forest* is a game of strategy, albeit not terribly deep strategy and that laced with luck. It begins a bit slowly, but establishing territories and building armies are necessary activities. Later it speeds up mightily. It makes an ideal family game for up to six players.

If you're playing with two or three players, we recommend that you play two characters each to keep the Gruds in their place. Gruds are terribly annoying, but they're also the salt that seasons the game. The wizard, serpent, and trolls? Pepper. **MCT**

Apple II, Apple II Plus, Apple III (emulation mode); 48K, disk. $29.95 from Sirius Software, 10364 Rockingham Drive, Sacramento, CA, 95827; (916) 366-1195.

**Star Raiders**

"Star Fleet to all units . . . Star Cruiser 7 destroyed by Zylon fire . . . Posthumous rank: garbage scow captain, class 2. . . ."

Make just one serious mistake, and that'll be you Star Fleet is talking about.

Atari makes very few game cartridges for their home computers; all but one are merely bigger or brighter translations of games already available for their small video system. The exception is *Star Raiders*, and it's quite a game.

*Star Raiders* seats you at the controls of Star Cruiser 7. Directional movement is made with an Atari joystick (one of the few Atari video components interchangeable with the computer system), which acts like the stick in an airplane: left and right are true directions, push forward to dive and pull back to climb out. Fire energy torpedoes using the red button on the joystick.

All other commands are executed by typing single characters on the computer keyboard. It's a good idea to hit S for shields before working out the game's complexity; a direct hit by anything—even a small meteor—with shields down, immediately ends the game.

F produces a look through the front screens; A a rear view through the aft screens. G is an important command: it calls up the galactic chart, which gives you Cruiser 7's position in known space relative to friendly starbases and hostile Zylon warships. If you move the tiny cursor to a given sector and hit H for hyperwarp (remembering next to hit F again to see what's coming up), Cruiser 7 will journey to a particular sector. Forward movement is achieved with the numbers 3 through 9; higher numbers will produce higher velocities.

The object of the game is to destroy the Zylon warships before they annihilate Cruiser 7, and preferably before you lose any starbases. After you've journeyed to a sector bulging with hostile forces, you can destroy these forces systematically with the aid of the attack computer, called up by typing C. The Zylons won't just sit still, either; they'll zip back and forth, firing energy bursts from all directions. It takes a true pilot (and considerable wrist action) to keep a Zylon lined up in the crosshairs long enough to blast him to multicolored smithereens.

More often than not, what you think are hits turn out to be collisions with bursts fired by Zylons. The sad truth doesn't become apparent until the debris clears, and the Zylon dances out of range while hurling more quick shots. The quickest way to verify a hit is by keeping an eye on the kill indicator located on the control panel at the bottom of the screen; successfully destroying a Zylon will change the number displayed.

Try to keep a third eye on the energy indicator. Spending

to page 32

# mouskattack

by JOHN HARRIS
and
KEN WILLIAMS

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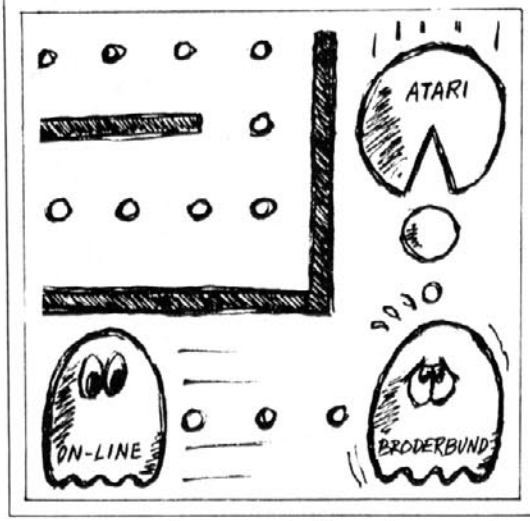
# The Great Arcade/Computer Controversy

## Part 1: The Publishers and the Pirates

by ALLAN TOMMERVIK




The fuss about software piracy is reaching a new peak with the coming of the new year. *Esquire* magazine has a major article on the subject in its January issue.

The very day that the article you're reading was being prepared, Softalk Publishing received a query call from a *Time* magazine researcher delving into the subject. If, or when, that piece will reach fruition is unknown, but the very fact that the national media are starting to take note of the phenomenon highlights the problem.

Inside the industry, the various facets of copyright infringement have been constant sources of irritation for more than a year. From the software producer's standpoint, the problem continues to become more complex, rather than resolving itself with the passage of time.

**Pirates of the Past.** Eighteen months ago, software publishers only had to cope with the depredations of the dedicated hobbyist/pirate. While every advance in copy protection met with a corresponding advance in breaking copy protection, the publisher had a reasonably even chance of recouping his investment and even pocketing a nickel or so prior to his software finding its way into the illegal alleys of rogue distribution.

Then came the advent of the universal copy devices—more commonly called nibble copiers because they purport to examine and duplicate each nibble found on the disk. Nibble devices put the means of piracy in the hands of that vast new market that had been technologically incapable of breaking most forms of normal copy protection.

Nibblers forced upon the software industry a heightened sense of copy protection, as well as a heightened awareness of responsibility to the end user.

The purveyors of serious applications software were forced by the nibblers to review their policies as they applied to back-up copies. Because archival copies had been specifically legalized by statute, applications software publishers had to address the question of whether to leave the making of archival copies to the end users wielding nibblers or to provide those copies themselves.

**No Longer a Game.** While the applications software publishers were wrestling with troublesome archival copy requirements, game publishers were being attacked on all sides as being masters of the big rip-off.

Coin-operated arcade game manufacturers besieged the entertainment software segment of the industry with lawsuits aimed at protecting what they felt were their legitimate copyrights. Companies as large as Atari and Magnavox found themselves eyeball to eyeball over a judge's bench on the issue of infringement. Such companies in the personal computer market as Broderbund, On-Line Systems, and Stoneware have had to cope with problems that vary from settling unintentional infringement out of court to defending themselves against infringement charges in expensive legal cases.

The reason for the increased intensity in pursuing legal solutions for these disputes is money, pure and simple.

In Atari's request for an injunction against On-Line Systems, asking that the smaller firm be denied the right to market *Jawbreaker* and *Gobbler*, one of Atari's vice-presidents reported back orders of "three or four million" *Pac-Man* cassettes for its Game Machine. In that same body of testimony, the witness, Charles S. Paul, senior vice-president and executive counsel, reported that Atari had spent $1.5 million on *Pac-Man* for its game machine before December 1981 and expected the total product development cost to hit $5 million before the game was actually ready for sale.

It's true that in these days of rampant inflation and trillion dollar national debts we get a little blasé about a million here and a million there. So contemplate these facts:

- *Raster Blaster*, *Alien Rain* (or *Apple Galaxian*), and *Space Eggs* each spent two or more months atop *Softalk*'s bestseller list. Yet none of the three programs has sold as many as thirty thousand copies.
- *VisiCalc*, the all-time bestselling champ, has yet to net its quarter of a millionth sale, including units sold for all of the dozen machines on which it will run.
- Apple Computer Inc., clearly the present champ in the personal computer market, aspires to selling three hundred thousand machines this year.

The point is that a vagrant million or so *Pac-Man* cassettes is no small matter to Atari or to Atari's dealers. Thar's money in them thar tapes, and anything that threatens the gold mine gets prompt attention.

**Catch-22.** To say that money is the point of all the whooping and hollering avoids the more basic issue of legality, however. Copyright law is reasonably clear-cut in most areas, and while computer software isn't the clearest of those areas neither is it so shrouded in arcane statutes that it

surpasseth all human understanding.

Essentially, copyright law is embodied in two acts: the Copyright Act of 1909 and the Copyright Act of 1976. The latter statute brought the former law up to the technological state-of-the-art. The basic act of 1909 had specifically forbidden copyrights for all works that could not be seen by the naked eye. Among areas thus foreclosed from copyright protection were computer software code and videotape productions, because neither could be witnessed in its original form by the naked eye.

Along came the omnibus amendments of 1976 which were intended to correct all such deficiencies, but that act created one loophole you could herd a whole company of Park Avenue lawyers through. The 1976 act referred the courts back to the 1909 act for each and every instance that was not covered by the new amendments. That's common practice when such omnibus amendments are introduced,


because the reference to the old law keeps intact the body of precedent that has built up around the old law.

Unfortunately, references to computer software in the 1976 amendments seemed to be mere afterthoughts, made almost in passing, which caused some people to look back to the prior act for guidance. Remembering that the prior act specifically forbade such products as computer code from copyrightable status, you see here a catch-22 of pristine purity: if what you have is a software program, then you're not clearly covered by the 1976 law, so you get to refer to the 1909 law. But the 1909 law denies copyright protection. However, the 1976 law implies that software does have protection. But when you read the act, you get sent back to 1909, and so forth.

Generally, that ambiguity is now resolved in most minds by accepting the intent of Congress to provide copyright protection to computer software code in its 1976 update to the copyright laws.

**Profit and Loss.** The general trend in courts has been for infringers of unmarked material merely to be deprived of the economic gain from their activity. However, if the work is properly marked, then the courts have held that treble damages are appropriately levied against the infringer.

When companies are the contestants, you always have these escalated stakes. But there's been enough contention about the copyright laws that no company so far has sought to defend its software copyright in court. What they've done instead is fall back on an audiovisual, as opposed to a literary, copyright.

Reduced to its simplest form, the audiovisual copyright affirms that if something looks like the original and sounds like the original, then it must be a copy of the original.

This approach makes more sense as the personal computers develop in capability. It is entirely possible to find five versions of the same game developed for the Apple computer: one programmed in Basic, one programmed in Pascal, one programmed in Forth, one written in assembly language and assembled, and one laboriously entered directly into machine code.

As literary works, they would be as uniquely distinct from each other as "Hansel and Gretel" is from *War and Peace.* But on the screen, even an expert might not be able to tell the difference.

The concept of the audiovisual copyright was firmly established last year in a U.S. Federal District Court action in Nebraska, *Midway v. Drikschneider.* Both companies were manufacturers of coin-operated arcade games and Midway was the manufacturer of *Galaxian*, one of the most popular arcade games of the year.

Midway brought the suit, claiming that a Drikschneider product was an illegal copy of *Galaxian*. Midway prevailed and Drikschneider was forced to cease manufacturing and selling its competitive game. The court held that Midway was entitled to protection of its audiovisual copyright, even if it had not filed one.

**Ten-Foot Poll.** The case may become even more of a landmark for its adoption of the "ten-foot" rule. The rule addresses the question of when a copy becomes so much like the original that it presents unfair competition in the marketplace by creating confusion in the consumers' minds. The Nebraska judge held that if a reasonable person could not, at ten feet, tell the difference between two competitive products, then there was cause to believe that an infringement was occurring.

The ten-foot rule probably needs a great deal of refining before it can be used by the layman as an accurate gauge to determine potential areas of infringement. The question of "How close is too close?" remains a subjective one, as Atari has found out recently.

Atari has been pictured of late as a corporate monolith seeking to break the small software houses functioning to provide product for the Apple market. A more balanced picture needs to be presented.

Atari is currently by far the largest purveyor of computerized entertainment products for the home market. While its personal computers have gotten off poorly, its game machines—going back to the time of *Pong*—have dominated the marketplace.

The company has aggressively pursued the rights to attractive games that would enhance their leadership position. They own the home distribution rights to *Asteroids*, *Missile Command*, *Pac-Man*, and *Centipede*, among others.

In the case of *Pac-Man*, the company had to negotiate with Midway, which had American coin-op rights, and Namco, the Japanese company that developed the original game.

**This Seat Taken.** When Atari turned to the home entertainment market, expecting little competition, they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found—much to their chagrin—that their expected advantage had been dulled by dozens of able Apple programmers, who had already converted *Missile Command* and *Asteroids* into faithfully duplicated programs.

This would be roughly akin to 20th Century–Fox buying the exclusive picture rights to a bestseller, only to find out that a Betamax version existed already and was doing brisk business. One need only imagine the accusations and lawsuits attendant to such a scenario to admire Atari's restraint.

The company approached each infringer on *Asteroids* and *Missile Command* rights and offered to settle for an almost unreasonably small royalty on each package sold.

.This represented a realistic look at what had happened in the marketplace. The first great rip-off was of *Super Invader*. Many of the publishers had authorized rights to the game, others just copied it. The important thing to note is that no one raised a voice against the copies.

**Spinning Wheels.** In retrospect, nobody comes out of such a situation unscathed. Why were obviously talented programmers limiting themselves to copies, much as a talented artist may make copies of Rembrandts rather than create his own new works? Why didn't software publishers awake to the fact that, if they didn't respect others' copyrights now, their own rights might be in danger later? Why did the coin-op companies take so long to respond to these copying practices?

The questions are not amenable to easy answers. The fact remains that the infringements and near-infringements continued unabated until Atari woke up the marketplace.

While Atari took a more than reasonable position on *Asteroids* and *Missile Command*, they decided to enforce vigorously their sole right to distribute *Pac-Man* into the home. They view *Pac-Man* as a unique phenomenon and believe their rights to the program to be invaluable. To that end, they approached Broderbund Software, distributor of *Snoggle*, and On-Line Systems, which distributed *Gobbler* in the Apple market and *Jawbreaker* in the Atari market. Atari also explored the question of infringement with Stoneware, which had marketing plans and advertising commitments for a program called *Maze Man* that was of the eat-the-dots genre.

It did not take the wisdom of Solomon to recognize that even a twenty-five-foot rule would probably not be sufficient to clear *Snoggle* of the charge of infringing on *Pac-Man*. Broderbund pulled *Snoggle* from the marketplace.

**A New Perspective.** But the decision to do so was not made to avoid losing an expensive court battle. Doug and Gary Carlston were looking instead to the future of the industry.

"We welcome the actions Atari is taking to protect copyrights of computer software," says Gary Carlston. "The entire industry will be strengthened when all authors of software get consistent protection such as the coin-operated companies like Atari are attempting to establish.

"In addition, we don't think that any one court case will set a precedent upon which all others can be judged. Each case of potential infringement will have to be considered individually.

"Because we feel strongly that mutual cooperation, rather than adversarial relationships, is in the industry's best interests, we felt it best to pull *Snoggle* from the market."

Stoneware, in the same spirit of cooperation, did not release *Maze Man* after discussions with Atari, even though the company had already invested in packaging and advertising materials.

On the other hand, Gary Carlston has already proven a prophet in his contention that no individual court case would decide the issue.

Within a week, Atari pressed its protection of *Pac-Man* copyrights against Magnavox in Chicago and On-Line Systems in Fresno, California.

Magnavox offers an eat-the-dots game by the name of *K. C. Munchkin* for its Odyssey game machine that Atari alleged was an infringement of *Pac-Man*. Atari asked for an injunction barring sale of the product until a trial on the merits of its allegations could be heard. A Chicago federal judge denied the request for injunction.

In Fresno, the issues were *Gobbler* and *Jawbreaker*. Ken Williams of On-Line Systems approached the Atari alle-


"ISN'T THERE ANYTHING *WITHOUT* HI-RES COWS?"

gations with a different mindset. "I don't think *Jawbreaker* is a rip-off of *Pac-Man*. And I definitely won't take Atari's word for it. If a judge tells me it's a rip-off, I'll gladly take it off the market."

As in Chicago, the federal judge found no reason to grant Atari's request for an injunction prohibiting the sale of *Jawbreaker*. But the issue is so complex that even Williams didn't know if he'd won something or lost something: "If this opens the door to other programmers ripping off my software, what happened here was a bad thing," Williams mused immediately after the judge announced his decision.

Whether Atari, having lost its bid to prevent two competitive products from being marketed, will pursue its infringement allegations in trials is still unknown.

**User Piracy Was Last Straw.** But what is known, from off-the-record comments with some Atari officials, is that individual piracy as much as the question of infringement is behind the company's move against Apple copies. Realistically, twenty thousand pieces in the Apple market makes little or no dent in Atari's proclaimed market of three to four million. But Atari officials privately express concern about rampant piracy that magnifies the official sales count by as much as five or six times.

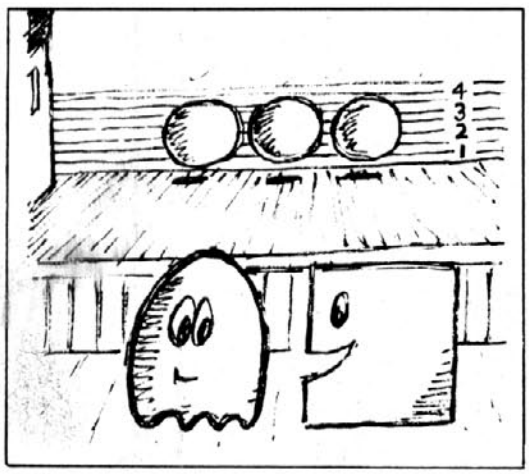
Even if Atari were to institute a licensing program, it

clearly would not produce revenue to compensate for the loss such piracy implies. And, even if the coin-op companies and the Apple software publishers could come to amicable terms, piracy might be an overriding barrier to consummating an agreement.

The salient point about individual piracy is that it is illegal—equal in the eyes of the law to the company that produces a faithful copy of another's program. No amount of ratiocination on the part of the pirates can avoid the fact.

One Apple user, who signed herself "A St. Louis woman flying the Jolly Roger" attempted to justify her actions on the basis that neither she nor her friends would have ever contemplated buying nibble copiers or using them for illegal copying if it hadn't been for the publicity articles such as this one had given the nibblers.

Such arguments are roughly akin to justifying My Lai on the basis of the publicity given Auschwitz during the Nuremburg trials. The same woman would not justify spouse abuse on the basis on seeing dozens of examples on after-




"THEY ALL LOOK ALIKE TO ME"

noon soap operas. Yet it becomes easy for her to blame the media for her indiscretions in "flying the Jolly Roger."

The nibblers themselves are no more invidious than any other piece of software—*ASCII Express*, for example. Used for the purpose of making archival copies, as provided for by statute, nibblers provide their owners with a valuable service, just as *ASCII Express* provides valuable communications capability to end users.

**The Discipline Not To Touch.** The problem stems from the lack of personal self-discipline in the personal computer market. Just as the software publishers had a reason, or excuse, for ignoring copyright requirements until such issues were forced upon them, so personal computer owners have had the same transformation to make.

Every personal computer introduced to the market has suffered initially from a lack of canned software. The universality of this experience makes it questionable whether or not the hardware manufacturer can be held accountable.

Nevertheless, in the evolution of a computer market, ingenious individuals are the first to produce software usable by themselves and other end users. And in time-honored tradition, such software—existing in the public domain—is used as currency to gather other such programs from other ingenious end users.

As events always transpire, some ingenious person will determine that he's invested so much in time and expertise in his program that there is no other barter currency out there worthy of exchange. So he puts a price tag on his product and becomes a publisher.

All those other pioneers, in whatever hardware you want to look at, will immediately feel betrayed by this untoward commercialism and vow to get revenge. This motive of revenge, plus the pioneering spirit of wanting to have all the software available for a particular brand of hardware, leads people down the path to piracy.

Nevertheless, the pioneer, who has indulged himself with all the software he could barter or pirate, needs to make the same transition that publishers such as Broderbund have made. Some activities, seemingly appropriate at one stage of development, cease to be appropriate at more mature stages of market development.

**Trusty Thieves.** When you stand aside from the issue, it's with no little bemusement that you notice that the thieves are usually citizens of very high standing otherwise. One clique of pirates consists entirely of aerospace engineers, all of whom have high security clearances and are entrusted with some of our nation's dearest military secrets.

Doctors and lawyers likewise are not immune from pirate fever. Yet these are people who must take oaths to follow the highest ethical standards even to begin practicing their livelihoods. Equally as interesting is the hobbyist who's writing the next *Raster Blaster* even as he's ripping off the last one. From whence will come his monetary reward if the market treats him the way he treats it?

The fact is that pirates of personal computer software are relatively immune from prosecution because federal attorneys are reluctant to prosecute copyright violation cases where profit is not the motive for the illegal transaction, and seldom is there a case where a pirate attempts to sell his wares. Rather, he uses them to return to the "good old days" of bartering for software.

But equally interesting is the musing of one private attorney, counsel for a software publisher, who conjectures that an entire pirate enclave could be cited for conspiracy to defraud because of their activities. Considering the fact that most of the trading groups are open and easy to find, gathering evidence of the conspiracy would, in his opinion, be a cinch.

What that concept needs is one daring software publisher and one gutsy federal attorney. Neither has stepped forward yet, but if one software publisher's estimate is true—that there're nine illegal copies out there for every legal one—it's only a matter of time before Apple software publishers get as militant toward the end user as Atari has gotten toward them.

**Remembering Conscience.** As with most things that entail the law, personal conscience and ethics are overriding considerations. No amount of haranguing or prosecutions will deter the professed pirate.

However, personal computer owners are not, by their nature, lawbreakers. Most who have become pirates have done so unthinkingly—as part of the pioneer syndrome. All that's required is reordered priorities. SL

*Next month, the Great Arcade/Computer Controversy, part 2: Is software overpriced?*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# *Games, Education, and Myth*

## *by SHERWIN STEFFIN*

As software companies have grown, so have their advertising machines, machines which, on request, can generate some wonderfully self-serving mythology. In this issue, we'll focus on one such myth—the idea that so called educational games are indeed educational.

For nearly twenty years, we've all been besieged to believe that educational television is educational. (After all, what other reason would anyone have for watching some of those program offerings against the lure of Monday night football if not to provide the kids with their intellectual vegetables?) So, too, the belief that educational games live up to their name is an easy on for software publishers to convince themselves of and to attempt to perpetuate.

But let's recall some of the ideas developed in earlier articles in this series. If, as suggested therein, we suppose that education consists of activities that bring about some pre-specified change in the learner's behavior, then we have a useful criterion against which to measure their educational value.

Measured against this definition, an activity that's alleged to be educational must have three essential components. First, it has one or more clearly stated intended learning outcomes; second, the strategies employed are directly linked to the intended outcomes; and third, the achievement of the specified outcomes is measurable and unambiguous.

If you accept this definition of education/instruction, try casting some of the games that are advertised as educational against these critieria and see how well the programs measure up. Look, for instance, at Apple's *Lemonade*, or *The Shell Game*; while both are well known and user-friendly, it is not at all clear what instruction they are intended to provide.

*Robotwar* is another well known game for which educational value is claimed. This game supposedly teaches programming. But programming, particularly assembly language programming, involves a complex series of skills. Read what the September/October issue of *Peelings* said about the instruction provided:

"The *RW* manual is not written for the new programmer; the errors and disorganization, coupled with the lack of user oriented programming techniques, make *RW* too tedious to get involved in. Only the most die-hard gamers will keep from losing interest in *Robotwar*."

What this implies is not that *Lemonade*, *The Shell Game*, or *Robotwar* lack entertainment value. It's only to say that as educational tools designed to help the learner achieve specified learning outcomes, they are not at all adequate. Their merit as entertainment is a completely separate issue that calls for judging them along wholly different criteria.

Writing in the December 21, 1981 issue of the *Christian Science Monitor*, Melvin Maddocks puts it rather succinctly: "If there must be games—and we're trying to keep an open mind—let them be sold on the basis of play-for-play's sake. When chess was intevented some fifteen hundred years ago, and checkers some five hundred years later, we can't believe that some bystander whispered, "He's learning—and he doesn't even know it!"

**Learning and Motivation.** In many programs developed for young (usually primary school age) learners, you'll find such things as smilling faces or "cute" sound effects that are meant to serve as reinforcement. Our contention is that such devices are worthless at best, and counter-productive at worst.

Most of us would agree that there must be some motivation on the part of the learner for learning to occur. Motivation can result from the perceived value of the material or activity to be learned, or from various factors in the learning environment which are perceived by the learner as positive.

The skill of swimming is an example of the first case. Swimming itself has intrinsic value—it's an activity from which pleasure can be derived, a valuable social skill, and a useful tool in maintaining one's health and well being.

An example of the second case can be illustrated by the scenario that may be set up when a person learns to swim. The setting of the beach or swimming pool, the presence of the teacher or friend teaching the skill—these are motivational factors that may make the prospect of learning attractive.

Conversely, many people place little or no value on gaining skills in American history or English grammar; these kinds of skills are not seen as having value to them, other than as a means of demonstrating to others—parents, teachers, college entrance committees, and so on—that the required learning has taken place. This stress on the extrinsic rewards for the act of learning, rather than on the rewards inherent in learning particular skills for their own sake, is inappropriate.

It is well recognized that two kinds of learning may be

identified. These are acquisition learning and maintenance learning. *Acquisition learning* is the initial learning of some new behavior or skill, while *maintenance learning* refers to that learning which is continuing and because of which skills are demonstrable long after the original learning experience.

Cramming for an examination (and then forgetting all the material once the examination has been completed) is an example of acquisition learning. Riding a bicycle, on the other hand, is an example of maintenance learning; once the skill itself is learned in childhood, it may be maintained without practice into the adult years.

In our view, it is fundamental that the learner's motivation come more from the respect he gains for his ability to master new tasks than from any inherent entertainment he may expect to derive from his participation in learning activities.

**The World Through Different Eyes.** As we age, so do our perceptions of the world, and therein lies a problem. Much of which we as adults may consider amusing, entertaining, cute, or even downright funny, will be considered just plain nauseating by children. Children who are unusually civil or obsequious will tell us that something is "interesting;" those who are rude (or honest) will use "y-e-c-c-h" to describe what they perceive.

If you disbelieve this asssertion, spend some time watching what children do for their own amusement. Then ask yourself how much entertainment the activities you observed would hold for you if you were to engage in them.

What all of this tells us is that from the perspective of the end user, the standards we've developed to determine the entertainment or motivational value of an instructional program or system have a high probability of falling short of the mark. Let's turn to research for a moment to suggest some of the features of CAI materials that have either positive or negative reinforcment values for young learners.

**The Look of the Program.** The very last message any learner wants to get from a computer is that he or she is a young child who needs to be treated as a young child. A program that introduces the computer with "I'm Mrs. Apple," is bound to produce a negative reaction in those looking at its display.

This same problem comes up for publishers of materials in remedial reading. Learners whose reading skills are limited still want reading activities directed at their interests. When Dick and Jane is presented to a fourteen year old, the result is certain to be disastrous in terms of the learner's motivation for reading the material. By the same token, materials that are too difficult, or that presume skills a learner doesn't have, are likely to prove frustrating because the tasks required are too demanding.

**Measuring Motivational Value.** With these ideas in mind, we can begin to establish a framework by which to assess instructional programs for their motivational value. Here are some questions you may want to ask yourself when you're considering the purchase of an instructional program and want to test its motivational aspects:

1. Are the system usage requirements clearly presented for the learner? Here, you're concerned with the things the learner has to do in order to operate the learning system. Are menus provided? Can selections be made with a single keystroke, with protection against user-error built in? Does a learner have easy access to information presented earlier? Can the learner skip over sections he has already mastered?

2. How much control does the learner have over screen display time? Many programs marketed these days have no provision for allowing the learner to control the amount of time information is displayed on the screen. As a result, information may move either so quickly that the learner can't assimilate it, or so slowly that the learner's attention begins to stray. Check to see what provisions have been made to allow the learner to determine the speed at which information is displayed.

3. How attractive and legible is the screen display? No matter how good the terminal display is, its overall legibility is somewhat less than that of a textbook. Program designers should make every effort to compensate for this problem. This can be done by using upper and lower case type fonts, double size letters, screen and subhead borders, and color accentuation.

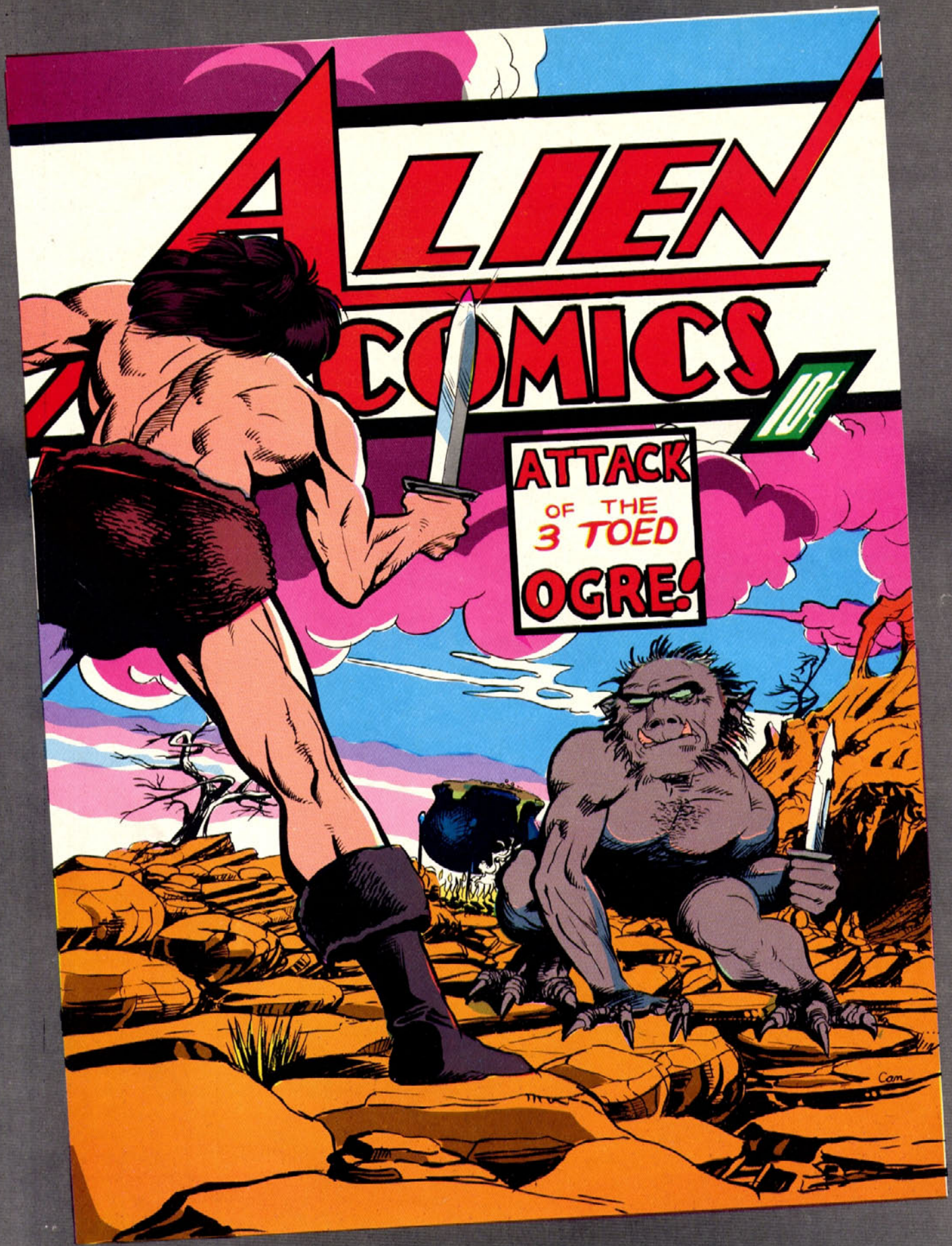
All of these devices are software controllable, and their absence can indicate a lack of programming and design sophistication on the part of the publisher. Beware of materials that present text in any but a left-to-right configuration. While it may be interesting to look at, text that's presented vertically, sideways, or in other deviant patterns is certain to increase readability problems.

4. What patterns of reinforcement accompany confirmation? A confirmation is simply an indication to the learner of whether his response is correct or incorrect. Confirmations that attempt to reward correct responses with statements like "Good," "You are doing great!", and so on, may strike the learner as consdescending, and negative reactions to incorrect answers are likely to evoke anger and frustration.

5. What provision is made for repeated failure? Nothing will frustrate the learner faster than repeatedly attempting an exercise and getting it wrong. It's important that program designers give serious thought to this situation and provide methods by which the learner's errors will be tabulated and responded to appropriately. Responses might include looping the learner back to earlier instruction, presenting the correct answer with an explanation, or branching the learner to some alternate treatment of the requisite information. When evaluating the motivational aspects of software, it's a good idea to look at whether this problem is being addressed in some way.

**In Summary.** In this article, we've attempted to dispel some of the mythology that exists relative to the educational value of educational software games. We've also outlined some consumer approaches you may want to employ as you assess the motivational value of various software programs. The position we've suggested focuses on respect for the learner's desire to learn, rather than on his desire to be entertained. In addition, some aspects of motivational enhancement have been enumerated.

Next issue, we'll discuss the relative merits of CAI for different curriculum areas. SL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# *Adventures in Adventuring*

## *by KEN ROSE*

There's a secret word that can take you out of your everyday existence and transport you to another world—a place where magic works and fair maidens await rescue; where heroes are made, not born; and where adventure is king.

**The Making of Heroes.** But before the secret password is revealed, let's recall some of the well known heroes who reside in that magical world. Superman, for instance.

Brought to life in the summer of 1939, Superman was a creation of the combined imaginations of Jerome Siegel and Joe Shuster. Among his superhuman powers were the abilities to leap an eighth of a mile, to hurdle skyscrapers, and to lift tremendous weights. He could run faster than a streamline train and, as the story goes, "nothing less than a bursting shell could penetrate his skin!"

What a puny creature was this early Superman compared to the Superman that emerged later on! For just as Superman grew tougher and more versatile as the years passed, so did his adversaries. After all, how much interest would people have if this superhero only fought ordinary garden-variety opponents who could be overwhelmed easily?

During the 1940s, another heroic figure arrived on the scene. This character was Captain Marvel.

Captain Marvel's super powers consisted of the wisdom of Solomon, the strength of Hercules, the stamina of Atlas, the power of Zeus, the courage of Achilles, and the speed of Mercury. Now there's a mixed bag for you.

The good captain received his powers from a magical character named Shazam, who transformed newsboy Billy Batson into the super character. Cutting across various mythologies and eras, good old Shazam (an Egyptian who lived in an abandoned New York subway tunnel), endowed Billy with the attributes needed to combat crime and evil.

Captain Marvel was one of the first modern age fantasy heroes to have his abilities so explicitly spelled out—inventoried, if you will. All the heroes of the time quickly came to be centered around a single, specific attribute. Some controlled fire, water, or certain meteorological phenomena. One could bend all matter to his will unless it was colored yellow. One got killed as a cop and came back in his astral form to haunt gangsters, Nazis, and others. And he could do anything—absolutely anything!

As a rule, however, the attributes of the hero served to define him clearly and to establish his limitations. The most interesting thing about Superman quickly became that which he could not do. (These days, there are countless varieties of kryptonite, ranging from the type that can kill Superman to the type that only makes him cranky and irritable before his morning cup of coffee.)

On such fare were generations brought up. The classical hero was no longer perceived as an all-around, can-do type of demigod, but rather as a fallible mortal with certain abilities on which there were certain limits. The seeds of the role playing adventure game were planted.

**A New Element.** When Gary Gygax developed the game Dungeons and Dragons, he addressed the whole range of attributes that heroes and villains—both natural and supernatural—might possess, and produced the definitive works on the subject. His *Player's Handbook, Dungeon Master's Guide, Monster Manual, Deities and Demigods,* and *Friend Folio* tell you all you'll ever want to know about the powers and peccadilloes of all creatures great and small.

As you probably know, Dungeons and Dragons is a non-computer role playing game in which each participant takes on the persona of a character who may be either good or evil and whose attributes are defined by the character's nature and the roll of the die. Dice are not necessarily of the six-sided variety, but come instead in different shapes ranging from four sides to twenty. Rolling the dice establishes the strength of a character's particular attribute.

One of the players acts as the dungeon master. The dungeon master creates the dungeon where a variety of monsters and unpleasant creatures reside. When encountered, these creatures must be fought.

The attributes of these nasties were set by Gygax, but the levels of the various attributes are set by the roll of the dice. When a conflict occurs between a player's character and one of these adversaries, it is resolved by—what else?—rolling the dice and comparing the relative strengths of the opponents' attributes.

**Conflict Based on Principles.** If all this sounds familiar to the computer gamer, that's not surprising. Every fantasy conflict game—whether hi-res, lo-res, or no-res (text)—whether programmed for the Apple, Atari, TRS 80, Commodore Pet, IBM, or what have you, is based on these same principles. As originally defined by Mr. Gygax, the attributes are intelligence, wisdom, charisma, constitution, dexterity, and strength.

Now that you've got the idea, it's time to experience the thrill of victory (or the agony of de feet). It's time to play *Attack of the Three Toed Ogre.*

The program listing to which we'll refer was written on an Apple II in Applesoft Basic, but should be easily convertible to whatever version of Basic you use. If you'd like some help in converting this program to another version of Basic, drop me a note care of *Softline*, and I'll supply an answer.

```
1     HOME
5     REM  VARIABLE NAME LISTING
10    REM  LF = LIMITING FACTOR OF DICE
15    REM  CO = CONSTITUTION
20    REM  OC = OGRE'S CONSTITUTION
25    REM  ST = STRENGTH
30    REM  OS = OGRE'S STRENGTH
35    REM  AG = AGILITY
40    REM  OA = OGRE'S AGILITY
50    REM  WI = WISDOM
```

```
55    REM  OW = OGRE'S WISDOM
60    REM  YT = YOUR TOTAL ATTRIBUTES
65    REM  OT = OGRE'S TOTAL ATTRIBUTES
70    REM  YH = YOUR HITTING THE OGRE
75    REM  OH = THE OGRE HITTING YOU
100   PRINT
110   PRINT "  ATTACK OF THE 3 TOED  OGRE"
115   PRINT "  BY"
120   PRINT "  KEN AND MIKE ROSE"
200   REM  SET UP CONSTITUTION
205   LF = 10: GOSUB 11000:CO = X
210   PRINT : PRINT
215   PRINT "WELL, HERE YOU ARE AGAIN
       TRYING"
220   PRINT "TO CONQUER A TERRIBLE
       MONSTER."
225   PRINT : GOSUB 10000
230   PRINT "YOU LOOK REALLY PEPPY TODAY.
235   PRINT "I'LL BET YOU COULD FIGHT YOUR
       WEIGHT "
240   PRINT "IN "; CO; " WILDCATS."
245   PRINT : GOSUB 10000
300   REM  THE OGRE'S CONSTITUTION
305   LF = CO: GOSUB 11500:OC = X
310   PRINT "AH HA...HERE COMES A MONSTER."
315   GOSUB 10000: PRINT
320   PRINT "IT'S A THREE TOED OGRE AND
       LOOKS TOUGH AS ";
325   PRINT OC; " WILDCATS.": PRINT : GOSUB
       10000
330   INPUT "ARE YOU READY TO TANGLE
       WITH HIM? "; A$: HOME
335   IF LEFT$(A$,1) = "N" THEN GOTO 20000
400   REM  MUSCLES LIKE STEEL
405   LF = 10: GOSUB 11000:ST = X
410   PRINT : PRINT
415   PRINT "HMM...LET ME FEEL YOUR MUSCLE."
420   PRINT : GOSUB 10000
425   PRINT "ON A SCALE OF 1 THROUGH 10,
       I'D SAY "
430   PRINT "YOU WERE A "; ST; "."
500   REM THE OGRE'S STRENGTH
505   LF = ST: GOSUB 11500:OS = X
510   PRINT : GOSUB 10000
515   PRINT "OF COURSE, JUDGING BY THAT
       OGRE'S KNOTTY";
520   PRINT "ARMS, I'D SIZE HIM UP AS A "; OS; "."
525   PRINT : GOSUB 10000
530   PRINT "NOW LET'S SEE...THAT OGRE IS
       AT LEAST"
535   PRINT "AS TOUGH AS "; OC; " WILDCATS
       WHILE YOU CAN"
540   PRINT "LICK "; CO; " WILDCATS.": PRINT
545   GOSUB 10000
550   INPUT "ARE YOU SURE YOU WANT TO
       FIGHT? "; A$: HOME
555   IF LEFT$(A$,1) = "N" THEN GOSUB 20000
600   REM  NIMBLE AS A GAZELLE
605   LF = 6: GOSUB 11000:AG = X
610   PRINT : PRINT
615   PRINT "YOU MIGHT HAVE A CHANCE AT
       THAT. IT"
620   PRINT "APPEARS YOU COULD LEAP "; AG;
       " BUILDINGS"
625   PRINT "AT A SINGLE (OR DOUBLE) BOUND."
630   GOSUB 10000
635   PRINT
700   REM  THE OGRE'S AGILITY
705   LF = AG: GOSUB 11500:OA = X
710   PRINT "OF COURSE, IT APPEARS THAT
       THE NIMBLE "
715   PRINT "THREE TOED OGRE COULD HOP
       OVER AT "
720   PRINT "LEAST "; OA; " BUILDINGS."
725   PRINT · GOSUB 10000
730   PRINT "DO YOU WANT TO STOP? IT
       APPEARS THAT"
735   PRINT "THE TERRIBLE CREATURE IS
       GETTING READY "
740   INPUT "TO SPRING: "; A$: HOME
745   IF LEFT$(A$,1) = "Y" THEN GOTO 20000
800   REM  WISDOM OF THE AGES
805   LF = 10: GOSUB 11000:WI = X
810   PRINT : PRINT
815   PRINT "JUST ONE OTHER THING YOU'D
       BETTER "
820   PRINT "CONSIDER. WHILE YOU'RE AS
       SMART AS "
825   PRINT "AT LEAST "; WI; " FOXES ,THE OGRE
       IS MORE"
830   PRINT "INTELLIGENT THAN ";
900   REM  THE OGRE AIN'T SO DUMB
905   LF = WI: GOSUB 11500:OW = X
910   PRINT OW; " OWLS. "
915   GOSUB 10000
920   PRINT : PRINT
930   PRINT "O.K. THIS IS YOUR VERY LAST
       CHANCE TO "
935   INPUT "QUIT. DO YOU WANT TO QUIT? ";
       A$: HOME
940   IF LEFT$(A$,1) = "Y" THEN GOTO 20000
1000  REM  THE GREAT FIGHT
1005  HOME
1010  YT = CO + ST + AG + WI
1015  OT = OC + OS + OA + OW
1020  LF = 20: REM  ROLL 20 SIDED DIE
1025  REM  OGRE'S TURN
1030  GOSUB 11000:OH = X
1035  IF OH > 10 THEN YT = YT - 1: REM
       OGRE LANDS A PUNCH
1040  IF YT = 0 THEN GOTO 30000
1045  IF OH > 10 THEN PRINT "OUCH...THE
       OGRE LANDS A PUNCH.": PRINT "YOU'VE
       ONLY GOT "; YT; " POINTS LEFT.": PRINT
1050  FOR X = 1 TO 1000: NEXT X
1055  REM  YOUR TURN
1060  GOSUB 11000:YH = X
1065  IF YH > 10 THEN OT = OT - 1: REM  YOU
       LAND A PUNCH
1070  IF OT = 0 THEN GOTO 30000
```


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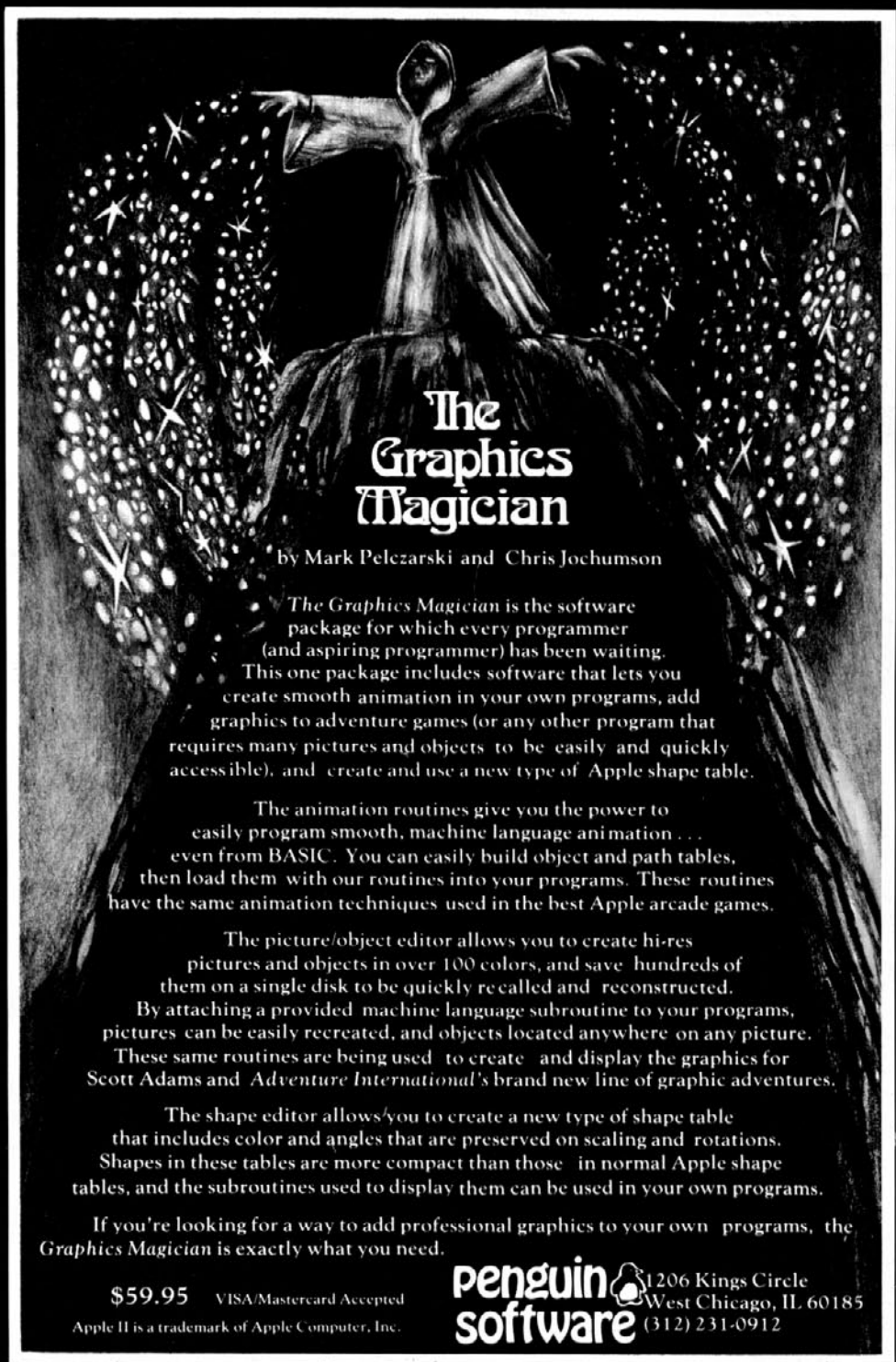

# The Graphics Magician

by Mark Pelczarski and Chris Jochumson

*The Graphics Magician* is the software package for which every programmer (and aspiring programmer) has been waiting. This one package includes software that lets you create smooth animation in your own programs, add graphics to adventure games (or any other program that requires many pictures and objects to be easily and quickly accessible), and create and use a new type of Apple shape table.

The animation routines give you the power to easily program smooth, machine language animation . . . even from BASIC. You can easily build object and path tables, then load them with our routines into your programs. These routines have the same animation techniques used in the best Apple arcade games.

The picture/object editor allows you to create hi-res pictures and objects in over 100 colors, and save hundreds of them on a single disk to be quickly recalled and reconstructed. By attaching a provided machine language subroutine to your programs, pictures can be easily recreated, and objects located anywhere on any picture. These same routines are being used to create and display the graphics for Scott Adams and *Adventure International's* brand new line of graphic adventures.

The shape editor allows you to create a new type of shape table that includes color and angles that are preserved on scaling and rotations. Shapes in these tables are more compact than those in normal Apple shape tables, and the subroutines used to display them can be used in your own programs.

If you're looking for a way to add professional graphics to your own programs, the *Graphics Magician* is exactly what you need.

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penguin software

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```
1075  IF YH ;MT 10 THEN PRINT "THUD...TAKE
      THAT MR. OGRE.": PRINT "THE MONSTER
      HAS "; OT; " POINTS LEFT.": PRINT
1080  FOR X = 1 TO 1000: NEXT X
1085  GOTO 1025
10000 REM  WAITING AROUND
10005 FOR X = 1 TO 2500: NEXT : RETURN
11000 REM  YOUR "DIE ROLLING" SUBROUTINE
11005 X = INT ( RND (1) * LF) + 1: RETURN
11500 REM  OGRE'S "DIE ROLLING"
      SUBROUTINE
11505 X = ( RND (1) * 2)
11510 IF LF * X < LF * .75 OR LF * X > LF * 1.25
      THEN GOTO 11505
11515 X = INT (LF * X + 1): RETURN
20000 REM  RUNNING AWAY SUBROUTINE
20005 PRINT : PRINT
20010 PRINT "O.K. YOU YELLOW BELLIED, LILY
      LIVERED"
20015 PRINT "TURNIP. YOU RUN AWAY AND
      LIVE AGAIN"
20020 PRINT "TO FIGHT ANOTHER DAY!!!": END
30000 REM  TALLY UP THE RESULTS
30005 HOME : PRINT : PRINT
30010 IF YT = 0 THEN GOTO 30035
30015 PRINT "CONGRATULATIONS. YOU HAVE
      BEATEN THE"
3002  PRINT "TERRIBLE THREE TOED OGRE TO A
      PULP."
30025 PRINT "YOU TAKE HIS BAG OF GOLD AND
      NEW SHOES"
30030 PRINT "AND GO WHISTLING MERRILY
      DOWN THE ROAD.": END
30035 PRINT "THE THREE TOED OGRE PICKS
      YOU UP AND "
30040 PRINT "OFFERS TO TAKE YOU HOME FOR
      DINNER."
30045 PRINT "WHICH HE DOES AND YOU ARE.":
      END
```

**Roll 'Em.** Lines 5 through 55 define the variables of this exciting program. Four attributes—constitution, strength, agility (dexterity) and wisdom—are involved. A look at line 255 reveals that the limiting factor (LF . . . clever, huh?) of the sides of the die to be rolled is ten. You will, in effect, be rolling a ten-sided die to determine the constitution of your character for the forthcoming battle. Line 205 then refers you to the subroutine at line 11000. What happens here is that the LF-sided die is randomly rolled and then you are returned to the line from whence you came.

In lines 405, 605, and 805, you are rolling ten-sided, six-sided, and ten-sided dice respectively to obtain the degrees of your character's strength, agility, and wisdom.

The villain, too, must have values set for him for each of the four attributes. Line 305 reveals an LF of "CO," with CO representing the constitution rating for ourselves. To prevent the ogre from being either too strong or too weak to be our worthy adversary, we have instructed the program to make the number of sides on the die equal to our constitution value. In other words, if our constitution is rated 8, the ogre rolls an eight-sided die to determine his constitution value.

**A Matter of Percentages.** Now we go to line 11500 to find the ogre's die rolling subroutine. Besides giving us a value for the ogre's attribute (in this case, his constitution), this subroutine further ensures that the ogre will be neither too strong nor too weak for the forthcoming battle. It does so by limiting the ogre's constitution to no less than 75 percent and no greater than 125 percent of ours. If our constitution is an eight, for example, the ogre's constitution will range somewhere between six and ten. Lines 505, 705, and 805 set the ogre's remaining attributes, using the same parameters, and the rest of the program up to line 1000 displays the attributes on the screen.

At line 1000, final calculations relating to the battle begin. The total value of the character is determined by adding up the individual attributes. YT represents your total attributes status, while OT represents the ogre's. In line 1020, we define the die used to judge the battle as twenty-sided.

The actual battle begins at 1025. Since this is the *Attack of the Three-Toed Ogre*, naturally, the ogre goes first. He rolls his die in line 1030, and if the result of that roll is greater than ten (line 1035), one point is subtracted from your total points (YT). If the result of the ogre's first roll results in reducing your total to zero, you lose and are sent to the subroutine at line 30000.

If the ogre misses when he attacks, or if your total point value is greater than zero, it's your turn to fight. At line 1060, you roll your die; if your roll of the twenty-sided die is greater than ten, the ogre loses a point. You and the ogre continue to take turns at rolling the die until the total value of one of you drops to zero. If the ogre's total (OT) is reduced to zero, you win and he is sent to line 30000 to pay the price of the loser.

**A Shadow of Its Eventual Self.** There's just a chance that this game will not go down in the annals of adventure gaming, efficient programmng techniques, or Dungeons and Dragons scenarios. It does deliberately sacrifice the complexities of each of the above in order to present a clear picture of the battling that takes place in the fantasy, computer, and encounter arena. A real game would be more complex, with each attribute interacting with the similar attribute of the opponent. Further attributes would affect how the characters used weapons, armor, and magic spells in their dealings.

Among the current games you may want to take a look at that incorporate these elements are *Crush, Crumble and Stomp, Wizardry, Upper Reaches of Apshai,* and *The Shattered Alliance*. You may also want to try your hand at writing your own adventure. Punching your own game into the computer can be one of the greatest thrills of gaming.

You'll recall that we promised to reveal a secret word that would allow you to enter this world of magic and amazement. In fact, without this word, there's no reason to be involved in the world of computer gaming because, if you don't have it, your character won't be a very interesting one. The word is imagination.

Trivia question of the month: What is an Ibistick, who uses it, and what does he or she do with it? SL

from page 16

too much time hyperwarping from sector to sector zapping Zylons drains your energy supply and Cruiser 7 will eventually run out of fuel. Refueling and repairs can be taken care of at any friendly starbase; lose the starbases, and that's it for repair work.

*Star Raiders* has four skill levels: novice, pilot, warrior, and commander. The odds are stacked a bit higher in each of the upper levels. At the novice level, your ship's shields block virtually all enemy fire. Jump ahead to pilot and two things become obvious immediately: hyperwarp must be guided by the joystick or your cruiser goes off course, and Zylon fire causes damage.

Zylons also move faster and strike harder in the upper levels. A novice captain reeling with the giddy confidence of an ensign, class 1, rating need only jump to warrior level to be knocked down a few pegs. The game stands repeat play well and remains quite difficult. DB

Atari 400 or 800, cartridge only; 8K. $49.95 from Atari Inc., Box 427, Sunnyvale, CA 94086; (800) 538-8547; in California, (800) 672-1430.

**David's Midnight Magic**

By David Snider.

A black cat forms the background for *David's Midnight Magic*, the first serious competitor to Billy's *Raster Blaster* for the title of pinball champ.

*Raster Blaster* had the market to itself for nine months before this first pretender arrived, the time span itself giving some indication of the complexities of programming an acceptable pinball simulation.

Nine months is an eternity in the Apple world as it presently is growing; from the standpoint of technique, few programs of that age are even competitive after that length of time. Not one of *Raster Blaster*'s contemporaries remains supreme in its genre.

But even as *Mightnight Magic* presents a serious challenge to *Raster Blaster*, it ratifies Bill Budge's extraordinary program as a programming tour de force. Although author David Snider has had nine months in which to better Budge's best, what he was able to accomplish is to equal Budge's effort. That's no shabby accomplishment—in fact, it's high praise—but in the fast moving Apple market it's also proof of Budge's technical lead over his rivals.

While Snider has not been able to improve on Budge in graphics or animation, he's obviously spent much time considering the playability of the game and has introduced at least one innovation that should warm the cockles of the pinball player's heart.

In *Raster Blaster*, the player was able to store balls in the claws until such time as he filled all three claws. Then the stored balls all came into play simultaneously. This was a neat feature except that failure to fill all three claws resulted in a definite increase in the frustration level when the game was completed with one or two balls trapped in the claws.

*Mightnight Magic* stores balls successfully shot into the snake in the upper lefthand corner. As with *Raster Blaster*, the third such ball frees all to play. But Snider has provided two alternative methods to release balls trapped in the snake.

One is an arrow which is always lighted once a ball is in the snake. Placement of a ball in the arrow frees whatever balls are in the snake.

When the player is reduced to his last ball, rollovers are lit in both side chutes. Loss of the last ball down either chute frees the contents of the snake. A ball escaping through the center between the flippers results in the snake's contents remaining suspended.

Another worthy innovation is the provision for earning extra balls. Placing a ball in either of two slots bumps the multiplier that affects bonus points. Once the multiplier has been bumped to five on any given ball, subsequent placement of that ball in the multiplier slots earns extra balls.

Given enough practice, some pinball wizard will eventually become so skilled at bumping the multiplier that he'll be able to accumulate an almost infinite number of extra balls.

Snider's tilt function can actually result in tilting the machine. A tap or two on the space bar during play will result in extra bounce off the bumpers. A tap too many will result in a tilt.

The layout of *Mightnight Magic* provides more opportunity for irretrievably dropping the ball between the flippers than is usual in pinball games, and Snider might have been well advised to close the gap between them an additional pixel or so.

If Snider had somehow preceded Budge into the marketplace, he'd be hailed today as a programming genius. As it is, the fact that he's second should not dull the glitter of this effort. ART

Apple II, Apple II Plus, Apple III (emulation mode); 48K, disk, game controllers. $34.95 from Broderbund Software, 2 Vista Wood Way, San Rafael, CA 94901; (415) 456-6424.

**Ceiling Zero**

By Stephen Warady.

It might have been Mark Twain who observed that skill with a pool cue was a sign of a misspent youth. The comment had its genesis in the hours spent sharpening the eye and straightening the stroke in the smoky environs of the poolroom.

In his day and age, pool and cards were the ways in which youth misspent itself, if misspent is the appropriate verb to apply.

Some future wit may cite skill at *Super Invader, Galaxian, Pac Man*, or *Crossfire* as a similar indication of wasted youth . . . or, as in the present instance, misspent dotage.

This generation will certainly have the finest honed hand-eye coordination of any in history because of the popularity of arcade games, both in arcade parlors and on home computers. And it now seems as though there's no end to the interesting twists that can be employed to induce the gamer to spend an extra hour or two unprofitably occupied.

*Ceiling Zero* is the latest case in point. Brought out almost too late for the Christmas season, this offering returns to the tried-and-true technique of placing a laser gun on the bottom of the screen with divers objects attacking from the top in an attempt to destroy it. But it's the variations on the

theme that make this one compelling.

As one might suspect from the title, the game features a ceiling. The player starts at ceiling fifteen, which is near the top of the screen, and works his way toward ceiling zero, which presumably is near the bottom of the screen—although skilled and dedicated gamesters at *Softline* have, at this writing, been unsuccessful at lowering the ceiling below level eight.

Above the ceiling cruises a mother ship, hurling its contents at you. At ceiling fifteen, it throws the space equivalent of beach balls; ceiling fourteen features flying saucers; ceiling thirteen presents speedy trapezoidal threats. Lower levels contain mixtures of all three objects.

At all levels, the objects bounce from bottom to sides to ceiling in regular fashion until you either shoot them or they get you. An added fillip is the random introduction of a mother ship lander which descends toward the floor. Its successful landing destroys your laser.

This program from a first-time author and a first-time publisher is stunning in its execution of the graphics and animation. The space balls revolve as they descend in one of the more effective animation sequences seen on an Apple.

Warady and Turnkey have given us plenty of challenge to while away our hours.

It'll be interesting to see whether it's misspent youth or adulthood who first lowers the ceiling to zero. **ART**

Apple II, Apple II Plus, Apple III (emulation mode); 48K, disk, game controllers. $29.95 from Turnkey Software, 13078 Mindanao Way, Suite 314, Marina del Rey, CA 90291.

**Softporn**

By Chuck Benton, Blue Sky Software. Atari version by Chris Iden, Yosemite Software Products.

Tired of slaying dragons, destroying enemy starships, and searching for treasure? Eager for something different? How about gambling, bothering drunks, purchasing contraceptives, and attempting to seduce members of the opposite sex?

Such are the pursuits and rewards of *Softporn*, a refreshing change of pace from the average software game.

*Softporn*, an "adults only" text adventure, resembles Scott Adams's work in visual design. Locations, objects, and exits are shown in the upper one-third of the screen, and explanatory text (of which there is much) scrolls up the lower two-thirds. There are no graphics, although clever use is made occasionally of color and screen display—a wall of bathroom graffiti and a billboard come to mind. While you won't miss graphics, the absence of sound in the Atari version is unfortunate. Given the Atari's capabilities, music in the disco would have been a nice, authentic touch, for instance.

The player starts in a sleazy bar with a bartender, a button, and a curtain in sight. A quick inventory reveals a wallet containing a thousand dollars. The money won't last long, though; drinks go for one hundred bucks a throw in this inflated vision of the future. Playing with the button and the curtain reveals the latter to be remote controlled, probably in response to the password you're asked to supply when pushing the former.

The world of *Softporn* consists of three major locations: the bar, a disco, and a casino. All are interconnected by a taxi service which obligingly sends a cab every time the command "Hail taxi!" is entered. (New York this isn't!)

Money is the key to success in this game, so you're likely to spend considerable time in the casino. Two games are available there, slots and blackjack. The brief instructions that come with *Softporn* claim that the chances of success are better at slots. This may be so, but the rate of return is slow—$300 for a pair and $1,500 for triples. At $100 a try, however, it takes quite a while to build up the reserve. The slot machine is well designed, however, and a lot of fun to watch.

Blackjack is the more interesting game, although it's presented in its simplest form: no splits, no double downs, and no insurance. Wagers must be a minimum of $100 but there's no maximum. Be warned, though; go broke in the casino and the immediate penalty is death.

Dying takes place in a manner Monty Hall would love—the player is sent to purgatory (white text on a black screen) where three doors await. One will send the player back to the game; another will leave the player in purgatory, forced to choose again; and one will send the player to hell. Which door does what changes randomly after each guess.

Although the program's imagination, sense of humor, and sexual weirdness provide many hours of entertainment, the game is not without its flaws. The most noticeable of these is its sexism.

The object of the game is to find and seduce three girls (the parser does not recognize the word *woman*). The women who shared the unveiling of this program—all healthy American types who enjoy their own sexual fantasies—felt it would be nice if the initial decision could be made whether to seduce either three women or three men.

The chauvinism in this program is unfortunate; it reinforces the notion that all computer freaks are emotionally underdeveloped high school and college boys who get their jollies reading the letters column in *Penthouse*. This image is strengthened even further by the author's terrible spelling, which is apt to offend the English majors in the audience. There's no reason a program can't be erotic, humorous, and intelligent.

It takes a while to find any women (excuse me . . . girls) in this game, not to mention the three who will allow themselves to be seduced. The disco waitress, for example, remains uninterested. Since one should always strive to use appropriate verbs in these games, a four-letter possibility springs to mind immediately, and given the game's kinky sense of humor, the temptation exists to try that verb with every two-legged animal in sight. The bartender, for one, fails to appreciate the novelty of the sugestion; attempting it with him only results in another quick trip to purgatory.

*Softporn* is hopelessly addicting. Chuck Benson deserves credit for being the first to plumb these depths on a commercial basis; it's just a shame that he didn't take the time to make his program a bit classier. That will come with his many imitators. **DB**

Apple II, Apple II Plus, and Apple III (emulation mode), and Atari 800; 48K, disk. $29.95 from On-Line Systems, 36575 Mudge Ranch Road, Coarsegold, CA 93614; (209) 683-6858. **SL**

# An Interview with Alick Dziabczenko

by THOMAS DANA

When Alick Dziabczenko was a high school student in North Hollywood, California, he wanted to build a laser. It was, he says now, one of his "passions."

Passion is a conspicuous word in Dziabczenko's vocabulary. The twenty-six-year-old programmer with the Ukrainian handle (it's easier than it looks; say dzeb-CHENK-o) has several. He has, at various points in his life, devoted himself ardently to the study of chemistry, electronics, physics, and biology.

That consuming interest in lasers turned out to be a local expression of a more general love for physics and mathematics, but Dziabczenko took the project—and his own ambition—seriously enough in high school that he immersed himself in college level physics for a time, mastering much of what he found there.

**The Long, Winding Road to Sierra.** The laser of his high school dreams did not get built. But Dziabczenko's curiosity and intellectual vitality have brought to fruition three imaginative and ambitious games for the Apple: *Alien Lander*, *Retro-Ball*, and *Space Adventure*. And Dziabczenko has launched the firm of Sierra Software to shelter and support his wide-ranging interests and activities.

Housed in a simple one-story building on Sahara Avenue, Sierra Software presents a dramatic contrast to the neon excess nearby. The company is located just off the Las Vegas strip.

En route to forming Sierra and adopting the profession of programming, Dziabczenko traveled the broad and tortuous path of the generalist. A fourth-grade teacher set him on his way by showing him how to build a crystal radio; electronics has ever since been a landmark on his intellectual skyline.

**A College Catalog.** In high school he did things that all good kids with a mind for chemistry do, or want to do—made nitrated cotton and other harmless concoctions of an explosive or incendiary nature. He also propelled himself into an accelerated course in mathematics and an early taste of collegiate life, taking up philosophy at a local college during his twelfth-grade year.

College seems to have agreed with him; over the next half decade or so, Dziabczenko lived the life of the nomadic student, sampling a variety of disciplines in a variety of locales. His first major was mathematics; subsequently he took up biology and set course toward a medical career.

In support of that ambition, he worked part time as a student x-ray technician. One day while he was so engaged, a victim of a serious motorcycle accident was brought in; the sight of the consequences was sufficient to divert the aspiring doctor from the pursuit of medicine.

Chemistry and physics followed math and medicine, and the student followed his family from Los Angeles to Las Vegas. The latter impressed him not at all; still a minor, he was unable to partake of the local pastimes, and besides, he missed the California beaches, his friends, and the Los Angeles County Museum of Science and Industry.

During a two-semester stint in San Francisco Dziabczenko began to focus his attention and energy decisively in the area of physics. At this point he returned to Las Vegas; he describes the glittering city, perhaps surprisingly, as "a good place to get serious."

**Vegas Not a Gamble.** Though he's now casino-legal and then some, Dziabczenko doesn't gamble. It's not that he objects to gambling on moral grounds; he just knows too much about the math and the odds.

Even so, at twenty-six, Dziabczenko is much fonder of Las Vegas now than he was as a teenager. His family is there, and Dziabczenko is a person whose roots seem to be in people more than in places. He likes living in Vegas, both because of strong personal ties and because he finds the environment conducive to creative work.

The thought that gambling may be going on almost in his backyard distracts Dziabczenko not the least; he finds it easy to settle down to work, and Vegas's lifestyle has some definite side benefits. The town caters to people who like to work irregular hours. The all-night facilities may have been designed because of the gambling industry, but they are also a welcome convenience for programmers like Dziabczenko, who get so involved in what they are doing that

they lose track of time and work around the clock.

And as a Las Vegas local, Dziabczenko knows where to go when he wants a change of pace from the city or from programming. The University of Nevada at Las Vegas is right nearby, providing cultural stimulation, and there's some peaceful desert territory outside the city as well.

**Life on His Own Terms.** One could easily interpret Dziabczenko's erratic collegiate career as evidence of immaturity, of a mind unwilling to commit. A fairer, more accurate appraisal would describe Dziabczenko as a person moved by strong and not altogether conflicting fascinations, one who feels confined by traditional career definitions.

Because the microcomputer industry offers ways of tying together diverse intellectual specialties, it's a natural for someone with Dziabczenko's sundry interests and capabilities. It also offers enough entrepreneurial opportunity to entice a person with gumption to try carving out his own occupational niche.

Dziabczenko has done just that, both by forming his own company and by the kind of games he writes—off the beaten track, imaginative, nonimitative.

**Happy Apple Accident?** Whether by accident or by the guidance of some internal homing device, Dziabczenko in early 1979 took the fatal step—he bought an Apple. He says he had no particular long-range purpose at the time, except enjoyment. He had no intention—no idea, really—that he would become a game programmer.

He had always liked electronic gadgets, especially programmable calculators. The Apple seemed like a natural extension to his Hewlett-Packard 67. Then, as fate would have it, his roommate at the time became hooked on a nongraphic lunar lander module on Dziabczenko's calculator. When Dziabczenko needed the calculator back, he had to promise his bereft roommate a lander program on the Apple.

**From Programmer to Publisher.** In such a manner was *Alien Lander* conceived; its gestation consumed the rest of 1979. Among other things, the author had to teach himself 6502 machine language, for, while he had picked up Fortran and Basic in college, they were inadequate for his present purposes.

Once he'd finished the program, Dziabczenko cast about for a publisher and, because he didn't fancy the financial arrangements that were offered him, decided to form his own company. Sierra Software officially came to be in March of 1980, with *Alien Lander* as its first product.

Probably the most striking quality of *Alien Lander* is its care for reality—not so much the visual reality of approaching hostile terrain as the physical and mathematical realities that determine the success or failure of the player's mission.

The program's graphic display includes a digital instrument panel, updated in real time, that displays the altitude and velocity of the ship, the amount of fuel in the tank, and the elapsed time of the mission. The last of these is resolved to the millisecond and, in fact, to achieve the correct timing and duration of thrust requires that the time be reported to that degree of precision.

Above the instrument panel the player can look either out the spaceship's window, seeing first a panorama of stars, then a rising, mountainous landscape, or at the terminal of the onboard computer, which provides pithy commentary about the condition of the ship and its impending fate.

Because of the quasi-experiential learning it provides in the subject of gravitation, *Alien Lander* would not be out of place in an elementary course in physics. But since the action of the game is essentially in the instrument panel and not in its visual display, it offers more charge to the intellect than to the viscera.

Dziabczenko's second offering, *Retro-Ball*, was more graphically engaging, while retaining the author's concern for scientific authenticity. It is a sort of space-age air hockey, in which the puck is powered not by percussion but by rocketry.

A special feature of the game was a hardware device called Videosync that plugged into the Apple's game port and appreciably smoothed the computer's graphic display.

If *Retro-Ball* qualifies as an arcade game dressed in scientific notions, Dziabczenko's third offering is astrophysics and rocketry applied to the oldest of computer game genres, the adventure.

*Space Adventure* is a truly eclectic piece of work. To solve it you not only need to be proficient in the traditional adventuring arts of mapping and deductive reasoning; you also need to understand how to navigate through a vast three-dimensional space.

When playing *Space Adventure*, you'll need to draw on your knowledge of space lore—both factual and science fictional. You'll need to know, for example, the import of an ion trail and the consequences of matter meeting antimatter. Furthermore, Dziabczenko hints that familiarity with the *Star Trek* television series will prove invaluable in getting you out of a tight spot near the end of the game.

**The Universe Is Your Oyster.** The scope of *Space Adventure* is impressive—both the extent of its physical layout and the number and complexity of the problems that you must solve. The physical territory is mapped into a million three-dimensional quadrants, each of which is subdivided into a million sectors.

There are in this game, however, reminders of the verbal language and style of earthbound adventures; the difference is that verbal commands are addressed to your spaceship's onboard computer, not to your Apple.

Dziabczenko's concern for physical and mathematical authenticity are evident throughout the game, notwithstanding the fact that your spaceship may travel in hyperwarp at speeds far greater than the speed of light. Dziabczenko says he's not convinced that Einstein was right; perhaps it is possible to go faster than light.

Sierra Software's next creation—still in design stage—will be a second episode of *Space Adventure*. The original conception proved too large to get into a single program. Episode Two, a continuation of Episode One, will incorporate other elements of traditional computer gaming, something to tax the skills of the arcade-game sharpshooter.

What his games reveal about Dziabczenko is both a diversity and a consistency. Each game has its own unique focus, along with a flair or signature that is Dziabczenko's own. He is expressing his fascinations, his passions, in the form of games—experiences and other worlds the rest of us are invited to explore. SL

# High Scores

| Game | Publisher | Player | Score |
|---|---|---|---|
| *ABM* | Muse | Bob Pulak, Oak Lawn, IL | 42,500 |
| *Alien Rain* | Broderbund Software | Alan Lee, Brighton, MA | 17,735,500 |
| *Alien Typhoon* | Broderbund Software | Andrew Bond, Kingsport, TN | 256,840 |
| *Apple Panic* | Broderbund Software | Sam Hoisington, Huntington Station, NY | 437,960 |
| *Asteroid Field* | Cavalier Computer | Jeff Feldman, Miami Beach, FL | 623,000 |
| *Asteroids* | California Pacific | Jim Kelton, Huntington Beach, CA | 1,986 |
| *Asteroids in Space* | Quality Software | Mark Adams, Salt Lake City, UT | 319,315 |
| *Autobahn* | Sirius Software | Jason Greenberg, Highland Park, CA | 1,500 miles |
| *Beer Run* | Sirius Software | Todd Kohler, Gulf Breeze, FL | 1,468 |
| *Bezman* | Bez | Al Tommervik, North Hollywood, CA | 40,171 |
| *Bug Attack* | Cavalier Computer | Jim Nitchals, program author | 60,000 |
| | | Bob Pulak, Oak Lawn, IL | 35,001 |
| *Crossfire* | On-Line Systems | Al Tommervik, North Hollywood, CA | 241,800 |
| *Death Star* | California Pacific | Jim Kelton, Huntington Beach, CA | 1,100 |
| *Dog Fight* | Micro Lab | William Tung, Towson, MD | 1,880 |
| *Epoch* | Sirius Software | Sandy Marks, Houston, TX | 206,040 |
| *Falcons* | Piccadilly Software | Jeff Feldman, Miami Beach, FL | 212,000 |
| *Firebird* | Gebelli Software | Robert Young, South Pasadena, CA | 63,850 |
| *Galaxy Wars* | Broderbund Software | Bill Kleb, Aurora IL | 28,350 |
| *Gamma Goblins* | Sirius Software | Joey Grisaffi, Houston, TX | 14,340 |
| *Gobbler* | On-Line Systems | Jeff Siegel, Saint Paul, MN | 182,203 |
| *Golden Mountain* | Broderbund Software | Joey Grisaffi, Houston, TX | 82,600 |
| *Head-on* | California Pacific | Brian Fargo, Newport Beach, CA | 175,320 |
| *Jawbreaker* | On-Line Systems | Tom Kopp, Burlingame, CA | 61,945 |
| *Missile Defense* | On-Line Systems | Dennis Quinn, Inglewood, CA | 368,796 |
| *Olympic Decathlon* | Microsoft | Jeff Feldman, Miami Beach, FL | 10,865 |
| *Orbitron* | Sirius Software | Dean Zevechek, Parma, OH | 42,800 |
| *Outpost* | Sirius Software | William Tung, Towson, MD | 25,952 |
| *Pegasus II* | On-Line Systems | Billy Phillips, Murray, KY | 40,430 |
| *Phantoms Five* | Sirius Software | James H. Sylvester, Yorba Linda, CA | 13,050 |
| *Planetoids* | Adventure International | Jon Beggs, Colorado Springs, CO | 322,460 |
| *Raster Blaster* | BudgeCo | Chris Reed, Saint Louis, MO | 2,243,000 |
| *Rings of Saturn* | Dakin5/Level-10 Software | Joey Grisaffi, Houston, TX | 441,693 |
| *Sabotage* | On-Line Systems | Haydn Butoy, San Bernardino, CA | 26,818 |
| *Snack Attack* | Datamost | Dan Illowsky, program author | 6,430 (maze 13) |
| *Sneakers* | Sirius Software | Jeffrey M. Rosen, Mount Kisco, NY | 100,289 |
| *Snoggle* | Broderbund Software | Ron Flickinger, Fort Wayne, IN | 179,900 (level 18) |
| *Space Eggs* | Sirius Software | Jim Johnson, Burbank, IL | 32,800 |
| *Space Quarks* | Broderbund Software | David Snider, Franklin, MI | 3,470 (8th level) |
| *Space Warrior* | Broderbund Software | William Tung, Towson, MD | 44,441 |
| *Star Cruiser* | Sirius Software | James H. Sylvester, Yorba Linda, CA | 103,295 |
| *Star Thief* | Cavalier Computer | Jason Greenberg, Highland Park, IL | 15,200 |
| *Stellar Invaders* | Apple Computer, Inc. | Kenneth T. Lim, Cupertino, CA | Turned over twice |
| *Super Invader* | Creative Computing Software | William Tung, Towson, MD | 63,570 |
| *Tail Gunner* | California Pacific | Jim Kelton, Huntington Beach, CA | 8,495 |
| *Taxman* | Hal Labs | Brian Fitzgerald, program author | 269,990 |
| | | Tim Hanna, Parma OH | 58,200 |
| *Thief* | Datamost | Dean Zevechek, Parma, OH | 5,240 |
| *Threshold* | On-Line Systems | Jason Greenberg, Highland Park, IL | 560,000 |
| *Tranquility Base* | California Pacific | Jeff Feldman, Miami Beach, FL | 750 |
| *Wormwall* | Sirius Software | Brian Smith, Austin, TX | 60,632 |

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