SOFTLINE

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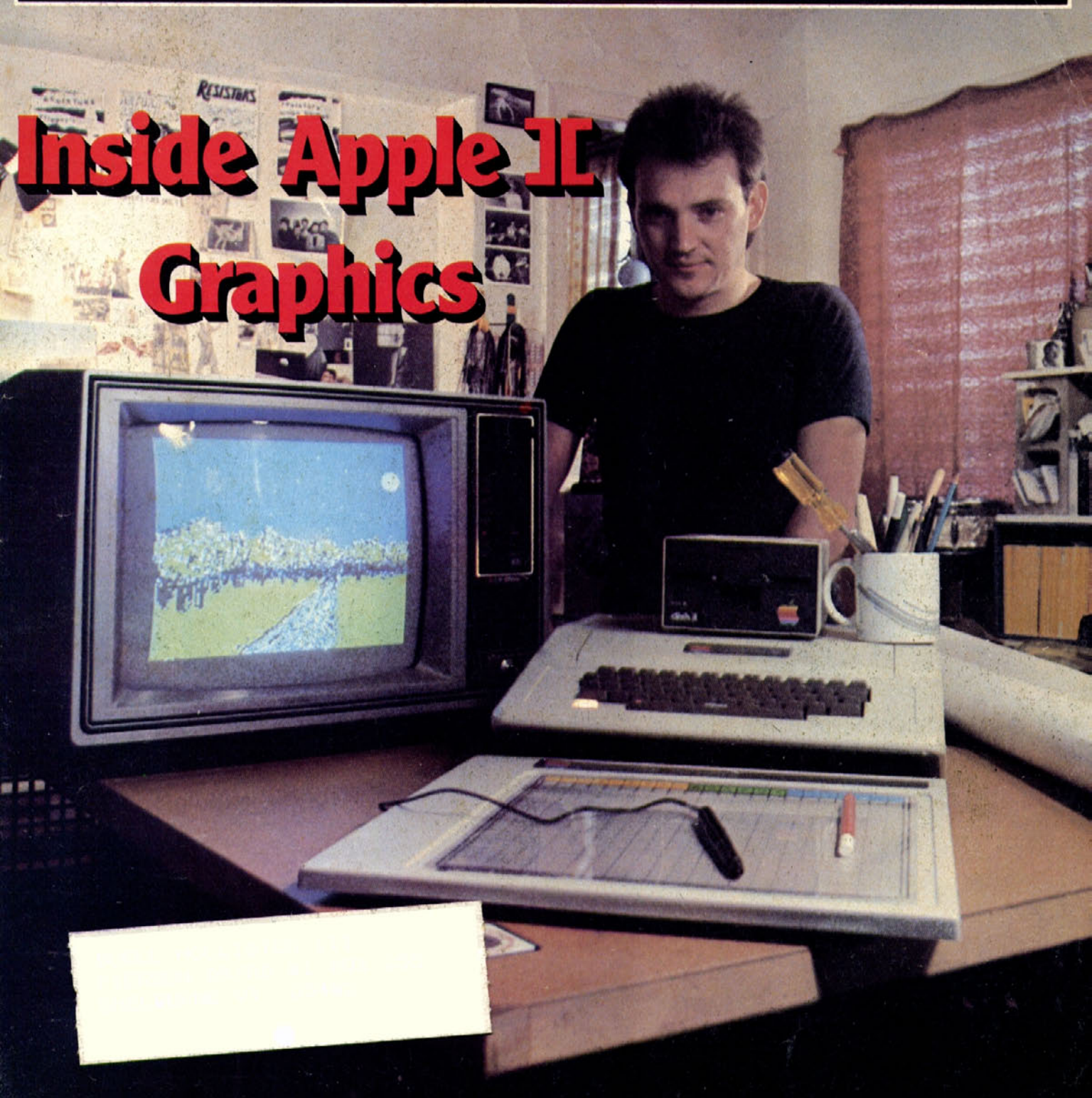

Inside Apple][Graphics

Ulysses

and the Golden Fleece

ON-LINE systems

HI-RES ADVENTURE #4 *by Bob Davis & Ken Williams*

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SOFTLINE

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Softline Staff

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Editor's Letter

Despite some manufacturers' lofty claims to the contrary, the primary use to which personal computers have been put so far is for playing games. If you like to play computer games, are curious about how various special effects and game features are achieved, and would like to keep up to date on new game developments and products, welcome to *Softline*, the magazine of computer gamers and gamemaking.

There's much highbrow talk these days about the desktop computer as an intellect enhancing tool. The personal computer does have an important role to play in mankind's progress and advancement in a variety of fields. But we also believe that people who look askance at those of us who enjoy playing games on our computers are overlooking some important points.

In every culture about which we have extensive knowledge, there have been games. Games through the ages have always taken the form of activities that draw on and enhance the player's physical and/or mental abilities. In fact, some form of gaming seems to be a sociological necessity.

Computer gamers can be thought of as the aerospace research and development branch of the programming industry. While the so-called serious programmmers working to deliver a faster data base are preoccupied with finding a way to milk the last microsecond of search speed out of their computers, gamers are experimenting with ways of making their programs more "user friendly." Making software user friendly may be the highest calling to which today's programming professionals can aspire.

Game programmers are also in the forefront of research into the outer limits of graphics and sound. So far, the serious programmers have dismissed these advances as frivolous. But one of these days, it will strike these serious types that business and professional programs need not be dry or without color. Then, there'll be a mad rush to reinvent the wheel the gamers have already worn out.

One real difference between gamers and business users is that nearly every game player has an idea for and dreams of programming something even better than the game he's playing now, while the business user typically has more interest in using a given data base or statistical package than in programming a new one.

Recognizing these facts, *Softline* has set out to provide a magazine strictly for the gamer—the person who loves to play and/or program games on a personal computer. As *Softline* develops, we hope to bring you articles about programming advancements as they pertain to games, profiles of programmers who write games, and ongoing tutorials that explain the fundamentals of game programming (see our Apple II Graphics series by Ken Williams beginning in this issue for an example).

We'll have articles on what makes a good computer game, previews of important new game packages that can be expected soon, and plenty of reviews of new gaming products. We'll also offer general interest articles and columns, such as Sherwin Steffin's series on educational software. While not all gamers are kids, most kids seem to be gamers, so an education column seemed a natural.

While some personal computers are especially versatile and suited for gamemaking, all brands are being used extensively for gaming purposes. While the focus of this first issue has been software designed for the Apple, future issues will cross product lines to consider games programmed on all personal computers.

Our aim in *Softline* is to bring you useful, entertaining information about events, products, issues, and innovations in gaming and game programming. Our fondest hope is that some of the pleasure we derive from gaming will be transmitted through these pages. SL

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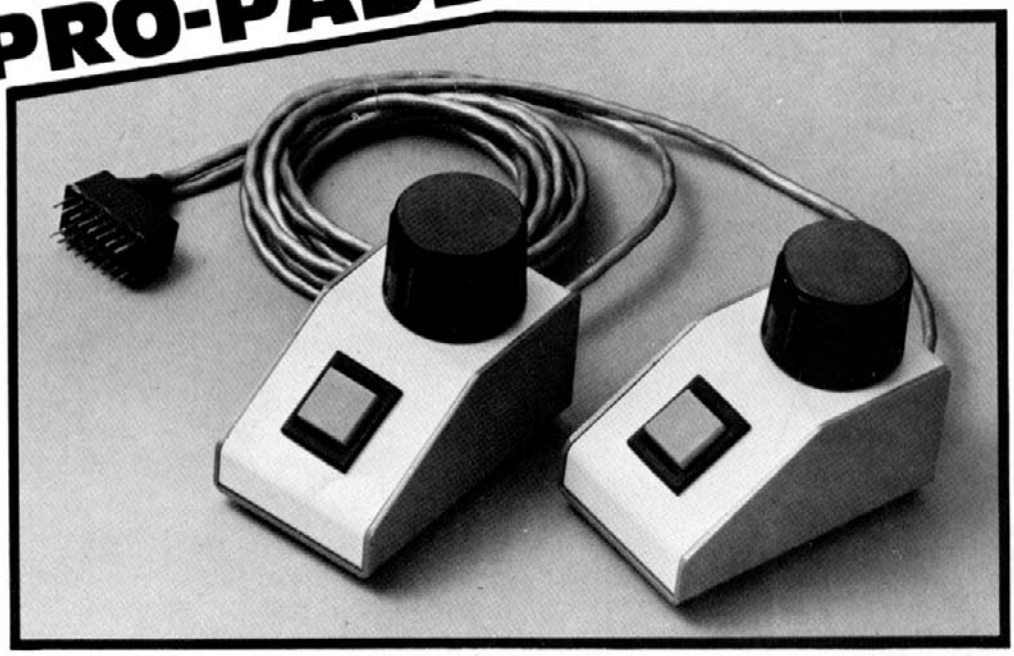

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High-Tech Type

by GREG VOSS

Notice anything different about the type you're reading? *Softline* text is now typeset entirely using telecommunications. The articles are keyboarded and edited on Apples, then sent to the typesetter over the phone with our trusty Hayes Micromodem II. Not only is it faster and cheaper, it saves a lot of headaches. No more typographic errors that come from rekeyboarding the manuscript at the typesetter's office. You can't imagine what it used to be like . . . well, maybe you can.

The following scenario is true (well, almost). Only our personalities have changed since we found a better way to set type—using our Apples, no less.

* * *

Kurt barreled down the freeway, sweat dripping from his forehead. A burst of wind caught the sheaf of papers on the seat beside him. His arm shot across the seat to catch the papers before they could fly out the window.

It was quarter to five. If Kurt didn't reach his destination in fifteen minutes, the production effort would be in big trouble.

* * *

Getting manuscript to the typesetter can be a headache. The scene just described is a typical one for a publishing house, since up until now, the most efficient way for a publisher to get manuscript to the typesetter has been to deliver it by car. The system of transmitting material back and forth between publisher and typesetter has been clumsy at best. As deadline approaches, manuscripts are often rushed to the typesetter twice daily, and overtime wages are charged by the typesetter for the rush jobs.

The courier who drops off manuscript also picks up the galleys that have already been typeset and returns them to the publishing house. The editorial staff at the publishing house proofreads the galleys to catch any mistakes that were made by the typesetting operator who keyboarded the manuscript.

* * *

Kurt approached the last turn before his exit. This was his second trip today for Backword Publishing. As he drove along the familiar route, he had plenty of time to wonder how much longer his car was going to hold up under the strain. Just then, the first page of the cover story manuscript blew toward the window; Kurt lunged to grab it and the car swerved. A horn pierced Kurt's ear and the driver in the next lane made an unfriendly hand signal.

* * *

Meanwhile at the offices of another publishing house:

Things at *Softline* were a bit further behind than usual. One of the writers had been late with his manuscript. Jean didn't seem worried, though, as she used her *Apple Writer* to incorporate the final editing on the late copy.

Jean looked up at the clock on the wall. Five to five. Too late to send the copy over the phone to the typesetter today. She decided she might as well key in the corrections in the last two articles tonight and send everything at once in the morning.

* * *

When he reached the typesetter's shop, Kurt hopped out of his car, ran to the side door, and started pounding. He looked down at his watch. Almost five. Was he too late?

The door opened and Kurt heaved a sigh of relief. After exchanging the new manuscript for the typeset galleys and galley proofs done that day, Kurt returned to his car. Time to hit the freeway again.

* * *

Micromodem Revolution. As if there haven't been enough revolutions already, microprocessors now make possible another radical change in the communications field: telecommunicated typesetting. Text material stored in a word processor can now be sent over the telephone to the typesetter. Just insert codes for measure, size, leading, and type face, dial up your friendly neighborhood typesetter, and call in your copy. Turnaround time is reduced dramatically. Send manuscript this morning; entertain with typeset galleys tonight. The instant age has moved beyond fast food and push-button bank tellers and now extends its services to the publishing house.

* * *

Kurt's car screeched to a halt and he dashed into the *Backword* office with galleys. The editorial staff dropped everything they were doing and began proofreading.

The *Backword* office had been buzzing all day. The typesetter would be closed a week from today for the Labor Day holiday. That meant that all text was due at the typesetter tomorrow for keyboarding by Wednesday, so that final galley proofs could be read on Thursday, and corrections set on Friday. The staff would be going at it until ten o'clock tonight. Kurt put a pot of coffee on the hotplate.

* * *

By eight that evening, Jean finished keying the text codes for her last article. It had been a long day, but at least tomorrow would be easy. She would get into the office by eight the next morning to transmit the manuscript copy; then she could take it easy until she picked up the galleys at noon.

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The following morning, a slightly groggy *Backword* staff arrived to finish the proofreading. They got done early and Kurt raced off with the galley corrections. The *Backword* editor wouldn't be ready with manuscript that had been late in arriving until the afternoon run. *Backword* would be paying overtime rates again to get galleys back by Wednesday.

* * *

Saving Money, Time, and Headaches. Typesetters with telecomunications capabilities claim they can save clients 30 percent over standard typesetting costs. These savings result mostly from eliminating the cost of rekeyboarding manuscript. *Softline* estimates that for 150 pages of manuscript, twenty-five to thirty hours of operator keyboarding time is eliminated. Fifteen to twenty hours of proofreading are rendered unnecessary because typographic errors are not introduced. Operator time for keyboarding galley corrections is reduced. Time, gasoline expense, and irritation are also minimized now that manuscript is no longer transported back and forth to the typesetter by car. The standard one week turnaround time drops to less than one day. But the proof is in the type.

* * *

As planned, Jean arrived at *Softline* by eight o'clock the following morning. She loaded *ASCII Express* into the Apple and by eight fifteen was ready to transmit. She wanted to make sure that the galleys would be ready by one o'clock. Although the whole process—from transmission to typeset galleys—usually took only three hours, she liked to give herself extra time in case anything went wrong.

First, Jean called the typesetter to give him the transmission type and protocol information. She explained that she would be transmitting at 300 baud (bits per second), approximately 30 words per second, and detailed the typeface specifications:

"Text one will be ten point on eleven leading, Goudy Old Style on 20 picas."

When she finished transmitting the type specs over the voice line, she dialed the telephone number of the typesetter's modem from her computer keyboard.

Her video terminal indicated that the typesetter had answered and the connnection had been made. At that point, she loaded her text files and began transmitting.

* * *

The Middle Man. The key to telecommunicated typesetting is in the interface. Computer typesetting is not a new technology and neither is word processing. Yet it's taken over eight years to bring the technologies together.

To receive data from a word processor, a typesetter needs an elaborate set-up. Data phone modems that will accept baud rates of 300, 1,200 and 2,400 are required. The modems are connected to an interface unit that matches the language of the word processor with the computer-generated typesetting equipment. Development of interface units and software programs has made it possible for typesetters to receive transmissions from any word processor from Apple and Radio Shack, to IBM and Hewlett-Packard, and to Wang and Lanier.

* * *

By nine o'clock Wednesday morning, all text for the October issue of *Softline* had been received by the typesetter. Jean decided to pick up the galleys after lunch. Since she had free time until noon, she decided to start writing her monthly column for the next issue.

Softline's layout artist had finished laying out most of the advertisements and photographs. By the time Jean got back with the galleys in the afternoon, he would be ready for them.

Jean finished her sandwich and then drove over to the typesetter to pick up the typeset galleys. Since she had done all the editing on the Apple before transmitting the manuscript, she anticipated that the galleys would come back in near perfect form.

It had not always been this easy. Before *Softline* and the typesetter worked out compatible communication procedures, a few problems occurred in the transmission process. Jean used to send every article twice during the morning transmission. That way, one copy usually came out perfect. Now it was no longer necessary to transmit copy twice. Galleys usually came back ready to be handed over to the layout artist. Jean proofread the galleys just to be safe.

As soon as she had checked over the first article, Jean gave it to the layout artist so he could begin work. By four in the afternoon, she had finished proofreading. She keyboarded a few minor corrections at her computer terminal and sent them over the phone at four-thirty. Since he was busy, the typesetter stored the copy on an eight-inch floppy so he could process the galleys later. He told Jean she could pick up galleys in the morning. That was fine, since the layout artist had plenty to keep him busy until Wednesday afternoon.

* * *

At the same time as Jean finished transmitting, the *Backword* editor threw the last of the manuscript into Kurt's hands. Kurt dashed out the back door to his car.

Shooting down the freeway, Kurt knew he was lucky rush hour traffic was light today. He didn't like putting his car through this. He thought about last month's deadline rush, when his fan belt broke. What a disaster that was!

* * *

Shaftstall and Intergraphics. The two leading manufacturers of interfaces and software programs that unite word processors and computer typesetters are Shaftstall and Intergraphics.

Manufactured in Indianapolis, Indiana, the Shaftstall 3300 has evolved from three or four predecessors manufactured during the eight years Shaftstall has been in business. The Shaftstall 3300 is the only interface now marketed by the company, says Tony Shaftstall, who believes the difference in the quality of the interface is in the software. The Shaftstall interface itself has been upgraded three times, while the software programs have gone through over 1,000 revisions in the last eight years.

Shaftstall's software and interface make more than 120 word processors compatible with twenty-five models of typesetting equipment. Tony Shaftstall explains that the introduction of new equipment means more revisions. "At the time we started manufacturing interfaces, microprocessors weren't around. Most of our work has been reformatting information to make different systems compatible."

Intergraphics in Washington, D.C. also manufactures an interface unit called the Intercom 100. Intergraphic's story is similar to Shaftstall's. Intergraphics put out its first interface unit in 1977 and has been working since to upgrade equipment and software. The Intercom 100 also

evolved from several earlier models, but most of the research and development goes into their software programs.

* * *

First thing Wednesday morning, Jean drove out to Speedy Graphics to pick up the galleys of corrections. By nine-thirty, she had them proofread and on the layout artist's table.

* * *

Kurt was on the freeway again, with the manuscripts that didn't make it the night before. He also had a long list of corrections for Turtle Typesetters, including one entire article that looked like it had been keyboarded in Chinese. "You just can't depend on rush work," he thought to himself.

The *Backword* staff had been up late again proofreading galleys and marking the necessary corrections. It would be another long day today.

* * *

The *Softline* layout artist went home by five o'clock that evening, since he judged that he should easily be able to complete his work the next day. The following morning he started work early. He laid out the text and had final pasted up flats ready for the printer by noon.

* * *

Back at *Backword* things were going more smoothly than Kurt had expected. All the galley proofs had been marked for correction by two o'clock, which meant that Kurt wouldn't have to rush to get them to the typesetter by five, and could spend what was left of the afternoon working on his car.

The staff at *Softline* took the rest of Thursday afternoon off as a reward for their hard work.

* * *

Until the next batch of proof came from the typesetter, there wasn't much the *Backword* people could do. If nothing went wrong, the corrections would be ready to be picked up on Friday and the text could be ready for the layout artist by Tuesday. One week from today, the final paste-up would probably be ready to go to the printer.

The *Backword* editor sipped a bitter cup of coffee and hoped everything would go well. He frowned when Kurt handed him the bill from Turtle Typesetters. They both shook their heads and sighed.

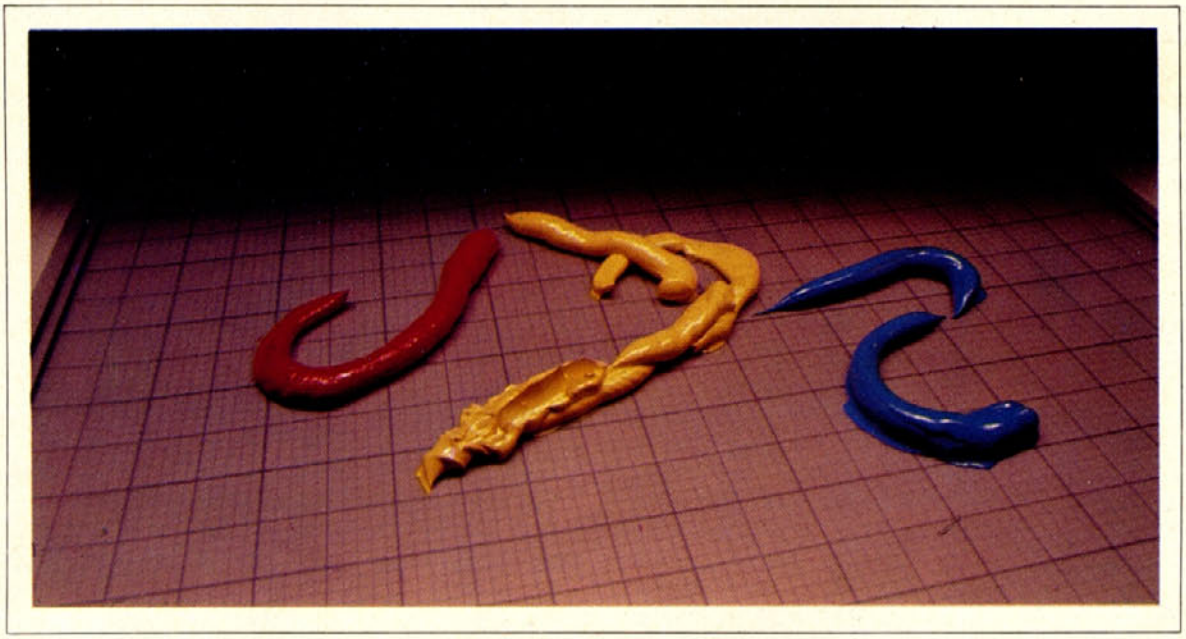
"There's got to be a better way."

* * *

Afterword. The field of telecommunicated typesetting is new and growing fast. George Alexander of the Seybold Report, a bi-weekly newsletter for the typesetting industry, estimates the number of typesetting or printing facilities with telecommunications capabilities for typesetting at between 3,000 and 5,000.

Macson Printing (Glendale, California) currently has half a dozen accounts including Global Marine, Hewlett-Packard, and Air California, with General Telephone coming on board in the near future. Macson claims to be the first printer in Los Angeles to have telecommunications capabilities. Their main problem now is that clients are having difficulty getting modem hook-ups from the telephone company. Sometimes it hurts to be one step ahead.

Apple II Graphics: An Inside Look



by KEN WILLIAMS

If you have been impressed by the remarkable graphics displays in some of your favorite game programs, you've probably also become curious about how these graphics were generated on the Apple. You may have read far enough in the *Applesoft Tutorial* or the *Apple II Reference Manual* to recognize the words bit, byte, Peek, Poke, hi-res and lo-res. But it may not be particularly clear yet, despite all the effort you have put in, just what these terms have to do with the colorful, entertaining graphics that dance across your screen when you play your favorite games.

If you are interested in an inside look at how graphics are generated, and in learning how to create graphics to illustrate and enhance your own programs, read on. This ongoing series of articles is definitely for you.

Of Peeks, Pokes, Bytes, and Bits. Learning about graphics means wading through some rather technical (and seemingly irrelevant, but essential) material. However unrelated such material may appear, being able to comprehend and apply what you learn here is crucial to your understanding and being able to make full use of the graphics capability of your Apple later on.

This series will acquaint you with the Apple II's graphics hardware. While knowledge of assembly language is not necessary to an understanding of this material, some experience with Applesoft is recommended.

In this first article, we will explore such topics as the binary and hexadecimal number systems, the System Monitor, ROM, and RAM. You will learn how RAM is laid out, and where and how graphic images are generated and stored in RAM. Once you have this foundation, you can learn various animation techniques, methods for incorporating graphics into programs, and how to construct graphic images. Other future columns in the series will cover such topics as font editors and character set animation.

ROM and RAM Remember. The graphic images that can be generated on your TV screen or video display monitor are possible because of the Apple's memory. As you know, the Apple has two kinds of memory, ROM (read-only memory), which is virtually unalterable, and RAM (random-access memory), the working memory area of your Apple, where program information is stored. The hi-res graphics pages, which will be of great interest to us in this series, are located in RAM.

Another familiar term about which you will learn more in this series is the Monitor. As you have probably surmised from the capital M, we are referring here not to the TV screen or video monitor, which displays the material you type in at the Apple keyboard, but to the System Monitor, a ROM-resident set of routines that enables you to look at the various RAM locations, and to move or alter (patch) them in order to achieve various kinds of results.

Digressing into Digital. In order to understand the memory usage of Apple graphics, you must first understand the numbering system your Apple likes to speak to you in, since this is related to the way information is stored in RAM. This numbering system is called hexadecimal.

But even before discussing hexadecimal, we must digress briefly and talk about digital electronics and the binary number system, both of which are essential to an

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by Mark Pelczarski

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understanding how the hexadecimal number system functions.

In relation to computers, digital electronics means, in very loose terms, that information is represented to the computer only by the presence or absence of voltage.

It is much simpler to test for the presence or absence of voltage in a circuit than it is to try to determine how much voltage is present. Imagine, for instance, the degree of complexity and accuracy that would be required to represent correctly a number such as 42,183 in terms of voltage level only.

Digital electronics, through which the precision of today's microcomputers is achieved, concerns itself with only two possible values, on and off. All modern microcomputers, including your Apple, use digital electronics. Digital electronics is based on the binary numbering system. In binary, there are only two possible numbers or values, zero and one.

Making It Happen with Zeros and Ones. Memory within the computer consists of a series of on and off switches. The convention is to call these switches bits. A bit always has a value of on or off, and, once set, a bit retains its value until the computer is turned off (and the values stored in RAM are lost), or the bit is modified. Bits are usually thought of as representing either a zero or a one, with zero indicating that no voltage is present, and one denoting the presence of voltage.

Having only two possible values in a circuit results in one very obvious constraint. It means that only two values can be represented by any given bit. With one bit, then, it would be possible to design a computer capable of counting up to one (0,1).

With two bits, four different values can be represented (twice as many as were possible with only one bit), and with three bits, eight values can be represented. As illustrated in Figure 1, the number of values that can be represented expands exponentially as the number of available bits increases.

The Apple has at its disposal hundreds of thousands of bits. These bits are grouped together by the computer to represent characters. Bit groupings are assigned based on two considerations: first, fewer wires are needed to access a group of bits than to access each individual bit; and second, a bit grouping should be big enough to represent one character (A, B, C, etc.) of the language in use on the computer.

When bits (individual electronic switches) are grouped by the computer as a single unit (a number, letter, or other value), the result is called a byte. Like most other microcomputers, the Apple groups eight bits into a byte. Eight bits is a convenient number to work with, because then any one of 256 possible values can be represented using only a single eight-bit byte. This arrangement works out quite nicely, since it means that any one of the keys on the Apple keyboard, including the upper case, lower case, and control equivalents, can be represented.

The total number of 256 possible combinations that can be achieved by one eight-bit byte was arrived at by taking two to the eighth. (Remember, each time a bit is added, twice as many possible values can be represented.) All of the instructions your Apple can execute are byte oriented. It cannot reference more, and it cannot reference less, than a byte of memory at a time.

In case you've ever wondered why the maximum amount of RAM the Apple II can contain is 64K, the

one bit

on
off

two choices

2^1

two bits

first bit	second bit
on	on
on	off
off	on
off	off

four choices

2^2

three bits

first bit	second bit	third bit
on	on	on
on	on	off
on	off	on
on	off	off
off	on	on
off	on	off
off	off	on
off	off	off

eight choices

2^3

Figure 1

reason is that the Apple's 6502 microprocessor uses two bytes to represent the addresses of items stored in memory. Two Apple bytes equal sixteen bits, and sixteen bits can be arranged in two to the sixteenth unique ways. If you do the math, you will discover that two to the sixteenth is 65,536, the true number of bytes the Apple can address. Many larger computers use three bytes for addressing; the extra eight bits in the third byte multiply by 256 the number of possibilities that can be represented, so with three bytes, a computer can address over sixteen million memory locations.

You may already have noticed that the operand of the Peek and Poke statements in Applesoft is always between 0 and 255. This is so because the thing being Poked is a

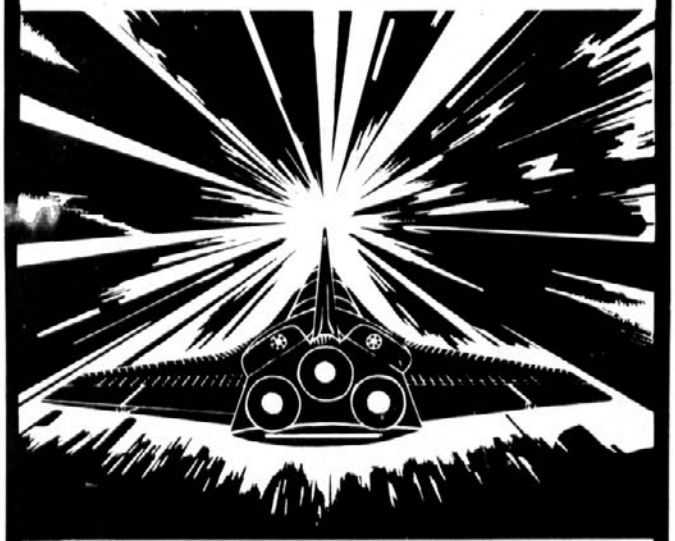
to page 21

ON-LINE systems

Presents

YOU ARE THE PILOT OF...

PEGASUS II



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IMAGINE being able to simulate common basic statements and executing them in Assembly language! Well, it's this easy . . .

BASIC:
```
10 FOR I=1 to 10
20 PRINT I
30 NEXT I
```

SPEED/ASM:
```
JSR FOR
ADR I,1,10
JSR PRTINT
ADR I
JSR NEXT
```

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by Randy Hyde
author of "Assembler Programming For Your Apple"
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Learning Made Easy

by SHERWIN STEFFIN

When you decided to purchase your microcomputer, you had some purpose in mind. Perhaps you wanted to generate your own programs or intended to use the computer in your business or for entertainment. Whatever your purpose, you were soon deluged with efforts directed at enticing you to buy various kinds of software.

Many computer owners are interested in acquiring educational software that is designed to teach them a new skill. Educational software is becoming more available at local computer stores, and advertisements for it often appear in the personal computing journals. The purpose of this series of articles is to give you information about educational software that will enable you to be more selective in your choices of software for yourself and your children.

The Home/School Information Gap. Let's begin by offering a rationale for the purchase of educational software for the home. In addition to wanting to learn new skills themselves, most parents are sensitive to and concerned about the difficulties their children encounter when trying to learn various subjects within the formal institutional context of the public school. But while computer assisted instruction (CAI) is beginning to make its way into school systems throughout the country, it is still an infant instructional technology in the public schools. For this reason, home CAI can serve as a valuable adjunct to instruction offered at school.

A second reason to consider buying educational software for home use is that it gives parents the opportunity to oversee the instructional activities carried on by their children's school in a way that is not otherwise possible. Most parents have only a limited view of the curriculum materials the school offers. Textbook acquisition takes place at a district-wide level, and other instructional materials are selected by the school librarian, by the audio-visual specialist, or at the request of the individual classroom teacher. Parents are not involved in the choice of instructional materials and, in fact, textbooks, tape recordings, and video cassettes are seldom viewed or evaluated in any significant depth by parents. With educational software now being sold to the school and home consumer alike, parents will have more opportunity to review the quality of the courseware being offered.

A Trio of Learning Tools. Three very different types of educational software can be identified, each one with its own distinct value in certain kinds of settings.

The most commonly found educational software is called *drill and practice*. Although most of it is designed to promote the development of arithmetic skills, drill and practice software offers specific categories of practice in a variety of subject areas. In drill and practice software, the system presents a problem, asks you to enter an answer to the problem, and "confirms" your response. This means that you are told whether you have answered correctly or not, and, if not, the correct answer is usually given to you.

Drill and practice programs are also used to drill English grammar, foreign languages, and geography; in short, anything involving memorization and repetition. Such programs have considerable utility to the learner engaged in "paired-association learning." This rote memory test involves no understanding of concepts on the part of the learner; it simply helps him to memorize certain pairs of words or symbols. Thus, if the task is memorizing the name and shape of each of the states, repeated practice will enable the learner to recognize the shape and match it with the correct state name.

A second form of educational software is known as *tutorial software*. The central purpose of tutorial software is to help you attain some new skill or conceptual understanding you did not have before. For example, a tutorial might teach how to add two fractions, how to find the nouns in a sentence, or how to compute the perimeter of a closed polygon. The presence of a "how to" question is one feature that helps to determine whether a software program is designed as a tutorial or as a drill and practice system.

The third cateory of instructional software is referred to as *simulation*. Simulations are designed to replicate some complex phenomena mathematically, allowing the learner to manipulate the effect a number of variables has on the total situation. Simulations can also have considerable utility in helping the learner to achieve a broad-based understanding of complex, real-world phenomena. Simulations have particular applications in the social and physical sciences and in some areas of mathematics. Whether simple or complex, simulations not only teach, but also provide a means for further exploration of the subject area once the elementary learning has taken place.

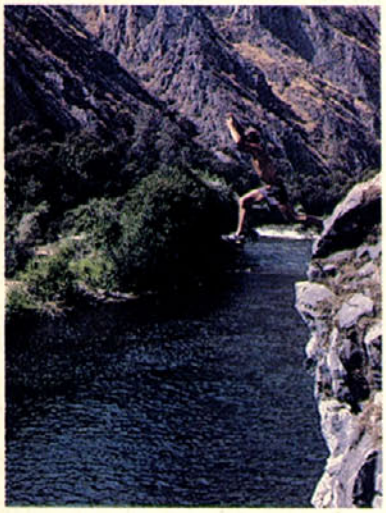
In the next column, we will discuss some tools that will help you, the user, become better able to evaluate educational software so that you can make wiser selections.

See you next issue. SL

URTH
OSSING

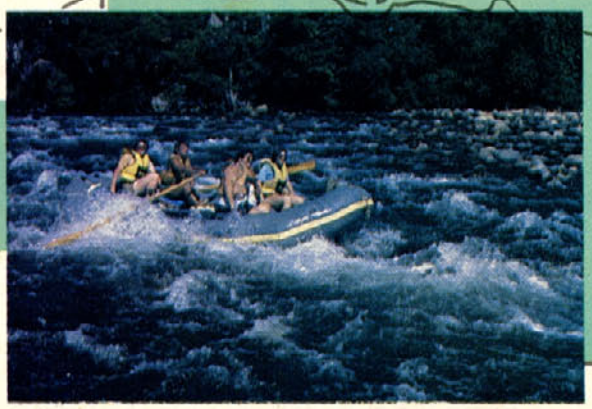
River

Clockwise from left: 1) Broderbund's new office? The Carlstons watch Bob Christiansen get wet; 2) Lunch stop; 3) In action: Randy and Mandy Hyde, Dave Gordon and river guide; 4) Peaceful waters; 5) Ken Williams and crew take it easy; 6) Computerists in the wood; 7) Ending it all.



Rafting

by GREG VOSS



It was a wild crew of computer buffs that braved the perils of the Stanislaus River the weekend of August 8 and 9. Thirty-seven of the west coast's top names in microcomputer software showed for a weekend of rapids shooting, water fighting, and merrymaking. The group survived treacherous bus drivers, twisting mountain roads, sheer cliffs, and baby diamondback rattlers.

The Best Laid Plans. Ken Williams, of On-Line Systems, admits to ulterior motives in sponsoring last month's white water raft trip for the computer industry's red hots. "We had intended to put a leak in every one of our competitors' boats, but it turned out that every boat had one of our people aboard." No wonder Ken was angry with the way O.A.R.S. handled the arrangements.

After breakfast at the Culture Counter Cafe, our heroes congregated in the O.A.R.S parking lot, south of Angel's Camp. Gear was stowed in water-tight rubber bags while important items needed during the day (i.e. cameras and beer) were stored in ammo boxes for easy access. After a briefing, everyone boarded an old ex-school bus to begin the winding crawl up the hill to Camp Nine.

Bail Bucket Brigade. The group took to the water like sitting ducks and it wasn't long before Greg Staie of Continental Software found a second use for the white bucket that was intended for bailing water. No one stayed dry for long, and paddlers found that most of the white water they encountered during the trip was tossed at them from a bail bucket. The Carlston siblings (Kathy, Doug, and Gary) of Broderbund were forced to promise free copies of *Apple Panic* in exchange for their lives.

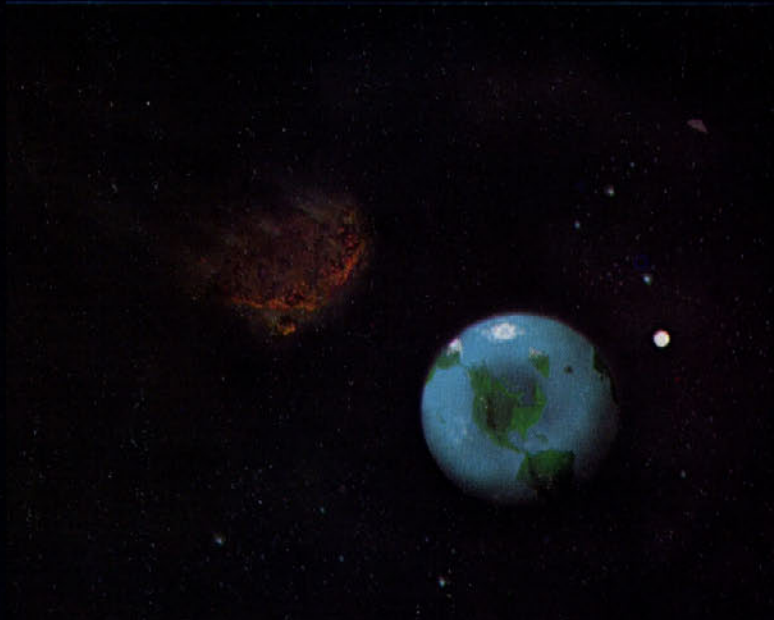
Dave Gordon of Datamost took his share of drenchings from Greg Staie, who quipped with great satisfaction, "Where else will you ever get the opportunity to inundate your former boss with gallons and gallons of water?" He's one who got his money's worth out of the trip.

Allan Staie wrestled with brother Greg to stay on board as Greg vented childhood frustrations: "Mom always liked Al best." A high, rock cliff proved too

ON-LINE systems

PRESENTS

HI-RES ADVENTURE



MISSION: ASTEROID
HI-RES ADVENTURE # 0

MISSION: ASTEROID is an introduction to the HI-RES ADVENTURE family of games. This adventure is slightly easier and a little shorter than our other HI-RES ADVENTURE games. MISSION: ASTEROID is designed to acquaint beginning Adventure players to the wonderful world of Hi-Res Adventure.

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In this particular HI-RES ADVENTURE game, you are transported to the front yard of a large, old victorian house. When you enter the house, you are pulled into the mystery, murder and intrigue and can not leave until you solve the puzzles. Your friends are being murdered one by one. You must find out why, and who the killer is. Be careful, because the killer may find you! As you explore the house there are puzzles to be solved and hazards to overcome. The secret passage way may lead you to the answer.

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"Hey!" the boatman scolded. "Stop talking shop. This is something you don't see every day at work. This valley's beautiful, so shut up and have a look."

inviting for divers to pass up, and Gary Koffler demonstrated a death-flip dive while onlookers coaxed an unwilling Roberta Williams to make the thirty-foot jump: "Come on, Roberta, just pretend it's a hot tub."

Despite the beautiful surroundings, rafters talked more about work than about the trip. The guides did their best to keep computer talk to a minimum.

"Hey!" the head boatman scolded, "Stop talking shop. This is something you don't see every day at work. This valley's beautiful, so shut up and have a look."

The river was beautiful and meals and rest were enjoyable amid the pines and steep sloping walls of the canyon. A rich blue sky looked over the white-capped water, which was clear all the way to the bottom and clean enough to drink. Cloudless days made for hot rafting and many a dip in the cool river. The Stanislaus, now threatened by the filling of the New Melones Dam, was a little low by the evening of the first day and the rafters had to rush to the campsite to avoid getting hung up on exposed rock.

After a full day of sun, Randy Hyde (Lazer Microcomputers) emerged from the waters as red as a lobster. During dinner, Mandy Hyde let everybody know that she is tired of being introduced as Randy's wife. After all, she keeps Lazer Micro solvent.

We Beat the Big One. In one of the more sober moments of the trip Diane Ascher, an independent market consultant, tried to explain what the madness was all about. "This is a group of people that is always looking for an excuse to party. The river just provided us with a scenic backdrop. Basically we have a lot in common. We all sort of feel like we beat the system: we got to microcomputers before IBM did. It gave us a chance to try out the business."

A lot of information was shared over the campfire: new products, new technologies, business problems and solutions, mergers and sales. Diane explained: "We're all competitors, but we like to cooperate. By the time most of the news about software development hits the press, it's too old for us. We like to get together and see what's going on. It's a real education."

The next day brought strange behavior from Roger Wagner (Southwest Data Systems), who helped assemble the rafts into a line to make a crude slip-n-slide on the bank of the river. Wagner then ran wildly and flung himself into the air over the upturned rafts, while two assistants dumped buckets of water onto the slippery raft bottoms. Wagner shot head first into the river. Apparently, he damaged something—he's been preoccupied with bugs ever since.

Back at camp, Ed Peters and Warren Schwader of On-Line found themselves on opposite sides of a volleyball net. Others went hiking. Steve Dom Pierre, a veteran of three snake bites, was charged with steering clear of rattlers.

Stowaway Earns His Place. The surprise guest was Harold Peterson, who showed up at the On-Line office Friday afternoon. John Williams, who organized the affair, asked Harold who he was with. Harold responded: "My wife, Betty."

John, who had been beating his head against the wall all day because of last minute changes in the number of reservations, took it all in stride. "Well, the trip was supposed to be for industry people, but if an Apple user wants to come along, it's okay with me."

According to John, Harold proved to be a valuable crew member. Not only is Harold Peterson a member of the Original Apple Corps, "He's a hell of a gunner," said John. "If there was any water fighting going on, Harold was in the thick of it." Harold manned the water bucket and led several boarding raids.

The party got rowdy near the trip's end as paddlers prepared for one final brawl. Ken Williams took the last rapid standing up on the front rail of his raft, and Randy Hyde followed suit. With Ken perched on the rail's edge like a kamikaze waterskier, his crew rammed and boarded an unsuspecting craft, throwing half of the surprised occupants overboard. Bob Christiansen (Quality Software) got a chance to test out his underwater camera when it wound up in the drink with him. Rafters who wound up in the water struggled to pull others overboard, while those still on board fended off the attackers with paddles. Water from paddles and buckets flew over the ten rafts. It was a tired and soggy crew that emerged at Parrot's Ferry at the end of the day.

Battle Scars: Grist for New Adventure. John Harris allegedly broke his jaw on a joy stick, and Rorke Weigandt is too zoned to go back in time for work. Terry Pierce is still trying to get his shirt on right-side-up.

John Heuer, Roberta Williams's father, is trying to figure how to get his apples picked this fall. He was seen several times during the trip trying to show Ken how to climb a tree.

White water with killer names like Widow Maker, Devil's Staircase, and Death Rock, didn't faze Ken's brother Larry, who spends his spare time knocking down mailboxes between Oakhurst and Coarsegold with his car fender.

Everybody is going to miss Sandy Blumstrom's white water suit except Ed Bracy who followed her home. Word has it that Dave Mullich was taken prisoner by river pirates. Sue Corner is still looking for him. Other paddlers foolish enough to tag along included Art Childs, Wendy Peterson, Lewis Ashelford (supposedly spying for IBM), and Dave Gordon's bodyguard, Skot Bradley. Sheila Clarke took notes for *InfoWorld*. SL

SOFTLINE Software Reviews

Ultima

By LORD BRITISH

Published by California Pacific

Review by John Williams

Adventure games for the Apple are now almost as common as the arcade-style shoot-'em-ups. Adventure games can be classified into two major categories: those that involve solving a puzzle, and those that involve fantasy and role playing. Examples of the first type include such familiar games as *Adventure*, *Zork*, *Wizard and the Princess*, and the Scott Adams series; examples of the second type include *Wilderness Campaign*, *Odyssey : The Compleat Apventure*, *Wizardry*, and *Ultima*.

Of the fantasy/role playing adventure games available, *Ultima* seems to be the best. The world of *Ultima* is presented in impressive high-resolution character graphics, making a color monitor a definite must. *Ultima* is played using thirty different commands, including the four directional commands (return, slash, and the two arrows) and the letters A through Z. Letters symbolize such commands as (A)ttack, (C)ast spell, (T)ransact with merchants, and so on.

An *Ultima* scenario might unfold as follows:

> Having just finished "rolling" your character, you find yourself in the middle of an open plain. Armed only with a dagger, you decide to search for a city where you can do some trading for a better weapon. While in the city, you also hope to quaff a couple of flagons of ale. You venture northward, and before you realize what's happening, a gang of wandering hoods jumps out of nowhere and madly attacks you with axes.
>
> Knowing that you are far more skilled a fighter than they, you decide to stay and fight, rather than to flee. You manage to do away with two of your adversaries, but in the meanwhile, the other two have brought your hit points dangerously low. Swallowing your pride, you decide to run. You escape a few gold coins to the richer, but you are in severe need of healing . . .

Throughout the game, your character will be sent on quests by various kings. (You're likely to find yourself working on at least three different quests at any given time.) Your character will travel over land and sea, through forests, deep into dungeons, and even into outer space to fulfill the kings' wishes. Eventually, your character will discover the real object of the game. Accomplishing this is no small undertaking; it requires experience, imagination, and a lot of hit points.

As the game progresses, so does the level of the technology. Don't be surprised if at some point you find yourself trading in your broadsword for a phazor.

The dungeons in *Ultima* have no rooms, only corridors. This may seem really trivial, but to a dedicated fantasy role-player, it's a moderate drawback.

Ultima was written by Lord British for a 48K Apple II or Apple II+ with a disk drive. Although *Ultima* works just fine with one disk drive, two drives are preferable, because the game is constantly switching you back and forth between the game disk and the character disk.

Ultima retails for $39.95 and is well worth the price. Oh, by the way, can you give me directions to the Tower of Knowledge?

Sneakers

By MARK TURMELL

Published by Sirius Software

Review by David W. Durkee

Sirius Software would probably groan to hear *Sneakers* described as an invaders-type game, and with good reason. *Sneakers* is of that genre, however. In it, the player controls a ship, moving it left and right at the bottom of the screen and shooting missiles from the ship's nose.

The player has the option of using the arrow keys and the space bar or paddle 0. The paddle is a better controller, because when you are playing from the keyboard, hitting an arrow will move you in the direction indicated until you reach the edge, hit the other arrow, fire a missile or get blown up. Because of the limits of the keyboard controls, it is too often the last of these alternatives that stops you. Still it is nice to have the option of playing from the keyboard, so that you don't get caught up the creek without a paddle.

More important than how *Sneakers* is like *Super Invaders* is how it is different from (and better than) *Super Invaders*. In *Sneakers*, your adversaries are far more varied. The cute sneakers, the little animated mushroom people that come at you first, are not particularly menacing fighters. When you have destroyed these sneakers, the cyclops, sinister one-eyed blimps, move as a group across

the screen. Neither of these first two foes will fire at you, but they may collide with you, and destroy one of your ships.

The saucers, next to appear on the baddies hit parade, are a little more complex. Half of them cross the screen in one direction, half in the other, and their movements are not synchronized. Besides, they are dropping things on you. The saucers are followed by the fangs, which sway rhythmically back and forth, evading your missiles. Instead of shooting at you, these critters themselves turn into missiles. And in missile form, they can't be hit. Occasionally, all of the fangs become missiles at the same time, leaving you with nothing to do but duck.

Of course, you get points for each of the enemies you hit, but, for the beginner, there is bigger money in the perfect player bonuses. If you are still on your first five ships, each time you clear the field, you get a bonus. After having played for a few hours, you may decide that if you lose your first ship to any of these first four enemies you might as well start over, because you have lost most subsequent bonuses. You'd be better off continuing, though, for practice on the harder foes that follow.

Your next adversaries are the dreaded H-wings. These look something like *Star Wars* Tie fighters, and they are just as mean and in similar numbers. Getting the 400 bonus points for doing in the H-wings is cause for breaking out the champagne. But don't celebrate yet, unless you like to fly through meteors with a buzz on.

Up until now, the secret of the game has been to know your enemy. Treating *Sneakers* like you would a quick shooting game may get you into trouble. Although there is no cunning in the meteors' behavior, that doesn't mean they are easy to deal with. They just keep coming, seemingly without end. Once in a while, you manage to get a bonus on meteors. Then for no obvious reason, the game moves on to scramble mode. Scrambles are strange triangular creatures that seem to reappear as if they each have several lives. The thing about a progressive game like this is that you don't get much chance to practice at the really hard challenges. This, of course, keeps the game interesting after you've been playing it for five hours straight, but it can also be frustrating.

It may be a while before you see much of the scrubs, the last of the nefarious nemeses to the by-now serious *Sneakers* player. They are swift and deadly, because hitting them turns them into bombs that speed up if hit again. A sneaky secret is that they *slow down* when hit several times, and each hit adds 100 points to your score.

When the scrubs are gone, you have broken the arbitrarily set top score, earning yourself a new ship and a chance to start again at the next level. That is, the same beasties, and more of them. Better save that champagne for a new day. You will probably want to play again. And again.

Two complaints could be made about this otherwise absorbing arcade game. Whenever your ship is destroyed, a huge contraption that resembles a cross between a rocketship and a cookie press comes down and squeezes out another ship. The animation is crisp, but this sequence takes just long enough to be dull when you have seen it fifty times. A more disturbing problem is that you sometimes miss when you think you've hit, and the enemy often blows you up when it looks as though he hasn't hit you yet. This can be distressing, especially

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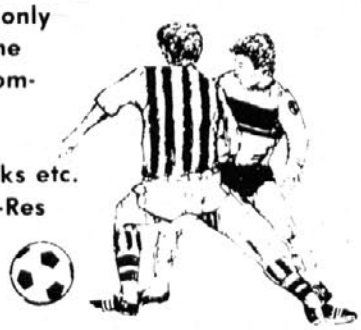

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when the last H-wing cheats you out of that 400 point bonus you were counting on.

The animation in *Sneakers* is good throughout and it's unique. The options for changing skill levels, turning the sound on and off, and pausing in the middle of a game are well formatted and easy to use. (The latter is very handy when you are interrupted by a phone call in the middle of things.) And finally, there's a test routine which executes when you boot the disk that will alert you to the presence of any bad RAM chips in your Apple. That's a well thought out function, and it sure beats having an unexplained glitch in the run caused by an unidentified hardware problem.

The Prisoner

By DAVID MULLICH

Published by Edu-ware Services

Review by John Williams

In the summer of 1968 a television program called *The Prisoner* aired. This program was unusual because it forced the viewer to think in order to understand what was going on.

Now, more than a decade later, Edu-ware Services, a company that prides itself on making people challenge their minds, has come out with an adventure program that exercises your intellect like few games you have ever played before. *The Prisoner*, by David Mullich, is an adventure game that pits you against your computer, challenging you to figure out its secrets before it figures out yours. You even have to figure out the rules and then figure out when to break them.

At the beginning of the game you are given your secret three-digit number. As you travel through the adventure, the program will try time and time again to trick you into giving the number away. If you do, the computer has won—and it probably will win two or three times before you do. This gives you a mild feeling of paranoia that makes you pay close attention to what you are doing and stops you from becoming too automatic in your moves.

Finding out what your computer is keeping secret is very difficult. The rules of the game are purposely vague and inconsistent. Their only purpose, it seems, is to keep you confused and disoriented so the computer can pry your secret from you. Disobeying the rules is the rule rather than the exception. (The *1984* concept of *doublethink* abounds in this game, and great clues are given for disobeying the right rules at the right times.)

The ultimate feeling of this game is that you are *The Prisoner* and that the computer is really playing against you. Your loss in a battle is the computer's gain, and it will tell you so (the computer seems to gloat just to get under your skin).

If you decide to play this game, remember: Keep your wits about you; if you are starting to feel flustered, quit for a while. Try new things—it's the only way to get anywhere. Have patience. This game can keep you guessing for hours, but if you hang in there, that new clue may make all the difference.

The Prisoner is imaginative, well presented and thought provoking. Hats off to Dave Mullich and Edu-ware Services for bringing real mental challenge to the game industry. SL

In this innovative game, you take command of a powerful gun base to shoot helicopters and aircraft out of the air. Beware! The opposing forces have plans to *Sabotage* your base. Can you defend yourself from the rain of bombs and paratroopers and keep your base in action?

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Apple Graphics

from page 11

byte. Unfortunately, it is hard to know the settings of the bits in a byte just by knowing the decimal value of the byte.

Hex to the Rescue. Here's where hexadecimal comes in. In hexadecimal, a byte is thought of as being composed of two four-bit nibbles. If you do the calculation, you'll find that two to the fourth gives you sixteen.

The main assumption in hexadecimal is that people would never be able to recall 256 separate bit combinations, but that anyone can remember sixteen combinations if really pushed. Also, the inventor of hexadecimal was able to arrive at sixteen symbols to represent a possible sixteen values but would have been hard pressed to come up with 256 symbols.

The sixteen symbols selected were zero through nine and the letters A through F. Zero through nine represent the first ten possible values, A the eleventh possible, F the sixteenth. Thinking too hard about hexadecimal is likely to make your head hurt, so you may want to make a chart for yourself (like the one in Figure 2) of the hexadecimal values and tape it to your wall as a reminder.

The contents of a byte when expressed in hexadecimal is really the value of the byte's two nibbles. For example, FF means two nibbles with all their bits on, and AA means every other bit on, while F0 means four bits on in

Bit 1	Bit 2	Bit 3	Bit 4	Hexadecimal	Binary
off	off	off	off	0	0 0 0 0
off	off	off	on	1	0 0 0 1
off	off	on	off	2	0 0 1 0
off	off	on	on	3	0 0 1 1
off	on	off	off	4	0 1 0 0
off	on	off	on	5	0 1 0 1
off	on	on	off	6	0 1 1 0
off	on	on	on	7	0 1 1 1
on	off	off	off	8	1 0 0 0
on	off	off	on	9	1 0 0 1
on	off	on	off	A	1 0 1 0
on	off	on	on	B	1 0 1 1
on	on	off	off	C	1 1 0 0
on	on	off	on	D	1 1 0 0
on	on	on	off	E	1 1 1 0
on	on	on	on	F	1 1 1 1

Figure 2

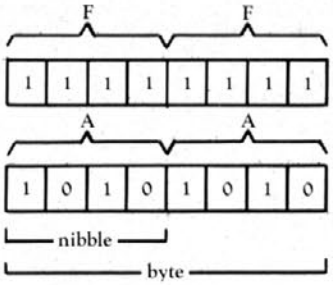


Figure 3

the first nibble and four bits off in the second nibble (see Figure 3).

The convention when writing a hexadecimal value is to precede it by a $. For instance, $DF. The value of a nibble ranges from zero to fifteen, with A equal to ten and F equal to fifteen. This means that the hex value of BC is converted to decimal by the equation eleven times sixteen plus twelve. Remember, $B is eleven and $C is twelve.

Resist the Temptation to Convert. In general, when dealing directly with the memory of your Apple, it is better not to think about converting hexadecimal numbers to decimal. It is not always necessary to convert, and it is often more efficient to try to think in hexadecimal, since that is the numbering system your Apple understands. When you do need to convert a hex number to decimal, such as for use in an Applesoft Poke statement, use the following algorithms:

For one-byte quantities (read the number from left to right)

decimal value equals (value of first nibble times sixteen) plus (value of second nibble)

For two-byte quantities (read the number from left to right)

decimal value equals (value of first nibble times 4096) plus (value of second nibble times 256) plus (value of third nibble times 16) plus (value of fourth nibble).

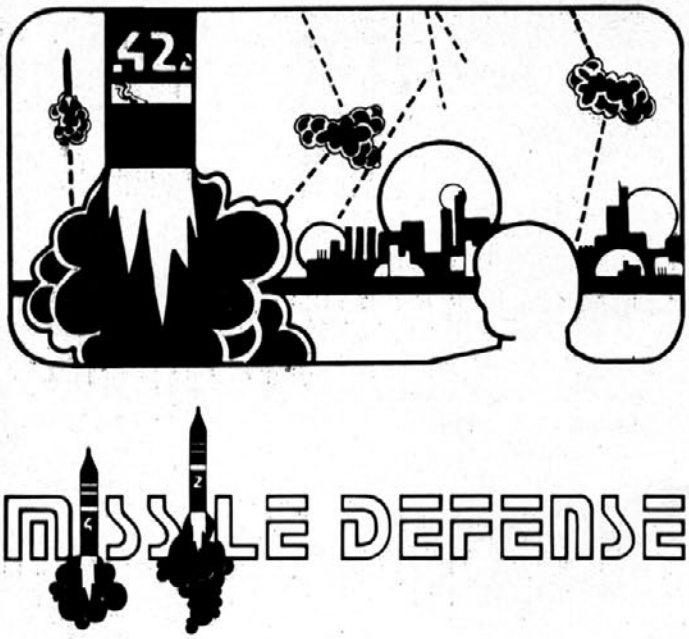
Memory addresses within the Apple's RAM are represented using two bytes, with values ranging from $0000 to $FFFF. If you apply the second algorithm to $FFFF, it will become clear once again why 65,536 is the biggest number in the Apple world.

To Memory through the Monitor. The ROM-resident system Monitor allows you to inspect, modify, or move the contents of RAM memory. It also contains commonly used subroutines that may be used by your programs to do such things as printing a character or making a beep sound.

Within the context of what you will learn here, the main use for the Apple Monitor is as a means of altering or moving RAM and displaying the contents of various locations. You will also learn to use the Monitor to enter short machine language routines that will be used to manipulate graphics from your programs.

As you have noticed, when you are in Applesoft, the prompt character] appears on your video screen. When you are in the Monitor, you receive the prompt character * instead. To reach the Monitor (assuming you have DOS up), enter CALL -151 from Applesoft. To return to Applesoft from the Monitor, enter 3D0G and press return.

Once you have gotten yourself into the Monitor, you



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Memory Map of a 48K Apple II

Function	Address
APPLE MONITOR	$F800-$FFFF
APPLESOFT	$E000-$F7FF
RESERVED	$D000-$DFFF
I/O DECODE	$C000-$CFFF
DOS	$9600-$BFFF
UNUSED	$6000-$95FF
HI-RES PAGE 2	$4000-$5FFF
HI-RES PAGE 1	$2000-$3FFF
UNUSED	$C00-$1FFF
TEXT/LO-RES PAGE 2	$800-$BFF
TEXT/LO-RES PAGE 1	$400-$7FF
DOS VECTORS	$3C0-$3FF
UNUSED	$300-$3BF
TEXT INPUT BUFFER	$200-$2FF
6502 STACK	$100-$1FF
ZERO PAGE	$0-$FF

Figure 4

can begin examining RAM. RAM in your Apple is laid out as shown in Figure 4.

RAM, which can be thought of as the working or program area of the Apple's memory, consists of 256 pages, each of which can hold 256 (sixteen times sixteen) bytes of information.

Now that you are in the Monitor and have an idea of how things are laid out, try displaying some memory. Enter C00 and press return. You should receive the response C00- XX. XX will be some hexadecimal byte, the contents of which depend on the program last run on your Apple.

Now try changing the value of C00. Enter C00:FF (you do not need the leading $ sign, since the Monitor always presumes you are speaking to it in hex). The colon Monitor command (equivalent to a Poke statement in Applesoft) causes memory to be modified to reflect the value that follows the colon.

To prove that memory location (address) C00 now contains the value FF, try displaying the contents of C00 by entering it and pressing return. This time, you should receive the response C00- FF.

Making Monitor to Memory Moves. If you want to alter the contents of eight bytes of memory starting at $C00, enter C00:FF FF FF FF FF FF FF FF. This will store the value FF at locations $C00 through $C07. Then, to prove that you have actually patched memory, enter C00.C07, which asks the Monitor to display the bytes in memory from $C00 through $C07. Remember, when you wish to display a range of memory, just enter its address and press return. When you wish to display a chunk of memory, enter the starting address, a period, and the ending address. (Do not use spaces to separate

these elements.)

This method of patching memory works fine if you only want to alter the contents of a few memory locations. But what if you have reason to change a larger range of memory, such as the contents of the entire hi-res page one ($2000.$3FFF). Typing 2000:FF FF FF FF . . . to 3FFF:FF would accomplish your aim, but it would take several hours.

Fortunately, the Apple Monitor contains a routine that will move entire blocks of memory in only seconds. To discover how the routine works, display the contents of $C00 through $C40 by entering C00.C40. Then, pretend you want to move what you have just displayed into the $D00 range of memory. To accomplish this, type D00<C00.C40M. This command tells the Monitor subroutine that $D00 is to receive <, the contents of memory stored in $C00 through $C40. The letter M stands for move. If you now display the contents of $D00.D40, it should contain exactly the same data as the memory range at $C00.C40. (Despite the fact that this command is called a "move" command, it does not mean that data is transported from one set of locations to another, but rather that data is copied and stored in a second location in addition to the first, original one.)

Clearing the Screen for Graphic Action. Now it's time to do something useful with what you've learned so far. The task is to try to clear hi-res page one ($2000–$3FFF) to black. This is similar to, but not exactly the same as, executing the HGR command in Applesoft. But besides clearing the screen to black, the Applesoft command will give you a four-line scrolling text window at the bottom of the screen. What you want to do right now is to clear the hi-res screen to black without putting a four-line text window at the bottom of your video screen.

First, store the value 00 at $2000 by typing 2000:00.This happens to be the bit pattern that causes your Apple to display black, because it means that all the bits in memory location $2000 are in the zero, or off, position. Next, clear the memory locations from $2001 to $3FFF by typing "2001<2000.3FFEM." Then, to verify that hi-res page one has actually been cleared, type "2000.3FFF" and watch all the zeros appear on your screen. Unfortunately, since the hi-res graphics were not "turned on," you cannot see your black screen, but you can ascertain from all of the zero values that the memory move command worked.

You will learn shortly how to control what is displayed on the screen, but first it is important to take a closer look at the move command you just executed. Whenever you use the Monitor move command, it works a byte at a time, going from left to right. When you moved memory to itself as you did earlier, several things happened. First, $2001 was loaded with the value from $2000, which had been set to 0 earlier. Next $2002 was loaded with the value that was just moved out of $2001, $2003 received the value moved out of $2002, and so on, until the last element in the chain was carried out when $3FFF received the value that had been contained in $3FFE. Although this may sound a bit complicated right now, you will soon become comfortable with it, and find ways to make use of it in the future.

How to Tell What's on TV. In the next article in this series, you will examine the hi-res graphics mode in detail and discover how memory is used to create the images

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NEW FOR THE APPLE II

you see on your video display monitor. You will now learn how to turn the different graphic modes on and off from the Monitor.

The Apple's RAM contains a series of switches called soft switches. These are actually memory locations, but they differ from other memory location switches, in that merely referencing their addresses in a program causes something to happen. (This is in contrast to normal switches, which can be altered by plugging new values into them, as we did in the earlier example.)

The graphics soft switches lie in RAM at $C050.C057 (for those of you who have not yet become accustomed to thinking in hex, that's 49232-49239). There are other soft switches in the Apple's RAM, but right now you only need concern yourself with the ones that affect the graphics.

Soft Switch Lives Here. Watch what happens when you mention to the Monitor an address that happens to be the location of a soft switch. Typing C050 will turn on a graphics mode, with a four-line text window at the bottom. As far as the Monitor is concerned, all you did was try to display the contents of memory location $C050. But since all that has to be done to flip a soft switch is to reference its address, you have gone directly into a graphics mode instead.

To switch to hi-res page one with a four-line text window at the bottom, type C057. If you ever want full screen hi-res graphics (sans the text window), type C052. To restore things to normal (that is, to return to text), type C051.

Here is a summary of the procedures to follow in order to turn on the various graphics modes from the Monitor or from Applesoft.

For hi-res page one, full screen graphics, enter C050 from the Monitor or Poke 49232,0 from Applesoft. Then enter C057 from the Monitor or Poke 49239,0 from Applesoft. Then enter C052 from the Monitor or Poke 49234,0 from Applesoft.

To get to hi-res page two (full screen, no text window), enter C055 from the Monitor or Poke 49237,0 from Applesoft.

To get back to hi-res page one, enter C054 from the Monitor or Poke 49236,0 from Applesoft.

For a split screen again (one with a four-line text window), enter C053 from the Monitor or Poke 49235,0 from Applesoft.

To set lo-res graphics, enter C056 from the Monitor or Poke 49238,0, from Applesoft.

To return to text mode once again, enter C051 from the Monitor or Poke 49233,0 from Applesoft.

And Now for a Bit of Fun. Now that you know how to put values into memory and how to turn on graphics, it's time to play with what you've learned.

Go into the Monitor (CALL -151) from Applesoft. Enter C050, then C057, then C053. Doing this will turn on hi-res graphics, with a four-line text window at the bottom of the screen. To clear the screen area to black, enter 2000:0 and then 2001<2000.3FFEM. You should now be looking at a blank screen, with your last four lines of text at the bottom.

What would happen if you were to plug some other value into $2000? Try it. Enter 2000:FF. A little white line should appear in the upper left hand corner of your TV screen. Now try entering the values $01, $02, $04, $08, $08, $10, $20, $40, $80. These values were selected because each of them represents a byte with only one bit on in each of eight possible positions, as illustrated in Figure 5.

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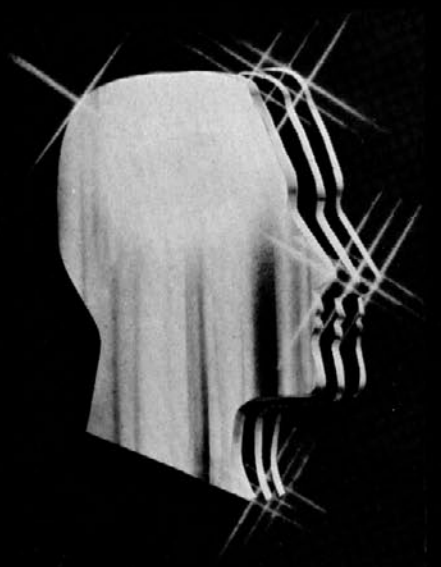

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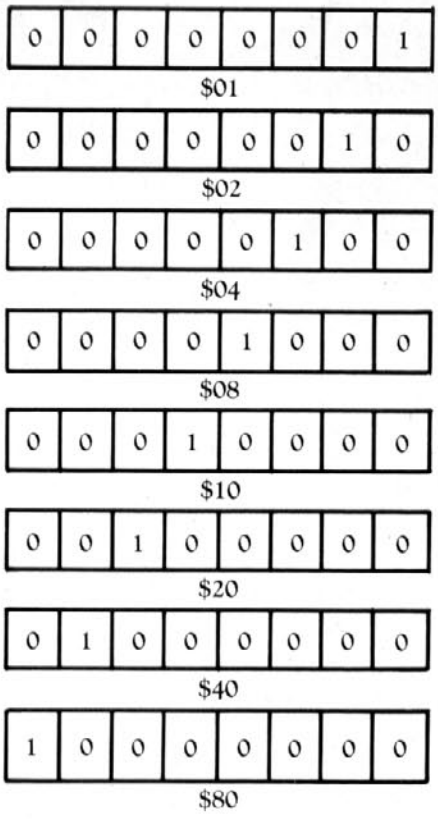

Figure 5

Entering these values should yield some surprising results. If you watched closely on the TV when you entered 2000:02 (after already having entered 2000:01), you saw the dot that was on the TV screen move to the right, even though the on bit within the byte you poked moved to left. This pattern should continue until you enter 2000:80, at which point the screen should once again go to black.

What this tells you is that only the last seven bits in a byte turn on a dot on the television screen, and that the bits turn on dots in reverse of the way you would expect them to. Try entering bit patterns with more than one bit on (for example, 42) and see if you can predict what you'll see on the TV screen.

Don't worry if the last portion of this lesson has you confused. It will be repeated in greater detail in the next issue.

Homework. Read about hi-res graphics and the System Monitor in your *Apple II Reference Manual.* Even though these sections are written in rather technical language, you're likely to find that whatever you do get out of them will enable you to get a little fancier in your applications of the examples we worked with here.

Have fun.

Although we haven't talked much yet about hi-res graphics, the ground we've covered so far is essential to your understanding and being able to take advantage of the graphics capability of your Apple II. If you understood everything you read in this article, you will be well prepared for your next hi-res graphics lesson. If you did not understand this article, chances are you won't be able to make much sense of the next one either.

If you have any questions or comments about information in this article, please write to me care of *Softline.* Then in subsequent articles, I can try to answer your questions and clarify any material that may have been confusing the first time around. SL

THERE IS MORE THAN ONE WAY TO PLAY "WHAT IF"

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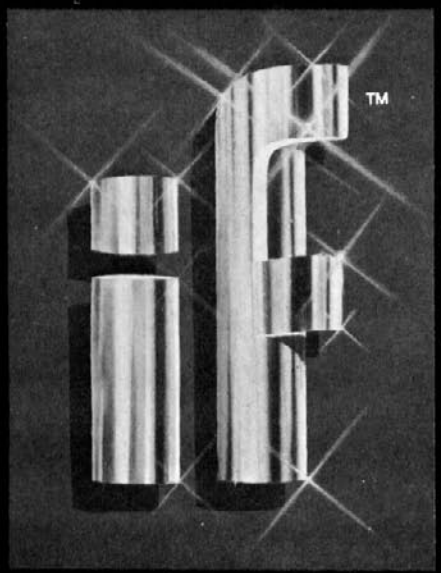

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Time Zone Preview

by ED PETERS

On-Line Systems has received many enthusiastic inquiries about *Time Zone*. Many of the people who have enjoyed their other adventures now want something more.

Time Zone is the brainchild of Roberta Williams. Roberta has spent more than a year mapping and setting up the many subscenarios. *Time Zone* will have 1,182 rooms and will occupy an estimated six disks.

Working under Roberta is the *Time Zone* task force (with Bob Davis, author of the forthcoming *Ulysses and the Golden Fleece*) as project head. The task force is made up of six people, each of whom is at work on different aspects of the game. Their method is to work region by-region, making each region complete in itself before tying all of the regions together.

Davis has been working on the logistics for many of the regions. Logistics basically means the implementation of the game, and includes giving a description of each room, with the necessary messages and proper responses to each command. This is accomplished through Adventure Development Language (ADL), a special language developed by Ken Williams. Working with Davis on the logistics are Eric Griswold and Rorke Weigandt, each making ready different regions.

Terry Pierce, On-Line's resident artist, is busy creating the hi-res pictures. Pierce's method is to draw pencil sketches on graph paper, and then to recreate them using the Apple Graphics Tablet, adding the color at this point as well. The task of developing the pictures once they have been drawn can be quite cumbersome and time consuming. Two people—Barry Blosser and Michelle Pritchard—are helping Pierce to recreate his sketches by means of the Graphics Tablet. Pierce estimates that from the first sketching to the final implementing, it will take at least 480 hours to create the pictures.

Why is so much work involved in making *Time Zone*, and why will it take up an estimated six disks? The story of *Time Zone* is one of time travel and enemy alien forces. It will take you almost anywhere at any time, all the way from the pre-dawn of mankind (evolution theory) to fictitious future, and will cover major events on all seven continents.

You will travel to Egypt in 50 B.C., meet Cleopatra, and witness the fall of Caesar. You will journey to England in 1000 A.D. to help Robin Hood in his cause, encounter a Samurai warrior, and meet Russian Cossacks. You will take part in Columbus's voyage and in the creation of the Declaration of Independence. You will see mystical Arabia in 1000 A.D., and primitive Australia in 50 B.C.

From aiding mankind's development to the final goal of saving Earth from Ramadu, the sinister ruler of the planet Neburon, your task will not be easy. With its many obstacles to get by, puzzles to solve, and mazes to get out of, *Time Zone* is not recommended to the greenhorn adventurer.

The task force members hope to have *Time Zone* ready by the end of November. But their job won't end at that point. After all, who do you think is going to be answering all those phone calls and letters from people stuck in the game?—Many of them are still trying to get past the snake. SL

Each issue, Softline *will bring you a preview of a major new game package scheduled to reach the market within two months. The preview will describe the making of the game as well as its playing values, giving readers insight into the resources that go into the development of a major new entertainment package, as well as giving them something to look forward to.*

High Scores

ABM
MUSE, Baltimore, MD
Jim Salmons 24,000
(previous high score of 16,000 by Silas Warner, program author)

Alien Rain
Broderbund Software, San Rafael, CA
Alan Lee 17,735,500
Brighton, MA

Apple Panic
Broderbund Software, San Rafael, CA
Alice Carlston 98,000
San Rafael, CA

Asteroid Field
Cavalier Software, Del Mar, CA
Dennis Zimmerman 132,510
Del Mar, CA

Gobbler
On-Line Systems, Coarsegold, CA
Al Tommervik 131,300
North Hollywood, CA

Missile Defense
On-Line Systems, Coarsegold, CA
George Richman 127,810
Vienna, VA

Mission Escape
CE Software, Des Moines, IA
Donald Brown 2,184

Raster Blaster
BudgeCo, Piedmont, CA
Chris Reed 2,443,400
(in a contest sponsored by The Computer Station, St. Louis, MO)

Sabotage
On-Line Systems, Coarsegold, CA
Steve Wozniak 13,678
Scott's Valley, CA

Snoggle
Broderbund Software, San Rafael, CA
Jun Wada Level 28
(program author)
Rick Crumpston Level 11
Stafford, VA

Star Thief
Cavalier Software, Del Mar, CA
Jim Nitchals 13,900 (single version)
(program author)
23,480 (partner version)
Randy Antler, Del Mar, CA, and Bill Emerick, La Mesa, CA

Do you have a high score on your favorite game? If so, write to let us know so we can publish your name and score in the next issue of Softline.

Softline Salutes

Did it ever happen to you? You're playing *Raster Blaster* (or *Space Eggs* or *Alien Rain*), and you're cooking. You've surpassed your former record by 50,000. You're on your last ball but you have two other balls caught in claws. You aim for that top claw and you get it! Out come all three balls and your chance for glory and—the phone rings.

You're faced with a dilemma. Do you keep on playing, reasoning uneasily that if it's really important, the caller will call back at a more convenient time, or do you quit to answer the phone, hoping it's a bill collector or a wrong number who won't care that you'll be carrying a grudge for the next two years?

Sirius Consideration. Now, Sirius Software has solved the problem. When you play *Sneakers* and other Sirius games, you're no longer placed in a no-win position. Instead, when you're interrupted by a phone call, have to remove a staple from your child's thumb, or smell something burning, just press the escape key, and you've put the game on hold. Take the brownies out of the oven, take Joanie to her violin lesson, or just take five. Then when you're ready to resume play, just hit the escape key again and pick up right where you left off. *Sneakers* awaits. SL

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- Erroneous statements are flagged during program compilation.
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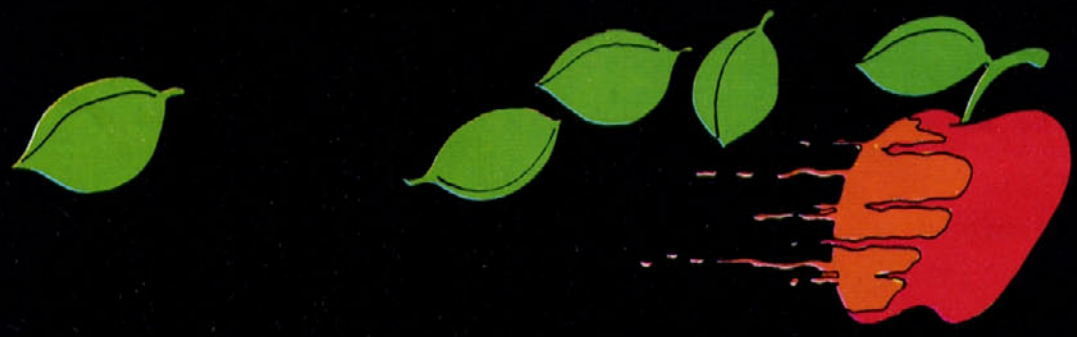

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