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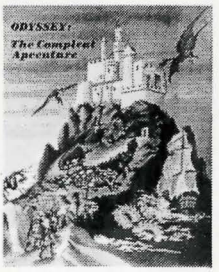

COVER POSTER:

Odyssey: The Compleat Apventure is depicted in this painting by Judy Swedberg. It captures some of the hazards you will encounter in high-res-color animation while adventuring in The Sargalo. Poster size copies may be obtained by sending $4.00 to:

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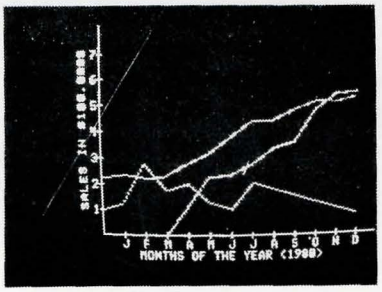

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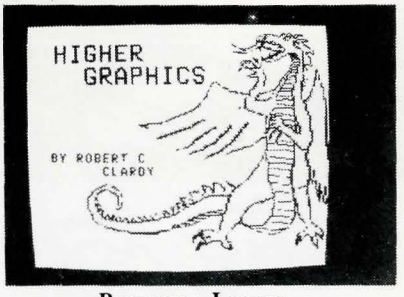

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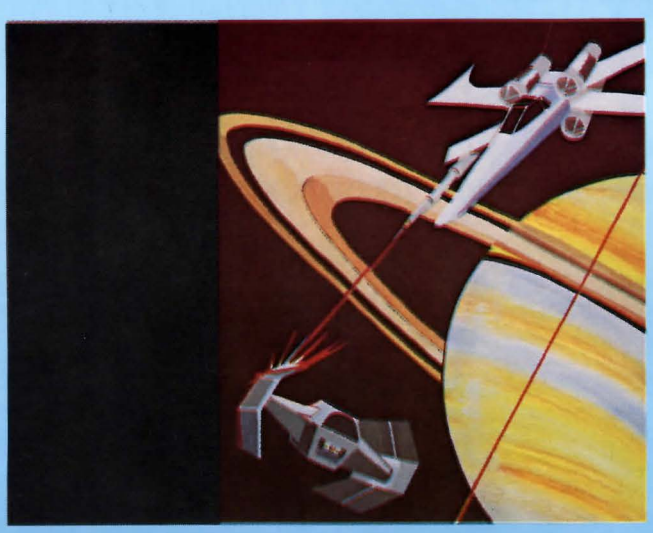

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REVIEW

Odyssey: The Compleat Apventure

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Harold Nelson, Editor

One Friday afternoon recently, I decided to try my hand at a new game that sounded most intriguing. The evening before I had read over the game documentation pamphlet (I would urge any *Odyssey* adventurer to do the same before undertaking a game). On this particular Friday, I played one game which ended in less than success. A friend then joined me and we played a game together – one person at the keyboard and the other going through the documentation pamphlet. We must have begun this game around 4:30 PM. After thoroughly touring the island on which the game begins (see photo 1) and amassing a large army, a good deal of wealth, and considerable equipment, we decided to embark on a ship we had just purchased (very reasonably priced) for another island. Thinking it was about 6:30 PM, we decided to have something to eat before going to sea. We were astonished to discover that it was actually about 8:00 PM. We had been playing for nearly four hours, though it seemed like only half that time.

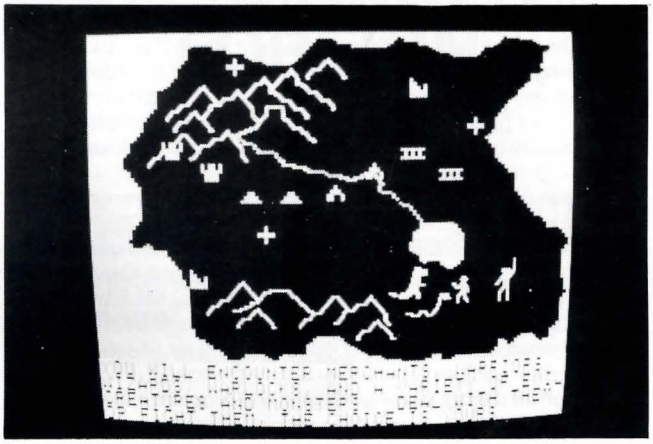

Photo 1: *The island on which the* Odyssey *game begins. The crosses indicate villages containing markets where you can purchase supplies and equipment for your journey. The human shape shows the location of you and your followers (mostly mercenaries). The figure to your south is an ancient temple which is locked and can be opened and entered only with the appropriate devices. The figure to the northwest of you is a hut which is the dwelling of any one of an assortment of characters. Directions, hints, and questions are generally given below the map. Commands are, for the most part, single keystrokes (e.g., E to move east). The major exception is typing numbers (e.g., amounts of quadroons to bargain for a purchase or a bribe). Photo by Charles Freiberg.*

Continued on Page 6

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Odyssey - Continued from Page 5.

Obviously, we decided, this is a game worthy of high praise. There is only one warning for the prospective player. The warning is simple: make sure you have sufficient time. It is obviously an engrossing game. It might be advisable to keep a clock handy or even set an alarm to your desired quitting time. Since a game in progress can be saved on any initialized disk and completed later, it is probably better to break off a game than risk the loss of family or job.

Upon returning to our game on that Friday evening, we set sail and were just getting the knack of handling our ship when we were lost in a fog bank and ran aground. We spent quite awhile trying, unsuccessfully, to get free. When we first went aground there was a brief message to the effect that local fishermen would help us for a price. This message appeared quite briefly and did not reappear.

In a case such as this, if the correct command is not found, it may seem as though there is a bug in the program causing it to go into an infinite loop. A call to Synergistic Software convinced us that this is not the case and that there is one command that can result in freeing a ship caught in this situation. (Hint: Use quadroons.)

Some friends have said that they would like to see a little more detail in the documentation about how the outcome of battles with bandits and various monsters is determined. But, on the other hand, the element of uncertainty and chance that the user experiences may add to the excitement and enjoyment of the game. Also, the documentation does include the relative worth of the different offensive and defensive devices available. And, with some luck, one can increase his ability to avoid battle when its outcome appears doubtful.

The finest feature of this game is its use of high-resolution color graphics. It is the best use of color graphics in a game for the Apple that I have seen.

While this program does not operate in real time, certain features of the game give the user the illusion that it is doing just that. This is especially true of traveling on horseback, flying on a magic rug (should you encounter a wizard inclined to give you one), and sailing.

Another strong feature of the game is the great number of possible encounters both on land and at sea and the variety of outcomes that can result from these encounters. These are too numerous to list or begin to describe in a brief review, and learning to deal with them is a major part of the enjoyment of this game.

It is also interesting that, as opposed to some Adventure games, it is virtually impossible to reproduce an *Odyssey* game. Each game starts at a randomly chosen point and the locations of castles, tombs, and other objects and creatures are also changed with each game. Hence, each game is unique.

Conclusions

- This is a very fine game for the Apple II computer. It makes excellent use of color graphics. Fans of Adventure and Dungeon games should find this to be an interesting and challenging addition, with some new twists, to their collections. For those just developing an interest in this type of game, *Odyssey* is such a good one that starting with it may greatly diminish the interest you have in other Adventure games.
- The documentation seems, at the very least, adequate. Some users may desire more detail on how various aspects of the program work. At any rate, there is enough information, presented in a clear and interesting manner, to allow virtually anyone to start playing the game.
- My only criticism of the program is that some of the messages offering hints on what to do next (such as that mentioned above about the local fishermen) appear so briefly that if their meaning is not clear at first or if you are momentarily distracted, they might as well not have been there at all.
- It is important to keep in mind that a well-played game of *Odyssey* is going to take a lot of time, but games can be saved and played in installments. The only short game is an unsuccessful game with an obvious outcome.■

THE SYNERGISTIC MODIFIABLE DATABASE

"Reprinted from July/August Issue of CALL - A.P.P.L.E."

A Review

by Tom K. Lewellen

It seems that one of the most frequently heard phrases when a group of people are discussing microcomputer software is "database." Unfortunately, the term database can cover a lot of ground and mean a variety of things to many people. My own tendency is to think in terms of the sophisticated programs found on large computer systems. However, when I found that I was in need of a quick method to retrieve reference and accounting information I turned to my Apple and the Synergistic Modifiable Database. I selected the Synergistic system because of its speed and flexibility.

The system is delivered with a master disk and a rather comprehensive manual. The manual begins with an overview of database useage, options offered in the Synergistic software, and a glossary of terms. The manual then discusses the setup procedures, with emphasis on the tradeoff between the length of records and the number of records which can be resident in memory. For example, if the total record length is 10 characters, 2300 records could be stored in memory. If the total record length is 100 characters, there is room for 230 records. The user then decides what record structure to use for a given application. The several examples in the manual provide a good beginning point. The actual setup program is easy to use and guides the user through the process, giving ample opportunities to change the various setup options. The end result is that a blank disk is placed in the disk drive and the modified (or customized) database is loaded on it. For example, I set up a "poor man's" accounting program with fields defined for client name, contract reference, tax ID, date, amount billed, amount received, and amount paid. I also set up a reference database with fields for author, subject keywords, journal, date and abstract.

Once a database has been created, the operation of the program is again straight forward. The system is menu driven. The main menu offers choices of 1) start a new file, 2) enter records, 3) list/modify, 4) search, 5) sort, 6) print, 7) disk access, and 8) terminate. The menu page also displays the number of records with data, the total possible number of records which can exist in memory, and the name of the current file. When entering records, the user is prompted with a display of all the fields and the number of characters available for each field. The display is excellent and makes entry very easy. At anytime, the user can edit the entries or return to the main menu. An excellent feature is that pressing escape at any point in the program will return the user to the main menu.

The list/modify option is also easy to use, allowing the user to specify which record number to start with and to modify, delete, or print any of the records as they are brought up to the screen. The search function allows the user to search the current file in memory, or all files on either one or both disk drives. The search options include searching for a substring, search for one field, search for two fields, and/or print out the results to the system printer as well as the screen. The sort option operates in a similar fashion in that one, two or three field sorts may be used. Currently the sort option only operates on the file in memory, although I understand that Synergistics is working on a version for sorting multiple disk files in a similar manner. The print option allows selection of printing one record, several records, all records in memory, or all records on either one or both disk drives. The disk access allows files to be saved, loaded or deleted. A nice touch is that the program remembers your last loaded file and thus saves you retyping the file name if you are saving new or modified entries. The terminate option is better known as quit, but reminds you to save the data if additions or changes have been made.

There are two additional programs available at optional cost: modifier modules 1 and 2. These modules add more functions to the database with the same ease as setup creates the "modified"

Continued on Page 7.

Modifiable Database - Continued from Page 6.

database. Module 1 adds some accounting ability to the package, allowing printouts to be produced in a user defined format with additions of numerical entries by row and column. The additions also include a search by numerical range option and the ability to alter individual entries by addition, or subtraction, or multiplication of a constant. This last feature is what allowed me to setup the accounts receivable database. The module also provides for proper dollar and cents formatted output, with right or left justified in each column. The second module allows the user to define a wide variety of printer output formats. I haven't used this module much as of yet, but it appears to function well. If the modifier modules won't do the job for a specific application, then you can purchase a program guide which describes the programs (both BASIC and machine language) in great detail, including listings. The guide includes locations (by line numbers) of the major subroutines and a complete cross reference of all variables.

The key to the success of any "database" program is the ease of use and the speed of execution of the various options. The Synergistic system gets excellent marks in both categories. The menu system is fast and well designed. The search and sort functions are handled by assembly level routines and are the fastest I have yet run on an Apple. Synergistic is also working on a file linking procedure so that files which are larger than the available memory can be segmented with all the data handling functions swapping in the proper segment without the user worrying about it. The only problem I have found is that I would like to have the accounting totals run on only a subset of the data as selected by the search routines, a function not yet provided. Of course, with the programming guide in hand, I can easily modify the "modifiable" database and plan to do so in the near future – unless Synergistic beats me to it.

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- Menu driven, single keystroke commands allow rapid access to any of the 50 general purpose or detailed programs.
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THE FIRST APVENTURE, REVIEWED

Dungeon Campaign

Gregg Williams, Editor

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Photo 1: *A partially explored maze in* Dungeon Campaign. *The red and green squares in the middle of the display are the explorers and a group of zombies, respectively, that are about to do battle. The thick white lines denote a stairway, while the light blue square near the bottom represents a hazard of unknown kind (at the moment).*

One of my favorite games for the Apple II is *Dungeon Campaign,* from Synergistic Software (see "At a Glance" for details). I cannot think of a game that offers so much entertainment per unit of program. *Dungeon Campaign* is an example of fine game design and expert use of limited resources. Even though it does not use either game paddles or high-resolution graphics, it is far more entertaining than most games that do.

When the game begins, the computer draws four levels of mazes and erases them (this takes a minute or two). It has just created the maze that you will explore. After the full maze has been created, the program places you in the middle of a blank area that represents the top level of the maze. You use five 1-keystroke commands (U, D, R, L and J) to move your explorer group (shown as a red square) up, down, right or left (J for jump can precede any of these commands to jump over a square that might contain danger). As you move in the maze, adjacent walls become visible, allowing you to explore the level you are on. If you are lucky in your explorations, you will find some treasure, your group of explorers will not be totally destroyed, and you will leave the bottom level of the maze, thus winning the game.

The object, of course, is to find treasure; but in your explorations you may find stairways, pit traps, monsters, poison gas, man-eating dragons,and several other inhabitants; I will not tell you about these others to give you the surprise of discovering them. Combat with different kinds of monsters is resolved by die rolls for each side and subsequent computation (all done by the program); this gives the program an entertaining *Dungeons and Dragons*-like flavor.

The program is, at times, subtle. For example, sometimes the bottom level is drawn with the single exit blocked off (the maze is randomly created for each game). At first, I thought there was no way to leave the maze and win the game. But, in a later game, I discovered a "magic carpet" treasure that can be used only once to take your explorers over walls. This is an indication of the sophistication of this seemingly simple (but always enjoyable) game.■

At a Glance

Name
Dungeon Campaign

Type
Low-resolution color graphics game

Manufacturer
Synergistic Software
5221 120th Ave. SE
Bellevue, WA 98006
(206) 226-3216

Price
$15 cassette, $17.50 disk

Format
Cassette tape or 5-inch disk

Language
Applesoft and Integer BASIC versions (both versions supplied in each package)

Computer
Apple II or Apple II Plus, with 32 K bytes of memory (16 K bytes for cassette Integer BASIC version)

Documentation
Instruction sheet plus instructions in program.

Features
Sound effects through Apple II speaker

Audience
Game enthusiasts of all ages (simple enough for children)

Graphics on the Apple

Who, What and Where?

by Robert C. Clardy

How many times have you seen some exciting new game and wondered how you could get similar graphics effects in your own programs?

Game software for the Apple microcomputer has come a long way from the early demos and games that come with your computer. At first, there was Breakout, the kaleidoscope demo, and the biorhythm programs. Now, the sophistication of the adventure and arcade games is topped every month by new releases utilizing newly developed wonders of high resolution graphics effects.

Some of the milestones in the evolution of Apple's graphic capabilities are listed below. This list is far from complete but provides a sampling of where the art has been and where it is going. For those authors whose works aren't mentioned, my apologies.

DATE	NAME	AUTHOR	CO.	REMARK	GRAPH TECH. (seeTbl 1)
Early 1978	Star Wars (Space War)	D. Reddington	Apple Computer	The earliest sophisticated high-res arcade style game. You fight one ship in space war combat. Smooth graphics, color, sound.	2
Early 1978	Escape	S. Warner	Muse	Lo-res adventure, escape from the maze game. Moving walls as you walk through the maze.	1
December 1978	Dungeon Campaign	R. Clardy	Synergistic Software	Lo-res role playing adventure with animation	1
June 1979	Wilderness Campaign	R. Clardy	Synergistic Software	First high-res role Playing adventure using sound, color and animation.	2
1980	Flight Simulator	B. Artwick	SubLogic	3 dimensional animated view.	7
Early 1980	Invaders			Fast action, multiple attacker arcade game.	6
May 1980	Mystery House	K. Williams	On-Line Systems	First high-res adventure game using over 100 high-res line drawing pictures for rooms.	4
1980	Computer Bismarck	J. Lyon	Strategic Simulations	Character graphics war game.	3
1980	Wizard & the Princess	K. Williams	On-Line Systems	Adventure with 100% full color high-res pictures.	5
'80 - '81	Various	Nasir	Sirius Software	Fast action, multiple moving objects, arcade quality effects.	6
1981	Ultima	L. British	California Computing	Adventure with huge scrolling maps.	3

There are, of course, hundreds of good games that didn't make this list, but these games represent transition points in the use of graphics on the Apple. Later games may have done it better, but these did it first. The graphics techniques used are listed in Table 1. These methods of doing graphics on the Apple represent a broad range of capabilities that any programmer can now use in his own programs. The remainder of this article will be devoted to telling you how you can use these methods and where you can find the utilities to help.

Table 1
Graphic Techniques Used in Games

(1) Lo-res plotting
(2) Hi-res screens and shapes
(3) Character graphics
(4) Vector graphics-sketch tables
(5) Color fill
(6) Bit mapped graphics
(7) 3D graphics
(8) Turtle graphics (PASCAL & Transforth II)

General Information

Before I address specific graphic techniques in detail, a few points about the Apple's high-res graphics in general must be mentioned. This information applies to all the techniques but falls far short of an exhaustive text on Apple graphics. For more information about Apple high-res graphics, consult the material listed at the end of this article.

The High-Res Screens

The Apple's high resolution graphics screens (there are two) are a series of memory locations. Screen 1 is composed of memory locations 8192-16383 (or hex $2000 to $3FFF), while screen 2 is at locations 16384-24575 (or hex $4000 to $5FFF). When a high-res screen is selected, the Apple will check these memory locations and display their contents on your TV or monitor screen. There is a direct hardware connection between these memory locations and the display, so the screens cannot be moved elsewhere.

The POKES listed in Table 2 can be used to select the high-res screens. These POKES can be used from Integer BASIC, Applesoft BASIC, or monitor.

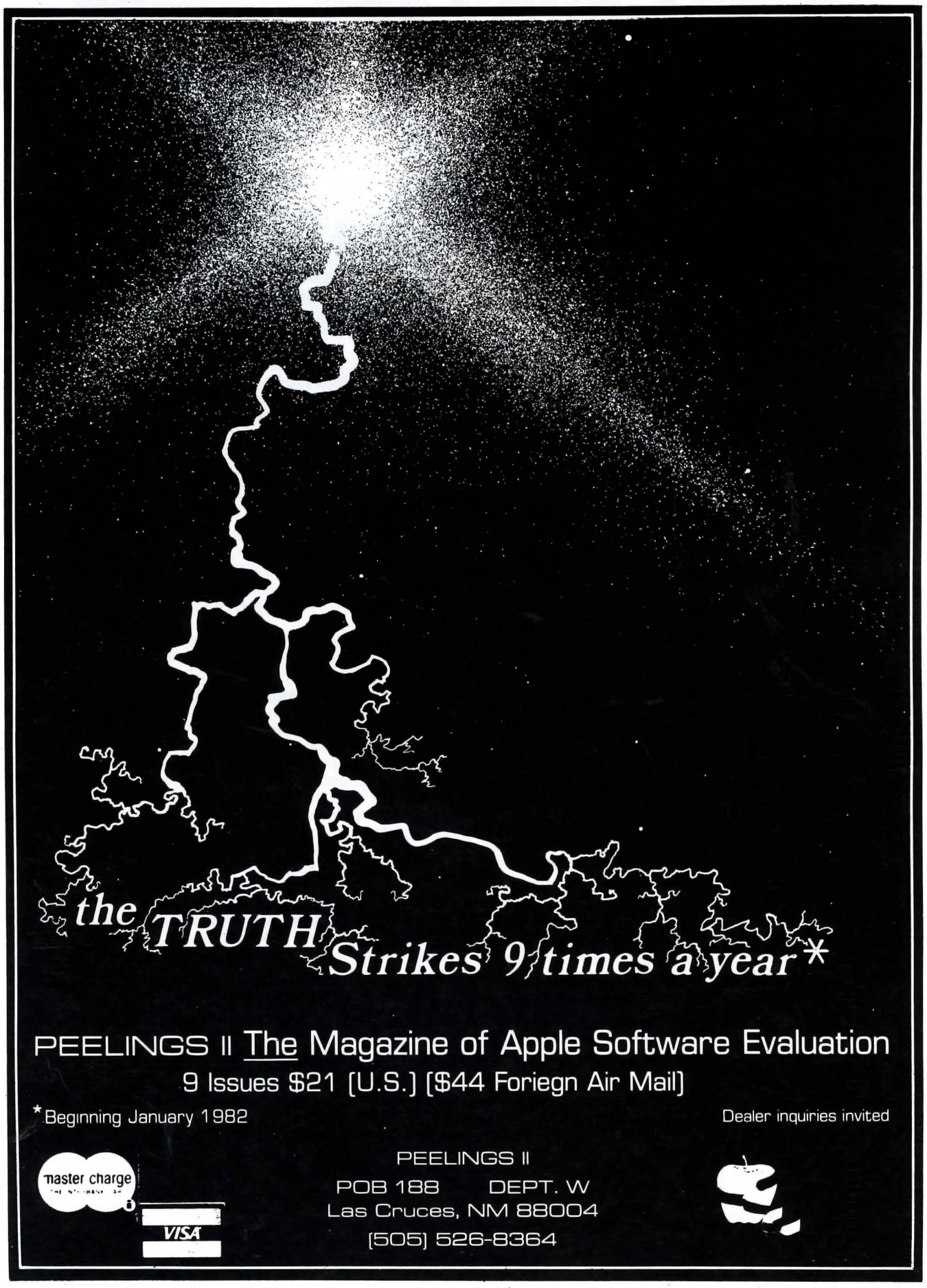
The resolution of the high-res screens is (theoretically) 0-191 in the Y-axis and 0-279 in the X-axis or 192 x 280 points. I say theoretically because in reality the resolution is greater or less as detailed below.

Table 2
Graphics Related POKES*

BASIC	MONITOR	EFFECT
POKE-16304,0	$ C050	Display a graphics screen/mode (high or low res)
POKE-16303,0	$ C051	Display text screen/mode
POKE-16302,0	$ C052	Display only text or graphics
POKE-16301,0	$ C053	Display mixed text and graphics (4 lines of text at bottom)
POKE-16300,0	$ C054	Display screen 1
POKE-16299,0	$ C055	Display screen 2
POKE-16298,0	$ C056	Display low res
POKE-16297,0	$ C057	Display high res

*To use any of these, type POKE XXXX and press RETURN. The effect will occur.

Continued on Page 12.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Graphics - Continued from Page 10.

High-Res Color Limitations

Normally, when working with the Apple's high-res graphics, you have 6 colors at your disposal: black, white, green, violet, orange and blue. Other colors can be obtained by judicious mixing techniques (see Color Fill section). Whenever you work with any colors besides black and white, however, you will experience some limitations imposed by the way colors are displayed by the Apple.

Table 3 outlines some of these limitations. In the X dimension (horizontally across the screen), the Apple can only display green or orange on odd coordinate values (X = 1, 3, 5, 7 ...), and violet or blue on even coordinate values (X = 0, 2, 4, 6 ...). This means that:

(1) Vertical colored lines can only use every other X coordinate, reducing the Apple's effective X resolution to 140 points.

(2) Care must be taken while doing plots to choose the correct X coordinate.

(3) Shapes or characters that look great in white may look terrible in color as every other vertical line in the shape disappears.

Why does white look better? Because white is achieved by turning on both a green and a violet dot. There are no holes or columns that cannot be plotted.

The second limitation of using colors on the Apple is the green/violet vs. orange/blue choice. To explain this requires a brief digression on how the Apple stores graphic information. Each of the memory locations storing information about the contents of the high-res screen is made up of 8 bits (1 byte). 7 of these bits specify whether or not a dot has been plotted at each of seven successive X coordinates. The 8th bit selects whether the entire byte, including 7 dots horizontally, is green/violet or orange/blue. Each successive 7 dots on the high-res screen are limited to one of these two choices. It is not possible to plot a green dot at X, Y coordinates 1,1 and an orange dot at 3,1. They will both take on the color of whichever was plotted last. The implications of this are:

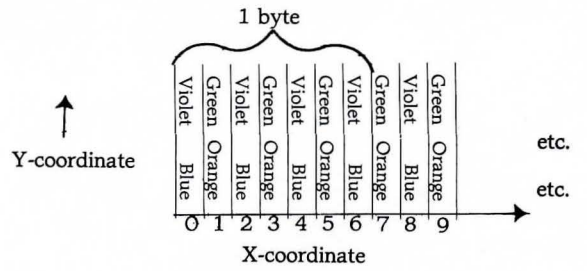
(1) You cannot have moving figures/shapes/etc. using colors from the opposing sets unless they are strictly separated into different bytes. This is very difficult to do. Example: An orange shape cannot be placed near a green or violet shape. Whichever was drawn first will have some of its color infected or changed when the second shape is drawn.

(2) Care must be maintained in moving a blue shape across a green background (or similar mixes). Splashes of orange will appear around the shape.

(3) Colored shapes can only use every other dot position in the horizontal dimension. Effective resolution is, therefore, only 192 x 140.

With an understanding of these color limitations, you are ready to experiment with some of the techniques mentioned above. The paragraphs that follow will discuss these techniques and tell you a little about the many utility programs available to you to help implement them in your own programs.

Table 3
Color Spread on the Apple's Screen



Low-Res Plotting

While this article is primarily about high resolution graphics, I want to briefly mention low-res for completeness. Much can be done with low-res graphics with its 16 colors, simple plotting commands, and the speed that can be achieved with it even in BASIC.

Roger's Easel from Southwestern Data Systems, The Electric Crayon from Muse and Introduction to Lo-Res Graphics from Computer Station allow sketch generation, storage, and animation in low-res.

Screens & Shapes

The high-res screens were defined earlier. There are many ways to create pictures on these screens and then save them to disk. This static picture can then be recalled later by other programs. To animate it, you can use shapes, a graphics display method provided with the Apple II. Shapes are lists of data that can define a (usually small) figure that can be drawn, erased, rotated, enlarged or moved about the high-res screen. Shapes are typically stored in tables which can contain up to 255 individual shapes.

Using shapes to provide animation on a previously created high-res screen is one of the oldest and most commonly used of the graphic techniques. Some of the programs that use this method include Odyssey: The Compleat Apventure by Synergistic Software; Creature Venture from Highlands Computer Services; Depth Charge, Blitzkreig and other early arcade games from Programma; Sabotage by On-Line Systems and many, many others. If you have an Apple with either Applesoft BASIC or the Programmer's Aid ROM, you have the routines needed for shape manipulation and animation. The only problem becomes the generation of the high-res playing field/board/screen and the shapes themselves. The methods of producing shapes by hand described in the Applesoft and Programmer's Aid manuals are incredibly tedious and frustrating. Fortunately, a number of alternatives to the tedious hand method of producing shapes and screens exist.

Higher Graphics II from Synergistic Software is a graphics utility with three major parts. The first allows for easy shape table production, using up, down, left and right commands to sketch each shape. The second program is for shape table editing and correction and the third for drawing, coloring, and labelling high-res screens. For the generation of games using high-res shapes and screens, this package should do much of the work for you.

Paddle Graphics from On-Line Systems allows sketches to be made using the paddles. These can be automatically filled with up to 21 colors, and shapes can be automatically generated from any image that has been previously created on the high-res screen.

EZ Draw from Sirius Software simulates Apple's Graphics Tablet, letting you sketch, color, and label screens using many detailed character sets (uses character graphics discussed below). U Draw II from Muse generates both screens and shapes. The Graphics Tablet from Apple Computer, Inc. and Versawriter from Peripherals Unlimited are hardware screen creation devices allowing you to trace pictures from paper, fill with color, or free hand sketch.

Character Graphics

Character graphics came about to solve the problem of mixing text and graphics on the same screen. Originally, the character generators were meant for the user to define a font or set of textual characters that could be printed to the high-res screen as easily as text can be printed to the text screen, using TAB and PRINT statements.

Two immediate advantages of high-res printing are that text can be colored and that it can be mixed with other graphics such as maps, charts, graphs, game boards, etc. Once users began defining their character sets, however, all sorts of other interesting variations began appearing. First the large and detailed character sets used in Higher Text II from Synergistic Software and EZ Draw from Sirius Software were developed. These include the baroque Old English font, the modernistic Countdown font,

Continued on Page 14.

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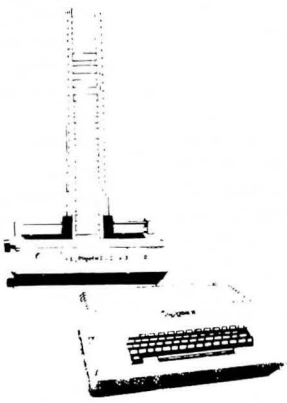

MACHINE LANGUAGE SORTS - All records can be sorted by any field or combination of any 2 or 3 fields. Sorting 200 records, comparing 50 characters takes less than a minute. After sorting, files can be saved, printed, or displayed. A separate sort/merge utility is provided for sorting an entire disk of records.

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Graphics - Continued from Page 12.

etc. Printing titles and labels with these fancy characters greatly enhances your graphic displays.

The next enhancement was the realization that the flexible font editors could be used to generate other symbols besides text. Scientific and math symbols, foreign languages, and figures for use in games began appearing. Programs using character graphics include most of Strategic Simulations games which use character sets to generate maps and scenes and The Linguist from Synergistic Software which uses foreign language character sets to help teach the user almost any language.

The most flexible and powerful character generator utility I know of is Synergistic Software's Higher Text II. It allows generation of characters in a variety of sizes, colors, and complexity. The package includes two font editors and can be easily incorporated into the user's programs.

Other character generators include the popular Animatrix on the DOS Tool Kit disk from Apple Computer, Inc., the Complete Graphics System from Penguin Software, the Screen Machine from Softape, and the Keyboard Filter from Mountain Computers. The Keyboard Filter is unique among these in that it is available only on ROM and must be used with a ROM PLUS board. This setup is somewhat more expensive but doesn't use any RAM, which may be significant to the user.

Bit Mapped Graphics

The major limitation of character graphics is that each figure can only be displayed at locations corresponding to the text page, that is, at 40 places horizontally and 24 places vertically. While this is fine for textual applications and relatively simple games, it is not adequate for a good arcade style game where smooth motion is required. Bit mapped graphics allows black or white figures to be displayed at any of the 192 x 280 points on the high-res screen while colored figures can be displayed at any of the 192 x 140 points available for colored high-res graphics.

Most of the arcade games now on the market use bit mapped graphics in one form or another. Alien Typhoon and other Broderbund releases, Gorgon and other Sirius Software products, and Raster Blaster from Budge Company are just a few examples. Bit mapped graphics is probably the most versatile, fastest, and smoothest graphics technique available on the Apple. Unfortunately, this technique hasn't been used by enough people long enough for a variety of utilities to become available. The masters of this method are understandably reluctant to give away their secrets. The only general purpose bit map utility that I'm aware of is Fast Draw on the Game Animation Package from Synergistic Software (available December 1981). This program will take anything on the high-res screen and convert it into a bit map pattern. The pattern can then be drawn (or XDRAWN) anywhere on the screen and used in animation. As a technique, bit mapping is faster than shape drawing, doesn't flicker, and can use multiple colors in one figure. All in all, cleaner animation can be generated with this technique.

Vector Graphics

Vector graphics is a technique in which lines are drawn from predefined point to point, yielding sketches that can fill the screen, instead of small figures. This technique has most commonly been used in adventure games such as the High-Res Adventures from On-Line Systems and Creature Venture from Highlands Computer Services. One method that can be used to obtain this effect is to simply use line drawing commands in BASIC to specified X and Y coordinates. Highland Computer Services' game Oldorf's Revenge was done this way, with a large number of sketches. This method, however, is tedious and not transferable to other programs. Again, I know of only one utility designed for this style of graphics - Micro-Sketcher - which is also on Synergistic Software's Game Animation Package. Micro-Sketcher lets you quickly and easily draw screen sized sketches, edit them, build sketch tables, and save them for use in your own programs. Machine language display routines provide rapid display and a fill routine (see below) allows you to color your sketches.

Color Fill

The major problem with the vector graphics techniques is that the resulting sketches are rather sterile; you have a line drawing in black and white with no color in it. Methods were quickly developed to overcome this lack by adding fill-with-color features to the vector sketches. The difference between the black and white Mystery House and the colorful Wizard and the Princess or Cranston Manor (all from On-Line Systems) vividly illustrates the desirability of the color fill technique.

The utilities available for color filling are of two types: those that can be used to color a screen and save it to disk and those in which the color fill feature can be added to your own programs. Of the first type one of the most impressive is Micro-Painter from Data Soft. This utility allows you to specify any of 21 colors (combining the six primary high-res colors in all possible pairs), indicate a starting point, and push a button to fill that area. The specified color spreads until it hits a boundary line. The utility also has a unique microscope mode that allows for fine touch ups. The resulting high-res painting can be saved to disk for loading in your own programs.

Paddle Graphics and Tablet Graphics from On-Line Systems also have a color fill feature as do the hardware graphics devices - Graphics Tablet from Apple Computer, Inc. and Versawriter from Peripherals Unlimited. As with Micro-Painter, these routines can be used to create a screen and save it to disk.

The Graphics Animation Package from Synergistic Software includes a color fill routine that can be added to the user's programs. It allows the user to color in the sketches generated by Micro-Sketcher and display them in his programs. The Complete Graphics System from Penguin Software includes a similar routine that works with 108 colors.

3 D Graphics

A fascinating extension to the use of vector graphics is the development of three dimensional graphical techniques on the Apple. These techniques typically let you see a three dimensional figure from several angles, rotate the figure in any direction, and have the figure reduce to a point as it moves off into the distance on your screen. Extensions of this basic concept include true perspective drawing, line clipping, and other enhancements to improve the realistic appearance of the display.

Some of the programs that use 3D graphics include Sub-Logic's Flight Simulator and Bill Budge's Trilogy and Space Album games from California Pacific. These programs all involve black and white line drawings that give the player a convincing illusion of being there. You actually feel as if you're looking out of a viewport at the Deathstar or out the windshield of your plane as you fly.

The 3D Graphic utilities include Bill Budge's 3D Graphic System from California Pacific, SubLogic's 3D Load & Go Package, and Apple World from United Software of America. The last package generates files describing 3D shapes and requires an additional package, Super Graphics from USA, to display and animate the shapes. Budge's and SubLogic's packages include both shape definition, editing, and display routines. The Budge package is fast, has provisions from missile generation and but has no true perspective and line clipping features. SubLogic's package is fast, has provisions for missile generation and control, Load & Go has a variety of other support packages for the addition of additional effects. Similarly, Super Graphics provides a number of special effects such as rotating within a shape (such as a room) that aren't available on the basic packages. The Complete Graphics System from Penguin Software also has 3D definition and display features.

Turtle Graphics

Turtle graphics is a new technique that is used by the PASCAL, FORTH, and PILOT languages. It is somewhat similar to working with shapes and shape tables but much more flexible. With shapes, you have commands for move up, right, left, and down one dot. Each move can be with or without plotting. Turtle graphics has a pen up and a pen down command. Movement is specified by an angle and a distance, such as plot a 6 unit line at a 45° angle from the current pen position. Large complex angular

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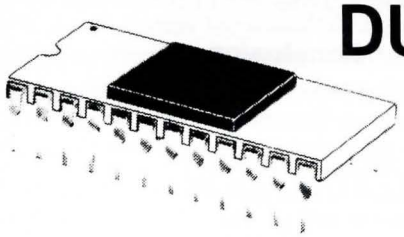

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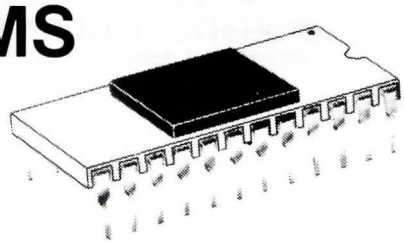

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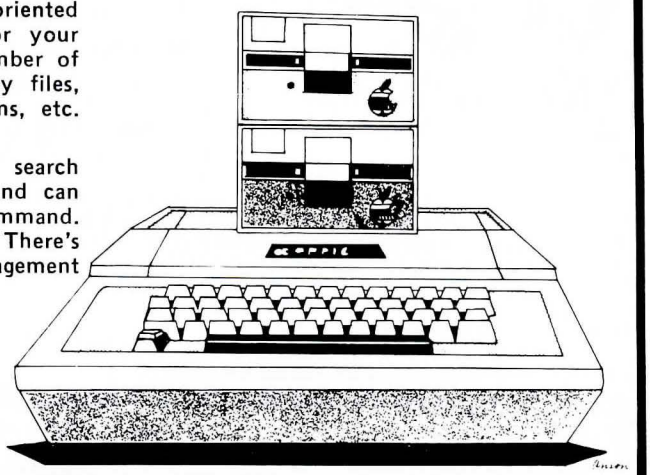

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Graphics - Continued from Page 14.

Table 4
GRAPHICS UTILITIES

NAME	COMPANY	Screen Creat'n	Shapes	Char.	Bit Map'd	Color Fill	Vector	3 D
Higher Graphics II	Synergistic	X	X					
Higher Text II	Synergistic			X				
Game Animation Package	Synergistic	X			X	X	X	
Paddle Graphics	On-Line	X	X					
Tablet Graphics	On-Line	X	X					X
3-D Animation Package	California Pacific							
EZ Draw	Sirius Software	X		X*				
The Complete Graphics Sys.	Penguin Software	X	X	X		X		X
DOS Tool Kit (Animatrix)	Apple Comp.			X				
Keyboard Filter	Mountain Hrdwr			X				
3D Load & Go	SubLogic							X
Apple World Super Graphics	USA							X

*Does not have character set editors, just high-res character set placement routines.

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Cupertino, CA 98014
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California Pacific Computer Co.
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Oakland, CA 94621

Mountain Computer
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Scotts Valley, CA 95066
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On-Line Systems
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Coarsegold, CA 93614
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New York, NY 10017

shapes can, therefore, be generated by relatively few bytes of data.

The only game program I have seen that uses turtle graphics is Galactic Attack by SIR-TECH. No known utilities work with this versatile technique.

Conclusion

This description of the many graphics techniques and utilities was of necessity very brief. There are many utilities and each has its uses. What I've tried to do with this article is let you know which programs used what techniques so you can get a better idea of the direction you want to go in your own programs and where you can get the utilities to help you use your selected technique. With these packages, many varied graphics effects can be achieved very easily without any necessity of reinventing the wheel by writing new utilities. This is not to say that there isn't room for improvement, but little need for duplication exists. If you want to write a graphics utility, let's see some more bit map systems, maybe some turtle graphic packages, or how about 3D graphics in color?

Table 4 summarizes the features of the utilities discussed in this article. After it is a list of the names and addresses of the companies selling these packages if you would like additional information. Finally, there is a brief bibliography of other sources of information about the Apple's high resolution graphics. Comparatively little has been written about the nuts and bolts of Apple's high-res, but much can be done even without a thoroughly detailed knowledge of the theory.

More Information About Apple Graphics

Apple II Graphics: An Inside Look by Ken Williams, Softline, September 1981.

Resolving the Resolution Myth by Bob Bishop, Apple Orchard, Fall 1980.

Understanding Hi Res Graphics by Loy Spurlock, Call-A.P.P.L.E., January 1980.

Animation with Data Arrays by Pat Connelly, Call-A.P.P.L.E., November 1981.

Synergistic Software Product Descriptions

ADDITIONAL INFORMATION IS AVAILABLE FROM SYNERGISTIC ABOUT ANY OF THESE PRODUCTS.

GAMES

Dungeon Campaign - Explore the maze-like dungeons in search of gold, jewels, and magical artifacts. Defeat or escape from a bewildering variety of monsters with varying powers and penetrate to the lowest, most dangerous levels to exit from the dungeon. Complex maze with stairs, pits, poison gases, monsters, and treasures is different with every game. I/A, 32K, cassette $15.00, disk $17.50.

Wilderness Campaign - Embark on a hi-res crusade to destroy the evil necromancer. Survive quicksand and avalanches as you seek out and explore ruins and castles to defeat their monstrous inhabitants. Win treasure and magical weapons to hire and equip an army suitable for the final battle. Game differs with each playing. I/A, 48K, cassette $17.50, disk $20.00.

Dungeon Campaign and Wilderness Campaign are available on one disk for $32.50.

Doom Cavern/Sorcerer's Challenge - Hi-res version of the popular dungeons and dragons type role-playing game. Establish the strength, intelligence, etc. of your party, then explore the complex dungeon. Second game is a duel of mighty spells between two powerful magicians. Use strategy and tactics to defeat your opponent: Integer, 48K, disk, $20.00.

Odyssey: The Compleat Apventure - Embark on a heroic quest across the dreaded Sargalo Sea to explore islands, caverns and castles. Gather the forces and weapons needed to defeat the cruel Caliph of Lapour. Three interlocking programs using several hi-res and lo-res maps provide an unending variety of opponents and challenges. I/A, 48K, disk, $30.00. Specify Integer or Applesoft.

Tank Attack/DeathRun - Two arcade games on one disk. In the two player Tank Attack, guide your vehicle through a variety of terrains to approach and destroy your opponent. With the one player Death Run, it's you against the wily computer controlled gremlin. Can you get him before he blows up your car with his bombs? I/A, 48K, disk, $20.00.

Apventure to Atlantis - The continuing apventure by Robert Clardy. The forces of sorcery are gathering to repulse the marauding scientific Atlantean kingdom. The epic battle can end either in the enslavement of the world or the absolute destruction of Atlantis and the evil it represents. Combines hundreds of high-res color pictures with arcade like animation and sound effects. Apventure to Atlantis has the best of arcade and adventure games combined into the ultimate apventure. I/A, 48K, disk, DOS 3.3, $40.00. Available this December.

Escape from Arcturus - The Griplems are invading your system; you must fight them off. This two part high speed arcade like game has plenty of high-res color graphics and sound effects. Commanding the Space Fortress, you are attacked from all sides by increasing numbers and speed. Later, piloting Escape evacuation ships from Arcturon, you fight off a variety of invading landing craft. Keyboard and paddle control of fast action fun. Applesoft, 48K, disk, DOS 3.3, $35.00.

BUSINESS

Mailing List Database - Enter your name and address files and sort them quickly and easily by any field. Print labels or lists with all names or only those matching search keys. Machine language search and sort routines are unbelievably fast, and the user friendly program is easy for anyone to work with. Applesoft, 48K, disk, $50.00.

Modifiable Database - A general purpose, customizable data management program. The program is self-modifying at your direction to become an accounting program, an inventory package, personnel files, etc. Machine language search and sort routines provide rapid access. Applesoft, 48K, disk, $79.50.

The Data Reporter - More than just a database, the Data Reporter is a complete information processing system including a text editor, a data graphing and statistical analysis program, a label maker utility, and a powerful easy to use database. Applesoft, 48K, disk, DOS 3.3, $220.00.

The Inventory Manager - A complete inventory package that keeps inventory statistics, vendors, reorder points, back orders, and master order status. It also writes reports, calculates all profit margins, updates mark up, lists wholesale and retail prices, generates summary and order reports. Limited access version included to protect managerial information. Handles 99 vendors and 2300 items on a 2 disk system (1 disk, 800 items). Applesoft, 48K, disk, DOS 3.3, $150.00. Available in January 1982.

EDUCATIONAL

Star Gazer's Guide - Learn the night sky with your Apple. The Star Gazer's Guide displays and describes the constellations, major stars, nebulae, galaxies, etc. that can be seen and located in the Northern hemisphere without any special equipment. Informative manual also gives stellar coordinates of the primary stars and all Messier objects and provides instruction on a host of astronomy related topics. Applesoft, 48K, disk, $30.00.

Continued on Page 18.

Product Descriptions - Continued from Page 17

The Planetary Guide - Put the Solar System at your fingertips. Discover the moon and sun, the planets and their orbits, comets and asteroids. Contains high-res graphic displays comparing planet sizes and orbital relationships. Planet movement as well as moon phases are animated. Interesting text and factual tables provide a fascinating education for all ages. All major Solar System members displayed in detail. Applesoft, 48K, disk, DOS 3.3, $30.00

The Linguist - Learn a new language or review one you once knew. The Linguist lets you enter words, translations, definitions, phrases, and phonetic pronunciations of any European language as well as Japanese, Hebrew, Russian, Greek, and other languages. The program will store these inputs and drill you on the word files when you're ready to be tested. All languages are correctly displayed on the Apple. (Hebrew prints right to left with vowels underneath.) Applesoft, 48K, disk, DOS 3.3, $40.00

UTILITIES

Higher Text II - Add colorful customized text to your hi-res graphics displays. Use the 10 character sets provided or define your own set with normal or double-sized characters. All the features of a normal text screen plus 10 colors and lower case with no hardware modifications are provided. I/A, 32K, disk, $40.00.

Higher Fonts I - A collection of 25 high-res graphic character sets for use with Higher Text and Higher Text II. Includes foreign languages, special graphic symbols, and a variety of alphabetic styles. I/A, 32K, disk, $15.00.

Higher Graphics II - Improved version performs the hi-res graphics screen creation functions of hardware graphics devices. In addition, this program allows you to create and edit shapes and shape tables for use in screens or animation. Produce games, business, and educational displays of stunning detail and color easily. I/A, 48K, disk, $35.00.

Directory Manager - Turn your disk catalog into a menu. Perform dozens of disk operations with just 2 keystrokes. Lock, Unlock, Load, Save, Delete, Un-Delete any file. Transfer files to other disks, sort or rearrange your catalog, or use flashing, inverse, or lower case characters in file names. Fast and easy. I/A, 48K, disk, $30.00.

Program Line Editor - This powerful program editor and programmer's aid allows fast and easy modification of program lines without retyping the line. With a few keystrokes, insert, delete, or replace parts of a line. Invoke any sequence of commonly used commands by pressing 2 keys. Program development and modification done infinitely faster than before. I/A, 32K, disk $40.00, ROM $60.00.

WHAT IS AN APVENTURE?

by Robert C. Clardy

Apventure is a term meaning an Apple-Adventure that we've coined here at Synergistic Software. These are adventure games specifically designed to take full advantage of *all* of the Apple's many capabilities. Basically, this means that three very important features that standard adventure games don't necessarily have are added to our apventures.

(1) Extensive use of color graphics and animation. No static displays. No large text displays.

(2) Sound effects to enhance the action and cue you, the user, when important events occur.

(3) Many random events to keep the challenge of the apventure fresh.

The first two features are rather self-explanatory. Their purpose is to make the game more real, more immediate; to involve you on an observational level. You can see it happening, not just read about it. Several other companies are now combining the adventure game format with high-resolution graphics, but Synergistic Software was first to use this concept with Wilderness Campaign.

The third feature listed above, random events at all stages of the adventure, is also rarely seen in other adventure games. Every apventure is different. The hazards and obstacles and the placement of treasures and magical items all vary from game to game. A fresh adventure awaits your every visit. As a reviewer once wrote about one of our competitor's adventures:

> "In a sense, this is a linear adventure. Without object A, you can't get object B. Without object B, you can't get to a new location, and so on. If you get stuck at any point, you can't go on to new areas. True, that's part of the rules in this universe, but it can be frustrating, especially when you know there are undiscovered wonders beyond your reach. The other problem is that once the game is solved, there is nothing left to do with it. Since it is linear, you will have encountered every obstacle and seen every location after a successful play."*
>
> Creative Computing, May 1981

*Copyright 1981 by Creative Computing, 39 E Hanover Ave., Morris Plains, N.J. 07950. Sample issue $2.50 12 issues subscription $20.

G.A.P. (Game Animation Package) - Finally available, a dual purpose graphics utility package for game production. Generates detailed multi-color shapes for arcade games as well as tables of hundreds of full screen sketches for adventure games. Now anyone can achieve the stunning graphic effects used in the best games for the Apple II. Applesoft, 48K, disk, DOS 3.3, $50.00. Available December 1981.

Soft Seventy - Get both a 70 column display and upper and lower case without any new hardware. A special graphic font is included, or you can add your own fonts. Soft Seventy can be used with any Integer, Applesoft, or machine language program. Text may be inverted or windowed, upper and lower case, and mixed in with graphics! This powerful software package uses little memory, is easy to use and understand, and comes with complete instructions for a wide variety of uses. Why pay mor for a less flexible board? Applesoft, 48K, DOS 3.3, disk $50.00, ROM $70.00. Available December 1981.

Continued on Page 19.

Apventure - Continued from Page 18.

Synergistic Apventures do not have this limitation. When an adventure is started, a whole new world is created for you. Each time you play, you will find a changed landscape that you've never seen before. Your old maps are obsolete, and you are beginning a new adventure.

To make the variety of play even greater, we have added role playing features to all of our apventures. For those unfamiliar with the term, role playing involves the creation of a detailed persona used during the play of the game. You are this persona with specified strength, intelligence, wisdom, dexterity, charisma, etc. All of these characteristics vary from game to game and even during the game, depending on your actions. The outcome of the many random events will depend largely on your capabilities in these areas. A character with high charisma, for example, will attract more followers and build a stronger force of warriors. High dexterity will enable you to escape harm in the event of an earthquake or landslide. Great wisdom aids you in the use of magical devices, while strength helps during battles. Each Synergistic Apventure uses some or all of these character traits to expand the game while also making it more of a participatory event. Why read about the trials and tribulations of an adventurer and issue directives from afar when you can become that adventurer and experience it all yourself?

The variable nature of an apventure includes one other key element. In addition to being diffent from play to play with random elements, every Synergistic Apventure must have a variety of resolutions or paths that can be followed to reach the goal. During a given game, you should never get bogged down trying to figure a way past a given barrier or hazard. If you can't figure out the secret of some obstacle, just go some other way. The other way may be longer or more dangerous, but at least you aren't stuck forever. In contrast, another comment about an adventure game describes the authors of a new game:

"The task force members hope to have (it) 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."*

Softline, September 1981

While Synergistic Apventures are full of obstacles, hazards, puzzles, and traps and while they may take hours or days (or even weeks in some cases) to play, it will never be because you are stuck trying to guess what the author wants at some point. The puzzles have logical solutions and hints are given. That doesn't necessarily make them easy, but you won't have to call us for help.

Our goal with the Apventures was to make games that are consistently challenging without being frustrating. Some of the comments made in other magazines (see Review Section) about the Apventure line indicate we may have achieved this goal. If you haven't already, why not try an apventure and see for yourself?

Synergistic Apventures include Dungeon Campaign (low-res), Wilderness Campaign, Odyssey: The Compleat Apventure, and Apventure to Atlantis (coming December 1981).

*Refers to an earlier game by the same company.

Many top selling game programs as well as educational programs use Higher Text II to provide bold attractive lettering.

SYNERGISTIC SOFTWARE

presents

GREAT APVENTURES

COLOR GRAPHIC GAMES OF HIGH ADVENTURE FOR THE APPLE][

DUNGEON CAMPAIGN

Explore the intricate complexities of a dungeon whose four levels are interconnected by stairways and pits. The dungeon is populated by numerous dragons, spectres, serpents, necromancers, dwarfs, elves, and an incredible variety of monsters. The inhabitants' varying powers and methods of attack will keep you guessing as your party searches the labyrinth for treasure and an assortment of useful magical devices. Try to collect your fortune and escape the dungeon before your party is destroyed. Requires 16K APPLE and a color display. Cassette version is $15.00; Disk version is $17.50. Integer or Applesoft.

WILDERNESS CAMPAIGN

A surface apventure of even greater variety in which you move across the HIRES map of Draconia exploring ancient ruins tombs, temples, and castles. Equipment and weapons can be purchased in village markets. Proper equipment will enable you to survive the numerous obstacles and hazards such as crevasses, quicksand, volcanos, avalanches, and hostile inhabitants. As you progress, you will gather enough men, weapons, and magical assistance to challange the Great Necromancer's fortress itself. Requires 48K. Cassette version is $17.50; Disk version is $20.00. Integer or Applesoft.

Both games for $32.50.

AVAILABLE NOW AT YOUR DEALER OR SEND CHECK OR INQUIRY TO
SYNERGISTIC SOFTWARE, 5221 120th AVE. S.E., BELLEVUE, WA 98006
(Washington State Residents add 5.4% Sales Tax)

A Few Comments From Reviews

MODIFIABLE DATABASE

"This program is a large step upward in flexibility. . . At every stage the program gives you the chance to change your answers. . . . Sorting is fast and simple. . . .the program is generous with informational messages and warnings. . . . The program has no bugs that I was able to find."

Terry Harmer for Creative Computing

"I selected the Synergistic system because of its speed and flexibility. . . . The key to the success of any "database" program is the ease of use and the speed of execution of the various options. The Synergistic system gets excellent marks in both categories. . . . The search and sort functions are handled by assembly level routines and are the fastest I have yet run on an Apple."

Tom Lewellen for Call-Apple

DUNGEON CAMPAIGN

"One of my favorite games for the Apple II is Dungeon Campaign. . . . an example of fine game design and expert use of limited resources. Even though it does not use either game paddles or high-resolution graphics, it is far more entertaining than most games that do."

Byte, December 1980

THE DATA REPORTER

"In all, I would like to compliment you on an excellent package, with what I think is one of the best bargains in the Apple Software Market Place today, and which offers very good interface to noncomputer people."

John Thomson, M.D.

"The system has provisions to modify existing data formats or make up new formats using some of existing fields. I believe this is a must for any data base system. . . . If you forget something, you can always go back and make changes with little effort. . . . After using CCA with its lack of menus (forcing the user to remember all the pieces or to wade through the documentation), the Data Reporter was really simple. . . . The ability to duplicate the data from a previous record field into the new record is an excellent feature. . . . Use of editor commands was easy. The Report Generator section is excellent for providing maximum flexibility in output of any kind and type of data in any form and format. . . . The documentation consists of a 7 x 9 padded binder with 83 pages. This does not sound like much but is very well written, clear, and concise. . . . This, coupled with the extensive prompting and screen text display, allows easy use of the programs."

Peelings II Sept.-Oct. 1981
by John Goodwin

HIGHER GRAPHICS II

"...I'd have to say Higher Graphics II is great. . . I highly recommend trying it. Higher Graphics II is a good way to begin."

Dale Archibald for Creative Computing June 1981

WILDERNESS CAMPAIGN

"All in all, however, Synergistic Software has turned out a very good value for the price, and one that will keep the avid computer gamer, his family, and his friends, well entertained for many hours."

Infoworld June 9, 1980

PROGRAM LINE EDITOR

"Overall the program and documentation are of top quality and professionally done. The 'PLE' does what it claims, and the special 'ESC' functions add a great deal to the utility of this package."

Peelings II Vol I, No. 4

"Program Line Editor gets my vote for the most useful programming utility ever created for the Apple. . . .will make all of your BASIC programming ten times easier."

Andrew Berentes
for Creative Computing

"Program Line Editor is possibly the most sophisticated program development tool currently available for the Apple. Although it is primarily intended for programming, the many functions of Program Line Editor make it highly useful to anyone regularly using an Apple II. . . .I would recommmend this program to any Apple II owner."

Pursers Magazine

". . . a must in every serious programmers library."

Softalk April 1981

STAR GAZER'S GUIDE

"The Star Gazer's Guide is a very well done casual introduction to the constellations and other astronomical objects. . . . a very fine programming. . . . The Star Gazer's Guide is full of interesting information presented in an accurate and readable fashion."

Peelings II Vol. 2, No. 2

ODYSSEY: THE COMPLEAT APVENTURE

"...as opposed to some adventure games it is virtually impossible to reproduce an Odyssey game. . . . thence, each game is unique. For those just developing an interest in this type of game, Odyssey is such a good one that starting with it may greatly diminish the interest you have in other adventure games."

Byte December 1980

"This game was great for my depleted fantasy life. . . . The only warnings I'll give you are to look out for the giant octopus, and be sure you have at least a whole day to play."

Popular Computing November 1981

HIGHER TEXT II

"If I could only own one text generator, Higher Text II would be the one . . . it does things others cannot do at all. I own few pieces of software that please me more than does Higher Text II."

Andrew Berentes
for Creative Computing

THE LINGUIST

"This is the most exciting piece of educational software I have seen this year. Excellent!"

1981 K.F. Moseley's TV
Interface & Evaluation

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- **APVENTURE TO ATLANTIS** is a new fast action apventure game, by Robert Clardy, continuing the Odyssey Apventure series. The forces of sorcery are gathering to repulse the marauding scientific Atlantean Kingdom. The epic battle can end either in the enslavement of the world or the absolute destruction of Atlantis.
- Computer adventuring has been good, Synergistic Software has just made it better. Can you imagine the most exciting adventure game ever composed with more color and sound, highly detailed animation, arcade like action, true role playing, greater challenge, unending variety and endless enjoyment? That's what the Next Generation of computer games is all about. This professionally designed adventure was specifically written to take full advantage of all the Apple's capabilities. Requires careful planning and strategy, quick thinking and reflexes, as well as a 48K Apple II* with DOS 3.3 and paddles.

Only $40.00

*Apple II is a trademark of Apple Computer Inc.

From

Synergistic Software

5221 120TH AVE. S.E.
BELLEVUE, WA 98006
(206) 226-3216

THE DATA REPORTER

THE DATA REPORTER is the user friendly data management tool for the Apple. No other data processing system is easier or more convenient to use.

THE DATA REPORTER is a rapid response, general purpose data management system that can be automatically customized to your particular data storage, access, and manipulation requirements. The programs will create, under your direction, any number of new special purpose data management programs. You can make your own inventory control, accounts receivable, sales analysis, bibliography, memo programs, etc. The variety of applications is limited only by your needs and imagination. The package includes a powerful database, a report generator, a plotter/analyzer program, and a variety of utilities, all designed to work together on common data files.

THE DATABASE

- EASILY CUSTOMIZED — The self prompting set-up program automatically modifies the basic program at your direction. You specify the number of fields, field lengths, headers, new program title, and type of printer. The customized application program is then created and saved to a new disk. The set-up can be easily changed at any time, and all data files can be reformatted without reentering data.
- CONVENIENT DATA ENTRY — All required inputs are prompted by the program. Recurring information and default values can be entered with a single keystroke. Specifying data files, report files, fields, etc., requires only one keystroke.
- FAST RECORD ACCESS — Single keystroke commands allow any of 220* on-line records to be displayed instantly for editing, printing, or deleting. Over 5000* records on four disks can be searched and/or printed with a single command. Data access and manipulation have never been faster or easier.
- MACHINE LANGUAGE SORTS — An on-line file of 220* records can be sorted in less than one minute by any field. Sorted files can be displayed, printed, or saved. A full disk sort/merge can also be performed.
- MACHINE LANGUAGE SEARCHES — Specify up to 10 fields to be simultaneously searched using any of three search criteria (substring, numeric range, or exclusion) on any field. Results may be counted, totalled, displayed, printed, edited, deleted, saved to a new file, or any combination of the above.
- CALCULATIONS — On data input, any two fields can be combined (+, −, *, or /) and stored in a third field. Perform calculations during printouts to display ratios, commissions, etc.
- OTHER FEATURES — You can append files, delete blocks of data, perform subtotals or category totals and/or grand totals on any field, etc.
- HARD DISK COMPATIBLE — The only database currently available that can work with hard disk storage.

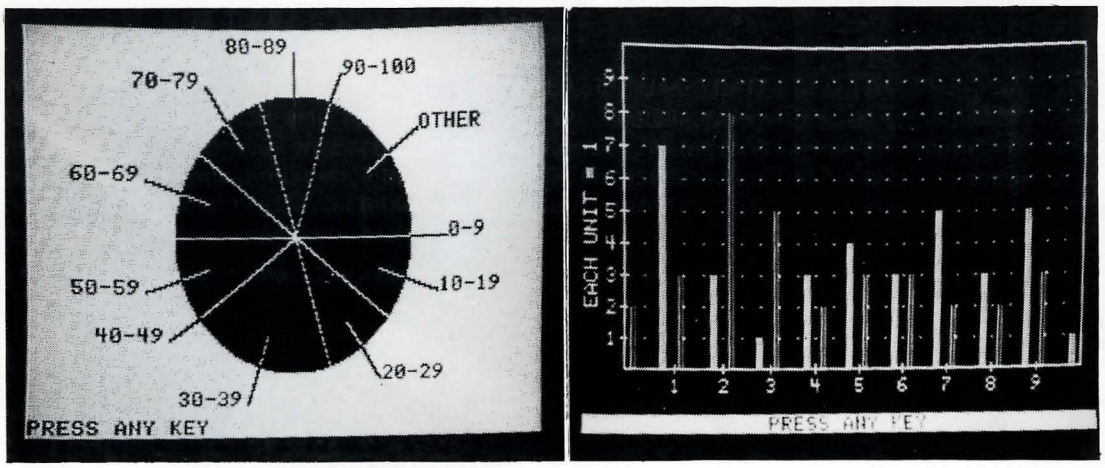
THE REPORT GENERATOR

- PRINT TEXT — The general purpose sophisticated text editor lets you design and print letters, reports, documents, contracts, you name it!
- PRINT DATA — Format your data output in an infinite variety of ways. Select the format you need and print your data using that format.
- PRINT TEXT WITH DATA — Print form letters, legal documents, sales reports, etc. with any data from your database embedded anywhere in the text. Calculations and totals can also be embedded anywhere.
- EDITING — Powerful editing features include insert char/line, delete char/word/line, find, replace, etc. PROGRAM LINE EDITOR format is used.
- PRINTER CONTROL — Embed printer control characters anywhere in your text, to give enhanced or double sized printing, etc.

Many, many more features.

*All record counts assume 100 character record length. Variations are directly proportional to record length.

DATA PLOTTING AND ANALYSIS



- VARIETY OF GRAPHS — Perform scatter graphs, line graphs, bar charts, or pie charts on any number of data files, to gain an easy visulization of your data's significance. Multiple plots, using different colors, if desired, can be done on one set of axes for comparisons.
- STATISTICAL EVALUATION — The program can find minimums, maximums, means, and standard deviations. The number of records meeting up to 10 different keys, can be counted or totalled.
- FLEXIBLE APPLICATION — Data from any field can be plotted. The graphs display range lines or standard deviation lines as appropriate.
- LABELING — Use the default labeling, or label the graphs yourself easily and quickly.
- SLIDE SHOWS — Graphs may be saved to disk for printing or slide show presentation. The slide show feature is included.
- EASY TO USE — No special data input is required. The programs can read any data file created with THE DATA REPORTER.

OTHER UTILITIES

LABEL MAKER prints mail labels, inventory bin labels, 3X5 cards, disk labels or whatever. Print any number adjacent, using any data from your files.

UPDATE MODIFIABLE DATABASE (another **Synergistic Software** product) files automatically, to work with THE DATA REPORTER without reentering the data.

REFORMAT data files, adding characters to fields, fields to your records, or restructuring completely. Create new files with one or two fields of your old files, plus new fields to be filled in later. No need to reenter any data.

EDIT A SET-UP — Change any set-up criteria (printer type, field headers, paper width or length, etc.) without having to reenter all the other characteristics of your program.

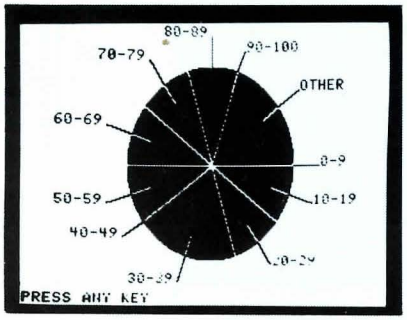
THE DATA REPORTER comes on a DOS 3.3 disk and requires 48K RAM and an Apple II Plus or Apple II with Applesoft firmware. The 80 page document provides complete instruction, numerous hints, and extensive examples. Available in floppy and hard drive versions.

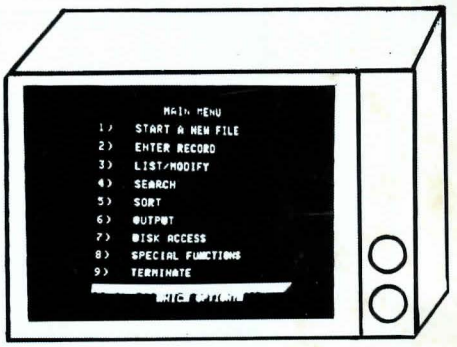
GET 120% VALUE FOR YOUR
PROGRAM PURCHASING DOLLAR
WITH

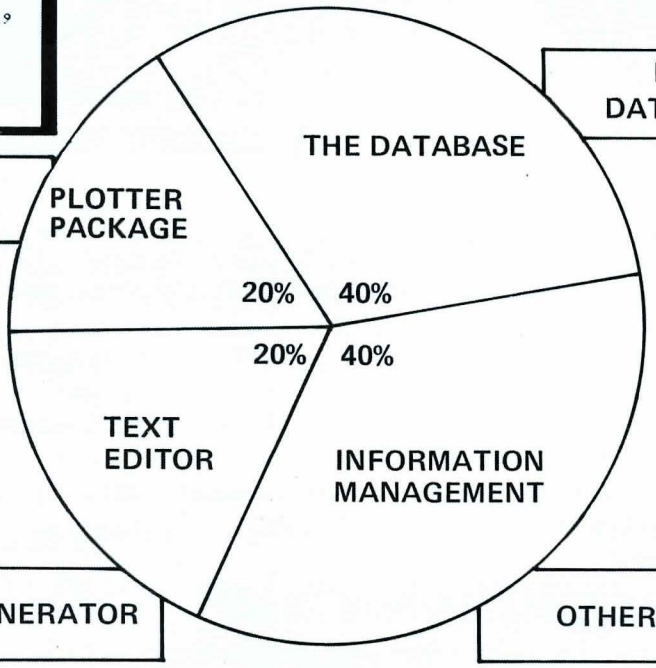
THE DATA REPORTER

MORE THAN JUST A DATABASE

Version 2 of the versatile Modifiable Database







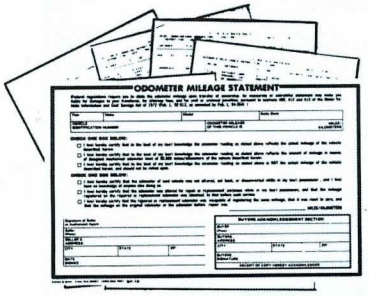
DATA PLOT & ANALYSIS

- Data may be plotted in a variety of formats such as scatter graphs, line graphs, bar charts, and pie charts.
- Ranges, minimums, maximums, means, standard deviations, correlation coefficients, etc. of any number of data files can be calculated

POWERFUL DATA MANAGER

- Versatile, user definable database can store data segmented by up to 35 fields.
- User oriented format is easy for the novice or professional to utilize. The use of menus, extensive prompting, single keystroke commands, and a universal escape capability allow anyone to store or retrieve information in seconds without errors.
- Machine language searches and sorts operate in a fraction of the time required by other programs.
- Searches or sorts, subtotals or totals may be performed on any field at any time, not just on those that are indexed or specified in advance.
- Search results may be displayed, printed, deleted, counted, totalled, edited, and/or saved to a new data file.

REPORT GENERATOR



- The sophisticated report generator allows you to format your data output in an infinite variety of ways.
- You can print form letters, columnar reports, lists, mailing labels, etc.
- Data, ratios or the results of calculations can be embedded anywhere in your letters or reports.
- The report generator gives your output the professional appearance that you require.

OTHER FEATURES

- **HARD DISK DRIVE COMPATIBILITY** with hard drive version, works with Corvus and other hard drives.
- Works with all Floppy drives with slot, drive and volume selection.
- You can append or merge up to a full disk of data files, or segment your data into separate files by a search key.
- Searches can contain up to 10 levels. You can search for a key word in any field, the absence of a keyword, or a number being within a specified range.
- Global editing of data may be performed.
- Arithmetic processing can be performed during record entry, edit, or output.
- Record entry, edit, or deletion (individual records or blocks) can be performed with no tedious delays waiting for disk accesses, index file updates, etc.
- Data may be stored on any number of floppy or hard disk drives.
- Data files can be reformatted at any time without reentering the data.
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