

# Peelings II<sup>TM</sup>

THE MAGAZINE OF APPLE  
SOFTWARE AND HARDWARE EVALUATION

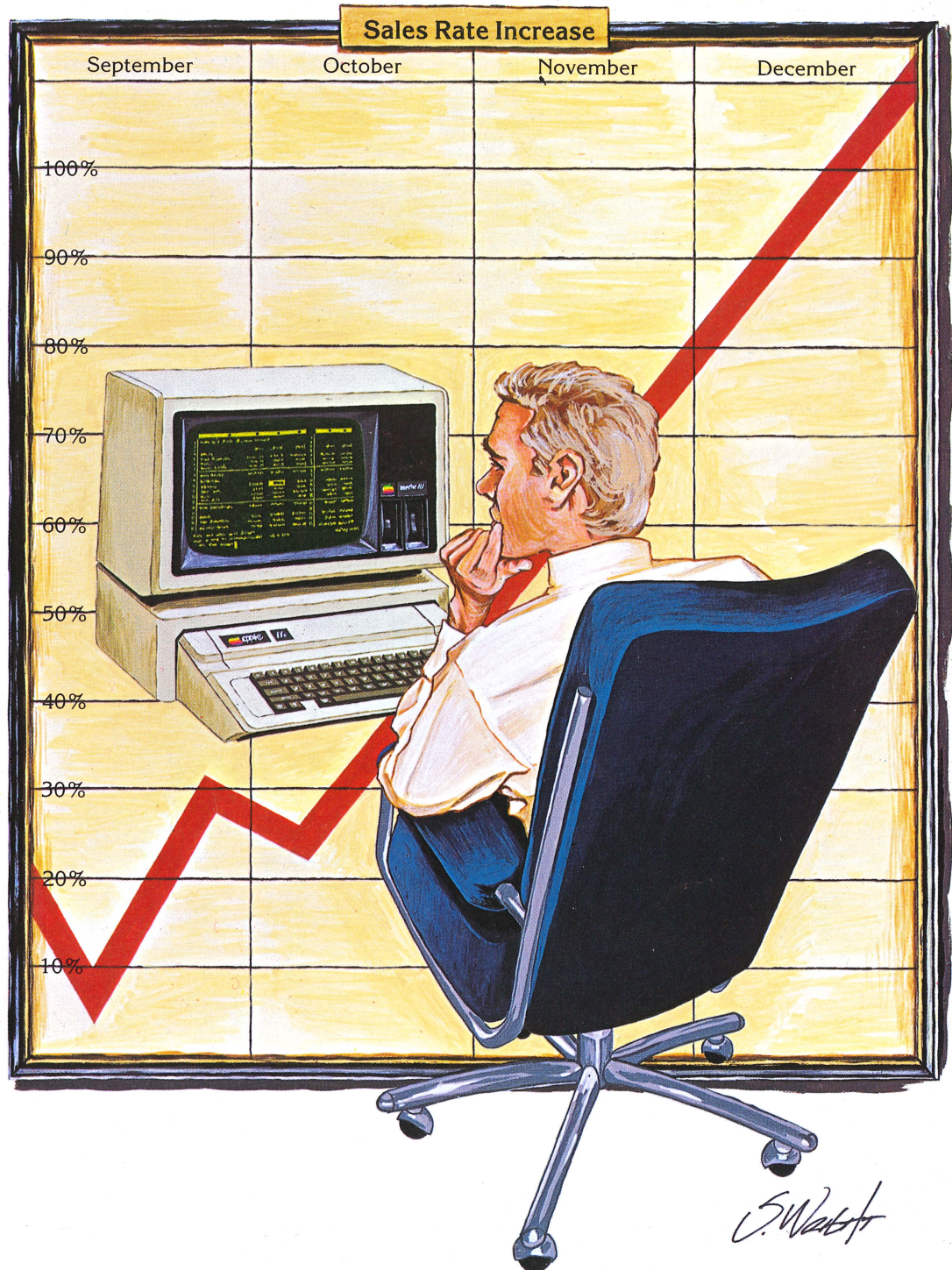


## SPREADSHEET REVIEWS:

- THE SPREAD-SHEET 2.0
- MAGICALC
- PLAN80
- DESKTOP/PLAN-II
- T/MAKER III
- THE INCREDIBLE JACK
- PERFECT CALC

## COMPUTER EDUCATION:

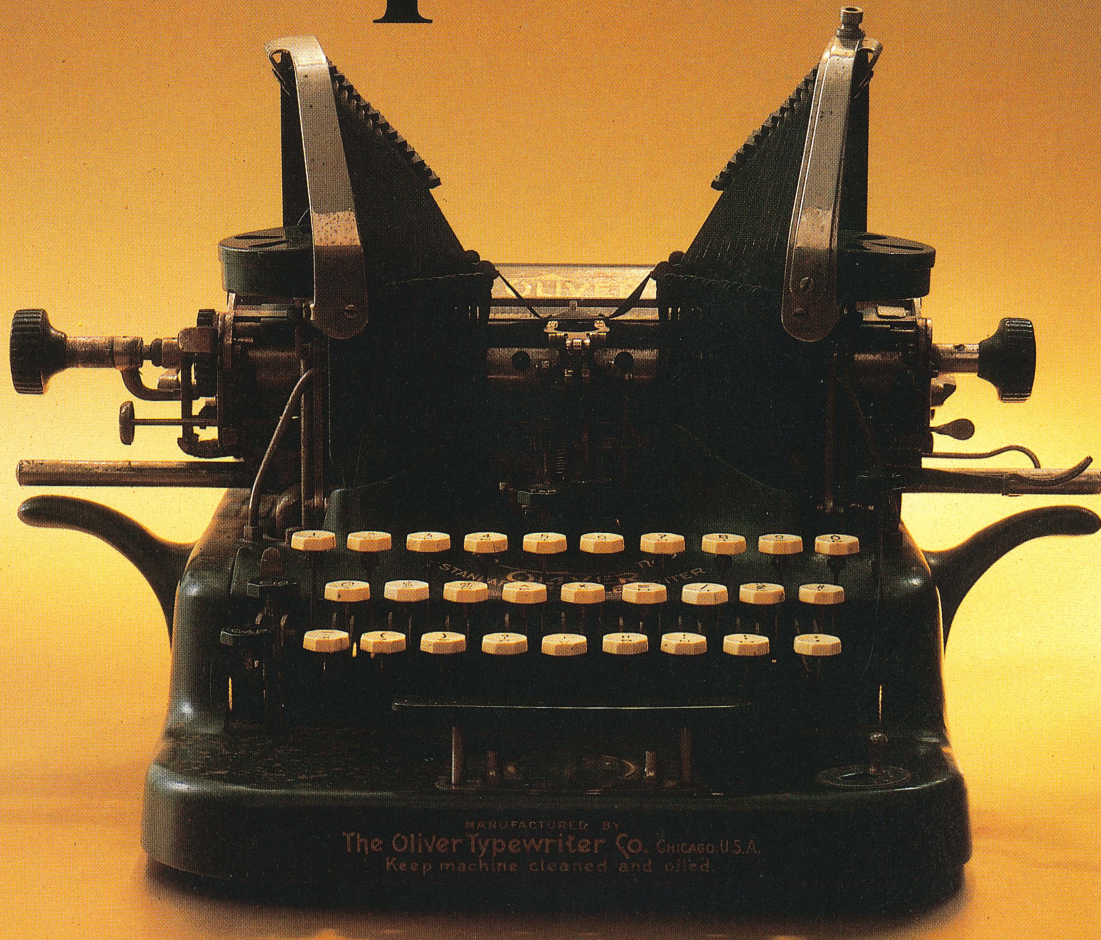
- A TEACHER'S VIEWPOINT
- PRISM READING 2
- ACADEMIC SKILLS IN MATH
- CAREER DIRECTIONS



BEGINNER COLUMN: "The Anything Machine"  
CHAPTER SEVEN: "Graphics"



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## THE ROUTINE MACHINE

The main "librarian" of the series, this package includes not only the Routine Machine itself, but all of these commonly needed routines:

Variable Swap	Error Messages	Hires Characters	Print Using (\$.00)	Calculated Goto	Turtle Graphics
Text Output	Calculated Gosub	Fast Bload	String Input	Line # Data Restore	Binary Address Read
String Search	Data Element Select	Reset Run	Array Search (1D)	Hex/Dec Convert	Reset Boot
Bubble Sort (1D)	Memory Move	Reset Onerr	Tones	Pointer Read	
Sound Effects	Pointer Write	Shape Table Converter	Error Handling Routine		

**\$64.95\***

## &CHART

**\$49.95\***

### Library Disk

This package contains a Hi-Res chart graphics (plotting) library of routines that really helps with those custom graphics programs. Doing stock analysis, sales forecasts, scientific applications or even just plotting the monthly budget, & CHART makes the job much easier! Routines and functions include:

Page/Mode Display	Vertical Labels	Zoom/Unzoom
"Work" Page Select	Horizontal Labels	FP Program Splitter
Clipping Windows	Grid Pattern	3D to 2D Transform
Full User Scaling	Log Scaling	Epson Screen Dump
Window Reverse	Arc Generation	Median Filter
Window Clear	Polar Charts	Window Frame
Axes Generation	Pie Charts	Area Fill
Fast Hires Load	Tic Mark Control	Fast Hires Save

## &ARRAY

**\$49.95\***

### Library Disk

This Library Package is dedicated to doing just about everything you ever thought possible (and some impossible) to an Applesoft array. With the tremendous number of routines in this package, you'll agree it's a bargain at twice the price. All routines work with two-dimensional arrays, many times with both string AND numeric data! In addition, routines are provided to perform virtually any usual mathematical operation on an entire array in ONE statement! For example, you could multiply every element in an entire array by a factor in one statement. You could also define a given array as the product of two other arrays. Over a year in development, this is a real bargain! Just some of the many routines are:

Fast Disk Read	Array Rounding	USR Function Library
Fast Disk Write	Matrix Identity	Fast FP Run
Search	Matrix Transpose	Fast Brun
Sort	Matrix Multiply	Hex Poker
Delimited Strings (1D)	Matrix Inverse	Keyboard Scan
Rename	Array Randomize	FP Onerr Fix
Clear	Array VAL	RP Rnd Fix
Redim (no data loss)	Array STR\$	FP Return Fix
Row/Column Add	Row/Column Delete	Fast Garbage Routine

## &SCREEN

**\$49.95\***

### Library Disk

An extraordinary collection of screen related routines, this disk is dedicated to extra display and input for the Apple II/IIe. For starters, the Screen Generator/Screen Processor allows you to design an entire input or output screen format, and then have the entire screen executed as one or two statements. This is useful for reports, menus, data entry and more. In addition to the Screen Processor, the following routines are also included:

Input Using	Speed Control	Control Char Display
Input With Editing	Print Pause	Lower Case Input
4 Way Scrolling	Keyboard Click	Special Line Scroller
Musical Keyboard	Printer Control	Center/Justify Strings
Screen Dump	Print Repeat	Clear Screen
Memory Dump	Memory Disassemble	Cursor Mouse Routine

## &SAMPLER I

**\$49.95\***

### Library Disk

This disk is a collection of a wide variety of useful routines written by Peter Meyer, author of the Routine Machine, and other professional programmers.

Number Input	Catalog Modifications	String Execute
If-Then-Else	Disk File Data	Write Protect Sense
Controlled Get	Catalog to Array	FP Program Erase
Print Hex	File Selector	Speed Up Applesoft
Print Binary	FP Disk RWTS	Modified Chain
String Character Strip	Disk Sector Map	Slot Drv Vol Select
String Left/Right Fill	Find Free Sector	Disk Catalog Sort
String Overlay	Mark Sector	Push Button Read
Shellsort (1D)	Disk R/W String	

\*Plus \$3.00 Shipping. (California Residents Add 6% Sales Tax.)

### More to Come!

In addition to all these Library Packages, even more are in development!

The ROUTINE MACHINE and its Library Packages really WILL make the difference in your programming! Try out these programs and if you aren't convinced that the ROUTINE MACHINE is one of the best programming innovations to come along in years, we'll gladly refund your purchase price within 30 days of purchase, with return of product.

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# Money Street<sup>TM</sup>

## CHECKBOOK FINANCIAL SYSTEM

For Apple® II, II+, IIe, III emulation, and Apple look-alikes - 48K DOS 3.3

### 526 SOLD ONLY 5 RETURNED!

We were astounded! When we offered Money Street with a money back guarantee, we figured about 10% would be returned. That's normal.

But our returns run less than one percent! What's more, customers write enthusiastic letters daily about Money Street. For example:

- Glen Rodkin, president of Oklahoma City Apple Users Group: "Tremendous! It's fast, reliable and covers all the contingencies a checkbook program should."
- Chris Bayha, Portland, OR: "I use it for my rental properties and for my business. It performs beautifully and is a great value."
- Dan Thomas, Elgin, IL: "The program has proved the hype of the Money Street as really too modest. How many programs are there that you can't think of one thing you would do differently?"

One reason for this enthusiasm is that Money Street lets customers do their own books. Keeping records has always been a bother, and an expensive one, especially for small one-person business or the independent professional. But Money Street solves the problem. Here's what Weston Cotten of Highlands, Texas says:

"I am an attorney with several business interests I run out of my office. I use nothing more complex than my checkbook to keep my financial records in shape for tax time. Your program has helped me to be a better record keeper and has allowed me to look forward to tax time with a better outlook."

**\$99 For a checkbook program?** Money Street isn't cheap, in fact it's one of the more costly checkbook programs. But with software, as with everything else, you get what you pay for:

- Money Street is fast! Example: 9 seconds from boot to data entry. Example: 5 seconds from the main menu to any sub-section. Example: 18 seconds start-up to print time.
- Money Street is easy to use! There are no complex set-ups; no monthly cut off. Gary Rominger of Sacramento, CA wrote: "Your claim of 30 minutes to learn it is fully justified."
- Money Street saves income taxes! It tracks deductions, credits, and income. Michael Salesin of West Bloomfield, MI wrote: "When next year's tax season rolls around my accountant will send love and kisses."

#### Saves money eight ways:

1. Finds tax deductions and credits.
2. Saves CPA write-up fees.
3. Allows "before year-end" tax planning.
4. Saves accounting time; provides input for journals, ledgers, and reports. The program also doubles as a mini-accounts receivable, inventory keeper, and job cost system.
5. Saves interest expense by keeping exact balances.
6. Saves NSF charges.
7. Saves credit card interest charges.
8. Changes your financial attitudes; puts you in control.

**Who can use it?** Anyone using a checkbook: Lawyers, investors, doctors, general partners, professionals, small business, mini-corporations. It's ideal for people with multiple sources of income, trustee accounts, pension and profit sharing plans, and owners of real estate.

Take farmers, for example: they can treat each crop or herd as a separate profit center. Stan Vasa of Lincoln, NE, says: "I use Money Street to keep my farm records and find the program to be excellent."

**Why not get the best?** Sure, you can buy a cheap program just as you can buy a cheap clock. But is it really worth it?

Many customers report that "home accounting" programs are difficult to learn, clumsy to use, and obsessed with budgeting; that only Money Street gives the speed, the ease of use, and the many reports needed.

Bill Sampler, Fairfax Station, VA puts it this way: "One way I judge a program's worth is how easy it is to use after you have been away from it for a couple of weeks. Money Street is no problem, it runs like a fine jeweled watch."

So, Money Street pleases customers just as a Porsche pleases drivers. Top quality costs more; that's a fact of life. But isn't quality always worth it?

One of our customers, Buzz Buggerman of Orlando, FL said: "We use Money Street in our law office. We figure it's not the cost of the program that's important, but how much time it takes to set it up, learn it, and run it. Money Street's a breeze."

**How it works.** On your computer screen, you create a facsimile of your checkbook. You see 17 items per screen, and can scroll for more. As the computer balances your checking account, you give each check or deposit its own category code.

ENTER ITEMS - BALANCE CHECKBOOK				
#	MO-DA	PAYEE	CODE	AMOUNT
101	01/01	WM JONES	01	300.00
102	01/01	ANY WATER CO	02	50.00
103	01/01	ANY POWER CO	04	25.00
104	01/01	ANY GAS CO	03	50.00
105	01/12	SHELL OIL CO	10	100.00
106	01/13	STATE FARM INS	11	100.00
107	01/13	GIANI TIRE CO	12	200.00
108	02/01	WM JONES	01	300.00
109	02/01	ANY POWER CO	04	50.00
110	02/01	ANY WATER CO	02	50.00
111	02/12	SHELL OIL CO	10	50.00
D	02/25	W SMITH	20	1000.00
D	02/25	J DOE	21	1000.00
DEBIT	02/27	PURCHASE CHECKS	99	25.00
112	02/28	STATE FARM INS	11	50.00
113	02/28	STATE FARM INS	05	100.00
113	02/28	JONES COMPANY	05	1000.00
ENTRY #0018				BALANCE 1550.00
CODE 01: -600.00				RENT PAYMENTS

#### PROGRAM FEATURES

- 100 user-defined accounts • On screen chart of accounts • Account sub totals, grand totals • Handles unlimited checking accounts • Three minute year-end rollover • Credit card accounting • Full editing, even after entry • Check search and scan screen • Help screen • Wildcard searches

#### PROGRAM LIMITS

- 2400 checks per data disk • 200 uncleared items • Scan speed: 6 per second • Amount limit: \$999,999.99 • 100 account categories

#### DOES MANY JOBS

- Finds tax deductions • Single entry accounting • Job costing • Budgets and estimates • Mini accounts receivable • Mini inventory • Tracks personal loans • Real estate rentals • Stock purchases/sales • Increases "float"

#### CHECKING ACCOUNT MANAGER

- Prints trial reconciliation • Balances checkbook and statement • Creates cancelled check file • Prints detailed audit trail • Includes check register • Prints checkbook "history" • Captures monthly income • Easy to use

COMPUTER OPERATOR YOUR NAME HERE					ACCOUNT NAME 1ST NAT'L BANK			
					SORT BY CODE 03/30/84			
ENTR	FILED	CHK #	MO-DA	PAYEE	CODE	DESCRIPTION	AMOUNT	TOTAL
0001	02/27	101	01/01	JMT JAN RENT	01/RENT	123 MAIN ST.	-100.00	-100.00
0005	04/05	104	02/07	JMT FEB RENT	01/RENT	123 MAIN ST.	-100.00	-100.00
0008	02/27	107	03/04	JMT MARCH RENT	01/RENT	123 MAIN ST.	-100.00	-100.00
								-300.00
0002	04/05	102	01/01	CITY POWER CORP	02/POWER	123 MAIN ST.	-50.00	-50.00
0004	02/27	D	01/03	REFUND	02/POWER	123 MAIN ST.	10.00	-40.00
0006	02/27	105	02/07	CITY POWER CORP	02/POWER	123 MAIN ST.	-40.00	-40.00
0009	04/05	108	03/04	CITY POWER CORP	02/POWER	123 MAIN ST.	-50.00	-50.00
								-150.00
0005	02/27	103	01/01	COUNTY WATER CO	03/WATER	123 MAIN ST.	-25.00	-25.00
0007	04/05	106	02/07	COUNTY WATER CO	03/WATER	123 MAIN ST.	-20.00	-20.00
0010	04/05	109	05/04	COUNTY WATER CO	03/WATER	123 MAIN ST.	-20.00	-20.00
								-75.00
							04/TOTAL 123 MAIN ST	-525.00
0014	04/05	D	01/17	JOHN'S WAGES	05/JOHN'S WAGES/ICCW	1200.00	1200.00	
0013	02/27	D	02/16	JOHN'S WAGES	05/JOHN'S WAGES/ICCW	1200.00	1200.00	
0011	04/05	D	03/04	FEES/ SUN CORP	05/JOHN'S WAGES/ICCW	1000.00	1000.00	
0015	04/05	D	03/17	JOHN'S WAGES	05/JOHN'S WAGES/ICCW	1200.00	1200.00	
								4600.00
0012	02/27	D	01/17	DIVIDENDS IBM	06/INVESTMENT INCOME	1200.00	1200.00	
0016	04/05	D	02/17	DIVIDENDS HERST	06/INVESTMENT INCOME	50.00	50.00	
0017	04/05	110	03/15	OVERPAYMENT IBM	06/INVESTMENT INCOME	-10.00	-10.00	
								1240.00
							07/TOTAL INCOME	5840.00
							08/NET	5315.00
0018	UNCLD	111	02/18	JM SMITH MD	09/MEDICAL EXPENSES	-100.00	-100.00	
0019	UNCLD	112	02/18	JM JONES DDS	09/MEDICAL EXPENSES	-150.00	-150.00	
0020	UNCLD	113	02/20	LAWK HOSPITAL	09/MEDICAL EXPENSES	-200.00	-450.00	
								-450.00
0023	04/05	115	02/30	JOHN SMITH	10/INTEREST EXPENSES	-100.00	-100.00	
0022	UNCLD	114	02/30	VISA INTEREST	10/INTEREST EXPENSES	-117.90	-117.90	
								-117.90
							11/TOTAL DEDUCTIONS	-567.90

**15 Ready-to-print reports!** Press four keys and the program will print any of 15 different reports. Just select from the Report Menu, and the program does the rest. Start-up to print time is usually 20 seconds. Reports include:

- Monthly code totals • To-date code totals • Sort by amount • List code dictionary • Sort by payee • List deposits • List uncleared checks • List uncleared deposits • List all entries • Sort by date cleared • Print check registry • Print selected month • Print selected code • List code totals • List monthly totals

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The program is copy protected. We sell back-up disks for \$10. We also offer a special utility disk that makes two back-up copies, makes quick copies of data disks, and allows fast sorts of selected months or code categories. Price is \$25.

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Dealer: Write or call for price list.



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# Peelings II<sup>TM</sup>

 THE MAGAZINE OF APPLE  
SOFTWARE AND HARDWARE EVALUATION

Volume 4, Number 7, 1983

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## BEGINNER COLUMN:

- 9 **The Anything Machine**  
Chapter 7: GRAPHICS  
By Tom Little

## EDUCATION

- 15 **Microcomputer Inservice:  
Educating the Educators**  
By Sandy Abernathy
- 18 **Locating and Selecting  
Educational Software**  
By Sandy Abernathy
- 24 **An Educational Challenge  
for Software**  
By Elma Ewing
- 27 **Prism Reading 2**  
Published by The Psychological  
Corporation
- 30 **Wordrace**  
Published by Don't Ask Computer  
Software
- 31 **Arcademic Skill Builders In Math**  
Published by Developmental Learning  
Materials
- 33 **Word Scrambler & Spelling Tutor**  
Published by Avant-Garde Creations
- 36 **Juggles' Rainbow**  
Published by The Learning Co.
- 37 **Career Directions**  
Published by Systems Design  
Associates, Inc.

## DATA BASE STANDARDS

- 39 **Data Base Standards Update**  
By John Mitchener
- 39 **Data Base Standards**

## SPREADSHEETS

- 45 **THE SPREADSHEET 2.0**  
Published by Apple Pugetsound  
Program Library Exchange
- 45 **MAGICALC**  
Published by Artsci
- 49 **PLAN80**  
Published by Digital Marketing
- 49 **DESKTOP/PLAN-II**  
Published by VisiCorp
- 56 **T/MAKER III**  
Published by T/MAKER Company
- 58 **THE INCREDIBLE JACK**  
Published by Business Solutions, Inc.
- 63 **Perfect Calc**  
Published by Perfect Software, Inc.

## DEPARTMENTS

- 5 **Authors**
- 6 **Peelings Ratings**
- 7 **Letters**
- 65 **Software Index**



## ADVERTISER INDEX

Advertiser	Page
APPLE ORCHARD .....	68
APPLIED ENGINEERING .....	8
AVANT-GARDE .....	67
CIRCADIAN SOFTWARE .....	66
COMPUTER TAX SERVICE .....	3
CRAWFORD DATA SYSTEMS .....	25
DAVID DATA .....	12
DOUGLAS ELECTRONICS .....	48
EAST SIDE SOFTWARE .....	14
EXEC-SOFTWARE .....	64
GLOW SOFTWARE SYSTEMS .....	54
HAYDEN SOFTWARE .....	34, 35
HAYES MICROCOMPUTER .....	C3
INTERACTIVE MICROWARE .....	13
LJK ENTERPRISES .....	C2
LUSTER SOFTWARE .....	32
MICRO-ANALYST .....	44
MICRO-SPARC .....	26, 55
PEELINGS II .....	2
SENSIBLE SOFTWARE .....	17
SIERRA ON-LINE .....	C4
SOF-TECH .....	20
SOFTKEY PUBLISHING .....	6
SOUTHWESTERN DATA SYSTEMS .....	1
WILDCAT COMPUTING .....	23

### ★ NOTICE ★

*Peelings II* has acquired the services of a subscription service, nominally to serve our readers better. As usual, there have been a few minor problems in this transition. If you are having any trouble whatsoever with your subscription service now, call toll free 1-800-345-8112 (1-800-662-2444 in PA) or write to: Peelings II, P.O. Box 625, Holmes, Pennsylvania 19043.

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Apr 84	V5N4

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Published 8 times yearly

# PEELINGS RATINGS

The Peelings Rating is a letter grade designed to indicate an overall impression of the product. It is a measure of how well the publisher did the job he intended to do taking into consideration comparison to other similar products, price to performance, ease of use, documentation, and sophistication.

We stress that you should not skip a review or disparage a program because it receives a low rating. The rating alone can never tell the whole story. Only reading the entire review will give you all the information you need. For this reason, the rating should never be quoted alone without reference to text of the review.

The Peelings II rating categories follow: some example criteria are given for the categories, but they are not meant to be all inclusive.

**AAA** — Absolutely astounding software. We have seen two programs that fit this category.

**AA** — Top notch, superb. These programs generally use the most sophisticated programming techniques and have excellent documentation.

**A** — Very good. Software in this class incorporates very good programming techniques and has clear and informative documentation.

**B** — Good. This software may have minor errors or be slightly flawed, it may be lacking in thorough documentation, or it may just be unexciting.

**C** — Average. Software of a mediocre nature. There may be a lack of good programming concepts or poor error trapping. It may be a repeat of other work, or have a low performance/price ratio.

**D** — Below Average. Software with a blatant disregard for the user in terms of programming design, unacceptable documentation or performance/price ratio.

**F** — Unacceptable. Software of such poor quality or usability that it should not be marketed.

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# LETTERS

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## **SOUTHWESTERN DATA SYSTEMS RESPONDS**

*Here is the shorter version of the letter I recently sent in response to your review of Routine Machine.*

*Although our product The Routine Machine received a favorable review (A+), there were a number of errors and misleading comments in the article.*

*Specifically:*

*1) I think the reviewer was unusually harsh on the backup copy program included on The Routine Machine disk. It would have been nice if he'd mentioned the fact that we're the only company that puts a backup copy program on its disks to give three backup copies, but that aside, his problems were rather unique, and the reviewer himself noted that we were happy to replace the problem diskette.*

*2) The statement that Routine Machine is a "slave" to its copy protection technique is absurd. The system is virtually transparent to the user in that any file may be loaded, listed or transferred from disk to disk; booting is not necessary for use either. In addition, Routine Machine is used only once to put a routine in a program.*

*3) As to the so-called problem of putting more routines on the disk, enough room remains on a disk that reaching the limit of 102 files per directory is much more likely than actually filling the disk.*

*4) The reviewer says that "mini-libraries" must be saved to library disks. This is simply not true and was obviously not tried, but rather assumed—a disappointing omission*

*for a hopefully "professional" reviewer.*

*5) As to the manual not having enough information about writing your own routines, more than 25% (over 40 pages) of the manual discusses this subject, including an extensive bibliography of over 60 references to ampersand routines and techniques.*

*6) Most important of all, I'd like to also voice an opinion about the review in general. The Routine Machine and its associated libraries is a powerful new programming tool that goes far beyond any single routine or menu function. Peelings has done a disservice to its readers by not devoting more of the review to the question of whether this package represents a valid new programming technique and is of value to the average and even advanced programmer (I personally guarantee both!). Spending so much of the review on minor, not to mention erroneous, matters misses the point of this remarkable new package.*

*I hope this helps to clarify certain points regarding The Routine Machine. One can only speculate what rating the program would have received if the review had been more accurate. Maybe next time around? If either you or your readers desire further information regarding this package, please don't hesitate to call me at (619) 562-3270.*

*Sincerely,*

*Roger Wagner  
President*

---

## **DR. ROGER ALTMAN RESPONDS**

*Judging the usefulness of stock or commodity software depends upon applying the proper criteria. Your comments in the Business and Finance section called "Stock Overview" (Peelings II, V4N5, 1983) imply that the criteria used to evaluate software which give specific buy and sell signals are the same as those used to evaluate software which help keep records or produce an assortment of attractive graphs. This apparent misunderstanding on your part can be quite costly to software producers who are engaged in developing trading systems which yield unequivocal buy and sell recommendations.*

*Most of the effort that has gone into developing the Stock Market Advance Decline Timing Program is invisible to the user, and, regrettably, to most reviewers. This is because the task of developing reliable buy and sell signals must be achieved long before a commercial trading program is ever written. Over a year and a half was spent in screening models and particularly in developing a valid statistical testing procedure to optimize program performance. This feature is responsible for the accuracy of the buy/sell signals, but unfortunately, was not even mentioned in Mr. Daugherty's review.*

*Very truly yours,  
Roger Altman*

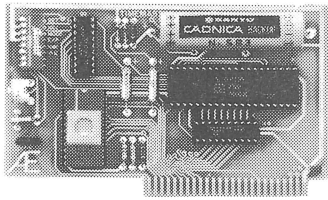


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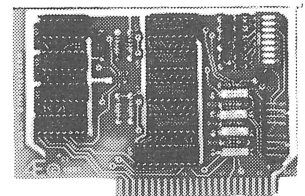
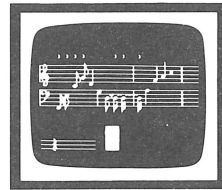
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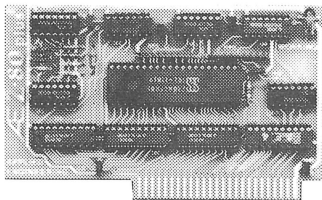
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# THE ANYTHING MACHINE

## Chapter Seven: GRAPHICS

by Tom Little

---

Dramatic graphics are an expected feature of computers these days. Whether in the form of video games, scientific plots, or business diagrams, graphics have come to be part of a computer's "standard equipment", and their quality forms a strong basis for evaluating a machine. One day soon we may see the teletype mentality of most computers give way to a graphic, screen-oriented approach (a la Apple LISA).

The sad thing is that there is no standard way of producing graphics. There are no graphics "languages" which standardize the production of video displays in the same way that BASIC and Pascal standardize the use of numerical and character-string data. The traditional wisdom has had it that graphics are too "machine dependent" to allow for a standard set of graphics commands. The result is that every dialect of BASIC has its own set of graphics commands peculiar to the computer it runs on. The situation is even worse with other languages, where a hodgepodge of additional software may be needed. A notable exception is UCSD Pascal, which uses a set of graphics commands called "Turtlegraphics" that is virtually the same on any system with graphics capability. Little progress in the standardization of graphics can be hoped for until graphics become routinely built into the specifications of programming languages (such as the new proposed ANSI standard for BASIC).

In spite of all the differences in commands and syntax, there are basically only a few general *techniques*

which are used in producing graphics. This column will attempt to cover these techniques, and show how the principles are realized by two Apple II programming languages: Applesoft BASIC and Pascal.

### PIXELS AND VECTORS

When you think of an artist producing a picture, the first image to come to mind is usually that of a line drawing executed with pencil or pen. This is especially true if you think of a draftsman or technical artist. It is not surprising, therefore, that most computer graphics systems have been based, in some sense or other, on the electronic display of line segments.

An obvious way to make line segments is simply to draw them on the screen. Some display screens are made like an oscilloscope, with a coating of persistent phosphorescent materials. When a beam of electrons is focused and moved across the screen, it produces a glowing line, which eventually fades. This kind of terminal is sometimes known as a "vector graphics" terminal. (Here "vector" means a straight line segment drawn in a certain direction on the screen.) The disadvantages of this type of terminal include difficulty in producing a large, solid area on the screen (if you've ever colored a large poster using only fine-point felt-tip pens, you will appreciate the problem); some technical problems relating to how long the lines should continue to glow (if they glow for a long time, you can't make the display

change quickly; if they glow for a very short time, they have to be constantly redrawn); and the considerable expense of the better models.

Another technique is called raster-scan graphics. This is the principle by which the TV set works. An electron beam rapidly scans the whole screen, one horizontal line at a time, from top to bottom. Each horizontal line is composed of a number of locations called pixels. Each pixel may be either on or off (on some terminals, they may be different colors or shades of grey). This kind of device uses as an input signal a steady stream of information which gives the status of each successive pixel.

The pixels show up as dots or small smudges on the screen when lit. If a set of contiguous pixels are lit, the result will be a line of dots or a solid area, depending on the arrangement of the pixels. The fact that the scanning electron beam always moves in the same pattern, pixel by pixel, row after row, allows it to be moved automatically and very rapidly. The result is that an entire screen can be drawn and erased in much less time than a vector graphics terminal would take, carefully drawing its glowing lines under electronic control.

The two methods are illustrated in figure 1.

Raster-scan graphics are much more common than vector graphics because of their flexibility, speed, and reduced cost. This method of display has one glaring fault, however. Resolution is limited by the



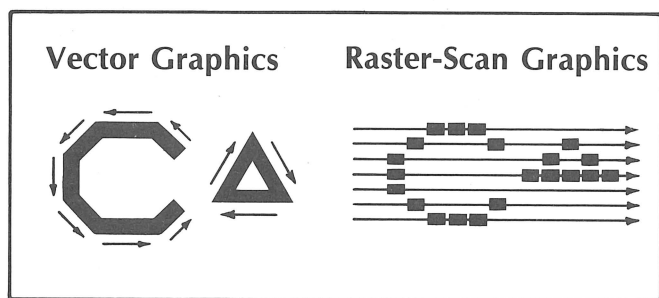


Figure 1. Vector and Raster-Scan Graphics

pixel size. Unless the pixel size is very small, a line segment will look like a string of dots. Everything tends to have a slightly "squared off" look because the pixels are arranged in neat, rectangular rows and columns. Diagonal lines look like little stair steps. The Apple standard video display is this way. There are 192 rows, each with 280 pixels lined up horizontally.

## THE MEMORY-MAPPED SCREEN

If a computer program had to continuously feed the display terminal the status of each pixel, the result would be very slow graphics. We'd be back to vector graphics, but plotting points instead of line segments. Fortunately, the principle of raster-scan graphics allows for a nice short-cut which makes computer graphics as we know them possible. Since the screen is scanned one pixel at a time, always in the same sequence, it is possible to put the status of each pixel into successive memory locations in the computer. The computer hardware can then very rapidly convert the contents of the memory locations into a stream of pixel information for the display device, requiring no force-feeding from the program at all. To change the appearance of the screen, the program can merely change the contents of the appropriate memory, and very, very soon the result of the changes will appear on the screen.

Now at last we're coming up out of the hardware. Most small computers do graphics in this way: The user types a graphics command. The programming language currently running interprets the command and modifies the pro-

per memory locations. The hardware, which is constantly busy converting the contents of memory into a video signal, produces an image on the screen which shows the changes brought about by the user's command (see figure 2).

This process uses a lot of memory. Each pixel uses at least one bit (this is the simplest information that can be sent to the display screen: pixel on or pixel off). For example, the Apple screen has  $192 \times 280 = 53,760$  pixels. Therefore it must require at least 53,760 bits = 6,720 bytes of memory to represent the graphics screen. Actually, the number is more than this, because the pixels can be different colors. The actual figure is 8,192 bytes.

The best newer computers have special memory, which is not part of the memory used to store programs and data, set aside for just this purpose. The Apple, however, was designed when memory was very expensive. As a result, this memory for the graphics screen is the same memory which is used by a large program. (For the curious, there is an Apple II memory map in this column in the last issue.) A common problem using graphics on the Apple is the accidental "clobbering" of part of a long program by the graphics commands when they are used.

## MAKING IT HAPPEN

The pressing question, O patient readers, must now be this: What are these graphics commands?

The complexity of using the graphics commands arises from the fact that it is necessary to tell the computer where to draw by typing, rather than by pointing (on a standard Apple being used under Applesoft or Pascal, that is. Refer to the ecstatic ravings on the Gibson Light Pen in previous issues of *Peelings II* (V3N7, 1982; V4N4, 1983) for an alternative!) This problem is almost universally solved by the methods of analytical geometry. Each pixel on the screen is identified by its Cartesian coordinates (or row and column numbers, if you prefer). In Applesoft, the command

**HPLOT 0,0**

will plot a point in the upper left-hand corner of the screen.

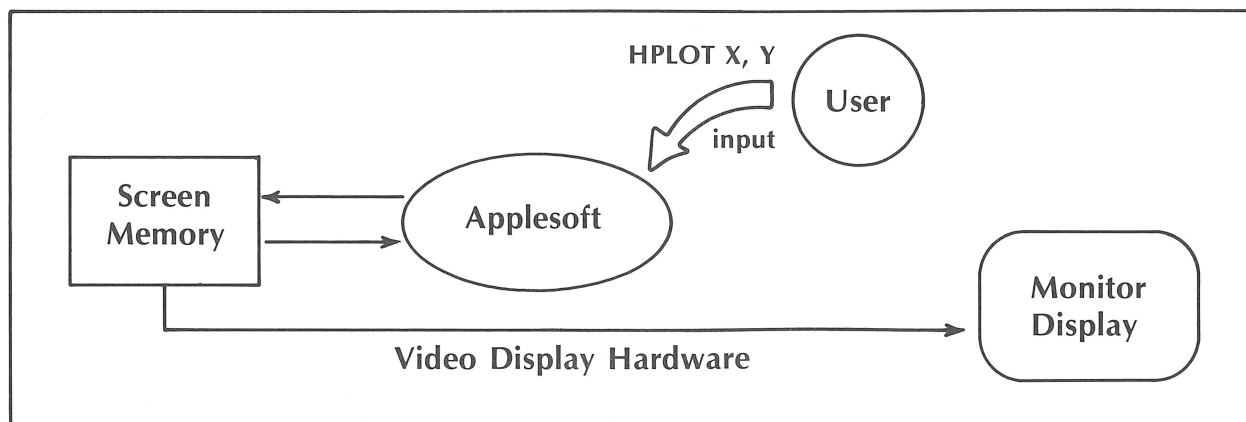


Figure 2. Execution of a Graphics Command



The point one column to the right is addressed as 1,0; the point one row down is 0,1. the lower right-hand corner is 279,191. Lines are drawn using the HPLOT TO command:

```
HPLOT 0,0 TO 279,191
```

draws a line from the upper left-hand corner to the lower right-hand corner, diagonally across the screen. A short-cut is the statement

```
HPLOT TO 100,150.
```

This causes Applesoft to plot a line from the last point plotted (wherever it was) to the pixel in column 100, row 150. The Pascal equivalent is

```
MOVETO(100,150)
```

except that in Pascal, the rows are numbered up from the bottom, instead of down from the top.

## COORDINATE SYSTEMS

Applesoft uses *absolute rectangular coordinates*. They are absolute because each pixel is identified by two coordinates which never change. They are rectangular because the rows and columns form right angles with each other.

Apple Pascal's Turtlegraphics has a few commands which use absolute rectangular coordinates, such as MOVETO. For the most part, though, Turtlegraphics was designed to use *relative polar coordinates*. They are relative because the coordinates of the point to be addressed next depend on the coordinates of the point addressed last. They are polar because points are identified by direction and distance from the last point addressed, not by row and column.

The Pascal user is encouraged to think of an invisible turtle which starts at the center of the screen, pointing right. The command

```
MOVE(30)
```

causes the turtle to move 30 pixels forward (which in this case is toward the right-hand side of the screen). We picture the turtle dragging a ball-point pen with him, so in general a line is drawn whenever he moves.

```
TURN(90)
```

causes the turtle to rotate counterclockwise by 90 degrees. In our example, he is now facing toward the top of the screen. A subsequent

```
MOVE(40)
```

would cause him to move forward (now upward) 40 pixels. All this is illustrated in figure 3.

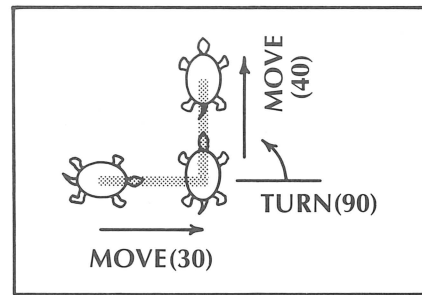


Figure 3. Turtlegraphics

To gain an appreciation for the differences between these two coordinate systems, consider the following equivalent programs in Applesoft and Pascal. They both draw a square, 50 pixels on a side, in the upper left-hand corner of the screen.

### Applesoft

```
10 HGR : REM INITIALIZE
    GRAPHICS
20 HCOLOR = 3 : REM
    WHITE
30 HPLOT 0,0 TO 50,0
40 HPLOT TO 50,50
50 HPLOT TO 0,50
60 HPLOT TO 0,0
```

### Pascal

```
PROGRAM SQUARE;
USES TURTLEGRAPHICS;

BEGIN
  INITTURTLE; (* INITIAL-
    IZE GRAPHICS *)
  PENCOLOR(NONE);
  (*DON'T DRAW LINES*)
  MOVETO(0,191); (* UPPER
    LEFT-HAND CORNER *)

  PENCOLOR(WHITE);
  MOVE(50); (* TURTLE IS
    POINTING RIGHT *)

  TURN(-90); (* CLOCKWISE
    90 DEGREES*)
  MOVE(50);
  TURN(-90);
  MOVE(50);
  TURN(-90);
  MOVE(50);
END.
```

The Applesoft coordinate system is more typical than the Turtlegraphics one.

## SHAPES

One of the advantages of raster-scan graphics, you will recall, is the ability to place solid areas of color on the screen, without using a bunch of lines to fill them. Yet the commands we have mentioned so far all seem designed more for vector graphics than for raster-scan. We need a command for putting a design some place on the screen all at once, instead of drawing the design, one line at a time.

Applesoft almost has such a command. It is called DRAW. The command

#### DRAW 1 AT 100,70

will draw shape #1, all at once, starting at pixel 100,70 on the screen. But what is shape #1? This is the sad news: shape #1 means the first shape in a shape table, which you have personally constructed, in machine language, in the grand tedious style described in the Applesoft manual. An Applesoft shape is basically a sequence of numeric codes which you place somewhere in the computer's memory. Applesoft interprets these codes as a sequence of moves (much as in Turtlegraphics) to plot on the screen when the shape is DRAWN. The large-scale creation and use of shapes by the methods described in the Applesoft manual are quite beyond the limits of the average Apple user's patience and ability. The situation is improved quite a bit by buying a shape-builder program which does most of the dirty work.

Yet there remains a flaw with Applesoft shapes. The shapes are coded as vectors, rather than pixels. So for a shape which is detailed or has large, solid areas, the Applesoft shape scheme, which draws it using line segments,

is rather inefficient. Graphics packages available commercially contain a large variety of superior shape-building and shape-drawing capabilities. However, life would certainly be much easier if these useful features had been present in Applesoft from the outset.

The Pascal equivalent to DRAW is DRAWBLOCK. Pascal indeed keeps shape definitions in pixel format, rather than vector format. The shape definition is a two-dimensional Boolean array variable in the Pascal program (if you're bewildered by the terminology, relax: it shall pass). This is definitely a cut above Applesoft, but still requires a prohibitive amount of expertise for the average Apple user.

The discouraging upshot of all this is that in order to make and use shapes easily, it is necessary to buy additional software. Even then, the software you buy may limit the range of application of the shapes.

#### COLOR

The most straightforward way to do color graphics would be to let each pixel be plotted in any of the colors the computer can produce. This is, in fact, commonly done with some newer computers. Once again, the Apple's primordial origins have imposed limitations on its design.

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Color requires memory. Just as resolution requires memory, because more pixels must be stored, so color requires memory, because more information must be stored for each pixel. To allow any pixel to be any of four colors (say black, white, red, or blue) would use two bits of memory per pixel, or 13,440 bytes for the Apple screen. Keeping this in mind, it is bordering on miraculous that the Apple can display six colors (black, white, green, violet, orange, and blue) nearly anywhere on the screen, and still use only 8,192 bytes! The strange restrictions on the use of color are discouraging to newcomers to Apple graphics. However, once understood, the restrictions do little to hinder the design of interesting and colorful screen displays.

The most important restriction is that complementary colors cannot appear in the same column. By "complementary" I don't mean what the artist means. In Apple graphics, green and violet are complementary to one another, and so are orange and blue. Thus a green pixel cannot appear in the same column as a violet pixel. Violet and blue may appear in even-numbered columns, green and orange in odd-numbered columns. The other thing to remember is that two dots plotted in adjacent columns will look like one white dot. Conversely, a single white dot will appear the color appropriate to its column (rather than white), if pixels in the adjacent columns are not lit. For example, the white square drawn in the sample programs above appears to have violet sides on the left and right, but white sides on the top and bottom.

## ANIMATION

The basic idea behind animation is simple. To make a shape look as though it is moving, simply plot it, erase it, then plot it again in a new position. Here is a short, simple program which does animation without using graphics at all! See if you can identify the plot-erase-plot cycle. (CHR\$(8) is the backspace.)

```

5 HOME
10 A$ = "*** PEELINGS II ***"
20 FOR I=1 TO LEN(A$) : PRINT CHR$(8); : NEXT
30 PRINT " ";A$;
35 FOR I=1 TO 70 : NEXT
40 GOTO 20

```

To do this on the graphics screen is easier in theory than in practice. This is because changing the images on the graphics screen generally requires a lot of time-consuming internal activities of the Applesoft interpreter, or whatever language is being used. The result is that the animation is slowed down. This is especially true if the program itself does anything time-consuming between plots, such as an elaborate calculation of a shape's new position.

Very good animation can be obtained simply by using Applesoft shapes carefully, and being mindful of speed when designing the program. But for the most sophisti-

cated arcade game programs, machine language is universally used, eliminating the delays inherent in the Applesoft interpreter. Several software packages are now available that provide some of these fast machine language routines in a ready-to-use form.

## ALAS, LO-RES

In the last few years, the low resolution (Lo-Res) Apple graphics mode has sunk into disuse and disrepute. It is a shame, because it does have some advantages over the Hi-Res mode.

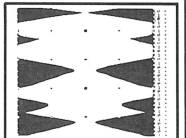
The Lo-Res screen is made up of blocks (they're too big to be called pixels with a clear conscience) arranged in 48 rows of 40 columns each. Each block can be any of 16 colors. These colors are quite bright. The whole screen uses only 1,024 bytes of memory, which is ordinarily used for the text screen anyway, and is out of conflict with program memory. Animation can be done more easily in Lo-Res.

When writing a program, some thought should be given as to whether the extra resolution is really needed. Lo-Res graphics provide a simple, colorful alternative.

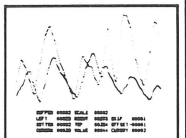
The column in the next issue will deal with using the computer to store, modify, and retrieve data. That's called data base management, regardless of the amount of capital you invest in the software.□

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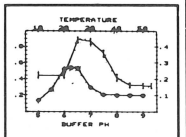
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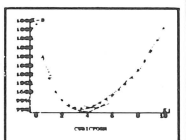


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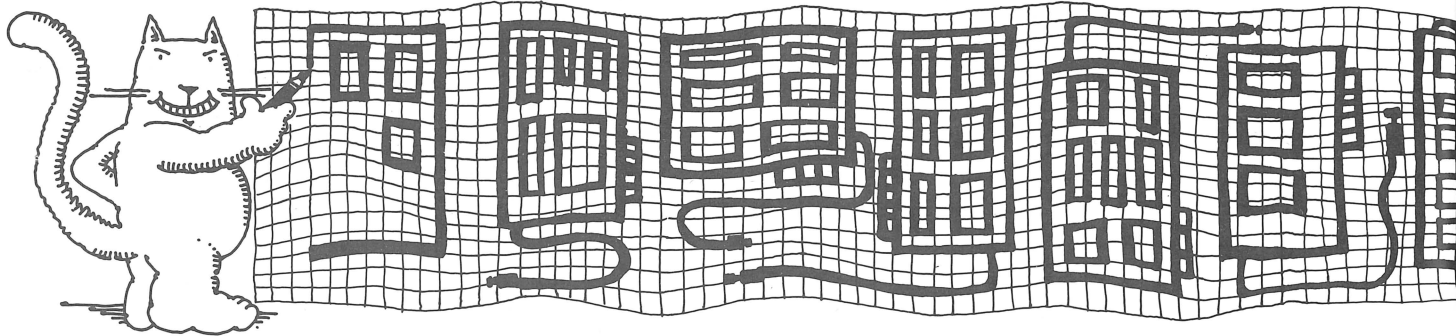
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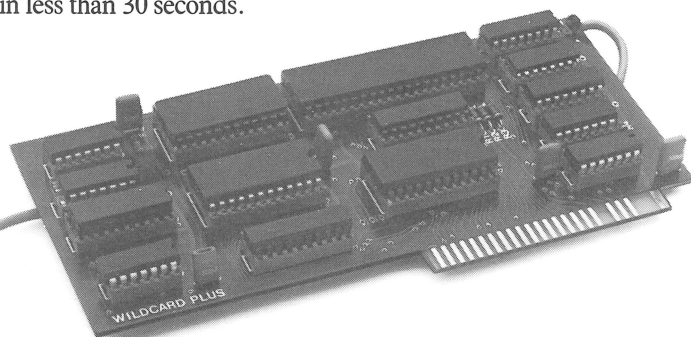
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# Microcomputer Inservice: Educating the Educators

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by Sandy Abernathy

## ANCIENT HISTORY

The public has become fascinated by computer technology. Parents are demanding that schools provide their children with computer experiences so that they will be able to compete in the job market. In response, school districts, professional education organizations, and colleges and universities have scrambled to present information to educators about computers through district inservice days, local, regional, and national conferences, and college classes. Judging from the numbers who have flocked to these activities, educators are aware of their need to "catch up" in computer technology.

Unfortunately, in the mad search to locate "someone" (anyone!) who would "do something" on computers, presentations sometimes resembled the old-time snake oil peddler's spiel: "Ladieees and gentlemen! Don't be afraid! Step right up and see the dazzling wonders of modern technology!" Under these circumstances, members of the audience often left with no more useful information or skills than when they arrived. At first, just the dazzle of the new technology was sufficient. But as educators became more conversant with microcomputers, mere amazement was not enough.

If educators will no longer accept "just anything" in the way of micro-

computer inservice, then what should be offered?

## ONE INSERVICE MODEL

As with other types of inservice, an overall district microcomputer inservice plan should be developed and goals set. District goals will vary depending on the amount of time already spent on: microcomputer study and inservice; the general knowledge level of district personnel; the perceived role of the computer in district curriculum and in ad-

ministrative functions; and the availability of district resources such as equipment, materials, space, people, time, and funds.

Inservice goals may be classified as awareness, general knowledge, or specialized knowledge. Awareness goals are usually thought of as the beginning level, general knowledge as the intermediate level, and specialized knowledge as the most advanced level. However, activities within specialized knowledge goals may provide information about new



applications which, in turn, may foster new awareness goals.

## INSERVICE ACTIVITIES

Goals will have an effect on the type of inservice presentations or activities planned by the district. For instance, the district just beginning to address the microcomputer issue may set as its goal, awareness of the role of computers in education. It may plan microcomputer activities as part of the regularly scheduled inservice. The purpose will be to introduce participants to educational computing and to make staff aware of the potential for microcomputer use in their own district.

Awareness activities are usually short, and several may be scheduled during a single inservice day. Hands-on time may or may not be part of the activities. Experts may be invited to talk about computers in education and to demonstrate educational applications. A computer fair may be set up where local vendors display hardware and software. When equipment is available, hands-on workshops may be offered to give participants time to explore computer operation and software packages.

In addition to activities scheduled during regular inservice times, school staff may view materials purchased by the district or may meet to discuss possible applications. One effective way to involve district personnel at the awareness level would be to schedule visits to other schools where microcomputers have become a part of everyday activities. Observations of microcomputers in use and discussions with staff members may help visitors become more aware of capabilities and limitations of this equipment. Staff also may be encouraged to attend professional conferences which emphasize educational computer applications. Sharing information gained through these experiences will be an important part of the overall inservice plan. As a result of such activities, a decision as to a future role for microcomputers in the district may be made.

The district which has already decided on the microcomputer's role, may set computer literacy (general knowledge) as its goal. If computer literacy is the goal, a very different set of activities will be planned. Here the purpose will be to provide as many district personnel as possible with the skills and knowledge necessary to use computers and to make intelligent decisions regarding them. An extended amount of time may be required for this type of inservice, and depending on the amount of equipment and expertise available, the inservice may be scheduled through the local Teacher Center, regional service center, or nearby college or university. Because this type of inservice requires hands-on time to be effective, the number of staff able to participate in a single section may be limited. Therefore, decisions must be made as to the topics to include, number of hours for a single inservice section, number of inservice sections to be offered, number of participants to be scheduled in each section, and method for selecting participants.

Possible topics may include:

- 1) Appropriate use of computer terminology.
- 2) Operation of computers and computer software.
- 3) Exploration of programming concepts and software packages.
- 4) Factors to consider in the selection of hardware and software.
- 5) Social and ethical issues pertinent to educational applications.
- 6) The role of the computer in district curriculum.
- 7) Noninstructional computer applications.
- 8) Microcomputer information sources.

Upon completion of an inservice section, participants should have an introductory knowledge about many aspects of computers and should be able to use computers for general applications in the classroom or in their specialized area. Based on this knowledge, participants should be able to make realistic decisions as to

the extent of their future involvement with microcomputers.

If many of the staff are comfortable with microcomputers, the district may continue to provide computer literacy for its new staff but set specialized computer applications as its district goal. The purpose of this type of inservice would be to provide small groups with the opportunity to study one aspect of computers in depth. The amount of time for each type of specialized training would depend on the complexity of the task. Teachers would be selected because of their expertise with the specialized application and their ability to teach educators. Participants would be selected because of their interest in that application. Some may want to increase their programming skills or learn a new language such as Logo, Pascal, or Pilot so they can develop materials or work with students more effectively. Others may want to learn how to use particular software such as a grading program, word processing package, or student management system. Still others may be members of a committee charged with the task of evaluating and incorporating district-owned software into district curriculum guides and of locating additional software, hardware, and applications that will enhance specific areas. This level of microcomputer inservice may introduce staff to new microcomputer applications and lead to a new awareness-general knowledge-specialized knowledge cycle.

## TEN HELPFUL HINTS FOR A SUCCESSFUL INSERVICE WORKSHOP

**1) Hands-on Time.** Give participants time on microcomputers to become familiar with terminology and to operate a computer.

**2) Hands-on Time.** Give participants time on microcomputers to help to reduce anxiety and fear of the machines and to build a positive attitude toward computers.



**3) Hands-on Time.** Give participants time on microcomputers to explore the capabilities and limitations of the machine and the man-machine combination. "Playing" with programming ideas and programs is one way to accomplish this. Programming activities may turn on participants because of the intensely creative aspects. These experiences may help participants make more realistic decisions as to their future involvement with microcomputers.

**4) Hands-on Time.** Give participants time on microcomputers to examine software packages in their area and discuss and use evaluation criteria. If basic programming concepts and design have been taught, participants should have an idea of what to expect in good software.

**5) Hands-on Time.** Give participants time to have fun and become aware of computer possibilities.

**6) Two on One.** Although participants may grumble about sharing a computer, the pairing and sharing helps the learning process. The act of working with another person in order to mutually solve a problem fosters cooperative computer use. Watch that pairs are evenly matched with similar interests and skill levels. Make sure that the computer time is shared evenly. Three on a computer can work but doesn't really give anyone enough time, and one of the three may be inadvertently frozen out. One on a computer can produce a sense of isolation in a teaching situation.

**7) Math Isn't Everything.** When developing programs to use with new computer users, strike a balance between math and non-math programs. Math may be a threatening topic and some teachers will feel more comfortable with non-math applications.

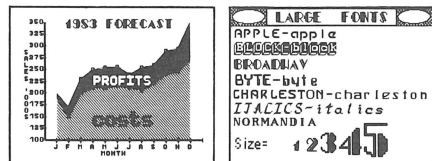
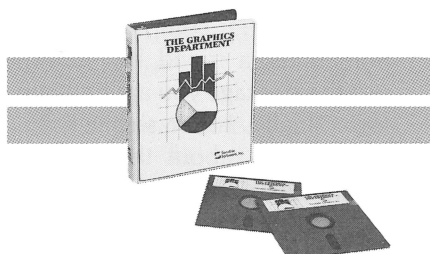
**8) Can You Relate?** The presenter should be selected carefully. He (or preferably she because of the higher percentage of female teachers) should speak "educationese" rather than "computerese". Find someone who likes to teach, likes to work with computers, and can communicate these attitudes to participants.

**9) Yes and No.** Discuss the difference between public domain, copyable, shareable software and commercial, copyrighted, non-shareable, purchaseable software. Use public domain software to teach programming and application concepts.

**10) Tangibles.** Give participants something tangible to take with them—a list of software sources, a disk with public domain programs, or a computer!□

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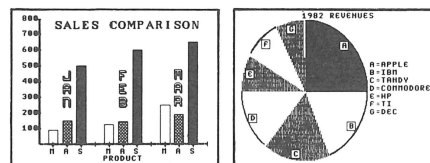
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# LOCATING AND SELECTING EDUCATIONAL SOFTWARE

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by Sandy Abernathy

For the past two years, I have been involved in planning and presenting microcomputer workshops for public school and postsecondary personnel. In addition, I have taught microcomputer courses for the Department of Curriculum and Instruction and for the Department of Educational Management and Development at New Mexico State University. Participants in these classes and workshops have included teachers, aides, librarians, counselors, principals, graduate students, secretaries, professors, and central administration personnel.

Several questions invariably come up during the sessions. Two are, "Where can I find information about certain kinds of software?" and "How can I tell if it's good software?" Participants have commented that ideas discussed in the sessions were helpful to them. The following two sections are based on these ideas. I hope they will be helpful to you as well.

Before you begin your software search, you should conduct some type of needs assessment and decide on the purpose of the software, price range and microcomputer system that will be used to run it. As you gather information about the kind of software you are looking for, prioritize the features you would like to have in your package. Some will be essential, some nice to have, and

some optional. Your final selection will probably be a compromise involving price, features, and the components that make up your microcomputer system.

## LOCATING SOFTWARE

Locating pertinent software may take some time since most towns don't have computer software department stores where people can browse through a comprehensive software library. However, there are several sources of information that may help you in your search. These include:

### 1. Friends .

Talk to other computer users. Sometimes a friend has found just the package you are looking for. Usually, he or she will be very candid about the advantages and disadvantages of a package. Ask to try it out or see it used. You may obtain someone else's name, the name of an article, or the name of a software package through this avenue.

### 2. Local Computer Stores.

Visit your local computer store. The dealer may have a package in stock that suits your needs, or he may be able to order software for you to examine.

### 3. Computer Magazines and Professional Journals.

**a. Read general articles about the kind of software you are looking for.** These usually discuss the general capabilities and limitations and may give you a better idea of what to expect from the sort of package you are looking for.

**b. Read advertisements.** You may find the description of a software package that appears to suit your purpose.

**c. Read software reviews.** A good one will discuss the capabilities and limitations of a particular software package. Good reviews should give you enough information to select a particular package for examination.

Look at the information in the section where new products are listed. You may find something there.

**d. Write a letter to the editor asking for help in locating software.** This may put you in contact with others who use computers for similar applications.

### 4. Resource Books and Directories.

Directories attempt to catalog current software for the buyer. Some describe a limited number of software packages in detail while others attempt to list as much software as possible.

Resource books may include articles of general interest and information about organizations as



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## SOME DIRECTORIES AND RESOURCE BOOKS

1. *Swift's Educational Software Directory 1983-84, Apple II Edition.*

Sterling Swift Publishing Co., 7901 South IH-35, Austin, TX 78744. 12-282-6840. \$18.95. 478 pages.

Software is categorized by subject. The directory lists and describes educational software for the Apple. Apple II/e compatibility is noted. Other sources of information regarding software packages may be included.

2. *Van Love's 1983 Apple II/III Software Directory, Volume II.*

Advanced Software Technology, Inc. 7899 Mastin Dr. Overland Park, KS 66204. 913-648-4442. \$24.95.

App. 1,000 pages, 200 pages are educational software listings. Software is categorized by application. The directory lists and describes software for the Apple II and III.

3. *The Book of Apple Software 1983.*

The Book Company, 11223 S. Hollywood Ave., Los Angeles, CA 90045. 213-410-9466. \$19.95. 491 pages.

Software is categorized by application.

The directory lists, describes, and grades software for the Apple. It includes a 50-page section on educational software.

4. *The Digest of Software Reviews: Education.*

The Digest of Software Reviews: Education, 1341 Bulldog Lane, Suite C, Fresno, CA 93701. \$52.95 per year for four issues.

Fifty educational software packages are summarized in each issue. Each software summary includes general information about the package, and excerpts from several reviews which have appeared in computer magazines.

5. *PC Clearinghouse Software Directory, 7th Edition.*

PC Clearinghouse, Inc. Publishers., 1781 Lee Jackson Highway, Fairfax, Virginia 22033. \$29.95. 816 pages.

Software is categorized by application. The directory lists over 21,000 software packages for over 200 microcomputers from more than 2,900 vendors. Contains an educational section and a specialized applications section that may be of interest to educators. No descriptions are included in this very comprehensive listing of software.

6. *LIST: The Software Resource Book for Personal Computer Users, Spring 1983.*

Redgate Publishing Company, 3407 Ocean Drive, Vero Beach, Florida 32960. \$12.50. 400 pages.

Contains articles of general interest and software listings. Some software listings include descriptions. Although most listings are for business and industry, it does have an education section.

7. *Classroom Computer News 1983 Directory of Educational Computing Resources.*

1983 Directory, 341 Mt. Auburn St., Watertown, MA 02172. \$14.95. 199 pages.

Although this directory does not list specific software, it does list and describe many resources which may help you in your search for information leading to specific software packages. Information includes names of associations, networks, periodicals, books, and regional laboratories, as well as a calendar of events for the year.

## EVALUATING SOFTWARE

Once software has been located, it must be examined to see if it really does what you want. This can be determined by running the program several times to see if it accomplishes the intended purpose efficiently, accurately, easily, and quickly. The evaluation forms I've used in workshops and classes are included at the end of this section. The single-page format, which participants liked, is a compromise between brevity and comprehensiveness. This section de-





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well as information about software and hardware.

These sources can be very helpful in getting a general idea of what is available as well as locating specific software. Some directories and resource books are listed at the end of this section. Although some are general and not designed primarily for education, they will contain information about business software that can be used for administrative purposes and information about applications which may be useful in specific disciplines.

## 5. Publishers.

Look in publishers' catalogs. Some publishers have produced separate software catalogs while others include a software section in their regular catalog. You may find something in one of these.

If you are searching for fairly complex, expensive software and have located a package that you would like to examine which your local vendor doesn't carry, write or call the publisher. Ask if they have an on-approval purchasing policy or a demonstration diskette. Demonstration diskettes may or may not have enough information on which to base a purchase decision. Ask the publisher for names of people in your area who have purchased the package. Call them. You may also want to find out what kinds of support and types of licensing agreements are available for the software. In addition to information about the software, communication with the publisher may indicate the kind of support to expect.

## 6. Other Sources.

Other sources of information are clearinghouses, networks, regional laboratories, state and county service centers, and colleges and universities.

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### 2. *Van Love's 1983 Apple II/III Software Directory, Volume II.*

Advanced Software Technology, Inc. 7899 Mastin Dr. Overland Park, KS 66204. 913-648-4442. \$24.95.

App. 1,000 pages, 200 pages are educational software listings. Software is categorized by application. The directory lists and describes software for the Apple II and III.

### 3. *The Book of Apple Software 1983.*

The Book Company, 11223 S. Hindry Ave., Los Angeles, CA 90045. 213-410-9466. \$19.95. 491 pages.

Software is categorized by application.

The directory lists, describes, and grades software for the Apple. It includes a 50-page section on educational software.

### 4. *The Digest of Software Reviews: Education.*

The Digest of Software Reviews: Education, 1341 Bulldog Lane, Suite C, Fresno, CA 93701. \$52.95 per year for four issues.

Fifty educational software packages are summarized in each issue. Each software summary includes general information about the package, and excerpts from several reviews which have appeared in computer magazines.

### 5. *PC Clearinghouse Software Directory, 7th Edition.*

PC Clearinghouse, Inc. Publishers., 11781 Lee Jackson Highway, Fairfax, Virginia 22033. \$29.95. 816 pages.

Software is categorized by application. The directory lists over 21,000 software packages for over 200 microcomputers from more than 2,900 vendors. Contains an educational section and a specialized applications section that may be of interest to educators. No descriptions are included in this very comprehensive listing of software.

### 6. *LIST: The Software Resource Book for Personal Computer Users, Spring 1983.*

Redgate Publishing Company, 3407 Ocean Drive, Vero Beach, Florida 32960. \$12.50. 400 pages.

Contains articles of general interest and software listings. Some software listings include descriptions. Although most listings are for business and industry, it does have an education section.

### 7. *Classroom Computer News 1983 Directory of Educational Computing Resources.*

1983 Directory, 341 Mt. Auburn St., Watertown, MA 02172. \$14.95. 199 pages.

Although this directory does not list specific software, it does list and describe many resources which may help you in your search for information leading to specific software packages. Information includes names of associations, networks, periodicals, books, and regional laboratories, as well as a calendar of events for the year.

## EVALUATING SOFTWARE

Once software has been located, it must be examined to see if it really does what you want. This can be determined by running the program several times to see if it accomplishes the intended purpose efficiently, accurately, easily, and quickly. The evaluation forms I've used in workshops and classes are included at the end of this section. The single-page format, which participants liked, is a compromise between brevity and comprehensiveness. This section de-

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scribes the procedure I use when evaluating software.

### 1. Package Familiarization.

Look at the manual or whatever materials accompany the program to get an overall idea of how it has been organized and what the package is supposed to accomplish. The clarity of writing and overall organization may be an indication of the quality of the program. Read the tutorial if one has been included.

If this is an administrative package, that is, one that is used by the educator rather than the student, the program may be more complicated to use, and the manual will contain more information. Is this information easy to find? Is there a reference section, quick-reference card, a comprehensive index and useful table of contents? Tabbed chapters are very helpful when trying to locate a section quickly.

If this is an instructional package, that is, one that students use, does it contain suggestions for using the package and incorporating it into the curriculum? Does it include activities to use before and after the program? Are there additional student materials, such as worksheets, which will extend the usefulness of the package. If there is extensive reading associated with the package, is this produced in hardcopy rather than displayed on the screen?

### 2. Program Familiarization.

Run the program correctly as many times as is needed to become familiar with it and to answer these questions: Does it do what you want? Is it useful to you? Is it appropriate for your intended audience? Is it easy to use? Does it do something more efficiently and effectively than some other way? If the program stores and retrieves information to and from disk, does it take a long time to search and locate information and/or does it access the disk frequently? Does the amount of time used for this activity seem excessive? Are screen displays informative, uncluttered, easy to read?

Are keystrokes kept to a minimum? Are program parts well organized? Is the program menu-driven, that is, is a list of choices displayed from which you choose your next step?

If this is an instructional program, does it have educational value? Are concepts, content, reading level, character size, screen display, pacing, time required for a single lesson, graphics, color, sound or lack thereof appropriate for the students who will use it? Is the use of the entire package in keeping with the district's microcomputer policy?

### 3. Check for Bugs.

Run the program and deliberately press wrong keys. Does the program crash or continue when inappropriate keys are pressed? Or does it ignore inappropriate key responses and continue only when appropriate keys have been pressed?

### 4. Check for Accuracy.

Run all possible combinations of the program to check for accuracy and additional program bugs. If the program is at all complex, this will take time, since the program must be run over and over until all possible avenues have been explored.

### 5. Let the Intended User Try It Out.

If possible, let those who will use the program try it out. Do they think it is easy to use and is useful? Do they like to use it? If you have questions about the package, do they have the same ones?

### 6. Check Against Reality.

If this package will be useful to you, is it within the allocated budget? Can you use it with your existing system? Would another package which is more/less powerful or is more/less expensive serve you and the district better?

When these questions are answered to your satisfaction, the purchasing decision should be made. Good hunting!□



# SOFTWARE EVALUATION FORM: INSTRUCTIONAL

Name of package \_\_\_\_\_

Company \_\_\_\_\_ Price \_\_\_\_\_

Type of program \_\_\_\_\_ Subject/grade \_\_\_\_\_

Necessary peripherals \_\_\_\_\_

## DOCUMENTATION

Clarity of writing \_\_\_\_\_ Extra materials \_\_\_\_\_

Other comments \_\_\_\_\_

## PROGRAM

Program bugs \_\_\_\_\_ Accuracy \_\_\_\_\_ Ease of use \_\_\_\_\_

Time for: Single lesson \_\_\_\_\_ Package \_\_\_\_\_

Speed of presentation/difficulty level controlled by \_\_\_\_\_

Appropriate for grade level: Concepts \_\_\_\_\_ Content \_\_\_\_\_

Time \_\_\_\_\_ Sound \_\_\_\_\_ Graphics \_\_\_\_\_ Color \_\_\_\_\_

Other comments \_\_\_\_\_

## EVALUATION

Educational value \_\_\_\_\_

Students like to use it \_\_\_\_\_

Best feature \_\_\_\_\_

Worst feature \_\_\_\_\_

Does something that can't be done another way \_\_\_\_\_

Worth the cost \_\_\_\_\_ Recommend purchase \_\_\_\_\_

Other comments \_\_\_\_\_

# SOFTWARE EVALUATION FORM: ADMINISTRATIVE

Name of package \_\_\_\_\_

Company \_\_\_\_\_ Price \_\_\_\_\_

Purpose \_\_\_\_\_

Necessary peripherals \_\_\_\_\_

## DOCUMENTATION

Clarity of writing \_\_\_\_\_ Ease of use \_\_\_\_\_

Reference section/card \_\_\_\_\_ Index \_\_\_\_\_

Tabbed chapters \_\_\_\_\_ Tutorial \_\_\_\_\_

Other comments \_\_\_\_\_

## PROGRAM

Appropriate for \_\_\_\_\_ Menu-driven \_\_\_\_\_

Program bugs \_\_\_\_\_ Accuracy \_\_\_\_\_

Ease of use \_\_\_\_\_ Complexity \_\_\_\_\_

Keystroke sequences \_\_\_\_\_ Display format \_\_\_\_\_

Load/search time/frequency \_\_\_\_\_

Other comments \_\_\_\_\_

## EVALUATION

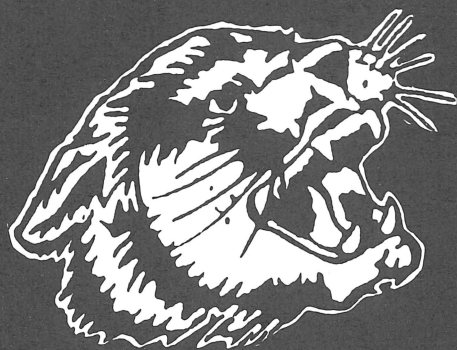
Usefulness \_\_\_\_\_ Like to use it \_\_\_\_\_

Best feature \_\_\_\_\_

Worst feature \_\_\_\_\_

Worth the cost \_\_\_\_\_ Recommend purchase \_\_\_\_\_

Other comments \_\_\_\_\_



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# AN EDUCATIONAL CHALLENGE FOR SOFTWARE

## A Teacher's Viewpoint

*by Elma Ewing*

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Computers are a part of our future and not a fad to be neglected. In realization of this fact, educational institutions all over the country are purchasing computer equipment, with the belief that it will not only help to educate the children, but that computer familiarity and use is a very important skill which needs to be developed. Some are using school funds, others, without funds available, are using Fund Raisers to purchase what is needed—but all are finding some way to provide their students with access to a computer, even though in most cases, it is a very limited access.

Purchasing a computer system is only the first step towards using computers in education. The most important step is the selection and purchase of sufficient good quality software with enough variety to be useful to as many students as possible.

Educators must look for software which will support the curriculum of their particular school and will promote learning for the intended group of users. Three general categories of educational software are now being offered. Among these are the **Tutorial Programs**, which concentrate

on teaching the user new material. In another category are the **Simulation Programs**, which allow the user to change various conditions in the program, in order to see the effect different decisions have on the outcome. The third category contains the **Reinforcing Programs**, which simply provide drill and practice on material which has already been taught.

The type of software a school decides to purchase will depend on the selected target area of each school. The school may be concentrating on using the computer and their software selections for enriching the regular curriculum, for reinforcing skills which have already been taught, or possibly to help teach problem-solving techniques.

The software must also serve a wide range of students in the best possible manner. The price of software today, combined with the lack of available funds for schools to purchase more than a few pieces of software, poses another problem.

The amount of available software has not only increased tremendously in the last year, but there is more educationally sound software than

ever before. One of the problems, which has been disastrous to some extent, is the lack of an opportunity to preview software before purchasing.

Up to this point, companies have concentrated on soliciting their particular hardware, and have not overly concerned themselves with the promotion of acceptable software. This situation has led to a type of blind purchasing. Materials are needed and there has not been sufficient help in choosing the proper software. Some software purchased this way is extremely good quality, but the risk is great because other purchased software has no real educational value and is not suitable for the intended users.

Some companies are now allowing schools to order on approval. Other companies are making preview disks available. This will help insure the schools are spending their money on good usable software.

The decision as to which software should be purchased is not one to be made without careful thought. It is important that the software being bought stimulates the students' interest and enhances the learning in-

tended by the program, as well as developing some computer familiarity.

The most important challenge facing educators today is the one of how to maintain children's interest in computers. This will require more than just a few good software programs. The very best software programs have a limited life, as far as children are concerned. Very quickly, the children become bored with doing the same thing over and over, and demand something new and different be provided for them.

It is impossible to provide students with an unlimited amount and variety of programs. The problem which has to be faced now is how to obtain sufficient software in order to assure continued interest in computers and computer programs.

Once purchased, the software must of necessity be used over and over and over. This will cause the users to turn off to the learning situation very quickly.

One possible solution to the dilemma would be a type of rental system which would allow the schools to use software for a certain time period, and then to be able to exchange the software for other programs. Needless to say, the ease with which most programs are copied makes this idea impractical.

Another possible solution is to have all of the schools in a district set up an exchange system. By using a continually rotating type of system, the programs which had been used in one school for a specified time period could then be sent onto the next school. In this way, all of the involved schools would receive the benefits of a much larger variety of software for their students. The more schools involved in this type of exchange, the more software to help hold the interest of the student without the tremendous expense to each school. One difficulty involved here is that different schools require

totally different types of software. The software needed will depend upon the target area of each individual school.

Another solution which presents itself is to teach programming to the apt student. Teaching the student enough basic programming to enable him to develop some of his own programs would help to maintain an interest not only in learning new material, but would also aid in developing some programming skills.

One way this could be accomplished is by presenting the students with software which provides various outlines to use in developing their own programs. These outlines could include all three types of educational programs.

The outlines should be ones that the user would be able to use certain line numbers and set up his own questions and answers for the program. Any amount of reinforcement and displays could be included in the outline, ready for the beginning programmer to either use or not use, depending upon his choice.

A method such as this would allow the students a continuous type of program to be used for any subject. The material programmed in this fashion would fit the needs of the classroom curriculum better than most software programs do now.

The student doing this type of programming would not only need to know the material, but would not forget it too readily after setting up a program. As classmates use this type of program, they in turn would be motivated to try to develop their own program, while the one who did the programming would receive self-recognition for his efforts. An unspoken challenge would exist: to make a program more fun than the ones written by peers.

This type of general software would permit each school to develop its own curriculum-oriented programs, as well as helping to maintain

the interest of the learners. This style of software programs would probably not hurt the overall software sales. Even with something like this available, schools would still have need of other types of software. The main thing needed is the variety, and part of this can be solved by building areas of adaptability into the software.

Educators and parents cannot afford to squelch the learning opportunities which have been made available by the mass production of microcomputers. The computer is a dynamic educational tool. The interest is there now, and it will be up to everyone involved with computers to help maintain this interest by doing whatever is necessary to stimulate further interest, rather than allowing boredom to develop. Above all, we do not want our students to become disinterested, or turned off to this tremendous teaching tool!□

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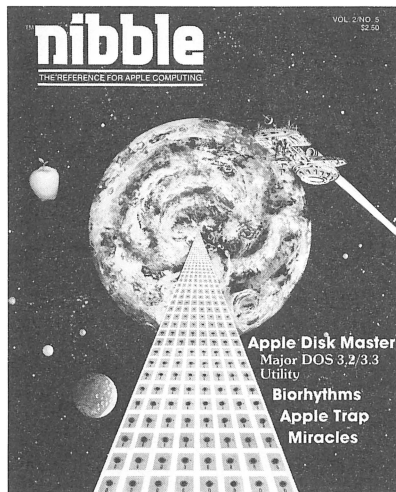
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# PRISM READING 2

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*The Psychological Corporation*  
757 Third Avenue  
New York, NY 10017  
212-888-3145

\$395.00

Rating: *B*

Reviewed by *Sandy Abernathy*

## INTRODUCTION

Prism Reading 2 is a package designed to provide practice for secondary and adult basic education students who are working on basic reading competencies. The package consists of 25 student workbooks, a manual (The Planner), one program diskette, and 11 data diskettes on which are stored over 1800 multiple choice questions. Additional student workbooks can be purchased in sets of five for \$25.00. The package is available for the Apple II, II+, and the TRS-80 Model III with 48K. The Apple II Plus version was used for this review.

The purpose of the computerized portion of the package is to provide a data base from which questions can be drawn to produce student materials. The teacher selects reading skills, competency tasks (reading passages), and number of questions, and the program randomly selects specific questions and prints them. Question sets can be used for practice or assessment. Two worksheets, selected from the same combination of categories, may contain some of the same questions but should not be identical.

This package is not designed to give students time on the computer. Instead, the computer is used to store, retrieve, and print selected questions. Because the program will randomly select questions and print worksheets pertinent to specific reading skills, the teacher can provide students with more individualized materials.

## PRINTED MATERIALS

The student workbook is designed to be used by students preparing to take the reading portion of a basic skills competency test. No "cute" pictures or other off-task additions have been included, nor does the material talk down to the reader.

There are two sections. The first is a set of 14 lessons, one for each reading skill. A lesson includes a definition of the reading skill, a self check, a more detailed explanation of the skill, and three reading passages, each with a set of multiple choice questions. Answers are included in the back of the workbook. The reading passages include one competency task passage and one excerpt from a literary work. The third passage may be another competency task or some type of recreational reading. This section provides the student with a wider variety of reading material than may be found on a competency test.

The second section contains 20 reading competency task passages. These are used to answer questions selected by the computer program. A list of reading skills and competency tasks is included at the end of the review.

The Planner is a standard-size

loose-leaf notebook which describes the program's rationale, suggests ways to use the package, gives directions for using this software, and houses the diskettes. The section on computer use can be read and understood by a beginning computer user. A tutorial has been included as well. Since the program is so easy to operate, this information will probably be used only a few times. However, it is helpful for those facing a computer the first time. A chart showing the number of questions for each basic reading skill by each reading competency task is included in The Planner. Although the program displays the number of possible questions for each question set requested, this chart should be very helpful for planning purposes.

In addition to the information about Prism Reading 2, The Planner also contains information about Classroom Management System, a student record program that can be used with Prism materials. The diskette can be purchased for an additional \$45.00. Since it was not included in the package, it was not reviewed.

## PROGRAM

The menu-driven program is simple to use and relatively short. It displays a question, asks the user to reply, and continues on to the next part. Screen displays contain necessary information and are easy to read. The program appears to be free of errors. If inappropriate answers are given, the program will not accept them. The user can select one, two, or three reading skills and reading competency tasks for each printout.

When the user is through entering information, the screen displays the selected choices and asks if the information is correct. At this point the user can change the information or begin the printing process which includes printing the answer sheet and the requested number of question sets.

If the user understands how material is retrieved, that is, combining specific reading tasks with specific competency tasks to produce questions, this part of the program poses no problem. The data bank has been arranged so that questions from specific category combinations are located on specific diskettes. Each diskette is marked clearly so the user knows which diskette contains which category combinations. Because of this arrangement, the user does not have to wait for long periods of time while the computer searches for particular data.

Printouts are nicely formatted as far as questions and introductory information is concerned. At the top, space is provided for the student's name, the class, and the date. The name of the reading competency task is used for the title of the sheet. Including the competency task's workbook page number might help the student locate the passage more quickly. Questions are printed with the four possible answers indented and listed underneath. As long as only four questions are requested, the page format looks fine. If, however, the user requests more than four questions, the printer will continue to print questions continuously with no page breaks. The Planner explains this lack of page formatting by stating that different printers use different commands and that if the user wishes page formatting (page breaks, margins, etc.), he should consult his printer manual for correct printer commands. For such a friendly program, this part is downright unfriendly and may be a source of frustration for some potential users. The teach-

er, aide, secretary, or other person pressed into printing out worksheets may not have the time, inclination, or knowledge to dig through a printer manual to discover how to set up page formats. Even if the person is interested enough to go to the trouble, the printer manual may not be available. A computer program designed to be used with a printer should include options to format printed copy. In order to produce a decent printout with this program, the user must limit the number of questions to four. This means that printing multi-page worksheets for a single student will be time consuming and tedious—but can be done.

## USEFULNESS

This data management package produces individualized instructional materials for student use. It can be a real help to the teacher who is already doing this by hand. Because less time is required to produce computerized materials, other teachers may also be encouraged to try individualizing materials.

Since the program is designed to produce instructional materials rather than to give students time on the computer, computer use is not limited to particular times or places. Materials can be produced at the convenience of school personnel. The program is well designed as far as it goes. It provides the teacher with a powerful tool to aid in the preparation of individualized instructional reading materials. If printer options for setting margins, page breaks, etc. were included in the program, the usefulness of this product would be enhanced tremendously.

This type of computer application, that is, management of information, is one very efficient way to use computers in an educational setting. Individualized materials can be produced in much less time by computer than by hand. The time savings inherent in this type of program has the potential to encourage more teachers to individualize learning

materials for their students and, ultimately, to improve the quality of education. However, as with any educational material, organization of material is secondary to content. No matter how the material is organized, if the content is inappropriate or of poor quality, the package will be of little value to the student. As more computerized information management packages are made available in the area of instruction, educators must view them in the same way they view other educational material. If the quality level of the program warrants further consideration, then the ability of the program to store, manipulate, retrieve and print selected information quickly and conveniently can become a factor in the purchasing process.

## SUMMARY

Prism Reading 2 provides practice in basic reading skills for high-school and adult basic-education students preparing for a basic reading competency examination. The workbook material and items stored on diskettes are businesslike and adult oriented. Over 1800 questions are categorized and stored on 11 data diskettes. Question sets are retrieved by selecting reading skills, competency tasks, and number of questions desired. The package helps the teacher prepare individualized reading materials for his or her students. The program is very easy to use and produces a nice printout if no more than four questions are requested for each worksheet. Because printer options have not been included in the program, it is more cumbersome to use than it should be. If you are looking for this type of package, and if the lack of printer options does not deter you, check the list of reading skills, competency tasks and sample questions to see if this one might be useful for your students.

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## READING SKILLS

Reading for Facts  
Recognizing Topics  
Finding Main and Subordinate Ideas  
Finding Examples  
Following Instructions  
Using Basic Function Words  
Analyzing Word Meanings  
Using Context Clues  
Finding Relevant Information  
Drawing Conclusions  
Identifying Cause and Effect  
Making Comparisons  
Detecting Point of View  
Using Reference Materials

## COMPETENCY TASKS

First Aid Booklet	Recipe
Labels and Advertisements	Insurance Policies
Tax Form 1040A	Employment Application
Newspaper Article	Dictionary
Business Letter	Social Security Number
Mail Order Catalog	Application
Help Wanted	Area Map
Advertisement	Resume
Magazine Article	Charge Account
Airline Schedule	Application
Telephone Directory	Bus Route Map and
Warranty	Schedule

## EXAMPLES OF COMPUTERIZED QUESTIONS

**Reading Skill: Using Basic Function Words**

**Competency Task: Business Letter**

1. IN THE SECOND SENTENCE OF LETTER 1, IF "THROUGH" WERE CHANGED TO "FOR", "FOR" WOULD MEAN:

- A. ON BEHALF OF.
- B. BECAUSE.
- C. IN FAVOR OF.
- D. INSTEAD OF.

**Reading Skill: Using Context Clues**

**Competency Task: Newspaper Article**

2. AS USED IN THE SECOND SENTENCE OF THE FIRST PARAGRAPH, "MERELY" MEANS:

- A. ONLY.
- B. SIMPLY.

- C. PLAINLY.
- D. PURELY.

**Reading Skill: Drawing Conclusions**

**Competency Task: Employment Application**

3. YOU CAN CONCLUDE FROM THIS APPLICATION FORM THAT THE EMPLOYER IS INTERESTED IN THE APPLICANT'S:

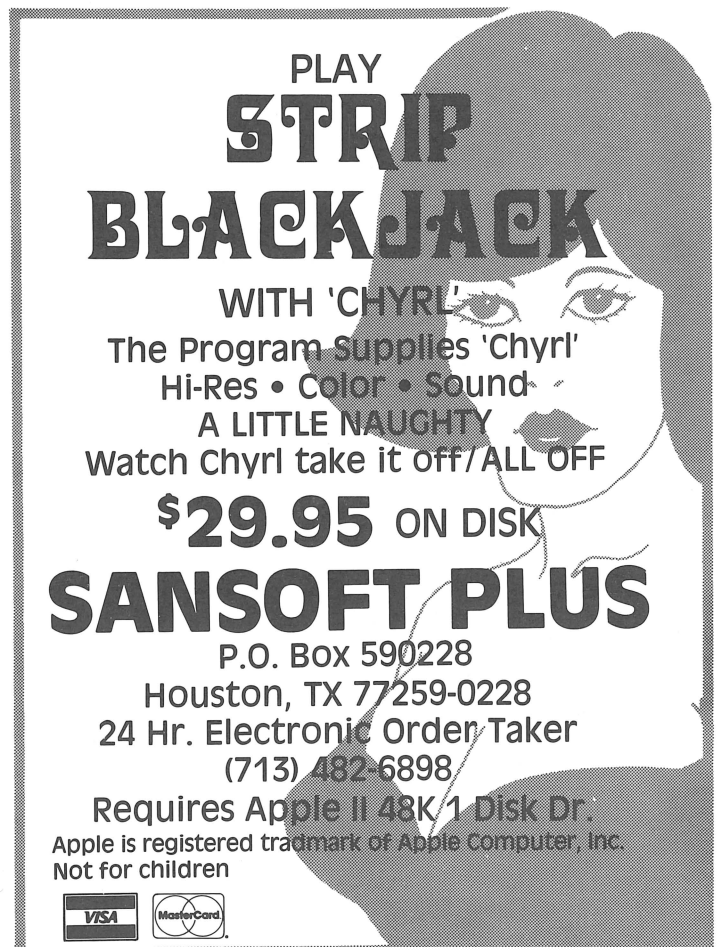
- A. TRAINING AND SKILLS.
- B. TYPING SKILLS.
- C. ABILITY TO TAKE SHORTHAND.
- D. PHYSICAL STRENGTH.

**Reading Skill: Finding Relevant Information**

**Competency Task: Application for Social Security Number**

4. WHEN ARE ITEMS 10B THROUGH E RELEVANT TO THE APPLICANT?

- A. WHEN THE ANSWER TO 10A IS "YES".
- B. WHEN THE ANSWER TO 10A IS "NO".
- C. WHEN THE ANSWER TO 10A IS "DON'T KNOW".
- D. THEY ARE NOT RELEVANT TO THE APPLICANT. ☐



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# WORDRACE

---

*Don't Ask Computer Software*  
2265 Westwood Blvd. B-150  
Los Angeles, CA 90064  
213-397-8811

\$24.95

Rating: C

Reviewed by Larry Ross

## INTRODUCTION

Wordrace is an educational game for one to four players which requires the user to find the correct definition of a word from six possible choices. The brochure claims that children from 9 to 14 through adulthood may use the game.

## DOCUMENTATION

The documentation is quite complete. A small pamphlet accompanies the program, detailing each step of its operation. The mechanics of operating the game is quite simple, therefore the documentation provided is sufficient.

## THE PROGRAM

Wordrace allows the user to choose three levels at which to play the game. These are: BEGINNER'S WORDRACE, which is recommended for ages 9 to 14; REGULAR WORDRACE, which is recommended for high-school students and above; and CHALLENGE WORDRACE, which consists of words that are not well known.

Each level is played the same way. One to four players may play each game. The number of words desired is established first. This may be any number less than 1000.

The next step is to play the game. A vocabulary word is displayed along with six definitions. The player must choose the correct definition in order to receive points for guessing correctly. The player plays against a counter, rapidly decreases the number of points possible for a correct answer. An incorrect answer results in a loss of points. The player with the most points wins the game.

## EVALUATION

The basic concept of this game is a good one. Any game which en-

courages the player to increase his/her vocabulary commands immediate applause. However, Wordrace has some obvious flaws.

The first problem is that the game is visually unappealing. It is set up to visually approximate business software, not an educational game. The inclusion of graphics would greatly improve the appeal of this game, especially to young users.

The program is copy protected. This is convenient for the publishers who plan future word lists to accompany Wordrace, but it is inconvenient for the user who wants to create lists of words and definitions. The creation of individual word lists is particularly important because the BEGINNER'S list has such a wide age range. Therefore, this list does not really meet the needs of children from ages 9 to 14.

Finally, there are too many definitions from which to choose. The program includes six definitions for each word. There are simply too many choices. Three definitions would have been adequate, giving the user a real opportunity to learn the meaning of the vocabulary words.□

## Don't Ask Computer Software Responds

*We found your evaluation of the product to fair; however, we would like to respond to one of the criticisms. The reviewer seemed to feel that the six choices for definitions seemed to be too many. The choice to use six rather than three was deliberate in order for the game to continue to be challenging rather than easy and predictable and also so that the game would be enjoyable for adults.*

*Also, Wordrace is now available for the Apple series, Atari and the Commodore 64 computers. And, it's been bundled with Claim to Fame and Sports Derby. Claim to Fame and Sports Derby follow the same play-style as Wordrace. Claim to Fame challenges players to recognize famous people in history and match them with their claims to fame. In sports Derby the object is to match famous and not-*

*so-famous athletes with what they achieved. This game is a real stumper that separates the sports trivia experts from the also-rans. The Wordrace gamepack retails for \$34.95.*

*Sincerely,*

*Patti Payne  
Sales Manager*

---

# ARCADEMIC SKILL BUILDERS IN MATH

---

*Jerry Chaffin & Bill Maxwell*  
*Developmental Learning Materials*  
*One DLM Park*  
*Allen, Texas 75002*  
*800-527-4748*

*\$39.00 per program*

*Rating: A*

*Reviewed by Larry Ross*

## INTRODUCTION

Arcademic Skill Builders In Math is an educational program package that includes six arcade-like games which focus on reinforcing fundamental math facts. Each program may be purchased separately, although Developmental Learning Materials (DLM) suggests purchasing the complete package at a reduced price. The programs are recommended by DLM for kindergarten to the fourth grade for regular education and for kindergarten to the twelfth grade for special education.

## DOCUMENTATION

The documentation is extremely complete and well organized. A "Diskette Instruction Sheet" is included in the vinyl diskette case. A detailed but concise explanation is offered for operating the program. This small instruction sheet is included in each program, since the essentials for each of the Arcademic Skill

Builders In Math are the same. In addition to this, a teacher's manual is also included with each diskette. The manual discusses the rationale, purpose, and components of the entire program, as well as giving detailed directions for the use of the complete package.

## THE PROGRAM

The complete Arcademic Skill Builders In Math package consists of six arcade-like math fact programs. Included with each program is a Diskette Instruction sheet, Teacher's Manual, and a deck of 52 flashcards. Also included is a Student Record Sheet, Progress Chart, Strategies for Improvement sheet, and nine Worksheets which contain practice problems. All of these sheets are intended to be reproduced.

Each program operates with the same principles in mind; therefore, it is only the game format and the mathematical content of each game that differ.

Each game contains a game option page which is accessed by typing "CTRL-P". This screen display allows each game to be tailored to the ability of the user.

The options change when the computer is booted once again. The game option page need not be accessed each time the program is used because DLM has set the options at what it considers to be "average". These options appear on the screen as the option page is chosen.

The first option is the Skill Level.

This allows the speed of the game to be adjusted. The 1 to 9 range, 1 being the slowest, allows a wide variety of speeds. The skill level is set at 7.

The second option is the Problem Range. There are three groupings within this option. Problems may be generated using either numbers from 0 to 3, 0 to 6, or 0 to 9. The numbers used refer to those numerals used in the math problem in some games and to the answers in others. The Problem Range is set at "0 to 9".

The third option is the Run Time. This option allows the user to choose to run the game from one to five minutes. DLM recommends two minutes as being the ideal running time. The Run Time is set at two minutes.

The fourth option is Paddle Control. In a game operated using the keyboard, the player must type in the answers to problems displayed on the screen and then perform the required action as directed in the game instructions. If the game paddle option is chosen, the answers are displayed and the user must find the corresponding problem and take the same action as required in the keyboard version of the game. The default on this option is the keyboard version.

The six game programs provide practice in addition, subtraction, multiplication, and division facts.

ALIEN ADDITION allows the user to practice addition facts in an "alien invasion" theme. Alien spaceships containing addition problems move



down from the top of the screen to a laser cannon positioned on a platform at the bottom. Answers are placed in the laser cannon to disable the approaching spaceships with the correct answer. A spaceship allowed to reach the cannon will eradicate it with an atomic cloud.

MINUS MISSION gives the user an opportunity to practice subtraction facts in a "creeping slime" theme. A large green slime at the top of the screen drips blobs of slime containing subtraction problems toward a robot at the bottom of the screen. The answers are placed in the robot who has the power to fire two laser beams at the slime problems. The object of the game is to destroy the slime subtraction problems before they reach the robot, disintegrating him into a cloud of dust.

METEOR MULTIPLICATION affords the user an opportunity to practice the multiplication of numbers

from 0 to 9 in a meteor shower format. Meteors containing multiplication problems surround a star station, gradually moving towards it. The object of the game is to destroy the meteors with the station gun before they reach the star station. If a meteor hits the star station, an explosion occurs, destroying the station and generating the next game.

DEMOLITION DIVISION gives the player an opportunity to practice division problems with answers from 0 to 9 in a wargame format. Tanks moving from the left side of the screen with problems fire at guns which are behind walls on the right side of the screen. Answers to the problems are placed beside the guns. If a tank shoots down the protective wall, it can then destroy the gun. The object of the game is to use the "answer" gun to destroy the "problem" tank.

ALLIGATOR MIX gives the user a chance to practice adding and subtracting numbers 0 through 9. The game takes place in a swamp. Alligators appear one at a time. Addition and subtraction problems appear in apples which are approaching the alligator. If the correct answer is in the alligator's stomach the player opens the gator's mouth and he eats the problem. If the problem doesn't match the answer, the player keeps the alligator's mouth closed. The object of the game is to make all five alligators appear on the screen.

DRAGON MIX provides practice in both multiplication of numbers 0 through 9 and division of numbers with answers 0 through 9. A dragon is defending a city from various invading spacecrafts armed with either a multiplication or division problem. The dragon has the answer in his stomach. The object of the game is to direct the dragon's fire on the invading spacecraft and destroy it. If any spacecraft is able to get past the dragon, it will enter the city and explode.

## EVALUATION

The Arcademic Skill Builder In

Math series is a very well integrated package. While DLM encourages the consumer to purchase the entire six programs, each program is able to perform very well on its own.

Each program has exceptional high-resolution graphics and good sound effects, both of which contribute to the effectiveness of simulating an arcade-like game. While the sound adds to the effectiveness of the arcade simulation, it can prove somewhat annoying in certain classroom situations. DLM does not offer an "on-off" sound option on its option page. The ability to delete the sound is offered in their language series, however.

The overall design of each program allows for motivation to learn the math facts presented in the programs. The arcade format immediately attracts the attention of children. The same concept which gets children "hooked" on arcade games, in this situation gets them hooked on learning.

The internal structure of the games limits frustration, yet provides the correct challenge when children are ready for it. The ability to vary the skill level and the problem range allows a child to grow with the program, as does the ability to use the keyboard or game paddles.

DLM's lack of attaching a grade level or age equivalent to the programs allows practicing math facts to appeal to a wide range of children. Thus, the Arcademic Skill Builder In Math series is a very flexible package. The complete package design is very professional. The accompanying materials discussed earlier add a professional quality to the programs which allow them to be integrated into a school curriculum if the need arises.

The use of these materials in the home is equally effective. The parent is able to control the same factors as the teacher.

Arcade games turn kids on. DLM is helping to turn them on to learning math facts. □

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# WORD SCRAMBLER AND SPELLING TUTOR

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Avant-Garde Creations  
P.O. Box 30160  
Eugene, OR 97403  
503-345-3043

\$19.95

Rating: C

Reviewed by Larry Ross

## INTRODUCTION

According to the directions, Word Scrambler and Spelling Tutor is a program that is designed to teach spelling. It might be more accurate to say that it helps one improve his ability to remember the correct spelling of words. The user is given practice in unscrambling words that are flashed on the screen, and duplicating the correct spelling of words that were previously flashed on the screen.

## DOCUMENTATION

Written documentation in the form of a pamphlet is nonexistent for this program. There is, however, an adequate direction passage which is part of the program itself. It will take the user some time experimenting with the part of the program that allows you to create your own lists, if the user has no previous experience with a computer. This, however, is not a serious obstacle to using the program correctly.

## THE PROGRAM

The program begins with a 30-second visual demonstration of

the name of the disk being unscrambled before your very eyes. Although the directions give no indication, this part of the program can be omitted by pressing CTRL-C.

There are two modes of operation. One mode only flashes the spelling words on the screen. The user chooses how long each word will appear on the screen. The second mode combines the flashing of the spelling word on the screen with a word to unscramble. The user sets the length of time both the scrambled word and the spelling word will appear on the screen. The word scramble gives you three tries, keeping track of and displaying incorrectly guessed words.

The disk comes with three word lists: **Grades 0-3** which contains 255 words with two to four letters in each word. **Grades 4-8** which contains 300 words with four to eight letters each. **For The Experts** which contains 200 words with five to fourteen letters each. The disk also allows the user to create his own lists. There is plenty of room for numerous lists.

## EVALUATION

This program is a good value for the money. It can be used at any grade level, but operation at grades 1-2 would, in most cases, require an adult or older child to help in the operation. This would mainly be necessary in starting the program, but would continue if the child were unable to read the prompts. Children in grades three and above could use the program independently after initial instruction on its use was given.

The program does have some drawbacks. For one thing, there are no graphics. This tends to cause the younger child to lose interest quickly. Second, the two graded lists—Grades 0-3 and 4-8—are not appropriately graded. There is too wide a variety in word difficulty within each list.

The main difficulty with the lists provided, however, is that they are too long—255 words for Grades 0-3 and 300 words for Grades 4-8. The game continues until each list is completed. The user can terminate the game at any time and find out his score throughout each game, but still, an immediate reward is lacking. The addition of graphics would have improved this point tremendously. The disk is still very useful, however, for the teacher, parent, or adult user to create tailor made lists.□

## IN UPCOMING ISSUES:

#8

**Data Base Management  
(Part 1)  
& Home Entertainment**

#9

**Data Base Management  
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Dictaphone Dual Disp.	dedicated word processor*	\$13,500	85¼
<b>PIE:Writer:</b>	<b>Apple II, IBM PC</b>	<b>\$149.95 \$199.95</b>	<b>84¼</b>
A.B. Dick Magna SL	dedicated word processor*	\$14,500	83
Write	CP/M†	\$400	82¼

\*Includes word processing hardware & multistation support.

†Requires additional CP/M Hardware for your personal computer (\$200-600 extra)

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# JUGGLES' RAINBOW

---

*The Learning Co.*  
545 Middlefield Rd.  
Menlo Park, CA 94025  
415-328-5410

\$29.95

Rating: *B*

*Reviewed by Larry Ross*

## INTRODUCTION

Juggles' Rainbow is an educational program for children ages three to six which teaches the concepts of "above, below, left, and right". The program is almost entirely visual, and the manufacturers call the three major parts of the program "games". It would be more accurate to call them exercises in low-resolution graphics.

## DOCUMENTATION

The documentation is complete. There is a small pamphlet detailing the various steps in the program. In addition to this, the program itself has an instruction section.

## THE PROGRAM

The program is designed for young children, and the menu is an excellent example of this. The user is greeted with a pictorial menu which allows four choices: three instructional exercises and one informational mode designed for adults.

The first exercise teaches the concept of above and below. In order to successfully do this exercise, a blue strip of tagboard, which is included,

must be placed on the "home row" of the keyboard. This part of the program consists of several steps, each of which stresses the concepts of above and below. The final step is constructing a rainbow. Parts of the rainbow are added gradually, as the concepts of above and below are stressed throughout the exercise.

The second exercise teaches the concepts of left and right. In order to do this exercise, the short blue strip of tagboard, which is also included, must be placed vertically on the keyboard dividing it in half. A butterfly is the central theme of this activity, and the child, after developing the concepts of left and right, constructs a butterfly as the final step in this exercise.

The third exercise combines the concepts of above and below, as well as left and right. This is a much more difficult principle. "Above left, above right, below left, and below right" are graphically illustrated in this activity. In order to do this exercise, both the horizontal and vertical strips of paper must be inserted over the appropriate keys. The final part of this exercise is the construction of a windmill.

The fourth choice in the pictorial menu is a low-resolution question mark. When this is chosen, the adult is able to flip to a "Choice Page" or a "Table of Contents".

The "Choice Page" allows the adult to receive instructions, include or eliminate picture clues in some of the exercises, or turn the music on or off.

The "Table of Contents" gives further directions on setting up the

keyboard, some special keys used in the operation of the program, and some special choices which can be made in the operation of the program.

## EVALUATION

The basic concepts taught in this program are very good. Above and below are important concepts for children to learn. Left and right are concepts which take much more time to learn and are often quite difficult for many children. The combining of the four concepts is a further step in their total understanding.

The low-resolution graphics displays are very appealing, and the addition of music makes the exercises even more enjoyable. The fact that the music can be turned on and off is another desirable feature, as is the ability to include or omit picture clues in each activity.

The child is required to do some reading in the program. In addition, the blue strips must be changed for each of the three exercises. Therefore, an adult or older child should be in attendance to help the young player with these possible frustrations.

The concepts covered in Juggles' Rainbow are definitely appropriate for children ages three to six; however, it should be noted that all children will not be ready for the entire presentation. Mastering left and right awareness is difficult for many young children. Thus, each concept should be introduced as the child demonstrates a readiness for it.□

---

# CAREER DIRECTIONS

---

by Steve Hyre  
Systems Design Associates, Inc.  
Suite 403, Union Building  
723 Kanawha Boulevard, East  
Charleston, West Virginia 25301  
304-342-0769

\$59.95

Rating AA

Reviewed by Sandy Abernathy

## INTRODUCTION

Career Directions is a software package which will lead the user through a systematic decision making process. Upon completion, the user will have explored (1) personal interests and abilities, (2) related occupations, and (3) requirements for selecting a training institution or strategies for initiating a job search.

The package includes two diskettes and a manual and requires one disk drive. If a second disk drive is available, it will make running the program much easier. If a printer is available, nicely formatted reports may be printed.

## MANUAL

The 32-page manual provides easy-to-follow directions and many sample screens to help the first-time user become familiar with the program. The manual is careful to point out that the program does not make career decisions for individuals, but only retrieves information based on the information submitted by the

user. The quality of information presented is directly related to the quality of information entered by the user. The 460 occupational titles included in the data base are listed at the end of the manual. They are a representative sample of occupations found in business and industry and are not meant to be all-inclusive. Although the manual does not state exactly how user information is analyzed to produce possible careers, the manual does state "the analysis of relevant occupational choices is based on a standard classifications system used in many businesses and by the United States Department of Labor".

## PROGRAM

The program is extremely easy to run, and it could be used without reading the manual if underlying concepts are understood. Clear directions and explanations are found throughout. The program is menu-driven and few keystrokes are necessary.

The program has two primary menus. From the Main Menu the user may go to (1) Career Assessment, (2) Career Analysis, (3) Career Exploration, or (4) Career Planning. Because of the complexity of the Career Assessment section, it has its own menu to allow the user to go to (a) Types of Work, (b) Work Activities, (c) School Subjects, (d) Work Situations, or (e) Learning Abilities, Physical Requirements, and Education and Training.

The section Types of Work consists of 12 categories such as Artistic, Scientific, Mechanical, Industrial,

Services, etc. The user is shown the category name and examples of this type of work which ordinarily include a range of activities from those requiring little or no training to those requiring considerable training. For example, the Mechanical category lists the following as mechanical activities:

- Design electrical equipment
- Direct construction of buildings
- Survey land to determine boundaries
- Pilot a commercial aircraft
- Operate a duplicating or copying machine
- Drive a tractor-trailer truck

In the Work Activities section, the user is given two activities such as Working With People vs. Working With Things, or Routine Tasks vs. Constantly Changing Tasks, and asked to choose one activity over the other. If the user does not like either activity, he may indicate this as well. The School Subjects section allows the user to indicate which of 12 school subjects he likes. Work Situations are somewhat similar to Work Activities, but further delineate the user's interests. Here the user is presented with a single situation and asked if he would or would not like to work under that situation. Questions include "Would you work in a job which . . . you would have to work under pressure, under stress, or in dangerous situations?"

The fifth section is a catchall. The user first indicates how he perceives himself in terms of learning ability in the areas of General Learning and Verbal and Numerical Ability. Next,



he is asked to state whether he likes to work primarily inside, outside, half inside and half outside, or has no preference. Finally, he is asked how much postsecondary training or education he would be willing to undertake (0 to over 10 years).

The user's choices will be used to search for appropriate occupations. A decision may produce unexpected results. For instance, if the user opts for Working Inside and Outside, only those jobs that include activities evenly divided between inside and outside will be included. The program describes this result before the user has a chance to enter an answer. If the user opts for No Preference, both inside and outside jobs will be included on the list. At the end of each section in Career Assessment, results are printed on the screen, and the user is given the opportunity to return to the program and change answers.

When the Career Assessment portion is completed, the user may return to the main menu and enter Career Analysis. At this point the program starts to sort through the 460 occupations to locate those that have the characteristics described by the user. This process takes several minutes, as the program warns. If this is being used in a classroom situation, the teacher may want to terminate the lesson at the end of Career Assessment, print out the career analysis information, and continue the lesson the next day. Five different career assessments may be stored at a time. With a printer, a report will be printed that will include all the information displayed at the end of each section in Career Assessment as well as all occupations with characteristics specified by the user. These occupations will be grouped according to the amount of training necessary to attain them. The highest level of training the user is willing to undergo will be displayed first. If the user does not like the results of the analysis, he can return to Career Assessment and change his

answers.

The third section, Career Exploration, is evidently a late addition to the program. It is not mentioned in the manual itself, but is described in an additional paper. It is a useful addition because it allows the individual to call up any occupation in the data bank by reference number and examine its characteristics. The user is not restricted to just those occupations retrieved by his career analysis.

The last section, Career Planning, will help the user begin a search for a vocational school, college, or job. There are no vocational schools or colleges within the data base, so this portion of the program is not designed to perform an actual search. However, the user is led through a series of questions that should help him or her think through the relative importance of factors such as type of institution, cost of training, distance from home, availability of financial aid, and availability of special programs. When the questions have been answered, a report giving this information will be generated along with a form which can be used to help in the selection of a training school or college. A person opting for a job search is led through a similar activity and presented with a summary of choices and a form which should help initiate a job search.

Overall, the directions are clear and appear where necessary. Screen and printed formats are excellent. Error trapping is well done. If an erroneous key is pressed, the program will say so and won't continue until a valid key is pressed.

I would suggest two changes, however. I don't think the intermediate menu at the end of each section within the Career Assessment portion is necessary. The program could go directly to the Career Assessment menu at the end of each section. The short musical selection played each time the diskette is accessed interrupted my concentration. Others may enjoy this interlude, but

I wish there had been an option at the beginning of the program to turn the music off. I am afraid that if this program were used in a classroom, the sound might prove distracting to other students.

## USEFULNESS

A letter from the publisher describes this program as a condensed version of an eight diskette package. I haven't seen the larger package yet, but this one can stand on its own. It allows an individual to explore his or her own interests and abilities and to match them against characteristics of a representative sampling of occupations found in business and industry. The package could be used in any situation where this type of exploration is desired. I am thinking particularly of secondary students in a career education class, but it could be used in other classes, in the home, or in other situations. In addition, it is an excellent exercise in decision making since it requires the user to make a series of choices based on personal information. If decisions are inconsistent or unrealistic, then the results will reflect this.

## SUMMARY

The program is extremely easy to use. Screen and report formats are well done. Directions are liberally and judiciously sprinkled throughout. Error trapping is consistently good. The manual is clearly written and uses many illustrations. It carefully describes the purpose of the program and states what the program is and is not designed to do. The program could be used at home or in an educational setting to systematically explore personal interests and abilities and possible careers. If you are looking for a program such as this, I would recommend that you give serious consideration to this package. □

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# DATABASE STANDARDS UPDATE

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by John Mitchener

Nearly two years ago we published a set of standards for the evaluation of data management software. The standards have been updated and we want to give you, our readers, the opportunity to give us your suggestions for additions, deletions, and changes based on your experiences with data management programs. We are also sending an individual copy of the standards to publishers of data management programs to get the views of the producers of this type of program.

Data management programs are offered in a wide price range, and one would expect that more features are offered in the more expensive programs. In fact, this is usually the case. In order that comparisons can be made on a more equitable basis, we intend to divide the programs into three classes based on price. Class I programs are those that have a retail price of more than \$351.00; Class II programs retail from \$151.00 to \$350.00; and Class III programs retail for less than \$150.00. Each program will be evaluated against the absolute point standard, but class will be considered as a factor in the assignment of the final rating.

The standards give approximately equal weight to the areas of Data Entry; Searching, Retrieval, and Editing; Report Generation; and File Structures and Maintenance.

These are the areas that are most crucial to a working data management system.

Approximately half of the weight given to the first group of functions is given to Data Base Definition and Creation, Documentation and User Instructions, and Miscellaneous. Documentation and User Instructions are the most important aspects of getting started with a data management system. However, once the features and capabilities of a program have been mastered, the documentation should receive infrequent use.

Information Analysis receives approximately a third of the weight given to the first group. Some built-in features are a true convenience, but one does not expect a data management system to perform the full range of statistical analysis functions. The important point in this area is that the program must provide a means to select data and write it in a format such that it can be used by statistical analysis programs, and that the results of the analysis can be placed back in the data file.

Please send your comments to:

Peelings II  
Data Base Standards Update  
PO Box 188  
Las Cruces, New Mexico 88004

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## DATA BASE STANDARDS

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### DEFINITIONS

#### Search

The process by which single (or multiple) records are found in response to user-supplied selection criteria.

#### Sorting

The process by which the order of the records is established for display.

#### Selection

The process of determining the record(s) to be retrieved by the search procedure.

### 1. DB DEFINITION AND CREATION

The necessity of user options should be apparent to all

users of data management systems. These flexibility options include the following:

### **1.1 Fields and Field Lengths (10 points)**

This criterion relates to the total length of the data base. Ideally, the number of fields and field lengths should be dependent only on the available mass storage and should not be limited by the program.

### **1.2 Field Types and Data Validity Checking (10 points)**

The system should allow for at least the following data types: character, integer, floating point, and date. It should be possible for the program to perform validity checking on all fields and types of data. The validity checking must be flexible enough to allow for blank fields.

### **1.3 Field Names (8 points)**

The field names should be user-definable. Allowing user definition enhances the understanding of what is being stored by those who must operate the system. Each profession has its own jargon, and being able to customize is an asset. The lengths of field names should be determined by the user.

### **1.4 Date Entry Form Development (10 points)**

A data management system should allow the creation of forms by placing the fields anywhere on the screen. This is in contrast to a straight list of field names. It should be possible to place non-data-field text anywhere on the form for explanatory purposes. Multiple pages and short forms that do not contain all of the fields in the record should be supported.

### **1.5 File Statistics (10 points)**

The system should print or display all file statistics indicating field names, types, lengths, and disk space available on demand.

### **1.6 Data Compaction (10 points)**

Unused fields should be compacted to minimize disk space.

## **2. DATA INPUT**

### **2.1 Optional, Automatic Save of Records (15 points)**

To protect data integrity, the program should, as a default, automatically save newly entered records to disk. It should be possible to turn this feature off at the user's option. The program should notify the user that new records have not been saved before allowing an exit from the program. Modifications to existing data must be handled similarly.

### **2.2 Speed of Keyed Data Input (5 points)**

Keyed data should be accepted and displayed as quickly as it is entered. It should be impossible to lose characters on data entry.

### **2.3 Defaults (10 points)**

To avoid having to retype information which is duplicated from a field in one record to the corresponding field in the next record, a default option should be provided. At least two types of default options should be available—master default and last-record defaults. A last-record default allows the user to replicate the contents of the previous record entered during data entry, preferably on a field-by-field basis. The master default should allow a user to specify the default values for any field or fields. The master default should be available any time that last-record default has not been invoked. For example, a user may be entering information for a mailing list from pre-sorted cards, and all the information is from New York City. The master default could be set to City = "New York City" before starting the entry session. If the source documents happen to contain an out-of-order entry like "Atlantic City", the master default could be overridden to show the correct value. The next card would then revert to the default of "New York City". It should be possible to turn off all defaults.

### **2.4 Cursor Movement (10 points)**

While editing or entering data, it is

desirable to be able to move the cursor around the screen quickly and easily. This is known as live-screen editing. Movement may be implemented by using the cursor keys, a sequence of control keys, or a pointing device such as a mouse. This feature is related to the ability to return to a previous field and make changes.

### **2.5 Incremented Fields (5 points)**

In some applications, time may be saved by an option which automatically adds a user-defined increment to a numeric field. Most often the increment is 1, but it is desirable to be able to change the size.

### **2.6 Computed Fields in Records (10 points)**

One of the things that computers do best is arithmetic calculations. If the application is one which requires a calculation to be stored in the data base, the user should not have to get out the paper and pencil or calculator. It should be possible to specify that the data to be stored in a particular field is the result of an arithmetic operation on the data in two or more other fields of the same or other records in the data base. An example of an application for which this would be appropriate is an accounts receivable system. Calculation should be "live", i.e., visible as data is entered. Compound equations should be supported, allowing an unlimited number of components including any numeric field, all mathematical operators, and constants.

### **2.7 Paging (8 points)**

When desired, it should be possible to divide the record into pages. The system should allow paging back and forth through the record for viewing and editing purposes.

### **2.8 Security (10 points)**

Password access to files should be supported. It should be possible to establish read-only as well as update passwords. The security features should be optional at the discretion



of the user.

### 2.9 Table Look-ups (5 points)

Table look-ups of alpha or numeric data should be supported whereby selected fields are automatically filled, based on the contents of others.

### 2.10 Non-keyed Input (10 points)

The system should accept machine-readable text files as input.

### 2.11 Audit Trail (8 points)

The system should permit listing of all new and edited records during a session.

### 2.12 Date of Update (5 points)

Storing the date of the last update facilitates the user's ability to measure activity within the application. The date may be entered by the user or, if a clock is available in the system, it may provide the date. Consideration should be given to programs that support a variety of clocks.

## 3. SEARCHING, RETRIEVAL, & EDITING

### 3.1 Search Criteria (10 points)

On large systems, data is often stored without the means to retrieve it economically and in a timely manner. This situation has given rise to the DBMS. The strength of any data management system is the ability to retrieve the stored data in virtually any way.

To retrieve data from a data management system, the selection criteria must be specified. The degree of flexibility with which data can be extracted is dependent upon the variety of selection criteria that can be specified. The following are the minimum types of selections that should be available:

#### Relational:

Equal

Greater than

Less than

Greater than or equal

Less than or equal

Range (from X to Y)

Not

#### Boolean:

And

Or

The user should be able to use all of these operators in combinations and with multiple occurrences of the same operator.

#### Other considerations:

The program should offer the ability to search on a full field or a partial field. It should allow a search for a particular string of characters which may occur at the beginning of the field or which may be embedded in the field. Another useful feature is a positional search in which the user specifies what should occur in a certain position in the field or to ignore what occurs in a particular position. The program should also allow for search for a particular record number. The search functions should allow all records selected to be listed to a printer or, if desired, displayed at the terminal. A "NEXT" function should be provided for stepping through all records satisfying the search criteria.

### 3.2 Multiple Search Criteria (10 points)

Searches of more than one field at a time should be supported.

### 3.3 Speed (10 points)

Speed is a subjective rating. The application will determine the speed requirement. If the use is for an on-line inventory system that is used to answer telephone inquiries, speed is more important than it would be for a home checkbook system. For a *general purpose* data management system, speed will be an important factor. Scrolling should be avoided—each new display should be created "in place".

### 3.4 Editing Ease (10 points)

Ease of editing encompasses many individual features such as cursor movement key definition, handling of characters in fields, and the process of selecting records for editing.

### 3.5 Global Change (10 points)

When it comes time to change one field containing the same data in the data base, the global change feature will be appreciated. An example would be to change the zip code entry for all people in a particular city found in a mailing list.

### 3.6 Save Deleted Records (10 points)

This feature makes it simple to save a history of the activity. Deleted records may be retained in the file, marked as deleted, or they may be kept in a separate "deleted" data file.

### 3.7 Deletion of Records (10 points)

It should be possible to completely delete records from the file. This process should be simple and provide protection from unintentional deletions.

### 3.8 Sort on Any Field (10 points)

Data must be available in many forms and one cannot predict precisely the form that may be needed tomorrow. It must be possible to order the data in any field in ascending or descending sequence. The system should allow sorted files to be saved and reused to rerun the original report or any other report based on the same sort sequence. Sorts should also be supported for multi-volume files.

### 3.9 Multi-level Sorts (10 points)

The program must be capable of subsorts after a major sort. For example, it may be useful to sort first by zip code and then sort by last name within each zip code.

Speed of sorting is not as important as speed of retrieval. However, the sort should employ techniques appropriate to the allowed size of the data base and should not take so long that it wearies the user.

### 3.10 Maintenance of Indices (10 points)

If the program allows indexed files, it should be possible to edit and add records while the program automatically manages the update of the indices.

## **4. INFORMATION ANALYSIS**

### **4.1 Built-in Functions (10 points)**

A data management system should have built-in functions in both the query mode and the report mode for simple information analysis. These functions include count, minimum, maximum, average, and total.

### **4.2 Frequency of Occurrence (10 points)**

Frequency statistics should be provided for any user-specified fields and associated test conditions. For example, in a mailing list, display each last name and how often it occurs where zip code is greater than 80000.

### **4.3 Procedural Language Interface (10 points)**

The system should provide a procedural language or procedural language interface so that programs can be written to use the information stored in the data base.

### **4.4 Graphical Presentation (5 points)**

The system should provide graphical charting capabilities to display the results of analyses of field values.

## **5. REPORT GENERATOR**

### **5.1 Field Selection (10 points)**

The system should allow the user to specify the fields to be printed and the format in which they will be printed. There should be no defaults that cannot be changed. All report formats should be printable/listable. Multi-line formats should be supported.

### **5.2 Computed Fields (10 points)**

It should be possible to set up a field that will print the results of an arithmetic operation between two fields or between a field and a constant. Horizontal and vertical totals and subtotals should be permitted. Calculations from record to record should be supported. It should be possible to line up decimal points of computed fields.

### **5.3 Support User Printer Drivers (10 points)**

Some users have software printer drivers that support a printer plugged into the game port or elsewhere. If this is the situation, a software package which supports it is a necessity. Paper format specification should be unlimited as to paper length, width, number of characters per inch, and top and bottom margins. The program must allow the transmission of control characters to the printer and assignment of these printer control characters to easily remembered labels for use within the report generator.

### **5.4 Page Numbering and Breaks (10 points)**

It should be possible to number pages of a report. Page numbering should be automatic, but must allow users to make specific alterations. Users should be able to specify page breaks in addition to subtotals when the contents of a given field change from one record to the next.

### **5.5 Report Titles and Footnotes (10 points)**

Users should be allowed to specify unlimited report titles, page headers, and footnotes which will appear on all report pages.

### **5.6 Print Page X to Y (10 points)**

This feature is useful when a ribbon malfunctions, paper misfeeds, or you just want to see page 19 of a long report.

### **5.7 Change Field Headers (10 points)**

In the interest of saving space in the data base, it is desirable to keep field names as short as possible and still retain the meaning. When it is time to print a report for use by individuals other than normal data base users, longer, more meaningful headers are useful and should be allowed upon user option.

### **5.8 Saved Report Formats (10 points)**

Each system must provide a standard, default report format. In addition

to this basic capability, users should be able to save the report formats they have created and recall them for later use. The saved formats should include selection criteria and sort information in addition to simply printing information.

### **5.9 Ease of Report Format Setup and Editing (10 points)**

Reports are often an important reason for having a data management system. Setting up a report should not be an ordeal, but rather should be a friendly interactive session between the user and the computer. There should be ample opportunity to correct mistakes without having to start over.

### **5.10 Translation of Coded Data (10 points)**

In order to preserve disk space, it is convenient to use coded information in the data files. For reporting purposes it is better to present the data in plain text. The DBMS should have this capability.

### **5.11 Redirection of Reports (10 points)**

It should be possible to direct completed reports to the screen, the printer, a disk, or to a modem.

## **6. FILE STRUCTURES AND MAINTENANCE**

### **6.1 Disk Based (10 points)**

That the memory size of the Apple is limited should be enough justification to go to a disk-based system. Programs that can manage only the material in memory are severely limited for large applications.

### **6.2 Simple Backup of Data (10 points)**

Data is the most important part of the system. More companies are recognizing that data is a resource that must be managed in the same manner as money and manpower. Since valuable data is stored on relatively fragile magnetic media, there must be a simple means to back it up.

### 6.3 Backup of Program Disk (50 points)

- Single Unlocked Disk (50 points)
- Two or More Locked Disks (supplied at the time of purchase) (10 points)
- Single Locked Disk (Free backup with registration) (5 points)
- Single Locked Disk (Charge for backup) (0 points)

My personal feeling is that if the software house that wrote the program goes out of business and the user has only one locked copy, he has bought only the disk and not the program. Disks do fail eventually. Given this situation, anyone who uses locked software for earning his livelihood is asking for trouble. Software vendors say: "We won't go out of business". The present economy is not such that this prediction can be made with the degree of certainty I would like.

### 6.4 Standard Files (20 points)

A program that builds data files capable of being operated on by programs which work with the standard Apple DOS (or CP/M or Pascal) is a great advantage. Otherwise, problems will arise in the communication of the data for use by other programs. This is especially important where users want to transmit files via information utilities (e.g., The Source) or from machine to machine. A second possibility is the use of the Data Interchange Format (DIF) for converting data from a nonstandard format to one that can be used by other programs.

### 6.5 Reformat of Loaded Data Base (10 points)

Without careful planning, a data base may be found to be missing a field that is crucial to the success of the application, or there may be extra fields that are merely wasting space on the disk and reducing the number of records that can be stored in the file. A similar problem may

result from a change in requirements. Users should not be required to recreate their data bases to modify data fields or data base structure.

## 7. DOCUMENTATION AND USER INSTRUCTIONS

### 7.1 Manual (15 Points)

Instruction manuals should be well organized, easy to read, and should include a quick-start section, a detailed tutorial, and a reference section. The instruction manual should include a detailed explanation of all features, functions, and commands. Manuals should be specific to the machine/operating environment being used. Manuals should not contain a multitude of alternate instructions for different machines.

#### 7.1.1 Index (8 points)

A detailed index should make finding the appropriate sections of an instruction manual a pleasure rather than a nightmare.

#### 7.1.2 Reference Card (5 points)

A quick-reference card should be provided to facilitate the operation of a program without the need to use the manual.

#### 7.1.3 Tutorial (8 points)

A tutorial is a valuable aid in learning to use a program. Tutorials should demonstrate the use of all major features and functions in conjunction with a preformatted sample data base with predictable search and sort results.

#### 7.1.4 System Map (5 points)

A complete map of all system menus and options should be provided, including page references to the user's manual.

### 7.2 On-screen Prompting and Help Screens (5 points)

Complete on-screen prompting and help screens should be provided for all system options and commands. These can be an adequate substitute for the quick-reference card.

### 7.3 Vendor Support (10 points)

Does the publisher have a consumer help line to provide assistance with problems? Does the publisher's telephone number appear in the documentation?

## 8. MISCELLANEOUS

### 8.1 Usable over Modem (10 points)

The data management system should be usable remotely as if the user were sitting at the keyboard of the host computer. It should be possible to update information and produce reports.

### 8.2 Number of Disk Drives (5 points)

The system should be usable by those who have only one disk drive (Class III program). It should allow the user to specify the number of drives available to reduce/avoid diskette swapping. Hard-disk versions should be available at no additional charge to purchasers of the original package.

### 8.3 80-Column Support (5 points)

Option should be available to use either 40- or 80- column displays.

### 8.4 Lowercase Support (5 points)

The full ASCII character set should be supported.

### 8.5 Error Trapping (10 points)

It should be impossible to cause a break in the program as a result of erroneous keyboard input by the user or as a result of disk errors. Data should not be lost during automatic error recovery. Program should detect for wrong disks in drives.

### 8.6 User Protection (10 points)

Users should be protected from losing data wherever potential faults may arise (within reasonable limits). Program control flow should follow logical paths to facilitate learning and to reduce the potential for user errors.

### 8.7 Additional Memory Support (10 points)

The system should support the use of additional memory cards.□



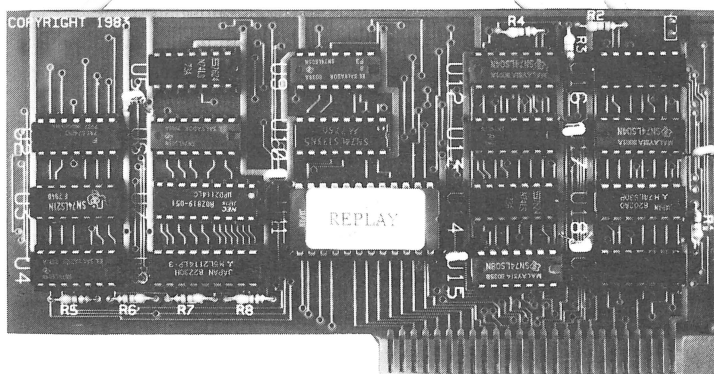
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REPLAY II is intended to be used as an analysis tool, for program development, and for making archival backup copies.

\*Apple is a registered trademark for Apple Computers Inc.

REPLAY II is an interface card that is slot independent. Users can stop a program, examine and change memory, or copy the program, and restart. Control of the APPLE is obtained by pressing the remote switch which comes on an 18 inch cord outside the APPLE. REPLAY II does not copy the original disk, rather it copies the program executing in memory. If a copy is desired a blank disk is inserted in drive 1 and the options on the menu are contained in the eprom on the REPLAY II card, no other disk needs to be booted for copying, unlike other copy cards. The very act of booting another disk alters memory which is detectable by some protected software.

REPLAY II does not change ANY memory. Extra memory is buffered to allow copying and analysis without altering the original memory contents. Other copy cards always change specific points in the original memory. REPLAY II faithfully reproduces the lower 48K of memory in a fast load format. The upper 16K can also be copied for a 64K copy. Standard DOS 3.3 files are created automatically for storage on floppy or hard disks. A RAM card is needed for this.

REPLAY II is fully documented in a 60 page manual. Utility programs supplied with the REPLAY II card include Program Analysis, Comparisons, Packing and Compression. A language card is not needed to run packed program copies.

Because most programs are written in Assembly language, the user should be familiar with Assembly in order to fully utilize the advanced Analysis and Packing programs. Users can now freeze a binary program and perform a transparent step or trace while continuous disassembly is shown. View text or hires during trace.

REPLAY II can automatically move protected APPLESOFT programs to a standard DOS 3.3 disk for listing or modification.

Now game players can save a game at any level and QUICKLY restart with the REPLAY II card. Users can freeze games, change variables to obtain unlimited ships or power, etc., then restart the program. Saving high scores is easy!

Minimum requirements are an APPLE II and a single disk drive.

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# THE SPREADSHEET 2.0 & MAGICALC

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## THE SPREADSHEET 2.0

by William G. Graves  
Documentation by Steve Ross  
Apple Pugetsound Program  
Library Exchange  
21246 68th Avenue South  
Kent, WA 98032  
206-872-2245

\$60.00 (A.P.P.L.E. members only)

Unlocked

Rating: A

## MAGICALC

by William G. Graves  
Documentation by Steve Ross  
Artsci  
5547 Satsuma Avenue  
North Hollywood, CA 91601  
213-985-2922

\$149.95

Rating: A-

Reviewed by Michael L. Weasner

## INTRODUCTION

THE SPREADSHEET 2.0 and MAGICALC are the same electronic spreadsheet program available from two different sources. A.P.P.L.E. is the group that publishes the excellent

magazine, CALL-A.P.P.L.E., and THE SPREADSHEET 2.0 is just one of the many outstanding products that they offer at reduced rates. MAGICALC is available from Artsci, a software publisher that has several other programs available. There are some differences in the product as offered by these two sources besides the price and these will be pointed out as they come up. Both programs are of the format and intent of all of the electronic spreadsheet programs since VisiCalc first made personal computers popular. In this review, we shall assume some familiarity with the purpose and operation of spreadsheet programs.

Both the Apple II (minimum 48K) and the new IIe are supported, as well as expanded memory cards up to a total memory of 512K (four 128K cards). There are 254 rows and 63 columns of work space on the spreadsheet. The program works in 40 or 80 columns (most of the 80-column cards are supported). A 70-column format is provided using Hi-Res graphics. Both uppercase and lowercase entry/display are allowed. The program can be used with multiple drives including hard disks.

## DOCUMENTATION

The documentation consists of a tutorial (87 pages) and a reference guide (160 pages) in a three-ring, 5 1/2 X 8 1/2-inch loose-leaf binder. Eight pages on thicker stock are a set of quick-reference cards. Both sections have a complete table of contents, but the reference cards do not

have page indicators where you can find more complete information. Since there is no index, you will have to refer to the table of contents which isn't alphabetical. However, the reference guide section is divided up into logical sections and matches the program menus. The tutorial is for the new Apple owner as well as for the first-time user of a spreadsheet program. Only the basic functions are discussed in the tutorial. The reference guide has all the functions explained but no tutorials on using them; if you are unfamiliar with using spreadsheet programs, you either have to experiment or read some of the many books and magazine articles about creating spreadsheets. Fortunately, this program is enough like all of the VisiCalc clones that it is generally compatible with all the information you will read.

There are some errors in the manual; however, none are major. With the Artsci version (i.e., MAGICALC), you receive an errata sheet correcting these. This errata sheet is not included in the A.P.P.L.E. version but can be used since both manuals are exactly the same; only the name has been changed. The configuration section is somewhat confusing when it discusses configuring the display. But overall, the information provided is complete, and the manuals are generally well thought out.

## CONFIGURATION SUBSYSTEM

When you first boot the program

disk, the menu will come up on the 40-column screen. Outside of the actual spreadsheet portion of the program, all actions are menu driven. This first System Menu has options for each of the subsystem menus: Calculate, File, Print, Format, Configuration, and a Boot Next Program option. All menus are "lightbar" controlled (the indicated selection goes INVERSE) using the Arrow keys, or you can use the number/letter keys to indicate your selection. You can load/save your configuration at any time (it might erase your work, though; a warning will be displayed), or you can just set up a configuration to try out without saving. Lowercase video and/or keyboard, one-wire shift modification, printer slot, printer drivers, video card slot, and video drivers are all selectable. These are the only configurable options, and as we will see later, more features should have been configurable. Printer drivers (not supplied) are not necessary for most popular printers, but the capability to have them exists. The driver must reside at \$800 and be no longer than \$200 bytes. Video drivers (three supplied: STB80, WIZARD, VIDEX) are also allowed and must load at \$1F00 and be no longer than \$100 bytes. I found the VIDEX driver compatible with both the Videx Videoterm and Ultraterm (80 column/24 lines only). One less than desirable feature is that if you need to use one of the supplied drivers, you have to boot normal DOS 3.3, BLOAD the driver, and then BSAVE it under the proper name. All these steps are outlined in the manual, but a computer-run operation would have been better. Should you desire to use the 70-column graphics display, I recommend a high quality monitor. And you will probably still find many of the lowercase characters difficult to read. With the 40-column lowercase display, text under the cursor will have the lowercase text converted to garbage since the cursor is INVERSE. Once the cursor is moved, the text appears normal. With a 64K Apple,

you will have 30K of work space in either 40- or 80-column mode. With the 70-column display, the work space drops to an almost unusable 18K.

Every time you boot the program disk, a title screen appears on the 40-column screen. You are asked to enter the slot, drive, and volume number where the configuration file resides. This was supposedly done to allow hard-disk usage with the protected MAGICALC program disk. You can just enter RETURN, and the boot drive will be used to load the configuration file. Consequently, booting is always a two-step process. Although THE SPREADSHEET 2.0 disk is copyable, both disks use a RWTS routine to load the program into memory, and therefore, you cannot modify the program and save it to disk as a binary file. This is also a major drawback should you wish to have the program on a hard disk, load up some function keys without having to make the startup a three-step process, or just add a faster DOS to the disk. All of these enhancements should be allowed in business software.

## OTHER SUBSYSTEMS

Before discussing the spreadsheet portion (CALCULATE SUBSYSTEM), we'll discuss each of the other subsystems. The file subsystem has all of the disk operations plus a DIF (Data Interchange Format) option in its menu. You can specify a starting and ending cell of the spreadsheet to be saved/loaded when using DIF files and a row or column order for the DIF file. You can change the disk slot, drive, and volume number, and CATALOG, LOCK, UNLOCK, DELETE a file. Loading and saving of worksheets are done from this menu as well. A nice and useful feature is the ability to INITIALize a disk from the subsystem menu when you realize your work disk is full and you have no more formatted disks. Many thanks to the author for that one. Each of the file operations will first

CATALOG the work disk, number each file on the screen, and prompt you to enter the number or name. When deleting files and overwriting existing files, the program does not ask for confirmation, so be careful. CATALOG and saving can be interrupted by pressing the ESCape key. Since the program can work with up to 512K RAM, a way to load/save these larger than floppy-disk-capacity files has been provided. When saving, if a disk-full error occurs, you will be prompted to insert a new disk. You can even INIT a new one at this time. Once a new disk is available, the program will continue the save. Loading of this file(s) will be in just the same way. Due to my limitation of 64K, I was not able to verify this feature.

The print subsystem is for making hardcopies of your worksheet. You can specify a beginning and an ending cell, DIF format, page pause to change paper, and print the formulae and formatting instead of the results. You can enter a printer set-up string to, for example, print in condensed mode. One limitation here is that you cannot use a CTRL-R print command because it is the terminator for this mode. You can also print the worksheet to disk, and it will be written to a file that you can read with any word processor that can read sequential text files.

One of the better features of the print subsystem is the ability to print worksheets larger than your paper. The program will print the worksheet in such a manner as to allow you to tape the sheets together into one large piece of paper. The power of the print subsystem is one of the major pluses for the program. There is a default set of format parameters included, and you can permanently configure these to some other values. This default is 80 columns by 66 lines per page, with 6-line top and bottom margins, and 8-space left and right margins. The format configuration is saved as part of the video configuration.



## CALCULATE SUBSYSTEM

Once you enter the calculate subsystem, operation of the program is generally like all of the other electronic spreadsheet programs. The cursor can be moved using the Arrow keys (all four of them on the //e), or you can use Control sequences to move the cursor. For example, the A, S, Q, Z quadrant can be used as Control sequences to move the cursor in any of four directions, regardless of the direction indicator ("-" or "!"). Other control sequences will move the cursor 10 cells up/down, to the top left or right bottom of the work space, or tab to the next/previous unprotected cell. Where possible, Apple //e keys are utilized for these functions. As with VisiCalc, the ESCape key (the DEL key on the //e) is used to erase (destructive backspace) characters. The following commands are allowed:

**Set Attribute** Accept all data, accept only labels or values, accept no entry in cell (protect) or hide contents.

**Blank Cell** Erase cell.

**Clear Worksheet** Must be confirmed.

**Delete Row/Column** Delete row or column where cursor rests.

**Edit a Cell** Modify the contents of a cell including insert.

**Format a Cell** Integer or dollar values, justify left/right.

**Global** Column width, calculation order, automatic/manual recalculation, attributes, or formats.

**Insert Row/Column** Insert row above or column to left of cursor.

**Column Width** Set individual column width, 0 to 36.

**Move Row/Column** Move cell or can move an entire row or column.

**Print Subsystem** Go to the print subsystem.

**Reproduce** Copy cell, range/

block of cells to another location with the following options: attributes only, formats only, contents only, formulae only.

**Storage** Go to the file subsystem.

**Set Titles** Define horizontal/vertical/both row/column as title.

**Set Window** Set horizontal or vertical, synchronized or unsynchronized scrolling windows.

**Repeating Labels** Repeat any character or string to fill a cell.

Many of these commands will be familiar to users of other spreadsheet programs. In fact, the program will be compatible with most spreadsheets created by other programs. The "@" functions (math, logical, tables, etc.) are all the same as with most other programs, except that trig functions (@SIN, @COS, @TAN) are not supported.

When scrolling the window, the scroll seems slow because only the row at the top or the column on the left is updated during the scroll. Once the scroll stops, the entire screen is updated. I found this annoying at first because I tended to want to scan the information as it scrolled by. After using the program for several months, I have found the increase in speed to be a suitable trade-off.

## SUMMARY

Before purchasing THE SPREADSHEET 2.0 from A.P.P.L.E., I was a VisiCalc user. The following steps were required to bring up the program in the way I wanted to use it:

1. Boot normal DOS and run a program to load the Videx Function Strip.
2. Boot the Videx VisiCalc Preboot to allow VisiCalc to run in 80 columns.
3. Insert the protected VisiCalc disk and press RETURN to boot it.

With THE SPREADSHEET 2.0, only step 2 is missing since the program

has an 80-column capability. However, it is still a three-step process since the video configuration driver step is required each time. I still prefer my applications programs to be binary files that can be BRUN from a controlling menu or EXEC file. Not everybody needs or wants this ability, but to eliminate it detracts from the program's usability.

Error trapping within the program is excellent. I succeeded in bombing the program only once, and this was by doing an unnatural sequence of loading the Hi-Res graphics video driver. Error messages are clear and allow you to make appropriate corrections. The results of calculations I performed were accurate and reasonably fast.

If you are looking for a spreadsheet program and are an A.P.P.L.E. member, then look no further. THE SPREADSHEET 2.0 is your best buy. At \$60.00 for the copyable program disk, the value received is great. At \$149.95 for the protected Artsci disk, the value is somewhat less (considering that it only costs \$45 to join A.P.P.L.E.) but still greater than purchasing comparable electronic spreadsheet programs that cost \$250 or more. (Now if somebody would just come up with a driver for the Videx ULTRATERM card.)□

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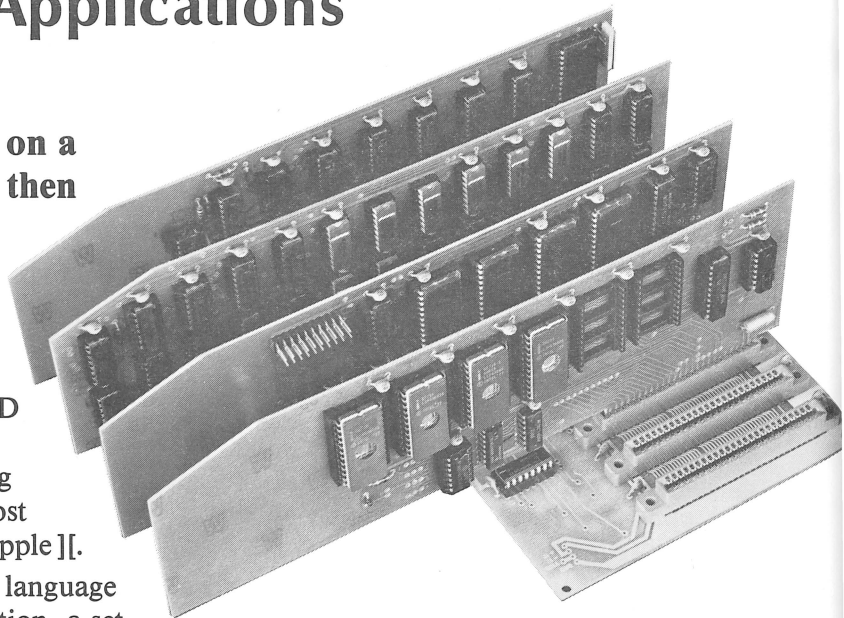
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# PLAN80 & DESKTOP/PLAN-II

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## *PLAN80*

*Version 2.5*

*Copyright 1983*

*by Business Planning Systems, Inc.*

*Two North State Street*

*Dover, DE 19901*

*Digital Marketing*

*2363 Boulevard Circle, Suite 8*

*Walnut Creek, CA 94595*

*415-938-2880*

*\$295.00*

*CP/M system*

*Unlocked*

*Rating: A+*

## *DESKTOP/PLAN-II*

*Version not specified*

*Copyrights 1980 (program) &*

*1981 (manual)*

*by Don Williams*

*by VisiCorp*

*2895 Zanker Road*

*San Jose, CA 95134*

*\$250.00*

*Rating: B-*

*Reviewed by Alan Shalette*

## **INTRODUCTION**

Before VisiCalc and the VisiCalc clones (VisiClones) attained their popularity and dominant presence in the microcomputer market, most spreadsheet models were

developed using timesharing systems. In comparison to newer "electronic spreadsheets", timesharing-based modeling packages generally support larger and more complex models since they are usually operated out of mainframe computers. They produce excellently formatted reports, while their development and operation tend to be more involved than is required for VisiCalc and related systems.

PLAN80 and DESKTOP/PLAN-II are hybrids. They combine the model development, operating, and report formatting styles of timesharing-based systems with some of the interactive operating conveniences and graphics capabilities of stand-alone microcomputers. In fact, their graphics capabilities are unique in comparison to most other electronic spreadsheeting packages available for the Apple.

It's understandable that DESKTOP/PLAN-II would be a hybrid since it was first published very early in the development of the microcomputer software market—at about the time VisiCalc was first introduced. What about PLAN80? It was published this year, when almost any machine has access to one or more of the newer electronic (interactive might be a better term) spreadsheeting systems. Is PLAN80 really a better mousetrap, or just a rehash of old technology?

## **HARDWARE AND SOFTWARE REQUIREMENTS**

PLAN80 is a CP/M 2.x-based system. It requires 56K of RAM, i.e., a 16K RAM or larger card in Slot 0 and an 80-column display in Slot 3. If you use a printer, which is highly desirable for either package, CP/M likes you to have it connected to Slot 1. Two disk drives are also highly recommended. I tested the system with a Microsoft Soft-card and a Videx Videoterm 80-column card.

DESKTOP/PLAN-II is compatible with a "plain vanilla" Apple, will work with a minimum of 32K, and will use up to 48K of main memory. Your printer may be connected to any available slot—with the exception of Slot 0 for the Apple II and II plus, which is reserved for memory/language cards. DESKTOP/PLAN-II will operate with just one drive, but two are recommended to eliminate data/program diskette swapping since only parts of the system are in memory at any one time. It is also available

in a version compatible with Corvus's hard disk, at additional cost.

To build PLAN80 models, you will also need a text editor or word processor, which is not supplied with PLAN80. ED, the text processor supplied with your CP/M system, should fill the requirement if you don't have something better to use. DESKTOP/PLAN-II supports all the functions you'll need to build and operate your models.

Operation of both systems follows a four-phased sequence of model definition, calculation, printing/graphics, and modification—although the two systems differ in the ways they each handle these chores.

## MODEL DEFINITION

In **Model Definition** mode, both systems use lists of instructions which govern how your model will be formatted and the calculations it will perform. These instructions are divided into the following groups:

- Report titles.
- Column titles and column variable name definitions (e.g., FY1985).
- Row titles and row variable name definitions (e.g., SALES).
- Assumptions or starting values— from which all other data are calculated (e.g., SALES in FY1982 were 1000).
- Calculation rules—which tell the systems how to use your starting values to fill in empty cells (e.g., SALES in 1983 through 1987 should grow at 10% per year based on the FY1982 value).
- Data formatting specifications— such as pagination, column widths, numbers of decimal places to display, dollar and percent sign (" \$" and "%") insertion, underscoring, and the like.

VisiCalc/VisiClone users will recognize that these same elements are present in any well-developed electronic spreadsheet. I'll point out significant differences in style and execution as we discuss these instructions in detail.

Once your model's definition has been created and saved, you would then enter **Calculation Mode**. Here, your model definitions are brought into memory, your spreadsheet calculated, and the results displayed. In either system, cursor moves will allow you to see parts of your spreadsheet which are hidden from view since spreadsheets tend to be larger than can be seen in one display screen. Since PLAN80 uses an 80-column display, it can show you more at any one time than DESKTOP/PLAN-II's 40-column display. Calculation and cursor movements in both systems are considerably slower than you will find in VisiCalc.

**Printing Mode** will allow you to send the calculation results to your printer using several types of special print instructions. For example, PLAN80 allows you to display rows and columns on your screen which you can suppress when printing, and DESKTOP/PLAN-II displays row-ref-

erence numbers which may be omitted in printed reports. In VisiCalc, you can produce the same results by interrupting printing to work around the rows or columns you don't want to show on your printed reports. Row or column suppression is accomplished automatically in both PLAN80 and DESKTOP/PLAN-II.

Both systems allow you to display calculation results on your screen in bar-chart form. PLAN80 will also produce scatter plots (i.e., single points), while line plots are available in DESKTOP/PLAN-II. DESKTOP/PLAN-II uses the Apple's Hi-Res graphics to produce its plots and can save the results to a disk file for printing with your favorite dot-matrix/graphics printer and print utility program (it will only print the plot with Silentype printers). PLAN80, on the other hand, simulates Graphics mode using text characters. PLAN80 can, thus, print its graphics directly on any compatible printer.

Neither system provides much flexibility in vertical axis scaling. It's almost impossible to have your vertical axis start at 0.0 and end at a given value. Nor can you select the number of "tick" marks defining the vertical scale or the increment between tick marks. Similar restrictions apply to both systems' horizontal axes. In contrast, VisiCalc provides only rudimentary bar charts using its /F\* command.

DESKTOP/PLAN-II's graphics look better, but PLAN80 provides more flexibility in their preparation. PLAN80 allows you to specify titles at the top and bottom of your charts and for their vertical axes. DESKTOP/PLAN-II automatically uses your row and column headings for axis titles and uses report titles as graphics titles. PLAN80 also accepts limited scaling commands and will plot up to three rows at a time in bar-chart form. Its scatter plot will allow you to plot any row against any other. DESKTOP/PLAN-II will plot only two rows and always uses your column headings (e.g., FY1981, FY1982...) to label its horizontal axis.

If you also own VisiCalc and one of the VisiPlot packages, you may convert your DESKTOP/PLAN-II results to a VisiCalc /PD file, load it, and then write a /S# DIF file which you may then send to VisiPlot to produce enhanced graphics. Alternately, you may send DESKTOP/PLAN-II data to Apple Plot.

In **Modification Mode**, if you want to run a new case or test a "what if" condition, the two systems part company in major ways. PLAN80 will allow you to enter new starting values and numeric data used in its calculation rules in Calculation mode—e.g., "10" in the rule "grow SALES by 10% per year". In DESKTOP/PLAN-II, however, you must go back to Model Definition mode to enter new starting values and then proceed to Calculation mode to see the results. In either case, if you want to change the model's underlying calculation rules, titles, or formatting commands, you must go back to Model Definition mode (there are some exceptions to this rule with PLAN80). With PLAN80, you'll have to reload your text editor to do so.



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of VisiCalc include: IF, THEN, ELSE; @IRR  
of return); @ACRS (ACRS depreciation  
MORT (interest and principal payments for  
payment loan); @SPREAD (spread/grow  
rows or columns by percents); @SL (straight  
line); @SOD (sum of digits depreciation);  
@BAL (balance depreciation); and @DBXSL  
(switch to straight line depreciation).  
not include most of VisiCalc's logic  
is @NA, @ERROR, @TRUE and @FALSE,

## 80 MODEL DEFINITION

DESCRIPTION COMMENTS

### ISTRATIVE BUDGET FOR COST CENTER 1001"

"1ST" "QTR" "Q1" is a column name.  
"2ND" "QTR" "2ND" and "QTR" will be  
"3RD" "QTR" printed on separate lines as  
"4TH" "QTR" the column title.  
"FULL" "YEAR"

"HEADCOUNT" Numbers in parens "(1)"  
"EXEMPT" indicate the number of  
"NONEXEMPT" decimal places to show  
"TOTAL" (unless overridden by a row  
"EXPENSE" (-) tells PLAN80 to under-  
"SALARIES" score the results in the  
"FRINGES" preceding row.  
"OVERTIME" (S) tells PLAN80 to insert  
"SUPPLIES" a blank line.  
"RENTALS"

"OCCUPANCY"  
"TELEPHONE"  
"TRANSFERS"  
"TOTAL" (- =) will underscore the  
preceding line and double  
underscore the following  
line.

2 2 2 (+1) The numbers shown are  
1 1 1 starting values or  
0 25.2 25.2 31.8 assumptions.  
0 3.0 2.0 2.3 Each "/" repeats the prior  
7 .8 // value.  
5 3.5 3.5 3.5 A "+" causes the prior num-  
8 + ber to be repeated for all  
6 4.1 3.4 3.5 columns. (+ 1) adds 1 to the  
prior value. These rules apply  
I + H02 to the corresponding cells in  
\* S01 each column. Special rules  
+ (.8\*H01) + (.5\*H02) available to move data across  
JM(S01..S08) columns or from any one cell  
JM(Q1..Q4) to any other.  
:DISPLAY tells PLAN80 to dis-  
play the results on your  
screen.

in a version compatible with Corvus's hardware, at a minimal cost.

To build PLAN80 models, you will also need a text editor or word processor, which is not supplied with PLAN80. ED, the text processor supplied with your Corvus system, should fill the requirement if you don't have a better one to use. DESKTOP/PLAN-II supports a command-line interface; you'll need to build and operate your model this way.

Operation of both systems follows a familiar sequence of model definition, calculation, printing, and modification—although the two systems handle these chores in different ways.

## MODEL DEFINITION

In **Model Definition** mode, both systems allow you to enter instructions which govern how your model will be calculated and the calculations it will perform. These instructions are divided into the following groups:

- Report titles.
- Column titles and column variable names (e.g., FY1985).
- Row titles and row variable names (e.g., SALES).
- Assumptions or starting values— from which other data are calculated (e.g., SALES in FY1985).
- Calculation rules—which tell the system how to calculate your starting values to fill in empty cells. For example, in 1983 through 1987 should grow at 5% based on the FY1982 value).
- Data formatting specifications— such as column widths, numbers of decimal places, dollar and percent sign (" \$" and "%") and underscore, and the like.

VisiCalc/VisiClone users will recognize that many of these elements are present in any well-developed spreadsheet. I'll point out significant differences in definition and execution as we discuss these instructions.

Once your model's definition has been completed, you would then enter **Calculation Mode**. In this mode, model definitions are brought into memory, the model is calculated, and the results displayed on the screen. In this system, cursor moves will allow you to see parts of the spreadsheet which are hidden from view. In VisiCalc, spreadsheets tend to be larger than can be seen on the screen. Since PLAN80 uses a column display, it can show you more at a time than DESKTOP/PLAN-II's 40-column display. In both systems, cursor movements are slower than you will find in VisiCalc.

**Printing Mode** will allow you to send the results of your calculations to your printer using several types of instructions. For example, PLAN80 allows you to print rows and columns on your screen which you don't see when printing, and DESKTOP/PLAN-II does not.

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VisiCalc's facility in handling equation changes interactively is far superior to those of either of these two packages.

MODEL DEFINITION CLOSEUP

Model definition is the core of all spreadsheeting systems and the place you're likely to spend most of your time working with them. So let's take a closer look.

PLAN80 keeps its entire model definition—report titles, column and row titles, starting values, calculation rules, and formatting specifications—in one file, and you may save your calculated results in one or more other files. DESKTOP/PLAN-II maintains four different types of files for each model: Model Definition (i.e., titles & formats); Calculation Rules; Planning Values (starting values); and Computed Values (calculated results).

Figure 1 contains a simple spreadsheet which I'll use to illustrate model definition in each of the two systems.

Figure 1. SAMPLE SPREADSHEET ADMINISTRATIVE BUDGET FOR COST CENTER 1001

	1ST QTR	2ND QTR	3RD QTR	4TH QTR	FULL YEAR
HEADCOUNT					
EXEMPT	2.0	2.0	2.0	3.0	9.0
NONEXEMPT	1.0	1.0	1.0	1.0	4.0
TOTAL	3.0	3.0	3.0	4.0	13.0
EXPENSE					
SALARIES	24.0	25.2	25.2	31.8	106.2
FRINGES	7.2	7.6	7.6	9.5	31.9
OVERTIME	2.0	3.0	2.0	2.3	9.3
SUPPLIES	0.7	0.8	0.8	0.8	3.1
RENTALS	3.5	3.5	3.5	3.5	14.0
OCCUPANCY	6.1	6.1	6.1	6.9	25.2
TELEPHONE	2.8	2.8	2.8	2.8	11.2
TRANSFERS	3.6	4.1	3.4	3.5	14.6
TOTAL	49.9	53.1	51.4	61.1	215.5

Figure 2 shows PLAN80's model definition to produce the result shown in Figure 1 along with selected explanatory comments.

As mentioned earlier, the list of commands would be created with a text editor, saved in a named file on a diskette, and then read and executed by PLAN80.

The example illustrates just a few of the many calculational and formatting commands available in PLAN80. Calculation functions (e.g., @SUM) work like those used in VisiCalc and should be familiar to users of most spreadsheet packages. Significant instructions not available in the

DOS 3.3 version of VisiCalc include: IF, THEN, ELSE; @IRR (internal rate of return); @ACRS (ACRS depreciation schedule); @AMORT (interest and principal payments for a constant payment loan); @SPREAD (spread/grow numbers over rows or columns by percents); @SL (straight line depreciation); @SOD (sum of digits depreciation); @DB (declining balance depreciation); and @DBXSL (declining balance switch to straight line depreciation). PLAN80 does not include most of VisiCalc's logic operators such as @NA, @ERROR, @TRUE and @FALSE, however.

Figure 2. PLAN80 MODEL DEFINITION

PLAN80 MODEL DESCRIPTION		COMMENTS	
:TITLES			
1	"ADMINISTRATIVE BUDGET FOR COST CENTER 1001"		
:COLUMNS			
Q1	(1)	"1ST" "QTR"	"Q1" is a column name.
Q2	(1)	"2ND" "QTR"	"2ND" and "QTR" will be
Q3	(1)	"3RD" "QTR"	printed on separate lines as
Q4	(1)	"4TH" "QTR"	the column title.
YEAR	(1)	"FULL" "YEAR"	
:ROWS			
H01		"HEADCOUNT"	Numbers in parens "(1)"
		"EXEMPT"	indicate the number of
H02		"NONEXEMPT"	decimal places to show
H99	(-)	"TOTAL"	(unless overridden by a row
S01	(S)	"EXPENSE"	a row specification).
		"SALARIES"	(-) tells PLAN80 to under-
S02		"FRINGES"	score the results in the
S03		"OVERTIME"	preceding row.
S04		"SUPPLIES"	(S) tells PLAN80 to insert
S05		"RENTALS"	a blank line.
S06		"OCCUPANCY"	
S07		"TELEPHONE"	
S08		"TRANSFERS"	
S99	(- =)	"TOTAL"	(- =) will underscore the
:DATA			
H01	=	2 2 2	(+1) will underscore the preceding line and double
			underscore the following
H02	=	1 1 1	line.
S01	=	24.0 25.2 25.2 31.8	The numbers shown are
SO3	=	2.0 3.0 2.0 2.3	starting values or
S04	=	.7 .8 //	assumptions.
S05	=	3.5 3.5 3.5 3.5	Each "/" repeats the prior
S07	=	2.8 +	value.
S08	=	3.6 4.1 3.4 3.5	A "+" causes the prior num-
:RULES			
H99	=	H01 + H02	ber to be repeated for all
S02	=	.30 * S01	columns. (+1) adds 1 to the
S06	=	4.0 + (.8*H01) + (.5*H02)	prior value. These rules apply
S99	=	@SUM(S01..S08)	to the corresponding cells in
YEAR	=	@SUM(Q1..Q4)	each column. Special rules
:DISPLAY			
:DISPLAY tells PLAN80 to dis-			
play the results on your			
screen.			



DESKTOP/PLAN-II's model definitions are entered following menu and system prompts. Its data entry is more convenient but, in some important ways, less flexible. To begin the comparison, look at Figure 3 which illustrates DESKTOP/PLAN-II's main menu.

Figure 3. DESKTOP/PLAN-II MAIN MENU

```

DESKTOP/PLAN-II
(DATE ENTERED WHEN SYSTEM IS BOOTED)

CREATE, MODIFY, OR DISPLAY MODEL FILES:
    1. MODEL DEFINITION
    2. VALUES (+ EXECUTE RULES, PRINT)
    3. CALCULATION RULES

EXECUTE MODEL FUNCTIONS:
    4. PERFORM CALCULATIONS
    5. PRINT REPORTS
    6. PLOT GRAPHS
    7. CONSOLIDATE SUB-MODELS

EXECUTE UTILITIES:
    8. DISPLAY UTILITIES MENU
        DEFAULT FILE NAME—>(FILENAME)

ENTER NUMBER FOR FUNCTION DESIRED
    TYPE "CTRL/Q" TO RETURN TO DOS
```

First, you would use Option 1, Model Definition, to enter and save all report, column, and row titles guided by separate submenus and formatted data entry screens. You would also enter formatting instructions at this point—including numbers of decimal places (up to two), underscores, blank lines, indents, and page skips. Most information would be the same as used in PLAN80, although DESKTOP/PLAN-II is somewhat more limited in the number of things you can use, as is summarized in Figure 4 (recall that PLAN80 requires use of a 16K RAM card).

Figure 4. SELECTED CAPACITY COMPARISONS

ITEM	PLAN80	DESKTOP/ PLAN-II
Report title lines (#).	Up to 9.	Up to 3.
Column titles (# lines).	Up to 4.	Up to 2.
Row titles (# characters).	Up to 40.	Up to 30.
Variable names (# char.).	Up to 8.	Not used.
Column width (# char.).	From 4 to 20.	Fixed at 8.
Footer lines (#).	None.	Up to 1.
Columns (#).	Up to 500 (with just one row).	Up to 18.
Rows (#).	Up to 375 with 9 columns. Up to 500 with 1 column.	Up to 300 with 9 or fewer cols. Up to 140 with 18 columns.

Each user manual has a table of row/column capacity relationships.

There are two chief differences between the two systems with respect to entry of descriptive information. First, DESKTOP/PLAN-II requires that you prespecify the numbers of columns and rows you will be using before their respective descriptions are entered—this is not required in PLAN80.

Second, DESKTOP/PLAN-II row descriptions are entered in pages of 10, prenumbered lines (i.e., not in a scrolled display). As you saw in Figure 2, PLAN80 does not use line numbers per se, although they may be incorporated in row titles.

DESKTOP/PLAN-II's approach is good and bad news. First the good news. You don't need to give your rows or columns short titles such as was shown for PLAN80 in Figure 2 (e.g., S06 for "OCCUPANCY"). Instead, DESKTOP/PLAN-II uses row and column numbers for reference in developing calculation rules, as will be illustrated later.

The bad news is that you will normally want to leave non-printing, blank rows interspersed with the ones you use since, if you try to insert a new row, you would otherwise need to "bump" all those below it—and change all your calculation rules accordingly (based on line numbers, they can't "float"). If you haven't left enough blank space, or if you haven't previously specified a large enough number of rows or columns to handle a major change in your model, recovery can be quite time-consuming. Further, any row or column definitions you would like to move or copy (as you could do with most word processors) will all need to be reentered instead.

Let's assume you've been able to get your model definition entered. Next, you would enter your starting values using Option 2 in Figure 3. Before doing so, however, you would probably use main menu Option 5 to print an "empty" copy of your spreadsheet to use as a worksheet. This would contain a formatted listing of the report, column and row titles showing underscores where they have been specified, but no values. You would use this blank report to note your starting values for easy entry in DESKTOP/PLAN-II's Enter Values Display.

This display is similar to the one used in row title and format entry. That is, you are shown pages consisting of 10 rows and two columns which you must leaf through to enter your starting values. Once these values have been entered, you would save the file and go on to enter calculation rules using main menu Option 3.

As with PLAN80, entry of your calculation rules can be the most taxing part of model development—even more so than you would experience with VisiCalc. Moreover, you're likely to find that DESKTOP/PLAN-II's rules are the most difficult of the three packages to deal with since it does not allow free-form entry of compound equations.

To illustrate, Figure 2 contains the following expression under the :RULES heading:

$$S06 = 4.0 + (.8*H01) + (.5*H02)$$

To accomplish the same result with DESKTOP/PLAN-II, you would need to add several rows to your model. Three rows



would be needed to house the constants 4.0, .8 and .5 since you may not enter numbers in rules. At least two more rows would be needed to store intermediate results. Assuming your values were in the following rows:

Row #	Value
5	H01
6	H02
20	S06
100	4.0
101	.5
102	.8
200 (to store intermediate results)	
201 (to store intermediate results)	

you would define the following rules, entering the numbers shown in the table below (note the use of line number references versus PLAN80's named variables shown in Figure 2):

REF #	RULE #	1ST ROW	2ND ROW	1ST COL.	LAST COL.	SAVE RESULT IN ROW
1	11 (MULTIPLY 2 ROWS)	102	5	1	5	200
2	11 (MULTIPLY 2 ROWS)	101	6	1	5	201
3	9 (ADD 2 ROWS)	200	201	1	5	201
4	9 (ADD 2 ROWS)	100	201	1	5	20

I won't bore you with a complete listing of a DESKTOP/PLAN-II model equivalent to the one shown in Figure 2 for PLAN80. But I'm sure you've noticed that DESKTOP/PLAN-II requires both more instructions/rules and more time to reach the same end result as PLAN80—or VisiCalc—due to its rather limited set of calculation rules and rather inflexible syntax.

DESKTOP/PLAN-II tries to overcome these inconveniences by permitting development and use of up to 20 custom rules which should allow "... any computations or any logic that can be programmed in Applesoft Basic." To use this feature, you will need to know about programming and matrix mathematics.

## MODEL CONSOLIDATIONS AND OTHER MAIN FEATURES

While these features of each system have not been discussed comprehensively, you should have a good idea of their respective operating styles and capabilities. Several additional aspects of each are worth noting, however.

After your model has been executed by either PLAN80 or DESKTOP/PLAN-II, you have a number of options to print the results. These include specifications of ranges of rows or columns to print, the number of columns to print per page, whether to print row numbers (DESKTOP/PLAN-II), and whether to stop printing between pages (e.g., as you would do if you were using sheets of paper rather than continuous forms). Where reports cover more than one page, report and row and column titles will be repeated on each page, as appropriate to the contents of that page. You would enter these instructions after the model had

been executed or after previously calculated values had been retrieved from a saved disk file. With PLAN80, however, you may include print instructions along with your model definition so processing will be continuous. The only way to print reports with DESKTOP/PLAN-II is to use its main menu Option 5 and respond to its Print Reports display options.

If you don't enter them explicitly, each system will supply default values. Defaults will normally do adequate jobs of laying out multiple page reports. In contrast, a fair amount of manipulation and title replication is required to get VisiCalc to print multiple pages with repeated titles.

DESKTOP/PLAN-II keeps its key print defaults in a configuration file. The configuration file also tells it the type of printer interface that you're using, the drive in which your data files are located, the volume number of the diskette they're on, and several other bits of information.

PLAN80's uses a terminal control file to define the

characteristics of the terminal you are using—necessitated by the peculiarities of the CP/M operating system. It can be modified with the system's INSTALL program. PLAN80's print defaults may not be changed. Instead, you have two places to enter values you want to use. Appropriate commands are available at the keyboard in Calculation/Display mode, or you may add print specifications to your model definition (keyboard entries can override model definition specifications). As is typical of the two systems, PLAN80's print control command set is much more extensive than DESKTOP/PLAN's.

Finally, and very significantly, each system can consolidate files containing calculated values.

DESKTOP/PLAN-II provides two consolidation options: SUMMARIZE and TRANSFER ROWS. SUMMARIZE causes the values in each column, of each row, from each of the specified computed values files to be added to each other. The results are recorded in a starting-values file it creates. You would use this option when each of the computed-values files represents one of several identical operating entities and you want to develop a report showing the totals for all operating entities.

TRANSFER ROWS allows you to transfer individual, selected rows from computed-values files to selected rows having identical or different row numbers in a resultant, new starting-values file.

PLAN80 provides the same types of consolidation capabilities with its usual large complement of commands (e.g., to move cells rather than complete rows or columns) and its ability to store your instructions for repetitive use. Moreover, PLAN80 has facilities for you to create pro-

cedures which will provide automatic execution of several models, request data from the keyboard as you might deem appropriate, print submodel results, and save the results to disk; and then perform one or more different consolidations, also printing and saving the results automatically.

Each of these steps requires manual intervention in DESKTOP/PLAN-II since it does not store commands for later use. All but very simple consolidations of VisiCalc models would require use of an auxiliary package such as Micro Lab's VISIBLEND (reviewed in V4N3, 1983) or Omega Microware's THE CONSOLIDATOR (V3N9, 1982).

## DOCUMENTATION

The following table compares some of the major features of the two user manuals.

The body of DESKTOP/PLAN-II's manual is divided into 13 sections containing an introduction, an overview, individual chapters devoted to each of the system's major functions, and a final section on error messages. Its text is well written and illustrated with pictures of each of its display screens. Its lack of an index is a major disappointment.

PLAN80's manual is divided into eight chapters, similarly

## PLAN80

Loose-leaf bound,  
150 pages total  
Page size: 8 1/2 X 11 inches.  
Typewritten.  
Typewritten exhibits.

Numerous different examples.

Table of Contents and Index.

Reference card supplied.

Five Appendixes covering:

Example models.

Installation.

How to operate.

Error messages.

Size/Capacity considerations.

## DESKTOP/PLAN-II

Loose-leaf bound,  
200 pages total.  
Page size: 6 X 9 inches.

Typeset.

Photographic copies of display screens for exhibits.

One major example used throughout.

Table of Contents for whole manual and for each section.  
No Index.

No reference card.

One compound Appendix covering:

Quick reference.

Contents of program diskette.

Equipment requirements.

Execution on a Corvus hard disk.

Model size/capacity limitations.

organized into functional units. While larger in format and containing an Index, it has a lot more to describe than does DESKTOP/PLAN-II, and specific reference information sometimes can be difficult to locate. However, its reference card is quite good and provides user manual page references. Unfortunately, it does not use its examples as well as DESKTOP/PLAN-II. For example, it will show an example and then explain its contents using other examples which are not contained in the first one.

## CONCLUSIONS

I have owned a copy of DESKTOP/PLAN-II and its predecessor, DESKTOP/PLAN, for almost three years. At first, I used it heavily but deserted it when I learned how to use the copy of VisiCalc I originally bought at the same time. VisiCalc's interactive operation and speed just can't be matched by DESKTOP/PLAN-II. Even considering its graphics, consolidation, and somewhat better formatting capabilities, I find that DESKTOP/PLAN-II has little to offer over VisiCalc. Its operation is too tedious for my taste.

PLAN80 is in a class by itself. Its abilities to define, execute, consolidate, print, display, and graph large complex models using stored control files should be a boon to those of you who must perform these chores repetitiously. Interactive data entry in response to prompts should protect your models from being altered or destroyed by unknowing operators. These considerations far outweigh any shortcomings in its user's manual, its stand-alone model definition, comparatively slow execution time, or unpolished graphics.

If it does what you need, the real issue underlying your decision to buy PLAN80 is whether you can also justify buying CP/M and 80-column cards and a reasonably good word processor to run it. For those of you who currently meet these requirements, PLAN80 should be worth the price. □

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### TABLE OF CONTENTS

Turtle Graphics .....	8
Applesoft Line Cruncher .....	14
TRAC Income System .....	19
MAMA .....	25
Amper Free Space Catalog .....	26
Machine Language Editor .....	27
Apple CALENDAR .....	36
Peaceful Coexistence .....	43
Apple Slugger .....	43
Reverse Key .....	45
Amper Find .....	45
Bond Manager .....	47
DOS 3 + 2 .....	53
Amper Speed .....	57
Apple Darts .....	61
MicroCalc .....	63
Variable Cruncher .....	72
Life .....	77
Apple Flash .....	80
Checker .....	81
GO- Greeting Program .....	83
Quick Sort .....	86
Applesoft Line Editor .....	90
Othello .....	96
SPRINT .....	99
Disk Dump .....	102
Hi-Res Colors .....	103
Apple Record Command System .....	104
Apple Art Gallery .....	114
Game I/O Expmnt .....	119
Super Keypad .....	123
Disk Commander .....	125
Compare Applesoft .....	132
Amp-L-Soft .....	136
Electronic Message Center .....	152
The Shape .....	155
Disk Map .....	159
Apple Bowl Football .....	161
Apple Scroller .....	167
Lower Case Letters .....	168
Recipe Box .....	170
Disk Doctor .....	178
Quasar II .....	182
DOS Command Entry .....	189
MLE Driver .....	189

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# T/MAKER III

---

Version 3.0

by Peter Roizen

T/MAKER Company

1742 Willow Road

#206 Palo Alto, CA 94304

415-326-6103

Price: \$275.00

Rating: AA

Reviewed by F. M. Remley

## OVERVIEW

T/MAKER stands for Table Maker; the name was coined by the program author when the original version was published about three years ago. The newest version, T/MAKER III, is much more than a table maker. In keeping with the current trend towards multi-purpose programs, it offers many choices to the user. It is speedy and is written in the C programming language. T/MAKER III can create and edit CP/M text files of various types: program files, data files, spread sheet files, and files for documents. It contains a powerful resident word processor and printing format designer. It can generate spread sheets computed with a wide selection of arithmetic, financial, and scientific operators. It can merge disk files, rearrange data fields within files, and sort files alphabetically or numerically in ascending or descending order. It can draw bar charts from file data to the screen or printer. It can display blank data-entry screens, designed by the user and called "masks". Data are then entered into the blank

spaces and later stored in a disk file, thus generating a data base. And most of these major functions offer several options, as well.

All in all, it's a powerful and flexible program, but one that can be mastered without undue difficulty. It has a concise command-driven structure incorporating about 40 primary commands and a reasonably compact group of modifiers. The commands make up a specialized language for directing program operation. The user may chain together a series of commands to automatically perform very complex tasks involving combinations of the program functions.

## SYSTEM REQUIREMENTS

T/MAKER III runs under the CP/M operating system and so requires the usual CP/M accessories for the Apple II. The system used for this review consisted of an Apple II+, a Microsoft Z-80 card, a Microsoft 16K memory card, the Microsoft version of CP/M 2.2, a Videx 80-column card, two Disk II drives and a printer driven from a CCS 7710A serial interface. I should note that two disk drives, or equivalent, are necessary since the program and its ancillary files occupy 110K out of the 126K available on a 5 1/4-inch Apple CP/M diskette. The remaining 16K can be put to good use for a few CP/M utilities, such as PIP: and STAT:. Additionally, some means of compensating for the limited Apple II keyboard is useful. A Videx Enhancer or a software character conversion routine can be used to good advantage since many T/MAKER III options can well

utilize the characters normally missing from the Apple keyboard.

## DOCUMENTATION

The documentation is very complete. It is provided in a comprehensive 250-page Reference Manual containing a 24-page chapter of tutorial lessons and 27 pages of Customization Notes—the installation instructions. The text is written in a relaxed, pleasant informational style. Examples are plentiful. The manual was prepared with T/MAKER III, using the word processor module. The only fault to be found with the manual is that it is printed from dot-matrix original copy. The visual appearance is poorer than either the program or the purchaser deserves. I hope that a typeset version will be available in the future.

In addition, a remarkably useful Quick-Reference Booklet is provided. It is 29 pages long, plastic-ring bound, typeset, and printed on stiff plastic-coated stock. All commands are briefly summarized, and in many cases illustrative examples are given. After the initial learning period, I found that WordStar the large Reference Manual was seldom necessary. The Quick-Reference Booklet suffices for most questions.

The program disks include demonstration files illustrating program operation. Four sizable files are chained together with a command sequence that gives very useful short examples of each available function. The files and the commands themselves can be listed and studied to learn the details of the command syntax and of command chaining. This technique makes learning very easy.



## INSTALLATION

The documentation falls somewhat short of optimum in dealing with installation of the program in the Apple II environment. Like most professional-quality CP/M programs, T/MAKER III provides a very flexible INSTALL program. The program will work with almost any standard CRT terminal, printer and CP/M computer. The documentation covers all of the steps necessary for making an Apple installation, but they must be gleaned out of the abundant information describing other systems on which the program will function. It would be a great help to Apple users if a short part of the installation instructions were devoted specifically to the Apple.

One excellent feature of the installation process is an option to redefine the special keyboard commands (control characters and escape sequences) used by T/MAKER III. Many users will find the original selections fully satisfactory and make no changes at all. But users familiar with WordStar commands, for example, may find the very different choices made by the author of T/MAKER III difficult to adopt. It is quite simple to configure the command sequences to be essentially identical to those of WordStar, save only for some special commands required by T/MAKER III and a few other commands unique to WordStar.

## OPERATION

The program is a pleasure to use. The word processor/text editor is powerful. It includes such niceties as automatic footnote placement, multi-line headers and footers, flexible page numbering, and an editing buffer for block moves. Column moves and automatic tabs are provided when editing data tables and spreadsheet models. Both search and search-and-replace are available at all times. File-inclusion is provided, allowing easy preparation of form letters and mailing lists, similar to the use of Mailmerge with WordStar.

Macros are supported, allowing a series of editing keystrokes to be specified and then executed any number of times. Printing options allow full control of justification, underscoring, margin changing, and number of copies.

Spreadsheet preparation is a different process when compared to the methods used for programs like SuperCalc or VisiCalc. T/MAKER III does not use data cells or a jumping cursor. Rather, a model is written using the word processor/editor. The model contains columns and rows of short commands, the data, and the formulas. The commands instruct the program about operations to be performed on data, the order of calculation, etc. After the model is complete, a function called COMPUTE performs all of the necessary calculations, and the spread sheet is completed. The range of commands and of operators is extensive, including arithmetic, trigonometric, and logarithmic operators together with financial operators like growth rate, projection, net present value, and discount rate. Storing a value, fetching it, later and passing it to a calculation can easily be done. In short, the spreadsheet function is very powerful and is comparable to the best of the many such programs now available. Maximum spreadsheet size is primarily limited by available memory, about 16K bytes when starting out with a 64K Apple. Chaining commands can give the user much greater effective capacity since intermediate results can be stored away until needed.

Data sorting is simple and flexible. Data may be sorted in ascending or descending alphabetic or numeric order. The SORT fields are explicitly defined by the user by reference to the data fields on his screen, and multiple sorts are possible with minimum difficulty. In addition, identifying and counting of like elements in lists of data is provided; the TALLY module provides a very readable summary of the tally it has generated.

The BAR charting function automatically scales a horizontal bar chart based on user-specified data files. The symbol used to generate the bars can be chosen, and the placement of the zero axis is under complete control; negative values may be plotted. The bars may be named as they are generated, and by use of the word processor module, complete control of labels and titles is possible.

The "mask" functions LOAD and UNLOAD allow unskilled operators to place data into data files; they permit loading and displaying a previously defined blank form into which data are inserted. When the form is completed for one record, the data are unloaded into a data file, and another blank form is presented. Thus a data base may be generated, then sorted, tallied, or otherwise manipulated, and a report prepared.

Complete file management functions are provided: creation of files, deletion of files, merging of files, listing of files from within the program, saving, renaming, and loading are all possible. A RESET function is provided, to avoid the nasty tendency of CP/M to be intolerant of disk changes during program operation.

## SUMMARY

T/MAKER III operates very smoothly. The fully integrated modules make complex data processing and report writing much more convenient than would the use of an equivalent set of single-purpose programs. It takes but a little practice to make full application of its features. The word processor is excellent, as are the spreadsheet and other functions noted above. No program bugs were discovered during use. In addition, a T/MAKER III Users' Group (T/MUG) exists that publishes a quarterly newsletter. Financial applications of the program are the main topics discussed, judging by four issues that I have examined. I expect that program support by the publisher will be excellent; certainly my contacts have been painless, with

help and advice offered freely.

T/MAKER III will meet the needs of the Apple CP/M user who finds attractive the idea of a combined text-editing/word-processing/spread-

sheet/list-processing/bar-charting program. A visit to a software dealer will permit prospective purchasers to view the demonstration programs. Such an examination is well worth

the time spent, before making a final decision to purchase the package.

The program is well implemented, well documented, and is quick in operation. It deserves an AA rating.□

---

# THE INCREDIBLE JACK

---

Version 1.3

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Rating: B+

Reviewed by Alan Shalette

## INTRODUCTION

Word processor, file manager, "calc package", and mailing list handler all in one? Incredible! That's JACK.

For those of us Apple II owners who read dolefully about the big splash being made by Lotus Development Corporation's 1-2-3 and Context Management Systems' MBA integrated, multi-function packages for the IBM PC, could JACK be our chance to catch up? Not really. But if you're interested in a "Jack of Many Trades" package anyway, read on.

## HARDWARE AND SOFTWARE REQUIREMENTS

JACK's hardware requirements are constrained by the Apple Pascal system with which the package was written. Requirements and slot-related dependencies are as follows:

**Slot 0** Pascal Language Card or 16K RAM card (mandatory).

**Slot 1** Serial or parallel printer must be here if one is used (highly desirable).

**Slot 2** Not used.

**Slot 3** 80-column board or external terminal only. If one is not present, JACK will use the Apple's native 40-column display.

**Slot 4** Third and fourth disks (optional).

**Slot 5** Third and fourth disks (optional).

**Slot 6** First (program) and second (data) disks (mandatory).

**Slot 7** Not used.

## THE BIG PICTURE

At its core, JACK is a very talented file management system. Its records are created with a simple word processor in a manner similar to records created by VisiDex and DataFax (reviewed in *Peelings II* V3N8, 1983 and V3N5, 1982, respectively).

JACK's display is 20 X 80 characters. It uses vertical scrolling to allow you to work with documents up to 60 pages long, although moving around in a big document gets cumbersome. Any document can be used as a "template" or record definition. The fields of the record may total up to 3500 characters, including "footnotes" which tell JACK how to calculate one field based on others.

Like VisiDex and DataFax, JACK's records may contain preformatted fields—making their respective records look like templates. This facility expedites data entry by allowing you to move quickly from field to field using simple cursor controls. JACK can store up to 1000 records on a diskette—in up to 60 different files. All records in a given file have the same text but may differ with regard to the contents of their respective data fields.

While all three allow you to place either alpha or numeric information in these formatted fields, JACK takes a giant step forward by allowing you to put equations in

# NEW PRODUCT PRICING PROPOSAL - 6/8/83

Given our product cost of \$2.40 and 40.00% desired margin we recommend a list price of \$4.00.

Our standard 30.00% distributor discount yields a distributor price of \$2.80 and our wholesale discount of 20.00% will result in a wholesale price of \$3.20.

PRICING PROPOSAL SUMMARY			
PRODUCT COST			
-	Materials		0.55
-	Manufacturing		1.45
-	Gen'l & Administrative		0.40
TOTAL PRODUCT COST			2.40
MARGIN	40.00%		1.60
LIST PRICE			4.00
STD DIST DISCOUNT	30.00%		-1.20
DISTRIB PRICE			2.80
WHOLESALE DISCOUNT	20.00%		0.40
WHOLESALE PRICE			3.20

Figure 1. JACK-FORMATTED PRICING EXAMPLE

them—in a manner remotely similar to what you may have seen or used in VisiCalc or Desktop/Plan II. Like these "calc" packages, you don't see the equation in the spreadsheet. Rather, each of JACK's formatted fields is given a name which is stored as a footnote along with an equation defining its contents.

For example, Figure 1 illustrates how formatted fields may be used in normal types of word processing text (top part) or in tables which look like VisiCalc spreadsheets (lower part). Footnote definitions used to produce the results shown are given in Figure 2.

```

83:
#01:TOTPRODCOST^2-
#02:MARGIN^-
#03:LISTPRICE^2-
#04:STDDISTDISC^-
#05:DISTPRICE^2-
#06:WHLSLPRICE^2-
MATERIALS:^2^
MANUFACTURING:^2^
ADMINISTRATIVE:^2^
TOTPRODCOST:MATERIALS+MANUFACTURING+ADMINISTRATIVE^2^
MARGIN:^2^
MARGIN$:LISTPRICE-TOTPRODCOST^2^
LISTPRICE:TOTPRODCOST/(1-MARGIN/100)^2^
STDDISTDISC:^2^
DISTDISC$:DISTPRICE-LISTPRICE^2^
DISTPRICE:LISTPRICE*(1-STDDISTDISC/100)^2^
WHLSLPRICE:^2^
WHLSLPRICE$:WHLSLPRICE-DISTPRICE^2^
WHLSLPRICE:LISTPRICE*(1-WHLSLPRICE/100)^2^

```

Figure 2 FOOTNOTES USED IN PRICING EXAMPLE

Footnotes are specified as follows:  
FIELDNAME:{EQUATION}^{FORMAT}

For example, as shown in Figure 2:

```

WHLSLPRICE:{LISTPRICE*(1-WHLSLPRICE/100)}^{2^}

```

LISTPRICE and WHLSLPRICE are defined elsewhere in the footnote table; the colon (":") stands for an equal ("=") sign; the first caret or up-arrow tells JACK to look for field formatting specifications which will follow; the "2" tells JACK to print with two places following the decimal point; and the last caret tells JACK to right-justify the number within the field.

Computational capabilities include +, -, /, exponentiation, and the logical operators <, >, =, NOT, AND, OR, and IF, THEN, ELSE, and any appropriate combinations thereof, up to three lines long. Other formatting instructions include field length, left justification, and deletion of trailing zeroes (variable length fields).

JACK knows how to distinguish formatted fields from text by looking for pairs of colons (":") and carets ("^"). Unless you tell it otherwise, the word immediately preceding and next to the colon is automatically used as the field's name. Formatted fields may contain either numeric data or alphanumeric strings.

Thus, the actual record shown in Figure 1, excluding data, would look like the contents of Figure 3 when displayed on your screen.

# NEW PRODUCT PRICING PROPOSAL - 6/8/83:

Given our product cost of \$: ^  
and : ^% desired margin we  
recommend a list price of \$: ^.

Our standard : ^% distributor  
discount yields a distributor price of  
\$: ^ and our wholesale discount of  
: ^% will result in a wholesale  
price of \$: ^.

PRICING PROPOSAL SUMMARY			
PRODUCT COST			
-	Materials:		^
-	Manufacturing:		^
-	Gen'l & Administrative:		^
TOTAL PRODUCT COST:			^
MARGIN:	^%:		^
LIST PRICE:			^
STD DIST DISCOUNT:	^% :		^
DISTRIB PRICE:			^
WHOLESALE DISCOUNT:	^% :		^
WHOLESALE PRICE:			^

Figure 3 SAMPLE RECORD SHOWING FIELD DELIMITERS

Note that the first footnote in Figure 2, ("83:"), was handled incorrectly by the system which should ignore

Once a record has been defined, it may be replicated and filled with different data; the records can be accessed based on search criteria and printed; selected fields can be copied; records can be deleted; and JACK will do other things most file managers do. These operations will be discussed in the next section.

JACK is menu-driven and operates in four main modes: **Disk**, **File**, **Select**, and **Print**. Disk, File, and Print modes use unique displays. Select and the Main Menu share the File Mode display. The Main Menu/File mode display is illustrated in Figure 4, which also shows the bottom of the example discussed earlier.

(-----)	
WHOLESALE DISCOUNT:	0.40^
WHOLESALE PRICE:	3.20^

**Figure 4 MAIN MENU DISPLAY**

**File Mode** is accessed by typing **F** in the main menu display. JACK's text editing commands for both 80-column and 40-column displays include basic cursor movements to move right or left one character, up or down one line, and tab right. The ESC key is used to return to menu level from editing.

- Insert, delete, and copy text and save the record.
- Create or change footnotes.
- Go to another record having the currently defined

- Load a new diskette.
- Load a file from the diskette, thereby eliminating the file currently in memory.
- Save the current/revised file description in memory.
- Delete records and files or erase the entire disk.
- Copy records from one file to any other which contains one or more fields having names matching fields in the



file being copied; copy an entire file; or copy all files on an entire diskette.

In **Select Mode**, record selection criteria may be entered as simple expressions such as `TOTPRODCOST > 2.00` or as compound logical expressions including calculations, and may include searches for strings with or without wild-card characters. You may also Select on the contents of more than one field at a time. In **Print Mode**, commands allow you to print: a catalog of your data diskette; the description of the file currently in memory; either the last record you were working on or all records satisfying the currently active Select parameters.

You may also specify 18 parameters which will govern formatting of your records on paper. These controls include line page length, left margin offset, whether to fill the lines with spaces to produce a flush right margin, top and bottom margins and titles, whether to sort the records based on the contents of Select criteria, and the like.

## PERFORMANCE

Unfortunately, JACK's performance and handling characteristics leave a lot to be expected and desired. I believe JACK suffers from two major and many minor faults.

JACK's first major problem is the quality of its word processing function. Since you use this function most of the time you spend with JACK (i.e., during file creation and data entry in the File mode), its quality underpins JACKS overall handling characteristics.

First, some good points: key entry and word-wrap/on-screen formatting are quite smooth, and in combination with JACK's buffered keyboard you get a good feeling about what will result as you think about what you want to accomplish without having to watch the screen formatting closely.

On the other hand, editing can be an agony. The following observations are not exhaustive:

- CTRL-T and CTRL-B are just not the right combinations to use for up and down cursor movements.
- JACK needs commands to move the cursor directly to specific places in the body of text.
- You may not, without spending a great deal of time fixing up the result, change your record's width by moving its tab marks.
- Vertical scrolling of the screen is akin to a ping pong ball bouncing on rocks—you never know how high or low the bounce will be, and you cannot position the display to show the specific lines you want to see.
- Uppercase/lowercase shift handling is rudimentary in both 40- and 80-column display modes.

JACK's second major problem is related to the twisted paths it requires among its various modes and options to accomplish what I consider straightforward tasks. For ex-

ample, suppose you just completed your first pass in writing a letter and would like to see a draft or would like to see a list of the footnotes you've created (the only way to see them all is to print them)—you would start out in File mode and would then:

- Hit ESC to get to the Main Menu.
- Type D to get to Disk mode.
- Type S to save the file definition.
- Move the cursor to a blank space on the Disk mode display and enter the file name.
- Hit RETURN to save the file.
- Hit ESC again to get back to the Main Menu.
- Hit P to get to Print mode.
- Hit R to select Record mode.
- Hit C to select the current record.
- And finally, hit RETURN to print the record.

This is quite time consuming and demands that you know almost every function of the system to accomplish the simple feat of getting a quick draft. Keyboard buffering helps if you can remember all the steps required in advance, but it's no excuse for such poor design of control flow.

### (Business Solutions response:

*This whole procedure can be simplified by creating the new file in Disk mode first. This action automatically transfers you to file mode, where the file can be saved with a single CTRL-S keystroke. This avoids returning to the Disk mode altogether and replaces 6 steps with one.*

*If it were a letter you were writing, you could press "P" for PRINT, "F" for FILE and RETURN to start printing. This replaces 2 steps with one. Overall, the 10-step process can be reduced to 5 keystrokes:*

CTRL-S Save File  
ESC Go to Main Menu  
P Go to Print Mode  
F File Definition  
RETURN Start Printer .)

Following are the more significant minor problems from a list I compiled as I stepped through each of the system's functions.

### In File Mode:

- You must go to the last record of the file you're working on to determine the number of records in the file. There is no display which will show the information.
- When a file is loaded, you are positioned at the first record on the file. Any changes to this record will cause its stored image to be changed (the last record on the file is the working copy or blank form).
- To change a particular record, you must either step through all preceding records until you reach it or go to the Select mode, enter a parameter unique to the

record, and then go back to File mode to GOTO it.

- You cannot delete a record in File mode.
- Any change to a formatted field while you're editing your record will clear the field's footnote definition (except if you copy it).
- You must print a record to see the collection of footnotes you've created. There is no way to see them all at once in File mode.
- Average time to save the record shown in Figure 1 was about 10 seconds.

#### In Select Mode:

- When you enter a parameter, Select goes off for a while to find the first record in the file containing the entered parameter—whether it makes sense to do so or not.
- The manual tells you that the key JACK uses for quickest access is the first formatted field you created. The key may appear anywhere in your text, and unless you have noted it, you'll never know what it is since there is no display which will tell you. If you deleted the first key you created as you edited the form, there's no telling what the new key is.

#### In Disk Mode:

- You may only remove or copy records which conform to Select parameters. Unlike Print, if you have not entered any Select parameters, no records will be deleted or copied. In Print mode this condition will cause all records to be printed.
- Even if you have entered an appropriate Select parameter (e.g., TOTPRODCOST = 0), blank records will not be deleted.
- If you made a mistake entering your Select parameters, JACK will attempt to read each record on the file you want to copy or from which you want to delete records and prompt you with an error message each time. In response you must hit the ESC key for each record on the file. There is no apparent way to abort the operation.

#### In Print Mode:

- Notice, in the lower part of Figure 3, that JACK didn't properly align the resulting printed output shown in Figure 1. I had to offset the formatted fields to get JACK to print the data correctly aligned with the underscores. I tried to replicate this problem with another test file, but alignment worked as expected in the latter case. I have no idea why it happened in the example shown.
- There is no indication of how the Print width parameter interacts with the width settings created in File mode (i.e., using the tab marks). If print width is less than the line width used in File mode, your printout will be scrambled.

- Many good word processors recognize the need for four vertical margins—above and below the header line and above and below the footer line. JACK allows only two—top skip and bottom skip.

## DOCUMENTATION

JACK is cleverly packaged in one of those hard-plastic disk storage cases which you might otherwise buy to store up to about 10 diskettes. It includes the program, a user manual, a "Key Card", and (in my case) several loose sheets containing errata and omissions in the user manual and a coupon for a discounted backup copy.

The manual serves its intended purpose fairly well—with several lapses. It contains no mention of the sample data diskette nor that the illustrations contained in the tutorial are also contained in the sample data diskette. It is filled with bold type "REMEMBER" warning messages about "what will happen if . . ." These messages are neither repeated in its Reference section nor are they as emphatically displayed as warnings of impending catastrophies when you operate the system. Overall, its Reference section contains inadequate detail, and the manual should contain a detailed system overview.

The Key Card is a two-page, folded, stiff card containing JACK's editing commands, hardware requirements, and a brief overview of all its menus and options (with the exception of File/Restart). Neither of the first two subjects is discussed in the user manual.

## CONCLUSIONS

JACK's potential is enormous—at a very reasonable cost. It significantly underachieves its potential, however, through poor word processing capabilities, poor flow of control, and plain lack of consideration for its users.

Erik Sandber-Diment reviews personal computers for *The New York Times*. In the May 31, 1983 edition he reviewed JACK, concluding that "Even with a manual that could bear some improvement, the software is surprisingly easy to learn how to use". He then went on to speculate that a ". . . total novice would need in the neighborhood of six to eight hours to become reasonably proficient in the basics. An individual with a couple of weeks' experience behind a keyboard could probably have things humming along within an hour or so. One certainly can't say that about many programs of this complexity and potential". He finally notes some of the operational difficulties noted earlier in this review.

I heartily disagree with his judgements about JACK's ease of use but won't argue JACK's functionality. You may judge for yourself.

If its creators took the foregoing comments to heart and made the many changes necessary to make JACK easier to use, I believe it could have AA or even AAA rating potential. I look forward to major revisions in the future.□

---

# PERFECT CALC

---

by Robert B. Wesson  
Perfect Software, Inc.  
1400 Shattuck Ave.  
Berkley, CA 94709

*Requires Z-80 Card*

*Unlocked*

*Rating: B-*

*Reviewed by Edward Burlbaw*

## INTRODUCTION

Perfect Calc is a new entry into the spreadsheet field. It is a CP/M-based program published by Perfect Software, and recently adapted to the Apple. A virtual memory system has been incorporated into the program to allow larger spreadsheets. Users of Perfect Writer will recognize the similarity in commands between the two programs. I have been using VisiCalc over the past few years, and more recently, Spreadsheet 2.0, so these programs will be my basis for comparison.

## CONFIGURATION

Perfect Calc is configured by running PCCONFIG; however, as provided, it ran on the Apple II with the Videx 80-column board. The active cell is delineated by < and > instead of the normal INVERSE method. One additional step is required to take advantage of the INVERSE features of the Videx board. Unfortunately, there appears to be a bug in the program, because when moving off the initial page, the entire screen becomes white and the cursor is dark.

The only disadvantage of using the default (<>) is that the cell delimiters overwrite characters adjacent to the active cell. Printer configuration is limited to selecting the page width and initialization and de-initialization strings. The command-key sequences can be changed to suit the user's taste; probably to correspond with a favorite word processor's commands. Because the commands are nearly identical to Perfect Writer's, this option probably won't be of interest to those users.

## DOCUMENTATION

The documentation consists of one fairly thick book (350 pages). The first 275 pages deal with beginning and advanced usage of Perfect Calc. Many simulated video displays of the program in use are included. The commands are highlighted by displays of oversized keys in the correct sequence. The rest of the manual demonstrates the use of Perfect Calc in home and personal finance and business applications using the included demo spreadsheets. Two of the three disks included with Perfect Calc contain lessons and sample spreadsheets for a variety of applications. There is also a glossary, index, and a small (too small) section on configuration procedures.

I found no mention of dual-drive use, although two drives are almost a necessity. One difficulty I had was in loading linked spreadsheets. It wasn't until I made the data drive the logged drive that it worked properly.

## CALCULATE SUBSYSTEM

Upon entering the spreadsheet part of the program, operation is very

similar to other spreadsheet programs. Commands for moving around the spreadsheet are patterned after Perfect Writer. Control keys are used for moving about the spreadsheet. Gone is using the Space Bar to toggle the cursor direction and the use of the escape key instead of backspace. The "/" commands are replaced by control key sequences. Of the 31 "standard" built-in functions, only 20 are supported by Perfect Calc. Missing are the inverse trigonometric functions: CHOOSE, ERROR, FALSE, ISERROR, ISNA, NA, PI, TRUE, ROUND, ROW, COL (the last three are from SPREADSHEET/MAGICALC, not VisiCalc). All the trig functions are missing from SPREADSHEET.

Column widths may be set individually. A unique feature is that cells may overflow to the right if the adjacent cell is empty. This simplifies titles or instructions that one might want to insert at the top of the spreadsheet. Cells (or formulas) may be locked. Regions may be moved about the sheet using the store and "yank" commands.

One convenient feature is the ability to do regional recalculations. If you are working on a large spreadsheet, perhaps with some of it in virtual memory (on disk), only the defined region will be recalculated; otherwise, all parts of the spreadsheet must be loaded one by one into memory and recalculated. The advantages of this are probably apparent to anyone who has used large spreadsheets or complicated expressions, even without the disk access.

The entire spreadsheet or only certain regions can be written to a disk

file for later editing with a word processor.

## SPECIAL FEATURES

Perfect Calc has the ability to keep up to seven different spreadsheets active at one time. Spreadsheets may be linked with other spreadsheets on the disk to share data. In this manner the disk is used as a virtual memory system. This allows the use of spreadsheets or combinations of spreadsheets that fill an entire diskette, or approximately 150K bytes. While this at first sounds like a lot of room, other spreadsheets now support memory boards up to a total of 512K.

## SPECIAL PROBLEMS

The file system is also the weakest link in the program. There are several problems in this area. Although up to seven buffers may be active at one time, the command for displaying the buffer directory (CTRL-X, CTRL-B) doesn't work on the Apple version. A call to Perfect Calc confirmed this as true, but no solution was promised. (The other command involving

CTRL-B, move backward on the spreadsheet, doesn't work either.) Another command which doesn't work is the repeat command modifier, CTRL-U.

I have grown to expect a certain amount of convenience when it comes to selecting the file to load into a word processor or spreadsheet program. From within Perfect Calc it is impossible to obtain a directory of a disk. The Find File command will start a new file if the requested file does not exist on the disk. Some kind of error message, even: HEY JERK, THAT FILE IS NOT HERE, WOULD YOU LIKE TO TRY ANOTHER?, would have been welcome. Would it be too much to ask for a directory at that time? If you don't have a directory of each disk stored somewhere, you have to resort to guessing, or exiting to system level. I learned that command quite well, it's CTRL-X, CTRL-C.

Two disk drives are almost a necessity. The program is segmented so that certain commands are loaded into memory only when needed. With one drive, a lot of swapping is

necessary, unless the active spreadsheet is on the program disk. If this is the case, there will be room for only 35K of spreadsheet; a severe restriction on the increased capacity allowed by the virtual memory management. Even with an entire drive allocated to a single spreadsheet, only about 138K is available for a spreadsheet. Other spreadsheet programs now allow spreadsheets up to 512K with memory cards.

## CONCLUSIONS

Perfect Calc is a CP/M spreadsheet program with most of the expected features. The ability to have multiple files open at once is quite an advantage over most other spreadsheets. Virtual memory management alone is no longer an advantage with the advent of other programs that are able to take advantage of mass-memory cards. There are still a few bugs to be worked out of the Apple version. I wouldn't say that it is unusable in its present form, but it is quite inconvenient. Look for the corrected and improved version for the Apple before rushing to buy Perfect Calc.□

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B	V3N2	Apple 6502 Assembler/Ed.	Apple Computer
A	V4N5	Assembler, The	Micro-SPARC
AA	V3N2	Big MAC	A.P.P.L.E.
AA+	V3N7	Big MAC.LC	A.P.P.L.E.
A+	V4N5	Compiler Plus	Hayden Software
A-	V3N2	Edit 6502	LJK Enterprises
A+	V4N5	Einstein Compiler	Einstein Corporation
A+	V4N1	Flash!	Laumer Research
A	V4N1	Integer BASIC Compiler	Synergistic Software
B+	V3N2	Lisa 2.5	On-Line Systems
A+	V4N5	Macrosoft	Micro-SPARC
A+	V3N7	Merlin	Southwestern Data Systems
AAA	V4N5	ORCA/M	Hayden Software
A+	V3N7	S-C Macro Assembler	S-C Software
AA	V3N3	TASC	Microsoft
AA	V4N5	Visible Computer-6502, The	Software Masters

## BUSINESS & FINANCE

A	V4N2	Accountant, The	Decision Support Software
AA	V4N2	B.P.I. General Ledger	B.P.I. Systems
C	V3N8	Color Calendar	Spectrum Software
D	V3N9	Consolidator, The	Omega Microware
C	V4N5	EZ-Ledger	Highlands Computer Service
A+	V4N2	Financial Mgmt System II	Southwestern Data Systems
C-	V3N5	Home Accountant	Continental Software
AA	V4N5	Market Illustrator	N-Squared Computing
A	V4N3	Market Maverick	Financial Software
AA	V4N5	Millionaire	Blue Chip Software
AA	V4N3	Permanent Portfolio Anal.	C.R. Hunter & Assoc.
F	V3N5	Personal Check Manager	Donald Poling
A+	V4N6	Portfolio Master 3.1	Investors Software
B	V4N5	Stock Mkt Adv/Dec Tmg Pr	Dr. Roger Altman
C-	V4N3	Stock Price Forecast	J R Software
A	V3N8	Tax Preparer	Howard Software
A-	V3N8	Time Manager	Image Computer Products
AA-	V4N1	Versaform	Applied Software Technology
A+	V3N8	Visidex	VisiCorp
A	V4N1	Visischedule	VisiCorp
AA	V3N9	Visicalc Preboot	Videx

## CODE GENERATORS

C-	V3N7	Last One, The	DJ "AI" Systems Ltd (review -1)
D	V3N7	Last One, The	DJ "AI" Systems Ltd (review -2)
C+	V4N2	Programmer, The	Advanced Operating Systems
N	V4N2	C.O.R.P	Gary Scotto

## COMMUNICATIONS

AA+	V3N8	ASCII Express, Profes.	Southwestern Data Systems
C	V3N1	Auto Modem	Computer Station
B-	V4N5	Data*Trans	ABT Microcomputer Software
AAA	V4N5	DOS File Exchange II	Arrow Microware
A+	V4N5	Hayes Terminal Program	Hayes Microcomputer Prod., Inc.
A-	V4N5	Intelligent Terminal Sys.-80	Unisoft
A	V4N1	P-Term	Southwestern Data Systems
A+	V3N4	Reflexive Visicalc	Arrow Micro Software
	V4N5	SSM Modem Card	SSM Microcomputer Products
B-	V4N5	STC Call	David Meredith
A-	V4N5	Super Smart	Softspoken
A	V4N5	Tekterm	Fountain Computer Products
B	V3N8	Telephone Transfer II	Telephone Software Connect.
A	V4N5	TeleText	Micro-SPARC
A+	V3N7	Transend 2	SSM Microcomputer Products
AA	V3N7	Z-Term, The Professional	Southwestern Data Systems

## DATA BASE PROGRAMS

C-	V4N2	Cardfile	Digital Marketing
A	V3N8	Data Factory 5.0	Micro Lab
AA	V3N5	DataFax	Link Systems
A	V3N9	DataStar	Micro Pro Int'l.
B	V4N2	Quick-Search Librarian	Interactive Microware
B+	V4N4	Super File Cabinet	Abacus Computing
B+	V4N4	Notebook	NIKROM Technical Products

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P	V4N1	David-DOS	David Data
AA	V4N3	David-DOS	David Data
A-	V4N1	Diversi-DOS 1-A	Diversified Software Reasearch
AA	V4N3	Diversi-DOS 2-C	Diversified Software Reasearch
AA	V4N1	DOS Enhancer, The	S & H Software

## EDUCATIONAL

D	V3N4	A.E.N. Grading System	Avant-Garde Creations
B	V4N1	A.E.N. Grading System	Apple Educator's Newsletter
B	V3N1	Algebra I	Edu-Ware
C	V3N4	Apple Grade Book	J & S Software
B	V4N1	Apple Grade Book 2.4	J & S Software
A	V3N1	Assembly Teacher	Computer Works
A-	V4N3	Bumble Games	The Learning Company
A	V4N2	Class Records	Educational Systems Software
B	V3N1	Crossword Machine	L & S Computerware
B	V3N1	Crossword Magic	L & S Computerware
B	V3N1	Elementary My Dear Apple	Apple Computer
B	V4N2	E-Z Learner	Silicon Valley Systems
C	V3N1	Hand Holding BASIC	Apple Computer
A	V3N1	Isaac Newton	Krell Software
A	V3N1	Link Sampler	Link Systems
A	V3N3	MasterType	Lightning Software
A	V3N1	Mathware	Math City
B	V3N3	Micro Atlas	Columbia Software
C	V4N3	Story Machine	Spinnaker Software
A	V3N1	Quicktrace	Aurora Systems
C	V3N4	Vectors & Graphing	Cross Educational Software
C	V3N4	Vocabulary Game	J & S Software

## GAMES

A	V3N8	Choplifter	Broderbund
B-	V3N9	Congo	Sentient Software
AA+	V3N9	Crisis Mountain	Synergistic Software
A	V3N9	Firebug	Muse Software
C	V3N4	Goblins	Highlands Computer Services
A	V3N9	Gold Rush	Sentient Software
AA	V3N7	Guardian	Continental Software
AA	V3N5	Hadron	Sirius Software
B+	V2N1	HIRES Football	On-Line Systems
B+	V3N3	HIRES Golf	Avant-Garde
A-	V3N9	Jellyfish	Sirius Software
A	V3N9	Microwave	Cavalier Computer
C	V3N2	MyChess	Datasoft
B+	V3N9	Neptune	Gebelli Software
B	V3N9	Norad	Southwestern Data Systems
A	V3N9	Pie Man	Penguin Software
AA+	V4N3	Pinball Construction Set	BudgeCo.
AA+	V3N4	Pool 1.5	Innovative Design Software Inc
B-	V3N2	Race For Midnight	Avant-Garde Creations
A+	V3N1	Raster Blaster	BudgeCo.
A+	V3N9	Rendezvous	Edu-Ware
A+	V4N3	Repton	Sirius Software
C	V3N9	Seafox	Broderbund
AA	V3N9	Serpentine	Broderbund
A	V3N9	Singles' Night at Molly's	Soft Images
A+	V3N9	Solitaire	CompuTek
A	V3N7	Snack Attack	DataMost
A	V3N9	Snapper	Silicon Valley Systems
A	V3N7	Starblaster	Piccadilly Software
A	V3N5	Swashbuckler	DataMost
AA	V3N4	Threshold	On-Line Systems
A	V3N5	Track Attack	Broderbund
A-	V3N4	Trick Shot	Innovative Design Software Inc
C	V3N9	U-Boat Command	Synergistic Software
A	V3N8	Ultima	California Pacific

## GRAPHICS UTILITIES & GRAPHICS DUMPS

A	V3N3	A2-3D1 Animation Package	SubLOGIC
A	V3N3	A2-3D2 Graphics Package	SubLOGIC
A	V3N3	A2-GE1 Graphics Editor	SubLOGIC
A+	V4N4	Accu-Shapes	Accent Software, Inc
B	V3N5	Amperdump	Madwest Software
A+	V3N5	Ceemac	Vagabondo Enterprises
AA	V4N4	Delta Drawing	Spinnaker Software, Inc
D	V3N5	EZEPSON	MicroComPac
AA	V3N7	Graphics Magician	Penguin Software
A-	V4N4	Graphics Processing System	Stoneware, Inc.
A-	V4N4	Graphics Processing Sys.	Stoneware, Inc
B	V3N5	Graphtrix	Data Transforms
N	V3N3	HIRES Secrets	Avant-Garde Creations
A-	V3N5	Image Printer	Sensible Software
A+	V4N4	Paper Graphics	Penguin Software
A-	V3N8	Printographer	Southwestern Data Systems
A+	V4N4	Printographer	Southwestern Data Systems

A-	V3N3	Special Effects	Penguin Software
A	V4N4	TGS: The Graphics Solution	Accent Software
A+	V3N5	Zoom Grafik	Phoenix Software

#### LANGUAGES

A+	V4N5	EnBASIC	COMPRESS
AA	V3N5	GraFORTH	Insoft
AA+	V3N9	Krell Logo	Krell (review #1)
C	V3N9	Krell Logo	Krell (review #2)
AA+	V3N9	Terrapin Logo	Terrapin Inc

#### PERSONAL

B+	V3N1	Agenda Files	Apple Computer
B	V3N3	Chequemate MasterWorks	Software
B	V3N2	Menu, The	C & H Video
F	V3N1	Sex Rated	No-Name Software
N	V3N1	Softporn	On-Line Systems

#### PLOTTERS

A	V3N5	Ampergraph	Madwest Software
A-	V4N4	Apple Business Graphics	Apple Computer
B	V3N5	Hires Graph-fit	Microware Dist.
B	V4N4	PFS Graph	Software Publishing Corp
A+	V4N4	Prime Plotter	PrimeSoft Corp
A-	V3N5	SuperPlotter	Dickens Data Systems
B	V3N2	UltraPlot	Avant-Garde Creations
D	V4N4	Versaplot	Spectrasoft
C	V3N2	Visiplot	VisiCorp

#### SCIENTIFIC

P	V3N2	HSD ANOVA	Human System Dynamics
C-	V3N3	HSD STAT	Human System Dynamics
F	V3N3	Statistics 3.0	Edu-Ware
B-	V3N5	Statistics With Daisy	Rainbow Computing

#### SIMULATIONS

B	V3N4	AIRSIM-1	Mind Systems Corp. (see V3N8)
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B	V3N8	A2-FS1	Sublogic
A+	V3N9	Air Navigation Trainer	Space-Time Associates
B	V4N4	IFR Simulator	Programmers Software
A	V4N4	Spitfire Simulator	Mind Systems Corp

#### UTILITIES

A-	V4N2	Amper-Magic	Anthro-Digital Software
B+	V4N2	Amper-Magic II	Anthro-Digital Software
A+	V3N2	APLIST	Unified Systems
C+	V3N4	Apple-cillin I	XP5, Inc
B+	V4N3	Apple Mechanic	Beagle Brothers
B+	V3N9	Arcade Machine, The	Broderbund
AA	V3N7	Bag of Tricks	Quality Software
A-	V3N7	Bug, The	Sensible Software
A+	V3N7	Build Using	Sensible Software
A+	V4N2	Copy II Plus	Central Point Software
AA-	V3N5	Electric Duet	Insoft
AA	V4N2	Inspector	Omega Microware
C	V3N3	MasterDisk	Masterworks Software
C-	V4N2	Mathemagic	International Software Marketing
A	V3N3	Memory Management System	Computer Data Services
B	V3N9	Programmers Library	Telephone Software Connection
A+	V4N2	Routine Machine	Southwestern Data Systems
AA	V3N3	Super Disk Copy III	Sensible Software
N	V4N3	Typefaces	Beagle Brothers
A	V4N3	Visiblend	Micro Lab
AA	V3N2	Univ. Boot Initializer	S & H Software
A	V3N3	Utility City	Beagle Brothers
A+	V3N5	Videoterm Utilities	Videx
AA	V4N2	Watson	Omega Microware

#### WORD PROCESSORS-EDITORS-SPELLERS

A	V3N6	Apple Writer II	Special Delivery Software (Apple)
AA	V4N3	Bank Street Writer	Broderbund Software
B	V3N6	Correspondent, The	S.W. Data Systems
B+	V4N4	ES-CAPE	S-C Software
N	V3N6	Gutenberg	Micromation Ltd.
A+	V4N6	Format II	Kensington Microware, Ltd.
A+	V3N6	Letter Perfect 5.0	LJK Enterprises
B	V4N6	Magic Window II	Artsci, Inc.
B	V4N6	Megawriter	Megahaus Corporation
B	V4N6	Perfect Writer	Perfect Software, Inc.
AA+	V3N6	Pie Writer	Hayden Software
A	V4N6	Pie Writer 2.2	Hayden Software
C	V3N6	Sandy	Software & Peripherals
A+	V3N6	Screen Writer II	On-Line Systems
C	V4N6	Select	Select Information Services
B	V3N8	Spellbinder	Lexisoft
B	V3N6	Super-Text 40/80	Muse Software
C	V3N6	Word Handler	Silicon Valley Systems
AA+	V3N8	Word Star	Micropro Int'l
AA	V3N2	Word, The	Oasis Systems
B+	V3N8	Write-Away	Midwest Software Associates
B	V3N6	Zardax	Computer Solutions

#### WORD PROCESSOR UTILITIES (OTHER)

B+	V3N8	Lexicom 2.0	Micro-Sparc
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#### HARDWARE

V3N4	68000 board	Digital Acoustics
V3N4	Command ROM	Soft Control Systems
V4N1	Crack-Shot	Pirates Harbor
V3N7	Gibson Light Pen (LPSII)	Gibson Laboratories
V4N4	Gibson Light Pen (LPSII)	Gibson Laboratories
V3N8	Graphtrax Plus	Epson America
V4N3	Guild Apple Stand	Guild Musical Instruments
V4N2	HP-16C Calculator	Hewlett-Packard
V3N1	Keyboard Enhancer (I)	Videx
V3N6	Keyboard Enhancer (II)	Videx
V3N4	Microspeed	Applied Analytics
V3N8	MXPLUS	Dresselhaus Computer Products
V4N4	Omniscan Laser Disc Ctrlr	Anthro-Digital Inc
V3N7	Pi-3 Amber monitor	USI Computer Products
V3N6	RAMDISK 320	Axlon
V4N1	Snapshot	Dark Star Systems
V3N6	Sup'R'Fan	M&R Enterprises
V3N6	Super Fan II	R.H. Electronics
V4N1	Super-MX Interface Card	Spies Laboratories

#### COMPARISON CHARTS AND STANDARDS

Assembler Comparison Chart	V3N2, V3N7, & V4N5
Compiler Comparison Chart	V4N5
Data Base Standards	V2N5
Flight Simulator Standards & Chart	V3N8
Flight Simulator Chart	V4N4
Graphics Dump Comparison Chart	V3N5, V3N8, V4N4
Word Processor Standards & Chart	V3N6, V3N8, & V4N6
Word Processor Draft Stds 1983	V4N3

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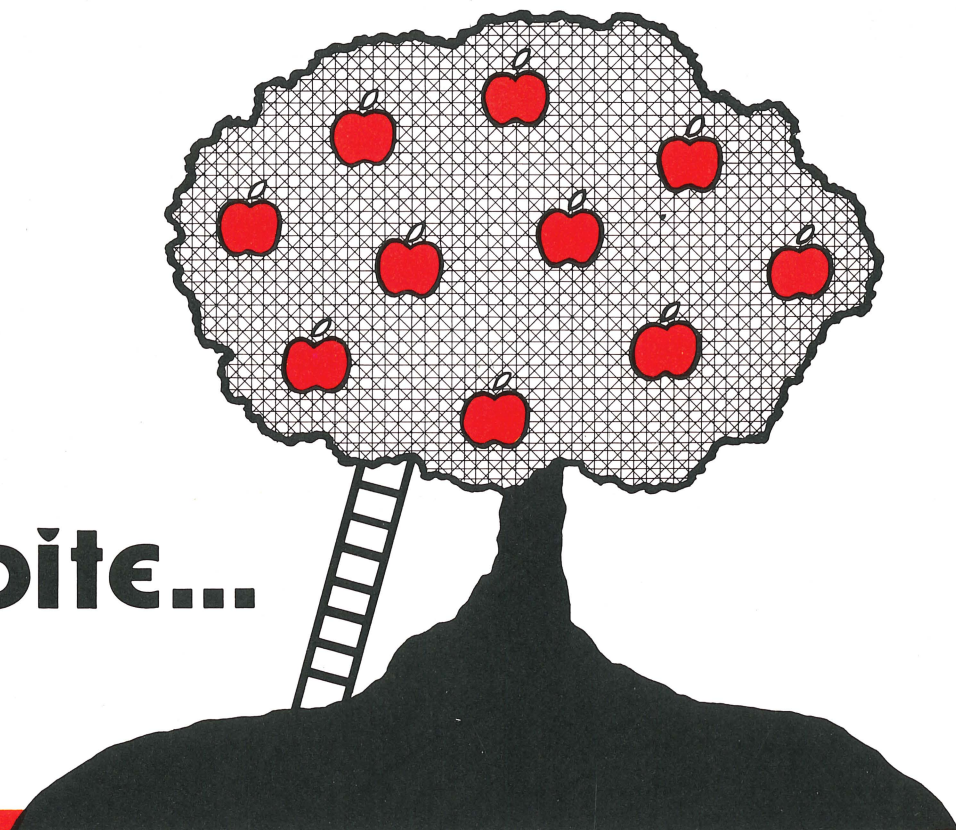
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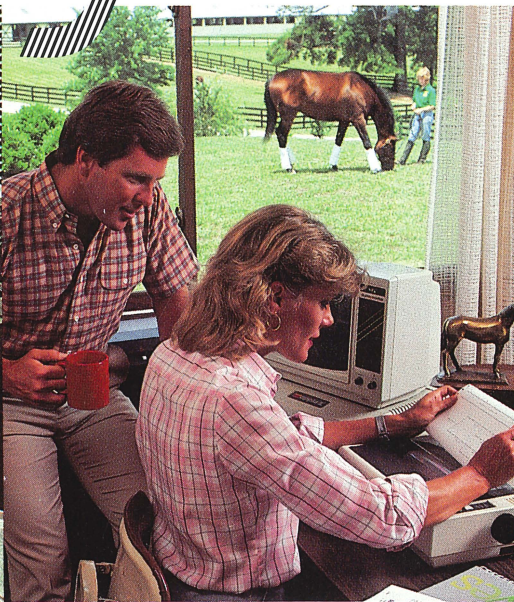


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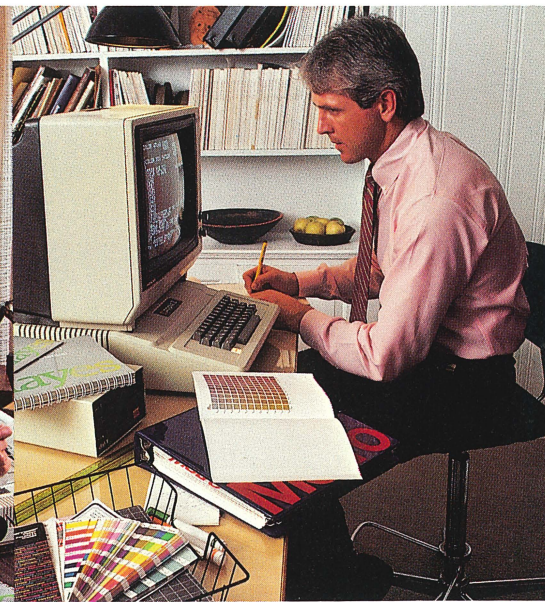
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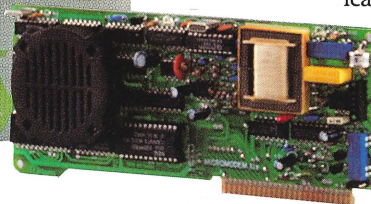
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