

Peelings IITM



THE MAGAZINE OF APPLE
SOFTWARE AND HARDWARE EVALUATION

APPLE[®]
ACCOUNTING



UTILITIES

- The Inspector & Watson
- Mathemagic
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DATA MANAGEMENT

- Quick-Search Librarian
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1983	
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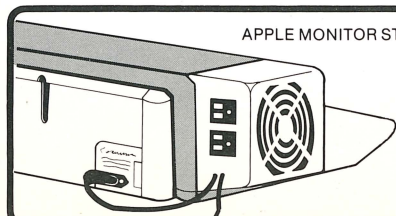
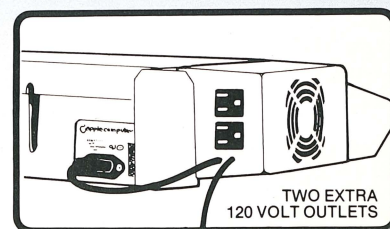
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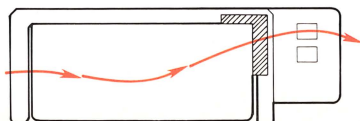
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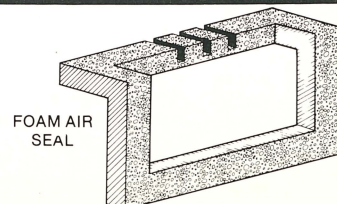
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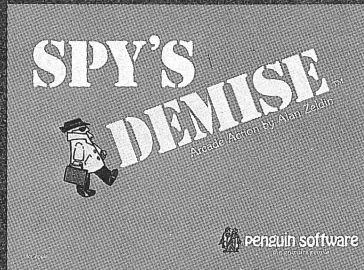
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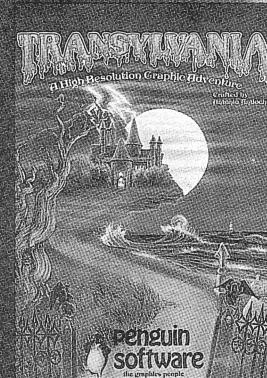
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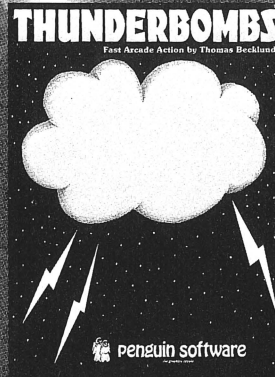


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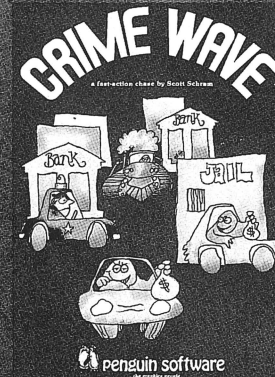
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“Non-computer characteristics in humans”

If you are an avid microcomputer user, you have probably been unable to avoid several year's worth of fiction and popular magazine articles about the supposed superiority of computers over humans. The usual track is to point out how computers and robots of the future will not suffer the rampant emotionalism, sentimentality, and prejudice of humans. In the end, however, ethnocentrism wins out and the author usually tries to make you feel better by pointing out that neither will computers be capable of love. No Star Trek fan is unaware of this theme.

Despite this friction and counterbalance between computer minds and human minds, there is an underlying thread that humans should become more like computers and computers more like humans. For example, many religions and philosophical scholars would propose that humans be calmer and more logical while computers should be more friendly and human. Again, an analogy exists in Star Trek with the popularity of Mr. Spock. His human half manifests the best of human nature in his loyalty to his crew and his Vulcan half keeps tight reins on the worst of human emotions.

In today's ever advancing microcomputer technology, highly skilled and dedicated men and women are working to make the dream come true of computers that are true companions. Computers that are approachable, speak English, are mobile, and willing to serve in ways that humans can appreciate are realizable near-term goals.

A good example of a major step in this direction is Apple's Lisa. Here is a computer that brings a technological breakthrough in software to the public. It represents a new way of communicating with a computer that is more natural (human) than anything heretofore seen. A great many people have understood this and have praised the machine highly. Nevertheless, there has been more than the usual grumbling about this new machine as well. Just about everyday, a company announces a new, small business computer. Perhaps it is an IBM clone designed to cash in on the popularity of IBM's PC. Perhaps it is a 68000 based system designed to be multi-user oriented. Every company that introduces such a computer has high expectations of making lots of money. Seldom does anyone bother to attack them in print.

Now after years of work and \$50 million in research and development, Apple has produced a moderate advance in microcomputer hardware and a major advance in hardware/software/human integration. What do they get for this kind of effort? Some frequently seen criticism:

“It's too expensive.” Rubbish. This statement, which I have run across more than any other about the Lisa, I propose, merely expresses individual jealousy. An individual can afford a kilobuck or two for a personal computer. Indeed, we have come to expect that we ought to be able to buy anything we want in the microcomputer sphere. If not, it must be a DEC or an IBM and who needs it? A mere 9 to 5 mortal, however, cannot afford \$10,000 for a computer and he's fighting mad. How dare Apple computer come out with such a fascinating, I-want-one, machine that I can't have. I submit that the outrage over the price more suitably expresses this jealousy that any deliberate estimate of the true value of a microcomputer with a megabyte of memory and 20 megabytes of software.

“Where's the color?” Inconsistent goals here. If you want to play games, buy a //e. (At least you can afford it.) The Lisa, like its Xerox predecessor and the PERQ is designed to do certain things very well on a high resolution bit mapped text display. The idea is to concentrate on the job to be done without distraction.

“Xerox did it first with the Xerox Star.” Sorry friends. The world is full of products that were first but failed by virtue of poor marketing. Apple Computer evidently has the charisma and the corporate will to make Lisa a marketing success. Whether Apple can bring together the necessary elements to make the product a success or not remains to be seen. But you don't win if you don't play the game. Remember, a good idea is not a failure just because it failed — in the wrong hands — once.

“It is a single user machine!” Who is going to buy a ten kilobuck machine that won't allow eight users to plug a terminal into it? Answer. Just about everyone who can afford one. In fact, I will predict here that the price of the Lisa will go up in, say September, to \$12000. Why? Sales will boom creating an enormous workload on Apple. Supply and demand will force the price up temporarily. Anyway, that poor little 68000 running at a mere 5 Mhz just cannot run Lisa's kind of software for multiple users. You want terminals? Buy a DEC VAX 11/730.

“The disks are non-standard.” All new ideas are non-standard. Commonality is common. Ask yourself: “What does it take to get the job done?” If someone else doesn't have the solution, you create your own. Problem solvers understand this kind of thinking. Some people don't.

These are the major objections I have seen by individuals. You are probably just beginning to see signs of the coming attack by companies. You see, there are many companies that make lots of money by building computers that mere mortals cannot handle. The poor businessmen who buy these computers are forced to hire a computer department that, in turn, opts for ever more complex systems. Those who hoped to make a bundle pushing Unix will probably feel threatened by Lisa. After all, a businessman can sit down and *relate* to Lisa and begin to use it in 30 minutes. “Whoops there goes another training department. . . .” Those companies that hoped to infiltrate the market of powerful business micros with small minis of their own will feel threatened by the enormous software breakthrough Apple has produced. Sorry guys. It's no longer as simple as throwing a sixty buck 68000 into some sheet aluminum and selling it for \$20,000. You will now actually have to *work* for your money. As the famous pain reliever commercial says: “The world just got tougher.”

Finally, there will be those who will feel threatened because the high priesthood of using a computer just dissipated a little with Lisa. No longer will it be an ego-trip to dazzle your lover with high speed fingers dancing over a keyboard typing strange symbols that only the computer's operating system understands. Miss a single comma and kaphlewie! The real test of a computer's humanity is whether a forty year old housewife can use it.

What I have described here is pretty much the gamut of human emotions in the face of a threatening change. Fear, jealousy, and cynicism. As with any revolution, the old breed will die out and the young will accept it naturally. However, this time, the revolution is too important to leave to the next generation. Things are happening too fast in the computer world. I would like to suggest that those who have expressed the emotions I have described above try instead to go as far towards being like the ultimate human as Lisa has come to being like us. That is probably the destiny we have created for ourselves. We can honor ourselves by living it now.

— Martellaro

THE AUTHORS

Peelings II has a group of highly qualified editors and authors who have expertise in their chosen areas for reviewing. We will, from time to time, tell you about this group. Note that not every author appears in every issue.

Sandy Abernathy, who taught elementary school for thirteen years, now teaches courses in microcomputer applications and management technology at New Mexico State University. In addition, she presents workshops on educational applications of microcomputers for teachers and administrators and uses her Apple for word processing and consulting projects. She holds a B.S. in Biology, an M.A.T. in Elementary Education and a Ph.D. in Educational Management and Development. Her hobbies include fishing, camping, swimming, reading, and using her Apple.

Edward Burlbaw is the regional manager for Science & Technology Corp. His background is in physics, electronics, and mathematics. He has a B.S. in physics, an M.S. in mathematics, an M.S. in physics and a Ph.D. Edward enjoys snow skiing and electronics.

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Robert Greenwald is a physician specializing in arthritis who divides his professional time between patient care, teaching, and laboratory research on Long Island. In addition to his interest in using his Apple, Dr. Greenwald is an avid stamp collector and is a regular columnist for STAMPS Magazine.

Montgomery Lee is a U.S. Air Force Captain currently assigned to the Dept. of Defense Shuttle Program Office in Los Angeles as a Manager for Shuttle Payload Flight Readiness. He is also an F-4 pilot. He has a B.S. in mathematics and astronautical engineering and an M.B.A. His hobbies are science fiction and photography.

Tom Little is a senior at New Mexico State University working on a B.S. with a dual major: physics and computer science. He is also the administrator of the computer center's UNIX system. Tom's hobbies are growing irises and writing science fiction (none yet published however).

John Martellaro is an operations research analyst for TRASANA, White Sands Missile Range working in computer graphics and combat simulation models. He has a B.S. in astrophysics and an M.S. in physics. John enjoys computer chess, science fiction, astronomy and soaring.

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Michael Weasner is a U.S. Air Force Captain and a fighter

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Peelings Ratings

Peelings Ratings are 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 one program in two years that fits this category.

AA - Top notch, superb. Programs in this class 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. Software in this class 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 lack of good 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 unacceptable price to performance ratio.

F - Unacceptable. Software of such poor value or usability that it should not be marketed.

P - Pending. The rating is on hold for comparison to other similar types or it is not yet appropriate to give a rating (e.g., mini-review).

R - Provisional. The reviewer has seen enough to give a tentative letter grade, but there may be more analysis necessary, or new documentation may be in the works, or some program bugs may still be present.

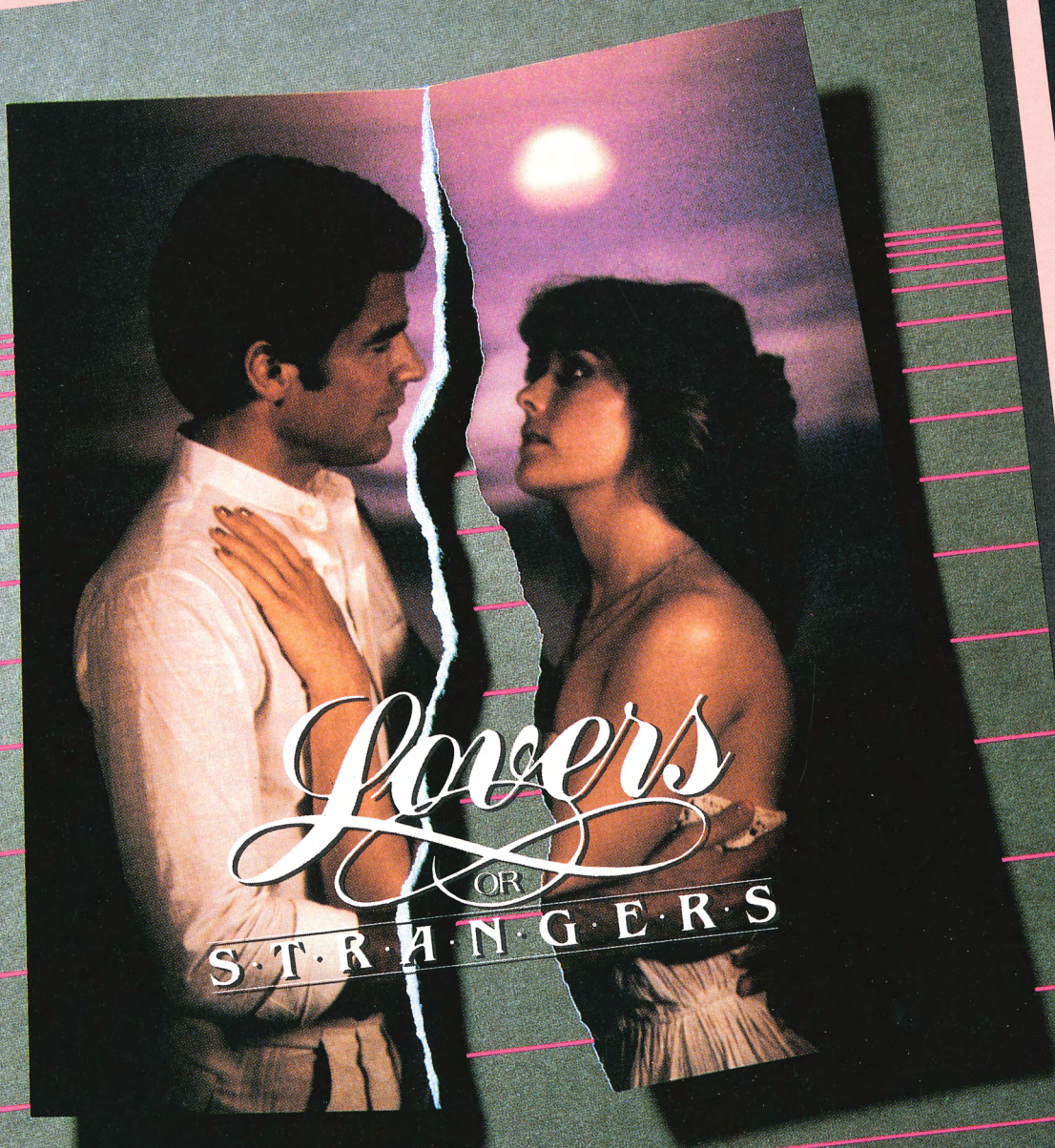
N - No Rating. The reviewer abstains, or a rating is inappropriate.

Corrections

In the V4N1 Editorial, end of the sixth paragraph, an editing error changed the intended meaning. It should have read "It should be a character oriented language like Fortran and BASIC as opposed to a symbol oriented language like APL and C. Symbol oriented languages are concise but sometimes unreadable, even by the author, months after writing. Character oriented languages are easier to read and learn."

In V3N9 the review of Programmers' Library from Telephone Software Connection incorrectly listed the author's name. His name is Leighton Paul. We apologize to Mr. Paul for the error.

In V4N1, page 24, the DOS Enhancers Comparison Chart incorrectly shows a rating for David-DOS. The rating for this product is still pending for a review of the final version.

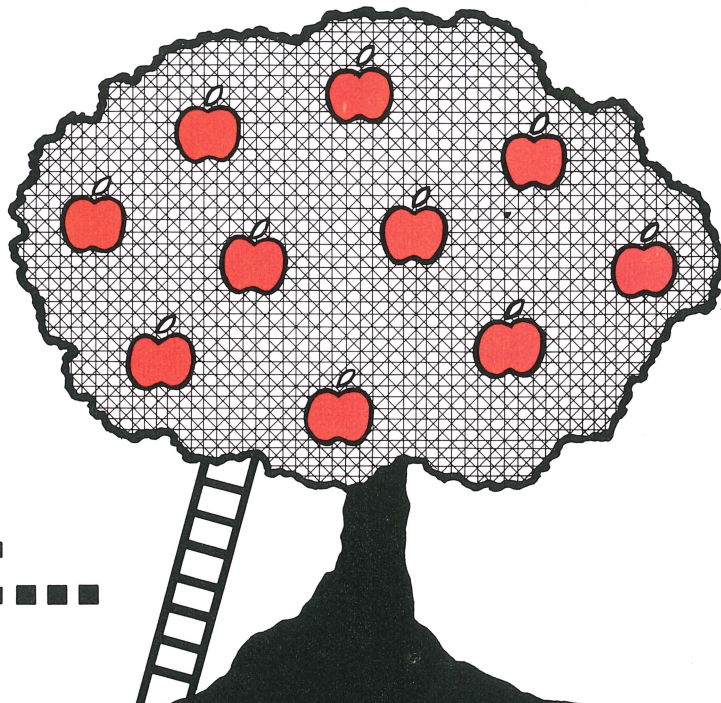


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LETTERS

Krell Responds to review of LOGO

Editor:

As you note the contrast in your reviewer's rating was startling. Naturally we believe Bill Torpay's (sic) to be correct. Sandy Abernathy clearly has not had a chance to review the full wealth of support material's (sic) that Krell provided for the neophyte. As the enclosed copy for Logo and Educational Computer Journal should make clear, Krell's commitment to supporting Logo far outstrip that of Tarapin (sic) and the Apple Corporation.

Sincerely,
Edward I. Friedland
Chairman of the Board
Krell Software Corporation

Both reviewers had the opportunity to review the same materials. The difference was in their levels of experience with LOGO. Also, there was no enclosure to Mr. Friedland's letter. — JLM

LOGO Reviewer has more to say

Dear John,

I've recently received my copy of Terrapin's tutorial manual for Logo, which I had not yet received when I did my original review, and I thought prospective purchasers especially might be interested in hearing about it. Anyone who has purchased Logo from Terrapin no doubt already has a copy of this excellent book; I seem to have more than the usual amount of trouble retrieving things from U.P.S. (Haven't they ever heard of people who work from 9 to 5?).

The 3" thick manual is very professionally done (as is all of Terrapin's documentation). It is printed in two colors on heavy paper, and packaged in a half-sized three-ring binder. The M.I.T. Technical Manual for Logo is also included.

The manual proceeds in a straight-forward way from the "Beginning in Logo" chapter into turtle graphics, followed by chapters dealing with music in Logo and numerical and graphing applications. Numerous appendices are provided which are organized for reference purposes; they also cover additional topics such as debugging. Additional chapters are promised by Terrapin, to deal with word and list operations, two of Logo's more advanced features.

The bulk of the manual is obviously intended to be read in order, preferably with Logo running, although the examples are numerous enough to allow one to follow along without a machine. The manual is generally patterned after the style of the Apple manuals (probably the best documentation I have seen); with lots of explanation of "what's going on", a pleasant tone, and helpful "signposts" (Terrapin uses mascots) to draw your attention to important topics.

I would imagine that the Terrapin tutorial would also prove an invaluable aid to the educator trying to come up with lesson plans for a Logo class, especially for younger children. Features of the language are presented in context with demonstration programs, in a natural progression starting with turtle graphics and music (Logo's most easily "grasp-able" features) and on to more advanced topics. This manual would seem to place Terrapin more squarely in competition with Krell for the "grass-roots" educational market (i.e., individual schools and teachers, rather than school systems that might be able to afford to develop their own curricula, etc.).

All in all, the Terrapin Logo tutorial is an excellent addition to an already excellent package.

Also, I'd like to suggest an explanation for the rather large dispari-

ty in the ratings given to Krell's version of Logo by Dr. Abernathy and myself, which must have puzzled your readers, since it certainly did me at first. On reading her review, however, the reason became clear: apparently Dr. Abernathy did not have access to Harold Abelson's excellent book, "Logo for the Apple II", which was not included in the review package from Krell. (I already had a copy, since I had purchased Logo from Terrapin.) As I mentioned in my reviews, this book is highly recommended for anyone interested in Logo (although for owners of the new Terrapin tutorial it is perhaps now just "extremely desirable" rather than essential). It is a tribute to both Dr. Abernathy's perseverance and the common-sense design of Logo that she was able to get as far into the language as she did with just the "Alice in Logoland" demos (which I feel are of questionable value) and the M.I.T. technical manual as references.

Sincerely,
Bill Torpey

TSC responds to review of Telephone Transfer II

Dear PEELINGS II:

We have just received a copy of your review of our Telephone Transfer II program, and appreciate your offer to include our comments in your next issue.

I do not believe our program was reviewed fairly by your magazine. In the EVALUATION section of the review, where it was compared with another program of similar purpose, only the negative, and none of the following positive aspects were mentioned:

- Although you mentioned that ours supports both the Hayes Micromodem II and the Novation AppleCat II (with optional Firmware), you did not mention that ours is not slot dependent — forcing the MODEM to be moved to a particular slot.

- Ours is not limited to a single Apple floppy drive in only Slot #6, Drive #1, but will send files from any slot or drive, and from either floppy or hard disk (Corvus compatible) systems.

- Ours is not limited to the first 38 files on a diskette, nor does its display truncate the titles after the 12th character (when displaying more than 19 titles).

- Ours keeps track of the remaining space on the receiving diskette to be sure there is enough room for the selected files, before unnecessarily wasting a lot of phone time.

- To chat with ours you just type — no need to switch to a special "CHAT MODE".

- To send files with ours, you just tell it the slot your MODEM is in, whether you will be waiting for or initiating the phone call (and the phone number), the slot, drive, and volume where the files are to be sent from, and then, when ready, just simply indicate with a "Y" or "N" which files you wish it to send.

- Both the TELEPHONE TRANSFER II and its companion free TELEPHONE LINKER program are available 24-hours a day 365 days a year via a simple MODEM call.

- Our staff is available during normal office hours for customer service, for this and all of our products.

I was somewhat taken back by the referral to our countdown timer feature, which shows how much time is remaining in the transfer, a feature that has been praised by our customers, being dismissed as "overkill" by your review.

I can assure your readers that we screen each product very carefully prior to acceptance for sale on our system — to be sure it is the kind of product that enhances our entire line — in that, due to our unique method of operation, we are dependent on satisfied customers coming back for many of our other products and in sending us their friends.

I personally, would welcome a more consumer oriented publication to review software, one that follows the example set by "Consumer Re-

ports" a little more closely — refusing to accept ads, especially from companies whose products it has or will be reviewing! In our case, an ad for the very same program ours was compared with was accepted and printed in the same issue as our review!

Not just in our review, but in many others in your magazine, I have read a great deal of more general suggestions as to how software should be written or marketed. If there is some yardstick to which the work of those of us in the industry is to be measured by your magazine, I'm sure we would all appreciate your letting us in on it. In the meantime, we resent being criticized for features we never claimed our program had, thus being victim of a very subjective form of "Monday morning quarterbacking".

Sincerely,
Ed Magnin, President
TELEPHONE SOFTWARE
CONNECTION, INC.

Peelings II responds:

Product comparisons can consist of a written description of features by the vendor or they can consist of a test case comparison by users familiar with the product. Except for the case noted below, we do not feel that the items in Mr. Magnin's letter tell the whole story. This is because we found that the negative features of TT II overwhelmed, in actual use, the positive features. That is not an unfair review; it is a factual review.

1. The review points out what we thought were the important virtues and defects of DFX and TT II in an operational environment. The two of us who evaluated the product found the chat mode of Telephone Transfer II significantly more inconvenient to use. On the other hand, we grant that DFX fails to keep track of the disk space of the receiving disk and this should have been emphasized in the review.

2. Just because a program does what it says it will do does not exempt it from comparison to similar products. The comparison process is the key to product evaluation.

3. We believe we said that time to hundredths of a second was "overkill."

4. *Peelings II* tries to be the "Consumer Reports" for Apple II owners. Unlike Consumer Reports, we accept advertising because we have a workable policy: we do not accept just any ad. Ads which appear in *Peelings* are for products that we feel will satisfy the customer, to the extent we can make that determination. Any given ad most certainly does not buy an unfavorable review of a competitor's product. We will continue to tell the truth about everyone and take ads from vendors who bring honor to the industry with good products.

More help in the wings . . .

Hi folks,

Thank you for the kind review of Pie Man in your December '82 issue, we are pleased to see the A rating.

We were also pleased to read the reviews you wrote about two other arcade games in that issue — Gold Rush & Congo from Sentient Software. Why? Funny you should ask. Your reviewers praised both programs in particular for the color-ful Hi Res graphics in them, graphics done by the authors Mike Berlyn & Harry Wilker. There was a third partner in those graphics, albeit a silent one: The Graphics Magician, from those silly birds at the South Pole. Just thought you'd like to know.

Take care,
Dave Albert
Penguin Software

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Half/Full Duplex	Yes	Yes	Yes
Auto-Dial/Auto-Answer	Yes	Yes	Yes
Fits completely inside Apple	No	No	Yes
Operates without additional serial interface	Yes	Yes	Yes
Touch-Tone® Dialing	No	Yes	Yes
"Single-Modem-Chip" Reliability	No	No	Yes
Audio Monitor	No	No	Yes
Self Testing	Yes	Yes	Yes
Warranty period	2 yr	1 yr	2 yr
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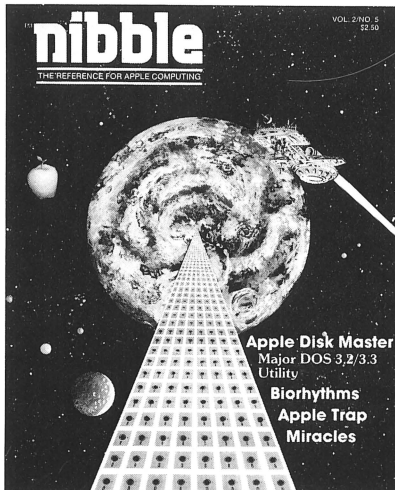
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Accounting Introduction

By W.K. Daugherty

For over 5,000 years, man has kept records of his financial transactions using clay tables and a stylus, paper and ink, and in recent times, computers and computer media. Business firms, not-for-profit organizations and households share the common problem of recording, summarizing and reporting the results of hundreds, perhaps thousands of transactions with suppliers of goods and services, financial institutions, governmental organizations, customers, employees, investors, owners and other constituents every year. Many software packages on the market are designed to assist users of microcomputers in solving this problem. We are reviewing some of these programs in this issue and will be reviewing others in the future.

The two major factors considered in these evaluations are how easy they are to use and what they do. Within these two categories, there are several factors to consider.

A program is easy to use when it is accompanied by well written, well organized instructions, examples, definitions and explanations. A system narrative that gives an overview description of the system and what it does, a tutorial section that leads the user step-by-step through the programs, a command reference section that contains explanations of each command that may select, an error message section with explanations of error messages and what to do about them, a glossary of key terms and an index are some of the things we look for in this area.

Other factors effecting ease of use involve design of menus from which processing options are selected, data entry screens and error detection and reporting. Because of the large number of transactions involved, even in household record keeping, it is important that screen layout and the instructions displayed on the screen contribute to fast, accurate entry and error detection and correction. Although the number of transactions may be large, most will fall within two or three categories. Systems that receive the higher ratings will be those that provide special data entry screens for these transactions.

Performance objectives vary greatly from one program to another depending upon the program author and the market segment at which the program is directed. Our review will report stated objectives and our judgment as to how well these objectives are met. The major factors considered are what information is printed or displayed by the programs, the correctness of this information, the extent to which the user can tailor the information provided to suit his own needs and preferences, and conformity with generally accepted practices and terminology. In addition, we believe it is particularly important that data and programs can be copied for the purpose of providing backup for ease of recovery in the event of loss or destruction of transactions recorded on computer media. □

THE ACCOUNTANT (Finance Data Base System)

by Ernest Forman
Decision Support Software
1438 Ironwood Drive
McLean, Virginia 22101

\$129.00

\$20.00 for optional VisiCalc Interface

Hardware lock in the game I/O socket.

Rating: A

Reviewed by William K. Daugherty

INTRODUCTION

The ACCOUNTANT is designed for personal rather than business use and to enable the user to plan and manage his/her personal finances. The programs enable you to keep detailed records of financial transactions, to enter budget amounts for various expense categories and to display or print a transaction journal, a balance sheet, a listing of transaction entries in any specified account and a monthly report. The monthly report listing shows all transactions for the month followed by the general ledger. Ending balances for all months for which transactions have been entered and changes in monthly balances can be displayed as a histogram. In addition to classifying by account, transactions can also be classified by user defined codes. This feature allows the mixing of tax deductible transactions in the same accounts with nondeductible transactions without the deductible items losing their special identity. A listing by code or by user

defined groups of accounts can be displayed or printed. In addition to programs for producing hardcopy reports, the utility program disk contains a bank account or credit card reconciliation program. An optional VisiCalc interface program allows the extraction of data from the financial data base and the creation of a VisiCalc file. Using an income tax template provided on a DBCALC Utility Disk, data extracted from the finance data base and some additional information provided by the user, the amount of federal and state income tax owed can be calculated at any point or projected for the entire year.

DOCUMENTATION

Program documentation, contained in a three-ring loose leaf binder and organized by topic, is very well done. The topics include an introduction, a demonstration problem, a tutorial which leads the user through the process of defining accounts and codes, sections on command usage, programs, files and disk capacity, the VisiCalc Interface, utilities, and an index. The index is comprehensive and makes it easy to find the information needed.

ESTABLISHING THE DATA BASE

The ACCOUNTANT lets you define your own accounts and codes — up to 63 of each. This should be enough for most personal or small business applications. The user contains a sample listing which should enable a person without an accounting or bookkeeping background to set up an adequate chart of accounts. Options displayed on a second level menu provide the means of creating a new data base, adding or modifying accounts or codes. Those with any accounting or bookkeeping background and who are therefore accustomed to seeing asset, liability, capital, revenue and expense accounts may be a bit dismayed to discover that the program allows only three types of accounts — assets, liabilities, and “reserve” accounts. Reserve accounts in the ACCOUNTANT programs include

capital (or equity accounts), expense and revenue accounts. This makes for a peculiar appearing balance sheet since all these accounts and their balances are listed in the Reserve section of the balance sheet. Professional accountants will object to the use of the term "reserve" in this manner. The term is rarely used today. When it was commonly used, it was used in three different ways and none of these usages coincide with its usage in the ACCOUNTANT. The balance sheets illustrated in the user manual are peculiar in appearance because the accounts within the three major account categories are in alphabetical order. In accounting, there is a fairly standard order in which accounts are presented in financial statements and it is not alphabetical. This situation can be avoided by entering the accounts in the order in which you want them to appear and not sorting them at the end of the creation process.

DATA ENTRY AND FILE MAINTENANCE

Access to data entry and file maintenance programs are obtained by selecting items from one of the two menus provided by the ACCOUNTANT. Transactions are entered in one of two ways. Up to nine sets of automatic transactions can be defined by the user. These can be posted to the data base at any time but would normally be posted at the first or last of the month. This feature is very useful for entering transactions that are the same for every period such as a rental payment or the receipt of a paycheck.

All other transactions are handled in the same manner — by indicating which of two or more accounts are to be increased or decreased and by what amount. The programs translate the indicated increases or decreases into the appropriate debit or credit entry in general journal form. Accounts effected by a transaction can be indicated by account number or account name. If the person making the entry does not remember or have a list of the accounts and their numbers, a list can be displayed at any time without interfering with the entry of the transaction. I found this to be a very handy feature. All transactions, other than automatic transactions, must be entered in this manner. In a program of this type, I prefer special data entry

screens for entering large numbers of transactions that have a common element such as cash disbursements, all of which result in a decrease in the cash account. By using a special data entry screen, it is not necessary to indicate a decrease in cash for every check entered in the records as this is done automatically by the computer.

The programs detect many of the common types of errors such as an attempt to use an invalid account number, to increase two asset accounts in one transaction or to enter an unequal amount of debits and credits. While testing the programs I made several mistakes entering data and found that the easiest way to handle the problem was to quit and start over with the entry. A "Q" entered almost any place will get you out of an error situation and back to the main menu where you can start again.

PROCESSING AND PRINTING RECORDS AND REPORTS

Transactions are posted to the accounts immediately after entry. A balance sheet can be displayed at any time and will reflect all transactions entered up to that point. The balance sheet and number of other reports and listings can be printed by selecting the appropriate items from the main menu. Three types of transaction listings can be produced — by account, by code and a general listing in chronological order.

CONCLUSION

My first impression of this package was not very favorable because of nonstandard terminology, peculiar looking financial statements, and entry of almost all transactions by means of general journal entry. After further involvement, I began to appreciate some of its good features such as immediate update, error detection and correction, its VisiCalc interface and its well written user manual. For someone who wants to keep household records for budget or tax purposes or business records for a fairly simple business operated on the cash basis and who is willing to invest a few hours in learning to use the programs, I think it is a good buy. □

GENERAL LEDGER ACCOUNTING SYSTEM

Author Unspecified
BPI Systems, Inc.
3423 Guadalupe
Austin, Texas 78705
512-454-2801

\$395.00

Rating: AA

Reviewed by William K. Daugherty

INTRODUCTION

If this system doesn't have it, you probably wouldn't want it anyway. Complete, well-written documentation, special data entry screens for entering large volumes of like transactions, just about any accounting statement or report that you could want, user specified configuration, friendly person/computer interaction and a reasonable price — what else could you ask for? BPI General Ledger was designed to bring sophisticated computerized accounting to the small business or the professional person and it does just that.

With this system in your Apple II plus, you can obtain:

- A Balance Sheet,
- A Profit and Loss Statement which shows Revenue, Expenses, Net Income for the current period and year to date including a percentage analysis of all expenses for both periods.
- Profit and Loss Statements for up to ten departments,
- A General Ledger,
- An Accounts Receivable Ledger,
- An Accounts Payable Ledger,
- A Payroll Register that shows each employee's earnings and deductions for the current month, the current quarter and year-to-date.
- A General Journal
- A Cash Disbursements Journal
- An Invoice Register
- A Cash Receipts Journal
- A Merchandise Purchased Journal and
- A Cash Sales Journal that shows summaries of cash transactions for each day of business.

There are special data entry screens for entering transactions in the special and general journals. The General Ledger, the Accounts Receivable and Accounts Payable Ledgers, and the Payroll Registers are posted automatically by the system from transaction information recorded in the journals. The user can define a Chart of Accounts

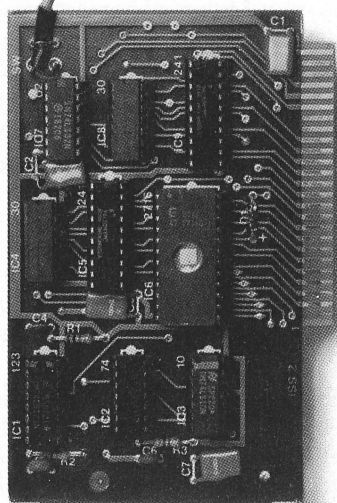
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containing up to 400 accounts to meet the needs of his particular business and can configure the system to include the journals that are appropriate for his methods of operation. Transaction entry, posting and printing is done on demand by selecting the appropriate commands from a menu. Several commands can be selected, entered in a Run Queue, and automatically executed in the order in which they were entered.

The system comes with a three ring, loose leaf owner's manual and four disks — a data entry disk, a posting disk, a maintenance disk and a training disk that contains a complete set of books for a grocery store. A set of backup program disks can be purchased from BPI for \$30.00.

Any number of separate sets of accounting records can be maintained by the system. A six character company code is associated with each data disk and must be supplied before any processing is done. This prevents transactions of one business from being entered as transactions of another business.

DOCUMENTATION

An Introduction (Chapter I) describes the equipment requirements, the Apple II Keyboard, disks used in the system, how to activate the system and how to copy a data disk. Chapters II, III, IV describe the programs and commands contained on the three program disks. Each command is explained and practice transactions are provided for entry in the Corner Grocery Store books. Chapter V provides an explanation of some special system procedures — estimating disk space requirements, disk full procedures, expansion of disk space for Accounts Receivable, and procedures for handling multiple checking accounts within the same business. Samples of all ledgers and reports for the Corner Grocery Store are provided in Appendix A. Appendix B describes special programs which can be changed to further customize the system and some error conditions and the proper response to these conditions when they occur.

There is no index but the logical arrangements of the chapters and a detailed table of contents fairly well offset this deficiency.

DATA ENTRY AND FILE MAINTENANCE

The Data Entry Disk provides a well designed Menu from which the user selects the journal in which he wants to enter transactions. Since special screens are provided for each journal, data entry is very easy and efficient. For example, when entering transactions in the cash disbursements journal, the computer automatically keeps track of all check numbers. For groups of transactions that have the same date, the date need be entered for only the first transaction in the group. Checks to employees for wages are entered with an "E" prefix which causes the checks to be posted to the payroll register as well as the General Ledger. Checks entered with a "V" prefix are automatically posted to the Accounts Payable Ledger. All dollar amounts are entered without decimal points or commas as the computer enters these automatically. The left pointing arrow is used to back up and correct any part of the entry. Listings of transactions entered can be obtained by selecting the appropriate listing command from the data entry menu.

The File Maintenance disk contains the programs for setting up the system, creating a set of accounting records, editing ledgers and journals, listing payees, customers and vendors, initializing disks, and several other useful programs. It is not necessary to reboot the system to transfer control from one disk to another. Transfer of control from the data entry disk to either of the other two disks can be accomplished without rebooting the system.

PROCESSING AND PRINTING RECORDS AND REPORTS

The posting disk provides another well designed menu from which commands may be selected to post transaction journals to the ledgers, obtain a profit or loss statement, trial balance or balance sheet or to perform end of month, end of quarter, end of 4th quarter or end of fiscal year procedures. The disk also contains commands to copy a data disk or to check disk space. This system does not maintain a file of all year-to-date transactions on the data disk. Some information is removed from the disk when end-of-month procedures are performed and, if this information is retained, it must be retained in hard copy form. Before end-of-month procedures can be performed, four questions are displayed and must be answered affirmatively before end-of-month processing can proceed. If the affirmative answers are also truthful answers, appropriate transaction listings will have been produced and a backup disk will have been made.

Reports and listings produced by the system are nicely formatted and use standard terminology. Professional accountants, officers of financial institutions and other users of business financial statements should feel quite comfortable with these.

CONCLUSION

This package is not perfect but I haven't seen one that comes close to being as good as the BPI General Ledger Accounting System for the Apple II Computer. If you are in the market for an accounting system for a small business or professional office, have a look at this one. I don't believe you can beat it for the price. □

FINANCIAL MANAGEMENT SYSTEM II

by D.R. Jarvis
Southwestern Data Systems
PO BOX 582
Santee, California 92071
619-562-3670

\$64.95
Unlocked

Rating: A+

Reviewed by: W.K. Daugherty

INTRODUCTION

The Apple II user who is looking for a program to keep simple cash receipts and disbursements records and who also wants a few bells and whistles thrown in should have a look at this package. It will store up to fifty files on each disk. Each file may contain up to 200 individual records. Files can be searched on any of five fields, records can be edited or sorted, and checks can be written, reports and lists may be printed by the programs on the single disk that comes with this system. The system is entirely menu driven.

DOCUMENTATION

The paper cover user's manual includes twenty-six very well written pages of information on how to use the programs. There is no tutorial and there are no examples. Not everything that one needs to know is contained in the manual but the information in the manual combined with the information displayed on the various screens used in the programs should be more than adequate for most users.

DATA ENTRY AND FILE MAINTENANCE

Financial Management II works with a simple six field record. The fields are #, date, item, explanation, amount, and code. The # field is a four character field that will accept only a check number, a "D" for deposit, a "C" for charge, and "M" for memo. Anything can be entered into the item field but since the checkwriter program gets the payee from this field, it should be used to indicate to whom a payment is made or, in the case of a deposit, from whom the payment was received. Up to 100 item macros may be defined and coded with up to three characters by the user. When one of the macro codes is entered in the item field, the computer automatically fills in the full item name. For example, if Dr. John Paul Jones was defined as an item macro and coded JPJ, entry of JPJ in the item field would cause "Dr. John Paul Jones" to be written into this field. Furthermore, as many as 100 code macros can be defined and coded. Entry of one of these in the code field causes the entire name to be written in the code field. For example, if medical was defined and coded "M", entry of M in this field would cause "MEDICAL" to be written into the code field. A code macro can also be tied to an item macro so that after the item field has been completed, the code field is automatically completed.

The computer will automatically fill in the next check number when "return" is hit or the check number can be typed into the field by the operator. If two or more transactions have the same date, the date need only be entered for the first transaction. Any part of a date can be repeated by hitting return. Data can be entered from the keyboard or loaded from a disk file. Records may be edited while still in memory or after they have been written to the disk.

In addition to transaction data, a budget may be entered using the Budget Manager Program. The amount fields may be totaled by code

using the Account Auditor Program and a report showing actual amounts in comparison to budgeted amounts and the variances can be displayed or printed.

To write checks, the record file is loaded and the user selects the checks to be printed and sends them to the printer. In testing this program, I discovered that the system does not know the difference between checks and deposits. If you select a deposit as an item to be printed, your faithful Apple II will follow your instructions and print the information as if it were really a cash disbursement.

PROCESSING RECORDS AND PRINTING REPORTS

Transactions entered into the system are stored in a file whose name is specified by the user at the time the file is written to the disk. Using the name of a month to designate the transaction file for that month works very nicely and makes file names easy to remember. Monthly summaries by code can be stored as an audit file. Printing is accomplished by selecting the print option from the appropriate menu. The reports are attractively arranged and are automatically headed with the report name, account name, address and telephone number. The latter three items are entered when the system is initially set up.

CONCLUSION

This system does only a few things but what it does, it does very well. Data entry is simple and efficient. The documentation is good and the reports are attractively arranged. □

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THE PROGRAMMER

by Ron Kelly
Advanced Operating Systems
4300 West 62nd Street
Indianapolis, IN 46206
800-428-3696

\$199.95, manual \$29.95
64K, Z-80 card with CP/M Operating System,
MBASIC/GBASIC

Unlocked

Rating: C+

Reviewed by: Michael L. Weasner

INTRODUCTION

The Programmer is another of a new type of program that has appeared over the last year; it writes BASIC programs based upon inputs from the user. In the September/October 1982 issue of *Peelings II* the program *The Last One* was reviewed. The Programmer is very similar to *The Last One* in many areas: both the good and the bad. The Programmer uses menus and submenus (just as does *The Last One*) from which the user selects the options and features desired to be in the final program. Screens are created, files are set up, forms are generated, all in accordance with a program outline or flowchart (user designed, preferably on paper). Once all the steps are completed, The Programmer will generate the BASIC program. One major difference (besides the price) between The Programmer and the version of *The Last One* reviewed is that The Programmer is used in the CP/M environment and hence requires some additional hardware and software that *The Last One* does not. But just as with *The Last One*, the user must know the flow and requirements of the program to be generated even if he doesn't know the BASIC coding necessary.

An 80 column display card is not necessary but if not available some of the various screens will be difficult to interpret (there is no display SYSGEN routine as in *The Last One*). Two drives are not necessary but will save disk swapping. If your printer works with CP/M, then it should work with The Programmer and all programs generated.

The Programmer will allow the use of graphics by the generated program. Microsoft's GBASIC will be required for many graphics functions. Microsoft MBASIC is required for The Programmer to operate.

An Applesoft version (DOS 3.3) is now available. According to *Advanced Operating Systems*, the only significant difference from the CP/M version reviewed here is that only the standard Apple 40 column screen is used. The price is the same.

DOCUMENTATION

The manual supplied with The Programmer is a standard-sized 3-ring binder with 104 typeset pages. There is a Table of Contents plus an excellent index. There are appendices containing additional but necessary information. The manual starts out with a tutorial lesson that creates a mailing list program. This comprises about half the manual. The next section is a discussion of each menu/submenu option. As was the case with *The Last One's* manual, the tutorial was complete but then the rest of the manual leaves you hanging with little guidance to creating your own programs. There are four additional sample programs that are provided but with the inherent

power of a program generator this is insufficient. At the very least, more samples should be provided covering the most common uses of BASIC programs. Otherwise much experimentation is required as well as considerable effort to learn the use of the program generator.

The manual did not agree with the program operation in several cases and appeared to be for an earlier version. This caused some entry errors which subsequently prevented the tutorial program from working correctly. No manual updates have been published to date.

LEARNING TO USE THE PROGRAMMER

Once all the files are placed on a formatted CP/M disk and some blank formatted disks created, you can begin to use the program. It should be noted that the two versions of BASIC must be supplied by the user. When the program was started it would not run properly; both disk drives were accessed and a low beep was heard after each access of drive B: Since *The Programmer* was written in MBASIC, it was possible to list the program to see if there was an error (there was; three of them in fact). Once the program was debugged (changed .DTA to .DAT three times) the program was run successfully. One is forced to wonder how a program is marketed with such a drastic error that it won't even run. (In discussions with *Advanced Operating Systems* they reported that this bug was only in the initial release versions and has been corrected. There was only one error; it should have been .DTA so the one occurrence of .DAT was changed. Corrections were sent to all registered owners).

The tutorial lesson covers every aspect of the creation of the mailing list program. Two text files, one random and one sequential, are created to contain the data. The Programmer is oriented to create a data base program but files are optional and so you should be able to create any type program (if you can figure out how to do it). When responding to the various prompts from the menus and submenus there are few chances to correct errors except by CTRL-C'ing and reRUNning. This is unfortunate and causes considerable learning frustration. To edit a line of BASIC from a menu option requires that the entire line, including the line number, be retyped. The MBASIC edit function is not supported.

Unlike *The Last One*, very little program structure is dictated by The Programmer. Hence the user must specify and remember line numbers where various modules will reside. This increases the flexibility but can cause some problems if you aren't consistent in your programming. Dig out the paper and pencil again.

Both upper and lower case entries are accepted at yes, no, or drive prompts. All screens (in 80 columns) are nicely laid out.

There is no DIRectory option within The Programmer so that if you give the program to be created the same name as an existing program on the disk then goodbye old program. There is no warning that the program already exists and a chance to confirm the name. There is an option which will show all the text files which have been created for use by the current program but again there is no way to tell before creation whether or not there is a file with the same name in use by another program.

A sort routine is available that will sort on selected fields. The discussion in the manual is weak and a tutorial would help the novice.

CREATING YOUR OWN

Before running The Programmer to create a program you will have to lay out the flow of your program to the smallest detail. For example:

CLEAR SCREEN

POSITION CURSOR AND PRINT A MENU DISPLAY

ASK FOR INPUT
CHECK INPUT
BRANCH ON SELECTION

- . do the necessary steps for
- . each selection
- . etc.

Each of the steps in your program will probably be a menu or submenu option. You then supply the necessary actions or text or whatever is to be done. Generally each step will turn out to be a single line number and sometimes more. If the step doesn't exist, there is an option to write your own BASIC lines or set up your own mathematical expressions. The flow development will consume the bulk of the time required to create a program in this manner. Granted that no actual BASIC programming is required, it still requires that you know and understand how BASIC programs function AND how to use The Programmer to implement your flow.

Should you leave out a step or two and find that your program doesn't run quite the way you wanted, there is no easy way to use the previously entered menu selections. With The Last One you can get a printout of the flowchart used to aid in reentering all the steps. The Programmer forces you to add your own program lines directly into the final program or to start over in The Programmer with only your paper program flow to aid you. Both methods leave much to be desired. Although The Programmer is unlocked, a form of unnecessary protection prevents you from accessing the text files that contain your program lines before it is converted into a stand-alone BASIC program. The filename extension is "P. 1" which with the spaces after the "P" causes CP/M to ignore all characters after the "P" and so will not find the file. This means you can't read or modify this file without some trickery (use a disk zap program to change the

filename extension). This is obviously for advanced programmers, not the novice.

SUMMARY

In the reviews of The Last One it was pointed out that the generated programs will be difficult to edit or modify since many variables are used. This is also true for The Programmer and means that a user may have to spend quite a lot of time analyzing the final program before making changes. There is an option for adding comments during program creation but the variables will still be undocumented.

Just as with The Last One, there is significant power in The Programmer, but utilizing that power will require that a novice learn to use it just as if he were to learn a programming language. If the user already knows BASIC, then using The Programmer might simplify programming efforts for some purposes but he will still have to learn in depth how to use The Programmer. Neither of these tasks will be trivial but will require a lot of devotion. For the novice the time might be better spent to learn BASIC sufficiently to write the program from scratch without benefit of a program generator. Certainly a knowledge of BASIC is desirable if the program requires you to debug it before you can even use it. One thing both approaches require is a knowledge of programming logic. So far no program generator has been able to replace that.

There is a lot of capability in the program to create many varied types of programs but doing so is not as easy as the ads would have you believe. The Programmer does alleviate the actual writing of lines of BASIC but still requires some programming knowledge. Simple data base or any input/output type of programs can be handled somewhat efficiently by a program generator but the more complicated the desired program is the more difficult it will be to create it by using The Programmer. □

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C.O.R.P.

by Alexander Maromaty and Gary J. Scotto

C.O.R.P. is no longer being marketed by Dynatech Microsoftware Inc., and distribution rights have reverted to the authors. This is a review of the previously available version (and any product remaining in circulation) and may not necessarily be relevant to any future releases. If nothing else, perhaps this is a good example of how not to market a product.

Reviewed by Michael L. Weasner

INTRODUCTION

The Combined Operating Re-entrant Programming Data Base Management System, better known as C.O.R.P., is a program generator program to create a data base management system of your own. The use of C.O.R.P. to create other than a data base type of program is not impossible but difficult since it is strictly data file oriented. C.O.R.P. runs on a standard 40 column display and the programs it creates are 40 column display only.

The C.O.R.P. system consists of a manual in a padded 2-ring binder, a Program disk, and two Utilities disks. The disks are locked and a protection device (inserted into game I/O socket) is required for all but utilities Disk II. A 90-day warranty is provided and backups can be purchased for \$25. Although the manual says "each disk will be \$25" the authors have advised that it is really \$25 for a backup of the system. This is just the first example of the confusion that has been generated about the C.O.R.P. system. Three addresses are mentioned in the documentation accompanying the program; just where does the user go for help? A final "Confusion Factor" that some readers may have noted is the price and what the system includes. Since starting to review the C.O.R.P. system in the spring of 1982, it has gone through several changes. First, there was just C.O.R.P.; a \$235 package which included a Diagnostic Disk. Next came C.O.R.P. II: C.O.R.P. plus a Demo Disk and a Utility Disk but it cost \$425. Then the price was reduced to \$250 but the Diagnostic Disk was removed from the package. Now we have this configuration: \$295 for the program disk plus two utilities Disks. The Demo Disk and the Diagnostic Disk are extra cost items: \$20 and \$30, respectively. By the time you are reading this who knows what the configuration may be. If you purchased C.O.R.P. at the \$425 price tag, you should definitely be trying to get a refund of part of your money.

DOCUMENTATION

The manual is an 8½ X 6 inch, 91 page tutorial on the use of C.O.R.P. It covers every aspect of C.O.R.P. from the creation of data entry screens to file manipulation. A similar manual of 43 pages discusses the utilities disk. An added manual of 10 pages (in a different typeface) covers the Utilities Disk II. All are in the one binder. A chapter of the main manual is devoted to the Diagnostic Disk which is not included. Just another Confusion Factor. The way C.O.R.P. is structured the information provided in the manual is generally sufficient although it should be rearranged; the discussion of how to change the system characteristics should have been presented at the start.

BOOTUP

Before starting to use C.O.R.P., you must insert a software protection device into the game paddle port. This device will not work in any game port expander and due to the configuration of my Apple,

was difficult to insert. The use of the device seems contrary to the intended user of C.O.R.P. (the non-experienced user with a business who has no desire to go poking around inside his Apple). Further, since the software itself is locked, a business may find itself without its system software (but not its generated programs). Having both forms of protection on a software product seems to me to be the height of piracy paranoia and reduces the usability of C.O.R.P.

Once the device is inserted correctly and C.O.R.P. is booted, a long series of musical notes is heard while the device is checked and then a long series of title pages. Both seem out of place in a business environment.

LEARNING TO USE C.O.R.P.

Once the main menu appears, the use of C.O.R.P. is straight forward. Options available from the menu include: create a data entry program, create a data printing program, initialize a work disk, catalog a disk, sort/delete/copy data files, and update master file. One can also modify system characteristics from the main menu.

The first step is to initialize a work disk in drive #2. (Two drives are required.) This disk will have, what is claimed to be, a standard DOS and is bootable without the hardware device. You then select the data entry program creation option. If you are the type who does not read the manual in its entirety before running the software, you will very quickly learn to hate bells. When you get to page 29 in the manual, you will be told how to silence the bells (with the change system characteristics option), but once in the create program mode (following the manual) you are stuck with bells (and lots of them). Again this seems inappropriate for business oriented software. Were the bell not just a Ctrl-G but a more subdued sound then it might be less disconcerting.

You create your data entry screen by first entering an optional heading which will appear centered and in INVERSE. Next you enter each field name and field type at the desired location on the screen by specifying a screen line number from 1 to 9 or A to I (18 lines maximum). The types of fields are alphabetic, numeric, anything, and dollar, and includes the option of specifying a decimal point position. No standard date field is available. A "key" field is specified which is the field used for rapid searches. Non-field text (instructions, titles, etc.) can also be included on this screen. Two minor irritations were noted in the screen entry mode; single letter responses required the RETURN key to be used instead of a single keypress entry method (true throughout C.O.R.P. and the generated program) and when specifying a screen line for entering text or data, the right arrow key must be used to move the cursor one position to the right (to get off the line number) before entering your text. Why the cursor was not placed here to begin with is unknown. If you forget and don't move the cursor one position to the right, then your entry will seem to be not accepted but in fact will appear briefly on your data entry screen minus the first character. C.O.R.P. checks for invalid field type entries and editing of the screen can be done simply. It is possible to clear the screen and start over.

After entering the name of your data file, you must determine the maximum number of records this file will ever have. You can select the largest file possible by pressing RETURN (based on the number of characters in each record and the disk capacity; limited to one file per disk per data base) or you can enter a smaller number. To give the user an indication of the maximum number, the manual says to count the data field characters on your screen. Since C.O.R.P. knows this number it should have been displayed. In fact, in this latest version, it is displayed briefly but scrolls off the visible area by the time you are prompted for the number of records.



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 **S&H
Software**

You are now finished with your part of the program generation; C.O.R.P. will proceed to create your program and some file information. The program is written to disk as a sequential textfile, EXECed back into memory by C.O.R.P. and then SAVED as an Applesoft BASIC program on your work disk.

To verify that the program works you can either leave C.O.R.P. and RUN your new program or execute it from the C.O.R.P. main menu. In either case, after some setups by the computer, you are presented with the data entry screen you created. It is a nice looking screen with the following file data presented: percent full, maximum number of records, number used, and number left. You can A)dd, S)earch, or Q)uit.

In the add mode the program will check for improper data entry and will not accept incorrect entries. This check is slow and makes for a long data entry session. Colons and commas can not be entered. The specified field length is shown with underlines. When entering data you can backup to a previous field until you press RETURN after the last entry. At that point your record is accepted with no opportunity for confirmation. Since the program is modifiable, you could insert one, but it's curious as to why it was left out. When entering dollar amounts you must include the decimal point even though it appears on the screen. You must add a trailing "00" instead of the computer adding them for you if you were to press RETURN after entering whole dollar amounts. If you did not turn off the bells by reading ahead in the manual, you will have lots of them in your program. If they had been turned off, your program would run totally silently.

To search on the "key field" you enter at least two characters of the field and then press RETURN for all of the remaining entries on the screen (specifying other fields will narrow the search). Shortly, the record will be displayed which matches your entry (no timings were done due to the lack of a large enough file in the proper format but it seems to be relatively fast). A record-by-record search from the beginning of the file can also be done. Once the record you want is displayed, you can either modify or delete the entry, or continue the search. Modification is done by stepping through the fields, reentering data as required. Records can be deleted but no opportunity is given to verify your choice. Should a search fail to find the record, you are returned to the initial screen with no other indication such as a message saying "NOT FOUND." Quitting the program updates the files and then tells you to insert a disk to be booted in drive #1. If you don't want this message displayed, you will have to modify the created program but no REMark statements are added to the program, so this job will be time consuming.

One final point: the manual says the "Termination Code" should be "0000" and if it isn't, refer to the appendix. Well, it wasn't, so I referred to the appendix to see what "0005" (the code received when I quit) was. It stated that "0005" was the normal termination code for the data entry program and should not appear on any other generated program. The manual also says that "YES" or "NO" must be entered at the various prompts when in fact a "Y" or "N" is sufficient. These are just indications of the inconsistencies created by the lack of a stable product.

If you are following the tutorial in the manual, you have now reached the information needed to silence all those bells you have been hearing. The change system characteristics option allows you to silence the bell, change the printer parameters, change the disk slot, or reboot. All changes are for that C.O.R.P. session only and must be reentered after each reboot of the Master Disk. It would have been nice if these changes were made permanent. Other functions you will learn about at this time are CATALOGing the disks, verifying or deleting the data files, and backing up your programs and files. The CATALOG function on the main menu is useful but should have also been available whenever C.O.R.P. asks for a filename on the disk. You will have to remember or write down the filenames.

The data entry program just created does not have a printout

capability so you have to create a print program to get hardcopies of your data. That is the next step in the manual. Right off you discover the value of a CATALOG option at a prompt; C.O.R.P. asks you for the master file name for your data file. If you can't remember it, you have to quit C.O.R.P. and reboot it (oh no, all those bells again, and now you have to reconfigure again. . .something needs changing here). If you guess at a filename, this is the name your print program will look for when it runs. C.O.R.P. does not check for it on the disk before continuing. The manual warns you of this but that doesn't make it right. You next select report header options (page numbering and dating), column width, and what fields to print. It is possible to cross-reference files, i.e., use code from one data file and print the entire name from another. This is a very useful feature for large and multi-use data bases. When entering the fields to print, you are shown all your fields from the data entry program and the current column for printing. You are warned when you exceed the width selected but can ignore it if planning to use more than one line for each record. User-defined fields such as calculations can be used. You can elect to have the computer format the report or do it yourself; the computer will format the fields in columns but you specify where user-defined fields are to be printed (total at the bottom of the page or end of the report, etc.). Once you complete the field entries, they can be edited in case of error. A good feature is selectively inserting or omitting fields based on certain criteria (, = , >) for alphanumeric data fields. Give your program a name and C.O.R.P. does its thing again.

The print program can also be executed from within C.O.R.P. I thought the program had hung when it finished reading the directory file and didn't do anything for nearly a minute. The confusion results from a flashing "*** LOADING DIRECTORY ***" message on the screen. Apparently, there is some garbage collection occurring but the message is misleading.

A worthwhile feature of the print program is a "transaction file" for keeping the values of user defined fields, i.e., you can keep a file of the current balances in your inventory program. The manual says this file is optional but as it turns out, it is mandatory. The print program asks if you want to print and update the transaction file or just update it. Being able to just update the file is good if, for example, you need to log the end of the day balances and don't want a hardcopy. Since I selected computer formatting during the print program creation, I was surprised to discover that my reports were messed up. The specified line length was exceeded with the data that was to be at the end of the line overprinting the beginning of each line. This is obviously not acceptable.

(I should point out that these print program comments are from an earlier version of C.O.R.P. The version received for this review would always give me a FATAL ERROR DURING PROGRAM GENERATION message and necessitate starting over. At first I thought maybe I had entered too many characters for a field image — there is no error trapping here — but after restarting and entering the correct number of characters, it still failed. Following the manual very strictly, I was never able to get this version of the print program generator to work.)

After you have finished the tutorial portion of the manual, it will be apparent just how easy it is to create data base entry and printout programs. In general, the features offered within your programs will be more than adequate for most requirements. But some comments are necessary about areas of C.O.R.P. that limit its usefulness. The manual does not indicate any limit to the number of fields per record but as there is only one screen available for data entry you will be limited by how much information you put on this screen. A properly formatted screen should be able to contain sufficient fields for most data base uses. The maximum size program that can be generated is also not described but is certainly limited since parts of C.O.R.P. and your program must be resident in memory at the same time. How much of C.O.R.P. is co-resident is unknown. (None of the other pro-

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of programs is basically the same as for the es. The utility programs are for creating a menu eating and executing a form letter or simple ata file merger program, and a powerful editor ndard C.O.R.P. options are also available and DELETE files, and change system char- o way to silence the bells on this disk which re- amount of noise from the utility programs.

n program will simplify the running of the vari- by C.O.R.P. by displaying a menu of items and e selection. Using the menu creation program natory. You first enter the heading desired for screen and then enter the program names and program does not allow duplicate codes which king this type of error. Disk functions can be in- d to quit the menu requires a reboot option or a ould have been a quit to Applesoft option but user modifiable, it can be inserted. Programs o be C.O.R.P. created. This menu program can HELLO program and other non-C.O.R.P. gen- ded onto this disk.

on program is a simple line-oriented editor to a simple printout program that will use the data data file. Editing functions like add, delete, in- are available. Calculations on existing fields are entry was possible using the Videx Enhancer II using other lower case entry methods (this is not nual). Editor commands were converted auto- se. Print margins must be specified but other must be changed with the change system char-



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You are now finished with your part of the C.O.R.P. will proceed to create your program a tion. The program is written to disk as a sequen back into memory by C.O.R.P. and then SA BASIC program on your work disk.

To verify that the program works you can and RUN your new program or execute it from menu. In either case, after some setups by the c sented with the data entry screen you createe screen with the following file data presented: p number of records, number used, and numbe S)earch, or Q)uit.

In the add mode the program will check fo and will not accept incorrect entries. This chee for a long data entry session. Colons and coe tered. The specified field length is shown w entering data you can backup to a previous fie TURN after the last entry. At that point your re no opportunity for confirmation. Since the p you could insert one, but it's curious as to why entering dollar amounts you must include th though it appears on the screen. You must add of the computer adding them for you if you we after entering whole dollar amounts. If you did by reading ahead in the manual, you will have program. If they had been turned off, your prog silently.

To search on the "key field" you enter at le the field and then press RETURN for all of the the screen (specifying other fields will narrow th record will be displayed which matches your e done due to the lack of a large enough file in th seems to be relatively fast). A record-by-recor ginning of the file can also be done. Once the r played, you can either modify or delete the e search. Modification is done by stepping throu ing data as required. Records can be deleted given to verify your choice. Should a search f you are returned to the initial screen with no ot a message saying "NOT FOUND." Quitting the files and then tells you to insert a disk to be boe don't want this message displayed, you will created program but no REMark statements a gram, so this job will be time consuming.

One final point: the manual says the "Term be "0000" and if it isn't, refer to the appendix. V ferred to the appendix to see what "0005" (the quit) was. It stated that "0005" was the norma the data entry program and should not appea ated program. The manual also says that "YES tered at the various prompts when in fact a "\ These are just indications of the inconsistencie of a stable product.

If you are following the tutorial in the m reached the information needed to silence all been hearing. The change system characterist to silence the bell, change the printer parame slot, or reboot. All changes are for that C.O.F must be reentered after each reboot of the Mast been nice if these changes were made perma you will learn about at this time are CATALOG ing or deleting the data files, and backing up yo The CATALOG function on the main menu is u also been available whenever C.O.R.P. asks disk. You will have to remember or write dow

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grams reviewed to date indicate this size either.) There is also no discussion of multi-disk files. You are probably limited to single disk files although your data files can reside on the same disk as your program or on a separate disk in either drive.

OTHER FEATURES

C.O.R.P. currently supports the following printers from the change system characteristics option:

1. Centronics 779
2. Centronics 704
3. Silentyper
4. Qume/Diablo
5. Other/Unknown

If selecting the last option you will have to define your printer codes for expanded print, speed, formfeed, clear buffer and more. All codes must be in decimal. I was unable to find the proper combinations or options to get the print program to work totally correctly with my Epson MX-80. It should be noted that there is no indication of what printers are supported visible before purchasing C.O.R.P. When there may be compatibility problems, this information should be available before you purchase a sealed package.

From the C.O.R.P. main menu you can sort your data files, patch up errors in files, or do a global update to all or some of the records in your files. The sort file option allows you to resort your data files on a different field than originally specified but will make your file unreadable by the data entry program you created earlier. This is because the key field is changed and hence you will have to create another data entry program. This is not as bad as it sounds since C.O.R.P. will allow you to modify a previously created screen and all it takes is changing the key field designator to the proper field. Only by creating many sort files and modifying your program can you have multiple sort searches available.

UTILITIES DISK

The use of this set of programs is basically the same as for the other C.O.R.P. routines. The utility programs are for creating a menu selection program, creating and executing a form letter or simple printout program, a data file merger program, and a powerful editor program. Other standard C.O.R.P. options are also available (CATALOG, VERIFY and DELETE files, and change system characteristics). There is no way to silence the bells on this disk which results in a tremendous amount of noise from the utility programs.

The menu creation program will simplify the running of the various programs created by C.O.R.P. by displaying a menu of items and allowing two-keystroke selection. Using the menu creation program is easy and self-explanatory. You first enter the heading desired for your menu selection screen and then enter the program names and selection codes. The program does not allow duplicate codes which prevents you from making this type of error. Disk functions can be included in the menu and to quit the menu requires a reboot option or a "99" to quit. There should have been a quit to Applesoft option but since the program is user modifiable, it can be inserted. Programs selected do not have to be C.O.R.P. created. This menu program can then be saved as your HELLO program and other non-C.O.R.P. generated programs FIDded onto this disk.

The forms creation program is a simple line-oriented editor to create a form letter or a simple printout program that will use the data from each record of a data file. Editing functions like add, delete, insert, replace, and list are available. Calculations on existing fields are allowed. Lower case entry was possible using the Videx Enhancer II and may be possible using other lower case entry methods (this is not mentioned in the manual). Editor commands were converted automatically to upper case. Print margins must be specified but other printer characteristics must be changed with the change system char-

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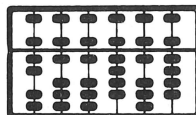


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acteristics option. When executed, this program prints a letter or report using fields from each record and inserting them where specified in the text. Although text entry was limited to the 40 column display, printouts are filled within the margins selected. Only two minor problems surfaced; the "l" character was changed to ":" in the printout and there is no way to stop the program. A major deficiency was the lack of a selection criteria input mode to specify which records are to be printed. Without this ability all records in the file are printed in order. Hence it may take some time to print the particular record you are interested in. You may have to print 500 letters (if you have 500 records) just to get letters for the 10 records you want. This program does have its uses though.

The data file merger option will combine two files of exactly the same format into a single file. The combined file can not be larger than specified in the data entry program. This new data file can then be used with any of the other programs.

The system editor program is the most powerful of all the programs offered by C.O.R.P. including the code generator programs. It can be used to create, read, or modify C.O.R.P. data files, and random or sequential text files. Lower case entry of data was possible but commands were not converted. The text editor is line oriented but includes many useful commands: list, insert, delete, find, copy, and more. There is a mode which will allow the "illegal" characters ",", and ":" to be part of the fields. Any text file can be read or written to by specifying sequential or record length if random access. This program is so useful that I would purchase it if it were offered separately at a reasonable price. The editor is an overall excellent program.

UTILITIES DISK II

The second utilities disk has two functions on it: a program to modify your data entry program to have calculated fields and a program to modify the print program to have some selection criteria at print time. The first will prove useful if you have to globally change your data entry program and the second will be generally useful and should have been included in the basic print program generator (but

I'm glad to see it is now available). There is also a copy function which will copy all the files (there are several) for each type of program generated by C.O.R.P. Perhaps the best part of this disk is the unprotected Sort, Merge, and Update files that can be used as part of the generated programs (if you know how to modify Applesoft BASIC programs).

SUMMARY

A serious problem was discovered while trying to execute a second print program (fourth created program on the work disk). A message appeared that stated there was an error in the program or the data file did not exist and to press ESC to continue. The program tried to load C.O.R.P. from drive #2 (still in drive #1) and hung. I had to reboot. In checking the catalog on drive #2 I discovered that the disk directory had apparently been overwritten and so the disk was blown. When creating a menu program with the Utilities Disk, a different type of error occurred; the menu generation stopped and the Apple entered the monitor (i.e., the program crashed). When checking the disk free-space I discovered it was full. It appears that the DOS used by C.O.R.P. does not check for a full disk and just keeps on writing. The problem can be avoided by not putting more than one set of data entry/print programs on a work disk. However, it is not acceptable to have to do this. Other than blowing the disk, not displaying proper DOS error messages, the RESET key not being trapped out, and accepting field images that are too long, both C.O.R.P. and your programs have good error trapping.

There are some formatting errors in some of the filename entry screens. As you type in the filename, you can exceed the screen width and the name will be split. Looks unprofessional.

Overall, the use of C.O.R.P. makes the writing of a general data base program extremely easy. However, the programs may require extensive modifications to make a complete, stand-alone, data base management system. Its suitability for simple purposes should be adequate for non-programmers but its usability is reduced by bugs. Programmers will appreciate the reduction in coding time but will be annoyed at the extent of modifications they will have to make. Nobody will appreciate the blowing of disk or the crashing of a program after you have entered all the necessary steps to create it.

There is one serious drawback to the hardware protection used by the C.O.R.P. system. The protection device disabled the macro downloading feature of the Videx Enhancer II. While many people won't consider that a problem it does point out that programs requiring the use of such a device may actually limit your computer system. Since the protection device is a non-standard item (granted so is the Enhancer II), other software or hardware that you may purchase in the future might not function properly with the device inserted. This may only mean removing the device (with the potential for damaging it or something else) or as in the case with the Enhancer II, you can not use the macro feature to simplify data entry by pre-defining often used data as macros. Before purchasing any program that requires a hardware protection device, consider what limitations may be placed on the use of your computer by the device. Since the authors of C.O.R.P. felt it necessary to require the protection device to prevent piracy, they may find that another way to prevent piracy is by the lack of sales resulting in the demise of the program. I hope that all distributors consider the effect of this type of protection on their sales.

PROGRAM GENERATOR SUMMARY

So far Peelings has reviewed The Last One, The Programmer, and C.O.R.P. None of these have been really what they claim to be: a program to allow the non-programmer to generate complete programs or to allow the programmer to reduce programming time and effort. All have had serious deficiencies. Peelings hopes to be reviewing The Tool (High Technology) and The Creator (Software Technology for Computers) in the near future and at that time we will summarize our findings for all the reviewed packages. □

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Chapter Two: *The System For You*

In the world of personal computing, there are four different life-forms: machines, persons, salespersons, and hackeroids. Discussion of hackeroid behavior lies beyond the scope of a magazine with pretensions of sobriety. Our purpose this month is to talk about persons and machines and, to a degree, salespersons.

Picture this familiar scene. A person much like any other person decides to purchase a personal computer. He walks casually into his local computer store, having just finished reading *The Third Wave* and ready for anything. On every side of him there are machines, going about their business and all looking pretty much the same except for styling. From amidst the machines emerges a well-dressed salesperson.

"I'm thinking of buying a small computer," says our hero. "I have a small business and I think maybe an accounts receivable program or a simple word processor would be a great help . . ."

"Let me show you the new Zaphod Mark IV. It is fully integrated, modularized, initialized, digitized, synthesized, sensitized, electrolyzed and customized. It has 357K and 29 bits. It has 18 serial ports and an RS-232 and an IEEE and a XYZ-compatible widget to boot! It has mass storage on-line, off-line spooling, and front-line friendliness. It's the top of the line."

"Can it balance my checkbook?"

"Well, now, that's a software problem. Let's see now . . ."

This example is not meant to give penetrating insight into the behavior of either persons or salespersons. It illustrates the confusion one encounters in trying to figure out just what hardware is necessary or desirable for a specific application. The field is advancing so rapidly that making purchasing decisions is a matter of great difficulty. Between advertiser's claims, magazine articles, conversations with dealers and reports from friends "in the know", a person may be left with a barrage of contradictory (or at best, hard-to-correlate) information about what kind of "systems" are available and what they can do.

In this month's column we'll discuss in general terms what various hardware items do for a computer system. In keeping with the now one-month-old tradition of this column, and the magazine's orientation toward the Apple computer, the Apple II will be used as the example machine. This perspective is quite justifiable, though, because if a piece of equipment exists, it probably exists in Apple-compatible form. So without loss of generality, onward!

RAW APPLES

The first Apple II was designed over five years ago. In a real sense it was the first personal computer. It costs (and still does) over \$1000 in its barest, simplest form.

Originally, the Apple II had a programming language called Integer BASIC in its ROMs. With "Integer," one could do color graphics, arithmetic with integers (whole numbers), and some simple operations with strings (text data: letters and other symbols).

The original Apple II also came with something called the "Old Monitor ROM." The Monitor is the machine language program which implements the machine's most elementary functions. When the Apple was turned on, the Monitor would gain control, and a special sequence of keys had to be pressed even to start programming in Integer BASIC.

Two improvements were soon made. One was the new, "Autostart Monitor ROM." This chip replaced the Old Monitor. Now when the Apple is turned on, BASIC is started up immediately. The Autostart ROM also returns to BASIC when the RESET key is pressed. In addition, it provides better features for editing BASIC programs (more flexible motion of the cursor around the screen).

The second improvement was the introduction of Applesoft BASIC. Machines supplied with Applesoft instead of Integer in ROM are known by the name of Apple II PLUS. Applesoft is a more advanced programming language than Integer, having floating point numbers (which have both greater range and greater precision than integers), better string manipulation, and much easier access to high-resolution (hi-res) graphics.

The most recent addition to the Apple II species is the Apple IIe of 1983. The most noticeable outward change is that lowercase letters are no problem. The machine has full-feature keyboard and a lowercase display, with an inexpensive upgrade to 80-column text display available. Inside, the IIe has been redesigned to use fewer components, and a Language Card (see below) has been effectively "built-in". These are long-awaited refinements, bringing the Apple II into conformity with other modern machines.

One can still find both kinds of Apple II (original and PLUS) with both kinds of Monitor ROM (Old Monitor and Autostart), which is why I've spent time discussing them. Also, it's educational to see how the computer has evolved to keep step with the times.

Almost all personal computers being sold today have a language very much like Applesoft as their natural language in ROM. A few of the less expensive, game-oriented computers have BASICs which are more like Integer. Generally, BASIC programs from one computer will not run on another. This is because originally standard BASIC had so few functions that each computer manufacturer felt the need to "extend" it with extra features, and each one added a different set of extras.

In the beginning, Apples were sold without disk drives (they can still be bought that way). A disk drive was considered an extravagance for a personal computer. But prices went down, and users' expectations went up, so now disk drives are everywhere. The advantages of having a disk drive are enormous. Not only can programs be loaded and saved more rapidly than from tape, but data can be filed and the files given names. These same files can be used rapidly by a computer program with no intervention necessary on the operator's part.

A disk drive costs about \$500, although there are some available for less.

Two years ago, Apple came out with DOS 3.3 (the successor to DOS 3.2). This is a combined hardware/software modification that allows more information to be stored on a single floppy disk. Nearly every Apple alive today has "upgraded" to DOS 3.3.

The Apple's processor can directly address up to 64K of memory. The ROMs (Monitor and BASIC) and I/O circuitry together use up to 16K of this, leaving 48K maximum "user memory." Early Apples came with only 16K RAM standard (or less), and more could be added (up to 48K) at considerable expense. Now memory is cheap, and nearly every Apple has 48K RAM.

The upshot is this: In today's world, virtually all Apple software is written with a 48K Apple II PLUS with Autostart ROM and disk drive in mind. (Most is compatible with the IIe, and new programs are being written just for this new machine). It (or the equivalent IIe system) is the only realistic system to purchase. You will find salespersons in full agreement with me on this point. Furthermore, any other computer that is intended for serious work must meet this minimum standard:

1. An extended, floating-point BASIC as the natural language
2. At least one floppy disk drive
3. Full use of the 64K address space.

A monochrome monitor is also desirable. Even as a bare minimum, this standard will soon be obsolete. However, it gives a person a way to make a ground-level comparison of different systems. Such a minimal Apple system will cost about \$1700.

ADD-ONS

The first "Apple add-on" was the Apple DISK II disk drive. So it's natural to start our discussion of add-ons with disk systems.

One can add disk drives at liberty, and two seems to be a common number. Two disks on-line makes for a more flexible system. A whole disk can be used for data, while the master program and other important files can reside on the other disk. It is also much easier to make copies of disks if two drives are available. Although two disks are an advantage, they are not a basic necessity for many applications.

Some people added large, 8 inch floppy disk drives to their Apples. This increases storage space and speed as well. As soon as one leaves the world of 5 inch floppies, however, he must be prepared to live with a non-standard system. Apple DOS was written and designed around the small floppies. Unless you like to experiment and "do your own thing," or know ahead of time that the software you'll be using is compatible with a non-standard disk system, the advice is: caveat emptor. (Let the buyer beware.) An 8 inch floppy system will cost perhaps \$2000.

In the last year, the cost of Winchester-technology hard disks has dropped substantially. These disks are permanently mounted in their drives and are extremely fast, and have a large storage capacity (measured in Megabytes, or millions of characters). For example, a 10-Mb hard disk can store the equivalent of about 2000 densely-printed pages, whereas a 5 inch floppy can store only about 25. A hard disk puts one in the category of the mini-computers. A business could easily be run with a personal computer and one or two hard disks. Depending on the nature of the business, this might be impractical with floppies. Once again, the hard disk makes for a non-standard system, but the person who is prepared to spend \$5000-\$20,000 for a system with a hard disk will probably be willing to invest in hiring someone to write or customize his software, if he does not wish to write it himself.

For home use (and many business applications), one or two 5 inch floppy disk drives will very likely satisfy all needs. See also the section below concerning solid-state disks.

Everyone needs a printer! Yes, everyone. Unless, that is, your computer is exclusively a game machine. A printer not only facilitates programming (printed listings are quite important, both to aid in writing programs, and to archive them safely afterwards), but opens wide the possibilities of word processing and report generation.

There are basically two kinds of printers at large in the world today: letter quality and dot matrix. The former type uses a daisy-wheel and produces print indistinguishable from a typewriter. The obvious advantage to this is that such printouts are beautifully readable and you are not embarrassed using them in a professional context. The disadvantage is that letter quality printers are usually slower and more expensive than the dot matrix ones. Dot matrix printers can produce "correspondence quality" printouts which, though the dots can still be seen, are quite readable and at a glance mistakeable for type. Such correspondence quality printouts are acceptable in a variety of situations. Typically, letter quality printers cost \$2000-\$3000, whereas excellent dot matrix printers can be bought for \$500. Paying more is unnecessary unless some special feature is desired which simply cannot be found in a less expensive model. Recently, some letter quality printers have emerged in the \$500-\$1000 range, including some that can be used as electric typewriters when not connected to the computer.

In most applications, a good dot matrix printer should be all that's needed.

With printers there is also the problem of "interfacing" to the computer. A raw Apple will generally require an interface card to use

printer. Such a card may be supplied by the manufacturer of the printer. You may be able to get more features for the money in an interface purchased elsewhere, but you should have enough experience to determine that it will work for you. Never leave the store until you see the printer you are buying work with your computer, especially with any word processor you have also purchased. If the interface is "Centronics compatible parallel", it should work with just about any printer. An interface card should cost no more than \$100. but may be more if combined with other devices on the same card (serial interface, clock, etc.) or if it has special features (a memory buffer, graphics firmware, etc.)

A modem is a device for connecting your computer to a phone line. It stands for "modulator-demodulator." Between the modem and the computer is another hardware device, a serial interface, that converts computer data to electronic signals. The modem then converts these signals to tones that the phone line can handle. This is very useful if you want to use your computer as a terminal to some other (for example, at work or school), or if you just like to be in touch with the electronic consciousness of the world. If you are willing to pay for the service, you can connect yourself to national information networks, and get that "plugged in" feeling. A modem also allows easy file transfer with other computer users. The modem itself will cost \$100-\$300 for a 300-baud (a standard transmission speed, 30 characters per second) or \$500 or more for a 1200-baud (120 characters per second) device. You also need an RS-232 serial interface, which may or may not be sold with the modem. (RS-232 is simply the name of the standard agreed upon for the type of signals generated by the device.)

Finally, we reach the "everything else" category of add-ons. These include firmware cards which provide the version of BASIC not present on the main board. A firmware card is not normally necessary if you have a language card (16K card). (But see below.) Others are clocks (which report the time of day), music synthesizers, appliance controllers, external terminals, oscilloscopes, light pens, thermometers, and too many more to name. (Regarding firmware cards: It is possible to have the Disk Operating System (DOS) reside in the additional upper 16K of memory. A firmware card, usually in slot 4, can give more flexibility in this case.) There are also two special classes of add-ons which are discussed in the following sections.

CLEANING UP APPLE'S ACT

The original Apple II was non-standard as far as computers go in four important ways: the keyboard could not produce lower-case letters, the screen could not display lower-case letters, and the screen was only forty columns wide instead of eighty, and the shift key did not work as it should. These four items were significant annoyances and were factors against buying the old Apple II unless one was willing to upgrade with certain hardware modifications. As you may well be aware, the inability of the original Apple to handle lower case letters takes all the fun out of word processing and many other serious applications. These deficiencies can be "patched up" and "faked out" with software, but software solutions to these basic problems lack general applicability and are often cumbersome. A better way is to make the necessary hardware modifications to the Apple to bring it into line.

The keyboard can be fixed with a device called a keyboard enhancer. The oft-discussed "shift key mod" is not what is needed: it lacks generality, requiring cooperation from the software. A genuine keyboard enhancer, in contrast, is installed between the keyboard and the Apple's main board, giving true, pure, lower case entry. Prices vary — around \$100.

The display can be fixed up with an 80-column card. This device presents a full 80-column, upper and lower case video display on your monitor (a TV does not have sufficient resolution). There are certain compatibility problems, though, since the software you are using must relate to the 80-column board on a deeply personal level.

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Most high-quality software packages support all the major 80-column boards.

If the 80 columns are not a necessity, a more direct solution to the display problem can be had by acquiring a lower case adapter. Such devices are inexpensive, and can even be purchased combined with the keyboard enhancer. No more than \$20 should be necessary. Generally, the interface to software is easier than with an 80-column board.

Lower case keyboard and display modification is a must for serious use of the original Apple II. Most other computers do not share this problem. Fortunately, it can be corrected in a straightforward and inexpensive manner.

Of course, these fixes are not necessary for the new Apple //e. The //e has many other extra features which can be taken advantage of by the proper software (including provisions for accessing 128K of memory).

EXTRA COMPUTER

The best has been saved for last. There are add-ons which transform your Apple into a machine no one would have dreamed of seeing in a person's home five years ago.

The first step in this direction is memory extension. Apple computer came out (in primeval times) with a "language card" for around \$400. This card contained 16K RAM which could be "bank switched" with the ROM on the main board. Bank switching means that one memory bank can be used in place of another, and the user or program can switch back and forth between memory banks. Thus, although the Apple can only directly address 64K bytes, more memory can be added indefinitely. The restriction is just that more than 64K cannot be used at any single instant.

The language card allowed other languages like Pascal or Integer BASIC to be used in addition to the Applesoft BASIC normally found in ROM. In fact, any language or program could be loaded into this card, effectively opening the door to all sorts of new uses for the Apple.

16K RAM cards which work just like the Apple language card are now available for \$50-\$100. But wait! There's more.

If you can add 16K, why not 32K, 64K, 128K, or even 256K or more? Such cards are available, and usually come with special software which can put them to all kinds of interesting uses.

For example, a 128K card sells for about \$500 and has about the same storage as a 5 inch floppy. And special software is provided that make it appear as another disk drive. Being electronic rather than mechanical, it is much faster. Alas, all files on it disappear when the machine is turned off.

Solid state disks are available for about \$1000 which have 200K-300K of memory, often with battery backup. If speed is the main object, such a device offers serious competition for a hard disk.

Now that the 64K memory barrier is broken, it's time to take a second look at the Apple's processor. This is the tradition of Apple computer evolution: if you want something the Apple doesn't have, find a way to plug it in!

Many other small computers use the Z80 processor, instead of the Apple's 6502. In fact, there is a standard operating system for Z80-based machines, known as CP/M. The possibility of missing out on something caused the Apple user community to pout en masse. So out comes the Z80 Softcard. This card has a Z80 processor on it. With a 16K RAM card, the Apple can now be used either as an Apple or as a Z80 machine. The Z80 card sells for about \$250.

And you can get other processors too. There are processors to make Pascal run faster; there are processors to make your Apple think it's an IBM PC; there is even a MC68000 board for the Apple, so the status quo can't sneak up on you.

Oh, yes. One last add-on: a box with extra slots in it for more add-ons!

MAKING SENSE OF IT ALL

If you feel just as confused as the person in the computer store where we left him waiting for a machine to balance his checkbook, never fear. I'll attempt to consolidate this technological garage sale into a useful viewpoint for assembling a customized computer system.

The preceding survey was intended to be quite extensive and sweeping. If carefully scrutinized, it should give a well-rounded overview of what's available. It is my hope that things were stated in a general enough way to allow appraisal of other systems besides Apples, and various Apple add-ons you may encounter.

It should be emphasized that after the basic system, described earlier, other add-ons are just that: add-ons. In a very real sense all computer systems are the same. Alan Turing showed this fifty years ago. If you are willing to pay for it in terms of the computer's running speed, you can make any computer act like any other. So, you don't need 256K memory and you don't need a 16-bit processor. These things (and most add-ons) simply increase the performance (speed and ease of use) of the system. Add-ons provide a way to put computer power exactly where you need it. It is this kind of extensibility which is largely responsible for the Apple's popularity. Careful consideration of the most frequent uses for your system should ease the decision of what to buy to customize it.

To summarize, I will now list two other systems in addition to the minimal one described previously:

SERIOUS SYSTEM

Apple II Plus, 48K	\$1400
Disk drive	400
16K RAM card	100
dot matrix printer w/interface	600
Keyboard and Display Enhancer	100
monochrome monitor	150
	<hr/>
	TOTAL \$2750

-or-

Apple //e, 64K, Disk II, monochrome monitor, 80 col dot matrix printer w/interface	\$2000 600
	<hr/>
	TOTAL \$2600

WHIZ-BANG SYSTEM

Apple //e, 64K, Disk II monochrome monitor, 80 col (or Apple II PLUS equivalent for about \$2100)	\$2000
dot matrix printer w/interface	600
modem & serial card	300
Z80 card	250
128K RAM card (pseudo disk)	500
Fan	50
	<hr/>
	TOTAL \$3700

I am often asked if I think the Apple is still a good buy in computers. As the proud owner of the Apple II Plus version of the "Whiz-Bang" system, I answer in the affirmative. I have never felt that having an Apple rather than something else limited my computing power. On the contrary, the ready availability of hardware to enhance and customize the system makes it more flexible and powerful for the uses to which it is applied than many a mini and mainframe I have known.

In fact, the current rash of small business-oriented personal computers in the \$4000-\$6000 price range would find stiff competition, I fear, in a Whiz-Bang anything machine. □

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Cost of Utilities Program (Included In Program)	\$00.00			Level Breaks Allowed At Users Option (Up To 4 Level Breaks Per Report)	YES		
Cost of Reports Program (Included In Program)	\$00.00			Designate Font To Be Used In Report	YES		
Compatible With Letter Perfect (tm)	YES			Boldfacing Allowed In A Report (With Dot Matrix Printer)	YES		
Word Processing				Mathematical Formulas Allowed In Report (Example, Field 'x' + Field 'y' = Field 'z')	YES		
Menu Driven	YES			Auto Page Numbering Allowed In Report	YES		
(Very User Friendly)				Auto Date Entering Allowed In Report	YES		
Complete Documentation	YES			Repeating Characters Allowed	YES		
(Manual Tabbed And Indexed)				Optional Level Breaks and Page Breaks When Sort Values Change	YES		
Single Load Program (No Swapping Of Program Diskette)	YES			Up To 7 Lines Allowed For Header on Each Report	YES		
Machine Language	YES			Up To 2 Lines Allowed For Detail Information On A Report	YES		
(Extremely Fast Operation)				Variable Spacing Allowed Between Data On Items In A Report	YES		
Can Use Single Disk Drive	YES			Multiple Fields Allowed In A Report (Number, Data, Alpha, Formula)	YES		
Can Use Multiple Disk Drives	YES			Search Criteria Allowed On Report (Same Criteria As In Editor)	YES		
Ability To Design Screen Mask (User Designs Arrangement Of Data)	YES			Ability To Have "Literal" Data Printed In A Report	YES		
Full Keyboard Editing Available (Delete/Insert A Character; Go To End/Beg. End of Line; Fine 'n', TAB, ETC.)	YES			Ability To Have "Conditional" Data Printed In A Report	YES		
Compatible with M&R Wizard 80, BIT 3, ALS, Videx or Use in 40 Column	YES			Can Use A Default Date Field	YES		
Works With Any Parallel Printer (Supports Atari 850 Interface)	YES			Designate Default Value For Specific Fields	YES		
Totals Of Numeric Field (Return Total And Average Value/Field)	YES						
Fail Safes Provided For Data Protection	YES			LABELS REPORT GENERATOR			
Error Messages Displayed	YES			Mailing Labels Allowed	YES		
Status Lines For Ease of Use (Options Always Available For Reference)	YES			(Specifically Designed For Labels)			
				User Designs Data Placement On Label (One Across Label Design)	YES		
SEARCHES AND EDITING				Multiple Fields Allowed On Label (Date, Alpha, Numeric, Formula)	YES		
Multiple Searches Allowed On Same Record (Search On 9 Criteria Per Record)	YES			Repeating Characters Allowed	YES		
Search On Two Criteria In Same Field (Up To 4 Fields In Single Record)	YES			Font Designation Allowed	YES		
Wild Card Searches (And/Or, Include, Character, Or Block)	YES			Print Label On A Conditional Basis	YES		
Search On Basis Of Record Number (Search For An Individual Record)	YES			Search Criteria Valid On Label (Same Search Criteria As Editing)	YES		
Search On Range Of Data Desired (Dates, Numbers, Values, Greater Or Less Than, Equal To, etc.)	YES						
Editing Of Records Individually	YES			MATHEMATICAL ABILITIES			
Editing Records Globally (Verification Allowed)	YES			Basic Math Calculation	YES		
Delete Records Globally (Verification Allowed)	YES			Addition, Subtraction, Multiplication, Division			
Deleting Records Individually (Verification Allowed)	YES			Built In Calculator (Automatic)	YES		
				(Use In Editing, Or Adding Data)			
UTILITIES SECTION				Find the Integer Value Of A Numeric Expression	YES		
Add Fields To Existing Data Base	YES			Find The Log Base 'e' Of 'x'	YES		
Delete Fields From Existing Data Base	YES			Find The Log Base "10" Of 'x'	YES		
Reformat A Data Base (Copy Format Of Existing Data Base)	YES			Find The Absolute Value Of 'n'	YES		
Make Additional Copies Of Data Base (Create Data Base For Extended Records)	YES			Exponential Notation Used	YES		
Sort on Multiple Criteria (Sort On Basis Of 4 Fields In A Sort)	YES			Find The Square Root Of 'n'	YES		
Sorts On Multiple Criteria (Ascending Or Descending)	YES			Formulas Allowed Between Fields (Field x (+ - *) Field y = Field z) (Field x (+ - *) N = Field Y)	YES		
Depth Of Sort Can Be Changed (Designate Number Of Charters Deep To Sort)	YES						
Merge Information From Other Data Bases (Merge Standard Text Files)	YES			SPECIFICS			
Add Or Delete Fields From Data Base	YES			Maximum Number Of Fields Per Record	32		
Merge Previous Entered Data From Existing File	YES			Maximum Number Of Formulas In A File	16		
Back Up A Data Base (Make A Back Up Of Current Source Data)	YES			Maximum Length Of A Field	127		
Pack A Data Base (Remove Deleted Records From Disk Storage)	YES			Maximum Record Length	511		
				Maximum Number Of Level Breaks	4		
				Records Per Diskette (Depends On Length And Number Of Fields)	VAR.		
				Data Bases Allowed On Each Diskette (Can Be Expanded To Additional Diskettes)	ONE		
				Form Letter Capability (Compatible With Letter Perfect)	YES		

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CARDFILE

Program: Pro/Tem Software, Inc.
Distributed by: Digital Marketing Corporation
2670 Cherry Lane
Walnut Creek, CA 94596
(415)938-2880

Version 1.4

\$89.00

Supplied on one CP/M 2.2 diskette — two drives required.

48K RAM and 80 column display required

Unlocked

Rating: C —

Reviewed by Alan Shalette

INTRODUCTION:

CARDFILE is a file management program intended to help its users access information typically kept on index cards. Other offerings in this software category include DataFax (reviewed in Peplings II V3 N5 — rated AA), VisiDex (reviewed in Peplings II V3 N8 — rated A+), Time Manager (reviewed in Peplings II V3 N8 — rated A-), Cardbox, and Superfile.

Typical of this type of software, CARDFILE's 'cards' consist of single page/display-screen records containing text and access keys. Its capabilities exclude card creation and maintenance. These functions must be performed with a user-supplied word processing system.

HARDWARE AND SOFTWARE REQUIREMENTS

CARDFILE is a CP/M-based system and, thus, requires the user to have a Z-80 card installed, operating CP/M 2.2, plus an 80-column display card and at least 48K of RAM. I used Microsoft's Z-80 Softcard and Videx's Videoterm for this review. Two disk drives are required to store the CARDFILE and word processor systems plus associated card files. A printer is optional, but desirable. I used an NEC 5510 Spinwriter connected to an Apple high-speed serial interface card. These devices were located in what are becoming standard slot assignments: Softcard — Slot 7; disk drives — Slot 6; Videoterm — Slot 3; and, printer interface — Slot 1.

The manual indicates general compatibility with all CP/M word processors, specifically mentioning WordStar, Spellbinder, Peach-Text, Select and Easywriter II. I used Select to test CARDFILE.

OPERATION

CARDFILE may be operated independently or within a system 'shell' surrounding both CARDFILE and your word processor. That is, routines can be executed which will allow CARDFILE to be run from within your word processor and which will pass control back to your word processor after CARDFILE operations are complete. These routines are established during installation when CARDFILE will create a disk file which acts as the system shell entry point. This file is given a pseudo-name for your word processor, e.g., I used "SEL" instead of the normal "SELECT" — which is then used to execute the shell. Flow of control between CARDFILE and the word processor is typified by the following processing steps:

- Enter the word processor to create new cards/records and save them to a disk file.

- Run CARDFILE — which will automatically copy the newly created cards to its index/data file.
- Scan the file, selecting records to be printed or saved to a new disk file.
- Exit CARDFILE, causing the system to save the selected records to a new disk file or to print them and then return control back to the word processor.
- Use the word processor to change the selected records or to incorporate the records in another document (e.g., as bibliographical references in a report).
- Rerun CARDFILE to update its file with any records you may have modified.

Each CARDFILE record contains three lines of descriptor information followed by text and must contain no more than 21 lines of 72 characters. Records can be described technically as containing four string fields, each terminated by a return character. Any text processor formatting commands used to arrange the text will be ignored or misused by CARDFILE in displaying or printing the records. This places a limit on the user's ability to format information on the cards — unless the records are to be fed back to the word processor to be included in another document.

The manual uses a bibliographical reference application to illustrate the system's operation. In this application, the three descriptor lines contain subject keywords, title of the referenced article and author/publication. Thus, "Subjects", "Title", "Author" and "Text" are displayed as prompts when the system is used to access stored records.

Descriptor line definitions are arbitrary and the prompts may be changed with a utility program supplied with the system. CARDFILE tracks its different card files by storing these prompt descriptions (e.g. Subjects, Title and Author noted above) and the names of their associated data files in small disk files with '.PRM' tags. One such file, CF.PRM, acts as the system default. If it contains the bibliographical file information mentioned above, the bibliographical file will always be loaded unless you tell the system to load a different one. A different one may be loaded by appending the name of its .PRM file to the CARDFILE system call. To illustrate, running 'CF' will cause CARDFILE to load the default file, while running 'CF NAMES' will tell it to load a file whose prompts and data file are described in a parameter file labeled NAMES.PRM. NAMES parameters may be associated with a file you have created containing customer reference information.

In search mode, you enter words, phrases or any other information previously used in the four prompt categories to describe the records for which you are searching. Keyword searches will be accomplished much more quickly than text searches. Blank responses to all three prompts will cause the system to display all records in the file. In any case, selected records will be displayed one at a time. You may abort a search and start a new one at any time by entering new keys. Similarly, the system may be exited at any point.

An auxiliary menu can be called up when the system displays a record satisfying your search criteria. Four options are provided: 'P' to print the record; 'W' to write it to disk; 'E' to erase it; and, 'C' to return back to the search mode. Since the 'W' option may be used to send the record back to the word processor modification, this option also asks whether it should be erased — records in CARDFILE's own files are not updated, just added or deleted. If P, W or E is chosen, the record is marked for further processing after the CARDFILE system has been exited. When this post-processing is complete, con-

trol will return to your word processor or to your operating system, depending on the method used to enter CARDFILE.

DOCUMENTATION

The CARDFILE manual is contained in a center-stapled, letter-sized booklet, 36 pages in length. Text is typeset in large font type, easy to read and enhanced by judicious use of boldface and figures illustrating the system's various menus, prompts and options. One manual is used to describe both Version 1.4 for use with CP/M 2.2 (now being called CP/M-80) — the Apple II version — and Version 2.0 for use with IBM PC-DOS, MS-DOS and CP/M-86.

It's a shame that the manual's otherwise high quality and good writing is weakened by poor organization. While starting with usual types of introductory information regarding system purpose, operating requirements and startup, it then dives into 'How to Search Cardfile' without first explaining how records are created. Next, it describes 'Installing Cardfile for Regular Use', explaining how to set up the system shell discussed earlier. Only then does it talk about 'Creating a Card For Cardfile' and 'Reading the Card Into the Cardfile Datafile'. Later chapters then describe printing and writing records to disk and modification of system prompts (.PRM files) and other file management topics.

The manual fosters the anxiety found in adventure-type games where, on your first few passes, you're not quite sure where you are or where you're going. Outside its Table of Contents, it offers no map or discussion of overall control flow such as I described earlier. Interleaving both Apple and IBM operating instructions also serves to slow comprehension.

PERFORMANCE

CARDFILE's limited functions are accompanied by slow and cumbersome operation. Major problems are related to record access, data file handling and word processor interfacing. I will illustrate these limitations by contrasting its performance to that of VisiDex, which I reviewed in Peelings II V3 N8.

Record access, as noted earlier, is limited to sequential display of only those records satisfying search criteria — or all records in the selected data file. All records are shown in the order in which they were added to the data file. By contrast, VisiDex will do the same and will also display an alphabetically-sorted index containing all key words used in its file. Thus, CARDFILE puts a greater burden on its user's memory and time to recall specific keywords. Also, VisiDex will, with only one input sequence, print all records containing a given set of keys or a range of keys. It will also sort the output, if desired. In CARDFILE, you must display and then tell the system to print each record you want on a listing — a very slow process in comparison to VisiDex. CARDFILE cannot sort its data records.

Data file handling during record access in CARDFILE, although fairly quick, is noticeably slower than VisiDex's. Further, since VisiDex includes record creation and maintenance facilities, adding records to a VisiDex file, or maintaining them takes much less time than the sequence of actions required to move between your word processor and CARDFILE to accomplish these same functions. This very major drawback to the CARDFILE system is not an effective tradeoff against the need to learn a new set of text editing commands as is required to use VisiDex.

CARDFILE's word processor interfacing, confounded by CP/M-related file handling problems, amplifies CARDFILE's slowness and make its file handling prone to error. Each record created or changed in your word processor must then be added to CARDFILE's data file. Apparently, each time this is done, CARDFILE's key index must also be reorganized. This process is quite time-consuming. File and index maintenance in VisiDex is done 'on the fly' resulting in much higher efficiency. VisiDex will support data transfers to and from other systems through normal DOS text files.

If you're not careful when starting up CARDFILE, it will attempt to automatically update its data files with other files which look like they contain CARDFILE records. Thus, great care must be taken to ensure that old word processor output files or files created by CARDFILE will not be included in its startup processing.

Further, one of CP/M 2.2's major weaknesses, relative to Apple's native DOS, is its apparent confusion when disk problems are encountered. Specifically, if a full-disk situation is encountered, CP/M will tend to hang and, as CARDFILE's manual notes, it will appear to be writing a disk file when, in fact, it is not. The manual suggests steps to avoid this type of problem, but, the system does not include a facility to determine the amount of free space remaining on the disk which is being used. You must, at least, exit CARDFILE to determine available space. Further, the system doesn't tell you how much space will be required in post-processing to write the records you have selected, to disk. So, you're never quite sure whether you will overrun the remaining capacity even if you knew what space was available. VisiDex file capacity and remaining space may be accessed readily and are continually updated.

CONCLUSIONS

If its simple functions were balanced by slick operations, this would not be a bad package. But, CARDFILE's very limited functions are accompanied by poor performance — resulting in a poor choice regardless of price.

If price is your chief consideration, if your applications are unusually simple and if you are equipped to run CP/M systems and have a CP/M word processor, CARDFILE may be worth a closer look. □

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DOS 3.2

Rating: B

Reviewed by: Robert Greenwald

INTRODUCTION

If your Apple work area is like mine, it's probably surrounded by piles of computer magazines, club bulletins, and articles torn from their bindings. There's a wealth of valuable information there, but retrieval on demand can be difficult. Unfortunately, the RAM section of my brain dedicated to indexing all those articles is highly volatile and can store only a few kilobytes at best. So what do you do when you want that subroutine that appeared six (or was it eight?) months ago in Nibble (or was it Byte?): you turn to a program like Quick-Search Librarian (QSL), a dedicated data base manager specifically configured for indexing and retrieval of bibliographic data.

As you struggle with QSL for the first time, two things will become readily apparent. One is that a great deal of technical brilliance and programming skill went into its creation. It is extraordinarily fast, quite clever, and highly structured. Two, it is obvious that the programmer wanted to push disk storage to its absolute limits, allowing more than 1000 records to be stored on a single 3.5 diskette. The trade-off for this latter goal was a substantial lack of user-friendliness, so much so that even an experienced Apple user will require several hours to begin effectively using this program.

HARDWARE/SOFTWARE

QSL is supplied on a DOS 3.2 diskette and is unlocked, so backing-up or conversion to 3.5 is readily accomplished (and highly recommended). The authors ask that the program not be passed along, a request which certainly should be respected. It will operate with only one disk drive, but two are recommended, and it will even support a third. With only one drive, the disk swapping is maddening.

When you boot the disk with a cold start or a PR#6, all you get is the Applesoft prompt; the Hello program, which displays a logo and then loads the main menu, is called Quicksearch. The manual tells you to RUN QUICKSEARCH to get started, but nowhere do they suggest that you initialize your disk with that name. This was my first clue that user-friendliness was not this program's strong suit; I eventually typed RENAME QUICKSEARCH, HELLO to make the program self-booting.

OPERATION

The first display you see has queries about which disk drives will contain what diskettes. These questions, like everything else in QSL, are crowded together on the screen without that extra skipped line or HTAB which would open up the display for better readability. You are then asked if you would like to create a new database. If you answer NO, you'd best know the precise name of the old database that you want, because getting a disk catalog requires a few extra steps and you must then backtrack to the same question. A

menu/catalog routine at this point would have been most comforting.

Each record in a QSL database consists of an article number, a general purpose alphanumeric field called ALPHA, twelve highly structured indexing codes called Keys, a Journal title, volume, year, page, author, and two text fields for title of the article, comments or whatever you like. When entering or editing data, control keys may be used to move the cursor, reenter previous data and so on.

The heart of QSL lies in the retrieval keys, called descriptors. These are designed to occupy no more than one byte of memory each, and you may define up to 255 distinct keys for each database. They are created alphanumerically, using the 26 letters of the alphabet to create what are known as categories, followed by a digit from 0 to 9. The first step in creating a new data base is to establish the descriptors for both indexing codes and journal names, a task which proved to take many hours and require much reworking before it was even partially satisfactory. To test QSL, I decided to create a data base containing all the articles published in Nibble magazine from its inception. I started out using mnemonics for the index categories, e.g., D for DOS, G for games, S for subroutines, U for utilities, etc. It wasn't long before I needed P for Pascal, Programming Tips, and Printers. Each category is then subdivided into as many as 10 separate indexing terms of no more than five characters each. For example, I divided S (subroutine) into SO (sorts), S1 (input), S2 (print), S3 (screen), etc. Much planning, ingenuity, and even pencil-and-paper work is required to establish these keys. My first 3 attempts to create the keys ended in a bombed program. The keys can be edited, but if the cursor is in the middle of an entry and you hit return (or CTRL-P, the exit key) after having entered fewer than the required five characters, the entry will not be entered. You may not discover this until you start to enter data, after which you will almost certainly think of additional indexing keys. It is important to keep notes of the keys used so you can go back after data entry and re-edit the descriptors. If all this sounds quite complicated, believe me it is.

A list of 255 journal titles can be set up the same way, using 26 letters and 10 digits. When entering those, however, the screen is filled with the category entries rather than the material upon which you are working, a very confusing feature. For the Nibble data base, I eventually decided to use A1 to A8 for volume 1 #1 thru vol 1 #8, B1 to B8 for Vol 2, etc. The categories, keys and journals all taken together are called the descriptors for that particular data base; if you store these descriptors on a disk separate from the data disk, you will gain an extra thousand bytes of storage for data records.

Once the categories, keys, and journal codes have been created, data entry is fairly straightforward, except that the screen is very crowded with the names of all 26 categories being displayed as well as the field names, etc. When you respond to the entry for a category, all ten keys within that category are displayed to help you remember your coding system. Unfortunately, they are jammed into a small section of the already crowded screen, further confusing the mass of data already there. Each entry is assigned a sequential article number. You enter up to three keys for each article, the journal information is put in, and you may put in as much text information as you wish up to a previously selected limit. The more text you allow for, the fewer records you can store on a single disk. As each new record is entered the data from the previous entry remains in the same place, under the cursor. This is supposed to simplify the entry of repetitive data, but I found it confusing, especially on the jam-packed screen. Copying data is easy with the right arrow key, but typing a new descriptive phrase on top of an old one can drive you crazy. A blank field would be much easier to cope with, using a control key function to recall the entry from the previous record.

Once the data base has been saved to disk, you can choose from a menu of options including sorting, searching, editing, etc. The search process allows for extremely complex formulas for data retrieval following a special syntax for which an open manual is essential. You may only search the ALPHA field, keywords, journal, or year. The author's name can be searched using a subroutine which transfers the first 5 letters of his name to ALPHA; you cannot search for an article by title. Searches can be constructed with OR, AND, <, =, >, and other logical operators. The retrieval is extremely fast, and the selected articles are placed into a previously named sublist and which you can print if desired. Up to ten sublists of the master data base can be stored in memory simultaneously. The list can then be sorted by ALPHA, year or journal in ascending or descending order.

After entering about 105 articles from Nibble, I created several sublists of utilities, for example, DOS and programming hints. Then I read through the manual to find out how to save these sublists. I eventually had to call the author to learn that it can't be done, except by saving each list on a separate diskette. A printout is no problem, but you just cannot save your search formula and partial sub-data base for future use after you've entered more records.

The printout routine has good flexibility to print more than one field on a line, skip selected fields, and change the order of appearance of the fields. However, you cannot insert blank spaces or lines, nor can you send printer control characters. A subsidiary program called IDENTIFIER is supplied to overcome the fact that the descriptive indexing keys are limited to five characters. With this program you can write long winded explanations of each key and prepare a printout to keep at your side as you enter data.

DOCUMENTATION

QSL is accompanied by 42 pages of photocopied dot-matrix printout which is fairly well written. The main features are summarized, the backup and booting procedures are explained, and there is even an introduction to the manual. The authors have wisely chosen to provide a sample data base consisting of all the articles which appeared during 1981 in Scientific American. This data base is provided in three different formats of increasing complexity and the user is "walked through" retrieval of the data so as to gain familiarity with the QSL command structure. Without this tutorial, the program would be almost impossible to begin using.

SUMMARY

QSL is a powerful data base manager for a specific application which suffers greatly from a lack of friendliness. I would prefer to be limited to 500 records per disk instead of a 1000+ if it thereby allowed the authors program space to open up the screen, add more on-screen instructions, and simplify the coding process. The program has some quirks which take getting used to; for example, all the screen prompts end in question marks. I don't mind being asked, "Another entry (Y/N)?," but I can't quite fathom the meaning of "Press return to continue?" Don't expect to hand QSL to your secretary with a pile of reprints and tell her to code and enter them. If you are technically minded and have lots of time, you can definitely use QSL to rapidly retrieve vast amounts of this type of data. A general purpose DBMS such as The Data Factory (which is more costly) can do the same thing in a more flexible manner. □

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THE ROUTINE MACHINE

by Peter Meyer
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Santee, CA 92071
619-562-3670

\$64.95
Rating: A+

Reviewed by: Monty Lee

INTRODUCTION

The Routine Machine is another programming utility similar to Amper-Magic reviewed in this issue of Peelings II. The Routine Machine attaches relocatable machine language routines to the end of your Applesoft BASIC programs and interfaces them via the ampersand (&) command. The routines are transparent and the user need not bother with BLOADs or HIMEM: to use the routines. Included with the Routine Machine are 31 machine language routines called library modules. Although not much mention is made of it, there are inferences to four additional volumes of relocatable routines available from Southwestern Data Systems.

DOCUMENTATION

The documentation consists of 162 8½ X 6 inch pages nicely bound together in a 3-ring binder. The documentation is divided into five sections: Introduction, Routine Machine, Appendices, Library Modules, and User's Notes. The material presented in each section is excellent. Barring the exceptions delineated below, the documentation is some of the best I've seen. It presents the use and operation in a clear and logical manner. Additionally, much material is presented that goes beyond actual use of the Routine Machine in order to provide the user with a better understanding of program operation and execution. For a beginner, this material need not be read and it will not detract at all from using the Routine Machine. For the advanced programmer, the material will give additional insight to areas of Applesoft operation.

The documentation first starts out with a hands-on 18 page instruction on how to use the Routine Machine immediately without reading the rest of the manual. The material is not as detailed as the rest of the manual and is designed merely to give enough understanding to the user to allow the user to start using the Routine Machine. The second section, the Routine Machine, goes into more detail on all the menu options of the Routine Machine, explaining how to use each option. The Appendices include information on making back-up copies of the Routine Machine, alternative ways of invoking the Routine Machine, and a technical section of relocatable machine language routines and Applesoft. Material from Roger Wagner's column in SOFTALK is reprinted here, along with material from Call-A.P.P.L.E.'s "All About Applesoft" describing Applesoft program structure. The next section, Library Modules, discusses each of the 31 library modules and their use. The last section, User's Notes, is obviously for the user to make his own written notes.

THE ROUTINE MACHINE OPERATION

To use the Routine Machine, you can either boot the diskette, or BRUN ROUTINE MACHINE. If you elect to boot the disk, you can type the letter 'C' while the disk is booting. This allows you to make a back-up copy of the diskette. Since the diskette is a locked diskette, the back-up procedure is accomplished by a special copy program by

the Routine Machine. The copy procedure is single drive only, and is very sensitive to drive speed and calibration. My first copy was done on a non-Apple Computer drive and was not successful. The second copy was done on an Apple drive and worked correctly. Since only three back-up copies are allowed by the special copy procedure, the first one was wasted. Southwestern Data Systems has very good user support and offered to replace the problem copy with a useable one. Nonetheless, to have such a useful utility as the Routine Machine be a slave to a very sensitive copy protection technique counters the value of the program. If the author felt such a strong desire to protect his product, it would have been better to protect just the routine machine portion, and leave the utilities off the protected disk.

After the completion of the copy or after a normal Routine Machine boot, you will be asked whether you want to run the Routine Machine or exit. If you elect to exit, you will be returned to Applesoft BASIC with a normal DOS. The one exception is that the DOS now has two new features. First, CATALOGing a disk will also display the free sectors left on the disk. The second feature is an optional termination of the CATALOG listing at any of the pauses which usually occur when a directory has more files than can be displayed on the screen at one time. When using the modified DOS, pressing RETURN will terminate the CATALOG listing at any pause. Pressing any other key will continue it. The 'free space' and 'catalog clip' features may be placed on other diskettes by INITING them after first booting on the Routine Machine diskette.

If a normal DOS is first booted, you can run the Routine Machine by typing 'FP' to assure a clean entry into Applesoft BASIC, or making sure the Applesoft program in memory is the one you want to attach the Routine Machine to. Then insert the Routine Machine diskette into your drive and type in EXEC AMPERSAND SETUP. This inserts a line (line 1) in your program which sets up the ampersand vector to connect your Applesoft program with the routines appended. Next type in BRUN ROUTINE MACHINE. This routine is actually a loader program which will move your Applesoft program in memory so that it will not be overwritten, and then installs the main Routine Machine utility program.

Whether you boot the Routine Machine or type in the two commands to run the program, you will be presented with the main menu:

*** ROUTINE MACHINE ***

SELECT AN OPTION:

1. APPEND A MODULE
2. REMOVE A MODULE
3. REMOVE ALL MODULES
4. COPY ALL APPENDED CODE TO DISK
5. RESTORE APPENDED CODE TO DISK
6. REPORT MODULES APPENDED
7. SEARCH FOR AMPERSANDS/CALLS
8. INSPECT APPLESOFT LINE
9. DISPLAY MEMORY MAP
0. EXIT

[NO MODULES APPENDED]

Since no modules are appended, that will be the first thing you want to do. Pressing '1' will ask you to now enter the name of the file. If you know the name of the routine, then just type in the name. If the file does not exist, the Routine Machine will advise you and ask you the FILENAME again. Typing 'CAT' will CATALOG the last accessed drive. Unfortunately, the Routine Machine does not support

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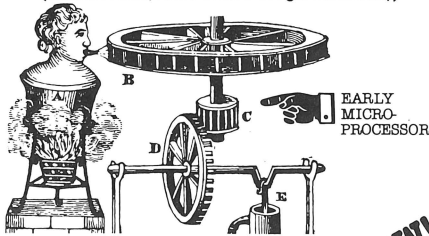
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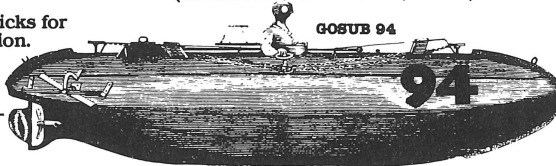
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- 20 FOR B = 1 TO 4: C = PEEK(49200); NEXT B, A

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SAVE 60-SECTOR PROGRAM	24 sec.	9 sec.
BLOAD LANGUAGE CARD	13 sec.	4 sec.
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multiple drives. Thus if your routine is on another disk, you will have to start swapping disks. Another major problem with the Routine Machine is the fact that all machine language routines you use MUST be on a Routine Machine disk. The documentation indicates they can be on a Routine Machine formatted disk. Discussion with Southwestern Data Systems revealed that this means one of the back-up copies only. Thus if you have routines from other utility packages, you must BRUN FID from the System Master diskette to place these routines onto the Routine Machine diskette as you need them. This is a major weakness to programmers that have established libraries of utility subroutines.

Once the proper Routine Machine diskette is inserted and the routine selected, the screen will display: 'INVOCATION NAME ->'. You must now enter the name (or character string) by which you will call this particular routine from within your program. Thus you can have routines with long descriptive names on the diskette, yet use short commands to access them from within your program. Using the example from the documentation, suppose you wanted to produce tones within a program. The routine to accomplish this is called BEEP.RM. So we would type in BEEP.RM for FILENAME. For INVOCATION NAME, we can use anything we want. In this case, TONE will do nicely.

The Routine Machine will now load the BEEP.RM routine and give it the name TONE within your program. After the routine is appended, the program will return to the prompt for a new FILENAME. This is in case you want to append multiple modules. Pressing RETURN will display the menu at this point. You can now select Option 0 to EXIT and use the TONE routine. However, I will first discuss each of the other options before discussing actual routine usage.

Option 2, REMOVE A MODULE, does exactly as it implies. Selecting '2' will display all the modules that you have appended, giving both the FILENAME and the INVOCATION name. The modules are shown eight at a time. Pressing the space bar displays the next eight, while RETURN displays the main menu. If you see the module you wish to remove, press the slash key and then enter the number of the module you wish to remove. Removal of one module does not affect the other modules. Option 3, REMOVE ALL MODULES, accomplishes the same thing as Option 2, except it removes all appended modules at one time. The Routine Machine wisely asks you to confirm your intentions for such a drastic action by asking you whether you want to continue or not. Responding with 'Y' will remove all modules.

As the documentation notes, the Routine Machine can append and remove modules from Applesoft programs that already have machine code appended. This machine code must be appended prior to appending the Routine Machine. If foreign code is appended, Option 3 changes slightly. With Routine Machine modules appended, selecting Option 3 the first time will remove these modules but leave the foreign machine code intact. On return to the menu, Option 3 will then read REMOVE ALL APPENDED MACHINE CODE. If you now select Option 3, the foreign code will then be removed leaving your program with no code appended.

COPYING ALL MODULES TO DISK, the fourth option, allows you to save an assembled group of routines to disk as a single unit. This is an excellent option and shows a nice touch of programming. There are two primary uses of this option. The first allows you to build a mini-library of multiple routines that you may use frequently. For example, a group of routines that may be frequently used are STRING INPUT.RM, PRINT USING.RM, ERR.RM, and BEEP.RM. These can be copied to disk and easily appended as a package later on.

The second main application is to save appended modules in order to use other programs/routines which might damage appended machine code. For example, Apple Computer's Renumbr program wipes out all machine code appended to an Applesoft program. Use

of this option will allow you to save the modules before using the Renumbr program. Use of this option will allow the user to specify a FILE NAME. A default, A.M.C. ('Appended Machine Code') is provided.

The fifth option allows you to RESTORE APPENDED CODE FROM DISK that you have saved by using Option 4. Selection of this option will prompt you for a filename with the default again being A.M.C. Selecting the default will load the modules previously saved and then delete the file A.M.C. If however you specify a FILE NAME, the file is not deleted.

There is one major problem with these last two options. Both require the use of the Routine Machine diskette. In other words, all mini-library modules you build and then COPY TO DISK must be saved on the Routine Machine diskette only. Thus merely by building a couple of common library modules, plus with the addition of other useful routines, the Routine Machine diskette will become quickly filled. You can make more room by FIDing routines not frequently used to other disks and then FIDing them back when needed, but this is a real nuisance. The author should have made it possible to use a normal diskette for storage.

Option 6 will allow you to REPORT MODULES APPENDED. This is useful in that it allows you to see what modules have already been appended and to check the names given to them. When selecting each of the 'report' options (numbers 6-9), you are given the option to output the information to the printer — a very useful option. The default is to the screen. In the report, each module appended is listed by INVOCATION name and the FILE NAME from the disk from which the routine was originally loaded. Option 7 will SEARCH FOR CALLS AND AMPERSANDS within your program. The search will normally be for ampersands, but the user can toggle to search for CALLS also. Selecting this option will display the following:

```
SEARCH TYPE: AMPERSANDS STATEMENTS
DO YOU WISH TO SEARCH FOR:
1. ALL SUCH STATEMENTS?
2. ALL MODULE INVOCATIONS?
3. INVOCATIONS OF A PARTICULAR MODULE?
(PRESS 'T' TO CHANGE SEARCH TYPE, OR (RETURN) TO
QUIT)
```

The first option will display all for the ampersand statements. The second choice searches for only those ampersand module invocations and not other uses of the ampersand. The third option will ask for the particular module you are searching for. All three options will display the line number and line where the actual ampersand (or CALL) is found that satisfies the conditions of the search.

INSPECTING APPLESOFT PROGRAM LINES, Option 8, is another nice programming touch by the author. This option is by no means required for the normal use of the Routine Machine, but may be used on any Applesoft program. The INSPECT LINE option is entered from the main menu by pressing '8' or by pressing 'L' from the SEARCH option (Option 7). You may specify a line number and if it exists, the line will be displayed together with the actual bytes in memory which constitute that line, along with its ASCII representation. Using the example in the documentation, suppose you had a line which read:

```
10 PRINT "APPLE JZ PLUS"
Selecting this option and searching for line 10 would display the
above line along with the following:
LINK FIELD AND LINE NUMBER:
2601- 16 26 0A 00
BYTES COMPRISING TEXT OF LINE: ' ' ' ' ' ' ' '
2605:                                     BA 22 41 "A
2608: 50 50 4C 45 20 5D 5A 20             PPLE JZ
2610: 50 4C 55 53 22                       PLUS"
END-OF-LINE TOKEN (00) AT $2615
```

END OF PROGRAM
 PRESS 'L' TO INSPECT ANOTHER LINE
 OR '**' TO EXIT TO MONITOR
 OR (RETURN) FOR MENU

Now by pressing '**' and going into the monitor, you can change the 'Z' which corresponds to the \$5A to the '[' character by typing: 260E:5B and pressing RETURN. This allows you to enter illegal characters in program lines. The same process will allow you to enter line numbers greater than 63999 which is not normally possible. There are a multitude of other uses of this option, some of which are detailed in the manual. The inclusion of this option greatly expands the potential of the Routine Machine.

The final option, THE MEMORY MAP, is another useful option that provides you with information on the memory layout of your program and attached machine code. It should be noted here that the Routine Machine menu program occupies memory from \$800 to \$25FF when it is present. Thus your Applesoft program starts at \$2601, as indicated in the example above. Selecting Option 9 will display the memory map with the location of your program as it would normally be as if it were at \$801 — without the Routine Machine menu program. You can toggle between the current actual addresses (with your program at \$2601) and normal operation addresses by pressing the 'A' key. With a program in memory, the display will look like the following:

```
PROGRAM START:           $ 0801 = 2049
BASIC PROGRAM END:      $ 0F5F = 3935
ACTUAL PROGRAM END:    $ 1289 = 4745
LOMEM = SIMPLE VARIABLES: $ 1289 = 4745
ARRAY SPACE:           $ 12BA = 4794
ARRAY SPACE ENDS:      $ 12E2 = 4834
STRINGS:                $ 936E = 37742
HIMEM = END STRINGS:   $ 9600 = 38400
DOS BUFFERS:           $ 9600 = 38400
BASIC PROGRAM LENGTH:  $ 075E = 1886
BYTES APPENDED:        $ 032A = 810
TOTAL PROGRAM LENGTH:  $ 0A88 = 2696
FREE SPACE:             $ 808C = 32908
STRING STORAGE:        $ 0292 = 458
```

As you can see, the display is full of useful information that can help in program debugging and analysis.

APPENDICES

The appendices contain additional information for advanced uses of the Routine Machine. For example, alternative methods of invoking a module through the use of pointer modification and subsequent use of a CALL is explained. Similarly, explanations of the use of non-relocatable routines in the Routine Machine are detailed. Finally, information on the ampersand and Applesoft program layout is provided. Most of this material is for more advanced programmers. The material is well written and explained with examples making it comprehensible to the average programmer.

Unfortunately, very little information is provided on writing of relocatable routines for use with the Routine Machine. The documentation does indicate to need to insure correct parameter passing, but does little to explain how to accomplish this successfully, nor how to modify relocatable routines from magazines to be compatible with the Routine Machine. I find this lack of documentation a detriment to the otherwise outstanding documentation.

LIBRARY MODULES

The final major section details each of the 31 library modules provided with the Routine Machine. Explanations of what each routine does and the syntax for passing parameters for the proper execution are explained. Additionally, each explanation is accompanied by sample syntax as well as a sample listing of a program using that rou-

tine. The combination of both these methods provides a clear discussion on how to use each module. The explanation of each option is excellent. A list of the major modules is as follows:

Swap	Print Using
Text Output	String Input
String Search	Array Search
Bubble Sort	Beep
Sound Effects	Error Routines
GOTO/GOSUB Variables	Data Statement Routines
Memory Move	Hex/Dec Converter
Pointer Read/Write	HIRES ASCII
TurtleGraphics (FP)	Free Sector Count
RESET Routines	

Additionally, there are many fine routines provided on the Routine Machine. Some examples include a PRINT USING routine that formats numeric data for screen, printer or disk file output. A STRING SEARCH and ARRAY SEARCH is also included. An excellent BUBBLE SORT routine is provided. Some others are: SOUND EFFECTS, GOTO and GOSUB to a variable, Shape table routines, ASCII characters for the Hi-Res screen, and Turtle Graphics.

Although the documentation indicates that an Ampersoft Program Library of three volumes exists with other routines, discussion with Southwestern Data Systems indicates that the routines will be packaged together according to application and will not be marketed until March. These four packages will include 1) Amper-Array — routines related to array handling; 2) Amper-Chart — routines related to hi-res functions, charts, and graphs; 3) Amper-Screen — dealing with screen formatting and scrolling; and 4) Amper-Sampler — consisting of miscellaneous assorted routines.

SUMMARY

When I first examined the Routine Machine, I felt initially that this was one program deserving of the AAA rating. The documentation was superb and program execution was virtually flawless. However, after using the Routine Machine for a while, I feel that several problem areas detract from an otherwise outstanding product. First, the documentation neglects to explain how to write/use relocatable routines from printed sources in order for them to be compatible with the Routine Machine. Additionally, no information is given on modifying existing modules from other programs. This is all left to the user on a trial-and-error basis. For a beginning programmer, this is unacceptable. For an advanced programmer, the additional challenge is unnecessary. Thus if I were rating the documentation separately, I would rate it AA.

Second, the requirement that in order to use the routines they must be on the Routine Machine diskette is unacceptable. The constant FIDding of files from one disk to another as needs arise while writing a program severely hinders the usefulness of the product. This is one example where copy protection has gone so far as to make the product a real nuisance to use at times. Additionally, the copy protection technique makes the back-up COPY routine extremely sensitive to various drives. Because of these areas, I would rate the user friendliness and ease of use a B.

Overall, the design and concept of the Routine Machine is the best machine language utility program for Applesoft programs that I have seen. The routines provided with the package are excellent, and if Southwestern Data Systems does release the four modules indicated, they will greatly expand the capabilities of the Routine Machine. It is unfortunate that such excellent design and concept had to be flawed in execution by such a poor and unnecessary protection scheme. □

THE INSPECTOR

Omega Microwave, Inc.
222 So. Riverside Plaza
Chicago, IL 60606
312-648-4844

\$59.95
Rating: AA

Reviewed by: Monty Lee

INTRODUCTION

The Inspector is a disk and memory utility available in either an EPROM or disk version. It works with at least one disk drive and as little as 16K of RAM memory. The Inspector is also compatible with lower case adapters. It allows you to search memory and disks, edit disks, display the disk map, and much more. It is an extremely valuable utility that aids both the programmer and the everyday user.

INSTALLATION

The Inspector comes in either a EPROM version or a disk version. For the EPROM version, you must have Integer BASIC either on the motherboard or on a ROM card. The Inspector fits into the D8 socket. The documentation is clear and explicit in the installation, providing figures to accompany the description. When the EPROM version is installed, it is a permanent part of the Apple. This means that it can be used at any time without stopping to load an extra program. It uses part of the Apple's unused memory allocation so it won't interfere with other programs in memory.

Although not detailed in the documentation, the Inspector will work with the Integer Firmware card installed in a slot other than zero. It requires two POKEs to DOS to recognize the Integer card, and a different monitor access call. Some earlier versions of the Inspector may not work correctly if not in slot zero. In this case, Omega Microwave's support is outstanding, and they will modify the EPROM so that it will work correctly.

For the disk version, a 16K RAM card is required. The disk version is for Apple II+ owners without an Integer ROM card. To install the Inspector you will need to use a BACKUP COPY of your DOS 3.3 System Master Diskette. You boot the Inspector diskette and the prompt will ask whether you want to modify your DOS 3.3 BASICS diskette or your DOS 3.3 SYSTEM MASTER diskette. Since the modifications to the disk are permanent, it is stressed that you use a backup. After your appropriate choice, the program will tell you that your disk has been modified. The Inspector may be accessed and used in the same fashion as the EPROM version.

OPERATION

Accessing the Inspector depends upon whether you have an Apple II or Apple II+ and from what language you are trying to access it — Integer, Applesoft, or the Monitor. Essentially it involves a CALL-10240 from Integer, an access of the Monitor from Applesoft and then a D800G (socket D8). Once you have initialized or used the Inspector, you can easily go from a program to the Inspector by a CALL-10240 from Integer, a CTRL-Y from the Monitor, and '&' from Applesoft. The use of the '&' will not work if your Integer card is not in slot 0.

Once called, the screen is cleared and the Inspector information is displayed. At the top of the screen is the information of TRACK, SECTOR, SLOT, DRIVE, BUFFER, DOS, and the VERSION of the Inspector. When first called, the Inspector defaults to zero for the track and sector, slot 6, drive 1, DOS 16, and the buffer at \$0800.

The Inspector is designed to be both simple and versatile to use. It recognizes 22 different commands. To get the desired function, you just press the key corresponding to the command. For example, to change to drive 2, just press the "D" key.

To appreciate the power of the Inspector, you need to see it in operation. Nevertheless, I will attempt to explain some of the various commands available and their uses. As an example, if you wanted to examine track \$11, sector \$F of a disk — the first sector of the disk catalog, you would first press 'T' and then '11' (the Inspector inputs are in hex). Next press 'S' for Sector and then 'F'. Now pressing the 'R' for READ will cause the Inspector to read track \$11, sector \$F into the buffer at \$800, and display the information on your screen. By pressing the 'A' key, you can toggle the display between ASCII and HEXADECIMAL. In the ASCII mode, you should see the file names of some of the programs on your diskette, along with the track/sector information. If you wanted to change a byte or bytes of this sector you would now EDIT the buffer. For example, if you wanted to change the name of a file, you would type 'E' followed by the byte location on your screen in hex. Next press the space bar and the value at that location would be displayed. You can now type in any new information in hexadecimal or ASCII that you would like at that location. Press 'RETURN' to transfer this new information to the byte location you have specified. The change to that location is now complete in memory.

All changes to the buffer are only changes to RAM. In order to transfer the buffer, along with the changes, to the disk, you must now type 'CTRL-W'. This will now WRITE the buffer to the track and sector displayed on the screen. Once 'CTRL-W' is typed, the buffer is written to disk and the changes are permanent. Beginning users are advised to work with back-up disks while exploring the potential of the Inspector.

There are other commands that work within memory. First, with the buffer at \$0800, any Applesoft program in memory will be destroyed since it starts at \$0801. Thus, you can press 'B' to change the buffer start to anywhere in RAM. If you set the buffer to '\$9D', it would be at the start of DOS for a 48K system. Pressing 'H' now will display a hex dump as well as ASCII display of memory starting at \$9D00. The hex dump is one way to look at an assembly language program and find where the text information is by examining the ASCII display. Another powerful feature of the Inspector is the 'F' or FIND command. This command does a rapid search of all 48K memory for all occurrences of any string you want to search for — both HEX and ASCII strings are allowed.

A similar command to the FIND command is the LOCATE command. Again, you input a string of characters you wish to search for and then press the 'L' key. Now as you read sectors of the disk into memory, anytime that string is found, the Inspector will beep at you and pause to let you know. Pressing any key will stop the search, otherwise it continues after the short pause. There are many other commands available with the Inspector. All are described and examples given in the manual.

The uses of the Inspector are unlimited. One major area of use is in the repair of blown disks. The Inspector can be used to determine bad sectors. These bad sectors can either then be repaired using the EDIT command or possibly just read from another diskette and then written to the blown disk. Control characters can be eliminated or added to file names. Programs can be undeleted using the Inspector if coupled with a knowledge of the structure of the CATALOG. Basic programs can be edited, either on disk or in memory. DOS commands can be easily changed. As you become more familiar with the Inspector, you will find more and more uses for it.

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The Inspector is one of the most valuable additions I have made to my Apple. I use it almost daily in repairing blown disks, editing files, and many other uses. There are other disk access utilities on the market, but almost all require a separate program to be run. The Inspector is always available and easily accessed when in ROM. Likewise, if the disk version is used, it is always available if you boot the modified DOS. The documentation is excellent, and the product is superb. □

sults in a continuous scan backward. The '.' command increments the buffer and the ',' decrement the buffer. This makes it particularly easy to read in several contiguous sectors and then write them back out to another disk.

One of the more valuable commands is the CTRL-D command. This will disassemble instructions starting at the buffer location and continue until a key is pressed. This is very convenient for looking at data areas in machine language programs. Additionally, the right side of the screen displays the corresponding ASCII of the disassembly. This is an extremely powerful command. Another useful command is the 'C' command which will convert HEX and Decimal numbers and display them as HEX, Decimal, and signed decimal numbers. It will also allow addition and subtraction of any of the three forms of numbers.

One command common to both the Inspector and Watson is the 'M' or MAP command. Watson modifies this command with a slightly improved VTOC map and the free space on disk displayed at the bottom center of the screen. Watson also allows you to toggle the status of a specific sector on a disk as used or free. Thus it is possible to lock out bad sectors or free up ones not used but not freed by the VTOC. CTRL-T causes the disk to be scanned and all sectors which could possibly be Track/Sector lists will be displayed on a map. This is also very useful in reconstructing a blown CATALOG.

Other utilities in Watson include the ability to reconstruct a track bit map for the catalog track. CTRL-R will read in the VTOC and attempt to rebuild the catalog from a blown disk. CTRL-K will kill DOS on the disk and thus free up tracks 1 and 2. CTRL-V can be used to compare two or more disks and display a map of any sectors which are not the same. And there are many other commands in Watson. Additionally, Watson also allows the use of nine user functions that can be accessed from Watson through the ESC key.

DOCUMENTATION

Watson comes with a 16 page 8½ X 6 inch booklet that details the installation and operation. The material details the specific functions of Watson and does not address the aspects of the Inspector since you have to own the Inspector to use Watson. The explanation of the functions is clear and concise, and in many cases followed by an example display. Each command is explained in detail so that no guesswork is involved in operation. In addition, the booklet also comes with a small summary chart for easy reference to the commands.

SUMMARY

Watson greatly expands the potential of the Inspector. The utilities of Watson are available in most cases through software, but from a variety of different sources. Watson combines them all together in a convenient and powerful package that is always available. Since Watson must be used in conjunction with the Inspector, the package as a whole must also be evaluated. Consequently, since the routines provided by both the Inspector and Watson are so useful and the documentation clear and well done, the overall package must be considered as outstanding. □

THE INSPECTOR

Omega Microware, Inc.
222 So. Riverside Plaza
Chicago, IL 60606
312-648-4844

\$59.95
Rating: AA

Reviewed by: Monty Lee

INTRODUCTION

The Inspector is a disk and memory utility available in either an EPROM or disk version. It works with at least one disk drive and as little as 16K of RAM memory. The Inspector is also compatible with lower case adapters. It allows you to search memory and disks, edit disks, display the disk map, and much more. It is an extremely valuable utility that aids both the programmer and the everyday user.

INSTALLATION

The Inspector comes in either a EPROM version or a disk version. For the EPROM version, you must have Integer BASIC either on the motherboard or on a ROM card. The Inspector fits into the D8 socket. The documentation is clear and explicit in the installation, providing figures to accompany the description. When the EPROM version is installed, it is a permanent part of the Apple. This means that it can be used at any time without stopping to load an extra program. It uses part of the Apple's unused memory allocation so it won't interfere with other programs in memory.

Although not detailed in the documentation, the Inspector will work with the Integer Firmware card installed in a slot other than zero. It requires two POKEs to DOS to recognize the Integer card, and a different monitor access call. Some earlier versions of the Inspector may not work correctly if not in slot zero. In this case, Omega Microware's support is outstanding, and they will modify the EPROM so that it will work correctly.

For the disk version, a 16K RAM card is required. The disk version is for Apple II+ owners without an Integer ROM card. To install the Inspector you will need to use a BACKUP COPY of your DOS 3.3 System Master Diskette. You boot the Inspector diskette and the prompt will ask whether you want to modify your DOS 3.3 BASICS diskette or your DOS 3.3 SYSTEM MASTER diskette. Since the modifications to the disk are permanent, it is stressed that you use a backup. After your appropriate choice, the program will tell you that your disk has been modified. The Inspector may be accessed and used in the same fashion as the EPROM version.

OPERATION

Accessing the Inspector depends upon whether you have an Apple II or Apple II+ and from what language you are trying to access it — Integer, Applesoft, or the Monitor. Essentially it involves a CALL-10240 from Integer, an access of the Monitor from Applesoft and then a D800G (socket D8). Once you have initialized or used the Inspector, you can easily go from a program to the Inspector by a CALL-10240 from Integer, a CTRL-Y from the Monitor, and '&' from Applesoft. The use of the '&' will not work if your Integer card is not in slot 0.

Once called, the screen is cleared and the Inspector information is displayed. At the top of the screen is the information of TRACK, SECTOR, SLOT, DRIVE, BUFFER, DOS, and the VERSION of the Inspector. When first called, the Inspector defaults to zero for the track and sector, slot 6, drive 1, DOS 16, and the buffer at \$0800.

The Inspector is designed to recognize 22 different commands. To just press the key combination to change to drive 2, just

To appreciate the operation. Nevertheless, the commands available are listed in the catalog, you would find them in hex). Next press 'R' for READ will cause the buffer at \$8000. By pressing the 'A' key and HEXADECIMAL names of some of the track/sector information in this sector you would want to change the byte location on the value at that location. Press 'R' to transfer any new information to that location. Press 'R' to change the byte location you have complete in memory.

All changes to the buffer, also type 'CTRL-W'. This vector displayed on the screen is written to disk and the Inspector advised to work with the Inspector.

There are other commands to the buffer at \$0800, destroyed since it starts the buffer start to any would be at the start of display a hex dump at \$9D00. The hex dump program and find what ASCII display. Another FIND command. This is a search for all occurrence of HEX and ASCII strings.

A similar command. Again, you input and then press the 'L' memory, anytime that and pause to let you otherwise it continues. The commands available are listed in the catalog.

The uses of the Inspector in the repair of blown bad sectors. These bad sectors can be repaired with the EDIT command or patched with the blown sectors added to file names. For coupled with a knowledge of the Inspector, you will find



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DOCUMENTATION

The Inspector comes with a 32 page 8½ X 6 inch booklet that details the installation and operation. The material is presented in a logical, orderly manner — starting with installation and moving through initializing and then to using the Inspector. The documentation is complete for the most part. Only one command was lacking an adequate description, resulting in a trial-and-error approach before getting the particular options to work. Finally, the Inspector comes with a handy reference card for easy access to the commands.

WATSON

Omega Microware, Inc.
222 So. Riverside Plaza
Chicago, IL 60606
312-648-4844

\$49.95

Rating: AA

Reviewed by: Monty Lee

INTRODUCTION

Watson is the companion to the Inspector that expands the power and capabilities of the Inspector. In order to use Watson, you must first have the Inspector. Watson, like the Inspector, comes in both a disk version and an EPROM version. Watson is also a disk and memory utility that uses all the features of the Inspector and adds the ability to reconstruct a VTOC, HEX/ASCII disassembly, file follower, disk compare, and many other functions.

INSTALLATION

The installation of Watson is identical to the Inspector, so refer to that review in *Peelings II* for the details. You can either add it to your DOS 3.3 SYSTEM MASTER or BASIC disk for use in your RAM card, or you can install it as an EPROM. The EPROM is inserted into the D0 socket. If the Programmer's Aid is in the D0 socket, it will have to be removed to use Watson. If you later have need of the Programmer's Aid, it can be re-inserted. In no way is the function of the Inspector impaired by removal/insertion of the Programmer's Aid.

OPERATION

Accessing Watson is similar to accessing the Inspector. From Integer BASIC a CALL-12288 will access Watson. From Applesoft BASIC, you access the monitor by CALL-151, then type \$C080 (or C081 with an Integer motherboard) and then D000G. As with The Inspector, once Watson is initialized you can go from a program to Watson by typing CTRL-Y from the monitor, '&' from Applesoft, and CALL-12288 from Integer. Like the Inspector, the '&' will not work if the Integer ROM card is not in slot 0.

The screen display for Watson is the same as the display for the Inspector with two exceptions. The first difference is that the version number is different. The second difference will not be seen until the first sector is read from a disk. The version number will be blank and a 4 digit HEX number will appear in the upper right-hand corner of the display. This number is a checksum for the current buffer and the current sector. This checksum is dependent not only on values in the buffer, but also the order of the bytes. This means that if either the values or the order of the bytes is different, the checksum will be different. By using this checksum, it is very easy to compare sectors to see if they are the same.

Watson adds several new commands for inspecting a disk and memory. First, a '+' causes Watson to start scanning forward sector by sector continuously until any key is pressed. Similarly, a '-' re-

SUMMARY

The Inspector is one of the most valuable additions I have made to my Apple. I use it almost daily in repairing blown disks, editing files, and many other uses. There are other disk access utilities on the market, but almost all require a separate program to be run. The Inspector is always available and easily accessed when in ROM. Likewise, if the disk version is used, it is always available if you boot the modified DOS. The documentation is excellent, and the product is superb. □

sults in a continuous scan backward. The '.' command increments the buffer and the ',' decrement the buffer. This makes it particularly easy to read in several contiguous sectors and then write them back out to another disk.

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AMPER-MAGIC

by Bob Nacon
Anthro-Digital Software
P.O. Box 1385
Pittsfield, MA 01202
413-448-8278

Product previously marketed by:
Aurora Systems, Inc.
2040 East Washington Ave.
Madison, WI 53704

\$75

Rating: A —

Reviewed by Monty Lee

INTRODUCTION

Amper-Magic is a set of utilities for programmers to link machine language subroutines to their Applesoft programs. This link is accomplished through the use of the Ampersand (&) function — a command not documented in the Applesoft manual. The ampersand command causes a jump from the program to location hex \$3F5. At \$3F5 is usually another jump to a machine language subroutine. After completion of the subroutine, the Applesoft program continues execution at the point following the ampersand command. Amper-Magic uses the ampersand command within your program to jump to up to 255 relocatable machine language subroutines of your choice.

To use Amper-Magic, you simply attach an Amper-Magic table at the end of your Applesoft program. This table contains all the information on the location of your subroutines and provides the vector to the appropriate subroutine called by the Ampersand command. To add subroutines to Amper-Magic, you just load them in from either disk or from the keyboard, and they are automatically attached to your program. Each subroutine is given a name of your choice that is used when calling that subroutine. Amper-Magic allows programmers to extend the capabilities of Applesoft by adding machine language subroutines to their basic programs without the need for 6502 machine language assemblers or the special loading of binary files and resetting of memory pointers.

OPERATION

The Amper-Magic diskette is not bootable, which is understandable since it is designed to be attached to an existing program. To use Amper-Magic simply have your program loaded into the Apple's memory, place the Amper-Magic diskette in your drive and type EXEC AMPER-MAGIC. The following menu will appear on the screen:

- 1-CREATE TABLE
- 2-VIEW TABLE
- 3-ENTER NEW SUB
- 4-LOAD/REVIEW SUB
- 5-SAVE SUB OR TABLE
- 6-DELETE SUB OR TABLE
- 7-CHANGE SUB NAME
- 8-EXIT

Each menu item is well documented in the manual. The first thing is to CREATE TABLE. This will load a table at the end of your program which indexes all subroutines you add.

To set up this table, you must specify how much buffer space (or memory) is to be dedicated for your subroutines in blocks of 256 bytes. The largest block you can dedicate is over 10K, which should be more than enough for any programmer. If at a later date it turns out that you have allocated insufficient buffer for all your subroutines, you can re-EXEC AMPER-MAGIC and request a larger buffer. All your current subroutines will remain intact. This dynamic nature of the buffer is a programmer's blessing.

You can now choose any of the other menu selections. To add a subroutine, select:

3-ENTER NEW SUB

You can then enter any relocatable subroutine by keyboard or by a binary load from disk. Entry from the keyboard can be in either decimal or hex. You will also enter the filename of the subroutine desired. Each subroutine name can be up to 4 bytes long (bytes not characters). Thus if Applesoft reserved words which are tokenized are used, each word is only one byte long. For example,

PRINTXDRAWRESTOREGOTO

is a valid Amper-Magic subroutine name and only requires 4 bytes of memory. Consequently, there is considerable flexibility in naming subroutines. Additionally, Amper-Magic will keep track of all subroutines you have loaded and how much space is used/left. Simply select 2-VIEW TABLE to see this information.

If at any time you want to review or edit a subroutine, just select 4-LOAD/REVIEW SUB. Amper-Magic will tell you what subroutines it has currently, and prompt you for your selection. You can then take a look at a hex dump or a disassembled listing of the subroutine. The SAVE SUB option allows you to save any subroutine or the table in a binary file. If a subroutine was entered by the keyboard, or edited by the previous option, this allows you to save it to disk.

I found both the entry and edit features from the keyboard tedious and not very friendly. First, the EXACT length in bytes of any routine must be known. If you overestimate, then memory is wasted. If you underestimate, you cannot enter any more data beyond your estimate. Thus, you must start all over and re-estimate the amount of bytes required and then reenter all the subroutine. This is particularly cumbersome on long routines.

Additionally, each byte entry must be followed by a carriage return. This means almost twice as many keystrokes to enter a subroutine as usual. Furthermore, each single digit byte must be preceded by a '0'. If it isn't, then the register's previous contents will override the null input. In other words, if you had to enter hex \$07 and the previous contents of that location in memory were \$45, entering '7' in the usual manner would result in the number \$47 in that location instead of \$07.

Editing is not particularly user friendly. If you only have to change a few bytes, the problem is not significant. However, if you want to insert any bytes or rearrange a portion, it cannot be done easily. Even for long subroutines, I found it easier to delete the old subroutine and start over.

Therefore, as far as entry and editing is concerned, I would recommend that the keyboard option be avoided if possible. Instead, entering the information normally while in the Apple's monitor (like *800:4C D0 3 < RTN >)

is much easier, and then BSAVEing it to disk and loading it into Amper-Magic later. For medium to long subroutines, I recommend the use of an Assembler. After assembly of the subroutine, BSAVE the program code and again load it into Amper-Magic later. In this way, later editing is much easier.

Options 6 allows you to delete any subroutines or the table, and 7 allows you to rename any subroutine if a name conflict exists. The

final option to exit must be accomplished for everything (program, table, and subroutines) to remain intact. After exit from Amper-Magic, it is wise to SAVE your program. The table is automatically attached and will be SAVEd whenever you SAVE your program. In order to access the table using the ampersand, one line must be inserted in your program prior to the use of the ampersand. Amper-Magic has conveniently provided this line on the program disk as LINE 3. You can add it directly to your program in memory by typing EXEC LINE 3 <RTN>, or you can type it in from the listing in the documentation. Your subroutines are now ready to use.

DOCUMENTATION

The documentation consists of 50 8½x11 printed pages in a plastic report binder. Twenty-four pages are for the explanation of how to use Amper-Magic, and the rest are dedicated to the 20 machine language subroutines that come with the program. The documentation is very clear and follows a logical presentation.

The final pages of program documentation deal with memory usage and relocatable subroutines. Since editing/writing an Applesoft program constantly changes the memory pointers, all subroutines used by Amper-Magic must be relocatable. That means no absolute addressing to a memory location (other than the monitor). That means that if you have any subroutines that are not currently relocatable, some assembly language expertise will be necessary to make them relocatable.

However, Amper-Magic does allow a non-relocatable subroutine to be stored between \$300-\$3CF. Unfortunately, you can not access any non-relocatable code through the ampersand vector at \$3F5 since Amper-Magic rewrites that vector to its table. Thus, any previous use in your program of the ampersand command to a non Amper-Magic entered subroutine will now be routed to the Amper-Magic table. If the table does not have a pointer to your old subroutine, program execution will cease with a SYNTAX ERROR. Therefore, you must insure that all use of the ampersand in your program is to relocatable subroutines that you have entered through option 3 of Amper-Magic.

Finally, Amper-Magic points out its compatibility with PLE and ACE editors and program optimizers. It is not, however, compatible with compilers.

THE SUBROUTINES

The remainder of the documentation deals with the 20 machine language subroutines provided on the diskette. The subroutines are all arranged alphabetically, which allows you to easily include your own subroutines that you may have obtained from other sources, including magazines. The subroutines on the diskette include:

- Binary File Information
- Disassemble Memory
- Find Substring
- GOSUB A
- Hex Memory Dump
- Move Memory
- POKE Hex
- PRINT Strings
- Remove Characters
- Search String Array
- Speed Restore for Applesoft
- Swap Variables
- Delete Array A
- Dump Variables
- Get 2-Byte Values
- GOTO A

- INPUT Anything+Strip
- POKE DECIMAL
- PRINT Hex\$
- PRINT w/o Word Break
- Restore A
- Speed up Applesoft
- Store 2-Byte Values

The documentation lists each subroutine's function, syntax, length, and gives an example.

It is in some of the examples and syntax that I find a minor weakness. Most are relatively simple, but in the more complex subroutines, a clearer description and more examples could have been given. For instance, on &[PRINT STR\$ (which provides a form of formatted string output), one example is:

```
&PRINTSTR$, A$PB$,CAD,I(BA <0),F(BA >0)[PC$,V22,H10
```

with no explanation given. Additionally, the recursive option (@) has no example, and I could not get it to work at any time.

As for the subroutines provided, many already exist in public domain libraries or can be found in many magazines. Consequently, the price might be high for what is provided. Some often needed subroutines such as print using are not included. The introductory page does say that more library disks are in the works, so maybe a better selection is forthcoming. (Subsequent conversation with Anthro-Digital indicate a release of a new diskette with several new subroutines, including a PRINT USING.)

Additionally, many of the subroutines provided are useful primarily only in program development. For example, DUMP VARIABLES is useful in debugging a program, and BINARY FILE INFO for determining the starting address and length of any binary file on a disk without loading the file. It is worth noting that these routines can be accessed in the immediate mode, after LINE 3 has been run. Thus, even though you may not be able to use some of the subroutines in your Applesoft programs, they can be used for writing and debugging. Many of the subroutines, though, can be used within a program. Examples of these include GOTO A, Delete Array, and others.

It should be noted that Amper-Magic does provide many subroutines all on one disk. So for the relatively new programmer or ones without the subroutines, they will be a welcome addition to their library. While all the routines, as mentioned, are relocatable, unfortunately, most magazine subroutines are not. These would require knowledge in assembly language programming to rewrite them in a relocatable form.

Anthro-Digital does provide a back-up diskette of Amper-Magic for \$7.50 once the warranty card is returned. All the subroutines on the disk can be transferred through the LOAD and SAVE options on Amper-Magic. Although tedious, it is wise to have a backup diskette of frequently used subroutines.

SUMMARY

Amper-Magic is a very good programming utility. It allows the programmer complete flexibility in building an Applesoft program and using relocatable machine language subroutines. The documentation provided is generally clear and orderly. Error trapping is extensive, and defaults are provided to most options. Amper-Magic is very friendly in that it allows flexibility in naming a subroutine or changing or deleting one.

As the documentation states, the program was designed as a programming aid. As such, its usefulness depends entirely upon the user. Therefore, if you are an Applesoft programmer who uses machine language subroutines, then you could make good use of Amper-Magic and it will be a useful addition to your programmer's library. □

AMPER-MAGIC II

By Bob Nacon
Anthro-Digital, Inc.
P.O. Box 1385
Pittsfield, MA 01202
413-448-8278

\$35.00
Unlocked

Rating: B+

Reviewed by: Monty Lee

INTRODUCTION

Amper-Magic Volume Two is a set of 27 machine language routines ready to be inserted into your Applesoft programs using the Amper-Magic program itself which is on Volume One. Consequently, Volume Two is an extension of Volume One that expands the programming capability and options available beyond those provided on Volume One.

THE ROUTINES

Probably the biggest drawback of Amper-Magic Vol. 2 is that not all the routines are highly useful. The following is a list of the routines included in Volume 2:

Print Array	Print Array with CHR\$
Print at Row,Col	Print CHR\$ + POKE
Print Text Screen	Print Using Plus
Print Using Simple	Clear EOL/EOP
	Clear ONERR GOTO
Clear Stack	Fake DOS C/R
Fix ONERR GOTO	Repeat Print
Scroll Text Screen	Text Screen Save/Restore
Move Cursor	Pause
Up/Down/Left/Right/Top/Bottom	
Pause with Return	

Of the routines provided, several will probably never be useful to most programmers. Although some extremely powerful routines are provided, like PRINT USING, the disk lacks other important routines such as a faster FRE(0) routine and SORT routine to name a few.

For example, some of the routines provided are practically useless. CLEAR END OF PAGE clears all characters inside the text window from the current cursor position to the bottom margin. CALL-958 or 'ESC F' does the same thing. CLEAR END OF LINE clears all characters from the current cursor position to the right margin. CALL-868 or 'ESC E' will do this also. Several other routines exist that have analogous commands in Applesoft.

There are, however, several useful routines that enhance the use of Amper-Magic in BASIC programs. PRINT AN ARRAY will rapidly print an entire single dimensioned array. This routine can be used in debugging a program. After program executions, you can print out the elements of the array and then check for the integrity of the loca-

tions. TEXT SCREEN SAVE/RESTORE will SAVE/RESTORE a full screen display of text from/to screen memory. One possible use is the rapid display of various screens of complex menus, information, or data structure.

By far the most powerful routine provided on the diskette is the PRINT USING PLUS routine. There are over 10 pages of documentation to accompany the use of the PRINT USING options. Several possibilities include the use of PRINT USING with both numeric and string output. The display can either be set for NORMAL, INVERSE, or FLASH modes. With numbers, you can have fixed or floating dollar sign and/or optional commas and a variety of fill characters. Additionally, you can even print to the screen while outputting to the printer. There are many, many other options outlined within the documentation.

As for the explanations of each option, I find for the most part, the description is sufficient for use, particularly when the routine is a simple one. However, Amper-Magic Volume Two suffers the same drawback at times as did Volume One when explaining some of the more difficult options. Only one example of SYNTAX is given, and is usually not even explained in the description of the routine. Furthermore, no program examples are given that would further clarify each option. Although the PRINT USING option is fully explained in detail, many of the others are not. If some of the detail that exists for the PRINT USING routine was present for the other options, the documentation would be excellent.

DOCUMENTATION

The documentation consists of 50 plus standard size pages that are punched for insertion into a three ring notebook. Each routine is started on a separate sheet in order that the routines can be inserted alphabetically into those of Volume One. This provides an easy way to access all the various routines, and allows the user to insert his own routines without adversely affecting any numbering system. A cover sheet is provided that lists all the routines in order to provide a quick reference to all the various routines.

One nice feature of the documentation is an explanation of how to interface your own commands to Amper-Magic, and its method of execution. Additionally, information is provided on debugging your own routines. I find that this explanation is extremely friendly, and encourages users to write their own routines or modify published or existing routines to work with Amper-Magic. This type of explanation is missing from the Routine Machine, reviewed in Peelings II. Furthermore, information is also given on how to use modules from other subroutine libraries, as well as how to interface Amper-Magic routines into programs like the Routine Machine. This free flow of information is very helpful to users trying to interface various modules from all sources, and thus reflects highly upon Anthro-Digital to include it. It has the effect of enhancing user friendliness.

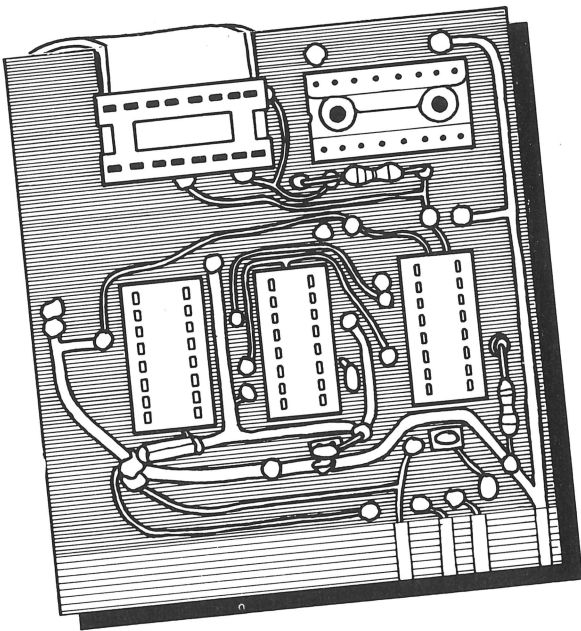
SUMMARY

Overall, Amper-Magic Volume Two is a useful addition to Volume One if you have need of some of the subroutines present. Although I find several to be essentially useless, the power behind some of the others justifies the purchase of Volume Two. If, however, you do not need a strong PRINT USING or several of the other routines, you must weigh the cost/benefit of the routines you do need.

Once the various options are figured out from the documentation and experimentation, the execution is smooth and without error. If the documentation were improved, the package would be excellent. The lack of sufficient documentation and usefulness of selected routines combine to give the program its overall rating. □

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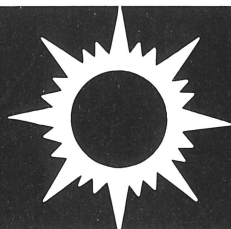
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MATHEMAGIC

International Software Marketing, Ltd.
Suite 421, University Building
120 E. Washington Street
Syracuse, New York 13202

Version 1.6A

\$89.95

Rating: C-

Reviewed by Alan Shalette

INTRODUCTION

MATHEMAGIC's appeal is predicated on the notion that you'd like to 'transform your microcomputer into the ultimate calculator' — kind of like hitching a horse to your new car so you can take slow rides in the country. Notwithstanding his curious market positioning, I was attracted to MATHEMAGIC by its ability to act as a high-level mathematical programming language. I expected it to be a lot easier to program for certain types of financial analyses than my HP-41C programmable calculator, or my Apple — whether in Basic or VisiCalc.

HARDWARE AND SOFTWARE REQUIREMENTS

MATHEMAGIC should work with almost any 'plain vanilla' Apple which includes 48K of RAM, Applesoft and at least one disk drive. It is most convenient to use with two drives and a printer, however.

OPERATION

I invest in bonds and would like to be able to quickly calculate yields to maturity, given basic market data. The equation which must be solved is fairly complex and takes the following form:

$$Y = 2 \left[\frac{\left(\sum_{k=1}^N \frac{C}{2} \left(1 + \frac{RE}{2} \right)^{N-k} \right) + 1}{P + AI} \right] \left(\frac{1}{N-1 + (TSC/B)} \right)$$

Where:

- Y = Yield to maturity
- C = Coupon rate
- RE = Coupon reinvestment rate
- N = Number of remaining coupons
- TSC = Days from settlement to next coupon
- AI = Accrued interest per \$1 of face value
- P = Price per \$1 of face value
- B = Basis, or number of days in the settlement coupon period

This equation was taken from Marcia Stigum's "Money Market Calculations: Yields, Break-Evens, and Arbitrage" (in collaboration with John Mann); copyright 1981 by Dow Jones-Irwin, (Homewood, Illinois).

When I skimmed MATHEMAGIC's documentation before buying it, it seemed just what I needed for this, and similar types of analyses. I expected I could program the equation almost exactly as shown above without line numbers, FOR/NEXT loops, GOTOs, formatted INPUTs and other housekeeping chores. Further, I could use up to 30 characters to name each variable, write formulas up to 227 characters long, get 9-digit precision, store equations and variables for later use, call the results of prior calculations and watch or print the results of intermediated calculations as each equation is processed. And, I expected it to perform a lot quicker than my HP

calculator (MATHEMAGIC runs on an Apple, after all) and to be a lot quicker to set up than a VisiCalc model or a Basic program.

To facilitate solution of the yield equation, I broke it down into several parts or formulas which are solved sequentially. The first part is named @DATAENTRY — each formula can be given a 10-character name preceded by an at-sign (@) and can be stored with a 67-character description. @DATAENTRY accepts date and coupon information, acting like a Basic INPUT statement:

```
1) @DATAENTRY: CUR.MO?;CUR.YR?;MAT.MO?;
                MAT.YR?;COUPON?
```

Semicolons (;) act like Applesoft colons (:), separating the five parts of this formula which is used to input current/settlement month and year, and coupon rate. Although MATHEMAGIC will prompt users to enter the values of any variables it cannot find in its variable table, this expression was used to force keyboard entry whenever @DATAENTRY is run. Question marks (?) after each variable instruct MATHEMAGIC to accept the variable's value from the keyboard instead of taking it from its variable table. It will show the stored value of each variable and prompt for a return key (accept the value shown), re-entry, or either an 'E' or an 'S'. An E tells the program to end asking for all values in the current expression and an S tells it to stop asking for values of the particular variable being requested. S and E are equivalent for the expressions in @DATAENTRY since there is only one variable in each.

The next formula calculates N and TSC assuming coupons at 6-month (180 day intervals) and initializes two variables (NUM and SUM) which will be used later:

```
2) @DATE: DDATE=(MAT.MO-CUR.MO+12*
            (MAT.YR-CUR.YR));
            N=INT (DDATE/6);
            TSC=((DDATE/6)-N)*180;
            NUM=0;SUM=0
```

MATHEMAGIC supports almost two dozen built-in functions such as INT (integer value), SIN (sine), COS (cosine), ABS (absolute value), RND (random number), HEX (hexadecimal conversion) and DEG/RAD (conversion from radians to degrees and from degrees to radians, respectively) as well as the standard mathematical operators (+, -, *, /, =, and ^). These functions do not include date arithmetic, however — thus requiring the approximate days between dates calculation (DDATE) shown above.

The next formula calculates the SUM () function using MATHEMAGIC's repeat calculation command. For simplicity, the reinvestment rate (RE) is assumed equal to the coupon rate:

```
3) @SUM: NUM=NUM+1;
          SUM=SUM+((COUPON/2)*
                ((1+(COUPON/2))^(N-NUM)))
```

The repeat command is entered from the keyboard along with N, the number of times the calculation is to be repeated. Each time the calculation is repeated, NUM is incremented by one, causing N-NUM to be decremented by 1. Thus, NUM corresponds to the summation index (K) shown in the yield equation.

Next, the total cost per \$1 of face value is calculated:

```
4) @TOTPURCH: (PRICE?/100)+(ACCR.INT?/1000)
```

PRICE is entered as a percent of face value and accrued interest is

entered in dollars — allowing the program to calculate (P + AI) shown in the yield equation.

The exponent is calculated next:

$$5) \text{ @EXPONENT: } 1/(N-1+(TSC/180))$$

In this case, the values of N and TSC are both retrieved from the variable table and B (the number of days in the settlement coupon period) is assumed equal to 180.

Finally, yield to maturity (Y) is calculated as follows:

$$6) \text{ @YTM: } 2*((SUM+1/TOTPURCH)*EXPONENT)-2$$

Here, the final value of SUM and the values of TOTPURCH and EXPONENT are retrieved from the variable table to perform the final yield calculation.

While the foregoing six formulas were developed and saved, I actually processed the calculation in three steps by executing the following formulas:

```
@DATAENTRY;@DDATE
@SUM
@YTM
```

The at-sign (@) preceding each name tells MATHEMAGIC to retrieve and execute the formula having the indicated name instead of looking in its variable table for the variable which may have the same name. Were it not for the need to specify the repeat calculation of @SUM, the entire calculation could have been executed in one formula:

```
@DATAENTRY;@DDATE;@SUM;@YTM
```

Other major features and functions not discussed above include simulation of subscripted variables; interchange of MATHEMAGIC variable data with other programs — including ISM's companion product called GRAPHMAGIC; direct access to, and entry of variables in the variable table; storage and recall of variable tables; and, several print options including the equivalent of a Basic TRACE command and the ability to list all equations and variables saved on diskette.

DOCUMENTATION

MATHEMAGIC's documentation is contained in two documents — a User Documentation and Reference Manual (54 pages), and Sample Applications & Techniques (12 pages). Each is typewritten on both sides of 8 1/2 x 11 inch paper and stapled. Extensive 'Help' menus are also available to explain each of the program's commands while it is operating.

The documentation is complete although expanded keywording in the Index and a short reference chart/card would speed referencing. Even with speedier referencing, first-time users will find learning a slow-going process.

PERFORMANCE

The yield calculation example illustrates many of MATHEMAGIC's capabilities and shortcomings. The greatest inconvenience noted was its inability to support embedded loops. Recall that processing must be interrupted for the user to enter the repeat calculation command and the number of times the calculation should be repeated.

This would not be too great a price to pay in trade for the conveniences it offers in equation syntax checking (each equation is verified after it is entered), flexibility in naming variables, optional step-wise execution, equation calling, and the like — were it not for its extreme

slowness in execution. For example, it took MATHEMAGIC 6 1/3 minutes to execute the @SUM formula given earlier, for a 20-year bond (N=40). In contrast, my HP-41C took 40 seconds and an Applesoft Basic program took about 4 seconds to do the same job!

Another major shortcoming is MATHEMAGIC's lack of conditional testing capabilities. That is, tests such as (IF A =B) and (IF A > B) cannot be performed directly. Rather, the Sample Applications & Techniques manual gives a series of trigonometric formulas which can be used to perform pseudo-tests for A=0?, A >0?, A <0?, A >=0?, and A <=0?. If the result of a test is positive, the associated formula will return a value of 1, if not, a value of zero is returned. A lot of extra work is required to replace standard conditional tests with these pseudo-tests.

Finally, while error handling is good, I find it hard to avoid losing equations and data while fumbling between the two menus or operating modes which are used to manage each. Experience should reduce this type of problem, but improved user prompts and editing features are more desirable.

CONCLUSIONS

MATHEMAGIC's capabilities are hardly my idea of the 'ultimate calculator'. If emulated, this program could put the state of the art back several years. Anyone willing to spend \$90.00 for this type of capability would be better off either buying a programmable calculator or a couple of good books and utilities to help them program in BASIC. □

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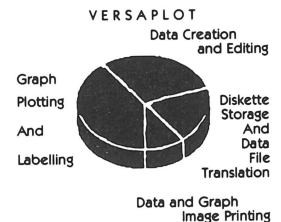
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COPY II PLUS Version 4.1

Central Point Software, Inc.
P.O. Box 19730-#203
Portland, OR 97219
503-244-5782

\$39.95
Rating: A+

Reviewed by: Monty Lee

INTRODUCTION

Copy II Plus Version 4.1 is the newest release by Central Point Software, Inc. Previously, Copy II Plus was only a bit copier, but in this newest version, Copy II Plus combines a sophisticated bit copy program with a powerful DOS disk utility package. This review will focus only on the utility package. Included within this utility package is a fast copy program, a powerful file copy program, a sector editor, and a program editor. Copy II Plus combines many features of the different disk utility packages on the market into one powerful system.

OPERATION

Since Copy II Plus is locked, the first thing the manual says to do is to use the BIT COPY option and make a copy of the original disk. Central Point Software wisely allows backups to be made and supplies the parameters for the bit copier to make them. Upon booting, the disk utility is first run automatically. The following display will appear on the screen:

```
CATALOG DISK          USE ARROW KEYS
                        & [CR] TO SELECT
COPY                  FUNCTION
BIT COPY
DELETE
LOCK/UNLOCK FILES
RENAME FILES
FORMAT DISK
VERIFY
TRACK/SECTOR MAP
VIEW FILES
FIX FILE SIZES
CHANGE BOOT PROGRAM
UNDELETE FILES
SECTOR EDITOR
NEW DISK INFO
BOOT DISK
DISK  SLOT  DRIVE  DOS  FREE&UNUSED  PRINTER
  A     6     1     3.3
  B     6     2     3.3
```

To choose the option you want, use the arrow keys to move a cursor up and down which highlights the current selection. Movement of the cursor includes wrap-around, which means you can move from CATALOG DISK to BOOT DISK in one up movement. Although the arrangement seems to be in a haphazard order, it is surprisingly convenient, with the most commonly used functions adjacent to each other.

Each option is fairly explicit in its function, but I will detail the more significant features of each. The CATALOG options include a normal catalog, one with file lengths, one which displays deleted files, and one which displays all hidden characters (control characters usually). Selection of all options in Copy II Plus is done with the arrow keys. The default is the normal CATALOG. The file length option shows the actual length of a BASIC program in both hexadecimal and decimal notation. For binary files, both the starting memory address of the file and its length is shown.

COPY will allow you to copy an entire disk in about 45 seconds, including formatting. It is extremely quick and accurate. COPY will also allow you to copy individual files to another disk or to copy DOS. One good feature of Copy II Plus is the individual file copy. Here the CATALOG of the SOURCE disk is displayed. By using the arrow keys and the RETURN key, you can now mark any file which you want to transfer to the destination disk. As you mark each file, the order of marking is displayed on the left side of the file. Thus you can place the files on the destination disk in any order desired. Furthermore, Copy II Plus supports the use of the wildcard to copy both files and filetypes. Consequently, you can specify what filetypes to match. For example, the pattern '=XYZ,BT' will match any file whose name ends in "XYZ" and is a binary or text file. This is a really powerful COPY option not fully implemented in Super Disk Copy III (PEELINGS II, V3N3). The only drawback of the COPY option is that it will not support COPY disk from a 13-sector to a 16-sector disk, excluding DOS, as Super Disk Copy III will. Instead, you must use the COPY files option to transfer 13-sector files to a 16-sector disk, and vice-versa.

DELETE is similar to copy in that you can choose to delete files, disk, or DOS. If you choose delete disk, an extra warning prompt is provided to prevent data from inadvertently being destroyed. LOCK/UNLOCK allows you to toggle the locked status of each file. You can also LOCK/UNLOCK all the files on the disk using the same wildcard setup described in COPY. RENAME allows you to rename various files on a disk. For every file that is renamed, an arrow (→) appears to the left of the file as a reminder. To make the changes permanent on the disk, you press the 'G' for GO key. The new filenames will be written to the disk. The ability to preview the changes prior to making them permanent is an excellent feature. FORMAT DISK is similar to the INIT command except that DOS is not written to the disk and a BASIC program is not saved. Format disk will format the disk to the DOS selected for that drive.

VERIFY is another powerful option. You are given the choice of verifying the disk, files, identical files, or drive speed. The verify disk option is used to check if any sectors on the disk are bad. If any bad sectors are found, their track and sector numbers will be displayed. The verify files checks the data and sectors used by individual files. From a CATALOG display, you select which files you wish to verify by using the arrow keys. Once selected, you press 'G' and Copy II Plus will verify the track/sectors of the files. Verify Identical Files is an option which allows you to determine whether or not two files on different disks are identical. It is a valuable option to verify successful

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copy of important data. Each file is checked byte by byte. If they are different, the message will say how many bytes into the file the first difference was found. The final selection allows you to verify your disk drive speed.

The TRACK/SECTOR MAP gives you an informative display showing what sectors on the disk are used by which files, and which sectors are free for use. The display includes which sectors are in use and by which file on the disk. Thus you can see where a given program resides on the disk, helping to pinpoint potential disk errors or aid in disk/program editing. VIEW FILES is another outstanding option in Copy II Plus. This option allows you to quickly and easily look at the data in any file. A sub-option lets you view the file as either a value, which means both the hexadecimal numbers and the ASCII characters in the file, or as text, which prints just the characters in a more readable form. In addition, if the printer is selected, the data can be sent to the printer.

FIX FILE SIZES frees up sectors that DOS does not when a short program is saved by the same name over a long program. The FIX option only works on BINARY or BASIC files. CHANGE BOOT PROGRAM will let you modify the DOS on a disk to boot a different BASIC program, or even BRUN a BINARY file or EXEC a textfile. UNDELETE FILES will recover any undeleted files you select if it has not been already overwritten.

One of the more powerful options on Copy II Plus is the Sector Editor. Unfortunately, it is also the one least documented. If you already have experience with a sector editor, then using Copy II Plus won't be too difficult. If instead you are a beginner at using a sector editor I strongly suggest you get a practice disk to work on to gain familiarity with the editor. Since it is poorly documented, gaining expertise will require some practice. Basically the sector editor allows you to directly view and modify the data on any sector of the disk. This is extremely useful for those who need to fix a program, fix a bad Sector, insert control characters in filenames, and so on. Once a sector is read into the buffer, Copy II Plus displays only 15 lines of the buffer. This is because both the hexadecimal and the ASCII equivalent of each byte is displayed, along with the various keys used to move and modify data while using the sector editor. Using the I-J-K-M keys, you can move the cursor around in the buffer. One weakness off the Sector Editor option is the display. Although the help prompts at the bottom are useful initially, the display would have been enhanced if the entire buffer was displayed on the screen — like most other sector editor programs do. It can be confusing to determine exactly where you are in the buffer due to the 15 line limitation. Although a powerful option, a little more fine tuning in both the execution and documentation of Copy II Plus would have made this an outstanding feature.

The final two options are virtually self-explanatory. NEW DISK INFO allows you to set up the A and B drives for the slot, drive, and DOS configuration desired. BOOT DISK will boot a new disk since RESET is locked out.

DOCUMENTATION

Copy II Plus comes with 72 spiral bound 8½ x 6 in. pages. The document is divided into three sections: DOS Utilities, Bit Copy Program, and the Appendices. Unfortunately, only 28 pages deal with the best part of Copy II Plus — the utility package. Each option is presented in the order of appearance on the screen, along with a brief description of the uses of that option. Additionally, a short description of any sub-menus that appear along with all prompts is provided. Thus the documentation is complete as far as screen prompts.

Where the documentation falls short is in the detailed explanation and use of the more complicated options. For example, the explanation of the CATALOG option is detailed in three pages, yet the explanation of Sector Editor is done in two — a much more complicated option. Additionally, the booklet lacks the much needed ex-

amples of the screen displays from the various options. The material is present in the text, but for a beginner it is hard to understand without seeing any examples of what to expect. The only way to overcome this with Copy II Plus is by trial-and-error with the program.

SUMMARY

Copy II Plus is overall an excellent disk utility system. It greatly expands upon some of the features present in other well known disk copy programs such as Super Disk Copy III reviewed in Peelings V3N3. I find Copy II Plus more powerful and more useful. As for the lower rating, I base it primarily upon the documentation. There are many powerful features and the flexibility within each option greatly enhances its usefulness. The major drawback is the lack of sufficient and explicit documentation of the disk utility options. For an advanced user, the explanations might be considered adequate while for a relatively new beginner to the Apple and copy programs, the detail is insufficient in many of the options for a complete understanding. Thus, the documentation pulls the program out of the AA+ category down to the current rating. If the documentation were improved, this would be an outstanding disk utility for practically every Apple user. □

Editor's Note:

The bit copy portion of this program will be reviewed in a subsequent issue.

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Wildcat Computing, Inc.

**1160 Park Boulevard
Plano, Texas 75074
(214) 424-3582.**

CLASS RECORDS

by Ron Graff
Educational Systems Software
23720 El Toro Rd., Suite C
El Toro, CA 92630
714-768-2916

\$89.95
Unlocked

Rating: A

Reviewed by: Sandy Abernathy

INTRODUCTION

Class Records is one module in a proposed interactive educational software system which, according to the introduction, will "relieve educators of tedious record keeping and repetitious drill and practice so that they will have more time to devote to the more creative aspects of their profession." The company plans to develop modules within six broad categories. These are Records for class and office, Exercises for student use, Editors for text processing, Resource Files with pre-recorded information to use with other modules, Educational Games and Audio Visual Aids. So far, one Records diskette, Class Records, and one Exercise diskette, Supermath II, have been completed. The modules are designed to be used alone or in conjunction with others in the same system.

Class Records stores and reports information on grades and attendance for individual students or for a class. The package is easy to use and the information that is requested and reported is quite detailed. A variety of well formatted reports can be printed. The program is menu driven and most options are self-explanatory. The package also includes an extensive manual. One disk drive is mandatory but the program can be set up to use two. The two disk drive option is very convenient.

DOCUMENTATION

Documentation consists of a "Menu Road Map" a manual and sample printouts. The "Road Map" shows the nine menus included in the program and the relationship among them. This addition is a very useful feature and makes moving from one menu to another much easier.

The manual consists of 51 pages and appears to be a formidable document at first glance. However, it has been written so each section stands alone and the same information may be found in several places. I found the information in each section to be adequate and easy to follow, if a bit repetitious, while scanning it. When it is used as a reference tool, as suggested by the introductory paragraphs, the idea of including all necessary information in each section is a good one.

The Table of Contents is quite detailed. Unfortunately, the major menu titles were not used for chapter headings. This organization would have made the manual more like the road map and the program. However, the program is easy to use and the Table of Contents is so complete that the lack of a strong relationship between program and manual is not a major problem.

PROGRAM

As mentioned earlier, the program is entirely menu driven and moving around in the program is simple. A set of dummy data has been included so the user can explore the options before setting up a

real class. The purpose of the Main Menu is to send the user to one of four major subprograms. These are Special Operations, Attendance, Class Structure, and Grades.

Special Operations is a miscellaneous collection of routines where the number of disk drives is stated, the printer is activated or deactivated, diskettes are copied, class lists are copied and class curve parameters are defined.

In the second subprogram, Attendance, the attendance period is set up and attendance figures are entered. Setting up attendance periods includes specifying the type of grading period (quarter, semester, or other), number of weeks (20 maximum), days in the week the class meets, and vacation days in the period. After the information has been stored, attendance figures can be entered. Information can be reviewed, revised or printed at any time.

The next subprogram is Class Structure. This subprogram is the most complex since it includes setting up the class structure and entering and printing information about assignment categories, assignments or exercises and students. When setting up the class structure, the user must enter the class name, the name of the teacher, the teaching period and the number of weeks in the period. Then the user has the option of entering the remainder of the information manually or from a Resource Diskette (not available yet). The information includes assignment categories and their relative weights, as well as names, due dates, and total points for each exercise. Student names are entered by calling up a subsidiary program. Information about students, categories or exercises can be reviewed, revised or printed at any time by calling up one of three subsidiary menus. Each class must be kept on a separate diskette and each class may contain as many as ten categories, fifty exercises and seventy-five students.

Grades is the last subprogram. Raw scores or grades are entered, analyzed and reported through this portion of the program. This is a true grading program since the end product is a set of grades, not a set of percentages. As with the other subprograms, information can be entered, reviewed, revised and printed at anytime. Grades can be retrieved and printed by student or by exercise or another subsidiary program can be called which will report summary information.

Grades can be obtained in one of three ways. Raw scores for exercises can be entered and grades will be figured based either on class grading standards, which are set up in this section, or on class curve parameters, which are set up in the Special Operations section. In addition, grades can be entered directly. Overall grades for categories are figured based on the scores or grades for exercises within that category. Overall grades for students are figured based on the weighted category grades. A student can be marked absent or excused from an exercise without being penalized during the grading process.

If grades have been figured based on class standards or have been entered directly, the user has the option of changing them to fit class curve parameters. However, this is a fairly irreversible procedure. If you don't like what you see after the computation has been completed, the only way to reverse the grades is to change each student's grade individually. I would prefer to have class curve grade information calculated and displayed so that I could compare it to the existing grade set and then have the option of saving or not saving. The opposite option of going from class curve grades to class standards grades could also be useful.

REPORTS

The reports are clear and well formatted. Even scores and percentages are lined up vertically. The program is set up so that each report is printed on a single page. Eleven different types of reports are available.

USEFULNESS

By itself, the program is a powerful tool which can maintain and report very detailed information about student attendance and grades. Depending on the need for such detailed records and the accessibility of an Apple microcomputer, the program may be a valuable tool for individual teachers.

If good educational software modules are produced to accompany this diskette, the potential value of the program may become greater. According to the manual, it will be possible to exchange student information between the Class Records and Exercise modules.

The program is written in Applesoft which means that execution is fairly slow. It takes about a minute to move from a third level menu

back to the main menu and five minutes to erase all files on the Class Data diskette and get ready to set up a new class. This may prove to be a drawback to some.

SUMMARY

In summary, the program works well although a little slowly, is easy to use, maintains attendance and grades for a class, has a variety of options available for deriving and reporting grades, produces useful, well formatted reports, and comes with a wealth of documentation. If the particular features described earlier are important to you, if one diskette per class doesn't bother you, and if an Apple microcomputer is readily available, this program may be what you are looking for. □

E-Z LEARNER

by Robert Berliner
Silicon Valley Systems
1625 El Camino Real #4
Belmont, CA 94002
415-593-4344

\$39.95
Rating: B

Reviewed by: Sandy Abernathy

INTRODUCTION

E-Z Learner does what it says it will do, that is, it stores and recalls questions and answers in a file. The purpose of the program is to review material, not to test. There are several utility routines included which will allow the user to add to, edit, merge, delete, transfer and print files created by the user. The name of the last file can be stored and recalled the next time the program is run. The program also has a set of instructions not included in the accompanying folder which can be displayed or printed out at the convenience of the user.

In order to use the program, a file of questions and answers must be created using the "Create New File" option found on the Main Menu. Once a file has been created, the user has the option of printing the file or displaying the information on the screen. If the print option is selected, the questions and answers may be printed and mounted on index cards to use when the microcomputer is not available. Editing functions allow for wordwrap and centering so that the printout is attractive and easy to read. If the user wishes to use the microcomputer to display information, the "Power Review" would be selected. The user has several options from which to choose. He may have questions displayed first or have answers displayed first. Items may be called up in original order or in random order. The user can type in his response and have it checked or may mentally respond and then check to see if the response was correct. The computer will keep track of correct and incorrect responses and will give the user the option at the end of the review of going over those sets of questions and answers that were answered incorrectly.

PROGRAM FEATURES

The program appears to have some nice features. The text editor is convenient. When questions and answers are entered, words that are too long for the line are moved automatically to the next line. CTRL-Q and CTRL-Z move the cursor vertically, the right and left arrow keys move the cursor horizontally, CTRL-I allows character

insertion, CTRL-D deletes characters and the ESC key is used to signal the end of text entry. A total of 252 characters are available for each question or answer. Each is enclosed in a window and both are displayed at the same time. The space may be inadequate for long questions or essay answers. New files are created using the "Create a File" option on the Main Menu and files may be edited using the "Edit" option. When editing a file the number of questions being loaded and the remaining memory is displayed very quickly. It would be helpful if the total memory remaining after all questions had been entered could be displayed for a longer period of time or if the remaining memory could be displayed at the top of the edit screen in between "File Name" and "Wordshift".

Screen displays are uncluttered and directions within the program are clear. As mentioned earlier, instructions for using the program are not printed out but are included on the diskette and can be printed out by the user. If you purchase this package and this feature is not available, you have received an older version. Write Silicon Valley Systems and they will update the disk free of charge. Error trapping appears to be adequate in this version.

Options are easy to use. File utility options include "Add to File", "Merge Files", "Transfer File", "List File Data", "Delete/Rename" and "Save/Recall Last Filename". For instance, to merge two files, the user is prompted to type the name of the main file and then the name of file to be added to the main file. When this has been done, the files are merged automatically. The catalog is displayed during the procedure for the convenience of the user. Menus are used in almost every instance. One exception is file selection. When a file is to be selected, the catalog is displayed and the user must type in the name of the file. As a convenience to the user, the name of the last file can be displayed at this time. Unfortunately, the Main Menu doesn't contain a "Quit" option. The microcomputer must be turned off and on to use another program.

In the updated version of E-Z Learner, questions can be set up in a hierarchical structure. If a particular question is answered correctly, a specified number of subordinate questions will be skipped. The user who indicates knowledge of one section of the file can be sent to the next section rather than having to go through all questions in the file.

PROGRAM USEFULNESS

The program is very friendly. This is especially important for beginning computer users. Lack of typing skills may be the biggest hindrance when using this program since questions and answers must be entered through the keyboard.

The usefulness of the program once files have been created has been increased in the updated version. Questions and answers can be formatted so that they can be printed and mounted on index cards

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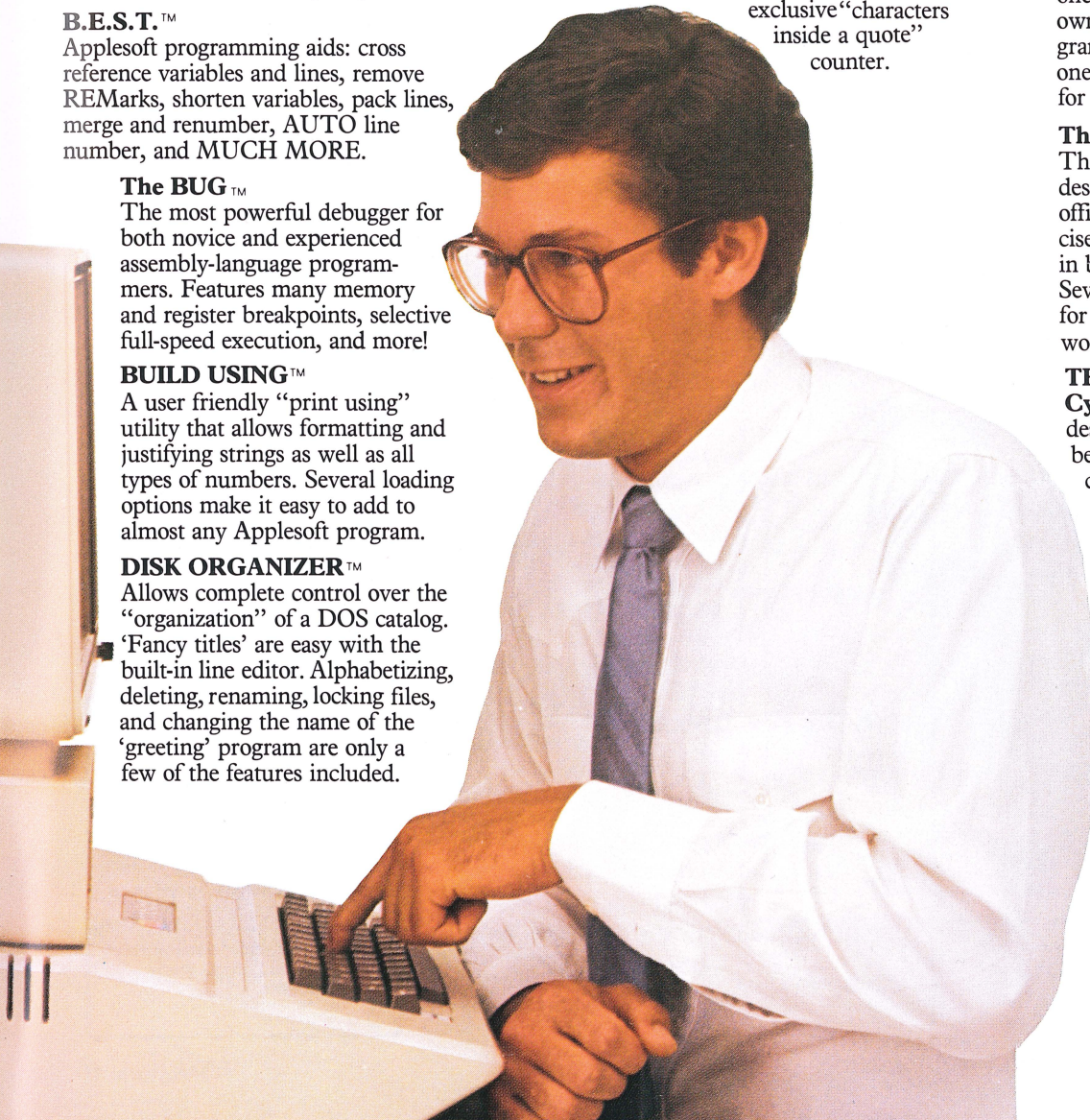
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and used by several people at once or used when an Apple is not available. Originally, the user had to respond to every question/answer set in the file. Now, a file can be set up so that repetitive questions are included for those who need extra review, yet those who know the material can skip them. Originally all questions were displayed in random order. Now, the user has the option of random order or original order. Originally, the user asked for questions or answers to be displayed first, made a mental note of the correct response, pressed a key to see the correct response and typed "C" for correct or "W" for wrong. I found myself losing interest very quickly with this type of response. Now, in addition to this procedure, the user can choose the option of typing in a response. The response must be letter-perfect to be called correct. If the response is close (spelling may not be correct) the program will indicate this. With a "Wrong" or "Close" response, the user has the option of trying again. If he chooses not to try again the correct response is displayed. I found this procedure much more attention sustaining than the original one even though I didn't type words or phrases correctly every time. The correct response display for wrong answers is essential for review purposes. Some users might object to the almost subliminal feedback for correct responses. If the response is correct, "Correct" is flashed very quickly at the bottom of the screen and the next question is displayed. It might be more useful if the user could decide when to go to the next question even if the response was correct. A certain amount of educated guessing is used to respond to some questions. I would prefer to have the "Correct" and "Wrong" displayed in normal print since this is a review. With the options available in the current program, this package could be useful at home or at school.

SUMMARY

The program is easy to use, no program bugs were found in the updated version and the program appears to be useful for reviewing information. Questions and answers can be printed and mounted on index cards or users can review material on the microcomputer itself. If the microcomputer option is selected the microcomputer will keep track of correct and incorrect responses and will redisplay incorrect question/answer sets if requested. A file may contain similar questions to give extra practice to those that need it and yet allow those that indicate they know the material to skip them. The files do not state the number of questions contained when the file is called. This would be a nice addition.

The program appears to be useful for students with good typing skills who want to use a microcomputer to set up review files for themselves. It also appears to have some utility for teachers who are looking for a computerized method to help students review material for a test. Questions and answers

can be set up so that only those that need extra practice will go through all questions in a section of a file. The interactive aspects may keep the attention of the students longer than the more passive procedure. □

Editor's Note:

The author reports that the quickly flashing "correct" has been changed in response to our review. The user now sees a normal display of "correct" and is prompted to "Press any Key" to go on to the next question. Updates of this fix are free of charge. □



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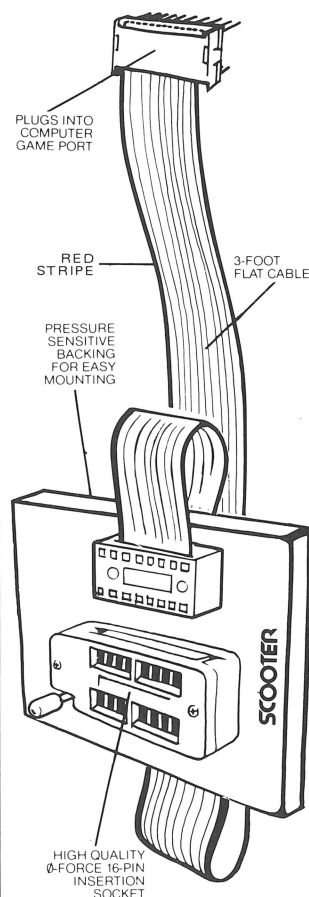


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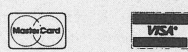
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HP-16C

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\$150.00

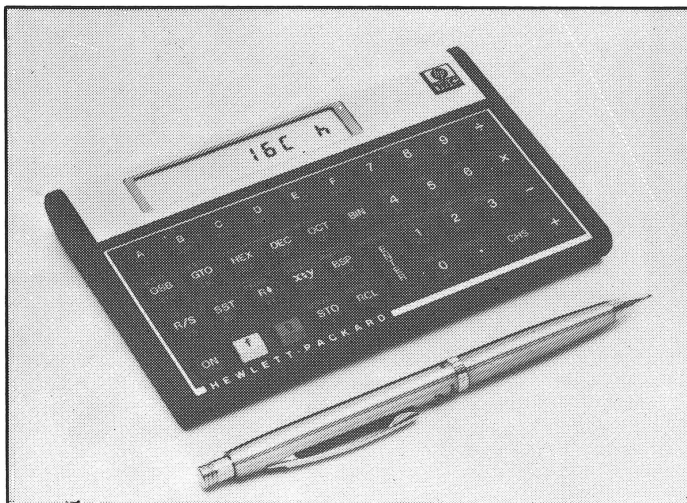
Reviewed by John Martellaro

Occasionally, a product comes to our attention that is not strictly an Apple II product but which we think would be of considerable interest to users of microcomputers. In this case, it is an entirely new kind of calculator that is especially designed for computer programmers: the HP-16C. If you do not program your Apple, you will probably want to skip this review. If you do program, especially in assembly language, you will be doing handstands by the end of this article.

The HP-16C is one of Hewlett-Packard's new generation of slim LCD (liquid crystal display) calculators. (See the accompanying photograph). It measures a mere 15 mm thick and fits easily into a shirt pocket. Aside from the matter of its functionality, like all HP calculators, it has a solid, aesthetic, and professional look about it. The 16C, like all HP calculators uses the RPN logic system which many consider to be a superior method of solving small mathematical problems. This involves a mini-stack of four registers called X, Y, Z, and T that can be used to solve any problem without ever hitting an "=" key. Forth uses a similar but larger stack.

One purpose of the HP-16C is to allow the programmer to quickly and easily do conversions between binary, octal, decimal, and hexadecimal numbers. This feature, taken alone, may not impress you since, from time immemorial, there have been base conversion programs published in various computer magazines. However, I purchased this calculator to solve a common problem, best expressed as a corollary to Murphy's Laws:

1. At the time when you need to do a base conversion, the Apple will be running another program that will be inconvenient to abort.
2. On those occasions when another program is not running, you will be unable to locate the diskette with the conversion program.
3. If you find the diskette, the wrong language or operating system will currently be running and require a reboot.



The following keystrokes are an example of the kind of conversions that can be done.

<u>Operation</u>	<u>Display</u>	<u>Comment</u>
3, 1, 2	312 d	
HEX	138 h	
OCT	470 o	
BIN	0011100 .b	dot indicates more in leftward windows
f WINDOW	1 b.	dot indicates all of number in rightward windows

The 16C allows the user to set the word size of the machine from 1 to 64 bits. All operations described below will act on the X register (the main display register) as if it were a register of the defined size. Since the display of the 16C can display eight binary digits (bits) at a time, it will require 8 windows (labeled 0 through 7) to display a 64 bit word. Each window can be observed by using the function WINDOW n, or the current display can simply be shifted by using the < and > keys. In the above example, window zero contains 00111000 and window one has a 1 interpreted as 1+00111000 or 100111000 which the programmers among you can identify as 312 (decimal).

Another purpose of the 16C is to operate on numbers with common functions of interest to a programmer. For example, suppose you are working with an 8 bit word size and you need to know the results of 37 decimal ANDed with 42 decimal. The and process produces a 1 bit only when both corresponding bits are 1's. The process is as follows:

<u>Operation</u>	<u>Display</u>	<u>Comment</u>
3, 7	37 d	
BIN	100101 b	an intermediate step to see the binary form. Not necessary.
DEC	37 d	
4, 2	42 d	pushes the 37 into the Y register
BIN	101010 b	again, not necessary
AND	100000 b	the result of "anding"
DEC	32 d	

In addition to the standard logical functions of NOT, AND, OR, and XOR, there is a complete set of shifting and rotating functions. There are logical shifts right and left. Shift Left (Right) brings a zero in from the right (left) and shifts the high (low) order bit into the carry bit. The Arithmetic Shift Right will perform like a Shift Right except that the sign bit will be regenerated into the high order bit. And to top it off, there is a Rotate Right and Rotate Left which is a circular shift and a rotation through the carry bit. The latter can be done 1 or n bits at a time.

Perhaps the most useful way to exploit these features is to testbed a logical sequence in an assembly language system. It may be just too much trouble to interactively debug a complex sequence of instructions that operate on data, but with the HP-16C, you can try it out ahead of time until you are happy with the algorithm.

PROGRAMMABILITY

In addition to the functions above and many more that I will mention, almost every keyboard operation can be put into deferred mode and combined to create a program. The power of this is similar to going from immediate mode BASIC to writing a program. This brings an immense amount of power to the programmer since it allows him

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to write complex utilities, preserve them, and execute them with a touch of a key. First, the memory of the 16C is non-volatile. It does not disappear when the power is turned off. In fact, the memory will even be preserved for a few minutes while the small silver oxide or alkaline batteries are changed, and this is only necessary about once a year.

There is precious little memory in the 16C, however. It is miniscule by Apple II standards: 203 bytes. This total memory is dynamically allocated between program steps and data registers. Each program step or instruction uses 1 byte. So if you write a program that requires ten 16-bit registers, the program size is $203 - 10 \text{ registers} \times 2 \text{ bytes/register} = 183 \text{ steps}$. On the other hand, if you have a 50 step program and need floating point registers (56 bits = 7 bytes), there is only room for $(203 - 50)/7 = 21 \text{ registers}$. A keyboard function displays the current partitioning.

Program editing is done in the fashion of previous HP calculators. Program steps can be inserted thereby bumping downward the remaining instructions. You can GOTO any program line number, delete a line, back step or single step forward. In run mode, the single step function will actually execute a single instruction at a time allowing the user to see the results in the display at his leisure. Or the user can simply RUN the program and allow it to run at full speed. I would like to note here that small calculators like the 16C do not run nearly as fast as you might think since they run on a limited amount of power. The full speed execution rate is in the rough vicinity of a dozen instructions per second.

Program control is achieved through branching, both unconditional (GOTO linenum) and conditional branching based on the results of comparing the X and Y registers or comparing the register to zero. A program segment is partitioned in memory starting with a label and ending with a return. All that is required to start the program is to do a GSB (GOSUB) from the keyboard followed by the label key (0-9, A-F). Thus, you may have many programs all in permanent memory invoked by GSB'ing to their label. I have labels A and B allocated to add or subtract 65536 from a number since one is always running into numbers like -16386 in Apple programming. There is also a powerful index register, the I register, that allows indirect branching (GSB I) and indirect memory references STO (i) which, for example, stores the X register value in the register whose number is in the I register. This is called indirect addressing. There is also the facility to create a loop structure plus a test so that a decrement or increment will continue to be performed until a test is passed. In all, there are convenient and powerful instructions for writing programs, but they will require the student of the calculator to apply himself.

ADDITIONAL FEATURES

The 16C can be put into a floating point mode so that it acts just like an ordinary calculator. If, in a pinch, you need the square root of 1.32E7, just flip over to floating point mode and hit the square root key. Since this is a programmer's calculator, most of the traditional scientific functions are missing. You have add, subtract, multiply, divide, square root, absolute value, and reciprocal. Sorely missed is the power key that takes Y to the X power.

The calculator may operate in unsigned mode, 1's complement or 2's complement. There is a function to sum the bits in the X register. There is a function mode that allows the exact calculation of products and quotients double the given word size. You even have the ability to set, clear and test on individual bits of a word.

I would say, in summary, that the 16C is a formidable product, well engineered and well thought out. It provides the system programmer or assembly language programmer with a powerful tool for simulating computer instructions and creating utilities that are portable and convenient to use.

DOCUMENTATION

The HP-16C comes with batteries, a very nice leather pouch, and a 133 page spiral bound instruction manual 6.5 inches high. It is

printed in two colors and makes good use of bold face type. It has an example for virtually every function. There is a complete table of contents and a complete 9 page index. In addition there is a Function summary and index. As usual, the documentation is superb in the tradition of HP calculators. It puts the documentation of many Apple products costing three times as much to shame.

COMPLAINTS

I have just a few criticisms of this product. 1) It is short of memory. HP calculators are always short of memory. I would like this to change someday. 2) The display, in program mode, shows keycodes. For example, f LBL D shows in the display as 43,22,d. The numbers correspond to the row and column of the key. That is, the LBL key is in the second row and second column. This was justifiable in the days of LED (light emitting diode) eight segment displays, but with the capability of LCD, it would have been a big human factors plus to spell out the name of the instruction in the display. 3) The Y to the X power key is missing. This is most often used when the user wants to know what 2 to the 13 power is. It is missed. 4) There is no indirect register arithmetic such as STO +(i) and STO -(i) as on other HP calculators. 5) Secondary functions are printed in yellow above the keys. On the HP-11C, this paint is a brilliant yellow and easy to see in poor light. For some reason, the 16C uses a more pale yellow-gold that is not so easy to see. Inspection of other 16C's at a local store confirms that mine is like any other. 6) Finally, I found the placement of the hex related keys A through F inconvenient and hard to adjust to. I know for fact that Hewlett-Packard agonizes over and studies in detail the placement of keys on their calculators. Personally, I would be more comfortable with the hex keys clustered with the decimal keys in the usual style of hex keypads. Others may feel differently.

SUMMARY

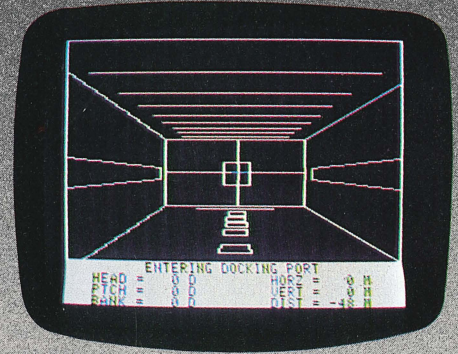
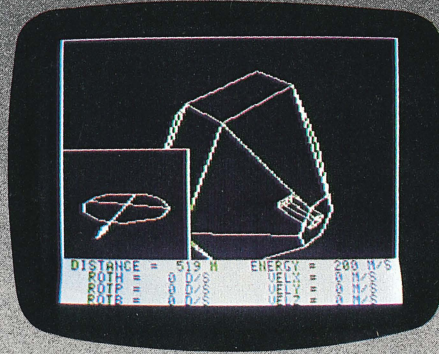
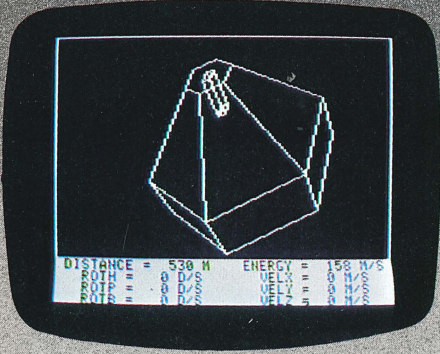
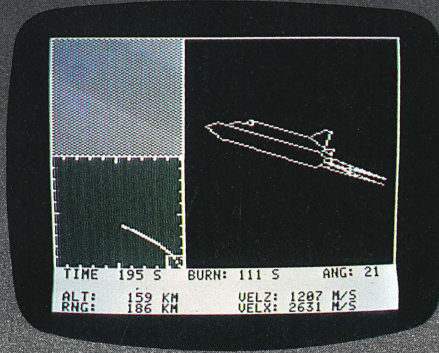
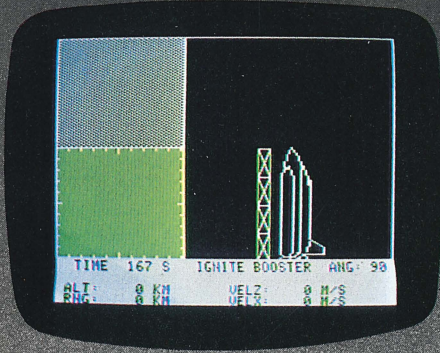
If you own a "TI programmer" you will want to know that it just does not compare to the HP-16C. It is like moving up from a ZX-81 to an Apple IIe. Putting aside the minor complaints I have mentioned above, this is the calculator that every serious programmer should own. HP is to be commended for having the courage to produce a calculator with perhaps limited market appeal. On the other hand, from what I have seen, few if any 16C's are collecting dust on merchants' shelves. It will be a classic. □

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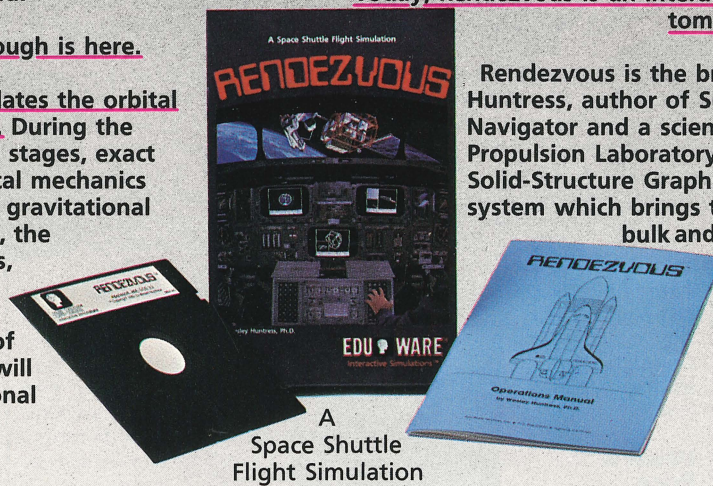
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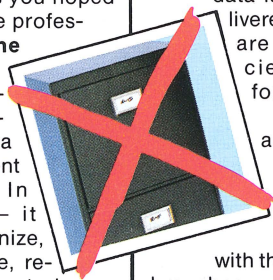
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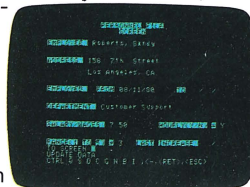
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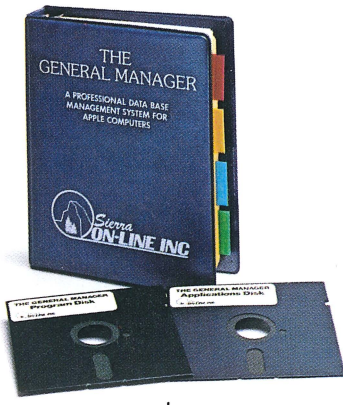
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