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# Washington Apple Pi



Volume 5

April 1983

Number 4

## Highlights

INTRODUCTION TO APPLESOFT 1.  
 COMPUTERS AND INCOME TAXES  
 VISICALC STATISTICS  
 SPEAKING OF FORTH : EXTENDING  
 THE COMPILER

## In This Issue

OFFICERS & STAFF, EDITORIAL, EVENT QUEUE, GENERAL INFORMATION	3
PRESIDENT'S CORNER	4
MINUTES, TREASURER'S REPORT	5,6
IAC CORNER	BERNIE URBAN 7
EDSIG NEWS	PETER COMBES 8
GROUP PURCHASE POWER	RICH WASSERSTROM 11
USE OF WAP LIBRARY DISKS & SOFTWARE LIBRARY	ROBERT C. PLATT 12
A PAGE FROM THE STACK	ROBERT C. PLATT 14
JOB MART, WAP HOTLINE, APPLE TEAS	15,16
SIGNEWS, BYLAWS AMENDMENT	17
LETTERS TO THE EDITOR, CLASSIFIEDS, INFORMATION EXCHANGE	18
THE SCREENWRITER WARM LINE	PETER COMBES 19
INTRODUCTION TO APPLESOFT 1.	DAVID MORGANSTEIN 20
APPLE TECH NOTES	ED SCHENKER 22
MICROCOMPUTER-ASSISTED INVESTING	MARVIN HASS 23
COMPUTERS AND INCOME TAXES	ROY ROSFELD 24
THE BOTTOM LINE	LEON H. RAESLY 28
THE QUENTIN APPLE-MATE DISK DRIVE: AN EVALUATION.	JIM KELLY 29
LEARNING DISABILITIES AND MICROS	JAY THAL 30
VISICALC AND INCOME TAX REVISITED	ROY ROSFELD 31
MATHEMATICAL SYMBOLS WITH WORDSTAR	MARILYN E. JACOX 33
VISICOLUMN: VISICALC STATISTICS	WALTON FRANCIS 34
SPEAKING OF FORTH: EXTENDING THE COMPILER	BILL WURZEL 40
THE APPLE'S WRITE ONLY NUMBER (WON)	W.R. SIMPSON & J.R. AGRE 44
THE GALTON QUINCUNX	JOSEPH HILSENATH & BRUCE F. FIELD 50
RANDOMLY SEQUENCED LISTS	L. BENNER 51
THE WILDCARD: A REVIEW	DAVID MORGANSTEIN 54
Q & A	BRUCE F. FIELD 55
LOGOSIG NEWS	NANCY C. STRANGE 59
FILEHANDLER REVISITED	J.T. DEMAY JR. 60
REVIEW OF PLATO COMPUTER LITERACY	ROBERT C. PLATT 61
FILECABINET REVISITED	DAVID C. ELDRIDGE 62
A REPORT ON THE ACLD CONFERENCE	JAY THAL 64
A HOLIDAY LETTER	JEANNE ESSLEY 65
CORRECTED LISTINGS FOR COLOR PLOTTING	A.R. RUMBLE 67
LOGO SURVEY FORM, REGISTRATION AND MAIL ORDER FORMS	69-72





## COMPUTERS COMMUNICATIONS

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Schedule of Classes

April 1983

- Apple LOGO** Four Saturdays, 1 to 3 pm. April 9, 23, 30 & May 7  
A class for teachers, parents, school administrators or others who wish to develop beginning skills in LOGO. (College credit is available under certain circumstances). Fee \$125.00
- Data Communications** Three Fridays, April 15, 22, 29  
How to equip and adapt the Apple II computer for communications. You will gain an insight into the complexities of the telephone network and a thorough understanding of protocols, etc. Fee \$90.00
- Business Graphics** Tuesday evening, April 26  
One graph is worth a thousand numbers. A one evening session on the basic techniques of making clear and effective graphs. Fee \$40.00 or \$25.00 with Visicalc.
- Visicalc** Three Tuesdays, April 5, 12, 19  
This introductory course in Visicalc will teach you how to design and use spread sheets for your own applications. Many exercises and demonstrations are a part of this course. Fee \$90.00
- Basic-BASIC** Four Monday evenings, April 4, 11, 18, 25  
This is a beginning course in BASIC programming. You will learn how to write uncomplicated programs in the BASIC language. Some prior computer experience required. e.g. Intro to Personal Computers I. Fee \$80.00
- Introduction to Personal Computers I** Thursday evening, April 7  
A one evening course designed to introduce the neophyte to the Apple II, computer terminology, and hands-on experience. This course is for adults only but is not X rated. Fee \$20.00
- Introduction to Personal Computers II** Thursday evening, April 14  
A continuation of session I. Hands-on overview of computer applications ranging from education to word processing will be experienced. Fee \$20.00
- Introduction to Data Base Systems** Thursday evening, April 21  
A hands-on involvement in how you can use your personal computer as a powerful data base management system and information management tool. Fee \$20.00
- Introduction to Word Processing** Thursday evening, April 28  
This beginning course will introduce you to the mysteries of word processing on your Apple II. Fee \$20.00

Evening classes are held from 6:30 to 9:00 pm. at the store in Laurel, Md. Classes are limited to 12 students. Call for information.

# IDS

## Available IDS Subroutine Functions

Routine	Function.
ZFD	Display a form.
ZFR	Read a form.
ZFV	Write to a form.
ZFC	Clear a form's fields.
ZFA	Change form field attributes.
ZFP	Print the current form.
ZFM	Display a message.
ZDO	Open a disk file.
ZDR	Read a disk record.
ZDV	Write a disk record.
ZDC	Close a disk file.
ZDE	Position to the end of a disk file.
ZDL	Locate a specific record/byte position.
ZDG	Get an IO list from a disk file.
ZDP	Put an IO list to a disk file.
ZPC	Configure the printer.
ZPL	Write a printline.
ZPV	Write a string to the printer.
ZPF	Format a printline.

## IDS Form Control Keys

Key	IDS Form Response
Return	Move cursor to next field
Ctrl-B	Move cursor back one field
Ctrl-T	Move cursor to next tab field
Ctrl-F	Move cursor to first field
Ctrl-L	Move cursor to last field
♦	Move cursor one position forward
◄	Move cursor one position backward
Ctrl-P	Print the current form
Ctrl-R	Redisplay and rewrite current form
Esc	Transmit form data to program

## Printline Field Formats (F Attribute)

Format	Explanation
E	Exponential format ( ± 9.999E ± 99)
F	Fixed point format (999.99 etc.). The numeric editing attributes (ZSMCP) only apply when F is specified as the format.
G	General format. The number will be displayed in whatever manner that shows the greatest number of significant digits.
C	Center text within the field.
L	Left justify text within the field.
R	Right justify text within the field.

## IDS Initialization

To run the IDS Structure editor, either boot the IDS diskette (preferred method) or run program IDS.EDITOR.

To load the IDS subroutines and your IDS library, include the following statements at the beginning of your program.

```

001 PRINT CHR$(4); "BRUN IDS"
002 CALL ZINIT; "your IDS library name"
    
```

## Form Variable Field Attributes

Attribute	Explanation
P	Protected Field — will not allow data to be entered by the user.
R	Required Field — forces the user to enter data into the field.
F	Full Field — will not allow blanks to be entered or left in the field.
T	Tab Field — defines this as a tab field.
A	All Characters Field — leaves trailing blanks on string fields.

## Printline Numeric Editing Attributes

Attribute	Explanation
Z	Zero Suppress — will suppress printing of numbers when they are zero.
S	Floating Dollar Sign — provides a floating dollar sign as long as the pad character is a blank. Otherwise, the dollar sign will occupy the left most position of the field.
M	Trailing Sign — will display the minus sign in the right most position of the field. Positive signs are displayed as a blank.
C	Use Commas — commas will be inserted in the non-decimal portion of the field.
P	Pad Character — will pad the field (on the left) with the specified character.

If you use Applesoft BASIC to develop commercial software packages or to write your own applications, you'll love IDS, the Integrated Development System. Take a look at a section of our reference card, shown above. IDS gives you

- Complete screen form definition and management under program control. Form display and response to keystrokes is virtually instantaneous.
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- Powerful print output formatting. No more "PR#s". Use scientific or fixed point notation with full numeric editing. Align decimal points. Left, right and center justify text.

Writing user-friendly input and output procedures is so easy with IDS that you may not believe you are using Applesoft. We've even included a simple address list application as a tutorial to show just how easy it is.

Try IDS for yourself at Frederick Computer Products and other stores. If your local dealer doesn't have it yet, phone or write us for more information.

Suggested list price \$85.00. IDS requires DOS 3.3 on 48K Apple II Plus or Apple IIe. Language card RAM is supported

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 SIG/DISABLED -Curt Robbins ABBS WAP428 or  
 write 8805 Barnsley Court, Laurel, MD 20708  
 (or phone) -John Molineaux (301) 341-7391  
 STOCKSIG -Robert Wood (703) 893-9591  
 Telecomm. SIG -George Kinal (202) 863-6489

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# EDITORIAL

Again this month, we have received many excellent and timely articles for our Journal. We continue to grow in volume and quality, thanks to you. From reading the appeals of editors of other Apple user groups, it seems WAP has an unusual group of contributors. Many of our articles are reprinted in other newsletters. (Come and see for yourself in our reading library at the office.) Our editorial nightmare of "The Empty Newsletter" is occurring less and less frequently. Carry on! ☺

# EVENT QUEUE

Washington Apple Pi meets on the 4th Saturday (usually) of each month at the Uniformed Services University of the Health Sciences (USUHS), Building B, 4301 Jones Bridge Road, Bethesda, MD, on the campus of the National Naval Medical Center. Library transactions, newsletter pickup, memberships, etc. are from 8:45 - 10:00 AM. From 9:00 to 10:00 AM there will be an informal "Help" session in the auditorium. The main meeting starts promptly at 10:00, at which time all sales and services close so that volunteers can attend the meeting.

Following are the speakers and topics for the next few months:

April 30 - LOGO - Nancy Strange  
 (5th Sat.)  
 May 28 - Telecommunications  
 June 25 - Garage Sale

## APPLICATIONS DEMONSTRATION SCHEDULE

All Demos are from 9:00 to 10:00 AM unless designated otherwise.

April - Statistical Packages ☺

## GENERAL INFORMATION

Apple user groups may reprint without prior permission any portion of the contents herein, provided proper author, title and publication credits are given.

Membership dues for Washington Apple Pi are \$18.00 per year, beginning in the month joined. If you would like to join, please call the club office or write to the office address. A membership application will be mailed to you. Subscriptions to the Washington Apple Pi Newsletter are not available. The newsletter is distributed as a benefit of membership.

Current Office hours are:

Mon, Wed, Thu, Fri - 10 AM to 2:30 PM  
 Tue - 12:30 to 2:30 PM & 7 to 9:30 PM  
 \*Sat - 12 to 4 PM (meeting Sat only)

\* Note: This is a change.

# PRESIDENT'S CORNER

by David Morganstein

**MEMBER SURVEY.** There is a need for the WAP to contact a sample of members regarding their background and interests. This membership survey will serve two purposes. First, it will guide the board and more active volunteers toward programs which have wide appeal. Finding out what the membership wants of the WAP is particularly important as we continue to grow. Most Board meetings are attended by few non-officer members, so suggestions from others are limited to our monthly meetings or phone contacts.

Second and of equal importance, a survey can be used to convey to Apple Computer, Inc. that members of user groups are "just plain folks", similar to the general consumer of their product.

At a recent meeting sponsored by Apple, over one hundred user group officers were assembled to discuss the //e. During this meeting it became apparent that Apple perceives user group members to be substantially different from their typical consumer. (Unfortunately, in a not altogether flattering way...) It is to Apple's credit that they were willing to foot the bill to bring this group together, just as they funded the beginning of the IAC several years ago. (A beginning which, unfortunately, has suffered from a lack of continued attention.)

Based on what may be their renewed interest in groups like ours, Apple may come to realize through user group member surveys, that our views are particularly relevant in assessing nation-wide product acceptance. This acceptance is, as we all know, critical in their life and death struggle for survival in the personal computer market.

**OFFICE USAGE.** During a two week period in early March, 90 people visited the Office. Members can purchase library disks, use the library and copying equipment (photocopying, that is), make a group purchase or contribute some volunteer help to assemble the monthly magazine mail-out. Several SIGSS are arranging to meet there, as well. Stop by!!!

**A LIBRARIAN'S JOB IS NEVER DONE.** A few words of deep appreciation are in order for our head librarian, Gordon Stubbs, and his second in command, Dave Weikert. As our public domain library has crossed the one hundred disk mark, their monthly efforts to insure an adequate supply of disks have increased. The availability of disks at the office is yet another challenge which they are meeting. Many thanks to you two and your other helpers. While the club continues to turn over much of the reproduction of disks to an outside business, just keeping track of the orders and needs for disks remains a near herculean task.

**TUTORIALS.** Steve Stern has arranged sever-

al valuable tutorials in the next few months. These tutorials will focus on specific software products which appear to be used widely. Please examine the registration form at the end of the magazine for details.

**COMPUTER CAMP.** Last year a program for younger members out of school for the summer was proposed. This program might consist of five consecutive mornings of a two-hour course on the Apple. Are there any members who would have the 15 or so hours needed to arrange and present such a program? If so please contact Steve Stern, Bob Wood or me regarding your interest.

**NOMINATING COMMITTEE.** Believe it or not, it is time to assemble a new list of candidates to direct the WAP for another year. To do this a few members are needed for a nominating committee. If you want to be on the committee or if you want to suggest someone (who is willing to participate) for office, please contact any of the Executive Board members.

**BUDGET.** Along with elections comes the preparation of a budget. Please write or call in your suggestions for budget items. If you desire, attend the planning meetings that will be held to discuss what services should be made available.

Preliminary discussions contained the following thoughts:

- video projector to improve the monthly meeting presentations
- a second full-time staff member
- donating microcomputer equipment and time to hospitals or schools (PTAs)
- assembling video tapes on computer literacy
- preparing educational TV broadcasts on the use of microcomputers
- a circulating library
- group purchasing a computer servicing contract for the entire membership from a "reliable" repair service
- buying a "classroom" full of used Apple II+s for an expanded office
- type-setting the magazine
- paying for services such as tutorial instruction or preparing special in-depth publications on topics of wide interest

Your comments on these suggestions and others of your own are sought by the Board. Call or write. The survey mentioned earlier may be used to obtain a broader reaction.

contd. on pg 27



# MINUTES

## FEBRUARY GENERAL MEETING

The general meeting of Washington Apple Pi, Ltd. was held on February 19 at 10 AM. USUHS rules were reiterated concerning arrival time, parking spaces, and use of underground pathways. Bob Platt will be the New Disk Librarian. Thanks to Jill and Vance Giboney for their work in this area. A table will be available before meetings to swap library disks for donated software (new) or corrected library disks. Volunteers were requested for the March panel presentation on word processors and topics to be covered were solicited. In the Group Purchase report it was reiterated that all business will be handled by phone or at the office, not at the meeting. New products were presented. The new member packet under development was discussed. It will include a manual describing the club and a disk with club software and will be available for a nominal fee to all members. The 2800th member was announced - Bill Kutz. A short presentation was made on what types of IRS deductions are possible. The main presentation was by Tom Riley on hardware interfaces.

## BOARD MEETING SUMMARY

The Executive Board of Washington Apple Pi, Ltd. met at the club office on March 9 at 7:30 PM. The agenda included: copyright protection of software library, attaining further non-profit status, establishing a nominating committee, projecting budget acquisitions for next fiscal year, use of office and library, upcoming Boston Applefest, meeting programs, another "garage sale", ABBS expansion equipment, sponsoring a summer camp, new member materials, possibility of club sponsored hardware repair or diagnostic service.



Tom Riley at APPLE PI, FEB. 19

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# TREASURER'S REPORT

The following balance sheet and status of budget performance are taken from the records of Washington Apple Pi Ltd.

WASHINGTON APPLE PI LTD.  
Balance Sheet  
December 31, 1982

## ASSETS

Current assets:		
Cash	\$18,137.53	
Insured CD's	60,000.00	
Inventories	13,257.30	
Imprest Funds	375.00	
	<u>          </u>	\$91,769.83
Other Assets:		
Deposits		700.00
Equipment		2610.52
		<u>          </u>
		\$95,080.35
		=====

## LIABILITIES AND FUND BALANCE

Accounts Payable	\$0.00
Dues Received for Future Benefits	16,041.00
Fund Balance	79,039.35
	<u>          </u>
	\$95,080.35
	=====

WASHINGTON APPLE PI LTD.  
Budget Performance  
Seven Months Fiscal Year 1983

	Seven Months End 12/31/82		
	Pro-forma Budget	Actual	Variance (pf-act)/pf
REVENUES:			
Dues	25,200	21,150	-.16
Group Purchases	90,585	76,446	-.16
Library Sales	19,833	21,024	.06
Advertising	5,600	6,919	.24
Other	14,920	6,890	-.54
Total	<u>156,138</u>	<u>132,429</u>	<u>-.15</u>
EXPENSES and COSTS:			
Newsletter	23,917	16,262	-.32
Office Expenses	13,833	1,455	-.90
Cost of Group Purchases	77,000	63,208	-.18
Blank Disks	12,833	8,403	-.35
Taxes	11,667	4,973	-.57
Other	8,904	12,696	.43
Total	<u>148,154</u>	<u>106,997</u>	<u>-.28</u>
Excess of Revenues Over Costs and Expenses	<u>7,984</u>	<u>25,432</u>	<u>2.19</u>
	=====	=====	=====

## CONGRATULATIONS TO THE MYERSONS

The Treasurer's Office has a new assistant. Her name is Laura Amelia Myerson, and she reported for duty on March 16, weighing in at 6 lbs. 9 oz. and measuring 21 1/2 in. Presently, her main duties are sleeping and eating, but just as soon as she can boot VisiCalc....



# IAC CORNER

by Bernie Urban

By now many of you have heard from your representative or from representatives of other clubs who attended Apple //e Day(s) in Santa Clara on March 4-7. This most welcome special event, funded almost exclusively by Apple Computer, Inc. provided IAC an opportunity to meet together with more than 70 IAC club representatives from the U.S., Canada, Australia and Europe.

Apple management and staff gave attendees a close look and hands-on view of the new //e. Much information not yet available at your dealers was provided to each participant. More on this in the WAP newsletter later. We also viewed and operated the LISA briefly on Saturday night in San Francisco. All in all - a most pleasant and informative time for which we say, "Thank you, Apple Computer, Inc., one and all." Would that we could do this annually...

The IAC Board, Officers, Staff and I were particularly overjoyed with this event because it enabled us to attach faces to names of individuals with whom we have been dealing by phone or letter over three+ years of IAC's existence. This meeting, more than any of our special or annual meetings or Applefests, gave our representatives the chance to meet with each other, to compare notes on their activities, their problems and needs, on how well (or poorly) we were doing, and what they thought should be our priority concerns. Those attendees who could or were scheduled to stay on through Monday met on Sunday for approximately seven hours to discuss their concerns and to prepare feedback to the IAC representatives. This was delivered at length the next morning. Out of all of this I developed a list of 39 items (problem areas and suggestions). One chief concern voiced by many was that the clubs viewed IAC as a top-down organization, i.e. one which pontificated ideas and services from Santa Clara and provided little opportunity for the member clubs to participate in the formulation of policies, projects and services. They were asked to name two or three items from their extensive list which they thought were high-priority and which could begin the process of dispelling that top-down image. This is what they suggested:

- A club-oriented newsletter to be prepared by the clubs which would include information on club incorporation, organization and operation. Proposals on how this may be accomplished are forthcoming. Your contact person on this project is John Wrenholt of the Big Red Apple club in Nebraska.

- A special workshop to be given at IAC's next annual meeting (which will probably be held in conjunction with the next Applefest in Boston in May). The major theme of this workshop is the same as for the club newsletter - how to organize local

clubs and how to publish and continue the publication of a local newsletter. Your contact for this project is David Lingwood of Call-A.P.P.L.E. in Washington.

- A request to Apple Computer, Inc. for access to their survey forms which had been used by Apple to get a statistical profile of their customer base. It was pointed out that any results of a survey by IAC of its member clubs could be more readily compared to Apple's results if the same survey forms were used. One possible outgrowth of this would be the insights gained by Apple as to the true composition of user group members. Currently many representatives feel that Apple considers user groups to be comprised of hobbyists and hackers rather than a cross-section of Apple's entire customer base of business persons, professionals, educators, scientists, engineers, etc. Your contact person for this project is David Morganstein of the Washington Apple Pi here in the DC area.

The remaining items will be parceled out to various IAC Board committees and officers and staff for their review and recommendations. Hopefully, we shall be able to report favorably on most, if not all of them, at our Annual Meeting.

Now that we've begun, let's try to maintain the momentum. To those of you who didn't attend, I express my personal regrets. Funding limitations prevailed. One item which came out of the IAC Board meeting was the initiation of the concept of regional meetings. We intend to reapportion our Directorships within the U.S. and abroad. This will happen in late Spring and will result in regions of far smaller size, which may permit the budgeting of IAC funds for annual regional meetings. &

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# EDSIG NEWS

by Peter Combes

## EDSIG Calendar

Tuesday, April 5th at 7.30 p.m.

"Programming for the Junior School" by Jerry McSpadden. Jerry has vast experience of teaching at schools of all types, and will explain and demonstrate his own new program series for teaching language arts.

Tuesday, May 2nd at 7.30 p.m.

"Who is Karl the Robot?" - an innovative approach to teaching programming, explained by Paul Keller.

All EDSIG meetings are held in Lecture Room A, Building A, of the Uniformed Services University of the Health Sciences, on the campus of the National Naval Medical Center, 4301 Jones Bridge Road, Bethesda, MD.

## Meeting Reports

Tuesday, March 1st at 7.30 p.m.

Languages for Education - Brian McLaughlin.

"Choosing a language can be like a religious experience - you are buying into a way of life."

Brian McLaughlin is a frequent speaker at EDSIG, and once again presented a complicated subject with great clarity, leading us through the "alphabet soup" of computer languages.

APL is a language of extraordinary power for special uses. It can express complex mathematical relationships very elegantly.

Smalltalk is an "actor based" language, developed largely at Xerox by their Learning Research Group. Technologically it is far in advance of the field, and the Apple Lisa was heavily influenced by Smalltalk. Each "actor" has things it can do, and this would lend itself to a multiprocessor environment, avoiding the "Von Neumann bottleneck" of current computers, especially micros. However, Smalltalk is still in a confusing experimental stage, albeit with some tantalizingly impressive demonstrations.

Lisp is heavily used in the Artificial Intelligence community, and is a grandfather of Logo. Its methods will become very relevant to education as we move away from CAI. It is not good for computation, however, and can be hard to decipher.

Forth is a "threaded, interpretive language" and is very good for development work, but Brian would not recommend it as a teaching language.

C "It is very hard to tell what is going on, but this could turn out to be the winner." It is currently very popular in the minicomputer field - you can write operating systems in it - and it is asso-

ciated with the Unix operating system. It lets you get "closer to the machine" than most other languages.

ADA was developed by the Defense Department. It is a "high level Pascal" and is very complex.

Modula II was written by the writer of Pascal, and could possibly turn out to be Pascal's replacement.

Fortran is still around, and is still very good for scientific computing. However, it is being challenged by other languages.

COBOL also survives, and is mainly for business computing.

PL/1 is a language that "tries to do everything", but its success is arguable.

Pascal is Brian's favorite, for both writing and teaching. Although it looks complicated to the outsider, there is in fact not a lot to learn. It is best with programs involving data structures. It embodies the ideas of structured programming, dividing programs into logical chunks, thus encouraging good programming. Standard Pascal is not very good at using strings (as we do a great deal in education), and I/O can be difficult. It is being implemented on almost every computer, though transportability can be a problem because of the various extensions, such as attempts to solve the string problems. The new Advanced Placement Course is in Pascal.

Pilot is a high level language designed to help teachers write CAI. It is simple to learn and can be taught easily. It is good for a teacher who knows his subject well, and wants to write a program to teach it to others. Logically, it leads to an authoring language, like TICCIT. Brian believes that we are in great need of a language like this, because we are short on both software and programmers. While it makes it easy for the neophyte to write acceptable CAI, Brian believes that the results are frequently "under stimulating" educational experiences. Complex programs can be slow to execute.

LOGO In the current Apple implementation, the key feature is the turtle graphics. These encourage the user to play and make and solve problems of his own design. It stimulates good programming techniques.

BASIC is currently under attack from professional programmers. Seymour Papert and others are openly contemptuous of BASIC, calling it the "Spaghetti Language". Certainly, BASIC is not the language of choice for writing large programs, but it is universally available. Many of its shortcomings date back to the days when memory was very expensive, and BASIC was simplified as far as possible. Now, however, BASIC is evolving to be more structured - as also is Fortran.

contd.



# FOR CONSUMERS

## A CONSUMER WORKSHOP FOR COMPUTER BUYERS

Saturday, May 21, 1983

L. Morganstein Consultants is offering a workshop for people who are THINKING of purchasing or who HAVE purchased any brand of computer and who want answers to some of the following questions:

- o What do I want to be able to do with a computer?
- o How do I select a computer? How do I know what I need?
- o How do I select software? How do I know what I need?
- o How do I go about purchasing a computer, and where?
- o How should I approach a dealer to purchase a computer?
- o How do I cope with a dealer who doesn't give me the help I need once I've purchased the computer?
- o What if I'm unhappy with my computer - what do I do?
- o What can I expect of a computer dealer; what if I have complaints?
- o Where do I go for help in learning more about my computer and how to use it?

This workshop will focus on helping you analyze your needs in the computer area, and on giving you some skills and knowledge to get those needs met. It will be held at the Sheraton-Potomac Inn on Shady Grove Road, in Rockville, Md. The workshop will contain two sections, each will have a fee of \$25.00:

Session 1. 9:30 AM - 12 NOON. Focusing on a needs analysis for people interested in purchasing a computer.

Session 2. 1:00 PM - 3:30 PM. Focusing on after-purchase problems.

The workshop will be taught by David Morganstein, President of the Washington Apple Pi Users Group, and Linda Morganstein, Computer Consultant and Assertion Skills Trainer.

Enroll me in \_\_\_ Session 1. and/or \_\_\_ Session 2. of the Consumer Workshop for Computer Buyers. Enclosed is a check or money order for the appropriate fee.

Name \_\_\_\_\_ Work Phone \_\_\_\_\_  
 Address \_\_\_\_\_ Home Phone \_\_\_\_\_

Mail to: L. Morganstein Consultants  
13424 Walnutwood Ln.  
Germantown, Md. 20874  
(301) 972-4263

# SPRING COURSES

1. AN INTRODUCTION TO THE APPLE: MICROCOMPUTER FUNDAMENTALS  
 April 9 and 16, 9 am. to 12:15 pm.  
 Including: Binary, Hex and Ascii systems  
 Bits, Bytes, nibbles, rams and roms  
 The Memory Map and the Monitor  
 Basic Programming  
 The Disk Operating System - memory usage, the Catalog, VTOC and DOS

AND

2. APPLESOFT BASIC PROGRAMMING  
 April 9 and 16, 1:15 to 4:30 pm.  
 Including: The BASIC Language, variables and program control  
 Input and Print  
 Limitations and Restrictions  
 Reading and Writing Files, EXEC'ing  
 Graphics, Music and Miscellaneous  
 Changing Program Control

The courses will be held on two consecutive Saturdays, April 9 and April 16 at the Washingtonian Hotel on Shady Grove Road in South Gaithersburg. There will be a limit of 20 participants at each course. Both courses will be taught by David Morganstein.

If you wish to attend one or both courses, please fill out the form below. Enclose check or money order made out to L. Morganstein Consultants for the appropriate fee. You will receive confirmation of registration and a list of suggested articles to read within two weeks. Mail form to:

L. MORGANSTEIN CONSULTANTS  
13424 Walnutwood Lane  
Germantown, MD. 20874  
(301 972-4263)

NAME \_\_\_\_\_ HOME PHONE # \_\_\_\_\_  
 ADDRESS \_\_\_\_\_ WORK PHONE # \_\_\_\_\_  
 \_\_\_\_\_ WAP # \_\_\_\_\_

I will/will not bring and be responsible for an Apple, Monitor and Disk Drive. If I do not bring a machine, I understand that I will look on with someone who does.

pls. ck. \_\_\_\_\_ Intro. to the Apple \_\_\_\_\_ Applesoft Basic  
 Each course - with computer- WAP member \$45. Nonmember \$60.  
 without computer " " \$60. " \$80.

Why do we teach programming in schools, when the languages we use may be obsolete in ten years or less? Brian replies that learning programming is "good in itself", and provides an endless supply of problems for the student, inevitably improving his general problem-solving ability.

#### Forthcoming Events - Dianne Lorenz

##### COMPUTER CAMPS for CHILDREN

##### Camps in the Washington Area:

1. Computers and the Arts: A Unique Summer Experience. Electronic Learning Facilitators in conjunction with the YMCA is offering a day camp in Bethesda for children ages 6 - 14. Computer programming, computer generated art and music, traditional art and music, and varied sports activities including swimming and tennis form an integrated full day program. Two week sessions beginning June 20. Call 493-9696 for additional information.

2. TIC Computer Camps - Open to children ages 7-16 for two-week sessions, June 24 through August 19, 1983, from 9 am to 3:30 pm daily. Campers may sign up for two, four or eight weeks. Programming in Logo, Basic and Pascal, allowing for a great deal of choice guided by competent instructors sensitive to individual needs. Contact Karen Rosenbaum, 241-5542.

##### Sleep-Away Computer Camps:

Contact the organizations below for the specific locations of camps for the summer of '83.

1. Atari Computer Camps - Department TLT, 40 East 34th Street, New York, NY 10016. (800) 847-4180.

2. Computer Camps International - 310 Hartford Turnpike, Suite D, Vernon, Conn. 06066. (203) 871-9227.

3. National Computer Camps - PO Box 585, Orange, Conn. 06477, (203) 795-9667.

4. The Original Computer Camp - 1235 Coast Village Road, Suite G, Santa Barbara, Calif. 93108. (800) 235-6965.

##### COMPUTER COURSES and WORKSHOP

##### COMPUTERS for CHILDREN:

1. Electronic Learning Facilitators (ELF) - Classes in programming in BASIC (ages 10 and up) and in LOGO (ages 6 - 12) for beginning and continuing students. Parent/child classes in both languages. Classes meet after school and in the evenings. Bethesda. 493-9696

2. Hands-On Science - Computer programming on the Atari for children ages 6 and up in addition to various science offerings. Silver Spring. 649-6921

3. Learning Works - 'Computers for the College Bound' - a new course in programming for high school students. BASIC I and LOGO I for children. Bethesda. Call 657-4488.

Mary Mullins - Classes in BASIC I and II, LOGO I and II, and junior word processing for children. Classes meet once a week after school. Northwest Washington. Call 537-0226.

##### Courses for Adults:

1. Electronic Learning Facilitators (ELF) - 'Getting Comfortable with Computers' - an introduction to microcomputers and the use of popular software packages - and BASIC programming for adults. Bethesda. 493-9696

2. L. Morganstein Consultants - Two courses for April: Fundamentals of Microcomputers - understanding the Apple and An Introduction to BASIC programming. Two consecutive Saturdays. Computer Consumer Workshop - how to deal with dealers. Gaithersburg. 972-4263.

3. Learning Works (657-4488) and Open University (966-9606). Many speciality classes in computing in addition to programming.

4. Montgomery College - Community Services - 'Fundamentals of Computing', special applications software for home and business, programming. Rockville. 279-5206.

##### SPRING CONFERENCES and WORKSHOPS:

1. American Association for Higher Education. March 27-30. Washington Hilton. Washington, DC. Campus computing, teleconferences, and other computer-related workshops for teachers and administrators. Call 293-6440.

2. 61st Annual CEC Convention. April 4-8. Detroit, Michigan. Sessions focusing on special education technology. Contact: Council for Exceptional Children, 1920 Association Drive, Reston, Va. 620-3660.

3. 31st National Science Teachers Association National Convention. April 7 - 10. Dallas, Texas. Seminars and workshops on the use of computers in science teaching. Contact: Priscilla Locke, NSTA, 1742 Connecticut Ave., Washington, D.C. 20009. 328-5800.

4. Second Annual New York Computer Show and Software Exposition. April 14 - 17. Nassau Coliseum, Long Island, NY. Thousands of different kinds of peripherals and accessories plus publications, support services, and an array of software of every conceivable application. APPLEFEST. Anaheim, CA. April 15 - 17. Same format, different location. Contact National Computer Shows, 822 Boylston St., Chestnut Hill, MA. (800) 343-2222.

5. Microcomputers in Education in the Coming Decade. April 16. Lincoln Center, New York City. Discussions of LOGO, CAI, software development, and computer implementation. Contact: Dr. Toby Tetenbaum, Fordham University, 113 West 60th St., New York, NY 10023. (212) 841-5591.

6. Ed Com/Spring '83. Washington, D.C. April 28 - 30. Contact: Judco Computer Expos, Inc., 2629 North Scottsdale Road, Suite 201, Scottsdale, Arizona 85257. (800) 528-2355.

# GROUP PURCHASE POWER

by Richard Wasserstrom

## Group Purchase Catalog

Many of you have asked for a list of Group Purchase items. Soooo..by popular demand:

### Printers

- Dot Matrix
  - Epson MX-80, FX-80, MX-100, and Graphtrax+ kits for older Epsoms
  - NEC 8023
  - Okidata Microline 92, 93
- Letter Quality
  - NEC 7700 and 3500 series
  - TEC F10

### Printer Interfaces

- Epson
- Interactive Structures Pkaso

### Monitors

- Zenith ZVM-121 green
- Amdek 300 green or amber
- Amdek Color I, II, or III
- USI P1, P2, or P3 green or amber

### Disk Drives

- Micro-Sci A2, A40, A70, Apple III drives and controllers for all

### Joysticks and Paddles

- TG Joysticks and Paddles

### Ram Cards

- Legend Industries 64K and 128K cards and related software
- AB Computer 16K card

### Modems

- Novation Apple Cat II
- Hayes Micromodem

### Eighty Column Cards

- ALS Smarterm II
- Videx Videoterm and related products
- Micro-Sci 80 column card with 64K memory with or without Magic Wand II, Magic Word, and Magic Calc. (for Apple //e)

### CP/M Cards

- ALS Z-Card and CP/M Card
- PCPI Applicard

### Software and Misc Products

- Verbatim Data Life diskettes (plastic boxes)
- Happ Electronics Game Port Extender
- Nibbles Away II
- The Accountant and DBcalc
- LKJ Letter Perfect (limited to stock only.)
- Wildcard (limited to those on hand)

### New Products

You will note that the list above contains several new products including 80 column cards from ALS, Videx and Micro-Sci, CP/M cards from ALS and PCPI, the Hayes Micromodem, and new printers from Epson and TEC. The new Epson FX-80 is well known, but you may be wondering about the F10 from TEC. The is a 40 CPS, letter quality, daisy-wheel printer which is manufactured by TEC and distributed under other names in the United States (e.g. "Starwriter"). The TEC F10 comes with either a parallel or serial interface as well as a six month warranty. Incidentally, all Epson printers available through the Group Purchase program also

have a six month warranty. Both the Epson and TEC extended warranties are serviced by our supplier on a depot basis.

### Group Purchase Participation Policy

The Group Purchase program is a benefit of WAP membership. Accordingly, you must be a member to take advantage of this program. Moreover, the program is limited to the personal, non-business use of WAP members. Please do not ask to purchase items for your friends, for your business, or for other organizations.

### New Group Purchase Pickup Policy

In response to numerous requests, we have expanded the number of items members may purchase at the WAP office without having placed an order through the group purchase phone. These include all the items which were previously available at monthly meetings such as: blank diskettes, disk drives, 16K cards, game port extenders, and the few software items listed above. I will try to keep enough items on hand to satisfy demand.

6

## **dBASE II\*** **BUSINESS APPLICATIONS** **SEMINAR**

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**ADVANCED** Business Programming - For Experienced Programmers.

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# HOW TO USE WAP LIBRARY DISKS

by Robert C. Platt

(Ed. Note: This description of the use of our WAP library disks will soon appear in the New Members Kit. We thought it might be of interest to our "old" members.)

New Apple owners will find WAP Library disks easy to use. The following tips will help you get the most out of your library disks. Library disks come in four separate formats, and different procedures must be used for each type of disk.

## DOS 3.3 DISKS

(Disks 100 through 195 and Disk EDSIG1 are all in DOS 3.3 format.)

With the exception of Disk 133, you can use these disks by placing them in Drive 1 when turning on the machine. The first program executed is usually called HELLO. The HELLO program displays the title of the disk and usually shows the catalog of the disk as well. The HELLO program on most of the recent disks are written in Applesoft BASIC. However, earlier disks (e.g. up to Disk 101) have HELLO programs written in Integer BASIC. If you try to boot such disks without first loading the Integer Basic interpreter, you will get an error message.

Recent disks also contain binary files with names like INSTRUCTIONS. To read such documentation files, type "BRUN INSTRUCTIONS" and then use the arrow keys to scroll back and forth through the file.

## DOS 3.2 DISKS

(Disks 1 through 40 are written in a 13 sector per track format, which was built into Apple disk drives sold before August 1979. Most Apple disk drives are now capable of reading 16 sectors on each track, but can still read the old format disks with special adapter programs.)

Most new Apple owners cannot read DOS 3.2 disks without using the special programs distributed on their DOS System Master Disk. The MUFFIN program described in Appendix K of the DOS Manual, will read files from a DOS 3.2 disk and transfer them to a DOS 3.3 disk. If you do not want to keep a separate copy of the DOS 3.3 version of your WAP library disk, you can use the BASICS diskette. Insert BASICS in your Drive 1 when you turn on your Apple. In about 5 seconds the screen will say, INSERT YOUR 13-SECTOR DISKETTE AND PRESS RETURN. You can then boot up your DOS 3.2 WAP library disk from Drive 1.

## PASCAL DISKS

(Disks 300 through 309 use the UCSD Pascal System disk format. You must have 64K of RAM memory and the UCSD Pascal System to run these disks.)

Each disk contains a documentation file named PIG6.DOC.TEXT (where the number is different for each disk.) To read the documentation on the screen, enter the Filer and type T and then "PIG6:PIG6.DOC.TEXT,CONSOLE:". To print the file type "PIG6:PIG6.DOC.TEXT,PRINTER:".

Many programs include commented source code and also a separate TEXT file with documentation. To run a program when a CODE file is included, type X from the Command menu and enter the name of the file. (Do not type the .CODE suffix. If the CODE file is not included on the library disk, enter the Filer, type G and the name of the program, quit the Filer and type R from the Command menu.

## CP/M DISKS

(Disks CPMSIG01 through CPMSIG04 have programs which execute under the CP/M operating system. A special circuit board with a Z80 microprocessor chip is required to run these programs.)

Our library disks do NOT include a copy of the CP/M operating system. To use these disks you must first boot CP/M from one of your own disks which contains the operating system. When you see the A> prompt, insert the library disk. Each library disk has a file of general documentation named CPMSIG01.DOC (or whatever the disk's number is.) To list this on your screen, type "TYPE CPMSIG01.DOC" and use CTRL-S to halt the scrolling of the listing. For a printed listing, type "PIP PRN:=CPMSIG01.DOC".

The following convention is used in naming CP/M disk files. The name of documentation files end with DOC. Executable programs end with COM, and source programs end with ASM, BAS or PAS, depending upon whether they are in Assembly Language, BASIC or JRT Pascal. These endings are called "extensions."

In order to save disk space, some of the files on the CP/M Library disks have been recorded in a special compressed format. These files have a Q as the middle letter of their extension. For example, file TED.DQC is a compressed version of file TED.DOC. Before a compressed file can be used, it must be expanded into regular format by running USQ-15.COM from disk CPMSIG02.

To execute a COM file, type the name of the file (without the COM extension) at the > prompt.

# WASHINGTON APPLE PI SOFTWARE LIBRARY

by Robert C. Platt

(Ed. Note: This article will soon appear in the New Member Kit. Present members may find it useful.)

The purpose of the WAP Software library is to furnish WAP members with a variety of software at minimum expense. The library contains utility programs that can be used as part of larger applications, programs traded from other clubs, and most important of all, programs which members have written to serve their own needs.

As of February 1983, our DOS library contains 15 utility program disks, 19 game disks, 16 EAMON adventure games, 3 business disks, 6 math/science disks, 6 graphics/music disks, 4 education disks and 20 others. Our library also distributes 9 disks in Pascal format and 4 CP/M format disks.

You can obtain these library disks in two ways: either by purchase or by donating a disk of programs to the library. Our library has grown to its present size by the continuing contributions of our members, and we welcome your donations.

**DONATION PROCEDURE:** Prepare a disk with any programs that you wish to share with the club. Did you just write a program to keep track of your kitchen recipes? We want it! Have you computerized your jogging logbook? We need it! We will also welcome programs typed from magazines, provided that the programs are not copyrighted. (Nibble and some other magazines which are selling disks with each issue are now copyrighting their programs.) If you did not write the entire program yourself, please let us know its source. If possible, include a text file with documentation on the program's use.

You can submit your disks at our General Meetings to the New Disk Librarian who will give you a voucher which can be traded in for a library disk of your choice. You need not "fill up" a disk before you contribute it. We are asking each contributor to complete a simple form which gives WAP the right to distribute your programs.

**PURCHASES:** You can buy library disks in person at either the WAP Office or before the General Monthly Meetings. Please pay by check. Each issue of the WAP Journal also has a mail order form (subject to a \$2.00 per disk postage and handling charge.)

**ERRORS:** Although every programmer attempts to write perfect programs, bugs tend to turn up when the public uses a program in ways which its author did not test. In general, WAP cannot guarantee the quality of its library programs. (What did you expect for \$5?) However, we would appreciate reports of errors and any known fixes. (Remember debugging another's pro-

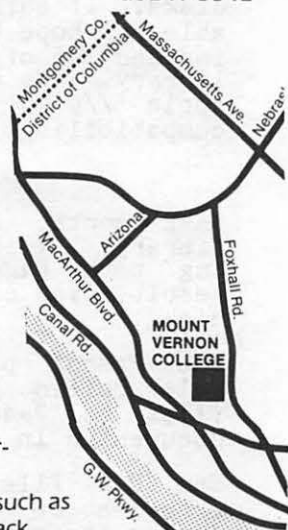
gram is a great way to learn new programming techniques.) Please send a note to the New Disk Librarian at the WAP Office and include the name of the program and the number of the disk and the exact nature of the bug. We will try to contact the program's author. If you propose a correct fix to an unreported program bug, we will reward you by trading your patched version for a library disk of your choice.

**FUTURE DIRECTIONS:** The WAP Library has reached its present size and quality through the efforts of a large number of members. With your support, the library staff hopes to continue to improve the software library in a number of ways. First, we hope to improve the level of documentation for each disk and to index our library by subject matter. Second, we hope to obtain more quality disks through trading with other clubs. Third, we are experimenting with distributing commercial-quality software through extra charges (See Diversi-DOS on disk # 130). Finally, we are in the process of converting our oldest disks to run under DOS 3.3. Please join us in these efforts.



## TIC Computer Camp

call Karen Rosenbaum  
at 241-5542



TIC Computer Camp is for any boy or girl 7 to 16 who is interested in computers.

Programming in LOGO, BASIC, and PASCAL; computer literacy instruction

athletic activities such as soccer, softball, basketball, track, tennis, aerobic dance, and gymnastics will be offered to each camper

# A PAGE FROM THE STACK

by Robert C. Platt

As Jill and Vance Giboney pop from the librarian stack to their new home in Canada, WAP sends its thanks to them for supervising our library disk program during a period of remarkable growth. They are a tough act to follow.

## ERROR REPORTS

In an effort to improve the quality of our existing library disks, we seek error reports from our users. Two types of errors can arise. First, bugs can creep into our disks during the copying process, so that in some cases a Basic program might not be able to be listed. These can be fixed by correcting the master disks which are used to generate copies. The second type of errors are programming mistakes which are not caught at the time the programs are originally placed in the library. If you have debugged or improved a library program, please contribute it (and receive a library disk in exchange.) We will then reissue the library disk with a new version number. Error report forms will be available at our monthly meetings and at the Club Office to help us share information on known bugs and fixes.

## VOLUNTEERS

I welcome your help in improving the library. Of primary importance are your contributions of new programs. The library needs application programs as well as utilities. So, review your handiwork and send in your programs for organizing your kitchen recipes or computerizing your jogging logbook. You will receive a free library disk in exchange for every disk you donate.

I also need help in documenting library disks. If sufficient volunteers are available, I hope that we could publish a well-indexed set of documentation for the entire library. We also need a volunteer with an Apple //e who could test programs for //e compatibility.

## DISK 133 - IAC 20

Last month, we added Disk 133 to our library. This disk is a "hybrid" containing both Pascal and DOS 3.3 files. As a result, you cannot boot DOS 3.3 from this disk.

The Pascal programs on this disk are Dr. Wo's Puffin program for converting DOS files to Pascal, which was previously documented in the Sept. 1981 WAP Journal.

The DOS files on Disk 133 include good examples of both assembly language and Applesoft programming. ADDRESS SEARCH by Harry Jones, LOGIC, Toronto Canada will list all locations in a range which have a given two byte value. This routine is useful for disassembling machine language

programs because you can find all locations which branch to a given address in memory. To use, type BRUN ADDRESS SEARCH.OBJ, which will load the routine and set the control-Y vector in the monitor to access the routine.

APPRIINT is a utility to help capture Applesoft programs in text files for listing or editing with word processor programs.

BENCHMARK will calculate all prime numbers from 1 to 1000 by an inefficient method which tries all possible divisors. Although there are faster ways to find prime numbers, this program can be used to test the speed and efficiency of compilers.

CANYON RUN - COLOUR and CANYON RUN are two versions of a space ship game. Game paddles are required to steer the ship through a canyon course.

DISK FREE SPACE displays the free sectors on a disk in a graphic chart.

FASTBOOT CREATE will modify a slave 48K DOS 3.3 diskette so that it will automatically load INTBASIC if a language card is present. (Will it work on a //e?) It uses its own version of DOS called FAST.RWTS which is supposed to be faster than the normal DOS BLOAD routines.

HELLO CRAE/APA allows the Co-resident Applesoft Editor and the Applesoft Programmer's Assistant to be in memory at the same time. You must obtain each of these programs before you can use this utility.

HYBRID HUFFIN is a modified version of Dana Schwartz' program for transferring Pascal files to DOS disks. This version will work on hybrid disks such as Disk 133.

LAPLACE INVERSION is for those WAP members who have completed four semesters of college level calculus and enjoy hi-res graphs.

MORSE CODE by Bobby Deen sends randomly selected characters in Morse Code over the Apple's built in speaker. You can select code speeds from 5 to 60 words per minute.

The disk also contains several assembly language source programs compatible with the DOS TOOLKIT assembler.

# THE SCREENWRITER II WARM LINE by Peter Combes

As I was writing this, an elegantly dressed gentleman with a wooden leg and a patch over one eye waved a skull and crossbones flag at the monitor while hissing in my ear, "I hear ye be searching for the legendary ScreenWriter ][ Foreign Characters, me hearty! Watch this now!" He prodded his cutlass at the keyboard of the Apple and POKEd 44505, 234 and 44506, 234. When he cataloged a new ScreenWriter ][ disk, strange signs and wonders began to appear on the screen. Suddenly there was a roar of cannon outside, and he left through the window, followed shortly thereafter by his parrot. A message left behind in a bottle said, "When ye replace ye olde DOS in ScreenWriter ][ by ye high speed DOS, ye may eliminate some of the I/O errors that ScreenWriter ][ gets by accessing the disk too quickly...."

On a more mundane level, it seems that On-Line is beginning to forget the original features of ScreenWriter ][, nee SuperScribe ][. I was surprised to receive several calls asking how you put ScreenWriter ][ into a 70 column display mode in Editor. Surely the ability to display 70 columns without extra hardware is one of the great selling points of ScreenWriter ][ - it must be on Page One of the manual in very large type..... No, it is not - it is tucked away on page 51, under "Screen Tabs"! For the record, you can get a seventy column display on your Apple ][ or Apple ][ Plus when in the Command mode of the ScreenWriter ][ Editor by typing "70c". If you wish, you can have a display 43 characters wide, or 52 characters, by typing "43c" or "52c". The same character set is used for all displays between 41 and 70 characters wide.

# Do you want the #1 Seller or the #1 Financial System?

FEATURES	The Home Accountant™	The ACCOUNTANT Finance Data Base System™
Transactions Per Disk	1000	2000-4000
Number of Codes	1	63
Automatic Transactions	25	900
Number:	Once a month	Unlimited
Double Entry	NO	YES
Accounting Background Required	NO	NO
Accommodates Any Type Transaction	NO	YES
Transaction Retrieval	One at a time	Screen at a time
Backdate Transactions	NO	YES
Ability to Interrupt While Printing	SOMETIMES	ALWAYS
132 COL PRINTER REQUIRED	YES	NO
NUMERIC FORMATTING	292661	292,661.42
Optional VisiCalc Interface	NO	YES
PERFORMANCE		
Startup to Transaction Entry	113 sec	44 sec
Begin Printing Balance Sheet After Entering Transactions	162 sec	1 sec
Begin Printing Transactions After Entering Transactions	106 sec	2 sec
RATING		
Peeling II evaluation	C/D	A
PRICE		
APPLE II Version	\$75	\$129
IBM PC Version	\$150	\$195

## MONEY MAGAZINE - Nov. 1982

"Among bookkeeping programs, earns high marks and is easy to use."

## CREATIVE COMPUTING - Jan. 1983

"The documentation is thorough, easily read, and complete."

"The program is so easy to use that rarely will reference have to be made to the manual."

## SOFTALK - Jan. 1982

"For the home user (and perhaps in some less complex small business), the best package we evaluated was The ACCOUNTANT by Decision Support Software."

"The ACCOUNTANT does, indeed, make financial management a simple and straightforward procedure."

## INFOWORLD - Jan. 3/10, 1983

"Complete flexible financial data base package for the home user."

"... exceptionally fast. ... highly recommend."

## PEELING II - MARCH 1983

A magazine of Apple software and hardware evaluation. "Rated A... a good buy."

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# INTRODUCTION TO APPLESOFT 1.

by David Morganstein

At recent meetings, we have found that about 1/4 to 1/3 of the attendees are brand new-comers to the Apple. There seems to be substantial interest in getting started in programming with Applesoft. We will try a few installments of an introductory column and look for feedback from the members. This column will be little different from what can be found in a number of commercially available texts but may be a gentler approach than buying such a book and committing yourself to its study.

## Computer Languages.

In the beginning there were only the bits and the bytes. To use a computer you needed to be a very sophisticated student of the art of programming. You needed to know all about registers and the transferring of data from locations through registers back to locations. You had to understand binary arithmetic and the meaning of a "carry". While that knowledge will help you get more out of your Apple, it is not needed to write programs to balance your checkbook, maintain mileage statistics or record and recall your recipes.

As to the choice of a language, BASIC is not considered to be the best language available. It is not "structured"; it lacks several very valuable grammatical and applications features which other languages have. However, its comes with your Apple and is very easy to learn to use. You might say, the price is right...

## Variables.

Before we discuss the form of a BASIC program, let's talk about something more elementary: numbers and letters, the data we want to massage. Most problems that you want to solve require that you enter, manipulate and display numbers or letters. The former are needed for computing while the latter are involved in text applications such as mailing lists and data bases.

To enter data into a BASIC program, you give a "variable name", followed by an equal sign followed by the information. BASIC has three types of variables, two for number and one for text information. The form of the names is similar, it consists of a letter and, optionally a second letter or a number. Additionally, a "\$" is included to indicate that the variable is to be used to hold text information while a "%" indicates the number is an integer between 0 and 255. If neither symbol is included, the variable is an "unrestricted" number. (That's in quotes because nothing is totally unrestricted...more later.)

For example, "A" is one name of a variable (for a number) as are "A1" and "AZ". Thus you can see that there are 26 (one letter) +26\*10 (one letter and one number) +26\*26

(two letters) possible names for number variables. That may sound like a lot (or may sound like a little) to you. Unfortunately, the two-letter limitation makes the use of helpful names difficult. Given the choice between PROFIT and PR, you would no doubt find the former a more helpful alternative. In fact, you can use more than two characters to form a name, but be careful. BASIC does not check beyond the first two characters so that PROFIT and PROBLEM will be the same variable PR. As to the number of variables, it turns out that you can, in fact, store many more variables in a BASIC program using something called an array. We'll get to that subject later.

To store the number 14.5 in the variable named "A" you would enter:

```
A=14.5
```

Why don't you try this directly from the keyboard. Similar examples for text information and for integer numbers (between 0 and 255) are:

```
A$="HELLO" and  
A%=100
```

Try some other example with the letter/letter and letter/number versions.

```
B5=45.6  
ZZ=-456.78
```

What do these variable names mean? They are actually memory addresses set up by BASIC. More specifically, they are pointers to addresses into which are put the bit patterns representing the numbers or letters which you want to enter, manipulate and display. Fortunately, these important functions are all being done by BASIC.

As a note, in the good old days, you had to be responsible for establishing which addresses held which information as well as for converting the data entered into the bits to be stored, as well as performing the bit manipulations which massaged the numbers, etc. Thank heavens for "higher level languages"! However, knowledge carries with it greater power and someone who is familiar with all of the bit-stuff may be able to do things in a faster or more memory efficient way.

From time to time we will point out how knowledge of the inner workings may be helpful. Perhaps this will be an incentive to dig a little deeper into the innards. For now, be assured that when you type "A=10.3" the name "A" actually appears in a memory location (in a coded form) which identifies where the "10.3" is stored. When working with numbers, reusing the variable name merely causes the contents of the previously established locations to be changed. In the case of string (text)

contd.

variables such as "Z7\$", a whole new set of locations are used while the old contents are left unchanged. This is, unfortunately a memory space waster and causes major problems when working with a lot of string data. Another subject for later discussion.

### Manipulating Numeric Variables.

It is well and good to enter data into a variable. What can we do with it? For numbers, all of the standard math operations (addition, subtraction, multiplication and division) can be used as well as a host of "functions". By function we mean something like taking the SIN or LOG of a number. When performing these operations you must supply a variable name into which the result will be put, an equal sign, and the operation. For example to add 2 and 2.2 you might say:

```
A=2
B=2.2
C=A+B
```

To take the LOG of 15 try:

```
D1=LOG(15)
```

### Displaying Variable Values.

To paraphrase Newton, "what goes in must come out" (which unfortunately is not always so in our computers...). To see the values resulting from the operations, we introduce a BASIC command: PRINT. This command, which can be abbreviated by you as a "?", is a work-horse since the value of computing would be nil without the ability to display the results. If you perform all of the above examples of entering strings and integers, use the "?" command to see the results.

```
?A$ should result in:
HELLO
```

and so forth. If you need to see more than one variable you can use several PRINT statements or you can include more than one variable in the "?" command. There are two ways to do this. The first way uses commas to separate the variable names (e.g. ?A,B,C) and the second uses semicolons (e.g. ?A;B;C). Try both ways and you will see the difference. The commas cause the value of the variable to be displayed in pre-specified column positions on the screen. The semicolon places them one immediately after the other.

If you want to add some text information to the display simply enclose the text in double quotes as seen in the following:

```
? "THE VALUE OF A IS ";A
```

You can include computations in the PRINT ("?") statement as well as individual pre-computed variable names. For example, to compute A times B you can use this expression:

```
? "A TIMES B IS ";A*B
```

Or to take the square root:

```
? "THE SQUARE ROOT OF 50 IS ";SQR (50)
```

To make the answers line up in columns other than those pre-set by the use of commas, you can include a "TAB (.)" in your print statement ala:

```
?TAB(10) A+B
```

to "left-justify" (i.e. line up the left-most digits) the output to column 10.

Unfortunately, Applesoft BASIC has no single command to right-justify (i.e. line up the right most digit) or to format the results of computations to the same number of decimal places. (Try PRINTing the SQRs of 49 and of 50.) For example, when working with dollar amounts, it would be nice to line up the decimal points, showing everything to the nearest penny. This can be done through string manipulation subroutines which you include in your program. We'll discuss a subroutine to do this in another session.

We will close this installment with a homework assignment. Define some numeric variables and manipulate them from the keyboard. Then print them out interweaving some text and using the TAB feature. In the next session, we will discuss string manipulations, the form of a BASIC program and a second command, "INPUT".

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# APPLE TECH NOTES

by Ed Schenker

Apple Tech Notes Update Number 1 has just arrived. I have selected some items from the section on Applesoft that I hope will help make your programming easier.

## 1) Disabling Reset

The Auto Start Monitor ROM allows the application program to retain control when the RESET key is pressed. The easiest way to take care of this is to have reset re-run the Applesoft program.

```
10 POKE 1010,102:POKE 1011,213:CALL-1169
20 REM
30 REM RESET WILL RE-RUN THE PROGRAM NOW
40 REM
50 POKE 1010,191:POKE 1011,151:CALL-1169
60 REM
70 REM THIS IS BACK TO NORMAL
```

## 2) Trapping Reset

A slightly more sophisticated way is to treat RESET as an error and vector it to an ONERR routine. Note: this is untested...

```
300:20 EA 03 JSR SWAP
303:A2 5E LDX #5E (an unused error code)
305: 4C 12 D4 JMP ERROR
```

This program treats a reset as a normal Applesoft error. Use the RESUME or CALL -3288: GOTO... to transfer control within your Applesoft program. This program will hang or give strange results if the user hits reset repeatedly. Again, be sure to restore the RESET vector at the end of the program.

## 3) Auto Run Byte

There is a byte in memory that will cause any Applesoft command entered from command mode to be interpreted as a RUN command.

```
POKE 82,213
SAVE
```

Will cause the auto-run-byte to be set when the program is loaded from tape. This "protection" scheme is very easy to defeat, and is not widely used. It does not protect the program from DOS commands.

```
POKE 214,128
```

will set the auto-run-byte from command mode or from within a program. But beware, there is no way to reverse this POKE from command mode because the next POKE will run the program.

```
POKE 214,0
```

from within a program will return the auto-run-byte to normal.

## 4) PRINT

The third comma tab field is only available

if there is nothing beyond column 23. The first character in the third comma field can print outside the text window.

HTAB can force the cursor outside the text window which can kill a program on the next PRINT statement.

VTAB ignores the text window. VTABing below the text window will cause all output to be on one line. VTABbing above the text window will scroll into the window but the area above the window won't scroll.

## 5) FRE(0)

PRINT FRE(0) will display the amount of memory available for Applesoft variables. This can return a negative number if there are more than 32767 bytes free. In that case, add 65536 to get the number of free bytes.

PRINT FRE(0) can blow the system if it is done in immediate mode immediately after loading a program from disk. Typing CLEAR before PRINT FRE(0) will solve this problem.

## 6) Monitor Move Routine

The MOVE subroutine in the monitor will not work directly from an Applesoft CALL because Applesoft doesn't insure that the Y register in the 6502 will be 0 which is necessary for MOVE to work. Here is a program which demonstrates a way around this problem:

```
10 DEF FN M(X)=X-INT(X/256)*256
20 POKE 768,160
30 POKE 769,0
40 50 POKE 771,44
60 POKE 772,254
100 REM DO THE MOVE
110 START=2000
120 QUIT=21000
130 DEST=30000
140 POKE 60, FN M(START)
150 POKE 61, START/256
160 POKE 62, FN M(QUIT)
170 POKE 63, END/256
180 POKE 66, FN M(DEST)
190 POKE 67, DEST/256
200 CALL 768
```

## 7) SHAPE TABLES

Applesoft will allow you to draw shape number zero with unexpected results. It will end up interpreting part of the shape table as the address of the desired shape and try to draw what it finds there. Since this isn't a shape table, the result is a random assortment of lines.

## 8) GET

Applesoft can present some strange results if the following program is typed in and run.

contd. on pg. 66

# MICROCOMPUTER- ASSISTED INVESTING

by Marvin Hass

Can microcomputers help the small investor? Various answers to this question can be given. Obviously, microcomputers can aid in recordkeeping. Even more important, microcomputers can be employed to retrieve stock prices and volumes on a periodic basis and plot such information on a chart. This can be helpful in making decisions on when to buy and when to sell a particular security. As an extension of this approach, various technical indicators based upon price and volume information have been proposed by some analysts and programs that even give automatic BUY and SELL signals are now available to microcomputer owners. Probably a safe answer to the question at the beginning of this article is that microcomputers are of potentially great value to those investors having existing well-defined strategies or who are capable of evolving their own approach. The casual investor might benefit to some extent, but should first consider becoming acquainted with some existing strategies.

At present there appears to be an increasing volume of commercial software programs available to investors with microcomputers, most of which are written for the Apple II+. These enable a variety of functions to be carried out including recordkeeping, stock price retrieval, charting of price and volume files, generation of technical indicators such as moving averages, comparison of the price behavior of several different stocks, and evaluation of prices of stock options. In short, the user can become inundated with a wealth of data and analysis. The effective utilization of such information is another question and one which is still in its infancy for the individual investor. It should be pointed out that information of this nature has been available to the professional investment community for years with mixed results.

In any case, there appears to be a great deal of interest in the application of microcomputers by small investors. As a means of facilitating exchange of ideas and information on this subject, a STOCKSIG is under formation in WAP. Those members who wish to join may contact Marvin Hass at 751-4737 or Robert Wood at 893-9591. Initially, various members of the STOCKSIG will demonstrate investment software that they are familiar with and discuss other aspects of potentially rewarding subject. &

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# COMPUTERS AND INCOME TAXES

by Roy Rosfeld

YES, VIRGINIA, THERE ARE TAX DEDUCTIONS FOR YOUR COMPUTER.

Many of you have expressed interest in tax deductions with respect to the use of your computers. As I promised last meeting, this article will be an attempt to enlighten you a bit more on the subject. It is not intended as a scholarly treatise, simply because of space limitations, but more as an introduction to stimulate you into doing more research on the topic.

In my thirty plus years with the Internal Revenue Service, I do not believe that I have ever seen the tax laws so complicated. As Benjamin Franklin once said, "There are only two things that are certain - death and taxes!" To which I might add, "But then death doesn't get worse every time the Congress meets!"

There are three major questions you need to ask. First, what do you use your computer for? Second, what deductions are available for you to use? And third, do you need to allocate usage between personal and "business" use?

As with any tax deductions, you must first demonstrate that you use your computer in one of several ways before you are entitled to deductions. Rather than bore you with technical Internal Revenue Code sections, I will refer to them generically. There are two basic types of deductions - those for business use - and those for use in the production of income. The first typically would be using the computer in your business - lawyer, doctor, small businessman, etc. The second, for such things as preparing your personal tax returns, as an employee in connection with your employment, as an active investor, as an educational tool, or as an executor or trustee receiving commissions for your services. The first category is fairly self-explanatory. If you use your computer in your business, there are tax deductions. The second is not that clear. For example, use as an employee does not necessarily guarantee deductibility. You must demonstrate that its use is either a requirement of the job or that it is of such great assistance not available from your employer that you use it. As an executor or trustee, you must demonstrate that you receive income before the deductions are allowed. This follows the basic principle that tax deductions are allowed when they are incurred in the production of income.

I will leave to your personal research what uses you put to your computer. The major distinction between the two basic categories is that the "business" use is deductible from your gross income in arriving at your adjusted gross income, whereas the second category is only deductible from your adjusted gross income as an itemized deduction. What this means, in essence, is

that if you are in the second category and do not itemize your deductions on your return, you cannot take any deductions. Very quickly, if your total itemized deductions do not exceed \$2300 if single or head of household, \$3400 if married filing a joint return, or \$1700 if married filing a separate return - you should not worry about itemizing since you are given those amounts up front.

So much for how you use the computer. Let's look at the deductions you are allowed. They are basically:

1. Depreciation
2. Investment Tax Credits
3. Full expense write-off

## DEPRECIATION

Since 1981, the tax laws provide for what is known as the accelerated cost recovery system (ACRS) for depreciation purposes. Under this system you are permitted to use either the tables provided which give you an accelerated writeoff, or elect the straightline method. Under either method, the usual time frame for a personal computer is 5 years (if you can demonstrate a shorter life, you can use it, e.g. computers used for research and development typically have a 3 year life). The allowable amounts are computed by using the following percentages:

	Accelerated Method	
	5 yrs	3 yrs
Year 1	15	25
Year 2	22	38
Year 3	21	37
Year 4	21	
Year 5	21	

One point you need to be aware of - under either accelerated or straightline, you can only take one-half depreciation for the year in which you put the computer into service. Note that this means that whether you put it in service on January 1st or December 31st, you only get one-half of the depreciation deduction that year. The feature is calculated in the above tables (e.g. first year computation for 5 years is 20% times 150% double declining method - or 30% - 1/2 year is 15%).

## INVESTMENT TAX CREDIT (ITC)

This is more complicated. There is one set of rules for 1982 and another for 1983 and later years. First, for 1982, use Form 3468 to compute your credit. If you use a 5 year life, list the basis (typically cost) times 100% (60% for 3 year property) to arrive at the ITC. (There are some limitations which are personal to your situation. See Part V of the schedule for these.) For example, suppose you paid \$5000 for your system, then your ITC would

contd.



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be \$500 if you have a 100% usage factor. If you allocated as discussed below, you would need to make the same allocation to the ITC - e.g. if 50% used for tax purposes, then take \$250 of the above amount.

For 1983 and later years, it is even more complicated. You have the option of two methods:

1. You can take the traditional ITC as outlined above but you must then deduct 1/2 of the ITC from the base before you apply the depreciation rates. E.g., suppose you have the same \$5000 system and take the ITC of \$500 - you must then subtract 1/2 of this amount from \$5000 and depreciate the remaining \$4750.

2. You can take an alternate ITC of 2 percent less than the regular method (for 5 year property - 8%) and you are not then required to make any deduction before depreciating the computer.

As you can see, this gives you the option of taking a large ITC in the first year but depreciating less in later years, or of taking a lesser ITC in the the first year and depreciating the whole cost. The option is yours; take a look at Form 3468, Part II, where it refers to the sec. 48(q) election to reduce credit instead of adjusting basis. Please note that if you are a fiscal 1982-83 year filer - this applies to you.

#### EXPENSING THE COMPUTER AND OTHER THINGS

Congress - in its infinite wisdom??? - recognized that all of the above is just too complex for many people, so it created a new section of the law to give you an election to write off as expense up to \$10,000 of certain assets which would otherwise have to be capitalized. There are only two requirements - that the property otherwise qualify as recovery property as defined in the ACRS rules - and the property has to meet the definition of property eligible for the investment tax credit (even though the ITC is not allowable if the property is expenses). The dollar limitation is phased in as follows:

Taxable year beginning	Tax limitation
1982 - 1983	\$ 5,000
1984 - 1985	7,500
1986 - on	10,000

If you don't want to be bothered by calculating the ITC and the depreciation, expensing may be more to your liking. Let me make it clear that if you take an expense writeoff you cannot also take an investment tax credit.

#### ALLOCATION PROBLEMS

Unless you have your computer in an office or business environment, it is unlikely that it is used exclusively for business or income producing purposes. Most of us have our computers at home, where the kids bang away at them, or where we do our personal budgeting and other such things. Accordingly, you will in all likelihood have to make some kind of allocation. The allocation

is similar to that made in the use of a personal automobile, except that with a computer it is more difficult since you don't have any "mileage" to use as a guide. While it may be cumbersome, it would probably be prudent to keep some kind of log of the actual hours you (or someone) uses the computer, with categories for the kind of use being made of the computer. I would suggest you keep a log during several periods of time during the year to obtain a representative sample of use. Be sure to include representative times, such as those times during the summer when the kids may be banging away on the games more frequently than in the winter. By averaging, you will be able to get a pretty good picture of your typical use. Since the use of computers has exploded recently, there are few guidelines. However, it would seem reasonably safe to conclude that an allocation based upon a ratio of "business" hours use to actual use would pass muster. However, I would point out that in the case of a home office, the government was sustained, under prior law, in requiring an allocation for business use of a room in a residence that was only partially for business based upon hours of business use to the total number of hours in the week. In my opinion (hope my malpractice insurance covers this statement), this analogy would not be applicable to the computer use. At any rate, be aware that you need to keep some kind of records or be prepared to explain just how you used your computer during the year.

#### SOME TRAPS FOR THE UNWARY

There are two areas you need to be aware of. The first is probably not too important (and if you come under this you probably have a tax advisor to help you). This is the minimum tax computation for the use of accelerated depreciation. I will not dwell on this other than to mention that it exists. The second is the recapture of investment tax credit if the property is not held for the full period (e.g. 5 years). For eligible property, there is no recapture if the property is held for the full period. But, if the property is disposed of in less than the full period, the credit must be redetermined as if the actual holding period had been used to determine the amount of the credit, and any excess must be recaptured as income. If the property is disposed of before the end of the 3 year or 5 year period, a 2% credit will be allowed for each full year that the property was held. For example, if \$10,000 of 5 year recovery property is placed in service on January 2, 1982 and is sold on January 3, 1984, a full 10% credit (of \$1,000) could be claimed in 1982. However, the early disposition would result in a recapture of \$600 (6% of \$1,000). The remaining \$400 would not be recaptured since the property was held two full years and a 4% credit is not subject to recapture.

#### WHAT IF I BOUGHT MY COMPUTER BEFORE 1981?

If you are NOT one of the "oldtimers" who bought a computer system before 1981, you can skip this paragraph and go on to the next.

contd.

All of the above information applies to computers purchased and put into service on or after January 1, 1981 - these are known colloquially as the ERTA rules (for Economic Recovery Tax Act). If you purchased and put into service your computer before that date, you have to follow the prior law. I am assuming that there are a few of you "oldtimers" out there and I don't want to leave you out, so here are a few notes for you. You can depreciate your computer over the useful life of the property under either the life you could establish for your usage, or under the Treasury Department's guidelines - typically the same 5 year period. The same investment tax credit recapture rules apply except that 100% of the credit claimed must be recaptured.

Note, however, that the new rules apply to any peripherals obtained in 1981 and later.

OKAY - all you "young" computer owners - back to the text.

#### WHAT ABOUT SOFTWARE?

Although the rules are fairly clear with respect to hardware, they are not so with respect to software. Disks are supposed to last for long periods of time, but as we all know they do not. Programs may become obsolete or may just plain break down. My recommendation would be to write off your software and disks as expenses (remember above - you can take up to \$5,000 this year?) and not worry about depreciation or investment tax credits. If you are purchasing more than \$5,000 worth of software or disks, you probably need a tax advisor anyway.

Remember the allocation discussion? I would deviate from the allocation in the software area in this respect. There are some programs or disks that you may use for 100% or close to that, for business purposes and others that fall into general usage. Keep accurate records of what you have and the use it is put to. For example, if you have a word processing package that you use fairly exclusively for business, a 100% writeoff is probably in order. I use mine for wills, contracts, and such documents almost exclusively so I wrote off the cost of the package last year. VisiCalc and similar templates are also the type not too often used personally (except for your budget perhaps). If you have education packages for the kids, they (the software, not the kids) are strictly personal and not deductible.

Other items you should remember to expense include printer ribbons, paper, and similar type items used in the operation. These are not capital type items and can be expensed as you buy them. Remember to keep good records.

#### WHERE DO I LEARN MORE ABOUT THIS?

The IRS has several good free publications available that are very useful in preparing your return. Publication 17 is probably one of the best on the market (and being free is even better); Publications 572, Investment Credit; 534, Depreciation; and A

Tax Guide for Small Businesses. They are available at your local district director's office or by calling the IRS on a special number for "Forms" - see your local telephone book.

#### CONCLUSION

I have tried to inform you in a general way and to stimulate your thinking about the subject. If you have any serious complicated questions, you would be well advised to seek the counsel of a good tax attorney or accountant - it may well be to your financial advantage. While my profession is as a tax lawyer and time for lawyers is money, if you have questions of a brief nature, I would be glad to try to field them. In the meantime, good luck with your taxes!!!!

## DEALERS CORNER

Tri State Systems is running a special on word processors starting on March 26. The address is P.O. Box 2314, Alexandria, VA 22301, (703) 569-9363.

New & Used Computer Exchange is featuring an inventory clearance of software and hardware - bargains while they last. The address is 11484 Washington Plaza West, Reston, VA 22090, (703) 471-0305.

President's Corner contd. from pg 4

#### VOLUNTEERS NEEDED.

● Arrangements: Our able arrangements chairman, Jim Carpenter, would like to expand his committee to at least two. If you live near the USUHS and/or are familiar with hardware related to hooking the Apple into the video displays at USUHS, please call Jim.

● Speakers: We are planning panel discussions on the following topics: graphics packages, spreadsheet packages; and telecommunications packages and services. If you would like to participate in these panels please contact me through the office.

● Apple Teas: A coordinator for the Apple Teas is needed. If you would like to do this or to hold an Apple Tea at your home, call the office. If you need an "expert" to lead the discussion, indicate this as well.

● Indexer: Is someone interested in assembling an index of our WAP articles? Such a project would serve many and not be overwhelming. We could supply a copy of back issues beyond what you may already own.

Please give me a call if any of the above strike your fancy.



# THE BOTTOM LINE

by Leon H. Raesly



Well, here it is time to write another article. I cannot believe that I am really doing this. When I read through our magazine (it has grown to be much more than a newsletter!) and see all these highly qualified articles on Peeks (I used to think that Peeking was what a voyeur did!) and Pokes, I wonder about the value of such an article as this to our members. Does anyone out there ever read any of these? How about dropping me a line care of WAP and let me know what you like or don't like? I am still trying to collect information on the uses of VisiCalc by our members, so how about including that on your note?

Memory - 48K, 16K, 128K. "How much memory do I have?" An area of some confusion to most of us. In terms of Business and Professional use of an Apple this question is often very important. "K" is a shorthand notation for 1000, so that a 48K machine would be able to store 48,000 characters in its memory. Let me ask you a question: which machine has more memory available to the user (that's you and me!), a 48K Apple, or a 64K PET? The answer is the 48K Apple. And understanding why is a beginning at unravelling some of this memory confusion.

Let's start with a couple of basic definitions. RAM stands for "Random Access Memory" and ROM stands for "Read Only Memory". Now in the "Great Memory Battle" (GMB, hereafter) the hardware manufacturers (the people that brought us the Apple, or Disc drives, etc.) are referring to RAM when the quote that an Apple is a 48K machine. An Apple has its Basic language in ROM, where it doesn't take space in RAM. So you have 48K RAM available for your use. Well, not quite, since most of us have at least one disk drive, we must also have a series of commands to operate the disks. This is called the Disk Operating System (DOS). In an Apple this takes approximately 10.5K. So our 48K Apple has about 36K available to us users. Again, not quite. Any time you use a program (rather than using the Apple in the immediate mode, which not many do) this program takes additional space. While programs can be any size, I will use VisiCalc as an example. That program uses approximately 12K of the RAM that is left after we deduct the space for the DOS. So when I wish to place data into VisiCalc, I have approximately 24K of potential data memory. Quite a step down from the supposed 48K!

Now to continue the explanation of how an Apple with 48K could have more user memory than a 64K PET, the key is that the PET (at least the earlier version that I am familiar with) loads its Basic language from a disk. While this has some advantages, it has one glaring disadvantage. It takes RAM memory. The particular PET that I used had 20K needed for its Basic language. Thus reducing available RAM to 44K. The DOS for that PET took 12K, leaving only 32K for

program and data. When VisiCalc was loaded, it reduced the final data usage RAM to 20K, so that the smaller memory Apple has more usable memory to us, the users, than the apparently larger PET!

From this naturally derives the question, "How can I get more RAM?" Aside from rebuilding your Apple, there are two primary ways to do it. Both involve a purchase of a RAM card of some brand. Unfortunately, simply plugging a RAM card into the Apple does not give you more memory. Something else has to be done first.

The simplest way would be to get back the space used by the DOS. We have a program in our WAP Library to relocate DOS onto a 16K RAM card in slot 0, if you have one. It resets all the things it is supposed to, to allow the user to "recapture" the memory "stolen" by DOS. So for SOME programs you can gain extra memory with this program. However, for most commercial programs that are not copyable by COPYA (and this is probably 99%), you cannot use this. There are also commercial programs that you can purchase to move DOS, but the same limits apply. If you must "boot the program" with a PR#6, it will reload DOS into its old location, and take you back to DOS in motherboard memory!

Another difficulty with a purchased program, even if you can get it to operate with a RUN command, is that it must be listable. Most operating programs store their data in either arrays or matrices, and these are usually dimensioned within the program. So even if we were to have more RAM available, the programmed limits (dimensions) of these arrays or matrices would still limit the usable memory, unless you could list the program, locate the dimension statements, and determine how the original programmer was using them, and then redimension them. And from much experience I can assure you that there is nothing worse than trying to modify someone else's program. The entry level in Hell is an anteroom where programmers are required to modify somebody else's program!

Another difficulty with the RAM boards is that even if you attempt to write your own program, you generally can't store your program on the board (well, yes you can, but it is not really operationally feasible), and only certain types of data can be usefully (that's a key word) stored there. I thank Bruce Field for his talking with me on programming difficulties with a RAM card. The conclusions are mine, however, so don't blame Bruce!

An exception to this is VisiCalc, which checks to see if you have a RAM card in slot 0, and if you do, gives you the extra memory. If you look in the upper right corner of your screen at the "Memory Indicator" you will see that it says 35 if you

contd. on pg 29

# THE QUENTIN APPLE-MATE DISK DRIVE: An Evaluation

by Jim Kelly

The ad in last May's SOFTALK promised "more juice for your Apple". For the meager sum of \$335, "Special Introductory Price", one could have Quentin Research's Apple-Mate (TM) disk drive. It was "fully software transparent with Apple's Dos 3.3, among other things. So after wringing my hands for a month, I finally forwarded with great trepidation a check to Northridge, California. (Why are all the great price deals way out there?)

And then I sweated some more. I had never heard of Quentin Research. Would I ever see the disk drive. Would I ever see my \$335 again? After three weeks I nervously called Quentin. The girl there assured me that it would only take another week or so. Sure enough, a package arrived within a day or two of my phone call. I unpacked the drive and read the scant documentation. It essentially just said to plug the cable into the Apple controller card and use it. That's all it took!

My first drive is one of the earlier Apple Disk II's and is fairly noisy, especially when searching for a track. The Quentin drive is considerably quieter, although not as quiet as the newer Apple drives. On the other hand, the Quentin cable doesn't have the shielding tab that the newer Apple drives have.

Since July, when I received the drive, I have been happy with the drive. I have had occasional I/O ERROR messages, more than on the Apple drive, but have always been able to recover my data. I think this problem might be related to the construction of the door on the Quentin. It does not have the two metal fingers which push the disk in when the door is closed, as the Apple drive has. The door itself is supposed to do this on the Quentin since the disk sits further forward in the drive. But I don't think the action is as positive as on the Disk II, so you have to be sure to push the disk all the way into the slot. This seems to solve most of the I/O problems.

The Quentin drive is capable of 40 track operation. The Apple standard drives are 35 track. If you could use the extra five tracks, you could save more data on a disk, and in fact you can. The tracking is controlled by the DOS 3.3 software. The Quentin drive documentation tells you how to make the required changes in DOS but warns that disks initialized with this modification will not be compatible with standard DOS disks. They may also not work in the standard Apple 35 track drives. For this reason I have not tried using the 40 track capability.

Aesthetically the Quentin drive matches the other hardware pretty well. I do have one complaint, though. Although the front of the drive matches the Apple drive closely in shape and color, the case is about one

inch longer than the Apple drive. This is a minor problem, however, which will only bother very particular people.

My only other complaint is that I have recently seen the Quentin advertised by some mail order houses at considerably under the introductory price I paid, but then the prices of all disk drives seem to have fallen lately. There is a more extensive review of the Quentin drive in a recent inCider magazine. Ⓒ

Bottom Line contd. from pg 28

have a 16K board in slot 0, rather than 24 if you do not. So the key to expanded memory is really whether the program was written to use all those extra boards you might buy. With VisiCalc, there are at least two companies making extra boards that also have a "Pre-boot" program that you boot before you boot VisiCalc, and VisiCalc will then use the extra memory. The companies that I know of are Saturn and Omega - there are probably more.

For instance, I use a Microsoft 16K card in slot 0, and a Saturn 32K card in slot 2. With Saturn's program called "V-C Expand" I have 64K of VisiCalc data memory available. While this approach provides a solution with VisiCalc, we are all left with the dilemma for the other commercial programs. What it really devolves into is that each of us must either be very selective of the programs we buy to make sure that they will handle the amount of data we need (always a good policy!), or change to CP/M or Pascal, or we must all write our own programs! Ah well, the GMB goes on!

## BUSINESS SIG

The Business SIG was presided over by John New, who also presented the program. First he gave a review of several tax preparation methods, then described a VisiCalc program he wrote for commodities and stocks value tracing. Scheduled for our next meeting (after the main meeting, and probably located again in the cafeteria) is another fine program that John has arranged. I hope to see you all there. Thanks for listening.

The following information was provided by Eric and Ben at HLA, Inc. an Apple dealer in Beltsville (345-1123). Thanks for their help.

16K to 128K Boards and Visicalc Pre-boot  
Omega Microware, Inc.  
222 S. Riverside Plaza  
Chicago, Illinois 60606  
(312) 648-1944

16K to 128K Boards and Visicalc Pre-boot  
Saturn Systems, Inc.  
P.O. Box 8050  
Ann Arbor, Michigan 48107  
(313) 973-8422 Ⓒ

# LEARNING DISABILITIES AND MICROS

by Jay Thal

As if the Association for Children with Learning Disabilities (ACLD) conference (reported on elsewhere in this issue) didn't clearly show that micros have made it into the world of special education, the Council on Exceptional Children (CEC) sponsored a three-day conference which was devoted entirely to the Use of Microcomputers in Special Education. It was held in Hartford, CT on March 10 - 12.

The CEC, together with Johns Hopkins University, is co-sponsoring a contest this year for software designed for use in special education applications. Considering the limited amount of really good educational software such a contest should prove worthwhile. Substantial prizes will also encourage participation. For further information the CEC may be contacted at 1920 Association Drive, Reston, VA (703) 620-3660.

As you all know the micro is a remarkably flexible tool, the ability of which we have barely begun to explore. It allows us, "the normal", to extend ourselves beyond that which was previously conceivable. With the handicapped it provides a marvelous mechanism for them to reach out to accomplish things formerly undreamed of and reach into themselves so that their personal strengths, which have been obscured by the handicaps, can be used. So it is not unexpected that a publication designed to address the matter of computers for the handicapped would evolve. The publication is called CLOSING THE GAP, and is printed bi-monthly. It is a valuable resource and may be secured by writing CLOSING THE GAP, Route Two Box 39, Henderson, MN 56044. Subscriptions are \$15 yearly.

Several other resources are:

The JOURNAL OF SPECIAL EDUCATION TECHNOLOGY, a publication of Utah State University and the Association for Special Education Technology (ASET). An annual subscription (4 issues) is \$17 and may be obtained by writing the Journal, UMC 68, Utah State University, Logan, UT 84322. ASET membership, on the other hand, includes the Journal and monthly reports for \$25. ASET may be reached by writing P.O.Box 152, Allen, TX 75002.

The Handicapped Education Exchange (HEX). Contact: Richard Barth, 11523 Charlton Drive, Silver Springs, MD 20902, (301) 681-7372 (Voice), (301) 593-7033 (Bulletin Board, ASCII, or Baudot).

Technical Resource Centre, Alberta Children's Hospital, 1820 Richmond Road S.W., Calgary, Alberta, T2T 5C7 Canada. The Centre has a publication entitled Multi-Handicaps and Computers.

I have also received a public-domain program developed by Dr. Richard C. Katz which he calls CATS. CATS stands for Computer-

ized Treatment System for Chronic Aphasic Patients. Aphasia is a condition which results in a loss of the power to use or understand words, and while the program was designed for adult patients Dr. Katz feels that it is modifiable for younger patients. The program fills two DOS 3.3 disks and comes with 34 pages of documentation -- copies of which will be made available through the WAP Disk Library. For further information you may want to contact Dr. Katz at the Audiology & Speech Pathology Service, Veterans Administration Outpatient Clinic, 425 South Hill Station, Los Angeles, CA 90013.

As a final note for this month, this short book review of SPECIAL TECHNOLOGY for SPECIAL CHILDREN - Computers to Serve Communication and Autonomy in the Education of Handicapped Children, by E. Paul Goldenberg, University Park Press, Baltimore, MD, 183 pages, \$12.95. Published in 1979 it is somewhat dated technologically but still very much worth reading. Goldenberg describes early applications of Logo with children having cerebral palsy, autism, deafness and other perceptual problems.

The book's great worth is its message: computers are the tools which will allow people to reach into themselves, tap their strengths, and control their environment. Until now teachers/therapists have used techniques or prosthesis to make their students/patients develop towards some "norm". When the "norm" is not achieved it is not the technique which is generally discarded, but the student.

The computer, on the other hand, allows an almost unlimited potential for perceptual or motor distortions to be translated into a normal or functional mode, and vice versa. This translation can be made transparent for the user and further miniturization will make it portable and flexible. Goldenberg reminds us that we are surrounded by a large portion of our population that is severely and functionally handicapped but for a simple device which is so ubiquitous that we forget about it -- eyeglasses.

The eyeglass metaphor is striking. As Goldenberg says: "Unlike a tutor, eyeglasses have no agenda for the wearer...., yet they allow the wearer to do things that would otherwise be difficult, perhaps impossible... The computer extends and amplifies the abilities of the person with normal needs.... The important distinction between the tutor metaphor and the eyeglasses metaphor is the shift of emphasis from programming oneself to learning how to influence one's surroundings -- from focusing inward to focusing outward."

It should be noted that Goldenberg's most recent published endeavor has been authoring the vastly improved documentation of Terrapin's version of Logo.

# VISICALC AND INCOME TAX REVISITED

by Roy Rosfeld

Last month Tom Warrick presented an excellent approach to preparing an income tax template. I would like to add some comments to his program so that you can use the actual printout from your template for schedules to be filed with your return.

The Internal Revenue Service is very fussy about the kind of return data it receives. Accordingly, it has issued two Revenue Procedures to guide you in preparing computer-generated returns or facsimiles. They are Rev. Proc. 83-9, IRB 1983-6, 2/7/83, page 4; and Rev. Proc. 83-10, IRB 1983-10, 2/7/83, page 23. Both may be ordered from the IRS or you may go to your public library and copy them. They set forth very rigid guidelines which you should read carefully.

The Rev. Procs. include several exhibits of acceptable computer-generated formats for the schedules usually attached to the form 1040. If your computer-generated forms appear exactly like the exhibits, you do not need prior authorization to use them. I have included here two of the more common schedules: A, for itemized deductions; and B, dividends and interest. (The VisiCalc templates for these are available for copying in the WAP office.) To reiterate, if you use the exact format as in the exhibit, you can file the printout with your return and not have to fill out the printed form that comes with your tax package.

Do not include any state tax information on the federal schedules. It is okay to put such data on your template (to the right, preferably) but then print out only the federal data for submission to the IRS.

Let me reiterate that Tom Warrick's template is fine for planning and gathering data but is not acceptable for filing with your return. In addition, you must use either the actual form 1040 that is printed by the government or a photocopy of that form. Except under some rather esoteric guidelines, you cannot use a computer-generated form 1040. At any rate, unless you are doing this for a living, the effort to create an acceptable form is not worth the trouble and expense.

Again, good luck with your taxes.

contd.

\*\*\*\*\*

What you want at reasonable prices  
We sell: Blank disks (5 & 8 in.)

Software for education,  
word processing, business, and  
entertainment

Peripheral hardware  
(printers, RAMcards, 80 column  
boards, fans, joysticks, paddles,  
disk drives)

Accessories (files,  
library cases, books, RF modulators)

Call to find out what bargains are  
available, for example:

Word Handler II .....	150.00
Flip N' Files .....	20.00
Apple II covers .....	10.00
Epson MX-80 covers .....	7.00
Epson MX-100 covers .....	10.00
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C. Itoh Prowriter Printer ...	390.00
Verbatim diskettes (10 pack)	
SS/DD .....	25.00
DS/DD .....	35.00
Verbatim head cleaning kits ..	4.00
RF modulators	
SUP' R MOD .....	55.00
SUPER MOD II .....	30.00
The new Epson printer, FX-80,	
160 cps .....	550.00
NEC 8023A Printer .....	430.00
The MIND II computer (Apple	
compatible) .....	675.00
The MIND II Computer, one Quentin	
disk drive and controller card, BMC	
green screen monitor, <u>Elementary</u>	
<u>Apple, Beneath Apple DOS</u> ...	1095.00
Choose from a variety of Income Tax	
Preparation Programs..Call for Price	
Computer SAT by HBJ .....	52.50
APPLEsurance Diagnostic	
Controller Card .....	93.50
16K RAMcard .....	75.00

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UPS shipping \$4.00 extra  
Quantity Discounts Available

\*\*\*\*\*



SCHEDULE A (FORM 1040) ITEMIZED DEDUCTIONS 1982 \* 07  
 OMB NO. 1545-0074

JOHN Q. & MARY J. TAXPAYER SSN 000-00-00-0000  
 \*\*MEDICAL AND DENTAL EXPENSES\*\*\*\*\*00,000.00  
 1. MEDICINE AND DRUGS.....1. 0.00  
 2. 1% OF LINE 33, FORM 1040.....2. 0.00  
 3. SUBTRACT LINE 2 FROM LINE 1 (ZERO IF MINUS).....3. 0.00  
 4. TOTAL INSURANCE PREMIUMS FOR MEDICAL & DENTAL CARE...4. 0.00  
 5. OTHER MEDICAL AND DENTAL EXPENSES: 0.00  
 A DOCTORS, DENTISTS, NURSES, HOSPITALS, ETC.....5A. 0.00  
 B TRANSPORTATION.....5B. 0.00  
 C OTHER (LIST)  
 1ST  
 2ND - OR SEE STATEMENT XX.....5C. 0.00  
 6. ADD LINES 3 THRU 5C.....6. 0.00  
 7. 3% OF LINE 33, FORM 1040.....7. 0.00  
 8. SUBTRACT LN. 7 FROM LN. 6 (OR ZERO).....8. 0.00  
 9. 1/2 OF LINE 4 BUT NOT MORE THAN \$150.00.....9. 0.00  
 10. LARGER OF LINE 8 OR 9.....10. 0.00  
 \*\*TAXES\*\*\*\*\*  
 11. STATE AND LOCAL INCOME.....11. 0.00  
 12. REAL ESTATE.....12. 0.00  
 13A GENERAL SALES.....13A. 0.00  
 B GENERAL SALES ON MOTOR VEHICLES.....13B. 0.00  
 14 OTHER (LIST) - 1ST 0.00  
 2ND - OR SEE STATEMENT XX.....14. 0.00  
 15 ADD LINES 11 THRU 14.....15. 0.00  
 \*\*INTEREST EXPENSE\*\*\*\*\*  
 16A HOME MORTGAGE INTEREST TO FINANCIAL INSTITUTIONS...16A. 0.00  
 B HOME MORTGAGE INTEREST TO INDIVIDUALS (LIST) - 1ST  
 2ND OR SEE STATEMENT XX.....16B  
 17 CREDIT CARDS AND CHARGE ACCOUNT.....17. 0.00  
 18. OTHER (LIST) - 1ST 0.00  
 2ND 0.00  
 3RD - OR SEE STATEMENT XX.....18. 0.00  
 19 ADD LINES 16A THRU 18.....19. 0.00  
 \*\*CONTRIBUTIONS\*\*\*\*\*  
 20A CASH CONTRIBUTIONS UNDER \$3000.....20A. 0.00  
 B CASH CONTRIBUTIONS OF \$3000 AND OVER (LIST)  
 1ST  
 2ND OR SEE STATEMENT XX.....20B.  
 21 OTHER THAN CASH.....21.  
 22 CARRYOVER FROM PRIOR YEARS.....22.  
 23 ADD LINES 20A THRU 22.....23. 0.00  
 \*\*CASUALTY AND THEFT LOSSES AND MISCELLANEOUS DEDUCTIONS\*\*\*\*\*  
 24 TOTAL CASUALTY/THEFT LOSSES FROM FORM 4684.....24.  
 25A UNION AND PROFESSIONAL DUES.....25.  
 B TAX RETURN PREPARATION FEE.....25B.  
 26 OTHER (LIST) 1ST  
 2ND  
 3RD OR SEE STATEMENT XX.....26.  
 27 ADD LINES 24 THRU 26.....27. 0.00  
 \*\*SUMMARY OF ITEMIZED DEDUCTIONS\*\*\*\*\*  
 28 ADD LINES 10, 15, 19, 23 AND 27.....28. 0.00  
 29 FILING STATUS ZERO BRACKET AMOUNT.....29. NA  
 30 SUBTRACT LINE 29 FROM LINE 28.....30. NA

SCHEDULE B (FORM 1040) DIVIDEND AND INTEREST INCOME 1982  
 OMB NO. 1545-0074  
 JOHN Q. & MARY J. TAXPAYER SSN 000-00-0000

PART I INTEREST INCOME  
 INTEREST INCOME OTHER THAN ASCS

1. INTEREST INCOME FROM SELLER FINANCED MORTGAGE AMOUNT  
 NAME OF PAYER  
 2. OTHER INTEREST INCOME (LIST)  
 (1ST PAYER) (2ND PAYER) (3RD PAYER) (4TH PAYER) 5TH PAYER)  
 3. ADD LINES 1 AND 2.....3  
 INTEREST FROM ALL-SAVERS CERTIFICATES (ASCs)  
 4. 1ST  
 2ND  
 3RD  
 5. TOTAL OF LINE 4.....5  
 6. ASC EXCLUSION.....6  
 7. LINE 5 MINUS LINE 6.....7  
 8. TOTAL LINES 3 AND 7.....8  
 \*\*\*\*\*

PART II DIVIDEND INCOME

9. NAME OF PAYER  
 (1ST PAYER) (2ND PAYER) (3RD PAYER) (4TH PAYER) (5TH PAYER)  
 10. TOTAL OF LINE 9.....10  
 11. CAPITAL GAINS DISTRIBUTIONS.....11  
 12. NON TAXABLE DISTRIBUTIONS.....12  
 13. EXCLUSION DIVIDEND FROM PUB. UTILITY.....13  
 14. ADD LINES 11, 12 AND 13.....14  
 15. LINE 10 MINUS LINE 14.....15  
 \*\*\*\*\*

PART III - FOREIGN ACCOUNTS AND FOREIGN TRUSTS

16. DID YOU HAVE AN INTEREST OR A SIGNATURE OR OTHER AUTHORITY  
 OVER A BANK ACCOUNT, SECURITIES ACCOUNT, OR OTHER FINANCIAL  
 ACCOUNT IN A FOREIGN COUNTRY? (ANS)  
 17. WERE YOU THE GRANTOR OF OR TRANSFEROR TO A FOREIGN TRUST  
 WHICH EXISTED DURING THE CURRENT TAX YEAR WHETHER OR NOT  
 YOU HAVE ANY BENEFICIAL INTEREST IN IT? (ANS)  
 \*\*\*\*\*

# MATHEMATICAL SYMBOLS WITH WORDSTAR by Marilyn E. Jacox

If you use WordStar and need to print out Greek characters or other scientific or mathematical symbols, you may be interested in CHARTECH, a recently developed software package which causes the character immediately following a "PE" command to print out from the alternate character set. The output obtained using my Epson MX-80 with Graftrax Plus is shown below:

## CHARACTER CODES FOR SPECIAL CHARACTERS

Code	Char	Code	Char	Code	Char
!	,	A	↑	ˆ	̂
"	∂	B	Γ	a	α
#	∇	C	∫	b	β
\$	)	D	Δ	c	γ
%	∠	E	∫	d	δ
&	∑	F	Φ	e	ε
'	∂	G	Γ	f	φ
(	\	H	ℵ	g	χ
)	/	I	Γ	h	η
*	½	J	∫	i	ι
+	±	K	√	j	θ
,	¼	L	∧	k	κ
-	-	M	/	l	λ
.	·	N	\	m	μ
/	↑	O	°	n	ν
0	○	P	Π	o	ω
1	●	Q	⊙	p	π
2	□	R	±	q	⊙
3	■	S	Σ	r	ρ
4	△	T	†	s	σ
5	▲	U	‡	t	τ
6	◇	V	∇	u	υ
7	◆	W	Ω	v	ϕ
8	»	X	Ξ	w	ω
9	«	Y	Φ	x	ξ
:	≡	Z	∏	y	ψ
;	≈	[	∏	z	ζ
<	≪	\	X	<	ι
=	≡	]	J	:	ι
>	≫	^	↑	>	ι
?	¼	-	∫	~	~
@	∞				

You will recognize some of these characters as parts of larger ones, which can also be constructed using combinations of CHARTECH symbols with WordStar backspace, subscript, and superscript commands. Some of the possibilities are:

## COMPOUND CHARACTERS

BIG SUM ∑	MID SUM ∑	BIG INT ∫	MID INT ∫
PARENTHESES ( )	BRACKETS [ ]	BRACES { }	
SQRT (+ "2") √2	HALF 1/2		

If you have a Videx 80-column board with the Greek-math ROM chip installed, you can also see most of these symbols on your monitor screen.

If you have an Epson MX-80 with Graftrax Plus, CHARTECH makes it possible to code in the Epson underlining, avoiding the "down-hill" stepping which plagues WordStar underlining on this printer. Other print control strings can also be communicated to the printer from within WordStar.

Several other features are available, including the capability for designing your own characters and suroutines for the screen detection of superscript and subscript errors and of errors in parentheses.

At the present time, CHARTECH can be customized for use with the Epson MX-80 or MX-100 with either Graftrax 80 or Graftrax Plus, the Okidata Microline 84, the C.Itoh Prowriter, the NEC 8023, the Apple 8510 Dot Matrix Printer, and the new Diablo 630 Extended Character Set Printer, which has 192 characters on two concentric rings of one daisy wheel.

For further information contact Joel W. McClure, Techware, 2510 Cresta de Ruta, Eugene, OR 97403, (503) 343-0566.

## MINUTE MANUAL for APPLE WRITER II

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# VISICOLUMN: VISICALC STATISTICS

by Walton Francis

One of the little known abilities of VisiCalc and other spreadsheet programs lies in the field of statistics. Statistics is, after all, mathematical modeling plus a lot of tedious arithmetic, and as we all know, VisiCalc excels at both tasks. Indeed, in my view VisiCalc is of intriguing potential in exploratory data analysis and as a teaching tool for statistics. Moreover, while you can buy statistical packages for the Apple which avoid VisiCalc's few limits (see below) and which save you the trouble of building your own model, many of these packages have their own problems. All worthwhile ones, of course, cost serious dollars. For example, a good and relatively inexpensive package is Statistics with Daisy (reviewed in Peelings II in the May/June 1982 issue), but this software costs \$100. And the professional statistical packages for microcomputers, such as ABSTAT (CP/M), STATPRO, AIDA, and Blue Lakes, cost many hundreds of dollars. Why not "do it yourself" with VisiCalc?

## THE USES OF VISICALC FOR STATISTICS

Traditional uses of computers for statistical analysis require the entry of data into a "black box" computer program, which works its magic and produces an answer. VisiCalc, in contrast, requires the entry of the calculating algorithm and then enables the user to SEE both the results and the intermediate calculations, as well as to test the sensitivity of the results to alternative data and to alternative statistical tests. Thus, in a teaching context the student can see instantly how the standard deviation or the Chi-square changes if one value changes.

VisiCalc statistical applications are also, of course, of whatever practical value as is produced by any statistical program, whether it be predicting future sales or analyzing the results of a survey. For example, VisiCalc can readily be used for tabulation of survey results through use of its logical (Boolean) commands to distinguish between, say, male and female voters for candidate X in an election. An even simpler approach to tabulating survey results, based on the useful fact that the product of zero and one is zero, is presented in the VisiCalc Home and Office Companion by David Castlewitz.

So far as I can determine, VisiCalc can handle any small to moderate sized statistical application. A data base involving more than 254 items would require carrying subtotals to extra columns, but even several thousand items should be no real problem. A multivariate analysis involving 5 or more variables would require solving some fairly complex simultaneous equations, but solving equations is what VisiCalc was made to do. The real limits have to do with memory size and processor speed, and, of course, the user's ability to handle

algebra (it took me more time than I would care to admit to pore through my old statistics texts to create the application below). As for memory, a 64K Apple under VisiCalc will handle a data base involving several thousand items readily. Processing speed is also no real problem--one simply waits a minute or so, if necessary, for the calculation results of a big VisiCalc model. Even the algebra can be avoided if one of the models listed below will do the job for your particular application with little or no modification.

To test my hunch as to the simplicity of using VisiCalc for fairly complex statistics, and because none of the published articles I have seen deal with multiple regression, I created the model which accompanies this article. It requires 9 columns for three variables. Adding a fourth variable would require 14 columns, a fifth variable 20 columns in total, etc. At nine variables and two hundred plus entries for each (or eighteen variables and one hundred plus entries, etc.) the VisiCalc grid simply runs out of room, though your Apple will run out of memory first unless you have a 256K memory board. Even these limits can be avoided, however, by using consolidation techniques.

In fact, creating a multivariate model is surprisingly simple (provided one is well up to speed in the underlying formulas), with the hardest part lurking in the need to solve increasingly complex simultaneous equations.

## THE MULTIPLE REGRESSION MODEL

The model is presented at the end of this article in both template and formula versions. The template version includes row and column coordinates so that you can readily find the corresponding entry in the formula listing. Thus, the sum of the Y values appears in cell B16, and the VisiCalc formula for calculating this sum appears opposite B16 in the listing as "@SUM(B8...B14)", which means "sum the values in column B from row 8 through row 14 inclusive". As VisiCalc requires (unless you have a special utility), the formula listing is printed in reverse order--the lower right entries first and the upper left ones last.

I do not propose to explain the model in detail. Its logic is obvious to those versed in statistics and those less blessed will do better with an elementary text than I could hope to emulate. Nonetheless, a few points are of interest. First, even complex formulas become simple if one makes a few intermediate calculations. I planned to calculate the F statistic in a single formula but was so lost in parentheses I decided that for error control alone I had better calculate the reduction and residual sums of squares separately. Second, it

contd.

would have been easy, but for my lack of patience, to add as many additional statistical measures or tests as one might desire--T test, standard deviations, partial correlation coefficients, ranges, etc. Similarly, I didn't bother to enter a formula using the regression equation to predict Y values. Third, I used simple substitution techniques rather than matrix arithmetic to solve for the beta coefficient. Had the model used several more variables, some fairly complex matrix operations would have been required.

The model has been set up to be directly usable with any data set involving three variables. Type it in from the formula listing (or visit the club office and copy the disk I left there), skipping only the actual data entries for X, Y, and Z; supply your own data (using the row insert command on any line between 8 and 14 to accommodate as many entries as needed); recalculate; and every calculated result appears.

In setting up your own statistical models, use a "cookbook" rather than theoretical statistical text. I found my calculus laden econometrics texts virtually useless, but a little \$3.50 Government Printing Office publication called Elementary Statistical Methods for Foresters a necessity.

(Ed. Note: Walt suggests that one of you statistics whizzes expand and improve this model, now that he's got it started.)

### THE LITERATURE ON VISICALC STATISTICS

There have been quite a few VisiCalc models published which use regression methods or other multivariate statistics. The ones I know of are:

- The November/December 1982 issue of SATN contains two well explained statistical articles, "What Next?" covering least squares, correlation, and forecasting, and "Calculating Chi-Square".
- The May/June 1982 issue of SpreadSheet has an article on "Curve Fitting by Linear Regression".
- Doing Business with VisiCalc by Stanley Trost contains three models using regression techniques, "Sales Forecast", "Inventory Forecast", and "Quality Control."
- VisiCalc Home and Office Companion also contains a "Sales Forecast" model.

Most of these articles are or soon will be available in the club library.

There is also at least one VisiCalc utility program that promises statistical capabilities, V-UTILITY from Yucapa Software (714-797-6331). This \$100 program also contains many other VisiCalc utilities.

contd.



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*              graphical output.
*
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* TIME:       9:00 AM - 4:30 PM
* PLACE:      Key-Bridge Marriott Hotel
*              Arlington, Virginia
*
* INSTRUCTOR: Alan L. Breitler, Ph.D. a microcomputer
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VISICALC MULTIPLE REGRESSION TEMPLATE

```
>E39:(E37/2)/(E38/G38)
>D39:"IS:
>C39:"ISTIC
>B39:"F STAT
>H38:" DF
>G38:+G19-3
>F38:" WITH
>E38:+G23-E37
>D38:"IS:
>C38:"AL SS
>B38:"RESIDU
>H37:" DF
>G37:" 2
>F37:" WITH
>E37:(G29*G26)+(G30*G27)
>D37:" IS:
>C37:"ION SS
>B37:"REDUCT
>D35:(G29*G26)+(G30*G27)/G23
>C35:"2 IS:
>B35:"THE R^
>H33:"*Z
>G33:+G30
>F33:"*X +
>E33:+G29
>D33:" +
>C33:+G31
>B33:"Y=
>G31:+G20-(G29*G21)-
(G30*G22)
>D31:") IS:
>C31:"ERCEPT
>B31:"A (INT
>G30:((-G28*G29)/G25)-
(-G27/G25)
>D30:"T IS:
>C30:"FICIEN
>B30:"C COEF
>G29:((G26*G25)-(G27*G28))/
(G24*G25)-(G28*G28))
>D29:"T IS:
>C29:"FICIEN
>B29:"B COEF
>G28:+J16-((D16*C16)/G19
>F28:"S-X*Z:
>E28:"RODUCT
>D28:"M OF P
>C28:"TED SU
>B28:"CORREC
>G27:+I16-((B16*D16)/G19
>F27:"S-Y*Z:
>E27:"RODUCT
>D27:"M OF P
>C27:"TED SU
>B27:"CORREC
>G26:+H16-((B16*C16)/G19
>F26:"S-Y*X:
>E26:"RODUCT
>D26:"M OF P
>C26:"TED SU
>B26:"CORREC
>G25:+G16-((D16^2)/G19
>F25:"--Z:
>E25:"QUARES
>D25:"M OF S
>C25:"TED SU
>B25:"CORREC
>G24:+F16-((C16^2)/G19
>F24:"--X:
>E24:"QUARES
>D24:"M OF S
>C24:"TED SU
>B24:"CORREC
>G23:+E16-((B16^2)/G19
>F23:"--Y:
>E23:"QUARES
>D23:"M OF S
>C23:"TED SU
```

```
>B23:"CORREC
>G22:+D16/G19
>D22:"F Z:
>C22:"ALUE O
>B22:"MEAN V
>G21:+C16/G19
>D21:"F X:
>C21:"ALUE O
>B21:"MEAN V
>G20:+B16/G19
>D20:"F Y:
>C20:"ALUE O
>B20:"MEAN V
>G19:@COUNT(B8...B14)
>B19:"N:
>J16:@SUM(J8...J14)
>I16:@SUM(I8...I14)
>H16:@SUM(H8...H14)
>G16:@SUM(G8...G14)
>F16:@SUM(F8...F14)
>E16:@SUM(E8...E14)
>D16:@SUM(D8...D14)
>C16:@SUM(C8...C14)
>B16:@SUM(B8...B14)
>J15:" -----
>I15:" -----
>H15:" -----
>G15:" -----
>F15:" -----
>E15:" -----
>D15:" -----
>C15:" -----
>B15:" -----
>J14:+C14*D14
>I14:+B14*D14
>H14:+B14*C14
>G14:+D14*D14
>F14:+C14*C14
>E14:+B14*B14
>D14:36
>C14:700
>B14:80
>J13:+C13*D13
>I13:+B13*D13
>H13:+B13*C13
>G13:+D13*D13
>F13:+C13*C13
>E13:+B13*B13
>D13:32
>C13:600
>B13:70
>J12:+C12*D12
>I12:+B12*D12
>H12:+B12*C12
>G12:+D12*D12
>F12:+C12*C12
>E12:+B12*B12
>D12:34
>C12:500
>B12:70
>J11:+C11*D11
>I11:+B11*D11
>H11:+B11*C11
>G11:+D11*D11
>F11:+C11*C11
>E11:+B11*B11
>D11:37
>C11:400
>B11:65
>J10:+C10*D10
>I10:+B10*D10
>H10:+B10*C10
>G10:+D10*D10
>F10:+C10*C10
>E10:+B10*B10
>D10:37
>C10:300
>B10:50
```

```
>J9:+C9*D9
>I9:+B9*D9
>H9:+B9*C9
>G9:+D9*D9
>F9:+C9*C9
>E9:+B9*B9
>D9:33
>C9:200
>B9:45
>J8:+C8*D8
>I8:+B8*D8
>H8:+B8*C8
>G8:+D8*D8
>F8:+C8*C8
>E8:+B8*B8
>D8:36
>C8:100
>B8:40
>J7:" -----
>I7:" -----
>H7:" -----
>G7:" -----
>F7:" -----
>E7:" -----
>D7:" -----
>C7:" -----
>B7:" -----
>J6:" X*Z
>I6:" Y*Z
>H6:" Y*X
>G6:" Z^2
>F6:" X^2
>E6:" Y^2
>D6:" Z
>C6:" X
>B6:" Y
>F4:"+BX+CZ
>E4:"N--Y=A
>D4:"RESSIO
>C4:"LE REG
>B4:"MULTIP
/X!/X>A1:>A1:
```

	A	B	C	D	E	F	G	H	I	J
2										
3										
4	MULTIPLE REGRESSION--Y=A+BX+CZ									
5										
6		Y	X	Z	Y^2	X^2	Z^2	Y*X	Y*Z	X*Z
7										
8		40	100	36	1600	10000	1296	4000	1440	3600
9		45	200	33	2025	40000	1089	9000	1485	6600
10		50	300	37	2500	90000	1369	15000	1850	11100
11		65	400	37	4225	1.6E5	1369	26000	2405	14800
12		70	500	34	4900	2.5E5	1156	35000	2380	17000
13		70	600	32	4900	3.6E5	1024	42000	2240	19200
14		80	700	36	6400	4.9E5	1296	56000	2880	25200
15										
16		420	2800	245	26550	1.4E6	8599	1.9E5	14680	97500
17										
18										
19	N:								7	
20	MEAN VALUE OF Y:								60	
21	MEAN VALUE OF X:								400	
22	MEAN VALUE OF Z:								35	
23	CORRECTED SUM OF SQUARES--Y:								1350.	
24	CORRECTED SUM OF SQUARES--X:								2.8E5	
25	CORRECTED SUM OF SQUARES--Z:								24.00	
26	CORRECTED SUM OF PRODUCTS-Y*X:								19000	
27	CORRECTED SUM OF PRODUCTS-Y*Z:								-20	
28	CORRECTED SUM OF PRODUCTS-X*Z:								-500	
29	B COEFFICIENT IS:								.0689	
30	C COEFFICIENT IS:								.6028	
31	A (INTERCEPT) IS:								11.33	
32										
33	Y=	11.33	+	.0689*X	+	.6028*Z				
34										
35	THE R^2 IS:	.9612								
36										
37	REDUCTION SS IS:	1298.	WITH						2 DF	
38	RESIDUAL SS IS:	52.32	WITH						4 DF	
39	F STATISTIC IS:	49.61								



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# SPEAKING OF FORTH: EXTENDING THE COMPILER

by Bill Wurzel

Many interpreters (like BASIC) and compilers (like Pascal) have a fixed vocabulary of reserved words (like FOR, MID\$, TYPE, REPEAT, etc.) which the programmer uses to write programs. These words tell the compiler/interpreter what to do and they cannot be changed. (In this regard, compilers and interpreters are similar - from now on, consider "compiler" to mean "compiler and interpreter.") There are compilers, however, which permit the programmer to add new words to the compiler's vocabulary and so to extend its capabilities. Such compilers are called "extensible." Similarly, languages whose compilers are defined to be extensible are called extensible languages. Forth is an extensible language and it is from this extensibility that its true power derives!

## DEFINING WORDS

We can think of an action in Forth as occurring at one of three levels. In general, a level 1 action is an execution or compilation of a previously defined word. For example, the sequence

```
1 2 3 + + .
```

is a series of level 1 actions. A level 2 action is a definition. A definition is a Forth action which results in a new word being added to the dictionary. Any word whose execution causes a definition is called a "defining word." The most frequently used defining word is probably ':' - the colon. Consider the following colon definition:

```
: ?ODD 1 AND ;
```

This definition leaves a 1 (which Forth understands to mean "true") if TOS is odd and 0 ("false") if TOS is even. The ':' causes the new word ?ODD to be added to the dictionary and associates with it the level 1 actions '1' and 'AND'. Another defining word is CONSTANT.

```
35 CONSTANT SIZE
```

In the above example, the interpreter first sees 35 - which it puts on the stack. It then encounters CONSTANT, which tells the interpreter "Create a dictionary entry for the word which follows in the input stream (in this case SIZE), and store the TOS (in this case 35) in this entry in such a way that in the future, whenever you encounter SIZE you will retrieve the value 35 and place it on the stack." Implicit in this compound instruction are Forth levels 1 and 2:

Level 2 - what to do when the word is being defined: i.e. create the dictionary entry and store TOS in the entry.

Level 1 - what to do when the word being defined is subsequently executed:

i.e. place the value of the stored TOS on the stack.

Every defining word must contain both level 1 and level 2 instructions to the Forth interpreter.

Although the Forth nucleus only contains three defining words - : (colon), CONSTANT and VARIABLE, its extensibility allows us to define new defining words! This is the level 3 action - not defining words but defining the defining words themselves. Let's say we want to work with the high and low temperatures of each day of October. In BASIC or Pascal, we would dimension a one dimensional array (e.g. DIM HITEMP(31), LOTEMP(31)) to hold the temperatures. How can we do this in Forth? Let's define a new defining word VECTOR, which we want to use like this:

```
31 VECTOR HITEMP
31 VECTOR LOTEMP
```

defines vectors HITEMP and LOTEMP, each of which can hold 31 numbers. Then, to cause the address of some element (say the 7th) of the vector HITEMP to be placed on the stack, we just would like to say

```
7 HITEMP
```

We remember that all defining words must tell the interpreter what to do at level 2 time and what to do at level 1 time. According to the above specification, at level 2 time (when a word like HITEMP is being defined) we want the interpreter to create a dictionary entry for HITEMP and reserve enough space in the dictionary to hold TOS + 1 numbers. At level 1 time (when the word HITEMP is subsequently encountered), we want the interpreter to add TOS elements to the address of the zeroth element of HITEMP and leave this address on the stack. We use the Forth word <BUILDS to specify level 2 instructions and DOES> to specify level 1 instructions. So, we define the defining word VECTOR as follows:

```
: VECTOR <BUILDS 1+ 2 * ALLOT
DOES> SWAP 2 * + ;
```

The <BUILDS identifies VECTOR as a defining word. <BUILDS tells the interpreter "From now on, when you encounter the word VECTOR, add 1 to TOS (this is because we are counting from zero - so a vector with a high index of 31 has 32 elements), multiply the desired number of vector elements by two (since each number is two bytes long) then add this number (the length of the vector in bytes) to the top-of-dictionary pointer to reserve space in the dictionary for the vector elements." To understand the DOES> part, we must remember that during execution, the inner interpreter places onto the stack the parameter field address of each word it encounters. When the word HITEMP

contd.

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is encountered, for example, the address of its zeroth element is automatically placed on the stack. (Since we are storing only vector elements in the parameter field, the PFA in this case represents the address of the zeroth element. So the code following DOES> may assume that the address of HITEMP(0) is already on the stack. The DOES> code tells the interpreter "When you execute any word which was defined by VECTOR, first swap the first two numbers on the stack." We want to do this because, although the index (say 7) was TOS after it was pushed, the interpreter pushed the address of the zeroth element of HITEMP onto the stack when it encountered HITEMP. Swapping the stack numbers makes the index again TOS, with HITEMP address NOS. "Now, multiply the index by two, (since each vector element is two bytes in length) and add this offset to NOS, the address of the zeroth element of HITEMP. Leave this number on top of the stack."

So, we can write the following Forth code to input high temperatures and compute the truncated average high temperature for the month of October.

```

: VECTOR <BUILDS 1+ 2 * ALLOT
      DOES> SWAP 2 * + ;

31 VECTOR HITEMP

: GETNUM QUERY 0 WORD HERE NUMBER
  DROP ;

: GETTEMPS 32 1 DO I DUP ." ENTER HIGH
  TEMPERATURE " ." FOR DAY " ;
  GETNUM SWAP HITEMP ! LOOP ;

: AVTEMP 0 ( INITIALIZE ACCUMULATOR )
  32 1 DO I HITEMP @ + LOOP
  31 / ." TRUNCATED AVERAGE HIGH "
  ." TEMPERATURE IS " . CR CR ;

;S

```

Multidimensional arrays are a little trickier. Consider, for example, a two-dimensional array (or matrix) consisting of some number of rows (say 3) and some number of columns (say 5). In the Forth program, each data element of this matrix will be referred to as a pair of numbers - one for the row and one for the column. Our problem is how to convert this pair of numbers into the single address where this data element is stored. One acceptable way would be to store the data elements in row order - row one first, then row two and so on. We can then locate an element from its row-column pair by multiplying the row number times the length of a row, adding the column number and finally adding the whole thing to the base address for the matrix. This scheme allows us to have a row zero and column zero and generally keeps things neat! But now, for each matrix we define, we have to keep its row length tucked away somewhere - a problem we didn't have with single dimension arrays. We'll use the first two bytes of the parameter field for the row length and the rest of the parameter field to store the matrix in row major order.

```

: MATRIX ( NUMBER OF ROWS IS TOS )
  ( NUMBER OF COLUMNS IS NOS )

```

```

<BUILDS 1+ SWAP 1+ DUP , 2 * * ALLOT
DOES> DUP >R @ * SWAP 1+ + 2 * R> + ;

```

Again, note the use of >R and R> to hold numbers on the return stack temporarily. Since the return stack also stores return addresses for the inner interpreter (its primary job), we must be sure that R> is executed from the same word in which R> was executed!

I don't think there's too much point in developing multidimensional arrays any further. The same sorts of applications which require multidimensional arrays usually require floating point capability - something this implementation of Forth does not support.

To further demonstrate the power of compiler extensibility, let's return to single dimension arrays. Suppose we want to make sure that the subscript into a single dimension array always lies within the range of the array's definition. If the language we're writing in happens to support such a range check, that's great - if not, we're usually out of luck! In Forth, if we want range checking, we just build it into the compiler. Say we want error #35 to mean SUBSCRIPT OUT OF RANGE. We can write the following definition of VECTOR:

```

: VECTOR <BUILDS
  DUP , 1+ 2 * ALLOT
DOES>
  OVER OVER OVER 0< 35 ?ERROR
  @ > 35 ?ERROR
  SWAP 1+ 2 * + ;

```

Instant range checking! To run without range checking, we just replace the above definition with the earlier definition of VECTOR and recompile. Of course, if we wanted the ability to disable range checking dynamically at runtime, we could easily build some sort of flag into the above definition!

One final example of Forth extensibility is the CASE statement. This is a handy control statement (found in languages like Pascal, ALGOL, PL/I, dBASEII) which says in effect, "Look at the value of some variable X. If it equals A, then do this stuff, if B, then do that stuff, if C, then do some other stuff, and so on. We'll simplify the CASE statement a little and write a defining word CASE: which we want to be able to use like this:

```

CASE: SWITCH
      WORD0
      WORD1
      WORD2
      WORD3
      WORD4 ;

```

This use of CASE: defines a word SWITCH. When any Forth word invokes SWITCH, then WORD0 is executed if TOS is 0, WORD1 if TOS is 1, WORD2 if TOS is 2 and so on. We define CASE: as follows:

```


: CASE: <BUILDS ] SMUDGE
DOES> SWAP 2 * + @ EXECUTE ;

```

As we have already seen, when CASE: is executed, <BUILDS creates a dictionary header

contd. on pg. 48

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# THE APPLE'S WRITE ONLY NUMBER (WON)

by W. R. Simpson and J. R. Agre

The idiosyncrasies of the Apple II never fail to amaze us. This article is written for those of you who occasionally manipulate bits. We have uncovered Applesoft's first "write-only" number. If you run into this problem, you'll be glad you read this article. It can save you hours of hard work. The rest of you may just enjoy uncovering another wart in Applesoft and getting a lesson in Apple bit arithmetic.

Q: Can you print the following integer on your screen?

I% = -32768

A: Not easily; the system tries to stop you.

In fact, as stated in the Applesoft manual on page 4, "true integers must be in the range from -32767 to 32767".

Why does it enforce this restriction? An integer variable in Applesoft is represented by 2 bytes or 16 bits. With 16 bits it is feasible to represent  $2^{16} = 65536$  integer numbers. But the number of allowable integers in Applesoft is 65535 (-32767 to 32767), one less than  $2^{16}$ . We call this missing integer -32768 (or sometimes negative zero) and it is the mysterious write only number.

If we consider the internal representation of an integer in Applesoft, the situation is less mysterious. A 2's complement scheme is used where the first 15 bits represent a number and the 16th bit is a sign bit.

In a 2's complement scheme, a positive number is represented by its binary value in 15 bits, the 16th bit always being zero. For example, a zero is 16 zeros and 32767 is 15 ones with a zero in the 16th bit. On the other hand, a negative number is formed by subtracting the absolute value of the number from  $2^{16} = 65536$ . For example, -1 is found to be 16 ones as shown

$$\begin{array}{r} 1\ 0000\ 0000\ 0000\ 0000_2 \\ \underline{\hspace{15em}} \\ 1111\ 1111\ 1111\ 1111_2 \end{array}$$

or -32767 as

$$\begin{array}{r} 1\ 0000\ 0000\ 0000\ 0000_2 \\ \underline{0111\ 1111\ 1111\ 1111_2} \\ 1000\ 0000\ 0000\ 0000_2 \end{array}$$

If one were to imagine what would happen in binary when we add one to 32767.

$$\begin{array}{r} 32767 \\ \underline{+1} \\ 32768 \end{array} \qquad \begin{array}{r} 0111\ 1111\ 1111\ 1111_2 \\ \underline{0000\ 0000\ 0000\ 0001_2} \\ 1000\ 0000\ 0000\ 0000_2 = ? \end{array}$$

This causes an Applesoft overflow but according to a 2's complement scheme, a 1 followed by 15 zeros is a -32768, or

$$\begin{array}{r} 1\ 0000\ 0000\ 0000\ 0000_2 \\ \underline{-\ 1000\ 0000\ 0000\ 0000_2} \\ 1000\ 0000\ 0000\ 0000_2 \end{array}$$

This number is an invalid integer. In most computer systems this number is indeed a valid number. It would be -32768. Adding one to 32767 would cause an overflow. Why do we also call it negative zero? The reason is that the negative value of this integer is equal to itself. That is,  $-x = x$ . Well, this is only true for  $x = 0$ .

$$\begin{array}{r} 1\ 0000\ 0000\ 0000\ 0000_2 \\ \underline{-\ 1000\ 0000\ 0000\ 0000_2} \\ 1000\ 0000\ 0000\ 0000_2 \end{array} \qquad \begin{array}{l} = 2^{16} \\ = 2^{15} \\ = ? \end{array}$$

Anyway, an ambiguity exists between -32768 and negative zero. Most computer systems legislate one or the other. Applesoft forbids the use of a perfectly good binary number! You can't get to -32768 through integer arithmetic. But suppose you get there by binary arithmetic. Why would one do that. An example or two should explain.

Suppose one has a problem containing a lot of numbers. Suppose the numbers have only two values, zero or one, or 14.2 and 6.1. How many numbers could you store with 48K bytes? If you use real numbers, they require 5 bytes (in array form) each, so you could store 9830 numbers (remember 1K = 1024 bytes). That may not be enough. If we multiply these numbers by 10 and store them as integers then it would only take 2 bytes to store either 142 or 61. With integer representation, 24,576 numbers could be stored in the Apple. However, with a 12K operating system and a 10K program we are reduced to 13,312 integer numbers. This may still not be enough.

Another further refinement is possible. Suppose we use strings and store a "0" internally to represent 14.2 and a "1" to represent a 6.1. They could always be converted back before printing them. Each string character requires one byte of storage so we could store twice as many numbers as with integers. But, if we could store these numbers as binary ones or zeros we could store 16 numbers in one integer or 8 in one character. For instance, eight 6.1's followed by eight 14.2's could be stored in one integer as 0000000011111111<sub>2</sub> or 255<sub>10</sub>. We have just increased the storage of the Apple by a factor of 16 for our purposes.

We call this method of storage bit mapping. How does one get specific bit values into specific locations? These values can be directly placed in each byte by use of the POKE instruction. Here's another exam-  
contd.

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ple. Suppose we encounter the reverse of the previous situation, i.e. eight 14.2's followed by eight 6.1's

```
11111111000000002
```

This is simply -256 (remember the 2's complement). Now, if we wanted to represent 14.2 followed by 15 6.1's as 1000 0000 0000 0000s or -32768, we would be stopped from creating this integer value in Applesoft.

However, if we are very persistent, even this can be achieved. The location in memory of the integer to be set, say I%, is found. We can then POKE the wanted value one byte at a time into the most significant byte (MSB) and the least significant byte (LSB) into the integer. For example, suppose the integer I% is stored at location 8163 for the LSB and 8164 for the MSB. Then, to store 1000 0000 0000 0000s one could place zero in the LSB and 128 in the MSB, i.e., POKE 8163,0 and POKE 8164, 128. If we then print I%, we find I% = -32768! This is our magic number and it can be printed on the screen, disk or anywhere.

So, what's the problem? The problem occurs if after you've written an integer -32768 to disk and then try to read it back, Applesoft won't let you read it because the value is out of range. The result is that the WON, or a number you can write but not read, has been produced.

Of course, there are many ways to get around this problem. One can read the number as a string, A\$, and test if A\$ = "-32768". If found then -32768 can be POKEd into an integer. Another solution is to avoid the use of integers altogether. One can use ASCII characters to store eight bits with no restrictions. A lot of time can be consumed doing FRE(0) garbage collection. But values can be directly POKEd into a string character. This is probably the best solution as it avoids garbage collect. (You must, however, find the memory locations of the string byte.)

In our work, we use bit maps to store data structures such as very large graphs and long term schedules. We like to use integer arrays or bit maps because we can sometimes do operations on all 16 bits in parallel. All in all, it seems a shame that the Apple wastes a nice integer like -32768 (or negative zero). So be it, and at least now we know.

A short program is provided which illustrates how we use bit storage with an integer array A%(1000). This array can be used to store 16016 binary values. The program consists of an Applesoft main program and uses three machine language routines. For starters, the main program asks whether you would like to fetch or store. Then you are asked to supply a location. If a store is requested, then you must also give a value to be stored, i.e., store a one at location 6789. In either case the Applesoft does a GOSUB 1000 for a fetch or a GOSUB 1001 for a store.

These subroutines must first find the actual location of the array A% in the mem-

ory. Our first machine language routine does this. This routine is the & (ampersand) routine and is called by &A%(0). The routine returns with the start address in locations 936 and 937 which can then be PEEKed. For more on the & routine see "The Return of the Mysterious Mr. Ampersand" by D. Lingwood in Call-A.P.P.L.E., May 1980, pg 26.

The Applesoft subroutine then computes the actual bit storage locations by figuring out the byte locations in the array A% and then the bit position within the byte. Machine language routines are then used to perform the actual bit storage or bit fetch.

The store machine language routine is found at location 844 and the fetch routine at location 899. These routines expect the address of the byte to be POKEd at locations 254 and 255. The bit within the byte, a number between 0 and 7, is POKEd into location 840. For a fetch, a CALL 899 will leave the value fetched in location 841 which can then be PEEKed. For a store, the values to be stored (a zero or a one) should be POKEd into location 841 and then a CALL 844.

Let's take an example. Suppose we wish to store a one at location 6789. Also suppose &A%(0) gives us the location B. Then the byte within the array A% is INT(6789/8) which is 848. Thus the byte location is B + 848. The bit within the byte is 6789 - (848\*8) which is 5. So the program POKEs the address B + 848 into 254,255, the bit location 5 into 840, the store value 1 into 841 and CALLs 844 to perform the store.

Using these routines, it is fairly easy to convert the Applesoft subroutines to map a 2-dimensional array of bits onto A%. A word of caution about using the & is that no new variables or strings should be encountered between the & CALL and using the address that it provides.

Now we've given you the capability to use bit storage and generate the Apple's WON. Use it carefully!

#### BIT DRIVER PROGRAM

```
10 DIM A%(1000)
15 FOR I = 0 TO 1000
   :A%(I) = 0
   :NEXT I
17 I% = 0
   :V% = 0
   :BT% = 0
   :WD% = 0
   :HI% = 0
   :AD% = 0
   :FL% = 0
20 INPUT "FETCH OR STORE OR QUIT?
(F/S/Q)";A$
25 IF A$ = "Q" THEN END
30 IF A$ = "F" THEN GOTO 100
40 IF A$ = "S" THEN GOTO 200
50 PRINT "BAD INPUT": GOTO 20
100 INPUT "WHAT LOCATION?";I%
110 IF I% < 0 OR I% > 1600 THEN PRINT
"BAD LOCATION": GOTO 100
120 GOSUB 1000
   : PRINT "THE VALUE FETCHED IS ";V%
130 GOTO 20
```

contd.



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The **Prime Plotter** is a modular system where each of its elements, such as the statistics, the plotting routines, and the character sets, can be replaced by another module. Thus, the base system can continuously be extended and enhanced by add-on modules.

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**Data Management:** Convert DIF files • **Create** data files • **Edit, transform, add, or group** data sets • **Display, save, or print** data and statistics.

## STATISTICS

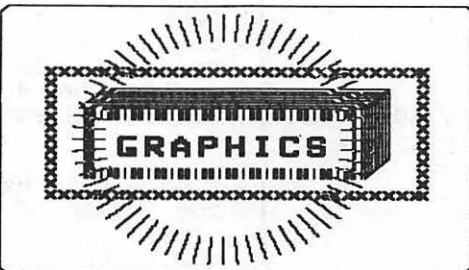
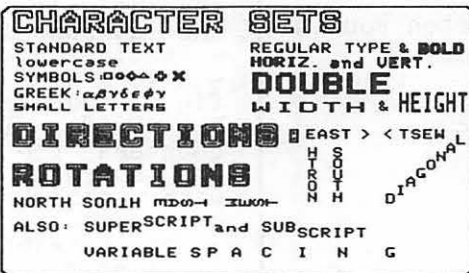
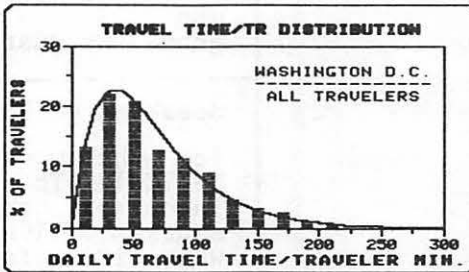
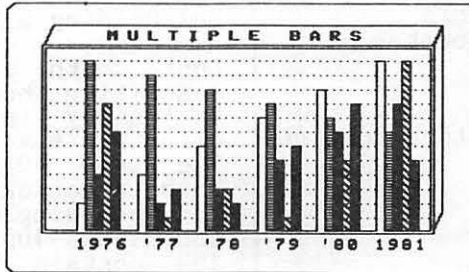
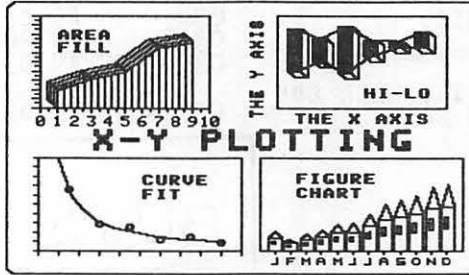
- Curve Fit Regressions:** Linear • Logarithmic • Exponential • Geometric • Inverse • Inverse Log • Spillman • Nth Order.
- Trend Analysis:** Averaging • Moving Average • Smoothing • Growth Rate • Frequency & Cumulative histograms • Logistic curve.
- Distributions:** Normal • Gamma • Chi-square tests and contingency table analysis.

**In Addition:** **User defined functions and sub-routines** • Basic stats on any data set (sum, mean, S.D. etc.) • **Customized** Modules (see below).

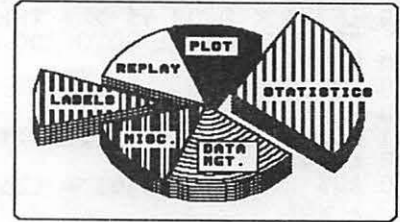
## X-Y CHARTS

**Options:** Data/fit • Log scale • HI-LO • Error bars • Axis of origin • User defined parameters for frame, axes, tic marks, grids, labels and graph types.

**Graph Types & Parameters:** Over 20 symbols for scatter • Variable line thickness • Dotted line with variable increments • Variable step for area fill • Bars with variable width and 6 filling methods in 15 steps • 3-D bars, or 3-D area fill in 4 directions, variable width and filling step • Up to 15 multiple bars on same tic mark • 10 different figures for unique figure charts.



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```

200 INPUT "WHAT LOCATION?":I%
210 IF I% < 0 OR I% > 16000 THEN PRINT
    "BAD LOCATION" : GOTO 200
220 INPUT "VALUE TO STORE?(1/0)":V%
230 IF V% < 0 OR V% > 1 THEN PRINT
    "BAD VALUE" : GOTO 200
240 GOSUB 1001
250 GOTO 20
1000 FL% = 1
1001 WD% = I% / 8 : BI% = I% - WD% * 8
1010 & A%(0)
1020 AD% = PEEK (936) + (256 * PEEK (937))
    + WD%
1030 HI% = AD% / 256
    : POKE 254,(AD% - 256 * HI%)
    : POKE 255,HI%
    : POKE 840,BI%
1040 IF FL% = 0 THEN POKE 841,V% : CALL 844
1050 IF FL% = 1 THEN CALL 899
    :V% = PEEK (841)
1060 FL% = 0
1070 RETURN

```

#### BIT STORE PROGRAM

0348-	00	BRK	Bit
0349-	00	BRK	Value
034A-	00	BRK	Word
034B-	00	BRK	Counter
034C-	A2 00	LDX #\$00	
034E-	A1 FE	LDA (\$FE,X)	
0350-	8D 4A 03	STA \$034A	
0353-	A9 08	LDA #\$08	Store Routine
0355-	38	SEC	
0356-	ED 48 03	SBC \$0348	
0359-	8D 4B 03	STA \$034B	
035C-	18	CLC	
035D-	2E 4A 03	ROL \$034A	
0360-	CE 4B 03	DEC \$034B	
0363-	DO F8	BNE \$035D	
0365-	AD 48 03	LDA \$0348	
0368-	8D 4B 03	STA \$034B	
036B-	EE 4B 03	INC \$034B	
036E-	18	CLC	
036F-	AD 49 03	LDA \$0349	
0372-	F0 01	BEQ \$0375	
0374-	38	SEC	
0375-	2E 4A 03	ROL \$034A	
0378-	CE 4B 03	DEC \$034B	
037B-	DO F8	BNE \$0375	
037D-	AD 4A 03	LDA \$034A	
0380-	81 FE	STA (\$FE,X)	
0382-	60	RTS	
0383-	A2 PP	LDX #\$00	Fetch Routine
0385-	8E 49 03	STX \$0349	
0388-	A1 FE	LDA (\$FE,X)	
038A-	8D 4A 03	STA \$034A	
038D-	A9 08	LDA #\$08	
038F-	38	SEC	
0390-	ED 48 03	SBC \$0348	
0393-	8D 4B 03	STA \$034B	
0396-	18	CLC	
0397-	2E 4A 03	ROL \$034A	
039A-	CE 4B 03	DEC \$034B	
039D-	DO F8	BNE \$0397	
039F-	90 05	BCC \$03A6	
03A1-	A9 01	LDA #\$01	
03A3-	8D 49 03	STA \$0349	
03A6-	60	RTS	
03AA-	20 E3 DF	JSR \$DFE3	Mr. Ampersand
03AD-	8D A8 03	STA \$03A8	
03B0-	8C A9 03	STY \$03A9	
03B3-	60	RTS	
03F5-	4D AA 03	JMP \$03AA	

Here is a more compact version of the

required machine language. This can be typed in and BSAVED as BSAVE A\$348,L\$B0.

```

0348- 01 00 30 00 A2 00 A1 FE
0350- 8D 4A 03 A9 08 38 ED 48
0358- 03 8D 4B 03 18 2E 4A 03
0360- CE 4B 03 DO F8 AD 48 03
0368- 8D 4B 03 EE 4B 03 18 AD
0370- 49 03 FO 01 38 2E 4A 03
0378- CE 4B 03 DO F8 AD 4A 03
0380- 81 FE 60 A2 00 8E 49 03
0388- A1 FE 8D 4A 03 A9 08 38
0390- ED 48 03 8D 4B 03 18 2E
0398- 4A 03 CE 4B 03 DO F8 90
03A0- 05 A9 01 8D 49 03 60 60
03A8- 00 00 20 E3 DF 8D A8 03
03B0- 8C A9 03 60

```

03F5- 4C AA 03

## BUGS AND OTHER PARASITES

Val Golding submits the following:

Last month Jim Allison wrote an article describing how to move Applesoft programs in memory (pg 46, March issue of WAP). Unfortunately, Jim referred to memory locations 103 and 104 as containing LOMEM. This is not quite true. LOMEM is the start of the simple variable storage and is in locations 105 and 106. Locations 103 and 104 contain the location of the start of the Applesoft program. All of Jim's examples are correct; he intended to and did use 103 and 104 as the start of the program. He just mistakenly called it LOMEM.

Speaking of Forth contd. from pg 42

for the word which follows (in this case SWITCH). The ] then places the interpreter into the compiling state and SMUDGE unsmudges SWITCH (remember SWITCH was smudged when its dictionary header was created). Since the interpreter is now compiling, it will place the code field addresses of all the non-immediate words it encounters into the current dictionary entry until it hits a semicolon. This is exactly what we want - a word with nothing but a series of code field addresses in its parameter field. The DOES> field says that when Forth encounters the word SWITCH, it should swap the address of SWITCH's parameter field with whatever index was TOS before SWITCH was encountered (in this case our 0, 1, 2, 3 or whatever), leaving the index as TOS. It then multiplies the index by two (since each code field address is two bytes long) adds it to SWITCH's parameter field address (which contains the code field address of the first of the routines to be executed) to give the code field address of the desired word. EXECUTE executes the code field address which is TOS - and we're done!

I hope this has given you a little feel for the power of an extensible language. We'll come back to <BUILDS and DOES> when we begin the development of a real-life Forth program soon.

May the FORTH be with you!

# Which came first: The chicken or the computer?



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# THE GALTON QUINCUNX

by Joseph Hilsenrath and Bruce F. Field

In 1889 the English geneticist Sir Francis Galton, a cousin of Charles Darwin, published a classic work entitled Natural Inheritance (MacMillan & Co. New York, p. 63) in which he described a device to approximate a normal distribution. A portion of the description of the device, shown in Figure 1, which has come to be known as Galton's Quincunx, reads as follows:

"I shall now illustrate the origin of the Curve of Frequency, by means of an apparatus shown in Fig. 7 that mimics in a very pretty way the conditions on which Deviations depend. It is a frame, glazed in front leaving a depth of about a quarter of an inch behind the glass. Strips are placed in the upper part to act as a funnel. Below the outlet of the funnel stands a succession of rows of pins stuck squarely in the backboard, and below these again are a series of vertical compartments. A charge of small shot is enclosed. When the frame is held topsey-turvy, all of the shot runs to the upper end; then, when it is turned back into its working position, the desired action commences... The shot passes through the funnel and issuing from its narrow end, scamper deviously down through the pins in a curious and interesting way; each of them darting a step to the right or left, as the case may be, every time it strikes a pin. The pins are disposed in a quincunx fashion, so that every descending shot strikes against a pin in each successive row. The cascade issuing from the funnel broadens, and, at length, every shot finds itself caught in a compartment immediately after freeing itself from the last row of pins. The outline of the columns of shot that accumulate in the successive compartments approximates the Curve of Frequency... and is closely of the same shape however often the experiment is repeated."

One of us had built a Galton Quincunx many years ago and used it in teaching elementary statistics. Thus a first glance at the high resolution graphics facilities of the APPLE was sufficient to recognize its utility for simulating the operation of a Galton Quincunx.

Fig. 2.

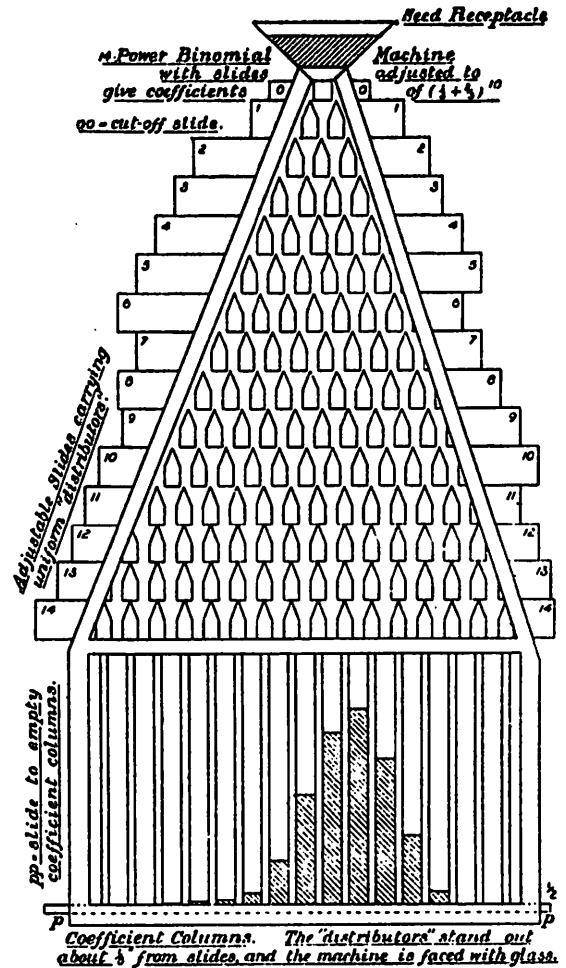


FIG. 7.

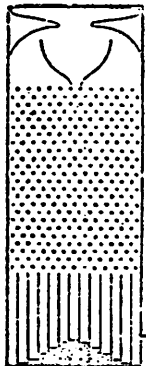


FIG. 8.

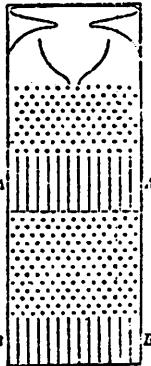
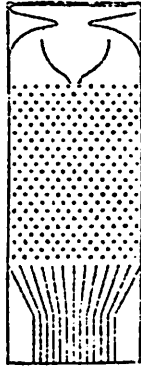


FIG. 9.



A variation proposed in 1895 by Karl Pearson (Phil. Trans. p.343 1895) is shown in Figure 2. It uses moveable wedges instead of pins which makes it possible to produce biased or skewed distributions.

The program listed below drops a ball (shaped, colored, scaled, and rotated in lines 105-165) through the simulated pegs. It falls to the left or the right at each of the levels depending upon whether a random number is less than or greater than .5. The result after 400 drops is shown in Figure 3. The result after 1000 drops is shown in Figure 4.

The program first requires three pieces of information (lines 40 thru 80). These permit one to bias the distribution, slow

contd.



down the operation, and start the drops at an arbitrary point in the random number generator. A typical biased distribution is shown in Figure 5.

The purpose of running the program at reduced speed is to illustrate the concept of runs in data. In the independent drops shown in Figure 6a thru 6f there are 4, 2, 6, 5, 6, and 4 runs respectively. If lines 70 and 80 were omitted and the program were run from a cold start, it would produce results identical to a previous run under the same conditions. By allowing the random number generation to spin thru an arbitrary number of cycles before starting the drops, one can achieve independence between successive runs. If successive runs are made without rebooting, the results are independent as the random number generator is not initialized on a warm start. This can be verified by entering the same value for SR (line 60) and noting that the random number displayed is different each time.

The program runs in vivid color and rattles as the shape drops. As the Quincunx is built on the first Hires page there is room below it to display the number of drops and the distribution in each of the compartments.

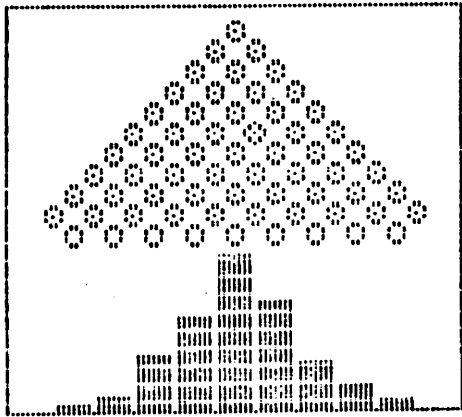


Figure 3. Results after 400 drops.

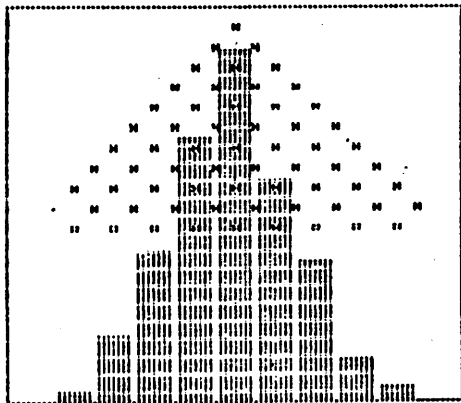


Figure 4. Results after 1000 drops.

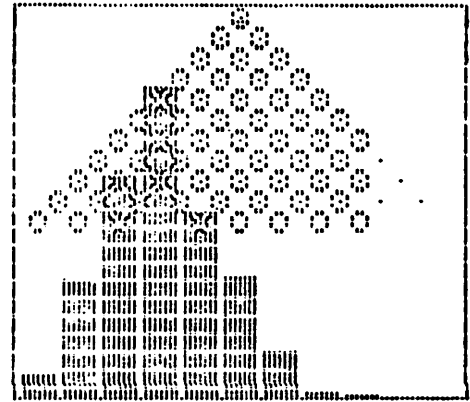


Figure 5. Results from a biased run.

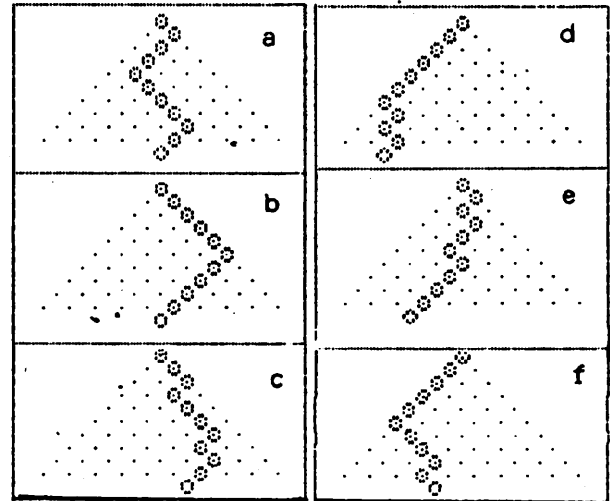


Figure 6. See text.

contd. on pg 58

## RANDOMLY SEQUENCED LISTS

by L. Benner

Here is a handy program to prepare a randomly sequenced list of numbers. It can be useful for teachers, for example, in selecting presentation sequences, clean-up duty or any other unpleasant tasks.

```

10 REM PREPARES LIST OF NUMBERS SEQUENCED
    RANDOMLY
12 TEXT : HOME : VTAB 2 : INPUT "HOW MANY
    NUMBERS TO LIST? ";A%
14 DIM X(A%) : DIM N(A%) : DIM J(A%) : K=0
16 VTAB 5: FLASH : PRINT "SELECTING RANDOM
    NUMBERS:" : NORMAL
17 Y = INT (((.2 * A%) ^ 1.3) ^ 1.33):
    PRINT: PRINT "LIST TAKES ABOUT ";Y"
    SECONDS TO PREPARE:"
18 FOR J = 1 TO A% : N(J) = 0 : NEXT J
20 FOR I = 1 TO 10000
22 X = RND (1) * (A% + 1) : X = INT (X) :
    IF X = 0 THEN 30
24 FOR J = 1 TO A% : IF X = N(J) THEN 30
26 NEXT J
28 J = K : N(J) = X : K = K + 1: IF K = A%
    + 1 THEN 32
30 NEXT I
32 HOME : VTAB 4: PR#1 : FOR J = 1 TO A% :
    PRINT N(J)" ";: NEXT : PRINT : PR#0 :
    END

```



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# THE WILDCARD: A Review

by David Morganstein

Readers of Apple-related publications have no doubt seen numerous ads for a new type of peripheral. This device is used to create archival copies of copy-protected software purchased by the user. The Wildcard is one such product. Below I'll describe what the card can be used to do and what a purchaser gets for their investment.

First, a few words of background. Many Apple owners have purchased copy-protected software. Some have received a second back-up copy of the program included at point-of-sale. Others have received a back-up upon request and submission of a warranty card (possibly at some cost). Other owners have purchased nibble-copy programs which may be able to reproduce the "protected" programs. The Wildcard and its competitors take a different approach to copy protection than the nibble-copy programs. These cards attempt to save the program on a DOS 3.3 formatted disk, thereby unprotecting the software for the owner's modification or ease of back-up.

The Apple uses the 6502 chip as its heart. This microprocessor contains a pin known as the NMI or non-maskable-interrupt. When this pin receives a required signal, the 6502 stops what it is doing and transfers control to a specific address. These new cards appear to use the NMI as the starting point for their approach.

The second part of the solution deals with the use of memory. When a program fits entirely in memory and does not require a specially formatted floppy disk to be in the drive, the program can be saved onto a standard DOS 3.3 disk. That is to say, once a program which begins on a specially formatted "non-copyable" disk is in memory, the copy-protection issue is irrelevant. If the program fits entirely into the lower 48K of a 64K Apple, there is ample room to move memory contents around and run a program which will save the contents of memory on a standard DOS formatted disk. (If the desired program needs the upper 16K as well, two saves are required, one for the "lower 48" and one for the remaining part.

The Wildcard permits the user to halt the Apple, moving things around in memory to permit a re-boot with a special version of DOS 3.3 (one which runs in the lowest 16K!) and prepare a disk image of the entire contents of memory. This disk, when booted, puts all the pieces back from whence they came and restarts at the point of interruption (a kind of suspended animation).

Given the above, the Wildcard will likely be successful with programs that a) fit entirely into memory (no chaining to other routines) and b) do not continuously read the disk. There are many such programs which are currently copy-protected. How-

ever, it doesn't take an Apple-Wizard to realize that the copy-protectors can one-up the Wildcard by including disk reads throughout their program. But for now, score one for the approach.

What you get with your Wildcard (which plugs into any slot) is a special on-board ROM, a diskette of "magic" software and a 38-page manual which describes the procedure for using the card. Unfortunately, the manual contains no technical information about the hardware or method, something many purchasers would find informative.

How well does it perform? It worked in "turnkey mode" in five out of five attempts at bat...(one of which involved a 64K program requiring two saves). "Turnkey mode" means simply following the written instructions and screen messages and requiring no additional knowledge about the Apple.

The manual is terse but complete. The people manufacturing the Wildcard have indicated that a re-write is in the process that will result in a more readable version.

I understand that competing products include "utilities" with their package. These utilities help to compress the backed-up program so that an entire diskette is not used up for storage. The Wildcard folks have indicated that they are now releasing such software as well, for an extra \$30.00 charge.



Tom Warrick and Bruce Field  
"Help" Session, WAP Meeting, Feb. 19

# Q & A

by Bruce F. Field

Q. Why can't a CP/M version program be written directly for the 6502 in the Apple? Are there needed instructions that the 6502 does not have? It seems to me that such a program would be commercially valuable.

A. CP/M is a disk operating system written in Z80 assembly language. It is certainly possible to write a program in 6502 assembly language that operates equivalently. However most programs that run under CP/M are also written (at least partially) in Z80 assembly language and wouldn't run on the 6502 unless they too were rewritten. Also, as a disk operating system CP/M may have some strong points compared to Apple DOS, but it doesn't really do anything more, it just does it differently.

Q. One of my drives is giving me the following problems: it is causing programs to think that disks inside it are write-protected. Also, I am unable to copy track 0 of certain diskettes. Are these related problems?

A. The problem of having unprotected diskettes appear to be write-protected is probably caused by a defective micro-switch in the disk drive. It may also be caused by a loose or defective cable from the drive to the controller card. Not being able to read track 0 is more of a problem and may indicate a mechanical misalignment problem in the drive. For the second problem I recommend you take the drive to your dealer.

Q. I have an EPSON MX80FT. I have tried to disable the paper-out sensor by software as described on page 10-3 of the Epson manual. It did not work. Do Apples work with the software instruction PRINT CHR\$(27)"8", or do you need a switch setting or hardware fix?

A. PRINT CHR\$(27)"8" is a perfectly valid Applesoft instruction and according to a friend that has an Epson MX100 this instruction does disable the paper-out sensor. For this to work, of course, the printer must be turned on before printing the CHR\$(27)"8" sequence so that it goes to the printer.

Q. Sometimes when using the procedure to round off a number, as in:

```
A=INT(A*1000+.5)/1000
```

the result ends in a string of zeros and a one instead of being limited to a number with three significant figures. Is there a better way to do this job?

A. There are a number of machine language print formatting routines but sometimes

they are too elaborate for simple rounding off. (A good print formatting routine is in Call A.P.P.L.E in Depth 1, All About Applesoft.) The procedure you give above usually works, but to be sure only three digits are printed after the decimal point we can convert the number to a string and force the number of digits to be three. Like this:

```
100 A$=STR$(ABS(INT(A*1000+.5)))
110 IF VAL(A$)<1 THEN A$="0000"
120 IF LEN(A$)<4 THEN A$="0"+A$:
    GOTO 120
130 A$=CHR$(32+13*(A<0))+LEFT$(
    (A$,LEN(A$)-3)+"."+RIGHT$(A$,3)
```

A\$ now contains the number. This also has the advantage of not removing trailing zeros from the number as Applesoft normally does. Lines 110 and 120 take care of small numbers and the CHR\$ function in line 130 restores the sign of the original number. To change the roundoff to a different number of digits, change A\$ in line 110 to contain one more zero than the number of decimal places; also change the 4 in line 120 to one plus the number of decimal places, and finally make the two 3's in the LEFT\$ and RIGHT\$ functions in line 130 equal to the number of decimal places desired.

Q. In another problem related to the one above, sometimes I need to round off to the level of accuracy of the number, instead of to a specific number of digits. For example, I often work with data that is taken with an 8 bit A to D converter and has an accuracy of one part in 256. Scaling and other math operations tend to add a lot of significant figures that are not really there. I want to round the output off to one part in 1000 to more closely reflect the accuracy of the input data. I will not know exactly what decimal places the significant figures will be in. Do you know of a short routine to do this?

A. Sure. All we have to do is let the Apple figure out how big the number is and then adjust the number of decimal places accordingly.

First compute the size of the number (assume the number is A).

```
D=INT(LOG(ABS(A))/LOG(10))
```

D is now the power of ten exponent of the number. LOG in Applesoft returns the natural logarithm so we have to divide by LOG(10) to get the log to base 10.

Now we normalize the number, that is make it a number between 1 and 9.99999 (or -1 and -9.99999 if it is negative). Then, round the number as demonstrated

contd.

for the last question and restore the power of ten exponent.

```
AN=A/10^D
AN=INT(AN*1000+.5)/1000
A=AN*10^*SGN(A)
```

If you object to extra digits occasionally hanging around you can use a modified version of the string manipulation routine shown for the last question.

- Q. Before a Basic program stores a file on disk, is there a short routine to check for a file of the same name on the disk so two files of the same name will not be stored?
- A. Apple DOS won't let you store a second file on the disk with the same name as another file. If you use the same name the original file is written over with the new information. Also, if the new file is shorter than the original the extra space is not declared free by the DOS. Thus if you originally had a file 30 sectors long and wrote a new file 5 sectors long with the same name, the file would still be listed in the disk directory as being 30 sectors long. The way to eliminate this problem is to first delete the file and then re-write it.

So, that answers part of your question. It isn't possible to save two files with the same name. Suppose though we have a situation where you want to write data to a file but aren't sure if it already exists. If you DELETE it and it isn't there you get an error. The solution is to do the following sequence.

```
100 PRINT CHR$(4)"OPEN FILE"
110 PRINT CHR$(4)"DELETE FILE"
120 PRINT CHR$(4)"OPEN FILE"
130 PRINT CHR$(4)"WRITE FILE"

dum de dum de dum

140 PRINT CHR$(4)"CLOSE FILE"
```

First we open the file if it exists; if it doesn't exist a file named FILE is created. Then we can delete it and not get an error. Finally we open it again and get ready to write to it.

The companion situation is where we want to check to make sure the file we are creating does not already exist on the disk.

```
100 ONERR GOTO 130
110 PRINT CHR$(4)"VERIFY FILE"
120 PRINT "FILE ALREADY EXISTS":STOP
130 IF PEEK(222)<>6 THEN 120
140 PRINT CHR$(4)"OPEN FILE"

de dum de dum de (Must be
Spring! Ed.)

200 PRINT CHR$(4)"CLOSE FILE"
```

Verify checks to see if the file is self-consistent and will return an error if it isn't or if the file doesn't exist. Line 130 checks to make sure the error was a FILE NOT FOUND error. If we

get any other error the program stops at line 120.

- Q. When using my Apple as a very expensive calculator, I find that occasionally the Apple doesn't know the correct answer. It seems that it thinks that 6.04-6.42 is -.379999997! Further experiments have led me to discover that the machine, while knowing that 9\*9=81, thinks that 9^2 is 81.0000001. Similarly, 7^2 is 49.0000001. Strangely, however, 8^2 is indeed, 64, and all other integers that I tested from 1 to 20 gave correct answers. Being concerned that my machine had bugs in its belfry, I asked my friendly neighborhood computer salesman (well, he was friendly when he SOLD me the machine!), and was informed that this was the way that computers counted, i.e. in binary. No further explanation, no suggestions as to fixes. Have you any?
- A. Nope. Actually the salesman was partially right. The Applesoft interpreter in the Apple stores numbers in base 2 (binary) and because of this fractional numbers are not always expressed exactly right. In practical terms the difference between .3799999997 and .38 is like being off less than a quarter of an inch when measuring the distance from New York City to Los Angeles.

Why do we get these inexact numbers? To understand this we have to understand how numbers are stored by Applesoft. (The following description only vaguely illustrates the concept, some details have been ignored to reduce the clutter.) When you input a number in decimal form, Applesoft converts it to a fractional multibyte binary number that is between 0 and 1. Since we all speak fluent binary, we can easily express the decimal number 0.5 in binary. Yep, 0.1. What would customarily be the decimal point is now the binary point. Positions to the left of the binary point are units, twos, fours, eights, etc., respectively. Positions to the right of the binary point are halves, fourths, eighths, sixteenths, etc. So a one in the position immediately to the right of the binary point indicates one half, or 0.5 decimal. So far, so good. Now how do we express the decimal number 0.3? There ain't no halves, but we can subtract a quarter leaving 0.05. The table below demonstrates this process.

decimal		binary	
0.3	-0.5	won't go	0.0
0.3	-0.25	= 0.05	0.01
0.05	-0.125	won't go	0.010
0.05	-0.0625	won't go	0.0100
0.05	-0.03125	= 0.01875	0.01001
0.01875	-0.015625	= 0.003125	0.010011

Thus 0.3 decimal equals 0.010011 binary, plus a small remainder. The key is that it is impossible to exactly express 0.3 in binary using a finite number of bits. At some point we have to say enough and ignore the remainder. In Applesoft 32 bits are used to store the mantissa of a number which means that the remainder is

contd.



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out in the tenth decimal place. But when we retrieve the number from memory it is slightly off because the remainder is missing. If we add the complication of performing arithmetic with inexact numbers the results can appear to be very strange. Also to answer your question, multiplying a number by itself and raising a number to the second power produce different answers because the computations are performed differently. To raise a number to a power the logarithm of the number is taken, this is multiplied by the power, and then the antilog is taken. In addition to being slightly less accurate it is also much slower.

What can we do about this? If you insist on performing arithmetic using Applesoft, not much can be done. However there is no law that says numbers must be stored in binary. In fact, some programs express and store numbers in decimal for more accuracy. The penalty is that storing numbers this way takes up more space. If you wish you can write your own set of arithmetic functions using decimal arithmetic; the way numbers are stored in a computer is not a function of the computer as much as it is a function of the program used to store them.

Q. I got a "good deal" the other day on some (brand name deleted) disks. Having used them before, I had no qualms about them, except that I noticed that they were double density, 40 track models, in comparison with the single density, 35 track models I have been using. I asked the salesman what "double density" meant, and he said that the disks could hold twice as much data!! They seem to work fine in my applications, however, and I wonder what the term double density is really supposed to mean? Furthermore, why 40 track instead of the usual 35? I always thought that the tracks were set up during the initialization procedure, and thus designed by the DOS for itself. Can you explain?

A. Double density means that the manufacturer certifies that the diskette is capable of being written with double the data density (i.e. twice as much data) as compared to a single density diskette. The point here is that it is possible, but not necessary, to write data at a higher density. You are correct in thinking that the diskette format is determined by the DOS during initialization. Apple DOS 3.3 sets up 35 tracks, each capable of storing 4096 data bytes. This data density is somewhat greater than what is referred to as "single" density but as far as I know most single density certified diskettes work okay. Some disk systems write 40 tracks on a diskette which again requires a higher data density, this time in the radial direction on the diskette. Any diskette certified for 40 tracks (or more) will work fine with your 35 track Apple. The only reason for not buying diskettes certified for double density and 40 tracks is that they usually cost more.

Galton Quincunx contd. from pg 51

```

10 HOME :BIAS = .5: POKE 33,40
20 REM ORIGINAL CONCEPT BY
30 REM SIR FRANCIS GALTON
40 REM DESIGN BY
50 REM JOSEPH HILSEN RATH
60 REM PROGRAM BY BRUCE FIELD
70 VTAB 5: PRINT "THIS PROGRAM PRODUCES A
GALTON QUINCUNX": PRINT : PRINT "TO
SIMULATE A NORMAL DISTRIBUTION."
80 PRINT : PRINT "DO YOU WISH TO BIAS THE
DISTRIBUTION?": PRINT : INPUT "
(Y/N)==>":A$
90 IF A$ = "N" THEN 110
100 PRINT : INPUT "TYPE A NUMBER BETWEEN
.3 AND .7 -->":BIAS
110 PRINT "": INPUT "TYPE A SPEED BETWEEN
0 - 100 -->":Z
120 PRINT : PRINT "ENTER A NUMBER BETWEEN
0 AND 100 TO": PRINT : INPUT " SEED
THE RANDOM NUMBER GENERATOR.==>":SR
130 FOR I = 1 TO SR:R = RND (1): NEXT I:
HTAB 30
140 DATA 1,0,4,0,35,45,54,63,4,0
150 REM GENERATE BALL-SHAPE TABLE
160 DIM H(11)
170 POKE 232,0: POKE 233,64
180 FOR I = 16384 TO 16393: READ A:
POKE I,A: NEXT I
190 FOR I = 1 TO 11
200 H(I) = 0: NEXT I
210 HGR : HCOLOR= 2: ROT= 8: SCALE= 3
220 HPLLOT 50,0 TO 230,0 TO 230,159 TO
50,159 TO 50,0
230 REM SET UP GRID
240 XO = 140:YO = 10
250 FOR I = 1 TO 9 STEP 2
260 X = XO - 8 * (I - 1)
270 Y = YO + 8 * (I - 1)
280 FOR J = 1 TO I: HPLLOT X,Y
290 X = X + 16: NEXT J
300 X = XO - I * 8:Y = Y + 8
310 FOR J = 1 TO I + 1
320 HPLLOT X,Y:X = X + 16
330 NEXT J: NEXT I
340 REM DROP BALL
350 DROPS = 1
360 X = XO
370 FOR Y = YO TO YO + 80 STEP 8
380 IF Y = YO GOTO 400
390 XDRAW 1 AT X,Y - 8:X = X1
400 DRAW 1 AT X,Y
410 R = RND (1):P = ( INT (100 * R) ) /
100
420 VTAB 21: HTAB 35: PRINT P
430 IF P < BIAS GOTO 450
440 X1 = X + 8: GOTO 470
450 X1 = X - 8
460 REM ADJUST THIS LOOP TO CHANGE SPEED
470 FOR I = 1 TO 102 - Z: NEXT I
480 S = - 16336: FOR B = 1 TO 4
490 BOUNCE = PEEK (S) - PEEK (S)
500 NEXT B
510 NEXT Y
520 XDRAW 1 AT X,Y - 8
530 I = (X - XO) / 16 + 6
540 H(I) = H(I) + 1
550 Y = 159 - H(I) / 2
560 HPLLOT X - 6,Y TO X + 7,Y
570 VTAB 23: HTAB 12: INVERSE : PRINT "THE
GALTON QUINCUNX": NORMAL
580 VTAB 21: PRINT "DROPS = ":DR:: HTAB I
* 3 + 2: PRINT ". "
590 VTAB 22: HTAB I * 3 + 2: PRINT
H(I):" "
600 DR = DR + 1
610 IF DROPS < 1000 GOTO 360
620 END

```

# LOGOSIG NEWS

TURTLE TRACKS



by Nancy C. Strange  
LOGOSIG MARCH MEETING

DATE: 26 March 1983  
TIME: 12:30 PM  
PLACE: 5616 Beech Avenue, ELF  
Facilities  
TOPIC: Logo Tools

The March meeting will center around the second in a tutorial series that uses Harold Abelson's book APPLE LOGO. The topic is Chapter 4 Workspace, Filing, and Debugging Tools (utilities) for Apple Logo. In addition Ron Murray will share his latest Logo travels.

### Future events:

Next month LOGO will be the topic for the main Washington Apple Pi Meeting; see info survey form in the back of this newsletter.

The April LOGOSIG meeting will have Mike Tempel from Logo Computer Systems, Inc. to share the latest, including a demo of the upcoming Sprite Board.

There will be an advanced Apple Logo Tutorial on May 1, 1983. This tutorial is open to all who feel they have learned what they could from available references and want to know more. For further details contact Nancy C. Strange, 691-1619, 3152 Bayswater Court, Fairfax, Va 22031. This is not limited to WAP members. Local college, university and school instructors are welcome to apply.

The May LOGOSIG meeting will continue the tutorial series in Abelson's book on the topic of Numbers, Words, and Lists and will be lead by Ron Murray.

### NEW LOGO ITEMS:

Krell Logo has recently released its first issue of the long promised LOGO & Educational Computing Journal. I was rather disappointed in it, however. It could have been so much more.

Apple Logo has provided the local Logo group with several items to assist in testing prior to release. These items are:

- Apple Logo Training Manual
- Apple Logo Toolkit (additional utilities disk and doc, includes Music)
- Apple Logo Sprite Board

Terrapin Logo has not come out with its documentation for words and lists.

(Note: if you know of any new hardware or software developments for any LOGOS, please contact me. Has anyone seen Logo for the Vic 64 computer, Atari, IBM?????)

⊗

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# FILEHANDLER REVISITED

by J. T. DeMay Jr.

Some of you may remember reading in the September WAP Journal about a program which would allow restructuring of FILE CABINET text files. As promised, the program is now available on Disk #124 UTILITIES E from the club library. Now for the bad news. Since the program has been published, I have become aware of several errors in the original version. If you have been having difficulties with FILEHANDLER, then you may want to make these corrections.

To be consistent with my system for indicating the latest version of a program, please save the corrected version using FILEHANDLER.1 as the new program name. If there are more changes/improvements to be made, the next version will be called FILEHANDLER.2. Using this procedure I always know which is the latest version. Using a new filename also prevents DOS from overwriting the original program. I like to keep the latest and the next latest versions of the program in the unlikely (ho! ho! ho!) event that I made a mistake in modifying the newer version.

Several of the changes are required because I neglected to DIMension some of the array variables. It is not required to DIMension array variables if less than 10 fields are to be used for each record. Applesoft will allocate room for ten fields automatically if it encounters an array variable before the variable is DIMensioned. These changes will (hopefully) correct this problem for any reasonable number of fields per record. The bulk of the remaining changes will be cosmetic, that is, they will allow room on each screen for the enlarged number of fields which FILEHANDLER.1 is now capable of dealing with.

Another error was caused by reusing the same variable for different situations. CH\$(W) has been changed in several lines to be HC\$(W).

If you don't need the fixed program now, you may wish to wait for the corrected version to appear on a new club library disk.

An article in the February 1983 issue of the WAP Journal by Dale Meyn concerning extra spaces after Applesoft keywords, helped me discover (re-discover?) a similar quirk with the DOS TOOLKIT EDITOR. It seems that those extra spaces are added to the end of each field of a text file. This may present a problem with a text file which was created or modified with the DOS TOOLKIT EDITOR. If a program tries to compare one variable with another variable, say while searching through a file to find all 20737 zip codes, it will not match those 20737's which have been added/changed with the TOOLKIT EDITOR. This is because the modified 20737's will look like "20737 " instead of the "20737" which the program is searching for. You can see the

extra spaces for yourself. Load a sequential text file into the DOS TOOLKIT EDITOR, make some minor changes and then save it under another name. Now boot a word processor. I used ScreenWriter ], but any good word processor should work. Load the original file and notice if the [CR] denoting carriage return is immediately following the last character in each field. Next load the file modified by the TOOLKIT EDITOR and make the same comparison. An extra space has been added to each field of each record of the file. In an earlier article, I suggested using the DOS TOOLKIT EDITOR, but now I must caution its use for modifying text files to be used by another program. If anyone has any insight into the EXTRA SPACES problem, please share it with all.

contd. on pg 66

## WAP TUTORIALS

by Steve Stern

At the request of many of our members, Washington Apple Pi will offer two tutorials on VisiCalc this spring. Leon and Tricia Raesly have agreed to lead these tutorials:

Introduction to VisiCalc - April 23, 1983;  
9:30AM at UHUHS

Intermediate VisiCalc - May 21, 1983;  
9:30AM at UHUHS

In addition Harold Paris has agreed to lead a tutorial on alternative spreadsheets, Multiplan (and possibly Magicalc) on June 4, 1983.

The fee is \$15 for members for each session, deduct \$5 if you bring your Apple. Non-members add \$5 per session. Registration is limited; members have priority - use the registration form in the back of this newsletter.

Remember tutorials are also scheduled for April 16 on DB Master with Dave Einhorn and Advanced DOS Techniques on May 14 with Richard Untied.

(Note: The DB Master tutorial has been changed from April 9 to April 16.)

All tutorials are at UHUHS, Room 2021 Building A, beginning at 9:30 am. All entry to the facility must be via the guard station at the garage entrance level. YOU MUST REGISTER YOUR COMPUTERS WITH THE GUARDS OR YOU MAY NOT BE ABLE TO BRING THEM OUT!

# REVIEW OF PLATO COMPUTER

## LITERACY: Introduction

by Robert C. Platt

If the recent barrage of ads in Byte and Softalk have caught your eye, you are probably wondering how an ancient Greek scholar can claim to "widen your world" with microcomputers.

### WHAT IS PLATO?

The Programmed Learning, Automated Teaching Operations (PLATO) system was developed at the University of Illinois during the 1960's to deliver instruction over a 1000 specially designed terminals attached to a powerful central computer. By linking an unprecedented number of terminals on a common network, PLATO encouraged student interaction and the sharing of a vast library of lesson materials. The PLATO project was primarily funded by the National Science Foundation and by hardware contributions from the Control Data Corporation (CDC). (Ref. 1-3) PLATO terminals offered powerful graphics with 512 x 512 resolution and user-defined character sets. In addition, because of the CPU resources devoted to each terminal, PLATO lessons were extremely responsive and highly interactive by even current standards.

Given this stimulating technical environment, it is not surprising that thousands of hours of instructional materials were developed for the PLATO system in every conceivable field of human knowledge. PLATO instruction was routinely given at every level from preschool reading preparation to graduate study. Because PLATO was the premier Computer Assisted Instruction project in the country, it attracted an exceptional group of creative authors from campuses around the nation. (In fact, several PLATO authors have gone on to become some of the most successful Apple game programmers, including Silas Warner, Andy Greenberg and Bob Woodhead.)

In 1976, CDC signed a marketing agreement with the University of Illinois and promised to make this wealth of CAI materials available on a commercial basis. CDC's efforts to market PLATO lessons through its remote terminal format have largely failed over the last seven years. The high cost of operating a nationwide timesharing network priced PLATO out of the reach of most of its potential users. Further, CDC's preference for marketing new in-house CAI materials over its publication of well-tested materials developed at academic institutions also handicapped the commercialization of PLATO. In 1982, CDC decided to expand its CAI marketing by adapting PLATO programs to run on microcomputers. At present, CDC offers lessons on the Apple II, the Atari 800, and the TI99/4A. Although I welcome the prospect of accessing the PLATO lesson library with my Apple, my first exposure to a converted lesson on my Apple II was disappointing.

Even though CDC has made a professional

effort to adapt PLATO lessons to the Apple, some technical sacrifices were made to take into account the Apple's lesser graphical resolution and limited memory. For example, when shifting between topics, a brief interruption occurred so that the next program segment could be read from the disk. However, my reservations stem from the lesson's content rather than from its packaging.

### LESSON CONTENT

I tried the Computer Literacy: Introduction lesson. Computer literacy is a subject which defies definition. Perhaps it would be best to describe this lesson as explaining the limitations of computers and their role in society. According to the manual, the lesson is designed for junior, senior high school students and vocational school students. The use of vocabulary words such as "inventory," "refraction of light," and "blacklist" prevent this lesson from being appropriate for younger users.

The lesson is divided into six parts which are accessed through a table of contents. The entire lesson takes about 30-45 minutes to complete. The first part explains the keyboard conventions and permits the lesson to be used by persons without any previous computer or Apple experience. The second part explains the input, output, CPU and memory components of the computer and includes amusing animated examples. The third section on the limitation of computers asks the student to classify whether given applications are easy to implement, difficult to implement or impossible to implement with a computer. The fourth section on the nature of computers illustrates the literal nature of programming by having the student play a maze game. The fifth part covers the history of computers including animated examples of other tools invented by man (ie the computer is just another axe or wheel.) The final section illustrates the impact of computers on society by listing computer applications and asking whether various groups would be helped or hurt by the application.

The lesson was adapted from a PLATO lesson by Dr. John Aikin and Greg Starling of the Evergreen State College in Olympia, Washington. It uses Synergistic Software's Higher Text II package for its lettering on the Hi-res page, and appears to be an assembly language coded program with smooth animated effects.

The package includes two copies of a copy protected DOS 3.3 diskette and an 89 page instruction manual which includes a glossary, suggested class activities, and a short written quiz on the history of computers. Although a professional effort, I would not recommend it at its \$45 price. Nor would I recommend it for anyone above junior high school.

contd. on pg 63



# FILE CABINET REVISITED

by David C. Eldridge

The program "File Cabinet" is familiar to most readers of this journal, as well as many of the versions which have been made available through various users' groups. For example, "Super File Cabinet" is available on WAP diskette volume 37, and "Elec File Cabinet" is available on WAP diskette volume 22. Call- A.P.P.L.E. made "File Cabinet II" available on its diskpak 6B-16. Articles on the subject have been numerous, including "File Cabinet Enhancements" by Donald E. Kahler (Washington Apple Pi, May, 1981). An extended collection of articles on this subject appears in PEEKing at Call- A.P.P.L.E., Vol. 3, pp 189-195.

I became interested in "File Cabinet" in its first version, in the Contributed Programs (Vol. 3) that were provided with the first Apple II that I had access to. A few associates at my school had use for such a program, but funds were not available to purchase a data base management program, particularly for every Apple II on campus. "File Cabinet" had some deficiencies, and of course many users would like to bend it to their own use. Since it is written in Applesoft and not copy protected, it is easy to modify.

I had four broad objectives in mind in modifying File Cabinet, in any version. First, it was desirable to take advantage of an extra 16K memory available on the language card, which has been installed on all the Apple II's on campus. Second, the problem of garbage collection was becoming intolerable, and so a fast garbage collector was needed. Third, the fast sorting subroutine (Ampersort II) available on WAP diskette volume 37 and used by "Super File Cabinet" was needed but had to be moved to a higher location. Fourth, I wanted to be able to enter colons and commas but also to avoid the very slow diskette reading normally involved with the GET command.

Since this was a learning process for me, I started with a version of File Cabinet that did not have any machine code subroutines that would have to be moved. "File Cabinet II" had some nice enhancements such as using "/" to copy a field entry from the previous record. It also allowed one to estimate the number of characters to be expected in a record.

In at least some of the versions of File Cabinet mentioned, it is possible to accept commas and colons by resetting the value assigned to COMMA\$. However, it takes an exceedingly long time to read in long files from the disc drive. This point has been addressed by Peter Meyer in "The Ultimate Input-Nearly-Anything Routine" in Call- A.P.P.L.E. in Depth, Vol. 1, pp. 94-99 and more recently by Bob Nacon in "The Penultimate, Penultimate Input Anything Subroutine" in Call- A.P.P.L.E., Jan. 1983. I grabbed the first one I could get working,

and it was satisfactory, although not even penultimate. An input routine provided by Meyer was chosen and loaded at \$300.

The GET subroutine needed a few other, less drastic, modifications. It was necessary to include a GET routine in the change subroutine as well as in the enter subroutine. Since overstriking is not desired in a printout, it must be remembered that the left arrow is not a true delete. A small patch was needed to convert the action of the left arrow to that of a delete. This is not a problem with the APPLESOFT INPUT as nothing really enters memory until RETURN is pressed. An associate inadvertently showed that it was also advisable at this stage to prevent an attempt to exceed the 255 characters/string limit.

One quick way to get extra memory is to move DOS 3.3 to the language card. This process was provided by Cornelius Bongers in "Loading DOS 3.3 on the Language Card", Call- A.P.P.L.E., July/August, 1981. The routine is available on WAP diskette volume 101 as "RELOCATE DOS TO MEMORY CARD". This immediately frees more than 10K of memory. The programmer now has memory available up through \$BEFF. The File Cabinet program BRUNS the DOS mover, and I designated it the HELLO program. Since DOS has been moved, one must use caution in using subroutines that use or modify DOS. For this reason I have not attempted to use "The Fast Text File Loader" described in Call- A.P.P.L.E., Sept., 1982. That procedure is described as being significantly faster than the Input Anything routines, but it does alter DOS.

To clear up the garbage collection routine speed problem, there are at least two general approaches. One is to avoid the garbage in the first place. The other approach is to clear away the garbage by some means more expeditious than FRE(0). The latter approach is discussed in "Fast Garbage Collection" by Randy Wiggington in the Jan. 1981 issue of Call- A.P.P.L.E. A corrected version of it, FAST FRE(0), is provided on the WAP diskette volume 101 along with a FAST FRE(0) RELOCATOR. Another version that works is described in "Graphic Garbage Collection" by Richard Cornelius and Melvin Zandler. A follow-up letter in Call- A.P.P.L.E., Jan. 1983 (Bugs in the Garbage) by Ken Kashmarek, answered the problem of why the original fast garbage collector, as listed by Wiggington, failed to work but the WAP program FAST FRE(0) did. The letter also strongly suggested changing two values set in the original (and WAP) program to speed things further.

I have not done much work with machine code or with assembler, but I have found the BIG MAC LC product from Call- A.P.P.L.E. very useful in working with FAST FRE(0). In particular, BIG MAC LC helped in changing

contd.

two values in FAST FRE(0).

One value in FAST FRE(0) is established to assign the minimum free storage allowed before the full garbage collection was actually activated. Originally this value was set at "1K". If, as an extreme example, the FAST FRE(0) was CALLED every time a character was read in and the free storage was greater than "1K", then calling this procedure would take relatively little time. However, if the free storage was less than "1K", then the full garbage collection routine would be executed for each character! To avoid this extreme application, where the cure becomes worse than the original problem, one can decrease this 1K value to a smaller number. I chose to use 256 bytes. If the memory drops this low, it is time to stop, before the program crashes with an OUT OF MEMORY error.

The other value in FAST FRE(0) referred to was designated as NUMELS by Wigginton. This is the number of strings in memory to be found in each scan through the variable table list. Presumably the higher the value of NUMELS, the faster the garbage collection. It does have a maximum value of 127, according to Wigginton's source code. The higher value of NUMELS did require more reserved space in memory.

Since Wigginton's program uses no subroutines in ROM, it will work fine on the language card, with no special patches. With the changes in NUMELS, the fast garbage collector consumes about 600 bytes of memory, well worth moving. I started with Wigginton's original source code, changed the two values referred to, and added the needed additional code, as identified by Kashmarek. Then BIG MAC LC was used to assemble it, after the ORG was changed to \$D000.

Mark Harris, in "New Uses for the RAM Card" (Call- A.P.P.L.E., Dec. 1982), gives a clear example (p. 28) on how to access a subroutine on the language card. Bongers indicates that the first 4K bank on the RAM is untouched by the moved DOS. Bongers also states that \$DD00-DFFF is claimed by the moved DOS on the second 4K bank. Bongers does indicate that the memory area from \$D000 (presumably on bank 2) upwards can be used as a buffer area. However since MAXFILES is set to 1, I may be safe in using the lower portion of the second bank of \$D000. If any doubt exists, the fast garbage collector could just as easily be positioned on bank 1. The garbage collection is initiated, at the appropriate locations in File Cabinet, by a CALL 795. That is the decimal value of the routine which jumps to \$D000.

Ampersort II is very fast, but it was in the wrong location. The program SOURCEROR on the BIG MAC LC diskette proved to be a tool able to disassemble Ampersort II. Ampersort II is a long program in machine code, which I did not have time to understand in detail. It did take some work to figure out SOURCEROR and how to apply it where there was some hex code and ASCII code. I took the resulting source code, changed ORG to \$B900 and reassembled it using BIG MAC LC.

SUPER FILE CABINET had a number of fine features that I was aware of and incorporated. In particular, the selection facility is very useful and also the extended submenus. The submenus included the ability to delete report formats.

One feature I sorely needed was to rectify mistakes made in previous fields of a record I was currently entering. I used the bottom two lines on the CRT to include directions for doing this correction. The text window was accordingly reduced.

Needless to say, many vermin made their way into the program. There was an occasion or two when certain inconsistencies suggested that the machine was overheated. I am still waiting for a fan to arrive. ONERR is a very nice device, but it often resulted in a very blank screen as it sometimes resulted in loops where they were not welcome. Errors had occurred for which ONERR provided the wrong remedy. This ONERR problem was cured with a few well placed POKE(216,0)'s.

The basic objectives were met. Some problems do remain. The most critical bug is associated with the sort routine. I have a long file of 411 records with 7 fields, with an average of about 41 characters per record. When I entered the 412 record and sorted, the last record (last record before sorting) gets garbled. Peter Rosden (in Washington Apple Pi, April 1982) has a nice discussion of the Ampersort II routine, and he notes the importance of setting HIMEM correctly. I set it just below the Ampersort II routine, which seems appropriate. I could avoid the garbling by setting the HIMEM to a lower value, but it would be nice to know why the problem developed. It is also desirable to avoid restricting the memory unnecessarily. ⚡

Plato contd. from pg 61

PLATO lessons are sold by mail order for \$45, with additional disks in the same order priced at \$35. All disks are sold on a 10 day free trial basis. However, if you want to try the real thing, the CDC PLATO Learning Centers at 21st and L and on North Capitol Street will rent PLATO terminal time on an hourly charge basis.

#### REFERENCES:

- (1) Smith & Sherwood, "Educational Uses of the PLATO Computer System," 192 Science 144 (1976).
- (2) Magarrell, "Computerized Education: Time to Sink or Swim," Chronicle of Higher Education, April 26, 1976, at 1, col. 4.
- (3) Hayatt, Eades & Tenczar, "Computer Based Education in Biology," 22 BioScience 401 (1972). ⚡

# A REPORT ON THE ACLD CONFERENCE

by Jay Thal

On February 16-19, 1983 the Association for Children with Learning Disabilities (ACLD) held its International Conference in Washington, D.C. This was the first time in its twenty year history that the ACLD addressed the use of microcomputers in special education and thirteen of the sessions were devoted to the subject. It is estimated that by 1985 there will be 150,000 micros in special education settings.

The issues are, of course, how will those micros be utilized; will there be the appropriate software to drive the hardware; and, who will be most influential in software development?

While the conference was the correct place to discuss those issues, it was not the place to impart computer literacy to the participants. It seemed that a large number of the attendees did not have the basics as to how to even choose the hardware or, if it had already been acquired, what to do to make it run. Perhaps prior reading of materials and books such as Schumacher's A GUIDE FOR THE PERPLEXED, would have helped these educators. While I am not an educator but a concerned parent of a learning disabled child, and somewhat computer literate, this digression made parts of the conference disappointing.

Part of any conference is the plethora of merchandisers selling their wares and this one was no exception. But, only a limited amount of the available software and hardware was there to see, and none to touch. For the most part the software that was there was of the computer managed instruction (CMI) type--of interest to administrators in helping to generate individualized education plans (IEP) and maintaining those controls demanded by law and necessity. This spilled over into the conference sessions.

At least three of the sessions dealt with IEP generation, one a "home brew" program, and two commercial packages. The best of the lot appeared to be the program by Learning Tools, 686 Massachusetts Ave., Cambridge, MA 02139. A solid user-definable record keeping and report generation system, of moderate cost, the Individualized Planning System supports Apple II & ///, DEC, and IBM-PC in their floppy and Corvus Omninet configurations. Learning Tree also has Administrative Planning and Curriculum Management Systems.

An unfortunate incident occurred when one resource teacher/speaker, after she had given excellent guidelines on selection of software, announced that learning disabled children shouldn't have access to computers more often than twice a week. One wondered whether she had ever read Goldenberg's SPECIAL TECHNOLOGY FOR SPECIAL CHILDREN.

On the other hand, there were many enlightening and exciting sessions. The Iditarod

Area School District in Alaska covers an area the size of Ohio, has nine schools, 320 children, and 30 Apples. The Area's Special Education Director, Malcolm Fleming, described how they built their system, from the ground up, learning the technology and how to do their own repairs where there are no roads and the planes do not fly on schedule. They've had the experience of teaching computer literacy to the children before the school administrators even thought of using micros as word processors or for support services. They were not able to use the micros exclusively for the disabled children, because all the children wanted to be identified as disabled in order to use the equipment. All the students currently access the machines for not only drill and practice, but to compose term papers and explore the world of Logo.

Joseph K. Torgesen of Florida State University, and Kay Young of Florida's Leon County Schools spoke at another session regarding their research and experiences. Torgesen noted that a preponderance of the recent data suggests that, for learning disabled children, the first priority should be on increasing individual word reading capabilities. Disabled children may be more "intuitive" than others, in the sense that they draw meaning from the context rather than from the individual words. The focus, therefore, needs to be on context-free word recognition skills. Learning efficiency and speed requires repetition.

Kay Young reported on actual teaching strategies she is conducting under a Federal education improvement grant. The grant is for an 18 month test of hardware, software, and the effectiveness of Computer Assisted Instruction (CAI). The hardware includes B&H Apples with two drives and green monitors. The children seem to favor the green over color monitors.

Two of the sessions dealt with the important subject of networking. One, a frankly commercial presentation of the National Association of State Directors of Special Education (NASDSE) was, nonetheless, of significance. The NASDSE has a service called SpecialNet, the Special Education Communication Network, which costs \$200 per year to join. SpecialNet includes data collection and information management systems as well as over 15 electronic bulletin boards that deal with subjects like computer applications, litigation, new products and publications, promising practices, advocacy information, etc. NASDSE may be reached at 1201 16th Street, N.W., Washington, DC 20036.

Alfred J. Morin, Director of the Microcomputer Education Administration Network (MEAN), spoke on the value of the technology as an intelligence amplifier. Good software, in his opinion, could be indi-

contd.

visualized in that the amount and type of multisensory material could be controlled. It is motivational, patient, and non-judgemental, and it can be interactive. He demonstrated the use of a lightpen, voice synthesis, voice entry/control of a computer, and brought to the audiences attention Bank Street Writer -- a word processing program specifically designed for children. MEAN can be contacted at 256 N. Washington St., Falls Church, VA 22046. MEAN's quarterly newsletter costs \$10 annually.

At another session, Gerald Senf who is the editor of the Journal of Learning Disabilities, and Personal Computing spoke about meta-cognitive skills development. He felt that the typical program branching techniques where success leads to higher level problems while failure causes a retreat to easier problems may be too simplistic a concept in special education. The Journal's address is 1331 Thunderhead Drive, Tuscon, AZ 85718.

Probably, if a consensus could be reached from the experience of many of the speakers it was that the educator needs to be his or her own programmer -- thus control and flexibility can be exercised. Despite some of the very slick educational software in the field, it was generally thought that Milliken's programs and Hartley's shorter, task oriented and cassette tape synchronized programs were the most solid. Developmental Learning Material's Academic Skill Builders also received some approval. Unfortunately, there was little discussion of authoring languages like PILOT which support teacher programming. Neither was there any talk of local user's groups which can support the educator's efforts or the seeming inevitability of the Logo and Pascal languages.

The presentation which was most enthusiastically received was Richard J. Hofmann's. Hofmann, who is a Professor of Educational Psychology at Miami University, 201 McGuffey Hall, Oxford, OH 45056, spoke on and demonstrated speech synthesis. Many feel that synthesized speech is one of the breakthroughs needed so that learning and other disabilities can be overcome. Instead of fighting through the often long instructions, which are written to screen, speech can speed understanding so that the student can progress on to the meat of the program. However, while the ear can readily adapt to the stilted speech of present synthesizers, and understand it, the speech patterns are not what we would like to hear emulated. Present technology uses either the memory demanding digitized methodology, which provides relatively clear sounds; or the technique that has reduced some 400 rules of speech onto a chip (while ignoring several thousand other rules) producing that stereotypical computer sound.

Hope for clearer speech is on the way. Hofmann demonstrated prototype software that supplements Milo Street's Echo II synthesizer board and the results were extraordinary. The technique is referred to as Phonemic Encoding -- it is a combination of digitized and synthetic speech. Look for it on the shelves in six months, board and software in the \$150-175 range.

Hofmann also demonstrated a home-grown "talking touch pad". The pad has upper and lower case letters, numbers, and colors. Anything touched is pronounced and displays simultaneously on the monitor. When the letter or number string is completed a graphic pair of lips is pressed and the microcomputer attempts to pronounce the entire character or arithmetic string. It allows exploration into word structuring and numbers up to a quintillion. It delighted the audience. Look to the Journal of Learning Disabilities (noted previously), Spring 1983 issue, for an essay by Hofmann.

As intelligence amplifiers and aids to the handicapped it is clear that microcomputers have arrived. And the best is yet to come.

## A HOLIDAY LETTER FROM Jeanne Essley

(Ed. Note: The following Holiday message arrived at the office around the end of the year. We had intended to publish it last month but somehow lost sight of it momentarily. It's still not too late to enjoy the humor!)

HELLO good friends:

The big news this year is that Phil decided to cut costs by printing our own Christmas cards -- so he bought an Apple computer, a monitor, a disk drive, and a dot matrix printer. By careful shopping he was able to cut costs to almost \$30 per card. Feel flattered. How many of your other friends sent you a \$30 Christmas card? If he decides to cut costs any more I'll send you our address at the poor house. I should have known better when I told him, "This year you do the Christmas cards." Our lives and LANGUAGE have changed.

I never would have guessed that a few BITS could BYTE into and INTERRUPT a marriage so. I'm now among that new breed of woman known as "computer widows". Phil is OPEN about the problem though. He says he'll LET me SAVE our marriage and RESTORE our past POSITIVE relationship by SHARING TIME on the computer. That way I could CREATE NEW INPUT to our marriage that could PROTECT our HOME and CALL FORTH NEW feelings (or verify old MEMORY(s)). He says that there is NOT any need for me to feel PERIPHERAL to the computer. If we ADDRESS our feelings across the BOARD, THEN we can RESET our marriage to a NEW HIGH RESOLUTION that will UNLOCK DISPLAY(s) of affection, OR CREATE an OUTPUT of love during the NEXT few years. The KEY to the future is to CONTROL the SYNTAX of our lives to POKE NEW COLOR into them and PLOT NEW paths to the CODE of life.

Ha! His PROGRAM for my life got an ERROR MESSAGE. I told him to GOTO .... I wouldn't NYBBLE. I'm not about to turn over CONTROL of my life to a DISK DRIVE. My feelings are as BASIC as that, and as LOGICAL as Apple Pi. The only DISPLAY that I feel is NORMAL, or that I can READ cor-

contd.

rectly is SHARING TIME other than on a computer. I don't intend to make a COLD START to learning a NEW LANGUAGE, or to RESET my life to fit into a computer SLOT in order to INTERFACE with my husband. The only ADDRESS I'll probably ever learn is the one FOR my HOME.

Other than that -- everything is fine along the Potomac. We are well and wish you health, happiness, and a computer-free 1982.

Love,

Jeanne (and Phil)

P.S. On occasions when Phil wasn't CHAIN(ed) to his computer we managed to ESCAPE to the ski slopes (infrequently) and the dance floor (frequently) as we continued our ballroom dancing. (Would you believe that Phil is trying to figure out how to program our dance steps on the computer?) All of the kids will be home for the first family Christmas in several years. We're looking forward to it.

P.S.-2 To those of you who haven't had the Berlitz course in computereze, and this letter doesn't make sense -- be thankful!

STOP

Apple Tech Notes contd. from pg 22

```
10 GETA$
20 PRINT VAL(A$)
30 GOTO 10
```

If the first key pressed after starting the program is 1, the program will present the value as 1.1111111E+16. The reason for this has to do with Applesoft's string memory initialization routines. The solution is to add: 5 HIMEM:PEEK(115)+PEEK(116)\*256-1

This line will decrease your variable space by one byte each time the program is run. No fix is required if DOS is booted as DOS automatically does a HIMEM to protect itself.

GOOD LUCK AND GOOD PROGRAMMING-ERS.

Filehandler Revisited contd. from pg 60.

LISTING OF CHANGES - FILEHANDLER

```
140 PRINT : INPUT "ENTER # OF CATEGORIES
PER RECORD: ";C$:C = VAL (C$); IF
NOT D1 THEN DIM H$(C + 5),HC$(C +
5),I$(C + 5):D1 = 1
150 FOR F = 1 TO C: VTAB 22: CALL - 958:
PRINT "ENTER HEADING #";F;: INPUT
":": H$(F): NEXT F: IF D THEN 190
220 IF F$ = "HEADERFILE" THEN C = FR: DIM
H$(C + 5),HC$(C + 5),I$(C + 5):
GOTO 250
230 IF F$ = "INDEXFILE" THEN TR = FR - 1:
IF NOT D THEN GOSUB 30
350 IF A$ = "B" THEN F$ = "INDEXFILE":
A$ = "": GOTO 190
4000 HOME : PRINT "SOURCE FILE CONSISTS
OF ";C;" HEADINGS ": PRINT "AND ";NR;
" RECORDS ": PRINT
4002 HTAB 5: PRINT "HEADING #";W" :
";H$(W):HC$(W) = "": NEXT W
4005 PRINT : PRINT "KEEP ALL OF THESE
HEADINGS (": INVERSE : PRINT "Y";:
NORMAL : PRINT "/N) "": GET AS$:
PRINT : IF AS$ = "N" THEN 4008
4020 VTAB 10: HTAB 1: CALL - 958: PRINT
"HEADING #";W;" : "H$(W)
4030 VTAB 12: CALL - 958: PRINT "KEEP
HEADING #";W;" (": INVERSE :
PRINT "Y";: NORMAL : PRINT "/N) "":
GET HC$(W): PRINT HC$(W);
4035 IF HC$(W) = "N" THEN NN = NN - 1:
VTAB 20: HTAB 15: INVERSE : PRINT
"CANCELLED": NORMAL : FOR KJ = 1 TO
500: NEXT KJ
4040 VTAB 24: HTAB 1: CALL - 958: PRINT
"CHANGE THESE HEADINGS (Y/": INVERSE
: PRINT "N": NORMAL : PRINT ") "":
GET CT$: PRINT CT$: IF CT$ = "N" THEN
HOME : GOTO 4050
4044 VTAB 7: INPUT "":I$(K): IF I$(K) = ""
THEN VTAB 7: CALL - 868: PRINT
H$(K): FOR KJ = 1 TO 350: NEXT KJ:
GOTO 4049
4100 FOR W = 1 TO C: IF AS$ = "Y" THEN
HC$(W) = "": NEXT W
4110 REM
4112 IF R < 1 THEN R = 1
4120 HOME : PRINT "PREV = "": INVERSE :
PRINT "<-": NORMAL : PRINT " (THIS IS
REC# ";R;: PRINT ") "": INVERSE :
PRINT "->": NORMAL : PRINT " = NEXT "
4140 PRINT : FOR W = 1 TO C + AH
4145 IF HC$(W) = "N" THEN NC = NC - 1:
GOTO 4160
4150 PRINT H$(W) " : "": IF A$ = "H" THEN
PRINT : GOTO 4160
4155 PRINT N$(R,W)
4170 IF CH$ = "V" THEN VTAB 24: HTAB 3:
PRINT "<M> ENU, <S> KIP TO ANOTHER
RECORD "": GET AN$(R): IF AN$(R) = "S"
THEN VTAB 24: HTAB 1: CALL - 958:
HTAB 7: INPUT "SKIP TO WHICH RECORD
# ? ";R$:R = VAL (R$): GOTO 4100
```

INTEREST IN COMPUTER FAIR?

by Alan Weiner

Washington Apple Pi is considering sponsoring a computer fair. Currently, a date in June seems likely. The fair would be for six hours or so. Booths would be available for around \$50 for WAP members and \$100 for non-members. To facilitate our planning, we would like to get an indication of how many would-be exhibitors there are out there. Please let us know of your interest by calling the club office at 654-8060 or leaving a message for me on the ABBS, WAP237.



CORRECTED LISTINGS FOR COLOR PLOTTING FROM EQUATIONS by A.R. Rumble  
(Page 40, March 1983 Wap)

(Ed. Note: Some mistakes are small and some are big, but try this one on for size. Last month we printed 4 listings which were identical instead of 4 different listings as had been submitted to us. Our apologies to Mr. Rumble and to you, our readers. Below are the correct listings.)

PROG. I, HIRES COLOR VS X.

```

10 HGR
20 Y = 5
30 FOR I = 1 TO 7
40 HCOLOR = 1
50 FOR X = 1 TO 41 STEP 2
60 HPLLOT X,Y: NEXT X
70 FOR X = 70 TO 110 STEP 2
80 HPLLOT X,Y: NEXT X
90 FOR X = 160 TO 200
100 HPLLOT X,Y: NEXT X
110 FOR X = 201 TO 240 STEP 3
120 HPLLOT X,Y: NEXT X
130 Y = Y + 15
140 NEXT I
180 S= 4096: H= 160: K= 159: M= 114
190 FOR X = H TO 205
200 Y = K - SQR(S - (X-H)*(X-H))
210 HPLLOT X,Y: NEXT X
220 FOR Y = M TO K
230 X = H + SQR(S - (Y-K) * (Y-K))
240 HPLLOT X,Y: NEXT Y
250 HTAB 1 : VTAB 21
260 PRINT"X ODD"; TAB(11)"X EVEN";
    TAB(28)"X BOTH"
270 HTAB 1 : VTAB 22
280 PRINT"STEP 2"; TAB(11)"STEP 2";
    TAB(24)"STEP 1 STEP 3"
290 HTAB 1 : VTAB 23
300 PRINT TAB(3)"FROM TOP,COLOR NOS
    ARE 1 TO 7"
310 HTAB 1 : VTAB 24
320 PRINT
330 HTAB 1 : VTAB 1

```

PROG. II, AERIAL DISPLAY

```

10 HGR2 : HCOLOR = 1
20 W = 119: Z = 11: A = 142
30 FOR X = 279 TO 29 STEP -2
40 B = X - W
50 Y = Z + B*B/A
60 HPLLOT X,Y: NEXT X
70 C = 9: D = 5: E = 10
80 X=X+1: HCOLOR = 2
90 HPLLOT X, Y-E TO X, Y+E
100 HPLLOT X-C,Y-D TO X+C, Y+D
110 HPLLOT X-C, Y+D TO X+C, Y-D
120 FOR I = 1 TO 2000: NEXT I
140 HCOLOR = 6
150 A = 80: B = 600: C = 200
160 FOR X = 0 TO 70 STEP 2
170 Y = A + (X - C) * (X - C)/B
180 HPLLOT X,Y: NEXT X
190 FOR X = 72 TO 132 STEP 2
210 Y=A+(X-C)*(X-C)/
    B-4*SIN(X-102)/3.17
220 HPLLOT X,Y: NEXT X
230 FOR X = 134 TO 148 STEP 2
240 Y = A + (X-C) * (X-C)/B
250 HPLLOT X,Y: NEXT X
260 C = 34: D = 20
270 X = X + 1
280 HCOLOR = 5
290 HPLLOT X-C, Y-D TO X+C, Y+D
300 HPLLOT X-C, Y+D TO X+C, Y-D

```

```

310 HPLLOT X, Y-40 TO X, y+40
320 HCOLOR = 2
330 HPLLOT 144,44 TO 158,44
340 HPLLOT 144,124 TO 158,124
350 HPLLOT 113,70 TO 121,58
360 HPLLOT 181,110 TO 189,98
370 HPLLOT 113,98 TO 121,110
380 HPLLOT 181,58 TO 189,70
390 END

```

PROG. III, SPIRAL

```

10 HGR2
20 HCOLOR = 3
30 C = 160 : D = 75
40 HPLLOT C,D
50 K = .175 : M = 5 : A=0 : R=1
80 A = A + M/R
90 R = EXP( K * A )
100 X = R * COS(A) + C
110 Y = R * SIN(A) + D
120 HPLLOT X,Y
130 IF A < 28.7 GOTO 80
140 END

```

PROG. IV, FLOWER III

```

10 HGR2
20 HCOLOR = 1
30 L= 300: M= 83: R1 = 40: R2= 80:
    N1 = 6: N2 = 4
40 DATA 249, 193, 5.50: 6.02, 191,
    173, 1.31, 1.83, 171, 83
50 FOR I = 1 TO 3
60 READ X1 : READ X2
70 FOR X = X1 TO X2 STEP -2
80 Y = (X-M) * (X-M)/L + M
90 HPLLOT X,Y: NEXT X
110 IF X>2 GOTO 210
120 READ A1: READ A2: Y2 = Y
130 FOR A = A1 TO A2 STEP .01
140 B = N1 * A
150 D = R1 * COS(B)
160 X = D * COS(A) + X2
170 Y = D * SIN(A) + Y2
180 HPLLOT X,Y
190 NEXT A
200 NEXT I
210 HCOLOR = 7
214 X3 = X: Y3 = Y
216 FOR A = 0 TO 6.28 STEP .02
220 B = N2 * A
230 D = R2 * SIN(B)
240 X = D * COS(A) + X3
250 Y = D * SIN(A) + Y3
260 HPLLOT X,Y
270 NEXT A
280 END

```

THANK YOU TO THE WAP HOTLINE VOLUNTEERS

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Daytime Phone \_\_\_\_\_ Evening Phone \_\_\_\_\_

- ( ) INTRODUCTION TO DB MASTER, led by Dave Einhorn, Apr. 16, 9:30 AM. Do Not Bring Apple. - Fee \$10.00
- ( ) ADVANCED DOS TECHNIQUES, led by Richard Untied, May 14, 9:30 AM. 4 APPLES needed for the instructor. - Fee with APPLE \$10.00 ( )  
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- ( ) INTRODUCTION TO VISICALC, led by Leon and Tricia Raesly, April 23, 9:30 AM - Fee with APPLE \$10.00 ( )  
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- ( ) INTERMEDIATE VISICALC, led by Leon and Tricia Raesly, May 21, 9:30 AM - Fee with APPLE \$10.00 ( )  
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- ( ) MULTIPLAN, led by Harold Paris June 4, 9:30 AM - Fee with APPLE \$10.00 ( )  
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# LOGO SURVEY FORM

The following is the Logo interest form, please fill out and mail to the address below. It will be helpful in preparation for the April Logo presentation. Thanks for taking your time!

DATE \_\_\_\_\_  
NAME \_\_\_\_\_ PHONE \_\_\_\_\_  
ADDRESS \_\_\_\_\_ AGES OF CHILDREN \_\_\_\_\_

(Fill out the school or business if using Logo):

SCHOOL AFFILIATION: Public \_\_\_ Private \_\_\_ (County \_\_\_\_\_ ST \_\_\_\_\_)

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\*\*\*\*\*

COMPUTER: Apple II \_\_\_ II+ \_\_\_ IIe \_\_\_ TI \_\_\_ VIC/64 \_\_\_ Atari \_\_\_ IBM \_\_\_ Other \_\_\_

Do you own Logo now? Yes \_\_\_ No \_\_\_ Do you plan to get Logo? \_\_\_

If Apple, which version? Apple Logo \_\_\_ Terrapin \_\_\_ Krell \_\_\_

How will you use Logo? Home \_\_\_ School \_\_\_ Tutor \_\_\_ Training \_\_\_

What age level? Preschool \_\_\_ Elem \_\_\_ JrHi \_\_\_ SrHi \_\_\_ Adults \_\_\_

\*\*\*\*\*

What Logo training have you had? \_\_\_\_\_

What Logo experience have you had? \_\_\_\_\_

What Logo References have you read? \_\_\_\_\_

What suggestions do you have for the Logo group? \_\_\_\_\_

Would you like to become involved in a Logo group? Yes \_\_\_ No \_\_\_

Please indicate which type of Logo groups you would like to see:

Logosig \_\_\_ Adv-Logo \_\_\_ Logokids \_\_\_ LOGO(all computers) \_\_\_ Other \_\_\_

Long-distance-Logosig \_\_\_ Long-dist-Adv-Logo \_\_\_ Long-dist-LOGO \_\_\_

Are you interested in the advanced Logo tutorial? Yes \_\_\_ No \_\_\_

What topics would you especially like addressed? \_\_\_\_\_

\*\*\*\*\*

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INDEX TO ADVERTISERS

Anderson Jacobson . . . . .	Back Cover
ARTRA . . . . .	26
BK Associates . . . . .	36
Clinton Computer . . . . .	Inside Back
Columbia Computer Systems . . . . .	52, 53
Comm Center . . . . .	Inside Front
Computer Den Ltd. . . . .	31
Craftsbury Software, Inc . . . . .	21
dBase II . . . . .	11
Decision Support Software . . . . .	19
Disk Connection . . . . .	35
Frederick Computer Products . . . . .	37
H L A Computers . . . . .	49
L. Morganstein Consultants. . . . .	9
Maryland Foundation . . . . .	17
Micro Connection . . . . .	25
Micro World . . . . .	57
MinuteWare . . . . .	33
Operant Systems . . . . .	41
Option Analytics Inc . . . . .	7
Paragon Technologies Inc . . . . .	5
Primesoft Corporation . . . . .	47
Ramada Computer Products . . . . .	23
Robins Inc. . . . .	15
R.R. Michaels Inc . . . . .	1
Sidney Kramer Books . . . . .	39
Softhink Inc . . . . .	59
TIC Computer Camp . . . . .	13
Tri-State Systems . . . . .	45
Turris Eborra Computer . . . . .	43
VF Associates . . . . .	59

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Apr 23. All sessions 9-1.

Learn the basic operating procedures of the world's most popular small computer! Course also includes TEN BLANK DISKETTES, onto which students may copy software from our library of over 700 programs.

APPLE LOGO FOR TEACHERS. \$75, or \$50 each for 2 or more persons  
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