

\$2

Washington Apple Pi



Volume 4

November 1982

Number 11

Highlights

PROGRAMMING THE ACIA
AN APPLE WRITER PATCH

BLAISE AWAY!

PASCAL TUTORIALS

"ONE OVEN MUFFIN" UPDATED

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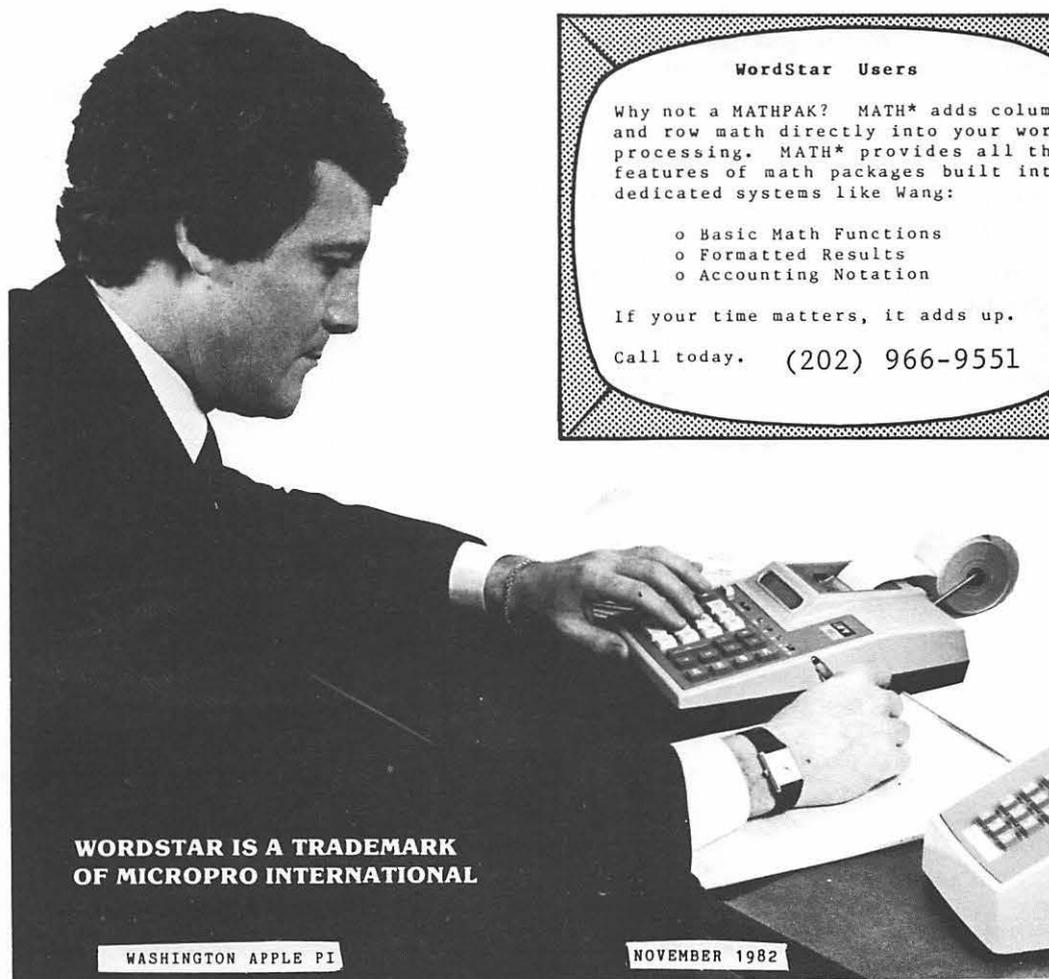
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| SIG/DISABLED | -Curt Robbins | ABBS | WAP428 |
| (or write) | 8805 Barnsley Court | | |
| | Laurel, MD 20708 | | |
| (or phone) | -John Molineaux | (301) | 341-7391 |
| Telecomm. SIG | -George Kinal | (202) | 863-6489 |

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(301) 621-2719

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What do we have here? It's true. For all you Pascalniks, guess who's back? No, not Dr. Who but Dr. Wo, with another Blaise Away ... And for encores he gives us an excellent peek at the curricula for his forthcoming tutorials. Perhaps we can keep things lively with both Tom and Jim Harvison alternating articles.

With this issue we have something for everyone. We seem to be developing a style which is different from the other Apple publications. Our SIGs are beginning to write to their members within these pages, thereby passing on valuable information to the rest of us which will undoubtedly inspire more to join their ranks. We have once again a highly technical article by Charles Mesztenyi - this time on the ACIA communications chip. George Kinal gives us a most valuable lesson on protecting our Apples from the phone company's inadequate protection of our phone lines. George also provides those of us with 48K APPLE II+ the means to run Dana Schwartz's "One Oven Muffin". Bill Jacobsen gives us a peek at the Apple Softcard system for the ///. Lots more, too, e.g. the usual fine Q&A and what the Pres sez. A veritable potpourri.

One personal note ... Jack Warner reviews Master Diagnostics Plus, which see, but I tried his copy on our Disk II, and while it says everything is just great Screenwriter II and Apple Writer says the thing ain't writing when it oughta. Gena wouldn't let me tear it apart until after we went to press. Let you know next issue what I found. &

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 phone and leave your name and address, or write to the P.O. Box above. 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. &



EVENT QUEUE SIG-NEWS

Washington Apple Pi meets on the 4th Saturday 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. Sales, library transactions, newsletter pickup, etc. are from 8:30 - 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:

- November 28 - Graphics
Charles Mesztenyi
David Morgstein
- Demo-Versawriter
- December 18 - Swap Meet
(3rd. Sat.)
- January 22 - Pascal - Dr. Wo
- February 26 - Hardware Interfacing
Tom Riley

**** SWAP MEET - DECEMBER 18 ****

by Joe Fuchs

The second annual Swap Meet will be held at the December meeting in lieu of having a speaker. Start now to clean out those drawers and gather up all that documentation! Bring anything -- games, software, books, hardware, etc. Plan to sell, swap or give it away, but please, no commercial sales. Also copyrighted software must be on the original disk.

Registration, space assignments, and setup will take place between 9:00 and 10:00 AM, and the cafeteria will be open to everyone after a short meeting. Library sales and other pre-meeting activities, including the Q & A session, will take place as usual.

If you would like to save some time, call Joe Fuchs any evening at 434-6756 to pre-register.

PETER THOMAS AND IAN THAL ARE WINNERS!

We have some winners! Two of our youngsters, Peter Thomas and Ian Thal, placed third in the International Computer Problem Solving Contest II, which was sponsored by Donald T. Piele, University of Wisconsin-Parkside, last Spring. This meant that they had to solve all five contest problems with ease and style. They demonstrated:

- 1) Good control of standard Basic;
- 2) The ability to solve problems in general;
- 3) Experience in implementing a problem-solving strategy within the context of a computer language.

How about a round of applause for Peter and Ian? Next year's contest will be held on April 30, 1983. Any more takers from the Appleseeds or Greenapples?

SIGAMES is the special interest group of computer hobbyists interested in using their APPLES for entertainment. They meet immediately following the monthly meeting of Washington Apple Pi.

PIG, the Pascal Interest Group, meets on the third Thursday of each month at 7:30 PM at the Uniformed Services University of the Health Sciences, Bldg. A, Room 2054 (2nd floor), on the campus of the National Naval Medical Center at 4301 Jones Bridge Road, Bethesda, MD.

EDSIG - the education special interest group - will meet on Tuesday, November 9 at 7:30 PM in Lecture Room A, Building A, USUHS. For details of this and other meetings, see the EDSIG Page elsewhere in this issue.

LOGOSIG meets each month on the Saturday of the WAP meeting at 12:30 PM at the Bethesda Country Day School, 5616 Beech Avenue, Bethesda, MD. For details of this and other meetings see the LOGOSIG Page elsewhere in this issue.

ASMSIG meets immediately after the regular Washington Apple Pi meeting.

The APPLE /// SIG meets on the second Thursday of the month at 7:30 PM. The meeting place alternates between the Walter Reed Medical Center and Universal Computers.

NEWSIG will meet just after the regular Washington Apple Pi meeting. We will answer questions and try to help new owners get their systems up and running. We will also explain how our club operates.

The following members have agreed to answer questions over the phone when someone gets stuck and needs help between meetings:

| | |
|---------------|----------|
| Bob Chesley | 560-0120 |
| Paul Hoffman | 831-7433 |
| Sarah Lavilla | 926-6355 |
| Boris Levine | 229-5730 |
| Steve Sondag | 281-5392 |

Another SIG has been added - the Telecommunications SIG. For information call George Kinal, 863-6489

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TELECOM SIG NEWS

by Jeremy Parker

September 25, 1982

The Telecomm SIG's second meeting, led by George Kinal, was a discussion of hardware and software needed to get started in computer communications. George has written a three page flyer on the subject, concentrating on cheap ways to begin. One example, showed at the meeting, was the Bizcomp 1080 modem, tested by Emil Levine and George Kinal. This modem works through the game port, and thus needs no interface card, and it comes with dumb terminal software, and software to record all communications in memory for later processing as desired. At a cost of about \$100, the Bizcomp allows one to talk to bulletin boards or (probably, not yet tested) the Source or Comuserve. However, the Bizcomp is "originate only", so two Bizcomps cannot talk directly to each other; they would have to communicate through a bulletin board. Because the Bizcomp does not use a serial interface card, other software to perform more sophisticated functions would not work with it.

George also brought up another subject: telephone lines as a source of lightning damage to your Apple. From personal experience George knows this to be a problem. Adding a telephone line to your Apple adds another potential path for lightning, that must be protected separately from one's power line. Sometimes the phone company protects their line but usually it doesn't. George has written another flyer on this, and is proposing to have a mass order for lightning protectors, which would cost about \$7 each.

The group discussed software packages, but did not have any information, even about club software. Some packages come with free membership in the Source, or free time on Comuserve. Greg Gallegher plans to investigate the various packages and compare them.

Telecomm SIG's next action will be to propose equipment for the club store to carry. Perhaps the Bizcomp? Comments are welcome. ☺

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WAP HOTLINE

Have a problem? The following club members have agreed to help. PLEASE, respect all telephone restrictions, where listed, and no calls after 10:00 PM.

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|--|---|----------------------------------|
| General | Robert Fretwell Dave Harvey Robert Martin | 971-2621 527-2704 498-6074 |
| APPLE SSC | Bernie Benson | 546-0076 |
| Apple TechNotes | Ed Schenker | 977-7349 |
| Communications Packages | | |
| Data Capture | Howard Simkowitz | 882-4645 |
| VISITERM | Steve Wildstrom | 933-7728 |
| Expediter Cmplr. | Peter Rosden | 229-2288 |
| Data Bases | | |
| DB Master | Dave Einhorn Leon Raesly | 593-8420 460-0754 |
| Data Perfect | Leon Raesly | 460-0754 |
| Games | Jim Eatherly Donn Hoffmann | 232-6046 966-2616 |
| Graphics | Bill Schultheis | 538-4575 |
| Home Account | Leon Raesly | 460-0754 |
| Languages (A=Applesoft, I=Integer, P=Pascal, M=Machine) | | |
| A | Peter Combes | 871-1455 |
| A,I | Jeff Dillon | 422-6458 |
| A | Mark Pankin | 370-9219 |
| A,I,P,M | Bill Schultheis | 538-4575 |
| A,I,M | Richard Untied | 241-8678 |
| P | Robert Fretwell | 971-2621 |
| Locksmith | Leon Raesly | 460-0754 |
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| ASCII Express | Dave Harvey | 527-2704 |
| Hayes Smartmod. | Bernie Benson | 546-0076 |
| XTALK CP/M Com. | Bernie Benson | 546-0076 |
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| CP/M | Robert Fretwell | 971-2621 |
| Paddles | Tom Riley (eve.) | 340-9432 |
| Pers. Fil. Sys. | Ben Ryan | 469-6457 |
| Printers | | |
| General | Walt Francis | 966-5742 |
| Anderson Jac. | Bill Etue Leon Raesly | 620-2103 460-0754 |
| IDS 460 | Jeff Stetekluh | 521-4882 |
| MX-80 | Jeff Dillon | 422-6458 |
| Silentype | Bruce Field | 340-7038 |
| Time-Sharing | Chuck Reinbrecht Dave Harvey | 299-6810 527-2704 |
| VisiCalc | Walt Francis Leon Raesly | 966-5742 460-0754 |
| Word Processors | Walt Francis | 966-5742 |
| Apple Writer | Bruce Field | 340-7038 |
| Letter Perfect | Leon Raesly | 460-0754 |
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| Star Warrior | \$ 29 | dBase II (CPM) | \$449 |
| Hellfire Warrior | \$ 29 | Calcstar (CPM) | \$117 |
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| HARDWARE ITEMS | PRICE |
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| Epson MX100 | \$700 |
| Smith-Corona TP-1 Ltr.-Qual. Printer | \$725 |
| Computer Desk (52" x 23") | \$110 |

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PRESIDENT'S CORNER

by David Morganstein

NEW MEMBERS MANUAL. Betsy Harriman who ably assembled the newsletter during the summer has volunteered to put together a manual for new WAP members. The manual will contain organizational information as provided in the information sheet now given; additionally it will include the WAP By-laws and perhaps a brief history of the WAP. Other useful items might be articles such as those written by Bob Platt and Tom DeMay in last month's issue (the first article described programs on the APPLE master diskette and the second article pictured a typical day at a WAP meeting). If you want to help, (with suggestions or a few hours) please contact Betsy.

SWAP FEST. Take note that our December meeting (the THIRD Saturday in Dec.) will feature a swap fest in place of a speaker. Joe Fuchs has volunteered to coordinate the activities. The purpose of the fest will be to allow individuals to sell or barter away programs or equipment no longer wanted. This means original programs with original documentation. Sales by vendors are prohibited. (See Computer Faire below for that opportunity.)

COMPUTER FAIRE. Plans for a computer faire have not moved very far yet, but Al Weiner, coordinator, is optimistic. The major stumbling block is to find a large enough location with ample lighting and electricity. If you have any thoughts please relay them to Al (946-2585) so that a date can be set. The primary purpose of the faire would be to allow local area entrepreneurs and club members to get together, view products and conduct sales. Other activities might include seminars and demos on special subjects.

TUTORIALS. Many thanks to our SYSOP, Tom Warrick for his excellent tutorial on machine language. About two dozen members attended the several Saturday morning programs and came away realizing that it "ain't alchemy after all!!"

The next tutorial scheduled will be on Pascal, the featured instructor: Dr. Wo. Check the last few pages for a registration blank. A description of the tutorial is given by Dr. Wo elsewhere in this newsletter.

APPLE TECH. NOTES. By prior arrangement with Apple, IAC has sent all member clubs a copy of the notes made available to Apple Dealers. Ed Schenker has volunteered to maintain the notes for WAP. Ed can be reached by phone (see the Hot Line) to

inquire about specific updates and corrections. This issue of the Pi contains a list of all topics found in the Notes. In addition, Ed will transcribe the notes, one item at a time, into a monthly column. I've asked him to select first those subjects requested by phone since they are of direct interest to at least one member. If you want a complete copy of the Notes, you can purchase them from your local Apple dealer. The IAC has arranged for a \$7.50 discount for member clubs (however, having seen the notes I would not encourage anyone to spend the \$65 price tag too quickly!!! Many of the notes are quite brief and of little benefit to most Apple owners.)

IAC. At our last Board meeting the role of the IAC in representing Apple club members to the Apple company was discussed. I was in agreement with those Board members who expressed the desire of seeing the IAC move towards being a voice for the clubs and whispering their interests in Apple's ear. The recently elected Chairman of the IAC Board, our Editor, Bernie Urban, told us that he would be reporting on some IAC changes in his column on the International.

One of those changes relates to efforts to make the 850 disk IAC library accessible to member clubs. Currently a club must contribute a disk of new software to receive a disk from the library, a system which greatly limits small clubs with little or no disks in their own library. (See "A Page from the Stack" in the October issue.) While the IAC has been busy setting up their office this year, I am hopeful that the clubs and the IAC can work more closely together to serve club members.

The WAP sent a copy of its ABBS software to the IAC Executive Director in August for distribution to all member clubs. I am hopeful that, when the IAC makes the disk available, this contribution will be of benefit to other clubs.

Two of our SIG chairmen, Jim Eatherly (GAMES) and David Stern (Appleseeds) have volunteered to act as IAC SIG chairmen for GAMES and for FAMILY ACTIVITIES. We hope that their efforts will strengthen the IAC's offerings to member clubs.

CLASSIFIEDS

URGENTLY WANTED: Back issues of Softalk. Good prices. Andrew Cutler, 347-5140.

FOR SALE: Modem - 300/1200 auto-answer 212A modem and telephone for \$350. SSM AIO board for \$75. Steve Willett, (H) (703) 573-0437, (W) (703) 827-1329.

FOR SALE: Silentype Printer, excellent condition, \$250. Call evenings (301) 730-6888 or write G.H. Levine, 9534 Pamplona Rd., Columbia, MD 21045.

contd. on pg 39

JOB MART

- APPLE PROGRAMMERS WANTED -

Postal Service Management Academy seeks serious computer hobbyists to complete small programming jobs on contract. The work can be completed in your home. Knowledge of Apple Basic programming required. Background in Computer Assisted Instruction desirable. Please contact Richard Thorp, (301) 492-5086.

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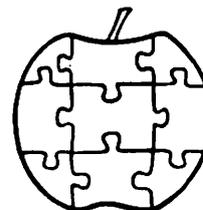
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A PAGE FROM THE STACK

by Jill and Vance Giboney

This month we're adding three new disks to the library.

Volume 123 is a French vocabulary disk. This disk contains a program for drilling you on French vocabulary. Included are three large files of words. Also included is a program to create other files so that you can use the tester program on your own words and phrases.

Volume 124 is a new utilities disk: Utilities E, which contains the following programs:

A.S. LINE LOCATER - This program gives you the RAM address of the beginning of a selected Applesoft line. Run A.S. LINE LOCATER DESCRIPTION for instructions.

ADDRESS/LENGTH FINDER - This program tells you the length and load location of a binary file on disk, and offers the option of transferring the file to another disk.

AMPERSORT II - This is a repeat of the ampersort program, and included here to accompany the recent article by Peter Rosden documenting the program. BRUN AMPERSORT DOC. (BRUN) for the documentation.

BOOT CHANGER - This program changes the file type that DOS will run when it is booted. A new disk must be INITed from the modified DOS in RAM.

BREAKER A\$7D00 L\$268 - This is a machine language debugging tool which allows the insertion and deletion of break points in a machine language program. RUN BREAKER INSTRUCTIONS for documentation.

COLORWHEEL - This is a harmoniscope program based upon the color wheel that can aid you in choosing appropriate colors.

COMPARE CAPTURER
COMPARE PROGRAMS ROUTINE - These programs allow you to compare different versions of a BASIC program. A description of how to use the programs is given with each program.

DISK VERIFIER - This program allows you to change the name of the hello program on a disk, scan the disk for bad sectors, or INIT a new disk and flag any bad sectors.

DISKSCAN 1.0 - Similar to Disk Verifier.

FILEHANDLER - This utility allows you to modify sequential text files.

FLOWER COMMENTS - This program discusses two different ways to handle plot information from BASIC programs.

GRAPHIC HELLO - A graphic hello program.

INT PRINT WRITER - This is a utility to assist you in entering numerous print statements in an Integer program.

LEW'S PEEK AND POKE - This program creates Applesoft program lines containing PEEKs or POKEs.

LINE DRAW - This is a graphics utility that allows you to plot lines on the Hi-res screen. Options allow you to change line and screen color.

NOPEEK - This is a demo of Integer BASIC internals which describes a method for passing data between an Integer program and an Assembly language routine.

PADDLE POT CORRECTION CAP - For the context and use of this program see the the January 1982 WAP newsletter.

PROGRAM PACKER - This program condenses Applesoft programs by eliminating REMs and combining lines. Also included is PROGRAM PACKER--UNPACKED as additional documentation.

READ AT.BIN - This Applesoft utility allows you to begin reading data from whichever DATA line you choose. For a demonstration run READ AT DEMO.

SHORT DOS COMMANDS - This program shortens DOS commands to one or two letters. For instructions run SHORT DOS INSTRUCTIONS.

SPEED LOADER - This program changes the DOS sector spacing for faster disk operations.

Our IAC disk this month is the new IAC miscellaneous disk: Volume 125 -- IAC 18. This disk comes to the IAC from the Wenatchee Valley Apple Computer Club of Wenatchee, Washington. &

BUGS AND OTHER PARASITES

The following is submitted by Mike Hugo.

There are two errors in "The Input Expressor" by Eli Argon, as published in the September 1982 issue of Washington Apple Pi. The first one is in the body of the article, in the tenth paragraph. BSAVE <NAME>,A,<ADDRESS>,L77 should be:

BSAVE<NAME>,A,<ADDRESS>,L78

The second one is in the listing, line 10. POKE 1014,0 should be:

POKE 1024,0 &

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PROGRAMMING THE ACIA

by Charles K. Mesztenyi

The ACIA, Asynchronous Communications Interface Adapter, is a central part of various Communications Interface Cards available for the Apple. The M6850 ACIA is used by the Apple Communication Interface card, by the California Computer Systems Asynchronous Serial Interface, and by Hayes Micromodem II. The Synertek SY6551 ACIA is used by the Apple Super Serial Interface card. The purpose of the ACIA is to send/receive data to/from another device which may be another computer, printer, plotter, etc. Connection to the other device may be through direct wire or phone lines with appropriate modems on both sides. Data are composed of characters which are composed of certain number of bits (up to 8). When the ACIA is to send a character, then this character must be stored in its transmit-register. The ACIA frames this character data and converts it to a series of output pulses toward the receiving device at a preset time rate (baud rate = bits/sec). Conversely, when receiving such a series of pulses, it de-frames it and collects the character bits into its receive-register. Relative to a ground signal, a negative pulse generates a 0-bit value, and a positive pulse a 1-bit value. Framing the character bits means sending "start bit(s)" in front of the bits comprising the data character and sending "parity" and "stop" bits after them. Bits comprising the character are sent or received starting from its low order bit. The most commonly used characters are the ASCII characters each of which are defined with 7 bits. During transmission of ASCII characters the high order bit of the 8-bit transmit-register is not sent out and the corresponding high order bit of the receive-register is left undefined.

The above mentioned interface cards have various programs in their ROM space to accommodate the ACIA chip, and to make it "easier" to use. Except for the Hayes Micromodem, the documentation for these interface cards also includes the assembly language listing of their ROM programs. Fortunately, sufficient information is provided by all to enable the programming of the ACIA directly without reference to the ROM programs which cannot be modified. I have listed a terminal program accommodating the lower case adapter in the February 1982 issue of Washington Apple Pi and recently George Kinal described a dumb terminal program (April 1982) with a short description of the M6850 ACIA. My recent problem is that neither the Apple Communication card nor the Apple Super Serial card allow you to bypass (disregard) the incoming ASCII NULL and DEL (Rubout) characters. Furthermore, by programming the ACIA directly, you can implement features which the ROM program on the interface card does not have.

ACIA Registers.

Direct programming of the ACIA requires the knowledge of its registers. The M6850 has four registers: the Transmit and Receive Data registers, and the Status and Control registers. The SY6551 has the same registers and a fifth one, called Command register. All registers are 8-bit registers. The Transmit and Receive registers are the same for the two ACIA's, the other registers are also functionally similar; the Command register of the SY6551 may be thought of as an extension of the Control register to accommodate the extended capabilities of the SY6551. These registers are associated with the certain memory locations of the Apple so that a program can directly address them. These memory locations are in the range of \$C080+s0 to \$C08F+s0 (s is the slot number of the interface card containing the ACIA). The exact location in the 16 byte range depends on the interface card. A further interesting feature is that some of these registers pairwise share the memory address; when you read it (load a 6502 register) from the memory address it picks up the contents of one ACIA register, while a store operation into the memory address causes the data to be stored into the other ACIA register. The actual addresses are shown in Table 1.

Transmit and Receive Data registers:

As their names imply, the Transmit register is where the data to be sent out by the ACIA should be stored; the Receive register is from where incoming data can be accessed. They share memory addresses for both M6850 and SY6551. You should store data into the Transmit register only if it is empty, and you should pick up the data from the Receive register only if it is filled. These conditions can be tested by checking the appropriate bits of the Status register.

Status register:

The bit values of this register show the status of the ACIA which are summarized in Table 2. Explanations of the interrupt requests and the RS-232-C signal status are beyond the scope of this article. Parity and frame errors usually indicate improper initial data set up with the communicating site unless it is due to hardware error or unusual noise in the communicating line. Character overrun errors occur when data which arrived earlier in the Receive Data register have not been picked up before new data arrives. The Receive Data register status bit changes to a binary one when a byte is assembled into it; it changes to zero as soon as its contents are picked up (read). The Transmit Data register status bit changes to zero as soon as a

contd.

byte is stored into the Transmit Data register, and changes to one as soon as the ACIA takes it out for sending. The Status register of the M6850 shares the memory address with its Control register.

Control and Command registers:

Storing appropriate data bytes into the Control register (and Command register of the SY6551) informs the ACIA about the transmission characteristics. This information falls into 3 categories: the number of data bits and its framing property, the baud rate, and interrupt enable/disable information. The Control register of the M6850 is also used to reset its registers after a power up. The Command register of the SY6551 is used to transmit a "break" signal, i.e. transmitting a continuous stream of zero bits.

Basic Programs for ACIA.

There are five basic operations to be considered for the ACIA:

- (1) Initialization,
- (2) Send a data character,
- (3) Test for received data,
- (4) Receive a data character,
- (5) Test if any error occurred.

These operations are illustrated below with examples assuming the Apple Communication Interface Card with the M6850 ACIA is in slot 2.

(1) Initialization.

As in the case of Apple II's cold and warm start, the ACIA must be initialized by a "master reset" after the power is turned on. This is followed by a "command reset" which informs the ACIA about the data type. Similarly to the Apple, one may need to repeat the reset if certain errors occur during the transmission. These reset operations consist of storing specific data to certain memory locations which are wired to the ACIA control/command registers.

```
Example: LDA #$03 ; Master reset to
          STA $COAE ; Control register
          LDA #$0A ; 7 bits data, even
                   parity, 1 stop bit,
          STA $COAE ; 300 baud rate.
```

(2) Send a data character.

Sending a data character consists of storing the character into the memory location which is wired to the ACIA's Transmit register. Since the microprocessor works faster than the ACIA at the established baud rate, you may have to delay this store operation until a previously stored data has been completed. For this reason, you have to check the value of a certain bit in the status register of the ACIA which is wired to a specific memory location.

```
Example: SEND LDA $COAE ; Wait til
           AND #$02 ; Transmit
           BEQ SEND ; register is
                   empty
           LDA DATA ; Get data and
           STA $COAF ; send it out
```

(3) Test for received data.

There are two reasons for this test. The first and obvious one is to retrieve the sent data character. The second, which is less obvious, is to decide whether we want to send a byte despite the fact that meanwhile a byte has arrived. The test is simply checking the value of a certain bit in the status register of the ACIA through the connected memory location.

```
Example: TEST LDA $COAE ; Get Status
           AND #$01 ; Mask receive
                   bit
           BEQ NO ; Jump if not
           BNE YES ; Jump if yes
```

(4) Receive a data character.

The data character is retrieved from a memory location which is wired to the Receive register of the ACIA. You should use (3) Test for retrieved data, and retrieve the data only if the test is affirmative.

```
Example: RECV LDA $COAE ; Get Status
           AND #$01 ; mask receive
                   bit
           BEQ RECV ; wait if not
                   received
           LDA $COAF ; else pick it up
           STA DATA ; and save for
                   processing
```

(5) Test if any error occurred.

The test consists of checking the values of certain bits in the status register of the ACIA. The reason for testing is obvious, but solving the problem of what to do in case of error, is not so simple.

```
Example: LDA $COAE ; Get Status
           AND #$F0 ; Mask error bits
           BEQ NOERR ; Jump if no error
           error processing to be followed
```

Note that the above examples were for clear illustrations of the operations involved. They use location DATA for the arriving and transmitting character. In practice, one of the 6502 registers is used for this purpose. Also detecting a certain bit value in the Status register can be implemented differently.

Table 1.

Memory Locations by Interface Card.
Add \$s0 Where s is the Slot Number.

| I | Trans. | Rec. | Status | Contr. | Comm. |
|---|--------|--------|--------|--------|--------|
| 1 | \$C08F | \$C08F | \$C08E | \$C08E | none |
| 2 | \$C081 | \$C081 | \$C080 | \$C080 | none |
| 3 | \$C087 | \$C087 | \$C086 | \$C086 | none |
| 4 | \$C088 | \$C088 | \$C089 | \$C08B | \$C08A |

- I.1 Apple Communication Interface Card (A2B003X).
- I.2 Cal.Comp.System Apple Asynch. Serial Int. 7710A.
- I.3 Hayes Micromodem II.
- I.4 Apple Super Serial Card (A2L0044).

contd.

Table 2.
Status Register Bit Assignment.

| 6850 6551 bit pos. | Explanation |
|-----------------------|--|
| 7 0 | 1 whenever there is an unacknowledged interrupt request pending, 0 otherwise |
| 6 7 | 1 if parity error, 0 otherwise |
| 5 2 | 1 if character receive overrun, else 0 |
| 4 1 | 1 if framing error, 0 otherwise |
| 3 6 | Clear to Send signal status (M6850), Data Set Ready status (SY6551) |
| 2 5 | Data Carrier Detect signal status |
| 1 4 | 0 if Transmit Data register filled, 1 if Transmit Data register empty |
| 0 3 | 0 if Receive Data register empty, 1 if Receive Data register filled |

Table 4.
Bit Values for SY6551 Control Register.

| bits | value | Explanation |
|------|-------|--|
| 7 | 0 | 1 stop bit |
| | 1 | 2 stop bits or |
| | | 1 stop bit if 8 bits data and parity bit |
| | | 1.5 stop bits if 5 bits data and no parity |
| 6-5 | 00 | 8 bits data |
| | 01 | 7 bits data |
| | 10 | 6 bits data |
| | 11 | 5 bits data |
| 4 | 0 | External receiver clock |
| | 1 | Baud rate generator |
| 3-0 | 0000 | 16x external clock |
| | 0001 | baud rate = 50 |
| | 0010 | = 75 |
| | 0011 | = 109.92 |
| | 0100 | = 134.58 |
| | 0101 | = 150 |
| | 0110 | = 300 |
| | 0111 | = 600 |
| | 1000 | = 1200 |
| | 1001 | = 1800 |
| | 1010 | = 2400 |
| | 1011 | = 3600 |
| | 1100 | = 4800 |
| | 1101 | = 7200 |
| | 1110 | = 9600 |
| | 1111 | = 19200 |

Table 3.
Bit Values for M6850 Control Register.

| bits | value | Explanation |
|------|-------|---|
| 7 | 0 | Disable receive interrupt |
| | 1 | Enable receive interrupt |
| 6-5 | 00 | Disable transmit interrupt RTS low |
| | 01 | Enable transmit interrupt RTS low |
| | 10 | Disable transmit interrupt RTS high |
| | 11 | Enable transmit interrupt, output break level RTS low |
| 4-2 | 000 | 7 bits, even parity, 2 stop b. |
| | 001 | 7 bits, odd parity, 2 stop b. |
| | 010 | 7 bits, even parity, 1 stop b. |
| | 011 | 7 bits, odd parity, 1 stop b. |
| | 100 | 8 bits, no parity, 2 stop b. |
| | 101 | 8 bits, no parity, 1 stop b. |
| | 110 | 8 bits, even parity, 1 stop b. |
| | 111 | 8 bits, odd parity, 1 stop b. |
| 1-0 | 00 | Isosynchronous clock rate |
| | 01 | 110 baud rate |
| | 10 | 300 baud rate |
| | 11 | Master reset |

Table 5.
Bit Values for SY6551 Command Register.

| bits | value | Explanation |
|------|-------|---|
| 7-5 | | Parity options |
| | | Transmit Receive |
| | --0 | none none |
| | 001 | odd odd |
| | 011 | even even |
| | 101 | marked not checked |
| | 111 | spaced not checked |
| 4 | 0 | Normal for receiver |
| | 1 | Echo for receiver |
| 3-2 | 00 | Interrupt RTS high disabled |
| | 01 | Interrupt RTS low enabled |
| | 10 | Interrupt RTS low disabled |
| | 11 | Transmit Break signal |
| 1 | 0 | Interrupt enabled from Status reg. bit 3 (Receive reg.full) |
| | 1 | Interrupt disabled |
| 0 | 0 | Interrupt disabled, DTR high |
| | 1 | Interrupt enabled, DTR low |

Remark: The 0 value for bit position 1, interrupt enabled when the receive register is full has been taken from the Apple Super Serial Card documentation. The Synertek documentation refers to the parity error caused interrupt. I was unable to check which is correct.

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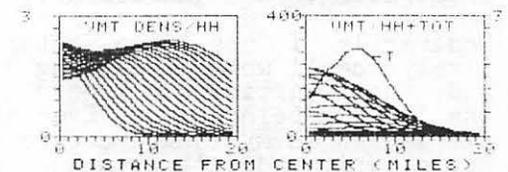
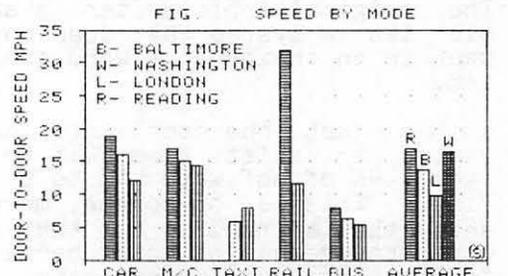
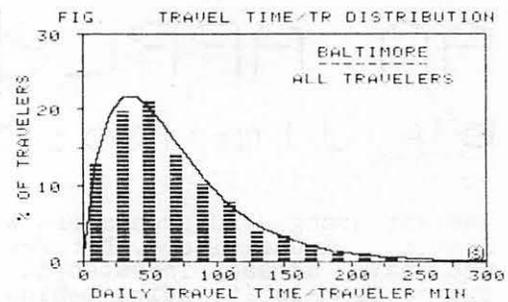
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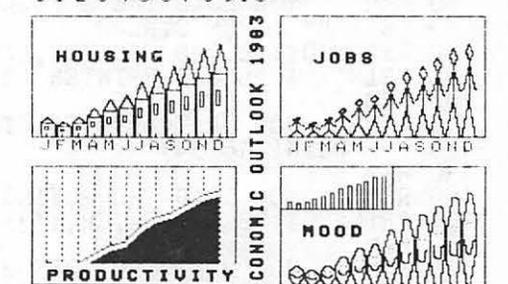
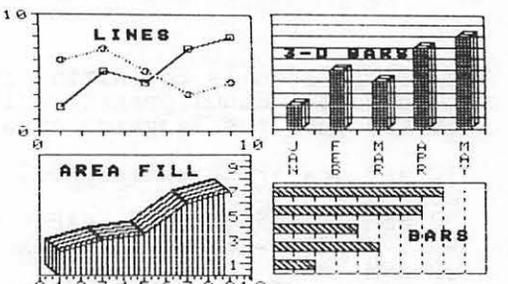
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AN APPLE WRITER PATCH

by Jim Rose

The war among word processors will probably continue indefinitely, but for those of us who have already invested in a product, there is relative quiet behind the lines. The original Apple Writer is still a capable little system that does most of what I want in an inexpensive word processing system.

I had just one complaint: each time I wanted to shift from EDIT to PRINT and back, 4K of software had to be loaded from disk. This is, of course, more an annoyance than a problem, but that interruption in "getting the job done" became thoroughly frustrating. And unnecessary.

Ordinarily I use Apple Writer for relatively small word processing jobs: letters and short articles. I have a lot of RAM that's not being used. Even more, with an extra 16K in my language card (memory that Apple Writer didn't even know about) there seemed to be ample room to solve the problem.

The plan of attack is simple: store both programs on the language card at boot time. Then, instead of each program BRUNning the other from disk, have them simply move the program to the executable area and start it up. Here we are treating the language card as a "softdisk" device.

The solution comes in four steps.

Step 1.

The first step is to initialize a new disk with a boot (HELLO) program which loads the software onto the language card.

```
10 REM NEW APPLE WRITER BOOT ROUTINE
20 REM
30 REM FIRST WRITE-ENABLE CARD
40 I = PEEK(-16255): I = PEEK(-16255)
50 REM
60 REM NOW LOAD THE SOFTWARE
70 D$ = "" : REM CTRL-D
80 PRINT D$;"BLOAD TEDITOR,A$D000"
90 PRINT D$;"BLOAD PRINTER,A$E100"
100 REM
110 REM NOW WRITE-PROTECT THE CARD
120 I = PEEK(-16254)
130 REM
140 REM NOW LOAD THE MOVING PATCH
150 PRINT D$;"BLOAD PATCH,A$350"
160 REM
170 REM NOW MOVE THE EDITOR DOWN
180 REM AND START IT GOING!
190 CALL 848
999 END
```

Most of this is fairly well documented in the APPLE language card manual on page 26. The only magic is line 160, and that's step two.

Step 2.

The Moving Patch is a simple assembler rou-

tine which we can put on page 3. Its sole purpose is to move a block of code from the language card to \$803 (Apple Writer's normal entry point).

The source code is contained in Listing 1, and for those of you without an Assembler, the bytes to poke are:

```
350- A9 E0 85 01 D0 04 A9 F1
358- 85 01 A9 00 85 00 A9 18
360- 85 03 A9 03 85 02 A9 11
368- 85 04 AD 83 C0 A0 40 B1
370- 00 91 02 88 C0 FF D0 F7
378- C6 04 F0 06 C6 01 C6 03
380- D0 ED AD 82 C0 4C 03 08
```

Type this code into your APPLE and save it with:

```
>BSAVE PATCH, A$350,L$86
```

Step 3.

Now we need copies of the Apple Writer software. But first you must change it so that it loads the companion program from the language card rather than from the disk. First type:

```
>BLOAD TEDITOR.
```

That will load your Apple Writer editor.

Now type:

```
>CALL -151 to get you into monitor mode.
```

Type *1280L to disassemble what's there. You should see (among the other stuff) "128C: JSR \$1328". That's the beginning of the BRUN PRINTER command, so we want to change that to: "128C: JMP \$0356" which is our own mover. So, type:

```
*128C: 4C 56 03. Now type
```

*3DOG to return to Basic, and save the TEDITOR on your new disk with:

```
>BSAVE TEDITOR, A$803,L$1040.
```

Step 4.

Now do the same with the PRINTER. Type:

```
>BLOAD PRINTER
```

```
>CALL -151
```

```
*1000L
```

You should see (among the other stuff): "100D: JSR \$108A". We want to change this to: "100D: JMP \$0350", so type:

```
*100D: 4C 50 03.
```

Now save the software with

```
*3DOG (to get back to Basic)
```

```
>BSAVE PRINTER,A$803,L$1040
```

Step 4+.

Don't forget to transfer the PRINT CONSTANTS to your new disk also. I'd like those constants on my language card as well, but that's another story.

contd.

```

0000:          1 *****
0000:          2 *
0000:          3 *   APPLEWRITER PATCH
0000:          4 * THIS ROUTINE MOVES EITHER TEDITOR OR PRINTER FROM
0000:          5 * THE LANGUAGE CARD, TO THE STANDARD EXEC LOCATION.
0000:          6 * IT ASSUMES THAT:
0000:          7 *   TEDITOR IS IN $D000 - $E040
0000:          8 *   PRINTER IS IN $E100 - $F140
0000:          9 *   EXECLOC IS IN $0803 - $1843
0000:         10 * WRITTEN BY: JIM ROSE (WAP#10) SEPTEMBER 1982
0000:         11 *****
0350:         12          ORG $350          ;PLACE TO PUT THE PATCH
0350:         13          OBJ $4350       ;TEMPORARY OBJECT LOCATION
0350:         14 *
0350:         15 FROM          EQU $0          ;POINTER TO THE SOURCE
0350:         16 TO          EQU $2          ;POINTER TO THE DESTINATION
0350:         17 NPAGES      EQU $4          ;NUMBER OF PAGES TO BE MOVED
0350:         18 PROGRAM     EQU $803        ;APPLEWRITER ENTRY
0350:         19 SELECT      EQU $C083      ;SELECT RAM READ
0350:         20 DESELCT     EQU $C082      ;DESELECT RAM READ
0350:         21 *-----*
0350: A9 E0          22 TEDITOR      LDA #$E0          ;HIGH BYTE OF TEDITOR'S LAST CODE
0352: 85 01          23          STA FROM+1        ;STUFF IT IN 'FROM' POINTER
0354: D0 04          24          BNE LOBYTE        ;JUMP OVER PRINTER ENTRY
0356:          25 *
0356: A9 F1          26 PRINTER      LDA #$F1          ;HIGH BYTE OF PRINTER'S LAST CODE
0358: 85 01          27          STA FROM+1        ;STUFF IT IN 'FROM' POINTER
035A:          28 *
035A: A9 00          29 LOBYTE      LDA #$0          ;SET LOW BYTE OF 'FROM TO ZERO
035C: 85 00          30          STA FROM
035E:          31 *
035E: A9 18          32          LDA #$18          ;HIGH BYTE OF 'TO' POINTER
0360: 85 03          33          STA TO+1
0362: A9 03          34          LDA #$3          ;SET LOW BYTE OF 'TO'
0364: 85 02          35          STA TO          ;TO THREE
0366:          36 *
0366: A9 11          37          LDA #$11          ;GOING TO MOVE 17(DECIMAL) PAGES
0368: 85 04          38          STA NPAGES
036A: AD 83 C0      39          LDA SELECT        ;OPEN ACCESS TO RAM
036D: A0 40          40          LDY #$40          ;START OFFSET WITH $40
036F:          41 *
036F: B1 00          42 MOVE        LDA (FROM),Y      ;GET THE BYTE
0371: 91 02          43          STA (TO),Y        ;PUT THE BYTE
0373: 88          44          DEY
0374:          45 *
0374: C0 FF          46          CPY #$FF          ;PAGE BOUNDARY YET?
0376: D0 F7          47          BNE MOVE          ;NOPE, MOVE SOME MORE
0378: C6 04          48          DEC NPAGES       ;DONE ALL PAGES?
037A: F0 06          49          BEQ QUIT        ;IF SO, QUIT
037C: C6 01          50          DEC FROM+1      ;ELSE RESET POINTERS
037E: C6 03          51          DEC TO+1
0380: D0 ED          52          BNE MOVE          ;ALWAYS
0382:          53 *
0382: AD 82 C0      54 QUIT        LDA DESELCT        ;DESELECT RAM
0385: 4C 03 08      55          JMP PROGRAM        ;GO EXECUTE THE PROGRAM

```

*** SUCCESSFUL ASSEMBLY: NO ERRORS

:

LISTING 1

6

MINUTES

SEPTEMBER GENERAL MEETING

Washington Apple Pi met on September 25, 1982 at 10:00 AM in Bldg B of USUHS. Apple Tech Notes are available from IAC for \$65. Someone will maintain the hotline on the notes and transcribe them piecemeal into the newsletter. Starting in October there will be a demonstration in the cafeteria 9-10:00 by owners of products. October will feature Montgomery County teachers on CAI. Tutorials: Oct - Tom Warrick on Assembly language; Nov - Dr. Wo on Pascal. Note the dates of meetings in upcoming months: Oct - 5th Saturday; Nov - 4th Sat. There will be a Swap Fest at the Dec. meeting, the 3rd Saturday. If you picked up the new disk on ABBS software, the title is right, the number on the disk is wrong. Bring it back for an exchange if you have the wrong one. The Bylaws of the corporation were printed in the October newsletter, to be reviewed and voted on at the Oct. meeting. From now on, all SIGS

will begin after the presentation. Applications are being accepted to maintain the prospective office. Office equipment can be loaned to the club until nonprofit status is obtained, whereupon it could be officially donated. The presentation was by Jim Burger and Ken Hautman on Federal copyright law as it refers to Apple computers, Apple vs. Franklin, and marketing software.

SUMMARY - OCTOBER WAP BOARD MEETING

The Executive Board of Washington Apple Pi, Ltd. met on October 12 at the home of the Urbans. The agenda included: acquiring office space, contents of new member packet, acknowledgement of applications, discussion on WAP/IAC projected activities, booth at Mid-Atlantic Computer Show, consideration of diskette prices and Quentin drives, Treasurer's report - how to spend nonappropriated cash, response to applicant search, WAP store repair facility, credit account for library disk copying, meeting date of Board returned to 2nd Wednesdays. &

IAC CORNER by Bernie Urban

Much news this month. First off, we've streamlined our organization for greater productivity and improved services to you. You will get the details in the next issue of the Apple Orchard, but essentially we have a new President, Jerry Vitt, who as you know is one of our regional Directors from the Southern Region. Jerry takes on the oversight function associated with the position, thereby enabling Ken Silverman, our Executive Director, to devote full time to running the IAC headquarters office in Santa Clara. Reproduced below is the chart depicting the official IAC organization. Please note that we have the Board reporting to you, our members.

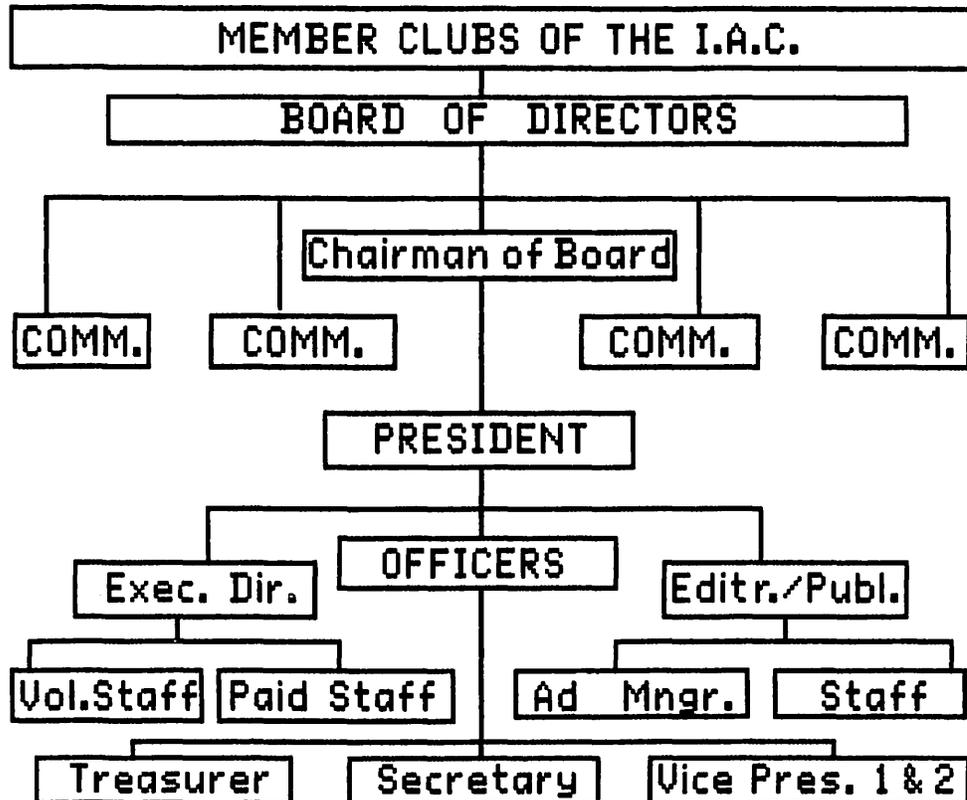
Last month I mentioned that I was asked to look into IAC's policy concerning software exchange. I have asked Jerry to task the newly created software committee, chaired by Charles Smith (416) 297-3575 and including Roger Keating and Bob Sander-Cedarlof, to formulate and publish within the next few weeks the official IAC policy and procedures on software exchange. Roger Keating and Bob Ramsdell have volunteered to review Terry Taylor's holdings of 850+ diskettes for the purpose of possibly putting together special IAC offerings in education and business.

Mike Markkula, President of Apple Computer, Inc., accepted our invitation to meet with the IAC Board on September 30. He graciously offered to continue the dialogue and to explore opportunities for joint Apple/IAC action which would be of benefit to Apple User Groups.

We are also setting up as one of our major priorities the continued improvement of the Apple Orchard under the expert guidance of our Editor, Peter Weiglin.

Many of you may have missed the last issue of the Orchard in which I attempted to provide you with some of my thoughts about the IAC. I would like to share these with you now.

contd.



Some Notes

from the

Chairman of the Board

Bernie Urban

The International Apple Core - The name to me conveys both pretention and whimsy - pretention because of its aspirations to be global in scope and whimsy for its substitution of "Core" for the more traditional "Corps". Yet it is fitting if only because of the presence of Canadian, Australian, Japanese, European, and South American member clubs, not to mention foreign U.S. clubs (I hate that word . . . it's foreign to me). Fitting also because we are an organization created ultimately for the edification of the individual Apple owner, concerning the potential for both serious use and sheer fun.

Our original purpose for formation of the IAC was to spread the word about anything which dealt with Apple computers. The clubs we represented at that initial meeting in October 1979 in San Francisco had voracious appetites for news, information and software - good, mediocre and even bad. So we rolled up our sleeves and started. Drawing heavily upon the larger, more experienced clubs and Apple Computer, Inc., we improved existing procedures for exchanging software, newsletters and information. We initiated the publication of the **Apple Orchard**. We sent out *ApNotes* to our members as fast as they were received. Quality was not necessarily our watchword. Remember, we were faced with an information-hungry membership. But with each passing month, other sources of information appeared. Mimeographed newsletters metamorphosed into magnificent magazines. Commercial ventures sprouted forth into veritable fountains of knowledge. And we improved.

However, we must now rethink our role and methods. Our purpose remains the same - we are organized to provide information and knowledge to our member clubs concerning the Apple computer and its use.

Through our past efforts the IAC Board and Officers have prepared and approved a comprehensive set of goals and objectives (5 major goals and more than 50 objectives within them). While this may seem too grandiose and too comprehensive, the present set was condensed from a list twice as long. But we are a volunteer organization. We have sponsoring members, but not to the extent of those which supported the old line SHARE, USE and other computer user organizations. We function within a budget which draws from funds derived from Club membership fees, subscriptions and ads for the **Apple Orchard**, and other up-till-now lesser fund raising activities.

Our goals and objectives remain as a basis for future activities and services, and they will change as we grow, but it is now time for me to address what is of most concern to you. If I were to put on your hat, the first question I would ask is, "What's in it for my club?" This immediately suggests a horde of others. "Why should we support the IAC? What has it done for us lately? How come we don't have an easy way to influence its policies? Who are our Directors and when have they helped us? SIGs (Special Interest Groups) - what SIGs?"

I have concluded from the beginning that the IAC should not become the equivalent of a local club except for size. We, in my opinion, should not be duplicating the services and functions which are best performed at the local level. Rather, we should be involved with matters which cannot be readily dealt with by the typical member club. For example, if the majority of our members call upon us to convey their disapproval of Apple Computer, Inc.'s policy on mail order purchase of Apple products, we should do so. Standards are both necessary and difficult to formulate; we're working on them. Perhaps we should become microcomputer activists and prepare testimony for presentation on Capitol Hill concerning the billing of long distance and local phone calls on the basis of distance, and its potential negative impact of computerists who frequently access data systems and who exchange information and software by modems. (To do that we would need to make major modification to our By-laws and perhaps lose our not-for-profit status.) Should we intervene on behalf of our membership when a significant number of our clubs experience difficulty with a particular software or hardware vendor, and what form should that intervention take?

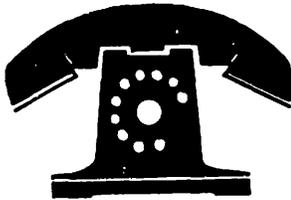
You have probably noticed that I have not answered directly the questions which surely concern you. I have hinted at possible answers and have implied services which I shall propose to members of the Board. But there is more to be said.

Communication is a two-way process. We get our share of gripes concerning tardy or non-delivery of diskettes of the month, foulups on **Apple Orchard** subscriptions, and the like. We strive to improve on these matters. We also welcome constructive comments. I will propose to the Board the following which should help the process:

1. Seek out and implement as soon as we possibly can the best ABBS currently available as a service to our membership. Responsibility for this function can conceivably reside with an individual or member club with all reasonable costs defrayed by the IAC. (See the President's Message, this issue.)
2. Each Director should solicit information from the member clubs within his jurisdiction concerning projects and activities which the clubs deem to be of potential interest internationally. This information should be made available through the pages of the **Apple Orchard**.
3. Clubs should be invited to initiate projects which could result in special purpose publications, software or hardware. IAC should give these activities prominent publicity and appropriate support.

Surely there are individuals and clubs out there who are willing to become responsible for passing on this knowledge to others. Others who share this interest can be encouraged to make their contributions, with the assurance of proper recognition of their worth.

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BLAISE AWAY!

Dr. Wo Strikes Back

by Dr. Wo

As I look over my notes from previous articles, I see that I haven't occupied this space since November of 1981. (I think. My notes are so bad I may be completely off.) My, how time flies! I also noticed a call from our Editor asking for a column on Pascal. He thought he had a regular one, but I fooled him.

"So what have I been up to?", I ask. Well, too much work for one thing. What was a hobby was turned into an occupation, and that, as David Morganstein predicted, became a lot like work. The way to counter this, it seems, is to make work more like a hobby. Dr. Wo strikes back! And Bernie gets a Pascal column.

IBM-PC

Now don't get me wrong. Some of this work has been real pleasure. For one thing, I have spent a lot of time with the IBM-PC, and it is a very nice computer indeed! My rig sports 2 double-sided drives (total capacity 800K), version IV.1 of the UCSD p-System, 384K of RAM, and a serial port on which I hang a printer and a D.C. Hayes Smartmodem. Part of the RAM (128K) is used by the p-System as data and code space, the remainder as a virtual disk. Total disk capacity is over 1 megabyte.

Time Out!

One thing I've been doing since I got so heavily involved with the PC is to perform some timing comparisons between the various Apple computers and the PC. (I've been assisted by WAP member Donn Hoffman. If he ever gets it together you'll see the results of our work here or in some other space. Are you listening, Donn?) Preliminary indications are that the PC is the fastest gun in this pack (no surprise) but that those of you with Mill cards should cry no tears.

Smartmodem

Speaking of the Smartmodem, I really like it. It can be joined to most any serial card, so it's not bound to any one computer, and it provides a lot of feedback to the user about how operations are proceeding. Especially nice is the audio feedback as the phone is being dialed. I am looking forward to the 1200 baud version of this modem, which should be out very soon; it is supposed to be switch selectable between 300 and 1200 baud.

Apple Super Serial Card

I say the Smartmodem can be joined to most any serial card. Actually it can be joined to any serial card which provides a minimum

number of RS-232 lines, but to make it do what I wanted it to do on the Apple II, I had to bypass the CCS card and take a look at the Super Serial Card.

The Super Serial Card is loaded with features. It is completely programmable (baud rate, data format, interrupts, etc.); has a good complement of RS-232 signals so it can easily be connected to many peripheral devices; the documentation is excellent, with one important exception; and it has enough software on it to solve almost any communications problem, if you can figure out what the 6502 code is doing. That's the exception to the documentation; the firmware could be better documented. I wound up writing my own driver just to be certain of what the code is doing.

Telecommunications

With all this talk of modems and serial cards, you'd think I've been working on some telecommunications programs. Indeed I have and I have learned a lot: architectures for computer networks, communications protocols, the USUS standard remote unit, interrupt driven serial I-O on the Apple, how not to write a communications package and more. I hope to share some of this with you in future articles, especially interrupt driven serial I-O combined with the USUS remote unit.

An Ace!

Have you ever been frustrated by the limited functions of the eX(change command in the editor? For example, how many times have you wanted to exchange beyond the end of the current line or onto succeeding lines, only to be frustrated by an unmovable cursor? How many times have you wished you could edit files bigger than 36 blocks? How would you like to be able to insert PROGRAM, PROCEDURE, BEGIN, RECORD etc. with a single keystroke? How about editor macro commands? Then the Advanced Systems Editor from Volition Systems is for you. The ASE is an ace! I've been using it exclusively for about three months now.

The ASE is produced by Volition Systems, Inc. of Del Mar, CA, (714) 457-3865. It is fully compatible with Apple Pascal 1.1. You can substitute it for the regular system editor, or you can execute it like any other program. In either case you get all of the goodies implied above and then some.

The size of files you can edit with the ASE is limited only by the capacity of your disks. The editor uses a paging scheme whereby what is in the editor's buffer is a window into a set of pages from the disk files, and the pages are a window into the entire file. The windows move around as

contd.

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needed so that files of arbitrary size can be edited.

Not only is the ASE a virtual editor, but it is recursive. One can invoke the editor from within the editor. Upon recursive invocation, the ASE backs up your current work in a stack-like fashion. When you finish editing a file, the ASE pops the stack, recalls the backed-up files, and asks if you want to continue with the task now on the top of the stack or push a new one. This feature is very handy when you want to simultaneously edit several related files without ever leaving the editor.

Of course, simultaneous editing can fry your brain. And your files if you lose your way. Some will find this feature handy; others will use it only rarely.

The eX(change command in this editor is very powerful. It is more like invoking another editor than a simple command since any other editor command, such as I(nsert or D(ecute, can be invoked from within eX(change. In addition, the cursor can be moved about arbitrarily so that exchanges are not limited to the length of the current line. It is difficult for me to describe how convenient this can be. Suffice it to say that I spend a lot more time in the exchange mode than I ever did using the regular system editor.

Another neat feature of the eX(change command is the ability to change the direction of the exchange. This makes it

```
t
r      silly things l
i              i
v      o          k
ial to d          e
                .siht
```

Not so silly is the ease with which you can make tables and draw simple figures using this feature.

You can add your own commands, or functions, to the editor up to a total of 8 at any one time. This is a two-step process. First, you declare certain keystroke sequences will be used to invoke the functions. For example, you might declare that the sequence <esc,1> will be used to invoke function 8. This is done using a configuration program supplied with the ASE. The information is stored in SYSTEM.MISCINFO, so the assignment of keystrokes to function numbers is more or less permanent.

Next you define what should happen when the various functions are invoked. Any legitimate sequence of editor commands and actions can be assigned to the functions, and you can easily alter the definitions of the functions from within the editor, so function definitions are dynamic. Thus, you might define function 1 so that the word PROCEDURE is inserted into the text whenever it is invoked.

This example is a very simple illustration of how one might use the function commands of the ASE. In fact, this feature is very sophisticated and the program offers a variety of ways to assign actions to the

function keys. One of these methods amounts to a text editing programming language: you write a program for a function key using this language; the actions defined by the program are then assigned to one of the function keys. It is also possible to have the functions assigned and invoked automatically upon initiating an editor session.

MODULA -----

Another Volition Systems program I have been noodling around with is their MODULA compiler. MODULA is a programming language designed by Nicklaus Wirth, Pascal's creator, to overcome some oft-cited deficiencies of standard Pascal, namely lack of separate compilation units, lack of dynamic arrays and primitive I-O. It bears a very strong resemblance to Pascal.

To be sure, Apple Pascal and UCSD Pascal have gone a long way toward overcoming these weak points: both have separate compilation units; both have a variety of I-O calls including random access disk I-O and hardware level calls; and UCSD Pascal has some intrinsic procedures which permit the programmer to construct dynamic array parameters.

From MODULA's point of view (or at least from Volition's, and in some cases my own) there are certain disadvantages to the way these features have been implemented. In each case MODULA extends these features, or offers a more general solution to the problem which a feature was designed to overcome. On the surface MODULA seems to be superior, but I haven't had nearly enough experience programming in the language to be sure. I'll review the language in depth in a future article; to whet your appetite, here's a preview:

MODULA's separately compiled units, called modules, are as general as procedures. That is, they can be nested in arbitrary ways, just as procedures can. And, they can be nested within procedures: procedures can have private modules.

MODULA permits true data abstraction. A data type and the primitive operations or procedures which can be performed on variables of the type are declared in the interface of the module. The underlying structure of the type is not revealed to the host program. Call accesses to variables of the type must be performed by these procedures. This insures that a host program is completely insulated from changes to the underlying implementation of the data type.

A good example of this technique is the use of file variables in Apple Pascal. The programmers's only access to file variables is through the procedures read, write, eof etc. Thus, Apple can change with impunity the data structures used to implement internal files, the code for connecting them with external files, the manner in which I-O is buffered, etc., provided only that at the programmer's level all I-O procedures still perform the services originally promised.

contd.

MODULA has divorced I-O from the language. In Apple Pascal the I-O procedures are embedded in the compiler; they are an intrinsic part of the language. This is why you can have calls to read and write with a variable number of parameters. In MODULA, I-O procedures are embedded in a library module. Therefore, they can be completely rewritten to suit the programmer. In addition both the compiler and the run-time system are smaller because I-O is not intrinsic to the language.

There is much more to MODULA than this. Further reports later.

Version IV.0

I've also been fooling around with Version IV.0 UCSD Pascal for the Apple, from Softech. The p-System community has directed a lot of criticism at IV.0 on the Apple, but I like it. See my article in The Apple Orchard entitled "Will the Real Apple Pascal Please Stand Up?"

The major criticism seems to be that Version IV.0 is slower than Apple Pascal. Unfortunately, this is true where disk I-O is concerned; disk I-O speed is reminiscent of the old Apple Pascal 1.0. It is also true that it takes longer for a program to begin executing under IV.0 than under Apple Pascal. But this is the tradeoff for Version IV.0's far more powerful version of UNITS. For me the tradeoff is better than even. Finally, Version IV.0 is not slower when it comes to execution, at least not according to my timing experiments. More on this in an article with Donn Hoffman.

Software Design

The other thing I've been doing is learning more about proper software design and development -- and unlearning some bad habits. I am indebted to my friend and colleague, WAP member Alan Freiden, for freshening my outlook, helping me to look at my programming practices with a more critical eye.

P.S.

Well there you have it! A little here, a little there, and that's what I've been up to.

Hope to see you again real soon!

Blaise Away!!!! Dr. Wo

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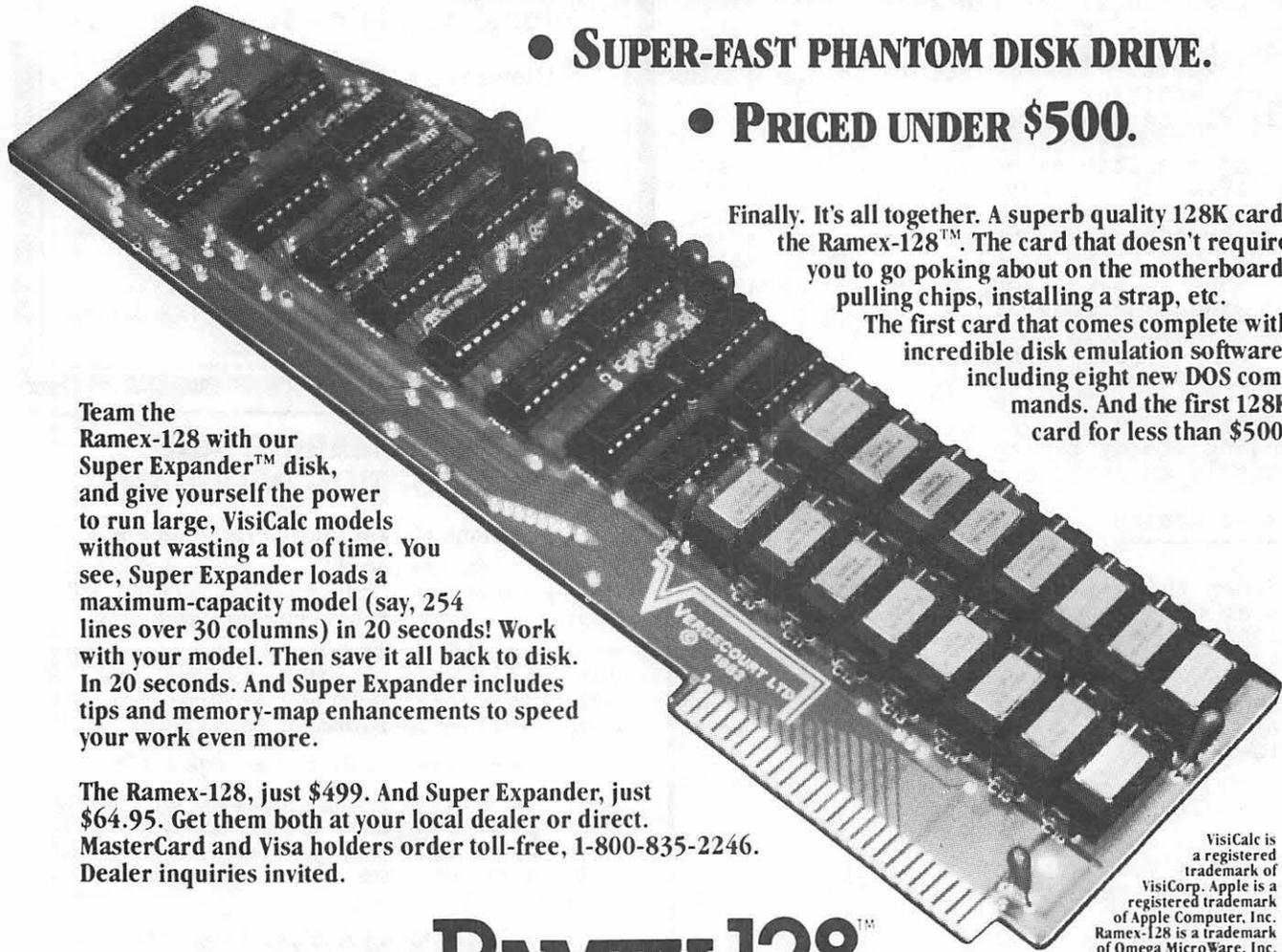
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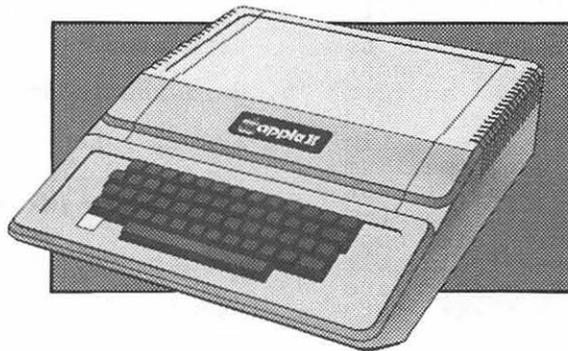
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PASCAL TUTORIALS

by Dr. Wo

I will be teaching two Pascal tutorials, introductory and advanced, in the coming months. The introductory tutorial will be held on four consecutive Mondays from 7:30 PM to 10:30 PM beginning November 22. The advanced tutorial will be held over four consecutive weeks beginning the week of January 9, 1983. Exact times and dates for the advanced tutorial will be published in the next issue of the Pi.

Introductory Tutorial

This tutorial is designed for individuals who want to learn how to program in Pascal, or improve their Pascal skills. A prerequisite for the tutorial is basic working knowledge of how to use the Pascal editor and filer.

Students will learn the concept of data types, the program control statements in Pascal, and how to write procedures and their role in Pascal programs. In addition, students will learn how to use the compiler to translate program source files into executable code files.

Apple Pascal is a programming language and an operating system. It is impossible to completely separate the language from the operating system; but it is also impossible to cover all the features and commands in the operating system, and learn how to program in Pascal all in 12 hours! Consequently, I have had to make some choices about what to include in the tutorial, and what to leave to the student to learn in advance. So: students who want maximum value from the tutorial should invest effort in learning how to use the system editor and filer. Together with the compiler, these are the two most frequently used programs in the system. They are basic tools to translate your ideas into working programs.

One of the best ways to learn how to use the system is to study and practice with Hands-On Apple Pascal, published by McGraw Hill. This book will show you how to use the operating system, and how to program on a step-by-step basis. It is designed to be used sitting at the computer, and you should plan to use it this way. Carefully working through the first three or four chapters will be excellent preparation for this tutorial. Two other good introductions are Beginner's Guide to the UCSD Pascal System by Kenneth Bowles, also published by McGraw Hill, and, of course, your Apple manuals.

The tutorials will concentrate on the Pascal language. A syllabus for the tutorial is attached. No textbook is required for the tutorial, but a good way to prepare is to match the topics mentioned in the syllabus to sections and chapters in any standard Pascal programming text and

study the text.

One of my favorite texts is Programming in Pascal by Peter Grogono, published by Addison-Wesley. The book is well written, the layout is nice, and the examples are good. Concentrate on Chapters 2, 3, 4 and 7.

Advanced Tutorial

This tutorial is designed for individuals who have a good working knowledge of Pascal programming and who want to learn some advanced techniques such as using library units in program development, and writing device drivers.

Several special topics may be covered in this tutorial. Which ones depends on you. Please let me hear from you! This is your tutorial, and I would like to help you. Some suggested topics are:

1. Top down program development and units.
2. Attaching device drivers to the BIOS.
3. A unit for accessing disk directories.
4. Interrupt driven serial I-O.
5. Records and file I-O, including I-O redirection.
6. Hardware independent screen control.
7. System internals.

SYLLABUS FOR INTRODUCTORY TUTORIAL

Prerequisites:

Introduction to the Apple Pascal
Operating System

What is an "Operating System"?
Elements of the Apple Operating System
and Their Functions

Filer
Editor
Compiler

Basic Housekeeping Tasks Using the Filer

Formatting Diskettes
Naming Files and Volumes
Copying Diskettes
Copying Files
Removing Files

Zeroing Diskettes
Setting the Date
Saving the System Work File
Renaming Files

Basic Operations with the Editor

Creating an Editor File
Adding Text
Some Editor Commands
Leaving the Editor

contd.

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Fundamental Structure of a Program

Input --> Action --> Output
Program Development in Relation to the
Operating System
Editing
Compiling
Revision

delete
insert
pos
length
copy
Strings vs. Characters
Programming Examples

Week 1:

Introduction to the Pascal Language

Characteristics of Pascal
Data Structures
Program Structure and Procedures
Comparison to BASIC

Declaring Data

The Concept of Data Type
Permissible Values
Permissible Operations
Constants and Variables
Declaring Variables
Examples
Syntax
Declaring Constants
Examples
Syntax
The Assignment Statement
Examples
Syntax
The Data Type Integer
Permissible Values
"maxint"
Permissible Operations
DIV and MOD
Examples
Varieties of Division
Pre-defined Integer Functions

Week 2:

Elementary Input and Output

"read" and "readln"
"write" and "writeln"
Input --> Action --> Output again
Examples Using Integer Data

The Data Type Boolean

Permissible Values
Permissible Operations
Examples
Conditions and Boolean Data
Examples
Boolean Expressions: Comparisons

Character Data

The Type CHAR
The ASCII Character Set
The Functions "ord" and "chr"

Strings

The Type STRING
The Length of a String
Built-in String Functions and Procedures
concat

Week 3:

Controlling the Action: Program Control Structures

The Purpose of Control Structures
Three Basic Control Sequences
Sequential Execution
Selective Execution
Repetitive Execution
Sentences in the Programming Language:
Statements and Sequential Execution
The IF...THEN...ELSE Statement (Selective Execution)
The WHILE...DO Statement (Repetitive Execution)
The REPEAT...UNTIL Statement (Repetitive Execution)
Relationship Between the WHILE and REPEAT Statements
The FOR Loop
The CASE Statement
Multi-Branch Control Structures
Using the Case Statement in Menu Oriented Programs

Programming with Control Statements

Syntax of a Pascal Program

Week 4:

Procedures in Pascal

What is a Procedure?
Header
Declarations
Body
Why Do We Use Procedures?
Declaring Procedures

Programming Examples

Parameters in Procedures

What are Parameters?
Why Do We Use Them?
Types of Parameters
Formal Parameters vs Actual Parameters
Variable Parameters vs Actual Parameters

Programming Examples

More about Procedures

Syntax of Procedure Declarations
Scope
Problem Refinement
Divide and Conquer

contd.

Procedures as Black Boxes: Hiding Data and Actions

Concepts

- Top Down Development
- Stepwise Refinement
- Divide and Conquer
- Nesting and Levels of Tasks

Some Exercises:

1. Write a Boolean-valued function

```
FUNCTION yes: BOOLEAN
```

which waits for the user to press a key and returns TRUE if 'y' or 'Y' is pressed and FALSE otherwise. For ease of use, make sure that the user need not press the return key in order for the computer to respond.

2. Write a procedure

```
PROCEDURE capitalize(VAR s: STRING)
```

which capitalizes all lower case letters ('a' .. 'z') in s, but otherwise leaves it unchanged, and returns the modified string.

Boundary consideration: make sure the program does not fail if the length of the string is zero.

3. Write a procedure

```
PROCEDURE get_file_name(VAR name: STRING)
```

which prompts the user to enter the name of a Pascal text file, reads the file name and returns it in the parameter name. For convenience to the user provide the following:

- * The ability to enter no name by simply pressing the return key.
- * The ability to choose *SYSTEM.WRK.TEXT by simply pressing the '\$' key followed by the return key.
- * The ability to forego specifying the suffix '.TEXT' as part of the file name.
- * Prompting sufficient to describe the above features to the user. That is, make sure you inform the user that pressing '\$' followed by return is sufficient to specify the system work file.

4. Write a function

```
FUNCTION menu-choice(VAR choice: CHAR; ok_set: SET OF CHAR): CHAR;
```

which repeatedly reads the keyboard and rings a bell until a character in ok_set is pressed, at which point the function should return the character pressed in the parameter "choice" and as its function value. Functions like this are very useful in developing menu driven programs.

Performance Considerations:

- * Make sure the function is indifferent to the case (upper vs. lower) of the characters pressed. In other words, pressing 'a' and 'A', for example, should invoke the same response.
 - * Make sure the system does not echo the characters pressed back to the screen. Otherwise, you will clutter up the screen and may confuse the user.
5. Write a program which copies text files. The program should prompt the user for the names of the source and destination files. It should check to see that the source file exists and return an appropriate message if it does not. It should check for the existence of the destination file and confirm that it is ok to destroy the current version. Make sure the program allows the user to "copy" the source file to the screen, for viewing, or a printer, for hard copy listing.

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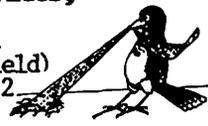
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GRAPHICS INTERFACE ROUTINE

by David Morganstein

The following short machine language program will be of benefit to few readers, since it is used to drive a PKASO printer interface card connected to an NEC printer using the Printographer Hi-res Screen Dump program reviewed in last month's Softviews column. So, why write about it? Well, its short, so it won't take up a lot of space... More seriously though, since we had a machine language tutorial last month it seemed a useful example of the need for simple machine language programs.

One important requirement about the driver was to make it "relocatable", that is, independent of any particular location for its operation. The code will run in virtually any available RAM because it makes no absolute references to addresses within itself; it makes only relative references. Specifically, it contains no JMP (jump) or JSR (jump subroutine) instructions to locations within itself. It does make a JSR to the location \$C100, the start of the ROM on the printer interface card in slot 1 (had the card been in slot "k", the JSR would be to \$Ck00). However, all other "hops" in execution are done by branch commands which are relative to the current location (e.g. branch to memory five locations after the current one).

Now for the program and its explanation:

```
10 ON/OFF SEC ;set the carry bit
20 BCS CONT ;branch if the
;carry bit is set
; i.e. branch always
30 PRINT PHA ;save the byte
;to be printed
;on the stack
40 CHECK LDA $C090 ;read PKASO status
50 ROL ;check high bit
60 BPL CHECK ;if not ready,
;recheck
70 PLA ;retrieve byte from
;stack
80 STA $C801 ;send to PKASO
90 STA $C800 ;
100 STA $C801 ;
110 RTS ;done, return from
;this routine
120 CONT CPX #$0 ;check X
;register
130 BNE OFF ;if 1, turn off
;DOS hooks
140 JSR $C100 ;if 0, initialize
;card
145 RTS ;return
150 OFF LDA #$F0 ;point COUT to
160 STA $36 ;monitor
170 LDA #$FD ;
180 STA $37 ;
190 RTS ;return
```

The Printographer specified that the driver was to have two entry points, that is two different CALLs to it would occur. The first call, to the beginning of the program would be used either to turn on (initial-

ize) the PKASO card or disconnect it from the DOS. The decision as to which function is required will be made by examining the X-register. Printographer would put a 0 in the register for the initialization and a 1 when things are done.

The second entry point, to be located exactly three bytes after the beginning, was to be used for the routine sending of a byte out to the PKASO. The byte would be in the A-register (accumulator) when the second entry was made.

Lines 10-20 of the program are a simple way to get to a location within the routine without using an absolute address reference. By first setting the Carry bit (SEC), then doing a branch if the bit is set (BCS), you get a "Branch always" instruction. This is needed to branch around the second routine.

Line 30, the beginning of the print routine, saves the byte to be printed by pushing it on the stack (PHA) temporarily because the A-register will be needed for the next step.

Lines 40-60 keep the computer in a loop waiting until the PKASO card is ready for a byte. Bit seven of address \$C090 is continually checked until it is zero. This address is not actual RAM; rather it is a register on the card into which a status byte is placed by the PKASO. By loading the address into the accumulator (LDA), then rotating the eight bits one bit to the left (ROL), then branching back to the load instruction if a plus result occurs from the rotation (BPL), a test for a zero in the next to the left most bit is made.

Line 70 pulls the byte from the stack into the accumulator (PLA).

Lines 80-100 send the byte to the card for printing. To be completely honest, I haven't the faintest idea why this works!!! I just found it in the PKASO manual, so...

Line 110 is a return from this part of the subroutine (RTS).

Line 120 is part of the continuation of the first function, to turn on or off the card. If the X-register does not have a zero in it, branch to OFF and reset the I/O hook on page zero at locations \$36 & \$37 to contain the monitor address \$FDF0, the original values. If it does have a zero do a JSR to the PKASO card ROM at \$C100 to initialize it.

MASTER DIAGNOSTICS

A Review by Jack Warner

A few meetings ago a member inquired about diagnostics programs for the Apple. MASTER DIAGNOSTICS PLUS is such a program. It tests the "innards", checking the chips, monitor alignment, whether you've worn out your paddle button on your shoot-em-up games and many other items. In addition, MD+ (it even sounds like a Apple computer doctor!) can be purchased with a disk head cleaning kit.

Apple's big brothers, the minicomputers, have built-in programs that check the CPU (central processing unit) each time you power up. While this is certainly nice when you run your equipment 8 hours a day, and can't tolerate too much downtime, for at home or small office use, MD+ does the job.

In my experience, there are two times when you are glad you have MD+:

1. Your year-old Apple starts garbling your work or games after its been on for two or three hours. Is it a chip or did your kid lay his Playskool magnetic letters on the disk you just inserted? MD+ can check it out.
2. You have just mistakenly plugged in a chip in reverse (taking out a 16K expansion card at 2 a.m. and putting the RAM chip in backwards...or, you plugged your Videx softkey board in backwards). Your Apple hisses gently as you power up. MD+ can check it out once you insert it properly.

The first case happens as your Apple grows old and the chip and board contacts oxidize. Cigarette smoke is a supplier of such contaminants. The second, happens so many times that MD+ mentions it as the most common problem encountered. (Ever wonder how the repair technician knew to reach for the 74SL125 chip as he saw you enter the shop carrying your disk drive?) MD+ will identify many component/chip problems.

The program is not a substitute for services by dealers, but it will help you stay running in the face of minor problems. The documentation is very helpful both in running the test programs (you do not have to open any components or the Apple to use MD+.)

The program provides 25 tests which I will not detail, but refer you to ads by NIKROM TECHNICAL PRODUCTS, the producer, in most computer magazines. It will not test your spouse's patience with your computer activities, but it does a fine job on your monitor alignment and your color TV to make sure your colors match what the Apple is producing. Other monitor programs help you adjust the fine tuning controls to center the picture and eliminate fuzziness.

I checked with an Apple dealer about the

diagnostics they use. Their similar program checks the Apple and the Apple brand peripherals. MD+ checks the D.C. Hayes Micromodem as well as providing for a very thorough check, adjustment and cleaning procedure for your disk drive.

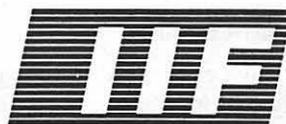
I have found the program useful, the documentation helpful, especially the section on actual user maintenance, and the lead-in program's select graphics nifty. The packaging is book style, making it easy to store neatly. MASTER DIAGNOSTICS PLUS is available from Nikrom Technical Products, 25 Prospect Street, Leominster MA 01453, 800-835-2246. Without the head cleaning kit \$ 55.00, with \$75.00. 



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CP/M ON AN APPLE ///

by William C. Jacobson

The CP/M Softcard marketed by Apple has finally arrived, permitting owners of the Apple /// access to the vast amount of software available for this business-oriented operating system. As touted by Apple, owners of the /// now can use DOS, SOS and CP/M on their marvelous machines.

I purchased one of the first copies of the Apple Softcard System available in the Washington, DC area and would like to relate some of my initial experiences with it.

While it will be sometime before I can classify myself as an expert in matters CP/M, I have been able to wend my way through its special command structure with a minimum of problems.

One of the first questions I had about my new Softcard was the existence of any unique features that distinguish it from its many relatives. As far as I can see, there are no special CP/M related functions of significance. It simply allows me to access CP/M.

Having said this, however, I must qualify my comment in two respects:

The SOSXFER function of the Softcard does allow transfer of ASCII files from SOS (the resident Apple /// operating system) to CP/M; and

It is as yet unclear what applications programs (off the shelf CP/M software) will work on the Apple ///.

The SOSXFER function continues the Apple "tradition" with the /// of permitting easy text file interchange between operating systems. An important use of this function involves the WordStar program that I used to write this article. I have been able to quickly transfer Apple Writer III files to CP/M for reformatting and modification. This compatibility also extends to the SpellStar spelling check software for WordStar. I am now able to prepare ASCII files using whatever word processing software seems appropriate for the file being created, and then use the special features of WordStar and SpellStar to full advantage. This statement applies both to Apple Writer and the powerful Pascal text editor available for the ///. I assume that it would also apply to Apple II files transferred with the Apple Writer III utility disk, but I have not attempted it.

The significance of SOSXFER is easily illustrated. My teenage son is a writer and finds Apple Writer III an excellent program for composing articles. It is very easy to use, so that he can concentrate on what he is writing, and not on the peculiarities of the software he is using. However, he also likes the formatting features of WordStar and the spelling checks avail-

able with SpellStar. With SOSXFER he can have all the advantages of each.

There are still many questions about what applications software will or will not work on the Apple ///, without major adaptation. This article is testimony to the fact that the Apple II version of WordStar can be adapted, if you follow the special instructions listed in the Apple Technical Note on this subject (Softcard III, dated August 16, 1982).

While I intend to make extensive use of the M-BASIC software that comes with the Softcard, my primary interest is off-the-shelf programs. Of particular interest is the dBASE II data base management system. I have sent a letter to Ashton-Tate, the creators of dBASE, and hope to receive a favorable response in the very near future.

If some adaptation is required, the key is instructions needed to make the conversion. The Dynamic Debugging Tool (DDT) feature of CP/M allows you to make changes very easily, once it is clear what you have to do. For WordStar, it took me awhile to learn to use DDT, but the actual changes only took a few minutes. I hope that Apple will provide Technical Notes for all popular CP/M software, so that this may be a simple, uncomplicated process.

(Ed. Note: The author would like to correspond with those Apple /// owners who will be purchasing and using the Softcard, so that one person's discoveries about this new hardware and software may become "public" as quickly as possible. You may reach him by phone at (703) 323-7214 or by mail at: 5063 Coleridge Drive, Fairfax, VA 22032.)

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The Micro Connection Inc., The Personal Computer Store has relocated its retail store to 320-A Maple Avenue, Vienna, VA. The new store telephone number is 281-1866.

American Language Academy - November 18-19 - Computers: Two-day workshop on individualized language teaching through micro-computer assisted instruction. For language teachers, corporate trainees, publishers, and administrators. American Language Academy at Catholic University. Contact Anita Mires, A. L. A., 11426 Rockville Pike, Rockville, MD 20852, (301) 984-3400 (day).

Anderson Jacobson would like to remind Washington Apple Pi members that the AJ-831 letter quality printer is available at a special price with a 60-day warranty, through WAP's Group Purchase.

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This is a problem-solving course in Applesoft Basic. Six 1-1/2 hour teaching sessions with take-home assignments. The course is designed for a maximum of 10 individuals who have some familiarity with Applesoft and are ready for a second course toward gaining mastery. The class will meet in Germantown, Maryland on Tuesday evenings, 8-9:30, January 18 through February 22 and be taught by David Morganstein.

Fee - WAP member, \$95.00 non-member, \$110.00

2. PRACTICAL PROGRAMS UTILIZATION - What They Do, How to Use Them

For home and business users; a hands-on, get-acquainted course on CPM and non-CPM versions of word processors/text editors, data base management programs and electronic spreadsheet programs. The seminar will be held in Montgomery County on Saturday, January 8 and 15, 9-4:30 pm. and be taught by Jerry Trowbridge. Mr. Trowbridge, President of Advanced Data Communications, Inc., has been teaching computer and data communications courses for Fairfax County Adult Ed. Dept. for 5 years, and runs a computer communications engineering firm with a micro turnkey business systems division.

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Q & A

by Bruce F. Field

A couple of months ago we had an unanswered question as to why line numbers greater than 63999 cannot be used in Applesoft. From Tom Warrick comes the following answer.

Applesoft stores the current line number being executed in \$75-\$76. When Applesoft is in the direct mode, it stores an \$FF in \$76, the high-order byte of the line number. In this way, it (and DOS) can check to see if certain commands, such as INPUT and OPEN, are valid. Line numbers of \$FF00 (65280 decimal) or more are prohibited for that reason. 63999 is \$F9FF. An analysis of Applesoft's use of the \$76 location reveals that there should be no reason why you could not enter line numbers between 64000 and 65279. Often, however, a user's options are limited to make future expansion of the language easier and more efficient. This must be such a case.

Q. I tried to write a program which would graph an equation which is input from the keyboard while the program is running. I have several programs which require you to write the equation in Applesoft in specific lines and then run the program, but this is not very satisfactory. Do you know a good way to do this?

A. There have been a couple of articles in CALL -A.P.P.L.E. on the subject. The first by David Lingwood appeared in the January 1981 issue. A dummy REM statement is added to the program and when the program is running a small machine language program is called to input a string from the keyboard containing the desired Applesoft statement, and this then replaces the dummy REM. An example is shown below.

```
20 POKE 885,32:POKE 886,0
25 CALL 768
32 REMXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

Line 20 pokes the dummy REM line number into the routine, line 25 calls the machine language routine listed below, and line 32 is the line to be replaced. There must be enough X's so that line 32 is longer than any line that will replace it.

```
300: 48 A5 B8 8D 70 03 A5 D6
308: 8D 71 03 A9 00 85 B8 85
310: D6 A5 B9 8D 74 03 8E 73
318: 03 8C 72 03 08 A2 BA 20
320: 2E D5 A2 FF 20 6C D5 AD
328: 75 03 85 50 AD 76 03 85
330: 51 20 1A D6 90 31 A0 04
338: B9 F9 01 F0 09 91 9B C8
340: 10 F6 A2 B6 10 23 A9 3A
```

```
348: 91 9B A9 B2 C8 91 9B 28
350: AE 73 03 AC 72 03 AD 70
358: 03 85 B8 AD 71 03 85 D6
360: AD 74 03 85 B9 68 60 A2
368: 5A 4C 12 D4
```

A second article by Cornelis Bongers just recently appeared in the September 1982 issue of CALL -A.P.P.L.E. In addition to allowing deferred execution of strings (as Lingwood above) strings may be executed in the immediate mode. Unfortunately this routine is too long to repeat here. Hopefully copies of this and other articles will be available to members at our new office (wherever that will be).

Q. How can I implement the program TED II+ DOCUMENTATION which appears on WAP utilities disk volume 101. I would like to enter simple assembly language listings and all I have been able to get so far is the documentation.

A. TED II+ DOCUMENTATION on WAP disk 101 is just that, only the documentation. The actual TED II+ program is on disk 8. (A neat way to increase club disk sales.) Unfortunately for Apple II Plus owners the program is in Integer Basic. This means that you must have an Integer Basic ROM card, or a Language (16K RAM) card. The TED II+ program on disk 8 will not work with the RAM version of Integer Basic on Disk volume 14 (INTEGER BASIC-DISK). A modified version is in the works and should be available soon on another library diskette.

Q. Can you discuss the track/sector setup on diskettes, possibly including a simple sketch. It is my understanding that tracks are concentric circles and that each of these is divided into 16 parts called sectors. Is this correct? If so, due to the fact that each track has a different circumference, sectors on different tracks have different lengths. If the same number of characters are stored on each sector how is this done?

A. You are correct, there are 35 concentric tracks on the diskette and these are shown in a drawing on page 135 of the DOS 3.3 manual. Each track (in DOS 3.3) is divided into 16 sectors. There are no physical marks on the diskette to indicate where the sectors are; they are positioned on the diskette with arbitrary starting points when the diskette is initialized. As you noted, sectors on different tracks are of different length, thus when an equal number of bits of information are stored the bit density (number of bits per unit length) is greater for the inside tracks. This is really no problem for the Apple, in

contd.



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fact it would be difficult to do it so that the bit density is constant.

Each revolution of the disk takes the same amount of time whether you are reading the outside track or the inside track. The Apple writes to the diskette on an equal time basis. What I mean is this: Suppose it takes the diskette 200 milliseconds to make one revolution and we want to write 50,000 bits on one track. (32,768 bits are available for storage of user data and the remaining bits are used for DOS housekeeping duties; 50,000 is the theoretical maximum number of bits per track.) Each bit will be written to the diskette 4 microseconds after the last. Therefore when we are reading a diskette, no matter what track the Apple is reading it knows that the bits should appear at 4 micro-second intervals.

If you want more information I would recommend the book Beneath Apple DOS by Worth and Lechner. This book goes into great detail about the storage process and the operation of DOS.

Q. When I switch from the text screen to the Lo-res graphics screen using the Applesoft GR command, there is an annoying flash of color before the screen is cleared. Is there some way of eliminating this flash?

A. Your problem of having the screen flash when you switch from text to low-resolution mode (or back) comes about because different values represent blank characters in the two modes. In the text mode the number 160 has to be stored in all the locations of the screen memory to display a blank screen, whereas in the graphics mode the number 0 is required to produce a blank screen. When you give the command GR (or TEXT and HOME) the Apple first switches to the desired mode and then fills the entire screen memory with the required character. Filling the screen takes a fraction of a second and during this time a non-blank screen is viewed.

One way around this problem is to first switch to a different screen (i.e. a previously cleared Hi-res page), clear the text/graphics screen, and finally switch to the text or graphics screen. This wastes a lot of memory. The Applesoft program segment below will do this but your entire Applesoft program must fit in memory below page one which starts at memory location 8192.

```
50 HGR:TEXT:LOMEM:16384:REM DO THIS
  ONCE TO SETUP HI-RES SCREEN AND
  PROTECT IT
100 POKE -16297,0:POKE -16304,0:
  CALL -1994:POKE -16298,0:VTAB 23:
  PRINT "GRAPHICS MODE":GET A$
110 POKE -16297,0:CALL -936:
  POKE -16303,0:VTAB 23:PRINT "TEXT
  MODE":GET A$
120 GOTO 100
```

A second way is to speed up the screen clear routine so the flash doesn't last

as long. The routine below does this. Unfortunately the flash is still there but maybe it's not as objectionable.

```
100 HEX$="300:A9 00 2C A9 A0 8D 50 C0
  A0 77 99 00 04 99 00 05 99 00 06
  99 00 07 99 80 04 99 80 05 99 80
  06 99 80 07 88 10 E5 C9 A0 D0 04
  AD 51 C0 60 A9 A0 A0 27 99 50 06
  99 D0 06 99 50 07 99 D0 07 88 10
  F1 60 N D9C6G"
110 FOR I=1 TO LEN(HEX$):POKE 511+I,
  ASC(MID$(HEX$,I,1))+128:NEXT:
  POKE 72,0:CALL -144
120 REM LINES 100 AND 110 POKE A SCREEN
  CLEAR PROGRAM INTO MEMORY AND NEED
  TO BE DONE ONCE AT THE BEGINNING OF
  THE PROGRAM
130 CALL 768:VTAB 23:PRINT "GRAPHICS
  MODE":GET A$
140 CALL 771:VTAB 23:PRINT "TEXT MODE":
  GET A$
150 GOTO 130
```

Q. I just purchased two disks from the library and one of them is defective. When I try to boot the disk, I get the volume followed by an I/O error. I tried the FID program but all I got was "UNABLE TO READ" messages.

A. Unfortunately bad or marginal diskettes slip by when we make copies. This may be caused by a bad spot on the diskette or possibly by a drive that is not running at the correct speed. It may be that your drive is slightly off, and combined with the speed error of the drive that wrote the copy the speed error is large enough to produce an UNABLE TO READ error. To help reduce this problem the club is using a professional copy service when possible and this should help reduce the problem. In your case simply return the disk to our librarians and it will be replaced.

Since this subject has come up I want to remind our members that disk volumes 1-40 are in DOS 3.2 format and will not boot on an Apple equipped for DOS 3.3. To boot these diskettes either BRUN the program BOOT13 on the System Master diskette or boot the BASICS diskette first.

Q. Is there some way to disable the RESET key when running Applesoft?

A. You can if you have an Autostart ROM. This ROM comes standard on all Apple II Pluses. The short program segment below will set up the reset vector so that whenever the RESET key is pressed Applesoft will GOTO a specified line number.

```
10 REM SET UP TRANSFER ROUTINE
30 A$="300:20 EA 03 20 FB DA A9 00
  85 51 A9 64 85 50 20 41 D9
  4C D2 D7 N D823G":FOR I =
  1 TO LEN(A$):POKE 511+I,
  ASC(MID$(A$,I,1))+128:
  NEXT:POKE 72,0:CALL -144
40 POKE 1010,0:POKE 1011,3:
  CALL -1169
```

contd. on pg 40

Classifieds contd. from pg 8

FOR SALE: Silentype Printer/3 rolls paper. Excellent condition, \$230. APPLE Disk II with controller. Used 8 months, \$395. Arcade style games, original disks/doc., swap or sell. Robert Hicks, (703) 569-3496.

FOR SALE: Choplifter, Star Blazer, Swash-buckler, and Beer Run. All original disks, \$18 each. Call Jay Vogel at (301) 596-4418 after 4:00 PM.

FOR SALE: APPLE II+, 2 disk II's, language card with Pascal, Videx 80-column board and keyboard enhancer. 12" monitor. \$2995. Also CP/M software, printer and 2 disk II's for sale. Andy Liwen, (H) (703) 425-6152, (W) 442-1270.

FOR SALE: Olympia Daisywheel ESW102 Printer, 17 cps, bidirectional and can select proportional spacing. 3 printwheels and manual included. Used less than 3 months. Call Bill Statsky, 363-7159 (days) or 966-3954 (evenings and weekends) with best offer.

FOR SALE: APPLE II Users Guide by Poole. McNiff & Cook. \$7. Call Bill Statsky, 363-7159 (evenings) or 966-3954 (evenings and weekends) with best offer.

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ES-CAPE

Extended S-C Applesoft Program Editor

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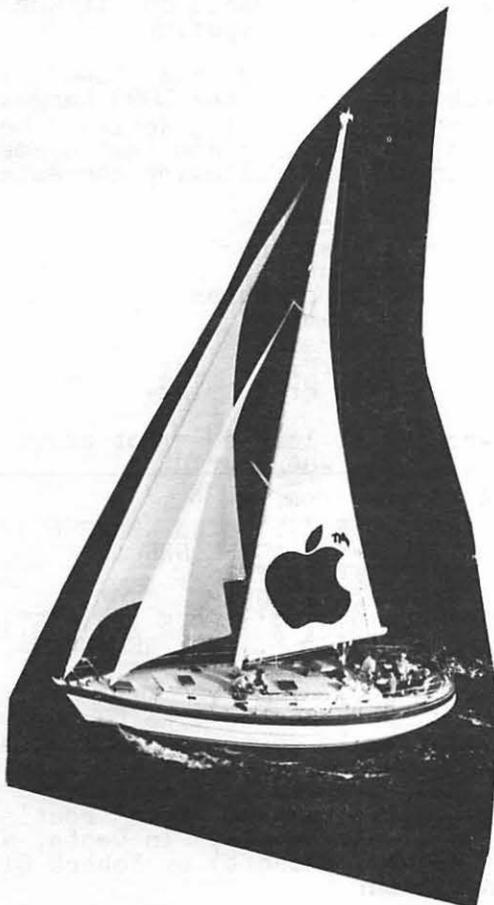
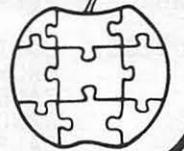
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EDSIG NEWS

by Nancy C. Strange

EDSIG CALENDAR

Tuesday, November 9th at 7:30

Learning Disabilities and the Apple

Carolyn Adler of Electronic Learning Facilitators will lead the EDSIG meeting on learning disabilities. Special guest speakers will be Nancy and Yehoash Dworkin who are the directors of the Center for Unique Learners. The Dworkins will share and demonstrate many of their creative uses of the microcomputer that they have used for the last five years.

Tuesday, December 14th, at 7:30

TEDDY - Language Arts

Karen Berlin and Mary Brown of Potomac Micro Products and EDSIG present their language arts program.

NOTICE: EDSIG IS CHANGING ITS MEETING DATE FROM THE 2ND TO THE 1ST TUESDAY OF EACH MONTH. THIS WILL START IN JANUARY 1983. PLEASE ADJUST YOUR CALENDAR ACCORDINGLY.

Tuesday, January 4th, at 7:30

Educational Videotapes

Susan Lewick of the Horace Mann Learning Center will share three videotapes on these educational topics:

- Computer Literacy
- The MECC System
- LOGO

Meeting Report

The October meeting topic was "TURTLE TALK" presented by the LOGOSIG. The attendees ranged in LOGO experience from those having never seen it to those having about six months exploration. The meeting was designed to be a feedback session to share what people were doing in LOGO.

The results of a limited survey of the local schools' use of computers and LOGO was shared. Anyone with knowledge of how schools in this area are using computers is welcome to provide any of the following information to EDSIG, and using the following format:

SCHOOL:
 ADDRESS:
 PHONE:
 TEACHERS:

COUNTY: CITY:
 PUBLIC: PRIVATE:
 OTHER INFO:

This will help EDSIG and WAP reach out to the schools and keep us abreast of current educational activities.

A general overview of the LOGO language was provided. Parents shared some of the LOGO work of their children, such as use of a single-key drawing procedure for the beginning young child and the use of a simplistic LOGO word processor that uses the LOGO editor.

Diane Lorenz of ELF used the product of the September LOGOSIG meeting to share LOGO problem solving and structured programming techniques. The project was to create in LOGO the masthead of the LOGOSIG column, but with the word "TALK" instead of "TRACKS" complete with tracks and turtle. The project demonstrated the use of modular procedures, creating letters for the graphic display and turtlegraphic pictures. Although the project is not quite finished it was enlightening to see its development and how the project could be done with various levels of sophistication.

Ron Murray also shared his complex version of the project with a scene of randomly generated sand, grass, and trees (he will be explaining in detail how it works at the 30 October LOGOSIG meeting).

Ron then presented his "LOGO & TEETH" project that proved the LOGO Language to be more than just turtlegraphics. He demonstrated by graphics and text examples how LOGO can use the following concepts:

- Procedures
- Iteration
- Variables
- Subprocedures
- Condition
- Recursion
- List Processing
- List Processing+

All who saw it learned a lot about LOGO. Thanks to all who shared.

```
Q & A contd. from pg 38
50  REM POKE 775, LINE NBR/256 AND
    POKE 779, LINE NBR
    -PEEK(775)*256
100 REM MAIN PROGRAM
9999 POKE 1010,191: POKE 1011,157:
    POKE 1012:56: END: REM WHEN DONE
    RESTORE THE RESET VECTOR
```

Be sure to poke the line number you want the program to go to on RESET as shown in line 50. And, restore the reset vector when your program is finished or peculiar things will happen. This routine comes from Call -A.P.P.L.E. In Depth, Number 1 (All About Applesoft) by Robert Clardy and Kevin Killon.

A PASCAL VS BASIC PUZZLE

by Paul A. Sand

Many discoveries have been made by people looking for something else entirely. Such is the case with this article; it all started when I tried to look at the relative accuracy of floating-point calculations in Apple Pascal and Applesoft Basic. I wound up instead looking at the way the two languages evaluate expressions. The result is ... well, I'll leave it to the reader to decide.

Type in and run the following Applesoft Basic program. Be careful to enter the complex expressions the same way it's shown here.

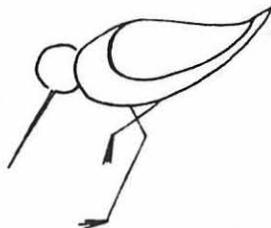
```
10 A = 1000001.0
20 B = 100.0
30 C = 0.0001
40 D = 1000000.0
50 E = 1003.0
60 F = 51.0
70 X = A - (B / C + (D * ((E - (E / F
    * F)) * D))))
80 PRINT "X = ";X
```

The program will display:

X = 1.00036621

Now type in, compile and run the following Pascal program. Again, be careful when typing in the complex expression.

```
program test;
var
  a,b,c,d,e,f,x:real;
begin
  a:= 1000001.0;
  b:= 100.0;
  c:= 0.0001;
  d:= 1000000.0;
  e:= 1003.0;
  f:= 51.0;
  x:= a - (b / (c + (d * ((e - (e / f
    * f)) * d)))));
  writeln('x = ',x)
end
```



The Pascal program will display:

x = 1.00000E6

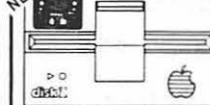
The puzzle is this: why are the two results from the two equivalent programs so different? Quite honestly, I do not know the answer to this question; I'd appreciate hearing from people who think they do.

I serendipitously stumbled on this problem by reading a letter to the editor in the September 27, 1982 issue of Infoworld by Robert A. Huntsman. That letter points out the imprecision of the way most computers do floating point arithmetic. But we aren't talking about simple imprecision here, are we?

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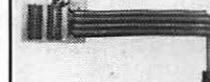
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A TRIP TO THE LAND OF WOZ

by Bob Platt

Steve Wozniak entranced his audience at UVA with tales of Apple's founding and with his speculations on the Apple's future.

The impish Woz spoke before 200 Apple addicts, professional educators, and undergraduates in response to an invitation from the University of Virginia School of Education and the local Computerland store.

Woz was most informative during the questions following his October 13 lecture. Woz reported that the Apple Super II will be compatible with the II+, but will feature a built-in language card and a full upper and lower case keyboard. The Apple II will not become obsolete, and Apple expects to continue supporting it for another five years. Woz believes that Apple Computer "is a long way off" from undertaking a multi-user machine.

Apple plans on adopting a network scheme to permit multiple Apples to communicate and share peripherals. Apple is looking at a variety of the currently available networking schemes.

US FESTIVAL

In contrast with previous press interviews, Woz contended that his point in sponsoring the Us Festival was to show that a large-scale rock festival can be run smoothly with proper planning. His next musical event will be two separate days held a week apart next Easter at the same site. The event may not include a technology festival.

SOUR GRAPES AT APPLE?

Woz reports that Apple's management shares "a general concern that product development is extremely slow". Originally, Apple had planned to supply the application programs for its machines. However, Apple is giving up such products in favor of supporting outside software vendors. In future machines, Apple will only offer major peripherals.

"Motivation at Apple is not as good as it once was", Woz noted wistfully. "I get bad comments from the people who were there long ago." Woz, who left Apple to complete his bachelor degree from Berkeley, plans to return after his Easter concert. He believes that it would be difficult for him to return to straight engineering duties at Apple because of all the interruptions and distractions which accompany his status in the company. However, he hopes to play a constructive role facilitating "engineering and technical motivation".

COMPUTERS & EDUCATION

Woz reported that the Educational Technology bill has passed the House and is on its way for Senate consideration. Steve Jobs conceived of this bill to provide computer manufacturers tax deductions for computers

which they would donate to elementary and secondary schools.

One of the most promising educational developments is a proposal to broadcast software, news and educational materials over FM radio stations affiliated with National Public Radio. Although Apple and Woz are not involved in this venture, Woz hopes it succeeds as it represents the first low-cost means for distribution of educational software.

Woz believes that a variety of computer languages will continue to be used, and that students at different levels should be exposed to different languages. Woz predicts a major trend toward programming languages such as Smalltalk, which are object oriented rather than procedure oriented. At present, all system development work at Apple Computer is done in Pascal with little optimization by assembly language code.

BUSINESS ADVICE

The audience had more than its fair share of entrepreneurs. They asked Woz for advice on starting a business, and he gave factors to success: (1) Knowledge in your field is more important than formal education. (2) Design your products with user empathy. (3) Motivation is important. (4) Respect other talents that are needed to accomplish a successful business (e.g. marketing, fiscal management, planning). (5) Don't expect an instant fortune. (6) Businesses selling good products fail without the right combinations of talents. (7) "Experience is worth more than knowledge, and luck is worth more than either." (8) Less corporate secrecy would improve productivity and quality.

Woz predicts a bright future for Apple Computers. Sales increase every month. Yet, Woz is contemplating starting his own business and is working on new hardware ideas. "I just got a great idea on the plane flying out here. It will be my next product," he gushed.

Woz believes that software piracy is a serious problem, which affects him as much as every other user. For example, Woz can't load certain copy-protected programs onto his hard disk. "You can't point the finger at the software manufacturer... you have to point the finger at the guy at the end that has no respect for copyrights." Woz believes that unbreakable protection schemes will ultimately be developed, though none exist at present.

Most of Steve's prepared talk centered on the founding of Apple Computer -- a tale that must be heard in person to be appreciated. The WAP delegation (Bernie Urban, Paula and Bernie Benson and I) wish to thank Stowe Keller and the local Apple users group for inviting us down for what proved to be an enjoyable evening. &

IS YOUR COMMUNICATING APPLE PROTECTED FROM LIGHTNING DAMAGE? by George V Kinal

The C & P Telephone Company installs carbon block or gas tube protectors on telephone lines only in those areas where there is a risk that the telephone lines may be exposed to contact with power lines. In areas where the power lines are underground, or are brought into the house from a direction different from where the telephone lines enter, current standards do not require a protector. Many portions of the D.C. Metropolitan area inside the beltway are thus exempt from any protection, by these criteria.

A telephone line which is not so protected also lacks a ground on the yellow conductor. If you use your APPLE for telecommunications by means of a line-powered (e.g. UDS), battery-powered, or APPLE-powered (Hayes, Novation) modem, and a high voltage is induced on the telephone line by a nearby lightning strike, the only path for this high voltage to reach ground potential is via the AC line ground of your APPLE! Substantial damage can occur.

It is important to note that the "protection" provided to the telephone network by means of the FCC type approval which all direct-connect equipment must meet does not protect the equipment from lightning damage. Neither do surge protectors on the AC line offer any help (although there are now available surge protectors which have both AC and telephone line sockets). The correct method of protection is the installation of gas tube protectors on the telephone line. However, the telephone company will rarely install these solely at the customer's request. These protectors are available, e.g. Cook Electric 400-2GC, \$6.98, from North Supply Co. (800 255-6515). However, North has a \$50 minimum order; the Telecom SIG will be investigating possibilities of a group purchase. I would be interested in any reports from other WAP members concerning suspected lightning damage.

How can you identify whether your telephone line is protected?

- 1) Direct inspection - At the point of entry to your premises, a protected telephone line has a protector on it. This protector will have a ground wire running from it to a nearby water pipe, or to a separate grounding rod driven into the earth. Inspection of the wiring at the point of entry will also reveal whether the yellow wire of the inside telephone wiring installation is connected to a ground at the entry block/box. An unprotected installation will usually have only the red and green leads connected to anything.
- 2) Inquiry - You may specifically ask C & P whether your installation is "protected" with a U.L. approved protector which complies with National Electric Code

Section 800-2. However, note that the older "carbon block" protector is still in widespread use, and it does not provide as high a degree of protection as the modern gas-tube type.

The greatest risk is to those installations which connect directly to the telephone line, have no line ground, and which have auto-answer features (which means that the modem is always connected to the telephone line). Acoustically coupled modems are essentially immune to such damage.

(For the record, I speak from personal experience. My modem and printer were damaged by the severe electrical storm of late July. Fortunately, the APPLE and disk drive had been put away in a safe place, since I had gone away on vacation. Had I not been away, and these units were in their usual configuration, much greater damage might have resulted. C & P alleges that this neighborhood does not require protection, and that surrounding structures provide a "cone of protection" to the telephone lines...)

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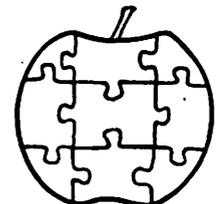
"It's great! I can now cease my quest for that great assembler in the sky." Rip Kemp. Miami, Florida

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"ONE OVEN MUFFIN" UPDATED

by George V. Kinal

About a year ago, Dana Schwartz published a program which, in conjunction with MUFFIN, would transfer an entire DOS 3.2 disk to 3.3, in several passes. (MUFFIN only converts one file at a time.) The program was based on a single drive 3.2 to 3.3 conversion program published by Steve Adams. Only one drive was required, with multiple alternating insertions of the original 3.2 and the duplicate 3.3 disks, not unlike the single drive copying procedure.

"One Oven Muffin" was written in Integer Basic. My original attempts to re-write it in Applesoft did not prove successful. I then attempted to run Dana's program as published by means of the Integer Basic-Disk interpreter program which is available on WAP library disk 14. It did not run. Apparently, some of the bytes of the IOB (Input Output Buffer) table and of the Device Characteristics Table, were not being initialized. (See the discussion of the RWTS in your DOS manual.)

The revised program listed here contains the necessary additional POKES. It will run on a 48K APPLE II+, after BRUNning Integer Basic-Disk from WAP Library disk 14 (which should be MUFFINed over to the DOS 3.3. disk on which this One-Oven program, as well as MUFFIN from your Master disk, have also been saved). The following TEXT file can also be placed on this disk; then simply EXEC this to initiate the conversion process;

```
D$ = "" (Note: Ctrl-D)
B$ = "BRUN INTEGER BASIC-DISK"
IF PEEK (51) = 221 THEN PRINT D$,B$
RUN ONE-OVEN
```

In this mode of operation, quite a lot of memory is taken up by the three co-resident programs, so that as few as three disk tracks are copied/converted on a pass. However, sectors which are free are skipped, so many disks are transferred in five or six passes. The disk to which the transfer is to take place should be one onto which DOS 3.3 has already been loaded (INITIALIZED).

Operation of the program is self-prompting. The program has not yet been tested with other forms of Integer Basic capability, nor with 16K RAM cards. I hope this updated version proves useful, particularly in the light of the fact that the only kind of APPLE II now being sold is the "+" model with 48K.

References:

- (1) "One Oven Muffin", Dana J. Schwartz, Apple Orchard, Summer 1981.
- (2) "Single Drive Copy.3", Steve Adams, Apple Orchard, Spring 1981.

```
0 POKE 74,8460 MOD 256: POKE
75,8460/256: POKE 204, PEEK
(74): POKE 205, PEEK (75)
1 A=B=PTR=LOC=RWTS=IBTRK=IBSECT=
IBBUFP=REP=REPS=CMD=TBL=IOB=
TRK=SEC=BYTE1=BYTE2=OLDPTR=
BITMAP=BUFLO=BUFHI=IBVOL=IBCMD=
0
2 TS=CT=0
499 D$="": REM CTRL D
500 PRINT D$:"BLOAD MUFFIN"
1000 TEXT : CALL -936: VTAB 4: TAB
11: PRINT "SINGLE DRIVE CONVERT"
: TAB 16: PRINT "3.2 -> 3.3"
: VTAB 7: TAB 11: PRINT "BY DANA
J. SCHWARTZ"
1001 PRINT : TAB 6: PRINT "MODIFIED B
Y G. KINAL, 9/82"
1002 PRINT
1005 TAB 11: PRINT "WASHINGTON APPLE
PI"
1006 PRINT : PRINT : TAB 16: PRINT
"BASED ON": TAB 11: PRINT "SINGL
E DRIVE COPY.3": TAB 13: PRINT
"BY STEVE ADAMS"
1010 VTAB 20: PRINT "INSERT THE DISK(
3.2) YOU WISH TO CONVERT AND GEN
TLY TOUCH RETURN TO BEGIN."
: GOSUB 5010
1021 REM *** FIND THE IOB ***
1030 A= PEEK (77): IF A)94 THEN
A=A-256:IOB=(A+33)*256+231
1044 REM
1050 POKE 0,169: POKE 1,IOB/256+
255*(IOB(0): POKE 2,160: POKE
3,232: POKE 4,32: POKE 5,217
: POKE 6,3: POKE 7,96
1060 REM
1064 POKE IOB+1,1: POKE IOB+2,96
: POKE IOB+3,1
1065 IBVOL=IOB+4: IBTRK=IOB+5: IBSECT=
IOB+6: IBBUFP=IOB+10: IBCMD=IOB+
13
1066 TS= PEEK (1)+1
1067 POKE -17152,76: POKE -17151
,0: POKE -17150,30: REM MUFF
IN RWTS
1068 CT=IOB+24
1069 POKE IOB+7,0: POKE IOB+8,TS:
POKE CT,0: POKE CT+1,1: POKE
CT+2,239: POKE CT+3,216
```

contd. on pg 46

APPLE TECH NOTES

Each month, Ed Schenker will include a different tech note in the WAP Journal. These notes are being made available to us through IAC with the understanding that this is copywritten material and can only be reproduced one item at a time, giving full credit to Apple for allowing this. Ed can be reached at 977-7349 if you want details on an item of interest to you. This first column contains a listing of topics found in the Tech Notes.

Apple III Emulation Mode
 Apple III Hardware
 Apple III Interfacing
 Apple Adventure
 Apple Bowl
 Apple II Hardware
 Apple II Interfacing
 Apple Plot
 Apple Post
 Apple PROMs
 Apple Stellar Invaders
 Apple Writer
 Apple Writer III
 Applesoft
 Applesoft Firmware Card
 Artist Designer
 Auto-Start ROM
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 Goodspell
 Graphics Tablet
 Hand Holding Basic
 High Speed Serial Interface
 Integer Basic
 Integer Basic Firmware Card
 Language Card
 Microchess 2.0
 Parallel Printer Interface
 Pascal
 Pascal III
 Pascal Animation Tools
 Pilot
 Plan80
 Profile
 Programmer's Aid #1
 Psort
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"One Oven Muffin" contd. from pg 44

```
1070 POKE IBVOL,0: POKE IBTRK,17
      : POKE IBSECT,0: POKE IBBUFF-
1,208: POKE IBBUFF,2: POKE
      IBCMD,1: CALL RWTS
1080 BITMAP=776
2000 REM
2010 TBL= PEEK (204)+ PEEK (205)
      *256+1:PTR=TBL
2020 VTAB 10: TAB 15: PRINT "I'M THIN
      KING"
2030 REM
2040 FOR TRK=3 TO 34:BYTE1=BITMAP+
      TRK*4:BYTE2=BYTE1+1:SEC=12
2050 A= PEEK (BYTE1): IF A#255 THEN
      2070:SEC=4
2060 A= PEEK (BYTE2): IF A=248 THEN
      2100
2070 B=A/128:A=A-B*128: GOSUB 3020
2071 B=A/64:A=A-B*64: GOSUB 3020
2072 B=A/32:A=A-B*32: GOSUB 3020
2073 B=A/16:A=A-B*16: GOSUB 3020
2074 B=A/8:A=A-B*8: GOSUB 3020
2080 IF SEC<0 THEN 2100
2090 B=A/4:A=A-B*4: GOSUB 3020:B=
      A/2:A=A-B*2: GOSUB 3020:B=A:
      GOSUB 3020
2095 GOTO 2060
2100 IF TRK<3 THEN 2120
2110 A= PEEK (BYTE1):B= PEEK (BYTE2)
      : POKE BYTE1,A/8+224: POKE
      BYTE2,B/8+(A MOD 8)*32: REM
      CONVERT BITMAP
2120 NEXT TRK: GOTO 4010
3000 REM
3020 IF B THEN 3030: POKE PTR,TRK:
      POKE PTR+1,SEC:PTR=PTR+2
3025 POKE PTR,TRK: POKE PTR+1,SEC:
      PTR=PTR+2
3030 SEC=SEC-1: RETURN
4001 REM   *** COPY ***
4010 BUFLO=(PTR) MOD 256:BUFHI=(
      PTR)/256: POKE IBBUFF-1,BUFLO:
      POKE IBBUFF,BUFHI
4020 REPS= PEEK (203)-BUFHI-( PEEK
      (202)<BUFLO):OLDPTR=TBL:TBL=
      PTR
4030 FOR CMD=1 TO 2: CALL -936
4031 IF CMD=1 THEN PRINT "READING"
4032 IF CMD=2 THEN PRINT "WRITING"
4033 POKE IBCMD,CMD:LOC=BUFHI:PTR=
      OLDPTR
4035 POKE -17152,76: POKE -17151
      ,0: POKE -17150,30: REM   MUFF
      IN RWTS
```

```
4037 IF CMD=1 THEN 4040
4038 POKE -17152,132: POKE -17151
      ,72: POKE -17150,133: REM   3.
      3 RWTS
4040 FOR REP=1 TO REPS: POKE IBTRK,
      PEEK (PTR): POKE IBSECT, PEEK
      (PTR+1): POKE IBBUFF,LOC
4045 VTAB 3: PRINT "TRACK= " ; PEEK
      (IBTRK); TAB 12: PRINT "SEC= "
      ; PEEK (IBSECT); " "
4050 CALL RWTS
4060 LOC=LOC+1:PTR=PTR+2: IF PTR#
      TBL THEN 4080
4070 IF CMD=1 THEN 4090
4071 GOSUB 6010: CALL -936: PRINT
      "FINISHED": PRINT : END
4080 NEXT REP
4090 FOR A=1 TO 1000: NEXT A: CALL
      -936: VTAB 5: PRINT "INSERT THE"
      ; IF CMD=1 THEN PRINT " DUPLICA
      TE(3.3)";
4100 IF CMD=2 THEN PRINT " ORIGINAL(3
      .2)"
4101 PRINT " AND HIT RETURN": GOSUB
      5010
4110 NEXT CMD:OLDPTR=PTR: GOTO 4030
5001 REM   **** WAIT FOR 'RETURN' **
      **
5010 POKE -16368,0
5020 IF PEEK (-16384)<>141 THEN
      5020
5021 POKE -16368,0: CALL -936: RETURN
6001 REM   *** HANDLE TRK 17 ***
6010 CALL -936: VTAB 3: PRINT "REVISI
      NG VTOC & DIR"
6020 POKE 722,15: POKE 723,3: POKE
      726,254: POKE 773,16: POKE
      844,0
6030 POKE IBTRK,17: POKE IBSECT,
      0: POKE IBBUFF-1,208: POKE
      IBBUFF,2: CALL RWTS
6040 FOR A=12 TO 1 STEP -1
6050 POKE IBSECT,A: POKE IBCMD,1
      : CALL RWTS
6060 POKE 721,17: POKE 722,A+2
6061 POKE IBSECT,A+3: POKE IBCMD,
      2
6062 CALL RWTS: REM   SHIFT & REWRI
      TE
6070 NEXT A: FOR A=720 TO 975: POKE
      A,0: NEXT A: REM   DO LAST 3
6080 POKE IBSECT,1: CALL RWTS
6090 POKE 721,17: POKE 722,1
6091 POKE IBSECT,2: CALL RWTS
6100 POKE 722,2: POKE IBSECT,3: CALL
      RWTS
6110 RETURN
```

HARD COPY MADE EASY

by James T. Demay Jr.

One of the questions in the Q & A column in a recent issue reminded me of a short program I wrote to make printing hard copy listings easier and more useful. The idea is to let the APPLE do all of the work. How can we do this? My technique uses a text file which can be EXECed to append several lines to an existing program. When RUN, these additional instructions should get the program name, version #, today's date (if you have a clock card), and the length of the program. Then turn on the printer, set 80 column mode, and print the listing. When finished printing, they should also return control back to the keyboard.

The first step is to assemble the required instructions. That isn't difficult. We will use input statements to get the program name and version #. Next, we PEEK the locations in which the program start and end addresses are stored. By subtracting the start address from the end address we can determine the program length. This will be stored in variable LE for later use.

Since I have a THUNDERCLOCK in slot #3, it is convenient to read the time and date, and store it in DTE\$. Why DTE\$ and not DATE\$? Because APPLESOFT will parse DATE\$ as D AT E\$ since AT is a reserved word in APPLESOFT. If you don't have a clock then substitute an input statement to get the date.

The next step is to assign line #'s that won't interfere with the existing program. If there are any line #'s the same as those EXECed into the program, the original lines will be erased and the new ones entered. I choose 63000 and up because most programs don't use line #'s this high.

The easiest way to build an EXEC file is to load your text editor and type the lines including the line #s just as if you were entering a Basic program. Be sure to use all upper case letters because APPLESOFT doesn't understand lower case. If you do not own a text editor, don't despair! There is always another way. See page 75 and 76 of the "DOS manual" for more about creating EXEC files. The basic program listing printed here will create an EXEC file named HCL (Hard Copy Lister). Just enter the program as listed except for the lines containing REM statements. They are only inserted here for your information. (If they are entered, the count in line #63090 will not be correct when the program is RUN.)

After you are satisfied that the program is entered correctly, type SAVE HCL MAKER to save the program. Next, type RUN, and you will see the EXEC file being written to the disk. Now any program can be listed using the following procedure:

- 1.) Load the program
- 2.) Type EXEC HCL
- 3.) Turn on the printer
- 4.) Type RUN 63000

If the program is saved following this procedure, the lines from the EXEC file will be saved along with it. Then whenever it is desired to list the program, all that is needed is to type RUN 63000. Typing GOTO 63000 will work equally well.

This file works for an EPSON MX-80 printer. You may need to modify the printer control and the W strings to work with other than an EPSON. See your printer manual. Be advised that most modifications to this program will result in an incorrect length being printed in line #63090. The correct length can be determined by EXECing the file created by the modified program after typing NEW or FP. Change the -356 in line #63090 to +2. And then run the resulting program. Note the program length, then load HCL MAKER. All that is necessary now is to replace the +2 in line #63090 with the new program length and save HCL MAKER again. A final test would be to EXEC HCL into an "empty" APPLE, and then RUN it. The program length should equal 0 bytes.

By the way, this technique will also work with Integer Basic as well. The INPUT statements and the string handling will require some modifications before they can be EXECed.

contd.

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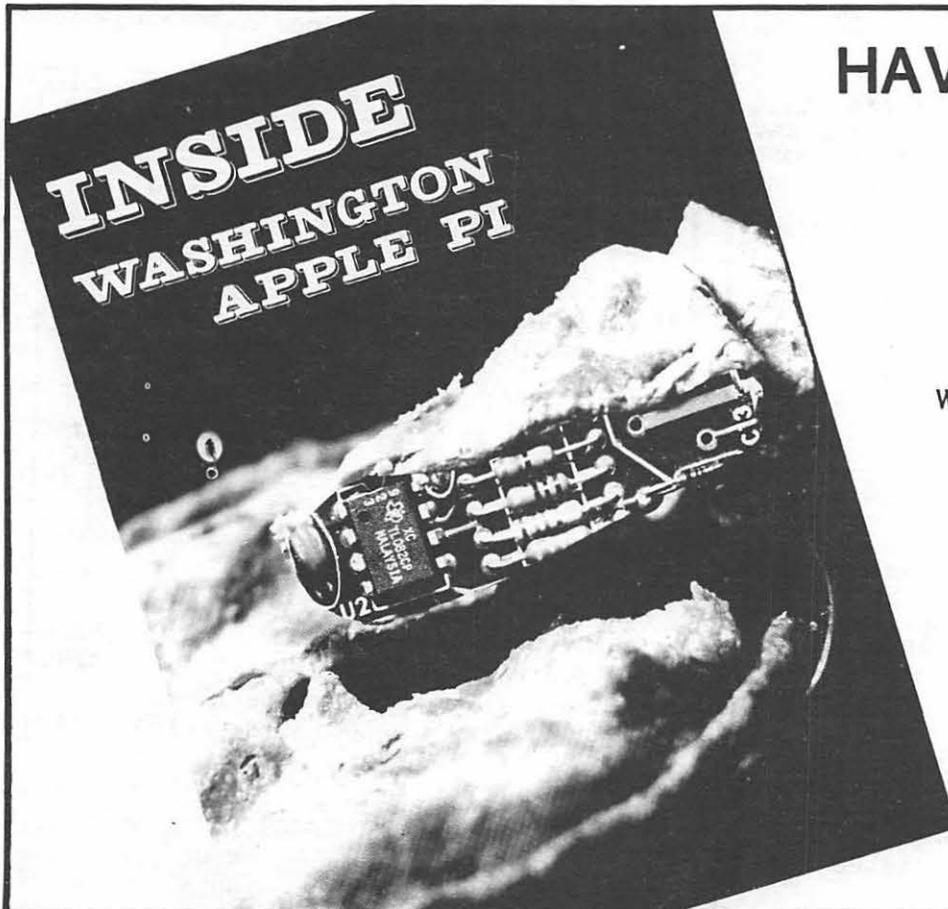
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LIST

```
59000 POKE 33,33:D$ = CHR$ (4): PRINT D$"MONCIO": PRINT D$"OPEN HCL": PRINT
D$"WRITE HCL": LIST 63000,63099: PRINT D$"NOMONCIO": TEXT : END
59999 REM CLR SCREEN & GET PROGRAM NAME
63000 TEXT : HOME : VTAB 5: INPUT "PROGRAM NAME => ";NAME$: PRINT : INPUT
"VERSION #";VERS$
63004 REM SET D$ = CONTROL-D
63005 D$ = CHR$ (4)
63009 REM FIND PROGRAM LENGTH
63010 LE = ( PEEK (175) + PEEK (176) * 256) - ( PEEK (103) + PEEK (104) *
256)
63019 REM GET TIME FROM CLOCK IN SLOT #3
63020 PRINT D$;"PR#3": PRINT D$;"IN#3": INPUT "%";DTE$: PRINT D$;"PR#0": PRINT
D$;"IN#0"
63029 REM INITIALIZE W$ FOR WIDE CHARACTERS
63030 W$ = CHR$ (14)
63034 REM INITIALIZE PRINTER CONTROL
63035 PC$ = CHR$ (9) + "80N"
63039 REM TURN ON PRINTER IN SLOT #1
63040 PRINT D$;"PR#1"
63049 REM SET PRINTER TO 80 COLUMN MODE
63050 PRINT PC$
63058 REM PRINT PROGRAM NAME - VERSION#
63059 REM DATE AND LENGTH DOUBLE WIDE
63060 PRINT W$;NAME$: PRINT
63070 PRINT W$;"VERSION #";VERS$: PRINT
63080 PRINT W$;DTE$: PRINT
63089 REM CHANGE 356 TO 281 IF NO CLOCK
63090 PRINT W$;"LENGTH ";LE - 356;" BYTES"
63097 REM LIST PROGRAM 80 COLUMNS WIDE
63098 REM THEN TURN PRINTER OFF
63099 PRINT : PRINT : LIST 0,62999: PRINT D$;"PR#0"
63100 REM IF NO CLOCK DELETE LINES
63110 REM 63020 AND 63080
```

1



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LOGOSIG NEWS

by Nancy C. Strange

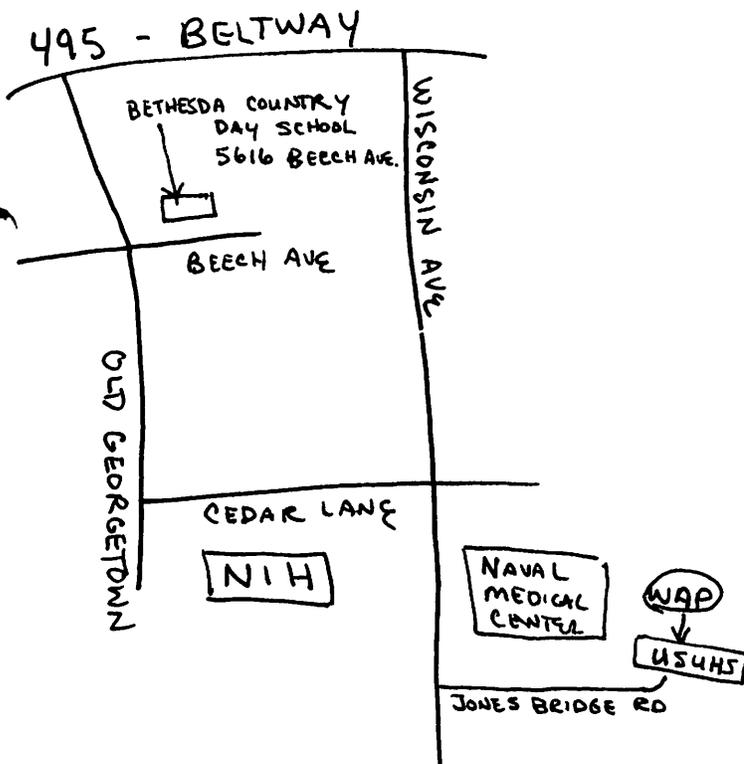


TURTLE TRACKS

LOGOSIG CALENDAR

Date: October 30, 1982
 Time: 12:30 PM sharp
 Place: Bethesda Country Day School
 Topic: Workshop 1 Wrap-up and Special Project

LOGOSIG will move to a new location with the October meeting. The Bethesda Country Day School at 5616 Beech Avenue, Bethesda, MD, just off Old Georgetown Road, is our new location. It provides a much better workshop setting and 4 Apple computers. We are very fortunate to be able to use this facility and we wish to thank the Electronic Learning Facilitators (ELF) team, who are members of LOGOSIG, for making it possible. Here is a map to help you get there:



Note: Use ELF entrance from parking lot.

Anyone with transportation problems is asked to contact Nancy at 691-1619 or prior to the WAP Meeting in the auditorium. All LOGOSIG members are reminded that the meeting starts at 12:30 sharp.

SEPTEMBER 25, 1982 MEETING REPORT

At the LOGOSIG Meeting for September the members divided into 4 groups for the first workshop session of LOGOSIG. There was a

new LOGO user group, and 3 workshop teams working on a project but with different levels of programming complexity. The project was to create with LOGO the masthead of this column "TURTLE TRACKS", including the tracks and turtle. In the session a lot of hands-on problem solving was done and the project was begun. Many members have been busy continuing the project between meetings. The modified project was used for the LOGOSIG presentation "TURTLE TALK" to EDSIG on October 12 (see EDSIG column).

WANTED POSTER -- see the October WAP Newsletter LOGOSIG article

APPLE LOGO BUY -- Call 691-1619

PRINTING TOOL PROCEDURES FOR APPLE LOGO

Last month several tool procedures for printing the Apple Logo graphics picture were provided. Thanks to Ron Murray and to Logo Computer Systems, Inc. (LCSI) more information on graphic dumps is available.

Evidently the primary consideration for dumping any Apple Logo graphic picture, is the printer interface card, not the make of the printer one uses.

APPLE SILENTYPE PRINTER:

The Apple Silentyper printer dumps the Hi-res screen whenever it is sent a Ctrl-Q. Once the Silentyper has been selected with .Printer 1 it is possible to change its parameters by using .DEPOSIT. Changing the direction parameters from bi-directional to uni-directional will result in a significantly better graphic printout. Here are two more graphic dump tools procedures for the Silentyper, but using uni-directional printing.

```
TO DUMP :STSLOT
.PRINTER :STSLOT
.DEPOSIT 65536 - 12529 128
TYPE CHAR 17
.DEPOSIT 65536 - 12529 0
.PRINTER 0
END
```

CHAR 17 = a Ctrl-Q
 :STSLOT = Slot of Silentyper interface card.

To dump an inverse or negative version of the Hi-res screen, i.e., white and black areas exchanged:

```
TO INVERSE :STSLOT
.PRINTER :STSLOT
.DEPOSIT 65536 - 12524 0
.DEPOSIT 65536 - 12524 0
TYPE CHAR 17
.DEPOSIT 65536 - 12529 0
.DEPOSIT 65536 - 12524 255
.PRINTER 0
END
```

EPSON DOT MATRIX PRINTERS:

The EPSON MX-80 and MX-100 printers can be used with Apple Logo graphics. The ease of dumping to the EPSON entirely depends on the interface card.

If the EPSON PARALLEL INTERFACE CARD is used, a software dump program such as GRAFTRIX or the COMPUTER STATION GRAPHICS DUMP UTILITY must be used. When using this method:

1. From LOGO run the graphic display.
2. Save the workspace to disk, if procedures are not already saved.
3. Save the Apple Logo graphic to a 3.3 DOS initialized disk by:
 - a. Place a 3.3 disk in drive.
 - b. Issue a .PRINTER 6 command if the disk controller is in slot 6. This will result in clobbering the LOGO Language LOGO Workspace, but retains the Hi-res screen intact.
 - c. The user is then in BASIC where the Hi-res screen with the graphic can be saved to disk by the Basic command:

```
BSAVE <filename>,A$2000,L$2000
```

4. To view the picture saved, from BASIC enter HGR and then BLOAD <filename>.
5. Once the picture is saved as a binary file, the dump software disk should be booted and the instructions followed. Then dump the binary picture to the printer.
6. To continue using Apple Logo reboot the language disk.

NOTE: The .BPT command to enter the monitor, mentioned last month was the cause of the static lines printed out with the Apple Logo graphic, because it stored temporarily the parameters of Hi-res memory.

If the ORANGE MICRO GRAPPLER PRINTER INTERFACE CARD is used with the EPSON printer with GRAFTRAX, a graphics dump can be made directly from Apple Logo without killing the LOGO Language or the user's workspace.

GRAPPLER commands all begin with a Ctrl-I, which is CHAR 9 IN Apple Logo. All commands end with a carriage return. The LOGO PRINT primitive's automatically-provided carriage return can not be used for this because a linefeed always precedes it, which will invalidate the GRAPPLER command. Instead the primitive TYPE should be used when communicating with the GRAPPLER, with carriage returns explicitly provided with a CHAR 13. The parenthesis around the TYPE statement in the following procedure forces the TYPE primitive to accept multiple inputs.

```
TO GRAPPLER :SLOT :COMWORD
  .PRINTER :SLOT
  (TYPE CHAR 9 :COMWORD
   CHAR 13)
  .PRINTER 0
END
```

To get a simple graphics dump with GRAPPLER in slot 1, one could type:

```
GRAPPLER 1 "G"
```

"G" is the GRAPPLER command to do a simple graphics dump. It may be followed by other option characters listed in the GRAPPLER manual, like "D" for double size. Be sure to precede all command words for the GRAPPLER with a double quote.

TERRAPIN LOGO

Terrapin Logo has just mailed the "Terrapin Logo Language for the Apple II" tutorial to all Terrapin Logo owners. It includes:

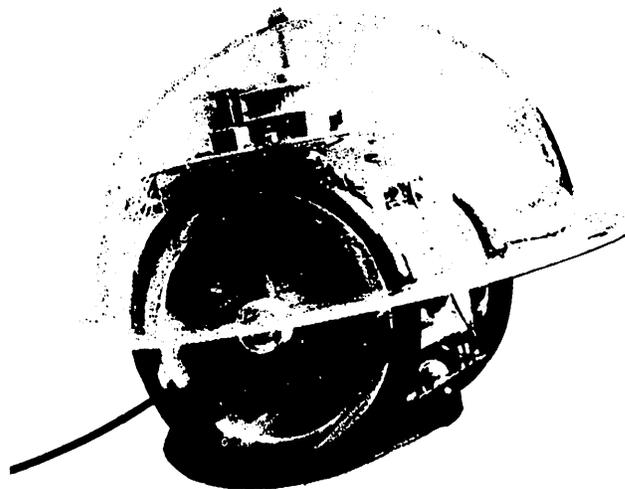
Beginning in LOGO
Graphics
Music
Computation: Handling Numbers
Appendix

as well as an ungraded Technical Manual. If you have not yet received it, be sure to contact Terrapin:

Terrapin, Inc.
380 Green Street
Cambridge, MA 02139
(617) 492-8816

TERRAPIN TURTLE ROBOT

The Terrapin turtle robot created by Terrapin, Inc. is a robot which may be controlled through the LOGO Language. It is interfaced with the Apple by a CALIFORNIA COMPUTER SYSTEMS PARALLEL INTERFACE CARD with custom proms. LCSI informs us that the floor turtle can also be used under Apple Logo in addition to Terrapin Logo and suggests the user contact Terrapin to provide Turtle driving software for it.



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- November 22 - Introduction to the Pascal Language
- November 29 - Elementary Input and Output
- December 6 - Controlling the Action: Program Control Structures
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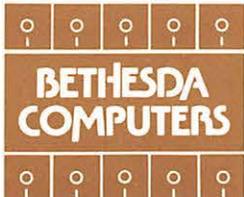
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