mini'app'les

apple computer user group newsletter

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IN THIS ISSUE:

NEXT MEETING

The next meeting of MIN'APP'LES will be on Wed. JAN
16th at 7:30 pm in the Minnesota Federal Savings and
Loan Building, 9th Avenue South, Hopkins.
We will have Bill Schloffer, a dealer representative
for Mountain Hardware, of Santa Cruz, California.
He will make a presentation to the group about
Mountain Hardware products. They make Supertalker,
ROM+, Apple Clock, Real World Control, etc. This
event has been arranged for us by Computerland whom
we thank.

WEDS., FEB. 20th

We have volunteers to talk about their experience
with packaged software or to give tutorials on
available software of interest to Business users.
We could still use some more volunteers.

BULK PURCHASE OF DISKETTES

As reported in the minutes, we are planning to
purchase diskettes in bulk. Two types have been
selected:
3M Scotch @ 2.75 each.
Georgia Magnetic @2.25 each.
Diskettes must be ordered in multiples of 10. To
pay for postage and handling from the supplier in
Pennsylvania, a charge of 50 cents per person per
order will be made. Since the diskettes are coming
from out of state there will be no sales tax. These
diskettes are to be used for the personal or
business use of the individuals buying them and are
not to be resold to non-members.
The selection of diskette type was made on the basis
of reports from Apple users both locally and in
other clubs. Call Apple have standardized on
Scotch. According to most reports Scotch and Dysan
are considered the Cadillacs of the industry. We
could have purchased the Dysans locally, but at a
higher price and with a minimum guaranteed purchase
required. The Georgia magnetics are somewhat of an
unknown entity. However, those who have used them
have had no problems.
The Scotch supplier, who is near the main Scotch
warehouse in Pennsylvania claims that he will have
sufficient stock to meet our demand by mid January.
Therefore, if you want diskettes, whether you signed
up at last meeting or not, be prepared to pay the
full amount to Terry Pinotti at the next meeting.
If you can't make the meeting send money to Terry
Pinotti at
2832 Laport Drive
Minneapolis, Minnesota 55432.
Terry plans to put next order in right after next
meeting - i.e Jan 17th. He will order both Scotch
and G.M.s.
Prices quoted do not allow for distribution after we
have received the diskettes. It is assumed that you
will pick the diskettes up from Terry or at a
Mini'App'Les meeting.

NOTE ON VERBATIM MINIDISKS

If you have had trouble with Verbatim minidisks, read on.

Some time ago the Verbatim people got some liner material for their disks that was not compatable with the magnetic media and has caused problems for their disks. This material provides support for the flimsy media both when the disk is in the drive and out of the drive. The liner is in contact with the media however the drive is supposed to flex the jacket slightly to reduce the contact to minimum when in the drive to lessen rotational friction. Due to the incompatibility problem the liner causes the media to "sing". The singing eventually causes the drive read/write head to vibrate. Eventually errors occur and the dreaded I/O ERROR occurs. This error is not recoverable without a lot of sweat and time unless the disk is re-initialized. Most inconvient.

I had not realized it but Verbatim guarentees their product and will replace defective disks. All it takes is a call to a toll free number. You may be requested to return the disk. Be prepared to give the date code on the back of the disk. On earlier disks this was stamped on with a rubber stamp-like device. Later manufactured disks have had the date code embossed on the back of the jacket. This date code will tell if the suspected disk is from the "bad" batch.

The Verbatim phone number is 800-538-1793. When I called I talked with Ms. Anna Sarafian. I am not an expert in the manufacture or use of floppy disks but have found one company willing to discuss a problem and do something about it.

MORE ON VERBATIMS

As mentioned in the last newsletter, and discussed at considerable length during the last meeting (See minutes), people have experienced problems with Verbatims. According to one source, most of the Verbatim problems have to do with eccentric alignment of the diskette on the spindle. If a disk is not centered when the spindle enters the diskette, the diskette may remain off center. The effect of this is, if you do a write, to write one or more tracks which are not concentric with the previously written tracks, and which may cross previously written tracks. Obviously such an occurence would result in distruction of data on the tracks that were crossed by the eccentric tracks.
Personally, I can't understand why Verbatim alone would experience this problem. Perhaps, Verbatims are significantly thinner than those of other manufacturers. Therefore they are prone to this problem.
At any rate Verbatim Company is very concerned about their image. As reported at last meeting, several members have communicated with Verbatim. One of these persons is Terry Pinotti. Terry reports that he received a phone call from Verbatim right after the last meeting inquiring about how the meeting went. As a result of that conversation, Verbatim have told Terry that they will send him some replacement diskettes. These diskettes are to be used to replace those diskettes with which persons have had problems. To receive one of these diskettes, you must be prepared:
(1) To hand over the bad diskette.
(2) To document your problem.
It is suggested that you make copies of all information on the disk, since you obviously will not get that particular diskette back.
If you want to avail yourself of this offer, call Terry at 786-7118.

MINUTES Dec. 19 Meeting

Meeting called to order at 7:40 by D. Buchler, and minutes of last meeting were approved as printed

OLD BUSINESS

1. User Bank--Circulation is better. ZIM Computer (Brooklyn Center) offers to copy disks in store using a fast copy (20 sec./side) program. The 500 new programs we recently purchased have been received, and should be in circulation shortly. Many seem to be duplicates of previously available materials.

2. Bulk disk purchase. After discussion of various disks available at various bulk prices the membership decided to purchase 3M disks at $2.75 each in minimum of 200 orders. There was some hope for still lower prices in larger quantities. An immediate purchase of about 600 was subscribed to be the membership, and a list was begun for those interested in the future. Contact D. Buchler if interested.

NEW BUSINESS

1. Dues are payable for 1980 NOW (in fact, you probably won't get this letter unless you have paid. So if you are not reading this, you have not paid!!!).

2. The club has joined the International Apple Club. Their first publication is Apple Orchard. 100 pages of APPLE documentation to be brought together by Val Golding of Call A.P.P.L.E. Cost of $1.00 if purchased at the Dec. Meeting, and $5.00 at a later date. There will be access to many benefits of the international group through our club, and later individual membership will be available for $5.00. About 20 indicated interest in individual membership.

3. The February meeting will be a business users meeting. We still need people to talk about their applications.

4. A suggestion to have a meeting to discuss printers was noted.

5. Dan needs volunteers to bring systems to the meetings. Please help us out.

6. If you have computer related items for sale, the newsletter will print your ad (within limitations of space of course). Send the info to Dan or Chuck T.

7. A brief and interesting report on the SOURCE time share system was given. Members are urged to look into it.

The meeting was adjourned at 8:40 for a presentation on some music applications.
55 members were in attendance.

2 SIDED DISKS

The following article is courtesy of DYSAN Corporation

Reversing Media on Single Head Flexible Disk Drive.

Flexible Disk Drives (floppys) offer the end user low cost random access to data records. Prior to the introduction of the floppy, the only other alternatives were sequential tape cassettes, low cost one-half inch tape, or single cartridge hard media disk drives. The floppy disk has been an ideal peripheral for low cost systems.

There has been a tendency by some end users to ecomomize by attempting to use the media on both sides in a single head drive. We must not lose sight of the fact that the value of the data stored on diskettes exceeds the cost of the media by a wide margin. Loss of data on either read or write means time delays, reconstruction of lost data, and customer dissatisfaction with the system, drive and/or media manufacturer. All of this can be avoided in advance if the end user is made aware of the whys and why nots.

Head Shoe and Pad operation----
The relationship of the head to the media is such that when the jacket is properly inserted, and all interlocks are satisfied, the head is loaded on to the media on the recording side, and a felt loading pad is applied to the non-recorded side. In a Shugart disk drive this is the top of the disk. In normal operation, a gradual build up of oxide will accumulate on the pressure pad. There might even be some wear on the non-recorded side due to a scouring action of the oxide impregnated pad.

If the media is reversed, that is turned up side down, the scouring action will now occur on the prime recorded side, and the previously scoured side is now presented for recording. The recorded data is now subjected to an abrasive wearing by the contaminated load pad. Since this data is not being read, there is not any means of detecting the amount of wear or the loss of data. While a catastrophic failure might not occur, it is possible that some drop out or other read errors might go undetected. Worse yet, is the possibility that the error condition might be intermittant, which makes the entire operating system suspect.

Another adverse effect of reversing the media, is caused by reversing the direction of rotation of the media against the jacket. This reversal of direction is apt to "break off" any build up of oxide particles. This presents a potential loose contaminent situation.

The net effect of this reversing (or flipping) action over a period of time, is to reduce performance and increase the probability of drop outs and errors.

Diskette tensioning------
On most Floppy Disk Drives, when the diskette is properly inserted and operation has begun, pressure is applied to the jacket on both sides so that proper tension is created on the flexible media prior to the recording head. This also provides a wiping action of the liner material against the flexible media. When the jacket is reversed (or flipped), the direction of rotation is reversed, breaking loose any extraneous particles built up by prior wiping. Thus, reversing the media increases the probability of extraneous contamination and again increases the probability of errors.

Two head Drives--------
The above problem areas do not occur on two-head drives that are designed for two-sided applications. On a two-head drive, the pressure pad has been replaced by a second head mounted on a ceramic shoe. The operation now consists of a head-media-head relationship. The soft presuure pad with possible oxide build up has been eliminated.

The diskette tensioning apparatus is the same on one and two-head drives. Since media spin direction is not reversed by flipping, the oxide break off problem does not occur.

Summary--------
The foregoing summmarizes the reasoning why Dysan and major OEM suppliers of diskette drives do not recommend two-sided media for one-head drive operation. Dysan feels the potential operating problems would make an unwarrented reflection on its reputation by using media in an unsuitable fashion. When IBM introduced the 3740 diskette, they intentonally interlocked reversal possibilities by off setting the index hole from the centerline. IBM does not make a reversable diskette. DYSAN does test and supply two-sided media for operation in two-head (two sides) disk drives. Note that the standard diskettes are not certified for operation in two-head drives!

Note by President. Several club members have reported problems in using both sides of a diskette. While those problems cannot be proven to be related to any of the above types of occurrences, it would seem wise to follow DYSAN's advice. Some members have argued that the manufacturers are trying to sell more disks. However, not one of them has come out and recommended two side operation or even sold diskettes with two slots cut. Another argument I hear frequently is that the member is using the second side for backup. Well you might get away with it, but I challenge anyone to religiously avoid using that reverse side except for the occassional update to create the backup. I myself plan to stick to one side from now on. If money is a problem, I suggest you talk to Terry about purchasing some diskettes inexpensively such as Georgia Magnetics at $2.25 apiece. (see elswhere in this newletter)

PROGRAMMA PASCAL

I know alot of people are buying the Apple Language
card just to get the PASCAL capability.   Apple has
done a fantastic job in putting together a very
sophisticated hardware/software package.   However
$500, less any discount you can talk your friendly
computer salesman into, is a good chunk of change to
most of us particularly if you are on the fence as
to exactly for what you plan to use the PASCAL for!
Therefore, why not consider another alternative, an
all software solution.   There are in fact several
versions of PASCAL which you can buy and have work
on your Apple.   I personally have had some
difficulty finding out about these versions. Our
local dealers seem to have little information about
them, or if they do they are keeping it a big
secret. (Hey you local Twin Cities dealers - step
forward and give us an update if you can!)
Applesauce, the publication of the Los Angeles
original Apple Corps has recently concluded a series
of articles on the Programma Tiny Pascal.
(incidentally someone in the club borrowed the Sept
issue with part 1 of this series. Would that person
please return that issue). Applesauce plans to
publish utilities written in Tiny Pascal. *Below we
are reprinting the last 3 1/2 pages of the Apple
Corps article on Tiny Pascal. This is the section
that deals with the supporting editor,and logistics.
The details of the actual language capability as
well as being described in Applesauce were
originally documented in a series of articles that
were published in Byte magazine in 1978. If members
are interested we can run a series on Tiny Pascal in
Mini'App'les newsletter.
For the moment, the following is a description of
Tiny Pascal from the Software catalog published by
Computer Forum of Sante Fe Springs.

Tiny Pascal is an inexpensive version of the
structured programming language that is becoming
increasingly popular in many computing environments.
Tiny Pascal is to UCSD Pascal as Integer Basic is to
Microsoft Basic. Numeric varaiables are limited to
integers, and arrays are somewhat limited. However
Tiny Pascal offers an excellent editor and compiler,
and is a fast way to learn an excellent and very
powerful language. It is a superb way to acquaint
the user with the beauty of structured programming.
Tiny Pascal costs $49.95 and is copyrighted by
Programma and sold by some software distributors
(such as Computer Forum)

Some alternatives to Tiny Pascal:-Other Pascals: As
stated above I lack full information in this area.
Applesauce, (we love you Apple-Corps), plans to
publish in their Nov issue a feature on APSCALLE
which is an extended Pascal created by Phil Wayne.
Apscalle includes such features as macros, floating
point, strings, units, built-in graphics, etc. The
package will sell for $100 to $150
OR-XPLO
is a Pascal like language which can be obtained for
$30.   * See Page 10

A special note on other groups:
there is a group in town called the "Pascal User
Group" or PUG.
There fiscal year is from July 1 to June 30, with
four news letters a year.
Newletters usually produced in September,November,
Febuary, and May.
The Pascal news is divided into these sections:
1. policy
2. editor's contribution
3. here and there with Pascal
4. Applications
5. Articles
6. open formum
7. Implementation notes

The standard reference and tutorial manual for
Pascal is: Pascal-User Manual and Report (second,
study edition) by Kathleen Jensen and Niklaus Wirth
The Pascal User's Group have more than 3357 active
members in more than 41 countries, with the
newsletter averaging more than 120 pages per issue.
To join send $6.00 for a years dues to Pascal user's
group, c/o Andy Mickel
University Computer Center: 227 EX
208 SE Union Street
University of Minneasota
Minneapolis, MN 55455 USA
or you may want to pick-up a all-purpose coupon from
Zim computer, which has a form for you to fill-out
before joining. By the way there is a international
telephone for the American Region: 1-612-376-7290
There is an interesting article and program for
Pascal in Interface Age, vol.5, issue 1 January
1980. page 98.
The article deals with a modification which will
make Pascal more efficient to program in as a
business or scientific language.

NEWSFLASH
It seems that Apple Computer is picking up in their
penetration of the market. According to a recent
edition of Datamation magazine, from the results of
a survey by that magazine, Tandy Corporation have
supplied 43% of Microcomputer systems, Apple have
supplied 17%, with other makes accounting for the
remaining 40%. 70% of these systems were for
organizational use, 30% for personal use. The
organizational is divided between Business,
education and office systems as the most frequently
mentioned applications. Since Apple systems
generally sell for more that TRS-80s, it seems that
Apple has gained market penetration to somewhere
around half the dollar value of Tandy's (my guess).
A year ago Apple supposedly had sold $25 million
versus $100 million for Tandy. Please note that
these numbers were never verified.

DAN ON PRINTERS

Two known owners of the Paper Tiger, who are also club members, seem to be enthusiastic about their recent acquisitions. One of these gentlemen stated that the Paper Tiger is much superior to its predecessor the Integral Data Systems (IDS) 210. He said that he was very satsisfied with the print quality. The availability of the graphics option seemed to be a major incentive for selection of said device.

You may have noticed that the Dec Newsletter was different in type style from previous issues. It was printed on a Diablo printer connected to an Apple through a Hayes modem, phone line and acoustic coupler. That Daiblo was operating at 300 baud but is capable of 1200 baud (120 chars per second). The Diablo is considered by some as the cadillac of serial printers. It is more expensive than a selectric, but faster, and probably prints a little better. It uses a 'Daisy Wheel' as the print mechanism. This wheel is a disk shaped device about 5 inches in diameter with embossed characters on the end of spokes in the plane of the disk. The wheel rotates in a vertical plane with t spokes lining up with a print hammer that strikes the emossed letter into a conventinal ribbon. The wheel can be replaced in a matter of seconds for a different style. The type font used for the newsletter had an exceptionaly fine stroke which was not too well suited to reproduction. A bolder style is required. Such a print wheel was not available to us. I am sure that you noticed in the Dec newsletter that the first one or more characters was occasionally missing from a line. In actual fact, the character was there, it was the ink that was missing. The Diablo, as stated above, uses a conventional type of inking ribbon. When the ribbon is not in use, it drops down out of line with the hammer, as on many typewriters. When the terminal receives a new character, it attempts to elevate the ribbon to the print position, then prints the character.

If letters arrive at a steady rate, the ribbon remains elevated. However, a pause of about half a second, allowsthe ribbon to drop. Well, the Apple software used to send the newsletter, often paused at the start of a line. On resuming transmission, the Diablo was just 'not able to get its ribbon up in time'! The problem can be solved by sending nulls at the beginning of a line. We hope to make this modification to JUST routine soon. (NOTE:NOD USED TO PRINT THIS N.L.)

I see lots of advertisements for the Microtek printer listing for $750 (mentined in an earlier Dan on Printers). With a 9*7 dot matrix it sounds attractive. Anyone know anything about it? There is another printer called the Micro Peripherals Inc model 88T which lists for $749. Anyone seen one of those ?

I also notice that some mail order dealers are discounting the ANADEX 8000 which is another 9*7 font printer listing for $999.

There's also a unit called DIP-80 from DIP Inc of BOSTON MASS for $625 with friction platen.

BUNKER RAMO PRINTER NEWS

Daryl Hammond, a Bunker Ramo printer user submitted a modified version of Improved Catalog, which works with the printer without creating an extra line space. If anyone wants a copy, please call Daryl or Dan. Incidentally, improved catalog in its original version is a neat variation on Catalog which provides more information on resource usage than the standard Catalog. Unfortunately, being written partially in Basic it is a little slow. It was written by U of C at Berkeley.

The Printer in the Meyer, Minn, school blew its power supply in Dec. It apparently got lots of use up to the failure. Dan has it in the shop for repair. This is the first serious casuality reported with any of the Bunker Ramo printers! Dan apologizes to those who are waiting for printers. It has just been an incredibly busy 2 months.

RUMOURS FROM AFAR

(Afar is a province of Iran which is currently uninhabited due to Nuclear testing by the Shar). Mention was made in the Nov newsletter of the Apple III or maybe its the Apple]]] or Apple <<>. Anyway, both Apple Inc and Tandy corporation are supposed to be concluding negotiations with Motorola for the supply of the 6809 Microprocessor chip for the next generation systems - Apple >>< and TRS 809s. The 6809 is a growth chip from the 6800 with increased addressing capability and more internal registers. This information as stated above comes from Afar and is as unreliable as its source.

The Apple <>> is apparently a stand alone integrated system. By that we mean it will probably have a built in color monitor and disk drive all housed in one case.

MINI'APP'LES USER BANK---(RULES!)
1. A person must be a member of MINI'APP'LES of good standing.
2. That person must sign the list, for the software to be borrowed.
3. At the time of borrowing for copying in the store, or taking it home you will be required to pay $2.00 per library bank, (there are three subbanks) or at your option, 50 cents per diskette which there are about 20.
4. There will be a time limit of three days per subbank, which you can be fined for not abidding by. It is the result of lack of cooperation of the membership, that these steps must be taken.
5. The borrower is responsible for damaged diskettes, or loss of data on diskettes, for which there will be a fine of $8.00 per lost diskette, or $5.00 charge for a diskette which has to be rewriten.
6. Anyone how cannot follow these rules is not entitled to copy the software bank, and should not!.
summary note:
These rules are more strict that before because things are not going well.
We have received our third subbank which will be installed soon, and some people have not copied the first subbank. This makes me look bad. It is not all my fault. Our members are taking advantage of the computer stores, and other members in getting their copies which take too long, or skipping another persons name. I have also given permission to the computer stores to skip over a persons name if they can not be reached within a 24-hour period. (THIS MEANS ONE DAY!)
If any member has any questions or problems please call the Librarian at 474-3876 and talk to Keith Madonna.

USER BANK STATUS

The new set of 500 programs have been received from the Apple Corps via Brad Smith of Topeka. As of this writing, one set resides in ZIM computer and additinal librarires are being oreoared for the other Distribution points. The Librarian, Keith Madonna, has also prepared an updated set of rules, which are being placed at the distribution points. The rules appear elsewhere in this newsletter. The additional programs are considered a 'volume' for the purposes of payment and members will be charged $2 to copy the whole lot. A complete listing of the catalogs for the 20 diskette sides is included elsewhere in this newsletter. It is emphasized that we still beleive that the library technique of program distribution can be made to work smoothly. The cooperation of all who borrow the diskettes is requested as well as that of the stores that are the Distribution points. To the out of towners, we have'nt forgotten you, its just that our system has some growing pains.
It is recognized that there is considerable duplication of programs between the new set and the 2 older volumes. We have considered reorganizing the older volumes to improve the way in which programs are organized on the diskettes and to get rid of some of the junk. We have not yet decided exactly what to do.

SCANNING THE ISSUES

January Byte magazine has an interesting article on interfacing the BSR X-10 Home Lighting Control system to a microcomputer. The BSR X-10 is sold by Sears and many other stores. For somewhere between $50 and $80 you get a little push button console and several remote units. By pressing a button on the console, a 120 khz signal is sent through your internal house wiring to a selected module which will turn on, off or dim any light connected to it. The nice thing is that the light or appliance remote modules can be bought for about $12 to $15 each. Thats not alot more than a hand operated dimmer. One version of the remote unit installs in place of a built in switch. The Byte article shows how to build an interface to the remote control unit. The latter is a hand held box which talks to the command module through supersonic signals. Thus, the Apple can talk to the command module without any electrical connection between it and the command module. That provides maximum convenience and safety. The nice thing about all off this is that one can use the computer to control lights, appliances and heating and air conditioning at an affordable price. Chuck Thiesfeld is working on one that doesn't need the command module.

Also seen in Byte magazine-
Sanyko Seiko Manufacturing Co has started building a 2-inch floppy that stores 9k bytes on one track.
Robert Best of Seattle was issued a US patent for a device that stores software in cipher to prevent unauthorized piracy of the program. (This writer finds most code undecodable anyway?)
For assembly language programmers there's an interesting technique for emulating indirect JMPs and JSRs. In page zero one stores a
JSR x
RTS
where x is the entry point to a subroutine which is looked up in a table or otherwise determined, and then stored in x. A JSR to the JSR in page 0. Read the article if you can't see the applicability!

In MICRO Dec, 1979-
A detailed article on building shape tables for use with Integer Basic. If you are not familiar with the shape capability in HIRES and want to move shapes around, the article might be of use to you. Incidently the two shape creating utilities on the user bank for both Integer Basic and Aoplesoft will serve most peoples needs. If you are making shapes , I recommend you get yourself a copy of those.
Applesoft Program Relocation by George Guild. If you have ever tried to move Applesoft away from $900 ($3001 for RAM systems) and been as frustrated as I was when strange things happen on trying to save the program , then read this article.

DISK VOLUME 254 SIDE#1

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I 014 SCIENTIFIC DISK #1
*A 019 S/APPLE-CHEM
 I 029 S/LOGIC ANALYSER
*I 005 S/COIN TOSS
*A 011 S/ANGLO TO METRIC CONVERSIONS
*A 014 S/TRIANGLE
*A 006 S/OHM'S LAW
 A 026 S/COST PER SERVING
*A 003 S/PROG.CHART
*A 016 S/STATISTICS
*A 011 S/UNPAIRED GROUP CMP.
*A 009 S/MATRIX OPERATIONS
*A 005 S/MATRIX INVERSION
*A 007 S/POINT GAUSSIAN QUADRATURE
*A 004 S/SIMULTANEOUS EQUATIONS
*A 003 S/DERIVATIVE OF AN EQUATION
*A 006 S/PI-NET DESIGN
*A 005 S/ANTENNA PLOT
*A 018 S/QUAD ANTENNA DESIGN
*A 013 S/CONDUIT FILL
*A 014 S/EQUATIONS
 A 011 S/ROBOT MOTOR
*A 003 S/ARCSIN
*A 012 S/FOOTCANDLE ANALYSIS
*A 014 S/LIGHTING LIFE CYCLE
*A 007 S/CONSECUTIVE REACTIONS
*A 010 S/CIRCULAR DICHROISM
*A 054 S/ENZYME KINETICS
 A 006 S/POWER CURVE FIT
*A 006 S/EXPONENTIAL CURVE FIT
*A 006 S/LOGARITHMIC CURVE FIT
*A 017 S/ELEMENTS
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DISK VOLUME 254 SIDE #2

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I 014 SCIENTIFIC DISK #1
*A 019 S/APPLE-CHEM
 I 029 S/LOGIC ANALYSER
*I 005 S/COIN TOSS
*A 011 S/ANGLO TO METRIC CONVERSIONS
 A 006 S/OHM'S LAW
 A 026 S/COST PER SERVING
*A 003 S/PROG.CHART
*A 016 S/STATISTICS
*A 011 S/UNPAIRED GROUP CMP.
*A 009 S/MATRIX OPERATIONS
*A 005 S/MATRIX INVERSION
*A 007 S/POINT GAUSSIAN QUADRATURE
 A 004 S/SIMULTANEOUS EQUATIONS
*A 003 S/DERIVATIVE OF AN EQUATION
*A 006 S/PI-NET DESIGN
*A 005 S/ANTENNA PLOT
*A 018 S/QUAD ANTENNA DESIGN
*A 013 S/CONDUIT FILL
*A 014 S/EQUATIONS
 A 011 S/ROBOT MOTOR
*A 003 S/ARCSIN
*A 012 S/FOOTCANDLE ANALYSIS
*A 014 S/LIGHTING LIFE CYCLE
*A 007 S/CONSECUTIVE REACTIONS
*A 010 S/CIRCULAR DICHROISM
*A 054 S/ENZYME KINETICS
 A 006 S/POWER CURVE FIT
*A 006 S/EXPONENTIAL CURVE FIT
*A 006 S/LOGARITHMIC CURVE FIT
*A 017 S/ELEMENTS
*A 010 S/DIFFERENTIAL EQUATIONS
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DISK VOLUME 254 SIDE#3

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*I 009 APPLE CORPS GAMES #5
*I 054 G/MADLIB 181 I
*I 054 G/MADLIB 181 II
*I 052 G/CHECKERS
*I 020 G/HUSTLE
*B 033 G/QUBIC.$AA$.IFFR
*I 009 G/GOODBALL
 I 004 G/TV TRIVIA
*A 089 G/WOM 20
*I 032 G/PSYCHIATRIST
*I 007 G/SUB COMMANDER
*I 014 G/COLOR SLOT II
*A 004 G/AIRPLANE
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DISK VOLUME 254 SIDE#4

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 I 002 APPLE CORPS GAMES #6
*I 009 G/TIME BOMB
*I 008 G/SEA HUNT
*I 008 G/NUMBER LOGIC
*I 009 G/BOMBARDMENT
*I 008 G/WELCOME TO THE RACES
*A 010 G/TORPEDOED BY ROD
 I 016 G/PROGRAM STARTREK
*I 018 G/DRAGON MAZE BY TOGNAZINI
 I 009 G/ADVANCED DRAGON MAZE
 I 009 G/LUNAR LANDER
*I 033 G/CHESS IN TEXT
 I 008 G/RUNAROUND
*I 005 G/RUSSIAN ROULETTE
 A 014 G/WIN
*A 015 G/TAXMAN
*I 037 G/BATTLESHIP VERS 78.0723
*A 011 G/TIC-TAC-TOE
*I 019 G/DOLLAR SLOTS
*I 019 G/TIC TAC TOE IN COLOR
*A 019 G/WORD SEARCH PUZZLE
 V 010 G/CORRAL
*A 022 G/JOUST
*I 027 G/ONE-PLAYER FOOTBALL
```

DISK VOLUME 254 SIDE#18

```
*I 002 DEMO DISK #4
*I 002 D/DISPLAY GRAPHS II
*B 034 D/GRAPH5
*B 034 D/GRAPH6
*B 034 D/GRAPH7
*B 034 D/GRAPH8
*I 004 D/DIAMONDS
 I 005 D/REAL ESTATE PLOT
*B 034 D/REAL,ESTATE PLOT
 I 016 D/MEET THE COMPUTER
 I 022 D/STORY TELLER
 I 030 D/COLORGRAPHICS DEMO
 I 039 D/3,8 TRILLION STORIES
 I 030 D/SUPER KALIEDISCOPE
 I 020 D/STARTREK INSTRUCTIONS
 I 007 D/SOUND EFFECTS
 I 009 D/UPPER-LOWER CASE
*I 019 D/SMALL WORLD MUSIC
```

DISK VOLUME 254 SIDE#5

```
*I 021 D/MENU
 B 026 D/SUPER SYNTHESIS 1100G
 B 026 D/HIRES DAZZLER
 I 008 D/811 DISPLAY
 I 003 D/UNBELIEVABLE
 I 004 D/COLOR EATER I
*B 021 D/APPLE-MUSIC SUBROUTINES
 I 022 D/BLUE DANUBE
 I 013 D/THE ENTERTAINER
 I 014 D/YESTERDAY
 I 014 D/CANTINA BAND
*I 012 D/DECK THE HALLS
*I 012 D/JOY TO THE WORLD
*I 002 D/CLASSIFIER INFORMATION
 B 002 D/CLASSIFIER
*I 007 D/VARIATIONS
*I 008 D/APPLE ART-RED ROM
*I 006 D/NATIONAL PRIDE I
*I 015 D/NATIONAL PRIDE II
*I 002 D/HYPERBOLA
*I 008 HIRES PREFIX -
 A 015 D/APPLE,RECORDS
*A 003 D/NEW PERSPECTIVES
*I 003 D/COLOR DIAMOND
*A 016 D/TOUCH TYPING
*I 004 D/ACNE
*A 006 D/LOVE
*I 006 D/SPLIT CATALOG
*A 005 D/IMPOSSIBLE FIGURE
 I 018 D/APPLE LOGO
*I 050 D/HOLIDAY GREETING PAK
*A 012 D/HIRES FIGURES
*I 002 D/PLAID COLORS
*I 003 D/HIRES AID
```

>CATALOG

DISK VOLUME 254 SIDE#6

```
*I 003 D/MENU
 I 036 D/SNOOPY FOOTBALL POSTER
 A 021 D/URSA
 A 015 D/INDOOR XMAS TREE & MSG
 I 024 D/AIRCRAFT INSTRUMENT SIMULATO
 I 002 D/AIRCRAFT (LOAD/HIMEM 8192/RU
 A 040 D/LITTLE PIZZA MAN POSTER
 A 013 D/MEMORY SPYING PROGRAM
 A 006 D/RANDOM WALK
 I 013 D/GMAZE
 I 033 D/HAIKU POETRY C.A.I.
 A 006 D/SPIRO
 I 008 D/TRACE
 A 005 D/GREAT SHAPES
 B 009 FAST DISK COPY (8-RUN)
```

These are the CATALOGS of
SUBBANK #3 (VOLUME #3)
There are 20 disk sides
numbered 1 thru 20.
NOTE The labelling of the
disks at the Distribution
Points may not correspond

DISK VOLUME 254   SIDE#7

```
*I 050 APPLE CORPS GAMES #3
*I 049 G/APPLE CASINO PAK
*I 045 G/APPLE COLOR GAME PAK
*I 040 G/MADLIB
*I 039 G/OTHELLO I
*I 050 G/TTT 2-D & 3-D
*B 008 TTT ROUTINES
 I 023 G/BINGO
*I 017 G/AUTOMATIC BINGO
*I 007 G/BINGO CARD
*I 022 G/THE STORYTELLER
*I 015 G/HAMMURAB1
*I 013 G/CHASE
*I 023 G/REAL TIME CHASE
 I 008 G/DARTS
*I 012 G/TAXMAN
*I 006 G/REVERSE
*I 003 G/MIRROR
*I 008 G/ONE CHECK
*I 008 G/RUSSIAN ROULETTE
```

DISK VOLUME 254   SIDE#8

```
 I 011 APPLE CORPS GAMES #4
*A 018 G/ARTILLERY
*A 015 G/CRAPS SLOT
*A 018 G/SPLAT
*A 010 G/ROCKET
*A 017 G/SLALOM
*A 011 G/BOMBS AWAY
 A 011 G/LEM
*A 010 G/TARGET
*A 007 G/GUNNER
*A 020 G/ROULETTE
*A 008 G/BOWLING
*A 006 G/BULLSEYE
*A 011 G/HORSERACE
 A 036 G/LUNAR
*A 018 G/BULLFIGHT
*A 021 G/FUR TRADER
*A 012 G/COMBAT
*A 010 G/PIZZA
*I 020 G/COLOR TIC TAC TOE
*I 036 G/MINI CHESS
 A 023 G/CRAPS
*A 020 G/CHECKERS
*A 010 G/LUNAR-500
*A 033 G/SWORDS
*I 023 G/CHASER
```

DISK VOLUME 254   SIDE#9

```
 I 023 APPLE CORPS GAMES #1   .
*I 046 G/APPLE 5 GAMES
*I 011 G/TWO PLAYER BREAKOUT
*I 008 G/RUNAROUND
*I 016 G/SLOT MACHINE
*I 020 G/TANK
*I 023 G/TIC TAC TOE
 I 007 G/BATTLESHIP
*I 018 G/KEYBOARD SLOT
*I 028 G/WAYNES OTHELLO
*I 013 G/SEA CHASE
*I 008 G/SAUCER WAR
*I 007 G/LO-RES STAR WARS
*I 014 G/DON'T FENCE ME IN
 I 012 G/MEMORY MADNESS
*A 007 G/STARS
*I 016 G/DRAGONMAZE I
*I 015 G/DRAGONMAZE II
*I 032 G/ELIZA
*I 007 G/HURKLE
*I 012 G/TWENTY MATCHES
 I 011 G/LAMBERT PINBALL
*I 020 G/HEXPAWN
*I 011 G/IMPROVED PONG
```

DISK VOLUME 254   SIDE#10

```
 I 055 APPLE CORPS GAMES #2
*I 013 G/IMPROVED BREAKOUT
*I 043 G/YAHTZEE
*I 040 G/TIC TAC TOE II
*I 017 G/COLOR BLACKJACK
*I 017 G/PINBALL -
*I 055 G/A.P.P.L.E. GAME PKG 1
 I 014 G/AIR DEFENSE
*I 015 G/GOSOEM
*I 012 G/MINI TREK
*I 009 G/HANDBALL & PONG
*I 009 G/CRAPS
*I 015 G/REAL TIME DRAGONMAZE
*I 014 G/AWARI
 I 007 G/SIMPLE SIMON
*I 008 G/HIDDEN MOUSE
*A 001 G/JURY
*I 013 G/ACEY DUCEY
*I 011 G/SINK THE SHIP
*I 005 G/ROCKS PAPER & SCISSORS
*A 007 G/ROSE
 A 006 G/WORD PUZZLE
*I 006 G/BOMBS AWAY
*I 009 G/CODEBREAKER
*A 020 G/GOLF
```

DISK VOLUME 254   SIDE#11

```
*I 010 APPLE CORPS GAMES #7
*I 026 G/TRISLOT
*I 015 G/SIMPLE SIMON
*I 010 G/SHOOT-OUT
*I 034 G/BRAIN TEASER
*I 004 G/STORE WINDOW DISPLAY
*I 009 G/TORPEDO RUN
 I 015 G/ANTI AIRCRAFT
*I 009 G/HANGMAN
*I 024 G/BRIDGES
*A 010 G/SUBMARINE
*I 015 G/GO-MOKU
*I 015 G/SPEEDWAY
*I 063 G/SUPER-HIRES CHESS
 I 009 G/SAVE THE WORLD
*I 024 G/BASEBALL
*I 025 G/CRYPTOGRAM
*I 011 G/NINES
*I 054 G/NIGHTMARE GAMEPAK
```

>CATALOG

DISK VOLUME 254   SIDE#12

```
*I 024 GAMES
*I 047 G/COLOR GAMEPAK III
*I 013 G/AUTO DRIVER
*I 022 G/TWONKY
*I 015 G/GOSOEM
*I 024 G/SEVEN
*A 001 G/STARLANES
 A 024 G/ STARLANES
*I 010 G/INTECEPTOR
*I 007 G/AIRPORT
*I 008 G/ONE CHECK
*I 006 G/TARGET SHOOT
*I 006 G/U F O
*I 012 G/MAZE TILT
 I 014 G/AIRPLANE
*I 028 G/APPLE EDUCATION PAK
*A 010 G/AUTO AUCTION
*A 007 D/APPLEHAPPY
*A 017 G/WORLD POWER
*A 027 G/HOCKEY
*I 056 G/OREGON TRAIL
```

DISK VOLUME 100   SIDE#13

```
 I 002 APPLE CORPS LIBRARY GAMES #9
 A 030 G/STUDENT DICE
 A 027 G/DEEP SPACE
 I 020 G/LASER CANNON
 A 034 G/FIZZBIN
 I 022 G/SMART ALECK BLACKJACK
 I 020 G/THREE PLAYER BLACK JACK
 A 013 G/HI-Q
 A 089 G/ATOM 20
 I 027 G/ONE PLAYER FOOTBALL
 I 011 G/FROGS
 I 026 G/APPLESTAND
 I 035 G/BAGELS/CLOCKS/20QUESTIONS
 I 038 G/LEGACY/TAKEIT
```

DISK VOLUME 100   SIDE#14

```
 I 002 APPLE CORPS GAMES #10
 I 030 G/BEGINNER
 I 015 G/HEADS
 I 029 G/STOCKMARKET GAME
 A 019 G/STORY MAKER
 A 021 G/HUNT THE WUMPUS
 I 009 G/LANDER
 I 011 G/BOMBARDMENT
 I 015 G/SIMPLE SIMON
 I 057 G/SPELLING BEE
 I 019 G/BLACK BOX
 I 008 G/EVIL
 I 023 G/MAD LIB
 I 010 G/SHOOT OUT
```

DISK VOLUME 254   SIDE#15

```
 I 006 MENU/D
*I 039 D/STORIES
*I 005 D/KALEIDOSCOPE1
*I 002 D/ROD'S COLOR PATTERN
*I 003 D/CLOCK
*I 003 D/HIRES HYPERBOLA
*B 006 HRGRAF
 I 007 D/HIRES ROTATION
*I 006 D/HIRES CUBE
*I 002 D/HIRES MULTICOLOR
*I 005 D/BOUNCING BALL
*I 015 D/FLAG
*I 030 D/CHRISTMAS
*I 007 D/APPLE DRAW
 I 002 D/SOUND EFFECTS
*I 006 D/MAZE CONSTRUCTOR
*A 003 D/SOFT#26
*A 003 D/RADAR
*I 005 D/QUADRA-DOODLE
*I 004 D/SCREEN SKETCH
*A 002 D/SINE WAVE
 I 007 D/MUSIC WITH GRAPHICS
*A 011 D/HIRES PATTERNS
*B 025 MUSIC ROUTINE A$ 800
*I 006 D/BUMBLE BEE
*I 012 D/SUPER HIRES GRAPHICS
*B 006 SUPER.HIRES
*A 007 D/FUNCTION PLOT 2-D
 I 021 D/GRAPHIC CROSS
*I 004 D/GRAPHIC DESIGN
*I 011 D/JOHAN S APPLE
*B 002 CUBE 3D
*A 007 D/CUBE
*I 005 D/HORSERACE
*I 021 D/PENTOMINOES
 I 014 D/BIT BIN
*I 005 D/DANCING BUTTERFLIES
*I 004 D/BROWNIAN MOTION
*I 006 D/COLOR DEMO
*I 008 D/COLOR KALIEDOSCOPE
*I 030 D/GIANT TYPEWRITER
*I 014 D/BIRTHDAY CAKE
·I 004 D/LIFE-SEAT
*I 019 D/APPLE COLOR DEMO
*I 004 D/APPLESTUFF
```

>CATALOG

DISK VOLUME 254   SIDE#16

```
 I 003 MENU/D
*I 004 D/TEXAS FLAG
*I 030 D/SEASONS GREETING
*I 009 D/COLOR DEMOS
*I 003 D/CHECKERBOARD
*I 011 D/MUSIC SYNTHESIS
*I 003 D/BUGLE CALL
 I 019 D/COLOR GRAPHIC CHR'S
*I 004 D/APPLE INSIGNIA
*A 003 D/BULLET
*A 002 D/IMPACT
*A 002 D/EASTER EGG
*A 003 D/CIRCLES
*I 019 D/OBJECT DRAWING
 I 008 D/BACH
*I 011 D/WASHINGTON
*I 003 D/HIDDEN LINES
*I 018 D/LINCOLN
*I 005 D/HIRES ART
```

DISK VOLUME 254 SIDE#17

```
 I 002 DEMO DISC #3
*I 014 D/APPLE BYTE
*A 003 D/GREAT SHAPES
*I 005 D/WALLS
*A 006 D/SPIRO
*A 002 D/ROSE
*I 003 D/ANIMATION
 I 014 D/MUSIC MAKER
*I 006 D/BAR GRAPH
*I 022 D/ANIMATIONS
*I 004 D/ERIC THE WORM
*A 005 D/SERENDIPITOUS CIRCLES
*A 003 D/HYPER 3
*A 003 D/HYPER 1
 A 004 D/PLOT 3-D (REQ HIRES)
*A 002 D/SPIRALS
*A 050 D/BUD'S APPLE
*A 003 D/HYPER 5
*I 004 D/WIG WIZ
*A 003 D/HYPER 4
*A 003 D/BENCHMARK
 A 003 D/COMMON BIRTHDAYS
*I 006 D/APPLE PI
*I 007 D/STOPWATCH
*I 003 D/COLOR DEMO 1
*I 003 D/EDS DAZZLER
*I 017 D/APPLE HIRES PAK
*I 021 D/PENTOMINO
 A 009 D/HIRES DEMO II
*I 006 D/APPLEGRAPHICS
*I 002 D/DISPLAY GRAPHS
*B 034 GRAPH1
*B 034 GRAPH2
*B 034 GRAPH3
*B 034 GRAPH4
 I 010 D/RANDOM ROCKET
*B 003 D/DAZZLE
```

DISK VOLUME 254   SIDE#19

```
*I 006 MENU/B
*A 017 B/SECURITY ANALYSIS
*A 006 B/COPY SECURITY DATA
*A 021 B/ DISCONTINUOUS OPTION PRICIN
*A 015 B/ BLACK-SCHOLES OPTION PRICIN
*I 006 B/LETTER WRITER
*A 008 B/WATER CONSERVATION
*A 008 B/TYPESETTER
*A 013 B/BOND
*A 032 B/BUDGET
*A 010 B/TRIP COST ANALYSIS
*A 017 B/DECISION MAKER
*A 013 B/DECISION MATRIX
*A 016 B/INVESTMENT
 A 028 B/LOANS
*A 014 B/AMORTIZATION SCHED FOR PRINT
*A 028 B/DATABASE
*I 014 B/PHONE LIST
*A 008 B/DIRECT REDUCTION LOAN CALC
*I 022 B/TRANSPORTATION COST MINIMIZE
```

```
*B 006 HIRES.OBJ
*I 008 D/BEGINNING (RUN TWICE)
 I 005 D/TWINE (RUN TWICE)
*I 008 D/COMPUTER ART (RUN TWICE)
*I 008 D/WINGS (RUN TWICE)
*I 008 D/TWO CIRCLES (RUN TWICE)
```

DISK VOLUME 254   SIDE#20

```
 I 002 MENU/U
*I 004 U/BSTAT
*I 007 U/SW16 DISASSEMBLER
*I 005 U/ASSM
*A 009 U/ALPHA QUICKSORT
*I 005 U/APPLE TEST
*A 006 U/NUMERIC QUICKSORT
*A 008 U/CATALOG MAINTENANCE
*I 008 U/A/S I TO A/S II CONV
*T 002 U/DOCUMENTATION
*I 004 U/DOCUMENTATION INFO
*B 004 U/SYMBOL TABLE XREF
*B 004 U/LINE # XREF
*A 008 U/CALENDAR
 A 006 U/WEEKDAY
*I 003 U/VER.APP & MEM DOC
*B 002 U/VERIFY
*B 003 U/APPEND
*B 003 U/MEMTEST
*I 008 U/STRING CONCATENATION
*I 006 U/BASIC TOKENS
 A 007 U/SORTING ROUTINE
*I 002 U/CENTERING ROUTINE
*A 005 U/F.P. UTILITY ROUTINES
*B 007 U/LAZERUS
*I 005 U/HAM LOG BOOK
*A 006 U/DAY OF THE WEEK
*I 005 U/HEX CONV.
 I 003 U/PERPETUAL CALENDAR
*A 003 U/APPEND FILE
*I 004 U/EXEC FILE-CREATE
*B 002 U/MEM.DUMP
*B 003 U/DISK-TO-TAPE DUMP
*I 003 DISK-TO-TAPE DUMP INSTRUCTIONS
*I 008 U/TRACE
 B 003 B.TRACE
*I 007 U/TEXT/TOKEN 'FIND'
*B 002 B.FIND
*A 008 U/HEAPSORT
*I 008 U/TV PATTERN GEN
*I 003 U/CONVERT INT/ASFTII
*I 004 U/BINARY PROG. LOCATOR
 I 007 U/SWEET 16 DISASSEMBLER
*I 005 U/FILE HANDLER
*A 005 U/BI-DEC CONV
*I 005 U/CHR$ FUNCTION
*I 007 U/TV GENERATOR
*A 007 U/TEXT JUSTIFY
*I 008 U/CATALOG MAINT.
 I 005 U/PICK A BASE
*I 004 U/FAST MEM TEST
*I 004 U/SLOW MEM TEST
*I 007 U/BSTAT 3.2
*I 008 U/ENTRY POINTS
*I 014 U/COPY PROGRAMS
*A 006 U/DEBUGGING AID
```

```
*I 002 U/HIRES END
*I 012 D/HOLIDAY PLOT
*I 005 D/THE DRIP
 I 010 D/SEASONS GREETINGS
*I 015 D/CONAN
*I 016 D/HIRES DEMO
*I 036 D/MUSIC
*I 010 D/THE MAZE
*I 025 D/POET
*I 042 D/DOILY DOODLER
```

USING THE PASCAL EDITOR

The editor provided with the Tiny Pascal system is a line oriented editor written by Herbert Yuen. The source for the editor (written in Pascal) is in the file "EDITOR.S".

You may enter the editor by typing "E" while in the Pascal monitor. The Apple II will respond with:

NEW/EDIT(E):

By pressing "E" or <cr> you can edit a file existing (created previously or L(OAD)ed in at the Pascal monitor level). By pressing "N" the editor will clear any existing text and place you directly in the "insert" mode.

Once you are in the editor (by using the "E" command or by getting out of the insert mode when editing a N(EW) file) you will be at the editor command level. Valid commands are:

           'n' refers to a decimal number in the range 1-999.

L: list entire file.
P: prints current line.
P^P: prints top line.
P*: prints last line.
Pn: prints the next 'n' lines.
R<string>: replaces current line by <string>.
A<string>: appends <string> to the end of the current line.
D: deletes current line.
D^: deletes the first line.
*: deletes the last line.
Dn: deletes the next 'n' lines.
X: status, prints size of file etc.
U: move the line pointer up one line.
Un: move the line pointer up 'n' lines.
N: move the line ponter to the next line.
Nn: move the line pointer past the next 'n' lines.
E: exit the editor.
I: enter the insert mode (automatic when editing a N(EW) file). All following text is inserted AFTER the current line. You exit the insert mode by typing <cr> as the first character of a new line (to insert a blank line type at least one space prior to the <cr>). If the textfile is empty (when editing a N(EW) file) you must insert at least one line of text before exiting the insert mode.
I^: Insert text before the first line.
I*: insert text after the last line.
M: enter intra-line editing mode. "^" denotes a control character. Commands in the intra-line editing mode are:
^A: copies current character.
^G: copies entire line.
^H: backspace one character.
^S<c>: copies all characters up to <c>.
^N: re-edit new line.
<cr>: exit modify mode.

In adition to the Pascal editor you may use the Apple Pie (version 2.0) text editing system to create source files for creating tiny Pascal source programs. Since Apple Pie textfiles and Tiny Pascal textfiles are incompatible, Pie textfiles must be converted before attempting to compile a Pascal program created by Pie. To accomplish this run the program "CONVERT/PIE" (a source is provided). Programs created using Apple Pie cannot be modified by the Tiny Pascal editor (even after conversion by "CONVERT/PIE".

Since neither Pie nor the Tiny Pascal editor allow you to insert control characters into the source code you must use constants with the appropriate value instead of the actual control character. For instance, to display a catalog from a progam you could use

WRITE(CTLD,'CATALOG',CR);

Where CTLD=4 and CR=13. The "[" and "]" characters are directly available from the keyboard using control-t and control-y.

Tab characters. The compiler and editor both recognize the TAB character (control-I). During listings two blanks are substituted for each TAB character.

– MORE ADVANCED TOPICS –
– ERROR MESSAGES –

The error messages printed by the compiler are the standard error messages found in PASCAL:USER MANUAL AND REPORT by Jensen & Wirth. In addition error 999 may occasionally appear. Error 999 indicates that the static function/procedure nesting level, or the number of permissible variables in a function/procedure, has been exceeded.

– MAXIMUM NUMBER OF VARIABLES –

The total number of integer variables (including each element of an array) must not exceed 2048 (decimal). If you need an array of 4000 elements you must break it into two arrays of 2000 elements each. One array must be declared at the current level of procedure or function. The second array must be declared within an internal procedure or function. The arrays must have different names (if both are to be accessed). The inner procedure can now "see" both the outer array and its own. The main body of the outer procedure can now be a simple call to the inner procedure.

If a function/procedure is 16 levels deeper than the outermost function it can no longer access variables in the outer function/procedure. This highly unusual situation is flagged with the error 999 message.

– RUN TIME ERRORS –

Runtime errors will return you to the Pascal monitor, which will identify the type of error and the P-code address of its occurrence. This can be matched against the compiler listing to determine in which line the error occurred.

– SYSTEM FLAGS –

The 6502 P-code interpreter maintains an eight bit flag register at location %000D hex which is used during runtime errors. Four of the eight bits are used to determine whether or not a runtime error will be flagged.

AS:7.19

The following bits are defined:
  BIT 0: arithmetic overflow (>32767)
  BIT 1: division by zero (ZERO DIVIDE)
  BIT 6: invalid opcode (*DAMAGE*)
  BIT 7: stack overflow (stack full)

The appropriate bit is on (1) if the error is enabled and off (0) if disabled. The invalid opcode and stack overflow bits cannot be disabled. The defaults are zero divide enabled and arithmetic overflow disabled. This is because the compiler uses + and - for address arithmetic which sometimes produces arithemetic overflow. Your program may wish to enable arithmetic overflow for a few instructions, the disable it again.

MEM[%000D] := %))FF; ... MEM[%000D] := %00FE;

PASSING PARAMETERS TO MACHINE LANGUAGE SUBROUTINES VIA CALL

It is possible to pass certain values to machine language subroutines invoked via the "CALL" statement. Whenever a CALL is made the accumulator is loaded from location %001A, the X-register is loaded from location %001B, and the Y-register is loaded from location %001C. When the machine language subroutine returns the contents of the registers are stored in their respective locations. This allows flexible management of data when calling machine language routines.

One very useful example might be hexadecimal output. Although you can output a hex number directly from Pascal you are forced to output exactly four hex digits with each hex write. Sometimes it would be nice to be able to output only two hex digits at a time. The following program will perform a memory dump outputting only two hex digits at a time.

```
PROGRAM HEXDUMP;
VAR LOCATION, LOWER, UPPER:INTEGER;
BEGIN
  WRITE('INPUT LOWER BOUNDS:');READ
  (LOWER%);
  WRITE('INPUT UPPER BOUNDS:');
  READ(UPPER%);
  FOR LOCATION:=LOWER TO UPPER DO
  BEGIN
  MEM[%001A]:=MEM[LOCATION];
  CALL(%FDDA);
  WRITE('  ');
  IF NOT(LOCATION MOD 8) THEN WRITE(13);
  END;
END;
```

— MINIMAL RUN TIME SYSTEM —

You may wish to overwrite the compiler and editor and use this memory space for your own program. By setting the P-code origin at 1800 you can run your program in a stand-alone invironment. You can also use the monitor F(ENCE) command to make more room for variable storage by setting low to 1800 and leaving your program at 5000.
AS:7.20

If you would like an autostart capability, overwrite the Pascal monitor with your program. RESET and *800G will then auto-execute your program (at hex %1300). However you must adjust the memory fences by changing the defaults in the interpreter. If you save the P-code interpreter and your program to disk, BRUN <progname> will auto-execute your program. In addition, if the "HELLO" program on your disk BRUN's the program, it will auto execute when the DOS is booted. For more information see the section on the interpreter.

EXTERNAL PROCEDURES AND OVERLAY

Any program may call procedure and functions which are external to it. The program should use the ordinary PROC or FUNC heading when it declares the external procedure or function. However, in place of the BEGIN... END block of the procedure or function bosy, a single hexadecimal constant should appear. When the procedure or function is called, control will be transferred to that hex address. The PROGRAM heading of the external procedure or function should match the internal heading of the calling procedure. For example, the Pascal monitor contans the declaration

FUNC EDITOR; (* PASCAL EDITOR *)
%3000;

The program line of the editor reads:

PROGRAM EDITOR;

Neither have any parameters (although both could). After the declaration, the monitor treats EDITOR just as it would any normal internal function.

— VERY HARD TO FIND BUGS —

Programma Pascal does not check array subscripts to see whether or not they are in bounds. If you store a value at position 10 of a nine element array you will damage the stack. Since return addresses are stored on the stack, you may find yourself in an embarrassing situation.

Another difficult bit to detect is the use of zero instead o "O" (oh) in a variable name, or a hidden control character which does not print.

LIBRARY.S

Phillip Wasson has written some very useful (though untested by Programma) functions and procedures. They are in the file "LIBRARY.S". You may find them to be of interest.

PROGRAMMA PASCAL vs. SUPERSOFT PASCAL

Programma Pascal is a derivative of Kin-Man Chung and Herbert Yuen's Tiny Pascal. Supersoft Pascal is also a derivative of Tiny Pascal for the Radio Shack TRS-80 and Northstar computers.

Supersoft Pascal has an additional array called MEMW. Assignments to and from MEMW transfer all 16 bits as opposed to MEM, which only transfers the low order 8 bits. See LIBRARY.S.2 for a procedure and function which simulate MEMW.

Programma Pascal has added the external procedure definition and the PROGRAM header, which work together.

Otherwise the two Pascals are quite compatible at the source level. although their P-codes have been optimized for different environments. It may be necessary to rewrite certain sections of code which have been designed to run on the different computers. However, translating Supersoft Pascal to Programma Pascal will be an order of magnitude easier than translating BASIC.

— DETOKEN —

Detoken is a program written by Randy Hyde which will "detokenize" an Integer BASIC program. It can be used to create BASIC program textfiles which can be edited by APPLE PIE.

— LIBRARY.S2 —

Contains several string handling routines which mimic many of the string routines in UCSD Pascal. Several other utilities are also given.

— CANNIBALS —

A programming example which demonstrates many of the features of Programma Tiny Pascal.

— THE P-CODES —

A table of P-codes has been provided with this documentation. One special P-code. hex 30, is used as a Pascal breakpoint. When executed hex 30 will exit to the Apple II monitor.

— THE INTERPRETER —

The 6502 P-code interpreter has been carefully designed to be a black box. The only locations which may need adjusting when moving from the 6502 environment to another appear in the JMP vectors and the following six bytes of default values.

```
0800-JMP COLDSTART
0803-JMP WARMSTART
0806-JMP ERROR ENTRY
0809-JMP READ BYTE
080C-JMP WRITE BYTE
080F-JMP SET MEMORY FENCES
```

0812×Default start address of P-code pgm (low order byte).
0813-Default start address of P-code pgm (hi order byte).
0814-Default starting PAGE of Pascal stack.
0815-Default fence PAGE.
0816-Default HIGH memory page location.
0817-Default SYSBIT error enable flag (currently hex $FE)

The interpreter itself was written using LISA (a 6502 assembler). The interpreter. monitor, compiler. and editor currently reside in locations $800-$4000. If you wish to use HIRES graphics (and the Apple supplied routines) the current P-code interpreter will prove to be located in the wrong area. On the Pascal disk is a binary file called "PCODE-.HIRES". it is assembled beginning at location $4000 in memory so that it will be out of the way of the first HIRES page and the Apple's HIRES routines. To use "PCODE-.HIRES" first create and compile your program using the

normal Pascal system. Once the syntax errors have been taken care of, save the codefile to disk. Load the binary file "PCODE.HIRES" and then adjust the memory fences so that they are ABOVE your program. Now you can use the "U(SER)" command from the Pascal monitor to run your HIRES program.

If you need the P-code interpreter assembled for a different location please contact Programma and they will be happy to assist you.

MEM REQUIREMENTS
MEMORY REQUIREMENTS

0000-001F:	These are the zero page locations used by the 6502 P-code interpreter.
00D8-00DF:	Zero page locations reserved from DOS-/Pascal interface.
0800-11FF:	P-code interpreter and the compiler's reserved symbol table.
1200-12FF:	A spare page for storing user builtin functions, patches, and so forth.
1300-17FF:	Pascal monitor. This is a Pascal program. The source code to this program can be found in the file "MONITOR.S", so feel free to modify it and substitute your own improved monitor here. The monitor is actually much smaller than the space provided, so you have plenty of room for growth.
1800-2FFF:	Pascal compiler.
3000-3FFF:	Pascal editor. You will find the source in "EDIT.S". 4000-4FFF: (LOW-FENCE) the stack. All variables created in a Pascal program are stored on this stack. The stack starts at fence-1 and grows towards LOW.
5000-95FF:	(FENCE-HIGH) User memory. This area is not quite a part of the Pascal memory space. It is used to store text. programs, user subroutines, and so forth. The Pascal monitor, editor, and compiler will not normally access or change any memory above HIGH.

CHANGING MEMORY LIMITS:LOW. FENCE. AND HIGH

The F(ENCE) command in the Pascal monitor allows the user to specify the memory limits for a Pascal program. This is similar to setting LOMEM and HIMEM in a BASIC program.

Instead of two memory bounds (as in the LOMEM/HIMEM commands) the Pascal user must set three memory bounds: LOW. FENCE. and HIGH. LOW is the absolute smallest memory location usable by a Pascal program. It is roughly equivalent to LOMEM. HIGH is the absolute highest memory location usable by the Pascal program and is roughly equivalent to HIMEM. FENCE resides somewhere in between LOW and HIGH and divides the memory area between LOW and HIGH into two areas. One of these areas

AS:7.21

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  or write 2008 Grand Apt 301

St. Paul, MN 55105

APPLE 16K memory upgrade

$80 call Rick Rogers @784-1850

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assembled and checked out 96 character set 80,96 or 132 char/line 6/8 lines/inch software driver.

$635.00 $900.00 value call Chuck T 830-5020 or write

C Thiesfeld 8416 Xerxes Ave S Bloomington Mn 55431.

As you can see there is room for more in this space send your ads for apple related items to the editor (see page 1).

PROGRAMMA PASCAL
— CONCLUDED —

(from LOW to FENCE-1) is reserved for variable storage. The other area (from FENCE to HIGH-1) is reserved for program storage.

Should you ever get a stack full error, it simply means that you have not reserved enough memory for your variables (which are kept on the stack) and as a result, you need to adjust the FENCE upwards towards HIGH. The default settings are LOW=4000, FENCE=5000, and HIGH=9600. This has been optimized for text editing when using the Pascal editor. This will only leave enough room for approximately 500-1000 variable locations. Generally, except for smaller programs, you will want to adjust the FENCE to give you more room.

PROPRIETARY NOTICE

Since many users will find Programma Pascal much easier to use (and twice as fast!) as Integer BASIC it should not be too long before programs written in Tiny Pascal begin to appear on the market place. Although, in this paper, explicit instructions have been given guiding the user in creating "stand alone/auto execute" Pascal programs, Programma does not release rights on the P-code interpreter. All information presented in this paper is intended for the sole use and enjoyment of the original purchaser. Since we do not want to discourage the propagation of quality software written in Tiny Pascal we can offer you four suggestions when selling your Pascal programs.

1. Sell the source listing (or file) only. The end user must purchase Tiny Pascal in order to use your program.

2. Sell the P-code file only. The end user must purchase either the Tiny Pascal system, or the P-code interpreter alone.

3. Negotiate a license agreement with Programma International to sell the P-code interpreter together with your program. You take care of your own marketing and distribution.

4. Sell your software product through Programma International. Programma will patch your program up so that it will auto-execute. All you have to do is sit back and collect the royalties.

FILE CABINET
File Cabinet is a program available on the Apple
Contributed Library bank and is also available from
our user bank with corrections. These corrections
were published in the Nov issue of Call Apple. If
you have'nt tried it and don't have access to any of
the commercially available database manipulators,
try olaying with it. It is a very easy to use
orogram and has many applications. For example, I
out my Christmas mailing list onto it in just a few
minutes. It could be used quite well for keeping
track of your financial records such as US bonds,
stocks, etc. It has a print option, and if you dont
have a printer, you might find it less useful but it
still could be used. Incidentily, I have a Bunker
Ramo printer version of File Cabinet.
It is not of course a panacea. In the standard list
mode, the name of the field(example "STREET")
appears at the beginning of the line. This is a
nuisance when one wants to list on a printer. You
can get around it by making all field names the same
length, then cut them off the oaper after you have
listed. We have also implemented the Call-Apple
version of File Cabinet which generates a sorted
catalog of all programs in your own library.

APPLE CONTACT 6
Apple just got though sending out issus 6 of the
Contact magazine. At the back of this issue is a
form which they, Apole, require to be returned to
them in order to continue receiving CONTACT. It has
been noted that several members have complained that
they have not been receiving CONTACT. It is
suggested that if you have not recently received an
issue of CONTACT magazine that you write to

APPLE COMPUTER INC.,
Mktg. Services
10260 Bandley Drive
Cupertino
California
95014

PASCAL & HAYES MODEM
It seems that if you have the language card, the
standard Apple Pascal system will not suoport the
Hayes modem. However, Peripherals Unlimited have
announced a package called Pascal Utility Micromodem
Package (P.U.M.P.) which for $24.95 allows use of
the full capability of the Hayes Micromodem from
Pascal.

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