



# mini'app'les

apple computer user group newsletter

VOLUME V No 6

JUNE 1982

## CALENDAR

| WHICH                          | WHEN                  | WHERE   | WHAT   |
|--------------------------------|-----------------------|---|--|
| <i>Pascal</i><br>Note 1        | Wed Jun 2<br>7:30pm   | Minnesota Federal<br>9th Ave S Hopkins                            | Regular <i>Pascal</i> Special<br>Interest Group Meeting. |
| Amateur Fair                   | Sat Jun 5             | Minn State Fair Grnds   | Swapfest & Exposition.                                   |
| <i>VisiCalc</i><br>Note 10     | Tue Jun 8<br>7:00pm   | PBS<br>4306 Upton Ave S.  | Demos: <i>VisiCaid</i> s and<br>Tax packages.            |
| <i>Dakota County</i><br>Branch | Tus Jun 8<br>7pm-10pm | St. John Neumann Chch<br>Pilot Knob Rd, Eagan                     | Bulletin Board Demo<br>Note 7                            |
| <i>Minnetonka</i><br>Branch    | Wed Jun 9<br>7pm-10pm | Fox Meadow Offices<br>Room 201 (conf)<br>3131 N Fernbrook Ln., >> | General meeting<br>Note 8<br>Plymouth                    |
| <i>Business</i><br>Note 11     | Thu Jun 10<br>7:00pm  | Dayton's Warehouse<br>701 Industrial Blvd                         | Data Base Management                                     |

**REGULAR  
MINI'APP'LES  
Note 2**

WEDNESDAY  
JUN 16th  
Prgm-7:00pm  
SIGs-8:00pm+

**PENN  
COMMUNITY  
CENTER**  
84th & Penn

*Process Control*  
Bill Irish,  
St. Paul Water Dept.  
*Map back cover*

*St. Paul*  
Branch

Tue Jun 22  
7pm-10pm

Minnesota Federal  
White Bear Lake  
Shopping Center

General meeting  
Note 3

*Nibble*  
"Subscribers"

Wed Jun 30  
7:30pm

Home of Ken Foss  
1832 Clear Ave, St Paul

Status/Discussion  
Note 9

*Pascal*  
Note 1

Wed Jul 7  
7:30pm

Minnesota Federal  
9th Ave S Hopkins

Regular *Pascal* Special  
Interest Group Meeting.

*Dakota County*  
Branch

Tue Jul 13  
7pm-10pm

St. John Neumann Chch  
Pilot Knob Rd, Eagan

Word Processing  
Note 7

*Minnetonka*  
Branch

Wed Jul 14  
7pm-10pm

Fox Meadows Offices  
Room 201

General meeting  
Note 8

**REGULAR  
MINI'APP'LES  
Note 2**

WEDNESDAY  
JUL 21st  
Prgm-7:00pm  
SIGs-8:00pm+

**UNIVERSITY  
MINNESOTA  
ST. PAUL**  
Room B45 Bldg 412  
Near State Fair

To be determined

Genealogy  
Note 4

Sat Jul 24

Lexington Library  
1080 Univ., St. Paul

Genealogical Computing  
Special Interest Group

**Apple-  
Fest 82**

Sep 16-19  
Note 6

Auditorium and  
Convention Center, Mpls

A Huge Exposition devo-  
ted exclusively to Apples

Note 1. Contact- *John Schoeppner* 7.  
2. see pg 2 *Chase Allen* 8.  
3. for tel. *Pete Halden* 9.  
4. nos. *Bill Decoursey* 10.  
5. *Ron Androff* 11.  
6. *Dan Buchler*

*Bob Pfaff*  
*Martin Thames*  
*Ken Foss*  
*Mike Carlson*  
*Subir Chatterjee*

# MINI'APP'LES

The Minnesota Apple Computer Users' Group, Inc.

P.O. Box 796  
Hopkins, MN 55343

## MINI'APP'LES OFFICERS

|                       |   |          |
|-----------------------|---|----------|
| <i>President</i>      | Ron Androff<br>1725 Crest Ridge Lane,<br>Eagan,<br>Minnesota, 55122             | 452-5230 |
| <i>Past President</i> | Stephen K. Johnson<br>6053 Wentworth Ave S.<br>Minneapolis,<br>Minnesota, 55419 | 869-3447 |
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| <i>Secretary</i>      | Hugh Kurtzman<br>11622 Live Oak Dr.,<br>Minnetonka,<br>Minnesota, 55343         | 544-7303 |

## BOARD MEMBERS

|  |  |                          |
|--|--|--------------------------|
| Membership<br>Co-ordinator   | Ann Bell<br>8325 39th Avenue N.<br>New Hope,<br>Minnesota, 55427               | 544-4505                 |
| Newsletter Editor  | Daniel B. Buchler<br>13516 Grand Avenue S.<br>Burnsville,<br>Minnesota, 55337  | 890-5051                 |
| Software Distr. - Mail<br>and Software Sales                         | Terry Schoeppner<br>4028 Upper 69th St. E<br>Inver Grove Heights<br>Mn., 55075 | 455-8613                 |
| Advertising Co'tor   | Eric Holterman   | 332-8460                 |
| Bibliographer  | Chuck Boody  | 933-5290                 |
| Blank Disk Bulk<br>Purchases Co'tor                                  | Peter Gilles   | 475-3916                 |
| Education Co'tor   | Chuck Thiesfeld  | 831-0009                 |
| MECC Librarian   | Dave Nordvall  | 724-9174                 |
| Program Editor   | Al Peterman  | 721-3295                 |
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| Spcl Int. - Apple ///  | Keith Madonna  | 474-3876                 |
| Spcl Int. - Business   | Subir Chatterjee   | 330-7347                 |
| Spcl Int. - Geneology  | Bill Decoursey   | 574-9062                 |
| Spcl Int. - Nibble   | Ken Foss   | 774-7772                 |
| Spcl Int. - Pascal   | John Schoeppner  | 455-8613                 |
| Spcl Int. - Visicalc   | Mike Carlson   | 929-4120                 |
| Spcl Int. - Z80/CPM,<br>Meeting Hdw Support &<br>Assistant NL Editor | Rick Gates   | 735-0373                 |
| Board members<br>at large:   | Ken Slingsby<br>Larry Larson   | 507/263-3715<br>788-0728 |
| Branch Co-ordinators:  |  |                          |
| Dakota County  | Bob Pfaff  | 452-2541                 |
| Minnetonka   | Martin Thames  | 934-3517                 |
| St. Paul   | Pete Halden  | 770-6624                 |
| Technical Advisers:  | Dave Laden<br>Jim White  | 489-8321<br>636-4865     |

## INFORMATION

This is the Newsletter of Mini'app'les, the Minnesota Apple Computer Users' Group, Inc., a non-profit club. Articles may be reproduced in other User Groups' publications except where specifically copyrighted by author.

## Questions

Please direct questions to appropriate board member or any officer. Technical questions should be directed to one of the Technical Advisers listed here.

## Membership

Applications for membership should be directed to the Membership Co-ordinator. \$12 buys membership for one year. Members receive a subscription to this newsletter and all club benefits.

## DOMs

The 3 most recent DOMs (Disk of the Month) are available at meetings for \$5/disk or any DOM may be ordered by mail for \$7.50/disk. Contact Software Sales coord'r.

## Dealers

Mini'app'les does not endorse any specific dealers but does promote distribution of information which may help club members to identify the best buys and service. Consequently the club does participate in bulk purchases of media, software, hardware and publications on behalf of its' members.

## Newsletter

### Contributions

Please send contributions directly to the Newsletter Editor. Hard copy binary or text files are preferred, but any form will be gratefully accepted. Deadline for publication is the 3rd Wednesday of the month preceding the month in which the item might be included. An article will be printed when space permits if, in the opinion of the Newsletter Editor, it constitutes suitable material for publication.

## Advertising rates

Full Page \$40/issue  
Half Page \$25/issue

Circulation 1200 (approx)

## ANNOUNCEMENTS

### APPLE /// CLASSES SOFTWARE DEVELOPMENT

If there is enough interest among software developers in the Twin Cities area, Apple Inc. will bring the intensive Apple /// software development course to Minneapolis. If you would be interested in a 3-day technical seminar on the Apple /// sometime this summer at a cost of \$100 to \$200, please contact Kathy Thompson at Clothier Herold Co., 944-1121.

### BUSINESS SIG MEETING NOTICE

Mini'app'les now has a **Business Users SIG!** The first meeting was held in Bloomington. Seven persons attended. There was a unanimous opinion that another meeting be held in June. Whether this will finally lead to an ongoing SIG, only time, and **your support**, can determine.

The group composition is split between corporate (2) and business operators (4); people who are experienced (4) and those who are beginners (3); and, programmers and non-programmers. There are even those who have dreams beyond 'mailing lists, accounting, spreadsheets and wordprocessing'!! To get to know more, you'll have to attend one of our meetings.

The **Next Meeting** is scheduled for **Thursday, June 10** when we will be discussing **DATA BASE MANAGEMENT**. The meeting will be held at:

DAYTON'S Warehouse,  
701 Industrial Blvd.,  
N. Minneapolis.

The meeting will start at 7pm. To get more information, please call Gene Kasper at Dayton's (375-2543) or Subir Chatterjee (330-7347).

### VISICALC SIG

The first meeting of Mini'app'les VisiCalc Special Interest Group met at Personal Business Systems (PBS). The general discussion was on the different uses of VisiCalc by the members. Also covered were new software products which support and enhance VisiCalc.

The next meeting will be held on June 8th at 7:00pm at:

Upstairs room  
PBS  
4306 Upton Avenue South  
Minneapolis

The meeting will focus on a demonstration of a new program, Visi-Caids; a demonstration of how Jim Doll uses VisiCalc for his personal tax records; and, Pansophic's tax package. Any Mini'app'les member can join the VisiCalc SIG by contacting Mike Carlson at 929-4120 during normal business hours. This group can benefit all users of VisiCalc.

### Mini'app'les PROGRAM FOR JUNE Bill Irish

Bill Irish is one of our own who has implemented a successful energy conservation program in the environment of his job with the St. Paul Water Utility. I won't steal his thunder, except to say that I was very impressed with what I heard, and that he is using the Apple to do a type of process control to conserve fuel in the water conditioning plant. I think we will find the application very interesting and hopefully thought provoking as to how some of us might come up with new ideas in our own jobs.

### BRANCH MEETINGS

Branch activity is definitely growing. Around 30 people turned up at each of the 3 currently organized branches in May. Activities are scheduled for June. SEE PAGE 1. Note change of meeting place for the Minnetonka group.

### Turning the Pages Continued from page 14

Coprocessors Inc. market "88 card" for \$899, while Metemorphic Systems Inc. market "Metacard" for \$980. Page 3.

LinkDisk, a disk manipulation utility for the Apple, by Donald Teiser. Software review. Page 25.

### INFOWORLD, Apr 19, 82

Processor lets you talk plain English to your micro, by Deborah Wise. Savvy, an adaptive pattern recognition processor by Excalibur Technology, makes the computer respond to natural language commands. Cost \$950. Page 13.

Special Report on CP/M. Pages 19-29.

# MEMOREX\*

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|             | BUG ATTACK  | \$ 30  | \$ 24 |
|             | PFS         | \$ 95  | \$ 76 |
|             | PFS: REPORT | \$125  | \$100 |

### MICROSOFT

|                 |                            |       |       |
|-----------------|----------------------------|-------|-------|
|                 | TASC (APPLE SOFT COMPILER) | \$175 | \$140 |
| <b>SPECIAL!</b> | SOFT CARD                  | \$395 | \$300 |
| <b>SPECIAL!</b> | RAM CARD                   | \$195 | \$150 |
|                 | PREMIUM PACKAGE            | \$775 | \$620 |

### VISICORP

|                 |                |       |       |
|-----------------|----------------|-------|-------|
|                 | VISICALC       | \$250 | \$200 |
|                 | VISIFILE       | \$250 | \$200 |
|                 | VISITREND/PLOT | \$300 | \$240 |
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## MORE FORMATTING

by Dave White

I tried Dave Onan's Decimal Formatter (May Mini'app'les) and it works very well. There is another approach which I use for printing dollars and cents.

The formatting routine is written as a subroutine (lines 2800 through 2990). To use the subroutine:

```
-Set JJ equal to the number to be
formatted. (line 1110)
-GOSUB 2800 (line 1120)
-NS$ now contains the formatted string.
(line 1130)
```

In the example main program:

Lines 1000-1030 read and print the data.

Lines 1100-1140 setup and GOSUB to the subroutine.

Lines 1200-1220 print the formatted data in a column in which the decimal points line up.

```

1000 FOR K = 1 TO 5
1010 READ AMOUNT(K)
1020 PRINT AMOUNT(K)
1030 NEXT K

1100 FOR K=1 TO 5
1110 JJ = AMOUNT(K)
1120 GOSUB 2800
1130 SAMT$(K) = NS$
1140 NEXT K

1150 PRINT
1200 FOR K=1 TO 5
1210 PRINT SPC( 15 - LEN (SAMT$(K)))
      SAMT$(K)
1220 NEXT K
1300 END

2000 DATA 120,54.3,27.15,.05,0.25

2800 REM FORMATTING ROUTINE
2810 H$ = STR$(JJ)
2820 IF LEFT$(H$,1) = "." THEN T$ = "0":
      I = 1: GOTO 2880
2830 FOR I= 1 TO LEN (H$)
2840 P$= MID$( H$, I, 1)
2850 IF P$ = "." THEN 2870
2860 NEXT I

2870 T$ = LEFT$( H$, (I - 1))
2880 R = LEN (H$) + 2 - I
2890 IF R < 5 THEN 2920
2900 H$ = LEFT$( H$, (I + 2))
2910 R = 4

2920 ON R GOTO 2930,2930,2950,2970
2930 C$ = "00"
2940 GOTO 2980
2950 C$ = RIGHT$( H$,1) + "0"
2960 GOTO 2980
2970 C$ = RIGHT$( H$,2)
2980 NS$ = T$ + "." + C$
2990 RETURN
```

## A HARDWARE/SOFTWARE ALTERNATIVE

by Jim Aulick

I would like to suggest an alternative subject for our monthly meetings and a challenge to our special interest groups.

The Apple is a great machine capable of interfacing to hundreds of devices in many very interesting and varying applications. Most of these applications require additional hardware. I think that many of these applications are interesting but most do not solve any particular problem of mine or have an application that I can use.

I have to admit that these gadgets are fun to look at, nice to know about, but they are not very practical for me to personally own.

The Apple, like any other computer, requires more than hardware to run. It requires something called "SOFTWARE". Software is another name for the programs that make our life so interesting. For me, the most important criteria in looking at an application is the availability and the quality of the software.

I would like to suggest that software be a subject for our monthly meetings. I am not suggesting that this take up all of our time but maybe half of our time would be appropriate. After all it is the union of hardware and software that makes the computer something useful.

I would also like to challenge the special interest groups. Most people only have an awareness of the special groups, not an understanding of what they are doing, how they do it, or why they do it. I would imagine that many people would like to become aware of what is going on in our club but not everybody has access to the people in these special groups.

People can be interested in a special group but still not come to the meeting because they do not know what the group is doing or if they will really benefit by coming.

I would like to challenge each group to prepare a monthly report and print it in the newsletter. It would also be nice if the group reported directly to the entire club at the meeting.

JOHN'S DEBUGGER is now in RELEASE 3.0

**BUG  
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DEBUGGER**  
**JOHN'S DEBUGGER**  
*the first debugger on the market*

**STEP**

**TRACE**

**BREAKPOINT**

"TOTALLY AMAZED - a VERY VALUABLE & NECESSARY PROGRAMMING TOOL"  
*Larry Shockley, Anchorage AK*

"LEARNED MORE about ASSEMBLY LANGUAGE in 3 HOURS with JOHN'S DEBUGGER than  
in the LAST 3 YEARS - EXCELLENT DOCUMENTATION"  
*Jerry Wolf, Riverwoods IL*

**FOR  
ASSEMBLY LANGUAGE PROGRAMMING  
ON THE APPLE II COMPUTER**

NOW YOU CAN **TRACE** OR **STEP** ANY 6502 INSTRUCTION  
LOCATED ANYWHERE IN MEMORY

BEGIN DEBUGGING FROM **ANY POINT** WITHIN YOUR PROGRAM  
COMPUTES EFFECTIVE ADDRESS FOR ALL ADDRESSING MODES  
& DISPLAYS ALL MEMORY CHANGES (BEFORE/AFTER)  
Options to quickly move thru your program-selected  
memory, equal zero, leave subroutine, etc.  
YOU ARE IN COMPLETE CONTROL OF THE PROCESSOR AS YOU  
MOVE THRU YOUR PROGRAM VERIFYING INSTRUCTIONS or  
LOOKING FOR POSSIBLE ERRORS

**BREAKPOINT** BREAK ON KEYPRESS, CYCLE COUNTER, ETC  
(6 OPTIONS) INCLUDES TIMING DELAY FROM 0.0 to 200 SECONDS  
(ALL OF THE ABOVE SAVES THE ENTIRE PAGE OF THE STACK)  
REQUIRES: 48K (MACH LANGUAGE USES FROM 8400 TO 9600)

**TRACE** LOGIC W/ INSTRUCTION - NOTING ALL JMPS, JSR, etc

**STEP** EACH INSTRUCTION DISPLAYING:  
-EFFECTIVE ADDRESS & MEMORY BOTH BEFORE AND AFTER INSTRUCTION  
-ALL REGS, STATUS & POINTER -ACCUMULATOR IN BINARY  
-LAST 8 BYTES ON THE STACK -DISPLAY OF ALL FLAGS SET  
-DISPLAY WHAT IS IN ANY 12 MEMORY POSITIONS WITH LABELS  
OPTIONS CAN BE USED IN ANY ORDER: STEP, TRACE, CONTINUOUS,  
ONE PAGE, SINGLE LINE, MONITOR EXIT & RETURN TO PROCESSING

JOHN'S DISASSEMBLER (PRINT or VIDEO)  
DISPLAYS BOTH ASC II & INSTRUCTION SIMULTANEOUSLY  
BREAKS UP CODE INTO UNDERSTANDABLE SUBROUTINES  
HIGHLIGHTS ALL POSSIBLE LOGIC CHANGES with arrows  
(DOES THIS INSTANTLY - NO WAITING)

|                     |       |
|---------------------|-------|
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## A Review of the Attached processor

by Dan Buchler and Chuck Thiesfeld

### INTRODUCTION

In the October (81) and January (82) issues of Mini'app'les, we brought to you a synopsis of the development activities related to DTACK GROUNDED's ongoing efforts to develop and market a 68000 based attached processor for the Apple. All of the information reported therein was derived from information published in the newsletter written by DTACK GROUNDED's President, Hal Hardenberg. Since then Hal was kind enough to lend us one of his boards. Some of you may have seen one of the demos of that board that we put on during April. This article represents our own evaluation of the board (with input from Hal of course)

### WHO IS DTACK GROUNDED

DTACK GROUNDED (DG) is a division of Digital Acoustics of Santa Ana, Ca. Digital Acoustics make quality noise measuring devices. Currently DG's products consist of:

- A 68000 based attached processor
- An Apple interface board
- A PET interface board
- Memory expansion boards

### APPLE CONFIGURATION

- 48k Apple II or Apple II Plus
- Language card
- Disk II
- A 68000 Attached Processor

Theoretically the DG Apple Interface board will plug into an Apple /// but software does not yet exist to make the /// play with the 68000.

### PACKAGING

When you buy the attached processor, you get two boards:

1. A tiny Apple Interface board with a flat ribbon cable coming out of it.
2. A large P.C. board (6.5 by 15") containing the Motorola 68000 16 bit Microcomputer chip, some miscellaneous support circuitry and a variable amount of memory and an 8 Mhz crystal. The item we tested was a minimum configuration with 4k bytes of Static RAM on board. The supplied memory is socketed, but sockets are not supplied for the unpopulated area of the board. The board is etched and drilled to receive the full complement of memory (92K bytes). So if you plan to expand yourself you will have to solder sockets onto the board.

There are 3 connectors on the board. One is where the ribbon cable from the Apple Interface plugs. The other two are for expansion to additional memory boards.

As far as a housing goes - "There ain't none!" Currently you get the board and lay it flat on your table. DG assures all of it's customers that a suitable case is being built and will be sent free to all customers to date. We hope he hurries up or he will have a bunch of shorted boards returned, or worse, Apple's with shorted innards!

### WHAT IS IT?

To those unfamiliar with the microcomputer industry, the 68000 is the king of micros. It is expected to be the processor for the next generation systems. It is super powerful. Rumours abound that announcements of 68000 based systems are imminent from Apple!

The DG board provides your Apple with a 68000 based 'attached processor'. By that we mean you get a complete computer with its own processor (the 68000) and its own memory. The 6502 can not talk directly to the 68000 memory or vice versa. The 68000 runs independently of the 6502.

The memory is expandable from 4k up to 92k bytes on same board, and up to 16.711 million bytes if you have enough boards and power supplies! DG has designed an expansion board containing up to 128k on one board. We have not seen the expansion board.

The minimum 4k byte memory system pulls nearly one amp and may be powered from the Apple itself. By cutting two jumpers on the board, the 68000 board may be isolated from the Apple power bus. Then a 5v supply may be, and must be, used for larger memory configurations. A fully populated board with 92k requires 1.5 amps at 5 volts. Since the Apple supply officially only delivers 2 amps, you wouldn't have much left over. DG will not supply any power-supply. Therefore you must buy a commercial power supply, make your own, or use an Apple add-on power supply. The DG board does come with a hefty power cord and connector.

DG has just announced that they will release in August a version of their board that uses 200nsec 64kbit Dynamic RAMS. Two configurations will be available: 124K bytes or 252k bytes, all on one board. Memory will not be expandable beyond 252kbytes (you won't be able to use memory expansion

**DTACK Grounded** Continued from page 7

boards). Since 64kbit dynamic RAMS are inherently more error prone than the 16kbit Statics, a Parity option will also be available. The 68000 will have to 'wait' during memory access since it is faster than the memory, but that wait should not account for much of the total process time.

The 68000 board talks to the 6502 through an 8 bit port. What that means is that when the 6502 wants to send/receive data to/from the 68000, it addresses the port and stores/loads a data word. Likewise the 68000 does the same to talk to the 6502. Several of us having bemoaned the absence of a DMA capability which would allow the 6502 to transfer blocks of data from its memory to the 68000 and vice versa.

DG's philosophy is to get the maximum performance from the 68000 board. Therefore, the board includes an 8Mhz clock which in essence means the 68000 is 8 times as fast as the 6502. However, the 68000 is a 16 bit microprocessor with a huge complement of instructions. The 68000 seems to be about 40 to 50 times faster than the 6502!

**SOFTWARE**

None of the above described goodies are worth anything if you can't use the board to do something. DG have not sat still in this area. They have developed some simple but effective tools:

-6502 software to communicate to/from the 68000 interface port. Simple calls allow block moves from/to 6502 address space to the port. At the 68000 side there is corresponding software.

-A bootable disk contains a HELLO program which loads a modified Applesoft into your language card such that all floating point manipulations namely:

+ , - , \* , / , SQR  
SIN, COS and LOG

are linked to some simple routines that pass the variables to the 68000 for processing. The 68000 then crunches and returns the answer back to the Applesoft run-time package just as if Applesoft had done the calculation itself. The same HELLO program also loads the 6502 linking routines and the 68000 run-time package that performs the add, subtract, multiply, divide and log functions. All the user has to remember is to use the DG boot disk and he/she can run any Applesoft program making use of the DG board.

-Another Monitor, written in Applesoft, allows viewing of the 68000 registers and other attributes.

-Two graphic demonstration packages which are discussed below under "Performance".

-A rudimentary Assembler. To help in the education process, DG has provided a menu driven program that 'walks' through the syntax for all the options for a particular instruction. This is an interactive user tool which allows someone unfamiliar with 68000 pseudo-ops etc to create valid instructions. In it's current version it allows a printed listing but does not save the binary code in memory for later use. (the author believes that a trivial modification could add such a capability)

This leads to a discussion of DG software philosophy. DG have repeatedly stated that they were not a Software house. They will place all of their own software, and all contributed software in the Public Domain. They are banking on there being a reasonably large market for their board, that will provide sufficient motivation for 'software houses' to develop products for the DG board. In a sense this has already happened. At least one company is working on a PASCAL implementation:

Cascade Graphics Development  
1000 S. Brand Ave., Santa Ana, Ca., 92705

They are offering a debugging tool called CGDEBUG which runs under the Pascal Op (\$250). System and a PASCAL to DG interface routine (\$125).

**PRICING**

Apple Interface card, all software and DG board with 68000 microprocessor and following amounts of high speed Static RAM.

| RAM on board | Price  |
|--------------|--------|
| 4K           | \$595  |
| 12K          | \$643  |
| 28K          | \$739  |
| 60K          | \$931  |
| 92K          | \$1123 |

Incidentally the above prices represent a reduction of 29% in 2 months all because of lowering of IC prices which DG is passing on to their customers!

Projected price for the 68000 with Dynamic RAM boards:

|      |         |
|------|---------|
| 124K | < \$800 |
| 252K | <\$1000 |

Unless you plan to use the DG board for payroll computations or the like, the Dynamic RAM version seems the way to go. If you consider 2 Saturn 128K boards cost \$1200, the DG price is a bargain.

GOTO 10



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**DTACK Grounded** Continued from page 8

Of course you might get a discount on the Saturn boards, and you can't address the memory on the DG board directly, but you could use the 68000 board simply as a sort of RAMDISK! It may seem like a waste to put a 68000 to this use, but currently available application programs could quickly take advantage of the resource.

**PERFORMANCE**

Floating point operations are required even in the most mundane internal book-keeping type software such as:

```
FOR I=1 TO 1000:.....: NEXT
```

where the Applesoft Interpreter must perform the equivalent of -

```
I = I + 1
```

DG has published alot of benchmark results. Two of their benchmarks were:

```
A B=SQR(3):FOR I=1 TO 5000:A=B/I:NEXT I
```

```
B FOR I=1 TO 5000:A=LOG(I):NEXT I
```

|         | Benchmark_Times |       | Speed_Ratio |      |
|---------|-----------------|-------|-------------|------|
|         | A               | B     | A           | B    |
| AI      | 29.3            | 127.8 | 1.0         | 1.0  |
| AI + DG | 17.7            | 20.9  | 1.65        | 6.1  |
| AC      | 16.2            | 116.5 | 1.80        | 1.1  |
| AC + DG | 4.6             | 9.6   | 6.4         | 13.3 |

AI = Applesoft Interpreted  
AC = Applesoft compiled

The speed improvement wrought by the DG board is most dramatic for benchmark B simply because it contains a LOG function. You will remember that the current version of the DG board contains a LOG function in 68000 code. The 68000 executes the combination of floating point arithmetic and the LOG function up to 13 time faster, the biggest improvement being for the Compiled version.

In the case of Benchmark "A", the DG board only improves throughput by a factor of 1.65 for the Interpreted version. This is a very important observation. The reason is that a significant portion of the interpreter time (14.8 seconds for Benchmark "A") is used up by Interpreter overhead. However the compiled version of benchmark "A" ran about 3.5 times faster with, than without the DG board.

We observed this phenomenon ourselves in applying the DG board to a practical test with a real life program. A ballistics simulation for ammunition fired from a gun (called GUNS) had been written in BASIC. This is a heavy

number-crunching application in which there is alot of multiplication, division and exponentiation. Using the Applesoft interpreter, the DG board improved performance by a factor of about 1.2. We reviewed the program and noted that there was little use of multiple operations per statement number. That is each equation had it's own statement number. Therefore, the program was spending a large proportion of it's time finding its way from statement to statement. If the program had been optimized, the DG board might have improved performance by a factor close to 2X.

We then 'HAYDEN' compiled the same program. The compiled version without the DG board ran about 2 times faster than the Interpreted version without the board. This was consistent with previous benchmarks of compilers, as reported in Mini'app'les, Softalk, Call A.P.P.L.E., etc. However the Compiled version plus the DG board ran 3 times faster than the compiled version without the DG board and 6 times faster than the interpreted version without the DG board. The 3 times figure is consistent with the results of benchmark "A" above (3.5 times improvement). Note that at this time we were using a version of the 68000 code which did not include the SIN, COS and SQR funtions. A better performance might have been acheived depending on the amount of times these functions were actually invoked.

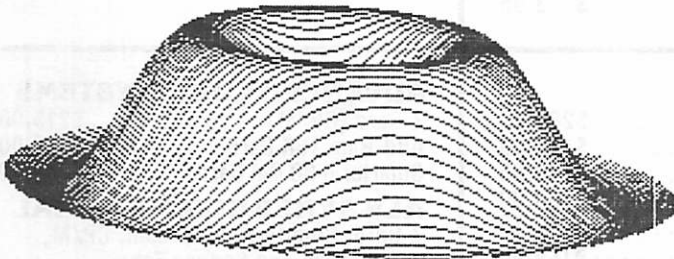
What does it mean? Many factors effect the throughput of a BASIC program. A large Applesoft program runs slower, and one with many variables runs slower. The DG board with the current release of software only helps speed up the execution of the floating point operations and the LOG function. In many cases the speed-up is masked by the overhead of the Interpreter. To effect dramatic improvements in throughput it is necessary to utilize the DG board in conjunction with a Compiler.

Now the whole world does not revolve around BASIC. There are alot of applications which are best not done in BASIC. One such area is Graphics. DG has provided two very dramatic examples of what an attached 68000 microprocessor can do with graphics. These are:

- A 3-D Demonstration Program
- A 6 Degrees of Freedom (DOF) real-time simulation

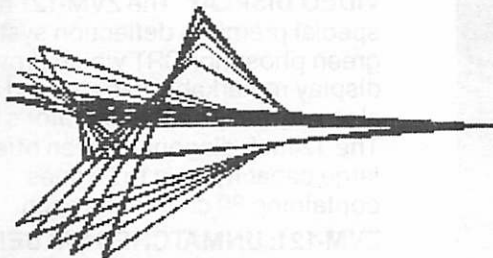
The original 3-D demonstration program computes and displays a

three-dimensional figure on the Hires screen (see below). In the optimized Applesoft version, the program takes 30 minutes to execute. DG lets the 68000 do the HPLLOT computations and provides floating point routines with only 4.5 digits of precision especially for graphics. The run time is 18.9 seconds, an overall improvement factor of 95:1!! We witnessed it run!



Three Dimensional Figure

The most dramatic piece of software provided by DG is undoubtedly the 6 DOF demo. You see on the screen a winged aircraft (an F104) which is animated by 12 lines intersecting at 10 points. (see below). Using the Apple keyboard, the acceleration of the aircraft about any of 3 axes A, B or C, or in any of 3 orthogonal directions X, Y and Z may be input with simple keystrokes. This information is passed to the 68000 where the co-ordinates of each line of the aircraft, as viewed from a fixed point in space, and the resulting Hires pixel information are computed. This involves a sine and cosine of each of 3 angles and a square-root, plus other manipulations.



F104 'Rolling' - 5 Consecutive frames are shown

To do all of the above for one frame takes 15 msecs and 4k of 6800 memory space. This information is then passed to the Apple's 6502, and the cycle for the next frame repeats. Meanwhile, the Apple is clearing the Hires screen, which takes 55msec. The actual

transfer and plot of the frame takes 25msec, so the Apple requires 80msec per frame which is 12 frames/sec. So, the 68000 spends 75% of the time waiting for the Apple to accept the next frame. It is interesting to note that the 68000 sine routine takes 370 microseconds compared to 17 msec for the Applesoft sine routine; a ratio of 46:1.

All of the above results in a very impressive flicker-free animation of the F104 flying around in front of you and doing rolls, yaws, etc. By alternating between Hires page 1 and page 2, the actual update of the screen is not seen by the viewer, resulting in very smooth animation. Actually, none of us were competent enough to really fly the vehicle, though I suspect that someone's 12 year old game addict could do a half way decent job with a little practice. We now understand that DG has a version of this simulation (which we have not seen) with increased resolution (54 plotted lines) that uses up all of the 68000's wait time but still updates at 10 frames/sec.

Most of you must have seen either the Sub-logic's Flight Simulator or their 3D package, which is used by the Flight Simulator. That's a great package. Sub-logic plays all sorts of tricks, table look-ups, etc. to maintain up-date rate of 3 frames/second. It hard to say exactly what could be done with the 68000, but I would hazard that we are achieving a performance improvement of 20 to 50 times in this sort of computation.

#### WHAT'S NEXT?

Except for the upcoming Dynamic RAM version of the DG board, the future really lies with the software developers.

DG themselves are planning two stages of enhancement:

1. Modify Applesoft to place the actual variables (numeric and string) in 68000 address space. This means that when you say

$$A = B + C$$

The fetching of the value of C and B, and the storing of the result will be performed by the 68000. This should speed the executing up somewhat and also makes more use of 68000 address space and less use of 6502 space.

2. Implementation of a BASIC Compiler which would execute in 68000 address space. Based on the performance improvements achieved to-date, one

GOTO 13



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**DTACK Grounded** Continued from page 11  
would expect a speed improvement of up to 100 times compared to an Interpreted Basic running in 6502 space!

Meanwhile companies like Cascade Graphics will continue their development of PASCAL related system software.

Less certain development possibilities are in the area of Graphics. DG have admirably demonstrated the power of the 68000 in this area. What is needed is that an outfit like Sub-logic should develop some Graphic software for use with the DG board. These companies must be convinced that there is a market. Game programmers will not be interested in the DG board for it is unlikely to be bought by the casual user, but rather by the sophisticated user who has a real problem to solve. Thus a company like Sub-logic might see a market for Graphics to be used in lets say a real flight simulator. At this point we can only conjecture.

### THE FUTURE

In order to perceive the future, let us reflect upon the past. The world changed when the personal computer became affordable to the general public. Just over four years ago the Apple was introduced and the 6502 was touted as the fastest microprocessor around. The Apple sold well as a result of it's virtues. 'Breakout', 'Starwars' and 'Startrek' were the games of the day. There were few business programs, just some tools like 'Checkbook' and 'File Cabinet'. Today we have games like 'PacMan' and 'Asteroids', real business programs like 'Visical' and 'DBMaster', and simulations like Sublogic's 'Flight Simulator'. All of these programs are very impressive, but the business packages sometimes run exasperatingly slowly and the games and simulations are limited in complexity by speed considerations.

We think that the personal computer of the future will include systems with more memory and more speed so we can have more complex and more user friendly programs. The DG board is one solution!

### CONCLUSION

Are you thinking of buying one of the currently available plug-in to Apple processor boards? Consider the DG board. It hasn't perhaps yet reached the software sophistication of the Z-80 board, the 8088 Metacard, the Stellation 6809 (The Mill) or the AMD9511 floating point number cruncher. (The 68000 is 3 times faster than the later). But in potential it far exceeds the capability of any of the above.

Right now you can plug it in and expect your Compiled Applesoft programs to run 3 times faster. Soon that performance will be enhanced further and a PASCAL capability should be available. For Graphics and real-time simulations the potential capability can't be beaten.

If you are a hobbist and want to keep up-to-date with your knowledge of a State-of-the-art processor, the 68000, the relatively small investment of \$600 gets you started. The slightly higher investment of \$800 or \$1000 for the 128k or 256k Dynamic Ram version is a bargain, if you have applications that require memory as well as the power of the 68000.

I honestly believe that this is the one product that may just keep your Apple from ending up in the local museum within the next 3 years!

\*\*\*\*\*

## EPSON NEWS

by Dan Buchler

Epson are now shipping a new version of their Graftrax dot graphix firmware. Called Graftrax Plus, on the MX-80 it provides a half-height font for use as super- or sub-scripts and a skip over perforation feature. On the MX-100 the 1/3rd dot vertical paper movement is added. Until we see the manual, we do not know what, if any, feature may have been subtracted or what other goodies might be included.

At the May meeting I was asked a question about using the Control I character with an Epson Interface board and an MX-80. The person asking the question recognized that the Interface board would treat a Control I as a control character for the interface board, as in:

```
Ctl-I 80 N
```

After the meeting I realized that I had incorrectly stated the mechanics of using Control I for tabbing, and that I had forgotten about the Interface board intercepting the Control I under all conditions except when you bypass the firmware. So if you plan to send a Control I to the Epson for any reason, precede the data with:

```
Control-I Control-A
```

```
CHR$(9);CHR$(1) in Applesoft
```

The Epson doesn't use Control A for anything. Then, you can do things like sending Tabs to the Epson without requiring a dummy tab line (to fool the interface card) or you can set line spacing to 9 dots with:

```
Esc A Control-I
```

## TURNING THE PAGES

with David E. Laden

### BYTE -- MAY 1982

Byte's topic this month is Japanese Computers.

Hardware Review: Apple II 80-Column Video Boards by John E. Howland. Pages 252-266. Mr. Howland looks at Omnivision, Full-View 80, Smarterm, Sup'R Terminal, and Videoterm.

More Apple 80-Column Boards by Gregg Williams. Pages 266-271. Vision-80 and Wizard-80 are reviewed.

More Maze Building by Thomas Edward Neldner. Pages 274-284. This maze generation program is written in UCSD Pascal.

Software Review: Super FORTH Isn't by Gregg Williams. Pages 296-298. A version of FORTH for the Apple is reviewed.

CREDIT A Graphics-Character Editor by Jerry N. Sweet. Pages 426-444. This Apple Pascal program allows you to define your own character set.

Give Your Apple a Voice by John Blankenship. Pages 446-456. The author uses a Radio Shack Voice Synthesizer to make the Apple speak.

### CREATIVE COMPUTING JUNE 1982

This month's focus is on word processing and business applications. Included are reviews of two letter quality printers: NEC Spinwriter and C. Itoh Starwriter.

Put One Over On Your Apple by David H. Ahl. Page 64. This is a description of Station II from Trace Systems.

Printer Control Codes From Within Apple Writer by J. Michael Riley. Page 142.

Underlining for Apple Writer by John E. Stith. Pages 146-152. Assembly language program is included.

Preview for Apple Writer by John E. Stith. Pages 154-155. Assembly language program is included "to perform an on-screen preview".

A Pseudo Work Processor by Bruno B. Wolff, Jr. Pages 178-181. This is an Applesoft program.

Apple Cart by Chuck Carpenter. Pages 188-196. This month, Mr. Carpenter talks

about Hi-Res entry points and routines, disk drives, and RAM cards in addition to other topics.

### POPULAR COMPUTING JUNE 1982

Second-Generation Word-Processing Programs by Steve Ditlea. Pages 38-48. Several word processors are described/compared including Executive Secretary, Superscribe II, and Apple Writer 2.0.

Add a Voice to Your Computer by Stan Miastkowski. Pages 81-86. The author reviews the Votrax Type 'N Talk.

Real Estate Analyzer by Robert Moskowitz. Pages 88-90. Howard Software's Real Estate Analyzer is reviewed.

An Apple in the Newsroom by Tom Moore. Pages 92-96.

Talk to the Animals by Kevin Strehlo. Pages 102-108. Apple's are being used "to try to establish communications with dolphins."

Hands On! by Rachael Wrege. Pages 110-122. Computer usage in amusement parks and museums is described. This includes a description of Sesame Place where Apple computers are being used.

Also included this month is an introduction to printers and a printer comparison chart.

Computer Generation A New Breed of Whiz Kids - Here Come The Microkids is the cover story of the May 3, 1982 issue of TIME. The article appears on pages 50-56 and is "the introduction of TIME's newest department, computers."

The following entries from INFOWORLD have been provided by Jane Chatterjee, a member of Mini'App'les. Thanks Jane!!

**INFOWORLD, Apr 5, 82**

Review of microcomputer-based music synthesizers for Apple II computers, by Steven Mann. Pages 21, 22, and 60.

**INFOWORLD, Apr 12, 82**

Two new 16-bit processor cards turn Apple II into IBM PC, by David Needle.

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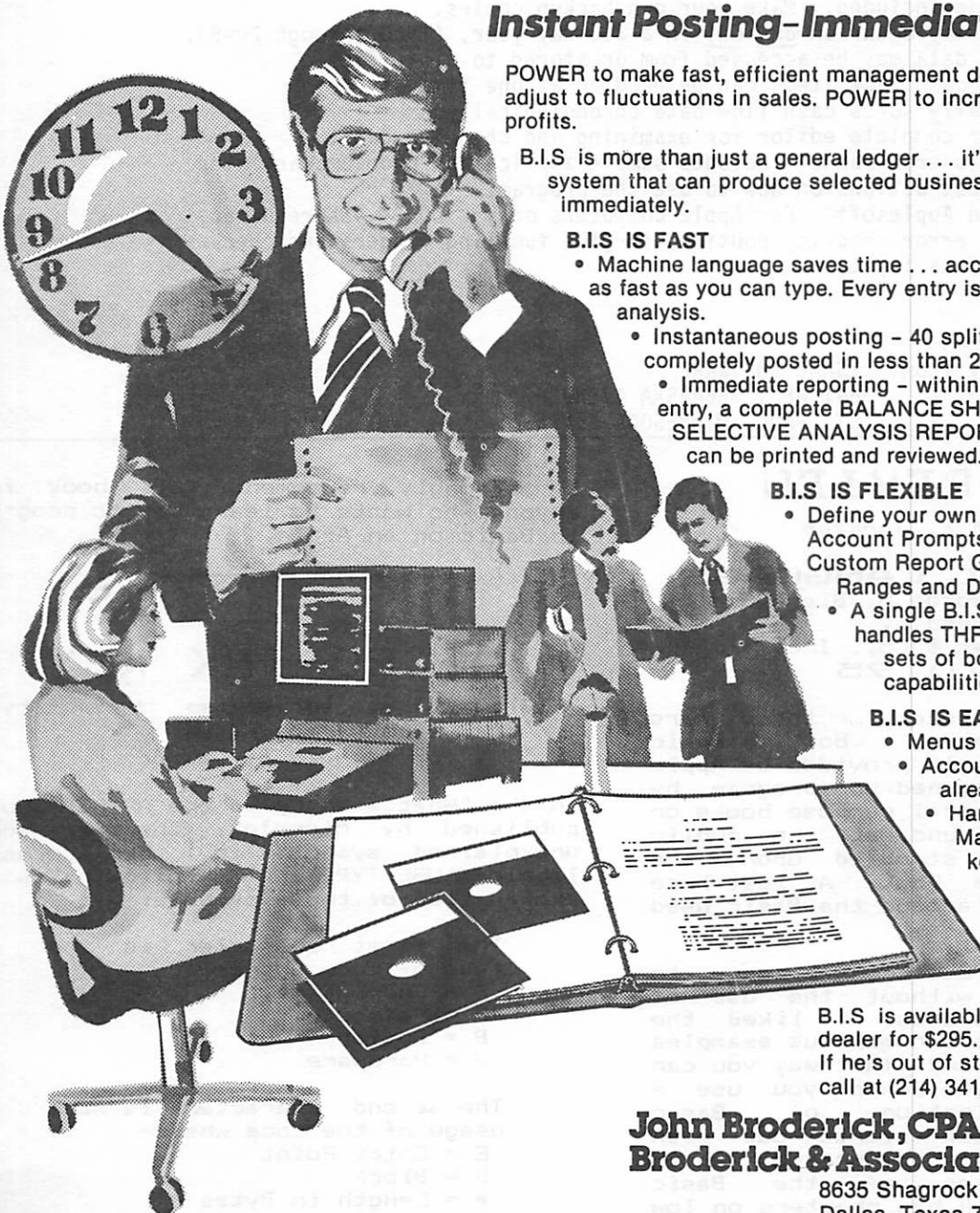
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**BOOK-REVIEW**

*by Stephen K. Johnson*

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by Brian D. & George H. Blackwood  
Published by  
Howard W. Sams & Co., Inc.  
Price \$10.95

After owning my computer for three years I still didn't have a book on Basic other than the manuals provided by Apple Computer. I had learned to program by reading several general purpose books on Basic that I found at the public library. Then I stumbled upon the Applesoft Language book. At last here was a book written around the Basic used by the Apple II.

This book presents Basic in a easy to understand way without the use of complex computer phrases. I liked the book because of the numerous examples for each basic command. That way you can see what you will get when you use a particular combination of Basic statements. The book starts out with simple examples and progresses on to more complex uses of the Basic statements. It even has chapters on low and high resolution graphics.

I strongly recommend this book for anyone who wants to learn how to program in Basic on an Apple.

**MICRO-INK KEY**

**What's Where in the Apple**

*by Richard B. Larson*

In the "What's Where in the APPLE" book, published by MicroInk, there are some unexplained symbols in the columns labeled \USE-TYPE\. The following is an explanation of those symbols:

The first character is the type of code where-

S = Subroutine  
P = Parameter  
B = Buffer  
H = Hardware

The second character is the usage of the code where-

E = Entry Point  
B = Block  
# = Length in Bytes  
L = Label  
F = Flag





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## VEEP'S VIEWS

by Chase Allen

At the Board Meeting held on March 12th, we discussed ways in which the club could better serve the membership. Having heard some rumblings from the newer members that the needs of the less experienced Apple Users are being neglected, a plan evolved which will be tried in an effort to alleviate this lack.

Starting with the June regular meeting, we will try a new format. The program of the evening will be started a half hour earlier... at 7:00. Following the program, we will break into "cluster" groups. Each cluster will focus on a specific area of interest, led by an individual who, in all likelihood should be able to field most questions with a satisfactory answer. For those which the leader cannot answer on the spot, an answer will be sought. The "cluster" areas which we will attempt to implement at that meeting will consist of:

Mini'App'Les Orientation  
Apple Beginner Orientation  
Basics - Starting Programming  
Languages - Applesoft, Pascal etc.  
Communications and Modems  
Visi-Calc - Demonstration  
Word Processors

This list is subject to modification by availability of qualified leaders. The subjects are not limited to these items, and I would be most pleased to hear from any of you who have a particular interest. Also, it is important to realize that these are very unstructured groupings and depend heavily upon your presence and participation.

In short, this is your club, for your benefit, and we need you to make it go. Your officers want to help in any way possible to make this a going organization. We have grown from an average meeting of 125 or so to around 300. It is very difficult to maintain the personal one-on-one contacts that help you over the rough spots of understanding the magnificent beast... The Apple! This meeting format promises a possible vehicle to further that aim. Try it... You'll like it!!!

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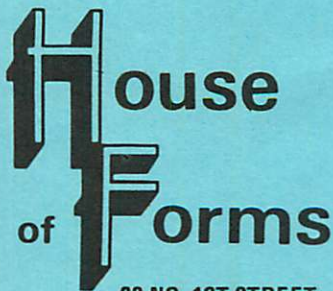
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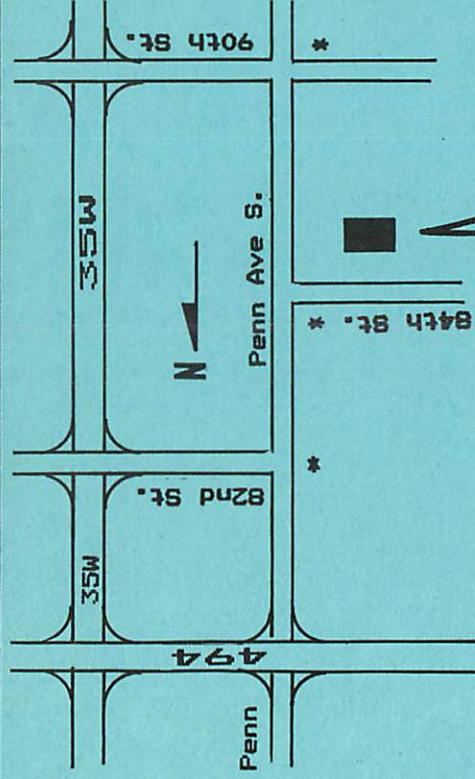


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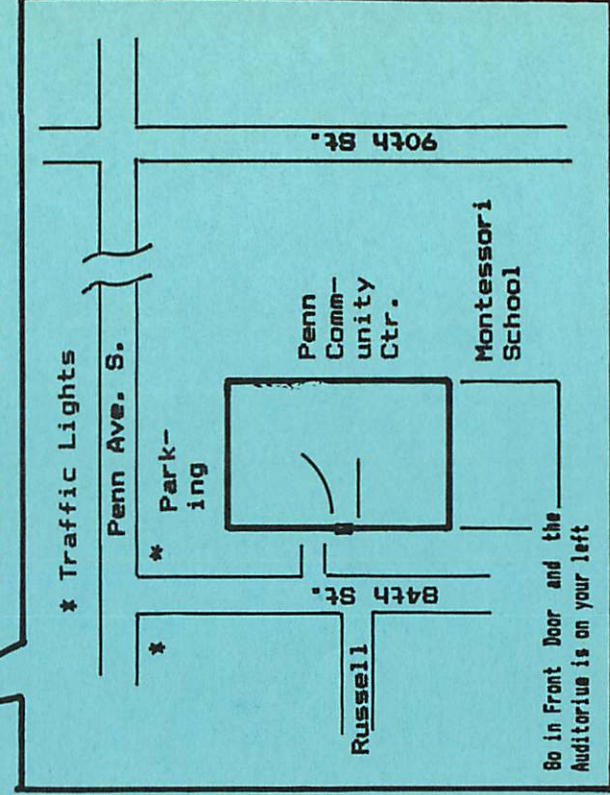


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