



# mini'app'les

apple computer user group newsletter

MAX  
H 377-2107  
W 631-5461  
ASSY

VOLUME V No 2

FEBRUARY 1982

## CALENDAR

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WHICH	WHEN	WHERE	WHAT
<i>Pascal</i> Note 1	Wed Feb 3 7:30pm	Minnesota Federal 9th Ave S Hopkins	Regular <i>Pascal</i> Special Interest Group Meeting.
Genealogy Note 4	Sat Feb 6	Lexington Library 1080 University St. Paul	Genealogical Computing Special Interest Group Regular meeting.
<i>Nibble</i> "Subscribers" Note 6	Wed Feb 10 7:30pm	Home of Ann Bell 8325 39th Ave N. New Hope	Status/Swap/Discussion
<b>REGULAR</b> MINI'APP'LES Note 2	WEDNESDAY FEB 17th 7:30pm	<b>PENN</b> <b>COMMUNITY</b> <b>CENTER</b> 84th & Penn Bloomington. Just S of 494 & W of 35W Free parking on premises. <i>Map inside</i>	<i>Copyright Software Law</i> Panel discussion by Software legal experts: Hank Hanson (Honeywell) & Bob Angus (CDC) + <i>Demo of Okidata</i> Microline 80 Printer. + <i>Twin City Connection</i> Computerized Want ads; Fred Weiner will talk about the Want Ads of the future. Rescheduled from January!
St. Paul Branch MINI'APP'LES Note 3	Tues Feb 23 7pm-10pm	Minnesota Federal White Bear Lake Shopping Center	General meeting
<i>Pascal</i> Note 1	Wed Mar 3 7:30pm	Minnesota Federal 9th Ave S Hopkins	Regular <i>Pascal</i> Special Interest Group Meeting.
<i>Board Meeting</i> Note 5	Wed Mar 10th 7:30 pm	Nokomis Community Ctr Minnehaha Parkway	Nomination of officers & potential Board members
<b>REGULAR</b> MINI'APP'LES Note 2	WEDNESDAY MAR 17th 7:30pm	<b>UNIVERSITY</b> <b>MINNESOTA</b> <b>ST. PAUL</b> <b>CAMPUS</b> Near State Fair Room B45 Bldg 412 <i>Map next issue</i>	<i>Tentative engagement</i> <i>Mountain Hardware reps</i> to demo Mountain products
IAC Annual	May 14th- -16th	Boston MA	Annual Meeting & AppleFest
Note 1. Contact-	<i>Keith Madonna</i>		
2.	<i>Chuck Thiesfeld</i>		
3.	<i>Pete Halden 770-6624</i>		
4.	<i>Bill Decoursey</i>		
5.	<i>Stephen K. Johnson</i>		
6.	<i>John Schoeppner</i>		

# MINI'APP'LES

Minnesota Apple Computer Users' Group, Inc.

P.O. Box 796  
Hopkins, MN 55343

## MINI'APP'LES OFFICERS

<i>President</i>	Stephen K. Johnson 6053 Wentworth Ave S. Minneapolis, Minnesota, 55419	869-3447
<i>Past President and Newsletter Editor</i>	Daniel B. Buchler 13516 Grand Avenue S. Burnsville, Minnesota, 55337	890-5051
<i>Vice President</i>	Chuck Thiesfeld 8416 Xerxes, Bloomington, Minnesota, 55431	831-0009 830-5020
<i>Treasurer</i>	Marilyn Thomas 2735 Irving, Minneapolis, Minnesota, 55408	872-7669
<i>Secretary</i>	Ron Androff 1725 Crest Ridge Lane, Eagan, Minnesota, 55122	452-5230

## MEMBERS OF THE BOARD

Membership Co-ordinator	An. Bell 8325 39th Avenue N. New Hope, Minnesota, 55427	544-4505
Software Distr. - Mail and Software Sales	Hugh Kurtzman 11622 Live Oak Dr Minnetonka, Mn., 55343	544-7303
Newsletter Editor	Dan Buchler	890-5051
Bibliographer	Chuck Boody	933-5290
Librarian	Terry Pinotti	786-7118
MECC Librarian	Dave Nordvall	724-9174
Program Editor	Ken Slingsby	507/263-3715
Hardware Sales	Al Peterman	721-3295
Blank Disk Sales	Peter Gilles	475-3916
Publicity Co'tor	A. Michael Young	884-2841
Education Co'tor	Chase Allen	432-6245
Spcl Interest - Pascal	Keith Madonna	474-3876
Spcl Int. - Geneology	Bill Decoursey	574-9062
Spcl Int. - Nibble	John Schoeppner	455-8613
Spcl Int. - Z80/CPM & Meeting Hdw Support	Rick Gates	735-0373
Technical Advisers	Dave Laden Jim White	489-8321 636-4865
Assistant Librarians:	Bill Decoursey	see above
Assistant Prog Editors:	Tom Edwards Rick Gates	927-6790 see above

## INFORMATION

This is the Newsletter of Mini'app'les, the Minnesota Apple Computer Users' Group, Inc., a non-profit organization.

### 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 (Diskettes 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.

### Newsletter Contributions

Please send contributions directly to the Newsletter Editor. Hard copy binary or text files (ASCII coded) 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

Rates are as follows:  
Full Page \$30/issue  
Half Page \$20/issue

Circulation 900 (approx)

**DOM #11***by Ken Slingsby*

The Disk Of the Month for February contains a tutorial in basic computer usage. More specifically, it is an Applesoft tutorial, however most of the concepts would apply to almost any computer. This is just the thing to make a new user more comfortable with the Apple.

The tutorial is quite lengthy and takes up almost all of the space on the DOM. I ended up making a "weighted" flip of the coin to choose from other contributions to complete the DOM. The programs on this disk are:

**APPLE TUTORIAL**

The Apple Tutorial is from the IAC disk #11. The program was developed by Diarmuid McCarthy at the Dublin College of Marketing & Design. (It only works on a green display!) Mr McCarthy requested that the software be made available to anyone who wants it and that no-one should make a profit from the sale of that software. That's the true spirit of Public Domain. You may of course copy it and distribute it to anyone who wants it.

The program is not intended to be a stand-alone Computer Aided Education (CAE) device, however it is nearly that as far as Applesoft is concerned. There are none of the usual questions found in the CAE material. There is a wealth of information contained in the tutorial.

While the tutorial was written with the new user in mind, there could be help for nearly everyone who uses it. I speak from experience!

It is recommended that you (or someone knowledgeable) copy the tutorial onto another disk and have the tutorial only on the new disk. To do this, initialize a new disk. Use FID to transfer the tutorial and its supporting files to that disk. There are seven files involved. Then use Master Create to rename the hello program on the new disk "APPLE TUTORIAL". This will make the tutorial the standalone package it was designed to be.

**TAX AID**

If you like many of us are pondering over the New Year's Greetings from the Feds and the State, this program may be of benefit to you.

NOTE: Mr. S. J. Fine wrote a tax program for us sometime ago that did the whole job for the Form 1040.

Unfortunately, the tax tables have changed since then but then the program is not that hard to modify. See DOM #2, Jan. 1981.

This program from Mr. Fine is to be used if you have interest income that is not taxable on the Minnesota State return. The program is self prompting and easy to follow if you can do your own taxes.

An interesting programming feature of this program (and the above mentioned TAX 79 for that manner) is the READAT routine. This will allow you to specify the line number of the DATA statement you wish to READ rather than having to read all preceding data statements first. This program contains inbedded machine language. It would be wise to load it then save it before it is run. If you need to modify TAX AID, please contact Mr. Fine.

**READAT INFORMATION**

This is additional information concerning the use of the READAT routine. The first portion of the program is a demo of the routine, showing how the routine can READ from any DATA statement rather than forcing the programmer to sequentially READ all prior data statements to get to the one of interest. The second portion of the information program is a text file reader. The text file READAT.TEXT contains more details in the operation of the READAT routine.

To save space on this disk I had to combine two of Mr Fine's contributions into one file. Therefore the lines numbered less than 10000 are the demo of the READAT routine. Lines numbered 10000 and greater are the text reader program.

**LOGO**

This picture file is being tried as a logo for the DOM. If you have any comments, please forward them to me. The LOGO was created by Tim Pfaff.

**IAC ADDRESS CHANGE**

Note change:

International Apple Corps  
Ken Silverman, President  
910 A George Street  
Santa Clara  
CA 95050

## BBS and Cheap Communications

by Minneapolis PMS SYSOP

Last time I wrote an article for the newsletter I was worried that the bulletin board system I had set up would not catch on. That was almost two years ago. I believe that I can now safely say that it has caught on. January will mark the two year anniversary for the system. In those two years the system has accommodated over 21,000 callers. The growth rate for this system and systems across the country has been phenomenal. Usage has increased everywhere. This is evidenced by the increasing number of systems both locally and across the country. Two years ago there was only one bulletin board system in the Twin Cities area. Today there are over nine (The numbers for these systems can be found elsewhere in this newsletter). The number of systems nationally has increased also. Recently a publication which reports on bulletin board systems reported a 139% increase in the number of verified systems from 5/12/81 to 11/3/81.

I suspect that the growth rate of bulletin board systems is comparable to the number of users who have telecommunication capabilities. For this reason I wasn't surprised to learn that 43% of the people who responded to the equipment survey had modems. Many of the new users that I have talked to report that they had no idea that there were such systems operating.

Each of the systems has its own personality and special areas of interest. If you call systems outside of the Twin Cities area you will find this to be especially true. A list of long distance systems is available on PMS. This list is the 'O' command. It may be searched by entering 'O:SEARCH' where SEARCH is what you are looking for. If you desired a list of all systems in the 612 area code then you would enter 'O;(612)'. The open parenthesis is necessary so that systems with 612 in the number would not be retrieved.

Those of you who call outside the Twin Cities area know this can be expensive, especially if you do a lot of calling. There are however ways to reduce this expense. There are three companies which offer alternatives to Ma Bell. Each of these companies has

several types of services available to the small consumer for long distance communication. All you need is a touch tone phone. Calls are placed by dialing a local number and then entering the number you wish to call plus your account number. From there it's all automatic and you get connected with the number you dialed just as if you had dialed through the telephone company. These services don't reach to every city in the country but they do cover all the large ones.

Here are the companies:

Southern Pacific Communications Co.  
(SPRINT) Burlingame Ca. 425-692-5600  
local: 333-2336

International Telephone & Telegraph Corp. (ITT-CITY CALL) New York City  
telephone: 800-221-7267

MCI Telecommunications Corp.  
Washington D.C. 202-872-1600  
local: 544-8177

The prices for these services vary depending on when you call and what type of service you select. Each of these companies offers two types of services. A business service which can be used 24 hours a day and a residential service which can be used after business hours (generally after 5:00 P.M.). The residential service offers quite a savings over the business service. The charges for the residential SPRINT and MCI services are similar. Each charges a \$5 monthly fee plus an average of \$.13 a minute per call. I understand that ITT charges are a little higher per call. If you make a lot of long distance calls these services can help save on your long distance phone bill.

For those of you who haven't called a bulletin board give it a try. It may be addictive.

For the new caller to PMS there is one time saver that you may not be aware of. This is the ability to flag messages during a scan 'S' or quickscan 'Q' by entering 'R' right after the message header appears. The flagged messages can then be retrieved with the '\*' command.

Good luck and happy BBS'ing.

## APPLE VS MAIL ORDER

by Dan Buchler

In case anyone hasn't heard, there's a battle in progress in California: Apple versus the Mail Order houses. In late November Apple sent out a letter to 1000 dealers requesting that they sign an agreement not to sell by mail. Part of the agreement says: "Dealer and Apple recognize that because of the special, technical nature of Apple products, customers purchasing them can be properly served only if they have the benefit of pre- and post-sale education orientation and support, specifically including in-person contact with the selling dealer, in order that each customer's needs may be properly assessed and the features, benefits, operation and applications of the Apple products being purchased may be demonstrated and fully explained to them by knowledgeable sales personnel."

Aside from the fact that you need an Apple to find the end of the sentence, this agreement in effect would put the mail-order Apple dealers out of business! Accordingly, 6 Apple mail-order dealers who together do over \$20 million of Apple business per year successfully requested a temporary restraining order preventing Apple from putting the new agreement into effect.

The rumour in the industry is that Computerland threatened to stop selling Apples unless Apple did something about the Mail-order houses who they, Computerland, felt were cutting prices too much and making it non-profitable to sell Apples. The big local dealers have for a long time complained about low prices, maintaining that they could not provide the services expected and remain competitive.

Now, from this writer's own point of view, I would love to see the major dealers providing a service such as intimated by Apple's 'agreement'. But, unfortunately, with certain exceptions, the dealers have not provided the services stated even when they have sold at list price. The dealers have concentrated on the business users where the return on time invested was higher. The hobbyist have not gotten the support.

Again, in all fairness to the dealers, the sort of support needed by the hobbyist tends to be much more technical than that needed by the business user for whom only a detailed knowledge of

certain types of application software packages is required. The hobbyists come from many more directions and it is difficult for the dealer to provide staff with the necessary training, background and experience. The Apple clubs have filled that void in many instances.

It is for these reasons that I personally support the Mail-order houses in their 'battle' with Apple. It should be noted that I have usually advised persons to buy from their local dealers mostly because of the hardware maintenance and warranty support which is often necessary due to infant mortality problems. There's no way a mail-order house can provide that service. I want to emphasize that there are some dealers who do support the hobbyist. But there are other dealers who try to provide a support service but are just not equipped to do it properly. And, there are a few dealers who don't try at all!

Concluding, if Apple were to succeed in this battle, prices would be forced up and we might not see any improvement in support, just less sales of Apples!

## THANK YOU

by Dan Buchler

Dave Jaskulke, of Blumberg Photo Sound, and assistants gave a fascinating demonstration of the Arion 2c Computer Compatible Dissolver. The dissolver is a box to which you hook from 1 to 4 slide projectors and a audio cassette or tape recorder. It then controls the timing of the slides, fading and dissolving of the pictures, and synchronization of the sound.

This sounds sort of un-interesting to the layman. The point is that with two slide projectors, the most fantastic and modern presentation can be put together, that approaches a well edited movie in effect. The Apple is used to edit the show which, without the support of the dissolver could not be done manually.

Dave gave an excellent demonstration of what the system could do and then showed how a show could be edited using the Apple. The presentation was enhanced by use of a Video projection system for the Apple output.

Al Peterman demonstrated the line of plotters which he carries.

We wish to thank Dave Jaskulke, Blumberg Photo Sound and Al Peterman for an entertaining evening.

# SOFTCARD

SoftCard\* is a complete hardware/software system for the Apple II or II Plus that adds an important new software dimension to your Apple—the ability to run software written for the CP/M operating system. The SoftCard system is comprised of the SoftCard circuit board, the CP/M operating system and Microsoft BASIC, supported by extensive utility software and complete documentation. With the SoftCard circuit board installed and CP/M running, your Apple has the ability to utilize many powerful software packages that are not available to the Apple in regular Apple DOS mode. These packages include programming languages such as Microsoft's BASIC-80 and COBOL-80; well-respected word processing and data base software packages; and a host of proven business applications. And SoftCard doesn't affect use of your Apple

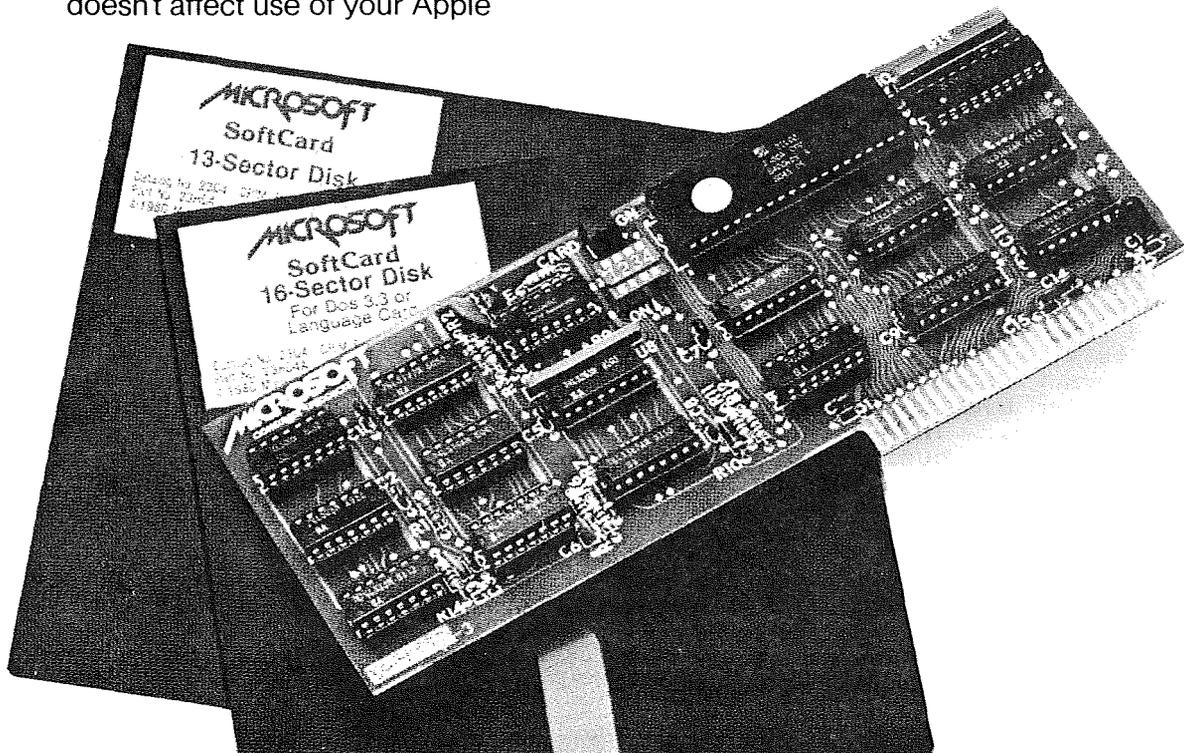
in normal Apple DOS mode. Every SoftCard package includes:

**SoftCard Circuit Board**—Contains a Z-80\* microprocessor, making it possible for the Apple to run CP/M.

**CP/M Operating System**—The software key to all the languages and sophisticated applications software you want for your Apple.

**Microsoft BASIC-80**—Ideal for developing sophisticated BASIC programs. BASIC-80 has many special features including 16-digit precision, PRINT USING, built-in I/O statements, CALL, CHAIN and COMMON and more. Provided with lo-res graphics on 13-sector disk; with both lo and hi-res graphics on 16-sector disk.

**Six Utility Programs**—Provide complete support of CP/M on the Apple. **Instruction and Reference Manuals.** SoftCard requires 48K RAM and one disk drive.



# INTERACTIVE SALES AND SERVICE, INC.

For the BEST deals in town!

## DISKETTES:

Maxell	10 in a softbox	\$29.00
Verbatim	10 in a softbox	\$27.50
	10 in a library case	\$29.50
BASF	10 in a soft box	\$27.50
	10 in a library case	\$29.50
	5 in a soft box	\$15.00

## PAPER:

9-1/2"x11" white pin-feed 15 lb, 3200 sheets/box.	\$24.50
20 lb, 2500 sheets/box.	\$21.00

## FEBRUARY'S FEATURE:

Microsoft Softcard (CP/M for the Apple)	\$315.00
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BMC Green monitor (BM12E)	\$165.00
Novation Apple-Cat II Modem (touch tone & 1200 baud)	\$340.00
Bit 3 80 column card	\$317.50
Flip 'N' File diskette storage files	\$24.00
Micropro Wordstar (Cadillac of word processors)	\$275.00
VisiCalc	\$165.00

These are just some of the products we handle. Stop at our table at the Mini'app'les meeting for a complete catalog.

Phone or mail orders accepted. If you have a modem, you may 'communicate' your order to us on PMS (612-929-6699). Merchandize is in stock. Normal delivery is at club meetings. UPS shipping is available; call for rates. Minnesota residents please add 5% sales tax. Mastercard and VISA accepted on orders over \$100.

Interactive Sales and Service, Inc.  
 P.O. Box 16152  
 Minneapolis  
 Minnesota 55416  
 (612) 929-2701

## NEW PRODUCTS

by Dan Buchler

I had intended to bring you this column less frequently than monthly, but the proliferation of new items is such that I am compelled to write it all down immediately!

### 320k RAMDISK

Axlon, Inc., Sunnyvale, Ca, demonstrated their RAM storage unit at the Comdex, 81 show in Las Vegas. This is a self contained unit with its own case about the size of a disk drive. It contains 40 64k bit ICs for a total of 320k bytes of storage. It has its own power supply which also powers the interface card that plugs into an Apple bus slot. A self charging battery powered backup supply lasts for 3 hours so you can unplug the RAMDISK, replug in and then boot from it. (see below)

Axlon provides disk emulation software which makes the unit look like two standard floppies. Beyond the 2 disk emulation, there is still 32k left over.

The Axlon rub is their price; \$1400. They did send out a notice offering to sell one to each Apple club or representative thereof for \$950. Anyone interested?

Axlon claims that a BLOAD of a 32 sector 8k HIRES picture takes 1/6th of a second. However, Dave Alpert, Northern Illinois Apple U.G. president reports that he saw it loading 8k picture blocks at one per second that is still 9 times faster than Floppy-DOS. In last month's, I reported that the Legend Disk emulator working with their 64k board speeded up I/O by a factor of 3 over that of Floppy-DOS. The question I would like to hear answered is why is the Axlon 3 or more times faster than the Legend, or is it? Now read on for more on bulk RAM storage:-----

### SORRENTO APP-L-CACHE

Sorrento Valley Associates (SVA), San Diego, CA have a 64k card, which sounds similar to the Legend except that it is expandable and it costs more (\$495). Expansion to 256k bytes is achieved by plugging in a 192k byte card that cables to the 64k card. The expansion card costs \$1295, or the two together \$1595 which is a higher cost/bit than for the Axlon RAMDISK. All of these new cards use the 64k bit ICs, the price of which is steadily decreasing!

SVA offer a disk emulator that emulates one super large floppy. They claim an

emulator/floppy-DOS speed improvement of 3 times.

The SVA must plug into slot 0. The Legend will plug into any slot. Of course the Legend, the SVA and maybe the Axlon can be used instead of a Language card. But read on, there are more memory cards:---

### MICROBUFFER II

Practical Peripherals, Westlake Village, Ca. have a variation on the memory expansion board. Its a parallel printed interface card with 16k bytes (expandable to 32k bytes) on board. Also included is extensive firmware which as well as performing HIRES screen dumps will do same while another program is running (presumably interrupt driven). The specs do not say whether or not you can address the memory directly which would allow one to use it as an expansion card too. Price is \$259 for 16k version, \$299 for 32k version plus an additional \$69 to get the background dump capability.

Please note that a very simple software routine can be written to use the language card or any expansion card as a print buffer. I wrote one in 1 hour the other day, and I am a real slow programmer! Of course the routine has to be BLOADED and the linkages set up, so its not as convenient as the Microbuffer II.

### DSI 16K

From Kleinofen Computer, Dusseldorf, W. Germany comes another combination. A buffered printer interface and Z-80 board. Contains Z-80, 16k Ram, Centronics compatible interface (same as used by Epson and others). Since the Z-80 drives the RAM, you can drive the printer from the Z-80/ 16K memory combination independently of the Apple 6502. You can also use it as a Z-80 board to run CP/M etc. Price is \$310 + \$7 shipping.

### SYNERGY-CARD

From Spies Laboratory, Lawndale, CA comes another combination which could save you money. For \$195 (list) you get a base card with 16k RAM that's essentially similar to the other 16k 'language' type cards. The difference is that you can add several features by simply plugging them into the base card.

For \$59 you get a Centronics type parallel printer interface with Firmware that will accept the same HIRES dump commands that are available on the Orange-Micro card. If you want to

interface to an Epson, you need a cable which costs \$30. A PR#8 invokes the appropriate linkages. Also included with the parallel interface are an RS232 serial port and 2 interval timers. The serial interface will talk at up to 9600 baud to serial printers or modems such as an acoustic coupler, but you will probably have to buy another cable for \$20. A PR#9 turns on the software. (Watch out, the board might not work with the Hayes Smartmodem!) If you have added the Parallel interface, for another \$49 you can have a clock/calendar card with battery backup which is compatible with the Mountain Hardware clock-card. IN#10 reads the clock.

Now, having spent \$363, for another \$39 you can buy a BSR X-10 Ultrasonic interface (which will allow you to do some of the things Mike Birnbaum demonstrated in Nov). A PR#12 accesses the BSR.

So, you blow \$402 (list), say \$360 at discount, on a fully loaded Synergy-Card. Using approximate discount prices, if you needed all of those features, one card has replaced a 16k Ram card (\$140), a Grappler type printer interface (\$140), a serial interface (\$100), a clock card (\$100), a BSR interface (\$70); about \$550 total (saving \$190), and you have also saved several slots and attendant power drain. Before you jump, make sure you really need all that stuff!

#### METACARD

Metamorphic Systems of Boulder Colorado has a plug in board with an Intel 8088 Microprocessor and an additional 64k bytes expandable to an additional 128k bytes for 192k bytes total. The 64k system sells for \$980.

With an 8080 (which is what's in the new IBM system) you can run CP/M-86 (which is supplied with the card). They also offer as an option the IBM operating system and Pascal.

#### DTACK GROUNDED 68000

When it comes to add-on processor boards, don't forget about the DTACK GROUNDED 68000 (see Jan newsletter) which is really more powerful than the 8088. We hope to be able to review the actual DTACK hardware within the next few months. They have already shipped their first Apple compatible boards.

#### LOGO

Terrapin, Inc., Cambridge, Mass. offer the Logo language that was developed at

MIT. The price is \$150. Backup disks cost \$15. System requires a 64k Apple!

#### Editor's Note:

An article describing LOGO was planned for this month, but we ran out of space. It will probably appear in next month's newsletter.

## MINUTES

### JAN BOARD MEETING

January 13, 1982

by Ron Androff, Secretary

Meeting was called to order at 8:01 by our president. October board minutes were read and approved.

#### FINANCIAL REPORT

5/18/81 Balance \$ 1933.30

Statement 6/81 thru 12/81:

ITEM	INCOME	EXPENSE
DOMS	\$ 3,981.00	\$ 3,336.98
MEMBERSHIP	6,209.00	
NEWSLETTER/MAIL		3,324.81
APPLE ORCHARD	344.00	425.40
MECC	624.30	304.47
MISC	27.00	976.90

1/13/82 Balance

4750.04

The club is incorporating as Minnesota Computer Users Group with a trade name of Mini'app'les. Completion is pending the filing of approved bylaws. Cost less attorney fees approximately \$36.00.

Motion to accept the amendments made to the bylaws and present those amendments to the membership for approval. PASSED

Moved we charge \$5.00 for DOMs with \$2.50 for mailing; effective February 17 (meeting night). PASSED This increase was approved as a measure to ease our cash flow problems caused by disk purchases for DOMs.

GOTO 12: REM Minutes Continued

# EPSON MX-80/100 COMPARISON

by Dan Buchler

I have been asked several times about the merits of buying an MX-100 over the MX-80. The obvious answer is that the 100 is simply a 'wide' 80. Well thats not really true. The following attempts to detail the differences.

## General specifications:

	MX-80	MX-100
Paper feed	Tractor (MX-80 F/T has platen or you can buy add on platen)	Tractor & Platen
Print Sizes & positions		
@10 chars/in	80	136
condensed	132	233
enlarged	40	68
enl/condensed	66	116
Block graphics	64chars	None

Variations on Roman character set	By switch selection only & only WITHOUT Graftrax option.	Software Control

Japanese Katakana As above		None
Italic Characters	All print modes but only with graftrax option.	None
Dot graphics	(With graftrax option)	Standard
Across page---		
Regular	480 dots	816 dots
Dual density	960 dots	1632 dots
Print speed	80cps	80cps
@10 chars/in		
Print modes	Regular Emphasized Double Strike	Regular Emphasized
Char matrix---		
Regular	9*5	9*5
Expanded	9*10	9*10
Inter-character spacing---		
Regular	1 dot plus	1 dot plus
Expanded	2 dots plus	2 dots plus

## Firmware specifications:

GOTO 11

## APPLE 8-BIT 8-CHANNEL A/D SYSTEM

- ▶ 8-BIT RESOLUTION
- ▶ ON BOARD MEMORY - (Just peek at data)
- ▶ FAST CONVERSION - (.078 ms per channel).
- ▶ ELIMINATES NEED TO WAIT FOR A/D CONVERSION
- ▶ A/D PROCESS TOTALLY TRANSPARENT TO APPLE.
- ▶ FULL SCALE INPUTS CAN EASILY BE CHANGED BY USER.

APPLIED ENGINEERING'S A/D board is a breakthrough product for all APPLE owners giving real world data at a really affordable price. Diverse applications include monitoring of:

.....TEMPERATURE.....HUMIDITY.....WIND SPEED.....WIND DIRECTION.....  
 .....LIGHT INTENSITY.....PRESSURE.....RPM.....SOIL MOISTURE.....  
 .....AND MANY MORE.....

CONTRIBUTED PROGRAMS ARE DISTRIBUTED FREE TO ALL A/D OWNERS IN OUR NEWSLETTER.

See your dealer or contact -

**APPLIED ENGINEERING**      **\$ 129**  
 P.O. BOX 470301  
 DALLAS, TEXAS 75247

MASTER CHARGE & VISA WELCOME



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7:00 AM - 11:00 PM 7 DAYS A WEEK

APPLE PERIPHERALS ARE OUR ONLY BUSINESS

Capabilities common to  
MX-80 and MX-100

Hex Code	Asc Code	Ctl Code	Feature
**Note 1 below			
**			

No preceding escape character----

07	7	Ctl G	Bell - 1 second buzzer
09	9	Ctl I	Horizontal Tab
0A	10	Ctl J	Line feed
0B	11	Ctl K	Vertical Tab
0C	12	Ctl L	Form Feed
0D	13	Ctl M	Carriage Return
0E	14	Ctl N	Enlarged on
0F	15	Ctl O	Condensed on
11	17	Ctl Q	Select printer
12	18	Ctl R	Condensed off
13	19	Ctl S	De-select printer
14	20	Ctl T	Enlarged off

Escape character precedes all codes.

30	48	Esc 0	Select 8 lines/inch
32	50	Esc 2	Select 6 lines/inch
38	56	Esc 8	Deselect end paper det
39	57	Esc 9	Select end paper det't
41n	65n	Esc A n	Set line spacing n/72"
42n..66n..	Esc B n...	0	Set vertical tabs
43n	67n	Esc C n	Set form length n line (Note 2)
44n..68n..	Esc D n...	0	Set horizontal tab (Note 3)
45	69	Esc E	Emphasized print on
46	70	Esc F	Emphasized print off
4Bnm	75nm	Esc K	Normal density graphic
4Cnm	76nm	Esc L	Dual density graphics

Note 1 n means additional single char follows ASCII code. nm is 2 byte count of graphic chars following.

Note 2 MX-80 255 lines max  
MX-100 127 lines max

Note 3 MX-80 16 tabs max  
MX-100 12 tabs max

Features specific to the MX-100

4E	78	Esc N	Set for skip over perforation at bottom of page
4F	79	Esc O	Turn off skip over perf
51n	81n	Esc Q	Set column width (This is similar to the "CTL I 80 N" provided by most Apple interface cards)
52n	82n	Esc R	Selects 1 of 8 char set variations for 8 languages. n=0 USA English n=1 French n=2 German n=3 UK English n=4 Danish n=5 Swedish n=6 Italian n=7 Spanish

Note that an MX-80 without Grafrax provides similar capability via switches. Allows setting of form length in inches instead of <c/r>s. This is particularly useful when using Graphics as MX-80 loses track of top of form.

Features specific to the MX-80 with Grafrax option installed.  
(All codes must be preceded by Escape)

43 On	Esc '0'n		
31n	49	Esc 1	Set line spacing 7/72"
33n	51n	Esc 3n	Set line space n/216" (1/3rd dot vertical spacing. Req'd for precision graphics such as writer's HIGHER PRINT)
34	52	Esc 4	Italics On
35	53	Esc 5	Italics Off
3A	58	Esc :	Block graphics mode on
3B	59	Esc ;	Block Graphics mode off
3C	60	Esc <	Home Print head
3D	61	Esc =	Clear Most Signif't bit
3E	62	Esc >	Set Most signific't bit This allows block graphics with unmodified Epson interface card.
3Fn	63n	Esc ?n	Redefine Escape codes
40	64	Esc @	Reset printer
47	71	Esc G	Double strike on
48	72	Esc H	Double strike off
4Anm	74nm	Esc Jnm	High speed dual density graphics (of dubious use!!)
50	80	Esc P	Condensed on (can do same thing with Ctl O)
51	81	Esc Q	Condensed Off (can do same thing with Ctl R)
53	83	Esc S	Expanded on (can do same thing with Ctl N)
54	84	Esc T	Expanded off (can do same thing with Ctl T)

### Summarizing

You can see that there are several things that the MX-80 with Grafrax option can do which the MX-100 cannot. In fact the following are things that the MX-80 without Grafrax can do which the MX-100 cannot:

Double Strike print mode. In general the Emphasized mode will satisfy most people.

Block graphics (selected with high order bit on)  
Japanese Katakana characters

Whether or not specific features are important to you, depends on your particular needs.

# MINI'APP'LES Education

by Chase Allen

D. C. Hayes has come out with a new modem called the Smartmodem. This modem does all the regular stuff and then some more. I will try to give you a brief on the principal features of the modem and also the criteria I see for making the choice between the more familiar Micromodem II, and the Smartmodem.

First, the most significant difference is the structure. The Micromodem was a self contained peripheral board, which excepting software gave you everything. The Smartmodem comes as an external box which still requires a board to connect to the Apple. Probably this is the principal reason Hayes took this path, as the Smartmodem will interface with anything using a serial interface of the RS-232 variety. No, not any serial interface board, just the serial interface protocol. It turns out, after trying three (Apple serial interface card, CCS 7710A, and finally the Apple Communications Interface card) that the best match appears to be the Apple Comm card. It has the advantage that Apple software (BASIC, and Pascal) understands the card well enough to talk directly, using the BIOS. This is a plus over the Micromodem, for which you had to tailor the BIOS.

Secondly, the Smartmodem can dial in Touch-Tone or Pulse dial modes, and under program control, you switch back and forth. Also, the Smartmodem has a speaker which can let you listen to the interface, often a help in debugging, and determining where you are. Incidentally, these feature were the critical factors which I sought when I switched from the Micromodem. I have a program which interfaces with Twin City Federal Bill Payment Program, and the cues from the sytem are via voice synthesizer, and require responses from me in Touch-Tone.

Finally, in my estimation, the Smartmodem is quite a bit easier to program. It has two states - Command and On-line. In command mode, commands take the form of an ASCII string such as "AT DT 123-4567;". This command string (which comes out of Pascal as: WRITELN(REMOUT,'AT DT 123-4567;'), is interpreted as ATTENTION!...Dial-in touchtone- 123-4567 and return to command state without transmitting a

carrier. Obviously, I am not intending to use the normal data transmission state in this example (dropping the semi-colon will put the modem through the receive-originate carrier sequence, and leave me in on-line state, ready to transmit-receive).

The most complicated sequence in the Smartmodem is returning to command state (necessary to terminate a session). In this sequence, one must program a one second quiet space (no data out - incoming is ok!), followed by a sequence of three plus signs (ASCII 43), followed by another one second "guard space". The modem will obediently say "ok" and start interpreting characters as commands. Oh yes, there are modem responses to commands, carrier detect, loss of carrier, and errors, as well as other state responses that are a little tricky, timing-wise to interpret.

All in all I am quite pleased with the Smart-modem, and am finding that I can modify most of the Micromodem packages to work. Generally, it is a case of simplification, as the Smartmodem does most of the work for you without affecting Apple timing. By that I am referring to the fact that the Micromodem does all its wonderous things on your time, whereas the Smartmodem does it on its own.

I heard that old programmers never die.....they just get nibbled away!

Minutes: CONTINUED from page 9

Moved that the club policy concerning sales of hardware and software be: The club will endeavor to locate sources for bulk purchases of computer equipment and supplies as a service to its members. Those providing this service will attempt to make clear to members the amount of service available to the purchaser at a given price. The club will not, however, certify persons as "dealers" for the club, nor publish prices except comparatively or through paid advertising. PASSED

Moved that we have an audit of our financial books to close out the year. PASSED

We listened to a fifteen minute tape from Jim Hassler our representative at I.A.C. The tape was a response to a letter by Dan Buchler to Jim Hessler.

Meeting was ajourned at 12:30

# MOUNTAIN MUSIC

A Different Review  
by Dan Buchler

As mentioned in last month's newsletter, Mountain Computer recently reduced the price of their Music System from \$545 to \$395. I had wanted a music system ever since I had seen a demonstration of the first ALF system in March of 1979. I was ready to buy an ALF system when Mountain announced their Music system. Then I was put off by the price. But, with the two Music Synthesizer system manufacturers (alphaSyntauri - Reference 1 and Passport Designs) committing themselves to the Mountain hardware, and the arrival of a price reduction, I finally decided to buy.

Now, if you want to see a detailed discussion on what the Music system does, read Reference 2. In there the hardware and software are described in considerable detail. I will not attempt to duplicate what the reference says but just summarize the capabilities of the system and then offer my own critique.

The mountain system consists of:

- 2 boards coupled together
- 1 light pen
- 2 double-sided disks of software
- 1 manual in 3 ring-binder

The music system provides-

- 16 voices
- stereo output (max of 8 voices/channel)
- A music editor to enter the scores. There are 3 ways to enter music. A light pen in combination with various Hires screens, or the paddles in combination with the screens or via the keyboard. Combinations of the 3 methods, depending on what you are doing, prove most effective. The editor creates 'source files' (called COMP files) which are COMPIled by the Music Player.
- A Music Merger program to combine together pieces of scores entered by the editor. The amount of music which can be accommodated by the editor is very restrictive, so the merger gets used alot.
- A music player program which will COMPIle the COMP files into PLAY files, load previously defined instrument definitions, and play the music.
- An Instrument Definition program which allows you to define your own instruments. The definition of an instrument consists of three parts:
  - \* The definition of the waveform.
  - \* the definition of the envelope.
  - \* A frequency history of the attack.

The technique used by Mountain is very sophisticated. The waveform is defined by 256 bytes, each byte representing (in 8 bits obviously) the amplitude of the waveform over one complete cycle. Each of the 16 voices may be thus defined. Because historically, the analysis of waveforms has depended on a representation of that waveform by its harmonic content, the instrument definition requires that you specify the waveform in terms of the relative amplitudes of the first 24 harmonics. The program then does a Fourier transform from the frequency domain to the time domain. (Excuse the technical jargon!) Incidentally, theres nothing to stop you providing a waveform derived from some outside source and converted to a 256 byte representation. Most of the competitive systems depend on a fixed waveform which is either square, sawtooth, sine or combinations of those. Incidentally most electronic organs and sythesizers use analog filtering techniques to vary the waveform.

The envelope is defined by specifying the shape of the attack (up to 16 co-ordinate pairs may be used), the time of attack and decay and the type of decay (log or linear).

The frequency history allows one to specify a departure from the fundamental frequency of the wave during the attack time. That departure is specified in percent.

As stated above, if you want to know more about what it is, read the Byte article, see a demonstration or call Chuck Boody or myself!

Now to the critique aspect of this article.

Most of the criticism I had read in referenced article and from knowlewdgable persons such as Chuck Boody revolved around a Music purists point of view. For example, the Mountain system can't do 'triplets'. Well, to my untrained ear, I could substitute a slightly different beat, and I would'nt be able to tell the difference. Anyway, I would'nt know where to find a triplet! They also criticise the fact that the Mountain system uses a stretched tuning scale. Again, I could'nt tell the difference except that perhaps it might make it a little harder to tune a real accompanymnt on such an instrument as a Trumpet.

GOTO 16: REM Mountain Music Cont

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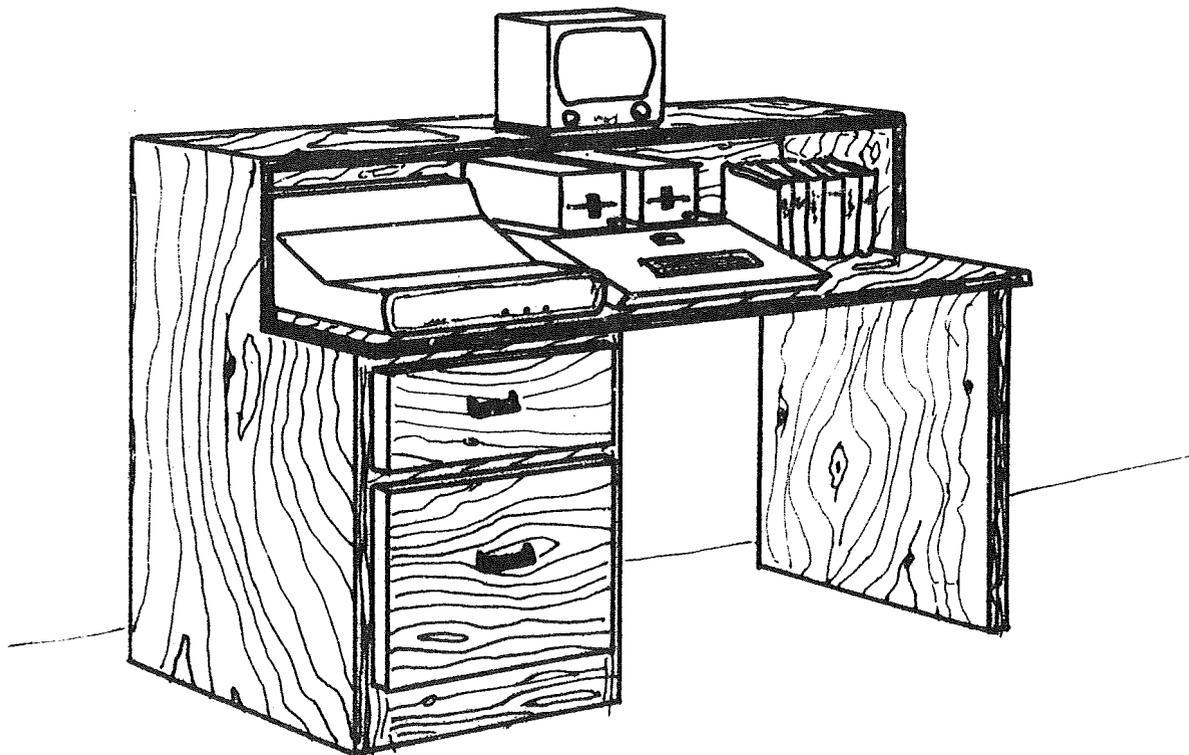
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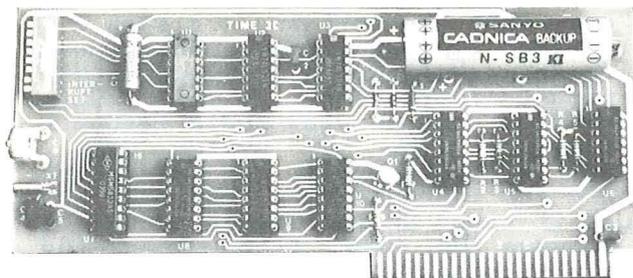
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- WE GIVE YOU LOTS OF SOFTWARE. IN ADDITION TO "COMPOSE" AND PLAY PROGRAMS, THE DISK IS FULL OF SONGS READY TO RUN.
- FOUR WHITE NOISE GENERATORS (GREAT FOR SOUND EFFECTS).
- PLAYS MUSIC IN TRUE STEREO AS WELL AS TRUE DISCREET QUADRAPHONIC.
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However, I had heard the statement over and over that the software (release 2.0 still needed improvements). What does that mean. Well Moore pointed out one significant deficiency. The Music editor does not provide audio feedback during entry (The ALF system does). This is a problem to me not because of the need for instantaneous feedback, but because it takes an incredible amount of time to save the COMP file, load the player program, COMPile, load the instrument definition and then finally hear it. That's like 2 to 4 minutes or more. By the time you get there, you forget what you were going to listen for!

One reason for the long time is that to go from one subsystem (Editor, Merger, player) the system performs an automatic reboot (PR#6) and brings up the main menu. Then, after selecting the subsystem, it loads 100+ sectors of disk for each subsystem. One of the new large 64k, 256K, 320K RAM systems emulating a disk would help here.

Another problem that's annoying is that with one drive, one does a lot of disk swapping during the course of entering music. Just about every operation requires loading of overlays. The Mountain philosophy is to keep the data disks separate from the program disks. If you have only one drive, try the system first in that configuration so you know what you face!

To me there are currently two major capability deficiencies: These are:

For any one part of Music, only one instrument may be defined. For example, it would be very desirable to enter a phrase using let's say a saxophone, then to repeat it as a trumpet. You can't do that. Because of the way parts are defined, you would have to enter from scratch two separate parts, each hooked to its own instrument. Further, even though only one of those two parts is playing at a time, the voices required to define the instrument must come out of your total available 16 voices. On the surface that doesn't sound too bad, but complex instrument definition, because of limitations in accuracy of the 256 \* 8 bits sampling, may require 2 or 3 voices. (The BRASS supplied by Mountain uses 3 and the PIANO supplied by MOUNTAIN is divided into PIANOHI, PANOMED and PIANOLOW each of which use several voices. So you see voices are in great demand!

Another thing about parts, evident from above, is that once you define a part,

you can't reassign it as a different part, i.e. you can't have a first part as a Trumpet and later use it as a part 3 for a Trombone.

This leads to another gripe. During Instrument Definition, you are able to hear the effects of small changes in any part of the definition process. And, they nicely allow you to transpose the music you are using during definition up or down by up to 48 semitones (4 octaves). You can listen to the definition using a scale provided or load a short PLAYfile of your own. Unfortunately you can't save the transposition (In ALF you can). This to me is a real pain. I am not an accomplished Musician, and was planning to use the system to create accompaniments for my son who plays the Trumpet, a b-flat instrument. The only way to do that is to use actual music correctly transposed, or to make the transposition as you enter the piece which can be difficult.

The system as delivered provides a score Printing capability that only works with the Apple Silentyte. If you own a Silentyte that's fine, but it isn't the most common printer around here!

Lastly, I would like to comment briefly on the ease of defining instruments. The tools provided are really very good. My problem is that I wanted to emulate that Trumpet of my son. To emulate a real instrument is very difficult. Mountain provides with the system very nice sounding instruments as follows:

ORGAN	WOODWIND
STRING BASS	GONG
WOODDRUM	BRASS
PIANO	CLAVICHORD
CYMBALS	

The problem is that, in a complex instrument like a Trumpet, the envelope of each harmonic is slightly different (Ref 3). To obtain a 'perfect instrument' would require the definition of several instruments each of which would play the same part. One could not combine them as one instrument because the Mountain system assumes one attack time and decay time/shape for each instrument. To do exactly as above gets one in to trouble with parts as described earlier. However, the Mountain system assumes a compromise in that the attack envelope is separately specifiable for each waveshape so one could combine those harmonics that have similar attacks under one attack envelope. I haven't had time to see how effective that really is.

GOTO 17: REM Mountain Music Screens  
GOTO 18: REM Mountain Music Cont.



## NOTICES

### DUES

Persons who have unwittingly sent in dues in the amount of \$10 instead of \$12 have been admitted as members for a period of 10 months. Starting immediately, membership will only be accepted upon payment of the full amount.

Please note that new memberships will commence upon receipt of dues. Late renewals will be retroactive to expiration date of previous membership (currently Dec 31st, 1981).

### DOM PRICES

Effective with Feb meeting, DOM disks will be sold at meetings for \$5 each, and the mailing charge for both MECC and DOMs will be \$2.50. Thus MECC and DOMs ordered by mail will cost \$7.50.

### SNOW DAYS

We hope that all members found out that the January meeting was cancelled as a result of the prevailing weather conditions. Announcements were made on WCCO, KSTP and KSJN radio stations. We hope you heard them. Should bad weather again come upon on on a meeting night, and it be necessary to cancel the meeting, please again listen to those Radio stations for an announcement. We also make all of the board members aware of the meeting status, so if you are uncertain as to whether the meeting is on, please call any of the board members.

### APPLE /// USERS

An Apple /// User group, under the auspices of the IAC has been formed. The President is Don Norris. Dues are \$25 and a newsletter called "The Open Apple Gazette" will be published.

For information write:

ORIGINAL APPLE ///'RS  
50 California Street,  
Suite 900,  
San Francisco,  
CA (No zip given)

### APPLE ORCHARD

The IAC magazine will be published 5 times in '82 starting in March, and then bi-monthly.

### IAC DENTAL SPECIAL INTEREST GROUP

If you are interested in a Dental SIG, a

national group is being formed. You need not be interested in dentistry 'per se'; other professionals (e.g. MD's, nurses, podiatrists, etc.) and business people who work in service industries would find the functions of the Dentistry SIG interesting if not helpful.

The aim of the group is to:

- 1) Identify, review and grade 'dental' software now in the market.
- 2) Identify Dental SIG members to facilitate communications.
- 3) Promote software guidelines and standards.
- 4) Inform members of present projects, needs and hardware/software.

Write:

Skip Neiburger DDS  
IAC Dental SIG  
417 Cove Rd.,  
Wildwood, Il 60030.

### Mountain Music CONTINUED from page 16

Why buy the Mountain system at \$395 list versus the ALF or even cheaper systems based on the General Instrument Music chip? The ALF software is undoubtedly better in that it is easier to use. That's not to say that the Mountain system through enhancements will not improve. Then there's the compatibility with the 2 Music Synthesizer manufacturers. That's a plus for the Mountain system. The last reason and perhaps the most important is the ability of the Mountain system to synthesize anything. The ability to synthesize virtually any waveform (in theory anyway), to emulate complex attack envelopes (ALF assumes a linear attack) plus the 16 voices gives it a definite advantage over the competition. Despite its shortcomings, the package is a very well designed system which tries to minimize operational errors.

Meanwhile, I am thinking of investing \$500 or \$600 to upgrade to a Passport Design system in which the software is reputedly better. Hope to bring you a review of that.

References:

1. alphaSyntauri Music Synthesizer by Steve Levine and Bill Mauchly, Byte Magazine, December 1981.
2. Mountain Computer's Music System by Robin B. Moore, Byte Magazine, July 1981, page 60.
3. Advanced Real-Time Music Synthesis Techniques by Hal Chamberlain, Byte magazine, April 1980. (Detailed plots of the Harmonic content v. time of a Trumpet are shown.)

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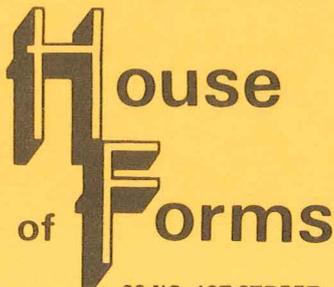
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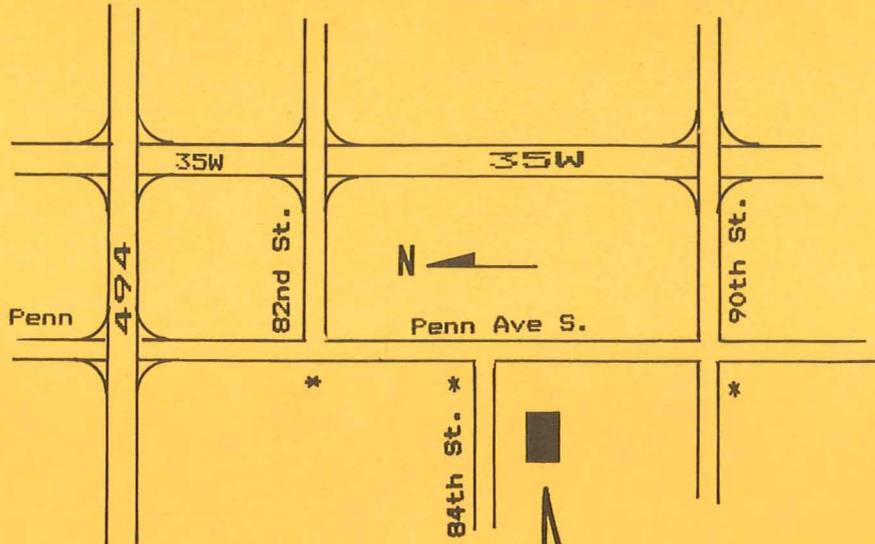


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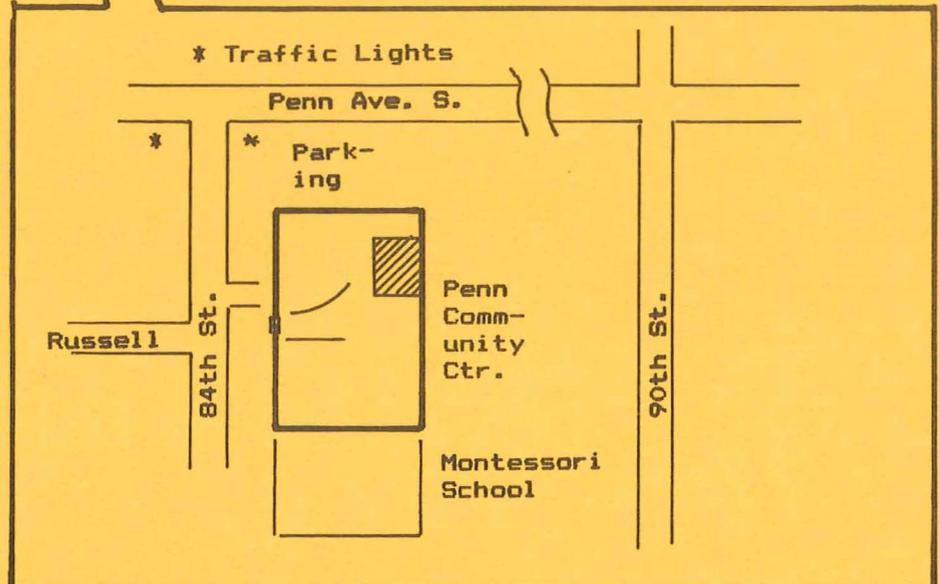
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**IN THIS ISSUE**

DOM #11 by Ken Slingsby.....3  
 BBS by PMS SYSOP.....4  
 Apple vs Mail Order  
 by Dan Buchler.....5  
 Thank You.....6  
 New Products  
 by Dan Buchler.....8,9  
 Minutes Jan Board Meeting  
 by Ron Androff.....9,12  
 Epson MX-80/100 Comparison  
 by Dan Buchler.....10,11  
 Mini'app'les membership.  
 by Ann Bell...centerfold  
 Mini'app'les Education  
 by Chase Allen.....12  
 Mountain Music, a Review  
 by Dan Buchler...13,16-18  
 Classified Ads.....17  
 Notices.....18

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168	BAGLEY, RUSSELL D., MD	55437	612-835-4195	31	DALE, BOB	55423	612-869-0689
414	BAGSTAD, RON & MIKE	55318	612-448-6715	10	DANDREA, GUY JR.	55437	612-831-7176
92	BAKER, STEVEN E.	55343	612-835-6141	484	DANIEL, LINDA	55364	612-472-4576
326	BAKSHI, RAUI	55428	612-535-1080	143	DAVENPORT, JOHN	55119	612-739-5389
127	BALSIGER, WILLIAM D.	55337		20	DAVERN, PAT	55108	
66	BAMBER, DONALD	56301	612-252-0653	351	DAVIDSON, BOB	55441	612-545-8478
148	BANGOURA, IBRAHIM	55433	612-421-8542	119	DE COURSEY, BILL	55421	612-574-9062
319	BARKSDALE, PHIL S.	55437	612-893-8206	550	DETMER, WAYNE F.	55115	612-426-4188
136	BARR, BRIAN	55407	612-722-4518	470	DEWEY, TOM	55426	612-831-5242
60	BARR, JAY	55115	612-777-0716	38	DICK, TERRY	55435	612-941-0212
337	BARTHOLOMEW, DALE	55119	612-739-4577	388	DIERKS, SCOTT	55112	612-633-7692
90	BARTOSH, MIKE	55122	612-452-3542	18	DIMATTED, TOM	55432	612-786-7675
122	BECKMAN, JOHN C.	55118	612-451-6572	559	DOCK, BUD	55125	612-735-8464
200	BELL, ANN T.	55427	612-544-4505	358	DOCKEN, GEORGE C.	55418	612-789-3384
26	BENING, BOB	55014	612-429-3434	471	DOHERTY, JERRY	55124	612-432-3629
503	BENSON, DORIS I.	55108	612-644-5368	35	DOLAN, REV LEO A.	55105	612-647-5386
401	BENSON, JACK A.	55112	612-633-1706	391	DONALDSON, WILLIAM H.	55407	612-724-3378
244	BERG, DARMAN	55429	612-533-5714	150	DOYLE, JOHN	55417	612-822-0563
350	BERGH, GEORGE S., JR	55110	612-454-6790	1	DRAEGER, GARY L.	55423	612-869-4006
340	BERKO, RICHARD M.	55337	612-890-4666	282	DUDYCHA, DAVID	55417	612-866-6157
392	BERQUIST, THOR	55121	612-452-6727	131	DUESCHER, KEITH	55438	612-944-2121
597	BIALKE, JAMES R.	55418	612-788-6959	394	DUNN, JAMES P.	55110	612-483-2366
402	BIRKHOFER, DEWEY MD	56007	507-377-3405	155	DUPREY, JIM	55435	612-941-2334
194	BIRNBAUM, MICHAEL	55426	612-546-2166	184	DYBVIG, NILS	55072	612-245-2903
104	BLOOD, JAMES A.	55421	612-571-0593	34	DYKOSKI, WILLIAM W.	55418	612-788-3272
427	BOHANNON, MARGARET (PEG)	55410	612-922-7063	125	EBNER, E.E.	55447	612-473-2681
258	BOLTON, LARRY D.	55337	612-432-6507	183	ED, JAMES M.	55105	612-698-8149
562	BONNIWELL, GEORGE B.	55343	612-474-1330	218	EDWARDS, BRUCE M.	55426	612-933-3416
490	BOODY, CHARLES G.	55343	612-933-5290	457	EDWARDS, LOIS	55409	612-922-3341
252	BORCHERT, RICK	55432	612-786-6242	223	EDWARDS, THOMAS	55410	612-927-6790
595	BORSHEIM, BRADLEY L.	55113	612-636-4651	535	EFRON, WILLIAM A.	55116	612-699-1867
497	BOUCHARD, SCOTT	55431	612-888-2829	523	EHLEN, TIM	55123	612-454-5931
459	BOWER, ED	55104	612-646-0098	105	EISENZIMMER, LEO	55440	
493	BOWLES, JOEL	55344	612-941-3409	478	ELLIOTT, C.L.	55410	612-926-9305
589	BRACKEN, WILLIAM M.	55340	612-478-6712	441	ELLIS, KENNETH R.	55421	612-781-7111
229	BRULAND, PHIL	55422	612-533-5173	77	ELMER, TIM C.	55416	612-920-7647
593	BRYNOLFSON, RUDOLF A.	55406	612-721-6115	585	EMERSON, EILEEN	54701	715-835-6314
160	BUCHLER, DAN	55337	612-890-5051	180	ENGSTROM, BOB	55407	612-822-6132
400	BUCK, CHRISTOPHER	55343	612-934-0611	376	ERICKSON, DAVID L.	55414	612-378-0756
333	BUCKLEY, KEVIN E.	55116	612-697-7462	174	ESH, ANDREW C.	55454	612-339-2451
65	BUELL, CHARLES D.	55391	612-474-4916	161	EUBANK, EUGENE O. III	55419	612-926-7726
211	BUENOING, WILLIAM A.	55343	612-935-7255	113	EWING, BEVERLY	55419	612-827-5140
4	BURESCH, SISTER MYRON	55106	612-774-9614	588	FARMER, BRIAN J.	55343	612-522-9043
68	BURNS, JON	55404	612-871-8951	2	FAY, THOMAS E.	55420	612-894-5694
255	BYKOWSKI, JAMES	55113	612-645-8982	130	FAZIO, MARIO	55391	612-938-7549
449	CABLE, LARRY	55432	612-574-9909	382	FERENS, JOSEPH A.	55431	612-884-6028
8	CABRINETY, STEPHEN M.	55435	612-941-4849	369	FESLER, DANIEL L.	55119	612-645-8155
175	CADWELL, DANIEL W.	55112	612-786-8493	426	FINE, S.J.	55411	612-529-6753
55	CAPE, ROBERT M.	55112	612-786-1187	202	FISCHBACH, RUSSELL	55433	612-755-0026
311	CARLSON, MIKE	55416	612-377-6553	328	FISH, JAMES R.	55443	612-566-5317
527	CARLSON, RICHARD W.	55435	612-944-6617	409	FLADMOE, JAMES S.	55422	612-537-9410
				291	FLEWELLING, LARRY J.	55397	612-467-3694

ID#	Name	Zip	Tel	ID#	Name	Zip	Tel
452	FLINT, ROGER	55106	612-771-2868	296	HOFFMAN, SHIRLEY	55395	612-485-4233
264	FLISTER, STEPHAN P.	55119	612-774-5665	334	HOFFMAN, TERRY J.	55421	612-781-2515
83	FLOM, JAMES H.	56301	612-252-3247	47	HOLMBERG, M.E.	55343	612-374-3215
318	FLYNN, FRANK	55337	612-894-1020	48	HOLMSTROM, DAVE	55014	612-784-6788
234	FOSS, KEN	55119		29	HOOVER, STANLEY B.	55055	612-459-7915
3	FOSSE, ANN C.	55435	612-835-3576	292	HUTZE, JOHN	55343	612-934-1281
469	FRAKES, MIKE	55105	612-698-4042	474	HUOLE, JAMES-VP, APPLELIST	06444	
468	FRANZMEIER, ROGER	55118	612-423-2377	507	HOYER, CHUCK	55423	612-866-3706
512	FROELICH, JOHN P.	55327	612-427-5705	336	HUBBELL, JAYMES	55117	612-489-4713
332	FRYS, RUSSELL N.	55343	612-938-3050	367	HUSS, A.J., JR.	54016	612-227-2772
598	FULL, DENNIS P.	55447	612-475-9053	250	HUTCH COMPUTER INDUSTRIES	55350	612-587-4861
104	FUNDINGSLAND, ROGER E.	55369	612-425-8722	64	IANTOSCA, DICK	55420	612-432-9039
445	GALLETTA, DENNIS F.	55435	612-831-4370	172	INGVALDSEN, RUSSELL E.	55418	612-781-3847
162	GAMMELGAARD, JAMES F.	55445	612-424-3432	293	JACKSON, EDGE	55391	612-473-6415
556	GARDNER, ROBERT L.	55042	612-770-3010	447	JACKSON, PAUL	55404	612-814-1956
495	GATES, RICHARD E.	55119	612-735-0373	511	JACOBS, DOUGLAS E.	55427	612-546-9107
357	GATES, THOMAS A.	55418	612-789-0390	299	JACOBSON, RICHARD	55426	
259	GEIGER, ANSON D.	55436	612-927-6851	349	JANKOSKI, JIM	55423	612-866-0788
393	GENSLER, HAL	55428	612-535-6386	52	JAROSZ, BOB	55430	612-560-8867
158	GEORGE, STEVE	55343	612-935-5775	95	JOCHUM, JOSEPH	55416	612-377-6479
463	GERSTICH, JAMES J.	55429	612-535-7613	451	JOHANNES, RICHARD	55407	612-824-8497
263	GERTENBACH, PAUL G.	55082	612-439-0492	548	JOHNSON, ALGERNON H.	55438	612-944-2862
372	GETTELFINGER, D.J.	55343	612-935-9195	375	JOHNSON, ALLAN	55418	
496	GEURS, ROBERT B.	56001	507-345-1522	489	JOHNSON, CURTIS J.	55356	612-473-4176
506	GIEFER, THOMAS S.	55337	612-435-6444	224	JOHNSON, EARL H.	55112	612-482-9949
434	GILLES, PETER	55447	612-475-3916	163	JOHNSON, KEITH W. MD	55116	612-698-3292
541	GILMAN, BYRON	55369	612-425-9112	19	JOHNSON, MIKE A.	55104	612-645-1377
566	GODENIUS, GRANT A.	55403	612-871-0624	139	JOHNSON, REESE C.	55401	612-339-5119
108	GOLDEN, GEORGE	55343	612-474-3895	363	JOHNSON, ROBERT C.	55343	612-934-2470
196	GOLDSTEIN, JULES	55116	612-690-4447	39	JOHNSON, ROBERT H.	55436	612-926-8675
406	GONDEK, SHARON	55116	612-698-6952	276	JOHNSON, STEVEN F.	55014	612-786-3028
75	GOOCH, ANDREA	55413	715-262-3426	220	JOHNSON, STEVEN K.	55419	612-869-3447
317	GOODING, MICHAEL J.	55437	612-888-9568	101	JONES, ARTHUR L.	55422	612-544-5305
404	GOTTIER, RICHARD C.	55343	612-474-7903	297	JONES, C.R. (BOB)	55420	612-888-5623
98	GRAY, RENEE & GREGORY	55408	612-824-5208	248	JONES, JERRY	55447	
201	GROMMES, RICHARD	55421	612-571-2075	97	JONES, MICHAEL A.	55124	612-432-8715
462	GROTH, LOUIS K.	55431	612-884-8506	456	JOSEPH, IRVING	55104	612-645-0899
141	GROVE, BRENDA & PHIL	55403	612-874-8658	329	JOSSMAN, JAMES	55433	612-757-7482
197	HAGBERG, DONALD	55428	612-535-7775	107	JUNCKER, DAVID F.	55419	612-824-2317
82	HAGEMARK, BENT	55057	507-663-2615	24	KAEMMERER, BILL	55417	612-823-9003
70	HAGER, RICHARD	55406	612-721-2665	442	KAMLA, RICHARD R.	55435	612-929-6237
266	HAGQUIST, DARLENE & JIM	55105	612-699-8919	28	KAMLA, SUSAN VAUGHAN	55435	612-929-6237
171	HALDEN, P.C.	55042	612-770-6624	96	KARLOS, TOM J.	55125	
513	HALE, HENRY E. IV	55343	612-934-3255	390	KARL, TOM	55104	612-644-0554
413	HALL, ALLAN J.	55082	612-439-9181	360	KASSELL, JIM	55105	612-222-3990
227	HALLA, DONALD & DAVID	55435	612-926-3322	519	KASTE, RAY R.	55422	612-588-2523
461	HALLBERG, JOE	55443	612-560-1425	431	KAUFFMAN, JERE F.	55428	612-535-6745
138	HALVORSON, JIM	56055	507-726-2638	249	KEISER, KEN	55421	612-789-2588
213	HAMILTON, LON A.	56093	507-835-3059	524	KELSEY, ROBERT C.	55113	612-633-6102
190	HAMMOND, DARYL	55117	612-487-1002	22	KIEFFER, MARTY & TOM	55416	612-929-7889
396	HANCOCK, ALLAN B.	55369	612-425-0334	69	KIENKE, BRUCE W.	55391	612-473-7497
362	HANSEN, JIM	55427	612-546-6121	533	KING, WILLIAM C.	55033	612-437-2161
592	HANSEN, WILLIAM H.	55802	218-727-7765	42	KIRCHNER, MIKE	55402	
383	HANSON, K.L.	55424	612-926-7814	231	KISTNER, JOAN	55437	612-835-0641
567	HARMON, HUBERT N.	55112	612-636-5716	514	KLAUSLER, THOMAS	55044	612-469-5120
251	HARMS, GORDON E.	55369	612-420-2767	254	KLEIN, CHARLES J.	55337	612-890-6813
152	HARRIS, MARY E.	55410	612-929-6678	281	KLEIN, GEORGE P.	55116	612-698-0454
467	HART, PATRICK V.	56097	507-388-3009	84	KLEINESCHAY, PHIL	55112	612-483-8498
590	HARTZELL CORPORATION	55114		267	KNIGHT, GARY E.	55369	612-424-3774
574	HATULA, LEO	55441	612-545-8225	173	KNUTSON, GERALD L.	55112	612-483-4269
356	HAYDEN, STEPHEN	55435		473	KNUTSON, ROBERT E.	56001	507-387-5197
472	HEALY, JOHN M.	55435	612-941-2439	455	KOLACKE, JOHN	55435	612-944-6600
525	HEANEY, LOIS	55409	612-823-8817	570	KOMAR, JOSEPH	55105	
546	HEIM, KENNETH F.	55406	612-729-4764	482	KOSMAS, GEORGE	55416	612-929-2233
11	HEIM, RICHARD C.	44826	419-668-3869	80	KOWALKE, TIM	55363	612-675-3715
284	HEINEMANN, WILLIAM O.	55118	612-451-8412	596	KRAHN, DAVID	55092	612-434-4105
423	HEINRICH, MARY & RICHARD	55344	612-944-1258	301	KULAWSKE, WILLIAM V.	55416	612-929-8152
389	HEMBERG, HOWARD H.	55437	612-831-4554	118	KURTZMAN, HUGH	55343	612-544-7303
9	HELTZER, DALE EDWARD	55105	612-699-6145	290	KUSHMAR, JEAN	55331	612-474-5821
33	HERBST, RONALD	55447	612-473-4124	480	LACY, DAVID R.	55016	612-459-4783
186	HETTERICK, DAVID R.	55424	612-922-1919	112	LADEN, DAVID E.	55113	612-489-8321
398	HIGBY, PORTER	55369	612-420-3649	304	LAMPE, FRED R.	55391	612-475-1947
430	HILLE, LAWRENCE S.	55432	612-571-5736	260	LANGER, ROBERT R.	55431	612-888-7040
399	HILPISCH, WILLIAM P.	55110	612-429-4937	446	LANGLE, GERNOT B.	55404	612-333-7263
198	HINES, ALAN	55432	612-571-1156	420	LARSEN, ANNE B.	55410	612-922-0929
508	HINRICHS, EARL & KAREN	55104	612-645-3918	494	LARSEN, JIM A.	55419	612-822-2940
78	HINSHAW, KENT A., SUPERV.	55102		424	LARSON, LARRY S.	55421	612-788-0728
142	HITCHCOCK INDUSTRIES, INC	55420					

ID#	Name	Zip	Tel	ID#	Name	Zip	Tel
312	LARSON, RICHARD	55407	612-722-1513	583	NICKEL, JOYCE, MEDIA SPEC	55337	
51	LARSON, RICHARD B.	55427	612-544-4756	140	NIELSEN, DONALD G.	55422	612-533-6222
36	LARSON, RICHARD D.	55420	612-854-8712	294	NODOLF, KEITH	55437	612-831-6150
295	LAU, DAVID	94305	612-920-1696	572	NOHA, RICK B.	55441	612-546-9150
305	LAUKKA, LARRY	55424	612-920-5360	215	NORDVALL, DAVID	55417	612-724-9174
242	LEASE, DAVID	55422	612-522-0875	93	NORLINGER, JOHN	55112	612-482-1121
435	LEDMAN, THEODORE M.	55109	612-777-0311	217	NORRIS, JANELLE A.	55410	612-920-1430
515	LEE, CHARLES C.	55109		73	NORRIS, L.F. JR.	55435	612-925-2733
338	LEMAY, PETER	55105	612-227-4154	54	NORTH, VIRGINIA	55044	
145	LEMMON, DUANE	56501	218-847-5227	262	NORTON, JERRY	55016	612-459-7923
277	LENNON, LARRY	55433	612-421-8702	324	O'GLASSER, LAWRENCE	55406	612-721-5641
460	LIGDA, DICK	55423	612-861-1032	526	O'LOUGHLIN, TERRY	55110	612-426-2033
237	LINDBERG, CURT	55438	612-941-9638	421	OGBORN, CLARENCE E.	55303	612-753-1698
238	LINDBERG, DALE	55431	612-830-1049	128	OLIVA, THOMAS	55406	612-722-6007
121	LINDBERG, GARY	55441	612-545-1460	374	OLMON, DAVID G.	55110	
27	LINDELL, C. BRUCE	55454	612-338-0207	240	OLSON, ALAN	55430	612-521-3497
287	LINNEY, STEVEN R.	55435		23	OLSON, KEITH	55025	612-464-5087
532	LOCKMAN, JAMES R.	55344	612-937-8184	309	OLSON, LEIF A.	55124	612-454-8393
273	LOMKER, MICHAEL	55422	612-535-0415	536	OLSON, RICHARD	55429	612-536-9938
151	LONN, DANA	55417	612-824-6074	575	OLSON, SCOTT	55414	612-623-9735
247	LOWE, BOB	55343	612-933-0464	308	ONAN, DAVID W. II	55391	612-473-0143
246	LOWE, FLORENCE	55344	612-934-0845	450	OSTLUND, WARREN	55435	612-926-3122
518	LUND, MICHAEL T.	55109	612-770-5143	165	OZOLS, JURIS & PAULA	55344	612-941-8299
335	LUNDBERG, HERBERT W.	55082		300	PATANI, AMIN	55438	612-941-6159
7	LUNDQUIST, LEON L.	55417	612-721-2395	178	PAYNE, WILLIAM B.	55402	612-374-2931
126	MAC FARLANE, RON	55438	612-944-7919	323	PEITZ, PAUL J.	55429	612-560-9370
465	MADONNA, KEITH	55331	612-474-3876	361	PERRY, DOYLE P.	55441	612-546-8169
560	MAGES, CHARLES J.	55427	612-545-1859	53	PETER, JAMES W.	55409	612-926-7079
483	MAHANNAH, STEPHEN L.	55409	612-822-4918	120	PETERMAN, ALAN	55407	612-721-3295
225	MALARKEY, SANDY & DENNIS	55113	612-631-0347	275	PETERSON, ELAINE & RICHARD	55405	612-377-9007
568	MALMGREN, H. CHRISTER	55344	612-937-1950	384	PETERSON, GENE	55421	612-571-1923
529	MANSFIELD, J.P.	55480	612-566-4845	203	PETERSON, RICHARD H.	55356	612-473-5846
157	MANSFIELD, SEYMOUR J.	55416	612-925-5446	204	PETERSON, SUSAN	55436	612-920-5688
440	MARCELLIUS, LEN	55423	612-869-8654	481	PETTIT, ROBERT E.	55110	612-429-6028
219	MARIASH, CARY N., MD	55112	612-636-8286	479	PFAFF, ROBERT J.	55123	612-452-2540
102	MARTIN, S.C.	55404	612-340-0650	154	PHILLIPS, DONALD & ASSOC	55419	612-926-2628
453	MARUSKA, WILLIAM O.	55343	612-935-5815	286	PINT, VIRGIL	55343	612-938-7874
164	MASON, THOMAS R.	55404	612-824-0825	432	PITCHER, J.R.	55391	612-471-8308
67	MATHIESON, NEIL	55024	612-463-2248	207	PLACK, GREGORY A.	55418	612-825-6190
366	MAXWELL, STEPHEN L.	55104	612-225-5431	475	PLUIMER, MIKE	55431	612-835-5915
74	MC CABE, ELIZABETH BETTY	55413	612-379-8524	418	POSTERS, HENK	55440	612-473-2281
348	MC CLAIN, ROBERT J.	55420	612-884-4647	582	POSTER, ROBB L.	55435	612-944-2725
521	MC CLURG, ROBERT R.	55429	612-537-5233	339	PUES, V.R.	55423	612-866-5534
132	MC FERRAN, JAMES S.	55454		397	PUTRICH, DAVID	55423	612-866-9473
71	MC LEAN, GARY	55124	612-432-3046	257	QUALEY, TERRY	55110	612-777-6915
310	MC MONIGAL, SUE	55427		134	QUIMBY, CHARLIE	55407	612-822-1661
500	MEIKOVITZ, ANTHONY	55409	612-922-6260	167	RAY, CHARLES D.	55391	612-475-2000
341	MELANSON, HAROLD	55417	612-722-7550	46	REINER, ERIC	55110	612-429-9605
433	MELONY, CHARLES	55331	612-474-9461	124	RHOADES, BLUTCHER	55337	612-890-9779
410	MEYER, ROBERT J.	55410	612-920-6414	347	RICE, JAMES C. II	55378	612-890-0803
377	MEYER, ROGER	55344	612-937-9855	327	RICE, JEAN M.	55435	612-941-1051
302	MIELLENS, PAUL M.	55116	612-459-6291	110	RICH, KEN	55403	612-377-4682
181	MILES, BARBARA	55124	612-432-0528	99	RICHARDS, LOREN	55391	612-471-9430
91	MILLER, ART	55118	612-457-6461	476	RICHARDSON, LORNE	55410	612-922-9498
199	MILLER, JOE	55303	612-427-1787	72	RICHMOND, DAVID	55112	612-784-3007
89	MILLER, JOHN A.	55356	612-475-1570	381	RICHTER, WAYNE H.	55110	612-484-4800
100	MINNESOTA DEPT OF HEALTH	55440		289	RIGSBEE, PETER A.	55337	612-890-7391
542	MISKE, STEPHAN	55421	612-574-0292	182	RIVARD, DUANE J.	55113	612-484-8896
487	MISKOWIEC, DELORES	55401		176	ROADFELDT, JON	55104	
230	MOORE, BOB	55116	612-699-1818	436	ROHLING, MELVIN	55113	612-483-0162
437	MORAN, JACK	55424	612-920-0558	584	ROLLWAGEN, MARY	55419	612-827-6226
486	MORSE, SAM	55432	612-571-6685	30	ROOS, CYNTHIA	55110-1894	612-292-0535
32	MOTCHENBACHER, CURT	55343	612-938-6647	492	ROSE, THOMAS J., MD	55082	612-426-1555
280	MOTZKO, DANIEL T.	55416	612-922-5708	76	ROWLEY, DAVID G.	55124	612-432-3176
271	MUELLER, TOM	55424	612-920-6315	61	RUBENSTEIN, RICHARD D.	55414	612-379-8951
491	MULLIN, BARRY	55419	612-861-3875	417	RUCKER, RICHARD, JR, MD	55105	612-698-8435
103	MUNSON, LEN	55113	612-488-2695	551	RUFF, ALAN D.	55337	612-941-7074
458	MURPHY, MICHAEL P.	55119	612-776-0068	253	RUSSELL, ROBERT	55427	612-544-2809
368	MURPHY, THOMAS E. JR.	55426	612-938-8069	17	RUDD, ORVILLE	55431	612-888-1961
149	MURRELL, MICHAEL	55419	612-866-7397	245	RUZEK, KENNETH V., JR.	55445	612-424-2003
270	NEDBALEK, JAMES	55343	612-934-3531	419	RYDELL, ROBERT E., MD	55343	612-933-1019
485	NELSON, BARBARA	55423	612-861-1038	241	SALO, BILL	55373	612-477-5596
228	NELSON, GREG	55113	612-487-2527	352	SALO, WAYNE	55330	612-263-2477
448	NELSON, JON T.	55431	612-888-2246	346	SALTER, ROGER	55379	612-445-6324
59	NEUMAN, WALLACE G.	55421	612-572-1615	561	SAMBANA, NURTJAHYA	55406	612-375-1532
306	NEWMARK, RICHARD	55119	612-735-4541	331	SANDERSON, WAYNE A.	55112	612-484-0913
94	NEWSTROM, TERRY L.	55419	612-827-3159	530	SANDVEN, ROGER L.	55420	612-884-5841

ID#	Name	Zip	Tel	ID#	Name	Zip	Tel
498	SCALETТА, PAUL J.	55391	612-475-1043	256	THOMPSON, ERNEST L.	55432	612-786-1891
379	SCHAEFFLER, MARK	55113	612-633-9451	169	THOMPSON, ROY L.	55113	612-636-3419
85	SCHMITT, ROBERT W.	55339	612-467-3309	535	TIMMONS, MARTIN J.	55437	612-831-2883
573	SCHNEIDER, ROBERT	55303		49	TITTLE, PATRICK	55104	612-778-8258
114	SCHOEPPNER, JOHN C.	55075	612-455-8613	44	TOFT, ROD A.	55042	612-777-5460
303	SCHRANTZ, GARY	55369	612-425-1499	364	TORKILSEN, GARRY W.	55343	612-938-7140
187	SCHREIER, PATRICK	55406	612-722-7995	129	TOSTO, MARIO	55105	612-291-1191
343	SCHROEDER, KENT	55364	612-472-4158	236	TRENCE, DALE L., MD	55108	612-646-1919
40	SCHROPE, DONALD P. SR.	55372	612-447-3501	58	TROTTOCHAU, LARRY D.	55357-0032	612-479-3375
385	SCHROTENBOER, ED	55431	612-881-1857	321	TUCHNER, JOHN R.	55109	612-770-1524
205	SCHURR, DAVID	55432	612-571-1113	243	ULLYOT, JIM	55104	612-646-0561
188	SCHWENDEMAN, PEG	55031	507-263-3801	411	ULSTROM, ROBERT A.	55416	612-377-7707
407	SCOBAY, JOHN E.	55419	612-822-5234	232	UNITED HOSPITALS PHARMACY	55102	612-298-8855
344	SEBIO, LOU & MILAN	55437	612-831-4630	235	UTT, WALTER	55427	612-545-5390
226	SELAND, SANDY	55417	612-721-1075	587	VAN BEEK, CURTIS E.	55082	612-436-5786
545	SELGEBY, GARY LEE	55431	612-888-3150	210	VAN DYKE, MARTIN & CAROL	55443	612-560-3565
520	SELLORS, PAUL E.	55418	612-789-1811	563	VAUGHN, JAMES R.		612-560-8559
88	SEMLER, DON	55343	612-938-4477	510	VENNE, DONALD J., JR	55433	612-427-7063
153	SENG, R.C.	55403	612-333-5840	239	VERES, RICHARD J.	55124	612-432-7576
25	SEVERSON, TERRY	55438	612-941-1061	315	VERPLOEGH, JAMES A.	55109	612-770-8175
320	SHANES, JOHN B., JR	23111		547	VILLELLA, RONALD L.	55436	612-935-1307
502	SHARP, DANNY	55418	612-788-0559	342	VINCENT, ROBERT D.	55414	612-331-8476
558	SHEA, M. CLARE	55403	612-339-1007	13	VOGEL, DANIEL	55106	612-776-4294
41	SHEEHY, XAVIER	55427	612-542-9504	534	VOSSLER, JUDY C.	55343	612-933-7447
87	SHEETS, GEORGE A.	55104	612-646-7018	209	WAGNER, EDWARD G.	55303	
353	SHEPHERD, BEVERLY	54022		387	WALD, RANDY	55406	612-333-3450
288	SHEPHERD, JOHN	54022	715-425-6203	208	WALL, MARGARET & JAMES	55117	612-484-5315
63	SHERMAN, DAVID C.	55402	612-929-1484	86	WALTERS, GERALD	55369	612-424-2758
5	SIEGEL, ED	90274		166	WASHBURN, DAN	55102	612-292-0387
185	SIENKO, RICHARD A.	55406	612-721-2872	365	WATASHI, ROMAN	55404	612-722-4594
334	SIMONS, GERALD A.	55431	612-881-2936	214	WEINER, HOWARD	55416	612-925-3411
14	SINGER, BOB	55119	612-738-3368	454	WEINKE, DONALD C.	55133	
189	SKARE, DAVID A.	55101	612-724-7743	269	WEISER, WILLIAM	55112	612-636-1379
549	SKILLESTAD, THOMAS E.	55009	507-263-4735	233	WENTZEL, EARL	55417	612-727-3593
116	SLINGSBY, KEN	55089	507-263-3715	565	WESTPHAL, MICHAEL D.	55068	612-431-7482
222	SMITH, CORTLAND	55384	612-827-6872	591	WHEATON, BRUCE	55432	612-474-3363
50	SMITH, MICHAEL E.	55912	612-437-8156	62	WHITE, CHUCK	55379	
179	SMITH, SCOTT W.	55337	612-435-6405	261	WHITE, DAVID E.	55112	612-483-6926
543	SMITH, THOMAS L.	55418	612-781-0689	105	WHITE, GARRY C.	55944	507-634-4161
522	SNOWBECK, DUANE F.	55343	612-938-5738	444	WHITE, GARY D.	55419	612-822-7956
279	SOLIE, KENNETH	55421	612-789-6242	221	WHITE, JAMES A.	55112	612-636-4865
123	SOREM, BILL	55426	612-546-8703	539	WIGAND, RICHARD G.	55410	612-922-5998
159	SOUKUP, LARRY	55411	612-529-5455	416	WIKK, JOHN E.	55112	612-483-2592
378	SOUTER, CAROL ANN, MD	55416	612-926-9875	212	WILLIAMSON, DR. KENNETH R.	55901	507-253-5831
464	SPOTTED EAGLE, CHRIS	55427	612-545-1748	314	WINSOR, JAMES A.	55431	612-831-8149
501	STANLEY, ADAM PAUL	55419	612-925-3802	21	WIRTH, NANCY & MARTY	55429	612-561-1597
557	STERLING, RAYMOND L.	55409	612-822-3202	403	WISKI, DONN R.	55113	612-488-9586
307	STEWART, JOSEPH P., JR	55343	612-474-8162	137	WOLF, JIM	55112	612-483-1418
359	STEWART, PATRICK W.	55411	612-825-8226	415	WOLKOFF, DONALD M.	55116	612-698-2023
438	STILLEY, GEORGE D.	55427	612-544-4767	405	WOOD, ERVIN D., JR	55422	612-588-4743
594	STOKES, PETER C.	55344	612-944-3864	170	WOODS, RICHARD	55113	612-633-7324
115	STRAND, DALE	55431	612-888-4029	56	WOODWARD, F.B.	55115	612-426-4060
580	STRATE, RICHARD G.	55110		12	WYDEVEN, ROBERT M.	55122	612-452-3919
206	STRATHMAN, LARRY	55417	612-724-2833	330	WYNE, EARNEST C. III	55343	612-935-7148
408	SUBY, STEVEN F.	55440		111	YOUNG, A. MICHAEL	55420	612-884-2841
371	SUCHY, CECIL M.	55110	612-777-7821	581	YOUNG, ALWIN C.H.	55431	612-835-3099
395	SULLIVAN, STEVE B.	55410	612-920-8463	422	YOUNGQUIST, RICHARD L.	55056	612-674-4493
272	SWAN, JANET & CRAIG	55408	612-374-2496	540	ZAJICEK, WILLIAM R.	55101	612-776-1577
117	SWANSON, KENNETH W.	55431	612-884-2716	345	ZERBY, JUDY & MIKE	55432	612-571-5378
528	SWEARINGEN, THOMAS F.	55112	612-636-2933	412	ZIEGLMEIER, MICHAEL J.	55423	
16	SWENSEN, DANIEL	54022	715-425-5866	466	ZIMMER, ROBERT K, INC.	55112	
316	SWENSON, DANIEL H.	55407	612-822-7315				
133	SWENSON, LYNN W.	55359	612-479-3327	01-21-82	MINI 'APP' LES MEMBERSHIP		
370	T & T PRODUCTIONS, INC.	55420		602	BARRY, DORIS S.	55435	612-927-5833
146	TADAVARTHY, ANIL	55344	612-944-2074	601	BERQUIST, GERALD JOHN	55105	612-227-1201
499	TAYLOR, GEORGE	55418	612-788-2800	497	BOUCHARD, SCOTT	55437	612-888-2829
109	TAYLOR, TERRY B	55405	612-374-5848	552	ELWELL, DONALD R.	55436	
147	TENNESON, ROSS	55379	612-445-8363	600	HUBERT, PATRICIA W.(PAT)	55436	612-922-7664
135	TESKEY, DAVID	55343	612-474-8032	458	JOHANSEN, DAG	55372	612-447-5495
537	THAMES, MARTIN	55343	612-934-3517	599	JOHNSON, ZACK	55108	612-646-8048
577	THIESFELD, CHUCK T.	55431	612-830-5020	604	MILLS, FRANK S.	55418	612-789-7656
578	THIESFELD, LLOYD A.			553	OLSON, C.KENT	55359	612-479-2708
373	THOMAS, KATHY	55435	612-644-4468	605	ROBBINS, WAYNE	55343	612-473-3270
216	THOMAS, MARILYN	55408	612-872-7669	603	STEPANEK, DAVE	55364	612-472-6692
505	THOMAS, MR. & MRS. JOHN	55117	612-484-8492	554	TUFTE, DAVID	55356	