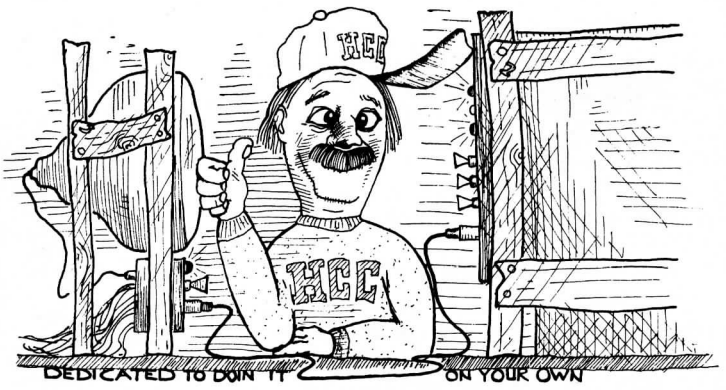
NEWSLETTER

Homebrew Computer Club



Robert Reiling, Editor — Post Office Box 636, Mountain View, CA 94042 — Joel Miller, Staff Writer
Typesetting, graphics and editorial services donated by LAUREL PUBLICATIONS, 17235 Laurel Rd., Los Gatos, CA 95030 (408) 353-3609

random data

by robert reiling

Personal and home computing continue to interest more and more people. The hobbyist clubs are expanding, more computer stores are opening, new products are being announced, magazines devoted to personal computers are increasing in number, and predictions are being made about where we are going. A few people are attempting to determine what has happened in the past two years and how many computers and computer people are out there.

This issue of the NEWSLETTER has a survey that presents a list of the Homebrew Computer Club systems. I even projected that data. Maybe you would like some facts about the Homebrew Computer Club, not projections just facts. OK, from the history file:

Homebrew Computer Club first meeting—March 5, 1975
First meeting attendance—32 people
First newsletter published—March 15, 1975
Homebrew Computer Club meeting—October 15, 1975
Attendance—-80 people
Computers up and running—38
Homebrew Computer Club Newsletter distribution March 1976—600 copies
Homebrew Computer Club meeting—June 9, 1976
Attendance—250 people
Computers up and running—101
Homebrew Computer Club meeting—January 19, 1977
Attendance—240 people
Computers up and running—182
Homebrew Computer Club Newsletter distribution January 1977—1500 copies

According to Gordon French, the Homebrew Computer Club is the oldest major hobbyist club in the world. Gordon's garage was the location of the first meeting.

The *Wall Street Journal* published a front page article Friday, February 4, 1977 titled: Home Input, TheComputer Moves From the Corporation To Your Living Room. The article by David Gumpert, staff reporter of *The Wall Street Journal*, makes this observation: "The home-computer industry is so new and so fragmented that it hasn't got around to computing its own progress, so nobody knows how many individuals have bought computers. But estimates range from 20,000 to 100,000." There is much more in this article including some quotations from Jim Warren, a member of the Homebrew Computer Club and editor of Dr. Dobbs Journal. Look this article up if you missed it.

I note that De Anza College is offering microcomputer programming courses. Contact DE ANZA COLLEGE — SHORT COURSES, 21250 Stevens Creek Boulevard, Cupertino, CA 95014.

David Bunnell, publisher of Personal Computing Magazine, has announced the acquisition of Microtrek Magazine which will become a special section in Personal Computing. Microtrek, the computer magazine for the hobbyist, was first published in August of 1976. Its second edition was recently published in December of 1976. Subscribers to Microtrek Magazine will begin receiving Personal Computing Magazine with the upcoming March-April edition.

Apple Computer, Inc., 770 Welch Road, Palo Alto, CA 94304, telephone (415) 326-4248, has advance order information for the Apple-II. The Apple-II consists of a 6502 microprocessor, video display electronics including color graphics, RAM, ROM, ASCII keyboard port etc. all on a single PC board. If you order now, delivery is expected to be no later than April 30, 1977.

Don't forget articles are needed for the NEWSLETTER. Also, don't forget your donations are needed to pay for postage, printing, etc. ☐

survey
hcc

homebrew computer club

At the meeting January 19, 1977

This survey was taken during the Homebrew Computer Club regular meeting on January 19, 1977. Approximately 240 people attended the meeting. The survey shows a remarkable number of personal computers in use by the club with many systems running with 8K bytes or more of memory. Seventy-five percent of this group own computer systems. Projecting this percentage of computers in operation to the 1500 people that receive the Homebrew Computer Club NEWSLETTER would indicate 1125 computers owned by the group. There is plenty of room for error in this type of projecting but it is a very good indication of the investment of club members in personal computer products. □

SURVEY STATISTICS

Manufacturer	*Total Systems Operating*	*Systems With 8K and Up Memory*
IMSAI 8080	*43*	*35*
ALTAIR 8080	*22*	*15*
PTC SOL	*5*	*1*
POLYMORPHICS 88	*5*	*3*
OTHER 8080 SYSTEMS	*19*	*11*
APPLE 6502	*6*	*5*
SPHERE	*1*	*1*
AMI BOARD	*20*	*10*
JOLT	*5*	*2*
SW TECHNICAL PRODUCTS	*4*	*4*
KIM	*4*	*0*
OTHER 6800/6502 SYSTEMS	*9*	*5*
F8	*5*	*2*
Z80	*9*	*6*
8008	*9*	*1*
TTL	*1*	*1*
BIT SLICE	*1*	*1*
RCA 1802	*6*	*1*
LSI 11	*3*	*2*
OTHERS	*5*	*5*
TOTAL	*182*	*111*

ADDITIONAL SURVEY STATISTICS

Systems with 16K and up memory	*52*
Systems with 32K and up memory	*11*
Floppy disc systems	*16*

a wild-eyed production in TECHNIFUNK

hcc meetings

Homebrew Computer Club Meeting
Schedule For Remainder of 1977

March 2, 16 and 30
April 15 and 29
May 13 and 25
June 8 and 22
July 6 and 20
August 3, 17 and 31
September 14 and 28
October 12 and 26
November 9 and 23
December 7 and 21

All dates are subject to change or cancellation. If a change does occur, advance notice will be published in the NEWSLETTER if time permits. □

club member develops EPROM bd.

by joel miller

Gary Mahoney, a Homebrew Computer Club member, has just announced his PROROM 8K Memory Module is ready for shipping. Not satisfied with existing EPROM memory board kits, Gary decided to design and manufacture his own to incorporate a number of useful features not found in other kits. Not only is this kit less expensive than the others, it has many unique and useful features.

PROROM is an 8K memory board with 7½K of 6834 EPROM, ½K of RAM, and a built-in EPROM programmer. It is fully S-100 bus compatible and can be used to hold and run BASIC. PROROM will transfer data from non-permanent RAM memory, or a keyboard, directly into the non-volatile EPROM memory contained in the PROROM board. Once the data is stored in EPROM, it is forever protected from power-downs, accidental or intentional.

PROROM is fully compatible with an ALtair, IMSAI, PTC or any other S-100, 8080-based computer. PROROM's power requirements are well within S-100 bus specifications.

A thoughtfully included on-board ½K of 6810 RAM provides a convenient area for stack and scratch pad. This means valuable little areas of other RAM boards don't need to be used. If you have used anybody else's PROM board, you know just how handy an extra 512 bytes of on-board RAM can be.

The flexible system monitor included with every kit transfers data from RAM using a transfer routine or inputs data directly into EPROM from the keyboard. The monitor keyboard loader allows any number of strings to be run right into EPROM without messing with RAM. Double-check routines verify that all EPROMs have been fully erased and that the memory transfer is perfect, bit-for-bit; addresses of any bad bits are printed out. Other monitor routines can be used to examine memory, modify memory, dump blocks or jump to a user routine. The status port is adjustable so the monitor can be used with any 8080 computer.

Since EPROMs are written just like RAM, you don't have to use this monitor if you have a favorite one of your own. Any transfer routine or keyboard loader will work just fine—another important feature not found in other EPROM boards.

Why 6834 EPROMs? The AMI S-6834s are used for a number of reasons. The first is price. Very simply, the 6834 is cheaper. The price per bit for a fully stuffed PROROM is 4¢ per bit. The nearest competitor uses the 2704 and his price (figure it out for yourself) is 5¢ per bit. But, according to Gary, price isn't the only reason the 6834 was selected. The 6834 erases to 00 in all bit locations which are NO OP instructions to an 8080. So, any number of bytes can be programmed at a time. You can program one byte or all 7½K. In other words, you can burn in a little bit of code, leave some blank area for later use and burn in another block. Since the 8080 sees the non-programmed area as NO OPs, the blank area can be used to modify or update the program at a later date.

Although not spec'ed as fast as some other EPROMs, the 6834 is fast enough to let an 8080 run full speed without a wait state for memory access. Programs as large as 7½K can be loaded into RAM in less than one second. EPROMs can be programmed in any of the eight PROM sockets and all PROM locations can be protected.

The complete PROROM kit is $164 which includes a double solder-masked pc board, sockets for all ICs, all other components including one 256-byte 6810 RAM and one 512-byte 6834 EPROM preprogrammed with the system monitor. Prime quality components are used throughout. The pc board has a silk-screened legend to simplify stuffing. Extensive documentation and excellent assembly instructions are included. Additional AMI S-6834 EPROMs are available for the following prices: 10 or more/ $17 ea., 5 - 9/$18 ea., 1 - 4/$19 ea. *For more information write to Gary at P. O. Box 1133, Ben Lomond, CA 95005 or, if you are really desperate, give him a buzz at (408) 336-2495.* □

do you like this format? let us know

computer music journal

The COMPUTER MUSIC JOURNAL is devoted to the development of computer systems which are capable of producing high fidelity music. The following topics will be covered:

composition of music using a computer

production of natural sounding timbre of quality of tone by

Fourier series synthesis

FM synthesis and other methods which take a small number of program steps

design of real time playing instruments

real time input controllers such as keyboards, joysticks, and new controllers

circuit design of computer controlled oscillators

high speed multiplication 16 bit X 16 bit → 16 bit product in less than 200 ns

review of hardware components

Homebrew computer music instruments

digital filtering

digital reverberation

high resolution, high speed digital to analog converters and sample and hold devices

analysis of acoustic instruments

psychoacoustics

music theory which would be more easily realized with a computer than with traditional music instruments

descriptions of presently existing computer music systems

reviews of books about computer music, acoustics of musical instruments, psychoacoustics, music theory, computer design, and electronics.

The first issue of the journal will be about 50 pages in length. If enough people subscribe to pay for printing a larger journal and if people contribute more articles, the journal will increase in size. There will be no commercial advertisements. The journal will be published every other month. Subscription is $14 for one year. Contact PCC, Box 310, Menlo Park, CA 94025. □

selecting a computer system

Red Stolle, in the process of selecting a computer system, sent the following letter. How would you answer Red's questions? Dick Sherman's letter in response presents several steps that may be taken. If you are starting into the hobbyist computer field you will want to consider Dick's remarks.

Dear HCC:

I found the Club address in the Jan. issue of Popular Electronics. In as much as your club is made up of Homebrewers and right smack in the middle of all the Calif. Know-how, I thought that perhaps someone could help me.

1. I live aboard a small sailboat in the Virgin Islands and wish to break into the RTTY/Computer World without a lot of fuss and expense.

2. Please suggest a smart and economical approach to the Ham, Commercial RTTY/Computer TV display system. I'm starting from scratch and hope to avoid the mistakes made by others.

3. I cannot afford to buy kits, bits and pieces indiscriminately to learn to play with.

4. All the equipment, kits, boards etc. must be operated from 12 volts or less. I have no A.C.

5. I will be able to understand your suggestions about equipment much better if you would indicate them on a simple block type flow diagram. Just hand write it in, starting with the receiver and ending with the TV display. Indicate each unit by name and function and tell me where I can buy it.

I've tried to make answering this letter as painless as possible. Any suggestions on this subject will be very much appreciated. I have included a stamped self-addressed envelope. You can if you like return this letter with the comments handwritten below and on the back, whatever makes answering easiest.

Sincerely,
Red Stolle

Dear Red:

I have been asked by the president of the Homebrew Computer Club to respond to your letter of Oct. 31, 1976.

First of all, let me say that since we are obviously talking about the hobbyist computer field there is no one vendor who can supply all of your needs for a computer controlled RTTY/CW amateur radio station. Most microcomputer/CRT display systems can be programmed to do these functions if properly interfaced with your receiver and transmitter. The October 1976 issue of BYTE Magazine has several excellent articles on automatic CW reception and generation from a keyboard. Recent issues of 73 Magazine and Ham Radio have included additional ideas on RTTY using small hobbyist computers. I would suggest you check these out to bring yourself up to date on the various methods available for achieving your goal.

Most of the microcomputer kit manufacturers offer systems suitable for your application. Price varies according to how many bells and whistles you decide you may need. The Altair and Imsai kits featuring the 8080A microprocessor chip function well and have a bus structure which has more or less become a standard. This allows you to buy additional peripheral boards from many vendors to expand your system if you so desire. Furthermore, there exists a vast amount of applications software for the 8080 type microprocessor.

The Motorola (and AMI) 6800 microprocessor has also been built into many hobbyist kits (Southwest Technical Products, MITS, SPHERE, the Digital Group, et. al.). It uses a different language for programming but a growing store of software exists for it too.

You should decide which microprocessor fits your needs best—or choose a kit which fits your budget.

If you don't need hard copy (i.e., teletype) you can use a system consisting of a microprocessor and a small amount of memory (several thousand bytes), plus a keyboard which will interface with a video display. The electronics for the video display are manufactured by several firms (write to Processor Technology or Southwest Technical Products among others for specifications and prices). The display itself can be a small screen TV with simple modifications.

Your power supply may lead to some problems since most microcomputers require +5 volts at several amperes and sometimes ±12 VDC at small current. The negative voltage can usually be obtained by building a small DC to DC converter (an oscillator and transformer plus rectifier and filter). If you can stand the current drain on your battery, you are in business.

RCA has a CMOS microprocessor chip family which operates on higher voltage and lower current but it is not currently offered as a kit by hobbyist type manufacturers. In addition, it would probably be considerably more expensive since their memory chips have not appeared as a discounted item.

To review, I would strongly suggest that you review the indicated literature as to techniques available to achieve your goal and then determine if you are willing to invest the time and money required. It is especially important to realize that a considerable skill in both programming (software) and building (hardware) is required to undertake such a project as yours. Should trouble arise, you may find help hard to obtain due to your location.

I wish you luck in your undertaking.

Sincerely,
Dick Sherman

WHAT TIME IS IT?

New Product Release

Lincoln Semiconductor has a new microcomputer card that provides the microcomputer with easy access to the time of day—hours, minutes and seconds. It communicates through an I/O port and is program settable and readable with no extra switches. It fits the standard Altair bus. The company has announced a kit priced at $95.00 containing all parts and documentation. An assembled and fully tested unit is available at $145.00. *Contact Lincoln Semiconductor, P.O. Box 68, Milpitas, CA 95035 for complete details and quantity prices.*

6800 users co-resident editor/assembler

by ***walter scott***

6800 users may be interested in a new co-resident editor/assembler from SWTPC which I found on the rack at BYTE, Santa Clara. Unlike the original assembler and editor programs from SWTPC which could not co-reside in memory, the new program requires just a keystroke to switch from one program to the other.

The new program uses the control interface port of the SWTPC 6800 for its primary terminal and can output to a printer like SWTPC's PR-40 line printer through a parallel port. The patches allow me to use a TVT and cassette interface as a terminal, and output to a TTY through a serial interface rather than the printer with parallel port.

The new assembler/editor appears to be the old SWTPC Motorola derived assembler combined with the Uiterwyk editor which was published in the June 1976 SWTPC Computer Newsletter. Except for the printer output and string handling features of the new editor, both have the same commands. □

```
PAGE  001   ACIAINIT


00010                          NAM     ACIAINIT
00020                  *ROUTINE TO INITIALIZE SERIAL PORT FOR TTY
00030                          OPT     O,S
00040  17A2                    ORG     17A2H
00050  17A2 CE 800C            LDX     #800CH    SWTPC PORT 3
00060  17A5 C6 43              LDA B   #43H
00070  17A7 E7 00              STA B   0,X
00080  17A9 C6 01              LDA B   #1
00090  17AB E7 00              STA B   0,X
00100                          END

TOTAL ERRORS 00000


PAGE  001   ACIA OUT


00010                          NAM     ACIA      OUTPUT ROUTINE
00020                          OPT     O,S
00030       1A86     BEGIN     EQU     1A86H
00040       800C     PORT3     EQU     800CH
00050  1A86                    ORG     BEGIN
00060  1A86 CE 800C            LDX     #PORT3
00070  1A89 E6 00     WAIT    LDA B   0,X       ACIA STATUS
00080  1A8B C5 02              BIT B   #02       TDR FULL?
00090  1A8D 27 FA              BEQ     WAIT
00100  1A8F A7 01              STA A   1,X       FILL TDR
00110  1A91 16                 TAB
00120  1A92 01                 NOP
00130  1A93 01                 NOP
00140  1A94 01                 NOP
00150  1A95 01                 NOP
00160  1A96 01                 NOP
00170  1A97 01                 NOP
00180  1A98 01                 NOP
00190                          END
BEGIN   1A86
PORT3   800C
WAIT    1A89

TOTAL ERRORS 00000
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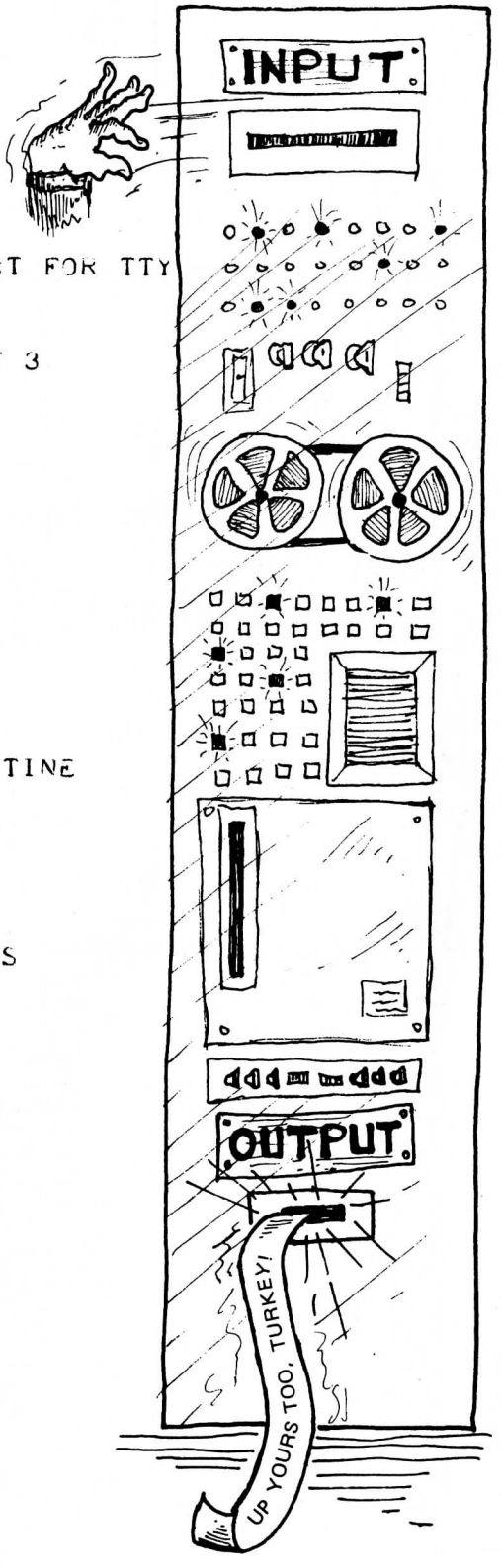
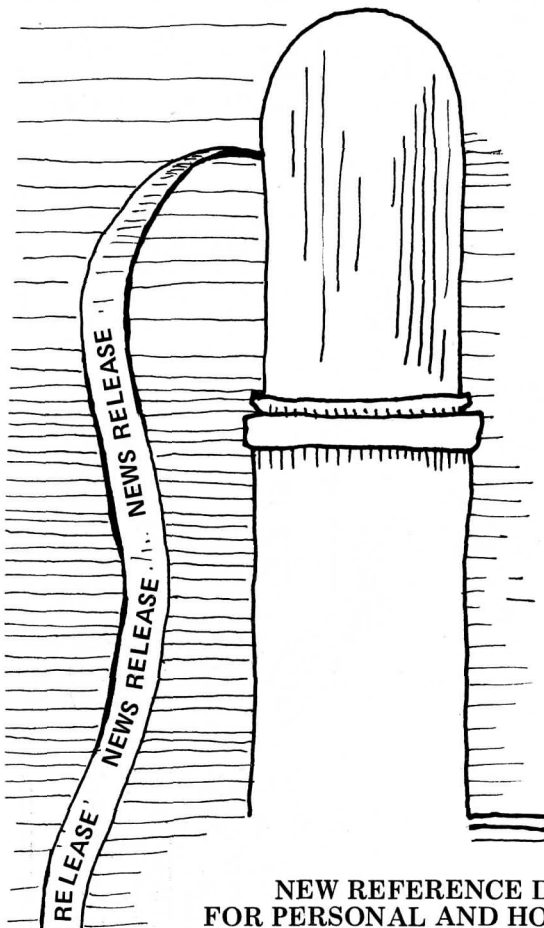


PROM erasers



Shepardson Microsystems, 20823 Stevens Creek Blvd., Bldg. C4-H, Cupertino, CA 95014, Telephone (408) 257-9900, is a stocking distributor for Ultraviolet Products' PROM Erasers. The following table summarizes the available models.

	UVS-11	*UVS-54T*	*S-52T*
Capacity (# of PROMS)	*4*	*8*	*16*
Approximate Erase Time:			
1702s, 5203s, or 5204s	*20 min*	*14 min*	*7 min*
2704s, or 2708s	*32 min*	*22 min*	*11 min*
Irradiance at 1" (uw/cm^2)	*5200*	*7500*	*15,000*
30 Minute Timer	*no*	*yes*	*yes*
Instant Start	*no*	*no*	*yes*
Tray	*no*	*yes*	*yes*
Price	*44.75*	*99.00*	*209.00*

All units are housed in rugged CYCOLAC (registered trademark of Borg-Warner Corporation) and UL listed. No filters are used when erasing PROMS. Erase times assume that 2704s and 2708s require 10 joules whereas 1702s, 5203s and 5204s require 6 joules. □

NEW REFERENCE DIRECTORY FOR PERSONAL AND HOME COMPUTING

A new, comprehensive reference directory for personal and home computing that will help every micro-computer enthusiast is being published by People's Computer Company. For the first time, PCC'S REFERENCE BOOK OF PERSONAL AND HOME COMPUTING—SPRING 1977 will bring together in one place listings of all possible sources or hardware, software, parts and services; of clubs, stores, periodicals and books. It will also contain many pages of more detailed information on numerous products and services. Invaluable cross-reference indices list and locate the manufacturers of specific products, for example, floppy disc interfaces.

PCC'S REFERENCE BOOK OF PERSONAL AND HOME COMPUTING—SPRING 1977 will soon be available (by the end of March) for $4.95 from most local computer stores or directly from People's Computer Company, 1010 Doyle St. #9, Box E, Menlo Park, CA 94025. □

DATA CATCHER

SAN DIEGO—Electronic Product Associates, Inc., 1157 Vega Street, San Diego, CA 92110, 714-276-8911, announces the availability of their new DATA-CATCHER option for the MICRO-68 line of 6800 Microprocessor prototype development systems. The DATA-CATCHER provides for single step operation of the MICRO-68. The DATA-CATCHER captures address and operand after the completion of each machine instruction and displays the data on an integral 6 digit hexdisplay. This feature provides for easy debugging of new programs written by the user. *The DATA-CATCHER is available from stock as an option to EPA's expanded-68 Micro-computer system for $140.00.* □

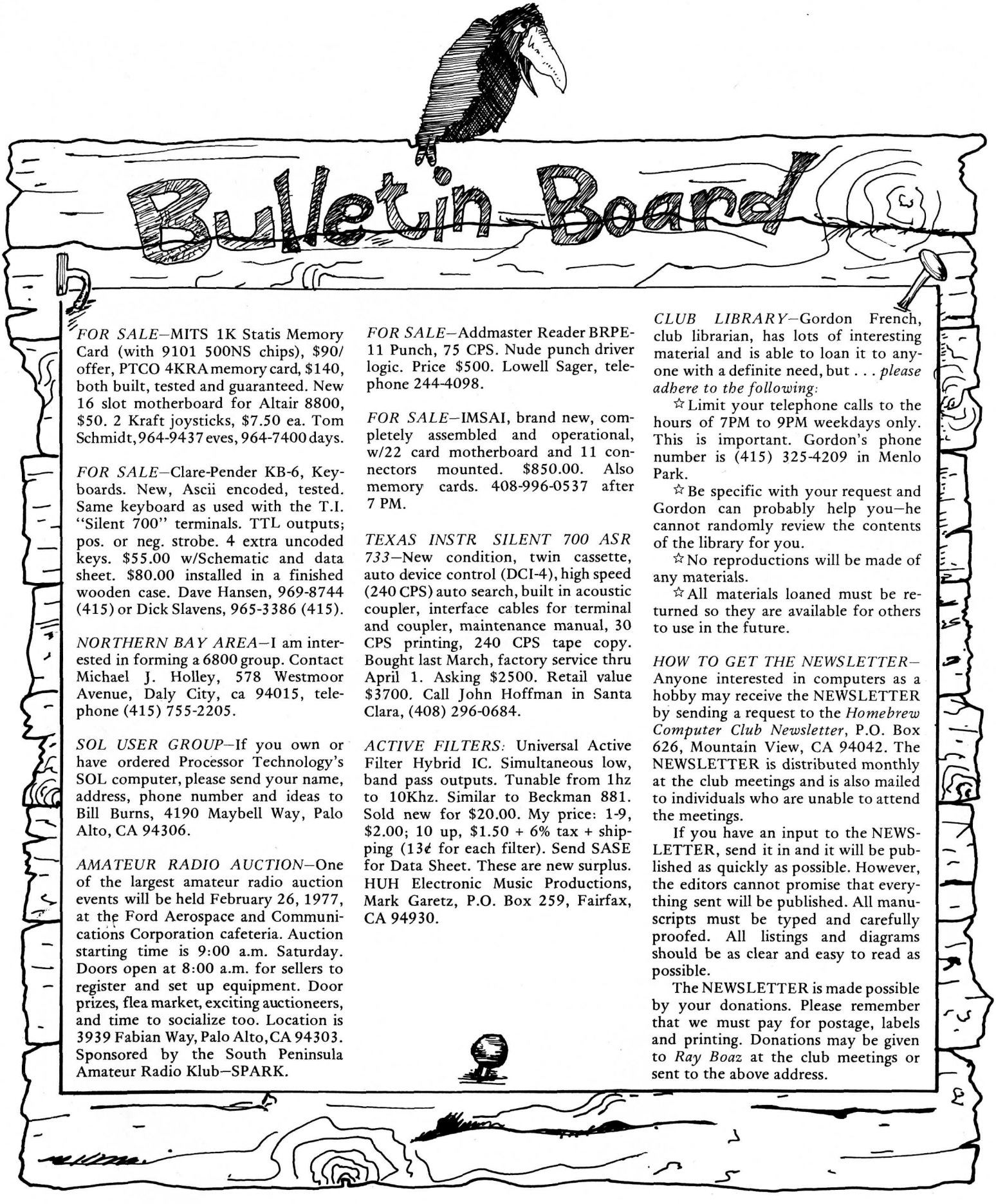
READY TO USE FLOPPY DISK SYSTEM FOR S-100 8080 MICROPROCESSORS

Synetic Designs FDS-2 complete disk system includes dual floppy drives, controller, interface, power supplies, cabinet and software. Utilizing ICOM's sturdy and proven IBM compatible Frugal Floppy system together with their excellent Executive system, Text Editor, and Assembler, the FDS-2 features a stylish cabinet and an exclusive "Executive Handler."

The system is delivered ready to use with no I/O vector assignments, initialization routines or program relocation required of the user. Simply insert the interface card into the computer, the customized diskette into the floppy drive, and RUN. A source copy of the FDS-2 Executive Handler is provided to allow the more sophisticated user to build a more complex disk operating environment.

Delivery is stock to two weeks with OEM and dealer discounts available. The ready to use disk system is distributed nationwide by the BYTE SHOPS and other dealers.

SYNETIC DESIGNS COMPANY, P.O. Box 2627, Pomona, CA 91766. Phone 714-629-1974. □



FOR SALE—MITS 1K Statis Memory Card (with 9101 500NS chips), $90/ offer, PTCO 4KRA memory card, $140, both built, tested and guaranteed. New 16 slot motherboard for Altair 8800, $50. 2 Kraft joysticks, $7.50 ea. Tom Schmidt, 964-9437 eves, 964-7400 days.

FOR SALE—Clare-Pender KB-6, Keyboards. New, Ascii encoded, tested. Same keyboard as used with the T.I. "Silent 700" terminals. TTL outputs; pos. or neg. strobe. 4 extra uncoded keys. $55.00 w/Schematic and data sheet. $80.00 installed in a finished wooden case. Dave Hansen, 969-8744 (415) or Dick Slavens, 965-3386 (415).

NORTHERN BAY AREA—I am interested in forming a 6800 group. Contact Michael J. Holley, 578 Westmoor Avenue, Daly City, ca 94015, telephone (415) 755-2205.

SOL USER GROUP—If you own or have ordered Processor Technology's SOL computer, please send your name, address, phone number and ideas to Bill Burns, 4190 Maybell Way, Palo Alto, CA 94306.

AMATEUR RADIO AUCTION—One of the largest amateur radio auction events will be held February 26, 1977, at the Ford Aerospace and Communications Corporation cafeteria. Auction starting time is 9:00 a.m. Saturday. Doors open at 8:00 a.m. for sellers to register and set up equipment. Door prizes, flea market, exciting auctioneers, and time to socialize too. Location is 3939 Fabian Way, Palo Alto, CA 94303. Sponsored by the South Peninsula Amateur Radio Klub—SPARK.

FOR SALE—Addmaster Reader BRPE-11 Punch, 75 CPS. Nude punch driver logic. Price $500. Lowell Sager, telephone 244-4098.

FOR SALE—IMSAI, brand new, completely assembled and operational, w/22 card motherboard and 11 connectors mounted. $850.00. Also memory cards. 408-996-0537 after 7 PM.

TEXAS INSTR SILENT 700 ASR 733—New condition, twin cassette, auto device control (DCI-4), high speed (240 CPS) auto search, built in acoustic coupler, interface cables for terminal and coupler, maintenance manual, 30 CPS printing, 240 CPS tape copy. Bought last March, factory service thru April 1. Asking $2500. Retail value $3700. Call John Hoffman in Santa Clara, (408) 296-0684.

ACTIVE FILTERS: Universal Active Filter Hybrid IC. Simultaneous low, band pass outputs. Tunable from 1hz to 10Khz. Similar to Beckman 881. Sold new for $20.00. My price: 1-9, $2.00; 10 up, $1.50 + 6% tax + shipping (13¢ for each filter). Send SASE for Data Sheet. These are new surplus. HUH Electronic Music Productions, Mark Garetz, P.O. Box 259, Fairfax, CA 94930.

CLUB LIBRARY—Gordon French, club librarian, has lots of interesting material and is able to loan it to anyone with a definite need, but . . . *please adhere to the following:*

☆ Limit your telephone calls to the hours of 7PM to 9PM weekdays only. This is important. Gordon's phone number is (415) 325-4209 in Menlo Park.

☆ Be specific with your request and Gordon can probably help you—he cannot randomly review the contents of the library for you.

☆ No reproductions will be made of any materials.

☆ All materials loaned must be returned so they are available for others to use in the future.

HOW TO GET THE NEWSLETTER—Anyone interested in computers as a hobby may receive the NEWSLETTER by sending a request to the *Homebrew Computer Club Newsletter*, P.O. Box 626, Mountain View, CA 94042. The NEWSLETTER is distributed monthly at the club meetings and is also mailed to individuals who are unable to attend the meetings.

If you have an input to the NEWSLETTER, send it in and it will be published as quickly as possible. However, the editors cannot promise that everything sent will be published. All manuscripts must be typed and carefully proofed. All listings and diagrams should be as clear and easy to read as possible.

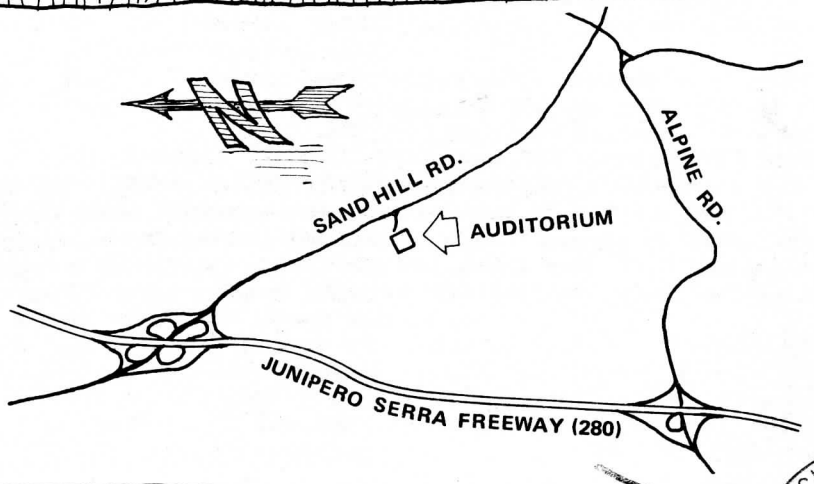
The NEWSLETTER is made possible by your donations. Please remember that we must pay for postage, labels and printing. Donations may be given to *Ray Boaz* at the club meetings or sent to the above address.

contents

HOMEBREW COMPUTER CLUB MEETINGS

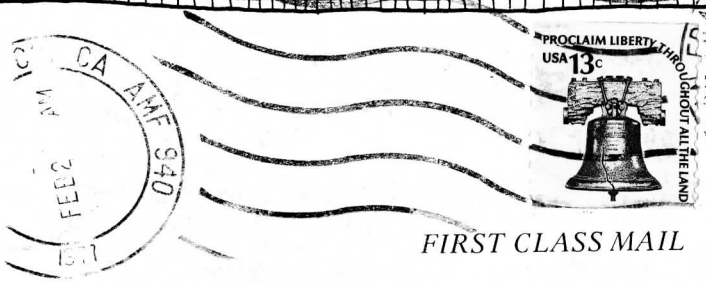
Where And When

The Homebrew Computer Club meets at 7PM at the Stanford Linear Accelerator Center Auditorium. Dates scheduled for March are the 2nd, 16th and 30th. A complete list of meetings scheduled this year is listed elsewhere in the NEWSLETTER. The dates and the location are subject to change. If a change does occur, every effort will be made to provide advance notice in the NEWSLETTER.



HOMEBREW COMPUTER CLUB NEWSLETTER

P.O. Box 626
Mountain View, CA 94042



FIRST CLASS MAIL

LENNY SHUSTEK
P.O.BOX 3210
STANFORD, CA
94305