NEWSLETTER

Homebrew Computer Club

RANDOM DATA
By Robert Reiling

Computer clubs continue to form around the country...E. Brooner would like to have material to help him get started with the "Flathead Computer Society" in the Kalispell area. His Address is P.O. Box 236, Lakeside, Montana 59922.

Did you see the SOL terminal demonstrated by Bob Marsh at the Sept. 1st meeting? An excellent design that will interest hobbyists and commercial users alike. It's available from Processor Technology, 6200 Hollis St., Emeryville, CA 94608. Write them for prices and specifications.

The OSI Systems Journal has been sent to all OSI customers (free—at least for the time being). It's a bi-monthly magazine with plans to go monthly in the future. There are 28 pages in the first issue (August 1976, Vol. 1, No. 1) with a hardware feature covering the OSI 440 Video Graphics System and software, features concerning Tiny BASIC for the 6800 and a Graphics Editor for the 6502. It also includes OSI product and software catalog data. The BASIC is, of course, the 2K Tiny BASIC developed by Tom Pittman. Many of you have met Tom at the Homebrew computer Club meetings. The OSI Systems Journal is a good way to learn more about the OSI computer hardware and software along with helpful user information. The contact address is: The OSI Systems Journal, P.O. Box 134, Hiram, Ohio 44234.

KIM-1 users now have a newsletter. Eric Rehnke is producing the newsletter every 5-8 weeks, MOS Technology, Inc. helped get it started by sending copies to all known KIM owners. The user group, however, is independent of MOS Technology, Inc. The newsletter is devoted to KIM-1 support. Subscriptions are $5.00 for the next six issues. Contact "KIM-1 User Notes," c/o Eric C. Rehnke, Apt. 207, 7656 Broadview Rd., Parma, Ohio 44134.

The BAMUG club has a new contact address. It is BAMUG, c/o Timothy O'Hare, 1211 Santa Clara Ave., Alameda, CA 94501. Write Timothy for club information. I suggest you include a stamped, self-addressed envelope.

Beware of board snatchers! Glenn Ewing reports 11 boards were taken out of his IMSAI computer. The boards are: MPU, 4 RAM-4's, SIO-2, P10-4, PIC-8, PROM-4, IFM and FIB. Glenn suggests you consider providing good security for your computer and associated equipment. In his case the computer was in a locked office which was burglarized. In the event you have information on the above boards, write Lt. Glenn Ewing, Code 62EI, Naval Post Graduate School, Monterey, CA 93940.

For family and friends of people who always wanted to know about computers, but didn't want to ask them, four easy-going classes are available starting Oct. 19th on Tuesdays from 7 to 9 p.m. You can learn how computers work and what they can and can't do. You will also have some of the jargon deciphered, see what you can do with a computer, play some games and learn to program. The cost is $25. Contact the Community Computer Center, 1919 Menalto Ave., Menlo Park, CA 94025, phone (415) 325-4444.

A call for papers in personal computing has been issued by the 1977 National Computer Conference. The conference is scheduled for June 13-16, 1977. I have a few copies of the guidlines if you would like to submit a paper.

The First West Coast Computer Faire will be held April 16 and 17, 1977 at the San Francisco Civic Auditorium. This faire is shaping up rapidly. If you would like to lead a conference or participate in a conference session, please contact me. More information about the Faire is in the accompanying article.□

THE FIRST WEST COAST COMPUTER FAIRE
A Call For Papers And Participation

The San Francisco Bay Area is finally going to have a major conference and exhibition exclusively concerned with personal and home computing—The First West Coast Computer Faire. And, it promises to be a massive one! It will take place in the largest convention facility in Northern California: The Civic Auditorium in San Francisco. It will be a two-and-a-half day affair, starting on Friday evening and running through Sunday evening, April 15-17.

It is being sponsored by a number of local and regional hobbyist clubs, educational organizations and professional groups. These include:

●The two largest amateur computer organizations in the United States—the Homebrew Computer Club and the Southern California Computer Society
●Both of the Bay Area chapters of the Association Of Computing Machinery—the San Francisco Chapter and the Golden Gate Chapter
●Stanford University's Electrical Engineering Department

•The Community Computer Center—one of the first walk-in-and-use-a-computer centers
•People's Computer Company—a non-profit educational organization
•The Amateur Research Center—affiliated with the Foothill College Space Science Center

It is expected that the Faire will draw 7,000-10,000 people, will have 50 to 100 conference sessions, and will include over 200 commercial exhibitors. These predictions are based on (1) the unusually wide range of sponsors and local support, (2) the proximity of the Fair site to "Silicon Valley"—the San Francisco Penninsula which is the undisputed center of semiconductor and microprocessor manufacturing, (3) the more than half-year of planning and organization that is going into the Faire, and (4) the increasing success of previous such conventions in the East and Midwest.

The conference portion of the Faire will include everything from formal papers through informal, off-the-cuff talks, as well as panel sessions, seminars, and presentations of homebrewed systems and projects. Prizes and awards will be given for the most outstanding such projects.

The conference details are shaping up quite nicely at this time and some of the Conference Sections include the following:

•Personal computers for education, a Section that will have associated with it a university-credit short course arranged through the University of California
•Computer graphics for personal computers
•Computer driven and computer assisted music
•Personal computers for the physically handicapped
•Computers and amateur radio
•Speech synthesis using home computers
•Computers for use in very small businesses
•Microprogrammable uPs for hobbyists
•Digital cassette tape standards—panel session
•Peripherals interface standards for personal computers
•Bus standards for hobbyist computers and peripherals
•Software modularization for program portability
•Discussion session for computer club officers
•Discussion session for conference and convention organizers
•Editing of computer club newsletters
•Discussion session for editors of computer hobbyist magazines
•Floppy disk systems for home computers
•Computer games—alphanumeric and graphic
•Word processing and text editing using personal computers
•Advertising and publications for manufacturers of personal computing products.

Each of the dinners and the luncheon will have speakers as well as offering the opportunity to socialize and exchange information with fellow computer enthusiasts. One of the speakers will be Professor Henry Tropp, who has been the Principal Investigator for almost three years in the Computer History Project jointly sponsored by the Smithsonian Institute and the American Federation of Information Processing Societies. During that time, he has traveled internationally, conducting in-depth interviews with many of the originators of the computer revolution, and building research archives for the Smithsonian. He is a most fascinating lecturer and will present a number of facets and stories of those early days of computing and the

people and events that have shaped the computer technology and techniques available today.

As far as the exhibition part of the Faire is concerned, response has been enthusiastic. In the first three days of contacting possible exhibitors, a considerable number of them committed to being there, including Zilog, National Semiconductor, American Microsystems, Inc. (AMI), MOS Technology, *Byte*, *Interface*, *Dr. Dobb's Journal*, *People's Computer Company*, *73* magazine, *Kilobyte*, *Microcomputer Digest*, Processor Technology, Cromemco, OSI, Percom, Osborne & Assoc., Technical Design Labs, Polymorphic Systems, Microcomputer Associates, national Multiplex, Quay Corp., Southwest Technical Products, Apple Computers, Byte Inc., Call Computer, STM Systems, Computer Conversor, Solid State Music, Project Support Engineering, iCom, Shugart Assoc., CompuMart, Monolithic Systems, Associated Electronics, and on and on.

There are two people primarily responsible for coordinating the organization of the Computer Faire:

Jim Warren, General Chairperson
(Editor, *Dr. Dobb's Journal* & Vice-Chairman,
Penninsula ACM Chapter)
People's Computer Company
P.O. Box 310, Menlo Park, CA 94025
(415) 323-3111 or (415) 851-7664

—and—

Bob Reiling, Operations Manager
(Editor, *Homebrew Computer Club Newsletter*)
193 Thompson Square
Mountain View, CA 94043
(415) 967-6754

The Faire coordinators are actively seeking additional speakers, panel session leaders and participants, Conference Section Chairpeople, suggestions of topics and speakers, and interesting homebrewed projects for exhibition. There are some nominal Grants-in-Aid available for those individuals who are some distance from San Francisco and are interested in exhibiting homebrewed projects at the Faire. These are refereed Grants and are intended to cover a portion of shipping costs for the homebrewed equipment. If you are interested in any apects of this Faire, contact Jim or Bob.□

COMPUTER PROGRAM VIRTUALLY ELIMINATES MACHINE ERRORS

Spokesmen for a local electronic firm have recently announced a computer program that—through fresh application of an old technique—virtually eliminates lost time due to malfunction of computer components. Called OREMA (from Latin "Oremus", meaning "Let us pray"). the program offers prayers at selected time intervals for the continued integrity of memory units, tape transports and other elements subject to depravity.

Basically liturgical in structure, OREMA uses standard petitions and intercessions stored on magnetic tape in Latin, Hebrew and Fortran. It holds regular maintenance services thrice daily on an automatic cycle and operator intervention is required only for mounting tapes and making responses, such as "Amen"

or "And with thy spirit" on the console typewriter.

Prayers in Hebrew and Fortran are offered directly to the CPU, but Latin prayers may go to peripheral equipment for transfer to the CPU by internal subroutines.

Although the manufacturer-supplied prayer reels cover all machine troubles known to date, the program will add punch card prayers to any tape, as needed, after the final "Amen" block. Classified prayer reels are available for Government installations.

In trials on selected machines, OREMA reduced by 98.2 percent the average down time due to component failure. The manufacturer's spokesman emphasized, however, that OREMA presently defends only against malfunctions of hardware. Requestor errors and other human blunders will continue unchecked until completion of a later version to be called SIN-OREMA.□

THE COMPLETE & UTTER IDIOT'S GUIDE TO COMPUTER PROGRAMMING (PART 3)
By Newett Awl

Last time we looked at how to lay code and test a condition. When the count we had set up had been decremented (had 1 subtracted from it) enough times to completely exhaust the number we had set up, we had a zero in that counter. Until we had decremented it enough, some portion of the count remained and the counter was not zero. So:

"Testing for conditions is equally effective when the condition is true, as when the condition is false. However, the procedure of the test may be quite different."

For example, last month our code read:

```
        MVI    C,8
        LXI    H, NEW ADD
        XCHG
        LXI    H, OLD ADD
BACK    MOV    A,M
        INX    H
        XCHG
        MOV    M,A
        INX    H
        XCHG
        DCR    C
        JNZ    BACK
        HLT
```

If, however, we changed the test itself from "JNZ BACK" to "JZ BACK", the program would halt on the first pass because the jump is a conditional one and the condition of register "C" on the first pass is not zero. If we want to use the JZ instruction we will have to change the code a little bit to make that possible. So:

```
        MVI    C,8
        LXI    H, NEW ADD
        XCHG
        LXI    H, OLD ADD
BACK    MOVE   A,M
        INX    H
        XCHG
        MOV    M,A
```

```
        INX    H
        DCR    C
        JZ     DONE
        JMP    BACK
DONE    HLT
```

As you can see, that takes three more bytes to do than the first way that we had it. Yet, both pieces of code act exactly the same way logically.

There is, however, one other difference in the code; since there are now three more bytes of code in the loop and we know that the loop will be executed eight times, we have also increased—by those three bytes— the number of times the machine must read the code. So the code to use the "JZ" instruction is less efficient that the code to use th "JNZ" instruction in this example. However, unless there is a good reason why this routine must do it's thing in 24 less memory fetches (3 bytes times 8 times), it might be just as well if we left it alone. There is, after all, another efficiency that is equally important and that is: how long does it take to get the code debugged and operational? If you look closely at the two pieces of code, you will notice that the one that jumps to DONE when register "C" is zero is very easy to read and understand. Now if anything goes wrong—and it probably will—you can easily see what you wanted to have happen, even if it didn't.

These are all very subjective considerations about which programmers have been hassling each other since they first began to practice the trade. My point here is that "good" code is both easy to understand and easy to fix.

The first consideration for your own code must be that it is easy for you to understand.

The conditions that the 8080 chip will allow you to set up and test are:

Zero   *The accumulator bits are all zero.*
Sign   *The leftmost bit (D7) is set (=1).*
Parity   *The sideways sum of of the bits is even.*
Carry   *The Carry bit is set.*

The only one which is not too clear is the parity and all that means is if you imagine that you can lay down and look at the bits of the "A" register then add them up, they total a binary number with no rightmost bit (D0). For example, if "A" is:

$$01\ 101\ 110$$

When you lay down this becomes:

Lefthanded Layers Down	Righthanded Layers Down
0	0
1	1
1	1
0	1
1	0
1	1
1	1
0	0
Total 101	Binary Add 101

But, if we change one of the zeroes so that "A" looks like:

$$11\ 101\ 110$$

When you lay down, this becomes:

Lefthanded Layers Down	Righthanded Layers Down
1	0
1	1
1	1
0	1
1	0
1	1
1	1
0	1
Total 101	Binary Add 110

Both layers down will get a total of 110. And since "D0" is now reset, parity will be even and the parity bit will be set (=1).

And that is all there is to parity. However, for perpetual students and Ph.D's who only understand it the complicated way, Intel explains it thusly:

"If the modulo 2 sum of the bits in the result of the operation is 0, (i.e. if the result has even parity), this flag is set; otherwise it is reset (i.e. if the result has odd parity)."

Which is a very interesting way to complicate something that is really quite simple. □

FLOPPY DISK FOR $599!
News Release

An under $1,000 floppy disk for personal microcomputer systems is now available, making possible reliable random storage of from 252,314 to 504,628 bytes of data at read/write rates of 100,000 Baud min.

For $599, Ohio Scientific Instruments is selling a fully-assembled diskette drive including read/write electronics, manuals, mating connectors, system interface board (bare) and 6502/6800 operating system with delivery guaranteed to be less than 120 days. Zilog, 8080 and probably PDP-8 systems can be expected later.

OSI claims it has made a price breakthrough by incorporating into the hobbyist's own microprocessor system the disk control functions and interface. Further savings are realized by making user options of the 24V-1A power supply, case, connector cables and components for the interface board.

User-supplied parts are conservatively estimated to cost an additional $145, bringing the total system cost to as high as $744. Eight to ten evenings of assembly time and testing are suggested. These added costs are $50 each for interface parts and power supply, $25 for enclosure and $10 each for diskettes and cables.

The OSI 470-Floppy Disk/Modem board, which occupies one slot in the company's standard backplane, can control up to four disk drives. It also can be configured to provide a 600-Baud modem with full dial-up and automatic answer capabilities.

Double density recording can be used, but greater than 1 MHz system clocks are required unless a very simple disk format is used.

The Model 470 comes with a simple, low-memory-overhead 6502 or 6800 operating system. Purchaser must specifiy which.

OSI says its $535 price for diskette drive, manuals and connectors means slim profits and therefore orders must be in writing—prepaid via check, Master Charge or BankAmericard—or via 20 per cent deposit for COD shipment. Purchase orders are not accepted. There is a 20 per cent restocking charge for cancellation of order unless delivery is delayed beyond 120 days after receipt of order.

Drives are manufacturer-guaranteed against defective workmanship for 90 days by General Systems International. Although the OSI interface is delivered with the GSI Model 105, it is compatible with the GSI 50 and 110 drives as well. OSI's $535 price is considerably less than GSI's 50-piece industrial price.

Ohio Scientific Instrument products are available exclusively from Bare foot Computer Company, Box 158, San Luis Rey, CA 92068. □

FROM TV TO MONITOR IN 20 MINUTES
By Bill Marlin

It has generally been assumed that modification of television receivers to function as computer monitors involves internal changes in the video drive level and fussing about with bandwidth limiting filters. Modern television receivers have sufficient gain in the video output stage alone to present computer-generated characters that are sharp and readable.

Computer video can be injected into the last video stage of the receiver without involved circuit changes or affecting the picture quality.

Locate the input to the final video stage. The base (or grid) is usually coupled to the preceeding stage through an electrolytic cap. Break the line on the input side of the electrolytic and bring out 50Ω coax leads from each side. Bond the leads together, then solder them to chassis ground. Taking the shortest path, route the coax cables through a drilled ¼" hole in the side of the cabinet.

Solder the center conductor of the cable coming from the input of the elctrolytic to the tip of a miniature phone jack, the other cable to the switch of the jack. Bond the braids together and solder to the sleeve of the jack. Secure the jack with locking nuts.

The television receiver may now be used as a computer monitor by simply plugging the video output from the computer into the jack. Since audio is picked off well ahead of computer injection, it is still available while the set is functioning as a monitor, should the user turn up the volume control.

I used Sony's TV920 and TV750 for this modification to produce printout from the Apple Computer. Character resolution was excellent. Pulling the phone plug from the jack returns the set to normal video—with no change in the quality of the original picture.

Some Sony sets have two external earphone jacks, one a cut-out type, the other a parallel. I used the parallel jack by removing the existing audio leads to this jack. Many sets today have external earphone jacks, but if you'd rather not sacrafice it, another jack can easily be installed.

Keep in mind that this modification should be attempted only on television receivers employing transformer power supplies. Other sets are connected directly to one side of the AC line and, as such, would constitute a shock hazard, not to mention possible damage

to the computer. A way around this snag is to use an isolation transformer when the receiver is being used as a monitor (*see "Monitor Mod" by Joe Alig & Joel Miller in Vol. 2, Issue 7*). If you don't want to go to the expense of an isolation transformer, two 6.3 volt filament transformers back to back will provide the necessary isolation for safe operation. It is understood that the two filament transformers have 110 VAC primaries and 6.3 V secondaries. The secondaries are hooked together. □

VARIABLE SPEED CLOCK

Pete Cornell sent this diagram of an interesting variable speed clock. Pete says that it is a nifty way to check for slow or fast parts. It is a variable speed clock using the 8224. Pete doesn't know if it is a good solid design for lack of a chip schematic, but it has been running for over a week now with no problems. This circuit yields a clock which varies from approximately 1.3 to 2.9 MHz. I expect juggling would give greater range. The 62-138 pF capacitor is a garden variety used in AM transistor radios.□
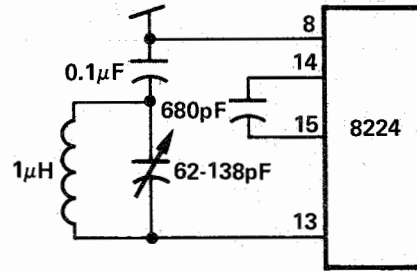
```
FIL #B998,PRBIN
:BEGIN


        SYMBOL TABLE
   NAME              VALUE
  START              0500
  LOOP               050B
  END                051E
 PASS 2
```

MOS 6502 SUBROUTINE
By Christopher Espinosa

This is a useful subroutine for a MOS 6502-based system to print the A-register in binary. It is assembled for location 0500_{16} but can be reassembled by changing lines 11, 12, 13, 18, 21 and 22. It changes nothing else and requires only a single-character output routine (ECHO) to operate. It only uses 22_{10} bytes for program and storage.

```
LOC.  OBJECT CODE LINE    SOURCE STATEMENT

                  0001    TITLE        PRBIN: PRINTS BYTE IN BINARY
                  0002    ;;;;     WRITTEN BY C. ESPINOSA FOR MOS 6502
                  0003    ;;;;
                  0004    ; LABELS ;
                  0005    AKEEP    EQU $051F   SAVE A REGISTER HERE
                  0006    XKEEP    EQU $0520   SAVE X REGISTER HERE
                  0007    SHIFT    EQU $0521   WORKING REGISTER FOR SHI
                  0008    OUT      EQU $FFEF   SINGLE-CHARACTER OUTPUT
                  0009    ;
                  0010             ORG $500
0500  8D 1F 05    0011    START    STA AKEEP   SAVE REGISTERS
0503  8D 21 05    0012             STA SHIFT   SAVE FOR SHIFTING
0506  8E 20 05    0013             STX XKEEP
0509  A2 08       0014             LDX #8      SET UP COUNTER
050B  0E 21 05    0015    LOOP     ASL SHIFT   SHIFT MSB INTO CARRY BIT
050E  A9 00       0016             LDA #0      CLEAR A; CARRY=0 OR 1
0510  69 30       0017             ADC #$30    ADD ASCII 0; A NOW EQUAL
0512  20 EF FF    0018             JSR OUT     OUTPUT IT
0515  CA          0019             DEX         DECREMENT COUNTER
0516  D0 F3       0020             BNE LOOP     LOOP AGAIN IF NOT ZERO
0518  AD 1F 05    0021             LDA AKEEP   FINISHED: RESTORE A
051B  AE 20 05    0022             LDX XKEEP            AND X
051E  60          0023    END      RTS         RETURN.
                  0024    ;;;;
```

Owners of the Southwest Technical Products Corporation 6800 Bomputer often use TV typewriters as their serial control device, instead of using an ASR33 teletype. This leaves them without a method of reading paper tape programs.
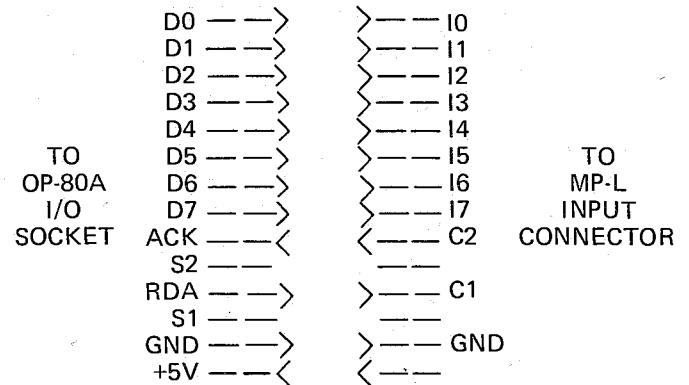
Faced with this situation, I had two alternatives. I could get my paper tape version of TINY BASIC 6800 listed and type it in by hand, or I could purchase the Oliver Audio Engineering OP-80A paper tape reader and a SWTPC MP-L parallel interface board and do things properly. After spending five hours typing in TINY BASIC, I decided that once was enough, so I purchased the reader and interface.

Construction of the paper tape reader is very easy. The reader should be jumpered so that point A goes ACK. There are no modifications necessary to make the OP-80A compatible with the SWTPC MP-L parallel interface.

Construction of the MP-L parallel interface is also an easy task. Jumper the board for maskable interrupt operation (A to IRQ and B to IRQ). Do not insert the small indexing plug into the Molex edge connector at the top of the board, and do not cut off the corresponding index pin of the male Molex input connector. Solder a jumper between the 5 V regulated side of IC2 and the index point of the Molex edge connector.

Connector wiring pf the OP-80A to the parallel interface is shown in the figure. Note that the index pin of the interface board is used to supply power to the OP-80A. Since the tape reader draws a maximum of 175 mA current, the regulated 5 V required cab be obtained from the interface board. Also note that S1 and S2 are being used as visual monitors of the data ready line (RDA) and data acknowledge line ($\overline{ACK}$). An $\overline{ACK}$ signal is used to reset the RDA line, as the signal source (CB2 of the PIA) is a normally HI signal when used as an output.

```
                  D0 — —>     >— — I0
                  D1 — —>     >— — I1
                  D2 — —>     >— — I2
                  D3 — —>     >— — I3
                  D4 — —>     >— — I4
        TO        D5 — —>     >— — I5           TO
     OP-80A       D6 — —>     >— — I6          MP-L
       I/O        D7 — —>     >— — I7          INPUT
     SOCKET      ACK — —<     <— — C2       CONNECTOR
                  S2 — —       — —
                 RDA — —>     >— — C1
                  S1 — —       — —
                 GND — —>     >— — GND
                 +5V — —<     <—·—
```

The actual programming of the MP-L for operation with the OP-80A may be on an interrupt or non-interrupt basis. The example shown is two hand-assembled, non-interrupt driven subroutines that set up the peripheral interface adapter and read one frame of the paper tape. Note that the PIA address used is 8000-8003, which is I/O slot zero on the SWTPC Mother Board. Information concerning interrupt programming is set forth in the MC6820 Peripheral Interface Adapter data sheets, and in the Hardware section of the SWTPC System Documentation Notebook. □

```
                        *PIASUP - PIA SETUP ROUTINE
     OF00                        ORG     $0F00
     OF00 CE 8000 PIASUP  LDX     #$8000       PIA ADDRESS
     OF03 86 36           LDA A   #$36         KNOCK DOWN C2(RESET C1)
     OF05 A7 03           STA A   3,X          SET CRB
     OF07 4F              CLR A
     OF08 A7 01           STA A   1,X          RESET CRA
     OF0A A7 02           STA A   2,X          SET DDRB = ALL INPUTS
     OF0C 43              COM A
     OF0D A7 00           STA A   0,X          SET DDRA = ALL OUTPUTS
     OF0F 86 3E           LDA A   #$3E         C1 SET ON A 0 TO 1, C2=1
     OF11 A7 03           STA A   3,X          SET CRB
     OF13 86 04           LDA A   #$04         DUMMY FOR CRA
     OF15 A7 01           STA A   1,X          SET CRA
     OF17 39              RTS                  AND LEAVE...
                        *
     OF18 0001   DATA     RMB     1            DATA AREA
                        *
                        *PIADAT - GET DATA FROM PIA
     OF19 CE 8000 PIADAT  LDX     #$8000       PIA ADDRESS
     OF1C A6 00           LDA A   0,X          READ ADR AND
     OF1E A6 02           LDA A   2,X          BDR TO CLEAR CR FLAGS
     OF20 86 3E           LDA A   #$3E         C1 SET ON A 0 TO 1, C2=1
     OF22 A7 03           STA A   3,X          SET CRB
     OF24 A6 03   DATLOP  LDA A   3,X          GET C1 FLAG(BIT 7)
     OF26 2B 02           BMI     GETDAT       DATA PRESENT?
     OF28 20 FA           BRA     DATLOP       NOT YET.  KEEP TRYING.
     OF2A A6 02   GETDAT  LDA A   2,X          YES.  GET THE DATA
     OF2C B7 OF18         STA A   DATA         AND SAVE IT.
     OF2F 86 36           LDA A   #$36         KNOCK DOWN C2(RESET C1)
     OF31 A7 03           STA A   3,X          SET CRB
     OF33 39              RTS                  AND LEAVE...
```

THE CONVERSOR 4000
A New Product

Computer Conversor Corporation, a sister firm to Call Computer, now offers an affordable alternative to high-priced computer terminals.

The Conversor 4000 provides video output consisting of alphanumeric uppercase characters and formatted as 24 lines down by 40 characters across. Interconnection to the terminal is either hardwired through the RS-232 serial interface (EIA connector) or established through the optional accoustic coupler. (The optional coupler comes built into the Conversor.) Data rate (110 or 300 Baud, i.e., 10 or 30 chars/sec) and half-full duplex mode are switch selectable from the keyboard. Output is composite video with EIA RS170 standards.

A video monitor is required to use the Conversor. Computer Conversor Corp. offers an attractive modified Sanyo television, which doubles as a standard TV. Alternately, you may provide your own video monitor or make the minor required modifications to an existing TV set (we will provide you with technical help).

To order a Conversor 4000 or for more information, contact R. H. Kirschke, Computer Conversor Corporation, 1961 Old Middlefield Way, Mountain View, CA 94043, phone (415) 969-3213. ☐

NEW CODING FORM
Press Release

Walton Electronics announces a new coding form for those who work in assembly or machine language. The forms are bound together in pads of 50 sheets and are formatted to accept code for any of the more popular microprocessors. Columns include: address, code, label, instruction and notes. Code can be written in either octal or hex with up to 3 bytes per line in regular assembler format. The lines are spaced to permit coding from a pica typewriter.

These forms make hand assembly easier and neater which helps eliminate errors. The pads sell for $1.95 each postpaid. Quantity discounts are available. Order from Walton Electronics, Box 503, Bethany, OK 73008 or check your nearest computer store. ☐

BULLETIN BOARD

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 immediately. 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.☐

6800 LISTER PROGRAM—CORRECTION

1. Line 6 was not printed. It should be: 6 FCOE CE FC74.
2. Line 12 Operand should be 2D

Bill Marlin picked up this error also. Bill sent in a modified lisiting (using this program) which does a compare on the sofware interrupt instruction (3F). It prints an op-code one-byte operand line which is good only for the AMI Proto System. This is a good example of how to apply a short routine like this to your own system.☐

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 requests 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.☐

DAVIS LAB 16K MEMORY BOARDS
Newsnybble

Connector pins #73 and #74 are jumpered together by a feedthrough hole at the edge connector. Isolate pin #73. Otherwise it works very well.☐

Laurel Publications is seeking additional work and is willing to pay a commission or finder's fee to anyone establishing a productive contact. We specialize in electronics manuals, advertising and technical art. We have a computerized typesetting system and the capability for drawing fine schematics and illustrations. We are experienced in the production of all types of technical literature. If you have any input, please call Joel Miller, Project Coordinator, at (408) 353-3609.

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HOMEBREW COMPUTER CLUB MEETINGS
Where & When

The Homebrew Computer Club meets at 7 p.m. at the **Stanford Linear Accelerator Center Auditorium.** Dates scheduled for the remainder of this year are October 1 and 15, November 12 and 26, and December 10 and 22. Please note that some of these dates are a change from the regular Wednesday schedule. The date and the location are subject to change. If a change does occur, every effort will be made to provide advance notice in the *Newsletter.* □
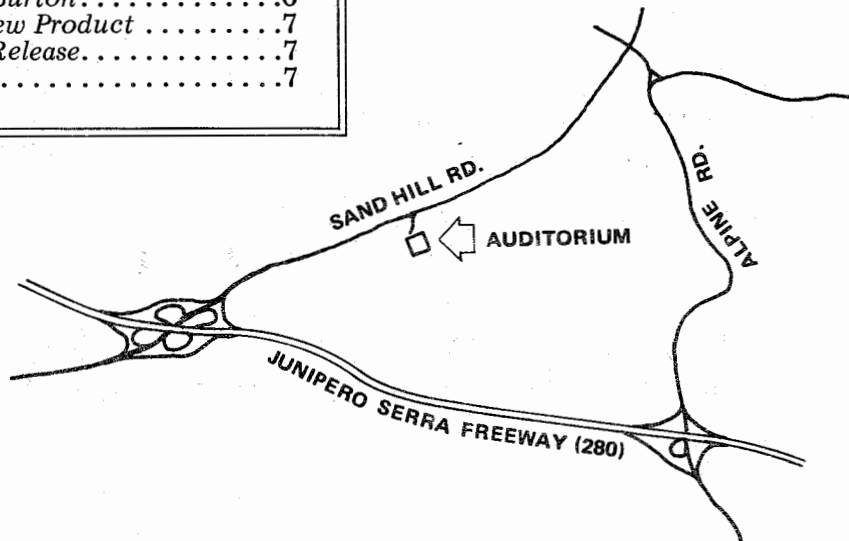
HOMEBREW COMPUTER CLUB
NEWSLETTER

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