HOMEBREW COMPUTER CLUB NEWSLETTER

August 20, 1975

AFTER SIX MONTHS

Fred Moore and Gordon French put the first club meeting together March 5, 1975 and they are due credit for starting the first amateur computer club in the Bay Area.

The Homebrew Computer Club has grown steadily since then. Thirty-two people attended the first meeting, and now attendance is approaching 100. The newsletter mailing roster is near the 300 mark.

FRED MOORE TO WASHINGTON D.C.

Fred Moore announced during the August 6, 1975 meeting that personal plans will take him to the Washington D.C. area.

At the first meeting Fred took the task of keeping everyone informed of club activities, meeting locations (remember those roving meeting locations), and news the computer hobbyist needed. He produced the newsletter faithfully and superbly. Look in the first issue of BYTE magazine's Club-Newsletter section for a reproduction of the complete first page of issue number four.

NEWSLETTER CONTINUATION

With this issue a new editor takes over and will, with the help of others, keep the files in order. Here's how it stacks up now: Robert Reiling, editor; John Schulein, technical editor; Tom Pittman, mailing list; Lenny Shuster, meeting room; Ray Boaz, treasurer; Ken McGinnis, contributing editor.

Others have offered assistance, such as Bill Hill who is thinking about a "Yellow Pages", Nick Donckel who is looking for a better information exchange system at meetings, and Terry Lee who has technical material if members are interested.

Some things are for the future but others are of immediate concern, for example, expansion of the contributing editors list. This is essential. Needed is material on software (practical routines a guy can get running on his hobby system), games that don't need a Super BASIC to run, application data, hardware ideas (how to modify your Altair, etc.), and peripheral devices.

Another immediate concern is feedback to the editor and to contributing editors. Did Terry Lee's Design Notes in the past several issues help you? What are your comments? Is the content oriented properly? Let's have some comments from you. It will help get the right information flowing.

Send along your material and don't forget those news items that others will want to read. When possible, "camera ready" copy will be a big help.

CASSETTE DATA RECORDING STANDARD - John Schulein

One of the most sought after items in a microcomputer system is a low cost read/ write bulk storage unit. When such a bulk storage device is interfaced with a microcomputer, program development is much easier than if attempted from the front panel switches. If a TV typewriter and monitor software (located in PROM) are added to the microcomputer system, program development becomes easier yet. New (machine) language programs (if not on a cassette your system can read) can be entered into RAM via the TV typewriter keyboard (this is the hard part!) under control of the monitor program. Once in RAM, the program execution can be started by the monitor. Any program changes can be made by modifying the contents of RAM from the keyboard under control of the monitor. At any time (before the power is turned off!) the program in RAM can be written into the cassette under control of the monitor program. Now that the program is on tape, the rest is easy. The monitor program also has the capability to read the cassette and load the machine language into RAM. Thus we can develop a program and if several cassettes are available, the old versions of the program can be kept until the new version has been thoroughly checked out. (Sometimes those changes don't do exactly what they were supposed to do!)

The commonly available audio cassette tape recorder at this point in time looks like the best means of implementing a low cost bulk storage unit. Hal Chamberlin has initiated an audio cassette data recording standard that is written up in "The Computer Hobbyist (Vol. 1, Numbers 5 and 6)." His recording technique uses pulse modulation, is self-clocking, and is asynchronous by bit. It is capable of operation at 300 bits per second and is block oriented. Cyclic redundancy checking is included, and monitor software (8008/8080) will be available shortly for the read and write operations. By the way, the monitor software is designed so that it is independent of the processor clock frequency and the number of wait cycles your RAM requires. PC boards for the hardware interface are designed and available from "The Computer Hobbyist" for $15.

Hal Chamberlin seems to have done his homework on cassette data recording, and his proposed standard should be seriously considered by anyone working on a cassette/microcomputer interface.

TOWARD A CASSETTE STANDARD - Tom Pittman

One of the factors which has not been given adequate consideration in the proposal for a cassette standard for the amateur computer is its flexibility of implementation. Most designers tend to regard their own designs as optimal. They neglect the tremendous diversity of requirements among hobbyists. Minimal software designs require byte parallel transfer. Maximum throughput requires interrupts or DMA. Minimum hardware tends to put greater burdens on the software. Maximum reliability or minimum hassle may be some combination of these. Any standard, among hobbyists, must encompass all of these requirements in a variety of implementations.

Hal Chamberlin's proposed standard admits to a variety of digital implementations including one incredibly simple (less than two IC's, no tuning). Byte parallel implementation could be greatly simplified if data were recorded least significant bit first instead of Hal's most significant bit first. Then a $30 USRT (Universal Synchronous Receiver/Transmitter) could be used.

TV DISPLAY TIMING FOR THE COMPUTER HOBBYIST - Ken McGinnis

Timing is probably the most difficult and most important consideration. An ordinary T.V. is designed to display 60 pictures (frames) every second. The human eye works at a slower speed so it thinks there is just one constant picture. The movies work exactly the same way. The speed- 60 frames per second- is critical; less so for a black and white T.V. than for a color set. For this reason, Black and white T.V.'s may work better for most hobby transmitters. In the U.S. a T.V. displays 525 horizontal lines on the front of the picture tube. There is a phosphor material on the inside of the glass which glows when hit by an electron beam. This electron beam is similar to a spark plug in a car. Actually only 262½ lines are scanned in each frame, then during the next 1/60th of a second 262½ different lines are scanned in between the previous lines. This may seem complicated but all it really accomplishes is a nicer looking picture. So: if one frame takes 1/60th of one second then one line occupies 1/262.5th of this time. This figures out to be 62 microseconds.

The frame is drawn like an artist spraying electrons at the picture tube in a "Z" pattern beginning in the upper left hand corner going to the right side then quickly and diagonally going down one space and over to the left. Then after 262½ lines the electron beam jumps from the lower right hand corner to the upper left hand corner. Going horizontally across the screen takes about 50 of the 62 microseconds and the diagonal retrace is faster and only takes about 12 microseconds. This means a transmitter must transmit a start signal (vertical sync) and then information for 50 microseconds, then an end of line signal (horizontal sync) within 12 microseconds. At the end of the frame another start signal is transmitted, and this repeats over and over. This movement of the beam would just make a glowing mess if it weren't for a neat switch which turns off the beam while all the retrace lines are present. This leaves us with nothing but horizontal lines, all being drawn from left to right. Now what would happen if we put in another switch to turn the beam on and off while it is drawing the horizontal lines? That's right, we would have black areas and white areas. (We can even make grey areas by not turning the switch completely off.) How do we control this switch? Well, that is the easiest part, believe it or not. We just put a little battery (low voltage) or a big battery (high voltage) onto the antenna terminal. Of course, we must switch from one battery to the other very fast or we will just have a solid white or a solid black picture. We can do this by having both batteries available and just switch from one to the other.

(Caution - Do not attach a battery to your TV set. Ken's use of the battery concept is for simplification of his discussion. Editor's note.)

Back to the timing: 1 second = 1000 milliseconds
                      1 millisecond = 1000 microseconds
                      1 microsecond = 1000 nanoseconds

1 frame = 1/60th second = 16.7 milliseconds = 16,700 microseconds
1 line = 62 microseconds
Since only about 50 microseconds of the line can be seen, we must turn the switch on and off several times during this time interval. How many times? This is easy to figure out. Lets say we want to display a character 5 dots wide and 7 dots tall. Lets allow 8 dots for width so there will be 3 black dots to separate the characters. How many characters? Lets try 32. This means there will be 32 X 8 dots or 256 dots in each line. How do you get 256 dots in a line only 50 microseconds or 50,000 nanoseconds long? 1/256th of 50,000 is 195 nanoseconds for each dot. The switch must be turned on and off every 195 nanoseconds. This is 5.13 million times each second. Each character lasts 8 X 195 nanoseconds or 1560 nanoseconds or 1.56 microceconds. You must present a character to the transmitter every 1.56 microseconds. Most integrated circuit memories will work this fast. There are many T.V. typewriter circuits available now at a low cost. If there is a demand for it maybe a circuit could be published which could read from a microcomputer memory while the computer isn't using it.

RANDOM DATA - Robert Reiling

MAILING ADDRESS - Temporarily send your letters to me at 193 Thompson Square, Mountain View, Ca. 94043. I have turned in an application for a club post office box and expect to be able to announce a permanent club address soon. Because several publications have listed the Menlo Park address, I will continue to check it for mail.

BACK ISSUES - Currently not available but may be reprinted in future if there is sufficient interest.   A nominal charge would be made.

SOUTHERN CALIFORNIA COMPUTER SOCIETY - Both D. EXTRAND and JON WALDEN sent letters about the Los Angeles Club now forming. The first meeting in June was attended by over 120 computer enthusiasts. The second meeting was scheduled August 9, 1975 but we don't have a report yet. They have a newsletter; title INTERFACE. Current mailing address % Hal Lashlee, P. O. Box 987, So. Pasadena, Ca. 91030.

SAN DIEGO COUNTY ENTHUSIASTS - Organizational meeting held August 7, 1975. JIM FARSCHON reports 40 people showed up at the meeting. Plenty of interest with more work to do on organization. The group grew out of the MITS MOBILE visit and is dominated by ALTAIR users. A club project is desired to collect 50 orders for a group LSI 11 purchase. Local contact is Dr. Michael N. Hayes, P. O. Box 367, Jamul, Ca. 92035.

THE DIGITAL GROUP CLEARINGHOUSE - At last Volume 1 Number 1 arrived, and it looks good. They will act as a source for references as well as providing distribution for submitted items. This issue has The Digital Group Clearinghouse Reference Notebook and notes, tips, hints, and aids.   The next issue will have, in addition, classified ads, club notices, and advertising. Layout is excellent with an 8½x11 inch format. Article of interest is a Suding TV readout modification, including software, covering a cursor addition by PHILIP MORK. Subscriptions are $6.00 per year for 12 issues. Contact the Digital Group, P. O. Box 6528, Denver, Colorado 80206.

BYTE MAGAZINE - Due out momentarily, if not already in the mail. Many interesting articles including Deciphering Mystery Keyboards, RGS 008A Microcomputer Kit, and Write Your Own Assembler. A section on Clubs - Newsletters lists, among others, the PEOPLE'S COMPUTER COMPANY and the HOMEBREW COMPUTER CLUB. Understand 94,000 copies were printed, which suggests a fantastic interest building in the computer hobby field. Charter subscriptions are $10.00. Write to BYTE, Peterborough, N.H. 03458. Editorial correspondence goes to Carl T. Helmers, Jr., editor BYTE, P. O. Box 378, Belmont, Ma.02178.

THE JOURNAL OF COMMUNITY COMMUNICATIONS - An initial issue has been published by LGC Engineering providing background material on community memory projects and the Tom Swift Terminal. The material is stimulating and brings up to date the status of Community Memory. LEE FELSENSTEIN, editor, suggests a remittance of $1.00 for the next issue; perhaps $1.00 would be in order for the current issue if you want it. Write LEE FELSENSTEIN, editor, 1807 Delaware Street, Berkeley, Ca. 94703.

CLUB MEETING JULY 23, 1975 - STEVE DOMPIER moderated this meeting during the absence of our regular "song and dance man" LEE FELSENSTEIN. Steve kept things really rolling and there was an active exchange of information. JOHN CALHOUN demonstrated his Suding TV interface with upper and lower case display. Very nice or, in the words of his display, "neat huh".---- BILL GODBOUT and company presented details of the forthcoming 16-bit microcomputer due from Godbout Electronics.

CLUB MEETING AUGUST 6, 1975 - Lots of information exchanged. MITS has 6800 system due out in November. Local rep BOYD WILSON stated shipments start in October. Basic kit - front panel, cards, and power supply - price may be around $300. ---- MOS Technology, Inc. is advertising MCS 6501 at $20.00; it's plug compatible with M6800. See them at WESCON 75 September 16-19, San Francisco Civic Auditorium, Brooks Hall. ----BASIC for 8080 systems discussed, programs for 8K systems now floating around. ---- FRED MOORE resigned and is going to Washington, D.C. BOB REILING now doing newsletter with help of others -- hope you like it.

K200 ACCOUNT - Cross Assembler for 8080 up and running on CALL COMPUTER. Documentation is being added now. JOHN DRAPER worked on this, call him at 964-5331 if any questions. Users send me your comments for the newsletter.

MEMORY - MARTY SPERGLE announced 500 microsecond 91L02As (like 2102A but low power) at 8 for $35 with IC sockets. Contact M & R Enterprises, P. O. Box 1011, Sunnyvale, Ca. 94088.

STANDARDS - A movement is in progress to set standards by a group called Hobbyist Computer Manufacturers Association (PTC, Godbout, RGS, Solid State Music, etc.). Let's give them a hand with this. The club should be ready with positive recommendations; can we form a standards committee?

SOLID STATE MUSIC - Plenty of 2102 RAMs available as follows: 1 microsecond - 8 @ $16.00, 64 @ $112.00, 128 @ $192.00; 650 nanosecond - 8 @ $18.00, 64 @ $128.00, 128 @ $224.00; 500 nanosecond - 8 @ $20.00, 64 @ $144.00, 128 @ $256.00. I/O kit for Altair available at $35.00 to Homebrew Computer Club members.

ELECTRONIC GARAGE SALE - Open each Saturday 10 AM to 4 PM. Inexpensive IC's, cabinets, surplus boards, and other items of interest. Location is corner of Independence and Charleston in Mountain View. Take San Antonio exit off 101 to Charleston, turn left and travel about three blocks to Independence.

AMATEUR RADIO/COMPUTER IDEAS - Being a radio amateur, call sign W6JHJ, I am interested in putting amateur radio and computers together. GUS O'DONNELL writes with some of his ideas which I quote in part here,

"Like some members of your club, I am a licensed radio amateur, call sign WA0YWD, and am very much into the gadgetry involved in the use of OSCAR, the amateur satellite. Recently I have been toying with the idea of using a computer to control antenna azimuth and elevation. Also, I am a big RTTY fan, having accumulated a mess of TTY gear and getting it on the air. Another scheme of mine involves a computer network linked by amateur RTTY. I am investigating the feasibility and legal aspects, but I would also like comments from out there. Finally, my great screwball idea of organizing a net of computer controlled satellite tracking stations automatically relaying information on telemetry and sending signals via satellite and all kinds of neat stuff. Pretty ambitious and far-out, but you might throw it out at a meeting and see if anyone laughs. Someone might even like the idea."

OK, send some comments!

NEXT MEETING - Meetings are held every two weeks at Stanford Linear Accelerator Center, usually in the Auditorium, ask the guard for directions. Dates are August 20th, September 3rd, etc.

HOMEBREW COMPUTER CLUB ROSTER ADDITIONS

JACK ABBOT
80 Alviso Street
Santa Clara, CA 95050

ROBERT BAER
921 Lincoln Ave.
Palo Alto, CA 94301

VICTOR BAILEY
4565 Black Ave.
Pleasanton, CA 94566

CHRIS BAJOREK
828 Mango
Sunnyvale, CA 94086

ELDON BERG
1411 Melwood Drive
San Jose, CA 95118

FRED BUSH
Aertech Industries
825 Stewart Drive
Sunnyvale, CA 94086

CORK CRAUBAUGH
4672 Dolores Ave.
Oakland, CA 94602

J. R. (BOB) DAVIS
2325 Quinn Ave.
Santa Clara, CA 95051

STEVE DeLATEUR
1655 Wright Ave.
Sunnyvale, CA 94087

DICK DELP
19703 Gary
Sunnyvale, CA 94086

KIT DOVE
169 Glenview Drive
San Francisco, CA 94131

NICK DUNCKEL
1695 Fairway Drive
Los Altos, CA 94022

PETER DUNCKEL
52 Seventh Ave.
San Francisco, CA 94118

PAUL D. GRACIE
117 Tennyson Ave.
Palo Alto, CA 94301

JOE McCRATE
562 Kendall #17
Palo Alto, CA

DAN MENDEZ
2007 Eucalyptus
Santa Clara, CA

DR. MICHAEL N. HAYES
MNH-APPLIED ELECTRONICS
Post Office Box 367
Jamul, CA 92035

BILL HILL
141 Lansdale
Fairfax, CA 94930

THOMAS KORNEI
P.O. Box 1246
Cupertino, CA 95014

LORIN S. MOHLER
219 Sweetwater Street
Anaheim, CA 92806

RICHARD C. PASCO
2005 California St. #29
Mountain View, CA 94040

HERMAN POOLE
1785 Crater Lake Ave.
Milpitas, CA 95035

J. SALE
XEROX COMPUTER SERVICES
5310 Bethoven Street
Los Angeles, CA 90066

CLAY SCARBOROUGH
450 Clipper Street
San Francisco, CA 94114

TOM SCHMIDT
P.O. Box 9674
Stanford, CA 94305

JOSEPH E. SHATARA
466 Giannini Drive
Santa Clara, CA 95051

SCOTT T. SPENCER
8080 Park Villa Circle
Cupertino, CA 95014

W. A. WARD
483 Rincon Ave.
Sunnyvale, CA 94086

BOYD W. WILSON
REPCO, Suite #2
50 E. Middlefield Road
Mountain View, CA 94043

DATA FILE

YOUR SPACE

This space is for you. Just layout your
information to fit this space. Paste it
on this sheet and send it to the editor
or just send the material and we will
put it on a sheet. Use additional sheets
if needed. News, data, articles, and
whatever of interest to the computer
hobby person will be published in news-
letters as space permits. Be sure to
include your name and address. The
editor reserves the right to select or
reject for publication material submitted.
Camera ready copy will be a big help.

Material for the next issue should be
received by September 5, 1975.

Mail to: Robert Reiling, editor

HOMEBREW COMPUTER CLUB NEWSLETTER

193 Thompson Square

Mountain View, CA 94043

ISSUE 6

NEWSLETTER

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AIRPORT

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