Micro-8 Computer User Group Newsletter
Hal Singer - Editor
Cabrillo Computer Center
4350 Constellation Road
Lompoc, CA 93436

April 22, 1976
Volume 2, Number 5 4

THE ANSWER TO THE 8008 USER'S PRAYERS IS CONTAINED ON PAGE 11. --- AN 8008 BASIC---. IT'S TOO BAD THE PRICE IS SO HIGH BUT THEN SCELBI INC. DOES HAVE TO MAKE MONEY AND COMPLETE SOURCE LISTINGS WILL ALLOW USERS TO START MAKING SYSTEM CHANGES AND ADDITIONS. FIND A FRIEND OR TWO AND SHARE THE BOOK. THAT WILL MAKE THE PRICE A LITTLE EASIER TO HANDLE.

NOTE ALSO THE NUMEROUS PLUGS FOR THE TINY BASIC NEWSLETTER. IT APPEARS THAT BOB ALBRECHT IS GOING TO MAKE THIS THE MOST EXCITING SOFTWARE INFORMATION SOURCE EVER AND A MUST SUBSCRIPTION FOR EVERY COMPUTER HOBBYIST.

MANY APOLOGIES TO ANYONE INCONVENIENCED BY THE MISSING ADDRESS FOR THE PIXIE-INVERTER. IT IS ATV RESEARCH, 13TH & BROADWAY, DAKOTA CITY, NEBRASKA 68731. SOMETIMES I GET TOO GOOD AT TRIMMING THINGS DOWN.

IF YOU HAVE AN 8080 OR A 6800, YOU NEED A CRAMER CUBE! IT'S A NICELY PRINTED AND FOLDED CARDBOARD SHEET THAT FOLDS INTO A 4" CUBE WITH A SUMMARY OF EITHER THE 6800 OR 8800 INSTRUCTIONS ON THE FACES DEPENDING ON WHICH WAY YOU FOLD IT UP. CONTACT JOHN STEVENSON, MICROCOMPUTER TECHNIQUE, INC., 17201 DAIMLER ST., IRVINE, CA 92705 FOR INFORMATION. INCLUDE A 4 X 9 AT LEAST SASE.

IN THE CLASSIFIED ADS IN RE AND OR PE THERE IS A SMALL AD FROM SUPERTRONICS, 29790 TOLAY CREEK ROAD, SONOMA, CA 95476 OFFERING INFO ON AN A4000A UTOMATION COMPUTER FOR $2.00. IT REMINDS ME OF THE AD FOR INFO ON HOW TO MAKE A MILLION SENT TO YOU FOR ONLY $2.00 -- JUST PLACE SUCH AN AD! YOU'LL SURE BE MAD IF YOU SEND SUPERTRONICS $2.00 FOR WHAT THEY SEND OUT.

Harold L. Novick, 2810 Henderson Ct, Wheaton, Md. : I have been holding off sending you the enclosed reply to Bill Gate's letter in the hope that I would be able to report that I had interfaced my typewriter with my Mark-8. Alas, my Mark-8 blew up for some presently unknown reason. However, John Kapp, a member of Chesapeake Microcomputer Club (CMC), has a beautiful 24 TTL chip interface built for his Dura Mach 10 and Altair. I am getting his schematics and hopefully will be able to send them to you. CMC is going strong with over 250 members and 4 or 5 local chapters. Time's up. Will write later when the Supreme Court hands down its decision in Dann vs Johnson, a case on the patentability of computer software (a banking program was involved.)

Richard Jinkins, 109 Bishop St, Dodgeville, WI 53533 : I bought the PC board for the Mark-8 computer August '74, R-E, and can't find a manual. I thought maybe you knew of a copy for sale or someone who would rent theirs to me to photocopy. I am a student at University of Wisconsin, Platteville majoring in Electronics. I was going to do this as a project, but I'm sort of stuck now.

SUBSCRIPTION FORM
(Copy if you don't want to mess up NL)

☐ ....Volume 1 back issues 1 thru 4 $3.50
(56 mice-type pages)
☐ ....Volume 1 back issues 5 thru 12 $6.00
(186 mice-type pages)
☐ ....Volume 1 combination 1 thru 12 $8.00
(the principal is on my back because we have too many boxes cluttering up the computer center)
☐ ....Volume 2 issues 1 thru at least 9 $6.00

Name ______________________________

Address ______________________________

____

Zip ______________

Telephone No. ______________ (may be published -- leave blank if you prefer)

Please also include a little note describing your equipment, plans for the future, experience, etc. Thank you.

MIDWESTERN AFFILIATION OF COMPUTER CLUBS
P.O. BOX 83 BRECKSVILLE, OHIO 44141

14058 Superior Dr. Apt. 8
Cleveland, Ohio, 44118
216-371-9304

Dear Hal, Craig, and everyone else,

Good news!
The Cleveland Digital Group, in conjunction with several other computer clubs in this area (Pittsburgh, Columbus, Dayton, Toledo, Detroit, and Buffalo, to name a few) has formed the Midwest Alliance of Computer Clubs. The purpose of this group will be to encourage cooperation and communication between our member clubs. It costs nothing to join our affiliation and there will be many benefits.

Our first official action will be a computer convention to be held this summer in Cleveland, Ohio. More detail can be found on the enclosed flyer. It's going to be a big deal and we expect to have a hell of a lot of fun. Future projects include a communications net, (clubs around here seem to be bunched very conveniently for this), group purchases, a hobbyest register, and a few others. Services offered by the group will include assistance in starting new clubs in the area, helping people to get in touch with their local clubs, and perhaps a group newsletter for groups that feel they are big enough to warrent their own.

We expect most of the projects to pay for themselves and will distribute the profits of our conventions to member clubs. Our convention is well planned and all of the major micro and mini manufacturers will be represented by their reps and products. The Flea Market promises to be a lot of fun. Some of the member clubs will be chartering busses to come in for this. The technical sessions should be entertaining as well as educational. The best part about our convention will be the fact that it will last a whole weekend and will be held in a convention hotel allowing attendees the oppurtunity to get a chance to know each other. There will surely be a lot of all-night bull-sessions going on in some rooms (at least mine!!!). Enough of this for now.

The Cleveland Digital Group is growing in leaps and bounds! We have been donated a clubhouse (7 000 sq. ft.!!!), and some pieces of equipment that will be auctioned off to the members. There's a good possibility that we may end up soon with free computer time from one of our members who owns a service bureau. We have near 100 members now and have not even begun to recruit!! Lots of enthusiastic amatuers. And a few real pros too. At our last meeting five selectric terminals changed hands, and one of our members moved 4 teletypes into the greedy clutches of our hobbyests. We have quite a few computers in our group. A few PDP's, 8008's, 6800's, 8080's, and others.

More later..................

Gary Coleman
Gary Coleman,
Secretary, Clevland Digital Group
Chairman, M.A.C.C.

P.S. Go to the New Jersey Group's Computer Festival!!!!!!!

I am currently working with the Motorola M6800 Microcomputer design kit. Its detailed applications and programing manuals attracted me. At present I am awaiting the arrival of the PC board from Motorola. The PC board is not enclosed in the kit. You must register your name (with a card supplied by Motorola) in Phoenix and they ship you the board free of charge. I am also studying the application and programing documents so I can fully understand the 6800 operation.

My plans are to design an inexpensive computer system to sell to local small businesses for inventory control, accounting and etc. A friend and I are working at this together. We plan to design software to suit the individual needs and demands of our clients. We plan to take at least a year in development of our system. We will be experimenting with all types of software and system applications and not just limiting to business computer applications. We are both Engineers. I have a BSEE.

I am sponsoring a SOFTWARE EXCHANGE for those interested. Anyone who wishes to receive software for any of the microcomputers send me your name, address and any software you have available. I have software for immediate distribution. When I receive software from other individuals I will distribute the material to those interested. Please include $3 to cover the cost of mailing and photo copying. You need not submit software to benefit.

I would like to congratulate you for your fine Newsletter.

Howard Berenbon
2681 Peterboro
W. Bloomfield, Mich. 48033
(313) 851-7966

Sincerely,
Howard Berenbon

Eric I. Pugh, 632 Levering Ave., Nr. D, Los Angeles, CA 90024 : I have heard from a student in my compiler class that you have implemented TECO (Text-Editor and Corrector) on an 8080-based system. Being a former DEC-10 user and a proud owner of an Altair 8080, I know the power of TECO and would like to have a version implemented on an 8080. I would be interested in any information on the availability of source or object listings/tapes.

David Ovalliere, 103 Richmond Rd, Victoria, TX 77901 : I am negotiating with R-E on 3 articles on TVT-II modifications, as well as working feverishly on a color graphics display drive. I will write a complete letter shortly.

J.G. Depoy, 604 Royal Palm Dr, Virginia Beach, VA 23452 : I just finished a Mark-8 and have a couple of problems maybe you could help with - It will execute instructions and data in locations 0,1,2, and 3, then for some reason it does an RST Ø, i.e. an interrupt is generated and it restarts, also an input or output instruction in one of those locations does not get a low pulse on the in or out. If you can make any sense out of that or could offer troubleshooting advice, I would appreciate it.

Tom Burke, 150 Church St, Burlington, VT 05401 : I have a TVT-II, not yet debugged. SWTPC is very helpful - too bad their kit delivery is so abysmally slow. I'm building an Altair 8800 with CPU and D/C boards purchased from MITS unpopulated (yes, it is possible, though difficult). I plan to order the motherboard and I/O board from Processor Technology. All will be housed in a rack-mount cabinet scrounged from an ancient, monster analog computer (how appropriate). I am hardware oriented (being an electronic technician), and find building as much fun as using. My major computer interest is in graphics (particularly games like Spaceman), and as soon as the Altair is running I will start on the design of as sophisticated a graphics terminal as I can manage. When at Carleton College (trying to major in physics), I had access to a PDP 8/L with a storage scope and FOCAL modified for graphics. My dream is to have my Altair be able to do what that could, and more.

OCTAL TO HEXIDECIMAL CONVERSION
(for MIKE-2 Microprocessors)

I wrote this little subroutine because I was constantly faced with the conversion task when setting up PROMs to be programmed. It is simple minded and takes advantage of existing Monitor programs.

```
20 000  307  LAM                        106  CAL,INHL
        133  OUT 15                     054
        326  LCL                        000
        106  CAL,EXP                    035  RST 30
        363                     20 020  074  CPI,017
        000                             017
        135  OUT 16                     110  JFZ,020017
        303  LAD                        017
20 010  044  NDI,360                    020
        360                             104  JMP,020000
        261  ORB                        000
        137  OUT 17                     020
```

Output is to the LED's. The first four LED's will contain the current (Octal) low portion of the address and the last two LED's will contain the Hexidecimal value at that location. The user simply depresses the "C" key on the MIKE 2 keyboard to increment the address pointer and step through memory.

To use, see the following example:

```
10 000  066  LLI,000     Set up the starting address of the area you
        000
        056  LHI,040        wish to display in hexidecimal.
        040
        104  JMP,020000
        000
        020
```

FROM:
John Ford
5561 Esplanada Ave.
Santa Maria, CA 93454

An Open Reply To Bill Gates*

by Harold Novick**

In Bill Gates's "Open Letter to Hobbyists" dated February 3, 1976 and published in numerous publications including this issue of "The Analytical Engineer", he critically labels us computer hobbyists as unfair thieves. The problem he faces is the lack of an economic reward for writing microcomputer software which results from the availability and alleged frequent use of Xerox and the like photocopying machines. Are we hobbyists guilty as charged? Are we conspirators and criminals if we did as Bill Gates alleged and must we follow the Watergate crowd to the "public leasure farms?"

Bill Gates poses a very valid question, though he does it in a very insulting and defamatory way. Without getting into a defensive posture or trading accusations, lets assume that Mr. Gates is correct and we hobbyists did copy and distribute software without paying the software's creator. Whether we are guilty of criminal acts or can be sued for misappropriation of the software depends upon the legal status of the software.

Software or computer programs are a rare legal bird, they can simultaneously fit all categories of legal protection and still not be protectable because of the nature of software. Traditional methods of protection of software includes copyrighting, patenting, keeping as a trade secret, or protecting with a contract.

If the software has been copyrighted (has a copyright notice consisting of ©, name of the owner, and year date of publication), then a "copying" of the software is illegal with possible criminal penalties if the copying is willful and for profit and civilly infringes a copyright or in any case with possible civil liability with a required payment of damages. However, a "copying" does not include the use of the software in a computer. The law is unsettled whether a tape onto which the program has been dumped would constitue a "copy" of the original work. In any event, a person would be free to read and use the theory behind the program to write a separate program of his own which does not embody a "substantial copying" of the original program.

Patenting, if possible, of the software would protect the invention behind the program. One could be prevented from making, using, or selling the patented invention even if there were such differences between the patented program and the other program such that there would not be a copyright infringement problem. Unfortunately the Supreme Court is presently considering whether software is patentable and the answer will not be known until a few months from now.

If the software were kept as a trade secret, then the software could never be sold and once it became public, anyone would be free to copy it. Many terminal users are tied in to a master computer in which the software is kept as a trade secret. Because a computer hobbiest can not afford to use a terminal, the trade secret route is probably not economically feasible for the programmer.

Finally, the software owner can lease the software under a contract in which the user is bound not to give, sell, or disclose the software to anyone else. The user breaching the contract may be liable for damages if the the software is impermissably disclosed, but the owner may never find out about the breach and even if he did, he probably could not afford to bring a law suit to collect damages that may be less than the legal fees involved. In any event, the owner has no recourse against someone who obtains the software without knowledge of the contract.

Okay, so what is the answer to whether we hobbyist are thieves? It depends on how Mr. Gates tried to protect his software. His letter is silient on this point. If he tried to protect his work by contract alone, the innocent receipient of the software is not a thief, but the giver under contract may be acting improperly (assuming the contract would be enforced by a court). I'm pretty certain that the software was not patented and it obviously was not a trade secret. Was it copyrighted? Who knows.

Nevertheless, the crucial point of Bill Gates's letter is that there is little or no incentive for professional software people to deal with computer hobbyists and to write for them programs that would be too complex and time-consuming for the hobbyists to write for themselves. Professional programmers have a right to earn a living. With computer hobbyists widely distributing software for free, they are cutting off a valuable resource and source of microcomputer programs.

I would propose that this is a gap that hobby clubs such as CMC can fill. If a few hobby clubs can get together, we can pool our financial resources and hire professional prbgrammers to write programs that we would be unable to write. In this manner, we hobbyists can all share the software rewards without getting a "bad name" or having to "steal" anything. Similarly, computer hobbyist magazines such as "BYTE" may be able to purchase software and publish it for us all to share.

Mr. Gates certainly has made a valid point regarding the difficulty of getting good software developed. Perhaps microcomputer hobby clubs can provide a solution.

---

*© Harold L. Novick 1976

** Harold Novick is a registered patent, trademark and copyright attorney with the law firm of Larson, Taylor & Hinds and is admitted to practice in Maryland and the District of Columbia. He is also general counsel for CMC. This article is only for the general information and education of the public and anyone having specific questions should consult their own attorney. Any member having general questions in this area which would be of general interest to the Club should send their questions to the Editor and selected questions may be answered in subsequent articles.

CMC stands for the Chesapeake Microcomputer Club and the "Analytical Engineer" is their publication.

Personal Computing

76 Consumer Trade Fair • Atlantic City, N. J. • August 28th 29th, 1976

503 WEST NEW JERSEY AVENUE SOMERS POINT NEW JERSEY 08244 (609) 927-6950

I am extremely happy to be announcing Personal Computing '76,the first consumer orientedcomputer show of the "New Revolution of '76". PC '76 will be held August 28th qnd 29th at the Shelburne Hotel,Michigan Avenue on the Boardwalk,Atlantic City,New Jersey,OB401. Special rates for the show are available by writing the show at the hotel.(Attn.Personal Computing '76)

The show is approaching the entire computer business from a unique point of view,that of the consumer. It will give you a chance to see all or the hobby oriented products side by side,ask questions about the devices,and see just what is available to fit your system needs and from whom.

Another unique concept of PC '76 is that all of the seminar sessions being run by the convention will be covered by the same low fee that gives you entrance to the exhibits and access to the door prizes. Tickets will be $7.50 at the door,$5.00 in advance, and for advance group purchassers,we are offering the special rate of $4.00. Tickets are available from me at our return address,and we invite inquiries.

Sessions are lining up rapidly,and heading the list will be Carl Helmers, editor of BYTE magazine. Carl will be presenting a program on the computerized control of music synthesis. BYTE by the way will kick off our national publicity in the MAY issue,and will be keeping everyone up to date with what will be happening at PC '76.

CMS Marketing will be presenting a three and one half hour session,of a highly technical nature,on microprocessors,featuring the MOSTEK F-8.CMS has also promised a set of F-8 chips as a door prize.

We are also inviting groups to participate in our printed programs.Write me for additional details on this.

PC '76 is lining up to be one of the most exciting events on the personal computing agenda for this,the year of the personal computing revolution. We invite you to participate,and hope that your group can be represented at this major hobby computing happening.

Thank you,

John David Jones,Jr.
Co-Chairman PC '76

Richard Rhinevault, 79 Sprucewood Cr, Geneva, NY 14456, says he has been busy working on a computer language for hobbyists. He wants to know if anyone is interested in a floating-point language lower in complexity than BASIC but higher than an assembler which could be used to write general purpose programs and could even be used to write a BASIC if desired. It uses Polish arithmetic and has provision for character comparisons. He has named it HELP, and is working on it as a language only, since he doesn't have the means to program it in machine language for any uP. He also wants to know if anyone else is interested in the new TI 990 uP (a 16 bit machine with a very elegant architecture).

S. A. COCHRAN, JR.
ATTORNEY AT LAW
P. O. BOX 607
TYLER, TEXAS 75701
PHONE 000-0000

March 24, 1976

Since my last correspondence I have had delivery of an additional 7-K of Memory from IMS, together with their cassette recorder board and their real time interrupt board, each of these units looks great but I have not really been able to play with them, because of a holdup in the delivery of IMSAI's serial output board. Apparently there were a couple of bugs that they found in it and delivery of these boards was held up for about two months, while they were preparing a revised serial input-output board and the revised instructions to go with it. IMSAI very promptly sent a note out to their customers for random access memory, when they found that they had received a shipment of 1.3 micro-second memory chips from Intel at the end of February. I also enclose one of two flyers from IMSAI that appeared at the March meeting of the North Texas Computer Hobbyist Group. One of them relates to IMSAI's new and improved static memory board which has a couple of new belts and whistles on it, at a price reduction of $24.00; the other was their announcement that the price for the basic IMSAI unit would go up from $499.00 to $599.00 effective April 30. At this meeting their was also a report that the Altair 8800B, to be introduced by MITS at its convention next week would be introduced at a price of $599.00. Doubtless, you will hear more about this from other sources if it is true.

Jim Garrett has gone forward to the point of offering the memory board mentioned in his letter of last January. The cost of the bare board will be $18.75 post paid, subject to an additional 5% sales tax for Texas customers. Apparently, he did not have enough demand for the other boards mentioned in his letter.

Phi-Deck had an introductory offer of its Super Board, mentioned in some of the letters from the Digital Group, at a price of $299.00, including power supply, controller, remote controller, and one Phi-Deck, with continuous variable tape advance from 0.5 ips to 20 ips. Upon my order for this introductory package, they gave me a notice of 60 days delivery. I will have to wait and see whether this one comes through or not. National Multiplex Corporation has been putting forward a number of interesting things in their ad BYTE. I would be tempted to trade with them instead.

I have a recent letter from Oliver Audio Engineering in which they insist that their address is 1143 North Ponsettia Drive, Los Ange les, California, 90046 and their alternate address is 7330 Laurel Canyon Blvd. North Hollywood, California, 91605, rather than 7230 Laurel Canyon Blvd., as listed in your latest newsletter. True to its traditions, the U.S. Post office returned my letter addressed to Oliver at 7230 Laurel Canyon Blvd, marking the letter undeliverable.

Please paraphrase this long letter for your newsletter as you see fit.

Yours very truly,

S. A. Cochran, Jr.

The Oliver thing has been a comedy of errors. Many apologies. The last flap stems from a gal at the SCCS desk display saying, "oh, we have a new address and penciling it in. One of the two of us messed up a digit and I think it was her. H.S.

John C. Lewczyk, 419 Fredericka St, North Tonawanda, NY 14120, wrote to say that he just purchased a MK-8 with 1K RAM, and got the address of the NL as a source of information on software, extensions, and modifications. He is a graduating senior at State University of New York at Buffalo, and is a Computer Science major. When he gets a full system running, he hopes to contribute to the NL.

A SECOND AND FINAL LETTER

Since sending out my "OPEN LETTER TO HOBBYISTS" of February 3rd I have had innumerable replies and an opportunity to speak directly with hobbyists, editors and MITS employees at MITS's World Altair Computer Convention, March 26-28. I was suprised at the wide coverage given the letter and I hope it means that serious consideration is being given to the issue of the future of software development and distribution for the hobbyist. In my remarks at the WACC I spent a great deal of time explaining why I think software makes the difference between a computer being a fascinating educational tool for years and being an exciting enigma for a few months and then gathering dust in a closet.

Unfortunately, some of the controversy raised by my letter focused upon me personally and even more inappropriately upon MITS. I am not a MITS employee and perhaps no one at MITS agrees with me absolutely, but I believe all were glad to see the issues I raised discussed. The three negative letters I received objected to the fact that I stated that a large percentage of computer hobbyists have stolen software in their possesion. My intent was to indicate that a signifigant number of the copies of BASIC currently in use were not obtained legitimately and not to issue a blanket indictment of computer hobbyists. On the contrary, I find that the majority are intelligent and honest individuals who share my concern for the future of software development. I also received letters from hobbyists who saw the stealing going on and were unhappy about it, and from small comoanies that are reluctant to provide software because they don't think enough people will buy the software to justify its development. Perhaps the present dilemma has resulted from a failure by many to realize that neither Micro-Soft nor anyone else can develop extensive software without a reasonable return on the huge investment in time that is necessary.

The reasons for writing my first letter were to open the issue for discussion, let people know that someone was upset about the stealing that was going on, and to express concern about the effect such activities will have on future software development. Some letters suggested that software should be sold for a flat fee to hardware companies who would add the cost of the software to the price of their computer. Whether this is legal or not, the marketability of software to hardware companies is questionable when software is so freely shared among hobbyists. Providing software in ROM may help, but commiting a complex software package to ROM before it has been field tested means that users will have to accept the bugs that inevitably turn up. Having a select trustworthy group do field testing for six months would mean that most of the bugs could be eliminated, but delaying the introduction of a product this long isn't feasible or desirable. In any event, software on ROM can be copied.

In discussing software, I don't want to leave out the most important aspect, viz., the exchange of those programs less complex than interpreters or compilers that can be written by hobbyists and shared at little or no cost. I think in the forseeable future, literally thousands of such programs will be available through user libraries. The availability of standardized compilers and interpreters will have a major impact on how quickly these libraries develop and how useful they are.

Two factors that will encourage people to develop software are that the hobbyist market is expanding rapidly and that many commercial applications of microcomputers require the same software that hobbyists need. Unfortunately, some of the companies I have talked to about microcomputer software are reluctant to have it distributed to the hobbyist, some of whom will steal it, when the company is being asked to pay a huge sum to finance the software development.

To avoid an endless dialogue, and to keep the current controversy centered on the primary issue, this is the last open letter I will write on this subject. I thank those who responded in writing to my first letter.

APL is well under way and should be completed by the middle of the summer, when it will be made available to hobbyists. Micro-Soft also has a high-level language compiler in the design stage and is trying to work out a way to publish the source of one of its interpreters in a fairly inexpensive book form along with about one hundred pages of explanatory text.

Bill Gates

MICRO-SOFT
1180 Alvarado SE #114
Albuquerque, NM 87108

BILL GATES
General Partner, Micro-Soft

Dear Hal & Group:

I am sure happy, you have found a way to deal with my long street address - I have received the Newsletter and sure enjoy it. - By the way - if you still have problems with my address, here is a way to make an abreviation, of which I have seen the postal service approve:

Mogens Pelle
BHT 416C
DK-3520 Farum
DENMARK - simple - when only you know!

I enclose US-dollars 6.00 and hope to be listed for the next period of the Newsletter too.

With my best regards,

Mogens Pelle

BY ALL MEANS LET'S HAVE THE LETTERS REGARDING BASIC/MITS/BILL GATES, ETC. FOR THOSE OF US HERE IN THE BOONDOCKS OF THE MIDWEST, YOUR NEWSLETTER IS ABOUT THE ONLY SOURCE OF INFORMATION ON WHAT'S HAPPENING "BEHIND THE SCENES", STUFF THAT THE SLICK-PAPER MAGS WOULD NEVER TOUCH

Joe Mockus
Columbus, Ohio

PLEASE REPRINT ALL THE LETTERS ABOUT BILL GATE'S MICRO-SOFT LETTER - I AM QUITE INTERESTED.

ALSO THE VENTURA COUNTY COMPUTER SOCIETY HAS ELECTED A SLATE OF OFFICERS DECIDED TO BECOME AN SCCS CHAPTER, GOT A MAILING ADDRESS (P.O. BOX 525, PORT HUENEME, CA 93041), AND ESTABLISHED A REGULAR MONTHLY MEETING (9:30 AM ON THE LAST SATURDAY OF EACH MONTH AT THE CAMARILLO PUBLIC LIBRARY CONFERENCE ROOM, 3100 PONDEROSA DRIVE, CAMARILLO.) PEOPLE DESIRING FURTHER INFORMATION CAN CALL ME DAYS AT 805-982-5685 OR WRITE TO THE P.O. BOX WITH A SASE.

SINCERELY YOURS,

John A. Borders

JOHN A BORDERS

JOHN A BORDERS
3235 W HEMLOCK #C
OXNARD, CA 93030
APRIL 13, 1976

Bob Wallace, designer

PO Box 5415, Seattle, Wa. 98105

New World Computer Services, Inc.

April 8, 1976

It will be sad to see the end of Micro-8, especially as a forum for good and bad experiences with manufacturers and distributers, and a voice (independent of advertizing) to deal with the computer hobby directions and goals in general. PCC will have to pick up the slack, I guess, as the only other wide circulation mag without advertizing.

I have been following the Bill Gate's Letter controversy with interest. It looks like I'll be going into the microcomputer software business, thanks to a family loan to (finally) get a system of my own. My professional experience is with operating systems and command languages, and I have an idea for a software development system with a strucrured, expanded 8080 assembler and device-independent operating system, probably oriented toward a VDM/TVT operator console (most of the present systems are Teletype driven), and relying on a Restart+opcode mechanism for stuff like dynamic loading and Zilog instruction set emulation.

Anyway, I agree with Bill Gate's philosophy, although the tone of his letter put many people off, I'm sure. I think large software systems should be developed full-time by someone who is financially dependent on the system working reliably. Consider, for a minute, that a system which takes one man-year to design, code, debug, and document would take three years on a part-time basis; i.e. if the developer must work at another job to support themselves while doing the system at night and on weekends. Besides the slowing-down of software development, I would venture to state that the quality of the code and (especially) documentation would be better in general when done by a person paid to do the work, although I'm sure there are cases when a project done for free is better than the same project done for money. I'm talking about large projects, of course; compilers and interpreters for major languages, word processing systems, data base retrieval systems, etc., and not so much smaller projects like math packages and simple assemblers.

I don't know Bill Gates, nor exactly how Altair Basic was developed, nor whether the asking price is unreasonable for either the hobbyist or MITS/Bill. It seems to me that a fair price would be the development cost (programmer labor, computer time, selling costs, documentation costs, etc.) divided by the number of systems to be sold would give a selling price; the big question system developers (including myself) is the number of systems likely to be sold. The computer hobby is so new, it is impossible to guess, even within an order of magnitude, the number of systems the development cost can be spread over.

I do have some suggestions to MITS and other software developers as to pricing and marketing. First, liberal quantity discounts should be available, allowing clubs or stores to buy a number of systems at a discount. This is standard practice for most products, automaticly lowers the per-system price as the number of systems increases, and would decrease the financial attraction of copying a friend's software. Second, the price of a given software system should fall with time, as the system becomes obsolete and the development costs are recovered. Third, a newsletter should be done for each major piece of software, with user modifications and complaints, bugs found and fixed, interesting applications and (for language processors) applications programs written in the language or announcements of software for sale written for the language (a BASIC newsletter might have listings of short demo programs from users, and announcements of longer programs such as a full astrology calculator available from other users). Finally (and most important), a dialog needs to be opened between software writers and users, so each can understand the problems of the other. The problems of developing and distributing software are unique. It's a little like writing a book, except that you don't save much copying a book instead of buying it; a little like a play or movie, except many people benefit when a play is performed and only the user benefits when software is "performed" (curiously, copyright law is being interpreted so that implementing a system based on someone else's copyrighted system manual is like performing a play copyrighted by the playwright); but software is it's own kind of information, and everyone - programmers, manufacturers, hobbyists, stores, magazines, and clubs - needs to get involved in deciding how to handle the situation.

Sorry for all that rambling, but I do hope to see more on the subject; not just "us" versus "them" letters, but also some new ideas.

Other projects - Northwest Computer Club is alive and well, meeting the 1st and 3rd tuesdays usually at Pacific Science Center. Recently we've been discussing cassettes and modems. My list of computer clubs is still growing, and available for 25¢ and a SASE. Comindex, the directory of computer alternatives, is about to come out with issue #2, again through RAIN magazine.

Compufraternally,

Bob Wallace

What's DDJCC&O all about?

My gawd! Not *another* computer hobbyist magazine! That was my first reaction when People's Computer Company approached me about becoming Editor of their one-issue-old infant, **DR DOBB'S JOURNAL OF TINY BASIC CALISTHENICS & ORTHODONTIA.** PCC had originally planned on publishing three issues of the **JOURNAL.** The response to the first, patchquilt issue, however, convinced them (and me) that an area of badly-needed information is not being convered by the presently existing publications. Furthermore, it seems unlikely that the other publishers will choose to cover that area; they have their hands (and pages) full just covering hardware and small bits of software.

What is this area; this information vacuum? It's *free and very inexpensive software.* One of the primary thrusts of **DR DOBB'S JOURNAL** will be to present detailed information concerning low-cost systems software; interpreters, compilers, structured assemblers, graphics languages, floppy disc file systems, etc. This will include user documentation and exmples, documentation on implementation including complete source code listings, updates giving errors and their fixes, explicit and detailed notes on the design and implementation of such systems software, and so on. This **JOURNAL** is explicitly available to serve as a communication medium concerning the design, development, and distribution of free and low-cost software for the home computer.

We encourage you to send in documented software, as you develop it. We hope that you will use the software that we publish in this **JOURNAL**; that you will study it and modify it to expand its capabilities, and that you will report any bugs you may note to us and to the authors.

We are also quite interested in publishing evaluations of *any* software and hardware that is being sold to the home computer user. We are supported by readers' subscriptions rather than advertising. We will not hesitate to publish positive *and* negative evaluations. We adamantly hold the position that, if a manufacturer of some hardware or software is going to peddle it to unsuspecting consumers for a healthy profit, their product damn well ought to perform as well as their advertisements and profit imply it will!

There are some other areas of information that we expect to cover, not seen in most of the other major computer hobbyist publications. These include complete indices to *all* of those publications, directories of computer stores and distributors, listings of computer clubs and organizations, listings of users and their equipment, etc. Another tidbit: as long as we can afford to, we will carry classified ads.

We also plan to begin reprinting articles and schematics from the club newsletters. We have heard the comment, over and over, "I wish I could see the stuff that's being printed by all the homebrew groups, but I just can't afford to subscribe to all of them." We expect to help with this desire.

Finally, we will be doing some fairly detailed "blue skying." Everyone is wondering where home computers are going, and what the potentials are. We have a number of ideas (with more rolling in, every day) about what can be done in the immediately foreseeable future. We will be presenting them and encouraging their realization. The Votrax articles on page 32 of this issue are one small example of this.

Thank you for reading. We want your suggestions. We want your contributions of software, hardware designs, evaluations, and anything else you're willing to share with other home computer enthusiasts. And, of course, we want your subscriptions. The more subscriptions we have; the more pages we can print; the more information we can pass along to you and your friends. If you like what you see here, we hope you will spread the word.

Nuf sed, for now. More in a coupla weeks. –Jim C. Warren, Jr., Editor

Dear Bob, February 4, 1976

Thank you for your note and interest. Our system is growing by small leaps and bounds. We have an Altair 8800 with the Processor Tech. mother board. We also have the following items:

Qty	Description	
1	VLCT (octal loader)	Altair
1	PIO	Altair
1	256 byte static RAM board	Altair
2	4K RAM boards	Godbout
3	4K RAM boards	Proc. Tech.
1	3 P + S	Proc. Tech.
1	wire wrap prototype board	TCH
1	cassette interface	TCH
1	VDM	Proc. Tech.
1	Real time clock and VI	IMS
1	ASR-33 (10 cps)	Teletype
1	Silent 700 (30 cps)	TI
1	2K ROM board	Proc. Tech.

We are building a version of the TCH graphics interactive display with direct Altair plus in boards (double-sided).

We are also ordering the Processor Tech. dual cassette drive, controller and PTCOS.

We have several interactive editors, assemblers, monitors, and cross assemblers. We are currently experimenting with minimal editors and assemblers and have a strong desire to put together a micro-BASIC (Tiny BASIC). The editor package looks like it will be around 510-512 bytes and the same for a "mini-assembler." We are also looking for 4K, 8K, and 12K BASICs which are public.

We are hoping to eventually acquire a TV Dazzler and a floppy disc to extend our system. Future desires also include the IMS shared processor/memory and an additional CPU board in addition to 12K-16K more low power status RAM memory. Who knows what else the future has in store?

We are strongly interested in developing software (for the Altair and other micro-processors) which can be used for instruction and instructional support in the school media center.

Our research interests vary considerably here so we also will be running some basic human learning experiments under processor control. We have been involved in research in CAI and computer-managed instruction for about 9 years here. We have PLANIT, COURSEWRITER, PICLS, PLATO (TUTOR), and BASIC available and a wide range of instructional programs for these languages.

Franz Frederick
Associate Professor
112 Education Blg
Purdue University
W. Lafayette IN 47907

Franz, We would be *very* interested in publishing the source code and documentation (user *and* implementation details) for the "tiny" editors and assemblers you are implementing. Any chance of your forwarding copies, once they are up and running? –JCW, Jr

TBX MODS FOR A SWTP TVT-2

Dear Dennis and all TB people,

First of all, thanks to Dick Whipple and John Arnold for a great job they have done on TB, and for making their program available. Many hobbyists, including myself, don't have the skill or time to write anything as complex as an interpreter.

TBX is working and programming is now FUN. It took about six hours to put TBX on a cassette. Loading TB from TP (tiny print) is a severe strain on the eyes.

A listing of the I/O routines for my Altair/TVT-2 system is enclosed. An instruction is included in the Entry Routine to turn on the TVT cursor and initiate a Home Up/Erase Frame. In the Input routine the code for ESC should be 033; otherwise a rubout (backspace in TBX) will give a system restart. The basic Altair executes a RST 7 if the keyboard is tied directly to the interrupt bus. I had to change the instruction at 000070 to 311. No harmful effects so far.

```
000  000 076 004     MVI A     Turn on cursor on
     002 323 002     OUT         TVT & initiate
     004 061 377 000 LXI SP      Home up/Erase fr.
     007 303 254 021 JMP       TBX entry point

     020 076 012     MVI A
     022 357         RST       Output LF
     023 076 015     MVI A
     025 357         RST       Output CR
     026 311         RET

     030 373         EI
     031 166         HLT       Wait for KBD entry
     032 333 001     IN        Input KBD charctr
     034 346 177     ANI       Mask parity bit
     036 376 033     CPI       "ESC"
     040 312 000 000 JZ        System entry
     043 357         RST       Echo character
     044 311         RET

     050 365         PUSH PSW  Save registers & flags
     051 323 001     OUT       Output character to TVT
     053 333 002     IN        Wait for "data ac-
     055 037         RAR         cepted" signal
     056 322 053 000 JNC       from TVT
     061 361         POP PSW   Restore register &
     062 311         RET         flags

     070 311         RET       Keyboard interrupt
```

PORT ASSIGNMENTS:

IN	001	ASCII keyboard input
OUT	001	Character output to TVT
IN	002	"Data accepted" from TVT
OUT	002	Cursor control to TVT

Progress

(Joe is talking to Henry)
Joe: I have a new advanced micro-processor.
Henry: Let's see it.
Joe: Right here.
Henry: I don't see anything!
Joe: It's that advanced!

Jim Williams
General Electric
Mojave, CA

Page 4

IN FUTURE ISSUES

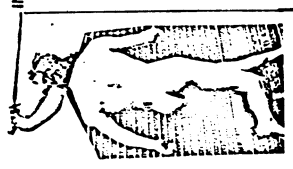
- Documented source code for the Denver version of Tiny BASIC
- A public-domain floppy disc file system
- Schematics & articles from club newsletters
- Directories of clubs, organizations, stores, distributers, used equipment sources, publications, etc.
- Lists of computer hobbyists & their equipment
- Indices to computer hobbyist articles in many publications

Facing The Music

A microprocessor design engineer standing in an employment line was explaining how he lost his job to the man behind him.

"After several months of sweating, I designed a chip for interpretive control of a piano keyboard. We went into production and I was put in charge. I was promoted to project head. After we were fully committed to production, a flaw in the system became apparent, and no amount of redesign could correct it. It seemed that no matter what we did to the device, its Bach was worse than its byte.

M.W. Brown
B.A.R.T.
San Francisco, CA



dr. dobb's journal of
COMPUTER Calisthenics & Orthodontia*
Running Light Without Overbyte

* formerly DR DOBB'S JOURNAL OF TINY BASIC CALISTHENICS & ORTHODONTIA

IN THE FIRST ISSUE, January 1976:

- Tiny BASIC Status Letter
- 16-bit Binary-to-Decimal Conversion Routine
- Build Your Own BASIC
- Build Your Own BASIC, Revived
- Design Notes for Tiny BASIC
- Tiny BASIC
- Extendable Tiny BASIC
- Corrected Tiny BASIC IL
- Tiny BASIC, Extended Version (TBX), Part 1 — *Example, Command Set, Loading Instructions, Octal Listing*
- Using a Calculator Chip to Add Mathematical Functions to Tiny BASIC

IN THE SECOND ISSUE, February 1976 (a partial list)

- Tiny BASIC, Extended Version (TBX), Part 2: *Complete implementation documentation, source listing, error corrections, notes on two relocated versions*
- SCELBAL–A Higher Level Language for 8008/8080 Systems
- Music of a Sort
- TVT-2 Octal Keyboard Loader
- A Critical Look at BASIC
- Letters, news tidbits, etc.

72 PAGES + COVER

DR. DOBB'S JOURNAL OF COMPUTER CALISTHENICS AND ORTHODONTIA is published ten time per year, monthly except in July and December.

U.S. Subscriptions:

- ☐ $1.50 for a single copy
- ☐ $3.00 for the first three issues
- ☐ $10.00 per year (10 issues/year)

For foreign subscriptions:

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Necessary Information:

Name (last name first) _____

Mailing Address _____

_____

City _____ State _____ Zip Code _____

☐ yes ☐ no: This information may be published in directories and lists of individuals interested in computers in non-commercial environments.

Optional Information:

Equipment that you have or are planning on purchasing, immediately:

Make & model _____ Manufacturer _____

CPU model _____ CPU Manufacturer _____

I/O Devices _____

Mass storage peripherals _____

Primary areas of interest concerning non-commercial and home computers:

_____

_____

Questions: What would you like to see published in DR. DOBB'S JOURNAL? It will help guide us if you will rate these, 1 to 10 (1 – minimally desire; 10 – super-eager to see) or 0 (would prefer we not waste space publishing it).

____ Schematics and acticles from all of the computer club newsletters
____ Short news articles directly related to home computers
____ Short news articles concerning computers in general, particularly their social implications
____ Indices to all articles in all other computer hobby publications
____ Indices to selected articles from other computer, electronic, and trade publications
____ Letters having technical, critical, or entertaining content
____ Classified ads (as opposed to display advertising)
____ Suggestions and "blue skying" about what can be done with home computers in the foreseeable future.

Directories of:

____ Users of home computers and their equipment
____ Computer stores and distributers
____ Manufacturers of computer kits
____ Computer clubs
____ Sources of used equipment
____ Microprocessor and minicomputer manufacturers

Source code listings and documentation: For which microprocessors? _____

____ Nearly full-sized (much less can be published)
____ Reduced as in recent issues (more difficult to read, but more info included in each issue)

What kind of software would you like to see developed and placed in the public domain?

Importance Rating	Software Description
_____	_____
_____	_____

What else would you like to see us publish? *Please use another page or ten, if you need them.*

TINY BASIC AVAILABLE FOR THE 6800

A version of Tiny BASIC has been developed for the Motorola and AMI 6800. A tape and instruction manual for it are available for $5 from:

Tim Pittman
Box 23189
San Jose CA 95153
(408) 578-4944

We understand that the source code will not be made available, however, we expect that Tom will back his "product" . . . and the price is right.

We would be interested in hearing of the joys and/or woes incurred by those who purchase Tom's Tiny BASIC.

BYTE SWAP

We are experimenting with offering a "Want Ad" section. We will continue to do it as long as we can afford it (in terms of staff time and printing costs). Note: the charge for running an ad will undoubtedly increase as our circulation (and printing costs) increases.

Please follow these instructions in submitting ads. Ads received in other than this form can/not be accepted, and will be returned to the sender.

1. *Type* the ad, with a blank space between each line, in lines no more than 50 character positions in length.
2. Include at least your name and address as part of the ad. "Blind" ads will not be accepted.
3. Compute the charge on the basis of $1 per line or partial line, per issue.
4. Forward the typed copy and a check or money order payable to "PCC," to: DDJ Byte Swap, PCC, Box 310, Menlo Park CA 94025. Do not send cash. Your cancelled check is your receipt. Payment must accompany the ad.

SAVE MY MARRIAGE! *Buy my new assembled IMSAI 8080, loaded 22 slot mother board, 8k Ram, regular price, $1835.00. Will sell to highest bidder above $1700.00. Also, IMSAI 8080 kit, still in box, large mother board, regular price $578.00. Will sell to highest bidder above $547.00. Send bids to: Eric Stewart, 664 Via Alamo, San Lorenzo CA 94580.*

I am looking forward to an annotated source code listing for TBS; like to do some tinkering. Floating point and math functions would also be nice to have. Dr Suding's scientific calculator interface looks good. However, it's only available through MiniMicroMart and doing business with them has been a frustrating experience.

When deciding on the future of the newsletter keep in mind that hardware is available and getting cheaper. Software has been a big problem and probably will be for some time to come (unless you can afford to pay for it). The newsletter is a step in the right direction to solve this problem. Please don't stop after three issues.

Adolph Stumpf
5639-A Ute
Glendale AZ 85307

A BIT OF BLUE SKYING

Bob, February 19, 1976

By all means keep up the Calisthenics & Orthodontia. But I suspect that as *Tiny BASIC* matures it will acquire a full set of canines, bicuspids, and molars. As the price of main memory continues to drop, the need for a minimal BASIC will assume less importance and the emphasis will shift to better performance and convenience. Still, IL is a good tool for those who may want to experiment with variants of BASIC or some other language. As unlikely as it may seem, I think that by 1980 most hobbyists will be using a subset of PL/1. I also predict that the 1980 hobbyist will own a computer system the size of a breadbox and comprising a 16-bit CPU, 256K bytes of main memory, 8M byte floppy disc, dual tape cassettes, full ASCII keyboard, CRT display, modem, and non-impact printer (all in one box). The whole thing will sell (assembled) for $695 at Sears and will have the computing power of an IBM 370. Last, but not least, the CPU chip will be designed expressly for the hobbyist, not for some pedestrian application such as traffic signal control.

Jim Day
17042 Gunther St
Granada Hills CA 91344

jim day's DAZE

[reprinted from PCC Vol. 4, No. 5]

COMPUTERS THAT TALK

Wouldn't it be nice if your computer could speak to you in English, French, German, or Esperanto like the computer on the starship Enterprise? Then it could say things like, "Wake up, sir" or "Get with it, turkey" (depending on what kind of mood it was in) or maybe, "The time is six o'clock, the temperature is 46 degrees, and tomorrow is your wife's birthday." Most people have probably assumed that some day, perhaps by the year 2000, talking computers will be a reality instead of simply science fiction. Well, hang onto your prognostications, people, because that day is today!

In recent years many people have been working on voice output devices for computers. Some of these devices have been electro-mechanical analogs of the human vocal tract, similar in principle to the Voder exhibited at the New York World's Fair in 1939. Others have used electronic waveform generators to synthesize human speech sounds. Of these, the Votrax synthesizer can truly be said to represent a significant breakthrough with respect to voice quality, ease of programming, and cost.

Smaller than a breadbox and priced at about $3500 for the basic unit, Votrax is produced by the Vocal Interface Division of the Federal Screw Works (500 Stephenson Highway, Troy MI 48083; (313) 588-2050). Any computer capable of outputting a string of ASCII code to a terminal can be used to control Votrax. As an output device, Votrax can be used alone or in conjunction with an ordinary TTY, using embedded ASCII control codes and simple logic to switch voice strings to Votrax, and print strings to the TTY, TVT, or other conventional terminal.

Programming Votrax is a snap. Using BASIC, FORTRAN, APL, PL/1, or just about any other programming language, it's easy to convert ordinary English (or other natural language) into voice strings for Votrax. The best quality of vocal output is obtained by using a dictionary lookup technique to substitute a string of phoneme codes for each English word. Votrax responds to ASCII codes for 63 different phonemes (basic speech sounds) and each phoneme can have one of four levels of inflection.

If perfect voice quality is not essential and random-access file space is not available for a large dictionary, an algorithm can be used to convert English words to phoneme codes. Such an algorithm, developed by Bell Telephone Laboratories, is said to work almost as well as dictionary lookup. An unpronounceable string such as "PDP-8" can be spelled out phonetically and although written "per dee per ate-ah ate," and the number 10.6 can be rendered as "ten point six" by means of a simple subroutine. Pauses can be inserted automatically in response to punctuation and paragraphing.

Maybe you are wondering whether anyone has actually used Votrax and, if so, how did they like it? The answer to both questions is yes. People are using Votrax and they like it a lot. For example, the Coast Community College District in Costa Mesa, California, is using Votrax for computer-aided instruction and also in an on-line student information system. Votrax was chosen in preference to other audio response units not only because it hasn't been expensive but also because it is ideal for a wide range of applications, the size of its vocabulary is unlimited, and it functions well in a real-time environment. In the student information system application, Touch-Tone telephones are used as "terminals." Although this limits the user to numeric input, it would be hard to find a cheaper or more readily available I/O device. Several extensions to the district's present use of Votrax are being developed, such as a voice-output interface for their on-line budget system, allowing administrators to inquire about specific accounts and receive immediate vocal replies. David Clements, senior programmer/analyst for the district's student information system, reports that he is amazed at the results achieved with Votrax and believes that synthesized voice output will become a widely used medium in the near future.

Another application of Votrax is as an aid to blind programmers. In the Homer system, written in FORTRAN for a CDC 6500 at Michigan State University, Votrax is used to echo each line input from a conventional terminal. It is also used to deliver FORTRAN diagnostics and as a tool in the editing of source-code program files.

Operating in conjunction with an optical page reader, Votrax can be used to convert printed matter, such as books, magazines, and newspapers, into audible form. If desired, the output from Votrax can be tape recorded for distribution to the blind.

These are but a few of the uses to which voice output can be put, and it appears likely that voice output will soon become a familiar feature of many computer systems. Maybe yours will be one of them.

(Also see "Talking Calculator" in November 1975 PCC [Vol. 4, No. 3, p. 9].)

COMPUTERS THAT TALK – UPDATE

Jim Day had an article in the most recent issue of PCC discussing the use of a Votrax machine to allow a computer to synthesize speech [article is reprinted, herein]. In the article, he indicated that the machine, essentially a solid-state phoneme generator, was priced at about $3500 for a basic system ... a bit high for most hobbyists' budget. [Phonemes are the basic components that make up spoken words.]

Well, we just finished talking to the west coast rep for Votrax for about an hour and a half, and have some exciting possibilities to report!

Votrax is currently selling relatively few of their systems. It would be easy for the computer hobbyist community to *significantly* increase their sales (and, presumably, thereby drive the price per unit significantly downward). And, the rep didn't even know the hobbyist market existed; *he does now.*

First of all, the price that Jim quoted was for a turnkey system; one that includes two 25-pin interconnect boards, an 80-byte buffer for the incoming phoneme codes, an amplifier, and a power supply. Such a configuration is usually expected and demanded by the commerical and industrial users. However, it's a different matter with computer hobbyists. Hobbyists are accustomed to using breadboarding, can supply their own buffering via their system's memory, invariably have the ability to input to a hi fi amp, and usually can find super-cheap power supplies.

Assuming this, all that one *really* needs to purchase are the four phoneme generator boards, and have access to the interface engineering specifications and schematics. These are available for under $2K in small quantities; $1800 @ in groups of ten, and $1600 @ in groups of fifty.

Would you rather have a $1600 hardcopy device or *the ability to generate English speech, including inflection?* Since the Votrax equipment is based on phoneme generation, the vocabulary is essentially unlimited. Further, since the generators are entirely electronic, the equipment has much greater reliability than electro-mechanical equipment. Also, the Votrax equipment and circuitry has been in the field for about half a decade, now, and is thoroughly debugged.

If you would like for Votrax equipment to become available to the hobbyist community:

(1) Write to John McDaniel, Votrax, 4340 Campus Dr., No. 212 Newport Beach, Ca. 92660; tell him that you would like for your computer to be able to *talk* to you, and indicate how much you would be willing to pay for that facility. Give him correspondence to support him when he approaches Votrax management. Make him and them aware of their untapped potential market for stripped-down systems in the hobbyist community.

(2) **Tell the owners of your local computer store about Votrax and encourage them to contact Mr. McDaniel.**

MARK-8

BUGS: So far, I have no indication that anybody has actually tested to see whether their Mark-8 has the bugs in my letter in vol. 2, issue 1p11. Apparently, I made a mistake in not pointing out that "just because you haven't encountered these bugs in no way means your Mark-8 doesn't have them--it is very unlikely for any one user to find these bugs, and try tracking them down (especially the register B,D bug--I found it only when I implemented my asynchronous ports; even experienced users are virtually certain to think "isolated peculiarities" are their mistake in operating the Mark-8). It is still quite possible that these bugs are in all Mark-8's, and I would be interested to hear the results anybody actually obtains from testing their Mark-8, whichever way the test goes. (Note: I got the registers switched in the issue 1 letter: D is sometimes clobbered for wait times near 4 sec.; a second 8008 produces the same symptoms.)

SUPPORT: I feel there is a tremendous need for newslett rs that specialize in individual microcomputers (or at least individual microprocessors), answer questions, provide hardware, software, help for that machine, etc. (The Mark-8 has nothing to compare with "Computer Notes" for the Altair.)

FUTURE PLANS: When I get the interrupt version asynchronous ports working, I intend to write a relocatable loader, and a SUFFIX notation programmable calculator, as my expertise runs the full range from hardware through software to a knowledge of continued-fraction series for transcendental functions.

"Impossibility proofs" of SAVING ALL 7 REGISTERS, FLAGS on any 8008 system without any special hardware ignore one register--as I have written such a routine.

MORSE CODE PROGRAMS could use a scheme for encoding dot-dash sequences for each character as a single 8-bit byte (no separate length code, etc.) as well as the same table for conversion both ways without fouling up input timing. The bit position of the most significant "1" would determine how many dots and dahses are represented, with a "1" in the sign bit indicating a sequence of 8 starting with a dot (thus allowing "error" and "attention" to be encoded).

Thomas R. Amoth
228 Fox Rd.
Media, Pa. 19063
ph:(215)566-1068
4/4/76

Sincerely yours,

Thomas R. Amoth

SUGGESTION TO HELP BEGINNING PROGRAMMERS

Publish octal byte input and output routines (for each u??), encourage beginners to try various input data and calling sequences ranging from adding 2 bytes together to storing as low address in a JUMP instruction to select one of several routines. Alternative I/O modes: binary, characters, hexadecimal (for appropriate uP), and a separate input port with 8 switches or output port with readout for each data byte--would allow the program to run continuously, thus giving an "instant" response to changes. (NOTE TO RETAILERS: 8 SWITCHES IN A DIP would be far more convenient for inputting 8-bit bytes than ?.

I've used a similar scheme to determine what the 8008's unpublished op codes do, as well as analyzing other properties by a hardware debugging technique based on setting up a continuous/repetative scope display (8 traces using 74151). Another hardware technique I've made extensive use of uses a latch and readout clocked by some signal (whose delay is adjustable) to sample, display logic states at any point during the waveform, thus getting around scope frequency response limitations by allowing any signal TTL's can catch to be displayed.

DOCUMENTATION IDEAS

SOFTWARE: comments should tell how data being manipulated relates to data at, for example, the entry point to a subroutine, to avoid having statements like "LAB load register A from register B" lose the reader by making him wonder "what data is being loaded?"

HARDWARE FLOW CHART NOTATION that is "state" and "transition" oriented--uses fewer boxes. (Example: issue 10,p4,). Also: arrows showing cause-effect relationships between states and transitions in both waveform diagrams and flow charts; a related logic notation.

March 31, 1976

Leor Zolman, 742 North June Street, Hollywood, Ca 90038 has an IMSAI 8080 and could use info on building it up.

You ask yourself, whatever happened to Steve Ciarcia? He's still alive and well and residing in Connecticut. I haven't given up on micro computers, but I've been rather low key about it since I've found it too easy to get burned in this business. How many times have you purchased 4K of RAM at $250 only to have someone selling it two weeks later at $200 and so on until it's at $100 now? I haven't been inactive, but I've been sitting in the background waiting for the smoke to clear. The newsletter has been beneficial by providing reviews of new micro processors and equipment manufacturers and, now rather than purchase everything hot off the wave solder machine, I wait until it cools off and the competition catches up.

I've received a lot of mail from newsletter readers as a result of my power supply article. Most ask about parts and suppliers. I cannot vouch for the company, but Delta Electronics carries all the required parts.

Speaking of suppliers, how is Maury Goldberg? Actually, I have no complaints. I bought 9K of RAM and several other things from him and received them each time within one week. There is a catch though. You must call Maury first and see if he has the parts in his hot little hands and make sure he has enough to last until you can ship some cash to him as fast as possible. If you are willing to do business this way, then he can give you some good buys.

Since last talking to you, I've built a graphics terminal. Right now I'm using my 5" scope and would like to hear from anyone having a 12" xy display for sale or trade. (I have one of those ping pong, squash, hockey TV games complete with sound and video scoring available for trade.) Once you have seen a graphics display in action, you'll never be satisfied with just a TVT again. They are fascinating.

Continue the good work and I'll continue reading it.

Regards,

Steve Ciarcia

Mr. Hal Singer-Editor
Micro-8 Computer User Group NL,
Cabrillo Computer Center,
4350 Constallation Rd.,
Lompoc, CA 93436

April 1, 1976

Dear Hal;

I received Vol 2, #3(Mar. 10) of the NL a few days ago.

The day of the computer with printer for under $500 is here due to Texas Instruments. They have a new programmable calculator, the SR-56, with 100 programming steps, ten registers and functions such as sin, cos, tan, log, ln, etc. that has a price of $180. It is programmable from the keyboard only, not like the 224 step, 20 register SR-52 that uses magnetic cards as well as the keyboard for program entry and costs $395.

Both the SR-52 and the SR-56 can use TI's new PC-100 thermal printer that uses 2 1/2 inch tape, no alpha's just numerics. The price is $295. For the SR-56 and the PC-100 the price is $475 and for the SR-52 and the PC-100 the price is $690. I don't believe any printing terminal has this low a price. It would be nice if TI would bring out an alphanumeric printing terminal for the SR-52 and SR-56, however, the price would probably be quite a bit higher than the PC-100.

I understand that Texas Instruments has a SR-60 and that's all I know about it. Does anybody know?

Yours truly,

David W. Johnston

David W. Johnston
P. O. Box 3781
Washington, D. C. 20007

THE MOD 80 DOCUMENTATION PACKAGE

The MOD 80 Documentation Package includes:

1. A description of the MOD 80 system
2. Component placement and schematics for the system
3. Detailed board descriptions
4. Parts Lists for the boards
5. The Monitor 80 software, a source code listing and description of its operation
6. The MIL cassette interface documentation including a software listing
7. Additional notes on the system and debugging hints

MOD 80 Hardware

The hardware of the system is based on eight 4-1/2 inch by 6 inch printed circuit boards.

The MOD 80 CPU Board This board contains the 8080 CPU, clock generators, state decoding, address and bus drivers.

The MOD 8-2 Restart, TTY I/O Board This board contains TTY I/O and reader control logic.

The MOD 80-3/Nano 80-J Jumper Board This board personalizes the backplane to the 8080.

The MOD 8-4 ROM Board This board will hold up to 2K X 8 of 1702A PROM.

The MOD 8-5 RAM Board This board will hold up to 2K X 8 of 2102-1 memory.

The MOD 8-6 Input Board This board has three 8 bit input ports.

The MOD 8-7 Output Board This board has three 8 bit output ports.

The MOD 8-8 PROM Programming and Backplane Board This board interconnects the others and also contains PROM programming circuitry.

The boards are available from:
Space Circuits
156 Roger Street
Waterloo, Ontario
Canada

The Monitor 80 Software

The Monitor 80 contributes greatly to the power of the MOD 80. This powerful 2-1/2k monitor can be run on almost any 8080 system. The Monitor 80 has the following features:

LDS A load symbolic routine accepts the standard Intel mnemonics. This routine interactively accepts symbolic input and creates object code. This is a one pass assembler.

DPS A dump symbolic routine disassembles object code and creates source.

LOC, DLP A routine initializes a location pointer and allows one to start entering code at any place in RAM. A routine displays the contents of the location pointer.

XQT An execute routine allows for execution of a program at any place in RAM.

EDT An octal editor enables one to examine any location in memory and modify any location in RAM from a keyboard.

CPY A copy routine moves blocks of data from one section of memory to another.

TRN A translate routine allows for relocation of code by translating jump and call addresses.

SBP, CBP These routines set and clear breakpoints. When a breakpoint is encountered, the flags, the contents of the 8080's registers and the memory pointed to by H, L. are printed.

LDO, DPO The load and dump octal routines allow for loading and dumping of paper tapes for backup.

PRG A PROM programming routine intelligently programs 1702A PROMS.

Software drivers control an ASR 33 teletype or other teletype compatible device.

This code is contained in 2-1/2K of ROM and needs 100 bytes of read write memory to run.

The MOD 80 hardware, in conjunction with the Monitor 80 represent a powerful microcomputer system.

The following are available:

1. The MOD 80 documentation package	$20.00
2. A Monitor 80 object code paper tape	$20.00
3. The Monitor 80 programmed on 10 1702A PROMS	$200.00

The above prices are postpaid. Delivery is generally one week ARO.

Order from:

Robert Swartz
195 Ivy Lane
Highland Park, Ill. 60035

DEAR HAL ET AL:

I GUESS IT HAD TO HAPPEN, THE END OF THE MICRO-8 NEWSLETTER I MEAN. GUESS THOSE OF US WHO HAVE BEEN WITH YOU A WHILE THOUGHT IT WOULD GO ON AND ON AND ON...,

FOR THOSE OF YOU WHO ARE LOOKING FOR SOFTWARE FOR YOUR 8080 BASED SYSTEMS HERE IS MY CONTRIBUTION. THIS SHORT PROGRAM LETS THOSE OF YOU WHO HAVE A TVT-1 HOOKED UP TO AN ALTAIR AS I HAVE, ALONG WITH A PARALLEL I/O BOARD, PRINT THE 64 CHARACTERS OVER AND OVER AND OVER...THE PROGRAM TAKES 23 LOCATIONS.

LOCATION	MNEMONIC	OCTAL CODE
000	MVI r (B)	006 (load register "B")
001	data	277
002	MVI r (C)	016 (load register "C"
003	data	377
004	MOV r1,r2	170 (move "B" to ACCUMULATOR)
005	CMP r	271 (compare ACCUMULATOR TO "C"
006	JZ	312 (jump if ZERO bit = 1
007		000
010		000
011	MOV r1,r2	127 (move ACCUMULATOR TO "D"
012	INPUT	333
013	CONTROL CHANNEL	000 (ANY EVEN NUMBER PORT)
014	RRC	017 (ROTATE ACCUMULATOR CONTENTS RIGHT
015	JNC	322 (JUMP IF CARRY BIT= ZERO)
016		012
017		000
020	MOV r1,r2	172 (move "D" TO ACCUMULATOR)
021	OUTPUT	323
022	DATA CHANNEL	001 (ANY ODD NUMBER PORT)
023	INR r	074 (increment register "A")
024	JMP	303 (UNCONDITIONAL JUMP)
025		005
026		000

I WILL TRY TO GET SEVERAL MORE "SUB PROGRAMS" TO THE MICRO-8 GROUP BEFORE THE LAST ISSUE IS PUBLISHED. I AM RUNNING MY TVT-1 AT 30 cps WITH MY ALTAIR 8800.

M DOUGLAS CALLIHAN, BERKLEY ST. R.F.D. # 1, BERKLEY, MASS 02780

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mini/micro systems/ mini/micro marketing

THE COMPUTER STORE

Page 6

A revolutionary technology, a revolutionary concept and a revolutionary location come together in this Bicentennial Year.

A visitor to Burlington, Massachusetts, is likely to pass through the historic towns of Concord and Lexington, where he would find literally hundreds of little shops and stores dealing in the artifacts of revolutionary America. Burlington also has its stores that specialize in revolutionary American artifacts. Among them is one called The Computer Store, and between it and the little shops in Concord and Lexington is a distance of some two miles and two hundred years.

What is revolutionary about The Computer Store is that it sells the world's most revolutionary products over the counter. Its founders, Dick Brown and Sid Halligan, are technological entrepreneurs who declared their independence from Digital Equipment and Prime Computer, respectively, to do their own thing with the things they know best: mini- and microcomputers. Appropriately, the location they selected to do it at is only a short distance from another convergence of Yankee independence and technology: the intersection of Militia Way, where stands the memorial to the revolutionary Minuteman, and Route 128, Boston's "Miracle Mile."

Beginning in mid-March, one will be able to purchase at The Computer Store just about anything associated with small computers. The store will feature the MITS line of Altair 8800 and 680 kits and fully-assembled systems, but equipment from such commercial vendors as Digital Equipment and Data General will be available as well. Also for sale will be tools and instruments; books and manuals; logic, memory and processor chips and boards; components such as keyboards, power supplies and T.V. monitors; and software. A blueprint library and copying services will be provided to stimulate what Sid Halligan calls "technology transfer at the hobbyist level." (He assures us, however, that proprietary software rights will be respected.) Experimenters with problems will be able to receive assistance from a technical staff with access to a library of diagnostic and development software, and equipped with ROM burners and a full complement of test equipment. Regular patrons will be invited to attend educational film showings and vendor presentations held evenings in a meeting room at the rear of the store that will also be available during the day for informal lectures and *cafe klatches.*

The Computer Store concept did not originate with Brown or Halligan. Another store with that name is already operating on the West Coast, and more are planned for opening this year. The Brown-Halligan operation, however, will differ from those others in that it will eventually offer a range of products and services that extends far beyond those intended only for recreational use by hobbyists. Thus, besides the products already mentioned, Brown and Halligan will also act as a distributor of commercial terminals and products, and will stock such general computer supplies as printer paper and ribbons, hard and floppy disks, paper tape and cards, and magnetic cartridges and cassettes. The Computer Store is already a distributor for the Information Terminals line of floppy and cassette drives, and for the 3M line of magnetic media.

This is in keeping with Halligan's observation that computers no longer present a public image of mysterious electronic brains that require the care of an elite group of specialists. Instead, Halligan sees computers as increasingly ubiquitous tools that before the end of this decade will be as accepted — and almost as pervasive — as office typewriters or copiers. To support this view, he cites the rapid "price evaporation of silicon" and the increasing realization by product developers that inexpensive four- and eight-bit processors can replace 16-bit minis in many applications. Even today, one can purchase at The Computer Store a disk-oriented BASIC system for under $2500. So with processing power becoming available to everyone, Halligan believes it only natural that retail computer outlets will begin to supplant commercial distributors and manufacturers' technical reps as sources of computer supplies and equipment.

Brown and Halligan do not expect this to take place overnight. That it *will* happen, however, they have no doubt. They are committed not only to *The* Computer Store, but to a business plan that involves establishing similar stores throughout the northeastern and mid-Atlantic states. For the present, however, their primary missions will be to serve hobbyists and experimenters, and, in general, to "stimulate awareness."

Certainly a more stimulating location than Boston's Route 128 would be hard to find. As Halligan points out, the typical Route 128 manager constantly hears about microprocessors, and The Computer Store offers him or her an inexpensive and painless way to learn about them. Says Halligan: "At this location we offer job security as well as fun."■

MIKE'S T.V. REPAIR
MICHAEL G. SCOTT
BOX 105 • KIRON, IOWA 51448
(712) 675-4255

11 APR 1976

Dear Hal & Group:

Well after waiting and bothering Howard Sams I've finally received my copy of Don Lancaster's "T.V. Typewriter Cookbook" and as a true Lancaster fan I think it's GREAT!

After reading it cover to cover I think that the whole book is every bit as good as the few short clippings which have been published in BYTE.

There are 9 chapters starting with the basics and covering Memory, Timing circuits, Cursors, Keyboards, Teletype and television interfaces, cassette recording, and also how to modify an IBM Selectric Typewriter for use as a terminal.

Also included are some pinout diagrams and info about common and some not-so-common I.C.'s.

I have gained a great deal from it and it has helped me in designing my own CRT Terminal (T.V. Typewriter).

If anyone else would like one, here's the information:

COST: $9.95 Product No.: 21313

Send to: Howard W. Sams & Co., Inc.
4300 West 62nd Street
Indianapolis, Indiana 46268

Sincerely,

Michael G. Scott

P. O. BOX 310 ■ MENLO PARK, CA ■ 94025

April 10, 1976
page 1 of 2

Greetings,

There is a viable alternative to the problems raised by Bill Gates in his irate letter to computer hobbyists concerning "ripping off" software. When software is free, or so inexpensive that it's easier to pay for it than to duplicate it, then it won't be "stolen."

Example: There are at least five versions of Tiny BASIC up and running on at least three processors. A cassette containing Tiny BASIC for the Intel 8080 is available for five bucks. A version for the Motorola and AMI 6800 also costs $5, including complete user documentation. If the price is still too high, complete user documentation and implementation details for one of the 8080 versions has already been published. This includes complete annotated source code. Anyone is welcome to retype it and reassemble it. No one will yell, "thief." All details of a second version will be published before the end of April. Several more versions will be published shortly thereafter, including a cross-assembled version created using the macro facilities of the IBM 360 Assembler. Versions are expected shortly thereafter for the MOS Technology 6502, and Signetics 2650. Note: Tiny BASIC is, essentially, BASIC sans array and floating-point operations, although one of the versions has array operations, and another uses a calculator chip to obtain floating-point capabilities. It is explicitly designed for minimal memory micros.

Example: Gary Kildall, who built the PL/M compiler for Intel and the PLuS compiler for the Signetics 2650, is making an entire floppy-disc operating system available. He plans to sell a disc and complete documentation for not much more than what it would cost to duplicate them.

Example: A complete alpha-numeric music system, including amplitude control, has been designed and made available. The documentation costs only $2, including complete schematics for the minimal hardware that must be added.

Information on all of these systems–and much more–is being published in a new, reference journal for home computer users (and anyone else interested in micros), *Dr. Dobb's Journal of Computer Calisthenics & Orthodontia*. The *Journal* is publishing all available details. For instance, the first issue contained: complete design details for Tiny BASIC, complete user documentation for the first 8080 version, complete details for using a calculator chip to obtain mathematical and floating-point functions, and a 16-bit, binary-to-decimal conversion routine.

The second issue included: complete implementation details and annotated source code for the first version of tiny BASIC, complete documentation and source code for a simple music program for Altair 8800s, design notes on a forthcoming high-level language for 8008/8080s, two articles on a $1K phoneme generator kit for micros that allows unlimited English speech synthesis, and a quick note on the 6800 version of Tiny BASIC.

The third issue will include complete details and code for the second 8080 Tiny BASIC which includes 1-D arrays, a simple debugger for the 6502, a keyboard loader for octal code, details of a contest to generate public-domain graphics software for CroMemCo's TV Dazzler, and much more. The *Journal* is also reprinting carefully selected, good stuff from the growing multitude of computer club newsletters. Additionally, it is publishing complete indices to all major computer hobbyist publications and selected articles from other publications, lists of hobbyists and their equipment, used equipment sources, clubs and organizations, computer stores and distributors, etc. Finally, it is actively pursuing a consumer advocacy role relative to the home computer user.

The point is that all of this information–systems software, design notes, schematics, etc–is being made available for little more than the cost of reproduction. The *Journal* came into being, explicitly to aid creation and distribution of that information. In some ways, it creates a sort of manufacturer-independent user's group.

It is reasonable to expect that free and inexpensive software will become increasingly available to and through the hobbyists' community. This is true, in spite of the failure of such SHAREing in the business and industrial communities.

1. Hobbyists are developing home-grown hardware and software, just for the fun of it. Since it's "fun" rather than "work," they have shown a great willingness to share and distribute what they develop. This is not an unknown phenomenon. It is the usual practice in most other hobby environments, and is certainly true in the academic environment.

2. As with the industrial mini and micro markets, hobbyists have learned to be wary of purchasing hardware from manufacturers who provide no software support. Through common sense, and by observing Mr. Gates' experience, those who wish to sell software for significant sums of money must realize that there is only one group that can practically be expected to pay for it: the hardware manufacturers. They need it to enhance their products in a highly competitive marketplace.

3. Concerning quality: A significant minority of computer hobbyists are also experienced computer professionals. It's their (our) play as well as work. The competency level is more than sufficient for the design and implementation of excellent systems software.

4. Finally, the approach used in producing the Tiny BASICs will be continued and expanded, a sort of modified Chief Programmer Team approach: An experienced pro does the overall design and outlines the implementation strategy (via the *Journal* and other hobbyist publications). Following those directions, the more experienced amateurs do the necessary hack-work (exciting to them, but drudgery for the "old pro"). Since it is a symbiotic effort, the implementors are almost certain to share their work with the designers, and hence, with the larger community of home computer users.

It's amazing how much "good stuff" becomes available when the producers think of their labor as "play" instead of "work." All who wish to do so are invited to join with the publishers of *Dr. Dobb's Journal* in the pursuit of realizable fantasies.

Jim

Jim C. Warren, Jr., Editor
Dr. Dobb's Journal of Computer Calisthenics & Orthodontia

P.S. *Dr. Dobb's Journal* is published by People's Computer Company, Box 310, Menlo Park CA 94025. Subscriptions are $10 per year. PCC is an established publisher of *PCC* newspaper (devoted to computers in education, and computer games), and of numerous computer books.

S. A. COCHRAN, JR.
ATTORNEY AT LAW
P. O. BOX 607
TYLER, TEXAS 75701
PHONE 592-3833

April 5, 1975

Re: Burroughs Model 9350-2 Communicating Typewriter

Dear Sir:

I have just received a letter from the Public Relations Manager of the Federal and Special Systems Group, Burroughs Corporation, at Paoli, PA, referring to the aobve equipment. The operating paragraph of this letter was as follows:

> "The subject equipment, which we had classified as obsolete and surplus, was disposed of some time ago, to a machinery dealer on an 'as is, where is' basis. Since no documentation - either hardware or software currently exists, we regret that we are unable to assist you."

Translated into English, he means that under extreme duress, Burroughs will admit that some such equipment formerly existed, carrying their logo, but that they are unwilling even to admit the equipment, if it now should chance to exist, can be made to type. The facts aren't very much better than that. I, for one, was surprised that anyone should build a unit that looked so very much like a type= writer, and leave the backspace key and equipment off of it.

I wonder if one of the readers of the newsletter who is now in the Armed Forces may have access to a manual on the use and connections of this equipment. If so, I wish that he would drop me a line saying how I could obtain a copy of the manual, and if disclosure of its contents would be permitted under current security regulations.

Yours very truly,

Sid Cochran

Sid Cochran, Jr.

P.S.: Thanks to Max Wymore for his short brief on the remedies available where delivery is delayed!

JAMES G. CALLAS, M. D.
EVELYN R. CALLAS, M. D.
631 NORTH SAN PEDRO ROAD
SAN RAFAEL, CALIF. 94903

4/6/76

Thought the following hint might be of help to users of Processor Technology's superb I/O board in running MITS Basic. The trick is to invert the status signals.

Jumper the channel select, in area B, left to right so that channel C=00 and D=01. An extra IC can be wired into the unused spot on the lower right of the board (I used a 7400). Connect "RDA" to the inputs of one gate and "CO" to its output. Connect "TBE" to the inputs of another gate and the output to "C7". Works great.

Sorry to hear the NL is folding, but we've all come a far piece from those early days, struggling with the wretched 8008 boards and worse instructions, that you did so much to clarify, as well as the early uncertainties of whether the Altair would turn out to be any good. Now you have to move on (and hopefully upward) too.

Regards,

Jim

April 5, 1976

Would you please send me a copy of any schematics you have for an optical type paper tape reader. (you've promised such in several NL issues!!) I have a mechanical (capstan) type paper tape reacer with a photoregistor read head but burnt out transitor type electronics. I'd like to update the electronics and interface it with the IMSAI 8080.

I now have an IMSAI 8080, with 8K of Proc Tech, 3P + S, TVT-I with Hogg scrolling circuit and ascII keyboard.

I have the IMSAI B basic on order (soon to be received I hope.)

The IMSAI 8080 is a rack mount type and its in a nice 19" rack.

Does anyone have schematocs for a teoc Mt-6 data cassette transport assy $193^{05}{}^{000}$-09, it also goes by NCR (not cash reg) modue M63-2 part $^{00}6$-$^{00}62^{07}$?

I have ordered four IMSAI $8^{08}{}^{0}$'s as part of a group purchase and have had no difficulty in dealing with IMS: They promised (Mr Karush of IMS) delivery in 3^{0} days, I got them in 26 days. Their product is vastly superior to the Altair, they have 4K Basic for basic machine owners now free of charge. ^{8}k Basic costs eight dollars (owners only 12K twelve dollars.)--Why bother with MITS???

I now have the documented comversion to convert the TVT-II to a 64 character per line display.(it works!) Interested readers should semd a SASE and 50cents for copying.

* TVT-II Owners Look AT This

Thats all

Gary Alevy, Emory University, Box 21393, Atlanta, GA 30322

Dear Hal and Readers,

There is an excellent engineering paper put out by Harris Corp., Broadcast Products Div., 123 Hampshire Street, Quincy, Ill. 62301. by A.V.Juettner Jr.

It describes Harris' System 90..One of the first direct applications of MicroP's to broadcasting. This system replaces the conventional hardware wired control automation devices and puts the whole concept of station control in the hands of the 8008 with a little help from its friends!

I think the cost of a stamp and a letter to Harris is well worth the effort for application minded readers.

Best wishes from a neo-byte (do you life THAT one ?) ,

John Anthony.

John Anthony
GRNDY/W?

creative computing

P.O. BOX 789-M MORRISTOWN, NEW JERSEY 07960 (201) 267-5559

For further information -
David H. Ahl
(201) 540-6506

FOR IMMEDIATE RELEASE

The Best of Creative Computing - Volume 1, David H. Ahl (ed.), Creative Computing Press, P.O. Box 789-M, Morristown, N.J. 07960; 1976; 8½ x 11, 328 pp. ISBN 0-916688-01-1 Paper $8.95

The diversity in "The Best of Creative Computing - Volume 1" can only be described as staggering. The book contains 328 pages of articles and fiction about computers, games that you can play with computers and calculators, hilarious cartoons, vivid graphics and comprehensive book reviews.

Authors range from Isaac Asimov to Sen. John Tunney of California; from Marian Goldeen, an eighth-grader in Palo Alto to Erik McWilliams of the National Science Foundation; and from Dr. Sema Marks of CUNY to Peter Payack, a small press poet. In all, over 170 authors are represented in over 200 individual articles, learning activities, games, reviews and stories.

This 328-page book has 108 pages of articles on computers in education, CAI, programming, and the computer impact on society; 10 pages of fiction and poetry including a fascinating story by Isaac Asimov about all the computers on earth linking up after a nuclear war to support the few remaining survivors; 15 pages of "Foolishness" including a cute cartoon piece - called "Why We're Losing Our War Against Computers"; 26 pages on "People, Places, and Things" including the popular feature "The Compleat Computer Catalogue" which gives capsule reviews and lists sources for all kinds of computer-related goodies; 79 pages of learning activities, problems and puzzles; 29 pages contining 18 computer games including a fantastic extended version of the single most popular computer game -- Super Star Trek; and 32 pages of in-depth book and game reviews including Steve Gray's definitive review of 34 books on the Basic language.

Creative Computing magazine, from which the contents of this book was assembled, has been described by reviewers as: interesting (The Space Gamer), unique (Bit Blaster), innovative (Output), thoroughly pedagogical, emphasizing brainwork (Modern Data), lively and fun (American Libraries), refreshingly informative (Page), very practical school-oriented activities (Media Mix), makes learning fun (Curriculum Product Review), entertaining and informative (HP Educational User Newsletter), recommended (Computer Notes). What more can we say?

"The Best of Creative Computing - Volume 1" is currently only available by mail for $8.95 plus 75¢ postage from Creative Computing Press, P.O. Box 789-M, Morristown, N.J. 07960.

# # # #

Man's Best Friend

A budding young engineer decided that a microprocessor system could be designed to maintain his apartment and that it would be more cost-effective than hiring a maid or getting married. The system he designed did absolutely everything for him. It woke him in the morning. It controlled the coffee pot and stove so that breakfast was waiting for him when he stepped out of the shower. It was programmed to provide stimulating conversation while it continued with its regular duties. Soon, it became more than just a microprocessor system so he gave it a name. He called it Mary. One evening, while working late, he required Mary's services so he typed in a commmand. Finally, after a long pause, the microprocessor responded: "Not tonight, I have a headache."

Les Papp
Southern Alberta Institute of Technology
Calgary, Canada

March 24, 1976

Mr. Hal Singer, Editor
MICRO-8 COMPUTER USER GROUP NEWSLETTER
Cabrillo Computer Center
4350 Constellation Road
Lompoc, CA 93436

Dear Mr. Singer:

We market a high quality mechanical calculator for adding and subtracting hexadecimal (base 16) numbers. The machine is extremely useful to computer programmers, operators, designers, etc.

We have been selling this machine for several years at $35.95 to companies and individuals in the data processing industry. Our customers include IBM and other computer manufacturers, Bell Labs, Western Electric, US Army, Navy, and Air Force, and others too numerous to mention. We have just recently become aware of the new field of computer hobbyists. It seems to us that hobbyists should be particularly interested in this machine because programming a microcomputer is mostly done at the machine language level.

The calculator, called HEXADAT, is a precision instrument made of the finest materials. We have included a sample machine so you can see for yourself the quality and workmanship.

The machine automatically indicates a credit balance or the complement of a positive total. This complement is especially useful in determining unused memory capacity.

Conversions from decimal to hex are done by adding on the machine the hex equivalents of the decimal number from the conversion table. Example: convert 745 to hex - enter hex equivalent of 700, plus hex equivalent of 40, plus hex equivalent of 5. The total indicated by the machine, 2E9, is the hex equivalent of the decimal number 745. To convert 2E9 to decimal you take from the table the decimal equivalent of each position of the hex number: 9 + 224 + 512 = 745.

We feel that HEXADAT should be of interest to readers of MICRO-8 COMPUTER USER GROUP NEWSLETTER, and are enclosing a press release and glossy photo for your use. Any space that you may devote to this unusual product will be appreciated.

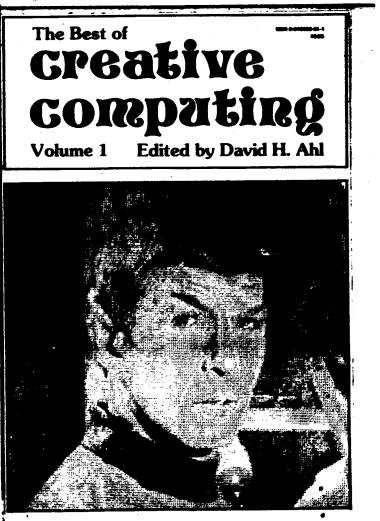
Sincerely yours,

RADIX PRECISION CO.

Jim Oxford

Jim Oxford

/gl
enc



TAYLAB

2009 N. GEYER ROAD
ST. LOUIS, MO 63131
314 966 4372

John E Taylor

April 6

I will sure miss your deft touch in editing the newsletter, and was surprised that there are not more subscribers.

Regarding mail order suppliers, in addition to those previously recommended, such as Solid State Music, Godbout and James, I would add:

Digi-Key - good prices
S. D. Sales, Inc. - good values
Solid State Systems - but wait for the 20% discount sales

I started a Mil Mod but was side tracked by other matters, including an evident need to beef up my understanding of current electronic and computer technology. Now that I am getting back to construction, I have decided to pick up some components and boards for an Altair type bus system. The way things are going, it would pay to stick with a general purpose, readily modifiable design so that you can take advantage of new developments. The processor will cost little whereas peripherals and software can be quite expensive.

Speaking of peripherals, I do not know that I would recommend either the Creed or the Herbach and Rademan terminal for print out- except perhaps as an interim solution until a cheap matrix printer comes along. *

Neither am I impressed with the audio cassette as a practical memory device. A much better solution to this problem could be cheap EPROMS and RAMS, which are in the works.

Sincerely,

John E Taylor

* I have both.

MIKE 2 INFORMATION PACKET NUMBER 1

Preface

Enclosed you will find over 100 pages of hardware design and software listings. I hope you find this information as exciting and useful as I have. Included are theory, operation and design of interfaces for cassettes, modems, CREED, RS232, TTY 33 ASR; a countdown circuit, and a hardware push/pop stack. About sixty percent of this Information Packet contains software listings of programs for testing and using the push/pop stack, keyboard monitor program, Super-Nim game, cassette cold start, Mike testor and demo, cassettes monitor, and CREED input/output routines. The MIKE 2 Testor and Demo Program starting on page 91 is an earlier version of the one starting on page 57. I included both as I have not had time to verify that the latter version includes all of the first.

Contributors

The names and addresses of all contributors are given below. Please feel free to contact them if you have any questions. I would appreciate it if you would send copies of any errors and improvements you find to both the contributor and myself.

Mark A. Condic, III
Department of Computer Science
Illinois Institute of Technology
Chicago, Il 60616
(312) 567-3000

Eric Schott
808 14th Ave.
Juniata
Altoona, PA 16601
(814) 944-5998

Jim Farschon/Tom Kasper
3949 Mt. Everest Blvd.
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(714) 292-9180

Jim Tucker
3 Grove St.
Exeter, NH 03833
(603) 772-3903

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MIKE User's Group

It is hoped that this Information Packet will stimulate enough interest in the MIKE system to form a MIKE User Group. Activities could include:

- Dissemination of MIKE information to computer hobbyist clubs and publications. (Note that I am not suggesting another newsletter.)
- Publication of Information Packets based on User contributions.
- Group projects such as cassette interchange standards, system configuration, software development (Tiny Basic, 8080 + 8008 Translator).

Your comments on the above and suggestions for other activities are actively solicited. The MIKE User's Group can succeed only if you support it.

Future MIKE Information Packets

Frankly, I priced this Information Packet too low. By reducing two pages to a side where possible and printing on both sides I hoped for a 5¢/page cost. This is possible only with a large volume, free material, and donated copy preparation and editing. For the future I propose we pay a royalty of 1¢ per page per copy for reduced copy and 2¢ per page per copy for computer listings. Twenty-five orders in advance would be required for printing at a price of $7.50 per copy. The cost breakdown is as follows:

$4.00	Printing
$1.50	Royalties
$1.25	Postage
$0.75	Copy Preparation
$7.50	

The above budget assumes camera-ready copy. Your help is needed to contribute material and volunteers are needed to type and redraw submitted material. Part of the royalty could be forfeited to support the preparation of non-camera ready contributions.

Please address any comments you have on any of the above or on any of the contents herein to:

Jim Farschon
3949 Mt. Everest Blvd.
San Diego, CA 92111
(714) 292-9180 (after 8 pm)

April 4, 1976

Dear Hal,

After waiting many months for delivery of a MITS 680 I cancelled my order with them. I decided to go with a Digital Group 8080 System. The boards are very well done and it made the assembly relatively easy. The kit assembly does assume some building experience. This probably accounts for why the Digital Group Systems are offered in several different versions from bare boards to completly assembled units.

In assembling the system I had two self caused problems with the TV board. One was a solder bridge and the other was a folded pin on an IC. After completing the assembly of the boards and putting the system together it worked the first time I tried it. I then loaded the tape cassette which was supplied with the system which contained some sample programs and they worked well. I am using a Clare-pender keyboard which was also purchased from the Digital Group.

I would be very interested in hearing from anyone living in lower Delaware that is interested in Micro-Computers.

I enjoy reading your newsletter and often get some interesting information from it please keep up the good work.

Bart DiCarlo
308 N. Bradford St.
Seaford, De. 19973

302-629-6378

---

5 April, 1976

Dear Hal,

Again, many thanks for the information via the phone call last night. Here's our $14 and hopes for continued success with the newsletter.

In regards to our problem with Tim Barry's Creative Computer, another phone call last night (hopefully) solved the question.

It seems the flu bug got hold of the computer bugs and printing etc. was delayed. We were promissed shipment in mid-April and letters are now going out to all who paid and/or inquired offerring refunds if desired.

Also in the conversation, we learned that he's the Tim Barry of RE's "Komputer Korner", so backgound should be good. Likewise he's an active programmer (DEC etc.) with a lot of respect for the 8080 series. The course is mainly geared that way with leads towards other units.

In case you might like to contact him, Creative Computer, P. O. Box 50, Palo Alto, CA 94302. The price for the 350+ page study course is $49.95 with mention of a possible "graduate course" at a later date. We let you know our progress towards the end of the month.(?)

Thomas M. Alewine, Jr.
103 Fredrick Street
Brandon, Miss. 39042

1702/1702A EPROM PROGRAMMER

System Description

The basic programmer consists of two stackable 6.5 X 9 inch cards.

The Data Entry system allows complete manual control and two hex digit display of data from either the data entry latches or from the copy socket. Data is entered from the Hex Keypad for initial programming. When the DATA IN/ DATA OUT switch is in the DATA OUT position, DATA entered from the keypad is displayed as entered with DATA entering the right digit position first and moving left. In the DATA IN position, a programmed EPROM can be verified. A KEY/COPY switch allows DATA to be accessed from an existing EPROM for copying into a new EPROM. By going to KEY, individual locations can be altered as required.

Addresses are provided by two 74193 counters and displayed as two hexadecimal digits. A clear switch clears both counters to address location 00. A LOAD switch allows the contents of the DATA latches to be entered as an address.

A Robinson-Nugent low insertion force socket is provided for the device being programmed. Programming level voltages, addresses, and data are supplied to this socket in the program mode; read level voltages are applied in the verify mode. A similar socket is used for copying. This socket has read level voltages and address information only. The copy data output is selected in lieu of the data latch output using a multiplexer controlled by the KEY/COPY switch. Identical addresses are supplied to both sockets.

A PROGRAM PROM POWER switch enables the pulse power supply regulator and timing circuits. With the ADDRESS and DATA selected, all eight bits of a location are pulsed from 32 to 50 times by circuitry associated with the GO! pushbutton. The completion of programming is signalled by a COMPARE light followed by automatic address incrementation or decrementation and a READY light. Additional locations are programmed by successively entering DATA and pressing GO!

A second card contains the pulse voltage regulators, timing circuits, address drivers, and data drivers/receivers. Facilities are provided for inverting data to the EPROM and inverting the data read from the EPROM. This card could be interfaced to a microprocessor.

CALIFØRNIA RESIDENTS ADD 6% SALES TAX

PLEASE SEND ME THE FØLLØWING:

[ ] KEY PADS ● 18.95

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[ ] PRØFILE PRINTED CIRCUIT BØARD ● 29.95

[ ] DATA ENTRY SYSTEM KIT ● 109.95

[ ] PRØFILE CARD KIT ● 79.95

[ ] CØMPLETE SYSTEM KIT (2 CARDS) ● 189.95

[ ] ASSEMBLED DATA ENTRY SYSTEM CARD ● 199.95

[ ] ASSEMBLED PRØFILE CARD ● 139.95

[ ] ASSEMBLED SYSTEM ● 299.95

NAME ADDRESS APT#

CITY STATE ZIP CØDE

ASSØCIATED ELECTRØNICS, 17855 SKY PARK CIRCLE, IRVINE, CA 92714
MASTER CHARGE NUMBER EXPIRES
BANKAMERICARD NUMBER EXPIRES

Jeb Boswell, M.D., 29 Kenilworth St, Newton, Mass 02158 (617)969-2740 wrote to say " My present system is the Scelbi-8H converted to the 8D with the help of the Digital Group's 8K RAM memory board which gives me 8K memory at much less cost than going to the Scelbi-8B. I have fixed up an adapter for the 8H to plug into the last memory slots on the Scelbi mother board. The Adapter will accept two of the digital group's 8K RAM cards, which will work directly with the Scelbi. The adater is made up of punched board, "Circuit-Stik" 22-pin edge connector patterns, a piece of aluminum cookie sheet, two small blocks of 1x2 white pine board, and wire wrap wiring (Wire wrap is great- first time I ever used it.) By making 6 connections on the mother board to otherwise unused connections on the memory board sockets (to bring the address lines to the 8K RAM boards), the Scelbi 8H is otherwise unmodified, and can be used with the standard Scelbi 1101 1K RAM cards if there is any reason to go back to the original configurations. If anyone is interested, I have two fully populated Scelbi 1K RAM cards for sale as a result of the above modifications. The 1101s are Poly Paks, so no guarantee, but they worked for me for several months after replacement of bad chips. I would like to ask $75 for both cards. The cards will be sent after check clearance (10 days) or immediately with postal money order. I have the Digital Group TVT and Cassette boards, both operating. The TV monitor is a Motorola terminal. Keyboards are the original Dr. Suding diode matrix/TTL design, and the Digital Group Clare-Pendar. The Clare-pendar blew its keyboard chip, which was replaced by the Digital Group for the cost of mailing. (The fellow who answers the phone at Digital Group is laconic, but they sure produce.). ...I have a fast manual loader hardwired a la the Scelbi newsletter (now defunct) and a relay operated Baudot teletype loop. James Electronics is excellent. They left out part of my order, and immediately sent the item when queried. Solid State Sales and S-D also been excellent. Forget Micro Mini Mart. I have the 8008 board and PROM and do not have time to fathom whats going on without adequate documentation. I can design better boards. My power supply is based directly on the NL information. Works beautifully cool even with 8K RAM. Future plans include implementing the programs listed in the various Scelbi manuals. Next time I write, I hope to have the Editor working. The Scelbi manuals are very useful, once you adapt to the style. The core program I have developed myself is a keyboard to specific memory location. It lets me change any memory location by keying in the address and change or rapidly enter programs from the keyboard. Otherwise, I use parts of the Digital Group's System relocated to high memory locations."

Page 10

THE ELECTRONIC PROJECTS NEWSLETTER

ROBERT DELP
EDITOR

BOX 1026
FREMONT
CALIFORNIA 94538

Dear Colleague:

We hope you and your students have enjoyed building the projects featured this year in "The Electronic Projects Newsletter." With the variety of projects covered this year, I'm sure many of your students found the "right" project for them. Next year's students will no doubt gain the same enjoyment and learning experiences which come from creating an electronic device from a handfull of parts.

Your subscription expires next month, so now is the time to send us your renewal. This will insure a continuing source of student-tested project plans, in a format designed for easy reproduction.

As your file of project plans grows, you will be able to offer your students an even greater selection of project choices. When a student selects a project in which he has a strong interest, the learning is far greater than would otherwise be possible.

Your school's purchase order is welcome, or you may include payment with your renewal. Either way, your renewal now will insure a continuing source of project plans for the year ahead.

Sincerely,

Robert Delp

Robert Delp, Editor

RETURN to

BOX 1026
FREMONT
CALIFORNIA 94538

Please renew my subscription.
Enclosed is my $1000 by ☐ check ☐ money order ☐ purchase order

NAME
SCHOOL
ADDRESS
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MiniMicroMart

1618 James Street, Syracuse, N.Y. 13203, Phone: (315) 422-4467

Dear Mr. Singer: March 15, 1976

Some weeks ago I mentioned the possibility of doing something for the benefit of 8008 users--a sort of hardware and software manual for those who own and are using 8008 systems. You discouraged me saying it would probably not be financially rewarding.

For no sound business reason and primarily to serve a need (we thought) we some months ago attempted to market improved Mark 8 boards. We no sooner got the project underway when 8080 prices took a real dive, and the whole Mark 8 program turned into a financial disaster and public relations nightmare for various and sundry reasons. Brother Thomas McGahee of the Salesian Center in Columbus, Ohio, who does some software and hardware consulting for us,is an avid Mod 8 user and has prepared some improved scientific calculator software, some improvement to Mod 8 hardware, and revisions to Monitor 8 including a fine overlay for parallel input and output (TVT, ETC). We have reproduced all of this material including some of his comments on the use of Monitor 8. The cost of all this material, shipped postpaid, will be $2.50 which will hardly cover the cost of printing, collating and shipping. We are suggesting that you let people know of the availability of this material for a number of reasons...your newsletter started as an 8008 group and we really need to know whether we should continue any further support of 8008 base systems in either hardware or software.

Perhaps the response to our offering of this $2.50 package will serve to test the market. If we get an unfavorable response to our $2.50 offering of some very useful material to any 8008 owner, then perhaps we should forget any further efforts in this direction. Incidentally, besides being useful to anyone who has an 8008 system or a scientific calculator, it should be of interest to anyone who is considering a scientific calculator interface or considering Monitor 80,as we suspect that we will shortly see from Brother McGahee revisions to Monitor 80 including parallel I/O routines, scientific calculator software, and audio cassette software.

Sincerely,

MINI MICRO MART

Maury Goldberg

P. S. The material is available now for immediate distribution. I would like very much to hear from your readers and hobby clubs as to whether a market still exists for 8008 software and hardware. Owners of Mod 8's can update their system to 8080 or 6800 systems with our boards, but the Mark 8 user can't, and I suspect there are a lot of 8008 users who are perfectly content with their CPU. They should be heard from, however, if they expect Mini Micro Mart or any other vendor to put any real efforts in developing hareware or software strictly for the 8008 user.

THE ASHEVILLE SCHOOL
ASHEVILLE, NORTH CAROLINA
28806

March 26, 1976

Just bought 10 reels of 3/4" used mag tape from Meshna. About first 10% of each are fairly used and scratched....rest looks brand new. ODT'd the FORMAT program to take the shorter tape (220 feet on a DEC reel as compared to DEC's 260 feet)... And tape works like a charm.. Testing programs have run for hours with no failures on my first reel. Their reels are 2400 feet...Honeywell.... at a cost of $2.50. I can get at least 10 DECtapes off each, at a cost of 25¢ plus the empty DEC reel (which I already have lots of).... Compared to paying DEC $6.00 per reel.. .wow...

Did you ever get the TD8's you wanted at one time?? If so, the above info may be of interest to you...

I still have zip $, but am trying to convince our Bus Mgr to get rid of the damn TTY and get us a line printer.. so I will need a reader, and therefore the address of Oliver Audio...

Know you are busy, so don't bother to write... just scratch the address and return... Tnx

Regards,

Chase Ambler

SCELBAL - A HIGHER LEVEL LANGUAGE FOR 8008/8080 SYSTEMS

The goal of about ninety percent of small systems owners appears to be to get their systems up and running with some kind of I/O and then procure enough memory to support a higher level language.

Unfortunately in the past when a system owner reached the stage of having enough memory a major problem arose. Unless the individual had purchased an entire system from one or two select suppliers, the cost of a copy of a higher level language was likely to be out of reach!

Even if one was financially able to purchase a higher level language from an equipment manufacturer one was likely to find that such programs were designed to operate with specific I/O devices which the prospective language user might not have access to or desire to obtain. If one did not have those specific devices for which the program was designed, one was usually in a tough spot. Despite advertisements that such programs came "fully documented," the "full documentation" was not likely to include a source listing of the program. Hence, attempting to modify such a complex program was a risky, frustrating, and often downright impossible task. And, without doing so, one was hard put to make the language work with unique types of I/O devices. Furthermore, such programs could not practically be modified to serve the particular wishes of individual users. If you were not satisfied with the program and what the program author's had decided to emphasize or leave out, that was simply too bad!

Few "canned" programs can be tailored to have all the features desired by all the possible potential users. To attempt to do so would result in programs requiring more memory than users could afford. The answer to this problem is, of course, to supply the programs in such a manner that they can be readily modified and altered by the users. This means, simply, that the detailed source listing for the program must be made available to the purchaser. Assisting the program owner by also providing detailed comments with the listing, a general overview of the program's organization and operation, and general flow charts can further enhance the value of the program to the owner. With this information available, the program user can safely proceed to tailor the capabilities of the program to serve the user's particular interests and requirements.

This is the approach SCELBI COMPUTER CONSULTING, INC., has taken in presenting its new higher level language for 8008/8080 machines. The language has been given the name SCELBAL for SCientific ELementary BAsic Language. As the reader can easily surmise from the title it is similar in capabilities to the highly popular language referred to as BASIC. This language was specifically developed to be able to run on 8008 based microcomputers. It is believed to be the first such higher level language to be made generally available that is capable of running in a system equipped with the ubiquitous 8008 CPU. The program can of course also be run on systems using the more powerful 8080 CPU though it is not as memory efficient as it could have been if the program had forsaken 8008 capability.

The language was developed to operate in an INTERPRETIVE mode. This means that the entire program resides in memory at one time along with the program written in the higher level language that is to be executed. When the INTERPRETER is given the RUN command it immediately proceeds to INTERPRET each line of the higher level language program and perform the necessary calculations and functions. This differs from a COMPILER which would first convert the higher level language source listing to machine code, then later execute the machine code.

A COMPILER oriented system generally is cumbersome to run on a small system that lacks reliable, high speed bulk memory storage facilities. For instance, if the program had been designed as a complier, the following steps would have been necessary in order to execute a higher level language program.

First one would have to load an Editor program into the computer and create the desired higher level language version of a program as a source listing. A copy of the source listing would then have to be saved on an external memory medium. Next, a portion of the compiler program - the actual compiler, would have to be loaded into memory. When it was resident, one would produce the desired machine code version of the higher level language statements by having the compiler process the source listing several times. (Much as an Assembler program would process the mnemonic listing when programming in machine language.) The machine code produced would have to be stored on an external memory device at this stage. Finally, the RUN TIME portion of the compiler would have to be loaded into the computer along with the machine code produced by the COMPILE portion of the program. The higher level language program would then finally be ready to run. Too bad if you made an error in the original source coding for the program that was not detected until run time. You would have to go all the way back to the Editor program to correct the higher level language source listing and start the process over again!

Developing the program as an INTERPRETER eliminates the requirement for the constant use of an external bulk memory device in order to get a program from the concept to execution stage. An INTERPRETER is definitely a much more convenient program for the small systems user. The entire INTERPRETER program resides in memory at one time. An area is set aside in memory to hold the higher level program. An executive portion of the program allows the user to enter the higher level language listing directly into the area where it will be operated on when the program is executed. The executive in SCELBAL will provide for the user entering a program from a manual input device such as a keyboard. Or, if the user desires to run a program that has been developed previously, a LOAD command will direct the program to read in a program from an external bulk memory device such as a magnetic tape peripheral.

SCELBAL has been designed so that it can operate in a "calculator" mode or operate in a stored program mode. In the calculator mode, each statement is executed immediately after it is entered by the input device. In this mode, the program is ideal for solving simple formulas when the user only needs to obtain a few values.

When operating in the stored program mode, the INTERPRETER will follow an entire series of instructions as directed by the higher level program. To enter a program that will be operated on as a stored program, the operator simply assigns a line number at the beginning of each statement.

The executive portion of the package allows the user to "edit" a program at any time. Lines may be deleted and new lines entered anywhere in the program. If the operator makes a clerical error while entering a line, a special erase code may be used to effectively backspace within a line and then re-enter the correct characters. Furthermore, the executive checks for various types of syntax errors as statements are entered, and will display a two character error code to the programmer when such errors are detected.

The executive portion of SCELBAL has five major commands available to the operator which are defined and explained below.

SCR for SCRatch effectively clears out any previous program stored in the program buffer along with any variable values.

LIST causes the present contents of the program buffer to be displayed for review or to make a copy for record keeping if a printing device is in use.

RUN causes the higher level language program stored in the program buffer to be executed by the INTERPRETER.

SAVE. This command directs the program to save a copy of the program stored in the program buffer on the user's external bulk storage device. A program saved in this manner can later be restored for execution by using the following command.

LOAD. This command causes the program to read in a copy of a program from an external device that was previously written using the above SAVE command.

A higher level language program is made up of STATEMENTS that direct the machine to perform selected types of operations. The SCELBAL language can execute 12 different types of STATEMENTS which are explained below plus the END statement which is used to signify the end of a program.

The REM for REMarks statement indicates a comments line which is ignored as far as program execution is concerned. Information on a REMarks line is intended only for the use of programmers and is used to document a program.

The LET statement is used to set a variable equal to a numerical value, another variable, or an expression. For instance the statement:

```
LET X = (Y*Y + 2*Y - 5)*(Z + 3)
```

would mean that the variable X was to be given the value of the expression on the right hand side of the equal sign.

The IF combined with the THEN statement allows the programmer to have the program make decisions. SCELBAL will allow more than one condition to be expressed in the statement. Thus:

```
IF X <= Y THEN LL
```

states that IF X is less than OR equal to Y that the program is to go directly to line number LL. Otherwise, the program is to continue on to the next statement in the program.

GOTO directs the program to jump immediately to a specified line number. The GOTO statement is used to skip over a block of instructions in a multiple segment or subroutined program.

The FOR, NEXT and STEP statements allow the programmer to form program loops. For example, the series of statements:

```
FOR X = 1 TO 10
LET Z = X*X + 2*X + 5
NEXT X
```

would result in Z being calculated for all the integer values of X from 1 to 10. While SCELBAL does not require the insertion of a STEP statement in a FOR - NEXT loop, a STEP value may be defined. The implied STEP value is always 1. However, it may be altered to be an integer value other than 1 by following the FOR range statement by the STEP statement and a parenthesis containing the STEP size. Thus:

```
FOR X = 1 TO 10 STEP (2)
```

would result in X assuming values of 1, 3, 5, 7 and 9 as the FOR - NEXT loop was traversed.

GOSUB is used to direct the program to execute a statement or group of statements as a subroutine. The statement is used by designating the line number in the program where subroutine execution is to begin.

The RETURN statement is used to indicate the end of a subroutine. When a RETURN statement is encountered the program will return to the next statement immediately following the GOSUB statement which directed the program to the subroutine.

SCELBAL permits multiple nesting of subroutines in a program.

DIM for DIMension is used to specify the formation of a one dimensional array in a program. Up to four such arrays having a total of up to 64 entries are permitted in a program when running SCELBAL. The statement:

```
DIM K(20)
```

sets up space for an array containing 20 entries. (Array size must be designated by a numerical value, not a variable.)

The DIM is an optional statement that may be left out of the program to provide additional program storage space in systems having limited memory.

INPUT is used to cause the program to wait for an operator to INPUT information to the program. After the information has been received, operation of the program automatically continues.

PRINT is used to output information from the program. Using the PRINT statement the user may direct the program to display the value of variables, expressions, or any information such as messages. The PRINT statement allows for multiple mixed output on a single line, and the option of providing a carriage-return and line-feed after outputting information or suppressing that function. For instance, the statement:

```
PRINT 'X IS EQUAL TO: ';X
```

would result in the program first printing the message 'X IS EQUAL TO:' and then the value of the variable X on the same line. After the value of the variable had been displayed, a carriage-return and line-feed combination would be issued. To suppress the issueing of the CR & LF the programmer would merely include another semi-

colon at the end of the statement! A comma sign in a PRINT statement will direct the output to start at the next TAB point in a line. A special function may also be called upon to direct the output to begin at a specified position in a line to allow for neat formatting.

The power of the language is further enhanced by the inclusion of seven functions that may be used in statements. The seven functions available in SCELBAL are discussed below.

INT returns the INTeger value of the expression, variable, or number requested as the argument. This is the greatest integer number less than or equal to the argument.

SGN returns the SiGN of the variable, number, or expression. If the value is greater than zero, the value +1.0 is returned. If the value is less than zero, the value -1.0 is returned. The value 0 is returned when the expression or variable is zero.

ABS returns the ABSolute value (magnitude without regard to sign) of the variable or expression identified as the argument of the function.

SQR returns the SQuare Root of the expression, variable, or number.

RND produces a semi-psuedo-RaNDom number in the range of 0 to 0.99. This function is particularly useful to have available for games programs.

CHR is the CHAracter function. It may be used in a PRINT statement and will cause the ASCII character corresponding to the decimal value of the argument to be displayed. (A reverse function is available for the INPUT statement which will return the decimal value of a character when it is inputted.)

TAB may also be used in a PRINT statement to direct the display device to space over to the column number specified in the argument. This function allows the programmer to format the output into neat columns.

Finally, An 8008 BASIC
The answer to the
Owner's Prayers!!
8008

Page 11

GENERAL INFORMATION

User defined variables are limited to one or two characters. A variable must begin with a letter of the alphabet. Limiting variables to a maximum of two characters helps conserve memory space. Up to twenty different variables may be defined in a single program.

SCELBAL allows the use of fixed and floating point notation. A minimum of twenty-three binary bits are used in the mantissa portion of all calculations allowing for six to seven significant decimal digits to be entered or outputted. The exponent range is from plus to minus the 38th power. Numbers may be inputted in either fixed or floating point notation. Output from the program is automatically selected to be either fixed or floating point, depending on the size of the number that is to be displayed.

The package, without the optional DIM statement, is designed to run in an 8K 8008 or 8080 system leaving approximately 1250 bytes for program storage. With this amount of storage available, surprisingly complex programs can be executed. The program authors have successfully loaded and run such games as Lunar Landing in this configuration by reducing the number of messages issued to the player.

The DIM statement requires approximately three pages of memory. It is recommended that users desiring to include the DIM capability have more than the minimum 8K of memory available in their system. A particularly attractive feature of SCELBAL is that users with more than 8K of memory can use the additional space for program storage. Thus, for example a 12K system will enable a user to execute SCELBAL programs having as many as 150 to 200 statements!

A major concern of the developers of SCELBAL was that the 8008 CPU might make the language so slow that it was impractical for the user. Our tests indicate that the time to perform typical calculations, while they are slow compared with more powerful machines, are certainly tolerable. For instance, the typical response time between the displaying of a new set of parameters when running the Lunar Landing game is in the order of six to seven seconds. A program that calculates the mortgage payments on a house on a monthly basis, and displays such values as the payment number and balance after each payment, requires a few seconds between the displaying of each new line of information. A dice playing game responds with new throws of the dice in the order of a second or so when using a formula that includes the use of the random number generator. These times are by no means fast, but they are certainly adequate for the intended uses of this language on an 8008 system. The developers were pleasantly surprised with the overall speed performance of the package. Of course, these response times can be cut almost in half by using an 8008-1 CPU. Naturally, if the program is installed in an 8080 system, the response time is improved an order of magnitude.

Since the program will be supplied in the form of a publication that includes a complete highly commented source listing (as well as assembled object code for both the 8008 and 8080), the user who desires to modify or expand the capabilities of the basic package will be in a position to do so. It is felt that the availability of such a powerful program in this form will greatly enhance the general usefulness of small systems and open new vistas to users. The program in this form should also be of considerable value to educationalists who desire a good reference framework from which to introduce students to the development of similar packages.

The publication will be made available in June, 1976, by the developer, Scelbi Computer Consulting, Inc., 1322 Rear - Boston Post Road, Milford, CT 06460.

Book Price: $49.00

THE CASSETTE INTERFACE, NAKED RAM, AND 8080 MICROPROCESSOR BOARD ARE ALL PARTS KITS USING TOP QUALITY PARTS, SOCKETS, AND BOARDS. EASY ASSEMBLY IF YOU KNOW HOW TO SOLDER AND CAN FOLLOW DIRECTIONS...OR IF YOU DON'T HAVE TIME TO DO IT YOURSELF, WE SELL ASSEMBLED VERSIONS FOR 35% OVER THE KIT PRICE

Cassette Interface $72

This cassette interface has two parts: the hardware to talk to the cassettes, and the software to do so intelligently. Our cassette interface board comes with 512 bytes of ROM software---enough software to talk to three cassette machines simultaneously, run an RS-232/TTY interface, and use the on-board RAM (again, 512 bytes worth) as Data buffers when you're reading into and from memory.

Although this board contains all the software you need, not all the hardware is implemented. This way, you can start off with our basic board, and expand it as your capabilities and system complexities increase. For example, the basic board only talks to one cassette machine, but you can add two more cassette channels for only $12. Other options include TTY interface hardware, and a general purpose, 8 bit I/O port. There's room for all these options on the board; all you need to add are the parts for implementation. No kluges required for upgrading!

PLEASE NOTE: The software in the cassette interface starts at 8000 hexadecimal. Also, there are certain default addresses (I/O address 4, 5, 6, and 7). But since this is all EROM anyway (therefore programmable), we can make any changes desired for special system requirements; please note them on order form or separate sheet.

ALTAIR 8800/IMSAI compatible, plated through holes, sockets for all ICs, industrial quality PC board, onboard +5 and -12V regulation, same size as an ALTAIR card.

PLEASE NOTE: CASSETTE INTERFACE AVAILABLE APRIL 1st.

CASSETTE INTERFACE BASIC BOARD	$72.00
2 EXTRA CASSETTE MACHINE CHANNELS	$12.00
TTY INTERFACE HARDWARE	$ 5.00
I/O PORT HARDWARE	$ 6.00

4k x 8 Naked RAM $79.95

This 4K x 8 RAM board is compatible with the JOLT system---same size card and connector scheme---but is also electrically compatible with other 8 bit machines using a bi-directional buss. Uses 2112 memories and draws little current; only about 700 mA. The board is industrial quality, and a compact 7 by 4.25 inches. And we really took advantage of the double sided/plated through holes aspect of the board: all the heavy trace concentrations are on the top side of the board (where you don't solder), so the soldering on the bottom side of the board is much simplified...none of this solder bridge stuff. Includes TI low-profile sockets for easy assembly, as well as instructions and a logic print of the unit.

These boards do not have buffers. What does this mean to your system? Although the DC characteristics are less than 1 mA load on any line, there are approximately 100 pF of capacitance on the 8 low order address lines and 50 pF on the data lines...so the AC characteristics are a little tougher than standard TTL. However--- starting May 1st, we'll be offering a slightly larger board that has address buffers and data transceivers. This will allow you to hang 65K of memory on a JOLT. Non-buffered boards allow 16K of memory, which means you can hang four of our NAKED RAM boards on a JOLT system...and unless you're a very fast programmer, that should hold you until May 1st.

Finally, the NAKED RAM connects into your system using the popular 3M style flat cable 40 pin connector, which is not supplied with the kit. However, we do stock AP connectors. For $20 we send you (2) male headers which solder into the board and (1) molded cable assembly, consisting of 2 female connectors connected together by a 3" piece of flat cable. These AP connectors have one especially neat feature: there are small holes on the outside of the connector so that you can probe the signal lines, which sure makes life easier if you need some test points.

8080 Microprocessor Board(s) $139.95

AVAILABLE MAY FIRST. Actually, we're talking about two boards here: the "Bigger Board" and the "Smaller Board". They have more similarities than differences, so we'll cover the common areas first:

Both are 8080 based systems with a crystal driven 8224 clock driver, using 8197s as address buss drivers and data out buss drivers, and an 8212 as a receiver for the input buss. There are also a number of innovations...such as

*Onboard 8 1/2 K ROM plus associated circuitry allows the microprocessor to be halted properly, so that the state of the machine (that is, registers, flags, stack pointer, program counter) are preserved at the keypad control panel. Once halted, the micro successor executes a program in the on board EROM and allows the user to examine and alter all registers of the microprocessor---just as if you were at the front panel of a minicomputer. This program also accurately simulates a step function, allowing the user to run through programs one step at a time. Either in step or continue, the original or user altered contents of all the registers and flags are restored to their original state before control returns to the user's program.

**16 key calculator type keypad and nine 7 segment readouts allow you to painlessly load and examine memory. Unlike some machines that only let you examine next, with this board you can also examine last, allowing you to retrace your steps---catch errors, makes life easier when debugging. Tape recorders have always had rewind as well as fast forward; now your 8080 does too.

**In the on board EROM, there's software for an RS-232/TTY interface, and there's room on the board for implementing the hardware for this interface.

**The buss is four 50 connector 3M style flat cable connectors, arranged in such a way that with the aid of a paddle connector, this CPU can plug directly into the edge connector of an Altair type buss.

DIFFERENCES BETWEEN THE TWO

"Smaller Board"---card size 6.25"x15", which just by coincidence replaces both the CPU board and front panel of an Altair 8800, fitting in exactly the same area. When used in this manner, you have a cure to many of the problems experienced with other microcomputers: no overloaded address busses (LEDs being incorrectly driven), no one-shot driven clock pulses, no erratic front panel instruction execution, and none of that ready line problem either. Although this board isn't expandable on board like the "Bigger Board", you can expand by using standard Altair sized boards from companies like MITS, Godbout, Processor Technology, Cromemco, or other "second source" RAM and ROM boards.

"Bigger Board"---won't fit into the Altair front panel anymore, it's too big...but still plugs into the Altair buss. The extra board space buys you room for 1K of RAM, 4K of ROM, and two cassette interfaces for mass storage. If you're looking for a board that can be expanded at a later date, then this one is the correct choice for you. We also have options:

CASSETTE INTERFACE (talk to two machines)	$30
EDITOR/ASSEMBLER programmed in EROM	$99
HARDWARE FOR RS-232/TTY INTERFACE	$20

8080 Chip Set

The 8080 has become the de facto industry standard as more hobbyists and companies use them in systems. We have tried to make things a little easier for you by assembling the support stuff and the 8080 in the same place at the same time; the chip set includes:

1 - 8080 8 bit CPU
1 - 8224 Clock driver
1 - 18 Mhz crystal
1 - 8212 I/O buss receiver/latch
4 - 8797 hex tri-state buss drivers

...And an application schematic.

$44

MICROPROCESSORS

In addition to the "industry standard" 8080, we're happy to offer two new up-and-coming microprocessors. For data see below

8080 $24.95 A popular 8 bit CPU.
SC/MP $22.00 DATA PACKET $3.50 EXTRA National's new 8 bit, CMOS/TTL compatible CPU. Designed for super easy use, especially for applications where a conventional CPU would be too complex or costly. With application note.
SBP0400 $35.00 New from Texas Instruments: a 4 bit, I²L bit slice microprocessor.

Programming Service

1702A	8 X 256 EPROM	$7.50
5203	8 X 256 EPROM	7.50
5204	8 X 512 EPROM	10.00
5600/10	8 X 32 PROM (MANUFACTURER: INTERSIL)	4.50
6330/31	8 X 32 PROM (MONOLITHIC MEMORIES)	4.50
82S126/129	4 X 256 PROM (SIGNETICS)	6.00
82S130/131	4 X 512 PROM (SIGNETICS)	7.50
74S287/387	4 X 256 PROM (TEXAS INSTRUMENTS)	6.00

All our programming is done with an intelligent PROM programmer made by Pro-Log

We provide FREE hexadecimal coding forms to users of our programming services. Please send SASE to defray postage costs

BOOKSHELF

Find out how to apply all these new whiz-bang parts with our various data books. Please include enough for postage (any excess refunded).

SC/MP DATA PACKET---EDITED FROM THE NATIONAL VERSION	$3.50
8080 USER'S MANUAL---THE BOOK FROM INTEL.	$5.00
SBP0400 DATA PACKET---NEW FROM TEXAS INSTRUMENTS. VERY COMPLETE, TOO.	$2.50
8080 ASSEMBLER, EDITOR, MONITOR SOFTWARE LISTING	$6.50
8080 MICRO-MONITOR SOFTWARE LISTING	$3.50
SIGNETICS 2650 USER'S MANUAL---FROM SIGNETICS	$5.00
PACE DATA PACKET---EDITED FROM THE NATIONAL VERSION	$2.50

HELP WANTED

Many times computer hobbyist companies have no way of knowing what the response will be to a new product introduction. So, the standard procedure---whether admitted or not---has been to announce a product, collect orders on it, and if the response is good, the company gets the product together...hopefully before people begin complaining.

We don't think this is a good way to approach things, so we're going to try a new method. Listed below are 4 products we're considering for introduction this year with each one identified by a number. On the order form on the other side is a "ballot". Rate the 4 products in order of your interest, with 1 being the one that interests you the most, 2 the one you like second best, and so on. Feel free to add comments, we'd like to know what you're looking for.

#1. 8K ROM board for JOLT systems, target price, $60. Sort of a "Naked ROM" board, using 5204s.

#2. Motherboard/Power supply for Altair/IMSAI machines, target price $130. Some neat features: 12A transformer/diodes/filter caps bolt on circuit board---no wires; solder mask prevents edge connector solder bridges; massive ground plane and other extras.

#3. 16K Static RAM board, ALTAIR/IMSAI compatible. Target price about $300, but memory prices are so volatile that figure is very tentatively given.

#4. Low cost (under $225) floppy disc interface for Altair/IMSAI machines.

Free Public Service

LEARN HOW TO STOP A MICROPROCESSOR...applicable to 8080s, SC/MPs, 6502s, etc. This scheme is a spinoff from the 8080 Microprocessor Board...it allows you to start or stop a microprocessor and examine or alter the registers of the processor, just as if you were at the panel of a minicomputer. In fact, this trick eliminates one of the major differences between a micro and a mini.

If you send us a self-addressed, stamped envelope, we will send you the complete story on learning to stop microprocessors. You don't have to buy anything, just send the SASE and your name and address.

GUARANTEE

Satisfied customers are worth more than money, and we want to keep you happy. We will replace, refund, or repair---your choice---if something doesn't match your expectations. Sorry, we cannot be responsible for user-inflicted injuries.

TERMS: Californians add tax; no COD orders. Please add shipping for our data books, otherwise, we pay postage. BANKAMERICARD customers are welcome. Please print carefully and give your street address if possible.

MORROW'S Micro-STUFF Order Form

NAME

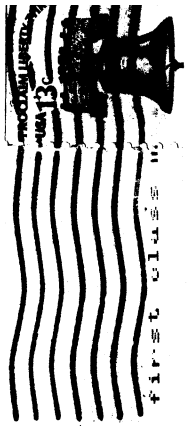
SHIP TO: STREET

CITY STATE ZIP

QUANTITY	Part Description & No.	Unit Price	TOTAL
	BANKAMERICARD®		
	SIGNATURE		
		TOTAL	
	ACCT.# EXP	SHIPPING	
	BILLING ADDRESS	Cal. Res. add Tax	
	CITY	GRAND TOTAL!	
	STATE ZIP		

"HELP WANTED" BALLOT: Please rate the four products in order of preference, as explained on the other side under "Help Wanted". THANK YOU VERY MUCH for your opinion.

	PRODUCT	RATING
#1	8K ROM Board for JOLT	
#2	Motherboard/Power supply for Altair, IMSAI	
#3	16K static RAM board for Altair	
#4	Floppy disc interface	



MORROW'S Micro-STUFF
BOX 6144
ALBANY, CA 94706

8080 Micro-Monitor

What we've done is taken a 5204 EROM and programmed it with some software for your 8080. With this software, you may:
---Examine and fill memory
---Punch and read paper tape
---Branch to, and recover from, programs

$22

This is a convenient little IC for computer hobbyists. Our package consists of the programmed 5204 as well as a complete software listing.

SUPPORT ICs

8224	8080 CLOCK DRIVER WITH GATED READY AND RESET	$9.00
8212	8 BIT I/O BUSS RECEIVER/LATCH WITH INTERRUPT REQUEST FLIPFLOP AND TRI-STATE OUTPUTS	$4.50
8205	8 LEVEL DECODER WITH TRIPLE ENABLE INPUTS	$1.75
74273	8 BIT LATCH WITH CLEAR	$1.75
74LS273	SAME AS ABOVE, BUT LOW POWER SCHOTTKY	$2.25
8197	3 STATE HEX BUSS DRIVER WITH HI Z PNP INPUTS AND 30 LOAD OUTPUT DRIVE CAPABILITY	$1.45
74S287	4 X 256 HIGH SPEED PROM WITH TRI-STATE OUTS	$4.50
74S387	SAME AS ABOVE, BUT OPEN COLLECTOR OUTPUTS	$4.50

MICRO-8 USER GROUP
CABRILLO COMPUTER CENTER
4350 CONSTELLATION ROAD
LOMPOC, CA 93436