Ryte Data
Dedicated to 99/4A and 9900 Computer Systems
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CANADA

R/D COMPUTING NEWSLETTER

Congratulations! Myarc did publicly ANNOUNCE the long awaited, much rumoured new "Myarc 256" computer at the TI Faire November 2nd. He who laughs best! We have a full 'on the scene' report... the reason THIS issue is early. They did NOT SHOW THE RUNNING UNITS AS HOPED. Among certain circles this information traveled like proverbial wildfire. Other owners have not heard the news. Can TI owners NOW breathe a collective sigh of relief? The 'official word' is that the January CES in Vegas will see the new console up and running.

This event is truly unique; an unparalleled first in the micro-computer industry. It takes a great deal of vision and lot of 'nerve' to see beyond the "orphan" label and create a NEW high power computer system based on superior TMS 9900 family technology. The challenge, of course, is to handle the development in a way that ensures success and longevity in a world dominated by 'the big guns'.

It comes down to SUPPORT. This issue is critical and cuts both ways. As some have said, "How many owners will buy a new machine from a company that is not yet stabilized?". With GOOD DOCUMENTATION, open architecture and a stream of upgrade products from innovative THIRD PARTY outfits - I'd say thousands of consoles will be sold. It depends on YOU: save your pennies, BUY ONE. We're not talking about a limited "home computer approach" - sold at firesale prices. Have you looked at the prices on other PCs and the commercial software? Count your blessings every time a new A program comes out priced less that $100. Only VOLUME sales support major efforts of this type. The work for this machine has been going on for at least a year.

For "true believers", the news is not so much a surprise as it is a fulfillment of a dream. Even though there are those that deride Myarc (or CorComp or anyone making an effort), I believe that there is really only ONE way to 'make it better'; get in there and help. Anyone can be a critic. EVER see a monument built to honour critics in our world?.

Now comes the Faire report:

Playing to a packed house, it was real excitement from opening to closing. TI owners from all over North America came to see new products and the new machine. A motherboard WAS shown, but the official word is that it is NOT in production at this time. A working demo model was originally rumoured to be present - but apparently wasn't quite ready in a finalized form.

Few REAL surprizes were in store according to the information we had obtained. Other than the 256k memory standard, much of the design is as was reported earlier. This machine is capable of performing ANY PC based tasks. The 40 or 80 column display is included with composite or RGB output. The RS 232 and Centronic parallel out put is be be included. As with many new design projects, the final details were filled in along the way. No doubt the input given to Myarc by users, groups and a number of others assisted in system features.

The console sports a REAL 'IBM' type keyboard. Separate numeric key pad and function keys - the current industry standard makes a great deal of sense. The video display is slated to resolve various text and graphic modes for very high resolution graphics uses. More on this from the talk given by Lou Philips of Myarc.

It is yet to be seen what hard/ software is compatible. With the

assorted third party products, SOME might not be useable. [On the other hand, with an open & disk based Operating System it will be easier to "patch" code on disk or EPROMs to solve problems]. Some 90% of all soft ware will be directly useable and 99% of the existing Basic programs will run on the 4A emulation mode.

Keeping compatibility with current TI users was the criteria. Your disk controller, drives, interface card and clock/AD cards should be usable. Memory and RS-232 cards are now surplus along with the 4A console. The more interesting area of compatibility centres around the use of TI's operating system: "Monitor and GPL routines internal to the 99/4A console. As Myarc had signed certain non-disclosure agreements, this will have direct bearing on how easy it is for innovative product development from other companies to be accomplished.

NEXT: QUOTABLE NOTES. The following is a series of comments made about the new computer by Lou Phillips.

"This is what we"re in the process of building. We want to see this machine come out in the first quarter of next year. I'm here to tell you about it; where we are. We've come through on all our other products we've developed and we'll come through on this one as well. [a motherboard, memory map and other comparative presentations were shown] As you can see we're going to include: 256k of main memory
64k of VDP RAM
64k of ROM
parallel output and RS-232.
Two 2 internal expansion slots, cartridge port w/ lid and a MicroSoft Mouse will be supported. The Basic Interpreter and library routines requires 48k of RAM. We're putting the GPL Interpreter in ROM (instead of GROM) and adding several features to the operating system ie: MS Mouse support and event driven keys - similar to GW Basic which allows a key interupt to go to a certain location in memory. Another 16k of RAM will be used upon power up with 240k available. Due to the (memory) mapper we're now able to support 2 megabytes of main memory. The 256k is internal with three outboard RAM expansion banks. The 512k card we now produce can easily fit and add a total of 3/4 meg to the machine. Future expansions built in are cartridge port, internal ROM and another empty socket. Processor we're using is the 9995 - which is 2 or 3 times faster.
A certain bit on the gate array sets the 4A mode to bank in any 8k segment so you have an entirely soft machine. This can make it virtually the same at the 4A... Although this processor was first marketed in 1981, it's multiply time is just as fast as a Motorola 68000 running at 6 mHz.
In the new mode, we're going to use the 256 bytes of ON CHIP RAM at >F000 with the workspace registers above that. All I/O will follow the internal RAM @ >FFFA - with the load vector onboard mapping in 8k segments. [for a TMS 9995 memory map see issue 1.2]... Our gate array includes address decode ie: sound chip, MSX (video) and cartridge port @ 16k and contains 8 x 8 memory mapper, the means by which the 9995 gets at 2 mb of main memory. This MSX chip is 64 pin DIP - 9938 which has impressive capabilities: 512 colours, six graphic modes, on-chip mouse and light pen interface and high resolution capabilities. [See Computer Shopper December 1985 Ed.]...
As critical as it is for Myarc to continue and manufacture this machine and continue to be a viable company, it is as important to make all information available to users of the machine - unlike TI. We plan to publish the equivalent of the IBM Technical Reference manual for the PC. [at which point the audience provided a round of applause]... Like TI or any other manufacturer, we don't want people tampering with the machine. I guess we can't stop you. ...With this (MSX) 9938 technology and 9995 for 99/4A compatibility, we're very close to the Atari ST or Amiga series. We're not Commodore or Atari - the January CES show will have.. ..this product - in the $499.00 range. We're going to support everything (peripherals) out there. The computer was going to be named "Noah" after My ark. [We have a new catalogue release which notes "Cypress". Ed] Over the next year we will introduce a new interface card / cable w/ a 19 line address bus, a new floppy disk controller and IBM compatibility. For the first year, we'll have a hard uphill battle and will be working more closely with our

distributors and the users groups."
-Direct from the speech given by Lou Philips at the TI Faire, November 2nd.

The history of Myarc and details on the new Level II Extended Basic w/ 128 operating system support were discussed as well. It was noted that the LII XB was over three months late and that it "would be available very shortly [yep, Real Soon Now]. This is an excellent product which gives 99/4A owners a link to advanced software and system capabilities.

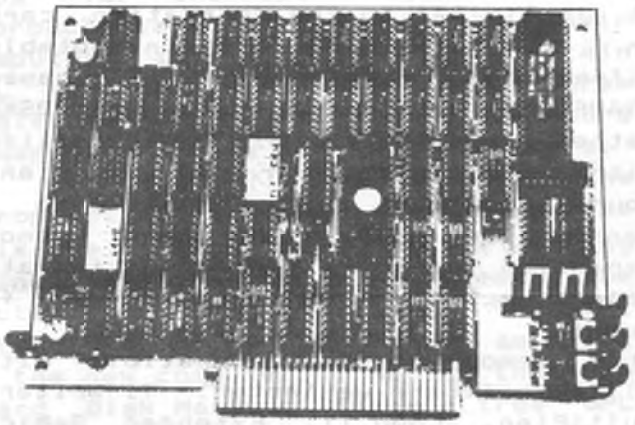
Many TI owners have expressed interest about what all this means for their 4A system... To upgrade or not - what of new products for existing owners. Will many companies still produce new software and hardware in light of a more powerful system?

What we've seen recently, first-hand, is that there are 'bridges' being developed for cassette & disk based systems which can migrate to the new computer system, increase the power and use of the 4A and provide tools for current owners to provide their own levels of improvements.

Products reported on in previous issues are now available. We have a HANDS ON report about the new 128k memory unit which works for BOTH cassette only or disk based systems! A photograph of this AND a new GRAM card for the PEB follow:

FIRST THE RAM/GRAM CARD: This unit is designed for the PE Box and carries 128k of memory - 64k RAM and 64k GRAM (graphics RAM) bank switched on GROM address 9800 with the RAM banked into the >6000 - >7FFF area. The EPROM software allows you to add three 128k cards for a total of 384k of memory! [We are also told that it is possible to have 8 cards in a system for a full megabyte of G/RAM - if there was room!] This unit also allows access to the 64k of RAM as GRAM at Grom address 9820. The other two cards are accessed as two 64k GRAMS. The software features these utilities:
- Save GROM in program-image to disk.
- Save ROM in program-image to disk.
- Load the saved files into GRAM/RAM.
- Load tagged object code from the GPL assembler into GRAM.
- Load tagged object code from TMS 9900 assembler into RAM.
- Load GROM 0 - 2 into the GRAM card.
- Load GRAM/RAM through a Load-File, which can be written with TI-Writer or the E/A Editor etc.

Upon power up, without a module in the slot, the GramCard master menu comes up as an option. You then have the choice of loading 8 Loader-Filenames for extensive system options!
This card would allow some radical new features & changes for the 99/4A. In fact a new operating system could be brought in through the loading of new GROM code... effectively replacing the TI GROMs in a 64k area.
Beta units are up and running. We will have production reports over the next three months - the E.T.A. for this new device.



There is another card in the works from the same company & designers that allows access to TI's "module library". This allows 8 Modules to be selected from the keyboard w/ all sub programs and DSR's from any cartridge. You can "SAVE MINIMEM" from Extended Basic - for example. The beta units are up & running with some minor problems. The real McCoy should have some very useful applications. We will, of course, keep you posted!

REVIEW: The 128k Memory Unit from Mechatronic, West Germany.

This is a 'stand alone' memory unit which connects to the side buss of the TI 99/4A console. You can daisy chain other devices or the PE Box cable to the unit: the PE Box is NOT required to add the 32k standard memory expansion AND 96k of program/file space. The additional 96k acts as a RAMDISK. A Centronics printer port is

included in this unit! Yes, it works just fine with the true Centronics printers tested. Other printers are being tested in the near future for a compatiblity report.
For console only owners without the TI expansion system, this unit gives you all the power of a 128k card at a VERY reasonable cost of $149.95 (U.S.)
It does require a 400 mA power supply at 7 - 9 volts. We used a universal supply from *Radio Shack rated at 300 mA with no apparent problems. The centre pin MUST BE POSTIVE voltage!
The set up is simple. Connect the unit to the side port, power up any peripherals, the 128k unit and THEN the console. Type "DELETE RAMFORM" and you have three 32k memory areas for use with XBasic, TI-Writer, E/A or other programs that access 32k memory. It is similar to the Foundation card in operation with certain notable differences. This unit is named "RAMFORM" and is accessed as DSKR rather than DSKX. It will collide with 32k cards, Myarc 128k and Foundation 128k expansion cards so it cannot be used with other memory expansion cards. (We're looking at a select scheme - but thats a hack for sure!)
This memory unit is compatible with all TI software we tested: TI-Writer, MultiPlan, Logo II, Extended Basic, Assembly code and SuperCart. You do need to have one of the modules that accesses the usual 32k expansion memory to take advantage of the extra space. Everything worked perfectly. The manual is a bit odd in English. A better translation would help, but it's really just as good as other manuals that have been shipped with other TI products. A full discussion on file types, sample programs, copy files function etc. is included in the 24 page 8 1/2 x 11 manual. The material is presented in a clear and straightforward manner. We found no problems in connecting and using the unit within minutes.
The biggest joy was seeing files and programs come up in split seconds on an unexpanded console. The printer port is an added plus that makes a good deal of sense. The warranty for the unit is three months from Mechatronic - repair or exchange. We left the demo model running for 24 hrs without any adverse affects.

We are offering these units to owners in Canada and the US on an individual basis. Price is $149.95 US funds. Shipping and insurance add 5%. We also include pictorial docmentation on connecting the power supply and pin outs for the Centronics port. Each unit will be shipped from our address or from Germany first class - depending on your location - at our discression. Allow 2 - 7 weeks for delivery. Volume dealer inquiries are invited. Call for details.
A package price of $199.95 for the 128k memory unit and Extended Basic II plus (see issue 1.4) is offered. The memory unit does require XB or other software which provides access to the additional 32k - similar to any other usual 32k expansion memory. Dealer inquiries are accepted for Extended Basic II plus as well.

NEXT: The GPL Assembler! We had mentioned a new program which was to be available Real Soon Now [nice to see "vapourware" come on line] that would allow the creation of true GPL code. Well, its here and available exclusively through Ryte Data. This program and documentation unlocks all the secrets within the TI 99/4A. Writing programs to access the internal GPL interpreter and GROM routines is now possible! The package includes the GPL disk, documentation and the book, "INTERN" - which provides listings, commentary and GPL tips and examples. Included on disk is a test example program of a module type GPL program: source, list and object code from the GPL Assembler. We have Version 2.1 available rather

than Ver 2.0 as noted at the TI Faire. The GPL Assembler uses the E/A Editor to write the program and assembles tagged object code for run time files. The E/A Editor files must be copied into the GPL Assembler disk (due to copyright laws) before using the Assembler. An optional GPL loader and EPROM loader will be offered.

Requires: console, 32k, disk drive(s), E/A disk and module (or SuperCart, Super Space or Maximem). TMS 9900 Editor Assembler manual and technical reference manual are useful for internal architecture details; but not for programming in GPL. This is NOT TMS 9900 assembly language as in the Editor Assembler BUT TRUE GPL code.

Price is set at $59.95 (US) for the GPL Assembler and documentation and $17.95 for the book "INTERN" or $75.00 as a complete package. Dealer and distributor inquires are invited.

The license on this package is limited to use of the program. Object code or run time files generated are not included in the license for commercial programs. Software developers are required to secure additional license from the copyright owners. Contact us regarding details and licensing.

Many questions about the book "INTERN" have been received. Following is a partial excerpt from the front of the book. It is recommended reading for anyone who is interested in WHAT the internal code does, why the TI acts as it does, how Basic and Extended Basic (or other modules) interact with the GPL interpreter AND/OR wish to write - modify GPL programs.

"The operating system of TI 99/4A internal ROM and GROM Listing with commentary and directions for GPL - by Heiner Martin (c) 1985 Technik und Handwerk GmbH."

The TI99/4A is a Home Computer about which little is known. This is due primarily to the fact that the manufacturer has published very little information about its inner structure. Nothing could be obtained from Texas Instruments about the operating system called "Monitor" and the Programming Language GPL (Graphic Programming Language) used for the TI 99/4A.

THE ROM

The operating system of the TI 99/4A has several versions. In the ROM area between >0000 and >1FFF only minor changes have been evident up to now. Therefore the listing of only one version shall be enough. How little Texas Instruments has been able to make change in the ROM, can be seen for example, by the fact that the Extended Basic Module accesses directly into some subroutines. The ROM contains the the GPL Intepreter, the interrupt routines, the Cassette routines, part of the Basic Interpreter and several Utility Subroutines.

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The book goes on to discuss GPL, Basic and other commentary and programming tips for the 99. With the new approach taken by Myarc in their computer, it is likely that certain GPL routines (and existing program modifications) will provide more powerful programs for both computers.

As TI still seems to protect the "proprietary" information, books like this one will continue to have bearing on new developments. As noted in the quotes from Lou Philips, the GPL interpreter is being retained as part of the new computer. Notice that the Myarc Disk Manager III is a true GPL program. For some applications this language is a logical choice. For other uses, it IS slow. Much faster execution of I/O and numerical handling can be obtained through 9900 assembly code rather than GPL code. In execution through the system monitor, hybid programs (through XOP procedures) would achieve better performance.

Speaking of which; does anyone out there know how to get the 4A to accept more than 12k off cassette? How about a trick to get greater length - hard or software based? There seem to be a couple of routines to condense the data... but nothing (yet) to allow longer programs. This little feature would allow console owners to add the 32k of memory and USE it fully. Seems that some local users groups are quite keen on an internal 32k upgrade. But even with XBasic etc., it doesn't do a lot of good. There are FAST tape load and transports available for several other machines - how about the TI?

Now: the out to lunch bunch. Sheer numbers of inquiries quickly forced a move to a larger 256k machines key-to-disk database - DataStar (to name names). VERY powerful and very complex. Works fine... except: It appears that some names were misfiled under certain catagories. Ooopps.

It boils down to this: if you are reading this, send us a note or letter stating your subscription status / any issues missed / and (if applicable) your renewal. Current yearly subscription data is listed at the end of each issue.
This is also a test to determine the "renewal rate" and support level from TI 99/4A owners.

Back issues available:

Ver 1.1 *not available*
Ver 1.2 Load interrupt switch
letters, opinions & Myarc news
8k E/A module upgrade
Ver 1.3 TMS 9995 memory map & specs
numeric keypad project
8k module update etc.
Ver 1.4 Extended Basic plus by Apesoft
Myarc 128k card
Auto fire project etc.
Ver 1.5 32k internal memory upgrades
MAXIMEM Universal module
DS/DD Ramdisk
Auto power-up project

Past issues are $2.00 (US) each to subscribers only. Detailed 8k E/A module instructions and the 32k project are available for $5.00 each.
Add $1.00 (US) for postage.
Overseas add $2.00.
For SPECIAL DELIVERY AIRMAIL add $4.00

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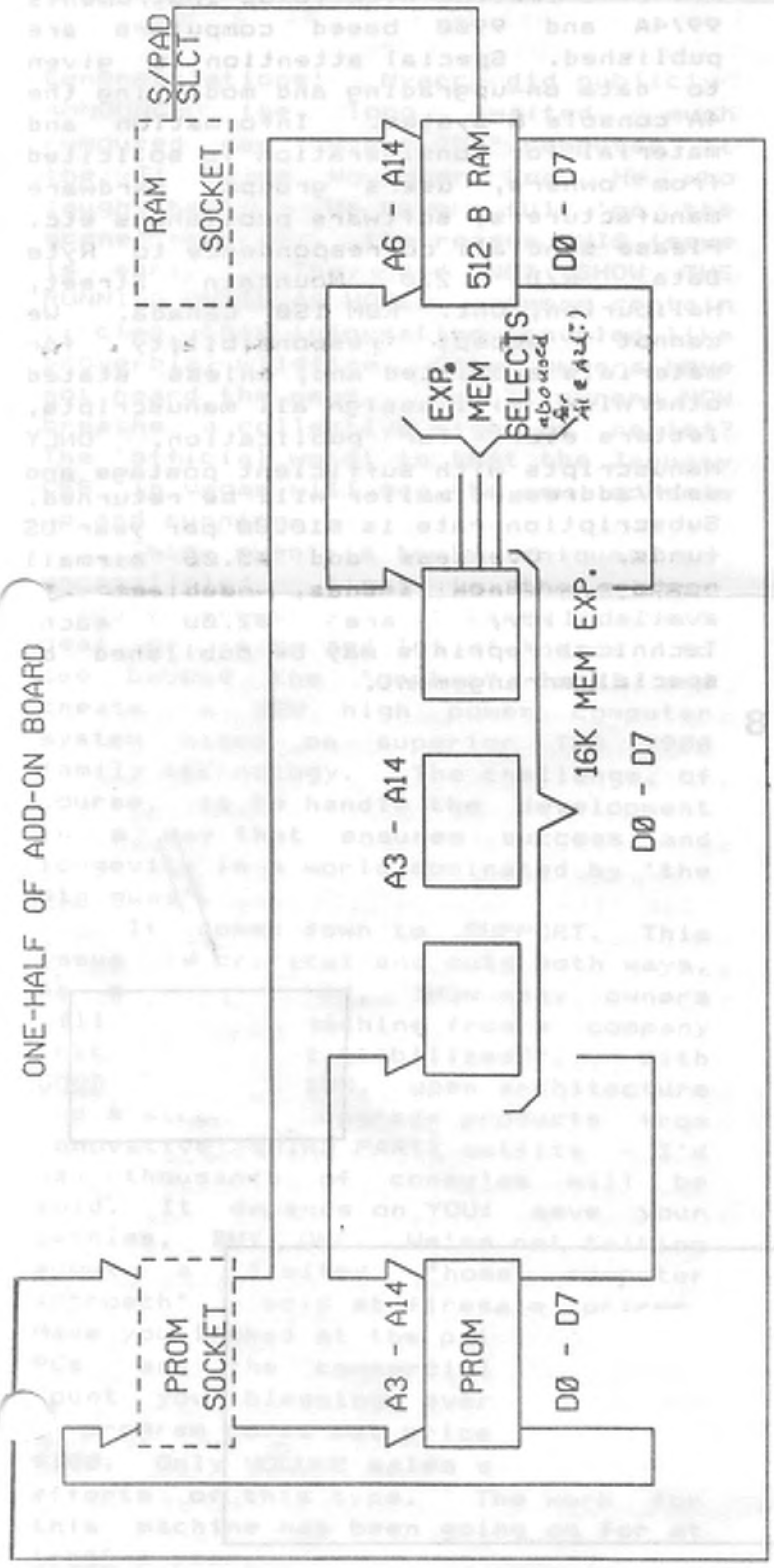
Okay, on to the next. Rumour had it that another 256 bytes 'could' be added to the 16 bit "scratchpad RAM" in the 4A console. This would work really well for certain routines that could use fast 16 bit memory. It would also add an area for bankswitching memory routines to exist OUTSIDE of a 32k memory bank (low and high memory). This feature would allow some great potential routines to be written in without the danger of the code being overwritten by routines that use the PAD RAM.

Great minds think alike. A letter arrived from Mark Scott that goes:
Dear Sir,
So far, I have received two of your newsletters (I sent my subscription in too late to get the earlier ones) The 99/4A computer is indeed quite powerful but I sometimes think that the TI engineers had been studying 2 Samuel 8:4 on the day that final design decisions were made. Too often TI hamstrung their computer while reserving just enough capability to get by for most jobs.
I think I have found another loophole in the hardware design through which we can squeeze a little more capability for our computer. While looking at the 99/4A schematics, I discovered that although the internal/scratchpad RAM occupies 256 bytes of physical address space from >8000 to >80FF, there is no HARDWARE reason why additional RAM could not be added to fill up the (physically) empty address space from >8100 to >83FF for a full 1K of scratchpad RAM! Having heard from another source that it was possible to add 32k of expanded memory INSIDE the console, I began to work on a design that would provid both 32k expansion memory and 1 scratchpad RAM. But, after your last newsletter, I put my design on hold until I saw whether or not your 32k RAM design could be augmented to include 1K of scratchpad RAM.
In order to do the whole job, I think the following things would have to be done:
1. Replace the current RAM and PROM chips with sockets...
2. "Piggyback" board to plug into the sockets to hold the PROM, the 32k expansion RAM chips and the new 1K RAM
3. Connect chip selects (a) existing internal RAM select from the sockets; (b) existing PROM select and (c) use the existing but unconnected high memory address selects for the 32k RAM chips (and possibly complete addressing for these chips).
4. Return the data to the processor through the data lines on the PROM sockets.
NOTE: It might be advantageous to use RAM chips larger that 1K (total) f the new scratchpad RAM since new RAM chip designs consume less power while providing more memory that older and smaller RAM designs.
Do you know of any reason why an

attempt to add more scratchpad RAM would fail, for example, are there any software problems? I have included a block diagram of my ideas.

Keep up the good work,
Mark Scott

Excellent ideas, Mark. We open this one for discussion. Block diagram is as follows:



Lou Philips mentioned a C Compiler for their new machine. No one even blinked! Hello?; "C" is a portable language being used for application development in the mainstream computer industry. Many of the more powerful programs are written in C, compiled for specific machines or transported to other machines. Similar to the concept of Pascal or P-Code except that is is more powerful and easier to use. Some people say that Pascal is on the way out. C on the other hand, is coming into it's prime. This development would allow some of the great programs running on other machines to be ported to Myarc's machine quite easily. Which in turn affects the software available, which in turn affects the markets, which in turn determines sales. The Macintosh, Amiga, Atari ST and assorted other new machines suffer due to lack of software applications and popular programs. You get the point.

From the CIM 99er Group in Montreal: You can get a copy of a "C" Compiler by sending a disk initialized SSSD, self addressed return mailer and $5.00 for postage to:

CLINT PULLEY
38 TOWNSEND AVENUE
BURLINGTON, ONTARIO
L7T 1Y6 CANADA.

A full system, 32k, drive etc. is required for operation, and a good "C" book is recommended.

[I don't have any recommendations. John McCain noted that there aren't any good books... The Programmer's Shop, 128-B Rockland Street, Hanover, MA 02339 USA sounds like a good source. (617) 826-7531 for free literature on "C", Editors, Debuggers and Linkers. They support MS-DOS - PC-DOS, Mac, 8086 and CP/M-80-86] but they should have generic "C" books or reference to such. Lattice C seems to be the top contender... by opinion.]

Running out of room. We had promised an EPROMMER and BBS project. The EPROM device has artwork, software and instructions. The BBS project comes from the wizards John Clulow, Ron Gries and David Romer. We will be opening up a 99 BBS Real Soon Now for downloading assorted information etc.

Small notes: one of the original sources for "hackers" comes from a

memo at M.I.T. back in February 1972. Titled HAKMEM memo 219, it was a set of "hacks" done on mainframe computers by dedicated programmers.

FLASH UPDATE: Moments before press - another note from the Delaware Valley Users Group notes that that the "C" Compiler costs $20.00 It is small c with documentation. Steve Lawless suggests a book e.g. "Learning tiny c" by Guthery, $14.95 TAB paperback via Walden Books, ISBN 0-8306-1895-3 to order from other bookstores.

A great collection of hardware tips has appeared from an unsung wizard Gene Angelcyk of PA. GRAM card, new real time clock, (working board is available) 8k RAM design, control card, EIA<>RS-232 switcher, joystick port 'carrier detect' and a 32k memory card article & memory check program. GREAT STUFF! We will publish various parts of this material over time as space permits.
Newsletter feedback is appreciated!

AND there's too much to cover very well. Do you think expanding the size and accomodating advertising is viable or desireable? Votes.
Remember, READ THIS and send us the update we need. End of line.

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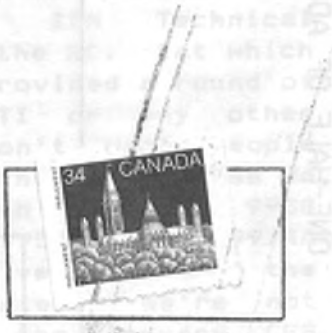

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