.....Ryte Data.....
Dedicated to 99/4A and 9900 Computer Systems
$2.00
VER 1.9
FEB. 1986

BOX 210 MOUNTAIN STREET
HALIBURTON, ONTARIO K0M 1S0
CANADA

R/D COMPUTING NEWSLETTER

Things have been heating up. Your support is more than appreciated! The law of cause and effect is definitely at work here.

We have started procedures needed to offer kits of newsletter projects. With the blessings of several designers and a technical wizard, these should be on-line in the VERY NEAR FUTURE. Crystal ball gazing is 'interesting' (one of my favourite words - the whole world is "interesting") but often fraught with a peculiar danger of its own... Hitting the target is not easy. (What does he mean by that?)

9995 Update

Yes, we had a frank discussion with the "mystery" people with the 9995 computer on-a-card. Took a little doing and talking to get the story without any associated hedging. Let me repeat myself: a promise has been made to NOT reveal the source of this information due to the rumours, phone calls and the general speculation that appears on ones doorstep. Our version of 'inside informant' is very well known in the TI community and does not want the source information and details published until a later date... nor do any of the involved parties want to start answering the phone every few minutes! Be assured, this is real.

The computer runs, sort of, and is only a wire-wrap prototype. The problem, as mentioned last issue, is one of the operating system. Regardless of WHO, Texas Instruments is simply not interested in providing any license or rights to operating system code or design aspects. Without resorting to blatant piracy, it is impossible to sell a 99/4A operating system legally built into a new machine. The only way this product is going to see the light of day is in a

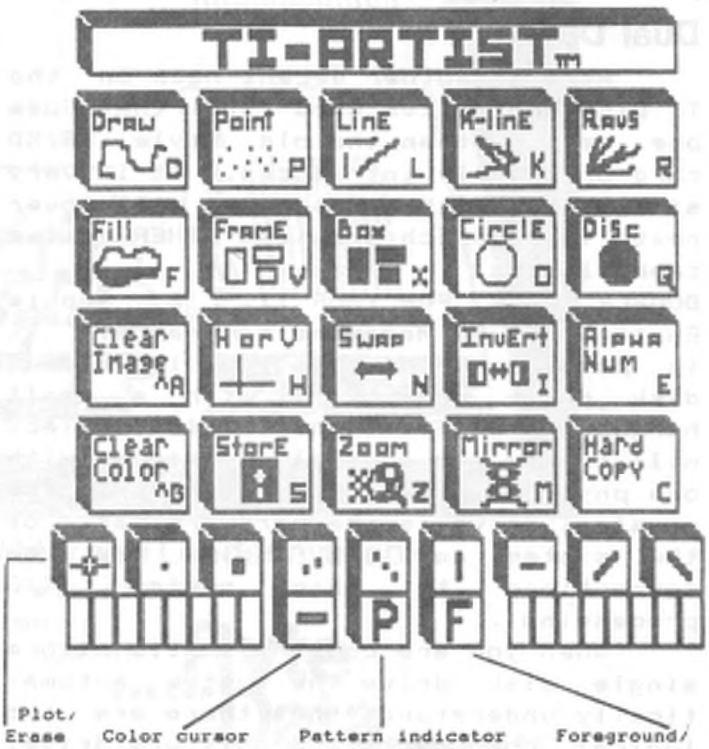
TO PG 10

TI-ARTIST

TI Artist is a complete graphics tool for the 4A which has all the bells and whistles. Pure assembly language speed and ease of use. The whole gang here has spent hours using this program - kids included!

The program boots up using X Basic, E/A module, TI Writer, Myarc or CorComp disk controllers and MiniMemory. VERY versatile interface. Any of these modules or devices will load and run the program - a definite boon to those that have one (or more) of these. No limitations as to the 'environment' one has or doesn't have.

When you choose the main program from #1 you are presented with a screen which contains all of the features of the program as illustrated below.



It takes very little study to start using this rich variety of features

from the manual which accompanies the program. Version 2.0 (a complete re-write of earlier version), so far, has ALL features you'll need to create very complex and sophisticated graphics on your 4A. Please note that many of the pictures in this issue were generated using TI ARTIST.

Dozens of features are included in this program: Draw, Point, Line, R-Line, Rays, Fill, Frame, Box, Circle, Disk, Clear Image, Horizontal or Vertical lines, Swap (image), Invert, Alpha/Num entry, Clear Colour, Store, Zoom, Mirror, Hardcopy and a variety of brush strokes, colours (foreground and background), erasing and cursor speed. The other nice aspect about this program is the ability to interface other input devices; mouse, sketchpad, touch tablet etc. (yes, the 99 Mouse will be interfaced to TI Artist!)

Another great feature is the ability to incorporate graphics from other programs and the addition of many typestyle fonts from Dave Rose.

This program is a must buy for anyone who likes to doodle or create computer art.

Price: $19.95 from INCEBOT
PO BOX 260
ARNOLD, MD 21012

Dual DDC

Here's another decent hack on the TI Disk Controller Card (DDC) that does one better than the old style SS/SD card originally introduced. It is very similar to another design we will cover next issue which provides OTHER drive capabilities.

DOUBLE FACE FOR YOUR TI. By Sophie Ehster from 99 Magazine #6 France. It is possible to have a "double sided" disk drive on your TI with a small hardware modification. This project will create two logical identities with one physical drive. Explanation: The physical drive is the hardware part of the system and the logics are the connections to this system (I/O processing).

When you are copying a file with a single disk drive the system automatically understands that there are two logical components and only one drive. You must change between the copy disk and the source disk frequently. A lot of disk swapping is the result.

Here we take a reverse approach. We take a double sided drive and tell the computer to consider each side as an independent drive. (ie: DSK1 and DSK2). The result is not a real double sided drive (using TI's DDC). With a double sided drive we do not know on which side the programs are located. This is like a single sided drive with double capacity. In one location we now have "two" drives.

It is important to remember that the "topologies" are different and that we cannot flip the diskette (change the diskette position in the drive - no 'flippies' allowed!). The rotation direction of the disk must remain constant.

These small modifications to the DDC give two advantages: more storage space at a lower price (per K of space in the system) and the use of existing disk controller cards - rather than paying for a new double sided double density controller.

It is possible to use double sided drives which are available at sharp discounts. Often second hand drives can be found for additional savings.

The hardware modification project will present this configuration: A) an internal TI single sided disk drive is replaced with a double sided drive which will work as DSK1 and DSK2. Less disk swapping will result. B) the old internal disk drive can now be used as DSK3 with the addition of a power supply. [Ed. Look for an article on how to use those cheap surplus TI console power supplies to run a drive!] At this point is it important to remember that the TI internal and external disk drives are identical. When modifying the internal drive a new power supply with the following specs is required:

25 watts with two regulated outputs - one 5 volts and 12 volts TTL. see figure #1. You can splice into the existing lines from the PE Box to obtain these voltages. Use care to insulate any work done to power an external drive!

Now, back to the real modification required of the TI DDC. Materials needed are:

6 inches of wire wrap wire (thin)
fine point low wattage iron
1 74LS38 chip

Disk Data Base

Today there are more programs available for the TI-99/4A than ever before. There are so many that yesterday's best disk cataloging programs just can't keep up. How many user's groups and individuals around the world can boast libraries in the thousands? The numbers are staggering, and until DISK DATA BASE, there was no way of easily keeping track of such an enormous amount of data. DISK DATA BASE is the only program you will ever need for organizing your disk library. Whether you have 100 or 10,000 files in your collection (DDB will store a catalog of up to 12,000 files on a single DSDD disk!), DISK DATA BASE is your tool for organization. DISK DATA BASE has more features than any of it's ancient competitors. With DDB you can now sort and print out your catalog by either diskname or filename,, print it out unsorted, or selectively print out all entries that contain a string you enter (for instance, you can have it print out all your files named "LOAD"). You can also break up your catalog into blocks of 250 entries for easy management - no longer will you have to print out parts of a catalog you don't need. You can even convert data files from Master Disk File to DDB's data format, so your investment in time is saved! DISK DATA BASE features assembly language routines for speedy sorts and snappy screens, a helpful on-line dictionary of terms for when you are confused, numerous prompts in English, and more ease-of-use than you can shake a stick at. Even if you only have a small collection, DDB is the program for you. Not only will it let you be organized from the start, DDB will also let you expand database files to fill new disk capacity. So if you upgrade your disk drives or controller, DDB will let you easily enlarge your database disk so it can handle a larger catalog. A more flexible program for maintaining your program collection doesn't exist! DISK DATA BASE requires Extended BASIC, a 32K memory expansion unit, and a disk drive and controller. A printer and second drive are recommended, but not required. DISK DATA BASE is an excellent value at $15 - not only does it include 3 disks and a eight page manual, it also comes unprotected so you can legally back up your investment. No data monster is too large to be tamed by DDB, so isn't it time you tamed yours?

$15.00

Send for a free catalog of our other fine products

Asgard Software

POB 10306, Rockville MD 20850

First solder the LS38 to the 74LS38 chip found on the board on pins 3,9 and 18 as illustrated. Cut the unused pins not soldered or wired. Next, wire pin 1 to pin 17 of the upper (new) chip and pin 2 to pin 16. Use wire wrap techniques and minimal soldering! You must make the new chip sit as close as possible to the chip set on the board so the finished assembly will fit back into its case.

Next modify the drive by cutting trace #32 for the "read" line from the PE Box. Then solder pin #12 to pin #32. Finally change the shunt jumpers located at the upper corner of the card behind the resistor pack. The hardware "hack" is now complete. Re-assemble and test to ensure everything works correctly. You now have "two" drives in place of one!

Compliments of SHER-TI-BUNE.

TI Shows

The New Jersey Users Group is holding the TI Computer Owners Fun Fest on March 15th, 1986 at Roselle Park High School in Roselle Park, N.J. You can contact J. Shader, Citron, 981 Townley Ave., Union City, N.J. 07083

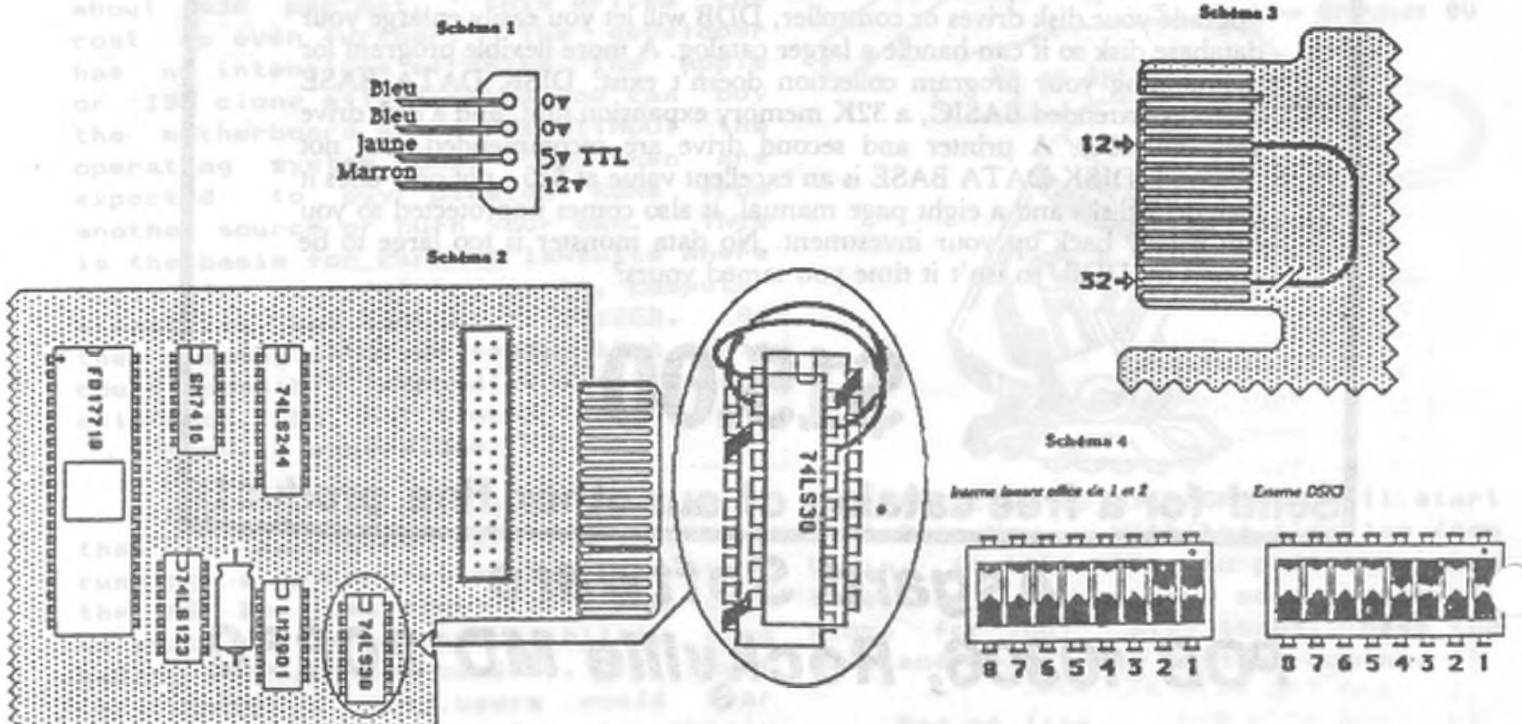
The Boston Computer Society is staging the first TI Faire Saturday, April 5th from 10 - 6pm at the Diamond Junior High in Lexington, MA. Contact Justin Dowling through the Boston Computer Society, One Center Plaza, Boston, MA 02108 (617) 367-8080.

The QUEENSBOROUGH 99ERS USERS GROUP is hosting the second annual TI Metropolitan Area Regional Conference of Users Groups on April 12th, 1986 at Queensborough Community College. From 1 to 6pm with groups, reps & vendors. Contact: John Frangos, 53-32 213th St., Bayside, N.Y. 11364 (212)369-0500 ext 2001 days for more information.

April 26th the Ottawa Users Group is staging a TI NORTH FEST in Ottawa. Contact the TI 99/4A NATIONAL USERS ASSOCIATION OF CANADA, 83D Glen Park Drive, Gloucester, Ontario K1B 3Z1 or call (613) 837-1719. This is a one day show from 10 - 4 for users in Canada and the US. Tell them you read about it in R/D COMPUTING.

Bob Boone from the Ottawa Users Group visited on the weekend here. Had a nice time showing off the new products from West Germany and yakking about the TI universe.

One of the points brought up in the discussion was that of freeware. Some people feel it is a boon to the TI community. Others, including freeware authors aren't so sure. Right now there are some pretty bizzare routines going down about certain freeware



COMPUTER, LIMITED

PO BOX 554
WALBRIDGE, OHIO 43465

RAMDISK ORDER FORM

The HORIZON RAMDISK is available in three different versions. Refer to the description and fact sheets for details. The price includes shipment within the continental United States.

Orders shipped to Ohio addresses must include 5 1/2% Ohio sales tax. Do not send cash. Make checks or money orders payable to HORIZON COMPUTER, LIMITED.

Write us for information on quantity prices for bare boards shipped to a single address.

Please allow four to six weeks for receipt of order. Be sure to complete all information requested below and include your payment for the correct amount including tax, if any.

Circle the item you are ordering. Quantity orders mark the quantity number under the item(s) you are ordering.

(1)	(2)	(3)
Bare Board Ramdisk Kit	Single Sided Built Ramdisk	Double Sided Built Ramdisk
$50	$180	$230

NAME _____

SHIPPING ADDRESS _____

MAILING ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____

programs with some people claiming that these works are actually public domain.

*Copyright laws specify something different - unless there is a written release stating the program is to be placed in the public domain. Touchy subject. Recent news articles in trade journals note suits brought about by Apple and IBM (plus others) on piracy issues based on CRIMINAL charges; ie. theft and fraud. This may prove to be more effective than civil suits based on copyright infringement.

One author, Monty Schmidt, noted in a phone conversation that certain aspects of offering freeware programs really bother him - notably that of people sending the requested disks and mailer without a note, written request, comments or anything! Worse are the late night phone calls from users demanding that he modify the program for them... as if he had sold a high priced program with support options! COME ON. Abuse it and lose it... pass the word. Montys next program(s) will be commercial and PROTECTED. Lots of luck trying to 'freeware' the next top flight programs.

Freeware!

I have a suggestion: in the IBM worlds, a certain amount of "freeware" exists. Quite often, same as with the TI programs, it is high quality and well deserving of support. Some very essential differences exist.

Let me digress: in the old days (a few short years ago), the ONLY way you got software was from those that wrote microcomputer programs - other owners and dedicated enthusiasts; most of whom BUILT their systems. Then came the commercial approach with all that THAT entailed. Everything has changed. It is very hard to gain shelf space now... much less market share. The glut of "me too" products doesn't help either.

In an effort to provide distribution, the concept of "free/share/fair" ware was (is) seen as a means of reaching computer owners via one to one distribution. Perhaps to beat the pirates as well... after all it isn't much fun to spend time cracking protection schemes that don't exist. One is encouraged to give away copies and the honour system takes it from there. Works for some.

And not for others. The returns tend to me rather dismal from the many comments made by freeware authors. After months of hard work, this can be a real disappointment. Particularly if you know that thousands of people enjoy the labour you put in - yet fail to provide any return in kind.

FREEWARE AUTHORS TAKE NOTE: Provide virtually ZERO documentation and the returns from your shareware programs will increase tenfold. Sure, you will have to put your documentation on disk or have some printed, but the donations will make it worthwhile. In the IBM market, when a freeware program goes out, there is virtually no DOC or *READ ME files. The title screen or doc files always start off with notices that you must send off your $$$ to receive complete docs and update support. Works! The documentation is often just enough to make the program boot up or be useful. No frills, no bells & whistles. "Send in your ($10 $20 $60) to receive (full doc files, updates or support)".

One chap, Jim Button reportedly makes six figures a year in this method of distribution. He writes some great stuff... with only the bare basic documentation on disk. People who respond with the requested fee are given the vital information needed to make his programs truly useful and worth the requested money. People who really want the benefits are more than happy to send for the information.

Besides. it's only fair.

Load Switch RESET

Several issues ago we ran a LOAD interrupt switch used to branch to high memory interrupt vector. This was originally published by Bill Gronos in the Enthusiast magazine with a software debounce [to recognize only one key press from depressing the switch]. Later came a hardware debounce using a resistor and capacitor [standard approach from an electronics perspective].

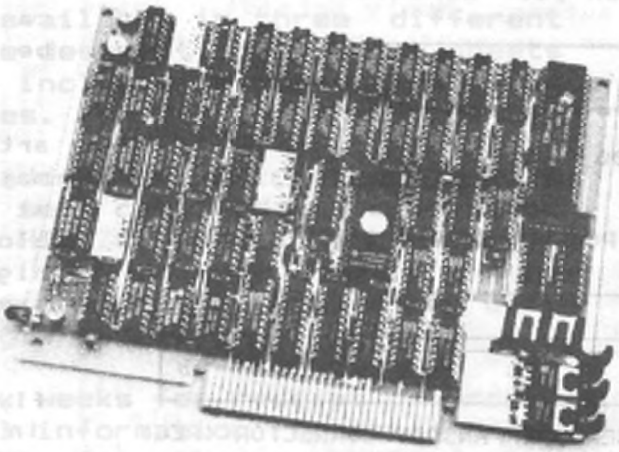
Now we have a RESET switch from Guy Gournay, the developer of MAXIMEM. This small device allows you to insert or remove cartridges WITHOUT the automatic power-up routine 'Reset'; which will erase anything in memory and re-initalize the system with the standard values (blank or otherwise). This can be very useful when trying to get into the machine, examining code or

from Mechatronic

New 128k/512k RAM/GRAM CARD

the ULTIMATE EXPANSION for the TI 99/4A

The most innovative expansion card ever designed for the TI 99/4A. This peripheral expansion memory card gives you new features, more power and control than ever before. Your computer can now perform tasks beyond all limits. It is packed with unique functions; to transform your 99/4A.



Features:

- > 128k RAM/GRAM memory • 64k RAM and 64k GRAM
- > Expandable to 512k • Two = 1 megabyte RAM
- > Use "Load" files for custom system operation from main menu screen
- > Add an **extra** 13k to Basic programs
- > Load and run assembly programs
- > Load and run GPL programs
- > Save GROM modules and programs to disk
- > Save ROM programs to disk
- > Load and run ROM/GROM programs
- > Load console GROMS 0-2 into the GRAM card, modify the 99/4A console operating system for new features!
- > Menu access up to 8 choices (modules, etc.) from main screen
- > Hex monitor allows you to change CPU, VDP and GROM memory directly from keyboard input
- > All software is on card. No disk required.
- > Change CRU address base via switches
- > Review module library from main menu

Available: NØW

$249.50 US FUNDS

with the GPL Package: $310

99 MOUSE - w/ software	$98
Extended Basic II plus	$75
128k Stand-alone memory ß printer port incl	$149
MAXIMEM	$145

TI DOS w/ icon interface $25

and AVAILABLE VERY SOON:

80 Column Card - 'Library' Card - Internal 32k w/ battery
New module Command Centre.
GPL Memory Module .... and more!

Fully compatible with TI, CorComp and Myarc disk controllers. Switch selection ensures compatibility with all current and future expansion cards. Tested with Foundation 128k and Myarc 128k memory cards, Horizon RAMdisk, Myarc and TI RS-232 cards. Now you can access all the true power of your TI 99/4A at a remarkable price. Anything you wish can now be accomplished! Download your most used modules. Modify programs to suit your needs. With the imminent 80 column card, you can have a "new" computer **now**, equal to any comparable machine on the market. Place your order today.

VISA

MasterCard

Ryte Data

MILLENNIUM COMPUTERS

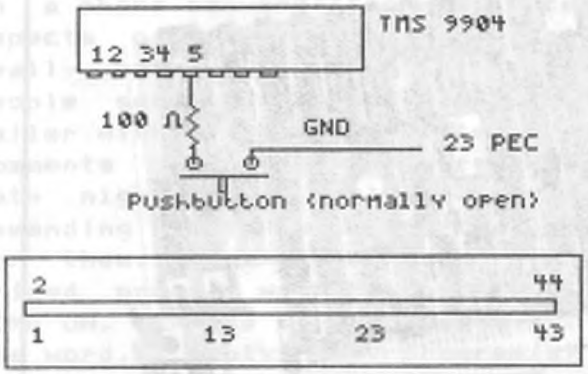
210 MOUNTAIN STREET,
HALIBURTON, ONTARIO K0M 1S0

downloading modules' etc. in memory.

This device maintains the TMS 9900 CPU in an idle step with the program counter = 0000 all the time it is depressed. This means the processor cannot erase an interesting program during that time.

All that is needed is to connect the pushbutton to pin #5 of the TMS 9904 chip (on the motherboard) and to ground through a 100 ohm resistor. Dead simple!

Follow the schematic below and bring the switch up to some convenient location on your console.



PERIPHERAL EXPANSION CONNECTOR (PEC)

Mr. Gournay also sent a SUPER LOAD INTERRUPT SWITCH design which we will run next issue. This one allows you to return to your program and analyze things in a way never before possible.

Brief update on MAXIMEM: the new version which has been developed and prototyped includes 80k of memory as well as another 8k for on-board Disk Manager. The improved version will also carry battery back-up for programs in memory!

New RAMDISK software has been developed and a new GPL loader is in progress. This is designed to work with new GPL code developed with the GPL Assembler. Look for more info more than Real Soon Now.

Horizon

Our HORIZON RAMDISK (board kit) came in today. Great show! This is a fine product worthy of any manufacturer. In that this was developed by John Clulow, Ron Gries and David Romer of Ohio, we are seeing good, solid design brought in at a very low price. You now have the opportunity to add 192k of RAMDISK memory to your PE Box. Very well done. Very professional. (These guys aren't "hackers" at all!) The price is right. It is a bit complex to assemble. Many novice soldering iron-wielding souls might not want to tackle the project. There are over 25 chips to install to obtain 192k of memory. Being CMOS static RAMs, care must be taken to not zap the memory chips. It will take a few hours to assemble. A full report is due next issue - space permitting! Gee, 192k plus 128k in the Foundation card plus 128k in the RAM/ GRAM card is a packed PEBox! Over 500k of memory in the one system of expansion memory alone! Now, lets see, a Myarc 512k card and two 512k RAM/GRAM cards would be right (off the deep end.?)

The Boston Computer Society ran an article which stated (in part) that the major reason Myarcs machine didn't run at the Chicago TI Faire was due to a blown chip which occured the previous night. Hopefully we'll have more to say after the 99 Fest West '86 in LA.

Manfred Wilhelm of Mechatronic is flying in from West Germany to meet us in L.A. So is Henri Schlereth for that matter... should be very productive. More next issue - as usual.

NEXT: Pat Saturn of MicroStuph called with the comment that their new PE Box prototype won't be ready for several weeks. They also have a 32k internal memory upgrade board for those who would like to build the Australian 32k project without the numerous solder and/or wire wrap connections. He does not recommend that novices attempt the 32k expansion without some assistance. Some people have blown up their consoles doing this - particularly with the battery back-up option.

Gram Karte

Yes, I know, we promised a sample program for the 128k RAM/GRAM card for this issue. Sorry, there just isn't enough time to pull this one off. Here are more details on the upgrade memory card:

First menu that comes up without a module in the port is

1. FOR TI BASIC
2. FOR GRAMCARD >9800
3. FOR REVIEW MODULE LIBRARY

Choosing #2 gives you another menu with

```
GRAMCARD >9800
PRESS
1 FOR LOADER
```

MasterCard VISA

Add $4.50 per order, shp & hnd.

5 NEW PROGRAMS!

QUALITY 99 SOFTWARE
1884 Columbia Rd. #1021
Washington DC 20009-5161

99 Q

NEW

QS-RAMDISK

Turn your Foundation 128K card into a true, 127 file, RAM disk, with no file-size or file-type restrictions. You can have sequential files, large Ex. BASIC programs, etc. All the capabilities of a SSSD disk, only at RAM disk speeds. Read, write, and save to the QS-RAMDISK exactly as if it were a regular disk drive, using all the normal BASIC commands. No new commands to learn. Written in Assembly language. The most incredible new program in years. At last you can really use the full capabilities of your 128K card. Save time, save money. Order now!

Req: Foundation 128K card, with DSR option (not disk file emulator)

only $49.95

NEW

BANNER MAKER

Print signs in large letters, up to 6" high, either horizontally or vertically. Upper and lower-case letters, numerals, punctuation marks, special characters ($,%,&,*,?,!, etc.), plus ten pre-defined characters. You can even design your own characters, and then print them in large size. Fast and easy to use. Lots of fun. "Happy Birthday, John!", etc.

Req: Any printer only $19.95

NEW

SOFTKEYS

Create your own programable function keys! Save time, eliminate typing mistakes. Define ten keys to be any commands you want, up to 140 characters each, e.g. SAVE "DSK1. or LIST "RS232.BA=4800.DA=8" etc. Thereafter, only one keystroke will instantly enter the entire command. A great time saver. Written in Assembly Language.

only $29.95

NEW

SCREEN DUMP II

A fast, easy, resident, screen dump program. Written in Assembly Language. Print the screen, in normal or full-page size, in only seconds, by simply pressing a key. NO programming required. NO hardware modification required. Load it once, then it is always ready for instant use, at any time, from your BASIC or Ex. BASIC program, or from command mode. You control which column the printout will begin in. Print the screen of certain modules, when used with a Load Interrupt switch (sold separately). Req: TI, Epson, Gemini, Panasonic, Canon, or Prowriter compatible printer.

only $29.95

NEW

DISK MANAGER IV

The ONLY resident disk manager program! Can be operated from command mode or from your program! Load it ONCE, then it is always ready for instant use, at any time. No more swapping modules, or loading a special program, just to catalog a disk, initialize a disk, change file protection, etc. Do it all instantly from command mode, or even in your Ex. BASIC program. A great time saver. Also saves wear and tear on your console. Now, with ALL the capabilities of the Disk Manager module (except disk tests), including COPY a file to an existing disk, and BACKUP a disk (full or selective) to an existing disk. Unfractures files, too! New HELP command included, plus a menu-driven option to make it even easier to use. Written in Assembly Language. Resides in the Assembly language portion of memory, does not reduce the amount of space available for your BASIC program, or disturb it in any way. Works with all disk controller cards.

only $39.95

[All programs in this catalog require disk, 32K, Ex. BASIC.]

```
2     DSK1.XB
3     DSK1.AS
4     DSK1.DM
5     DSK1.MP
6     DSK1.WR
7     DSK1.TE
8     DSK1.LG
9     DSK1.MM
```

Choosing #1 from this menu gives you the Loader menu with

```
1  LOAD (G)RAM WITH PROGRAM
2  LOAD GRAM WITH ASS-FILE
3  LOAD RAM WITH ASS-FILE
4  LOAD GROM Ø-2
```

```
 5  SAVE GROM
 6  SAVE ROM
 7  LOAD-FILE
YOUR CHOICE [ ]

     c by H. MARTIN
```

You can see the diversity and flexibility involved with this card. All features are software controlled - you do not have to throw switches and move back and forth in order to activate the functions on the card. The beauty of this is that you can down load all of your most used modules to disk, re-load them into the GRAM card

and have all of them instantly accessible from the keyboard.

Interested in a card that does all of this and more? Write or call. We are shipping these for $249.50 (US funds) plus 3% for shipping, handling and insurance. Master Card and Visa are accepted. Add another 3% for MC or Visa orders. A full instruction manual (in English) comes with each unit. A special offer which includes the GPL Assembler package is available for $310.00 The card includes a GPL loader specific to this design.

from PG. 1

kit form - according to the developer - as of our most recent update today.

Now, I have this Wild Idea that a computer could be done AND the tools to install a proper operating system could be worked out from the user level. It's also a question of development money...reverse engineering a project is both expensive and fraught with compatibility problems.

Apparently this computer will boot up and run a version of Basic. Total software compatibility DEPENDS on having at least good emulation of the current operating system code. Program conventions must be adhered to in order to make GPL and assembly code programs work correctly in a new environment.

We were also told that TI will sell the chip set [ROM and GROMs] for about $30 per set. This drives the cost up even further. The developer has no intentions of doing the Apple or IBM clone effect where you can buy the motherboard and parts WITHOUT the operating system ROMs. You then are expected to buy pirated ROMs from another source or burn your own. This is the basis for current lawsuits where Apple (for example) has parts, computer assemblies and equipment SEIZED. So the company involved feels that this could possibly jeapordize their sheer existence. No, not a good idea.

Back to square one.

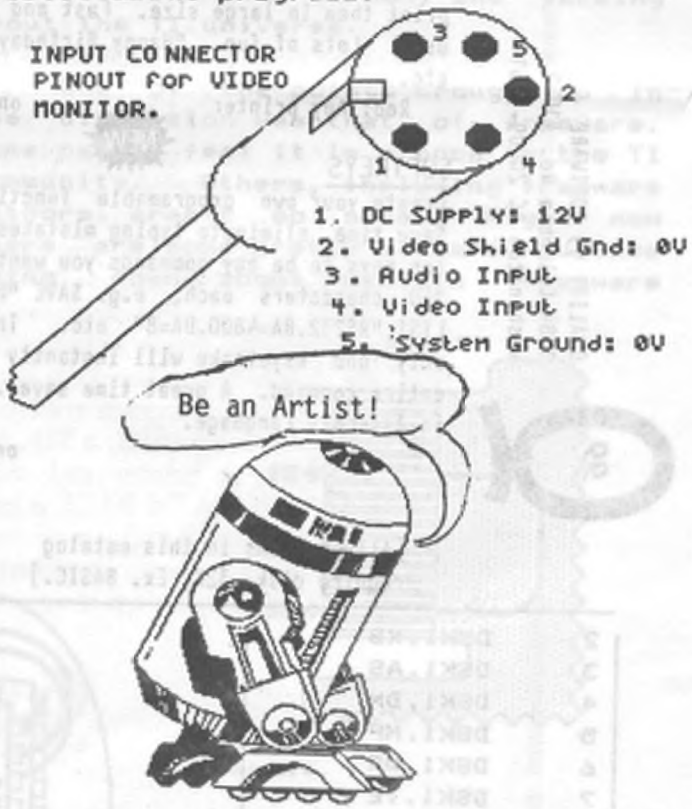
Part of the Wild Idea approach is that an expansion card capable of running a new operating system within the PE Box just might carry the day. We shall see if the compatibility does exist and what can be done. I doubt very much if many users would tear apart their 99/4A consoles to obtain the chip set needed.

As there have been several letters and phone calls about this, we will take a journey to the shop with a RAM/GRAM card in tow to see what happens.

What is needed then is a new video display card to provide 80 column capability along with a keyboard unit to hang off the back of the PE Box.

80 Columns!

Speaking of which, there are two very well founded stories about 80/40 column display cards in progress! Using the new 9938 video chip, these cards end the frustration of the limits set by the 99/4A display. The trade off with display size vs monitor (TV) resolution will no longer be a concern. You will be able to use high resolution monitors and run 80 column software. Part of this story involves re-writing some of the more popular software packages for a full sized screen. The prices should be within reach. Next issue should have a photo of prototype boards. We will, of course, keep you posted about progress.



Articles by Bill GRONOS will start Real Soon Now. With the time lag from Spain, it takes time to pull the show together. Do we have some treats in store for you! Stay tuned, pass the word and keep those letters coming.

End of line.

MAXIMEM™ 48k Universal Module

A POWERFUL STATIC RAM MODULE: 48K RAM and 8K ROM

This module works on ALL TI 99/4A computers to expand the memory to 96k RAM. MAXIMEM gives you the ability to download ANY module to disk or cassette. You can then run ALL your software from disk.
No additional power supply is needed. MAXIMEM works on your computer without modification. With two sections of memory: 32k GRAM (Graphics RAM) and 16k RAM added to the 16k VDP RAM and 32k memory expansion; your computer now has 96k of memory available.

MAXIMEM starts automatically through an 8k GROM with the menu choices of 1) TI BASIC 2)MAXIMEM or 3) EDITOR/ASSM MAXIMEM can replace all your modules & holds data after you "Quit". It can also load several programs at once! MAXIMEM can also function as a RAMDISK to save and load programs to its memory banks. Software is provided to use all these features.
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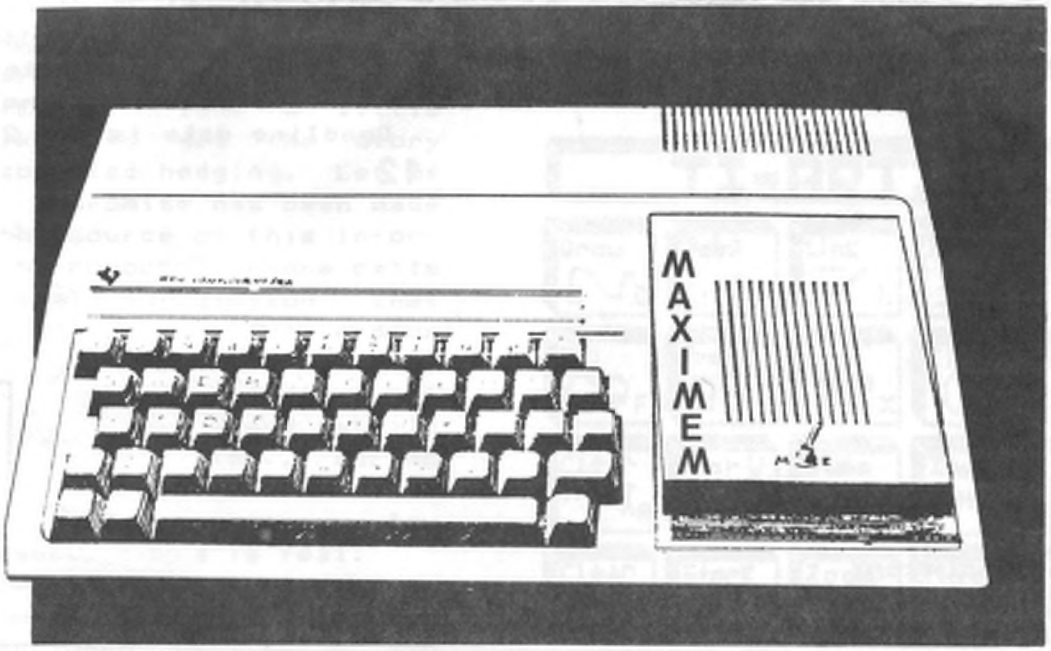

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