NEWSLETTER 9T9

Texas Instruments
USERS GROUP
TORONTO
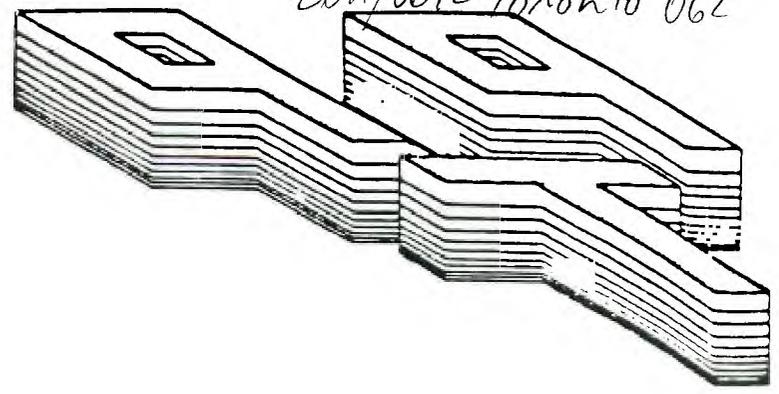
FOR THE TI-99/4A COMPUTER

NOVEMBER — DECEMBER 1986 ISSUE

SEASONS GREETINGS FROM THE
9T9 USERS GROUP

34 CANADA

FROM:

9T9
USERS
GROUP
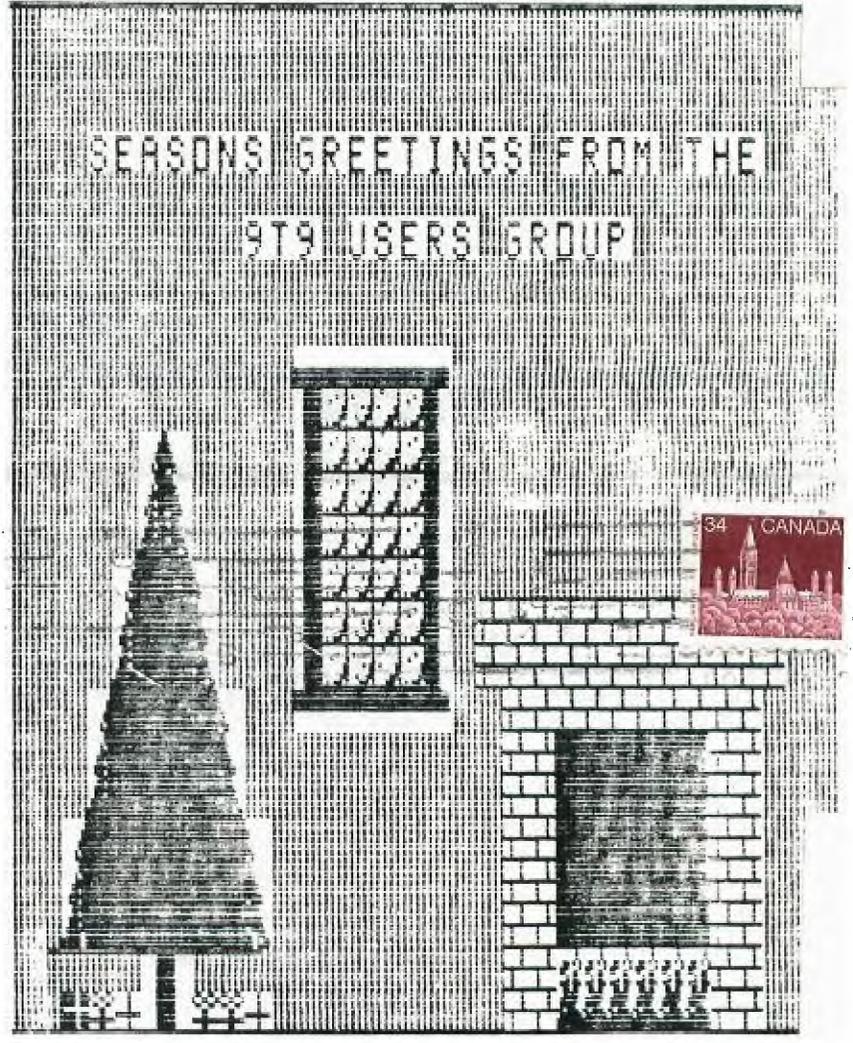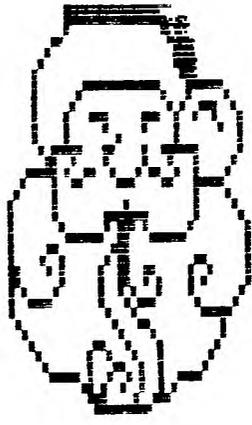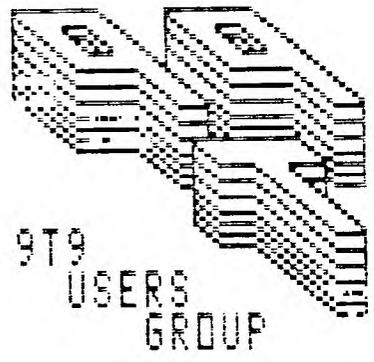
15 KERSDALE AVE.
TORONTO, ONTARIO
M6M-1C9, CANADA

TO:

Edmonton UG
Box 11983
Edmonton, AL T5J 3L1

EXECUTIVE COMMITTEE

PRESIDENT Emile Verkerk (633-1451)
VICE-PRESIDENT Randy Rossetto (469-3468)
SECRETARY Randy Rossetto (469-3468)
TREASURER Peter Sandford (820-7389)
OFFICER AT LARGE Boyd Brown (793-3761)
PAST-PRESIDENT Lloyd Lindsay (743-3868)
LIBRARY DIRECTOR Gary Bowser (960-0925)
MEMBERSHIP DIRECTOR Gil Tenant (755-3466)
SOCIAL DIRECTOR Steve Mickelson (657-1494)

NEWSLETTER EDITOR

Steve Mickelson (657-1494)

MEMBERSHIP FEES

FULL MEMBERSHIP $25.00 / year
NEWSLETTER SUBSCRIPTION $15.00 / year

All memberships are household memberships. An newsletter subscription is only for those who do not wish to attend meetings, but wish to receive our newsletter and have access to our library. You are welcome to visit one of our general meetings before joining the group. If you wish more information contact either our president, in writing, at the club address on the front cover or phone him.

The meetings are usually held on the last Tuesday of each month, unless stated otherwise. Consult this issue of Newsletter 9T9 for the date and time of the next meeting. Meetings are held in the downstairs meeting room of York Woods Public Library, in Downsview, starting at 7:30 pm. The library is located at 1785 Finch Ave West, just west of Keele St. The entrance to the library is on Finch Avenue.

COMMERCIAL ADVERTISING

Any business wishing to reach our membership may advertise in our newsletter. The rates are as follows. (height by width):

FULL PAGE   (9" x 6) $40.00
HALF PAGE   (4 1/2 x 6") $20.00
QUARTER PAGE (4 1/2 x 3") $10.00

Please have your ads camera ready and paid for in advance. For more information contact the editor.

Don't forget, that any member wishing to place ads, may do so free of charge as as long as they are not involved in a commercial enterprise.

NEWSLETTER ARTICLES

Members are encouraged to contribute to the newsletter in the form of articles, mini programs, helpful tips, hardware modifications, jokes, cartoons and questions. Any article may be submitted in any form by mail or modem. We welcome the reprinting of any article appearing in this newsletter providing credit is given to the author and 9T9 If more information is required, call the editor. The name 9T9, Nine-T-Nine, Newsletter 9T9, Nine-T-Nine Users Group, and 9-T-9 Users Group are Copyright, (c), 1986 by the 9T9 Users Group, all rights reserved.

DISCLAIMER

Meeting Schedule

The next four meetings will be:
Tuesday, November 29
Tuesday, December 9
Tuesday, January 27, 1987
Tuesday, February 24, 1987

Get the
. Message.

Meetings at the York Woods Public Library, 1785 Finch Ave.   West,   between Keele and Jane Sts., at 7:30 P.M., in the downstairs meeting room.

2

Time To Renew !!!

An important reminder to all current and prospective club members to renew now and *SAVE!* Since this a combined November/December issue of Newsletter 9T9, it is our last chance to remind you to renew at 1986's rates. We have tried to keep costs at a minimum, but inflation and the new postal rates, along with a larger format newsletter has made it necessary to increase the rates for a subscription to $20.00, **after** January 1, 1987. All renewals for 1987, postmarked before December 31, 1986 will be accepted at the current rate of $15.00.

Full membership rate is increasing, as well. The current rate is $25.00. After January 1, 1987, it will go up to $30.00 per year. Expect to see more demonstrations and tuitorials of hardware and software; answers to technical problems; as well as a new "disk of the month", to be introduced by Andy Parkinson; and expect a both the disk and (other club) newsletter "loan-out library, (see my TId-bits column for more on the library). Also, will be our periodic hardware/software sale/swap meet, the next one will take place December 9, after the regular order of business,(which includes election for the 1987 club executives.

Finally, if you have recently moved or are joining as a new member, please include with your renewal, your name, address, and postal codes. If you like, you may bring your membership renewal to either the November 25 or December 9 meetings. Otherwise mail-in a cheque or money order to 9T9 Users Group, **PLEASE DON'T SEND CASH IN THE MAIL!**

Have a safe and happy holiday in December and don't forget to renew. You know a club membership or subscription might make a thoughtful gift.

Plug Pulled On 99ERLINE BBS

The following notice was captured from Stan Lemon's BBS. Stan operated the 99er BBS approximately the last two years, filling a void left when Steve Wood's TI-BBS folded. We will miss the 99ERLINE and wish Stan well.

$ 1 DIALING: 8316751. END =

ON-LINE

THE 99ERLINE WILL BE CLOSING DOWN FOREVER AS OF SUNDAY NOV.23,1985. I HOPE THAT SOMEONE WILL PICK UP THE TORCH BY THEN. OF COURSE YOU WILL HAVE JASON'S BBS AT 736-6492. YOU WILL ALSO HAVE GARTH'S BBS AT 221-3578. IT HAS BEEN FUN RUNNING THIS BBS AND I HAVE TRIED TO KEEP IT RUNNING LONG ENOUGH TO ALLOW YOU TO FIND A NEW BBS TO CONTINUE TO COMMUNICATE IN A WAY THAT IS NECESSARY TO THE SURVIVAL OF THE T.I. USER COMMUNITY HERE IN THE TORONTO AREA. I THANK YOU ALL FOR YOUR KIND COMMENTS. IT HAS BEEN FUN. -STAN LEMON

300/1200 Baud Date: 00/00/86 Time: 12:00:00 am Caller #73 Last caller was STEVE NICKELSON Press enter to continue

```
 V     V   OOOO    TTTTTT  EEEEE   !!
  V   V  O    O      T     E       !!
   V V   O    O      T     EEEEE   !!
    VV   O    O      T     E       !!
    V     OOOO       T     EEEEE   !!
 ======================================
```

Get the
Message.

A REMINDER TO ALL THAT THE 9T9 USERS GROUP IS YOU! AND THAT IF THERE IS A POSITION WITHIN THE CLUB YOU WOULD LIKE TO SERVE, THAT YOUR CHANCE WILL OCCUR. THE ELECTION WILL TAKE PLACE AT OUR DECEMBER MEETING, TUESDAY DECEMBER 9. IF YOU DON'T WANT TO HELP, THEN READ ON:
(This came from a recent issue of the CIM 99, MONTREAL NEWSLETTER)

HOW TO KILL AN ORGANIZATION:

1- Don't attend meetings; but if you do, arrive late.
2- Be sure to leave before the meeting is over.
3- Never offer your opinion at a meeting; wait 'till you get outside.
4- When at a meeting, vote to do everything; then go home and do nothing.
5- The next day find fault with your officers and fellow members.
6- Take no part in your organization's affairs.
7- Sit in the back and start up your own meeting with one or more members during discussion periods; if you keep it down low, no one will notice.
8- Get all the organization can give and give nothing in return.
9- Talk cooperation, but never cooperate.
10- Never ask anyone to join the organization.
11- Threaten to resign at every opportunity; especially when things are not going your way.
12- If asked to help, always promise to do so, but be busy when called upon.
13- Never read anything pertaining to the organization in case you learn something on your own.
14- Never accept an office; better to criticize than to be criticized.
15- If in a moment of weakness you find you have gotten yourself on a committee; apply all of the above rules and let the chairman do all of the work.
16- Don't do anything more than you have to and when others give freely and willingly of their time and talents to help the cause, be the first to leap to your feet to remind everyone:
What's wrong with this group is that it's being run by a clique!
(-from President's Corner, Summit 99'er Users Group)

4

Well folks looks like this will be it for the 1986 issues of Newsletter 9T9. This month's issue is a double-issue. Our next meeting is Tuesday, November 25; with the December meeting to shortly follow on December 9.

Expect to see the introduction of a lending library of other clubs' newsletters. I have compiled one set and am working on the second. Only about ten more to go!

For those who would like to get involved, there will be elections of the club's executive on December 9. There will be a Swap-meet, following the business portion of the meeting. So bring you hardware, software and/or money and enrich your computer resources.

A new disk-of-the-month should be featured at the next two meetings.

As suggested from the floor, I have indented the newsletter's pages about 5 spaces and off-set the lay-out so that your issue can be punched for a notebook without affecting the text. Also, the improved script is due to my new Seikosha Printer. I can now set the margins using printer switches. This is great for listing programs and maintaining the margin spacing mentioned earlier.

I know I had a few typo's last month; grammar and even typo were a couple. I still didn't get to run most of the letter through the spell-check utility; but I should get ahead in my articles in the next few weeks.

PLEASE NOTE; It has come to my attention that the project for the re-wiring of the Atari joysticks for the TI, which appeared on page 16 may damage your system as there's no mention of suppressor diodes, Such diodes are used in the Wico adapter. So hold off making or using this one until I can print a fix.* (* OCTOBER ISSUE OF THE NEWSLETTER)

Space limitations keep me from having the next installment of Terry Atkinson's Gram kracker tuitorial. Expect them to appear in the New Year, providing I'm elected back to the editor's chair.

And last month's program-of-the-month had line #15 print out poorly. It should read: 15 ELSE CALL KEY(5,N,O) :: J=(N<84)-(N>77) :: P=(N=66 OR N=84)-(N=77 OR N=85) :: A(B,I)=Q :: IF P=0 THEN 7

GABOR BENEDEK IN DIE ZEIT

Computer Fest '86 was an overwhelming success! The attendance for this show for the small home computer reached about 5,000,(only 2,000 to 3,000 were expected). Many vendors ran out of sale items by noon. Club booths were a beehive of activity throughout the day. One of the busy booths belonged to the Toronto 9T9 Users Group. If one picture tells a thousand words, then here's a volumn of them.

Computer Fest'86 line-up looked
like this until past noon.
(photo S.Mickelson)
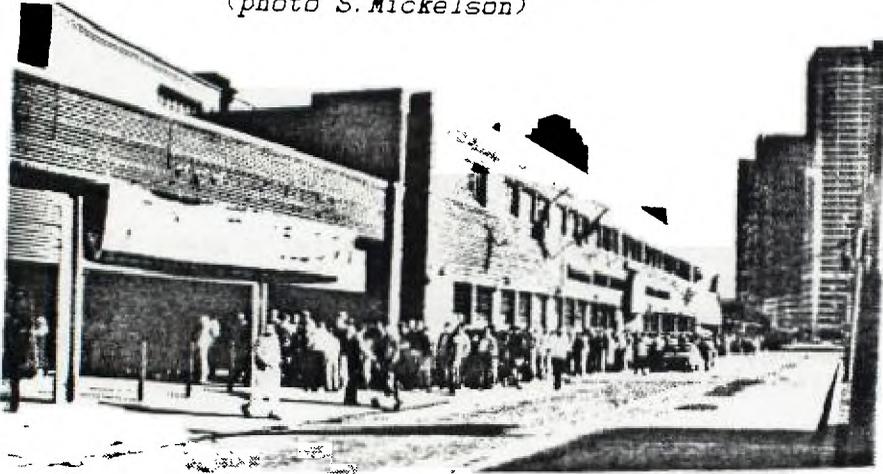
Randy Rossetto,Neil Allen &
Bernie Roache (L to R)
(photo S.Mickelson)
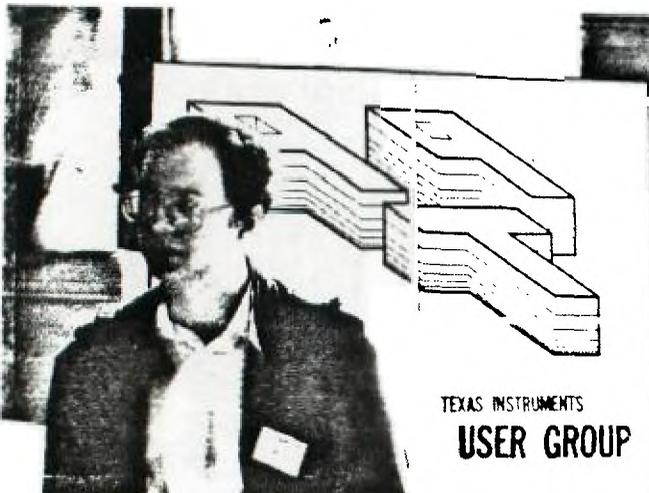
Your newsletter editor at club
booth.
(photo B.Macleod)

TEXAS INSTRUMENTS
USER GROUP

"It's worried about being replaced
by a smaller machine."
DUNAGIN. © 1981 FIELD NEWSPAPER SYNDICATE

Steve Mickelson, Gail & Neil
Allen(L to R) meeting the crowd
(photo B. Macleod)

Only TI for sale at the auction
was this console
(photo S. Mickelson)

DISK HEADS - TO CLEAN OR NOT TO CLEAN? THAT IS THE QUESTION!
- by Art Byers, CIS #73157,3017

When asked by club members, my instinctive answer has been an immediate
"NO"!!! - afterwords qualified by the old sage advice: "If it ain't broke
don't fix it!".

The quick reply is backed up by two things: a great deal of personal running
time on two different brands of disk drives, and the advice of one of the
most respected authorities on the 99/4A, Craig Miller of Miller's Graphics.

Personal: In two years of heavy use, I have yet to clean my PERCOM drive.
It performs flawlessly. When I first got it, it was used 2 to 4 hours a
day, five or six days a week, for a year. It was carried to club meetings
(and still is on occasion), used for copying the club library, and so forth.
As long as it performs, I will not even THINK about cleaning it.

The TI drive in my new PE box has not had that kind of use as yet. I
suspect that I probably use my computer more hours a week than any other
club member. After many months of heavy use - the club newsletter is turned
out on it etc. - I have not given a single moments consideration to head
cleaning because IT IS WORKING WELL.

...con't

7

Therefore I reprint, without comment, Craig Miller's advice from the May 1984 issue of the "Smart Programmer":

The reason I'm against these head cleaners is that they are ABRASIVE and if you use them too much you will wear out the read/write head in your drive. I know the head cleaning kit manufacturers say to clean your drive at least once a week and more often if they are used heavily, but nowhere on my kit does it guarantee NOT to hurt my drives. As a matter of fact most of them have a disclaimer and they will only replace the cleaning kit if something goes wrong. We use our computers between 6 and 15 hours a day, 6 to 7 days a week and we don't clean heads any more than ONCE or TWICE a year."

To which I say: Thank you Craig!

"My opinion on cleaning your disk drives with a head cleaning diskette is only to use it as a last resort!. If you have made sure that its not the floppy, a bad connection or an improperly closed file, then run the destructive disk test. If you have a lot of errors on a lot of different floppies than as a last resort use the head cleaner BUT follow the directions to the letter!! If they say 9 or 10 drops don't use 20 or 30 unless you want it all over the inside of your drive. If they say run the disk for 30 seconds, then don't run it any longer!

Based on that, the average club member should not clean his drive more often than once every four or five years!!

To hammer home the "overkill" of my point, here is the Warrantee copied from a cleaning kit for sale in a local store. It is typical of them all. As all such disclaimers are very similar, I have deleted the manufacturer's name. I urge you to read and THINK about what it says!

"IMPORTANT NOTICE TO PURCHASER

The following is made in lieu of all warranties, implied or expressed:

Manufacturer's and Seller's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. The foregoing may not be altered unless in writing signed by an officer of xxxxxxx Corporation."

If reading that on the product does not make you think twice before using a disk head cleaner, you need your own head cleaned!!!!

"Well O.K." you may say after reading this, "but I have reached the LAST RESORT and am DESPERATE enough to try a head cleaner. How do I get the disk drive to run for the 30 seconds that most cleaning kits require.?" - and you'd have a good point because the moment the head finds out there is no magnetic media in the disk jacket, but rather some wet fuzzy stuff, it will send out an error message and stop.

Here is a program to take advantage of that error message to keep the disk running until you stop it:

```
100 ! This extended basic program has appeared in many newsletters and
magazines. Original source is not known-AJB
110 CALL CLEAR
120 PRINT "**WORKING!**": : : : :
130 PRINT "HOLD FCTN/4 TO STOP": :
140 ON ERROR 160
150 RUN "DSK1.ZZZ"
160 GOTO 140
```

The second installment of Gil Tennants load-interrupt did not arrive in time. I substitute this from my archives and trust that you have not already cut up your console. The only thing wrong about this article was the author likes to spell interrupt with one "r" and not hyphenate "load-interrupt"! After about twenty corrections, I can attest to the effectiveness of the FS command of TI Writer. The usual disclaimer about doing this project at your own risk still applies! -Editor.

LOAD-INTERRUPT, HOLD and RESET SWITCHES FOR THE TI-99/4A COMPUTER
-by Brian Kirby, CIS #70346,1703

First, lets describe what each of these switches will do for you and the /4a computer.

LOAD-INTERRUPT: *The load-interrupt, when activated will cause the computer to suspend it's current operations. Then it will look at a specific memory locations that will tell the computer where to go for the next set of directions. This switch is usefull for several utility type programs. You can have a debugger or disassembler loaded in the memory along with the program you plan to check. When your running program cuts up, you can hit the load- interrupt and be put into your debugger program. Then you can go see what happened to your program in the computers memory. Another use is screen dump routines. You can have a utility loaded up in the computer and your program. When you want a copy of the screen you hit the load-interrupt switch and then the screen dump routine takes over and you end up with a hard copy of what was on the screen. You can come up with all kinds of utilities for the load- interrupt switch.*

In specific a load-interrupt causes the 9900 cpu to initiate a interrupt sequence immediately following the instruction being executed. The memory location at >FFFC is used to obtain the vector for the Workspace Pointer and the Program Counter. The old Program Counter (PC), Workspace Pointer (WP) and the Status Register (ST) are loaded into the new workspace and the interrupt mask is set to >0000. Then the program execution resumes using the new PC and WP.

Here is a check, just for grins, that will let you know that the load-interrupt works. If you have a memory editor type program (SBUG,MEMORY+AID, GRAM KRACKER,etc) go into memory location >FFFC and change the next four bytes to >83 E0 00 24. The first two bytes are the Workspace Pointer (>FFFC) and the last two bytes are the Program Counter (>FFFE). If you do a load-interrupt using these changes the computer will do a power up reset routine. Another is to set the WP and PC to >83C0 and >0900. This is a level one interrupt. When you do it, the system will lock up, but you will note all your P-Box cards lights will be on except the memory.

HOLD: *The hold does what it implies. It puts the microprocessor on hold. It's good for stopping the computer dead in its tracks. Works great for games that do not have a pause function. There is times when you do not want to use it. The states you do not want to be in are Input/Output functions. Mainly, like during a disk read or write or initilization routine. I think you can understand why, but if you don't know its possible to crash your disk or cause some timing problems during a file transfer. Let's not worry about that. The real uses for the hold, is so that other devices may access the computer busses without the 9900 CPU on line.*

Specifically, when the hold is active, it is signaling the CPU that an external device, such as another CPU or a DMA device would like to use the address and data busses to transfer data to and from memory. The 9900 goes

9

into the hold state when it has completed its present memory cycle. The 9900 then places its address and data buss tranceivers into an high impedance state, along with the control lines WE, MEMEM, and DBIN. Then the 9900 will activate another signal called HOLDA. This is a hold acknowledgement. When the hold is removed the processor will return to normal.

After installing the hold switch, it is very easy to test. Just turn it on while listing out a program in basic or XB. Try it during a game.

RESET: Again it resets the computer. It causes the computer to do the power up routine. This is great when the computer locks up. You hit the reset switch and your back to the title screen. This saves wear and tear on your power switch and extends the life of the computers power supply. There have been many articles on the reset switch and not all reset switches work properly. Let me explain why. First the basic form of the reset comes from the cartridge that you plug in the computer. There is a line that runs from the GROM port or cartridge port back to the clock chip that supplys timing for the whole computer. When the GROM port reset line gows low it causes the clock chip to reset and it in turn passes a reset on to the CPU and the 9918 VDP and the 9901 CRU chips. If you have a Widget this is what they use to reset the computer when you put a new cartridge in. But I'm sure you have notice that when you have locked up a few times and the reset on the Widget didnt do the job, You had to shut the computer off and on to bring it back up. This was due to a lockup in the clock chip and it could not pass the reset along. The modification listed will reset the computer, no if, ands or buts. Thats because it bypasses the clock chip and runs directly to the CPU. When the CPU sees the reset it will in turn, reset all other devices that are resetable.

Specifically, the reset causes the CPU to be reset and inhibits WE and CRUCLK. When the reset is removed the 9900 initiates a level 0 interrupt sequence the acquires WP and PC from locations >0000 and >0002. It also sets all status registers bits to zero and starts execution. Reset also terminates an idle state.

To check it out is easy. When running a program push the reset button. You will be returned to the title screen. If you computer locks up while running a program and does not respond to anything, press the reset button and you will be returned back to the title screen.

Now we will discuss how to install these switches.

First, This modification will require you to open up your computer and solder a few connections directly to the 9900 CPU chip. If you can't solder or open up the case, then this article is not for you. You also may end up drilling holes in the case to mount the switches, but you don't have too. So think about it, your computer will never be a virgin again. Also I cannot be responsible for any problems you may have by trying to implement these modifications. I have supplied you information in good faith but again, its up to you.
Now the required parts:

One push button switch, normally open type, use a micro type if you plan to mount it in the console.

Two lever type switches, normally open, again micro types if for the console.

10

Three 2.2 uF/16V tatalum capacitors.

About 4 feet of small gauge wire for hook-up. Wirewrap wire is great if you mount the switches inside the console. If you want to not drill holes in the console, buy some ribbon cable and a mini box.

Open up the console by remove the screws on the bottom of the console. Note how the door on the I/O port to the P-Box is installed. Then note how the power switch is assembled on the power supply. Remove the screws on the power supply board and set the power supply aside. Remove the plug from the power supply to the computer board. Note how the plug connects. Notice the keyboard and how it connects to the computer. Remove the screws that hold the keyboard and remove the keyboard. The computer is then removed by taken out the remaining screws that secure it. Note its position. Then remove the screws that hold on a sheild to the I/O port. Note how that connects. Then remove the remaining screws that hold the sheilds on the motherboard. Locate the 9900 chip inside. Its the biggest chip and it has 64 pins. On the bottom of the board, where no ICs are mounted, locate the CPU chip. We are interested in pins 4 (LOAD), 6 (RESET) and 64 (HOLD). Solder three wires to these pins and mark the wires as to what they are. Be very careful not to splash solder or to short out connections while soldering. Bring these wires out thru a hole in the shield. If you are going to install switches in the console, come out thru a lower hole near the power supply. Reassemble the motherboard with its sheilds and note all the above that was discussed while taking it apart. If you are going to mount the switches in the console a good place is beside the power supply so the switches stick out beside the I/O port. Be sure to mount them so that they do not short to the power supply and make sure you will have enough room to mount your speech synthesizer. If you are using stand alone devices, you may want to mount the switches in the rear of the console. Now that you have found a location that works, mount the switches and solder one each of the three wires to each of the switches. Make sure that the reset line goes to the pushbutton. Solder one of the capitors to each switch accross the cnnections. Make sure the positive side of the capacitor is connected to the line that goes to the computer. On all of the switches run a jumper to the other side that has no connections. Jumper all of them togather and run one wire back to a ground on the computer. The sheild is a good ground point. Put the computer back togather following the reverse of taken it apart.

If you do not want to drill holes you have several options. First you can use ribbon cable and run it out of the rear of the computer to your minibox where you can mount your switches. This way if you decide to remove the switches you can just unsolder your connections and everthing will be back to normal. You can also mount the load-interrupt switch external to the console, by coming off of the I/O port. You can mount the switch in the speech synthesizer be connecting one side of the switch to edge connector finger number 13 (LOAD) and the other side of the switch to pin 21 or 23 or 25 or 27 (all grounds). But you cannot access the hold or reset thru the I/O port. They do not make it outside of the computer. If you want just a load interr upt, Naverone sells a board that goes between the "firehose" and the console and supplys a load- interrupt. Its about $15.

-> Questions requiring an awnser cost $1.00
-> Questions requiring thought cost $2.00
-> Dumb looks are still free <grin> !
-> Compuserve users can contact the author through Compuserve, sending a message via EasyPlex. Contact Brian Kirby 70346,1703.

11

```
    pin 6, 9900 CPU, RESET ------------------------------------\
                                                                !
                                                                !
    pin 4, 9900 CPU, LOAD ----------------------\               !
                                                !               !
                                                !               !
    pin 64, 9900 CPU  HOLD ----------\          !               !
                                     !          !               !
                                     !          !               !
                                     o !        o !       o !   !-!
                                     !          !          !   !- !
                                     o_/        o_/       o  !
                                     !          !          !
                                     !          !          !
                                     !          !          !
                                     o----------o----------o
                                     !
                                     !
                                     !
                                  ___
                                   -      ✗ this is the shield or ground
                                              connection
```

COCHRAN IN OMNI MAGAZINE
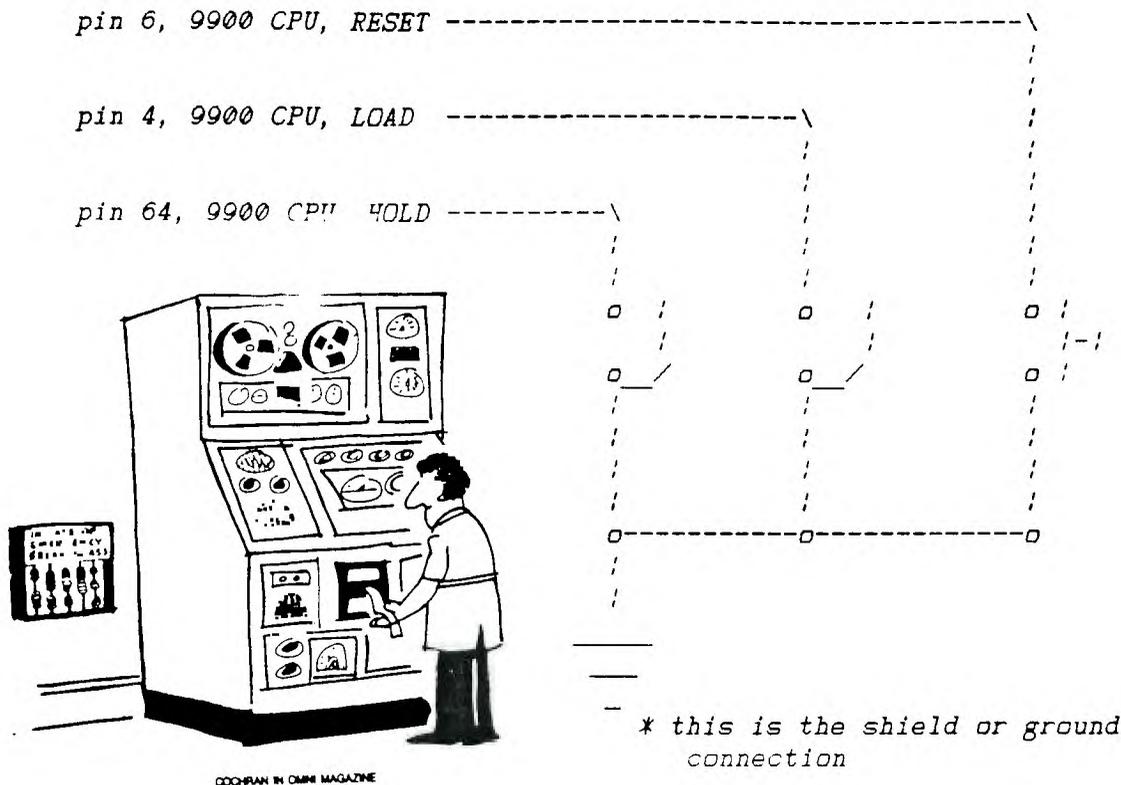
The following response was to a note left on the FAMFORUM of Compuserve re: their dropping TI-99/4A. I notice one program in their November issue, hopefully an example of the power of the electronic press:

#: 16570 S8/Machine Specific 02-Oct-86 19:06:26 Sb: SUPPORT TI-99/4A Fm: CYNTHIA BECKER 76625,1133 To: STEVE MICKELSON 76545,1255 (X)

Applause! I too, am a member of the Boston Computer Society TI user group, and we boast over 300 members in this SIG. Yes, the TI is alive and well and has more support now, than when TI was in the home computer market! What with the new Geneve on the horizon, and Mechatronics of Germany working on new products, thanks to Heiner Martin, such things as the Gram Card (128K and 512K) are here; also the Eprommer, and coming soon the 80 column card. Rumor has it that they are also working on a new computer. Additionally, there is a 60% chance that they will be opening a plant in this country. Sounds very interesting! Franz Wagenbach, of T.A.P.E. Ltd. in California who is the authorized rep. for Mechatronics in this country (I sell the products for him here), is going to be a featured speaker at the upcoming Chicago Fair. He just returned from Seattle, where, among honored guests was Cheryl Regena Whitelaw, (the famous C.Regena of Compute). So, by all means, lets have more support for the TI. Let's hear it out there! Cynthia

(Editors note: Could the proposed T.A.P.E./Mechatronics Plant, mentioned above, possibly be related to the Craig Miller venture mentioned in last month's issue of Newsletter 9T9?)

12

– Kid Writer –

```
1 !KidWriter is a word          processor of sorts, aimed   at providing your kid
s       with a quick and easy to   use program for writing
2 !notes, messages, or other    text. It requires a disk    drive and Ex.Basic al
ong     with a printer.
3 !The printed output is in      double-wide characters,      28 columns to the lin
e,       centered on an 80 column    page.
4 !The program provides the     user with Edit,Load,Save     and Print features. U
p to    19 lines of text are          allowed on a single page.
5 !After that, the page must    be saved. Up to 999 pages    can be written and sa
ved,     each as its own file.
6 !I hope that you like it.      My kids do.
100 !KidWriter 05/03/86          Bill Gaskill                 Chicago TI-UG #468
        Front Range 99ers           Villa-TI #94                 CIS(72267,253)
110 CALL CLEAR :: D,E=1 :: ON WARNING NEXT :: CALL CHAR(126,"00FF"):: GOSUB 440
120 OPTION BASE 1
130 DIM A$(22)
140 CALL SCREEN(14):: FOR C=1 TO 14 :: CALL COLOR(C,2,8):: NEXT C :: F=0 :: P=1
150 DISPLAY AT(3,1):RPT$("~",28):: DISPLAY AT(23,1):RPT$("~",28):"Press ENTER to
  begin typing"
160 GOSUB 420
170 IF K=12 THEN 270 ELSE IF K=6 THEN 220 ELSE IF K=15 THEN 320 ELSE IF K=14 THE
N 380 ELSE 180
180 FOR I=4 TO 22 :: ACCEPT AT(I,1)BEEP SIZE(-28):A$(I):: K=0
190 GOSUB 420
200 IF F=1 THEN 240
210 IF K=12 THEN 270 ELSE IF K=6 THEN 220 ELSE IF K=15 THEN 320 ELSE IF K=14 THE
N 380 ELSE 230
220 I=4 :: GOTO 180
230 K=0 :: NEXT I :: F=1 :: GOTO 190
240 DISPLAY AT(1,1):"Save The Page Now or Print  It And Then Save The Page." ::
DISPLAY AT(23,1):"Redo To Escape":"Proc'd to Print,Back To Save"
250 CALL KEY(0,S,K):: IF K=0 THEN 250 :: FL=1
260 IF S=6 THEN 140 ELSE IF S=12 THEN 270 ELSE IF S=15 THEN 320 ELSE 250
270 DISPLAY AT(24,1):"Last Line To Print:" :: ACCEPT AT(24,20)SIZE(2):L :: IF L<
4 OR L>22 THEN 270
280 OPEN #1:"PIO",OUTPUT
290 FOR I=4 TO L
300 PRINT #1:CHR$(14);TAB(7);A$(I)
310 NEXT I :: CLOSE #1 :: GOTO 140
320 IF A$(4)="" THEN 130 :: DISPLAY AT(24,1):"Page Number:";P;"   (0=Exit)" :: A
CCEPT AT(24,14)VALIDATE(DIGIT)SIZE(-3):P
330 IF P=0 THEN 140
340 OPEN #2:"DSK1.PAGE"&STR$(P),OUTPUT,INTERNAL,VARIABLE
350 FOR I=4 TO 22 :: PRINT #2:A$(I):: NEXT I :: CLOSE #2
360 IF FL=0 THEN 140 ELSE 370
370 FOR I=4 TO 22 :: DISPLAY AT(I,1):" " :: A$(I)="" :: NEXT I :: GOTO 140
380 DISPLAY AT(24,1):"Page Number:";P;"   (0=Exit)" :: ACCEPT AT(24,14)VALIDATE(D
IGIT)SIZE(-3):P
390 IF P=0 THEN 140
400 OPEN #2:"DSK1.PAGE"&STR$(P),INPUT ,INTERNAL,VARIABLE
410 FOR I=4 TO 22 :: INPUT #2:A$(I):: DISPLAY AT(I,1):A$(I):: NEXT I :: CLOSE #2
  :: GOTO 150
420 DISPLAY AT(1,1):"to: EDIT  LOAD  PRINT  SAVE use redo  begin procd  back"
430 CALL KEY(0,K,S):: IF S=0 THEN 430 :: RETURN
440 D$="    4567891111111111222  " :: D=4 :: E=1 :: GOSUB 460
450 D$="          0123456789012" :: E=2
460 FOR D=1 TO LEN(D$):: CALL HCHAR(D,E,ASC(SEG$(D$,D,1))):: NEXT D :: RETURN
```

13

Hi again Steve! Congrats on the newsletters. Now if I only knew what peeks and pokes were! But I'll get there one of these days and astound myself alone.

Right now I have the problem of an RS232 card that is ok for communications but apparently the cause of telling my gem10 to give unbroken lines of &'s of a total character length approx that of the feed. Gem selftests ok and the cable too. Maybe a schematic would help and believe it or not your October letter with your tech manual offer arrived just when I was so thinking. Tell me you are sending two and I'll send you a cheque for say $12 to cover costs.

There seems to be no knowledge here of ramdisks blowing due to overvoltage. Maybe Gil would write it up for the newsletter. The Group here are considering going formal. Maybe you could get me a copy of 9T9's byelaws.

Thanks for helping.
Leo in Miami Beach

Hello Leo. It is good to here from one of our members in Florida, albeit via the Sourcemail. The article Gil wrote was for the Corcomp Triple Tech card. I think a back issue of Randy's Rumour Rag has mention of exploding batteries. I'll get the manuals in the mail A.S.A.P.

As far as the problem with your Gemini 10X, a number of club members use this printer, perhaps we can get some feedback to you. Try swapping cables and/or RS-232 Cards with another user to help isolate which of the two may be at fault.
Regards,
Steve in T.O.

P.S. How about sending some HOT Florida sunshine, as well!

XB To TI-Artist INSTANCE Conversion Programs
-by Terry Atkinson

Forward: These programs were created to ease the pain of converting existing TI Extended BASIC scr eens to a DV80 format which is loadable by TI-Artist 2.

At present, I have written two versions. Version 1 is used for XB. This takes about 25 minutes to convert a whole screen (768 screen positions), 58 sectors depending on how many characters are on the screen.

Version 2 takes only about 7 to convert a screen and requires the Corcomp disk controller; using the tool shed utilities.

There will be no difference in the file size, from either version. Both versions can be easily converted to run in Console Basic (CB), using E/A module).

There are two ways to run this program; either as a sub-program merged within a program or as a program RUN from Extended BASIC at the appropriate breakpoint. Instructions are geared towards that end.

14

Running the program is very simple. First, "RUN" your graphics program.
Remember that this program was designed to work with a graphic screen, of 24
rows and 32 columns, and not a text screen.

Next, you must "BREAK" the program (FCTN 4) and look at the breakpoint,
making sure it does not contain a FOR-NEXT statement. Then, you replace the
line of the breakpoint with some thing like RUN "DSK1.ARTXB" or whatever you
name the program. In the case of a FOR-NEXT staements, it may be safer to
select another line, located either before or after the breakpoint line.

The resultant file obtained after running this program can be loaded
directly into TI-ARTIST, as an INSTANCE. After the INSTANCE is altered,
SAVE it as a TI Artist program. The resultant instace is named SCREEN_I.
You may change this to whatever name you like.

For any advice re: any problems. contact the author: Terry Atkinson, 28
Savona Ct. Dartmouth, NS, CANADA; CIS # 75376,1277, or on Dartmouth TIBBS:
1-902-434-3121.
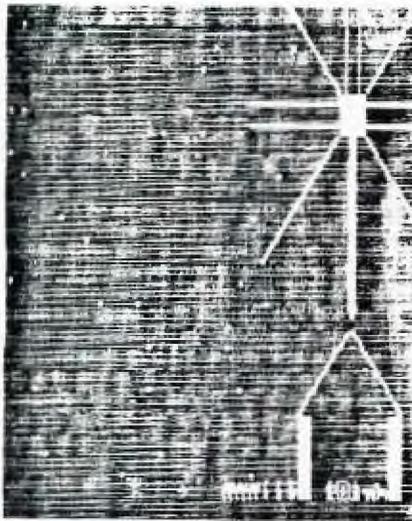
← 3 conversions
of XB Screens
↓ to Instances. →
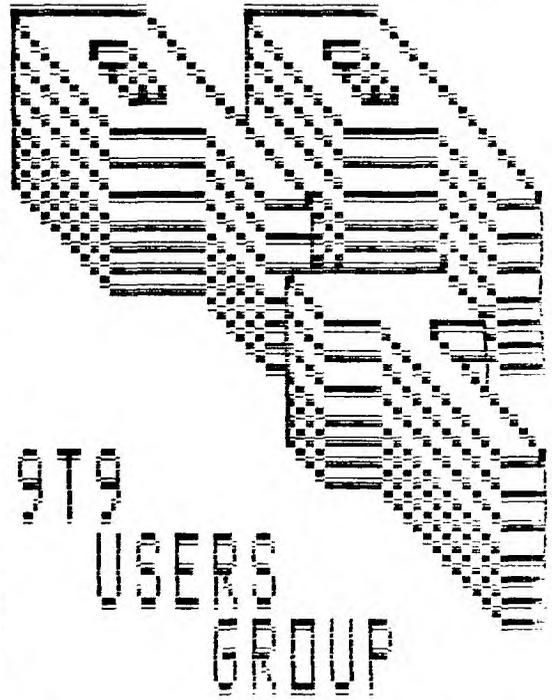
ARTXB

VERSION #1

0 ! by Terry Atkinson   28 Savona Court   Dartmouth, NS B2V
4R1 (Voice)1-902-434-1346   (TIBbs)1-902-434-3121
1 ! This program may be   freely distributed. Please do not remove the author
s   name. APRIL 1986
2 DATA 1,24,1,32
3 DATA DSK2.SCREEN
4 READ SROW,EROW,SCOL,ECOL,OUT$ :: IF POS(OUT$,"_I",1)=0 THEN OUT$=OUT$&"_I"
5 IF SEG$(OUT$,1,3)="DSK" AND LEN(OUT$)<16 THEN 7
6 CALL CLEAR :: PRINT "Please check filename!" :: END
7 FOR E=0 TO 14 :: CALL COLOR(E,2,8):: NEXT E :: CALL DELSPRITE(ALL):: CALL MAGN
IFY(1):: CALL SCREEN(8):: CALL SPRITE(#1,32,16,1,1):: B$="123456789ABCDEF" :: OP
EN #1:OUT$
8 PRINT #1:STR$(ECOL-SCOL+1)&","&STR$(EROW-SROW+1):: FOR F=SROW TO EROW :: FOR G
=SCOL TO ECOL :: CALL GCHAR(F,G,H):: IF H>32 THEN I=H ELSE I=95
9 CALL LOCATE(#1,F*8-7,G*8-7):: CALL PATTERN(#1,I):: CALL CHARPAT(H+ABS(H=31),C$
):: GOSUB 10 :: NEXT G :: NEXT F :: CLOSE #1 :: CALL SOUND(4000,400,1):: CALL CL
EAR :: END
10 FOR E=1 TO 15 STEP 2 :: D$=SEG$(C$,E,2):: E$=E$&STR$(POS(B$,SEG$(D$,1,1),1)*1
6+POS(B$,SEG$(D$,2,1),1))&"," :: NEXT E :: E$=SEG$(E$,1,LEN(E$)-1):: PRINT #1:E$
:: E$="" :: RETURN

15

ARTCCXB VERSION #2

```
0 ! by Terry Atkinson        28 Savona Court        Dartmouth, NS B2W
4R1 (Voice)1-902-434-1346     (TIBBS)1-902-434-3121
1 ! This program may be      freely distributed. Please  do not remove the author
s   name. APRIL 1986.
2 CALL INIT :: DELETE "LD-CMDS" :: CALL DELSPRITE(ALL):: CALL MAGNIFY(1):: A$,B$
,C$,D$,E$,F$,G$,H$,I$,J$,K$=" " :: A,B,C,D,E,F,G,H,I,J,K=255 :: Y$=RPT$("80",7):
: Z$=RPT$("01",7)
3 FOR I=0 TO 14 :: CALL COLOR(I,2,8):: NEXT I :: CALL LINK("MOVEM")(2,0,40960,76
8):: CALL CLEAR :: CALL LINK("MOVEM")(2,880,41728,1920):: CALL CHARSET
4 CALL A(L$,L,M,N,O,Y$,Z$):: CALL DELSPRITE(ALL):: CALL CHARSET :: CALL LINK("MO
VEM")(3,41728,880,1920):: CALL LINK("MOVEM")(3,40960,0,768)
5 OPEN #1:L$ :: PRINT #1:STR$(O-N+1)&","&STR$(M-L+1):: CALL SPRITE(#1,32,16,1,1)
:: FOR P=L TO M :: FOR Q=N TO O :: R=(P-1)*32+Q-1 :: CALL LINK("VPEEK")(R,160,A$
)
6 IF ASC(A$)>32 THEN S=ASC(A$)ELSE S=95
7 CALL LOCATE(#1,P*8-7,Q*8-7):: CALL PATTERN(#1,S):: T=768+8*ASC(A$):: CALL LINK
("VPEEK")(T,96,B,C,D,E,F,G,H,I)
8 PRINT #1:STR$(B)&","&STR$(C)&","&STR$(D)&","&STR$(E)&","&STR$(F)&","&STR$(G)&"
,"&STR$(H)&","&STR$(I):: NEXT Q :: NEXT P :: CLOSE #1 :: CALL SOUND(4000,400,0):
: CALL CLEAR :: END
9 SUB A(A$,A,B,C,D,Y$,Z$):: CALL CHAR(34,"FF"&Y$&"FF"&Z$&Y$&"FF"&Z$&"FF"):: CALL
 SCREEN(8)
10 CALL SPRITE(#1,34,16,1,1,#2,35,16,1,1,#3,36,16,1,1,#4,37,16,1,1)
11 DISPLAY AT(1,1)ERASE ALL:"THE SCREEN HAS BEEN SAVED   AND WILL BE RESTORED LA
TER." :: DISPLAY AT(4,1):"SAVE FILENAME: " :: ACCEPT AT(4,16)BEEP SIZE(-8)VALIDA
TE(UALPHA,DIGIT):A$
12 DISPLAY AT(5,1):"WHAT DRIVE NR? 1" :: ACCEPT AT(5,16)BEEP SIZE(-1)VALIDATE("1
234"):B$
13 A$="DSK"&B$&"."&A$&"_I" :: DISPLAY AT(7,1):"FILENAME IS: ";A$: :"DO YOU WISH
TO DUMP THE      COMPLETE SCREEN? N" :: ACCEPT AT(10,18)BEEP SIZE(-1)VALIDATE("YN
"):B$
14 IF B$="Y" THEN A,C=1 :: B=24 :: D=32 :: SUBEXIT
15 DISPLAY AT(12,1):"DO YOU KNOW THE ROW/COLUMN  COORDINATES THAT YOU WISH TODUM
P? Y" :: ACCEPT AT(14,7)BEEP SIZE(-1)VALIDATE("YN"):B$ :: IF B$="N" THEN 19
16 DISPLAY AT(16,1):"START ROW:     START COL:       END ROW:       END COL:"
17 ACCEPT AT(16,11)SIZE(-2):A :: ACCEPT AT(16,25)SIZE(-2):C :: ACCEPT AT(17,11)S
IZE(-2):B :: ACCEPT AT(17,25)SIZE(-2):D :: IF D<2 OR D>32 OR D<C OR C<1 OR C>31
OR A<1 OR A>23 OR A>B OR B<2 OR B>24 THEN 17
18 GOSUB 21 :: DISPLAY AT(24,1):"DOES THIS LOOK CORRECT? Y" :: ACCEPT AT(24,25)B
EEP VALIDATE("YN")SIZE(-1):B$ :: IF B$="N" THEN 17 ELSE SUBEXIT
19 DISPLAY AT(15,1):"RECOMMEND YOU LOAD AND RUN  THE GRAPHICS PROGRAM YOU    WIS
H TO DUMP AND COMPUTE THEROW/COLUMN COORDINATES"
20 DISPLAY AT(19,1):"AND RE-RUN THIS PROGRAM.":"THANK YOU." :: CALL SOUND(1500,1
10,0,-4,0):: STOP
21 CALL LOCATE(#1,A*8-7,C*8-7,#2,A*8-7,D*8-7,#3,B*8-7,C*8-7,#4,B*8-7,D*8-7):: RE
TURN
22 SUBEND
```


FRANK & ERNEST

I'VE BEEN SITTING AT MY PERSONAL COMPUTER SO LONG I'VE DEVELOPED A FLOPPY DISK.

Thaves 3-4

What Could Have Been:

The article below is timely as we wait for Myarc to bring out their new computer. Compare the features of the 99/8 with what Myarc is offering on the 4A's new big brother/sister. What is the current market value of a 99/8? We recently received a flyer that advertised the computer for the mere sum of $950.00. Don Veith, Editor.

THE MYSTERY UNVEILED: A LOOK AT THE TI-99/8 COMPUTER
by John Phillips

It has been just about two years since TI made the announcement that they were pulling out of the home computer business. I remember the day well. All the hopes and promises made to me by TI were, essentially, killed by this decision. The /4A was to be no more. All the current development projects were stopped. One of these projects was so near to completion that the production lines were already established. This product, of course, was the awesome TI-99/8 computer. The big brother to the /4A. This computer would have revolutionized the home computer industry. It was a year ahead of the Apple IIc and two years ahead of the Commodore 128. The irony of this situation is that the 99/8 was more powerful than either of these machines! TI was "years" ahead of their time!

I would like to present to you a description of what the 99/8 was all about. Since I possess one of these fine machines, I can give you a first-hand look at the capabilities of the machine and the potential. So, sit back and enjoy reading about the TI-99/8 (code-name "Armadillo") home computer. The TI-99/8 computer closely resembles the Commodore 128 home computer in looks. The dimensions are 15" wide by 13" long by 2" high. Compare this to your /4A which is 15" wide by 10" long by 2" deep. It was to be made of the same, beige plastic as the late-generation /4A's.

The physical differences were quite noticeable , however. The keyboard on the /8 was 11" wide and contained 54 keys. The caps lock was not a click-down type of key, but an electronic circuit key. It is located in the upper-left corner of the keyboard. The FCTN key was moved below the CAPS key and the CTRL key was just below that. So, all the "special" keys were moved to the left-column row of the keyboard. The SHIFT, ENTER, and FCTN keys are all oversized for easy access. The power switch is located on the

flat portion of the unit to the left side on the top surface. It is a rocker-type switch and is flush with the surface. The cartridge slot is located across from the power switch on the right side of the top surface. In other words, cartridges are pushed into the top of the unit and sit facing the ceiling (90 degrees different from the /4A).

The back panel is the most interesting of the physical differences. Starting from left to right are:

1.   The CC port for hexbus peripherals.
2.   The cassette ports. No longer is the D plug for cassette interfacing. These use the standard "subminiature" cables available at most electronic stores. There are three ports for MIC, EAR, and MOTOR.
3.   The joystick port. Incidentally, the CAPS no longer interferes with joystick UP operations. This is still the D-shape plug.
4.   The monitor port. This is similar to the monitor port on the /4A.
5.   TV port. This is a port designed to be used with a video box. You can use any TV-GAME adapter from this port. In other words, you do not need TI's RF modulator to hook the /8 to a TV.
6.   Channel select - for use with the RF modulator.   7.   Power supply port. The /8 used the same power supply as the /4A.

On the right side of the console, there is a port similar to the expansion port on your /4A's. However, the /8 is not compatible with the expansion box. It never was and never planned to be. This later port was designed strictly for the hexbus interface special set of peripherals which ran on 16-bit busses. More on this later.

The inside of the /8 is wonderful. First of all, the /8 contains 225,280 bytes of ROM. In essence, it is packed! It contains 16K of VDP RAM (just like the /4A) and 64K of CPU RAM. If you need more, the /8 can access up to 15 megabytes of RAM! The CPU was not the TMS9900, but rather the TMS9995. The 9995 was faster and contained a larger instruction set. The /8, within all that ROM, contains Extended Basic II as it's main language. This language is compatible with TI Extended Basic, but contains a great number of additional commands to support the new architecture. It also has, built-in, the P-SYSTEM! This is for development of P-CODE from PASCAL or PILOT. In addition, Solid State Speech is also built-in the /8. As you can see, a minimum of three peripherals for the /4A are already in the /8: RAM expansion, Speech, and P-SYSTEM! Not a bad unit, wouldn't you say?

As a final plus, the /8 had a speed select mode which allowed you to choose which speed level. The /8 allowed you to choose slow speed, /4A speed (for games) and /8 speed. You know how TI-WRITER will drop characters on word-wrap? Running TI-WRITER on the /8 eliminates this problem because of the speed mode. When it is set on /8 mode, things run much more quickly! You should see PARSEC on fast mode! The speed option was a real plus for this machine. So is the Extended Basic II! The BASIC interpreter included in the /8 is an integral part of the system software. The interpreter is intended to be ANSI and TI standard compatible and is intended to provide access to some of the unique features of the /8's hardware. The interpreter provides several enhancements above the ANSI nucleus to access color graphic capability and to access the sound generators contained in the machine. The interpreter resides in approximately 32K of ROM and 18K of GROM. As much of the speed critical code as possible as put into high-speed ROM to increase the speed of BASIC. The ROM code portion of the interpreter is contained in 19 separate assembly modules. The GROM portion of the interpreter is contained in five separate GPL modules. These modules are the input and
...cont't

18

output routines, and all of the GPL subprograms such as SOUND, COLOR, and KEY.

As I mentioned before, the /8 has a 9995 processor with 64K of physical memory in the console and is expandable to 16 MEG of physical memory. There are two possible modes: /8 mode and /4A mode. Pascal uses the /8 mode and BASIC uses the /4A mode.

In /4A mode, there are 16 address lines from the 9995 and 24 address lines to physical memory. Because of this, there is a need for intermediary addressing logic. The Address Decoder and the Memory Mapper Chip are the intermediary components for the /8. The Address Decoder takes logical addresses and routes them to the appropriate place. The memory mapper translates logical addresses from the Address Decoder into physical addresses. This is the scheme used to differentiate between /4A mode and /8 mode. With the inclusion of Extended Basic II, there were additions to the graphics subsystem. Armadillo BASIC has added several graphics modes. These new modes affect the results of certain subprograms, such as: CALL CHAR, CALL COLOR, CALL HCHAR, CALL SCREEN, and CALL VCHAR. Four new graphics subprograms have also been added. These are: CALL DCOLOR, CALL DRAW, CALL DRAWTO, and CALL FILL.

Armadillo BASIC has six graphics modes. The format for selecting the desired mode is:
-> CALL GRAPHICS(mode)   The following modes are available:
     1. Graphics I - a 32 column by 24 row grid of pattern positions.
     2. Text - a 40 column by 24 row alphanumeric grid.   3.
Split   I - split screen where the top 1/3 of the screen displays text, and the bottom 2/3 of the screen displays HIRES graphics. 4. Split II - split screen where the top 2/3 of the screen displays HIRES graphics, and the bottom 1/3 of the screen displays text. 5. Graphics II - HIRES resolution color graphics (256 x 192). 6. Graphics III - LORES color graphics (64 x 48 blocks).

You must remember that all of these modes are accessible from BASIC! You don't need assembly language to get into them. Since descriptions of 4 of these modes are listed in the Editor/Assembler manual, I will describe the Split modes.

The Split mode has a split screen in which the screen is divided between text and bitmap mode. The text portion is a column and row grid where each position is one character. The graphics portion is a dot-column and dot-row grid where each position is one pixel. Color can be assigned by character-code to each character in the text portion of the screen, and to each 8 pixels in the graphics portion of the screen. All the graphics subprograms work in this mode, but the results from the ACCEPT, DISPLAY, INPUT, LINPUT, and PRINT statements are placed in the text portion of the screen. Also, results from the HCHAR and VCHAR subprograms are always placed in the text portion of the screen. There is a maximum of 32 sprites available.

There is a new command, CALL MARGINS, which defines the screen margins. In essence, you may create windows of text in which to work! As far as the new graphics commands, let me give you a quick description of what they do.

CALL DCOLOR specifies the color to use in the DRAW, FILL, HCHAR, and VCHAR subprograms. CALL DRAW draws a line connecting the two given points. This allows you to draw, erase, or reverse a line on the HIRES screen.

"He is the only one who understands how it works."
ERIK LIEBERMANN IN STUTTGARTER ZEITUNG
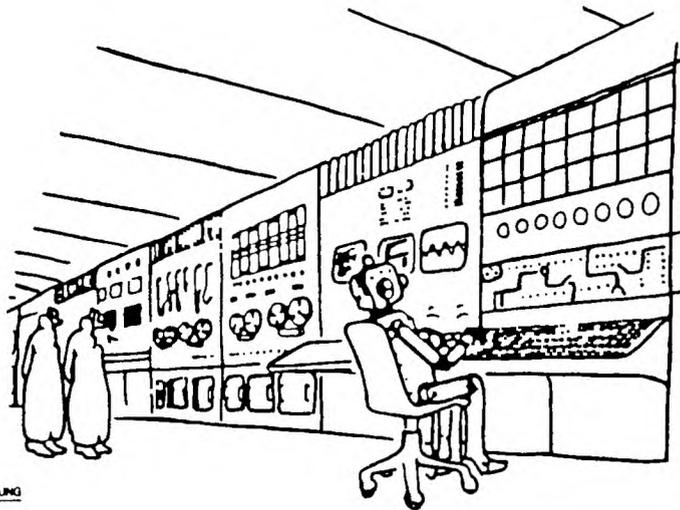
CALL DRAWTO draws a line from the current position to the point specified. You may connect lines very easily with this command. CALL FILL fills all pixels surrounding and including the pixel defined by the dot-row, dot-column.

Other commands are modified. CALL COLOR has added parameters, depending on which graphic mode you select. CALL SCREEN allows the inclusion of a FOREGROUND color if you are in text mode. There are many other enhancements to BASIC which are too numerous to mention here. Just take my word for it: Extended Basic II was every bit as good as MS BASIC for the PC!

A couple of side notes. The P-CODE system disks for the /4A do not work on the /8. A new system utilities disk was created just for the /8. I emphasize A NEW DISK FORMAT because the /8 disk drive is double-sided, double-density. To my knowledge, there are no pieces of software that do not work on the /8. Anything written for the /4A will work on the /8. This included disks, cartridges, and tapes.

The peripherals designed for /8 are the hexbus line of peripherals. These are a set of devices designed for the CC40 and they operate on 16-bit busses. Many of these devices were released for sale by TI including the wafer-tape, RS232, etc. I have the RS232 attached to my /8 for telecommunications.

It is difficult to describe to you, on paper, just how wonderful the /8 is. TI made a grave mistake in not releasing this machine. As I mentioned before, it was years ahead of its time. I hope my article has shed some light on the mysteries of the /8 to you.

As for me, this will be my last article for this fine newsletter. Times have changed and I have moved on to other machines. Although the /4A has given me a nice livelihood, I must look toward the future and not dwell on the past. I will, from time-to-time, drop in with a special article, or a special product review, so don't think that I am forgetting any of you. If you haven't learned to appreciate your machine, you have missed one of the greatest electronic wonders of our time. Until next time.
***.

Having read this thorough description of the orphan that almost never was,(only about 120 or so apparently manufactured), let's see how many of the above features will be found in Myarc's clone:

20

What Is Available:

The following from a review of the First Annual Seattle TI Convention on Compuserve and extracted from the San Antonio Area 99ers U.G. Included is a list of features of the new MYARC 9640 Genev'e computer, including a CPU Board Layout,(downloaded from Compuserve).

Jim Horn announced the upcoming formation of the first Genev'e User's Group. The first board meeting will be held online with the TI Forum within two months. The purpose of the U.G. is to foster support and usage of the new computer, as well as provide a source of answers to the many expected questions to arise. NOTE: Membership to this U.G. is NOT limited to Genev'e owners (As there aren't any yet!).

Lou Phillips covered the progress of the long-awaited Genev'e computer from MYARC. A summary follows:

MYARC 9640 Genev'e Computer
CPU Board Layout

```
+------------------------------------------------------------------+
!            +-----+                  +-----+       +-------+ !
!  +-------+ !     !                  !     !       !       ! !
!  !       ! ! BOOT! +-----+          !VIDEO!       !       ! !
!  !       ! ! ROM ! !CLOCK!          !CHIP !       ! VIDEO ! !
!  !       ! !     ! !     !          !     !       ! PORT  ! !
!  !       ! +-----+ +-----+          +-----+       !       ! !
!  ! 512K  ! +--------------+                       +-------+ !
!  ! DRAM  ! !             !          +-----+                 !
!  !       ! !             !          !     !       +-------+ !
!  !       ! ! 9995 uPROC. !    .     !9938 !       !       ! !
!  !       ! !             !          !     !       !       ! !
!  !       ! !             !          +-----+       ! MOUSE ! !
!  !       ! +--------------++-----+               ! PORT  ! !
!  +-------+                 !9901!+-----+          !       ! !
!                           !    !!     !          !       ! !
!                           +-----+!    !          +-------+ !
!           +-----------+          !    !                    !
!           !           !          !    !          +-------+ !
!           !           !          !    !          !       ! !
!           !  MYARC     !         ! VDP ! +----+   !       ! !
!  +-------+ !  GATE     !         ! RAM ! !    !   ! JOYST ! !
!  !       ! !  ARRAY    !         !     ! !    !   ! PORT  ! !
!  !       ! !           !         !     ! !    !   !       ! !
!  ! POWER ! !           !         !     ! !    !   !       ! !
!  ! SUPPLY! !           !         !     ! !    !   +-------+ !
!  !       ! +-----------+         !     ! !    !   !       ! !
!  !       !                       +-----+ !    !   !       ! !
!  +-------+                               !    !   +-------+ !
!                          +-------+       !    !   !       ! !
!           +--------------+ !     !       !    !   !       ! !
!           !              ! ! POWER !     !    !   ! KEYBD ! !
!           !  BUS         ! ! SUPPLY!     !    !   ! PORT  ! !
!           !  DRIVERS     ! !     !       !    !   !       ! !
!           !              ! +-------+     !    !   !       ! !
!           +--------------+               !    !   +-------+ !
+-----------------------------------------------+ +-----------+
```

21   cont

Some of the commands available:

CHKDSK COMP(ARE) COPY DATE DEL DIR DISKCOMP DISKCOPY ERASE EXE2BIN FORMAT MODE REM(ARK) REN(AME) SYS TIME TYPE

Some of the functions available:

KEY(n)=A$ (MACRO) SPEED LLIST LPRINT LTRACE MOD BLINK MOUSE ON MOUSE OFF MOUSE PRESS(x)

Other features:

* 512K CPU RAM:user allocates between CPU-RAM, RAMDISK, PRINTSPOOLER
* *Built in mouse interface(including Macintosh mouse commands)*
* *Standard Joystick interface*
* *WHILE -> WEND*
* *TMS9995 CPU is 3 to 4 times faster than TMS9900*
* *Same instruction set as TMS9900 plus 4 new ones*
* *"Pipe Line Processor"(capable of multitasking)*
* *Same graphic instruction set for TMS9938*
* *46 VDP Registers (8 soft, 38 hard)*
* *Commands include DRAW,FILL,SEARCH,MOVE,CIRCLE, RECTANGLE*
* *Supports 256 colors/screen in 256x424 mode;16 in 512x424 mode*
* *7 graphic modes of which some allow 256 colors*
* *True "Bit Mapped Graphics"*
* *Composite or Analog RGB Video output*
* *128K VDP RAM (8n times /4A)*
* *Real-Time clock*
* *Same sound chip as /4A (3tones,1 noise)*
* *Fully compatible with all Disk Controller cards*
* *Will support 1 MEG DRAM with zero Wait States*
* *Compatible with Myarc,Corcomp and TI floppy disk controllers*
* *Compatible with RS-232 cards from above vendors*

(Note: PRINTSPOOL function incompatibilities may exist with Corcomp RS-232,Ed.)

* *Compatible with Horizon RAMDISK*
* *Myarc DOS(similar to MSDOS 2.1)*
* *Myarc Advanced Basic(compatible with TI X/B)*
* *TI Writer and Multiplan in 80 Columns*
* *Utility to save cartridges to disk*
* *UCSD Pascal from Pecan Systems(free with system)*
* *Optional:FORTRAN 77,COBOL,PASCAL, (PECAN)BASIC*
* *C compiler,Super-Super Forth,Super Word,Pilot,plus much more*

Minimum Hardware Requirements:
P-Box Type Housing Environment, and associated cards
Genev'e Keyboard/CPU Card

Optional hardware: RGB Monitor 512K Memory Expansion

```
*********************************
* Due to ship to retailers in *
*      November/December       *
*********************************
```

============> *APPROXIMATE RETAIL PRICE: $495 (U.S. Funds)* <==========

22