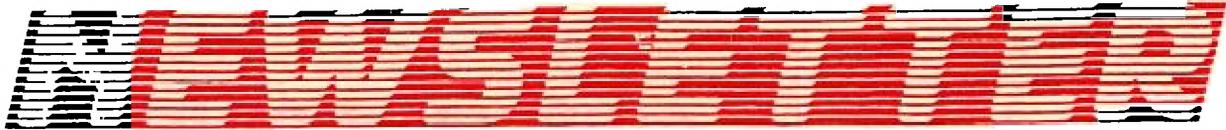


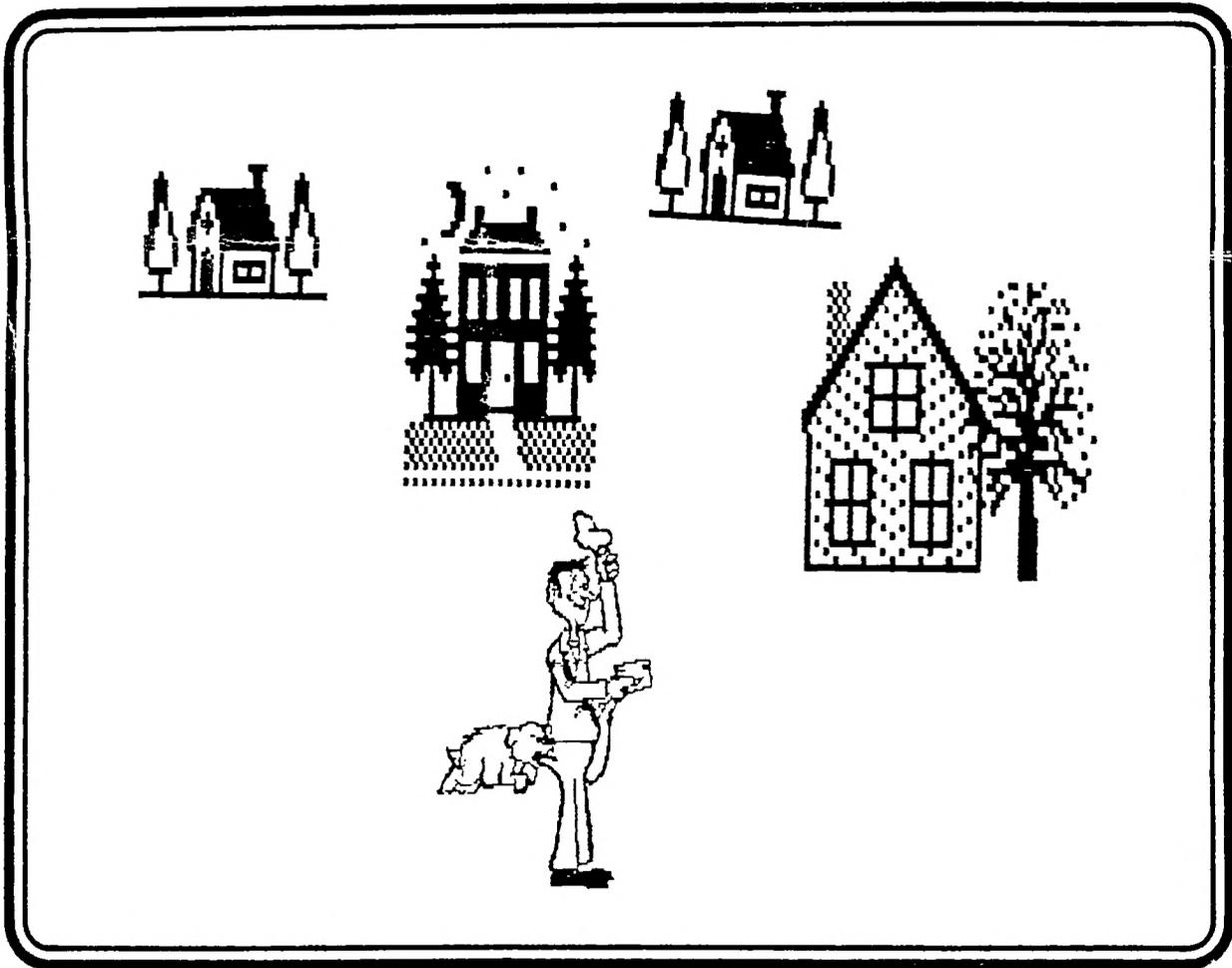
Ottawa (063) 8609
Sept 86



The Ottawa T.I.99/4A Users' Group



VOLUME 5 NUMBER 07 SEPT 1986



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HOTLINE NUMBERS

The executive has expressed a desire to assist all members should you have some problems or have some questions, do some library swapping or borrow a book. This will be the place to look. Of course if you wish to be placed on the list just give me a call...I know there is a lot of expertise within our Group. I hope to add to this list and improve the coding. Please respect normal hours unless you specifically know that someone doesn't mind a call at 3am or use the BBS to leave a message at 738-0617, 24 hours a day, 7 days a week.

BERRY MINUK.....CHAIRMAN...TUTORIALS,ASL,B,F,XB..... (M) 234-5472
JANE LAFLAMME.....V/CHAIRMAN.RECORDS,Lb,Lc,Ls,MBX,Mwp,B.. (M) 837-1719
BILL SPONCHIA.....P/CHAIRMAN..TUTORIALS,B,Ls,XB..... (M) 523-0878
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BOB BOONE.....NUAC CO-ORD..UG CO-ORD,CC,I,Ld,Ls,S,SS.... (M) 623-7841
PETER ARPIN.....CO-SYSOP.BBS..... (M) 523-0017
BENOIT TANGUAY..CO-SYSOP..ASL,MBX,Mmp..... (M) 830-1718
MARG. O'CONNOR..EDITOR.....NEWSLETTER..... 833-2626
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HARDWARE AND SOFTWARE REPAIR DEPOT IN RICHMOND HILL (TORONTO)

SOFTWARE:::ASL=ASSEMBLY LANGUAGE
B=BASIC
F=FORTH
L=LOGO
Lb=BOOKS/MAGAZINES
Lc=CASSETTE LIBRARY
Ld=DISK LIBRARY
Ls=U/G SOFTWARE SALES

Mp=PLATO
Mea=EDITOR ASSEMBLER
Mmm=MINI-MEMORY
Mmp=MULTIPLAN
Mwp=TI WRITER
S=SALES
XB=EXTENDED BASIC

HARDWARE:::BBS=SYSTEM OPERATOR
CC=COMPCOMP EQUIPMENT
I=INSTALLATION
M=MODEM EQUIPPED

MBX=VOICE RECOGNITION
MY=MYARC EQUIPMENT
R=REPAIRS
SS=SALES

EDITOR'S NOTES
by Marg. O'Connor

ARTICLES WANTED

This month our newsletter is a bit thin due to few contributions.

Have you bought some new hardware or software? Yes? How about a product review for the club. Have you discovered a new hint or tip, write it up and hand it in! Are you using your computer to help with another hobby - such as genealogy or base ball? Tell us how!!!! Lets make this the best Newsletter going. I could also use some graphs for the front cover - any ideas?

If you give me a disk with your article on it I will return your disk, also if you would formate your article as follows it would save me a lot of time...

.TL 60:27,69
.TL 62:27,48
<
>
.PL +21
.AD
.FI
.LM 6
.RM 72
.CE

Last weekend while at Mal Taggart's Moosehead Lodge on Big Cedar Lake, P.Q., we were discussing how the newsletter used up printer ribbons when Mal gave us a very good hint that was suggested to him and he gave his permission to pass it on.

Open the ribbon box gently and spray WD-40 on the ribbon. Let it stand several hours and try it out. If it hasn't stood long enough it will be spotty. If your printer uses typewriter type ribbon look for a small hole in the casing to insert the WD-40. Mal says that if you spray new ribbons before using them they will last 3 times as long and can be sprayed several times!!! I tried it and it sure worked for me. A BIG BIG thanks Mal!!!

In his NUAC NEWS Bob Boone said that Mal Taggart's address was elsewhere in the newsletter so I will give it here...

Mal Taggart
Moosehead Lodge
P.O.Box 61
Messines, PQ
J0X 2J0

See you at the meeting on TUESDAY OCT. 7 AT MERIVALE HIGH SCHOOL. 1755 MERIVALE ROAD IN NEPEAN. School open at 7 pm and the meeting starts at 7.45 sharp.



CHAIRMAN'S TWO CENTS WORTH

by Berry Minuk

As we near the end of the term of office of this year's executive, I have paused to reflect on what has been accomplished this year and how we can do even better for next year. First of all I would like to thank all the members of the executive and all the committee chairpeople. Without their efforts this group would soon disappear. I would like to particularly mention Jane Laflamme and Dennis Denny who are retiring and also Bud Reid who has been our Archivist for the past 2 years.

Looking back over our accomplishments during the past year we can be proud of having organized a successful TI-fest (thanks to Jane). Our library continues to grow, the newsletter keeps improving and our BBS system has gone to 1200 baud. Next year should also be an opportunity for further improvements but these can only happen if more members take part. We need more articles for the newsletter. We need more workshops. We need your input in order to keep improving.

Most important of all we need people to run for next years executive. We also need more people to help with the library and our other committees. We must know what you want in order to provide it, so participate, participate, participate.

I would also remind you again of the recent appointment of Steve McWattie as Chairman in charge of pictures and other graphics created with any of the drawing programs such as GRAPHX, TI-ARTIST or DRAW N PLOT, etc. Give yours to Steve and he will see that you get those created by others in the Group.

The next meeting will be the final time for collections for the 3 freeware programs. These now stand at around the \$60. mark but we would like to raise more for the c99, Neatlist and Fast Term. This is absolutely the last chance so get your donations in. We are still a bit short on the Hard Disk drive so get that in also.

The Tutorial Schedule for the next month or so is as follows:

<u>Date</u>	<u>Event</u>	<u>Time and Place</u>
Wed Sep 24	Forth Tutorial	7:30 Wordsworth H.S.
Wed Oct 01	Assembly Tutorial	7:30 Wordsworth H.S.
Wed Oct 08	C Workshop	7:30 Dave Johnstone's
Wed Oct 15	Forth Tutorial	7:30 Wordsworth H..S.
Wed Oct 22	Assembly Tutorial	7:30 Wordsworth H..S.
Wed Oct 29	Forth Tutorial	7:30 Wordsworth H..S.
Wed Nov 05	Assembly Tutorial	7:30 Wordsworth H..S.

Plans for Basic/Extended Basic tutorials will be announced at a later date. Lets all come out to the election meeting and if you are intersted in being on the executive next year have someone nominate you.

I will see you all at the October meeting and let's have a super turnout for it.



PRIOR PATTERNS Sept 86
By Bob Boone

Boy oh boy is time ever rushing by! Seems to me we definitely need to stretch more than 24 hours out of each day. It must be anticipation of the upcoming TI Faire in Chicago that's doing it to me and others and the now immanent release of Geneve by Myarc as well.....

I spoke to Lou Phillips of Myarc earlier this week and he confirmed the new computer would be released this month. They have redesigned the board; streamlining it quite a bit and, in the process eliminating 14 chips on the board and cutting his costs by a considerable amount which may be passed on to the consumer. In the process he has also been able to free up additional memory for the machine's operating system and reports, as a direct result of that now has a totally error free operating system with even more power than seen to date! He is producing 2300 units in his first run and says nearly a thousand are sold now. I suspect the computer will sell here in Canada somewhere under \$600 Canadian but am unable to quote a firm price as yet as there are so many variables in the equation. Watch here and on TIMELINE for more news as it develops.....

I asked him at the same time for news concerning their personality card for operating hard disks on the 99/4A. He said Myarc is now in the process of licencing another company in New Jersey to produce the card and has temporarily suspended production of the product. The good news on this front is its operating system and hardware interface have been greatly overhauled. When production resumes in November the system will be much more user-friendly and far less cumbersome AND \$200 US cheaper per unit as well!!! He also casually mentioned that our little machines will, at the same time, be capable of addressing virtually unlimited amounts of storage space(when I last spoke to Lou on the subject of hard disk drives he said uncatagorically that due to hardware limitations the TI was unable to address more than 15 Megabytes of storage on any given peripheral). They've obviously found a way around the problems he foresaw! Paul Charlton(author of FastTerm and developer of Quad Density disk accessing software on the TI), had a hand in development of this new hard disk operating system.

On to a third topic concerning Myarc: My 128K ramdisk had arrived back in their shop the week before I called him. They reported that once again they were unable to find a problem with the board which has never worked properly in my system??? He then added hastily that a brand-spanking new one would shortly be on its way back to me. So I should be able to review it next month for you all. As I mailed along 12 TMS4464s in the package as well, I'm actually now looking forward to receiving a 512K card in the very near future!

The Horizon ramdisk is now starting to get the attention it so richly deserves! Orders are pouring in from all across Canada; faster than I can handle, as a matter of fact! I won't bore you with details but it appears I'm going through memory chips faster than my supplier anticipated and he's having trouble keeping up to me! Version 4 of its operating system is now available and we're still watching eagerly for the print-spooler mentioned last month and Art Green's new package for it!

Tony McGovern of FunnelWeb Farms in Australia has already gotten back to me with yet another update to his Funlwriter package as well. In addition to updating it with Version 3.3 of our DM-1000 package, he has corrected most of the problems in interfacing it with the Ramdisk and cleaned up the Diskpatch program in the package too! Tony has ordered a Horizon ramdisk package from me as well so watch for further marrying of the three packages(Funnelwriter, DM-1000 and Horizon's ramdisk) in the foreseeable future! We're on a roll!!!

I have just now returned from a fantastic weekend at the Moosehead Lodge in Maniwaki Quebec where again Mal and Mary Taggart hosted the Ottawa UG executive and committee members this year. The Taggarts have once again donated a free week for a couple at their lodge as a prize for an upcoming, yet to be announced contest. Value of the prize, and I'll personally attest to its worth, is

\$525. I thank them for their generosity to the club and for their hospitality to us all this weekend.

Steve McWatty and I have finally gotten around to disbursing the fairware income from our II Faire in April. Fairware authors were mailed their due amounting to an underwhelming total of \$198 just last week. We apologise for the very long delay in sending out this money and hope next year's showing on this front will be far more impressive both on our parts and yours.

Special note to members with unexpanded systems: Many of you have stopped coming to our general meetings, though you are still committed enough to rejoin the club each year. You may not be aware of the fact there is now an abundance of things available expressly for you at each and every meeting. There is a good selection of module-based software(both new and used), cartridge expanders, joysticks, trackballs and very soon again our cassette library software will be on hand for your consideration as well. Come on out and let us know how we can be of further assistance.

I have seen JOYPAINT-99 and I'm impressed! In fact, impressed enough that I'm now looking for a way to import the product for you all. I saw it up on the screen at RYTE Data in Haliburton where I'd stopped to visit when returning from a family visit last weekend. Bruce Ryan also had many other new and inovative things on his workbench(mostly from Germany)from far afield. A small company in the USA is looking at building small peripheral expansion boxes for those of you that don't want or can't afford II's 'tank'! It will hold three cards and cost should be less than half of a new II Expansion box! A new way to grow into Geneve is what it basically amounts to and is exciting in that light alone! There were two or three smallish boxes taken apart on a workbench in his shop that I enquired about while there. One was a stand-alone RS-232/Disk Controller from Atronic; another was a 32K/Disk controller from the same company and the third was a disembowelled 80 column card! The bad news here is that developement of the third product is inexplicably delayed. Bruce says its developer has stopped cold for some reason on work for its operating system and can no longer forecast any kind of release date on the product? The other products look more promising but were too new to Mr Ryan for him to offer much news of them. He couldn't tell me if they worked double sided or double density, how many drives they'd support or even an approximate retail price for them so they'll have to stay at the starting gate for now....but I saw 'em!

I hope a good number of you will be at our October meeting to offer appreciation for the best year ever to our outgoing executive and also offer all possible encouragement to those you elect or re-elect at the meeting. Special thanks especially for effort above and beyond the call of duty to our outgoing Vice president and treasurer; Jane Laflamme and Dennis Denny, both of whom have expressed regret that they won't be standing for re-election this year. Jane: It was mostly your fault that our Faire in April was the astounding success it was. In this, and too many other ways to enumerate, you've made this past year of tenure a memorable one for many of us and we'll hold you to your commitment to stay active in the group. You're too valuable an asset to our group to let lie fallow. Dennis: I take heart from your comments comparing the Atari User Group to ours. It is indeed a tribute to our organization and its camaraderie, that a gentleman who no longer owns an orphan can say he prefers attending our meetings over those of his chosen machine's organization. Thank you for your continued support as treasurer over the past few months. Its been our pleasure as much as yours. I do hope we will have the pleasure of your company on the road to Chicago again this year and its my fervent wish that Geneve WILL be at least enough of a machine to entice you back to us.

We will keep you as informed as possible about all developements regarding the aforementioned topics and others as they develop. You can call our BBS at 613-738-0617 for up to the minute information as it happens. In the meantime keep on Tling.

NUAC NEWS
By Bob Boone

Another month gone by and still no local people have stepped forth to offer a hand in administering our association....

Its not all that dismal though. Pat Graham of the North Bay User Group has come through with, not one, but several possible designs for a logo and several of you, both groups and individuals have renewed membership for 1987! I still want more entries in the NUAC Logo contest and will suspend judgement of the entries till the end of this year. If we don't get at least five people/groups to repond I'm afraid it'll have to go the way of the DODO bird and those abandoned computers that DID die!

Mal Taggart, an OUG member from Maniwaki PQ has a favor to ask of us. He's been administering his lodge with his TI for quite some time now and is happy in all respects, save one, with the software he's acquired to do so. His one notable need now is a Canadianized Payroll package(preferably one that can easily be converted to reflect Quebec's unique peculiarities. Can anyone out there help him out? Members of GO-TI-QUE, CIM-99, local members, do you already have such a package either adapted or self-written? If so, let us know so we can get the two of you together or contact Mal directly(he's been a regular advertizer in our newsletter for quite some time now) at his address or phone number listed elsewhere in the newsletter.

Sandra Bartels of Chicago has called to thank us for pre-registering for their Faire this year. Sandra is the overall co-ordinator of the event down there for at least the second year in a row...must be something in the feminine persuasion that makes 'em shine at the job, eh Jane?! Anyway I've committed us to take over Chicago this year and I'm counting on your support to live up to the commitment. If time is a problem, consider flying down, if not, drive, and enjoy the kind of excitement we experience at these multi-national events! We've checked and a return flight from Ottawa to Chicago booked 30 days in advance is only \$180 which makes it very affordable and it can't be a whole lot more from anywhere else in Canada. Terry Atkinson flew down from Dartmouth Nova Scotia last year, as did Jacques Corbeil from Sherbrooke PQ. It was in fact quite a bit cheaper for them then, for those of us that drove as we had 2 days of driving each way, and needed shelter and food along the way. I daresay we had more fun too as the trip was a riot! If more than two are interested, driving down will probably work out cheaper, but far enough in advance it can be quite a bit more economical both timewise and financially to fly. Don't arbitrarily discard the idea. I guarantee a good time will be shown you. I will post the address of the motel we'll be staying at in Chicago in next month's article. If you can; be there! I want to meet you and shake your hand personally to thank you for your support!

The Ottawa TIUG will have a booth and we're committed to releasing another update to our DM-1000 package and some other nice new updates and possibly NEW releases on November 1st. When I spoke to Sandy earlier this week she said they had commitments for 20 booths already, including Craig Miller, Ryte Data, Corcomp and Myarc. I suspect it'll be a dilly of a show, especially since they've tagged 3 more hours onto it! Sandra has also sent a questionnaire asking for input on whether to expand to a two day show next year. Yes! Yes! Yes! Its too much fun and excitement and activity to fit into one day! My initial response upon reading the letter/questionnaire was: "why bother to ask?"; it is still my response upon reflection.

Till next month

**GREEN MONITOR BLUES
COLOUR KILLER FOR THE TI-99/4A**

BY PAUL LANOIE / RICHARD BAILEY NH99ER USER GROUP

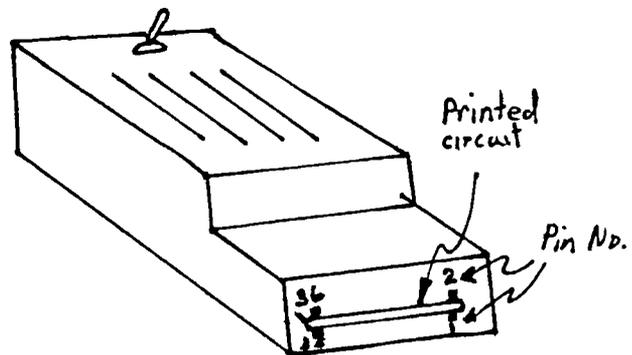
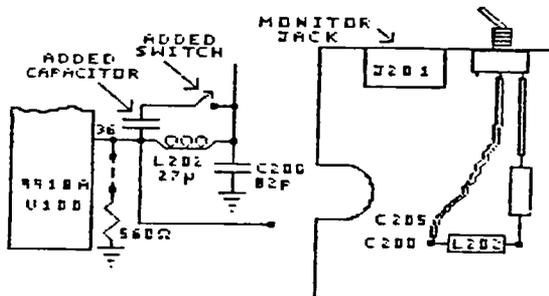
Announcing the COLOUR KILLER FOR THE TI-99/4A, a hardware modification for the console, that will let you select colour or, black and white output from the TI-99/4A.

This modification adds a capacitor and a switch to your console, (cheap and easy). One switch position yields a normal colour output from your console, the other yields an output that has no colour. Connect the console to a colour T.V. with the switch with the switch in this position and you will see a black and white picture. Connect to a monochrome monitor and you will see the picture that I've been after all along; a nice display with different levels of brightness representing the range of colours. And best of all, you still have the sharpness and resolution available from a monitor in display text.

A technical explanation. First let me say that both Bailey and I consider the workings of a television to be in the realm of "magic". However some very persistent research has led to the following conclusion. The Video Display Processor in the console puts out what is called a "composite video" signal to your monitor, or your R.F. modulator if you are using a T.V. This signal, when in colour, contains what is called the "colour burst". When the signal is black and white the "colour burst" is not present. So then the object of the hardware modification is to get rid of the colour burst portion of the "Composite Video" signal.

Now pick up your Radio Shack electronics data book (RS#62-2040), and you will find out that the colour burst portion of "Composite Video" is a signal with a frequency of 3.579545 MHZ. Go to the schematic of the TI-99/4A and see that the output of the VDP (9918A) is on pin 36. Connected to pin 36 is an item called L202. This is an induction coil, often called a choke. What you do is add a 100 PF capacitor in parallel with this choke. The result is a tuned circuit that will kill the 3.579545 MHZ portion of the video signal. Put a switch on the back of you console in series with the added capacitor, and you will now have a switch selectable "Colour Burst Filter".

The sketches for this change are shown here, the schematic on the left and the pictorial of the right-rear corner of the main circuit board on the right. By the way, the cost of this modification is about 70 cents for the capacitor (Radio Shack 272-152), plus \$1.69 for the switch (Radio Shack 275-152 or 275-613).



Pin No.	Pin No.	DESIGNATION STANDARD
2 GND	1 RESET IN	D7
4 Cru ck out	3 D0	D6
6 Cru in	5 D1	D5
8 A0	7 D2	D4
10 A2	9 D3	D3
12 A3	11 D4	D2
14 A4	13 D5	D1
16 A5	15 D6	D0
18 A6	17 D7	(MSB)
20 A7	19 +5V	A12
22 A8	21 Grom select out: \overline{GS}	-----
24 A12	23 A1	
26 A9	25 RD out	
28 A10	27 GRCK out	
30 A11	29 -5V	
32 \overline{WE} out	31 Grom ready in	
34 \overline{CE} out	33 -0.7v	
36 GND	35 GND	(LSB)

MULTIPLAN AS DATABASE by Gabriel Laszlo

Many TI owners look at the "integrated" software available for commercial computers found in offices, and wonder whether anything similar will ever be on the market for their 99/4A.

One of the popular products is Lotus 1-2-3, which offers a spreadsheet, a database and a graphing package all in one program. There is, unfortunately, nothing in the TI repertoire to equal this program but there is one that comes surprisingly close: Multiplan.

In fact, Multiplan scores 2 out of 3, which is not bad. No one can claim that Multiplan has any graphing capabilities comparable to Lotus 1-2-3, which would be nice. On the other hand, Multiplan is a renowned spreadsheet program; some believe it's the best. But there is another ace up the sleeve of Multiplan users which can turn the program into a database, quite similar to Lotus 1-2-3.

The feature that makes a program into a database is the sorting function, and Multiplan has got it. The program can sort numerically, alphabetically, in ascending order or the other way around. This power gives Multiplan a 1-2 punch that comes pretty close to 1-2-3.

The following example may serve as an illustration:

Multiplan can be set up to catalogue programs recorded in a VCR library. Each program is described on one row, using column headings such as tape name, program title, counter start, counter stop and elapsed time. Other headings can be added, of course, as Multiplan has 63 columns available, up to 32 characters each.

Once the entries are made, the catalogue can be whipped into shape using the sort function. Here, care must be taken not to sort the title rows together with the data. First, all rows are sorted by the "counter start" column in ascending order. Secondly, all rows are sorted by the "tape name" column, again in ascending order. Now we have all tapes listed in order with the programs on them according to their place on the tape. This format can now be printed, to provide an inventory of programs and recording times still left on each tape, if blank spaces were also noted on separate rows.

Next, an alphabetical listing of programs can be also obtained by simply sorting again on the "program title" column. In order to make the printout more readable, the columns can be rearranged using the Move function. For example, the program titles can be shifted to the first column. Together, the Sort and Move functions can be used to provide a wide variety of reports from a single set of data stored in rows of Multiplan. A helpful hint here: The print range has to be checked and revised after each set of column moves, using Options.

The possibilities, of course, are endless. The spreadsheet capabilities can be combined with the data handling to result in pretty powerful applications. Added to this is Multiplan's ability to use supporting sheets, and the option to use Multiplan files with TI-Writer.

The final conclusion is very encouraging to TI owners: The 99/4A has some very useful and up to date software, limited to a large extent only by our imagination.

BROWSING THE LIBRARY -- with STEPHEN BRIDGETT

Many of the members don't know me. Until last month when Bob and Berry asked me if I would look after the library, I was one of the the great silent majority. Well, for some time I had been feeling a bit "sheepish" about getting so much out of our club and not putting much in, so I felt the time was right and accepted.

Like most members I am not, as yet, well acquainted with the library, but here is a little story which certainly peaked my interest. Last week I was glancing over a bit of advertising from Millers Graphics when I closed the brochure and noticed the back page. There was a list of TI User Groups and this is what I saw: In addition to the useful info provided on each club such as telephone numbers and address was the size of the club libraries. The range was N/A to 1000, except for notables such as Belgium (4000). Where do we fit into this range? We don't. Our library is listed at a staggering 4500!! You can thank a lot of people for this but not me.

My ambition is to make this library more accessible to our members! I have just taken on the job and I'm told it's a big responsibility. Well I'll start slow and gather momentum as I go. I will ask for your support in the form of suggestions and yes, occasionally assistance.

I want to produce a new disk every month for sale. I'd like to have requests, either by talking to me or the suggestion box or the BBS and, I want to hear from our cassette based members as well. We all started with cassettes and some of the best programs in the library were developed on cassette. October is our annual elections night and the executive have agreed that the balance of the meeting will be a 'copy session'.

So come on out, lets put the TI spirit that's made us the best behind our annual elections, then come and tell ME about YOUR library. I'm HERE for you but I've got to HEAR from you!

CHEERS.....

Stephen

EXCELTRONIX

217 BANK ST

230-9000

PANASONIC DRIVE

159.00

COPAL PRINTER

329.00



**PUSH BUTTONS
"LOAD" AND "RESET"**

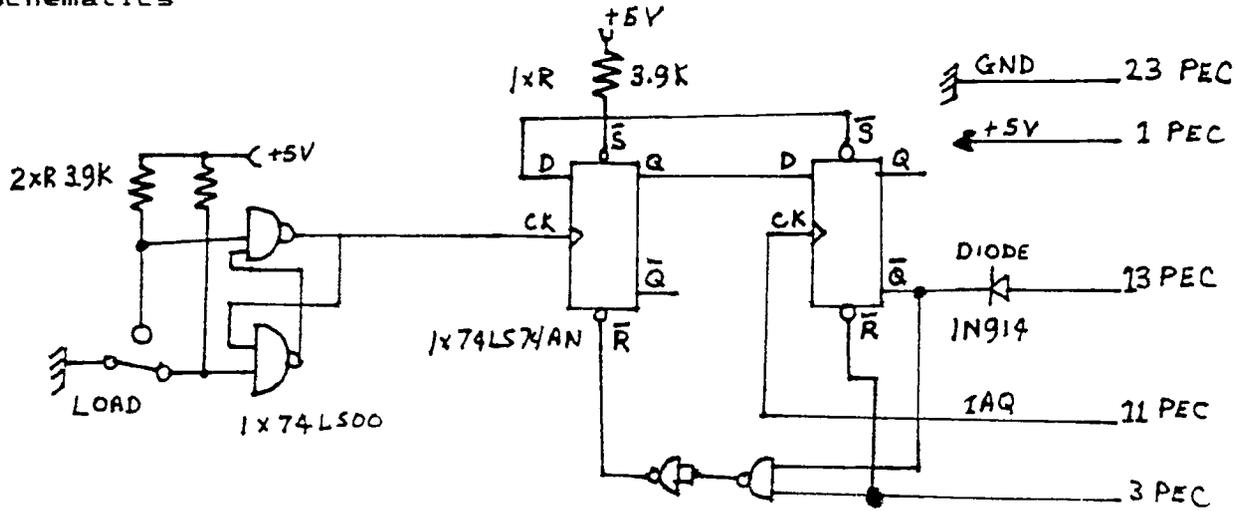
"SUPER - LOAD" (SPDT push button)

I use this hardware very much with the "DEBUG" of Editor-Assembler. Thanks to that system, I could analyse many things.

We first load the "DEBUG" (this program loads a vector at address FFFC= WP and FFFE= PC), then we press "QUIT".

We run the program (Assembler, Basic or Extended Basic we want to analyze). When we depress "LOAD" and release it, it occurs exactly synchronized, one load (and only one) instructions; if vector is set for DEBUG, the program that we want to analyze passes control to DEBUG from which we can see what happens... When ready, we end DEBUG by hitting "Q" and "ENTER" to continue master program...

Schematics



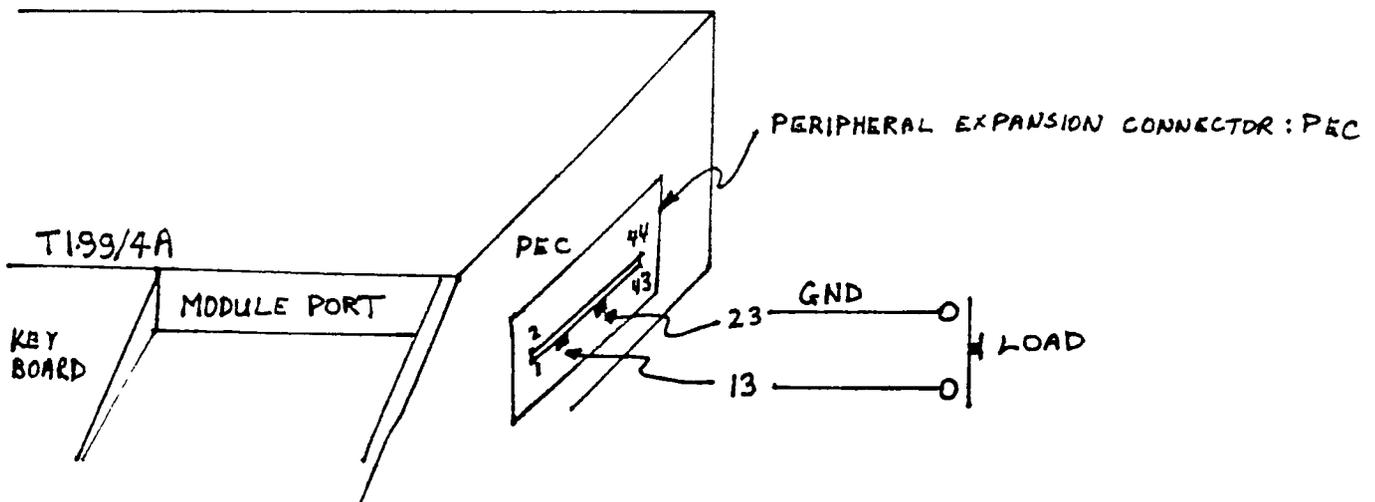
"STANDARD - LOAD" (SPST ON push button)

This button allows to enter DEBUG as indicated above (or another program provided the vector is correct) but it doesn't allow to return to master program.

In that case, we just need to connect push button at pin 13 and 23 of peripheral expansion box connector (give space enough for speech or connector).

For MAXIMEM, this LOAD and the following RESET will allow to dump any module to disk.

Schematics

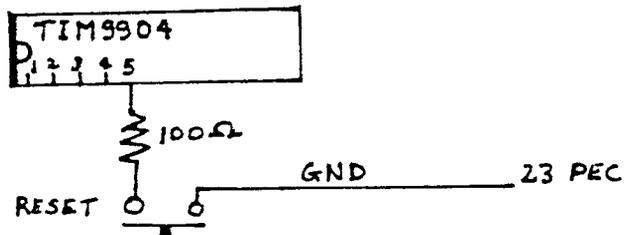


PUSH BUTTONS
"LOAD" AND "RESET" (CON'T)

"RESET" (SPST ON push button)

This RESET maintains the TMS 9900 in an idle step with PC= 0000 all the time it is depressed; so the processor can't erase an interesting program during that time. Connect the push button to pin 5 of TIM 9904 and ground through a 100 ohms resistor.

Schematics



FOR A BRIGHT FUTURE
by Gabriel Laszlo

The last issue of our Newsletter had some very interesting letters from correspondents around the globe. We were treated to a number of views of the various regions of the TI world

As it happens often, one has to look elsewhere to appreciate what's good at home. The reports from Italy painted a picture of a TI community in disarray. The Talent is there, the enthusiasm is there, but the community spirit isn't. Because of the lack of organization, a few sharks were able to feed on the ready-to-be-fleeced computer buffs. One was said to have posed as a user group, obtained free software from to his unsuspecting victims. Similar incidents were said to have happened elsewhere too.

We in Ottawa are very fortunate that our User Group is able to maintain more healthy traditions. This association of interested amateurs is safe-guarding the interest of local TI enthusiasts, keeping commercialism at bay. Many members are giving of themselves freely, without looking for financial payoffs. Meetings get organized, tutorials are given, a great BBS is run, a monthly newsletter is published; all by volunteers.

The situation is certain to remain like this, because of the dedication and readiness of club members to participate just for the sheer pleasure of it. The appreciation and thanks seem to be sufficient reward for all the effort.

But, there is always a but, we must not take our Executive for granted. Able people came forward in the past to serve the group, now it's time to ensure that the tradition continues. Elections for next year are just around the corner. Let's support those individuals who are ready to take on the challenge for another year. Let's make sure that there will be always enough volunteers directing our club to allow the spirit of friendliness to prevail.

TI enthusiasts have a good thing going in Ottawa, let's keep it that way.

Exploring BASIC Programs by Tim MacEachern

The program listed below demonstrates how BASIC programs are stored in the 79/4A. The program as listed will work in Extended BASIC with the Memory Expansion card or peripheral attached. A similar program can be run in normal BASIC with the Editor/Assembler or Mini Memory module inserted. To convert this program to normal BASIC simply change the calls to subroutine 'PEEK' in lines 200, 240 and 260 into calls to subroutine 'PEEKV'. That is, add a 'V' between the 'PEEK' and the '(' in each line. This program will not work properly in Extended BASIC unless you have the memory expansion.

The techniques used in this program are intended to make it as easy to understand as possible, while still showing how the DEF statement in BASIC can be used to do all the hard work for you. For instance, lines 100 to 130 of the program create a function HEX which will convert a string of hexadecimal (base 16) digits into a decimal number. As can be seen in lines 150 and 170, this allows us to write the actual hexadecimal addresses as used by assembler language programmers.

Line 130 takes the string of hexadecimal digits given to it and pads it with leading zeroes to make sure that there are four hex digits. Then function HEX4 is called to evaluate this four-digit hex number. In line 120, HEX4 splits the number into two two-digit hex numbers and combines them to get the proper decimal result. Similarly, line 110 splits a two-digit hex number into two one-digit numbers. Line 100 then is used to figure out the value of each separate hexadecimal digit.

Using nested DEF statements as in this program can simplify development of a working program, but be warned that DEF statements take considerably longer to run than the exact same code put directly into your lines wherever needed. Still, you may find it convenient to write some programs that consist solely of DEF statements! After such a program is RUN in normal BASIC (or in Extended BASIC without the memory expansion), the defined functions will be available to use in BASIC's calculator mode. For instance, if your program consisted of lines 100 to 130 only, it would provide a conversion function from hex to decimal that you could use while in calculator or direct command mode.

Let's get back to the program. Line 140 defines a function that is used to convert a 16-bit unsigned number (from 0 to 65535) into a 16-bit signed number (from -32768 to 32767). For some strange reason BASIC insists on signed numbers for addresses passed to PEEK, PEEKV, LOAD and POKEV. So whenever an unsigned address is calculated function MA is used to convert it to a signed number. This function works by comparing its argument to the largest positive value allowed. If the number is too big the comparison yields a value of -1. The rest of the expression then causes 65536 to be subtracted from the argument value, giving the correct result. If the original number is okay (from 0 to 32767) the comparison yields a result of 0 and the value of the function is the same as the value of its parameter. It seems complicated to write functions like this, but try to figure them out - you may find them fascinating.

BASIC stores your program in two sections. In the top of memory it stores each line of the program, not necessarily in the correct order. As a matter of fact, each time you edit a line, it becomes the last line in this area, with all other lines packed together above it. Each statement is made up of three parts. The first byte is the length of the rest of the statement in memory. The last byte is zero, and in between are bytes that represent the particular BASIC statement you have written. BASIC keywords are translated into a single byte each (known as a token) while strings and numeric constants are represented as a leading token (199 or 200) followed by a length byte, followed by the ASCII character values of the string. By running this program you can determine how other elements of a BASIC program are stored.

Underneath the statements (that is, lower in memory) is a list of statement numbers and pointers to the first token in each

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