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



VOLUME 8 NUMBER 6.....June 1989



DON'T FORGET THE MEETING -- June 6, 1989

P.O. BOX 2144, STATION D, OTTAWA
*** ONTARIO, CANADA K1P 5W3 ***

COMING EVENTS

June Meeting:	June 6, 1989 7:30 p.m.	Merivale High School Back in the cafeteria, and we'll have a special quest from the RCMP! Bring a friend!
Membership Drive	July 8, 1989 9:30 a.m. on	Carlingwood Mall Come and help us show off!
Summer Exec Meeting	July ??, 1989	Moosehead Lodge - contact Bill Sponchia to make reservations -- all welcome!
Newsletter Deadline:	August 15, 1989	(or any time before that!)
Membership Drive	August 19, 1989 9:30 a.m. on	St. Laurent Shopping Centre Come help show off our favorite computers!
5th Annual TI-FEST	??????????????	Why not? This year's was great! Let's hear a round of applause for Jane, and everyone who helped her!

Note: Saturday seminars and the beginner's assembly workshops are suspended until the fall.

EDITOR'S NOTES from Ruth O'Neill

Well, this is it... my 3rd-to-last newsletter. Instead of 2 weeks notice, I've given the executive 2 newsletter's notice. I'm going to be retiring as newsletter editor for the Ottawa group after the October issue goes into the mailbox. I don't want anyone to think I'm leaving the job because I'm unhappy with it -- on the contrary, I've had a wonderful time! It requires a fair bit of time and effort, but to be honest, not quite as much as some people think. There are many, many people who make the newsletter what it is. AND IT'S WORTH IT. It has been a terrific experience, and it's certainly broadened my horizons in the TI community. Our editors over the years have built up a good reputation for our newsletter, and the post of editor comes with a considerable amount of respect. I've met many exciting, interesting new people through this job. In spite of this, I feel that two years is a reasonable commitment to the position, and I'd like to go on to some other work in the club. I also think that somebody else deserves a chance at this job. If you're even slightly interested, give me or someone on the executive a call. I'll do all I can to make the transition smooth for you.

We have another ending in this newsletter, too. This month's issue carries the final installment of Stephen Shaw's book, TI BASIC, which he generously allowed us to serialize. Thank you, Mr. Shaw!

Since we're losing a regular feature of the newsletter, we'll have to work harder at filling the newsletter for September. I've been pleased with the number of people volunteering articles, but we can ALWAYS use more. Short pieces, reviews or even just helpful tips are JUST as welcome as long articles or reviews. The more contributors we have, the richer this newsletter will be. I know there are people who picked up new items at the Fest, and I'd love to see some articles about these products. And remember, you don't have to write about commercial packages. There are many fairware items worthy of a review, and just because it's fairware doesn't mean everyone's heard of it.

Have a terrific summer, and don't forget to write!

The President's Two Cents' Worth
by Jane Laflamme

As this is my last chance to write before the summer takes us away from our computers (well, at least a few of us) this is going to be a long article.

There are several events coming up over the summer months that will be of interest. First there will two membership drives: one at the at Carlingwood Mall on Carling Ave. on Saturday, July 8th and the other at St. Laurent Shopping Centre in the east end on August 19th. We are trying to give our computer high visibility in the community. (We still receive astonished calls from owners who are surprised to see we are still alive and supported.) We will be setting up at around 9:30-10:00 a.m. If you can spare some time to visit or relieve our members, or bring a piece of software that will show off our computer to potential members, we would appreciate it. Please call me or the BBS for further information as it develops.

For the past 4 years, we have been holding the summer executive meeting at Moosehead Lodge, on Big Cedar Lake near Messines, Quebec. The first year, we went up for the day, the second we stayed one night, and the third and fourth, we stayed for the whole weekend! These meetings, or weekends are open to all members, family and friends, although space is limited. In lieu of a family picnic this year, we are organizing this larger event. Moosehead Lodge is great for fishing and hunting (in season -- as I do neither, I have no idea when the seasons are open!) Small motorized boats are available for rent; there is a large beach for swimming; and it is very good for those that enjoy nature and the call of the loon! We usually take our canoes with us to explore the islands and connecting lakes. (Two years ago, we went for a night paddle with a full moon shining upon us -- we will be very close to a full moon this year -- what a contrast to the hustle and bustle of city life..) You can come up for the day of the executive meeting, Saturday, enjoy the surroundings or join the meeting, or you can come up for a partial or full weekend, or even stay for a week. If you are a single booking, please be prepared to share a room to allow space for more to attend. Bill Sponchia has offered to co-ordinate this event so give him a call in the evening at 523-0878 (until 10:00 p.m.) to reserve your rooms. This has to be done at least one week before the weekend, although as mentioned, space is limited so I would advised calling as soon as possible!

I would also like to give our sister group, the Carleton Home Computer Club, a plug. The Carleton group is a less formal atmosphere and is a very good way to talk computer, solve problems, and just plain socialize with computer friends. Membership is \$10 a year (a real bargain! It actually pays for coffee and refreshments served at the meeting.), we usually meet at the offices of Laflamme & Wrigley Whls. the LAST Thursday of the month (present members, please note the change) at 8:00 p.m. AND we continue right through the summer months! The summer meetings will be June 29th, July 28th, and August 24th. Everyone welcome. Please call Michael Taylor at 831-0143 for more information.

As announced at the May meeting, the executive approved two additions to our BBS for our members who own other computers. One is a message base and the other is an upload/download sections for those computers. We are also hoping that these additions might entice former members who have bought other computers back to the fold; we miss them. If you know any former members, perhaps you could mention this to them.

Before summer begins, we are thinking about the fall already! Bill Sponchia once again will be heading the nomination committee. (Thank you Bill.) He will be calling you over the summer months asking you to stand for either an executive position, or in some way, be it large or small, help the club for the upcoming year. As we get farther and farther away from our parent company, it becomes more challenging to keep the club active and viable. More hands mean less work, needless to say. There are a number of ways to help the club if an executive position is not "your cup of tea". For instance, we require a phoning committee to contact users that registered with Texas Instruments when they originally purchased their units. We have a list of over 500 odd names sent to us by T.I., and if you could take 10, 20 or even 50 or 100, verify if they still have their units, and if so, inform them of our services, etc. This can be done slowly (it could take a week, a month, or even a year!) just as long as we contact them!

After two years of service, Ruth O'Neill will be retiring as our Newsletter Editor to allow her time to face other challenges within the group. She will publish the October Newsletter and, as she says, will be on hand for her successor for guidance should it be required. On behalf of the club, I would like to thank Ruth and her "committee" for their services; we will be sorry to see you leave, Ruth; you have added your own special touch to our Newsletter.

Of course, that means we are looking for a Newsletter Editor. As with most jobs, there are many rewards. Think about it over the summer; talk to Ruth or executive members to see what the job entails.

Are you a budding author -- a little hesitant in submitting an article for our Newsletter? Try one over the summer holidays. It can be about a piece of software or hardware you have recently purchased, or a humorous incident about your computer, anything you would like to write about. Contact Ruth or another from the club for advice... Give it a try.

Also, we are still trying to persuade out-of-towners to submit articles -- to no avail!! Tell us about your trials, tribulations, joys, or User Club. You can send them to the address at the back or upload to our BBS.. Give it a try! Or, how about a budding cartoonist.....??? The Newsletter Editor would love them to fill those little spaces. Another project we have in mind is hardware comparisons... Why it would be better to acquire a CorComp RAM disk vs. the Horizon RAM disk, or would it be better for you to purchase a Gramulator.... price comparisons, etc. If you have a piece of hardware and would like to join in, call us. It could also be a subject of a meeting with each "expert" (the term is used lightly; don't let it scare you off) talking about their piece of hardware and why they bought it.

Our next and final meeting before the summer recess will feature Sgt. Val King of the R.C.M.P. Sgt. King's specialty is user groups' BBS's and computer law. As most of our group were busy with the FEST when he spoke last, we are fortunate to have a return visit from Sgt. King. For those who caught his talk at the FEST, he has mentioned that this talk will be slightly different. As this is a general interest subject, we will once again open our doors to non-members who have other computers. Mention it to your friends and invite them to attend. (The last event we sponsored, at the KAO-Didak plant, was well attended by both Tiers and non-Tiers alike.)

For the raffle this month, we are proud to offer *Music-Pro*! This is the first program the Ottawa Users' Group has tried marketing through a commercial software house, Asgard Software; it was released by Asgard at our TI-FEST. As you remember, Music-Pro took first prize at our last software contest. Extensively re-written since last shown by the winner, David Caron, it is even more powerful. Our Lucie Dorais, of Fast Extended Basic fame, wrote the comprehensive users manual to complete the package.

'Til September, have a great, restful, and safe summer! -- Jane

BROWSING THE LIBRARY --with DAVE MORRISON

From all that I have heard, our Fourth Annual TI-FEST was again a success! As all I saw from my position at the Library table were passing familiar and strange faces, I have had to rely on other sources for that statement!

Stephen Andrews, a very talented programmer from North Bay, stopped by to give me his new CAPTIONS programme. This two disk (DS) set contains two hundred "balloons" - those that hang over the heads of the characters in cartoon strips - containing some very imaginative captions. Stephen has designed the package for use with TI-Artist, but I understand that any graphics programme that uses "Instances" will run the captions. Incidentally, CAPTIONS was featured as our May Disk-of-the-month.

I have not received any correspondence during the past several weeks so I must assume that no news is good news! I hope!

The final Disk-of-the-month prior to our Summer break will feature three programmes (one SSSD disk) by Ottawa member Jeremy Frank. This disk consists of a Character Planner, a Hockey Game and a game of Cribbage. All three are

fully documented.

The Library will be available during the Summer months. All mail will be answered and requests via TEXLINK or telephone are quite welcome. Have a good Summer without neglecting your T.I.

TEACHING PR BASE
by **BILL SPONCHIA**

"HOW TO RUN"

Program: PRBASE Version 2.0

(...Continued from May)

- Option 7 - used for the setting of the database name, the printer device, designating your data disk as single or double sided and setting up your tab settings for mailing labels.
- for each, type appropriate information and press Enter. If correct information is already in the field just press Enter

Warnings:

- i) Before entering the printer device name, blank the entire field by pressing the space bar (whether or not anything shows on the screen), backspace to the start of the field, and type in the device name
 - ii) When entering data to the 2 label fields do not try to correct any erroneous information just typed in. If you make a mistake, go FCTN 9 to get back to menu and then go Option 7 again
 - When all information is input, save with FCTN 6. A series of questions will be asked and then the information will be saved.
3. Exit the CREATE program by using Option 8. This will take you back to the TI colour bar screen. Reboot to get the first menu.
 4. Press "2" to get into the Data Management program. After the title screen is displayed the colours may be changed by pressing "F" for foreground colour and "B" for background colour.
 5. Press any key (except "F" or "B") to get the database file prompt. Type in the Disk # and file name (ie - DSK2.LIBRARY). If you do not remember the file name you can type "?" after the disk # (ie - DSK2?) The screen you created with the CREATE program will be displayed and you will be in Command Mode.
 6. All commands are available to you and these are shown in the next Section; however, since no data is currently in the database you will have to use Command A to "Add Record"
- Press "A" - you may now enter data in each field.
Press ENTER or FCTN X to advance to the next field. FCTN E will allow you to return to a previous field.
To save the data to diskette press ENTER when you are in the last field or press FCTN 6 any time.
- Note: Pressing FCTN 9 at any time will return you to Command Mode without saving the data to the diskette.

Section III - Subsequent Use

1. To boot the PRBASE program use the steps as outlined in Section II, 4 and 5.

2. The commands available for use are listed in the documentation in alphabetical order. This list can also be seen by pressing "H". Below I have grouped them by the type of command:

a) General Commands

B - to go back to title screen and Boot another database file
H - to display commands for Help
Q - to Quit PRBASE

b) Commands to Working on Records

A - to Add another record
D - to Delete a record from the database
E - to Edit a record

c) Commands to Change Screens (Records)

N - to get directly to a specific record Number
FCTN X - to scroll to next screen
FCTN E - to scroll to previous screen
CTRL X - rapid scroll screen 1 to top
CTRL E - rapid scroll screen top to 1

Note: rapid scrolling can be stopped by pressing any key and resumed by pressing FCTN 6. Pressing any other key returns you to Command Mode.

Additional Commands for Changing Screens when Index Sorted:

FCTN D - goes to next alphabetical screen
FCTN S - goes to previous alphabetical screen
CTRL D - goes to first alphabetical screen

d) Commands to Search Screens (Records)

F - search designated Field for specified data string
G - search all fields (Global) for specified data string
U - used to search up to the first 8 characters of the current index (Use-index)

e) Commands to Work with the Index

I - to build an Index on a specified field
S - to alphabetically Sort the current index
V - to View the current index

f) Commands for Printing

L - to print Labels - note: index must be sorted
P - to Print hard copy of screens
R - to print Report - note: index must be sorted

g) Commands for Setting up Options

C - to select one of the 5 Control character sequences previously set up or to manually enter another one
O - used to set Options: i) change data file drive #
ii) change printer device name
iii) turn on or off Selective Index

Section IV - Hints, Tips & Answers

1. Backup copies of your database should be made using TURBOCOPY. The programmer implies that other sector copies would not work.
2. When adding records (Command A), if you know there are NO empty records, then it will save time if you do a Command N first. This will take you to the last used record on file.
3. When doing searches (Commands F,G and U) it is possible to use "?" in place of any character. This wild card feature allows you search for character combinations you are not quite sure of (eg - Allen or Allan ? - just put All?n)
4. When doing Selective Indexing and you enter the characters to be looked for in a specific field, be advised that:
 - i) there is no distinction between capital and lower case.
 - ii) the entire field is searched for the character combination entered - not just at the start of the field.

Therefore, if you want to selectively index on the first name field wanting anyone with a name starting with "B" it would select "Bill" (as wanted) but also select "Albert" (not wanted)

5. Screen, report and label layouts should be prepared before hand to make it easier to set up when typing in. Also it allows you to see the results before actually doing all the work, thus enabling you to save a lot of trouble changing things.
6. Hard copy print outs should be made (and kept) of -
 - the designed screen (see Section II.2 Option 3 (v))
 - the listing of all fields (see Section II.2 Option 4 (iv)) showing screen starting location and size of each
 - the layouts prepared (see #5 above) especially report and labelThis will make future changes much easier.
7. If you already have one database and wish to set up a second with the same screen (or one very similar) instead of redoing everything do the following:
 - i) enter CREATE and initialize a new disk
 - ii) take out the new disk and insert the old disk containing your present database
 - iii) go to Option 3 (Design Data Screen) and this will read in and display your present database screen
 - iv) take out your present database disk and insert the new disk
 - v) make the necessary changes to the Data Screen and then save it to the new disk
8. When entering CREATE it is always wise to go to Option 1 immediately to change the Disk Drive # for data file. This will save grief and anger when you create a screen, a report, or a label and then find out that you forgot to change the drive #.
9. When creating your screen it may be beneficial to set up some of the characters as part of the screen display even though you wish to use it in printing out a report or label. It is easier and faster to enter "523"; ENTER; "0878" then it is to enter "523-0878".
If all your addresses are for the City of Ottawa rather than having to enter OTTAWA in for each record why not just make it part of the screen display. This not only makes it easier but it also opens up the opportunity to put more information into the record. Remember the limitation of all your defined fields is a maximum of 32 with a maximum of 255 characters.
10. Setting up Selective Indexing is done as follows:
 - i) When in the command mode enter "0" to select Options.
 - ii) The Selective Index option is the third item, so press ENTER twice.
 - iii) Turn Selective Index on.
 - iv) Press "I" to select Indexing.
 - v) Put cursor in field you wish to index and press ENTER.
 - vi) Put cursor in field that you wish to be used for making the selective condition.
 - vii) Enter the character combination you wish to select on (see #4 above) and press ENTER.
11. When doing Selective Indexing, if the character combination you wish to search for contains a blank, you must insert a "?" in place of the blank. Otherwise it only selects on the character combination preceding the blank.
12. In setting out your fields, remember that the index is made on 10 characters starting with the first one in the field you select to index on. Therefore if that field's size is less than 10 characters it will also use characters out of the next field.
Unless it is planned for, this may give some undesired results.
13. I found that setting up the printer codes in the Report section did not work; however, if the printer codes were set up in Section 6, "Set Printer Codes" and then before typing out a Report you did a Command C, everything worked okay.

1	2*				
	JGT	VMBW2	1	1*	Loop for all bytes
	RTWP		1	4	Return
SWSP	DATA	>8C00,>8C02	2	-	R9, R10 Preloaded
	BSS	4	2	-	R11, R12 Work Regs
	BSS	6	3	-	R13 to R15 Linkage
*					
*		Total Cost	24	34 + 8	per byte

As you can see, even on this not very complex routine, we overcame the adverse storage and time cost of the BLWP linkage; and at the same time, added the "interrupt enabled" feature.

Next time we'll continue our discussion of linkage, and look at entrance and exit code for main programs.

"It's impossible to make a program foolproof because fools are so ingenious."

THE GRAMULATOR: a report by Lawrence Wade

The Gramulator, by CaDD Electronics, is a fascinating device. It allows cartridges to be "dumped" to disk, has a full editor allowing the modification of cartridges, and it has 96K battery-backed up RAM designed to replace the cartridge, GROMS 1&2 (TI console BASIC) and GROM 0 (The operating system). The uses for a device such as this are limited only by one's imagination, except for a few minor shortcomings it seems to have. They are, most notably:

- 1) The fact that there is no documented way of loading and/or using a cartridge saved with the Gramulator with TI Extended BASIC.
- 2) The documentation provided with the Gramulator itself.
- 3) The shape of the Gramulator with respect to keyboard efficiency.

Okay, first. The instruction manual supplied with the Gramulator does not describe a way of running cartridges dumped to disk without the Gramulator itself. The assembly language gurus in the Group may be able to come up with a way to do this, but I couldn't. The way it works is by first dumping the cartridge to disk. Once this has been done, it should then be a simple matter to maybe write a loader to load the cartridge from Extended BASIC. The XBASIC loader isn't even suggested in the manual, so it may be possible, it may not be. Better to just leave this to the "assembly gurus." What the Gramulator does to use a saved cartridge is first you put it into the Gramulator's memory from disk. Then you reset the computer once the drive has finished. Then you set a little switch on the Gramulator from "Gramulator to Cartridge". Then, having pressed the proverbial ANY KEY, you will find that the dumped cartridge is on the menu, as well as any others you may have loaded into the Gramulator at the same time. The cartridge runs as usual.

Second, the documentation describes clearly and concisely how to do everything from saving cartridges and then using them to how to make the Disk Manager 2 cartridge capable of operating 4 drives instead of the usual 3, to putting your name on the master title screen and changing TI BASIC to your own obscure dialect, where "FUN" replaces "RUN", etc... The problem is it does not tell you why you turn on the bank switching in some cases, and why you leave the write protect off in other cases -- or what the loader and RAM 1/RAM 0 select switch does. Otherwise, the documentation is pretty good.

Lastly, the shape of the cabinet is an awkward shape for typing. Being a two-finger typist, it just makes me feel crowded. But, when I put my fingers on the home row, the corner pushing its way into my hand from the cartridge port is insupportable. CaDD, if you can read this print, ROUND THE EDGES!!! The battery is in a very easy to get at place in case of servicing, but I have lost data in the Gramulator due to its position -- the top of the cartridge port catches the battery's positive clip, breaking the connection. There are no capacitors in the Gramulator to protect against short power interruptions. It is hard to plug in properly due to the position of the battery.

Even though it could stand a few improvements in these areas, it is an exciting product!

FAST EXTENDED BASIC

LUCIE DORRIS

Before starting this month's column, I want to thank the friends who helped me during my continuing hardware problems; the problems are still there, but for the past few months I was able to produce my monthly column and cover picture with the help of borrowed peripherals (but good ol' console is still working like new!): Henri Monat, Jane Laflamme and Dave Morrison, thank you. I am still working with some borrowed hardware, but with my own drives. This is what a Users' Group is all about!

As for the Cover picture: it was done with the DISK OF DINOSAURS that Michel Gosselin reviewed last month; the landscape is one of the two on the disk, but as Michel said, the dinos are too big (or the beach too small) and I had to erase part of the background, then redo it around my actors; a tough task. Who will win? Frog or dinos? Stay tuned... And if you wondered about last month's cover picture, "After the Fest", it is... after Edouard Vuillard, a French painter of the Nabi group; the original, "Au lit", dates from 1890.

There are a lot of Checkbook reconciliation programs around; but most are too cumbersome for the average person, who writes only a few checks a month, and make even makes few deposits... This program will not keep a file of your checks; you use it only once a month, when you get your bank statement (or have your bank book updated), to balance with your own register. It is always a good practice to make a note of every transaction in it: that way, you always know where you stand, without having to wait for the monthly statement. If you already do that, skip the next paragraph!

When you receive your bank statement, or each time your bank book is updated, you should check the deposits and cleared checks into your register; there is usually a column just for that. Before using the program, you should also enter the interests and administration charges, mark them as checked, and calculate the new balance. You then take the bank statement final balance, add the not yet checked credits (deposits, transfers to), then subtract the debits (checks, transfers from, and withdrawals) that have not yet been cleared by the bank. If you made no error, the result should be the same as the bank balance. Of course, I always forgot something, made errors in the numbers, never remembered if the credits should be added or subtracted... and I never balanced... so I wrote this quickie and have been using it regularly since.

The program is short, but don't be fooled: it is packed with goodies, and could be used as a review of what we have learned so far. I tried to make it as performing and compact as I could, using a lot of the functions we learned (minus the sprite ones), plus a few more. Please read the text carefully before typing.

```
100 ! ** CHECKBOOK RECONCILIATION ** L. Dorris / Ottawa U.G. / 1985-Apr.1989
110 CALL CHAR(92,"00000000FF00FF",128,"000000FF",129,RPT$( "18",8))
120 CALL COLOR(13,14,1) :: ON WARNING NEXT :: IM$="#####.###"
130 B$=CHR$(129) :: S$=" " :: LB$=" "&B$&S$&S$&B$&S$ ::
    ER$=RPT$(LB$,9)
140 DIM M$(2),A(20),B(20) :: M$(1)="CREDIT" :: M$(2)=" DEBIT"
150 CALL CLEAR :: GOTO 170 :: AM,C,K,NL,X :: CALL SCREEN :: !@P-
160 ! ** start **
170 DISPLAY AT(1,1):"LI"&B$&" DEBIT CREDIT "&B$: : : " CHECKBOOK
    RECONCILIATION" :: CALL C(4,5,128,24) :: CALL C(0,3,128,28)
180 DISPLAY AT(8,1):" Before starting, you must":" enter the INTEREST/ADMIN."
    ":" charges in your register,":" and mark them as CHECKED."
190 DISPLAY AT(13,4):"Find the new BALANCE.":" When asked for CREDIT or":
    " DEBIT, enter only amounts":" not yet checked."
200 CALL C(21,3,128,28) :: GOSUB 400 :: GOSUB 390
210 CALL SCREEN(8) :: NL=0 :: X=1 ! ** enter data **
220 CALL S(X) :: CALL D(" [D]ebit [C]redit [E]nd",67,69,K)
230 IF K<>69 THEN GOSUB 410 :: X=X+1 :: IF X<21 THEN 220
240 NL=X-1 :: FOR C=1 TO 150 :: NEXT C ! ** end options **
```

```

250 CALL SCREEN(15) :: CALL D("Clorr [Bal. rg re]Dlo [E]nd",66,69,K) ::
    ON K-65 GOTO 260,300,370,370
260 CALL SCREEN(10)! ** balance check register **
270 CALL D("REGISTER BALANCE:",24,19,AM) :: IF AM=B(NL) THEN 250
280 IF AM<B(NL) THEN AM=B(NL)-AM :: S$="BANK" ELSE AM=AM-B(NL) :: S$="REG."
290 DISPLAY AT(24,1):USING "$###.## TOO MUCH in ### >":AM,S$ :: ACCEPT
    AT(24,28)BEEP:S$ :: GOTO 250
300 CALL SCREEN(4) :: ! ** corrections **
310 CALL D("CORR. LINE? (0=BNK BAL)",24,25,X)
320 IF X>NL+1 OR X=21 THEN 250 :: IF X=0 THEN GOSUB 400 :: GOTO 360
330 IF X<=NL THEN C=17+4*SGN(A(X)) :: CALL C(X,C,60,1) ELSE NL=X ::
    CALL C(X,2,62,1)
340 CALL D("new val: [D]ebit [C]redit",67,68,K) :: GOSUB 410 ::
    IF AM=0 THEN 340
350 IF X=NL THEN CALL C(X,2,32,1) :: IF X<20 THEN CALL S(X+1)
360 FOR C=X+1 TO NL :: CALL B(C,B(),A(C),IM$) :: NEXT C :: GOTO 250
370 IF K=69 THEN END ELSE GOSUB 390 :: GOSUB 400 :: GOTO 210 ! ** end/redo
380 ! ** subs **
390 DISPLAY AT(3,1):ER$:ER$:LB$:LB$ :: RETURN ! erase/display vert. bars
400 CALL D("Enter BANK BALANCE:",24,21,B(0)) :: DISPLAY AT(1,21):USING
    IM$:B(0) :: RETURN
410 CALL D(M$(K-66)&" [esc=0]:",24,18,AM)! ** ask for debit/credit
420 IF AM=0 THEN IF NL=0 THEN X=X-1 :: RETURN ELSE RETURN
430 IF K=68 THEN AM=-AM :: C=4 ELSE C=12
440 IF NL AND SGN(AM)<>SGN(A(X)) THEN CALL C(X,6,32,16)
450 DISPLAY AT(X+2,C)SIZE(-8):USING "###.##":ABS(AM) ::
    CALL B(X,B(),AM,IM$) :: A(X)=AM :: RETURN
460 !@P+ ** user-def. subs **
470 SUB B(X,B(),AM,A$) :: B(X)=B(X-1)+AM :: DISPLAY AT(X+2,21):USING
    A$:B(X) :: SUBEND
480 SUB C(R,C,K,S) :: CALL HCHAR(R+2,C,K,S) :: SUBEND
490 SUB S(X) :: DISPLAY AT(X+2,1):STR$(X) :: CALL C(X,23,92,8) :: SUBEND
500 SUB D(A$,A,B,K) :: DISPLAY AT(24,1)BEEP:A$
510 IF A=24 THEN ACCEPT AT(A,B)VALIDATE(NUMERIC):K :: GOTO 530
520 CALL KEY(3,K,S) :: IF S=0 OR K<A OR K>B THEN 520
530 SUBEND

```

Entering the data, and calculating the final balance, takes only a few lines, 210-230. But, since I kept making mistakes even with the help of Tex, I added two options: when you have finished entering the data, you can CORRECT it; if you still don't balance, you can then compare your balance with the one in your register. If you really goofed, or have more than one bank account, you can always restart.

Before entering a value, whether in enter data or correction mode, you must tell Tex whether it is a DEBIT or a CREDIT, so that he knows where to place it on the screen, and save it in his memory as positive or negative (you should never see a "-" on your screen, unless you are in the red: then your balance will be negative...). There is space for twenty transactions: more than enough for one month, for an average person like you and me. When you have entered all your data, press "E" for End: you will be offered (line 250) options to Correct, Check with the balance in your register, Redo; if you are lucky and made no mistakes, you can just press "E" again to quit.

In CORRECTION mode, you are asked which line to correct; you can also correct the bank balance, numbered line 0, or keep adding lines if you forgot an amount when entering your data: that line is always the next after last, and its number will show on the screen to remind you. Tex will again ask you if DEBIT or CREDIT, because it is a common error to enter a DEBIT as a CREDIT (why not! makes you richer...), or vice versa.

In BALANCE REGISTER mode, you are asked for your register balance; Tex will then compare it with your bank balance. If it is greater, you have more money in your register than in the bank; careful! If not, you have more money in the bank, lucky you. In both cases, check everything carefully, you can still make all the corrections you want, since pressing <ENTER> will get you back to the option prompt.

Now the detailed analysis of the listing: in line 120, ON WARNING NEXT tells Tex to redo the ACCEPT if you enter a string when he wants a value, or vice versa; the ACCEPT value statement in line 510 already validates numeric only, but when in a hurry we sometimes press <ENTER> (an empty string) and Tex, quite

mad, gives you a WARNING that disrupts your screen... therefore this wise precaution. IM\$ defines one of the IMAGE that we will use many times in the program (with DISPLAY AT USING, we can use a string variable, but not a numeric variable for line number...).

Next line, some strings: they are not used often, but help make the program work much faster: LB\$ is an empty screen line, containing char. 129, a vertical bar, first defined as B\$ because we also use it in line 170 and that makes for a cleaner program line, and S\$, a string of eight spaces; then ER\$, our eraser, is built: since LB\$ is 28-char. long, ER\$ will be 252-char. long, enough to erase/display nine lines in a zip. In line 140, M\$(n) are messages to be printed when asked for a value.

Two days ago, the program had not one user-defined sub; then I started to create and eliminate them as I worked on it -- when you understand how useful they are, and so byte-saving, you just cannot do without them! We encounter the first one, C for CALL HCHAR, in lines 170 and 190: the parameters are simply row, column, char. and repetition; why a sub? well, "C" takes fewer bytes in memory than "HCHAR"... and some of the characters need to be displayed two rows below the screen line, as when correcting data, so we also save a lot of "+2"s, but we need to adjust some CALL Cs, therefore the row "0" in the second one. Lines 180-210 are easy: some instructions, another CALL C, then GOSUB 400 to enter the bank balance and display it, then GOSUB 390 to erase the instructions.

The ENTER DATA portion starts by CALLING the SCREEN... its usual blue, because the other portions each will have a different screen color; when we restart the program, we want that blue back! NL, total number of lines, is set to 0 here for the same reason (I use it as a flag to know if some subs are called from the enter or correction portion: it is given a value only when you finish entering your data, in line 240). X is our all-purpose array/line counter. CALL S displays the next line number, and also a double bar (char. 92) in the balance column, to underline your last balance.

SUB D replaces no less than seven sequences of DISPLAY AT(24,1) followed by CALL KEYS or ACCEPTs; how does Tex know the difference? Well, the number of parameters passed is always the same, but they don't always have the same meaning: look at lines 500-530. If the second parameter, a numeric value read as A, is 24, this means next ACCEPT (lines 270, 310, 400, 410); otherwise, it means do a CALL KEY, its lower limit being this A (lines 220, 250, 340). Next parameter is the column for ACCEPT, the higher limit key for CALL KEY; last one is the returned value: always passed back as K for the CALL KEYS, or any numeric variable needed by the program for the ACCEPTs. The use of sequential key values for the CALL KEYS explains why you must press "D" for "Redo" in the option prompt, line 250.

If the key pressed at the prompt is C(redit) or D(ebit), GOSUB 410 to ask for the amount and display it. Here is how, lines 410-450: the string passed to CALL D is a prompt; if key is 67 (C), display message M\$(K-66), i.e. M\$(1), "CREDIT"; if 68 (D), then "DEBIT". If you enter "0" to escape, then if NL=0, this means we came from ENTER DATA, decrement X and return; if NL>0, don't touch the X, but return also, this time to CORRECTION. Then, in line 430, if the key is 68, we have a DEBIT, so the value becomes negative in memory, and the display column is 4, otherwise it is 12. The next line is used only if NL>0 (shortened as "IF NL"), i.e. if we came from CORRECTION: if we replace a negative number by a positive one, we need to erase the former value A(X) on screen; if the sign is different, SGN(n), an XB function (see below), will be too. Line 450 displays the ABSolute value of AM on screen, since we don't want to see the negative sign.

As in ADDSUB, all sub-balances are kept in memory, in a B() array, and shown on screen; SUB B, called from line 450, simply adds or subtracts the new amount AM to the previous sub-balance, and displays it on screen. A note on the parameters passed: the "B()" is not a typing error -- it means pass the whole array, since we need both the previous balance and the new one; we also pass our current line number X, the new amount AM, and the image IM\$. Finally, upon return from SUB B, A(X) takes the value of AM.

We get to line 240 when we have entered all our data or reached 20 entries; the small delay FOR-NEXT C prevents us from ENDING by mistake if our finger is too heavy. The screen changes color, and we get four options. [E]nd and re[D]o (erase display, then ask for bank balance) are dealt with in line 370.

BALANCE REGISTER simply takes your register balance as AM, then compares it with the bank balance contained in B(0); the message uses an IMAGE, where S\$, a now useless variable, is re-used twice: as part of the message, then as ACCEPTED value to make the cursor blink until you press <ENTER> (or any other key, but then you must also press <ENTER>!). We cannot use CALL D here because <ENTER> cannot be read as a numeric value.

The CORRECTION module is more complex, but so useful! You first enter the line number, from 0 for correcting the Bank balance, to NL+1 if you want to add a debit/credit. Tex will then act according to the value of X (line number). If the number is too high, back to ACCEPT; if zero, GOSUB 400 to ask for new bank balance, then to line 360 to recalculate all the sub-balances kept in the B() array. If the line number is between 1 and total NL: you will get a "<" besides your present value A(X). To find the right column, we use the SGN function again. Since it returns "1" if the value is positive, and "-1" if negative (or "0" if zero), we use it to calculate C: if A(X) is a DEBIT, therefore negative, $C=17+4*(-1)=17-4=13$; if positive, do it, $C=21$. Else, if X is none of the above, it must be equal to NL+1, so NL takes that new value, and a ">" appears at the left of the line number.

Again, a DEBIT/CREDIT prompt, then GOSUB 410 to get new amount and display it (see above for line 440). If you pressed the wrong key, enter "0" to get the prompt again; if you really got here by error, just re-enter the value already on screen to escape! If you have corrected the last line or added a new one, line 350 will erase the ">" in column 2 if there is one and, if we have not yet reached the bottom of the screen, display the next line number and the double bar under the balance with CALL S.

We finally re-calculate all the sub-balances by CALLing B in line 360; don't worry if you corrected the last line, Tex will understand and will not bother (you can always write something like: 'FOR X=6 TO 5 :: DO SOMETHING :: NEXT X, Tex will skip it with no objection.

If you need to DEBUG, this program or any XB one, here are a few tips for common errors: always check your typing carefully! In particular, count your parentheses: in a statement, the number of "("s is always equal to the number of ")"s, and Tex does check them! Be also careful with ">" and "<": inverting them will cause great problems, and Tex does not check them, because he doesn't know what the programmer intended. And if you get a SYNTAX ERROR and your typing is perfect, it means that Tex has encountered a variable which is not included in the pre-scan (the XB guru obviously ran out of memory when he wrote those error messages...).

And if you typed last month's SORT program and find XB too slow, good news: the SORTING assembly routine has just been published by MICROpendium (April 1989, p. 32) as a text file, so you don't need the Assembler. It consists of a bunch of letters and digits (machine language in hex code, 22 very full lines) to type into TI-WRITER and then save with the F option to create a DIS/FIX 80 file. If you don't have TI-WRITER, you can even still do it: OPEN a DIS/FIX 80 output file, ACCEPT each line as A\$, then PRINT A\$ to the file, then close it. I personally did not have the time to type it yet, but it should work with my program. The assembly file must first be LOADED, then the routine LINKed to the program when needed. If you decide to go that route, here are the changes you will need to make in last month's program:

```
155 DISPLAY AT(10,1)ERASE ALL:"Loading ASSEMBLY" :: CALL LOAD("DSK1.SORT/O")
320 CALL LINK("SORT",N$( ),N)
```

[and delete lines 330-370.]

In the above addition, N\$() is of course our entries array (passed in its entirety), and N is the total number of entries. If you want to get that issue of MICROpendium, or to subscribe (how can you live without it!), write to: P.O. Box 1343, Round Rock, TX 78680.

Have a good summer!

TI BASIC continued from May
by Steven Shaw

In the section on advanced programming the use of single byte control codes in explained. The following are the meanings of the various codes. NB: They are not all available in TI Basic or Extended Basic.

CODE; MEANING:	CODE: MEANING:
129 ELSE	193 +
130 :: (Ex Bas Separator)	194 -
131 ! (Ex Bas tail rem)	195 *
132 IF	196 /
133 GO	197 ^
134 GOTO	198 unknown
135 ??	199 'string follows'
136 ??	200 'number follows'
	ALSO used with CALLs.
137 DEF	201 LINE NUMBER FOLLOWS
138 DIM	202 EOF
139 END	203 ABC
140 FOR	204 ATN
141 LET	205 COS
142 BREAK	206 EXP
143 UNBREAK	207 INT
144 TRACE	208 LOG
145 UNTRACE	209 SGN
146 INPUT	210 SIN
147 DATA	211 SQR
148 RESTORE	212 TAN
149 RANDOMIZE	213 LEN
150 NEXT	214 CHR\$
151 READ	215 RND
152 STOP	216 SEG\$
153 DELETE	217 POS
154 REM	218 VAL
155 ON	219 STR\$
156 PRINT	220 ASC
157 CALL	221 PI
158 OPTION	222 REC
159 OPEN	223 MAX
160 CLOSE	224 MIN
161 SUB	225 RPT\$
162 DISPLAY	226-231 Not known
163 IMAGE	232 NUMERIC
164 IMAGE	233 DIGIT
165 ERROR	234 UALPHA
166 WARNING	235 SIZE
167 SUBEXIT	236 ALL
168 SUBEND	237 USING
169 RUN	238 BFEP
170 LINPUT	239 EKASE
171-175 Not known	240 AT
176 THEN	241 BASE
177 TO	242 Not known
178 STEP	243 VARIABLF
179 ,	244 RELATIVE
180 ;	245 INTERNAL
181 :	246 SEQUENTIAL
182)	247 OUTPUT
183 (248 UPDATE
184 &	249 APPEND
185 Not known	250 FIXED
186 OR	251 PERMANENT
187 AND	252 TAB
188 XOR	253 # (for files)
189 NOT	254 VALIDATE
190 =	
191 <	
192 >	

HOTLINE NUMBERS

The executive has expressed a desire to assist all members should you have some problems or questions, want to do some library swapping or borrow a book. This will be the place to look. Listed here are the members of the executive, committee heads, and others in the group willing to help in their specialized areas. 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, so I hope to add to this list. 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.

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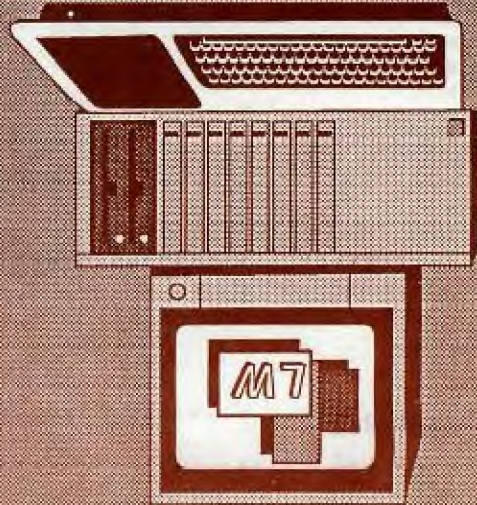
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