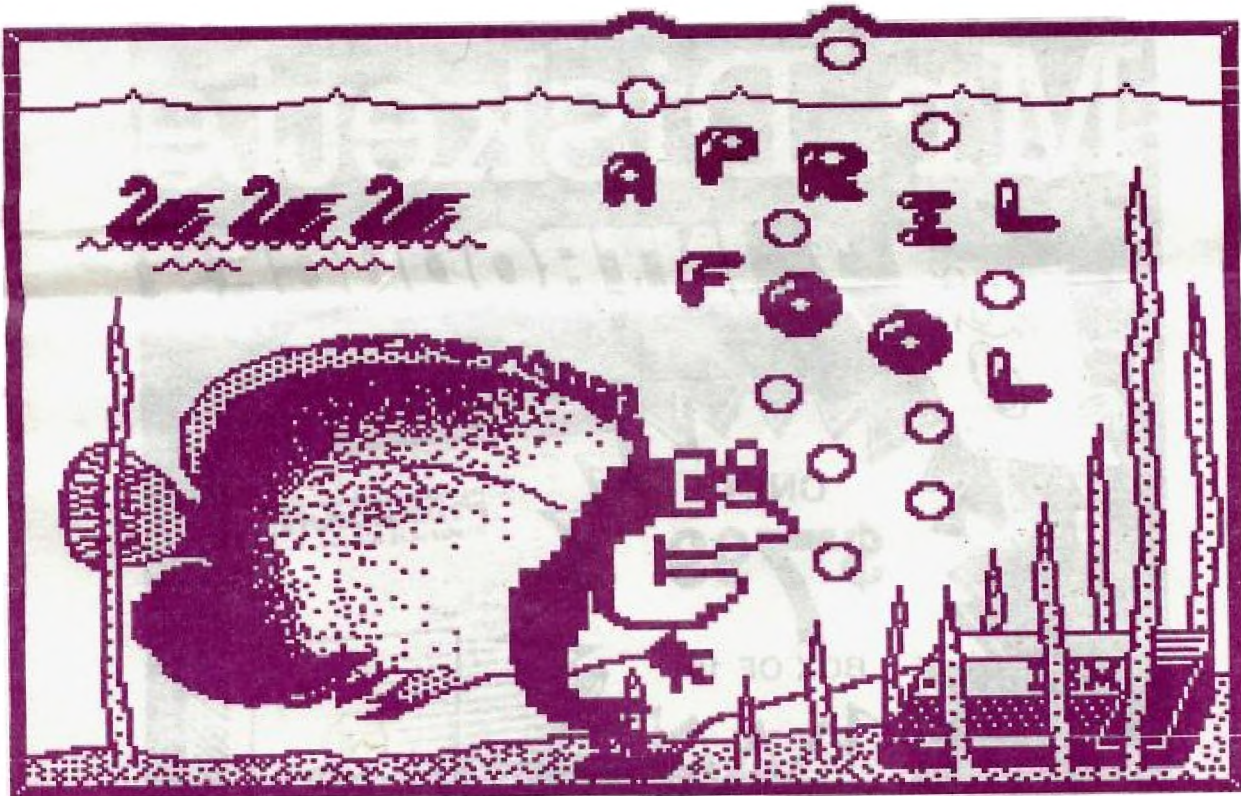# The Ottawa T.I.99/4A Users' Group

NEWSLETTER

VOLUME 7 NUMBER 04........APRIL 1988

DON'T FORGET THE MEETING -- APRIL 5, 1988
* ALTERNATE ROOM THIS MONTH!   SEE INSIDE. *

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

COMING EVENTS

April Meeting:	April 5, 1988 7:30 p.m.	Merivale High School * Not in the Cafeteria this month! Instead, downstairs in the lecture hall. *
May Meeting:	May 3, 1988	Merivale High School Back in the Cafeteria
June Meeting:	June 7, 1988	Merivale High School
Beginners Assembly:	April 20, 1988 7:30 p.m.	Dick Piché's home Contact Bill Sponchia for further information.
Newsletter Deadline:	April 15, 1988	

EDITOR'S NOTES
from
Ruth O'Neill

This month, the newsletter is missing one usual feature, and has gained another. The missing one is Bill Sponchia's "Questions and Answers". The questions have been coming in a bit too slowly to keep the column going in that format, but Bill has a lot of information to share with us, so he will be changing to "Hints, Tips and Answers". (Thus avoiding any possible scandals that could result if he made up questions.) Your questions are still very welcome, so don't hesitate to contact him through the mail, by phone, or on the BBS. A note for any skeptics: he really is there regularly, now! The new feature is Stephen Bridgett's "MAIL CALL", where he'll be keeping us posted on the group's correspondence.

I hope everyone will join me in welcoming Dave Morrison to these pages as our new Librarian. Let's show him all the support we can!

And thank you once again, Lucie Dorais, for the cover art!

The President's Two Cents' Worth
by Michael Taylor

Our TI-FEST is now behind us for another year. In spite of last minute trepidation, it was a success. For that success we owe thanks to the FEST coordinator, Jane Laflamme, and to the many members who assisted her. Thanks also to the members who turned out at the FEST. Your participation encourages the vendors to continue to support the TI world.

In regard to that latter point, a group is planning to attend the New England Fayuh in Lexington (Boston), Mass. on the weekend of April 9. If you are interested in joining the expedition, call me or Jane. Perhaps you were too busy at our FEST to really visit the booths or listen to the talks; if so, here is an opportunity to catch up on what you missed and to show the colours of the Ottawa group. Mutual support within the TI community is also important; besides, these expeditions are always fun trips (provided you don't mind losing a strip of bacon or a french fry occasionally). [Editor's note: or more than occasionally!]

I understand a copy of TEXLINK was sold at the FEST. While this is not exactly a runaway seller like Charles Earl's TELCO, it is a start. A few more sales and Ottawa could corner the TI BBSing market!

At the last general meeting (Feb.), the executive was directed to consider expanding the scope of our group to include the IBM PC (and clones). This is a major topic and many members are already polarized on the subject. By the time these words appear, the executive will have made its first attempt to deal with the question. I anticipate we will not resolve it in one meeting since a change to our constitution would be required to add to the scope of our club. Please convey your thoughts on the subject to members of the executive. Remember, we work for you to further the group's interest.

The club's 300 baud acoustical modems have all been lent out; however, if someone would like to borrow a modem for a trial period, please leave your name with me. The club modems are only loaned for a short period and as they are returned I will lend them out on a first come, first served basis.

Dan McCormick has asked for someone to take over from him on the telephone questionnaire. A volunteer, please. I understand most of the members have been called; it remains to process and present the results.

The C language workshop has evolved into an advanced programmer's workshop which will address topics in C and in assembler. Talk to Tom Bentley or Charles Earl concerning dates and locations.

Finally, don't forget the "How To..." workshops being coordinated by Bill Sponchia. Bill is deliberately keeping these low key, introductory level get-togethers.

BROWSING THE LIBRARY
with DAVE MORRISON

As your new Librarian, my first contribution to the Newsletter is to request
That you re read Stephen Bridgett's "BROWSING THE LIBRARY" column in the last
few editions of the Newsletter. They are well worth re-reading and I fully
support everything that he has written. I also wish to suggest that when you
use a programme from the Library in which there is a request for a donation by
the author, please take the time to consider the time and effort it has taken
the author to produce that programme. If you don't like and don't use it, so be
it · but if you have found it useful in your work or play, please make that
little extra effort to send a cheque or money-order, together with a few words
of appreciation (or even criticism!). Effective immediately, the Library will
be available to members, seven days a week, daytime and evening, at any
reasonable hour. I am willing to make up disks from any listing in the Library
Catalogue, or you may visit and "do-it-yourself". As Stephen Bridgett was, I
also am, open to any suggestions that would enhance or improve our Library, so
please call me at 737-4889.

GENEVE UPDATE
by Jack Adams

MYARC was represented by Lou Phillips at the TIFEST Mar.5th in Ottawa. His main
interest was the new Hard-disk and disk managing system which seemed to be
rather exciting. However there wasn't too much printed information available
and I missed hearing his presentation later on in the afternoon. Perhaps next
month will bring forth some newsworthy items.

Paul Meadows, of "The Orphanage" in Nova Scotia, has passed the word that he is
interested in compiling a Geneve User names and address list to set up an
information exchange. If you can find the time, please drop him a line at the
following address:

2846 Gottingen Street
Halifax, NS
Canada
B3K 3E1

(902) 454-0232 [BBS 455-2076]

Until next month, happy Geneve-ing.

And the Winner Is...

At the FEST on March 5, the winner of the special Printer Buffer door prize was
one of the people who had Bill Sponchia hold their tickets for them:

******** TOM SOMERTON ********

of Ottawa. Congratulations, Tom. We hope you'll enjoy it.

MAIL CALL !!!

Getting off on the right foot, I will make a sweeping apology to all those folks who have written to us and may have since forgotten about us. No doubt about it, the mail is behind. Well, I could blame Her Majesty's Post as everyone else does, but in truth, the mail has just not had the attention it deserves. Why not? - "No time" is the simple and yet not very satisfying answer. However, as past Librarian, I want to say that without a doubt, the most rewarding job I've had to date is talking/writing to TI'ers. To all our TI enthusiasts who have written to us and not yet received a response, we apologize, and as your new correspondent, I will attempt to make amends.

Formalities out of the way, let's make a summary of those folks whose letters I have yet to answer. By the way, many, many letters have been answered! If yours hasn't then it just means that it's getting closer to the top of the pile. Oh yes - I give preference to Ottawa members. If you are reading this newsletter, you probably are a member. We welcome and respond to all correspondence, but members will always get priority.

Here is the list of unanswered correspondence as it sits on my desk, last name first and in alphabetical order:

BECK, MARK; BRANDON, WILLIAM; CHAMBERLAIN, C.; CRANKSHAW, EDWARD; DUBECK, JOSEPH; GILLIAND, K.W.; KROLL, MARTY; LARUE, HAZEL; LEFEBRE, RONALD; LYNN, MATT; MEDICI, ENNIO; MOORE, FRED; NADEAU, DAN; REJEAN, ANDRE; RAAP, CHRISTIAN; SHELLENBARGER, N.R.; STARKEY, NEAL; WALROD, LAWRENCE.

If your letter has been misplaced, please let us know. We do care!

Bulletin board messages will be considered valid correspondence. I am on the board every day, and even a quick call from the west coast on off hours won't cost you much more than postage. It's your medium, and it's there to tie us all together. If you haven't tried it, I sincerely recommend the experience. Check the phone number and terminal configuration on the HOTLINE page of this newsletter.

In this column I hope to reprint your requests, suggestions and feedback. I'll *make the monthly article as interesting as you permit*. Next month we'll get right into it! As they used to say (somewhere, sometime or other), 'keep those cards and letters coming folks.'

Stephen Bridgett

2846 GOTTINGEN STREET, HALIFAX, NS CANADA B3K 3E1
902-454-0232 [BBS 455-2076 24hrs 3/1200]
[formally The ORPHANAGE Computer Store]

GENEVE
9640

Data Port

MYARC AMSTRAD

REPORT ON THE THIRD ANNUAL CANADIAN TI-FEST

Once again, the Canadian FEST turned out to be a great success. As is usual with most large events, at one point we were beginning to wonder if anyone was interested in coming. We had heard by word of mouth through Bob Boone's travels, but on paper nothing seemed to be materializing. Then it happened; one by one, vendors, distributors, manufacturers and most importantly, users, began to send in letters that they were attending... We had a show! And now Ottawa had to pull through, and show the world our colours.

The local media were informed and kindly gave us some good air time; we put classified ads in the local papers; we heard from some users who were astonished to hear we were around... We rounded up volunteers; had commitments for their equipment; banners were planned; name tags; lunch and dinner arranged; and this year, something new - we lined up a customs broker to be on hand for the U.S. dealers where they crossed the border. And all this was done around two very exciting events, the release of our own assembly language, multi-message base BBS, TEXLINK, and the release of TELCO by our very own Charles Earl. These past few months have been very exciting for the Ottawa Users' Group.

Friday, March 4th, we opened a hospitality suite in the "official" FEST hotel, the Talisman in Ottawa, to welcome our out-of-town guests. They started coming in early in the afternoon. We had users from New Brunswick, Nova Scotia, Quebec, Ontario, and Alberta. We met for the first time some users from northern New York, and also, for some of us, Chris Bobbitt, Jim Horn, Peter Hoddie, and Lou Phillips. I wish we had had a tape recording of the discussions held in that room! The next day, the users from Montreal arrived - by bus! - and, of course, there were the local people.

We were very excited about Chris Bobbitt's new release from Asgard Software, Calendar Maker 99, written by Chris and Ed Johnson. (You should see it! Its a super program.) He also donated a copy for a door prize, plus gave us a very optimistic talk on the /4A into the '90s. Charles Earl had a booth and was showing TEXLINK in conjunction with Version 1.1 of TELCO. Lou Phillips, in addition to demonstrating MY-Art, the fantastic drawing program for the GENEVE, showed us the exciting HD controller. He concluded his talk with their plans for future developments for his computer, which includes, among others, a programmers package, and a professional word processor. Jim Horn, representing Disk-Only Software and Compuserve, talked to us about telecommunications and we in turn picked his brain on the optimum use of Compuserve! We also thank him for a door prize, the Orphans Survival Handbook. (The recipient was very excited about it.) Peter Hoddie gave us a demonstration of Genial Computerware's up and coming release, FirstBase..... and what a database package that is going to be! With IBM-style query commands, multiple keyword searches, large capacity, (to mention just a few of its features!) it is being written by Warren Agee in C99 and slated for release in the second quarter of '88. (The C99 compiler was written by a fellow Canadian, Clint Pulley.) We were very disappointed that Barry Traver was unable to attend this year, and wish him well in his recovery. And speaking for the Ottawa group, we understand why Genial TRAVelER is behind! Don't worry! And we hope to bring the Canuk Contingent, at this point about ten of us, to Boston to tell you just that - Peter did the job for them! (As I was writing this, Genial TRAVelER arrived in the mail. Which reminds me of a retort to Cynthia Becker's remark on the U.S. "Snail" on our BBS. Our mail corporation is called Canada Post, and Ken McKenzie asked Cynthia if she had ever seen a "POST" move! Different countries, but related problems?)

I digress... Michael Koeckritz of Canaria Data Inc., 264 Weber St. W., Kitchener, Ontario, N2H 4A6, is also developing a new PE Box. He had one up and running at the fair, but as yet it is not in full production. He expects it to be available around the second quarter of '88, with a projected price tag of approximately $250 Cdn. (With 12% F.S.T., 3.9% duty, plus the exchange rate on the Canadian dollar, some U.S. items get pretty pricey for the Canadian User. This is a very attractive price and it's great to have a Canadian jumping into hardware manufacturing. We wish him luck.)

There were other booths, including Users Groups "9-T-9" from Toronto, manned by Gary Bowser of T.A.S.S. fame, CIM99 of Montreal, manned by their president, Sylvain Mornard, the Ottawa group's library, run by librarians Stephen Bridgett and David Morrison, a "console only" booth manned by Jack McAllister, plus, for those so inclined, games with Dave Caron and Daniel Laflamme at the helm. But

the one with the hardest job of all was Lucie Dorais (also the head of our membership committee). She organized and ran the "rummage" sale. Lots of good bargains at that booth... The show was rounded off by miscellaneous Ottawa booths for information and free literature donated by dealers who were unable to attend, and local vendors of hardware, disks, paper, etc.

Ahhh, but did I forget one? No! I saved him for last... Bob Boone, our undisputed Ottawa User Group Ambassador, of Computer Download Unlimited, had a booth and was spreading his words of wisdom around freely, plus selling those hard-to-get items for the TI. (He always manages to find 'em.) The reason I saved him for last is because we dedicated the show to two people in the opening ceremonies, he being one. After a glowing record of his services from our Past President Bill Sponchia, Michael Taylor, our current President, presented him with a trophy thanking him for all he had done for the club and the TI community in the past. (He did a one-man blitz in circulating Bruce Caron's DM1000 for Ottawa and together with Bruce, wrote our very first BBS program, for instance!) The other was Berry Minuk, one who put a tremendous amount of energy into the club. He was a founding member, served as Vice-President, and suddenly passed away last May, in his second year as President of our group. Berry was always there with words of wisdom and travelled far and wide with us to various different shows over the years. We dearly miss him......

When the show was over, we packed up, thoroughly tired, but once we got to the Talisman and started mingling with the dinner guests, somehow the adrenalin started to flow again. Conversations picked up, and with renewed energy after a meal, we wandered back to the hospitality suite, and the wonderful companionship that TIers enjoy.

Personally, I lasted 'til midnight. How much longer others lasted, I never found out... (I know some lasted to the wee hours on Friday night, or should I say Saturday morning.)

In closing, I would like to thank all of those Ottawa group members that helped to put on a large project like this. Without them there would be no show. Secondly I would like to thank all the dealers for contributions to the door prizes (from both Canada and the U.S.). Some sent items even though they were unable to attend. Lastly, thank you to the dealers, distributors, and manufacturers who did attend; we dearly hope it was a successful show for you and hope you will think of Ottawa with fond memories. We appreciate your continued support of our computer and hope that we in turn will show you how much, by purchasing your products through the coming years.

Hope to see y'all in Ottawa next year!

Jane Laflamme, 1988 CANADIAN TI-FEST Co-ordinator and Vice President of the Ottawa TI-99/4A Users Group, P.O. Box 2144, Station D, Ottawa, Ontario, Canada - K1P 5W3

By David Caron

In last month's newsletter, I explained how to access the 9901 through the CRU lines, how to program the interrupts, and how to program the internal clock, but I did not get around to explaining how to use the chip for simple inputs and outputs. In order to properly understand this article, you will have to dig out the March newsletter to recall how to access the 9901, and you will also need the February newsletter which contains the pinout and the memory map for the 9901. (Sorry if you find it tedious referring to two newsletters as well as reading this one, but there simply is not enough room in one newsletter to explain all the fantastic features of this chip.)

The last thing I mentioned was the fact that the 9901 can be reset two ways. The 9901 is automatically reset whenever the computer is turned on. The power is initially applied, and RST1 (active low, pin 1) is held low for a short period of time. The 9901 can also be reset by entering clock mode (SBO 0) and setting bit 15 low (SBZ 15). In each case the same effect occurs:

During reset all the ports will be programed to the input mode. Therefore if CRU bits 16 to 31 are read (TB 16-31) then the condition of their relative pins on the 9901 will be reflected in the read instruction. The equal status bit will be set if the pin read is being held high or floating high, and the equal status bit will be reset if the pin being read is held low.

Example: If pin 34 is being held low then TB 31 will reset the status bit. Of course, if MASK 15 was set to one, then an interrupt would occur the instant pin 34 was held low. If you wish to use CRU bit addresses which have a common physical pin on the 9901, it is a good idea to disable those interrupts. I am specifically referring to pins 27-34, which are both used for interrupts and input/output interfacing.

If you wish to set an input/output pin to output mode, you need only perform a SBZ or a SBO to set or reset the corresponding CRU bit for that pin, and the pin will automatically reflect the condition of the CRU bit register.

Example: SBO 16 will make pin 38 high.

By the way, once you have set an input/output CRU bit to output mode, it cannot be set back to input mode. If, for example, you read CRU bit 16 after it has been set to output mode, the state of the bit will be returned. In other words, if you used (SBZ 16) when you executed a TB 16, the status bit would be reset. Similarly, if you used (SBO 16), then when TB 16 was executed, the status bit would be set. The only way set CRU bit 16 back to input mode would be to perform the software reset as described above, which would of course reset ALL the input/output pins or relative bits to input mode. (This should not be a problem unless you have painstakingly set a selected number of input/output ports to output mode, only to mess up one of them and have to do it ALL OVER AGAIN).

WARNING: When setting the pins 27 to 34 to output mode, their interrupt bits SHOULD be disabled. (I cannot predict what will happen if the interrupts are still enabled, expecting data on those pins when you program those same pins to output data AT THE SAME TIME. Therefore, I suggest that you NOT try it.)

DOUBLE WARNING: If a device is connected to pins on the 9901 that are being used as inputs, that is to say, the device is forcing those pins low or high to communicate its intentions to the computer, DO NOT EVER go and program those pins to output mode. I can predict the results if you do:

If the external device is forcing pin 21 low and a SBZ is performed, then that pin 21 will be forced low both from the 9901 and the external device. Nothing much would happen in this case, nor would anything happen if a SBO was performed on the same pin that an external device was forcing high. HOWEVER, if a SBZ was performed while the external device was forcing that same pin high, then the 9901 would attempt to make that pin low and the external device would attempt to make that pin high AT THE SAME TIME. This condition is identical to connecting both ends of a battery together. The same condition would occur if a SBO was executed when the external device was forcing that same pin low.

1, 2 or 3 things could blow simultaneously. The first thing that could blow is your 9901. The second thing that could blow is your "external device", and the

third thing that could blow is the computer power supply, unable to cope with such a tremendous load. The most dangerous of the possibilities is the computer power supply, since the -5v line and the +12 volt line could be disrupted when the +5v line goes. The remaining two lines could spike , endangering the rest of your chips, although the latter is not to likely. Nevertheless, SBO and SBZ should be used with caution when programming the input-output ports to output mode. If there is a chance you suspect or realise that you have done the above, POWER DOWN YOUR SYSTEM IMMEDIATELY! Whatever you do, DO NOT TOUCH THE KEYBOARD.

Well, that about explains all the features of the 9901. Next month, I will try to explain exactly how the 9900 communicates with the 9901 through the CRU lines and how the 9901 can be replaced with simple gate chips for simple tasks such as enabling memory chips, (as in a ram disk it contains no 9901, yet it uses the CRU lines). If you have any problems, doubts or worries, feel free to contact me at 745-4618.

THE OUG ONLINE
by Ruth O'Neill

The Ottawa Users' Group BBS has been seeing a lot of activity for quite some time, and opened up a whole new world for me when I discovered it. I recently been introduced to a whole new world beyond that, on Delphi and Compuserve. I was first introduced to Compuserve when Bob Boone attended a conference at Jane Laflamme's home in February. It was exciting to see people from all over the continent all talking (typing) together. Over the next little while, I had the opportunity to see more informal chats as Bob happened to be online while other interesting people happened along. He uploaded TELCO to Compuserve, which has been a tremendous medium for distributing it. We also posted messages about our TEXLINK BBS.

Lately, some of our own people have been asked to host their own conferences. Shortly after his program's release, Charles Earl was the guest of honour to talk about TELCO. A number of people from our group watched that conference, again from Jane's terminal, and the people attending the conference knew that we were there. Our presence there has been greatly increased with all this, and just last Sunday (March 20) Jane Laflamme hosted a conference to tell everyone about our recent FEST and the other activities of the group, once again, with a number of other group members present. Tom Bentley was also asked to hold a conference, but was unable to make it on the available dates. These conferences can become very animated, and are a fabulous way to pass information around quickly. A lot of business is also done by way of private messages during the conference discussions. With all of this excitement, and after talking to Jim Horn and hearing his fascinating presentation on "Telecommunications: The Home Application that Apple Forgot" at our FEST, I rushed out to get onto Compuserve myself, and I've been having a wonderful time.

I've also had the opportunity to see part of a DELPHI conference, through Bob Boone, on the Canadian TI activity. During this conference, Jeff Guide brought up the possibility of creating a special area for Canadian TIers on DELPHI. I urge you all to get starter packs (Check with Bob) and get on to DELPHI soon, and give Jeff your support! This is just the sort of thing that keeps our TI community flourishing.

I'd like to see more people from our Group online at Compuserve, too. Currently, you'll find myself, Bob Boone, Jane Laflamme, and Charles Earl there, and we could use the extra support. (Bob, Jane, and Charles are also on Delphi.) Keep your ears open for word of the next conference the Ottawa TI99/4A Users' group will be attending, and make a date to come along and watch. You won't regret it!

This hasn't been written to discuss the relative merits of the two systems, or even to plug them over other available systems, such as The SOURCE and GENIE. These are the only two I've seen in action so far, and seem to be where the Ottawa Group is most active right now.

Come on in! The water's FINE!

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BY CHARLES EARL

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FAST
EXTENDED BASIC

LUCIE DORAIS

PRINT and DISPLAY are two of the most often used statements in XB, and their syntax is easily understood. But wouldn't it be nice to be able to tell the computer exactly how to place the variables on the line, without having to fiddle with the concatenation of strings, or trailing spaces for numeric variables? How about aligning a whole column of text and a whole column of strings?

Like bigger Basics (Microsoft's GW-BASIC, for example), TI's Extended Basic uses a statement called PRINT USING (plus of course DISPLAY USING). In the GW-BASIC manual, there are three pages of different ways to format your line, and you must tell the computer if your value is a string or a number; if a number, you must tell if it is positive or negative when you format the string! Quite complicated... The wise XB guru has provided us with only one way to do it: define the line by using any constant character, and the string or numeric values by replacing them with the maximum number of "#"s that you think you will need. Any character which is not an octothorpe (a.k.a. "#"), including the space and the comma, tells Tex to separate the values. And there is no need to specify if the value is a string or not - Tex will know and react accordingly. It will even learn and display the proper sign of your numeric value, so you can use the same format for almost anything. Better still, the period will be used for decimals if the value is numeric, or will be "forgotten" if the value is a string!

The PRINT USING statement normally expects the formatting string to follow (in ""s), as in PRINT USING "####":A$. But if you want to use the same format many times, you can use a very unique statement, called "IMAGE". It allows you to define any formatting string on a separate line, without quotes. Great idea isn't it? The only drawback is that if your value is bigger (i.e. has more characters) than the format defined, you get asterisks. Some problem, but not bad if you consider that if the same thing happens to you in GW BASIC, subsequent formatting can be destroyed.

This short program is a quick review of some of the possibilities; the results at the right are printed exactly as they would appear on the screen:

```
100 IMAGE ###/###.##                      | R
110 PRINT USING 100:100,3                  | E    100/  3.00
120 PRINT USING 100:5.23,-76.45            | S      5/-76.45
130 PRINT USING 100:2000,9999              | U    ***/******
140 PRINT USING 100:"TOT",258.50           | L    TOT/258.50
150 PRINT USING 100:"ME","THERE"           | T    ME /THERE
160 PRINT USING 100:"HOUSE","MAILMAN"      | S    ***/******
```

You will quickly note that the slash (a constant character; any other would have the same effect) separates the two values; numeric values are printed with decimals if there is a period, but only the integer part is printed if there is none. The values which are too big are replaced with asterisks. Another feature, very useful but hard to spot here: the string values are left-justified, the numeric values are right-justified. Great for printing lists of words and numbers! How about a short program to print a bill?

```
100 REM QUICKBILL/IMAGE DEMO - L. Dorais/March 1988
110 CALL CLEAR :: LI$=RPT$(" ",28)
120 CALL CHAR(95,"000000FFFF",124,"1818181818181818")
130 DIM N(15),IT$(15),P(15),TP(15)
140 GOTO 160 :: K,S,TOT,X,AD$,CI$,NA$,PC$,SP$ :: CALL KEY :: !@P-
150 REM == enter data ==
160 ON WARNING NEXT :: PRINT "       QUICK BILL MAKER": : :
170 LINPUT "Bill to: ":NA$ :: LINPUT "Address: ":AD$
180 LINPUT "City/Pr: ":CI$ :: LINPUT "P. Code: ":PC$
190 PRINT :"Now, enter the data for":"each item; enter nothing"
    :"when you are finished.": :
200 FOR X=1 TO 15
210 PRINT X; :: LINPUT "Item Name: ":IT$(X)
220 IF IT$(X)="" THEN 290 ELSE IF ASC(IT$(X))<65 THEN 210
```

```
230 INPUT "   How many? ":N(X):: INPUT "   Cost Each? ":P(X)
240 TP(X)=P(X)*N(X):: TOT=TOT+TP(X)
250 PRINT :: NEXT X
260 REM == screen display ==
270 IMAGE ############### |
280 IMAGE ### ############### $####.##
290 CALL CLEAR :: DISPLAY AT(1,1):USING 270:NA$,AD$,CI$,PC$
300 DISPLAY AT(5,1):LI$
310 FOR X=1 TO 15 :: IF N(X)=0 THEN 330
320 DISPLAY AT(6+X,1):USING 280:N(X),IT$(X),TP(X) :: NEXT X
330 DISPLAY AT(1,20):"TOTAL:"
340 DISPLAY AT(3,20):USING "$#####.##":TOT
350 DISPLAY AT(23,1)BEEP:LI$:"PRESS  <P>rint <R>edo <Q>uit"
360 CALL KEY(3,K,S):: IF S=0 OR K<80 OR K>82 THEN 360
370 IF K=81 THEN END ELSE IF K=82 THEN RUN  ! easy way out...
380 REM == print bill ==
390 IMAGE ###   ################ | $####.## | $####.##
400 IMAGE T O T A L :    $#####.##
410 OPEN #1:"PIO" :: PRINT #1:TAB(35):"* B I L L *": : :
420 SP$=RPT$(" ",15):: PRINT #1:RPT$(" ",11)&"TO: "&NA$:SP$&AD$
    :SP$&CI$:SP$&PC$: : :
430 PRINT #1:SP$&"NUM   ITEM NAME[14 spaces]UNIT     TOT. COST":
    SP$&RPT$(" ",46):""
440 FOR X=1 TO 15 :: IF N(X)=0 THEN 460
450 PRINT #1:SP$; :: PRINT #1,USING 390:N(X),IT$(X),P(X),TP(X) ::
    NEXT X
460 PRINT #1:TAB(53):"         ": :RPT$(" ",37):
470 PRINT #1,USING 400:TOT :: PRINT #1:"";TAB(53);"         "
480 CLOSE #1 :: GOTO 350  ! finished, return to the beep line
```

This crude program (but good things can always be improved) is divided into
three modules. The Input Data part is very simple; I decided to use the INPUT
and LINPUT (line input, which allows the comma) statements for simplicity. The
data entry for the address of the receiver is a straightforward string input,
with no error catching. The bill part is a bit more sophisticated, because it
is very easy to mix the data, and enter a number when asked for a string. If
you enter a number for "Item Name", the program checks to see if its ASCII
value (that of the first character of the string) is lower than 65, i.e. "A".
The error checking for the INPUT statements in line 230, which expect numeric
values, is controlled by the ON WARNING NEXT in line 110. Without it, your
program would crash with a not so nice "* WARNING INPUT ERROR IN 230"... With
it, it simply re-executes the statement and will keep doing it until you
understand.

Line 240 calculates the total cost for each item in the bill, and tabulates the
running total. You can enter a maximum of 15 items in the bill; if you have
less than that, simply press enter at the next "Item Name" prompt.

The second part of the program displays our bill on the screen, by using the
DISPLAY AT USING statement. Please note carefully the syntax of each
possibility, both for DISPLAY and PRINT, as this is the most complicated part
of the statement, and is different when you print to an output device other
than the screen. The XB manual is incomplete in that area, and I found the
correct syntax after a lot of trial and error. I only format variables in this
program, but the first example above has shown you how to print constant
strings or values.

The IMAGES we will use are conveniently placed at the beginning of each section
of the program, but they could be anywhere, since they are referenced by their
line number. For the screen output, we use two images: line 270 to display the
client's name and address, plus a vertical bar (a constant character), and line
280 to design the bill proper.

Line 290 uses the image in line 270. Since all the octothorpes are continuous,
that means we can use only one variable. True? No... as I discovered when I
wrote the program, you can re-use the same image for any number of variables;
each use of the image will take a new line: easier formatting when you need to
mix values and constant characters! When, on the other hand, we format our
display to print more than one variable in the same formatted line, everything
will fit exactly where you want it: look at line 320, which prints three
variables using the image in line 280, and also provides for the dollar sign.
In all cases where you format more than one value, they MUST follow the format

string or reference to an image, and they MUST be separated by commas.

Since the format in line 340 is very short, I decided not to use an external image; in that case, the formatting string must be between quotation marks, but again it can include any constant character, in this case the dollar sign again. Please note the CALL KEY in line 360: defining the keyboard as "3" allows us to enter either upper or lower case while Tex will always read it as upper case!

Our bill looks fine on the screen, but how do we send it to our client? Well, we print it, and again the IMAGE statement will help us to easily format a nice, professional-looking document. Since the printer is wider than the screen, we can include more values in our bill proper, and some formats can be longer.

The Image in line 390 expects four values (see line 450) and also provides the dollar signs plus some vertical bars. As for the longer values, try to bill your client for a few ANTIESTABLISHMENTS; the screen will show asterisks, but the printed bill will be OK. Don't sell him any ARCHEOLOGICAL ARTIFACTS though – he will see only stars, and will rightly refuse to pay for them!

Line 400 Image is used to print the total in line 470; instead of including a long line of spaces in the IMAGE statement (in that case, we would need quotation marks to keep those spaces in), we print them in the previous line, followed by a semicolon. Why use an image for such a simple case? Well, you guessed it: whatever the value of the TOT variable, it will always be placed at the same spot on the page, and always aligned with the list of prices in the main portion of the bill.

I hope that you followed me through my picture book, and that you will use the very useful IMAGE statement, or at least DISPLAY USING.

And now a MEA CULPA: these articles are printed via the TI-WRITER FORMATTER, with some unexpected results. As you know, it uses the "&" sign to underline; but this sign is also used to concatenate strings in programs. I usually catch them all when I test, but some get lost, especially if they are at the end of a line. Therefore, I must apologize for a mistake in the QUICKLABEL program (Feb. 88). Line 380 should read ".....&CHR$(138)&" (= "&CHR$(139).....". If in doubt, never hesitate to ask me (at least I will know that someone has typed in my program!).

TI BASIC continued from March
by Steven Shaw

Instead of the = sign, you can use any of the relational operators, = < and >. The same structures can be used with string variables.

The JOYSTICK program following this chapter makes use of these relational expressions.

Here are some more advanced uses of EDEFF   DEF
ACS(C)=1.5708-2*ATN(C/(1+SQR(1-C*C)))

All that does is supply you with an ARCCOS function. The trigonometrical functions which TI do not provide can all be made up in a similar manner.
Now in your program when you want to compute the ARCCOS (the angle 4IN RADIANS5 of a right triangle formed by the hypotenuse H and one of the sides X. Angle=ACS(X/H)) you use this defined function. eg ANGLE=ACS(SIDE/HYP)

If you don't like radians, you can amend the defining line, or add a second, after this one:

DEF DEG=RAD*57.29578

Then when you want to convert a radian result, set the variable RAD to the radian angle and whenever you use DEG the computer will use the degree measure equivalent to the radian angle which RAD is set to.

This represents another use of DEF: No 'argument' is passed. The defined variable DEG will, whenever used, take a value which depends on the 4 current 5 value of the variable RAD.

To avoid using INT frequently for the same variable, you may use the DEF function:
```
DEF A=INT(A)
```

Now whenever the variable A is used, any fraction will be dropped each time.

The DEF function does not allow you to have more than one argument to be passed, and must occupy just one program line. It is possible however to use one defined function in another, so long as they occur in sequence in your program.
```
eg DEF RAN(X)=INT(RND*X+1)
   DEF SCORE=RAN(LEVEL)+SCORE
```

A routine to use the joystick, which we will develop into a rather complex multi-purpose input routine:

The CALL JOYST format is not ideally written for the TI99/4A. The row and column variables are reversed compared to the graphics commands, and the subprogram seems to assume the screen origin is at bottom left (it is actually at top left).

The return variables are placed in the command as follows:
```
CALL JOYST(NUMBER,COLRETURN,ROWRETURN)
```

whereas the graphics commands are in the form:
```
CALL HCHAR(ROW,COL,CODE)
```

To move a character to the screen left, we need to decrease the value of the column. If the joystick is moved to the left, the column return variable is indeed negative, while movement to the right gives a positive return. However, the top of the screen is Row 1, so to move down the screen the row must be increased : move the joystick down and the row return variable is NEGATIVE. This can cause confusion very easily! The sign has to be changed to make this work!

Remember: the alphalock MUST be up for the joystick to work.

If we wish to amend ROW and COL variables using the joystick, it is necessary to use:
```
100 CALL JOYST(1,COLRET,ROWRET)
110 ROW=ROW-ROWRET/4
120 COL=COL+COLRET/4
```

Notice the different signs used to amend the row and column variables. We have to divide by four because the CALL JOYST will only return 4, 0, or -4.

To use the above in a program leaves one problem: you need to know which is joystick number one! This can be marked, but you can also scan both joysticks:

```
100 CALL JOYST(1,CR,RR)
110 CALL JOYST(2,CR2,RR2)
120 ROW=ROW-RR/4-RR2/4
130 COL=COL+CR/4+CR2/4
```

This will take a little longer to process and you will have to see the effect in your program before you decide to use it.

When using CALL KEY there is a status return we can check to see if NO key has been pressed. With joysticks there is no status return, only the return variables. A status return can however be created.
Instead of the CALL KEY "IF ST=0 THEN" it is possible to use "IF CR+2*RR=0 THEN"
Why multiply the second return by 2? Check through all the possible returns from the joystick and you will see that a simple addition, subtraction or multiplication will not return a unique answer to equate with "joystick central".

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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