WORDPLAY

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From the President

Summer is near, but the fun still goes on with PUNN! We are getting NEW members, our membership renewals are holding steady, we're expanding our Bulletin Board System with new hardware, and ... the SECOND ANNUAL PUNN PICNIC is already deep in the planning stages. At the last Board Meeting, held at the home of Chuck and Charleen Ball, we approved the menu and the PICNIC committee is hard at work. The "famous(?)" one-legged Pizza Cook (yours truly) will be slaving over a hot grill, we'll have swimming, good conversation, a Disk of the Month, and LOTS of FOOD! Plan now to attend.

We have also begun discussions to see if we want to have a display table set up in the Seattle TI FAIR this coming September. Be sure to give this some thought, and let's hear your ideas at the next General Meeting. Here's a chance to show off that special hardware or software project you've been working on.

Remember, now that we have an active Workshop Chairman, let's keep him busy with your requests for workshop ideas! Tell us what you'd like to see.

See you at the meeting.

—Al

News and Views

Lots of good things coming up for PUNN User Group members——There is going to be a PICNIC again in August—same place, the Milwaukie Elks Club——The Seattle Fair will be held again in September—more on both these events inside———Work is proceeding on the 2400 baud for the BBS—when it is completed you'll hear about it.——Read in this issue about FCC decision———A new publication has been announced, published by Asgard Software—it will be published 4 times a year—subscription price until July 1, is $6.00 for 4 issues———Our secretary Don Barker is very active these days with the Merchant Marine veterans—he is the editor of their newsletter—do we have a future editor for PUNN?———Your editor along with his twin brother reached his 67th year in May (seems old but he still feels young)———Do you have some tidbit of information about yourself or another member?—Here's the place for it-give the editor a call———We are still looking for programs and other information for WordPlay-give the editor a call———We need your ideas on what to do about the the Seattle Fair-Do we want to set up a table?-What should we offer?-This kind of activity not only could make some money for our treasury, but it offers an exchange of ideas with other User Groups———come and express your opinions at the June meeting———Thanks to Paul Heerman-he provided the Extracting Routines program for the May issue-last month I failed to remember who gave it to me———ccb

```
**********************************************************
*                                                        *
*   Our Librarians have prepared several interesting     *
*   disks for the June meeting. A music disk contains     *
*   "Yes We Have No Bananas", "Axel F", " The Beatles-    *
*   "I Fell In Love Again", and others, will be avail-   *
*   able. Another disk containing a Backgammon game,     *
*   and a Biorhythm program will also be available.      *
*   Don't forget you can order any program that you      *
*   want. Our Library is full of games, utilities and    *
*   entertainment programs to fill your needs.           *
*                                                        *
**********************************************************
```

Newsletter on Disk

Some of our compatriots in the User Group world are debating the relative merits of distributing their news letter to other Users Groups, via diskette. The plan seems to be to send out an ARCHIVED diskette with the newsletter articles and files of the past two months, to UsersGroups with whom they swap newsletters.

Seems like an innovative idea to me. Our hardcopy librarian lugs hundreds of pounds of newsletters to each meeting and most of them seem to follow the 80/20 rule, where 80% of the new material is generated by 20% of the Users Groups. Given that, and considering the recent increase in postage, the cost of printing and the success of models like Barry Traver's excellent diskazine Genial Traveler this seems like a prudent way to shave a few dollars from the User Groups LARGEST RECURRENT EXPENSE, the newsletter.

While we enjoy and look forward to reading newsletters from other groups, remaining forever dedicated to a paper copy just seems a bit narrow-minded. One major group has flatly stated they will trash ANY archived material sent to them, and will presumably drop from their exchange lists the offending group who dares to send them such stuff. Seems like I could paraphrase an old quotation here..."No Users Group is an island, standing unto themselves." Why not give this a try and see if it doesn't help. In this time of declining memberships and Users Groups folding because of financial problems, anything that helps seems to us to be worth considering. —Al Kinney, PUNN

Solving problems is easy. It's living with the solutions that is tough.

Beauty of Basic

The following program will demonstrate a most amazing thing that is one of the many features that exist in TI Extended Basic, even if TI put them in accidently or not. We found the program in the Delaware Valley Users Group newsletter, but no hint of the author.

If you don't do a lot of programming, you may not see the subtle beauty of what is demonstrated here. The line 110 tells the computer to go to a subroutine at line 130 in the program, after which it will return to the next command. You are able to insert remarks in Gosub or Goto statements which are part of multi-statement lines OTHER THAN AT THE END OF THE LINE!

This feature, although demonstrated by this short program, could be even more highly appreciated in a 5-row Extended Basic line, to directly point to what you are going to do when you get there.

The only stipulation is that the type of (REM) string is continuous (no spaces). That is why the " _ " exists. Try it, this may put a new TI weapon in your already great TI programming arsenal.

```
100 CALL CLEAR :: PRINT "HER     120 END
E I __" ::                       130 FOR D=1 TO 400 :: NEXT D
110 ___ 130 DELAY_ROUTINE        140 RETURN
:: PRINT "HELLO ! I'M BACK"
```

```
*****************************************************
*                        _                          *
*       Murphy's Rule:                              *
*                                                   *
*           If there is a possibility               *
*        of several things going wrong,             *
*            the one that will do the               *
*           most damage is the one that             *
*                     will go wrong.                *
*                                                   *
*****************************************************
```

What's the 'Good Word'?

As we have mentioned in previous columns, we are not running an English Class. We'll leave that for the educators. However we are interestered in helping you with some fundamentals and that is the purpose of these articles.

If you were to wear a striped green tie with a tuxedo, the minute you were seen in public there would be an immediate open reaction and you would soon learn that what you were doing was not acceptable. Hit a duffer on the number #1 tee-off and you'll receive immediate advice on what you did wrong and how you should have addressed the ball.

But the minute you use improper wording, whether it be in writing or speaking, nary a hint of criticism will be offered. Your errors will go un-noted, so we are discussing some basic good words for your writings.

This month we are going to discuss a few commonly misused words. The first words are principal and principle. Principle is a noun and refers to a belief, an ideal, an attitude and other meanings that refer to opinions or ideals. Principal is also a noun but can also be an adjective. The easiest way to remember when to use principal is to think of school. The princi-pal. He was your pal wasn't he? A principal can also be the head of a group or the #1 of an organization. Used as an adjective compare the words leading, main, most important, etc. to help you know when to use it.

Our next words are compliment and complement. Compliment means to flatter or show respect and you can remember when to use it by thinking (the "i"). I flatter and I respect. Complement on the other hand means that which fills up or completes, such as the number of men to man a ship.

Our two final words this month compare your and you're. These are often misused today. Your is an adjective. Your home, your car, etc. You're is a contraction of you and are. You is a noun and are is a verb. Properly used-you are going to do- - -, or using the contraction, you're going to do- - -. We've see the adjective your replace the above phrase-your going to do- - -. But an adjective can't go anywhere or do anything. Read your dictionary for more help with these words.

Advice to Beginners

To become comfortable at your computer, all it takes is time. Time at the keyboard. Any avid game fan can outplay me in ANY game, because he/she spends TIME at it...I don't. Thhe first time he/she plays a certain game, the score isn't necessarily impressive, but with time they become champs.

I've been programming in Basic and XBasic since I purchased my TI, but admit to being a beginner in LOGO and FORTH. The beauty of Basic is that I could write a 5 to 10 line "what if...?" program and see the results, good or bad immediately. Most beginners have the mistaken idea that they must write useful code right from the start. Ain't so! Ain't the way to learn! Play around with an idea, try it this way...then that way. The machine may lock up, but it won't explode! So my advice is simple. JUMP in ...don't be afraid of making mistakes. That's part of the learning process. A wise man once said, "If you do it right, you already know it. If you do it wrong, you just LEARNED something."

Here is a little something to play around with. It is a routine to stop a scroll. It could come in handy with a READ DV/80 FILES type program. The first one will stop the scrolling when you press the space bar.

```
10 CALL CLEAR
20 PRINT "THIS IS A TEST"
30 CALL KEY(0,K,S)
40 IF K=32 THEN 30
50 PRINT
60 IF K=13 THEN PRESS<ENTER>
TO QUIT
70 GOTO 20
```

The whole routine is lines 30 and 40 (and that could have been written in one line) and the balance of the program is to create a scrolling situation. Now change line 40 to:

```
40 IF K<>32 THEN 30
```

Now the program will only scroll WHILE you are holding down the space bar.
Try writing a program to READ a DV/80 file and include either version of this routine.

The next item comes from the POMONA VALLEY Computer Group (and I believe, Bill Harms). It scrolls an underline beneath a displayed string and the unique thing about it is it aligns itself beneath the string perfectly. First try this little demo:

```
110 DISPLAY AT(4,4):"Underli
ne Routine"
1030 CALL CHAR(95,"00FF")
1040 CALL HCHAR(5,4,95,17)
1050 GOTO 1050
```

You'll notice the Col. 4 of the DISPLAY AT routine does NOT line up with Col 4 of the CALL HCHAR. Now enter the routine as Harms wrote it.

```
100 CALL CLEAR
110 DISPLAY AT(4,4):"Underli
ne Routine"
120 CALL UL(4,4,17)
130 GOTO 130
1000 !UNDERLINE ROUTINE
1010 SUB UL(R,C,L)
1020 ! (Row,Col,Length)
1030 CALL CHAR(95,"00FF")
1040 FOR I=1 TO L :: CALL HC
HAR(R+1,C+2,95):: C=C+1 :: N
EXT I
1050 SUBEND
```

After you have entered and run it, to see that it works, make these little changes. (This is not meant to be an improvement, to the routine, but simply a way to demo its real real capabilities.

```
102 PRINT "Enter a String" :
: INPUT A$
105 L=LEN(A$):: C=(28-L)/2
110 DISPLAY AT(4,C):A$
120 CALL UL(4,C,L)
130 CALL KEY(0,K,S):: IF S=0
THEN 130
140 CALL HCHAR(4,1,32,64)::
GOTO 102
```

Tragedy of a Blown Disk

If you have ever experienced the tragedy of blowing a disk with a lot of important files, then perhaps this information is important to you.

The following information was found on one of the newsletters but the original source of the material is obscure. We'll print the techniques offered for your information. You may need it someday to repair some valuble information.

If you should blow a disk for some unknown reason, you'll need to load up a Sector Editor, such as Advanced Diagnostics or one of the other sector editors that are readily available. Take a freshly initialized blank disk and also the one to be repaired. Place the blank in drive one and go to the Sector Edit mode of the program. Now load in sector 0 (zero). Remove the blank disk and place in your bad disk. Copy this sector to the bad disk. Next place the blank disk back in the drive and go to sector 1 (one). Repeat the procedure as above.

Now you can go to DM-1000 and using the recover files routine, type in the names of your files, if you know them. If you aren't sure of the spelling and what files are on the disk, you should use Sector Editor of Advanced Diagnostics and search the various sectors to find the names. Use the command that changes the Hexidecimal to Ascii. In Advanced Diagnostics that is FCTN=.

We hope you never need to use this technique, but if such a time ever comes, it could be a lifesaver.

Time for a Round-Up

A maverick, for information of you ten-derfeet, is a young Texas critter which has lost its mama. There are over a million of them hiding in the closets of America, and I think it's time for a roundup!

There are perhaps 200 or 300 TI-User groups in the country and even others all a-round the world. A few boast of several hun-dred members and others has no more than a dozen. I doubt that the average is more that 50 users actually paying dues and attending meetings. That computes to at most 15,000 members of the "organized" TI World. Of course, there are many others who keep in contact by subscribing to those magazines which support the TI, and still others who are kept up to date on new developments by the catalogs from the big mail order houses. Still, no matter how you compute it, there are certainly well over a million owners of the TI-994/A who have no way of knowing that our computer is alive and well.

These people have read that Texas In-struments abandoned the computer. They have seen the supplies of hardware and software disappear from the big retail stores. Many of them bought their computer during the fi-nal suicide sales, therefore never got on the mailing list for the Texas Instrument news-letter.

And yet, relatively few of the TI- 994/A are showing up in the classified ads and in garage sales. A recent national sur- vey found that the TI-994/A was owned by more people than any computer except the Commodore.

True, many of these owners are only in-terested in plugging in modules and playing games. But some have a deeper interest - and even five percent of a million is a lot of computers!

When I bought my TI, in March of 1982, I searched in vain through the articles and ads of every magazine on the newstand for any-thing relating to my computer. It almost seemed that there was a conspiracy of silence. I had taught myself to program and written dozens of programs before I finally made contact with the TI world. I was once a maverick and I can sympathize with those who are mavericks now.

Is your User group dwindling away? Some members move away to bigger but not necessar-ily better computers. Others become so po-larrized in their interests that they have little in common with each other. Are your givers tired of giving to the getters? Are your doers tired of being used by your users? Do you miss the enthusiasm and excitement of your first meetings? Does your group need a transfusion of fresh blood? The donors are out there and waiting if you can find them.

Do you want to see new hardware, new software, new publications for your computer? The bigger the market the more that will be produced. And the market is there - it just doesn't know that it's there!

The user groups are the only ones who can round up the mavericks. You can do it by publicizing your meetings and by letting the TI owners in your community know what you can do for them. You can get newspaper publicity and television publicity Some of you are already offering classes in programming or in computer use to the general public, to the schools, to libraries, to senior citizens and others. These are very fine endeavors in themselves and they can also bring the pub-licity which will attract new members. Here and there among those new members will be an ingenious hardware hacker or programmer ge-nius who will make our computer better than ever.

TI-Writer Tip

If you are using TI-Writer or one of the clones, you probably realize that the charac-ters & and @ are used for underlining and overstriking. You can overide this function by striking the respective characters twice, but there is a better way.

If your document requires a lot of these characters, try this method. With a sector editor search the FORMA1 file for 23 21 40 26. Change the 40 26 to 60 5C. This will allow you to use the "TICK" (CTRL C) and the "BACKSLASH" (FCTN Z) for the overstrike and underline. You seldom find a use for these characters.

I am using Funnelweb and using Advanced Diagnostics you will find the HEX numbers to change in the FO file. They are located in Sector 152, Bytes 115 and 116.

First use the Find File command followed by the Edit Sector command. After changing the numbers you must use the Write File com-mand to change the instruction. It might be a good idea to copy your disk before attempt-ing the change in case of making an error.

Profile of a TI-99er

Here is a profile of the typical TI-99/4A owner according to Ali Ulgen of the North Coast 99ers of Ohio.

He is a male over 45 years, with a col-lege degree and uses his computer in his self employed business. He owns 2 TI's one of which is fully expanded. He has a multiple disk system that is single sided and single density, but does not have a RAM disk.

His printer is a Star Gemini. One of his systems has a color monitor and the other is attached to a television set. A large percentage of his use is for Word Processing, doing letters and small tasks. He is trying to organize his life with the ideal database which he has yet to find. He programs a lit-tle mostly in Extended Basic. He occasional-ly uses a modem to either connect to a friend's computer or to a BBS. He is think-ing about joining a commercial computer net-work. He attends user group meetings and wouldn't think of leaving-it's his lifeline to continued use of his TI.

Well, how do you stack up?

Funnelweb Trick

Do you need to change the case of your DV-80 files? If so, when using Funnelweb you can do so easily.

To change the case from lower to upper use <CTRL> <;>. That's holding the CONTROL key down and pressing the semicolon at the same time. It will auto repeat and affects A thru Z. To change upper case to lower case use <CTRL> <.>, that's CONTROL and period at the same time.

These functions of Funnelweb 4.0 can be useful when coverting a file that someone might have written in all upper case and you want to convert it to a more readible mode.

FCC Decision Favors BBS

The Federal Communications Commission has quietly decided to scrap its plan to sharply increase telephone rates for computer users, agency and congressional sources report.

The Agency informed important lawmakers that it wouldn't go ahead with it plan to assess access charges to computer users who access local telephone systems.

" They got the message loud and clear from Congress that this plan was a political and policy loser, said a House staffer who was informed of the FCC decision. So you see all those letters and calls to congressmen by computer users did some good after all.

Representative Edward Markey (D.,Mass.) said he would still introduce legislation to kill any access charge, in the event the FCC changed its view in the future. This has to be good news to all of us, because if such charges had been levied, it could have affected all of us.

Several agency officials described the FCC's action as a way of patching up its tatered relationship with Congress, which is still fuming over the FCC's decision to assess charges as much as $4.50 per hour per user to hook up your private phone to any network, which includes our own BBS.

June Program

Program Chairman, Ted Peterson, announces that the program for the June PUNN meeting will feature "LOAD" programs. As Ted notes, there is a wide variety of load programs available for your TI-99/4A computer, ranging from the simple to the more complex. He will be demonstrating many of these.

You will learn from this demonstration how to set-up any of your own programs so they automatically load when you turn your computer on. The load program used in starting Funnelweb will also be reviewed and he will show you some variations of it. You'll not want to miss this interesting demonstration.

Ted wants your ideas on programs for future meetings. If you have a favorite of your own or want some particular function of your computer explained let him know.

Seattle TI Fair

The third annual TI-Fair in Seattle will be held this year Friday and Saturday, September 23rd and 24th. It will be held at the Seattle Center this year which should make it more convenient for most people.

The PUNN Board discussed at its May meeting the feasibility of sponsoring a table at the Fair. In order to do this a number of volunteers are required. There are many things that PUNN has to offer the TI World. Programs from our library and how our BBS operates are just two of them. Plan to attend the June meeting when a discussion will take place on this important matter.

Easy Color Change

There have been a lot of color change programs written over the years, but this one seems to be one of the best.

This one was in the San Fernando Valley newsletter. Type it in and save it on one of your working disks under the name "LOAD" and when you're ready, it is too.

You can specify the colors that you want in line 110.

```
100 CALL CLEAR
110 B=5 :: F=16 :: !B=backgr
ound, F=foreground
120 C=16*(F-1)+(B-1)
130 CALL INIT :: CALL LOAD(9
984,C,C,C,C,C,C,C,C,2,0,7,15
+B,4,32,32)
140 CALL LOAD(9999,48,2,0,8,
0,2,1,39,0,2,2,0,8,4,32,32,3
6,2,0,8,8,4)
150 CALL LOAD(10021,32,32,36
,2,0,8,16,4,32,32,36,2,0,8,2
4,4,32,32,36,4,91)
160 CALL LOAD(-31804,39,8)
170 CALL LOAD(-31952,255,231
,255,231)
180 END
```

Sprite Demo

This is another demonstration of the power and capabilities of the TI 99 4/A using sprites in Extended Basic. Try it out.

```
1 !!!!!!!!!!!!!!!!!!!
2 ! BY DANNY COX !
3 !!!!!!!!!!!!!!!!!!!
4 !
5 CALL MAGNIFY(4):: CALL CLE
AR :: CALL SCREEN(2)
6 CALL CHAR( 96,"FFFFFFFFFFFF
FFFFFF7F3F1F3F07030180C0E0F0
F8FCFEFFFFFFFFFFFFFFFFFFFF")
7 FOR X=7 TO 4 STEP -1
8 R=190 :: C=250
9 FOR I=1 TO 25 :: CALL SPRI
TE(#1,96,RND*3,R,C):: R=R-X
:: C=C-7 :: NEXT I
10 R=190 :: C=250

11 FOR I=25 TO 1 STEP -1 ::
CALL SPRITE(#1,96,RND*3,R,C)
:: R=R-X :: C=C-7 :: NEXT I
12 NEXT X
13 FOR X=5 TO 7
14 R=190 :: C=250
15 FOR I=1 TO 25 :: CALL SPR
ITE(#1,96,RND*3,R,C):: R=R-X
:: C=C-7 :: NEXT I
16 R=190 :: C=250
17 FOR I=25 TO 1 STEP -1 ::
CALL SPRITE(#1,96,RND*3,R,C)
:: R=R-X :: C=C-7 :: NEXT I
18 NEXT X :: GOTO 7
```

Plot Functions - Pixel Accuracy

This program, written by Wesley R Richardson of the Blugrass Computer Society, Lexington, KY (a user group) and it will plot functions in graph form to the screen with pixel accuracy.

There are many REM statements in the listing which are functions suggested by the author to try.

If you wish to select any of these suggestions enter it in line 230. DO NOT remove the Rem statements from the other functions. If you have a screen dump, you could print out the graph drawn on the screen.

(FROM THE PUNN EDITOR: Line 230 contains the define statement for the function you wish to plot. For a trial if you wish you can run the program as listed and the function DEF F(X)= (25-X^2)^1/2

A function in mathematics is a rule which assigns a value to a given element. The above function is asking, what is the value of the square root of 25-X squared? In order to make a graph with varying values we assign a series of values to X, for instance (-5 to +5). Thus a curve is drawn on a graph to show the various values. Another example would be - Y=2X which means Y is equal to two times whatever value is given to X. Therefore Y is a function of X. Accordingly in this case if X were assigned a value of 3, then Y would equal 6 (2 times X) or in this case (2 times 3). This is one of the best graph programs I have seen. Most of the previously written programs could not print out with pixel accuracy such as this program.
—Charles Ball)

```
100 REM FUNCTION
110 REM TI-99/4A BASIC OR EXTENDED BASIC
120 CALL CLEAR
130 PRINT TAB(10);"FUNCTION"
    : : :
140 PRINT TAB(4);"WESLEY R RICHARDSON"
150 PRINT TAB(7);"MARCH, 1988"
160 REM BLUEGRASS 99 COMPUTER SOCIETY, INC.
170 REM VARIABLES A$,C(160),C$,F(X),H$,H0$,HL$,I,J,K,KEY,L,M,MH,ML
180 REM VARIABLES S,ST,T,U,V,V1,V2,W,Y,YP,YU,Z
190 OPTION BASE 1
200 DIM A(160)
210 DIM C(160)
220 Z=57
230 DEF F(X)=X^2+2
240 GOTO 500
250 REM
270 REM DEF (F(X)=SQR(6.28)*EXP(-(X^2)/2)
275 REM X1=-3  X2=3
280 REM
290 REM DEF F(X)=0.1*X^5+0.4*X^4-18*X^3-60*X^2+ROO*X+7
300 REM X1=-13  X2=13
310 REM
320 REM DEF F(X)=X^2+(S*SIN(10*X))
330 REM S1=-5  X2=5
340 REM
350 REM DEF F(X)=10+0.5*(X-3+ABS(X-3))+0.5*(X-6+ABS(X-6))
360 REM X1=0  X2=9
370 REM
380 REM DEF F(X)=ABS(SSIN(X))
390 REM X1=0  X2=9.4
400 REM
410 REM DEF F(X)=10+(X-1+ABS(X-1))-10+(X-1.1+ABS(X-1))
420 REM X1=-10  X2=10
430 REM
440 REM DEF F(X)=(ABS(SIN(X))+0.0001)/(SIN(X)+0.0001)
450 REM X1=0.01  X2=12
460 REM   /
470 REM DEF F(X)=SIN(X)+SIN(2*Y)+0.5
480 REM X1=-6.28  X2=6.28
490 REM
500 PRINT :"DEFINE F(X) AS ONE OF THE FUNCTIONS IN LINES 190-520";"OR DEFINE F(X) AS YOUR OWN":"FUNCTION,"
510 PRINT :"BE SURE THAT FUNCTION NAMES";"YOU DO NOT USE";"TAKE A REM":"IN FRONT OF THEM"
    : : :
520 INPUT "PLOT FUNCTION (YES, N=NO)?";A$
530 IF A$<>"Y" THEN 2040
540 PRINT "RANGE X1,X2 ?"
550 INPUT "X1 ?";X1
560 INPUT "X2 ? ";X2
570 IF X2>X1 THEN 600
580 PRINT "X2 MUST BE GREATER THAN X1"; :
590 GOTO 540
600 T=(X2-X1)/191
610 X=X1-T
620 PRINT : : :"COMPUTING TAKES ABOUT 1 MIN"; : : : :
    :
630 ML=F(X1)
640 MH=F(X1)
650 FOR I=1 TO 192
660 X=X+T
670 Y(I)=F(X)
680 IF Y(I)<MH THEN 710
690 MH=Y(I)
700 GOTO 730
710 IF Y(I)>ML THEN 730
720 ML=Y(I)
730 NEXT I
740 YK=(59)/(MH-ML)
750 FOR I=1 TO 192
760 Y(I)=INT(YK*(Y(I)-ML)+1.5)
770 NEXT I
```

```
780 CALL CLEAR
790 GOTO 1670
800 FOR J=0 TO 23
810 YU=Y(8*J+1)
820 YL=Y(8*J+1)
830 FOR I=1 TO 8
840 IF I*J=184 THEN 940
850 S=ABS(Y(I+8*J+1)-Y(I+8*J))
860 GOTO 940
870 IF S<2 THEN 940
880 FOR K=0 TO S-1
890 YC=INT(F(X1+T*((I+8*J-1)/191+K/S))+1.5)
900 C(YC)=C(YC)+10^(8-I)
910 NEXT K
920 NEXT I
930 GOTO 980
940 C(I+8*J+1))=C(Y(I+8*J))+10^(8-I)
950 YU=YU+0.5*(Y(I+8*J)-YU+ABS(I+8*J)-YU))
960 YL=YL+0.5*(Y(I+8*J)-YL-ABS(I+8*J)-YL))
970 GOTO 920
980 YU=INT((YU-1)/8)+1
990 YL=INT((YL-1)/8)+1
1000 FOR L=YL TO YU
1010 C$=""
1020 FOR M=L*8 TO L*8-7 STEP -1
1030 U=INT(C(M)/10000)
1040 GOSUB 1200
1050 U=10000*(C(M)/10000-U)
1060 GOSUB 1200
1070 C$=C$
1080 NEXT M
1090 IF C$="0000000000000000" THEN 1140
1100 Z=Z+1
1110 IF Z>143 THEN 1140
1120 CALL CHAR(Z,C$)
1130 CALL HCHAR(23-L,4+J,Z)
1140 NEXT L
1150 NEXT J
1160 CALL KEY(0,KEY,ST)
1170 IF ST<0 THEN 1160
1180 GOTO 1170
```

```
1190 GOTO 100
1200 IF U<>0 THEN 1230
1210 C$=C$&"0"
1220 RETURN
1230 IF U<>1 THEN 1260
1240 C$=C$&"1"
1250 RETURN
1260 IF U<>0 THEN 1290
1270 C$=C$&"2"
1280 RETURN
1290 IF U<>11 THEN 1320
1300 C$=C$&"3"
1310 RETURN
1320 IF U<>100 THEN 1350
1330 C$=C$&"4"
1340 RETURN
1350 IF U<>101 THEN 1380
1360 C$=C$&"5"
1370 RETURN
1380 IF U<>110 THEN 1410
1390 C$=C$&"6"
1400 RETURN
1410 IF U<>111 THEN 1440
1420 C$=C$&"7"
1430 RETURN
1440 IF U<>1000 THEN 1470
1450 C$=C$&"8"
1460 RETURN
1470 IF U<>1001 THEN 1500
1480 C$=C$&"9"
1490 RETURN
1500 IF U<>1010 THEN 1530
1510 C$=C$&"A"
1520 RETURN
1530 IF U<>1011 THEN 1560
1540 C$=C$&"B"
1550 RETURN
1560 IF U<>1100 THEN 1590
1570 C$=C$&"C"
1580 RETURN
1590 IF U<>1101 THEN 1620
1600 C$=C$&"D"
1610 RETURN
1620 IF U<>1110 THEN 1650
1630 C$=C$&"E"
1640 RETURN
1650 C$=C$&"F"
1660 RETURN
```

```
1670 PRINT TAB(11);0.0000001*(INT(10000001*MH+0.5)); : : :
    : : : : : : : : : : : :
    : : :
1680 PRINT X1;TAB(11);0.0000001*(INT(10000001*ML+0.5));TAB(20);X2
1690 IF 0>MH THEN 1860
1700 IF 0<ML THEN 1860
1710 YH=INT((159*(0-ML)/(MH-ML)+1.5)
1720 YB=INT((YH-1)/8)+1
1730 YP=YH-8*(YB-1)
1740 H0$="00"
1750 HL$="FF"
1760 H$=""
1770 FOR W=1 TO (8-YP)
1780 H$=H$&H0$
1790 NEXT W
1800 H$=H$&HL$&HL$
1810 FOR W=2 TO YP
1820 H$=H$&H0$
1830 NEXT W
1840 CALL CHAR(40,H$)
1850 CALL HCHAR(23-YB,4,40,24)
1860 IF 0>X2 THEN 2030
1870 IF 0<X1 THEN 2030
1880 XH=INT(191*(0-X1)/(X2-X1)+1.5)
1890 XB=INT((XH-1)/8)+1
1900 XP=XH-8*(XB-1)
1910 V=10^(8-XP)
1920 V1=INT(V/10000)
1930 C$=""
1940 V2=10000*(V/10000-V1)
1950 FOR W=1 TO 8
1960 U=V1
1970 GOSUB 1200
1980 U=V2
1990 GOSUB 1200
2000 NEXT W
2010 CALL CHAR(41,C$)
2020 CALL HCHAR(3,3*XB,41,20)
    :
2030 RETURN
2040 END
```

High Res Graphics - Part III

(#3 in a series, by Ann Dhein of the Los Angeles Topics-part #4 will appear next month)

With so much graphics software coming out so fast for awhile, it was hardly surprising that some of it would be obsolete almost before it even hit the market. Navarone's Paint 'N Print cartridge was originally meant for the unexpanded system. Apparently not enough users were interested in a software package which did about half of what competing programs could do. In an effort to save Paint 'N Print from complete obscurity, Navarone released a companion disk which greatly expanded Paint 'N Print capabilities. But by that time there were many graphics packages on the market competing for the customer dollar. One of them was Graphx. Another was TI Artist, which along with Graphx, would radically affect the 99/4A graphics software market.

Graphx got its start in Australia and was such a good paint program that before anybody realized what was happening, the era of the TI 99/4A Paint Program was in full swing. With Graphx, freehand drawing and erasing in the bit-map mode are controlled by the joystick. It offers speed control and full color capability. Circles, boxes and lines can be drawn automatically. Shapes can be filled with built-in patterns as well as color. Portions of the picture can be copied and/or moved to another location in the picture, or even to an entirely different picture by means of the "clipboard" feature. Text may be incorporated into the drawing. A 'zoom' mode lets the user view and edit a small portion of the picture that has been magnified to four times its original size. The resident screen dump prints to an Epson or compatible printer in four different formats. A unique feature of Graphx is the aforementioned clipboard which lets you store and retrieve parts of pictures while you are working on them. Picture parts or special alphabets (fonts) can also be saved to disk to be incorporated into drawings whenever you want them. With the clipboard, you can also try your hand at computer animation. This program's not only easy to use but has an excellent tutorial/ reference manual that comes with it. The manual even explains how to display a Graphx picture file in an assembly language program.

TI Artist, like Graphx, was a sleeper at first. But it quietly ran down the competition until today it is the front-runner of all graphics programs. Like Graphx, TI Artist can be used almost without referring to the manual. Drawing and erasing are done freehand in full color with various brush widths and with most of the frills that Graphx supplies, plus some of its own. The screen dump is the best of any program around, and will work with practically any printer. Another thing that makes this program a winner is the ability to save any part of a screen as an "instance". This instance is saved in a display/variable 80 file format that can be looked at by TI Writer. When converted, the numbers in this file can be used for Call Character routines in Basic, or for transliterate codes that will dump graphics into TI Writer files! Those features make TI Artist the most versatile program on the graphics market, and have spawned a new type of software: Artist support packages.

As support packages pour out for Graphx and TI Artist, these two have become more and more established as the best paint programs for the TI 99/4A, and now fewer programs are being introduced. Bitmac, which made its appearance in 1985 was another good program doomed to obscurity. Authored by David Vaughan, Bitmac was simultaneously introduced by Data Biotics and Vaughn Software, both of whom claimed copyrights. Despite its cloudy beginnings it is a nice program with many of the features of Graphx and TI Artist as well as a couple of new ones. This program is operated by icons which are pointed at with a joystick. To select, the Fire button is pressed. Besides the standard features you would expect a good drawing program to have, this one has a feature that neither Graphx or TI Artist has. It can reduce as well as enlarge the pictures it draws. A screen dump to Epson compatible printers and a Slide Show are also contained in the program. Where Graphx has clipboard and TI Artist has instance, Bitmac has its Boolean input. This option allows the user to overlay current screen graphics with graphics that are stored on a disk. For an advanced or specialized user the program also has an interesting coprocess which allows the use of a second computer, not necessarily a TI, to calculate plots for Bitmac. All you need for the second computer is an RS232 and the proper cable to interface it to the 99/4A's RS232/2 port. With this setup, very elaborate and beautiful graphics can be created on the 99/4A while the second computer manipulates data for business graphics, maps, satellites or a host of other things.

Because of their unique differences Graphx and TI Artist have been able to flourish side by side, complimenting rather than competing. As yet no other program has come close to replacing either of them, but there may be a competitor in the wings. Joy Paint, fro Great Lakes Software has some impressive new features of its own. Like TI Artiss and Graphx, it is a full-fledged paint program, with one exception: it has no color capability other than a choice of screen background color and black or white for the pencil. The lack of color is not necessarily a disadvantage - you may never use color anyway if your main objective is to dump the graphics to a printer. Painting here refers to filling in with patterns and Joypaint has a large selection of patterns with which to paint. With the companion disk Joypaint's Pal, you can even create and save your own patterns.

Joypaint is fully joystick controlled. The drawing board features are accessed by pointing your drawing tool at the function you wish to use and pressing the fire button. Parts of drawings can be moved, copied and even enlarged. Joypaint employs a windowing technique that allows 92% more drawing space than just the normal screen. Joypaint's Pal allows files from other program such as Graphx and TI Artist to be converted to Joypaint format, and back again. This easy-to-use program is truly impressive! Whether or not it will catch up to Graphx or TI Artist in popularity may depend more on what kinds of companion disks become available.

Now a better definition of a drawing program can be given. As seen here, it is a program or group of programs that will allow users of the TI 99/4A to create high resolution graphics on the monitor . The graphics should be able to be saved and later reloaded, edited and printed to a dot-matrix printer. High resolution means that each pixel can be placed anywhere on the screen individually and removed as desired. We have seen that the programs discussed here can do this and much more.

The next thing to consider is how the program is to be used. The program you buy for your own use should be a program which will best do the things you want and need a paint program to do. There are three distinct ways in which a drawing package can be of value: 1)as a utility for adding graphics to your own programs; 2)as a tool for designing slide presentations and printed materials for business and home purposes; 3)and last but not least as personal enrichment. Using a drawing program in this manner can be rewarding and satisfying as well as simply entertaining. Each of the packages focuses just a little differently on these three aspects and this is something that will be explored as we continue this series. All of the currently available drawing packages allow individual pixels to be placed anywhere on the screen and removed as desired, to create detailed pictures. Drawings can be saved to disk (and in some cases tape) and later reloaded for editing or printing. As you can see, all the TI99/4A paint packages do much more than just this minimum. But the features present in a particular package, and how they are implemented vary widely. When this series is complete, we will publish a chart comparing the ten main drawing packages. By comparing the features of the various programs you will have a better idea of which particular program would best fit your needs.

(Next month: Getting down to details)

Note: address block printed upside-down.
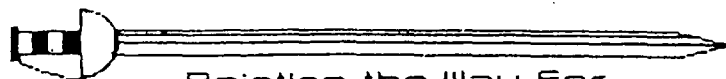
ALL GENERAL MEETINGS ARE HELD
ON THE FIRST TUESDAY OF EACH
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‼ NEXT MEETING DATE ‼
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