
THE GUILFORD 99'ER NEWSLETTER

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Joseph Martin, President
Mike Garrett, Secretary/Treasurer
BRS: (919)274-5760 (FIDO)

Mack Jones, Vice President
Robert Dobo, Program Library
(919)621-2623 (ROS)

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The Guilford 99'er Users' Group Newsletter is free to dues paying members (One copy per family, please). Dues are \$12.00 per family, per year. Send check to P.O. Box 21691, Greensboro, NC 27420. The Software Library is for dues paying members only. (Herman Geschwind, Editor)
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OUR NEXT MEETING

DATE: February 3, 1987. TIME: 7:00 PM PLACE: Glenwood Recreation Center
2010 S. Chapman Street.

Our January Swap Fest was quite a success. For this meeting we enjoyed the largest turn-out in a long time. Our thanks to Bob for making his "goodies" available to us and to George for providing us with a PE Box. As it happened, many of those attending ran out of diskettes and also we ran out of time. For that reason we will have a Swap Fest II in February. Bob, again, will bring his box of treasures and this time let everyone planning to attend be forewarned: Bring plenty of diskettes. Another second system certainly would speed things up and if you could help us out, give Mack Jones a call prior to the meeting (288-4280).

WELCOME NEW MEMBERS

We would like to welcome George Jordan and Lester Parker to our group. George lives at 905 Kemp Road West and Lester at 402 Springtime Drive, Greensboro. In addition to the new members who have joined us, it is also gratifying that many of our members have renewed their membership for 1987. For those that have not yet paid up for 1987, we urge you to put a check in the mail to our Post Office Box "real soon now". Club rules, which were re-affirmed at the last meeting provide that this newsletter and other club privileges are for paid up members only.

TI SHOPPER

The biggest news in the TI marketplace is BAD news. It seems that a couple of the TI "mainstays" will no longer be with us. CorComp has reputedly filed for Chapter 7 Bankruptcy. What that means is that they will cease business and their assets will be sold to satisfy their creditors. That leaves Myarc as the only large supplier of cards for the TI PEB. It looks like Craig Miller's prophecy has at last come true.

Speaking of Craig Miller, Miller's Graphics has now become M6 and will soon be leaving the TI market. In a recent telephone conversation with Susan Miller, it was confirmed that M6 will not be introducing any more major software or hardware packages for the TI. In fact, the December issue of MICROpendium carries the story that M6 has ceased production on the once lucrative GRAM KRACKER. Oh well, farewell to both!!!

I recently came into possession of a rather short catalog (a description of products, really) from THE CAPTAINS WHEEL, 17295 Chippendale Ave., Farmington, MN 55024. Described in the two pages was a kit for a three-slot PEB --sans case --for \$35.00 (\$10.00 extra if you wish to power a disk drive from it. The documentation says that it can built in less than a day by someone reasonably handy with a soldering iron.

There is also a description of a "BOX CAR" 32K standalone with several interesting options. The basic unit is available for \$49.00 (\$39.00 for two or more). Options include a load interrupt switch, file utilities software, and the duplication of up to three additional banks of memory (>2000->3FFF, >4000->5FFF, >6000->7FFF, >A000->BFFF, >C000->DFFF, >E000->FFFF). V-E-R-Y interesting!! Each of the options will cost an additional \$10.00. It might be worth a look if you haven't already expanded your system.

For those of you who didn't make the "swap" meeting, the McGovern's have released some updated files for FUNNELWEB 3.4. The Editor files have been enhanced and the word-wrap has been speeding up to eliminate the "lost keystrokes" when the text wraps from one side of the screen to the other. The Disk Editor file (Disko or Dpatch) has also been re-worked for ease of operation. It is really a "slick package". Well worth a donation!!!

Well, that about does it for this month. There is still some valuable and powerful software and hardware available for your 'ol TI. (Contributed by Bob Carmany)

UPDATES UPDATES

One of the computing facts of life is that no sooner that you have installed and customized and became familiar with a piece of software than an update or a new release rolls around. Quite rightfully some of you might say, why all this and how come that the programmers can't get it right the first go around.

We certainly can assume that new releases are coming out not because the authors are after your Fairware dollar (many barely break even with the original version) or that it is a streak of perversity on their part. Let us take a look why we had so many versions and updates of FUNNEL and DM1000 and MassTransfer, etc.

In order to squeeze a maximum of performance (both in terms of functionality and execution speed) into a minimal amount of systems memory, all current "name" products more likely than not were written in Assembler. This in turn means many hundreds of lines of low level code where mistakes are easy to make and very tough to find. Certainly all reputable authors will make every effort to test their products but with very complex products it is almost impossible to uncover all "bugs" with customary testing. The saying "If it is bug-free, it is probably obsolete", certainly is true. Conscientious programmers need user feed-back to uncover and correct all these insidious bugs that even rigorous testing did not uncover. Many authors in their update documentation will list "bugs" that had been reported and corrected.

Another problem in the 99/4A world is a lack of standardized hardware. Even TI is not without guilt in this area, the best known are certain incompatibilities between the black and silver and beige consoles. In plain English this means that a program that will perform flawlessly with a black and silver will crash with a newer beige console. But even among the black and silver consoles, TI made some subtle, undocumented changes which can create havoc. With add-on peripherals the situation is even worse. For that all important disk-access CorComp violated whatever standard the TI disk-controller might have set. Myarc on the East coast also felt compelled to go TI one better, only heaven forbid, don't use the same approach that CorComp used. For the software authors (and many are not well-heeled capitalists) it is almost impossible on first try to satisfy users with either all-TI, Myarc or CorComp equipment. Chances are that software initially will be written to one of the "standards" and that there will be cries of anguish from the "other" user community. The result: fixes and updates to satisfy all standards to the extent possible.

The TI user community is very sophisticated now and quite often we expect software developed by independent authors to work in concert. Yes, for c-99 source code we want to use the FUNNELWEB Editor and we expect FUNNELWEB to load DM1000 and FastTerm and MassTransfer to upload files packed with ARCHIVER. All this means that changes in one product quite often require updates and fixes in other products so that we all may have the benefit of this seamless integration.

Software authors and programmers, contrary to our expectations, are only ordinary human beings and they are as incapable of thinking of everything the first go around, just like most of us are. Fortunately, the programmers that we are dealing with in this article, are very conscientious and quite willing to accept our feedback and suggestions. Quite often it is possible to squeeze that extra item of functionality into already tight code or to add that one feature that we felt was so badly lacking. The result another update. Just look back at the evolution of FUNNELNEB or DM1000 and judge for yourself how much more has been added in functionality or to use that overworked phrase: "User friendliness". Certainly well worth making a few Fairware contributions.

While Updates, New Releases, Fixes or whatever they might be called on first sight look like a nuisance, we really should be grateful to the authors that they were willing to go back and make their products better and more useful for us.

In practical terms this means: (1) A new release should be given preference over the older product. If nothing else chances are that hidden bugs, even the ones that you have not yet encountered, have been purged (there is also a chance that by getting rid of one bug, another was introduced, but that is the price of progress). (2) Test the new release and assure yourself that you feel comfortable with it and everything works to your satisfaction. (There have been instances where in new releases features were added at the expense of doing away with some functions that the prior release might have had. If that functionality is important, then don't upgrade). (3) Once you have satisfied yourself that the upgrade is to your liking, purge all files of the prior release. "Mixing" and "matching" of component files of different releases can have drastic effects. A good example is FUNNELNEB where the authors very explicitly warn against mixing old and new release files. (4) Last but not least, be sure to pay for whatever the authors are asking for updates. Contrary to what many might think, having paid for the original program does not usually entitle you to an unlimited number of updates. (Contributed by Herman Geschwind)

FORTH FORUM

TI-FORTH is, at best, a very unruly beast to work with. In an effort to ease the problem somewhat, there have been a series of solutions to let the system "boot" faster. The most popular is to boot the system as a binary image. Variations of this procedure have appeared from time to time in a multitude of publications. The one that we are going to go through this month came from Richard Terry of the HV99'ers (Australia) some time ago. Without further delay, here it is:

1) Make sure, first of all, that your system has all of the updates and "fixes" (ie. the PIO change to SCR #72, for instance).

2) Initialize a blank disk by placing it in drive 1 and typing: 0 FORMAT-DISK <ENTER> Type EMPTY-BUFFERS <ENTER>

3) IF YOU HAVE TWO DRIVES place your initialized disk in drive 2 and type 180 DISK_HI ! which tells the system you are using 2 drives. Place your MASTER COPY DISK in drive 1 then type 0 90 20 SMOVE which will copy the first 20 screens (0-19) containing the error messages and the boot screens and the binary core of Forth onto screens 0-19 of your new disk.

4) IF YOU HAVE ONE DISK DRIVE place the MASTER COPY DISK in drive 1 and type: 0 DISK_LD ! <ENTER> ; GETBLOCK DO I BLOCK UPDATE LOOP ; <ENTER> 5 0 GETBLOCK <ENTER> and wait until loaded and then type FLUSH <ENTER> Reinsert the master disk after every FLUSH.

10 5 GETBLOCK <ENTER> Reinsert copy disk and FLUSH <ENTER>

15 10 GETBLOCK <ENTER> Reinsert copy disk and FLUSH <ENTER>

20 15 GETBLOCK <ENTER> Reinsert copy disk and FLUSH <ENTER>

5) Place MASTER COPY DISK in drive 1 and type COLD <ENTER>. Choose the options that you want to use from the master disk including one of the editors and load them: e.g. -PRINT -GRAPH -VDPMODES -COPY Next type in -BSAVE -EDITOR

6) Place your new disk with the saved screens in drive 1 and type TASK 20 BSAVE <ENTER>. This saves all your options on the disk from SCR # 20 upwards.

7) Next we must modify the boot screen (# 3). Type EMPTY-BUFFERS <ENTER>, then 3 EDIT and make the changes below:

0 (Welcome Screen)

1 BASE->R HEX 10 SYSTEM (Clears screen)

2 0 0 60TOXY ." Booting... BINARY FORTH" CR 10 83C2 C!

```

3 ( Quit off) B 3 GOTOXY ." -EDITOR" B 4 GOTOXY ." -PRINT"
4 B 5 GOTOXY ." -GRAPH" B 6 GOTOXY ." -DUMP" B 7 GOTOXY ." -VDPMD
5 DES" B 8 GOTOXY ." -COPY"
6
7 DECIMAL 20 BLOAD
8 1 VDPMODE ! ( Into text mode )
9 0 DISK_LD ! ( Allows EDIT/COPY on all screens)
10 180 DISK_HI ! ( Set up for 2 single sided drives)
11

```

8) If you wish to change your disk name for identification with the editor just alter the first 10 characters of SCR # 0 (e.g. to BIN-FORTH and FLUSH <ENTER>)

9) Type COLD to re-boot and see the difference in load speed.

10) Finally, make a back-up copy, tape over the write-protect and store your new master disk in a safe place!

That does it for this month's column, I hope you enjoy your binary image forth system. Incidentally, if you load everything except -TRACE, you will have about 3900 bytes of memory left! (Contributed by Bob Carmany)

MODEM TALK

As of this writing (1/10/87) the ROS board is still down. I have talked to Dan, our SysOp, and he expects to have the board up in about ten days (January 20). The new number for the board will be 621-2623. It turned out that in Dan's new home quite a few wiring changes needed to be made, both for power to his computer room and telephone. All this is taking longer than was originally expected. We certainly miss our ROS board!

The FIDO board is still going strong but is very short on disk space. For that reason we have uploaded only one file this month FUNUP.ARC. This file has all the updates to FUNNELWEB 3.4 that Bob mentions in his TI Shopper column. I can assure you that the fix to the editor is really great. I am using it right now to type this letter and while I am not typing whizbang, even at my speed I used to drop keystrokes on word wrap, but not anymore!

We have a number of goodies ready to upload but we will wait till ROS is up and running again.

We really should delete some files on the FIDO board so that we can upload some new stuff again. If there is something in File Section 12 that you have meant to download but have not gotten around to, please do it soon. Drop me a message on FIDO with those files that you think could be deleted. (Contributed by Herman Geschwind)

CARTRIDGES

This is a text file discussion of the ROM cartridge port for the TI-99/4A. It represents information I have been able to obtain from various references. Cartridge programs must operate from >6000 to >7FFF. When the computer is RESET or turned on, the power up routine looks for a Header or Control block at location >6000 in the cartridge port. This control block establishes the linkage into your cartridge program and allows you to have multiple entry points.

Here is an example control block used to provide one entry point; 0000

```

AA01 DATA >AA01
6000 ID FOR BOOT
0002 0000 DATA >0000 6002
0004 0000 DATA >0000 6004
0006 000C DATA CHAIN 6006
ADDRESS OF MENU LIST
0008 0000 DATA >0000 6008
000A 0000 DATA >0000 600A
000C 0000 CHAIN DATA >0000 6010
CHAIN POINTER
000E 0020 DATA SLOAD 6612

```

ENTRY POINT
0010 OF BYTE SLOAD-1 6014
LENGTH OF MENU TEXT
0011 54 TEXT 'CARTRIDGE NAME'
0020 0460 SLOAD B START 0022 092E

Let's examine the control block. If the TI operating system finds >AA at >6000 it knows a cartridge is plugged in the port. The next byte must be a >01 at location >6001. This informs the operating system that the code in the cartridge is executable machine language. Other codes are used for GROM, but that's another discussion. The data at location >6002 - >6005 is zero. Location >6006 must contain a word pointer to a list which identifies the menu text and associated entry point when that item is selected. This location usually contains a >600C. Locations >6008 - >600B must be zero. The chain list at >600C contains the following: Bytes 1 2 = chain pointer to the next menu list - or 0000 is this is the last list in the chain. Bytes 3 4 = entry point associated with this menu selection. Byte 5 = length of the menu text. Bytes 6 - N = Menu Text - this is displayed on main menu.

Craig Miller's newsletter has additional information on the power up routine for the computer. Remember all dynamic data must be in RAM usually in the >8300 area. This area is used for registers plus VDP RAM is used for variable storage. Cartridges cannot REFERENCE any label or routine outside the cartridge. This means the cartridge program must provide it's own VSBW, VSBR, VMBW, and VMBR routines which are normally loaded from the Editor Assembler cartridge. Examples of what these routines look like may be found in the Tombstone City game or Craig Millers newsletter. Armed with this information, it possible to disassemble code to see how the program works. (Contributed by Mack McCormick)

MORE ON FUNNELWEB

Last month I covered how easy it was to install the new version of *FUNNELWEB* into the Gram Kracker and to use the GK as a menu/loader for the *FUNNELWEB* utilities (Editor, Formatter, Assembler, FastTerm) which were installed on disk.

Well, Santa was real nice to me and my latest hardware addition is the Horizon RAM Disk. This gizmo is a card which fits into the PEB box and which looks to the system like a double-sided disk drive #3. The big difference is that the board is populated with memory chips so that a disk read or write is very, very fast. Unlike conventional memory, the HRD uses low-power CMOS memory chips which are battery-backed. The three nicads that support the system are trickle charged whenever the PEB is turned on. In other words, whatever files are loaded into the HRD will stay there, even with the system power turned off.

In case you are interested, the HRD is available in kit form (printed circuit board, instructions and three diskettes with system software) for \$53. A fully assembled 360 sector version costs \$165 and the 720 sector version goes for \$210.

The installation of the HRD into the PE box is no big deal, assuming that an empty slot is available. Comprehensive diagnostic tests come with the board and it was a matter of ten minutes to run the diags to make sure that everything was up to snuff. The final installation step is to install the DSR software from disk. This is a menu driven process and goes faster than typing these lines to describe it.

Since the HRD looks to the rest of the system like an additional floppy drive, DM1000 can be used to format the HRD and do all the other things like copy to it, delete, etc.

The only *FUNNELWEB* change was a one character addition to the LOAD file to let *FUNNELWEB* default to drive 3 for its utilities. With that accomplished it was just a matter of running UPATCH to create an up-to-date UTIL1 file for installation in the GK. A DM1000 "file copy" from the FW disk to disk 3 completed the installation process.

The benefit ? Instant (and I mean instant) access to Editor, Formatter, etc. with no more waiting for the disk drive to quit churning.

PS: Even without the Gram Kracker it is possible to have a menu driven access to programs and files loaded on the HRD. A software utility is available which will create Main Title Screen menus to load and run whatever programs might be installed on the HRD. (Contributed by Hernan Geschwind)

TI REPAIR CENTER

In need of repairs? Here is the address of the TI Repair Facility: Texas Instruments, Inc., 2305 N. University Avenue, Lubbock, TX 79415. They accept MasterCard and Visa. The most common repair involves the cartridge port wearing out. If you have a lot of console lockups, order the GRAM PORT EXTENSION, part number 1049693-1. The price is \$5.84 plus tax plus \$2.99 shipping. The telephone number for the parts department is 1-800-741-3064. (Information courtesy of Akron 99ers Newsletter)

BASIC CORNER

This month we will start a new feature, BASIC CORNER, in this newsletter. As of late we have covered many advanced topics such to the neglect of BASIC which still is the mainstay of our computer.

We have a number of non-trivial programs that we will feature from month to month and in order to print out a listing that you will find easy to use, we will use a program called COLIST which was authored by the same team, Tony and Will McGovern, that gave us FUNNELNEB. This program listing will be exactly in screen format so that you can check your typing as you key in each program. If things don't line up on your screen as they do on the column margin of the listing, chances are that you missed something somewhere and better go back to the line where things diverge and check for a typo. The listings will be made from the original program and unless there is a typing error, they should run.

Some of you rightfully might ask, why should I type in a program listing that I could copy from the library or download from the board. We believe that there are a number of reasons for typing in a Basic listing. Just like a musician needs to practice his scales to stay proficient, it is good practice to hone your Basic skills by sitting down at the keyboard. If we don't practice it and keep it up, very quickly we will forget our keywords and our syntax. If nothing else, some keyboard exercises will keep us topfit in Basic.

But there is more to BASIC CORNER. Many of the programs that we will list will be in Console Basic. Now, if you have XB and peripherals, we challenge you to come up with an Extended Basic version (no cheating here with SHRINK or COMPB or the like!). Bring your results to one of our meetings and show us what you did.

Many of the programs could be improved by redirecting output to disk or an 80 column printer. Think about all these changes as you type. Maybe a program lacks structure, (easy with XB), maybe you can come up with some improvements in that direction.

Our first offering is PLOTTING, a program that lets you enter data and then produces various plots on screen or other devices. After typing the program be sure to key in CALL FILES(!) followed by NEW before you try to load and run this program, otherwise you will get the ominous MEMORY FULL error.

One of the changes that you might want to make is change the T.P. printer output (who still has a 40 col thermal printer) to 80 column output. What changes need to be made to the plotting algorithm? (A nice challenge here).

Enjoy this first issue of BASIC CORNER. While PLOTTING is a "serious" program, we intend to have a variety of fare, some fun games and speech or music from time to time. Have fun! (Contributed by Herman Geschwind)


```

1790 CALL SCREEN(5)          | 2220 RETURN                | 2600 Y1=INT(Y)             | 3000 GOSUB 1770
1800 CALL VCHAR(1,1,96,48)   |                               | 2610 RY=INT((Y-Y1)/7+.5)   | 3010 IF FILE=0 THEN 3030
1810 CALL VCHAR(1,31,96,48) | 2230 REM POLAR-PLOT***     | 2620 X=13.5+(R/COS(T)/MAX)* | 3020 PRINT " TABLE BEING P
1820 RETURN                  |                               | 2630 X1=INT(X)             | 3030 PRINT #FILE:" T
                               |                               |                               | F(T)":" -----
                               |                               |                               | -----
1830 REM FUNCTION F11***    | 2270 CALL COLOR(12,2,8)    | 2660 IF C1<>" THEN 2680    | 3040 FOR T=A TO B STEP H
1840 ON I1 GOTO 1850,1870,18 | 2280 CALL COLOR(13,2,8)    | 2670 A$(Y1,X1)="*"         | 3050 PRINT #FILE:" ";T,F(T)
90                            | 2290 S$=""                 | 2680 NEXT T                | 3060 CALL KEY(0,KEY,ST)
1850 F11=F1(X)              | 2300 FOR I=146 TO 104 STEP - | 2690 GOSUB 1770           | 3070 IF KEY<>32 THEN 3100
1860 GOTO 1900              | 7                            | 2700 IF FILE=0 THEN 2720   | 3080 CALL KEY(0,KEY,ST)
1870 F11=F2(X)              |                               | 2710 PRINT " GRAPH BEING   | 3090 IF ST<=0 THEN 3080
1880 GOTO 1900              |                               | 2720 PRINT #FILE:" MAXIMU | 3100 NEXT T
1890 F11=F3(X)              |                               | M MODULAS=";STR$(INT(MAX#100 | 3110 PRINT : " PRESS
1900 RETURN                 |                               | 0+.5)/1000);              |
                               |                               |                               |
1910 REM CALL KEY****       | 2330 CALL CHAR(I+2,S$*303") | 2730 REM PRINT ARRAY****   | 3140 REM REDIRECT OUTPUT***
1920 CALL KEY(0,KEY,ST)     | 2340 CALL CHAR(I+3,S$*1818" | 2740 FOR I=1 TO 23         | 3150 GOSUB 1770
1930 IF ST<=0 THEN 1920    | )                            | 2750 PRINT #FILE: TAB(3);   | 3160 PRINT " PRESS FOR"
1940 RETURN                 | 2350 CALL CHAR(I+4,S$*0C0C" | 2760 FOR J=1 TO 25         | 3170 PRINT : " 1 SCREEN
                               | )                            | 2770 PRINT #FILE:A$(I,J);  | "
                               |                               | 2780 A$(I,J)=V$           | 3180 PRINT : " 2 TP.U.S
                               |                               | 2790 NEXT J               | "
1950 REM XY-GRAPH CHARS*** | 2360 CALL CHAR(I+5,S$*0a0a" | 2800 NEXT I               | 3190 PRINT : " 3 OTHER"
1960 FOR I=112 TO 128 STEP 8 | )                            | 2810 IF FILE=0 THEN 2840   | : : : : : : : : : :
1970 S$=""                  | 2370 CALL CHAR(I+6,S$*0303" | 2820 PRINT #FILE: : : : : | : :
1980 FOR J=0 TO 6           | )                            | 2830 GOTO 2890             | 3200 GOSUB 1910
1990 CALL CHAR(I+J,S$*1818" | 2380 S$=S$*00"            | 2840 S$="PRESS ANY KEY"   | 3210 IF KEY<49 THEN 3200
)                            | 2390 NEXT I                | 2850 FOR I=1 TO 13        | 3220 IF KEY>51 THEN 3200
2000 S$=S$*00"            | 2400 GOSUB 1770           | 2860 CALL HCHAR(24,1+6,ASC(S | 3230 FILE=0
2010 NEXT J                | 2410 PRINT : : : : :       | EG$(S$,I,1)))            | 3240 IF KEY=49 THEN 3330
2020 CALL CHAR(I+7,"00000000 | 2420 CALL HCHAR(22,6,35,22) | 2870 NEXT I               | 3250 FILE=1
00001818")                 | 2430 PRINT " PLOT OF R=F(  | 2880 GOSUB 1920           | 3260 DEVICE$="TP.U.S"
2030 NEXT I                | T) IN":" POLAR COORDINATE | 2890 RETURN               | 3270 IF KEY=50 THEN 3290
2040 RETURN                 | S ON":" THE INTERVAL (T1, | 2900 REM TABLE****      | 3280 INPUT " DEVICE ? ":DEVI
                               | T2)"                        |                               | CE$
2050 REM INITIALIZE ARRAY*** | 2440 PRINT " AT INCREMENT  | 2910 GOSUB 1770           | 3290 IF DFLAG$="0" THEN 3310
                               | S OF H.":" F MAY BE DEFIN | EG$(S$,I,1)))            | 3300 CLOSE #1
2060 PRINT " INITIALIZATIO | ED":" AT LINE 160.":" :   | 2920 CALL HCHAR(22,4,35,26) | 3310 OPEN #1:DEVICE$,OUTPUT
N TAKING":" PLACE. PLEASE | 2450 CALL VCHAR(16,6,33,8) | 2930 PRINT " TABLE OF VALUE | 3320 DFLAG$="1"
WAIT.":" : : : : : : : : | 2460 CALL VCHAR(16,27,34,8) | S: T,F(T)":" ON THE INTERVA | 3330 RETURN
2070 IF FILE=0 THEN 2120   | 2470 CALL HCHAR(24,6,36,22) | L (A,B)":" WITH INCREMENT H |
2080 IF DEVICE$="TP.U.S" THE | 2480 PRINT : : : : :       | . F MAY"                 |
N 2120                     | 2490 INPUT " T1,T2,H ? " : | 2940 PRINT " BE DEFINED IN |
2090 C1$="!"              | A,B,H                      | LINE 160.":" :           |
2100 C2$="--"            |                               | 2950 CALL VCHAR(18,4,33,6) |
2110 GOTO 2140            |                               | 2960 CALL VCHAR(18,29,34,6) |
2120 C1$=CHR$(155)        | 2500 PRINT : : : " GRAPH M | 2970 CALL HCHAR(24,4,36,26) |
2130 C2$=CHR$(154)        | OW BEING":" GENERATED." | 2980 PRINT : : : : : : : : |
2140 FOR I=1 TO 23        | 2510 MAX=0                 | : : : : : : : : : : : : |
2150 A$(12,I)=C2$         | 2520 FOR T=A TO B STEP H   | 2990 INPUT " A,B,H ? ":A,B,H |
2160 A$(1,13)=C1$         | 2530 R=F(T)                |                               |
2170 NEXT I               | 2540 IF MAX>ABS(R) THEN 2560 |                               |
2180 A$(12,24)=C2$        | 2550 MAX=ABS(R)            |                               |
2190 A$(12,25)=C2$        | 2560 NEXT T                |                               |
2200 IF C1$<>" THEN 2220   | 2570 FOR T=A TO B STEP H   |                               |
2210 A$(12,13)=CHR$(156)  | 2580 R=F(T)                |                               |
                               | 2590 Y=12.5-(R/SIN(T)/MAX)* |                               |

```