TEXAS INSTRUMENTS

The TI Forum

by Ron Albright & Jonathan Zittrain

In my "other" job, I am a teacher and have an interest in such things. For some time, I have envied the ability of the PC clones to do graphs because aside from my constant lament for a decent database system, the perceived lack of graphing software for the TI 99/4A has been a real sore spot with me. In the past few months, through some diligent searching, I have discovered not one, but three graphing software packages available for the TI 99/4A. They have filled the void in our software library and now, I can only pursue "the holy DB system," but that is the subject for another story.

Extended Basic Graphics

Extended Basic Graphics (Great Lakes Software, 804 E. Grand River Avenue, Howell, Michigan 48843; $24.95) is a package written in Extended Basic with generous assembly language linkage for speed at critical points. It boots automatically from the XB environment as a "Load" program. The software is well-documented and menu-driven. It allows creation of three types f graphs: pie charts, bar arts, and X/Y plots using up 12 data points and can save the data to disk for future uses. EBG requires a disk system, Extended Basic module and Memory Expansion. The disk an be easily backed-up for consumer protection. Printouts are to the screen or to printer in a boxed 3 by 4 inch format which automatically labels all data elements. The confinement to relatively small printouts is limiting, but there are plans to produce an upgrade soon which will:

(1) Increase the printout size to a full 80 columns.

(2) Allow for up to 200 data elements for graphing.

(3) Allow for saving of screens from the graphing software that can be used for editing with Great Lakes soon-to-be-released by Joy Paint graphics software.

There are no problems with speed in the program in either data entry or printouts. Extended Basic Graphics has a couple of annoying problems. It requires data to be saved to disk when changing the type of graph you want (it won't work with the data in memory). EBG does not make provisions for printer open statements and other defaults to be saved to disk and loaded with the program (you have to re-enter the printer statement every time you want to print a graph). The system also has limited error checking (I could crash the program when trying to save graph data to a full or write-protected disk. Despite these minor complaints I like this program and look forward to the new version from Great Lakes.

Von Graphs 99

A second package is called "Von Graphs 99" (Utilitee Software, P.O. Box 7275, Dearborn, MI 48121; $19.95). This is written entirely in assembly language and is the fastest of the graphing packages. It is also the most limited for graph types, offering only pie charts and bar graphs. The disk is heavily protected and cannot be backed-up. It, too, allows for only 2-12 data elements and the printouts to printer are extremely fast and are full-sized (taking up almost a half-page). The program has good error checking and I was not able to crash it despite all of my best "Albright Klutz Attack" moves (breaking with FUNC 4 while the graph was printing, etc). One nice feature was that the program automatically adjusts the maximum and minimum labels for the graph once all the data has been entered. If your largest data element is 500, the printout will reflect 500 at the top of the scale and breaks down the divisions into fourths (so there would be a label at 375, 250, and 125). On the printouts for the pie charts, the data is conveniently displayed with the name of the data element, its value and its percent of the total, all automatically. It only accepts up to 3 digits for the data entry which is limited for larger numbers and the printout labeling capabilities are rather sparse. The pie charts will not printout with labels for the graph's title and the bar charts do not label the vertical axis. I understand that Utilitee Software plans to further upgrade this package also. This could be, with some minor enhancements, a great software package.

Business Graphs 99

The best of the three graphing software packages, in my opinion, is Business Graphs 99 (McCann Software, available from Disk Only Software, P.O. Box 4170, Rockville, Maryland 20850, credit cards accepted; $29.95). Written entirely in Forth, this package has enabled me to use graphs in lectures, and they are readily reproducible for overhead transparencies and, yes, even color slides taken directly from my monitor. The program is not protected and is extensively documented with a 26-page manual. It requires either Extended Basic or Editor/Assembler, memory expansion, and disk drive. Like the other packages, a printer is almost imperative. Business Graphics 99 has the most extensive selection of graph types and includes pie charts (with the ability to "explode" any and all slices), bar charts (single, stacked, or double bars), and line graphs (plain line, hi-lo, and area plots). The program allows for the use of 7 textures patterns and all colors for the graphs and allows for the use of a grid with the bar and line charts if desired. You can save the graphs to disk (all but the pie charts). Business Graphics 99 also accepts up to 100 data elements for the line plots and up to 20 for the bar graphs and 2-6 slices for the pie charts. The manual includes a brief tutorial on how to access Multiplan data for use with this graphing program and there is a simple way to save the default printer settings to the program disk. The most exciting thing about this package is the ability to print the graphs (including pie charts) to disk. The author has made available on Compuserve's TI Forum, a conversion program which allows the graphs to be easily incorporated into TI Writer files. Thus, you can, for the first time, generate graphs and incorporate them into your word processor for printing. I was able to lock-up the program using the "Klutz Attack," but it took a major assault. The program has only one size printout (almost as large as Von Graph 99), it has the slowest printer routine of the three packages reviewed (about 45 seconds per graph), and, for my monitor, the 64 column Forth mode used for data entry was a little rough on the eyes after long periods at the screen, but otherwise the software was absolutely superb. The author, Mike McCann plans a new software product written in Forth for the 99/4A to be released this summer. Based on his work with Business Graphs 99, I eagerly await its introduction.

The moral of this review is before you moan and groan about the lack of software for the TI 99/4A, look around. Spend some time asking for specific applications. A lot of great, unknown software awaits your application needs if you will only seek it out. It may take some time and effort to call dealers or ask one of the electronic information networks, but it will most probably, as these three packages have shown me, pay dividends.

Assorted Newsbytes

Congratulations to Mark Sumner (CSI Design Group, St. Louis, MO) for being chosen to run the new TI Roundtable on the Genie electronic network. We understand that a new TI Fair will be held in conjunction with the annual computer exposition in Nashville, Tennessee. The Fair will be sponsored by the Music City Users Group on May 3 and 4, 1986. Contact the group at P.O. Box 24886, Nashville, Tennessee 37202. If you have any questions or problems of any nature, write us at TI Forum, *Computer Shopper*, 407 S. Washington Ave., P.O. Box F, Titusville, FL 32781. We will reply to every letter. That we promise.

Figuring Out Files

Ever wondered just what "file type" means when cataloging a disk? There are quite a few of them, and the following is a short guide to figuring out file types and just how to use those unknown or forgotten disks that you are just not sure what to do with.

First, we can take a look at a sample printout of a disk catalog from the Disk Manager module:

Filename	Size	Type P
CHARA1	9	PROGRAM
DATA	27	INT/VAR 23
LOAD	12	PROGRAM
MAIN	181	DIS/FIX 80
PGMDOC	31	DIS/VAR 80

Of course, depending on the disk you are using, you will get many different catalog listings, but from our sample one we can piece together some general information about files and file types.

The first type of file to recognize is "PROGRAM." A PROGRAM file usually means just that--the file is a program that can be run from BASIC or Extended BASIC. If you have an unidentified PROGRAM on your disk, you can always try typing 'OLD DSK1.name' from the Extended BASIC or BASIC prompt, or even 'RUN "DSK1.name"' if you are adventurous enough (this will load and RUN the program).

However, you will sometimes get an '" I/O ERROR 51" or the like when trying to load such a PROGRAM file. The problem is that a few other kinds of files are stored in PROGRAM format. For example, some assembly programs can be squeezed into PROGRAM format, yet still require an Editor/Assembler module to run. For example, the TI-Writer program has a file called "CHARA1" that will change the 99/4A lowercase letters to "true" lowercase. It cannot be accessed from Extended BASIC or BASIC, or even run from the E/A module--it is called up automatically as the TI Writer program is run. If you have tried loading and running a PROGRAM from BASIC or Extended BASIC and failed, you can always try Editor/Assembler option 5 (from the E/A main menu) to attempt to run the program. If that doesn't work, the PROGRAM can be left alone in the hopes that it is automatically loaded by another program, such as the case with CHARA1 and TI-Writer. One note about PROGRAM files and Editor/Assembler--each PROGRAM file is no larger than 33 sectors (note the file size in the catalog listing), so files are often strung together by incrementing the last character in the filename by one ASCII number. For example, if you see GAME, GAMF, and GAMG on your disk, chances are they are strung together, and using E/A

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option 5 to run GAME will load the other two as well.

So, in the case of our sample catalog listing, CHARA1 could probably be left alone in favor of testing LOAD, another PROGRAM. Extended BASIC automatically checks disk drive one for a PROGRAM named LOAD when Extended BASIC is selected from the main TI-99/4A menu, so LOAD is rarely used for anything else but a TI Extended BASIC program, and usually as one that will chain to another, larger program. To cancel the autorun of LOAD, simply hold down <FCTN>4 as the disk drive light is on, and the program will "break" at its first line, putting you into the Extended BASIC command line.

LOAD is often used so that people without an Editor/Assembler module can still use assembly programs; it would be reasonable to guess that in the example above LOAD is used to load and run the assembly file MAIN. This brings us to another common filetype: DISPLAY/FIXED 80. DIS/FIX 80 is used for standard assembly object code (prepared program). If you see a DIS/FIX 80 file on your disk, you can attempt to run it with Editor/Assembler option 3 (from the main E/A menu), or even through Extended BASIC with the 32K Memory Expansion attached, with CALL LOAD ("DSK1.name"). In both cases, you will often need to know the "program name" in order to get the assembly file to start running. "START" is a common program name, but it can be anything the programmer desires. If a program name is needed, you will get the "filename?" prompt from E/A option 3 again; hit <ENTER> and then try a program name. In the case of Extended BASIC a CALL LINK("name") would be needed to get the program running. Most commerical programs will be self-explanatory (using DSK1.LOAD to run a program from Extended BASIC, for example) or will have instructions, but it is useful to know a bit of background about the way different kinds of programs are stored.

Another common file type is DISPLAY/VARIABLE 80. DIS/VAR 80 files are often used to store text. In the case of "PGMDOC" above, it could be guessed that documentation is in that file, in text format. DIS/VAR 80 is used as the default file type from the TI-Writer program, as well as for Editor/Assembler source code (the original, non-runable format of object code). If you have a DIS/VAR 80 file (or even a DIS/FIX 80 file) you can load it into TI-Writer or Editor/Assembler's editor and take a look at what you have. A simple Extended BASIC program (which is listed at the end of this article) can also be used to examine the contents of such a file.

One more common file type is INTERNAL/VARIABLE 254. INT/VAR 254 files are used by Extended BASIC for large (over 52 sectors or so) programs instead of PROGRAM format. If you see an INT/VAR 254 file on your disk, you can try to load and run it (OLD DSK1.name) just as you would any other program, and see what happens.

DIS/VAR 163 is used to hold Extended BASIC programs in "merge" format; some programs take advantage of this to create "merge" files from text files, allowing you to write your programs with TI-Writer or any full-featured editor, and then converting them to regular PROGRAM format. If you see a DIS/VAR 163 file on your disk, you can try 'MERGE "DSK1.name"' at the Extended BASIC command prompt to try to convert the merge file to regular PROGRAM format.

Files are often used by programs to store large chunks of data, and can be in any format from DIS/VAR 254 to INT/FIX 47. Even the common filetypes listed above can be used to store generic data, so attempts to load, run, or merge some files that look like they are in the proper format may not always work. The following program executed in Extended BASIC will allow you to list out any file (except one in PROGRAM format) to your screen:

```
10 OPEN #1:"DSKn.name",INPUT,type
20 INPUT #1:A$
30 PRINT A$
40 GOTO 20
```

In the above program, "n" should be the number of the drive where the file is, "name" the name of the file, and "type" the type of the file, e.g. DISPLAY,FIXED 80 (remember to use a comma instead of a slash). If the file is in DISPLAY format, it is best to change INPUT in line 20 to LINPUT, but INTERNAL format cannot use LINPUT. The program will load in each line of the file and print it onto the screen, ending with an error. The error is fine; it simply means that there is nothing left to load in and print from the file.

One final note, remember that "DIS" or "D" is often used as an abbreviation for "DISPLAY," "INT" or "I" for "INTERNAL," "FIX" or "F" for "FIXED," and "VAR" or "V" for "VARIABLE." You must use the full names in the above program, of course. Write with your questions to *Computer Shopper*. Happy file handling. ●