THE GUILFORD 99'ER NEWSLETTER

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, President , Vice President
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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 3202 Canterbury Dr., Greensboro, NC 27408. The Software Library is for dues paying members only. (George von Oeth, Editor)

OUR NEXT MEETING

DATE: September 6, 1988. TIME: 7:30 PM PLACE: Glenwood Recreation Center 2010 S. Chapman Street.

DIRECTIONS TO GUILFORD 99ers

Take I-40 from Winston-Salem to Patterson Street exit. Stay on Patterson St. crossing High Point Road, past coliseum parking lot on your left, to Chapman Street. Go right on Chapman Street crossing Florida Street and you will find Glenwood Center at the top of the hill on your right. Welcome!!!!

We look forward to seeing many of you at the meeting—September 6th, 7:30 PM.

Herman Geschwind will present the program this meeting. He will demonstrate Ram Disk and Gramkracker along with open discussion on both.

MINUTES

The August meeting of the Guilford 99er Users' Group met at the Glenwood Community Center in Greensboro, N.C. on the 2nd. There were 11 members present.

The meeting was called to order by President Janice Snider at 7:30 p.m.

The July minutes were read and accepted as read. Janice told the group that she must give up her office of President due to a new job at work which will cause her to do extensive traveling. Janice said she still wants to be as active in the club as her time will permit.

OLD BUSINESS

1. Herman asked the Sect. if there had been any response to the offer of the TI-WRITER and the HOUSEHOLD BUDGET MANAGEMENT module that we had posted on the BBS. He suggested I enter it again which has been done.

2. Herman told members that the monies sent to Dan Post was well received and helped to buy a new cable needed for the renevated BBS.

3. Another census was taken for the office of VP, but there were no volunteers for the job. Another census will be taken in September for the office of President and Vice President.

4. President Snider commended Bob Carmany for the good job he did as VP.

5. Herman raised the question as to why the VP had to be in charge of the monthly programs, and it was mentioned that at the onset of the group that there was a program chairperson, but it was somehow combined with the VP when Bob first took over the office years ago. Herman suggested that each member be responsible for one program one month of the year.

NEW BUSINESS:

1. It was brought to the members of the group that the Winston Salem group has disbanded. Bob Carmany posed the motion that we send each member of that group one of our newsletters for September. John Goller suggested an ammendment to the motion to have a seperate issue sent to those members with an invitation to join our group. Motion was carried.

2. It was suggested a map be drawn so that the W.S. people can find the location of our meeting place. Bob Carmany volunteered to draw the map which will be on their copy of the newsletter.

3. The disk of the month was then offered, and 4 were sold. The disk was WRITER/EASE which is a word processor for the TI. The disk was a flippie with the dictionary on the flip side.

PROGRAM:

The program was a lecture and demonstration on MULTIPLAN by Herman and was a very good program. Herman started with the explanation of the basics of a spread sheet and, using his IRS information, demoed the operation of the program. There was a question and answer period at the end.

As the meeting was never officially adjurned, members enjoyed fellowship with each other and started leaving around 9:30 PM.

Respectfully submitted,
L.F. "Mac" Jones, Sect./Treas.
Guilford 99er Users' Group

RAMBLING BYTES

By "Mac" Jones

It was sure nice seeing a good "turn-out" at the meeting. Herman really "shucked the corn" with his demo of Micro Soft Multiplan! I think even I might could figgure it out now and you know how dumb I am on those type programs.

Missed George's smiling countance and Bill Woodruffs familiar face in the back seats! Mike Garrett must have been off selling sausage and we missed you Mike. I guess Carl is on extended vacation. I have had his a pack of paper here for 4 months but haven't heard from him. Where are you Carl? It was good to see Emmett Hughes back again. Emmett has had to do some traveling for Cone but hopefully he can be with us some. I guess you heard that George is treking over seas. He and Jenny are seeing what they can find over there that we don't have over here, but since George promised to bring me some coins and stamps, I won't be too hard on him for missing the meeting!!

As soon as George gets home we will try to get together and finish the stand alone drive. Herman donated us a cable to connect it to the PEB drive and that was about the only thing that was holding us up. I promised to do the electronics if George would build the case for it. As you know, Herman donated the drive and Bill donated the parts for this project.

Hopefully, the members of the disbanded Winston Salem group will come over and join us. I feel that we can all benefit from their presence at our meetings. I realize it will mean a little farther drive for these nice folks, but with the new super highway systems we have, just once a month wouldn't be quite so bad. I am pretty sure that under similar circumstances, I would be willing to drive a ways to keep my TI fellowship alive. I like this little ol' computer and I really don't want to change.

I talked to Scott Hughes after the meeting and I think he might just accept the office of President. As you know, Scott lives in Burlington and his forte is heading the staff of a hospital there. This is the one thing that Scott fears might interfere with his taking the office. In the event he might be giving a lecture to the staff, he might not be able to be here at the beginning of the meeting. However, the VP could open the meeting if that was the case. I really don't understand the reluctance of the members to hold office. I have held everything except newsletter editor and librarian and it's really nothing to it. I hope that we will have some folks wanting to hold the vacant offices come September. An ideal officers is

January, so really the job wouldn't be long!

It was good to see members taking the newsletters home to read. I am trying to keep them current, but a lot of them are not coming during the summer and I have been told that a lot of the clubs do not publish at this time of year. Hopefully, we will hear from all our friends in the fall.

The new format of the ROS BBS is real nice. It gives you an idea of what the program is all about. I know on the old board, I just had to kind of guess at what the file was if I didn't know exactly what it was I was looking at. Herman deserves a hand for the good job he has done and for the time he has spent on our behalf. He has really spent a lot of his time helping out in his capacity of assistant SYSOP on the board. Thanks Herm! Everything we have in the library is now there for you to download. By compressing the files it now takes a whole lot less time to download a file than it used to. Bob has also uploaded quite a bit of the files he has received from the dirty dozen in Australia(as he calls them)! Just kidding all you Mates over there.

You know, there really is a brotherhood among TI'ers that has not been snared with any other home computer in my opinion. We even have a TI Echo that goes all over the country and is easily accessed on the OPUS BBS. I would strongly urge you to make use of your modem and get in on the fun that is to be had on these boards. You can leave messages to any of the users in N.C. and on the Echo, any one in the country.

Until next time, have fun and enjoy the good TImes.

MODEM TALK

By: Herman Geschwind

OK gang, July 22 was the big day when we were able to start up the new ROS. The new hardware is quite an improvement over the old system even though we are still amazed that the old Kaypro 4 kept going 24 hours a day for months on end without missing a heartbeat. Our new hardware is a good bit more sophisticated and instead of having to shoehorn things into 64K we now have 640K to play with. Part of the ROS software now is in a RAM disk which makes the response a good bit peppier. For storage Dan supplied a 20 megabyte Seagate ST225 and believe it or not, we are almost full already. Fortunately we have an ample power supply and enough drive bays that we can add a second drive which Dan has in reserve.

Putting the hardware together was quite a bit of fun and a few anxious moments, too. The motherboard was supposed to take a set of 256 kbit chips but refused to work. Since this was a donated piece of equipment we did not have any schematics for it and felt rather frustrated. Dan then found an otherwise unlabeled jumper and after changing it and installing all 64 kbit chips, lo and behold the system came to life. Another irritating problem was that the diskette drives that we initially planned on using refused to cooperate. Fortunately Dan had a spare and that little problem was resolved. Who ever said that computing was easy!!

A more formidable task was to transfer the upload libraries to the new system. The Kaypro is a CPM machine and the new one is PC DOS with an entirely different file format. I did not watch Dan do his magic but all of our nearly 6,000,000 characters of TI files were converted over without missing a byte. Quite a feat of magic on Dan's part.

So, here we are, not only with new hardware but also with a new BBS software system. If you have logged on already you will agree that the new ROS is a lot friendlier to the user.

First and foremost for all the files there are now descriptions. In fact the description line can be 50 characters long. Bob helped a lot with getting descriptions added to the old uploads. For most of the files we now have descriptions and Bob is still working to get things fixed up and we should be complete before too long.

There are also many improvements in the message area. ROS will now let you know when you have mail waiting and (R) for read will bring up the first new message. Another real neat item is that in replying to a message all that needs to be done is press (R) for Reply again and ROS will supply the name of the addressee and subject.

When you access the file area, ROS defaults to NEWIN and pressing (N) for new and <enter> will list all the new uploads since your last log-in. No more need to wade through all the old stuff to find the new uploads.

In fact, there are so many neat features that one of the first files that you should download is ROSMAN.ARC.- the ROS user manual. Again we are indebted to Bob Carmany for fixing this manual up in TI format.

ROS can be easily customized to suit you. The (U)tility section lets you set your preferences. For my own use I toggled (B)ell off since I don't like all the sound effects with each system prompt. For use with the TI screen I set on (L)ines per page for 12 and (C)haracters per line for 40. This keeps things from scrolling off the screen when I ask for a directory

listing. My (T)ransfer protocol is set for 3 - Ymodem CRC. Theoretically ROS can automatically match either Xmodem or Ymodem. Unfortunately TELCO is also very polite and will match the other system so that in automatic mode both systems defaulted to Xmodem CRC. From my phone exchange I usually have a pretty clean connection to ROS so that I can use Ymodem and benefit from the increased speed and efficiency. If you have problems with shaky phone connections, Ymodem is more trouble (for every missed bit more than 8000 bits need to be retransmitted).

So much for all the good news. The bad news is that the User File for ROS 3.81 is entirely different and could not be ported over from the old system. I you have not used ROS in a while and now log on, unfortunately you will have to reregister again and have to be validated to be given full access. Dan is doing his best to process new users as frequently and quickly as possible. Just don't let that deter you, you will quickly find out that the new system is worth it!!

SOFTWARE

Have you ever wondered exactly what is available in the software world for your TI? Even with a "semi-expanded" system, the possibilities are staggering. Just to give you an example, let's take a look at what has come out in the past three months for the TI that will run on a TI with a single disk drive and 32K memory expansion.

In May (the 25th), Tony McGovern came out with Vn 4.11 of F'WEB. If you have never tried this outstanding piece of software, you are definitiely missing a superb product. F'WEB brings together TI-Writer, E/A, and DM1000 into a single package. You can load virtually any program that can be loaded on the TI -- even some that lock up the GRAMKRACKER loaders. As "slick" as Vn 4.11 was, Tony found some room for improvement. His prolific programming mind re-worked DM1000 and enhanced his son's LINEHUNTER program (an A/L utility). Some pernicious "bugs" were squashed and the August 12th Vn 4.12 came out. It is really "state of the art". In fact, I imposed on George and transferred it to a couple of SSSD disks and promptly spent the remainder of an evening configuring and re-arranging it to my satsifaction. The result was a series of 7 disks that will allow me to do just about anything that can be done with a TI --- from telecommunications to GPL assembly and dis-assembly. Incidently, it is in the UG library on the ROS BBS.

At the same time (Aug 16th), Barry Boone released ARCHIVER III. This is the "perfected" version of his ARCHIVER 2.4 which squeezes and archives programs. Vn 3.0 was followed in quick succession by 3.01 and 3.02 -- about one a day! The end result is Vn 3.02 which in Geneve compatable. ARCHIVER III takes the Lempel-Ziv algorithm and optimizes it to squeeze those file groupings even more than they were before. In addition, the buffer size has been increased and you can now extract a single file from an archived and squeezed file. But the most amazing aspect of the program is that it combines the archive and squeeze functions into a single step --- no more intermediate disks to clutter up the tabletop! An added benefit is that the process has been streamlined and everything has been speeded up.

John Birdwell joined the group and came out with three successive versions of DISK UTILITIES. Vn 4.1, 4.11, and 4.12 all came out within a couple of weeks' time. The latest version is Myarc and Geneve compatable as well as working flawlessly on the TI. The utilities have been grouped more logically and are easier to use. There are some functions in Birdwell's programs that just aren't found in any other comparable programs.

These three programs are outstanding enough by themselves but what if . . Birdwell have combined their considerable talents to make all three of these programs interface quite nicely. Both ARCHIVER III and DISK UTILITIES are "Funnelweb aware" --- they have a menu option to reload F'WEB by way of F'WEB's UTIL1 file. So when installed in the F'WEB system shell, they make a truly integrated software package. Add TELCO, PRBASE (or CMINDEX), SPELLCHECK, and 19 or 20 of your other most-used programs and you have a software system that will do anything that you want it to. As Mr. Spock once said in STAR TREK "The possibilities are almost endless . . ."

LIBRARY EXPLORATION

By: Bob Carmany

Recently, I have been going through our UG library on ROS trying to help Herman Geschwind get everything straightened out. We have been trying to standardize the filenames, and getting everything archived and compressed to conserve space. At any rate, through these ramblings through the almost 6 Megs of programs we have available, I have made some rather startling discoveries. For one thing, there are some truly outstanding "fairware" programs in the library --- many of which were designed to work together. That is what we are going to explore in this article.

Among the programs in our UG library are two files that are of particular note --- LABELS.BIN and GRAPHED.BIN. Each of them, by themselves, are impressive fairware efforts. Taken together, they are especially impressive. We will look at LABELS.BIN first.

Actually, there are three seperate programs archived under that filename. The first is DISK LABEL VN 2.0 by Paul Shiedemantle. The second is GRAPHIC LABELS VN 3.0 from the Ottawa LG. The third program is a LOADer although it really isn't necessary since both are written in XB. At any rate, DISK LABEL VN 2.0 is a versatile program to read disk directories and print labels. It is one of the "Epson-compatabile" programs and there are a variety of print sizes and formats --- 4600 combinations according to the documentation. The one that we are interested in is the second of the programs ---- GRAPHIC LABELS VN 3.0.

The GRAPHIC LABEL program will produce labels that combine text and graphics to create address labels, and labels for other uses. It uses the 2-sector D5SD pictures that come from Dave Rose's program. Everything is menu driven and there are on-screen instructions as well so documentation is scarcely necessary. The program does come with a few text files (with the suffix "/TX") and a few graphics (with the suffix "/GR") but the question arises of what to do when you would like to use a graphic that isn't included? The solution is actually quite simple. First of all, there is an extensive library of "/GR" files available from various sources but if that doesn't fit your needs, here is the ultimate answer.

The program DRAWED.BAC solves that problem quite nicely. It is a graphics editor that will create all of the 2-sector graphics that you want for your label program. There are a couple of "/GR" graphics files included but the main portion of the program is the editor itself (UTIL1 and UTIL2) with an XB LOAD file. Once again, there are on-screen instructions as well as a simple, easy/to-follow menu that will take you through the process of creating your own miniature artworks. The program allows you to turn off or turn on the individual pixels of your drawing. You can scroll horizontally or vertically to use the entire available area. "Freehanding" in a miniture version of North Carolina took me about 10 minutes --- and that was with just a cursory look at the documentation. Once the graphic has been created, simply SAVE it to disk and it is ready to be used with GRAPHIC LABELS VN 3.0. You could re-create your college logo, for example, or anything else that you want to be used on your address labels. The process is simple and much quicker than I imagined when I started to mess around with the program. It is a very "painless" way to create some customized address labels.

FORTH TUTORIAL

By: Lutz Winkler

This is in answer to questions regarding the use of sprites and other graphics capabilities of the 99/4A with Forth. As we all know, we got a pretty good deal because TI built a fair amount of graphics into this little machine. Anyone who has seen PARSEC etc. can vouch for that. And all of them can be utilized in TI-Forth, with commands (statements) which are very similar to the ones employed in BASIC and XBASIC.

However, there are a couple of things which must be done in order to use any of the available VDP (graphics) modes. First of all, the appropriate LOAD OPTION must be booted, i.e. -GRAPH and -VDPMODES. If you are using the 64 column editor you only need to boot -SPLIT2, the rest of them are already booted. Another thing you will have to do is to fix a bug in line 10 of screen 58. It should read as shown below:

```
VDPMDE @ 4 < IF SMTN 80 VFILL 300 ' SATR ! ENDIF
```

(in other words the ! after 300 should be a ' (tick)). And while you are at it, fix line 1 of page 10 in Chapter 6 of the manual to read: HEX 3800 ' SATR ! Also, on screens 53, 54 and 55 the last word of line 1 should be SETVDP2, NOT VDPSET2. For some strange reason it is correctly shown on screens 51 and 52. Finally, on screen 59, line 9, change the 00FF to 00FE.

Now let's take a look at what is available in Forth. I have drawn up the following chart for easy reference:

VDP MODE	ASCII CHARS DEF?	CHAR DO	FB/ DO	HCHAR VCHAR	SPRI- TES	SPR. HOT.	DISPLAY SIZE
TEXT	YES	YES	NO	YES	NO	NO	40 x 24
GRAPHICS	YES	YES	YES	YES	YES	YES	32 x 24
MULTI	NO	NO	NO	NO	YES	YES	64 x 48
BITMAP	NO	NO	NO	NO	YES	NO	256 x 192

```
SPLIT    |  same as BIT-MAP with 8 lines text on bottom
         |
SPLIT2   |  same as BIT-MAP with 4 lines text on top
-------------------------------------------------------
```

There are essentially four display modes, except one of them, BITMAP, comes in three versions. When Forth boots, the display is in TEXT mode: 24 lines of 40 characters each. This is the mode used by the 40-column editor. New characters can be defined but all characters have the same foreground/background colors, there is no control of individual character sets. The easiest way to set text/background color is by using nn 7 VWTR (see tut 1). If -TEXT is booted you can return to text mode by entering TEXT.

The screen display of the GRAPHICS mode is identical to that of BASIC or XBASIC: 24 lines of 32 characters. And, as the chart shows, its features the same also. But beware! If you want to set FG/BG colors, charsets are numbered from 0 and start at ASCII 0. The first set containing dis- playable characters is number 4 in Forth. It is not stated in the manual but you can go to Appendix A (ASCII KEY CODES) and divide each column into groups of 8 characters, then number them - starting with zero - and you will know what sets to use. IF -VPDMODES is booted you can enter this mode by invoking GRAPHICS.

Then there is the MULTICOLOR mode. I've seen those 'crazy quilt' demos, what else it might be good for, I don't know. A 'character' is a block of 4x4 pixels, thus there are 48 lines of 64 blocks. Each of them can be set to a different color. Use MULTI to enter this mode.

The BITMAP mode provides the highest resolution. Each of the 256 pixels in the 192 lines can be controlled individually. But there is a drawback: No automotion for sprites. Since standard characters can not be displayed TI has provided a neat feature with split modes where a large part of the display is in bitmap and the remainder can display ASCII characters. This comes in real handy when you want to experiment with the various graphics words since you'll be able to see what you are typing. The words for en- tering the various bitmap modes are GRAPHICS2 (full-screen bitmap), SPLIT (text at bottom) and SPLIT2 (text at top). By the way, if you opted for the 64-column editor, it uses SPLIT.

Study chapter 6 of the TI-FORTH manual. You will notice that: a) all you need to know is there, b) you are already familiar with most commands by way of BASIC, and c) if you have absorbed enough Forth by now, it's easy to see that the main difference is that parameters (in typical Forth fashion) go on the stack before the operative word is invoked. If you want to use sprites, pay particular attention to the section on Sprite Initialization (page 8 of Ch.6). Here is a brief example which shows how sprite is set up:

```
 0 ( SPRITE SAMPLE )
 1
 2 BASE->R  HEX
 3 : SETUP
 4       GRAPHICS  ( set standard graphics mode )
 5       2000 SSDT ( set sprite descriptor table )
 6       1028 4482 4428 1000 2A SPCHAR ( char def )
 7       3F 2F 0F 2A 1 SPRITE ( sprite parameters )
 8       15 0 1 MOTION ( motion parameters)
 9       2 #MOTION ; ( set sprite in motion )
10
11 DECIMAL  R->BASE
12
13 SETUP
14
15
16
```

This example is for standard GRAPHICS mode. If you wanted to use bitmap line 4 would have to read GRAPHICS2, for SPLIT or SPLIT2, line 7 would have to include 3800 ' SATB ', but lines 8 and 9 would be superfluous. As this screen is loaded a sprite is displayed and set in motion. You can enter TEXT and return to the edit mode. Typing SETUP will again produce the sprite.

Only by exploring and experimenting will you be able to gain proficiency with the graphics features offered by TI-FORTH. As I have mentioned, all the necessary information can be found in the manual, though not in a tutorial manner.

*** END SESSION 7 ***

*** CONCLUSION OF SERIES ***

AUTHOR'S NOTE:

Apparently, the information furnished by the above seven tutorials did the job. The flow of questions dried up and no. 7 became the final one of this series. I wish to thank all of those who contacted me and thus provided the inspiration to keep writing them. Hope you are enjoying Forth as much as I do.

TI ARTIST TO GRAPHX

By: Ron Albright

Almost simultaneously (I honestly don't know which one was first), the owners of the Texas Instruments 99/4A Home Computer were blessed with two of the finest graphics designing utilities available for any machine. TI-Artist by Chris Faherty and Graphx from Aus- tralia were remarkable implementations of the latest programming technologies for obtaining the elusive "user- friendliness"; the use of "icons" (TI Artist) and "pull-down menus" (Graphx) made the user manuals almost redundant as one could begin using them almost immediately. It was difficult for the consumer to choose which to use, each having certain unique features absent from the other. Graphx featured clip- boards (which enabled animation and the use of virtually unlimited character fonts), while TI-Artist featured the ability to expand a single type font into 81 different type sizes, and different brush strokes and fill patterns. But now you can justify buying both because they, thanks to Artist's conversion utility, can be used to enhance each other and make each more useful. Thanks to an idea planted with me from Warren Agee, I will now explain how to use Artist and Graphx almost compatibly and certainly for the enhancement of the other.

One of the most under-rated (at least I haven't heard its praises sung as widely as they should) features of Artist is its conversion utilities. With this set of routines, art screens drawn with any of the graphics design software that predated Artist can be loaded into Artist and saved back to disk in Artist format for future printing or improving with Artist's advanced features. Convertible formats included art previously created with Draw-a-Bit and Draw-a-Bit II (Data Force, Inc.) and Draw 'n Plot (Quality 99 Software). It was marvelous fore- thought by Chris Faherty in making this conversion available. But even though Graphx and TI-Artist were developed without contact each on a different side of the world, these two are also "almost" compatible.

TI-Artist saves its screens into two files, both in "Program" format. It stores the actual screen designs in a file annotated with "_P" (When you save the file with Artist, you are allowed to enter up to an 8-character filename, not 10; the program then annotates the suffix on), and the color scheme of the graphics is saved as a file annotated with "_C". Both files are 25 sectors long.

Graphx, on the other hand, saves its screen files in a single file, again (luckily) in "Program" format, and 54 sectors long. So where is the compati- bility?

First, Graphx will load the 25 sector "_P" file saved with Artist. The art will lack color, as the file containing the color scheme (the "_C" file) is useless to Graphx, but you can fill in colors with Graphx quite easily. Unfortunately, there is no way (that I know of) to load Graphx-saved art into Artist. But little matter, you can work up through Artist and then put the finishing touches on the drawing with Graphx. Let me give an example of how this can be useful.

I really liked the large number of type fonts immediately available to Artist; with Graphx they have to be designed manually (or bought on disk from Asgard and its Graphx Companion software). So, why not use Artist to create the type fonts and use Graphx's clipboard option to use them. Here's how. Get into Artist and use "Alpha- numeric" function and Ctrl 1-9 and Fctn 1-9 to vary the horizontal and vertical size of the letters (respectively) to type the alphabet and numbers. Keep the letters as far apart as possible, because we will be 'collecting' the letters a la the clipboard option of Graphx and it requires a sizable distance between objects on the screen. With larger size letters, you may be able to get only incomplete characters on each screen, but that won't matter. Save the incomplete screen, clear the screen, and type the remainder of the letters of

numbers. Let's say we were using a small type font and could get all the letters well spaced on one screen and we saved the screen to disk with Artist as a file named "TYPE1". You recall that Artist will actually save 2 files, one called "TYPE1_D" and one "TYPE1_P", the letter being the only one that is important.

Now let's go to Graphx and use the screens and fonts we have created. Boot Graphx and choose from the menu to load a saved screen. Enter "TYPE1_P" when asked for the filename. It will load in (but only in black and white, which is fine). Then, use the pull-down menus to get to the "clipboard option" sections Then choose "Add frames to clipboard". You will then be allowed to select the size of the clipboard to save; pick the smallest sized box that will "pick up" each of the letters. Then pick up each letter, move them to the upper-left corner and add them to the clipboard. Once you have picked up the letters off the screen and saved them out to disk, you will have quickly created an entire new font to be used to label your drawings with Graphx. I found I could create 3 new fonts in about an hour with this method.

The usefulness isn't limited to just typesetting. By using the marvelous mirror and brush styles of Artist, features Graphx lacks, you can create the initial parts of a drawing which could use these features, save it, and use the unique features of Graphx to finish the drawing. All in all, the two programs complement each other beauti- fully.

I am sure there are TI-Artist and Graphx fanatics who profess that one can do everything they need with only their favorite program. I submit that, used together, the combination of Graphx and TI-Artist gives the serious graphics designer almost unlimited features and greatly augmented facili- ties. Give them both a try and see if you agree.

TECH/NOTE

With the introduction of the Geneve this article on how to repair your expansion boxes' special problems will come in handy.

1. If the cards and any drives lose all power and the fan is still working.

A fuse inside the transformer is blown.

Caused by some short temporary, unknown or otherwise.

Double check by looking for an open (by an ohmmeter or continuty tester) in the primary of the transformer with primary wires isolated disconnected or open circuited.

Fix by digging at the platstic cover and/or tape of the transformer until you find, it could be on either side towards the card connectors or the pc board, the fuse then jumper (short it) around it (the fuse in the fuse holder in the back of the box near the power input is now your only protection) instead you could put a new fuse in parallel with the old fuse.

If there continues to be a short because the fuse in the fuse in the fuse holder in the back of the box or the fuse continues to blow then problems 2 or 3 below might be the problem.

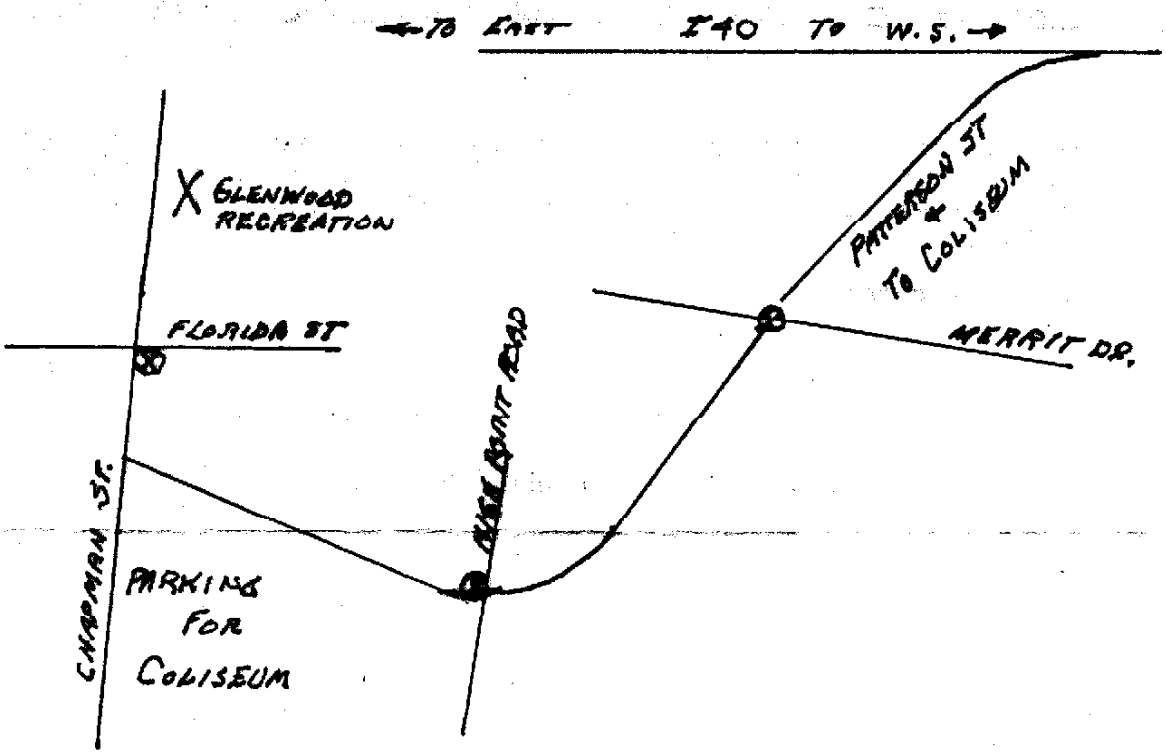
2. The diodes on the PC board in the power section of the box are bad.

Caused by the accidental reseating of cards while power is on or shorts by foreign metal objects fallen on the card connectors.

If too quick an accidental of cards occured or foreign object fell while the cards were operating then the diodes in the power section and the buffer chips (74ls244's or 74ls245's) on victim cards (any cards known to be operating at the time) should be replaced.

3. Metal objects got in under the edge card connector bus PC board or the edge card connector bus PC board broke, fractured in a small spot due to forcing the cards in to hard.

The short is caused by the fact that at manufacture pins of the card edge connectors were left at there normal long length which means that those pins come closer to the grounded exp. box chassis than anyone would expect. This makes it easier for small metal objects to cause shorts between the pins and ground or a cracked edge card connector PC board to touch the grounded chassis.



⊗ Denotes Traffic Signals

Winston Group, Y'all Come!