THE PUG PERIPHERAL

THE MONTHLY NEWSLETTER OF THE
PITTSBURGH USERS GROUP
SEPTEMBER, 1988

CLUB NEWS BY GARY TAYLOR

WE WILL BE STARTING A SPECIAL INTEREST GROUP ON THE PRINTER'S APPRENTICE AT THE SEPTEMBER MEETING. WE HAVE DEMONSTRATED THIS PACKAGE BEFORE BUT WE HAVE NEVER DEVOTED TIME DURING OUR SIGS TO INVESTIGATING WHAT THIS COMPLICATED GRAPHICS PACKAGE OFFERS. MARLENE CURRAN WILL BE DIRECTING THE SIG BEGINNING AT 4:30. SHE ADMITS SHE IS FRUSTRATED USING THIS PACKAGE SO, NOW IS THE TIME TO PITCH IN AND HELP WITH DISCOVERING ALL THE FEATURES OF THE PRINTER'S APPRENTICE. IF YOU ALREADY HAVE THE PACKAGE THEN BRING YOUR QUESTIONS, HELPS AND HINTS. IF YOU DO NOT HAVE THE PACKAGE COME AND FIND OUT ABOUT IT. IF THERE IS ENOUGH INTEREST WE WILL TRY TO GET A DISCOUNT ON A CLUB PURCHASE. YOU CAN GET THE PRINTER'S APPRENTICE FROM MCCANN SOFTWARE, PO BOX 34160, OMAHA, NE 68134 FOR $22.50.

GARY KUHEN OF THE AIRPORT AREA USER'S GROUP IS GOING TO DEMONSTRATE THE MULTITASKING CAPABILITIES OF THE GENEVE 9640. MULTITASKING IS THE ABILITY TO RUN MULTIPLE PROGRAMS AT THE SAME TIME. FOR AN EXAMPLE, YOU COULD BE UPLOADING OR DOWNLOADING A FILE USING A COMMUNICATIONS PROGRAM AND ALSO BE WRITING A LETTER ON YOUR WORD PROCESSOR AT THE SAME TIME.

RAY WALLIS HAS ORDERED THE NEW AVPC (ADVANCED VIDEO PROCESSOR CARD) 80 COLUMN CARD FROM DIGIT SYSTEMS AND HAS OFFERED TO SHOW IT OUR MEETING. THE AVPC IS A CARD THAT FITS INTO YOUR EXPANSION BOX AND CONNECTS TO AN 80 COLUMN RGB MONITOR. THE NEW 80 COLUMN FUNNELWEB WAS DEVELOPED USING THE NEW CARD.

WE RECEIVED A DISK FROM FRANK LEGLER CONTAINING TURBO 3-D TIC-TAC-TOE. HE HAS RE-WRITTEN THE 3-D TIC-TAC-TOE PROGRAM RELEASED BY TEXAS INSTRUMENTS IN THE OLDIES BUT GOODIE - GAMES II CASSETTE. THIS PROGRAM IS A HYBRID EXTENDED BASIC/ASSEMBLY LANGUAGE VERSION AND REQUIRES EXTENDED BASIC AND MEMORY EXPANSION. IF YOU HAVE EVER PLAYED THE OLD VERSION YOU WILL REMEMBER HOW S-L-O-W THE COMPUTER WAS IN MAKING ITS MOVE AND HOW QUICKLY YOU LOST INTEREST IN THE GAME. THIS VERSION IS SO FAST THAT THE COMPUTER IS NOW WAITING FOR YOU TO MAKE YOUR MOVE! I WILL HAVE SEVERAL COPIES AT THE NEXT MEETING. THANKS FRANK!

THE LIMA USER'S GROUP HAS SENT US THE COMPLETE "XDP" (EXTENDED DISPLAY PACKAGE) FROM THEIR LIBRARY. WHEN WE DEMONSTRATED THIS PACKAGE AT OUR MAY MEETING WE DID NOT REALIZE THAT WE HAD ONLY PICKED UP THE DEMO DISK, THE PACKAGE IS ACTUALLY CONTAINED ON FOUR DISKETTES. ALSO INCLUDED IN THE PACKAGE FROM LIMA WAS: THE LATEST VERSION OF FUNNELWEB 4.13: THE 80 COLUMN EDITOR UPDATES FOR THE GENEVE AND 80 COLUMN CARD OWNERS: "XHI" HI-RESOLUTION SUPPORT SOFTWARE FOR 80 COLUMN CARDS: AND A NEW QUICK DIRECTORY FOR FUNNELWEB CALLED "WHIPBIRDS". WHIPBIRDS IS THE LATEST FROM FUNNELWEB FARMS AND IS AN ENHANCED VERSION OF THE OLD "QUICK DIRECTORY" THAT ALLOWS MANY NEW FEATURES, INCLUDING THE ABILITY TO RUN A PROGRAM DIRECTLY FROM THE DIRECTORY. IT WILL DETERMINE WHAT KIND OF FILE YOU CHOSE AND LOAD THE APPROPRIATE LOADER FOR THE PROGRAM AND THEN RUN IT. THIS VERSION IS STRICTLY FOR 80 COLUMN CARDS. CHARLES GOOD OF THE LIMA GROUP IS CURRENTLY TESTING A 40 COLUMN VERSION.

THE MYARC GENEVE 9460

By Gary Taylor

Number One

Why I bought One.

I purchased my Geneve at the Chicago Faire in the Fall of 1987 and since that time I have grown to enjoy it more and more. But before I go into the details of my configuration and how I use it, I thought I would tell you the reasons that I bought it in the first place.

In 1986 I moved to Pittsburgh from Dallas. I was a member of the Dallas TI Home Computer User Group where the use of Ram disks was becoming popular. I had a full blown system and a Ram disk was certainly going to be the next addition to my system. Unfortunately, during my relocation to Pittsburgh my TI computer was stolen, replacing the computer delayed my ability to purchase a Ram disk for the next year or so. During this time I became active in the PUG as librarian and found myself using TI-Writer to produce these wonderful newletter articles. At nearly the same time I was given an IBM XT to use on my assignment at work. It didn't take long before I wanted a full 80 column screen and a keyboard at home similar to the one I was using at work. I had already set my TI-Writer screen tabs to 39 to avoid the 40 column windowing and I was using the latest version of Funnelweb, so I was taking advantage of the latest software and techniques available. But I wanted more.

So why didn't I go out and buy a clone? Well, I guess the II represented fun to me! It certainly did all that I needed a home computer to do. It provided me with endless hours of entertainment, allowed me for the first time to type letters without Sno-Pak. And I could communicate with the world through my modem. The theives that stole my equipment did not take any of the books or software and I had over 250 diskettes of programs. I admit that the TI-99/4A is not as fast as the computer I have at work but then I can only type at 45 words a minute and my modem is only 2400 bps, so what do I need a faster computer for? My main use of the computer was and still is word processing and tele-communication. Besides, the cost of buying a clone was going to be expensive, even though I could probably pirate all the business software I could ever use. What was I going to do with R-Base 5000 at home? or Lotus 123? I had never even loaded Multiplan on my TI even though I had two copies of it.

So there I was with a wish list that included a Ram disk, an expanded keyboard, and an 80 column display. The third party equipment manufacturers had all the pieces I needed. All I had to do was come up with the money and put it together. I could buy an expanded keyboard for $200, a Horizon Ram disk for $200 (Ah remember 1987?), and a Mechatronics 80 column card for $200 and I would be all set.

But wait, this is 1987 and that **mysterious Geneve was just released** earlier in the year. I had read about it in MICROpendium. It came with an expanded keyboard; it came with a built in Ram disk; it came with 80 column display capability; and it only cost $425! Plus I get all that other stuff everyone was talking about like MDOS, and clocks, and a faster processor, and RGB graphics, and 80 column Multiplan (whatever that was), and 80 column Myword, and Pascal, and Advanced Basic, and Multitasking ?? and all kinds of other stuff that I did not understand, all for only $425. Well I could hardly wait to get to Chicago and talk to this guy named Jack Riley about this new computer. The doors opened at 9:00am and I was standing in front of his booth at 9:01. He ran the Geneve through its paces showing me the DOS like commands that I had become familiar with at work and demonstrated a graphic program called MYART. He even had a mouse to draw with! I was sold! Off I went to make my best deal at the vendor tables.

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HIGH RES GRAPHICS AND THE 99/4A

PART 2

The Comparison Chart

By Anne Dhein

Section Three: Picture Storage, Color, and Unique Features

Scratchpad Memory - Most drawing packages have provisions for setting aside part of a picture and later adding it to another picture. This "scratchpad" memory can be handled in two ways: by saving a permanent version of the clipped picture onto a disk which you can reload as needed; or by storing the picture-part in intermediate memory where you can recall it when you need it, even though you have loaded new picture files in and out of the program since the picture part was saved.

When this type of picture-part is saved to a disk it should not be confused with a regular picture file. When a picture file is loaded into your program, whatever you had on the screen before is erased and gone, and the new picture takes its place. Picture-parts, however, are loaded IN ADDITION to whatever else is already there. These small pictures have become very popular with the drawing community so that they have their own special term - clipart.

Each program is unique in its handling of this additional storage. Joy Paint uses internal storage for a Cut and Paste method much like the paint programs for other popular computers do. All screens are saved in the same format. When something is wanted from another picture, save the current picture first, then load in the picture to be borrowed from. "Cut" out the piece you wish to use. Reload the original picture and "Paste" the new part any where on the drawing.

Bitmac uses the "Store" function for internal temporary storage. Current screen graphics can be overlaid with graphics stored on a disk, using what is called "Boolean Input". This allows special graphics effects which are unique to Bitmac.

TI Artist also has unique storage methods. Besides the normal full screen picture files, parts of pictures can be saved as "instances" or "slides". Slides are a collection of up to 24 miniture designs that can be independently designed, rotated, and moved around on your drawing. Instances are images that can be added to your drawings or combined together in whatever manner you wish. They can become a permanent, editable part of your drawing. The nice thing about instances is that they are saved in a DISPLAY VARIABLE 80 format which can easily be transported to Extended Basic programs or TI Writer files as well as being used for clipart.

Graphx has a very powerful "Clipboard" feature. With it you can create and store clipart permanently on a disk and it is also possible to copy a portion of one picture into another, much like Cut and Paste. A portion of a picture, or even several pictures, can be stored, then decided on later as to which ones to keep and which ones to erase.

Use of Color

In the high resolution mode each graphic position available to be used on our electronic drawing board is called a pixel. You may remember being told that the screen is like a grid with 256 pixels across and 192 pixel rows; and that each individual pixel on the screen can be turned off or on separately while you are drawing - all 49,152 of them! Right? Wrong, if you are using color!

Color resolution for the 99/4A is not the same as drawing resolution. We still have the same 192 rows of pixels, but instead of 256 pixels across, we have only 32 graphic positions across each row. Each row of pixels is grouped in eights, starting from the left of the screen, and each set must be the same two colors - a foreground and a background.

The foreground is the color assigned to the brush or pencil line in each eight-pixel group. The background is the color assigned to those same eight pixels when the pencil is not used. When you first begin using the drawing board, all of the eight-pixel groups have been assigned the same two colors. The color you see before you begin drawing is your background, and, of course, the pencil line is your foreground color. You may also see a third color in the form of a border around the perimeter of the screen. This is the screen color. If you don't see it, that means the screen has been assigned the same color as the background.

Now you can see why color resolution is 64 X 192 instead of the drawing resolution of 256 X 192. Any given group of eight horizontal pixels MUST be the same two colors. The groups on either side can carry entirely different colors, but each group is limited to two colors. Knowing this, and arranging your drawings according to the color boundaries is important when working with color.

Most programs make full use of the 99/4A's 15 brilliant colors, allowing control over the foreground and background colors, and in many programs over the screen color as well. Sometimes the screen color is called the "backdrop".

All programs using color allow the swapping of one color in a drawing for any other. When the exchange takes place, every incidence of that color on the screen is swapped for the new one. Additionally, some programs like TI Artist and Graphx allow selective repainting of a chosen area.

Some of the programs provide special helps for working with color. TI Artist provides a function that lets a special color cursor move on color boundaries. Graphx does the same; also providing a "Grey and White Checkerboard" function which is handy for planning drawings which will use a lot of different colors. This makes it much easier to plan the various colors in your picture so that they don't bump into each other. When you no longer need the grid simply choose the "Remove Grey Boxes" option.

For special color effects, two programs that shine are Draw-A-Bit with its Redraw feature described elsewhere, and Paint 'N Print which includes five extra rainbow colors in varying widths of horizontal and vertical stripes. Draw 'N Plot makes limited use of color. Only two are used at any one time - foreground and background. These colors can be easily switched so you can see how the various combinations of color look together.

Besides the Graphic Package, which doesn't use color either, Joy Paint is the only major paint program not using color. Here the emphasis is on the manipulating of picture components, and color is used only as a background, with the pencil line alway being your choice of either black or white. Painting refers to filling shapes with the many patterns available, or using the air brush to "spray paint" an area with a chosen pattern.

A Slide Show is a method of presenting pictures in a selected order. Bitmac is the only program with this feature built in; Draw A Bit and Draw 'N Plot have disk demos that you can adapt for your own pictures. TI Artist has an excellent companion disk called Display Master that gives you many options in designing your own slide display. Asgard Software puts out a slide show program for Graphx files.

The Undo command lets you "take back" the last step of a drawing. If something was moved or erased that shouldn't have been, no harm done, just "undo" it. Joy Paint is the 99/4A's only program with this feature but it is quite common in paint programs for other computers.

Like Undo, each program has special features not shared by the others. If you are in the market for a new paint program, one of these might be just the feature you were wishing you could find. For instance, Joy Paint has a drawing area that is actually 92% larger than the screen. To see the rest of the drawing board, the screen is used as a window, and can be moved from side to side or up and down. When the screen dump program is used the whole area, not just what is visible on the screen, is printed.

Do you have a second computer that you have wished you could tie in to your 99/4A? The Bitmac software will let you do just this. When the coprocessor function is in effect, the other computer (not necessarily a TI) can manipulate data while the 99/4A is processing elaborate graphics from that data.

Bitmac has a Cursor Report feature which can be turned on or off as desired. It keeps track of the actual pixel location of the cursor. The program also lets you scroll your picture one pixel at a time to the right or left, up or down on the screen. This is handy for getting a drawing onto color boundaries, and also for special effects using the Boolean inputs AND, OR, and XOR.

The TI Artist instance file was already mentioned above as being excellent additional storage for clipart, because these files can be added so easily to any picture you are currently working on. The instance file is invaluable for using as a vehicle to transport your artwork to other mediums. Many support programs have been built around the ability of these instances to be so easily used, including Font Writer (Asgard), Art Convert (Trio+) and Character Sets and Graphic Design III (Texaments).

Besides being used for planning color in drawings, the unique grey box function in Graphx can be used for designing schematics and other precision drawings which require precise measuring.

The Graphx clipboard also lets you experiment with computer animation. If you store the appropriate images on the clipboard you can create short, animated sequences which you can display against a background of your normal Graphx pictures.

Like the Norton Graphics Package, Draw N Plot is primarily a programmer's tool. Unlike the Graphics package however, Draw 'N Plot has a very nice, full-featured drawing board. Also, the routines in Draw 'N Plot are in assembly language which considerably speeds up operations. Draw 'N Plot makes an excellent program to design your own Extended Basic programs around; however, memory can be a problem.

Draw A Bit is really a full-scale programmer's tool too, but the programmer must be somewhat conversant in assembly language as well as Extended Basic to use it with his own programs.

As you work in the Draw A Bit environment, your picture is automatically saved for you in intermediate memory. Any time you wish you may clear the screen and with the push of the right keys, redraw the picture, line for line. This is a fascinating procedure to watch. Pictures may also be saved in this Draw mode if desired. Also interesting to use is the Connect-Dots option. This is like a line function except that you plot all your dots first; then the lines appear when you are ready for them.

Built right into Paint 'N Print is a font editor that will let you easily change the shape of the resident alphabet. The companion disk additionally allows editing of the texture character for all sorts of special textural effects.

Paint 'N Print is the only drawing package which allows a screen dump to be in color, providing you have the right printer (the Axiom GP 700).

Super Sketch is the only program that includes a touch tablet. This graphics tablet, although deceptively simple looking, is a precision tool that accepts commands through a control arm which determines screen position. The control arm moves the pointer (your pen) around the tablet, and the computer keeps track of where this pointer is at all times. In this manner, any picture placed on the tablet can be traced onto the screen. The device is so simple that even a child can use it easily.

The Artist Extras package from Inscebot allows the use of the Super Sketch touch tablet with TI Artist. When used this way, the tablet becomes an integral part of the TI Artist program and the is used in place of a joystick or trackball to allow designed traced with the tablet to appear on the screen.

Continued next page

Hi-Res Graphics continued.

Section Four: Hard Copy,
File Management and Extra Support

Except for Super Sketch and Draw A Bit, which both have supporting disks that contain screen dumps, the drawing packages listed here all include built-in printer routines. The printer and the software package you use must be compatible. All of the programs listed are compatible with the TI Impact Printer which was made by Epson, so any printer that uses the same formats and codes as an Epson is also compatible. Paint 'N Print comes in a choice of three cartridges depending on which printer you have. Cartridge A works with the Axiom GP-100 and GP-700 printers. The GP-700 will give color printouts. Cartridge B is set up to work with the Axiom GP-550 and Okidata printers, and C is for the Epson compatibles, which include Star and IBM. The Extended Graphics Package which supports Paint 'N Print contains the routines from all three cartridges. Other printers that can be used with a particular drawing program are listed on the chart.

Screen dumps vary widely in several important respects, including size, density, and placement on the page. All details given here were gotten from screen dumps using the TI Impact printer. They should more or less apply to all screen dumps but there could be differences. A small size screen dump occurs when the screen image is copied exactly as shown, pixel for pixel. A larger dump has more printer dots per pixel - usually either 4 or 16 dots for each pixel, which can give a blockier effect from up close but looks great when the viewing distance is further away.

The size of the printout is also affected by density. On the TI Impact printer there are normally 60 dots printed horizontally per inch. This would make 480 dots per each 8 inch row. Double density prints 120 dots horizontally per inch, and some printers have an even higher dot resolution than that. Since the graphic image has the same number of pixels no matter what density is used, it will be only half as wide when printed double density as when printed in normal density mode. Most of the packages listed here handle this factor for you by adjusting the line spacing when double density is used. Because of the difference in printers, and because screen graphics don't match up exactly pixel for dot with printer graphics you may still find some distortion in your printouts. On the whole, though, most paint packages produce a reasonable hard copy of your screen graphics.

Joy Paint gives you a choice of two dump sizes and either size can be single or double density. The small dump is centered on the page, and because Joy Paint uses 92% more area for graphics than other packages, it pretty well extends from one side of the page to the other (5 1/2 inches wide times 3 1/2 inches high). Three of these dumps will nicely center on a page, which, using three screens consectively, will produce a very good flyer. The large dump produces a horizontal picture 8" X 9" in size.

Bitmac also gives you a choice of large or small dump. The small dump places exactly one dot on the paper fo each dot in the screen to give a single density printout 4 1/4 inches wide X 2 5/8 inches high. You have a choice of centering the graphics, or placing them over to the right or left margin. The large dump is centered and is double density. On the TI Impact printer it is distorted quite badly, however, as it is the same heighth as the smaller picture, but 6 3/8 inches wide.

TI Artist gives you the most control over the final output for your hard copy. You have a choice of up to three magnifications and four densities depending on what your printer is capable of doing.You can also control line spacing when the printing is being set up. Using the TI Impact printer you can have a double density printout as small as 1 3/8 X 2 1/8 using a magnification of 1 and a line spacing of 4; or a printout which will fill an 11" X 15" large size paper with a magnification of 3, a line spacing of 8, and single density. And all this from the same screen image! Printing can also be done from the zoom mode.

All TI Artist printouts are centered no matter what the size. A single density printing that has been magnified twice exactly fills one-half of a standard page; two consecutive printings make a very nice flyer.

Graphx gives you a choice of two sizes, single or double density. The smaller (4 1/4 X 2 5/8) is printed at the left margin. The larger is half of a standard page - again, two screens make a nice flyer. Draw 'N Plot has one size, 4 1/4 X 2 5/8, single density. Paint 'N Print also has one large size single density printout. Paint 'N Print gives a choice of which part of the drawing will be printed - from a very small section up to the whole screen. The drawing will be printed horizontally and in the upper left corner of the paper.

Sketch Mate, the Super Sketch companion disk, and the Master Painter program, both by Amerisoft International, have virtually identical printouts. Each is 7 3/4 inches wide and 4 5/8 inches high, single density. Each uses a technique whereby colors are assigned a texture (light, medium or dark) to simulate color. This gives pictures a very nice printed appearance. Each color is assigned a default setting which can be changed by the user if desired. The Paint 'N Print program also uses the technique of assigning a different print character for each color. The Draw A Bit companion disk also allows two printout sizes; single or double size, and each can be normal or double density.

The Morton Graphics Package doesn't actually contain a screen dump. Rather, it allows you to print out data that is needed to rebuild your graphics in your own program, either as Sprites or as Call Characters. This graphic data may also be saved in merge format on a disk.

File Management

Disk Catalog - It's handy to have a catalog available if you need to find out just what you did name a certain file, or even if it's on that disk. Only two programs perform this service - TI Artist and Joy Paint. Joy Paint also provides

for deleting files.

Conversion Features and Compatibility - If you are intending to use pre-designed graphics either instead of or in addition to creating your own, file compatibility among the various programs becomes important because you will need a ready supply of artwork and clipart. The core program here is TI Artist. Not only is more ready-made artwork available for TI Artist than for the other paint programs, but TI Artist allows picture files from Draw 'N Plot, Graphx and Draw-A-Bit to be loaded in and permanently converted to the TI Artist format. Or, TI Artist files can be converted with TI Artist and loaded from any one of those programs. Instances, which are a very popular form for clipart, can be converted by first saving as a picture, then converting to an instance. CS6D graphics, which are another popular form of clipart, can be converted using any of several available programs including the Artist Extras companion disk. CS6D fonts can also be converted to TI Artist fonts using the same disk.

Joy Paint's Pal allows the conversion of Graphx, TI Artist, and Draw 'N Plot picture files to the Joy Paint format and visa versa. Joy Paint will also load the first of the two output files for Sketch Mate. It will not, however, load Bitmac files, even though Bitmac has the same Internal/Fixed/128 format that Joy Paint does. This leaves Bitmac as the only major paint program to lack compatibility with the others.

Graphx does not have a file conversion feature, but it will load TI Artist files that end with _P. If you transfer the picture file this way you do lose the color. If the color is important the file must be converted to Graphx format within the TI Artist program first, then loaded into Graphx. Graphx will also load Joy Paint files that have been through the conversion program on Joy Paint's Pal.

If you are primarily interested in screen graphics then file portability is important. This is the ability to move picture files into another environment without a great deal of programming; for example being able to move a picture you have drawn in TI Artist into your Basic program. This ability is built in to TI Artist's instances, slides and font files, which has caused a great many support programs to be written, both commercial and as shareware.

Draw 'N Plot and the Norton Graphics Package can easily be used by the average Extended Basic programmer. In the same way, Draw A Bit and Graphx adapt easily for assembly language programmers. Portability for the rest of the programs is limited.

Additional Support

In many cases the manufacturers themselves are doing a good job of supporting their paint programs. Great Lakes Software puts out clipart disks for Joy Paint, as well as Joy Paint's Pal, which has routines to allow file conversion, creation of new patterns, and a reduction feature. Great Lakes also supports a user-drawn base of Joypaint clipart. Their Extended Business Graphs II, while a stand alone package, has file compatibility with Joy Paint.

Besides Artist Extras, Inscebot has released Display Master for the TI Artist which lets you add captions to your drawings and show them in any sequence. Quality 99 Software has some disks of very good artwork out for Draw 'N Plot. A volume of artwork was also released for Bitmac.

Other software producers have also done their share. Asgard Software has released several Graphx Companion sets that contain clipart, full pictures, fonts and animated sequences for the Graphx environment. They are a veritable gold mine of art and ideas for your own creations. Asgard has also released a disk for TI Artist that contains some of the same artwork imported to the Artist environment, but you can still use the Graphx Companions with TI Artist or JoyPaint if you don't mind making the conversions. Asgard has also released Graphx Pictures which contains more of their outstanding artwork - 24 pictures - and a Slide Show program with which to show them.

Trio+ Software has released some excellent artwork for use with TI Artist. Each 2 disk package includes pictures, clipart, fonts and slides.

Texaments handles the Artist Companions authored by Dave Rose as well as the whole CS6D series. One of the best and most prolific sources of instances and fonts for TI Artist actually started out as clipart for another program - Character Sets and Graphic Design by David Rose. But that's a whole new story so it'll be saved for Part three.

Otherwise, the chart has been covered and you should now have a much better understanding not only of what can be expected of paint programs in general but the strengths and limitations of any particular package.

TO BE CONTINUED NEXT MONTH

Thanks to the following members who have recently renewed their memberships...Ray Wallis, Theodore Anderson, James J. Bowe, George O. Dick and John Wilforth.
We're still waiting to hear from Martin Kroll, Jeffrey Scott, St. Norbert School, Norman Rokke, and Don Heiber.

Geneve (Continued from page 2)
When I got home and opened the box, I found a P-box card with a bunch of connectors sticking out the back, an expanded keyboard (hoo-ray), a large binder full of instruction, a bunch of disks and a warrantee card. Installation was a snap. I opened the P-box and pulled out the 32k card and replaced the flex cable with the geneve 9640 . Then I connected the keyboard to the Geneve and plugged in my composite monitor and turned it on. WOW! There was the beautiful white swan that I had seen in Chicago. Suddenly disk drive one came on, the swan disappeared, the screen honked, and I was staring at an error message - "NO BOOT PROGRAM FOUND ON DISK - PRESS ANY KEY TO RETRY". Thus I was welcomed to the wonderful world of M-DOS. Which is the topic for next months article.

NOTE: Beginning on the next page is the first in a series of articles on Console Debugging Help. It will be running over the next several months and will be printed so that you may remove it from the newsletter and compile your own booklet.

CONSOLE DEBUGGING HELP

By John Guion
Dallas TI Home Computer Group

PROBLEM AREAS

1) Console will not power up
2) Keyboard errors
3) Intermittent console lock up
4) Module errors
5) Joystick port errors
6) Video output difficulty
7) Sound problems

The TI-99/4A Console and Peripheral Expansion System Technical Data manual available from Texas Instruments' Dealer Parts Department (1806) 741-2265) will serve as an excellent source for schematics and part location guide.

The information contained herein is only intended for use as a reference for possible debugging procedures. It is not intended as a repair guide for the common user with little or no knowledge of digital electronics or the basic structure of the TI-99/4A system. The author assumes no responsibility for damages resulting from improper use of this information.

1) CONSOLE WILL NOT POWER UP

1.1 General information

Failure of the TI-99/4A console to power up and produce the TI title screen is a common problem that is also the hardest to track down and fix since failure of nearly any component in the console or power supply can cause this.

The following are not intended as solutions to the problem, but merely as points to check that may aid in finding the actual problem and fixing it.

Unless a particular part is suspected, replace any socketed chips possible with known working equivalents before desoldering any components. Since the socketed chips are common causes of lock up, eliminating them as possible problems first may save excess soldering on the board. The console will power up if the sound chip is removed entirely, but not if that chip is shorted internally.

A simple TTL logic probe can be used for tracing signals in the circuit. An oscilloscope may also be used and has the advantage of being able to check clock signals for proper frequency. When a signal should exist as an output from a particular device, be sure to check that device's input for proper signals before attempting to replace the component. When checking for locked up signals, try to trace all signals back through the circuit to the point of origin. A set of schematics (available from several sources, including TI) will help greatly in this part of debugging. Tracing locked signals can determine whether or not the signal is missing due to a faulty component that it must pass through or what power up operation was occurring during lock up.

1.2 Console power up procedure

A. TMS9900 CPU resets and addresses low ROM locations.
B. TMS9900 initializes.
C. TMS9900 sets up workspace registers in MCM6810 RAM.
D. TMS9900 begins GROM read.
E. TMS9900 enters delay loop for about 1/4 second.
F. TMS9919 sound chip is disabled.
G. TMS9918A VDP chip is initialized.
H. 4116 VDP RAM is initialized (requires about 1 second).
I. Title screen is loaded into VDP.
J. TMS9919 sound chip emits beep.
K. TMS9900 CPU enters keyboard scan.
L. System is ready for use.

1.3 Voltage/signal checklist

A. Check power supply for +5V, +12V, and -5V. Lack of -5V often results in a gray flickering screen on power up. Check for +5V on chips throughout board. Check TMS9900 for -5V at pin 1; +5V at pins 2, 33, 59, and 64; and +12V at pin 27. If any voltages are missing, check for shorts on main board. Replace power supply if necessary.

B. Check TMS9900 pins 8, 9, 25, and 28 for clock signal. If not found, check TIM9904 clock generator pins 1, 2, 3, and 4 for clock signal. If not found, check TIM9904 supply voltages (+5V at pin 20, +12V at pin 13), crystal, and tank circuit. If no external problem can be found, possible TIM9904 failure.

C. Check TMS9918A pin 39 and pin 40 for the 10.73863 MHz clock. If missing, check crystal and oscillator circuit. Otherwise, check TMS9918A pin 36 and pin 37 for clock outputs. If not found, remove GROMs and sound processor (located next to GROMs) and test again for clock. If missing, possible TMS9918A failure. Reinsert GROMs and sound processor after tests.

D. Check TMS9918A pins 14 (-CSW) and 15 (-CSR) for lock up. If locked up, check memory enable from pin 6 of 74LS32 and pin 13 of 74LS138 located next to MCM6810. Trace signal to find possible failure.

E. Check TMS9918A pin 13 (MODE) for lock up. If locked up, trace signal back to TMS9900. Also check for other components that may be locking up this line (it is used as A14). If no other fault can be found on that line, possible TMS9918A failure.

F. Check TMS9918A pin 1 (-RAS), pin 2 (-CAS), and pin 11 (-R/W) for lock up. If locked up, possible TMS9918A failure.

G. Check TMS9918A pins 17 through 24 (data lines) for signals. If missing, trace to fault. Possible TMS9918A or TMS9900 failure.

H. Check TMS9918A pins 3 through 10 (RAM address/data lines) for signals. If missing, possible TMS9918A failure.

CONSOLE DEBUGGING HELP (Cont.)

I. Check 4116 RAM pin 14 (DATA OUT) on each chip for signal. Each chip missing signal may be at fault as well as TMS9918A.

J. Check TMS9900 pin 62 (READY) for lock up. If locked up, check TMS9900 pin 6 (-RESET) for signal. If pin 6 is locked up low, possible TIM9904 failure. If high, possible TMS9900 failure. If TMS9900 pin 6 is not locked up, trace circuit back from pin 62 to find fault.

K. Check all three GROMs (CD2155, CD2156, and CD2157) at pin 10 (-CS) and pin 15 (GREADY) for signals. If either is missing, remove all three GROMs and test pin 10 again for signal. If the signal at pin 10 does not exist, trace back through circuit to find failure. If signal exists, replace GROMs one at a time until GROM that causes lock up on pin 15 is found.

L. Check all three GROMs for signal on pin 11 (MO/A14) and pin 12 (M1/DBIN). If missing, trace circuit to find break in signal path.

M. Check each GROM for -5V at pin 14, +5V at pin 9, and -.8V to -.6V at pin 16. If missing, check for broken trace. If -.8V/-.6V is missing or at -5V, check diode connected to that line.

N. Remove sound generator. If console powers up, check pin 16 for +5V, pin 4 for clock from TMS9918A, pin 5 (-WE) for signal, and pin 6 (-CS) for signal from 74LS138 closest to MCM6810. If these signals exist, possible sound chip failure.

O. Check TMS9918A pin 36 for composite video output. If missing, check TMS9918A crystal and clock circuit and pin 16 (-INT) for interrupt signal. If signals exist, possible TMS9918A failure.

P. Check GROMs for clock on pin 13. If missing, check clock output on TMS9918A pin 37. If signal on TMS9918A exists, check for break in signal path. If not, check TMS9918A oscillator circuit. If oscillator operates, possible TMS9918A failure.

Q. Check pin 20 (-CS) of console ROMs for lockup. If locked up, trace circuit back to find fault.

R. Check pins 7 and 9 through 15 of 74LS138 nearest I/O port to determine memory area accessed during lock up. Check pin 4 (-MEMEN) for lock up. If no signal can be found on pin 7 or pins 9 through 15, possible 74LS138 failure.

S. Check pin 11 (-CS) of MCM6810 RAMs for lock up. If locked up, trace circuit back to find fault.

T. Check TMS9901 pin 5 (-CE) for lock up. If locked up, check 74LS138 nearest I/O port for failure. Check TMS9901 pin 11, 17, and 18 for lock up. If locked up, trace circuit back to find fault.

2) KEYBOARD ERRORS

2.1 General information

After much use, the keyboard will sometimes malfunction and key presses will not appear to have any effect or will only work part of the time (either single keys or groups of keys). Keys may also show multiple entries even though only one key was pressed.

The TI-99/4A's keyboard is set up using an X-Y matrix to allow encoding of output signals from a 74LS156 to drive the interrupt inputs of the TMS9901. This method requires only 15 lines to encode all 48 keys. Keyboard failure is almost always a mechanical problem, but occasionally one of the computer's support components will fail and cause similar problems.

2.2 Possible causes and solutions

A. If only one key works intermittently or not at all, that single keyswitch is probably dirty or damaged. Some keyboards may allow for disassembly and repair while others make single key repair less practical than replacement of the entire unit.

B. If a group of keys has suddenly failed to work properly, it is likely that the switches in the keyboard are good and that some common component has failed. Typically, this is a broken wire or faulty driver chip. Consult a keyboard schematic to determine control lines common to groups of keys. When a common line is found, check continuity from the keyboard to the main board. If continuity exists, check loading resistors on the control lines from the keyboard connector before replacing any chips.

C. If the ALPHA LOCK key fails to operate properly and the console has been modified with the addition of a diode in the ALPHA LOCK circuit, remove the diode and replace with a piece of wire. The diode is added by some users to allow use of joysticks with the ALPHA LOCK depressed, but it sometimes introduces a timing problem and is not reliable.

D. If some keys do not work at all and others result in improper entries, check the keyboard plug connector for proper alignment.

E. If a group of keys with a control line common to the 74LS156 fail to function and continuity exists to the main board, use a logic probe to check for output pulses on pins 4 through 7 and 9 through 12 of the 74LS156.

F. If the entire keyboard fails to function and continuity exists to the main board, replace the 74LS156 and test again.

G. If 74LS156 replacement has no effect, replace the TMS9901 and test again.

TO BE CONTINUED NEXT MONTH..

FORTH TIP #4 : IN-BETWEEN DISK COPIER

From the time TI-Forth was first released a number of disk-copying routines have been published. This was mainly in response to TI's implementation of FORTH-COPY which - being nothing more than a DO-LOOP of SCOPY - tediously copies one screen at a time while giving the disk drives a good workout. My complaint about those 3-pass copiers is that they necessitate rebooting and for the most part also disk-swapping. In essence, not much time is saved. One might as well leave Forth and boot a disk manager. That, of course, is something a true fanatic is not going to do.

From my point of view, too much is made of speed anyway (I am in the enviable position of having plenty of time) and am inclined to look for convenience. That is the reason my disk copier does not set any speed records, but it does away with disk-swapping and re- booting. It copies from drive 1 to 2 (0 to 1, if you want to be finicky about it), takes up about 720 bytes of memory, and five screens are read/written per pass. It will copy formats other than SS/SD, however, the disk-formatting feature will only provide the format which is invoked by your FORMAT-DISK word.

```
0 ( DISK-COPIER - 1 )   39 CLOAD AB  0 CLOAD COPY-DISK
1 BASE->R HEX     0 DISK_LO !   0 CONSTANT INC
2 : AT GOTOXY ;  ( skip this if already in your autoboot )
3 : .SCR#  DUP 6 .R ; ( format for screen number display )
4 : READ5  5 0 DO I INC + .SCR#
5               BLOCK 1 400 # 1400 + 400 VMBW
6             LOOP ;
7 : WRITE5  5 0 DO I 400 # 1400 + 1 INC +
8               DISK_SIZE @ + .SCR# BLOCK 400 VMBR UPDATE
9             LOOP  FLUSH  EMPTY-BUFFERS ;
10 : M1  F1 7 VWTR CLS 2 A AT ." Reading source screens" CR
   CR ;
11 : M2  1E 7 VWTR CLS 2 A AT ." Writing copy screens" CR CR ;
12 : M3  CLS CR ." FORGET INC to clear memory" CR ;
13 : MORE?  ( --- f ) CLS 0 ' INC ! 4 E AT ."Continue (Y/N)? "
14         KEY DUP 59 = SWAP 79 = OR 0= ;
15 -->
```

```
0 (DISK-COPIER - 2 )
1 : TITLE  CLS 4 5 AT ." 0)------  COPY-DISK  ------>1"
2            4 8 AT ." Insert source disk in drive 0,"
3            4 A AT ."          copy disk in drive 1,"
4            4 D AT ." Press 1 to format copy disk or"
5            4 F AT ." any other key when ready  "
6         KEY 31 = IF 1 FORMAT-DISK THEN ;
7 : XFER  DISK_SIZE @ 5 / 0
8         DO M1 READ5 M2 WRITE5  5 ' INC +!
9         LOOP ;
10 : COPY-DISK  EMPTY-BUFFERS
11              BEGIN TITLE XFER  F1 7 VWTR MORE?
12              UNTIL  M3 ABORT ;
13
14 R->BASE  COPY-DISK  ;S
15
```

By the way, the first parameters in M1 and M2 (as well as the one preceeding 7 VWTR in DISK-COPY) change the text and background colors. ()F1 = white text on black screen.) You may substitute others to suit, just make sure you do it in HEX. READ5 and WRITE5 are DO-LOOPs which read(write) five screens at a time. XFER combines them into a DO-LOOP which derives its limit from DISK_SIZE. The top level word COPY-DISK is an indefinite loop which allows repeated execution by way of MORE?. About the >1400 in READ5 and WRITE5: Screen contents are put into an unused area of VDP memory. As I said, convenience, not speed, was my main objective. So, please excuse me while I fetch that second cup of coffee.

EOF/LW

I GOOFED!

In last months article, F-Tidbit #3, there is an error. Line 5 of the program should read:

```
5          CURPOS @ DUP VSBR OVER OVER
```

Sorry about that. Editor

NEW PROGRAM

By our own Lynn Gardner

```
*      ZOOM FLUME      *
.....................................
.                                   .
.   In this adventure, you are in your .
. bathing suit at the water park. Want .
. fun and excitement? Try the fast and .
. slippery track of the Super Slide, a .
. 5-story-high water slide. Speed down .
. a twisting course on the Zoom Flume, .
. a water-filled gully plunging you to .
. the bottom. See if you can hang onto .
. the Tarzan Trolley, a rope strung on .
. a pulley between platforms. Ride the .
. bumper boats in the lake or ride the .
. waves in the wave pool.  It's a cool .
. day, but surf's up.  Enjoy!        .
.                                   .
.     Copyright 1989  Lynn Gardner  .
.    Distributed by Asgard Software .
.                                   .
.....PRESS ANY KEY TO BEGIN.........
```

DOCUMENTATION FOR CASSETTE INDEX UTILITY VERSION 1.0 (IB)
CREATED BY HARRY BRASHEAR OF THE WESTERN NY 99'ERS
MODIFIED (V.2.0) BY MICKEY SCHMITT OF THE WEST PENN 99'ERS

PROGRAM NAME: CS1§INDEX (SEE LIBRARIAN)
PROGRAM DOCS: CS1§DOCS (DOCUMENTATION)
PROGRAM FILES: MOCKFILE1 AND MOCKFILE2 (BASIC SET-UPS)

This extended basic program will allow you to print out a neat little insert for your cassette tapes, just like the ones that come with them.

All printer codes are Epson compatible. You may wish to modify program line 570 to open your particular printer. Currently this program opens the following printer device: (RS232/2.DA=0.BA=9600).

When you first boot up the program, you'll be asked if you want to use files or input the information directly. (More on this later). You will then be asked for your full name, for good reason. That little fold over the other side of your tape will be put to good use by stating who the tape belongs to. (The default space limit is 28 characters).

Next you will be asked if you want one or both sides of the tape indexed. (The default is 2 for both sides).

You will then be asked for the cassette title (the default space limit is 25 characters), and any special information that you may wish to record. (Again, the default space limit is 25 characters).

Finally, you will be able to input your cassette programs, using any coding system you may prefer. (The default space limit is 27 characters).

Should you make a mistake while entering your program data just hit the <ENTER key> at a blank line and you will then be prompted back to your previous entry.

When you have completed all of your program data inputs, just type <0> and hit the <ENTER key>. (NOTE: the <0> will not appear on your printed insert).

Last, you will be asked if you would like to file or print your inputs. (This special feature was included by Harry so that people without printers could file the information till they could borrow a printer or con a friend into printing the inserts).

NOTE: If you have filed information stored on your disk you could just type <F> at the first prompt, which would prompt you for the filename you have your data stored under. Once you have entered your filename, just sit back and watch your printer go into action. (Provided you did remember to turn your printer on).

You may also make multiple copies by simply reprinting. The "BUTTONS" are just for fun, and you will have to hold your key presses longer because of them.

SIDE 1	SIDE 2
12345678901234567890123456 2 3 4 5 6 7 8 9 0 1 2 3 4 5234567890123456789012345	12345678901234567890123456 2 3 4 5 6 7 8 9 0 1 2 3 4 5234567890123456789012345

SIDE 1: 123456789012345678901234 5 123456789012345678901234 5

SIDE 2: 123456789012345678901234 5 123456789012345678901234 5

THIS TAPE IS FROM THE LIBRARY OF 123456789012345678901234 5678

MOCKFILE1

SIDE 1	SIDE 2
PROGRAM 001 - COUNTER 000 B PROGRAM 002 - COUNTER 010 B PROGRAM 003 - COUNTER 020 B PROGRAM 004 - COUNTER 030 B PROGRAM 005 - COUNTER 040 B PROGRAM 006 - COUNTER 050 B PROGRAM 007 - COUNTER 060 B PROGRAM 008 - COUNTER 070 B PROGRAM 009 - COUNTER 080 B PROGRAM 010 - COUNTER 090 B PROGRAM 011 - COUNTER 100 B PROGRAM 012 - COUNTER 110 B PROGRAM 013 - COUNTER 120 B PROGRAM 014 - COUNTER 130 B PROGRAM 015 - COUNTER 140 B	PROGRAM 016 - COUNTER 000 B PROGRAM 017 - COUNTER 010 B PROGRAM 018 - COUNTER 020 B PROGRAM 019 - COUNTER 030 B PROGRAM 020 - COUNTER 040 B PROGRAM 021 - COUNTER 050 B PROGRAM 022 - COUNTER 060 B PROGRAM 023 - COUNTER 070 B PROGRAM 024 - COUNTER 080 B PROGRAM 025 - COUNTER 090 B PROGRAM 026 - COUNTER 100 B PROGRAM 027 - COUNTER 110 B PROGRAM 028 - COUNTER 120 B PROGRAM 029 - COUNTER 130 B PROGRAM 030 - COUNTER 140 B

SIDE 1: WEST PENN 99'ERS CASSETTE LIBRARY PROGRAMS 001--015

SIDE 2: WEST PENN 99'ERS CASSETTE LIBRARY PROGRAMS 016--030

THIS TAPE IS FROM THE LIBRARY OF THE WEST PENN 99'ERS LIBRARY

MOCKFILE2

TIPS FROM THE TIGERCUB

050

TIGERCUB SOFTWARE
156 Collingwood Ave.
Columbus, OH 43213

Distributed by Tigercub Software to TI-99/4A Users Groups for promotional purposes and in exchange for their newsletters. May be reprinted by non-profit users groups, with credit to Tigercub Software.

Over 120 original programs in Basic and Extended Basic, available on cassette or disk, NOW REDUCED TO JUST $1.00 EACH!, plus $1.50 per order for cassette or disk and PP&H. Minimum order of $10.00. Cassette programs will not be available after my present stock of blanks is exhausted. The Handy Dandy series, and Color Programming Tutor, are no longer available on cassette.
Descriptive catalogs, while they last, $1.00 which is deductable from your first order.

Tigercub Full Disk Collections, reduced to $5 postpaid. Each of these contains either 5 or 6 of my regular catalog programs, and the remaining disk space has been filled with some of the best public domain programs of the same category. I am NOT selling public domain programs - they are a free bonus!
TIGERCUB'S BEST, PROGRAMMING TUTOR, PROGRAMMER'S UTILITIES, BRAIN GAMES, BRAIN TEASERS, BRAIN BUSTERS!, MANEUVERING GAMES, ACTION GAMES, REFLEX AND CONCENTRATION, TWO-PLAYER GAMES, KID GAMES, MORE GAMES, WORD GAMES, ELEMENTARY MATH, MIDDLE/HIGH SCHOOL MATH, VOCABULARY AND READING, MUSICAL EDUCATION, KALEIDOSCOPES AND DISPLAYS

NUTS & BOLTS DISKS
These are full disks of 100 or more utility subprograms in MERGE format, which you can merge into your own programs and use, almost like having another hundred CALLs available in Extended Basic. Each is accompanied by printed documentation giving an example of the use of each.
NUTS & BOLTS (No. 1) has 100 subprograms, a tutorial on using them, and 5 pp. documentation. NUTS & BOLTS No. 2 has 100 subprograms, 10 pp. of documentation. NUTS & BOLTS #3 has 140 subprograms and 11 pp. of documentation.
NOW JUST $15 EACH, POSTPAID.

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These are full disks which contain the programs and routines from the Tips from the Tigercub newsletters, in ready-to-run program format, plus text files of tips and instructions.
TIPS (Vol. 1) contains 50 original programs and files from Tips newsletters No. 1 through No. 14. TIPS VOL. 2 contains over 60 programs and files from Nos. 15 thru 24. TIPS VOL. 3 has another 62 from Nos. 25 through 32. TIPS VOL. 4 has 48 more from issues No. 33 through 41.
NOW JUST $10 EACH, POSTPAID.

```
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$          NOW READY            $
$ TIPS FROM TIGERCUB VOL.5      $
$ Another 49 programs and files $
$ from issues No. 42 through 50.$
$ Also $10 ppd                  $
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
```

TIGERCUB CARE DISKS #1,#2,#3 and #4. Full disks of text files (printer required).
No. 1 contains the Tips newsletters #42 thru #45, etc. Nos. 2 and 3 have articles mostly on Extended Basic programming. No. 4 contains Tips newsletters Nos. 46-52. These were prepared for user group newsletter editors but are available to anyone else for $5 each postpaid.

This educational program is a much expanded version of a routine I published before.

```
100 DIM M$(100)
110 GOTO 150
120 S,K,A$(),J,M$(),Y$,Z$,Z,X,ING$,A,AN$
130 CALL CLEAR :: CALL COLOR :: CALL SCREEN :: CALL CHAR :: CALL KEY :: CALL ING :: CALL HCHAR
140 !@P-
150 CALL CLEAR :: FOR S=0 TO 12 :: CALL COLOR(8,2,8):: NEXT S :: CALL SCREEN(5):: DISPLAY AT(3,1):"LEARNING TO ""ING"" IT  V.1.1"
160 CALL CHAR(64,"3C4299A1A199423C"):: DISPLAY AT(5,1):"@ Tigercub Software 1987 for free distribution - no price or copying fee to be charged "
170 CALL KEY(3,K,S)
180 A$(1)="No, if the word does not end in B, D, G, M, N, P, R or T you always just add ING"
190 A$(2)="No,if the last letter is not E and the next-to-last letter is not a vowel, just add ING"
200 A$(3)="No, if the word has two vowels just before the last letter, just add ING"
210 A$(4)="No, if a word ends in B, D, G, M, N, P, R or T with one vowel (but not two vowels!) just before it, you must double the last letter and add ING"
220 A$(5)="No, if the word ends in IE, change the IE to Y and add ING"
230 A$(6)="No, BE is an exception to the rules,"
240 A$(7)="Some dictionaries give EYING but EYEING is better"
250 A$(8)="No, if a word ends in E (except BE and words ending in IE,OE,UE AND YE) you must drop the E and add ING"
260 A$(9)="No, if the word ends in EE, or OE or UE, just add ING"
270 A$(10)="No, QUIP, QUIT and QUIZ are exceptions to the rule.  Double the last letter and add ING."
280 FOR J=1 TO 100 :: READ M$(J):: NEXT J
290 FOR J=1 TO 100 :: Y$=Y$&CHR$(J):: NEXT J :: Z$=Y$
300 DISPLAY AT(3,1):"":"":"":" Type the word with the correct ING suffix"
310 RANDOMIZE :: Z=INT(RND*LEN(Z$)+1):: X=ASC(SEG$(Z$,Z,1)):: Z$=SEG$(Z$,1,Z-1)&SEG$(Z$,Z+1,255):: IF LEN(Z$)=0 THEN Z$=Y$
320 CALL ING(M$(X),ING$,A)
330 DISPLAY AT(12,1):M$(X):: ACCEPT AT(12,15):AN$
340 CALL HCHAR(15,1,32,280):: DISPLAY AT(10,1):"" :: IF AN$=ING$ THEN DISPLAY AT(10,10):"CORRECT!" :: GOTO 310
350 DISPLAY AT(15,1):A$(A):"":"The word is ";ING$ :: GOTO 310
360 !@P+
370 DATA LODGE,BUY,HOPE,QUIP,TITHE,WISH,CUT,DRIVE,SEE,EYE,GO,CRY,TRY,AGREE,QUIT
380 !@P-
390 DATA BOIL,COOL,HURT,BUTT,CAGE,BE,ROVE,PITY,SAVE,COOL,RULE,MEASURE,TUNE,RAVE
400 DATA RUN,BEG,STOP,THINK,ERR,BORE,TEAR,BAR,CARE,BARE,BEAR,LET,QUIZ,HOOT,HEAT,COME
410 DATA DREAM,TAKE,FRY,CADDY,FLEE,HOE,SEW,TRIP,HOPE,RIG,DRAG,SUE,KNEE,BOO,BABY,NURSE,CRUISE
420 DATA LIE,TIE,DIE,BELIE,VIE,DODGE,LIVE,DRIVE,LOVE,LEAVE,HUM,HOP,BEG,BEGIN,BOMB,BOB
430 DATA ADD,AID,BAT,BOAT,PRAY,LAY,QUOTE,SNORE,STARE,HIRE,FIRE,LINE,CRY,SAY
440 DATA BOOGIE,RAGE,RATTLE,GRATE,LEAVE,STRIVE,DRAW,WRITE
450 !@P+
460 SUB ING(M$,ING$,A):: E$=SEG$(M$,LEN(M$),1):: F$=SEG$
```

```
(M$,LEN(M$)-1,1):: A$="ING"
:: C$="BDEGMNPRT" :: V$="AEI
OU"
470 GOTO 500
480 C$,E$,ING$,M$,A$,A,V$,F$
490 !@P-
500 IF LEN(M$)=4 AND SEG$(M$
,1,3)="QUI" THEN ING$=M$&E$&
A$ :: A=10 :: SUBEXIT
510 IF POS(C$,E$,1)=0 THEN I
NG$=M$&A$ :: A=1 :: SUBEXIT
520 IF E$="E" THEN 550
530 IF POS(V$,F$,1)=0 THEN I
NG$=M$&A$ :: A=2 :: SUBEXIT
540 IF POS(V$,SEG$(M$,LEN(M$
)-2,1),1)<>0 THEN ING$=M$&A$
 :: A=3 :: SUBEXIT ELSE ING$
=M$&E$&A$ :: A=4 :: SUBEXIT
550 IF F$="I" THEN ING$=SEG$
(M$,1,LEN(M$)-2)&"YING" :: A
=5 :: SUBEXIT ELSE IF F$="E"
 OR F$="O" OR F$="U" THEN IN
G$=M$&A$ :: A=9 :: SUBEXIT
560 IF M$="BE" THEN ING$="BE
ING" :: A=6 :: SUBEXIT
570 IF M$="EYE" THEN ING$="E
YEING" :: A=7 :: SUBEXIT
580 ING$=SEG$(M$,1,LEN(M$)-1
)&A$ :: A=8
590 !@P+
600 SUBEND
```

I still have a sort of an old-fashioned idea that the computer can be a useful educational tool -

```
100 CALL CLEAR :: FOR SET=0
TO 12 :: CALL COLOR(SET,2,8)
:: NEXT SET :: CALL SCREEN(5
):: DISPLAY AT(3,6):"NOUN TO
 ADJECTIVE" :: CALL KEY(3,K,
S)
110 CALL CHAR(64,"3C4299A1A1
99423C"):: DISPLAY AT(5,5):"
© Tigercub Software":"":" Fo
r free distribution - no pr
ice or copying fee to be ch
arged."
120 DISPLAY AT(12,1):" One m
oment...loading memory"
130 DATA ROGUE,ROGUISH,HOG,H
OGGISH,PIG,PIGGISH,SWINE,SWI
NISH,THIEF,THIEVISH,KNAVE,KN
AVISH,BRUTE,BRUTISH or BRUTA
L
140 !@P-
150 DATA FAME,FAMOUS,TUMULT,
TUMULTUOUS,RIOT,RIOTOUS,SCAN
DAL,SCANDALOUS,MOUNTAIN,MOUN
TAINOUS,ODOR,ODOROUS or ODOR
IFEROUS
160 DATA CAVERN,CAVERNOUS,VI
LLAIN,VILLAINOUS,DANGER,DANG
EROUS,PERIL,PERILOUS.ADVANTA
GE,ADVANTAGEOUS
170 DATA BARB,BARBED,FORK,FO
RKED,BORDER,BORDERED,WHEEL,W
HEELED,HUNGER,HUNGRY,ANGER,A
NGRY
180 DATA PARLIAMENT,PARLIAME
NTARY,PLANET,PLANETARY,LEGIS
LATURE,LEGISLATIVE,PARISH,PA
ROCHIAL
190 DATA CONGRESS,CONGRESSIO
NAL,ELEPHANT,ELEPHANTINE,FAN
TASY,FANTASTIC,BULL,BULLISH
200 DATA GIRL,GIRLISH,BOY,BO
YISH,BABY,BABYISH,AMATEUR,AM
ATEURISH,FEVER,FEVERISH,DEVI
L,DEVILISH,FOOL,FOOLISH
210 DATA DAF,DAFISH,SHEEP,SH
EEPISH,CHILD,CHILDISH or CHI
LDLIKE,VIRTUE,VIRTUOUS,PRIDE
,PROUD or PRIDEFUL
220 DATA HATE,HATEFUL,DOUBT,
DOUBTFUL,THOUGHT,THOUGHTFUL,
SHAME,SHAMEFUL,FEAR,FEARFUL,
SORROW,SORROWFUL
230 DATA WISH,WISHFUL,PEACE,
PEACEFUL,EVENT,EVENTFUL,TRUT
H,TRUTHFUL,SKILL,SKILLFUL,MA
N,MANLY
240 DATA WOMAN,WOMANLY,FATHE
R,FATHERLY,MOTHER,MOTHERLY,B
ROTHER,BROTHERLY,SISTER,SIST
ERLY
250 DATA NIGHT,NIGHTLY,HOUR,
HOURLY,MONTH,MONTHLY,ORDER,O
RDERLY,SERIES,SERIAL
260 DATA TIME,TIMELY,GRAVEL,
GRAVELLY,FRIEND,FRIENDLY,WOO
L,WOOLLY,YEAR,YEARLY,SOUTH,S
OUTHERN or SOUTHERLY
270 DATA NORTH,NORTHERN or N
ORTHERLY,WEST,WESTERN or WES
TERLY,EAST,EASTERN or EASTER
LY
280 DATA CHARITY,CHARITABLE,
TERROR,TERRIFIED or TERRIBLE
,HORROR,HORRIFIED or HORRIBL
E or HORRIFIC
290 DATA RAG,RAGGED,MILITARY
,MILITARISTIC,ART,ARTISTIC,C
AT,CATTY,DOG,DOGGY,FOG,FOGGY
,SUN,SUNNY
300 DATA BAG,BAGGY,LEG,LEGGY
,BOG,BOGGY,STUB,STUBBY,FUN,F
UNNY,FUR,FURRY,GUM,GUMMY,AVA
RICE,AVARICIOUS
310 DATA CLOUD,CLOUDY,RAIN,R
AINY,FLOWER,FLOWERY or FLORA
L,GREED,GREEDY,THIRST,THIRST
Y,AIR,AIRY,BUSH,BUSHY,FISH,F
ISHY
320 DATA SOUP,SOUPY,BLOOD,BL
OODY,FOAM,FOAMY,DEAD,DEADY,S
WAMP,SWAMPY,SILVER,SILVERY,C
OPPER,COPPERY,DUST,DUSTY
330 DIRT,DIRTY,GUILT,GU
ILTY,SALT,SALTY,GRAIN,GRAINY
,OIL,OILY,TRICK,TRICKY,HILL,
HILLY,ROCK,ROCKY
340 DATA SAND,SANDY,SOAP,SOA
PY,SUDS,SUDSY,SILK,SILKY,WOO
D,WOODY,MODESTY,MODEST,PIETY
,PIOUS,DAY,DAILY
350 DATA TREE,TREELIKE,TOY,T
OYLIKE,FINGER,FINGERLIKE,SWA
N,SWANLIKE,WAR,WARLIKE,DISH,
DISHLIKE,PLATE,PLATELIKE
360 DATA SPOON,SPOONLIKE,BIR
D,BIRDLIKE,SNAKE,SNAKY,WIRE,
WIRY,BONE,BONY,SMOKE,SMOKY,F
LAKE,FLAKY
370 DATA NOISE,NOISY,BRINE,B
RINY,TASTE,TASTY,STONE,STONY
,WAVE,WAVY,GORE,GORY,PASTE,P
ASTY,BUBBLE,BUBBLY
380 DATA LABOR,LABORIOUS,ORN
AMENT,ORNAMENTAL,GOVERNMENT,
GOVERNMENTAL,CONTINENT,CONTI
NENTAL,MUSIC,MUSICAL
390 DATA MAGIC,MAGICAL,TOPIC
,TOPICAL,SENSATION,SENSATION
AL,LOGIC,LOGICAL,ALARM,ALARM
ING,ARTERY,ARTERIAL
400 DATA GOLD,GOLDEN,EARTH,E
ARTHEN,GLAMOUR,GLAMOURIZED,D
EPUTY,DEPUTIZED,ENERGY,ENERG
IZED,PART,PARTIAL,FIRE,FIERY
410 DATA ANGEL,ANGELIC,CHERU
B,CHERUBIC,BURDEN,BURDENSOME
,TROUBLE,TROUBLESOME,BEAST,B
ESTIAL
420 DATA HISTORY,HISTORICAL,
GEOGRAPHY,GEOGRAPHICAL,BOTAN
Y,BOTANICAL,BIOLOGY,BIOLOGIC
AL,LITURGY,LITURGICAL
430 !@P+
440 DIM A$(175),B$(175):: FO
R J=1 TO 174 :: READ A$(J),B
$(J):: Z$=Z$&CHR$(J):: NEXT
J :: Y$=Z$ :: RANDOMIZE
450 DISPLAY AT(7,1):"":"Type
 the adjective form of -":""
460 X=INT(RND$LEN(Y$)+1):: Y
=ASC(SEG$(Y$,X,1)):: Y$=SEG$
(Y$,1,X-1)&SEG$(Y$,X+1,255)::
 IF LEN(Y$)=0 THEN Y$=Z$
470 DISPLAY AT(12,1):A$(Y)::
 ACCEPT AT(12,14):B$ :: IF P
OS(B$(Y),B$,1)=0 THEN 490
480 DISPLAY AT(18,1):"";"" :
: FOR D=1 TO 100 :: NEXT D :
: DISPLAY AT(18,1):" That is
 the word in my     memory b
anks.":"" :: GOTO 460
490 DISPLAY AT(18,1):" The a
djective in my memory banks
is ";B$(Y):: GOTO 460
```

When one program is run from from another by RUN DSK.., the screen is not cleared, sprites are not deleted, and screen color, character definitions and sprite magnification are not returned to the default values. This can cause some strange results, which can be prevented by CALLing CLEARALL just before the RUN.

```
1000 SUB CLEARALL :: CALL CL
EAR :: CALL DELSPRITE(ALL)::
 CALL SCREEN(8):: CALL CHARS
ET :: CALL MAGNIFY(1)
1001 FOR CH=65 TO 90 :: CALL
 CHARPAT(CH,CH$):: CALL CHAR
(CH+32,"00"&SEG$(CH$,1,12)&S
EG$(CH$,15,2)):: NEXT CH
1002 CALL CHAR(96,"000201008
",123,"0018202040202018",124
,"0010101000101010003008080400
0808300000205408")
1003 FOR CH=127 TO 143 :: CA
LL CHAR(CH,"0"):: NEXT CH ::
 SUBEND
```

The routine in line 1001 can be used, by deleting the +32 if necessary, to modify some of the character sets on my Nuts & Bolts disks.

From an idea in a program by Ed Machonis, here is an improvement to my 28-Column Converter published in Tips #18. After line 160, insert

```
165 DISPLAY AT(20,1):"Tab se
tting? 1" :: ACCEPT AT(20,14
)SIZE(-2)BEEP:T
```

And change line 290 to -

```
290 PRINT #2:TAB(T);L$ :: S=
S+28 :: GOTO 410
```

MEMORY FULL! - Jim P.

THE KIDDIE CORNER

by Sue Harper
Pittsburgh User Group

For kids of all ages, a series of articles on how to get started making your own programs.

In the previous article, we started looking at the music capabilities of the TI. This month, we will look at some more musical stuff to do with the computer!

For a quick review, here is a sample music command:

```
CALL SOUND(100,440,0)
```

The 100 tells the computer how long to hold the note - in this case, 100 milliseconds. The 400 tells the computer what note to play - in this case, middle A. The 0 tells the computer how loud to play the note - 0 is the loudest, and 30 is the softest. Written as the command is above, the computer will play the note as soon as you press ENTER. If you want it to be in a program, don't forget the line number.

There are a few other things that the TI can do with music. One of them is to play more than one note at a time. The TI can play up to three notes at the same time. Lets look at how that happens:

```
10 CALL CLEAR
20 CALL SOUND(300,262,20)
30 FOR WAIT=1 TO 25
40 NEXT WAIT
50 CALL SOUND(600,262,10,330,10)
60 FOR WAIT=1 TO 25
70 NEXT WAIT
80 CALL SOUND(900,262,0,330,0,392,0)
90 END
```

The program above will first clear the screen, then play a middle C note. After a short pause, it will play the notes middle C and E above middle C at the same time, for a longer time and a little louder. After a second short pause, the computer will play a full C chord (C,E, and G) for a longer duration, and at the loudest setting. Then the program will end.

Notice that the number sequence in the commands has only one number for duration, but a separate volume for each note. This is very important, and forgetting it could lead to many unhappy error messages!

One other thing that the TI does is make noise. Noises are generated the same way notes are. Noises available are numbered -1 to -8. The computer can generate up to three notes and one noise at the same time, or just one noise by itself. Try out all the numbers, you will find out which noise your computer program uses in your favorite game when you win, or when you lose. The command format is the same:

```
CALL SOUND(421,-4,0)
```

Once again, use a line number for delayed execution.

One more musical note (pardon the pun!) There is a program available from Trio+ Software called TI SINGS, and believe it or not, the computer actually sings. Beatles fans everywhere can thrill to the TI singing Octopuses Garden, and other songs. There are even directions with the program to program your own selection of songs. It is a really neat program, and fun to work with for those who are interested in music. Really, imagine a computer singing You're So Vain! Check with your favorite librarian for TI SINGS!

See you next month. . .

PROGRAM REVIEW

by Sue Harper
Pittsburgh User Group

Program: Music Note Recognition (Extended Basic required)
Copyright Tigercub Software

This program, listed as program 'MTCX-1011' was made available to us by Jim Peterson of Tigercub Software. He has been and is a real supporter of the TI computer. Be sure to check out his Tips From the Tigercub when reading your newsletters.

The program I am reviewing this month is a good program for those who want to have perfect pitch. The program begins by asking you to choose one or two octaves, and then procedes to play notes, and wait for you to guess what note it played. If you are correct, the computer will add a point to your score, and play another note. If your guess is wrong, the computer will review the note played and the note guessed both graphically on a music staff and audibly, showing the relationship between middle C and the notes, as well as the notes in relation to each other.

The program is good. The notes are true, and the timings given are adequate for an untrained ear, and not annoying to a trained ear. There are a few things about the program that I would change, but nothing that affects the execution of the program.

There are REM statements that indicate that this program will run in Basic or Extended Basic, and that is not true. It will only run in Extended Basic. Also, there is no way to tell the computer you have had enough. FCTN 4 is the only way to stop. One clever touch at the beginning is that the program asks "ARE YOU READY?(Y/N)" and ANY answer you give other than a lower case 'y' will get the reply "RELEASE THE ALPHA LOCK". Now, this is a nice touch, but I expected the program to really want a Y or an N. Truely, it only wants a y. (I know, I know, details!!!)

All in all, my opinion is that this is a good program, and that the 'bugs' are not worth worrying about. This program could be used for voice training or with instruments, asking the student to play the same note, and then name it based on keyboard or fret position.

Next month, another Tigercub program review.

{A BRIDGE REVIEW}
by
(Joe M. Simmons)
ATHENS COMPUTER CLUB

John H. Bull of the K-town Computer Club has just completed and released version 2.25 of his Bridge tutorial and version 2.27 of his Rubber Bridge.

As you may recall, I first mentioned John's Bridge program in my July "Stumblings" article. John is a retired minister who enjoys the game of bridge. Wanting to generate an interest and later enjoyment by others in the game of Bridge, John has developed a tutorial. Unlike TI's Bridge tutorials by Robert Hamman and Robert Wolff in 1980, John's tutorials allows one to bid and see what his actions may develop into. TI's on the other hand is a step by step tutor allowing the user up to three chances to make the predetermine "correct" action. Being an American, I prefer John's method which allows one to profit by his mistakes.

John's tutorial begins with a narrative of how to count bid points, determine bidable suits, and how to score the hands. After a short exercise on the counting of the card points, one is allowed to bid with the computer bidding the west,north, and east hands. All of these hands are visible so that you can see what they contain. If you, your partner or your opponets win the contract bid, then you can see your action and theirs (the computer playing the other hands). After the game is won or lost the score is computed and displayed by the computor. This continues until one completes the (rubber).

TI's Hamman and Wolf's tutor teaches one the conventions of bidding;however, John's arrives at the same point through the avenue of repeated experiences.

The second portion of John's Bridge program is (Rubber) (Bridge). Rubber Bridge is much like the tutorial except that one may not see his partners nor his opponets hands. After having played John's program through seven (Rubbers), [I Like it!] The only weakness I see is that the computer does not see the void in the dummy's hand. Perhaps the more experienced Bridge players will see other flaws.

However, you will not find a better $20.00 investment. If you should want a copy of this "fairware" program, you may contact John H. Bull at 409 Blue Valley Lane ; Knoxville, Tennessee, 37922. If on the other hand you have received a copy of this program by mail, be certain that you send John his $20.00 for you will certainly enjoy his program.

August 1988

At our K-town meeting, John Bull released an update to his BRIDGE, fairware program. He calls it version 2.90 and has some new graphics as well as a redo feature. I find this feature fantastic in that I often wonder what would have happened if I had made a different bid or play a card at a different time.

EDITOR'S NOTE: A copy of this new version will be placed in our library this month, replacing v 2.27.

FROM THE LIBRARIAN.....

Well not really. Your editor is putting on another hat for this column. I handed Sue a stack of disks for the Library last month and she informed me that she was leaving for vacation and asked me to write a little something about each disk. So I'll give it a try.

A new version of Checkbook Manager System III v5.6 has been added with many new improvements. I also note that the author has increased his asking price from $10 to $12. The program is well worth the money. It was reviewed in the April issue of Micropendium.

We have several programs by Wesley Richardson of the Northcoast 99ers. Spinner is a program which gives the illusion of rotating a pattern on the screen. From menus you have the ability to create, modify, view, save, recall and print Spinner patterns. It's a fascinating program. Wes also sent us his Instance Converter. With this you are able to convert TI Artist instances into a file suitable for TI Base v2.01 to use as a database. With this program, you can now import and use graphics on your labels printed with TI Base. Character Codes is a listing of all the character codes from 32-127 and there is also a program to generate a character code listing. Last of all, there is PI, which gives the value of PI to 5000 decimal places.

We received Contract Bridge from the Athens Computer Club. See the review elsewhere in the newsletter.

A disk was also received from Bill Gaskill containing his TimeLines, an interesting chronology of significant events in the life of the TI-994A and 9640 computers. He also sent a shareware program that he is asking $5 for. It is Memowriter, a text processor that is capable of producing a full page of text, that is generated in three screens. He wrote it for his kids to use in lieu of struggling with TI Writer. It is easy for kids to use to write notes to their friends and such. The printing of Memowriter files is all done in double wide text. The program is archived.

Susan also asked me to remind you that you can order any disk for $2. She will bring it to the next meeting or mail it to you for an additional $1. There are well over 500 disks in our library. Why not browse around. You'll surely find something that interests you.

()

THE COMPUTER PROGRAMMER...: One who passes himself off as an exacting expert on the basis of being able to turn out, after innumerable debugs, an infinite series of incomprehensible answers calculated with micrometric precision from vague assumptions based on debatable figures taken from inconclusive documents of problematical accuracy by persons of dubious reliability and questionable mentality for the purpose of annoying and confounding a hopelessly defenseless department that was unfortunate enough to have asked for the information in the first place.

PRINTERS #1

by John F. Willforth
(SEPT. 1989 PUG) (ML=MoreLater)

I will not say how far I'll go with this series on printers, only that when NO ONE finds strategically placed ERRORS, I'll assume that either no one cares, or I've lost you all.

I must start out at the beginning. The printer is probably the most common and useful device for a computer. You can do without a disk (you could store all in memory), and you could do without modems (some of you could never imagine how), you can even do without a monitor, I've seen people do it. But to take away the printer would be akin to taking away the brush, paint, and canvas from Picasso. Almost nothing that is input to a computer from keyboard, modem, disk, or even a cassette serves a useful purpose unless a "HARDCOPY" of the redesigned, sorted, aligned, deleted, added to, or otherwise corrupted data is created. Even the act of writing the initial program that does all of the above is made easy by making a listing of that program as it develops (a frequently used aid in debugging). I know that initially, even more than a disk, I desired a PRINTER.

A printer generally is like me. It takes orders, but can only let you know if it is getting behind in it's work, is hungry, or has died (so maybe this is the only way for both of us to be missed. A printer is generally a RO, (Read Only) device. There are those with keyboards, but those are generally used as hardcopy master consoles on commercial computers so that the business will have a paper trail of all actions taken by the system manager and operators on the system. I would have a very hard time identifying system problems, if a CRT Terminal was used as a master console. The printer is generally interfaced to the CPU through either a SERIAL (RS232) or PARALLEL interface and cable. The T.I. 99/4 and /4A using a P.E.B. RS232/PIO card can drive either interface. The old T.I. interface was first the TP (we won't discuss here), and then the dual-RS232 Stand-alone. I know that a limited number of them were produced, and that some companies like CORCOMP, MYARC, BOXCAR, and others produced a variety of cards for this purpose.

The printer receives the data to print if it is READY:

* UN-LINE and POWERed up.
* The printer buffer (if it has one) is NOT FULL. The printer will usually print slower than data will be sent. Today's printers generally have 1K, 2K, 4K, 6K, 8K or even larger BUFFERS within themselves to allow data to flow at a faster rate to the printer than it can actually be printed. ML
* NOT OUT OF PAPER!

The printer can only let the CPU know when it is behind in it's work, or out of paper in a serial printer hooked to the RS232 port, this is accomplished with a HARDWARE BUSY signal from the printer CTS (Clear to Send) pin 5 to DTS (Data Set Ready) pin 20 on the RS232/PIO card. In otherwords when the printer can not accept any more control or data from the CPU logic in the printer changes CTS to NOT CTS, this in turn is INPUT to the RS232/PIO card as NOT DTR, and the flow of data stops until the printer catches up (just by printing one line), having the new paper installed, or the OFF/ON LINE status changed to ON LINE (Ready). These three conditions are NORMAL and occur often even when you don't think about it.

If the printer is PIO (the most common) all of the above conditions apply, but the method is slightly different. When the printer is BUSY it OUTPUTS a signal on pin 11 (BUSY) [High at +5v.] more directly NOT GROUND to the PIO port on the RS232/PIO card pin 10 called HANDSHAKE IN. The flow of data will be stopped.

If you do not have the cable for the SERIAL or PARALLEL (PIO), printer made as it should be to control data flow, you may print a page or two but eventually characters of data or control will be lost.

(continued next page)

Since TI didn't like convention, they made TRANSMIT on the SERIAL port, pin 3. RECEIVE must therefore be pin 2. When you hook up RS232 ports on other types of equipment, you usually have to cross pins i.e.: 2 to 3 and 3 to 2 so the mouth of one speaks to the ear of the other and visa versa. Not TI! No! pin 2 goes to pin 2 and pin 3 goes to pin 3. On the PARALLEL port to the RS232/PIO card, they did even more dirt. They chose a 16-pin connector that is so rare that God threw away the pattern. But the signals that do arrive there are acceptable to the PIO convention. The only real problem here is with STROBE (the signal that tells the printer when to look at the eight data lines for a good character), and polarity appears to be the major problem, the problem lying with a few printers, not TI. In case you didn't know it, the PARALLEL (PIO) interface sends to the printer much faster than SERIAL (RS232) because the entire 8-bit byte of data appears at the printer in one time frame, while it is spelled out one bit at at time to the printer.

As you can tell, I'm dealing with the interface cables for your printer this month. If you can't get the printer to run on your TI, then you won't be able to keep up. Below are two cable configurations that should work, and cause the flow of data between your TI and the Printer to be smooth, and complete. (Remember, there are printers that will give you trouble because of "NON-STANDARD", [whatever that is] protocol, strobe or data polarity, timing, etc.)

The SERIAL (RS232/1) cable:

TI end		Printer end	
GROUND	7 ——	7	GROUND
REC. DATA	2 ——	2	TRANS. DATA
TRANS. DATA	3 ——	3	REC. DATA
DTR	20 ——	5	CTS

The SERIAL (RS232/2) cable:

TI end		Printer end	
GROUND	7 ——	7	GROUND
REC. DATA	14 ——	2	TRANS. DATA
TRANS. DATA	16 ——	3	REC. DATA
DTR	19 ——	5	DTR

The PARALLEL (PIO) cable:

	TI end		The Printer end
STROBE	1 ——	1	STROBE
DATA 0	2 ——	2	DATA 0
DATA 1	3 ——	3	DATA 1
DATA 2	4 ——	4	DATA 2
DATA 3	5 ——	5	DATA 3
DATA 4	6 ——	6	DATA 4
DATA 5	7 ——	7	DATA 5
DATA 6	8 ——	8	DATA 6
DATA 7	9 ——	9	DATA 7
READY	10 ——	11	BUSY
GROUND	16 ——	16	GROUND

(optional) ground 19 thru 30

If you can't get your printer to run with one of the cables indicated above, I can give you some suggestions, but I won't be reprinting these special cables in this series.

In PRINTERS #2 we'll start with the commands that are sent to printers to make them do what they do. This is one of the most interesting things that we'll get into in this series. This therefore will not be a hardware only series. I wanted to get into printers because this is the one peripheral that everyone of you can really make perform, and to do it takes some understanding of hardware, but even more understanding of printer commands.

PS: The Parallel interface on the TI RS232/PIO card is BI-DIRECTIONAL. This is significant for those of you who are looking for a high speed INPUT/OUTPUT port for the TI. You just have to control the reading of this PIO port. Maybe you can find something in the Editor Assembler manual on this. Why not look into it? ML

FROM THE MAILBOX
Reprinted from the Decatur 99'ers

WONDERFUL AS IT IS, FUNLWEB has a few foibles that can get in the way of using it in the way it was intended. As a diversion from the tedium of cataloging library disks on a hot HOT HOT!!! afternoon, I set out to fix a couple of them.

One of my pet peeves about the program is the fact that the 'Tab' ruler starts at '0' and ends with '79', whereas a typewriter has columns '1' through '80'. Now this isn't really important for most things, but if you're trying to do selective editing in the columns of a table, the error can mess you up!

To see what I mean, prepare a little file where there are several lines filled with AAA's. Place the cursor on the first character of the first line. Now replace A with B in columns 3 and 4 by the command 'RS c/r', followed by the operands '3 4 /A/B/'. Reply 'A' at the query 'Yes, No, All, Stop'. (The command RS is described on page 85 of the TIwriter manual.)

Behold! The file looks like this:

```
AABBAAAAAAAAAAAAA...
AABBAAAAAAAAAAAAA...
AABBAAAAAAAAAAAAA...
0.........1.........2..
```

The Tab ruler might deceive us into thinking we had edited columns 2 and 3, if we didn't know otherwise. THE SO-CALLED '0' COLUMN IS REALLY NUMBER '1'.

I prefer a Tab ruler that has the 5th, 15th, 25th,etc columns marked with colons and the 10th, 20th, etc columns numbered correctly:

```
....:....1....:....2....:....3...etc
```

To fix it, make a copy of the FUNLWEB disk, and use a sector editor such as Birdwell's DSKU to find the last (32nd) sector of the file named 'ED'. Look for the string that starts in byte >A3 with the entry '0' and continues through byte >F3, which has the entry '8'. This is the source for the Tab ruler characters; anything placed here will show up in the ruler.

Replace the '0' in byte >A3 with a dot and continue with three more dots, then a colon, four more dots and a '1'. Continue the pattern of 'four dots, colon, four dots, numeral' until you reach the byte >F2, which receives '8'. Replace the '8' of the original string by putting a 'space' in byte >F3. Don't forget to save the changes by rewriting the edited sector to your disk.

If you were to load and run the program now, you'd find that the 'T(ab)' command would show the amended ruler at the head of the screen with the repeated clusters

'123456789^123456789^123...' etc

offset by one position from where they should be. To fix THAT, edit the same sector of file 'ED'. Start with byte >4D; replace the 'space' with '1' and change each of the following 9 characters to '2 3 4 5 6 7 8 9 0'; save the changes and you're done!

FLASH!! On rereading this just now I'm struck by the words which begin 'anything placed here...' Can we preset our margins and tabs so that they need not be reset each time we load FNLWEB?

(Furious clatter at the keyboard and cries of joy and satisfaction!)

Yes, YES, YES!!! Now I can keep the right margin permanently set on the 40th column without having to reset it each time I want to write a letter or newsletter article. I can have tabs set at every 5th column across tha page if I wish. Just put 'L', 'I', 'T' and 'R' where you want them in the Tab ruler. You can override them from the keyboard if you like when using the program. Another advantage of putting the Tab settings into sector 32 is that you have a visible reminder in the bottom rule as to where you've set them. But of course this changes to a DISADVANTAGE as soon as you override one of them from the keyboard, because the 'tailing' rule isn't updated.

FOR ALL THOSE BORN BEFORE 1945

We are survivors!!! Consider the changes we have witnessed!

We were born before television, before penicillin, before polio shots, frozen foods, Xerox, plastic contact lenses, Frisbees and the PILL. We were before radar, credit cards, split atoms, laser beams and ballpoint pens. Before pantyhose, dishwashers, clothes dryers, electric blankets, air conditioners, drip-dry clothes and before man walked on the moon.

We got married first and then lived together. How quaint can you be? In our time, closets were for clothes, not for "coming out of". Bunnies were small rabbits, and rabbits were not Volkswagons. Designer Jeans were screaming girls named Jean, and having a meaningful relationship meant getting along with our cousins.

We thought fast food was what you ate during Lent, and Outer Space was the back of the Riviera Theater. We were before house husbands, gay rights, computer dating, dual careers and commuter marriages. We were before day-care centers, group therapy and nursing homes. We never heard of FM radio, tape decks, electronic typewriters, artificial hearts, word processors, yogurt and guys wearing earrings. For us, time-sharing meant togetherness, not computers or condominiums. A chip meant a piece of wood. Hardware meant hardware, and software wasn't even a word.

Back then, "Made in Japan" meant junk and the term "making out" referred to how you did on your exam. Pizzas, McDonalds and instant coffees were unheard of. We hit the scene where there were five & ten cent stores, where you bought things for five and ten cents. Good Humor sold ice cream cones for five cents or a dime.

For one nickel you could ride a street car, make a phone call, buy a Pepsi or enough stamps to mail one letter and two postcards. You could buy a new Chevy coupe for $800...but who could afford one? A pity too, because gas was 11 cents a gallon!

In our day GRASS was mowed, COKE was a cold drink and POT was something you cooked in. ROCK MUSIC was a Grandma's lullaby and AIDS were helpers in the Principal's office. We were certainly not around before the difference between the sexes was discovered, but we were surely here before the sex change. We made do with what we had. And we were the last generation that was so dumb as to think you needed a husband to have a baby.

No wonder we are so confused and there is such a generation gap today.

But, WE SURVIVED!!! What better reason to celebrate?

GEE$BEE BASICS

CUSTOM SOFTWARE WITH A PERSONAL TOUCH
13246 Harper Road
Strongsville, Ohio 44136

GEE$BEE BASICS is a newly formed company that will (we hope) fill a niche in the TI-99/4A user's world. There are many loyal users out there who realize the power of the 99/4A, but, for one reason or another, are unable to completely satisfy their personal home use needs with commercial or Public Domain TI-Basic / Extended Basic Software. There are many of us who do not have either the time or the knowledge, or for that matter the interest, to sit down and customize or create a program on the TI-99/4A that will meet or satisfy our individual needs.

This is where GEE$BEE BASICS comes in. We are offering, for a VERY nominal fee, custom programming to suit your precise needs. We will enhance or revise existing Public Domain software, or create a custom routine or program just for you! Think about it. You may have said to yourself, "This program is pretty good, but I wish it would do just one more thing for me. I only wish I had the time or the know-how to make it do what I want it to do." For a base charge, depending on complexity, of $2.50 per routine (eg. printer, data file recording, sorting, etc), GEE$BEE BASICS will be at your service.

Just send your software requirements and one (1) blank 5 1/4" disk or cassette tape to GEE$BEE BASICS - 13246 Harper Road - Strongsville, Ohio 44136, and let us write something just for you! (There will be no obligation to pay the itemized billing if you are not satisfied with our product. All we ask is that you let us know what your dissatisfaction is. Of course, GEE$BEE BASICS would appreciate prompt payment if our efforts are satisfactory.)

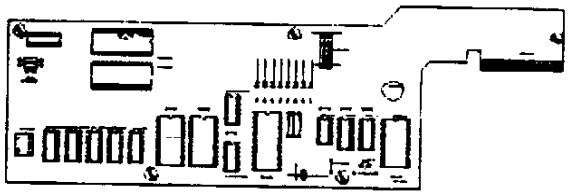
NEW EPROM AVAILABLE FOR MECHATRONICS 80-COLUMN CARD

A new upgraded EPROM that corrects several "bugs" in the original Mechatronics EPROM is being offered by Barry Boone for $20 + $2 for shipping and handling. It comes with extensive documentation on using the card to it's fullest. To order or for more information, contact Barry Boone at P.O. Box 1233, Sand Springs, OK 74063 or phone 8-10 PM CST weekdays or 10 AM to 10 PM CST weekends (918)356-4648.

ANNOUNCING THE "INTERNAL BOARD"

The "Internal Board" AKA the "Zenoboard" is now in production. The PC board is being manufactured by one of the best quality manufacturers around. As promised, this board will allow you to build 32K memory, a clock circuit and add your extended basic and speech synthesizer to the interior of your console. Orders are now being accepted at a cost of $17.50. Documentation will consist of approximately 8 pages of schematics, builders notes, parts list, software for the clock and parts placement overlay.

Specifications:



* 32K STATIC RAM
* battery-backed clock
* speech synthesizer
* extended basic
* 3 additional, switched grom sockets
* any circuit configuration can be used
* requires no additional power
* move your extended basic and speech synthesizer inside
* eliminates nearly all lock-ups due to extended basic cartridge
* in addition to soldering components connectors, only 12 additional wire conections have to be made to build a complete board
* switches lights may be added to turn off any or all circuitry
* grom reset switch
* compatible with all other known hardware/software
* circuit designs have been tested

Orders and technical questions/comments can be directed to:
Eric Zeno 414 Highland Rd., Pgh, PA, USA 15235 (412)371-4779
The boards are being manufactured in quantities of 100. Don't delay and get caught waiting for the subsequent manufacturing runs!

Small modifications must be made to the plastic on the inside of the console.
Hand soldering skills are recommended.
Please allow sufficient time for delivery.
Overseas shipping may require additional invoicing.
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THE PUG MEETS
ON THE 3RD SUNDAY OF THE MONTH
AT COMMUNITY COLLEGE OF ALLEGHENY COUNTY
OFF ROUTE 885 NEAR CENTURY III MALL

CLASSES BEGIN AT 3 PM
GENERAL MEETING BEGINS PROMPTLY AT 6PM

SEPT 1989						
S	M	T	W	T	F	S
3						
TI FAIR, VA.						16
17	MEETING					
24						

OCT 1989						
S	M	T	W	T	F	S
1						
8						
15	MEETING					
22						
29						

PUG OFFICERS

Pres:	Gary Taylor	412-341-6874
V Pres:	Mike Sealy	614-282-5627
Treas:	Frank Shoemaker	412-921-8702
Rec Sec:	Herb Reich	412-531-9023
Librarian:	Susan Harper	412-464-0525
Mem Chair:	Bill Krieger	412-344-5220
Cor. Sec.& NL Editor:	Audrey Bucher	412-881-5244

SCHEDULE

3-4:30 Questions and Answers on anything.....Rm. 482
4:30-6 Printers Apprentice with Marlene.....Rm. 482
4:30-6 Printers with John Wilforth.....Rm. 475
6:00-? General Meeting
Demos....80 Col card.....Ray Wallis
Multitasking on Geneve..Gary Kuehn
SEE YOU THERE

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