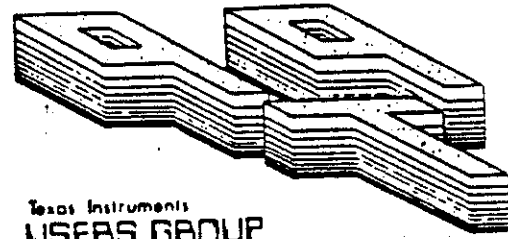# Newsletter Nine-T-Nine

FEBRUARY 1992 ISSUE

Texas Instruments
USERS GROUP
TORONTO

Farcus

by David Waisglass
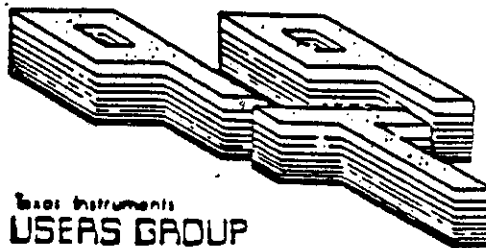Gordon Coulthart

Does it come on disk?

FROM:
9T9 USERS GROUP
15 KERSDALE AVE.
TORONTO, ONT., M6M-1C9
CANADA

To:

NEWSLETTER NINE-T-NINE

9T9 USERS GROUP

Texas Instruments
USERS GROUP
TORONTO
Newswsletter Nine-T-Nine

MEMBERSHIP FEE'S

FULL MEMBERSHIP .... $30.00 / year
NEWSLETTER SUBSCRIPTION .... $20.00 / year

All memberships are household memberships. A newsletter subscription is only for those who do not wish to attend meeting, but wish to receive our newsletter and have access to our library. You are welcome to visit one of our general meetings before joining the group. If you wish more information contact either our president, in writing, at the club address on the front cover or by phone.

The meetings are usually held on the last Wednesday of each month, (exceptions are December's meeting date, usually mid-month and the months of July and August, when there are no meetings. Consult this issue of Newsletter 9T9 for the date and time of the next meeting, meetings are usually held at Neil Allen's place, 52 Graystone Gardens, south of Bloor St., just west of Islington Ave., at, 7:30 P.M. from 7:30 - 10:30 PM.

BBS

The 9T9 Users Group supports the Toronto BBS, The TI Tower BBS #(416) 921-2731, 300/1200/2400 BPS, 24 hrs. Sysop. Gary Bowser.

MAILING ADDRESS

9T9 Users Group, 15 Kersdale Ave., Toronto, Ontario, M6M 1C9, Canada

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Any business wishing to reach our membership may advertise in our newsletter.
The rates are as follows (width by height).
FULL PAGE (7" x 10") $30.00
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QUARTER PAGE (7" x 2 1/2") $7.50
Please have your ad's camera ready and paid for in advance, for more information contact the editor. Don't forget, that any member wishing to place ad's may do so free of charge as long as they are not involved in a commercial enterprise.
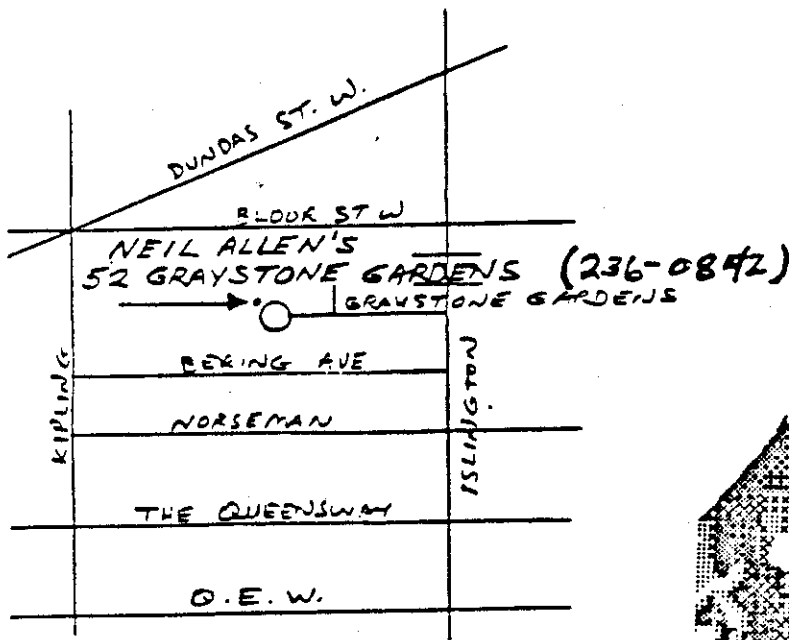
NEWSLETTER ARTICLES

Members are encouraged to contribute to the newsletter in the form of articles, mini programs, helpful tips, hardware modifications, jokes, cartoons and questions. Any article may be submitted in any form by mail or modem, we welcome the reprinting of any article appearing in this newsletter providing credit is given to the author and 9T9. If more information is required, call the editor. The names, 9T9, Nine-T-Nine, Newsletter 9T9, 9T9 Users Group, and Nine-T-Nine Users Group are Copyright (c) 1982-1992, by the 9T9 Users Group of Toronto, Canada, all rights reserved.

DUE TO CHANGES IN THE HOURS OF OPERATION AT C.R.S. THE MEETING OF THE 9T9 USER GROUP WILL BE HELD AT THE LOCATION NOTED BELOW.

DUNDAS ST. W.

BLOOR ST W

NEIL ALLEN'S
52 GRAYSTONE GARDENS (236-0842)
GRAYSTONE GARDENS

KIPLING

ISLINGTON

PEKING AVE

NORSEMAN

THE QUEENSWAY

Q.E.W.

NEIL ALLEN

-By Steve Mickelson, President 9T9 Users Group
Compuserve 76545,1255; Delphi SMICKELSON; GEnie S.MICKELSON

<u>Last Month's Meeting:</u>
Because Neil was away the last wednesday of January, our meeting was moved up one week. Unfortunately, I was given only a few day's notice of the change, and was not able to change my plans for the new date. On the matter of a meeting place, on behalf of the club members, I would like to thank both Neil and Gail for their hospitality for allowing us Tiers in, for our meetings and for the Assembly language Special Interest Group meetings. If you are interested in learning to program your TI, why not give Neil or Gary a call.

Also, I would like to thank Randy for providing me with a printer "muffler box", that his work was discarding, to be used as a "light box" for my cut and paste-ups of the newsletter. It sure has been a back saver.

The TI Tower B.B.S. has been revamped and improved, check it out, if you get a chance. I don't get on the BBS, as often as I like, or the commercial databases, I've been very busy lately, at work, lot's of overtime, which Brian and the boy's get anyhow. I've been so busy, that I've just got around, now, to mailing-in my registration cards for the software purchased at the Chicago Fair.

The next Chicago Fair, is scheduled on Halloween, which might make it difficult for any TI-ers with little users in the family, to attend.

<u>Of Tonto and Stallone:</u>
Do you remember, several year's ago, an imaginative commercial for Gino's Pizza roles? The commercial used William Tell's Overture as a theme. At a black tie and tux ball, a waiter carried a tray of Gino's Pizza Roles, singing "Have a pizza, pizza, pizza role...",(to the W.T. Overture theme). There then arrived Elliot Ness character, with a pack of Lucky Strike cigarettes,(which also used the same theme), who announced to the party that he wanted to talk to those gathered about the theme song they were using for this commercial. Without missing a beat, the original T.V. Lone Ranger and Tonto,(both in costume), told the Lucky Strike character that they wanted to talk to **him** about the theme of **his** commercial <smile>! To which Jay Silverheels ,(Tonto), said "Right Kemo Sabi (sp?). I did not see William Tell or the author of either the story or the overture in the commercial. So what has this to do with Stallone?

Well, it appears that a GRAM device, much like the Gram Kracker, called the GRAMBO, will soon debut, across the pond in England. I'm not sure if GRAMBO is acronym for the device, as RAMBO, or just the sincerest form of flattery!

<u>Next Meeting:</u>
Gary Bowser attended the Fest West, and I hope we can get a report from him at the next meeting. Well that's it for this month.

TI System For Sale

1) *TI console with 32K memory expansion built-in*
2) *TV RF Modulator*
3) *TI Peripheral Expansion Box, which includes:*
RS232 card, disk controller card, one Full-height SS/SD drive,   plus two external drives
4) *All necessary documentation*
5) *Several TI-related books*
6) *Extended Basic cartridge*
7) *Hunt the Wumpus cartridge*

Asking price for all of the above $300.00
Contact Glen at 941-2041(Day) or 849-1489(Evening)

RE-SETTING THE CPU

A HARDWARE MODIFICATION
re-written by Paul Hulvaney

CIN—DAY

Reprinted from Hunter Valley 99er News - December 1987

Original article written by John F Willforth from the West Penn 99's Club, Jeaneatte, PA.

This console modification allows a reset of the CPU without powering down, a handy feature for getting out of a crashed program or a program with a disabled QUIT key. It also allows a module to be changed without reset, handy for cartridge dumps, and in the normal position everything is back to normal.

To do the mod you will need a three position switch with a spring return to centre on one side and stay in position on the other. A C&K 7107 is suitable and available from electronic stores.

Rear view of cartridge connector (GROM Port)
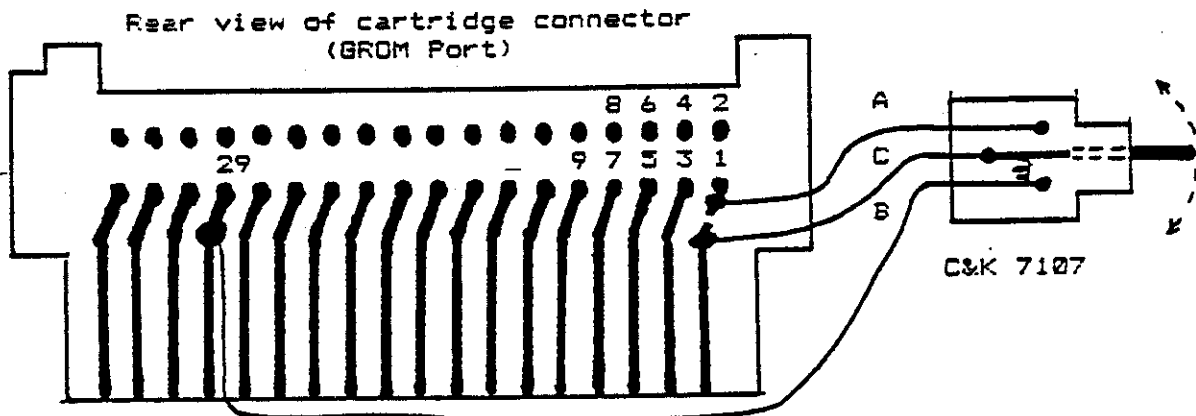
Looking at the back of the GROM Port cut the track coming from the number one pin of the module and solder the wire from the centre of the switch just below the cut. The wire from the stay put side of the switch goes to the other side of the cut track. This allows the 'normal' operation by joining the track together by means of the switch.(C-A). When switched to the centre position the track is opened up and prevents resetting of the CPU when a module is inserted. (As shown above). The third wire is soldered onto the track from pin 29. This is the spring reset position and provides a reset signal to the CPU.(C-B).

Take care when cutting the track that the cut is above the connector socket that the GROM Port plugs into. When cutting the track use a sharp knife to cut the track then apply a hot soldering iron to the section to be removed. The heat will lift the track off. When soldering the wires on only apply the heat for a short time to prevent the tracks from lifting.

The suggested switch fits on most consoles in the space beside the = key. We had some trouble with two consoles that had a metal frame around the keyboard, it interferred with the switch and we had to relocate the switch to the side of the console.

If the suggested switch is unavailable a substitute can be made from a switch and a pushbutton as shown below.
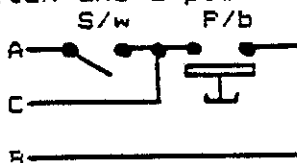
Thanks to John Willforth for a simple but very useful modification.

TELEVISION TO MONITOR
(A Simple Cable Conversion)
by Glenn Bernasek, TI-CHIPS, Cleveland, Ohio

Has your old B&W gone "belly-up", and your family (spouse) says no-way to your suggestion to hooking up the TI to the family's color TV? As luck would have it, you pick up a Trading Times, and lo and behold, someone is selling a used monochrome monitor. This is just what you are looking for to replace the dead B&W. However, either the seller can't find the interface cable, or the cable won't fit the output plug in the back of your TI-99/4A.

What to do? Do you try to find a TI monitor cable (fat chance now), replace the incompatable console plug with one that works, or just cut off the 99/4A cable from the Modulator and fit it with two RCA connectors? All of the above will work , but I have a "better" solution to the problem of interfacing the TI with the monitor without sacrificing the potential use of the TV modulator at some future time.

As it turns out, the TI modulator interior is accessible to both the hobbyist and the tinkerer for experimentation. All that has to be done is pop off the top and bottom covers, and the inner secrets of the device are exposed to the world! Therefore, you are able to modify this unit as you desire.

Following is a list of items you will need to complete this project.

1. One (1) RADIO SHACK, "ARCHER" brand, (Low-loss) AUDIO/VIDEO DUB CABLE Cat. No. 15-1538.
2. A low wattage (Pencil) soldering iron, resin core solder and resin flux.
3. A pair of needle-nose pliers, a small screw driver and a pair of tin snips.
4. A SHARP knife or wire strippers and a pair of side cutters.
5. A couple of small (1/2 inch) pieces of #118 guage wire insulation.
6. A well lighted work area and about 15 to 30 minutes of spare time to do this SIMPLE project.

Now that you've got everything together, let's get started. First, cut the Dub Cable in HALF (one half will be used for the VIDEO lead and the other will become the AUDIO lead), and CAREFULLY strip about one inch of insulation from each cut end. Untwist the braided shield, and retwist it into a separate lead. The CAREFULLY strip about 1/2 inch of insulation from the center conductor. At this point, it would be a good idea to pre-wet all four (4) stripped wire ends with a coating of solder. Set the preparred cables inside.

Let's take a look at what we're about to modify. With the small screw driver, pry off the snap covers from both sides of the TI MODULATOR. When you look into the TOP side, you'll see some compartments and where the main cable from the 99/4A enters. If you look closely, you'll notice that the wire connections are NAMED on the circuit board. This way you'll know which is the VIDEO and which is the AUDIO leads. Now turn the Modulator over and look at the solder points that are in the SAME area as the cable wires were.

You're going to LIGHTLY solder one (1) center cable conductor to the VIDEO IN solder point and one (1) center cable conductor to the AUDIO IN solder point. (See the enclosed illustration for an idea of what I'm talking about.)

At this point, slip a piece of 1/2 inch insulation over each re-twisted copper shield lead, and solder these leads to the large area of the circuit board that is connected (soldered) to the Modulator's frame. This is the return GROUND loop for both the VIDEO and AUDIO circuits.

Now cut a SMALL 1/8 inch wide by 3/8 inch long notch into the corner of the bottom cover where the Monitor leads will come out. All it takes is two (2) parallel cuts and a bend-out with the needle-nose pliers of the notch piece.

GENTLY press the soldered connections to the board to allow room for the cover to snap in place (with the leads extending through the notch). Then replace the top cover, making sure the modulator switch is in the PROPER position on the interior switches, by snapping it shut as you did with the bottom. Your TV/MONITOR modulator unit is now ready for service. The best part of this modification is that this unit will now serve equally well on either a TV or computer monitor. By the way, I hope you took the time to mark each lead as to where it goes.

If you find that the Video input jack on the monitor is a BNC type connection (it has ears on it) instead of an RCA type jack (as both plugs on your new leads are), then all you have to do is pick up an RCA/BNC adapter at RADIO SHACK and you're in business.

This is an easy project that works, and the modification won't interfere with the normal operations of the TI Modulator.

CIN—DAY

NOTICE
Due to current financial restraints, the light at the end of the tunnel will be turned off until further notice.

TI WRITER BUG

SPIRIT OF 99   by JIM PETERSON

According to the TI-Writer Reference Guide, page 77, when you select the PrintF command, then type C and space once and then the device name, any control characters with ASCII less than 32 are removed before the file is printed.

With Funlwriter, at least, this is not quite true. A carriage return character, ASCII 13, or a line feed character, ASCII 10, at the end of a line is actually not deleted but is converted to th[space bar character, ASCII 32.

This can be proved by running this little routine -

```
100 OPEN #1:"DSK1.(enter your filenae here)",INPUT 110 LINPUT #1:M$ ::
PRINT M$:LEN(M$):ASC(SEG$(M$,LEN(M$),1)
120 CALL KEY(0,K,S)::IF S=0 THEN 120 ELSE 110
```

Therefore, when a file is Filled/Adjusted, and the line feed characters are stripped with the C option, the lines are one character longer than they are supposed to be. An apparently blank TI-Writer line also contains an ASCII 32.

Since these characters are blank, they normally do no harm. However, they can create problems when the records are read into programs for multiple column printing or concatenation of strings.

In these cases, the following routine can be used to strip out any ASCII characters below 33 at the ends of records.

```
100 DATA INPUT, OUTPUT
110 FOR J=1 TO 2 :: READ J$
:: DISPLAY AT(12,1)ERASE ALL
:J$" FILENAME?":"DSK" :: AC
CEPT AT(13,4):F$(J):: OPEN #
J:"DSK"&F$(J),UPDATE :: NEXT
J
120 LINPUT #1:M$ :: IF ASC(S
```

```
EG$(M$,LEN(M$),1))<33 THEN M
$=SEG$(M$,1,LEN(M$)-1)
130 PRINT #2:M$ :: IF EOF(1)
<>1 THEN 120 :: CLOSE #1 ::
CLOSE #2
```

-K8 Saturday, January 25, 1992 THE TORONTO STAR

Future is now, thanks to inventors

The idea of operating a computer simply by looking at it seems so futuristic that you wouldn't expect to see this advance until well into the next century. The fact is, on a very small scale, eye-operated computers are already being sold.

The system is called Eyegaze and it comes from LC Technologies in Fairfax, Va. The Eyegaze Computer sends movements to be tracked. Pictured on the screen is a keyboard that the user can operate by visually "pushing" the keys. The computer is able to determine which button the user is looking at.

Joe Lahoud, president of LC Technologies, sees the Eyegaze system as ideal for people who are "disabled, required to use their hands for something else while using the computer, or people who have to keep their hands clean."

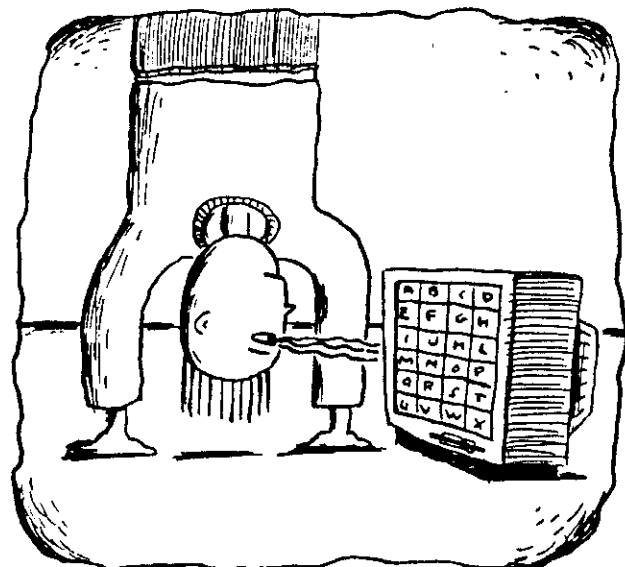Voice Credit Cards — Odds: 85 per cent; ETA: 2001; price: NA.

ILLUSTRATION BY GARY CLEMENT

EYE-OPERATED computers may be here by '95

9T9 - PAGE 6

WICO TRACKBALL CONVERSION

by James P. Donovan
#### Kentuckiana 99/4a Computer Society

The Wico Trackball for the TI-99/4A hasn't been very common in the TI world. The Trackball for the Atari video game is much more plentiful, and shows up frequently in "flea markets".

Like all Atari type peripherals, they can be converted easily for use on the TI computer. Since the TI uses two isolated common (-) terminals instead of a common ground, optical couplers may be used to isolate the inputs and power supply. Motorola 4N25As were chosen to isolate the inputs. Four (4) are needed to isolate all lines. The encoder chip in the Trackball is normally supplied from the internal supply in the Atari. The TI computer has no internal supply, so the coupler power also supplies the encoder chip. A 9VDC power supply, regulated at 5V DC, is used to power the optical couplers, vane sensors, and encoder chip in the Trackball.

When the Trackball is moved, a series of pulses are sent to the various control functions instead of a constant pulse as with the joystick. This makes a more sensitive and precise control. An added feature of the Trackball converter is the addition of the slide switch. This switch allows selecting Joy1 or Joy2 for the track-ball. The original TI/Wico Trackball only used Joy1. The Trackball converter also functions as an adapter for the Atari type joysticks when used on the TI computer. Most parts are available from Radio Shack with the eception of the 4N25 optical couplers. They are readily available from Jameco Electronics ($25 minimum order). Total cost should not exceed $23, but Flea Market shopping could reduce this cost to less than $8!

PARTS LIST

Quantity	Desc.	Radio
4 -	4N25 Opto Coup.	n/a
1 -	7805 Reg.	276-1770
1 -	1000/16V Cap.	276-958
1 -	22/16V Cap.	276-1437
1 -	1N4148 Diode	276-1122
1 -	DB-9M Conn.	276-1427
1 -	DB-9F Conn.	276-1428
1 -	Mini jack	274-1565
1 -	Plastic case	270-221
1 -	6-32 bolt/nut Mt. for Reg.	276-1373
4 -	330 ohm 1/4w	271-1315
asstd.	hookup wire	278-1304
1 -	AC adapter (9VDC out)	273-1455

Note: 4N25A available from Jameco Electronics

PICTORIAL
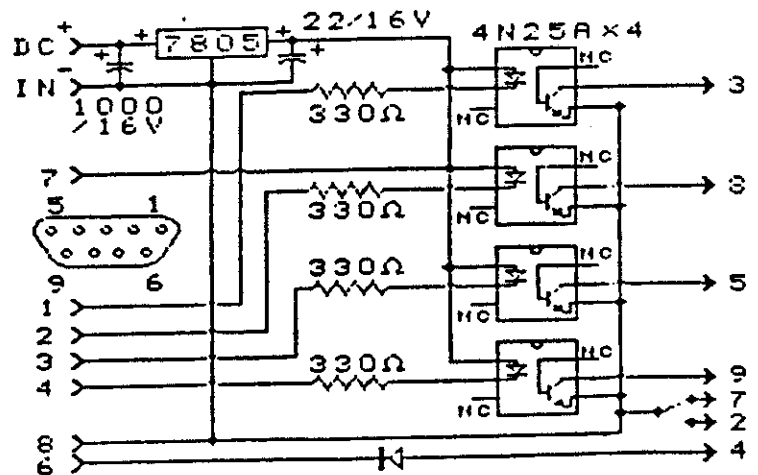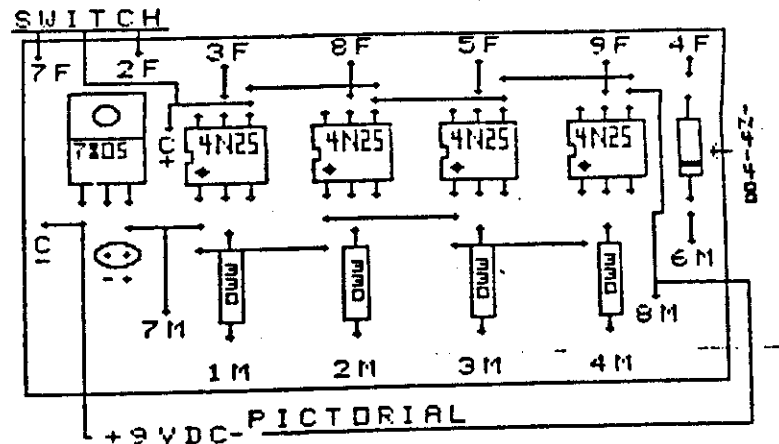
DSDD PLATO CONVERSION
by Michael Dorman

INTRODUCTION

   One of the things I have been quite interested in was converting PLATO from
the original Single Sided/Single Density format to Double Sided/Double Density.
A while back, I ran across a text file by Charley Summerhill, that explained
just how to do that. The only drawback to his technique was that it required,
several tools to do the job. In his article he used Advanced Diagnostics, Rapid
Copy, the CorComp Disk Manager, and DISK+AID to convert PLATO to DS/DD. Later,
Barry Traver issued an Extended Basic program (PLATO/PREP) that simplified the
proceedure somewhat. This program and Charley's article were published in Barry
Traver's excellent "GEniel Traveler" diskazine.

   John Birdwell's "Disk Utilities" version 4.1 or higher contains all the tools
necessary to make the changes without requiring the use of any other programs.
This speeds up the conversion time tremendously. (The only possible exception
to soley using Disk Utilities would be using Rapid Copy to initialize DS/DD
disks before beginning the .PLATO conversion process. However, Disk Utilities
has a pretty fast initialization process and has the advantage of being able to
format as we go.)

   This article gives the details of how to use Disk Utilities (DSKU) to convert
PLATO diskettes to DS/DD. The basic idea remains Charley's and I am grateful
for the service that he has provided to the 4A community. For the purposes of
this article, I will assume that you have a two drive system and that drive two
is DS/DD. If you have a single drive system, the instructions will still work
for you. Just use DSK1 when I refer to DSK2 and remember to change diskettes
accordingly.

PLATO DISKETTE ORGANIZATION

   PLATO diskettes have a fairly simple disk protection scheme. The first is the
disk protection that can be installed with the Disk Manager II. This simply
writes a "p" to sector 0 of the disk and can easily be changed with a sector
editor. The second form of protection for PLATO diskettes is a moved file
directory. The directory normally resides in sector 1 and contains the file
headers. However, on PLATO diskettes the directory is in sector 359. Sector 0,
which causes the disk directory to show the only file to be $$1, is not used by
PLATO at all.

   We can view the actual catalog by copying sector 359 to sector 1. This will
allow us to not only see the directory, but will also allow us to move or copy
the files that are on the PLATO diskette. After any changes, however, we must
remember to copy sector 1 back to sector 359 since PLATO interpreter expects
the file header information at sector 359.

PLATO PROGRAM TITLES

   Since PLATO packages generally contain 6 or fewer SS/SD flippy sides, most
PLATO programs will fit on a DS/DD diskette. There are a few that won't fit on
one DS/DD. In fact, one course contains 14 sides. We will deal with this sit-
uation later in the article.

   For now, use a package with 6 or fewer sides. Don't use one with only one
side if you have others available. (If you don't, then you don't really need
this anyway!) The instrutions will use 4 as the number of sides in a package,
but it is easy to follow with any numbr that will fit on one DS/DD diskette.

INSTRUCTIONS

   STEP 1: Load DSKU and make backup copies of the PLATO diskettes you are going
to convert. Use the sector copy method.

STEP 2: Initialize a blank diskette in drive 2 as DS/DD.

STEP 3: Choose "Mark Sector" from the Sector Utilities menu. Mark sector >167 (decimal 359) on DSK2 as used. This will prevent us from copying files over the sector used for file headers for PLATO diskettes.

STEP 4: Select "Edit Sector" from the Sector Utilities menu. After inserting the first backup PLATO diskette in drive 1, select drive 1 and sector >167. Press CTRL-P to printout the sector.

STEP 5: Select "Edit Sector" to edit drive 1, sector 1. Enter the same information from the printout in step 4. This will copy the file header info. to a normal TI format. This will allow us to copy all the PLATO files to the new diskette.

STEP 6: Select "File Copy" from the File Utilities. Copy all the files on DSK1 to DSK2. Press CTRL-P to get a printout of DSK1.

STEP 7: Repeat steps 4 5 for the following diskettes. Copy all the files except TIMENU and $$1 (these are duplicated on each diskette). When you copy DISKMENU from DSK1 to DISK2, increment the filename by 1 (e.g. DISKMENV, DISKMENW, DISKMENX). Press CTRL-P to get a printout of each SS/SD PLATO disk.

STEP 8: Choose "Edit Sector" and select DSK2, sector 1. Press CTRL-P to get a printout. Then, edit sector >167 of DSK2 to match that of sector 1. This will restore the file header info. needed by PLATO into the sector the cartridge uses.

STEP 9: Using either the file editor or the file search options of the file utilities, find "BOOT" in the file DISKMENU. Change BOOT to DISKMENV. Find the string "Select another diskette" in DISKMENU and change to "Select Menu 2 of 4" (4 assumes that there are 4 diskette sides in this PLATO package - adjust accordingly.) Do the same for DISKMENV - change BOOT to DISKMENW and change "Select another diskette" to "Select Menu 3 of 4". Repeat until the last file (DISKMENX) - change BOOT to DISKMENU and "Select another diskette" to "Select Menu 1 of 4".

STEP 10: Using the printouts of the PLATO SS/SD diskettes, find the files that match DISKMENU-DISKMENX. They are the remaining filenames (excluding $$1 and TIMENU). For each of these filenames, sector edit the file to change the string "DISKMENU" to the appropriate menu (i.e. DISKMENV, DISKMENW, and DISKMENX). Since the first diskette corresponds to DISKMENU, there is no need to change the files that are on that diskette.

CONCLUSION

You should now have a complete PLATO program on one diskette - probably with room to spare! There are two occasions that might arise making a DS/DD PLATO diskette. One is the problem of diskettes that only have one program on a side. On these diskettes there is no menu to select from and the diskette autostarts. The method suggested by Charlie Summerhill is to use a DISKMENU file from another disk and modify it to use the program name used by the diskette (e.g. LESSON).

The other difficulty comes when the total files of a lesson add up to more sectors than are available on a DS/DD diskette. In that case, you will need to break the program up into 2 or, at the most, 3 parts. On the last DISKMENU file on each half (or third), leave the word BOOT and change the menu to say "Change Disk-See Menu x" where x will be the first menu on the next diskette. The BOOT causes the cartridge to go through a reboot sequence that reads the next disk.

I'm looking forward to adopting the same ideas to 3-1/2" diskettes or, better yet, to a hard drive.

This small program is one of my most used programs. I can never remember the number associated with a key press or ASCII symbol. So, I threw this thing together. Let me caution you before I continue. Do not run this program until you have saved it. Once you start it, the only way to stop it is to turn your computer off. Function Quit and Function 4 are disabled so you can't break back in or kill it. This was done so that all combinations of key presses could be viewed. If you dont want these features delete line numbers 160 to 190. You must delete line 170 if you dont have memory expansion hooked up or a syntax error is generated.

Once this program is running, press any key.
It's number will be displayed. If an ASCII symbol is associated with that particular key press it will be displayed just to the right of the number.

This program does not break any new ground. However you might find a part of it to be of use. I have added one of my favorite little details to it.
If no key is pressed for a given amount of time it jumps to a screen saver type of subprogram.

The BLANK variable is a counter. This clock ticks away and if a key is pressed it is reset to zero and begins again.
If no key is pressed it jumps down to line 400 and stays there until a key is pressed.

```
100 ! KEY TO NUMBER PROGRAM
110 ! extended basic & 32k
120 ! by Bob Webb, 6-1991
130 ! Caution: you will have to
140 ! turn off computer to end.
150 !
160 ! CALL LOAD disables quit
170 CALL INIT :: CALL LOAD(-31806,16)
180 ! ON BREAK NEXT disables ftcn 4
190 ON BREAK NEXT
200 !
210 CALL CLEAR
220 BLANK=0
230 DISPLAY AT(5,5):"KEY TEST PROGRAM"
240 DISPLAY AT(7,5):"Press Any Key."
250 DISPLAY AT(9,5):"It's Number will"
260 DISPLAY AT(10,5):"be displayed."
270 !
280 ! MAIN LOOP
290 !
300 CALL KEY(0,K,S)
310 BLANK=BLANK+1
320 IF BLANK>1000 THEN 410
330 IF S=0 THEN 300
340 DISPLAY AT(12,4):K
350 DISPLAY AT(12,10):CHR$(K)
360 BLANK=0
370 GOTO 300
380 !
390 ! BLANK SCREEN
400 !
410 CALL CLEAR
420 CALL KEY(0,K,S)
430 IF S=0 THEN 420
440 GOTO 210
```

This second program can be added to your own program. It has the same kind of screen saver loop in it as the first. after the GOSUB statement you can test for which key was pressed (IF K=13 THEN X). Happy Computing, and long live our 99/4a!

```
100 ! KEY LOOP - extended basic
110 ! by Bob Webb, 6-1991
120 CALL CLEAR :: DISPLAY AT(10,7):"TEST"
130 GOSUB 180
140 CALL CLEAR :: DISPLAY AT(10,7):"ENTER"
150 ! 13 IS THE ENTER KEY
160 GOSUB 180 :: IF K=13 THEN 140
170 GOTO 120
180 ! PRESS ANY KEY LOOP
190 FOR BLANK=1 TO 200
200 CALL KEY(0,K,S):: CALL HCHAR(24,16,32)
210 IF S=1 THEN 250 :: CALL HCHAR(24,16,107
220 NEXT BLANK :: CALL CLEAR
230 CALL KEY(0,K,S):: IF S=0 THEN 230
240 GOTO 190
250 RETURN
```

MAKE YOUR OWN FLASH CARDS

by Tony Falco

Last summer a friend came to me with a programming problem. He wanted a program to display arithmetic flash cards, with any numbers, and problems in text book format. It was not as easy a task as I thought it might be, but the string commands in BASIC coupled with T.I. Extended BASIC's DISPLAY AT and ACCEPT AT commands did the job.

The user picks one of three operations. Then he picks his own numbers. Entering <Q> for the first number will end the program. The program works best if the child and parent work at the computer together.

In a future article, I will show how to adapt the program so the computer generates the problems.

WORDPLAY   The PUNN Newsletter - Portland, OR

```
10 CALL CHAR(104,"FF8080808080
8080FFFF010101010101FF")
20 DISPLAY AT(12,6)ERASE ALL
:"PICK ONE--->+-X  +"
30 ACCEPT AT(12,22)SIZE(-1)V
ALIDATE("+-X")BEEP:OP$
40 CALL CLEAR :: CALL FLASH
:: CALL CHAR(95,"0000FFFF")
50 DISPLAY AT(3,4)SIZE(-6)BE
EP:"RIGHT:" :: DISPLAY AT(3,
15)SIZE(-6):"WRONG:"
60 DISPLAY AT(5,10)SIZE(-6):
"SCORE:"
70 FOR J=12 TO 15 :: DISPLAY
 AT(J,1)SIZE(-25):" " :: NEX
T J
80 DISPLAY AT(13,7)SIZE(-1)B
EEP:OP$
90 ACCEPT AT(12,9)VALIDATE(D
IGIT,"Q")SIZE(-4):A$
100 IF A$="Q" THEN 280 ELSE
ACCEPT AT(13,9)VALIDATE(DIGI
T)SIZE(-10):B
110 A=VAL(A$)
120 C=-(A+B)*(OP$="+")-(A*B)
*(OP$="X")-(A-B)*(OP$="-")
130 B$=STR$(B):: C$=STR$(C):
: M=MAX(LEN(A$),LEN(B$)):: N
=MAX(M,LEN(C$))
140 DISPLAY AT(13,1)SIZE(-5)
:" " :: DISPLAY AT(13,7-M+LE
N(A$))SIZE(-10):OP$
150 DISPLAY AT(13,9+LEN(A$)-
LEN(B$))SIZE(-10):B$
160 DISPLAY AT(14,8+LEN(A$)-
N)SIZE(-10):RPT$(CHR$(95),N+
2)
170 ACCEPT AT(15,9+LEN(A$)-L
EN(C$))SIZE(-LEN(C$))VALIDAT
E(DIGIT,"-")BEEP:D
180 IF D=C THEN R=R+1 :: CAL
L SAY("#THAT IS RIGHT"):: CA
LL DELAY(200):: GOTO 250
190 DISPLAY AT(12,19)SIZE(-L
EN(A$)):A$
200 DISPLAY AT(13,17-M+LEN(A
$))SIZE(-1):OP$
210 DISPLAY AT(13,19+LEN(A$)
-LEN(B$))SIZE(-LEN(B$)):B$
220 DISPLAY AT(14,18+LEN(A$)
-N)SIZE(-9):RPT$(CHR$(95),N+
2)
230 DISPLAY AT(15,19+LEN(A$)
-LEN(C$))SIZE(-LEN(C$)):C$ :
: W=W+1
240 CALL SAY("#THAT IS INCOR
RECT"):: CALL DELAY(700)
250 S=INT(100*R/(W+R)+.5)
260 DISPLAY AT(3,10)SIZE(3):
R :: DISPLAY AT(3,21)SIZE(-3
):W
270 DISPLAY AT(5,17)SIZE(-4)
:STR$(S)&"%" :: GOTO 70
280 CALL SAY(STR$(R)):: CALL
 SAY("CORRECT AND"):: CALL S
AY(STR$(W))
290 CALL SAY("NOT CORRECT"):
: CALL CLEAR :: END
300 SUB DELAY(X):: FOR D=1 T
O X :: NEXT D :: SUBEND
310 SUB FLASH :: CALL SCREEN
(12):: FOR Z=1 TO 8 :: CALL
COLOR(Z,2,15):: NEXT Z
320 CALL COLOR(9,2,2,10,12,1
2):: CALL HCHAR(1,1,104,768)
330 FOR Z=2 TO 6 :: CALL HCH
AR(Z,5,32,22):: NEXT Z
340 FOR Z=10 TO 18 :: CALL H
CHAR(Z,3,32,27):: NEXT Z
350 CALL HCHAR(7,6,96,22)::
CALL VCHAR(3,27,96,4)
360 CALL HCHAR(19,4,96,27)::
 CALL VCHAR(11,30,96,8):: SU
BEND
```

Bob's Corner
by Bob Sherburne

After shooting off my mammoth keyboard, I find myself in a position I do not like, and this is not good! I don't want to be the only one looked upon as a traitor to the 99/4A! But perhaps "traitor" is too harsh a word... Was Thomas Edison a "traitor" to the candle, Henry Ford a "traitor" to the buggy, Albert Einstein a "traitor" to gun powder? (sly grin) Then again, "Devil's Advocate" probably has a nice ring to some of the more steadfast TI'ers. Do I really care? No! Let them eat chips! Cake? Whatever? Right Marie? Marie? The time has come to look towards the future of computing, and Myarc doesn't appear to be there. Beery Miller stated in his last newsletter that Lou Phillips loves TI'ers and would not abandon us, but according to George Campbell, Myarc has disconnected their phone, and this is also, NOT GOOD! So, if we as a group are to be truly revolutionary, the Darwinists of the TI community, pouncing upon the theory of computer evolution, then let us do it as a gourp! (I mean group!) As you can see, everyone makes mistakes. Most of you have probably noticed dozens of them in my articles over the years and if you depend on one person for your news and information you are asking for false information, or information you are not interested in. Since we, as a group, have voted to allow users of other computers to become members, we, as a group have a responsibility to support them. If you have come across a terrific program, tip or trick, whether it be for TI, IBM, ALTAIR or CRAY, share it with the group! Write a little article about it and you may become another infamous traitor, I mean guru, of the TI computer evolution revolution. In order to prove I practice what I preach, next month I will be the first to submit an article dealing with a computer other than the TI or GENEVE. I do ask one favor of the group though, if anyone using a MACINTOSH computer comes to one of our meetings, please throw that person bodily from the building!

There is a bit of good news in the NEWS section of the latest 9640-NEWS, although I seem to remember hearing some news about this news before, it bares repeating since I don't believe in the adage that, "no news is good news". Jeez!

According to Beery Miller, Al Beard and Clint Pulley have teamed up in order to more quickly finish Al's version of the Full C Compiler! At present they are said to be removing the last of the bugs in the program. Apparently the pesky insects were in the original source code from which AL was working, and only show up when more complicated coding is used in a program. Beery "suspects" that the program will be mailing "very soon now". When this occurs, we will be able to utilize SOME programs written for other computers. Once we have the source code to a program, and as long as the source code (standard ASCII text) conforms to the ANSI C standard, it can then be converted to TI disk format. Once this is done the program can then be compiled with AL's program and theoretically, should run as an E/A option 5 program on the TI at Assembly speed. There are lots of pitfalls to this process however, and I wouldn't expect a tremendous influx of new programs. (even though a small influx would seem tremendous...) For instance, even though Microsoft Windows was written in C, it is highly unlikely that it will ever be ported to the TI. But C programs can be written, and where there are but a handful of TI Assembly programmers, there are thousands of expert C programmers. Books on C programming, crammed with sample code can be found by the dozen, and C routines are (for the most part) freely passed around among programmers. In Las Vegas there is a IBM bbs (Dust Devil) which is dedicated to C programming, and ideas and code are passed around like a wine bottle on Main Street. If you

Bob's Corner   continued

have a C programming problem, you can call this board, place a message asking how a certain piece of code or keyword works, and within a few days there are replies with sample code that can be logged to disk, edited, and changed into true C code in about one minute. The C language is not particularly hard to learn once you get started, but because of the strange syntax, and the over abundance of terminology it is bewildering to the beginner. Once Al Beard's C Compiler is a reality, and if there is any interest, I will be glad to include short tutorials in this newsletter. Any takers?

Many of the members of our group are now using hard drives with their systems so I thought I would pass along a little tip which, again, "saves key presses!" If you have a directory you often access from MS-DOS or MDOS, this little trick will save time and typing? What is this tip you ask? Glad you asked! Here is a hint: It involves BATCH FILES! Yup, one of my favorite topics? Just use copy con directoryname to write a batch file with the same name as the directory you would like to jump to? For instance, Let's say you have a directory which is a pain in the fingers to access, (D:\ART\MYART\GIFS) and you are constantly adding or deleting files from it? To make it easy on yourself, just add the following batch file to the utility directory in your path:

```
D:
CD\ART\MYART\GIFS
^Z enter
```

Name this batch file GIFS.BAT, and the next time you need to get to this directory from any drive or directory, just type GIFS and you're there! Pretty spiffy huh?

TTYL (talk to you later) Bob Sherburne

Born Loser
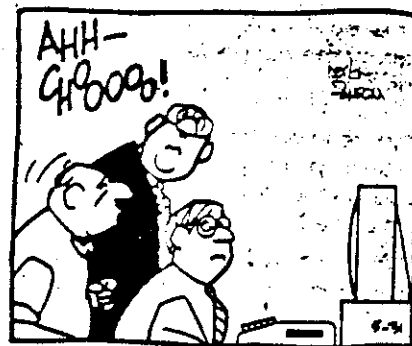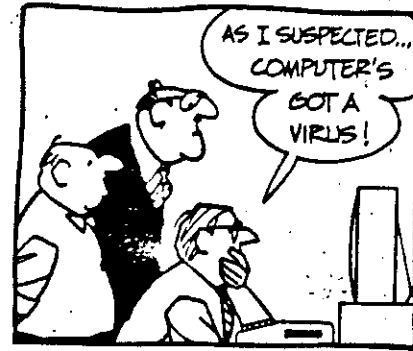
MONITORS

### OR WHY A TV SET ISN'T GOOD ENOUGH FOR 80 COLUMNS

Tom Morrison

FIRST, WE HAVE TO GO INTO A LITTLE BIT ABOUT BANDWIDTH. IF YOU WANT TO COMMUNICATE, YOU CAN USE YOUR VOICE. IT WILL TRAVEL ABOUT A MILE WITH PERFECT CONDITIONS. WHEN YOU WISH TO SEND INFORMATION A LONGER DISTANCE, YOU MUST TRANSMITT IT ON A WIRE OR WITH ELECTROMAGNETIC WAVES. THE PHONE WIRES ARE BUILT TO HANDLE VOICE FREQUENCIES (ABOUT 400 TO 15,000 CYCLES PERSECOND). RADIO WAVES, SAY FM RADIO, USES A CARRIER FREQUENCY OF 90 MILLION CYCLES PERSECOND. IT IS OBVIOUS WE CAN NOT HEAR THAT FREQUENCY, SO WE HAVE TO PRESS OUR VOICE ON IT SOME WAY. THIS IS DONE BY ADDING AND SUBTRACTING THE VOICE FREQUENCY TO THE CARRIER. THIS, OF COURSE, WILL MAKE THE CARRIER DEVIATE IN FREQUENCY AT THE RATE OF THE VOICE INFORMATION, AND IT WILL TAKE UP 90 MEGACYCLES PLUS AND MINUS THE 15,000 CYCLES OF THE INFORMATION. THIS IS THE BAND WIDTH. FOR REALLY GOOD RECEPTION, THE 1,000 CYCLES MAY DEVIATE THE ORIGINAL 90 MILLION CYCLES BY MORE THAN JUST 1,000 CYCLES. THIS MEANS THAT THE BANDWIDTH MAY BE 10 MILLION CYCLES ALTOGETHER. YOU MUST REMEMBER THAT THERE IS A RECEIVER THAT MUST PICK OFF THE AUDIO OR NOONE CAN HEAR THE INFORMATION. IT IS EASIER TO SEE AND RETRIEVE A LARGER SWING OF THE CARRIER THAN A SMALL ONE.
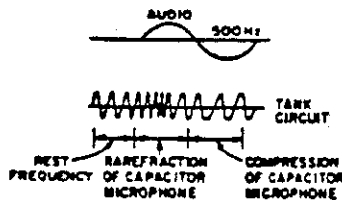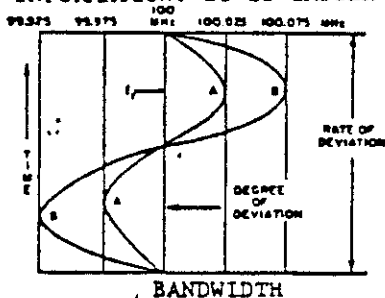
NOW THAT YOU HAVE SOME IDEA OF WHAT THE TERM BANDWIDTH MEANS, WE CAN DISCUSS THE TELEVISION THAT A LOT OF TI USERS HOOK UP AS MONITORS. THE RF MODULATOR ACTUALLY DOES MODULATE THE VIDEO AND AUDIO ONTO CHANNEL 3 OR 4. WHAT GOES INTO THE SET IS JUST LIKE A TV SIGNAL. A TELEVISION IS DESIGNED TO RECEIVE SIGNALS SENT OUT TO BE DISPLAYED AS PICTURES. IT DOESN'T HANDLE 80 COLUMNS VERY WELL DUE TO THE TECHNICAL LIMITATIONS.
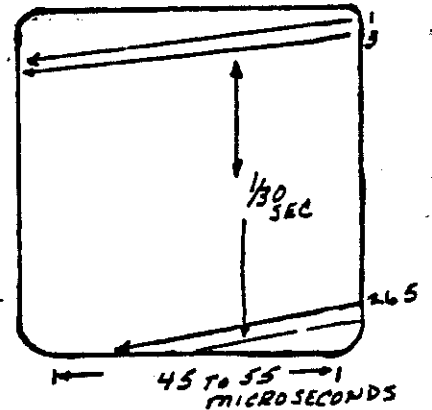
THE SET HAS A PICTURE TUBE WITH THE SCREEN COATED WITH PHOSPHOROUS. REMEMBER TURNING OFF THE OLD BLACK & WHITE AND WATCHING IT SHRINK TO A DOT IN THE MIDDLE? THAT WAS DUE TO THE DEFLECTION GOING AWAY BEFORE THE BEAM DIED OUT. WITHOUT MAGNETS TO DEFLECT THE ELECTRON BEAM, ALL YOU GET IS A DOT RIGHT IN THE CENTER. THE COILS ON THE NECK OF THE TUBE CAN PUT THE DOT JUST ABOUT ANYWHERE ON THE SCREEN AND CAUSE THE PHOSPHORS TO GLOW. COLOR HAS THREE DISTINCT PHOSPHORS AND THREE BEAMS TO HIT EACH ONE. WE CAN STAY AWAY FROM COLOR FOR THIS ARTICLE SO I WILL.
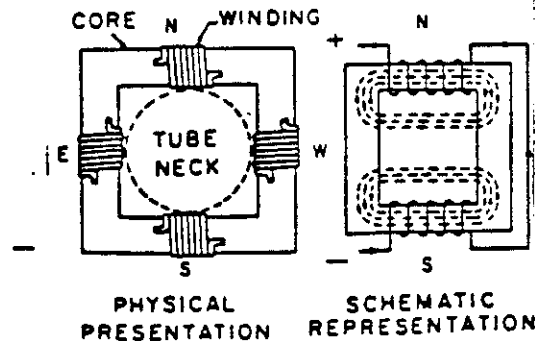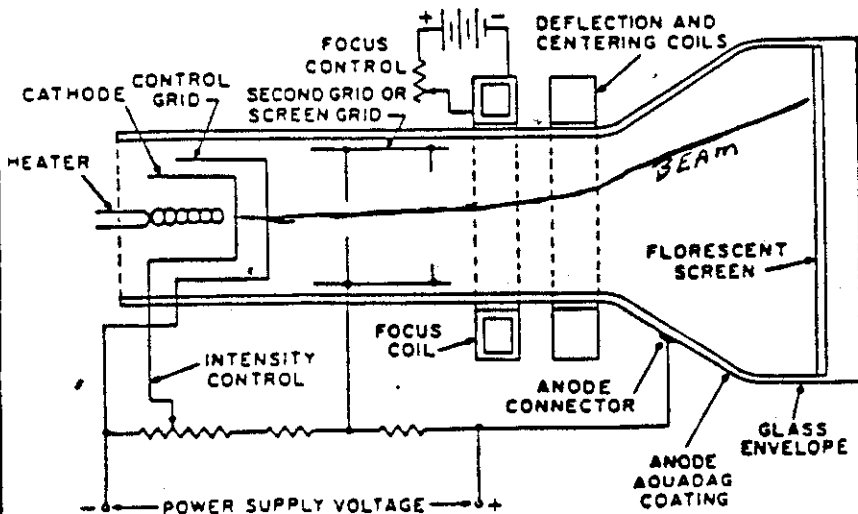
THE BEAM IS SCANNED ACROSS THE SCREEN FROM LEFT TO RIGHT, AND THEN IT IS QUICKLY MOVED
BACK TO THE LEFT SIDE. IT DOESN'T GO STRAIGHT ACROSS, BUT ANGLES DOWN A LITTLE ON ITS
WAY ACROSS THE SCREEN. THE NEXT SCAN IS JUST UNDER THE FIRST. THIS CONTINUES UNTIL THE
WHOLE SCREEN IS COVERED TOP TO BOTTOM. WHEN THE BOTTOM IS REACHED, THE BEAM IS JUMPED UP
TO THE TOP TO START ALL OVER AGAIN, BUT THE NEXT SCAN IS INBETWEEN THE FIRST. THERE ARE
262 LINES MADE ON EACH JOURNEY THAT IS TECHNICALLY CALLED A RASTER. YOU CAN SEE THIS BY
TURNING ON THE SET WITHOUT ANY INPUT SIGNAL. ALL YOU SEE IS THE SWEEP WITHOUT ANY VIDEO
INFORMATION ON IT. THIS TRACE ACROSS THE SCREEN TAKES 65 MICROSECONDS. THAT IS .000065
OF A SECOND. NEAR TO CONFUSION? THIS OUGHT TO GET YOU THERE.

THERE ARE 525 LINES! THE FIRST SCAN DOES THE ODD LINES AND
THE NEXT SCAN DOES THE EVEN LINES. EACH PASS IS CALLED A
FIELD AND TWO FIELDS MAKE A FRAME. YOU GET 30 FRAMES AND
60 FIELDS EVERY SECOND. HENCE NO FLICKER. REMEMBER WATCHING
"MY FRIEND FLICKER"? YOUR EYE CAN NOT SEE THINGS CHANGE AT
THAT RATE, SO YOU SEE MOTION. COMPUTERS DO NOT USE THIS
INTERLACE, IT IS DONE IN THE TV SET. AS THE BEAM MOVES
ACROSS THE SCREEN IT IS INTENSIFIED TO MAKE THE PHOSPHOR
GLOW. THIS IS CONTROLED BY THE VEDIO SIGNAL. WHERE IT
DOES NOT INTENSIFY, THE SCREEN STAYS BLANK. ALONG WITH
THIS VEDIO IS AUDIO, AND SYNCHRONIZING SIGNALS. THESE
SYNCHRONIZERS TELL THE BEAM TO GO BACK TO THE TOP AND
START A NEW FIELD, AND THE TELL THE BEAM TO GO BACK TO
THE START OF A NEW LINE. THE FIRST IS THE VERTICAL SYNCH
SIGNAL. THE SECOND IS CALLED THE HORIZONTAL SYNC SIGNAL.
COMPUTERS TURN PIXELS ON OR OFF. WHEN TEXT IS DENSER THAN 40 COLUMNS, THE TV JUST DOES NOT
HAVE THE RESOLUTION TO DISPLAY IT VERY WELL.
    IF YOU CHECK OUT A CLONE MONOCHROME CIRCUIT, YOU FIND THE SPECIFICATIONS ARE:
 18.5 KILOHERTZ--THAT IS ABOUT 55 MICROSECONDS PER TRACE LINE WITH 350 LINES IN A FRAME.
  THERE ARE 52 FRAMES PER SECOND WITHOUT ANY INTERLACE. IT WILL DISPLAY 720 DOTS ON EVERY
LINE FOR A A TOTAL OF 25 LINES OF 80 CHARACTERS. EACH CHARACTER IS 9 DOTS WIDE AND 14
HIGH.
    REMEMBER THAT LETTERS HAVE TO BE MADE OF DOTS(ON & OFF) AND YOU NEED A SPACE BETWEEN
EACH WITH THE DOT TURNED OFF--THAT IS ON THE HORIZONTAL. THEN YOU NEED SCAN LINES WITH A
TOTAL OF THE VERTICLE NUMBER OF DOTS YOU USE FOR THE LETTER AND ONE CLEAR LINE INBETWEEN
EACH VERTICLE LINE OF CHARACTERS. IF YOU FIGURE 80 CHARACTERS ON A LINE MADE UP OF 8 BY
9 DOTS YOU NEED 8 TIMES 80 OR 640 DOTS. THAT MEANS 320 ONS/OFFS PER LINE. THE TRACE WILL
TAKE 65 MICROSECONDS,BUT 10 MICROSECONDS ON EACH SIDE ARE NOT USEABLE, LEAVES US 45 MICRO-
SECONDS. WITH 320 ONS AND OFFS IN 45 MICORSECONDS WE HAVE 6.8 MILLION EVENTS EVERY SECOND.
IF THERE WAS A 7 MEGACYCLE BANDWIDTH TV SET, ALL WOULD BE FINE, BUT THE AVERAGE TV HAS A
BANDWIDTH OF 3.58 MEGACYCLES. THAT IS WHY IT CAN HANDLE 40 COLUMNS. BANDPASS EQUATES WITH
RESOLUTION.
    IF YOU GET AN 80 COLUMN CARD, BE SURE YOU HAVE A MONITOR TO HANDLE IT. THERE ARE A
FEW OTHER ITEMS ABOUT MONITORS SUCH AS PERSISTANCE AND AUDIO RESPONSE JUST TO NAME A FEW,
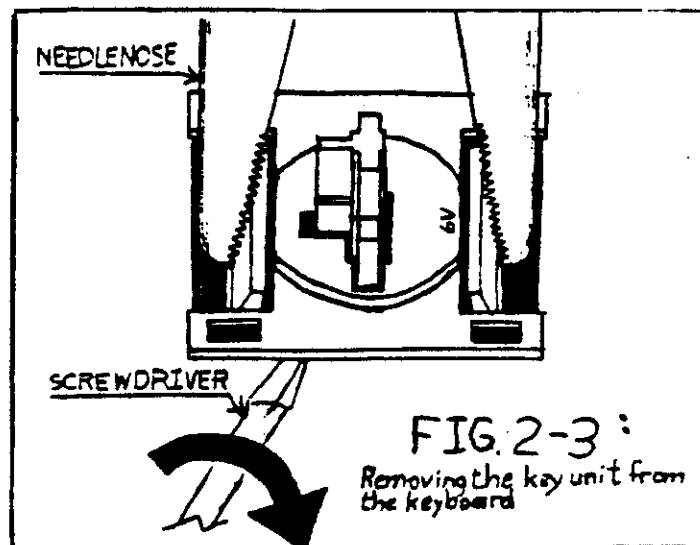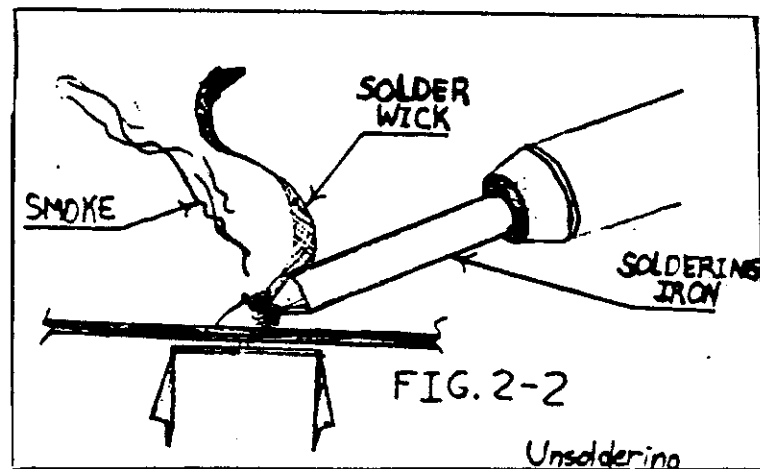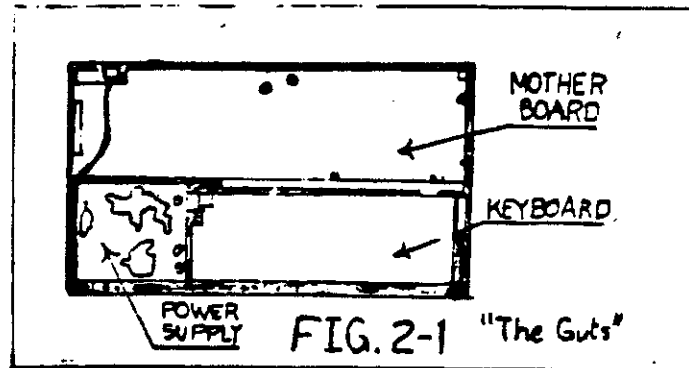THAT SHOULD BE CHECKED BEFORE PURCHASE.
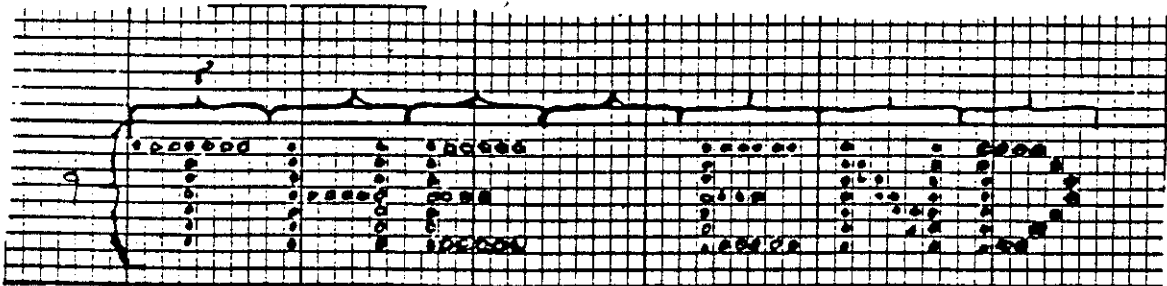
2. UNPLUG EVERYTHING CONNECTED TO THE CONSOLE INCLUDING THE CARTRIDGE AND THEN TURN THE CONSOLE OVER.

3. TAKE THE CONSOLE TO A WORK BENCH AND PLUG IN YOUR SOLDERING IRON.

4. BEGIN REMOVING ALL OF THE SCREWS ON THE BOTTOM WITH THE PHILLIPS SCREW DRIVER, THEN LIFT OFF THE BOTTOM COVER.

5. LOCATE THE POWER SUPPLY BOARD, (FIG.2-1) REMOVE THE SCREWS, THEN LIFT THE BOARD OUT OF THE WAY.

6. REMOVE THE SCREWS HOLDING THE KEYBOARD AND PULL IT OUT TOWARDS YOU AS FAR AS POSSIBLE.

7. NOW FIND THE WIRE STRIP CONNECTING THE KEYBOARD TO THE MOTHER BOARD; UNPLUG THE STRIP FROM THE MOTHER BOARD.

8. SET WHAT IS LEFT OF THE CONSOLE ASIDE FOR NOW. SET THE KEYBOARD SO THAT THE SOLDER JOINTS ARE FACING UP.

9. TAKE YOUR SOLDERING IRON AND SOLDER WICK, PLACE THE WICK ON ONE OF THE JOINTS, THEN PLACE THE SOLDERING IRON ON TOP OF THE WICK, AS SHOWN IN FIG.2-2. PRESS DOWN FIRMLY AND WATCH TO SEE THAT ALL OF THE SOLDER DISAPPEARS.

10. REPEAT STEP 9 FOR THE OTHER JOINT. ONCE ALL OF THE SOLDER IS REMOVED, WIGGLE THE EXPOSED PINS AROUND. BREAK LOOSE ANY SOLDER STILL ON THE JOINTS.

11. TAKE THE NEEDLENOSE AND PLACE THE TIPS IN THE POSTION AS SHOWN IN FIG.2-3. SQUEEZE THE NEEDLE-NOSE MAKING SURE THAT THE TIPS DO NOT LOSE THEIR GRIP.

12. WHILE HOLDING THE NEEDLENOSE IN PLACE, TAKE A PLAIN SCREW DRIVER AND PRY AND TWIST IT UNDERNEATH THE BASE PLATE ALSO SHOWN IN FIG.2-3, LIFTING THE KEY OUT OF THE KEYBOARD. IF THIS KEY IS NOT READILY ACCESSIBLE, THEN YOU MAY HAVE TO REMOVE SEVERAL KEY CAPS FROM THE KEYBOARD THAT ARE ADJACENT TO THE KEY UNDER REPAIR.

IN THE FOLLOWING STEPS BE CAREFUL SO AS TO NOT BREAK ANY OF THE PLASTIC PARTS OF THE KEY!

13. ONCE THE KEY IS REMOVED, THE TOP OF THE KEY MUST BE TAKEN OFF BY PUTTING A SCREW DRIVER IN THE POSITION AS SHOWN IN FIG.2-4. NOW PRY OUT THE PLASTIC CLIP THAT HOLDS THE TOP DOWN, ALSO SHOWN IN FIG.2-4. WHILE DOING THIS TRY LIFTING THE TOP OFF.

ILLUSTRATIONS FOR REPAIR OF THE MICROSWITCH TYPE KEYS

FIG. 2-1 "The Guts"

FIG. 2-2

Unsoldering

FIG. 2-3:
Removing the key unit from the keyboard

(CONTINUED FROM PAGE 4)
YOU MAY HAVE TO DO THIS BY
SLIDING THE SCREW DRIVER ALONG
THE GROOVE AS SHOWN IN FIG.2-5,
AT THE SAME TIME TWIST IT A BIT
UNTIL IT STARTS TO POP OFF.

14. REPEAT STEP 13, EXCEPT THIS TIME
    PUT YOUR THUMB NAIL IN PLACE OF
    WHERE THE SCREW DRIVER IS.

15. TAKE OUT THE WHITE NECK AND
    SPRING, THEN LOCATE THE CONTACT
    ARM AS SHOWN IN FIG.2-6, THIS
    ARM MUST BE BENT OUT MORE TO
    MAKE BETTER CONTACT. THIS
    IS ILLUSTRATED IN FIG.2-7.

16. TAKE YOUR MULTIMETER, PUT BOTH
    LEADS ON BOTH KEY JOINTS AND
    DEPRESS THE KEY NECK. IF THE
    TEST PASSES, YOU WILL NOTICE THAT
    BOTH THE NEEDLE AND THE DIGITAL
    READOUT WILL READ CLOSE TO ZERO
    OHMS. IF THE TEST FAILS REPEAT
    STEPS 15 & 16.

17. REASSEMBLE THE KEY AND PUSH IT
    BACK INTO THE KEYBOARD PROPERLY
    MAKING SURE THE JOINTS LINE UP
    WITH THE HOLES AS SHOWN IN
    FIG.2-8.

18. TAKE YOUR SOLDERING IRON AND
    SOLDER, AND SOLDER THE JOINTS
    TO THE BOARD AS SHOWN IN FIG.2-9.
    UNPLUG YOUR SOLDERING IRON.

19. PLACE THE KEYBOARD BACK INTO THE
    CONSOLE, BE SURE AND PLUG STRIP
    BACK INTO THE MOTHER BOARD.

20. PUT THE POWER SUPPLY BOARD BACK.
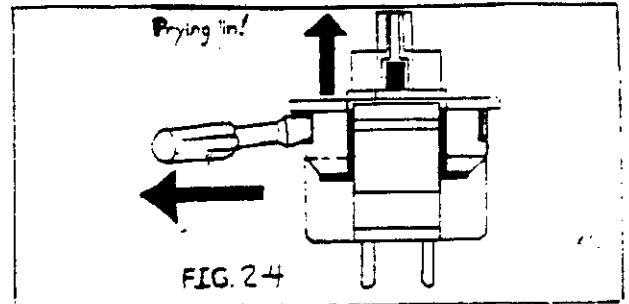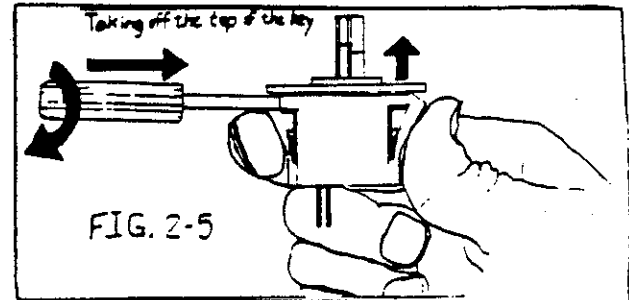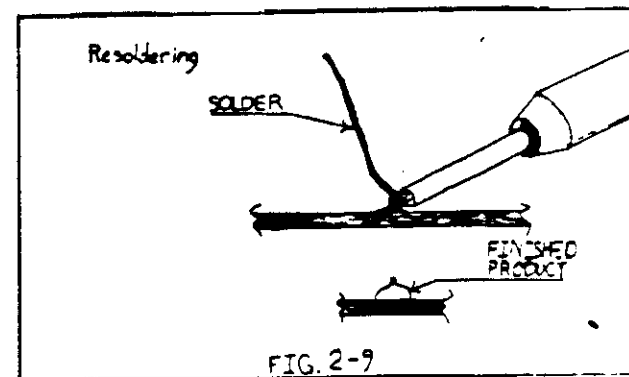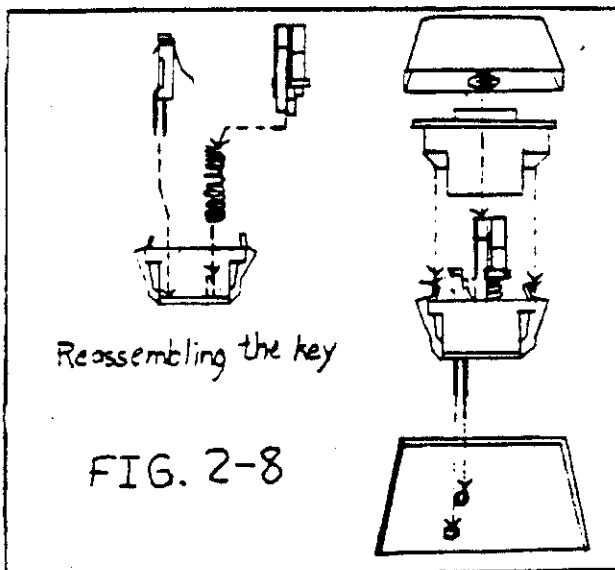
21. REPLACE THE BOTTOM OF THE
    CONSOLE.

Prying 'in'!

FIG.2-4

Taking off the top of the key

FIG.2-5

CONTACT ARM

Taking a look   FIG.2-6

FIG.2-7 Readjusting

Reassembling the key

FIG.2-8

Resoldering

SOLDER

FINISHED PRODUCT

FIG.2-9
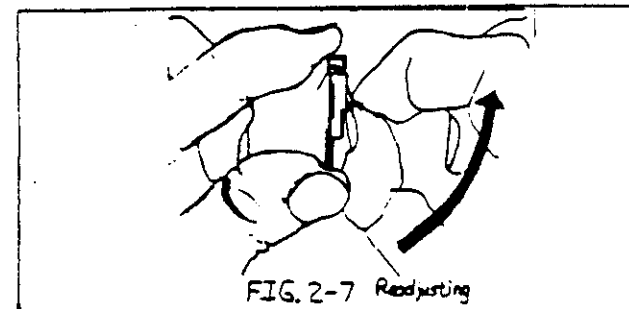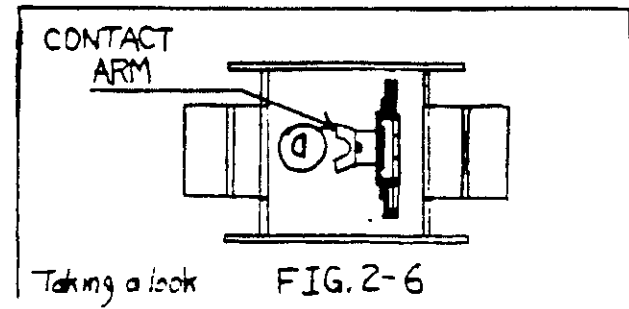
I found the following post from Cynthia Becker to be very inspiring...

From: Cynthia Becker
To: All   Msg #261, 04/25/91 08:18am
Subject: Myarc, Et Al

23-apr 23:50 RE: msg 22909 From : WALTHOW There are still some wonderful people putting a lot of energy into the TI and 9640 world these days, but JPH isn't one of them. A lot of vendors have tried to keep things going beyond all financial reason, including CORCOMP, Myarc, JPH, Miller Graphics and maybe Asgard now, too. NOBODY gets a fair return on their time now, and as the service falls away, each vendor comes under ENORMOUS CRITICISM for not maintaining a high level of service and dedication. Only love for the machine and the people keep anyone going! Somehow, every time a Craig Miller or a Lou Phillips or a JPH drops out or becomes impossible to contact, a RAVE or a GARY BOWSER or a GRAMULATOR somehow mange to keep things going. And a fer perennials hang on at the best level they can maintain -- Paul Charlton, Barry Boone and our own Jerry Coffey, just to name a few, who seem to love the challenge, whatever the return, and Bud Mills [and I might add, BEERY MILLER!] I call for a round of applause for everyone who has kept the TI world alive -- and understanding for those who can't keep their promises at the level they wish they could. No one who has dropped out has done it willingly. They have been far too optimistic, when cold business sense would have said to forget it, and cut the losses & disappear. Those who have tried to maintain the presence when everything is shouting at them to quit. EVERY product you buy now is far below cost! Anything you buy now, whatever the company, is probably returning 10 cents an hour on invested time, if that. Don't be too hard on those who have made promises far beyond all ability to perform. They tried, and they remained optimistic far to long, and the result is shattering criticism for not doing better. And if anyone still manages to make expenses, BRAVO for them! But above all, keep up the support for those who still keep finding the wonderful capabilities that never seem to find limits in the TI world. They aren't making any money, but the challenge to stretch the limits far beyond what TI once thought the machine could to, to learn, to share wonderful relationships with creative people are still worth the effort for some brilliant people who are still with us and still keep appearing. No one will ever get rich or even make a comfortable living anymore from the TI world, but there are still a lot of rewards to be realized of other kinds! KEEP IT GOING! the end is NOT in sight!

WP ◆

.... AND AFTER THE COMMITTEE HAD DECIDED UPON THE SHAPE OF THE TABLE, 13 MEN SAT DOWN ON ONE SIDE, AND 12 ON THE OTHER. ....

"I didn't realize I'd be expected to think on the job, Mr. Khol. I thought the entire operation was computerized."