

THE WEST PENN 99'ERS CLUB

JANUARY 1986 NO.4

The WEST PENN 99'ERS

ANOTHER NEWSLETTER.....

So I lied. I told all of you that there would be no more newsletters for those who did not send in their dues for either the associate or family membership. Well, that wasn't a very nice thing to do to anyone in December, the gas and electric companies would'nt even do that. Besides you have enough of those year end bills to contend with, and I didn't want to add to them.

The December newsletter was not a real gem either, we had to get too much in it dealing with the by-laws and membership to give you an adequate feeling of it's worth. I'm hoping that you will feel that this is much more of what you want and expect.

TEMPORARY INCONVENIENCE, A PERMANENT IMPROVEMENT.....

We've had two meetings at the Norwin YMCA, and to date have had something to complain about both times, so lets hope that the third time will be THE CHARM. The first month we only had 1 and 1/4 rooms with chairs, the second month, we had 1 and 1/4 rooms with no chairs. What could happen next?

EVEN I WAS IMPRESSED.....

We had a demonstration of some Christmas software by Don Baker, a cassette program capable of loading assembly language programs into a console with 32K of memory by Clyde Colledge, and the actual console with 32K of expansion memory inside it by myself (using plans from the WESTRALIA group). Note: I'm including plans in this issue, so that any of you who are capable or know someone who is, can build your own. It works, and it works VERY WELL!!!!!! If you have any questions on either the cassette loader, or the memory, call either Clyde or myself (Clyde 412-828-3042, John 412-527-6656). The cost of the parts should be from \$14. to \$22. , depending on how much you want to dress it up.

WE'RE GOING TO THE POLLS.....

Because this is not a normal year, we must break some of our by-laws at the onset, and that is we must have a slightly accelerated election for the 1986 period. We had a nomination from the floor in the December general meeting, and will accept nominations at the January meeting, followed immediately by the elections, so that the new officers can begin to serve in February. Nominated:

PRESIDENT-----	Scott Coleman	TREASURER-----	Jan Trayers
-----	John Williforth	LIBRARIANS-----	Bob Sadusky
VICE PRESIDENT--	Chuck Strink	-----	Clyde Colledge
SECRETARY-----	Ed Bittner	-----	Rob Ekl
COR. SECRETARY--	Gene Kelly	EDITOR-----	TO BE APPOINTED

Please, if you are or know someone who is capable and willing to perform in one of the above positions, come to the meeting and nominate them (or get someone to nominate you). The more dedicated your officers are and the more they represent your wishes the better this club will be.

GRAM KRACKER DEMONSTRATION, JANUARY 20TH MEETING.....

Clyde Colledge has just let me know that he has received his Gram Kracker from Miller Graphics, (Christmas Eve no less) and he will be demonstrating it at the next meeting. You can put nearly ALL YOUR CARTRIDGES into retirement with this module. Yes, with it you can take cartridge programs and put them on diskette, and I understand even to cassette. But there are even greater things that you can do. So if you would like to see something that is NOT VAPORWARE, come to the meeting!

HEAR YE! HEAR YE!

By the way, the last time I was so rushed with the newsletter that I forgot to put the time and place of the meeting on the front page, but because the only thing that wasn't printed was the AD from the COMPUTER BUG, I got the not so bright idea that I could stick this on the outside where everyone would see it. Wrong! It appears that the most obvious is not the place for the analytical sorts, which I know make up this group, so here is the time/date:

PLACE OF NEXT MEETING----->>>>	NORWIN Y M C A	<<<<-----
TIME OF NEXT MEETING----->>>>	7:00 P.M.....	<<<<-----
REQUIREMENTS ----->>>>	YOU BE THERE..	<<<<-----
SIGS IMMEDIATELY FOLLOWING>>>>	BASIC (Chuck Strink)	<<<<-----
THE MEETINGS(B:30 apx.) >>>>	XBASIC(John Williforth)	<<<<-----

DON'T WORRY ELINOR'S WORKING ON IT!.....

I'm glad to know that at ELINOR is working on my BASIC program problem for the last issue. Keep it up ELINOR and hurry, I'm getting anxious.

LOGO II , WHAT'S IT ALL ABOUT ALPHIE?(I'm not Alphie but..).....

By the way, for any of you who would like to get LOGO II, you can now get this very HIGH LEVEL procedural, interactive programming language. The author of LOGO have tried to make it possible for children (and adults) to control a computer in self-directed ways, even at their first attempts at LOGO.

LOGO programs are created by combining commands into groups called procedures and by using these procedures as steps in other procedures, and so on to arbitrary levels of complexity. Each individual step of a procedure may be any primitive LOGO command or any user-defined procedure. Procedures can communicate among themselves via INPUTS and OUTPUTS. Any LOGO command, whether built into the language or defined as a procedure, can be executed by simply typing the command at the keyboard. LOGO's integrated editor makes it easy to define, execute, and modify procedures, because there is no necessity to deal with separate compilers, loaders, monitors, and so on. LOGO's data objects (those things that can be named by individual variables, passed directly as inputs to procedures, and returned as values) include not only numbers and character strings, but also compound structures called LISTS. Many computer languages force the programmer to manipulate data structures in terms of sequences of operations on individual numbers and character strings. In contrast, LOGO's LISTS are functional units that can be transformed in single operations, making LOGO a convenient and powerful language for applications involving symbol manipulation. In fact LOGO procedures can themselves be represented and manipulated as LISTS. This means users can attain considerable direct control over the way commands are interpreted— for example, to provide special interfaces to LOGO for the physically handicapped or the very young! LOGO also incorporates a programming area called TURTLE GEOMETRY. A TURTLE is computer controlled "cybernetic animal" that lives on the display screen and responds to LOGO commands that make it move about the screen at the direction of the programmer. The LOGO enables young children to create spectacular animation effects with SPRITES, and includes commands to generate music with three voices plus a drum, and both graphics and music can harmonize together.

Well, that should interest you, but the best part is yet to come. Why should I tell you about this now? With the addition of the 32K of internal memory, at the price of the LOGO II package (current price less than \$25.), you are in business, and you can use a cassette to save and load programs!!!!

FREE TENEX CATALOG.....

Many of you receive no catalog at all, from any distributor, well if you would like one, you can call: 1-800-348-2778 (toll free) or write for the free "The TENEX COMPUTER EXPRESS 1985/86 CATALOG", "The Everything Book for the Texas Instruments 99/4A Home Computer", boy do they like long names. The address is:

TENEX
P.O. BOX 6578
SOUTH BEND, IN

46660

FREE PROGRAM OFFERED (but what do it do?).....

Jim Lewis of Champaign IL, has said that he will send you and I a copy of his program, called "FORTH BACKUP" absolutely free (we just send him a formatted diskette, with a stamped/return addressed mailer. I think that if you are interested in FORTH, or even just a program to run Back-ups, you may be interested in this FREE offer. Jim's address is:

JIM LEWIS
1907 TROUT VALLEY RD.
CHAMPAIGN, IL

61821

FREE TUTORIAL (but who can read?).....

Karl Reed of Huntington Beach, CA offers a Xeroxed copy of a public domain Tutorial, the information is schetchy, but it looks like FORTH. If I were sending for it, I would send him about \$2. worth of postage, and THANK him for whatever it is. I like surprises, don't you? Karl's address is:

KARL REED
8522 WILME DR.
HUNTINGTON BEACH, CA

92666

ANOTHER FREE PROGRAM (but really exceptional).....

MAIL-CALL by Gary D. Watts, (used to sell for \$25.) is now entered as public domain software. The Mail List program allows users to create, maintain, and print mailing lists. Also, has a program to allow use of mailing list with TI-WRITER. Requires exbasic, and disk. Send a stamped/self addressed mailer, with your formatted diskette, to:

GARY D. WATTS
1739 BURNING TREE DR.
VIENNA, VA

22180

Please say THANKS!

LOCAL COMPANY OFFERS A BETTER PROGRAM.....

TRINITY SYSTEMS of Pittsburgh, offers what they call, "entertaining, educational, and Christian software for home computers". They offer what appears to be a very good States and Capitals game for the TI-99/4A, including individule, 2-player, and team play. David Batalla and Philip Van Sichel are the owners. You may inquire by phone or write:

TRINITY SYSTEMS
1022 GRANDVIEW AVE.
PITTSBURGH, PA

15237

(412) 366-5811

CLOCK/CALENDAR and A/D CONVERTER KIT (heeeee...).....

This card is for the PERIPHERAL EXPANSION BOX, and is supposed to have the above in it, and the cost was \$80. If you are interested, write:

NBP
5522 EAST HARRY ST.
WICHITA, KA

67218

(That's all I know)

NAVARONE HAS MOVED.....

Navarone Industries has moved from SONORA, CA, to:

NAVARONE INDUSTRIES
11836 JUDG COURT
SUITE 304B
DALLAS, TX

75243

(213) 437-1118

PARTS IS PARTS (but you gotta know where, and what).....

If you need any parts for your TI, and don't know where to find it, just call this number: (806) 762-7457. And if you would like the address of the DEALER PARTS DEPT. it is:

DEALER PARTS DEPT.
P.O. BOX 53
LUBBOCK, TX

79408

(It's not their fault)

SPEAKING OF PARTS.....

I have acquired six switcher power supplies (the ones that run cooler), at a very good price, and will make them available to club members for just \$1.70 for each power supply. I may have even more by meeting night (JANUARY 20). They all have the DC OUT connector directly on the board, rather than sidway down the dc cable to the CPU board.

MORE PARTS.....

I have in the past bought 6264LP-15 (16k static memory chips) for \$2.99, (+ shipping). The more of these chips I buy, the more I can devide the shipping costs on each chip. I would like to order more, and if there is anyone out there who would like to participate, let me know by the next meeting (JAN. 20). These chips will work in the GRAM KRACKER and the 32K Expansion that I'm doing for CLUB MEMBERS (also shown in this issue).

I would like to get involved in bulk purchasing of cassettes/diskette if you are interested, let me know what length cassette you are interested in if diskette, the type: SSSD, SSSB, DSSD, or DSSB. From this information, I should be able to determine where our options lay.

WHERE IS OUR LIBRARY.....

With the elections set for JANUARY 20, 1986 at the 5th meeting of the WEST PENN 99'ERS, at the MORNING YPCA, at 7:00 PM, for anyone who hasn't seen it yet, we will be selecting a LIBRARIAN, and that person will continue with the groups desires in this area. Thank you for being patient.

TI-WRITER GROUP STARTS.....

Stan Katzean has volunteered to start a TI-WRITER group in his home, at a time and date to be worked out between the first FIVE people who call him, and can co-ordinate their schedules with Stan's. The reason for the small number is so each person can have sufficient hands on experience. Stan by the way is a Professor at PITT (Greensburg campus). Stan's home phone is: (412) 837-8275.

BASIC BASICS

by Charles Strink

GOTO and GOSUB, the two messenger commands. At first glance they would seem to do the same action. but Lets take a closer look at each one.

It is hard to write even a simple program without using a GOTO command. The GOTO Command does just what it says, it tells the computer to GOTO a specific line in a basic program. You can use it to send the computer forward to a larger line number or backwards to repeat a smaller line number. Once you use a GOTO the computer will go to the line number specified and will continue to execute the program from that point on. Here is a short example:

```
10 Print "The endless loop"
20 GOTO 10
```

You may use the GOTO command as a counter as shown in this short program:

```
10 X=X+1
20 PRINT X
30 FOR DELAY=1 TO 100
40 NEXT DELAY
50 GOTO 10
```

The GOTO statement should never be used to transfer control into a subprogram.

That brings us to the next statement, the GOSUB.

Much like the GOTO statement, when you use GOSUB the computer goes back or forward to the line number you specified. Instead of just jumping to the requested line, the computer leaves a marker at the location of the GOSUB line. It then jumps to the line indicated in the GOSUB statement and begins executing the program at that point. Just like a GOTO statement, right? Up to this point yes, but here is the difference; While executing the GOSUB, the computer is looking for another special statement. That statement is RETURN. When this statement is encountered the computer looks for and returns to its previous marker and continues to execute the program with the next statement following the GOSUB statement. Here is an example:

```

5 CALL CLEAR
10 PRINT "PRESS ANY KEY TO
CONTINUE"
20 GOSUB 50
30 PRINT "PROGRAM CONTINUES ON
NEXT STATEMENT AFTER GOSUB"
40 END
50 CALL KEY(O,K,S)
60 IF S=0 THEN 50
70 RETURN

```

When should we use GOTO and GOSUB? As a rule of thumb, use GOTO when you wish to jump over some sections of a program. Use GOSUB when you want to perform the same action in different parts of a program.

Until Next time.....
Happy computing

STAR GUARD
 by Chuck Strink

Star Guard is an interactive program using both "text" and "graphics" in a very exciting space game. Chuck has put a lot into this program and for anyone who likes games and has extended basic, memory expansion, and a disk drive, you come to the meeting and see a demonstration of this game, and pick up your copy from Chuck, or call 412-668-2811. \$10.00

QUICK TRICK #1

by Ed Bittner

Here is a quick one for the newsletter! A four liner for extended basic users, it will "MERGE" easily with any basic program and can be used to catalog the disk while the user is writing a basic program, without loss of the program currently in memory.

Limitations- DO\$() may not be dimensioned in the main program.

```

22221 ! PROGRAM NAME - BITTNERCAT, IN MERGE FORMAT BITCATERG
22222 CALL SCREEN(10):: CALL CLEAR :: DISPLAY AT(12,1):"What Drive?(1,2,3,4)" ::
ACCEPT AT(12,27):DD
22223 OPEN #1:"DSK"ASTR$(DD)&" ".INPUT ,RELATIVE,INTERNAL :: FOR Z=1 TO 127 :: I
NPUT #1:DO$,A,J,K :: IF LEN(DO$)=0 THEN Z=128 ELSE IF Z<>1 THEN PRINT TAB(3);DO$
,J ELSE PRINT DO$;TAB(20);"USED";J-K;TAB(33);"#####FREE";K;"#####"
22224 NEXT Z
22225 DISPLAY AT(24,10):"PRESS ANY KEY" :: CALL KEY(O,K,S):: IF S=1 THEN END ELS
E 22225

```

Obviously, one of these lines can be deleted.
 See you at the meeting!

MICROpendium/December 1985

Plotting circles

The question was simple: How do you draw a circle in BASIC? According to the Cin-Day (Ohio) Users Group, you can do it on paper or use the following program to plot it using CALL HCHARs. While the program doesn't actually draw a "circle," it does calculate and draw the closest approximation based on X,Y and radius coordinates. And it runs in BASIC with nothing added.

RC equals the center row of the circle. CC equals the center column of the circle and "radius" equals the distance in blocks or tiles on the screen of the circumference from the row and column center of the circle. Thus, you would enter the following numbers when prompted: 10, 12, 16 for radius, RC and CC, respectively. Row 12 and column 16 are the approximate center of the screen.

```

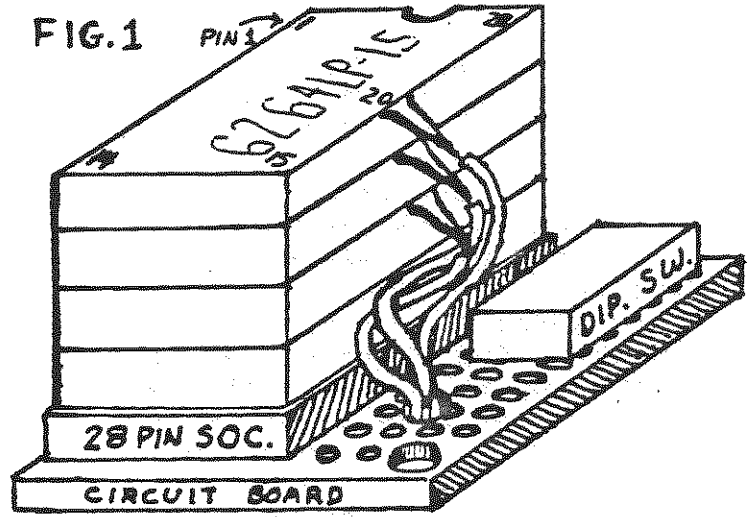
100 CALL CLEAR
110 INPUT "RADIUS,RC,CC? ":R
ADIUS,RC,CC
120 CALL HCHAR(1,1,32,704)
130 FOR X=-RADIUS TO RADIUS
STEP 1/RADIUS
140 R=X+RC
150 C=SQR(RADIUS^2-X^2)+CC
160 IF (R<1)+(R>24)THEN 220
170 IF (C<1)+(C>32)THEN 190
180 CALL HCHAR(R,C,42)
190 C=2*CC-C
200 IF (C<1)+(C>32)THEN 220
210 CALL HCHAR(R,C,42)
220 NEXT X
230 GOTO 110

```

32K MICRO EXPANSION

By JOHN F. WILLFORTH (from WESTRALIA)

Note: This is taken from an article printed in a Western Australian newsletter. I have condensed it's contents and altered it's physical layout, so that those with minimal electronics background can construct this marvelous device. GOOD LUCK!



The above figure is a very much enlarged drawing of the circuit card, with (4) 8k byte static ram chips in a single 28 pin low profile socket, and the optional 4 pole single throw DIP switch, used to disable selectively, any or all of the static rams in 8K blocks. If the switch is not used, the 4 wires coming from U504 on the CPU board, will go directly to the chips, with the one labeled as SW1 going to the socket pin #20, the one labeled SW2 going to the second chip up pin #20, the wire labeled SW3 to the third chip pin #20, and the wire labeled SW4 going to the top chip, pin #20. (pin #20 on chips 2,3,4 will be extended to isolate them electronically from the other pins numbered 20)

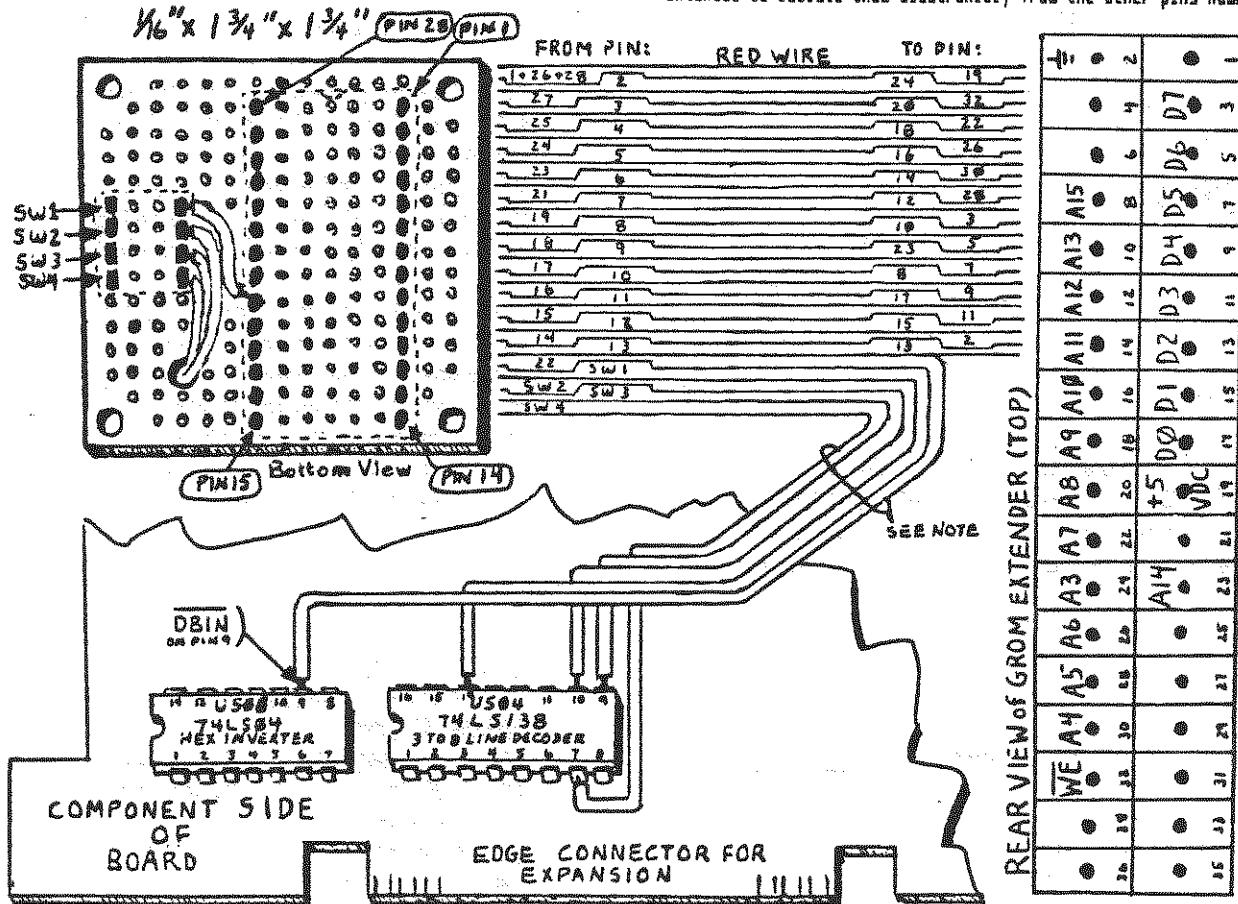


FIG. 2

On the next page you will receive enough information to build this 32K memory expansion that fits inside your console, and will not cost you in excess of \$15.00 in parts, and should take between 4 hours and forever (depending on how many thumbs you have). You will find a parts list to help, and hints, if you want to approach it in the same way that I have done it. There are many other ways to accomplish this expansion.

The drawing above is a pictorial representation, rather than a schematic. I believe that because of the simplicity of this circuit, that it is better to use a drawing of this nature, than to try to use, and explain a schematic. This will enable nearly ANYONE with moderate technical ability to build this circuit, and install it IN a console.

First please take note of the location of parts by using the above two drawings. The major component in the expansion is the circuit card. The card's bottom view (shown in upper left FIG.2), has copper lands (small donut shaped eyelets) around each hole. This will provide for better soldering of wires, and components to the board. The circuit card actually is 1/2 of a board which comes from RADIO SHACK, to be used as either a half, or a whole. How convenient, two for the price of one (see parts list). You may use the placement of components, as I did or you may choose not to use the switch pack, in which case all of the board that is not directly under the chip socket, may be clipped away easily using small side cutters. You will see later that if this course is chosen, that you can even mount the assembly directly behind the GROM connector, making a very tidy and secure module.

The use of ribbon cable was my choice here, but any multi-strand wire with a gauge no smaller than say 26 could be used. The connector shown in FIG.2 extreme right side, is the rear view of the GROM connector, with the black dot seen in the center of each rectangle, representing the 1/8" long pin extending through the verticle connector card, and to which you will be soldering your completed assembly.

Finally, the bottom left represents the component side of the TI-99/4(4A)'s CPU board, near the right side expansion connector. You will note that I have soldered the 4 chip select wires to the decoder chips pins directly. You could, if you really feel squeamish about this, get the schematics for the console, and trace these lines to a better location. It can't hurt to try, but I've done three consoles, and have not damaged one yet (Please read precautions). You will also note that the DATA BUS IN (DBIN), is also soldered to pin 9 on U508.

The 32k micro memory expansion functions exactly as the 32k MEMORY EXPANSION used by TI, and all the stand alone 32k's on the market. You will find no difference in operation. The micro expansions that I installed even operated well with a 32k card in my PEB at the same time. I do not have it in now, and by the way if any one is interested in a 32k card, I now have one for sale.

The best way to build this device is to acquire ALL the parts that you will need for the particular type of memory that you will build. After you have gathered the parts and proper tools, you must learn how to take your console apart. Work in a well lighted place, with room to work, no carpet underfoot, and wearing no polyester, nylon or wool clothing. (now that you are naked in the cold garage) Let me tell you that I broke ALL the rules, but I bought an extra 9 chips before I started, and since I do service computers as a profession, I am very much aware of the destruction that static can do, not only to the memory that you are attempting to build, but also to the poor console board, which you are about to relieve of it's only protections. So be very cautious. As for the carpet, Stay-Puff fabric softener, sprayed on the carpet will keep the static down for a week or two.

1) Place the console bottom up, with the keyboard toward your stomach. Remove the (7) Phillips head screws. If this is the black and silver console, you must now remove the ON/OFF switch knob, by simply pulling it toward you. Now lift the bottom cover up and set aside.

2) On the left, front side you will see a circuit card (approx. 4 1/4" x 4 1/4") which is the power supply, and can be removed by removing (2) Phillips head screws on it's right side. Lift the card noting: the AC (18vac) cable coming to it from the rear of the console, the DC cable (carrying DC voltages to the CPU board) and noting that there are basically two kinds of cables, one that connects via a (4) pin Molex connector directly to the power supply board, and the other that has a mid-line connector which is keyed for reassembly. Be sure that in the first case you squeeze the locking latch on the connector to remove the cable (so as not to damage the connector. Set the power supply aside.

3) Remove the (3) Philips head screws, (2) around the outer perimeter of the console board, and (1) to the rear of the board, but seen down in a recessed area of the board through a hole about an inch from the rear edge. DO NOT REMOVE any screws with nuts on the other side at this point! Now remove the (4) screws that hold the keyboard in place, 2 at either end. Lift the console board up carefully, until it is high enough to disconnect the cable to the keyboard, and do so. Now place the top cover with the keyboard still lying in it aside.

4) Turn over the shielded console board to expose the GROM connector. Lift the GROM Connector Assy. out of it's slot and examine it as you carefully note FIG.2. Before we forget, remove and discard the Snap-on connector cover with the felt wiper assy.. This is the device that causes most of those system freezes under extended Basic that have plagued you. Clean the inside of the connector with alcohol on a piece of clean cloth stretched on a piece of thick paper inserted into the connector.

5) Construct the module as viewed in FIG.'s 1/2. I would first assemble the circuit board, locating the chip socket and DIP sw if selected) to the circuit board, soldering all component legs lightly. Then being very careful gauge the lengths of the various cable wires so that as you start to solder them to the memory circuit board, the leads will be compact (neat). Since the Radio Shack ribbon cable is only 25 wire, you will have to use two lengths. I would use the full width (25 wires) for the top 24 wires (those that go to the GROM connector), and cutting the other length to 5 wires by slicing lengthwise 5 wires from the rest using an EXACTO-KNIFE, or some other sharp instrument. These will be the 5 wires that will go to the two chips on the CPU board. You may find that if you strip about 3/16" of insulation off each lead and twist the bare lead ends, and then lightly solder these ends that later final soldering to the circuit board, the GROM connector, and the two chips on the CPU board, will be much easier. I can not get into step-by-step instructions on what wire to put where. The drawings are correct and the completed device will function if the physical assembly is correctly done.

NOTE: In FIG.2 the note reference is that you may find it wise to put the optional connector (parts in list), to make it easier to remove this module in case problems do occur for you. You will not have to remove the shields from the CPU board and unsolder the (5) wires. Repeated soldering and resoldering could cause chip failure.

6) After the above assembly is constructed and the 24 wires are attached to the GROM connector (soldered to the pins shown as black dots in FIG.2), and the (5) wires that will go to the CPU board have been prepared, now we must expose the CPU board for what it really is. Get the Shielded CPU, and remove the (3) philips headed screws with nuts on the other end. take careful note which direction these screws go through the board, mark them if you have to. Now, lift off the shield that had the GROM connector go through it. Locate the edge connector where the expansion devices connect to the TI. You will see these two chips (see FIG.2), that must have the lines for chip select, and DBIN connected to them. Put a little solder on the wire end and carefully heat the wire (with solder already on it) as you press the wire against the leg of the chip. Repeat for all (5) wires.

NOTE: In FIG.2 the note in lower left of CPU card, draws you attention to an ideal area to notch the upper shield to allow the cable an exit to the outside of the shield. The notch need only be slightly wider than the (5) wires and 1/16" high. Carefully wrap electrical tape around the wire where it will pass through this opening.

7) Install the shield, put the GROM connector back into the top of the CPU board, lay the board on a non-electrically conductive surface, such as card board.

Now is the time to remove the (4) memory chips from their protective sleeve. Carefully take each chip and gripping each end of the plastic housing of the chip, press the chip down against the non-conductive material, in such a manner as to bring the two rows of legs toward each other in a more parallel fashion. The purpose is to enable the piggy-backing or stacking these chips, with this action causing tension to be exerted by the legs of the higher chip on the legs of the lower chip (except pin #20). Pin #20 must be bent out about 30 degrees on the 2nd, 3rd, and 4th (top) chip for the connection of their respective Chip Select leads . Note: See instructions below FIG.1. Now with the four chips prepared, push one with pin #20 bent out on the only chip with pin #20 not bent out. Now carefully solder the four corner pin connections between these two chips, and then add the 3rd chip above the second, repeating above procedure until the fourth chip is like wise in place. Now at your discretion, solder all the pins that contact ANOTHER pin very lightly. Insert this assembly into the 28-pin ram socket with pin #1 located properly. Then solder the three chip select lines , one to each pin #20. (If you get these mixed up, the only thing that will happen, will be that you will find it very difficult troubleshooting to the correct chip, it will be difficult enough since you have just soldered all the chips together.) Put some wide protective tape in a large area, several layers thick, not covering any vent holes, where the memory module will rest chips up, about 2 1/2" to the left of GROM connector. This is to insulate the electronics temporarily from the chassis for testing.

Attach your power supply out to the right, attach your keyboard, attach your T.V./monitor, and apply power. If you get the Title Screen, you probably are safe in going on. Now power down, and insert your Xbasic, E/A, Mini-Mem, modules. With these, you can peek and load into an address on each of the BK blocks. With Xbasic try a CALL INIT and a SIZE. you should see an additional 24k of memory available to you.

Lower 8k memory.....>2000 to >3FFF.....bottom chip
1st 8k in high memory....>8000 to >BFFF.....2nd from bottom chip
2nd 8k in high memory....>C000 to >DFFF.....3rd from bottom chip
3rd 8k in high memory....>E000 to >FFFF.....top chip

If you are successful, then go on to the next step, if not go back and check all of the previous steps. If you have an ohm meter check continuity, also if you have a DC volt meter, check between pins 2 and 19 on the back of the GROM connector for +5. 7) The Grom connector extends up through a plastic guide and support assembly in the top cover of the Console. Remove the (2) screws holding it in place, and remove it, now lower this assembly down over the GROM connector just as it would be if it were still in an installed cover. Place the assembled Memory unit to the left of the GROM connector, with the leads going to the back of the GROM connector pulled to the left and toward the back of the connector as much as possible. Now mark this plastic with a knife where some relief will be needed, and relieve it. (Of course this is to be done with power off.) 7) If you are successful to this point, you are really flying. These chips give almost no heat! At this point you could use double sided tape and put it under the memory circuit board, or you can think up your own method of attachment.

8) Re-assemble. (Do I leave you out on a limb or not)

PARTS:

DESCRIPTION:	Radio Shack PRT#	PRICE
1-Miniature 4-pos. DIP switch	275-1304A	1.29
1-5 feet 25 conductor Ribbon Cable	278-772	3.59
1-Molded Nylon Connector 6-conductor Male	274-226	1.39
1-Molded Nylon Connector 6-conductor Female	274-236	1.39
1-Dual Component Per/board	276-148	.99
1-Low Profile IC socket (28 pin dual-in-line)	276-1997	.89
4-6264LP-15 (8K STATIC RAMS)	see below	...

Electrical tape, solder (resin core), and tools

If you cannot find the Static RAMs locally contact me, I'll help you get them. Call John Willforth (412)527-6656. Good Luck!!

Tone dialer

Members of the 99/4A Owner/Users Group of Wonder Lake, Illinois, have learned how to use the sound capabilities of their computers to dial the phone. Listed below are the ten tones required by a standard "tone phone." The Wonder Lake group says that if you place the telephone mouthpiece near the speaker of your monitor or television and use their program, you can let your computer do the dialing. You'll need to add your own input lines, but this will get you started.

- 1—CALL SOUND (100,1209,0,697,0)
- 2—CALL SOUND (100,1336,0,697,0)
- 3—CALL SOUND (100,1447,0,697,0)
- 4—CALL SOUND (100,1209,0,770,0)
- 5—CALL SOUND (100,1336,0,770,0)
- 6—CALL SOUND (100,1447,0,770,0)
- 7—CALL SOUND (100,1209,0,852,0)
- 8—CALL SOUND (100,1336,0,852,0)
- 9—CALL SOUND (100,1447,0,852,0)
- 0—CALL SOUND (100,1336,0,941,0)

Screen colors

The following program allows users to change screen and border colors by inputting the respective color codes.

```

100 !+++++!
110 ! "XB SCREEN COLOR" !
120 !By Larry Bantley with!
130 !modifications by John!
140 !Behnke Will change !
150 !your screen display !
160 !to your choice while !
170 !in command mode. !
180 !Requires 32K Memory !
190 !+++++!
200 CALL CLEAR
210 INPUT "Border Color (1-16)? ":A
220 INPUT "Screen Color (1-16)? ":B
230 CALL CLEAR
240 C=(B-1)+(A-1)
250 CALL INIT :: CALL LOAD(9984,C,C,C,C,C,C,C,C,2,0,7,15+A,4,32,32)
260 CALL LOAD(9999,48,2,0,8,0,2,1,39,0,2,2,0,8,4,32,32,34,2,0,8,8,4)
270 CALL LOAD(10021,32,32,36,2,0,8,16,4,32,32,36,2,0,8,24,4,32,32,36,4,91)
280 CALL LOAD(-31804,39,8):: CALL LOAD(-31952,255,231,255,231)
  
```

Insanity

The following program may drive you crazy, but you'll probably give up for endangering your sanity. It requires Extended BASIC and a joystick. It has appeared in a number of newsletters, including the Southern California Computer Group newsletter, The Computer Voice.

The object is very simple: try to vertically align four colored blocks. Sounds simple, doesn't it? It ain't.

Here's the program:

```

1 REM *****
2 REM *INSANITY BY G. MINEO*
3 REM *
4 REM *WESTMEGO, LA
5 REM *
6 REM *
7 REM *****
8 CALL CLEAR
9 DISPLAY AT(12,1):"INSANITY"
10 DISPLAY AT(15,1):"LIKE THE NAME SAYS, USE YOUR"
11 DISPLAY AT(17,1):"JOY STOCKS TO PUT 'EM LIKE"
12 DISPLAY AT(19,1):"YOU FOUND 'EM. GOOD LUCK!"
13 DISPLAY AT(23,1):"PRESS ANY KEY TO BEGIN"
14 CALL KEY(0,K,S):: IF S=0 THEN 13
  
```

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```

15 CALL CHAR(42,"FFFFFFFFFFFF")
16 CALL MAGNIFY(2)
17 CALL CLEAR
18 DISPLAY AT(1,12):"INSANITY"
19 CALL SPRITE(#1,42,5,96,128)
20 CALL SPRITE(#2,42,9,112,128)
21 CALL SPRITE(#3,42,11,80,128)
22 CALL SPRITE(#4,42,16,128,128)
23 CALL JOYST(1,Y,X)
24 CALL MOTION(#2,-20*X,20*Y)
25 CALL MOTION(#1,-20*X,20*Y)
26 CALL MOTION(#3,-20*X,20*Y)
27 CALL MOTION(#4,-20*X,20*Y)
28 GOTO 23
29 REM IT CAN BE DONE!
30 REM REPRINTED FROM SAN FRANCISCO 99ERS NEWSLETTER
  
```

MAIL TO: PUG SAPPHIRE SOFTWARE
 % DARREN LEONARD
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 PITTSBURGH, PA 15227

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