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December 1989 THE HUGgers NEWLETTER Volume 8, Number 10

NEWS & SUCH

Items of interest for this month's column are in short supply, so.... this will be a short column. To start off with, we recently recieved the latest "disk newsletter", NEWS #8, from the Central Westchester 99'ers Club. Among the contents were the archived text files for the technical manual for the Peripheral Expansion Box. This and another article concerning a newer 9900 family CPU chip - the TMS99105, manufactured by Texas Instruments, may be of interest to those that are techinacally oriented. The NEWS #8 disk is available in the club library. Also, one of this month's articles goes into more detail about the RAMBO (Ramdom-Access-Memory-Bank-Operator) directly addressable memory modification for Horizon type ramdisks that was mentioned in this column last month. Finally, Dan Eicher has volunteered to start an ASSEMBLY LANGUAGE Special Interest Group. So if you have been interested in trying to learn about assembly language try to attend the next meeting or at least let Dan know of your interest.

B.C.P.

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VICE-PRES.....	CARL CLARK	1-398-6226
LIBRARIAN..	BRYANT PEDIGO	255-7381
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2839 S. McCLURE
INDIANAPOLIS,IN
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2:00 PM
DECEMBER 17 1989

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*    SECOND-----THURSDAY         *
*     AFTER THE MEETING          *
*          MONTHLY               *
*       CALL 888-5654            *
*        FOR LOCATION            *
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"          782-994A              "
"                                "
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EXTENDED BASIC GROM/ROM PARTS..... THIS INFO IS RIGHT OFF THE INVOICE I RECEIVED WITH THE PARTS FROM TI DEALER PARTS:

PART-NUMBER	DESCRIPTION	QUANTITY	UNIT-PRICE
1015960-1113	GROM,EXT.BASIC	1	3.60
1015960-1114	GROM,EXT.BASIC	1	3.60
1015960-1122	GROM,EXT.BASIC	1	3.60
1015960-3115	GROM,EXT.BASIC	1	3.60
1041016-0006	ROM,EXT.BASIC	1	6.80
1501392-1025	ROM,EXT.BASIC	1	4.60
TOTAL FOR PARTS AVAILABLE ONLY FROM T.I.----------			25.80
ADDITIONAL CHIPS NEEDED 74LS00 AND 74LS74 TO BUILD XBASIC			
1015960-1204	EDITOR ASSEMBLER	1	3.60

NO ADDITIONAL CHIPS NEEDED FOR EDITO ASSEMBLER
T.I. WILL NOW TAKE CHARGE CARDS, AND CHARGE LOCAL SALES TAX PLUS 3.00 FOR S/H.

I'M INCLUDING THIS UPDATED INFORMATION FOR THOSE WHO WANT TO BUILD XBASIC AND EDITOR ASSEMBLER ON THE NEW ZENO BOARD WITHOUT THE DESTRUCTION OF A CARTRIDGE. IT TAKES ABOUT 2-WEEKS TO RECEIVE THE PARTS. YOU MUST CALL DEALER PARTS AT: 806 741-2265 AND ASK FOR JOE SANCHEZ.
I SOCKETED AN XBASIC CART. AND USED IT TO TEST ALL THE NEW CHIPS I RECEIVED.

INTERNAL BOARD
(ZENO BOARD)

THE INTENT HERE IS TO HELP THOSE OF YOU IN THE WEST PENN 99'ERS AS WELL AS ANY IN THE USER GROUP COMMUNITY TO GET STARTED IN THE CONSTRUCTION AND INSTALLATION OF THE BOARD. I WILL TRY TO ADDRESS SOME OF THE PITFALLS AND GIVE SOME HINTS THAT MAY BE HELPFUL. I HOPE THAT YOU REALIZE THAT EVEN THOUGH ERIC ZENO HAS HAD THIS BOARD IN DESIGN FOR ABOUT A YEAR NOW, HE LIKE MOST OF US, IS DOING THIS FOR YOUR BENIFIT, AND WILL NOT QUIT OUR JOBS TO MAKE A LIVING ON TI USERS.

FIRST, THE BOARD DOES HAVE ONE ERROR IN THE TRACE LAYOUT, AND THAT IS THE DATA BUS ON THE CLOCK CHIP U12. MOST OF YOU WILL NEVER USE THIS CIRCUIT, AND THOSE OF YOU THAT DO, SHOULD BE ABLE TO INSTALL THE SIMPLE INVERSION OF THE EIGHT DATA LINES. I.E.: REVERSE THE PINS 15 THROUGH 22 UNDER THAT CHIP. I FEEL THAT THIS SHOULD STOP NO ONE FROM BUYING AND USING THE BOARD.

SECONDLY, THE TRACES ARE SMALL AND TIGHT IN AREAS THAT WILL GIVE A NOVICE FITS. DON'T BUILD IT YOURSELF IF IT LOOKS TO TIGHT FOR YOU AND YOUR EQUIPMENT.

THIRDLY, THE INITIAL INSTRUCTIONS ARE BRIEF, AND INADEQUATE FOR MOST OF YOU, THAT IS WHY I'M INCLUDING THESE TWO PAGES IN THE NEWSLETTER. YOU NEED HELP NOW! I HAVE BUILT TWO AND SINCE I DID THEM WITHOUT INSTRUCTIONS, I FEEL THAT YOU SHOULD DO MUCH BETTER WITH A LITTLE HELP.

DECIDE WHAT PORTION YOU WISH TO BUILD FIRST. ATTEMPT AND GET ONE CIRCUIT WORKING AT A TIME. DO NOT FULLY SOCKET THE ENTIRE BOARD. SOCKET ONLY THE CIRCUIT YOU WILL NEED FIRST, SUCH AS THE 32K CIRCUIT. MAKE UP THE HARNESS FROM P2 TO THE CPU BOARD, SOLDER THE BOARD TO THE GROM CONNECTOR (SEE PAGE 6), AND BEFORE YOU PLUG IN P2 POWER UP THE CPU. IF ALL SEEMS WELL, THEN PLUG IN P2, THEN PLUG IN THE 32K MEMORY CHIP (FOR EXAMPLE). IF ALL IS STILL WELL, THEN RUN A MEMORY TEST BY LOADING A PROGRAM THAT USES EXPANSION MEMORY OR BY RUNNING A MEMORY DIAGNOSTIC. IF A STEP FAILS, DON'T GO ON , BUT GO BACK AND CHECK FOR A SHORT OR CHECK TO SEE IF P2 HARNESS IS WIRED CORRECTLY.

HERE IS ANOTHER AREA OF CONFUSION. THE P2 CHART ON P. 7 OF ERIC'S INSTRUCTIONS DOESN'T ADHERE TO THE PIN PROTOCOL FOR THE CONNECTOR, THEREFORE USE THE CHART AT THE RIGHT, AND ON THE ASSEMBLY DRAWING ON P. 9 OF INSTRUCTIONS CHANGE THE PIN NUMBERING SCHEME TO THAT SHOWN AT THE RIGHT ALSO. THIS WILL PROVIDE YOU WITH A MEANS TO ASSEMBLE A 16-WIRE HARNESS WITH A 16-PIN RIBBON CABLE CONNECTOR TO MATE WITH A 16-PIN DOUBLE ROW HEADER AND HAVE EVERYTHING COME OUT SO THAT THE WIRES ARE IN ORDER AND EASY TO COUNT AND MATCH CONVENTION.

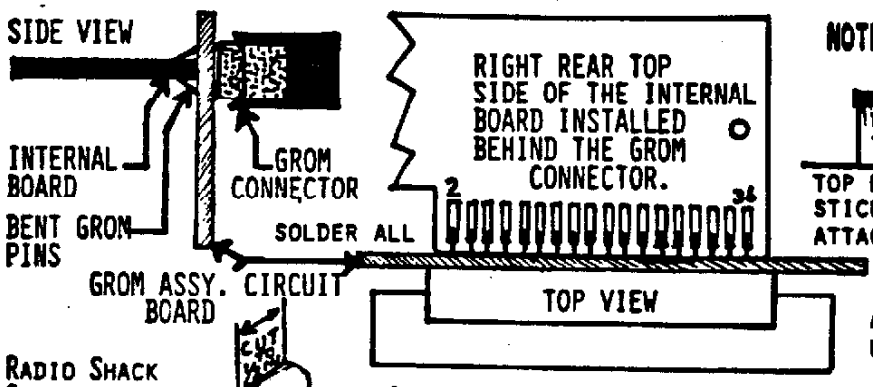
THE SPEECH SYNTHESIZER SCHEMATIC HAS SEVERAL ERRORS INCLUDING CR1 IS SHOWN BACKWARDS, THE ANODE SHOULD GO TO GROUND, AUD P2-8 SHOULD READ P2-10 (UNTIL YOU MAKE CORRECTIONS TO P2 CONN. CHART) AND RDY P2-9 SHOULD READ P2-4 AGAIN UNTIL YOU CHANGE THE P2 CONN. CHART. CR1 AND C2 MUST BE INSTALLED WITH CORRECT POLARITY OBSERVED SO TO HELP, PUT A PLUS SIGN TO LEFT OF C2 ON ASSEMBLY DRWG. AND ALL ⊣ REPRESENT THE CATHODE SIDE OF DIODES HERE.

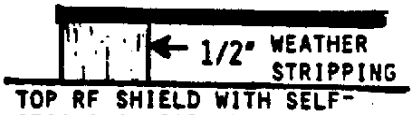
P2 CONNECTOR
(CORRECTED VERSION)

P2	TERM	USE	CPU CONN.
1	0407	32K	U504 P. 7
2	00	CK/CA	U504 P. 3
3	RDY	SPCH	U506 P. 3
4	01	CK/CA	U504 P. 2
5	SBE	SPCH	U506 P. 8
6	02	CK/CA	U504 P. 1
7	RST	SPCH	U508 P. 6
8	SPARE		
9	AUD	SPCH	R510 RIGHT
10	MEMEN-	CK/CA	U504 P. 4
11	SPARE		
12	0414	32K	U504 P.14
13	SPARE		
14	0410	32K	U504 P.10
15	SPARE		
16	0409	32K	U504 P. 9

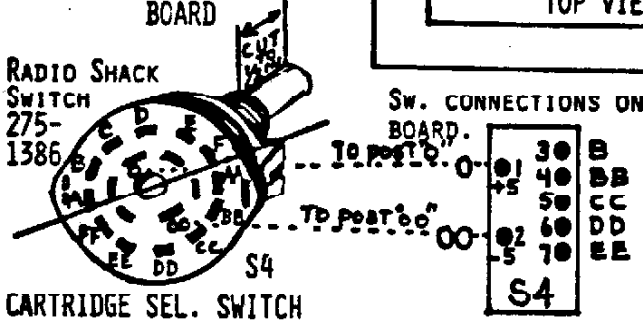
(Reprint from WEST PENN 99'ers Newsletter, Nov., 1989)

NOTES ON THE INTERNAL BOARD (ZENO BOARD) BY JFW



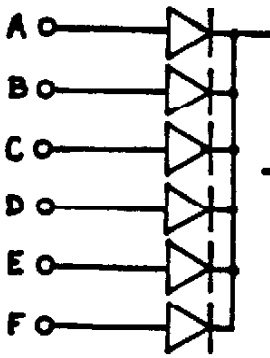


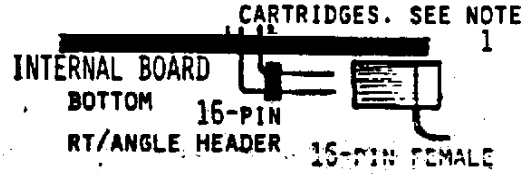
TOP RF SHIELD WITH SELF-STICKING WEATHER STRIPPING ATTACHED. BOARD RESTS ON THIS.

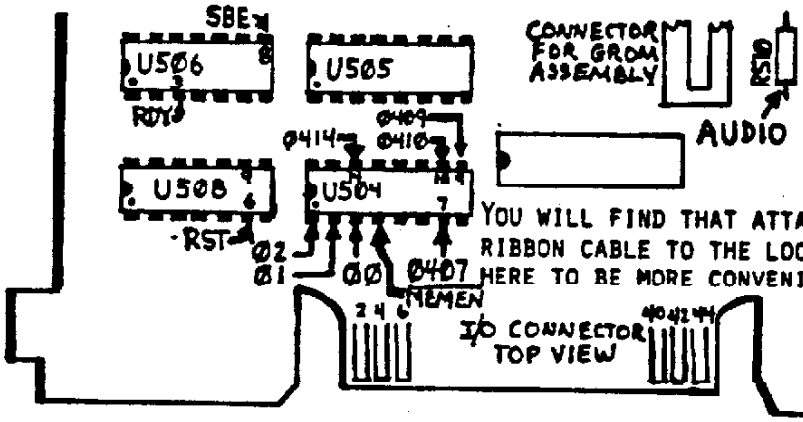


THE SWITCH S4, THE SWITCH CONNECTIONS AND THE LED DRAWING ON THE RIGHT CAN ALL BE USED TO SELECT AND DESELECT AS WELL AS INDICATE WHICH OF THE CARTRIDGES OR GROM PORT IS IN USE AT ANY ONE INSTANT. CONNECT WIRES FROM THE POSTS ON S4 INDICATED BY LETTERS A-F AND BB-FF. SEE NOTE ON HOW TO ADD A FOURTH GROM CARTRIDGE WHICH WILL USE FF ON S4. JUST TRUST ME THIS WORKS! EXAMPLE: ATTACH A WIRE ON POST B OF S4 AND THE SAME WIRE TO B ON INTERNAL BD. S4 LOCATION 3 (B) AND ALSO TO LED AT TERMINAL B. ATTACH A WIRE FROM BB ON S4 TO BB ON INTERNAL BD. S4 LOCATION 4 (B). THIS WILL MAKE THE SECOND POSITION ON THE ROTARY SWITCH S4 ACTIVATE XBASIC AND LIGHT THE SECOND LED. THE FIRST LED WILL BE USED TO LET YOU KNOW THAT NONE OF THE INTERNAL CARTRIDGES ARE ENABLED SO THAT A CARTRIDGE CAN BE INSERTED IN THE GROM PORT.

THE SIX LEDS BELOW ARE AN EXAMPLE OF LED INDICATOR USAGE TO INDICATE THE ONE INTERNAL CARTRIDGE SELECTED WHEATHER IT IS THE XBASIC, OR ANY GROM. YOU WILL NOTE THAT THE INTERNAL BOARD HAS ONLY 3 ADDITIONAL GROM SOCKETS BUT I HAVE 6 SHOWN. THE ONE ON "A" POSITION SHOWS ALL INTERNAL ARE DISABLED. THE OTHER 5 ARE XB AND 4 GROM CARTRIDGES. SEE NOTE 1







ROUTING THE RIBBON CABLE FROM CPU TO P2 CONN. CAN BE DONE BY CUTTING A 1/4" SLOT FROM FRONT EDGE OF TOP RF SHIELD OVER THE U506 AND U505 CHIPS. TAPE THE ROUGH EDGES TO PREVENT CUTTING THE RIBBON CABLE.

YOU WILL FIND THAT ATTACHING THE 12 WIRES USED FROM P2 RIBBON CABLE TO THE LOCATIONS ON THE CPU BOARD LISTED HERE TO BE MORE CONVENIENT AND MUCH SAFER.

I HOPE THAT THESE DRAWINGS AND NOTES WILL AID ALL THOSE WHO PURCHASED AN INTERNAL BOARD TO CONSTRUCT IT AND ENJOY IT SOONER WITHOUT MUCH TROUBLE. BELOW ARE NOTES:

NOTE 1. TO ADD A 4TH GROM PIGGY-BACK IT (UP TO TWO HIGH) ON ANOTHER GROM PIN FOR PIN EXCEPT PIN 14. ATTACH A WIRE FROM PIN 14 OF THE 4TH GROM TO POST FF ON S4.

NOTE 2. DO NOT INSTALL LEDS WITHOUT A 200 OHM RESISTOR IN SERIES.

NOTE 3. THE SPEECH SYNTHESIZER HAS TWO ERRORS. BELOW U1 AUD P2-8 SHOULD BE P2-10 AND BELOW U2 RDY P2-9 SHOULD BE P2-4. (ERROR ON SCHEMATIC)

NOTE 4. MORE LATER

JOHN F. WILLFORTH 10-27-89

(Reprint from ONLINE TODAY)

TI-99/4A Lives On!

An Orphan Survives with Help of Loyal Users, Vendors

by Joel Dreyfuss

One nightmare haunts the consciousness of computer users who skate on the cutting edge of technology: to wake up one morning and discover that the manufacturer has stopped making their beloved machine. Such abandonment may be inevitable in the fast-changing world of computers, but it doesn't soften the blow. Those who cut their teeth on CP/M-based Osbornes and Kaypros were soon cast adrift in the surging tide of MS/DOS. In turn, quite a few owners of Eagles, Victors and Columbia personal computers found themselves abandoned when those companies went bankrupt.

The most famous—and most widely used—orphan computer of all may be the Texas Instruments TI-99/4A, launched 10 years ago as the chip maker's entry into the fledgling market for personal computers. With comedian Bill Cosby as spokesman, Texas Instruments made some 3 million of the little slab-like machines during a four-year period before getting caught up in a price-cutting war it couldn't win.

In December 1983, TI announced it would stop making the TI-99/4A. For thousands of users, the nightmare had come true: They were out in the cold.

But the 99 lives! There's no better proof than the Texas Instruments Forum (GO TIFORUM), where "99" diehards share information about equipment, software and technical problems, and track user group meetings in the United States, Canada, Europe and Australia.

Since abandonment made the 99 by necessity a hacker's machine, it isn't surprising that programming languages dominate the forum's libraries: Forth, C, Assembly, BASIC, Pascal and P-system. But there also are games, utilities and music programs. The TI Forum bristles with advice for the beginner who has just dusted off an old 99, but it also will guide the expert through a complex programming problem.

No doubt, the large number of machines produced by TI created a user base large enough to assure the computer's survival and guarantee profits to the companies who service 99 users. So does the 99's sturdiness. Texas Instruments was a military contractor and the 99 was built to meet military specifications. "It could probably take two hits of a .50-caliber machine gun and survive," says Jim Horn, a Rockville, Md., resident who administers the forum. Horn, who is retired from the military, is one of many users who first came across the 99 in a PX and fell in love with it.

The 99 was more than tough. It was an advanced machine for 1979: a 16-bit computer when Apple IIs and CP/M machines used 8-bit chips and long before the PC was a gleam in IBM's eye. Initially it was a modest machine with 16K RAM, 72K of ROM, a built-in operating system and a cartridge slot, but TI soon introduced an expansion box that gave the 99 a future. The box had eight slots and the capacity to control disk drives. Horn estimates that 80 expansion cards are now available and that users hook up everything from external hard disks to laser printers.

Jonathan Clark

Dispenses expert TI advice: *Beebe*

Unlike the fate of most orphan computers, a number of companies still actively support the 99: Myarc, a New Jersey manufacturer, makes the Geneve card, which gives the 99 an 80-column display, extended memory and advanced graphics. Asguard, a Maryland software distributor, has introduced 25 software products for the 99; Triton, a distributor owned by software giant Ashton-Tate, carries products for the 99, including a version of Microsoft's Multiplan spreadsheet that sells for $18. Even TI, the original maker, provides some support. According to users, the company will repair the interface box that connects the 99 to a television set.

Another reason for the 99's resilience is the constantly evolving base of new young users who turn up those strange little slabs. "We call them third-generation users," says Horn. "But the first and second generations never opened the box." To a beginning computerphile, the 99's first attraction is price; a shrink-wrapped 99 console sells for $75; you can pick up a used 99 for about $25 at a computer fair, and as little as $5 at a yard sale.

Matt Beebe is one of those "third generation" users, a 15-year-old who often dispenses expert advice on the forum. Beebe, who lives in Millford, Mich., 50 miles northwest of Detroit, got his "4A" in 1980 when he was just seven. He started with games and simple programming and expanded his machine for word processing when he reached junior high school. He later added a modem and a CompuServe subscription.

Beebe, who helps out on the TI Forum, estimates that he spends 20 hours a week online writing messages and answering questions. His age has never been an issue: "On CompuServe nobody ever thinks to ask how old you are," he says.

Beebe, who takes computer classes in high school, had a big decision to make last year: Should he switch to an IBM PC? He evaluated the costs and decided to stick with the 99. "The IBM would have cost twice as much and not given me much more except—maybe—a better word processor," he concluded. He added a Geneve card and color monitor (512 by 640 resolution) and is working on some software he hopes to sell commercially. He does offer a backhanded compliment to the IBM PC he uses at school. "It's really nice," he says. "You can do just about anything you can do on the 99/4A."

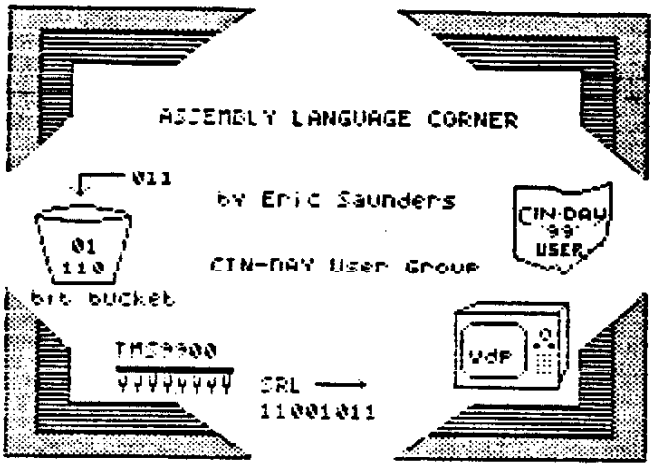
His loyalty is typical of 99ers. They scrounge the junkyards for machines, travel hundreds of miles to user group meetings and fiercely defend their aging machines against the adoration of the newer and better that dominates the world of computers.

Horn has his own pet project. He wants to rescue the thousands of 99s gathering dust in closets and basements and get them into the hands of the many children who don't own their own computers. One teacher who obtained a number of 99s reported important gains when she allowed students to take their computers home, something she couldn't do with more expensive machines.

Horn tries to explain that fierce cult like allegiance of 99ers. "We've been out on the limb since December 1983," he says. "We're a community. It's wonderful to enjoy the freedom that being an orphan gives you. Nobody's going to rescue you." For those loyal 99ers, the TI Forum on CompuServe is the lifeline to a world of support.

Joel Dreyfuss, who covers the computer industry for Fortune, *has a Kaypro II in his closet.*

CIN-DAY July 1989



ALC #3: HOW TO ASSEMBLE

Wake up! After I put everyone to sleep with the last article it's time to get intoa more interestin topic. we are actually going to create, assemble, and run our very first AL program! I know, you're nervous, maybe a little bit scared, but not to worry, this is a very easy program. Here's the AL code:

```
      DEF  GO
GO    BLWP @0000    Goto address >0000
      END
```

That's it! Now you're asking yourself what these three lines of coce could possibly do. I purposely picked this little routine to examine all the elements required in an AL program.

First thing in an AL program is the DEFinition statement. This just lets the computer know where your Program will start once it's loaded into memory. Think of it as telling the computer, 'Hey, I what you to start my program with the line labeled GO.' All AL programs need at least one DEF statement to work properly.

The next line of the code is the meat of the an AL program and has four (4) parts. The first part is the LABEL. You can think of the label as the equivalent of a BASIC/XB line number, except we only need it occasionally, not every line. It's just a reference point so the AL equivalent of a GOTO/GOSUB can find the proper statement. The second part of the line is known as the OP-CODE. An op-code is an AL command that tells the computer what to do. BLWP means Branch and Load Workspace Pointer, which is just a fancy GOTO command. (Actually, it's a pretty powerful command, but we'll get to that later...) The third part is the OPERAND; this is the receiver of the action or op-code. In this case, we are telling the computer to branch (BLWP) and we're telling it to go to the program located at >0000 in memory. (Remember, '>' means a hex or base 16 number.) Finally, the rest of the line is a comment field which is used to explain what is happening. So, to summarize, an AL line of code has the following structure:

label op-code operand comment

Notice there is at least one space between each part of the command.

The last line of code is known as an assembler directive, because it is not actually a part of your program code. The END statement just tells the assembler that this is the end of the source file and to stop assembling.

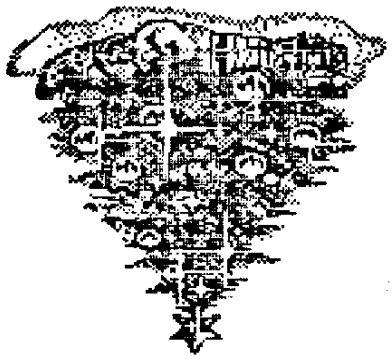
Since we have a program we can now create a source file, which is an AL program file. You can use any sort of editor that does NOT write funny symbols to the data file. This would be, for example, the editor that came with the Editor/Assembler cartridge, the Funnelweb editor on the E/A screen (the E/A screen has the Editor listed first and Assmbler listed second; if you see formatter, just press the space bar to get to the E/A menu), and perhaps the newest E/A editor on the market, PrEditor from Asgard (I'll be talking more about this later). After you save the file, (let's call it PROG1/S) you want to create an object file, or the file that tells our computer what we want it to do. We create an object file using an assembler. In the Funnelweb environment, you would press the number 2 to select the assembler. Once the screen comes up, you type in your program name, PROG1/S, and press ENTER. Notice that when the FW assembler askes for your object file name, it prompts you with your original file name with the last two characters removed. This is helpful since most AL programmers tend to name their source files as with a /S and their object files with a /O for clarity. This is a very good practice. Type O and press ENTER again. The next line asks if you want to print a listing of your program; just press ENTER for now, we will return to this step later. Finally, you will see the prompt OPTIONS ? - again press ENTER, we will cover the options later.

The assembler will convert your source code, the file made up of more-or-less English looking commands, into an object code, those series of 1's and 0's that are really the only thing the computer understands.

Now let's run the program you just created. At the E/A menu, press 3 for the LOADERS. At the PROGRAM LOAD ENVIRONMENT menu, press 4 for LOAD/RUN (EA). You will see DSK1., with the cursor one the 1. type 1.PROG1/O to load your program. Again, the DSK1. prompt comes up but this time we just press ENTER. The next screen is called the DEF TABLE CONTENTS and we see our label GO here with the cursor underneath it. Press FCTN-6 to PROCEED. We just told the computer to run our GO program.

What happen? Well if everything worked right you should see the main TI title screen. Our program branched to memory location >0000, which is the start of the reset routine in the TI. You should now rename your program RESET/S and either re-assemble it or rename the object file RESET/O. We will use these programs later.

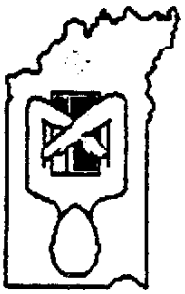
Now your a true assembly language programmer. Congratulations! Enjoy yor summer and see you here next month.



TIME DATED
December 17 1989
MATERIAL

Dan H. Eichler
4410 Cardinal Drive
Indianapolis, IN 46237

490/10



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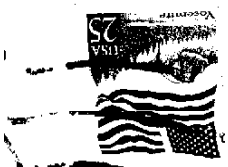

APPLICATION FOR MEMBERSHIP

Below you will find an application for membership to the Hoosier Users Group. Active membership entitles you to the Newsletter, up and download on the HUGbbs, attendance and voting rights at regular club meetings, access to the HUGger Library of Programs, special club activities and special guest speakers for one year. Subscribing members will receive the **NEWSLETTER** only.

Make check or money order payable to **Hoosier Users Group.** Send completed application to:

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Indianapolis, IN 46206-2222

(Cut on dotted line)

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Phone: (_____) _____-_____

Interests/Comments: _____

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