

The Paper Peripheral

November 1985

Putting you Online with the Central Texas 99/4A Users Group

From the President's Soapbox...
...er, I mean Keyboard.

Well it is now two years after "Black Friday", and once again I feel the need to sit back and take a look at how our little home computer has fared in the last year.

At the end of last year, the big thing in hardware was the introduction of third party 32K memory expansion and disk controller cards. Essentially the companies were filling in where TI left off. But they knew that they couldn't make it by just providing hardware compatible with TI. It had to be better in order to get the business of existing /4A owners who already had a complete system. So the disk controllers were all DSDD and handled four drives instead of three.

The hardware manufacturers have continued this trend by providing RAM disks, print buffer cards, and clock cards. The RAM disks, especially those whose contents can be preserved across usages of the machine, are extremely useful since commonly used programs can be placed there and make the machine much easier to use. The print buffer cards are very nice if a user's printer doesn't already have a buffer. They let a user print text to the buffer at high speed and then the user can use the computer for other things while the buffer sends text to the printer at its speed. Clocks are nice, but more software needs to optionally support the clocks by automatically reading it and placing the time and date in the data automatically before they'll be very useful.

In the past two years, software has gone from games and wordprocessors to graphic packages, terminal emulators and database management systems. Some of these are good, some are bad, the fact that so many exist however is testimony to the amount of life left in the 99/4A.

Companies aren't the only ones creating for the /4A. Individuals are busy designing circuits for the /4A. I've seen designs for home made clock cards, and internal 32K memory expansion. (If the 32K can be made to have a 16 bit bus and remove the stupid wait states that the current 32K memory designs impose, I might even consider this one myself. I never cared running my memory bus out that black cable.)

Freelancing in the software field however is where a lot of the action is for the /4A. In the past year, the concept of "freeware" has developed. My personal belief is that "freeware" is a direct result of the amount of software piracy that happens with the /4A. A programmer spends a great deal of time writing a program, and for the /4A, I think most programmers do it for the fun of writing the program. But if a program is really useful, it is a shame to not let others, who may not have the desire to program, use it. Piracy makes it unprofitable to try to market and sell a program. And the sheer boredom of manufacturing copies to sell eats up the programmer's spare time to create something else. So if you can't beat the pirates, use them! Why spend nights and weekends copying programs, when pirates will do it for free. The programmer merely needs to put a message in the program that has a name and address to send money to if you like the program. Then all that they do is get the program into the right hands and the pirates will do the rest. Sending copies to other pirates and eventually the program will spread across the country. And any money that is sent in is pure profit.

These days, freeware has gained such a good status as a place for good programs, that freeware can be obtained from many places such as CompuServe, The MICROpendium, and User Group libraries. In fact, it has taken all the fun out of piracy, and we may see the end of it at last.

What does "Freeware" mean for you the average user? Well for one thing it means that you get to see what you're paying for. It really makes me angry when I see a warranty on a program that says open this package and it's yours. If you don't like a program, if it doesn't fit your needs then you've just thrown away money. Freeware however means you get to use the program for a while and if you find it useful, then you can send the programmer a vote of approval by sending money. This will encourage them to write more good programs. It also ensures that good programs thrive, bad ones fail, and ones that are marketed and sold for \$50.00 or more are extra special.

And finally, perhaps the most important plus is that these freelance programmers get valuable experience that will serve them well, especially if they continue on and begin to program professionally. (It has been my experience that professional programmers don't have the spare time to freelance like this.) So we win all around.

Looking to the future, I personally would like to see someone put a more complicated operating system on the /4A. I made the mistake of dropping round and looking at an Amiga the other day. (I was drooling when I left, but then I drool over new cars too.) I personally think that the /4A's hardware will support a simple version of one of these icon driven systems. It would need to provide built in support for the driving of the menus, and have a well defined interface for assembly language programs. I think that it should be able to provide direct support for using these 128K memory cards for executing programs. Then high level languages like Pascal or Modula 2 would be more feasible. Multitasking would be nice too. (Don't laugh. I've demonstrated that multitasking can be done on the /4A in a straight forward fashion.)

In the area of hardware, I would still like to see a Modem card. I also like to see a 128K or 256K memory card that used a memory mapping chip instead of bank switching to access the extra memory. This would make the job of the before mentioned OS a lot easier.

Getting back to the real world, John Lesene gave a demonstration at the last meeting of speech digitizing hardware that he has built for his /4A. However it didn't like the collection of equipment that we gathered for the meeting, so John wants to try again at the next meeting, and this time he's bringing his own system.

Also at the last meeting, there was a demonstration of the Byte Bench. It is a very flexible piece of furniture and the /4A can fit very well in it. (As oppose to other computer desks that are specifically designed for ANOTHER type of computer.) There will be flyers for the Byte Bench at the next meeting.

At the last meeting we also had signup sheets for the nominating committee and a tour of the UT computer center. A lot of people signed up for the tour, only one for the nominating committee. Unfortunately, neither happened. My tour guide backed out on me. I'll try to set something else up as soon as possible.

As for the nominating committee, I guess I'll have to appoint one. It doesn't seem right, but I'd really like to see this group continue to see the third anniversary of "Black Friday".

Mike Schultz

International Users Group

The Central Texas 99/4A Users Group received in the mail last month a notice of a bankruptcy auction for the International 99/4 Users-Group. The auction was held Thursday October 24 in Oklahoma City.

From the Business End of the Mailbox

Mail this month was rather light, but by adding a few things that I and other members received personally in the mail, it is still interesting.

The first piece of mail is from The Computer Task Force; P.O. Box 275; Cedar Park, Tx 78613. They have a new service called "The Computer Pages". It is a listing of computer hardware and software of any type that people want to buy or sell. To list is free. Two issues of "The Computer Pages" cost \$5.00 and will be mailed First Class, two weeks apart. There will be an order form at the meeting.

Also this month we received some flyers about the Byte Bench that was seen at the last meeting. They flyers will be at the next meeting.

Next is a piece of mail forwarded to us by Craig Dunn. Dynamic Enterprises; Box 690; Hicksville, NY 11801 is a supplier of quite a few items from hardware (consoles, standalone memory expansions for example), to modules (LOGO II, Terminal Emulator II). Plus they have a interesting sounding set of BASIC and Extended BASIC programs for \$9.95 each. There are programs that demonstrate the speech, music and graphic capabilities of the /4A, plus educational programs and games. See the catalog at the meeting for more details.

I received a catalog from "The Adventure Store" last month. They are now carrying InfoComm games (\$32.00 - \$39.00), the PILOT CAI language (\$19.95), Advanced Diagnostics, BITMAC, 4A/TALK, the Doom of Modular adventure series and the Miniwriter word processor series. Miniwriter III for \$99.95 requires no extra expansion of the /4A. It even includes its own parallel printer port. 4A/TALK is a disk based terminal emulator with 300 to 9600 BPS speed, XMODEM or TE II file transfer, and a autodialer (for smart modems). They also handle CorComp hardware.

Next is a letter stuffed full of information from DataBioTics; P.O. Box 1194; Palos Verdes Estates, CA 90274. First, they are setting up a "National Advisory Panel and Demo Software Giveaway." The idea behind the NAP is that someone in this group will be selected to be our groups representative to DataBioTics. (We'll talk more about this at the meeting.) This person will receive from DataBioTics new products to test and evaluate before their release to the general public. They will also be able to purchase what DataBioTics calls almost free software. (Their letter gets vague here, talking about helping them the cost and including "a prepayment amounting to 20% of the price.") This software is from their existing products including 4A/TALK, BITMAC, RENOIR (a 64K cartridge including FORTH and a Graphic Generation Package), MiniWriter I, II, and III, and PILOT. Plus they have a 256K RAM disk for \$299.00. The National Advisory Panel also will allow local programmers to publish their own software through DataBioTics and receive royalties. Members of our group will also be able to submit new products ideas, receive "technology updates and inside information", plus contribute to "a newsletter full of tips and user aids".

This leads us to the second thing in the DataBioTics letter. "The National 99'er" is a nationwide newsletter devoted to the /4A. I have a subscription and it seems pretty nice. They were having a little problem getting material, but that seems to be clearing up as more people contribute. What they do have is more technically oriented than this newsletter, so you might consider them if you feel you'd like more of the nitty gritty. If you would like to subscribe, they have an offer. If we can get ten new members for them from this users group, then these people can subscribe for the price of \$9.00 for ten issues. I'll have the form at the meeting. If you are interested bring your money too.

Guy Gournay; 146 178 CAN INC; 933 Delorimier; Longueuil, P.Q. Canada, J4K 3M8 sent us a flyer. It concerns a product that he has called MAXIMEM. It has 32K GRAM and 16K RAM. It plugs into the cartridge port and provides the same functions as the Widgeit (3 cartridge expansion). But it can also be used to copy cartridges to disk and then load them later from disk into its own ROM and GRAM without the original cartridge. Price is \$199. Canadian.

VIK Memory Systems; 260 Eliot Street; Ashland, Ma 01721; 1-800-VIK-DISK has sent us another flyer. They offer diskettes in three colors: Black, Gray and Red. SSDD diskettes are for \$.70 each, and DSDD go for \$.90 each. They also have mailers for \$.38 and desk organizers for \$1.89. (They obviously haven't seen my desk.)

US/Disks, Inc.; 2235-101 Encinitas Blvd; Encinitas, CA 92024; 1-800-992-1992; has sent us a flyer for diskettes in bulk. SSDD are \$.58 in quantity 200. Unfortunately the offer expired on October 31, 1985.

And finally Valley Computers; 613 North Idlewild, WI 54130 is having a fall sale on Ms. Pac-man (\$6.99), TI Invaders and Tombstone City (\$3.49 each). Sale ends November 15, 1985.

Mike Schultz

National Users Groups

I am a member of a couple of national users groups and I thought I'd pass their address along.

The first is called USUS; P.O. Box 1140; La Jolla, CA 92038. They are a UCSD p-System users group. At the moment I don't know what membership dues are, but they have a nice newsletter, even though it isn't very regular. The last issue has an article about the /4A implementation of p-System. They also have a library of p-System programs, and have them available in /4A format. They have regular meetings in which they usually have several forums, one of which is usually about the /4A. They hold the meeting in a different city each time, but so far none of them have been very close. However the last newsletter contained very enlightening notes on each of the sessions.

Next is the FORTH Interest Group; P.O. Box 8231; San Jose, CA 95155. Their dues are \$20.00 and they also have a nice newsletter, which is full of Technical tidbits on FORTH.

Mike Schultz

The Library

Here is more of the programs in the library. Again, they are programs that were reviewed favorably. There are still several more disks and a lot of cassettes in the library that need to be reviewed so if anyone is interested, please let me know and I will be happy to show you what needs to be done.

PROGRAM NAME	DESCRIPTION	REQUIREMENTS
BoaAlley	Game-snake eats eggs	Basic
Micro/jaws	Game-shark eats the fish	XB
Amort%	Amortization calculation	XB
Camel2	Game-text adventure	XB
Checkbook	Checkbook manager program	XB
Snakes&Ladders	Game	Basic
Jumpjack	Game-move man over platform	Basic, XB
Hangman	Game-typical hangman game	Basic
Farm	Speech demo-Rocky Robot	Basic, TE-2, Speech
Basket	Basketball statistics	XB
Airdefe	Game-like missile command	Basic, XB
Scrn	Disk cataloger	Disk
Pirana	Game-throw pies at target	XB
Cube	Game-like rubics cube	Basic

Mark Milam

Peripheral Expansion Box Interconnect

The hour is late. Only the steady hum of a muffin fan and the subdued clicking of a keyboard disturbs the fragile silence in the darkened house. A small circle of light surrounds you at your computer. You've just about finished keying in that big program (term paper, mailing list, spread sheet, or whatever.) You stretch your aching back, flex your tired fingers, and absent-mindedly adjust the position of the console before you make that final attack to finish it off. Too late you realize that moving the console, no matter how slightly, is the wrong thing to do. The screen fills with odd characters and begins howling in such anguish (or is that you making that noise?) that it startles the cat and wakes your wife. That hippopotamus of a connector came loose when you moved the console and your 99/4A just lost all contact with the memory and disk in the Peripheral Expansion Box. Talk about wasted days and wasted nights.

What is that big black plastic thing on the end of the PEB cable anyway? And why is the cable so thick and unwieldy? Well, to be truthful, the big black plastic thing houses some interface circuitry for the PEB cable that TI didn't put in the console. The cable is so thick and stiff because its a shielded cable; its wrapped in metal foil and protected by a thick covering to prevent stray electromagnetic noise from interfering with the signals in the cable and to prevent those same signals from radiating Electro-Magnetic Interference (EMI) and Radio Frequency Interference (RFI) to other electronic appliances. No, sorry, the EMI/RFI filter on your power strip doesn't protect your system from EMI/RFI except that coming in on the electric utility's power lines.

But despair not faithful 99/4A users. Ten-X Precision of Concord, California, may have the answer to your lost files and anguished cries in the night. For a mere \$46.85 (suggested list price \$56.95) you too can be the proud owner of the P.E. Box Interconnect (TM) and "alleviate all of the problems associated with the TI Peripheral Expansion Box's heavy cable and interface connection."

What is this miracle of modern electronics? Why its just some plexiglass and a ribbon cable, dear users. Not to worry, though, it stays out of sight and so does that big black cable. In fact the computer printed ad I received from Ten-X Precision shows an empty frame titled "The Ten-X Interconnect in action." And you know what? They're right! The Interconnect and the PEB cable are out of sight under the monitor stand and the keyboard is raised to a better touch-typing angle. That's right, this gizmo is really two products in one; a cable to allow the PEB cable to be moved out of the way and a platform to raise the back of the console so you have some place for the cable to go.

I eagerly plugged the foot long ribbon cable into my speech synthesizer and proceeded to wonder how I could tell if I had the other end plugged into the PEB cable adaptor right side up. It seems simple enough, even though I wasn't following the instructions to the letter, but there are no keys in the connectors to prevent one from plugging this thing together upside down. Visual clues are lacking

too. No obvious "foot" like the PEB cable adaptor and the ID label is even on the BOTTOM side of the Interconnect connector. Picky, picky, picky. Sorry, but I've helped too many computer neophytes to believe that nothing can go wrong ... go wrong ... go wrong. My Technical Data manual shows that nothing too terrible should happen even if the PEB were plugged in upside down since there are only + and - 5 volts power sources, the same as the signal levels, and no power supply voltages would cross connect to grounds.

When I first saw the Interconnect, I was concerned about the EMI I mentioned before. Thus far -- knock on wood -- I haven't noticed any interference problems, not even with my TV with the "rabbit ears" antenna. The sizzling sound my monitor makes when the expansion memory is being accessed isn't even any worse. The best news is that I've only had one disconnect since I hooked the cable into my system, and that was because I apparently didn't get it plugged into my speech synthesizer quite all the way.

Now for the console tilt platform. As shipped, it raised the back of my console so high that the monitor cable strain relief was mashed into the monitor stand. Too high, I felt, for comfortable typing, so a modification seemed in order. Since this dizzying height is achieved by stacking two rubber feet under each back corner, obviously all I needed to do was remove the feet, cut the bolts to length, and reinstall the larger of each set of stacked feet on the platform. Much better.

By now you're probably wondering how the tilt platform is attached to the console. No mystery here, just the magic of double-faced foam tape. While the assembly instructions admonish you to "carefully clean the bottom surface of your computer" and to "pay special attention to the feet as they often collect quite a lot of gunk and it is most important that they are perfectly clean", one look at the rough surface of the bottom of my beige console convinced me that the torque applied to those pieces of tape would surely overwhelm them in time.

More customization seemed in order and I did have those two leftover feet I had removed earlier. Rushing in where even fools think twice before venturing forth, I located two suitable bolts and the proper size drill bit. After some experimentation with the spare feet, I marked the platform, drilled the holes, and attached them near the front side of the tilt platform. A stunning enhancement, if only the speech synthesizer would fit over the bolt that attaches the right front foot. No problem, just move the hole in a little and presto! It now wobbles while trying to balance on six feet. I must have missed a little and placed the front feet too far forward. Before anyone could notice, I hastily removed this latest modification and decided that foam tape is really amazing stuff. It will probably outlast both the console and the tilt platform.

While nearly \$50 may sound like a lot for a short cable and about 80 square inches of plexiglass, I decided that this product really is well thought out. If you've priced quarter-inch Plexiglass or card edge connectors lately and realized the amount of hand work involved in making this thing, I think you'd agree that the price is fair. Don't raise your eyebrows like that when I mention hand work. How else could small quantities (less than a few thousand) of such an item be done economically any other way? Although the edge finishing of the plexiglass is a little rough, the custom assembly used to provide a card edge to plug into the console (or speech synthesizer) is very neat and quite ingenious. I admit that when I first opened the box I was a little dismayed to see what I had paid good money for, but having to seriously consider all aspects of this product to write this review has elevated my respect for it and its inventor considerably.

The Interconnect comes in two versions: with or without a short extension to support the speech synthesizer for \$46.85, postpaid, anywhere in the United States. Just the console tilt platform (with or without the extension I would suppose, but the price list doesn't say) without the Interconnect cable is \$17.85 postpaid. COD orders are to add \$2 and California residents must add sales tax. Foreign orders must make payment in U.S. funds and add \$8 for shipping. These prices are from the August 1985 price list and, as always, are subject to change.

While Ten-X claims to ship via airmail, don't expect overnight delivery. They warn that orders paid by personal check are held until the check clears, but it took over a month to ship my order (via insured first class mail) although the check didn't arrive at my bank until just a few days before the Interconnect came. Don't expect much documentation either. The page of assembly instructions provides no pictures or diagrams but the descriptions are clear enough for most hobbyists to be able to install it. Contact Ten-X Precision at P.O. Box 163, Concord, CA 94522.

Dave Wolfe

Auto Loader for Assembly Programs

I wrote this program over a year ago for a project that I started but never finished. I have always intended to submit it to the

newsletter, but I felt that there was some minor changes that I wanted to make first. Of course I kept forgetting to do it. Well I finally took the time to fix up this program and now I feel that I can submit it for your approval.

First, let me explain what this program is good for. When you're trying to debug an assembly language program, you simply have to have a current listing in order to effectively use the debugger. However, if your assembly language program grows bigger than 1000 lines (which can easily happen), it becomes a big pain to reassemble everytime you make a change to the program. So the only reasonable thing to do is to break the program into different source modules. Each module might contain several routines of similiar nature, such all the VDP control routines.

All that one really needs to do is to define a calling sequence for the routines (i.e. don't use too many global variables). Then DEF the names of the common areas and routines. Then the source modules can be assembled separately, and loaded individually at runtime, with the DEF/REF table making the necessary final linkages.

This has some additional benefits such as the individual source modules allow quicker loading for editing, and since the modules are assembled separately, this reduces conflict for local labels names, and lets labels such as LOOP1 to be reused.

Unfortunately, this technique has several problems. The first problem is that it is tedious to reload the individual object modules everytime when testing. Another is that we now don't know the starting address of the modules to set the X command. It is these two problems that this program addresses.

This program, when run, will prompt for a control file name. In this control file there is some option information and then the names of object files to load. The program performs a INIT of the computer's memory, then uses LOAD to load the individual files from disk into memory. As it loads, it prints a line to Load Map device detailing the location of the object, presuming that the object doesn't alter the normal loading sequence by using an AORG directive. Next after all the object modules are loaded, the program produces a listing of the DEF/REF table. This table is very useful for finding unresolved references.

Finally the program will optionally load the debugger and call it, followed by executing your program.

Here is an example of the control file:

```
Program Entry Point: BOOT
Load Map:
Debug: Yes
Include:
DSK2.COMMON:0
DSK2.TIMER:0
DSK2.BOOT:0
DSK2.SCHDLR:0
DSK2.TEST1:0
DSK2.TEST2:0
```

The options "Program Entry Point:", "Load Map:", "Debug:" and "Include:" must be spelled exactly as shown. The options may be in any order except for "Include:".

The option "Program Entry Point:" gives the entry point of your program. It is the name used in the CALL LINK when entering your program. If nothing is given here, then your program is not entered. The option "Load Map:" is the device where the load map and DEF/REF will be printed. If nothing is given here, no output is generated. The option "Debug:" must have a response of Yes or No. If yes is the response, the debugger is loaded from DSK1 and entered.

When the option "Include:" is encountered, the program is almost ready to begin loading. But first it will display the responses to the above options on the screen and allow you to change them. Simply press return to take them as they are.

After loading is complete, if the debugger option is Yes, then the debugger is loaded and entered. Remember to use the U command to switch the debugger into BASIC mode. Then use the load map to set X, Y, and Z offsets and your breakpoints. Then use the Q command to return the debugger to the program, which will then enter your program.

```

100 REM Auto Load Program
110 REM Written by: Mike Schultz
120 REM Date: 9/22/84
130 REM Last Update: 10/29/85
140 DIM HEXDIG$(16),V(4)
150 CALL SCREEN(8)
160 CALL CLEAR
170 CALL INIT
180 PRINT "Auto Loader"
190 INPUT "Control File: ";C$
195 DEBUG$="N"
200 OPEN #1:C$,INPUT
210 INPUT #1:P$
220 IF P$="Include:" THEN 420
230 PS=POS(P$,";",1)
240 IF PS>0 THEN 270
250 PRINT "Parameter Error: ";P$
260 END
270 KEY#=SEG$(P$,1,PS)
280 VALUE#=SEG$(P$,PS+1,80)
290 IF LEN(VALUE#)=0 THEN 210
300 IF ASC(VALUE#)<>ASC(" ")THEN 330
310 VALUE#=SEG$(VALUE$,2,80)
320 GO TO 290
330 IF KEY#<>"Program Entry Point:" THEN 360
340 START#=VALUE#
350 GOTO 210
360 IF KEY#<>"Load Map:" THEN 390
370 L#=VALUE#
380 GOTO 210
390 IF KEY#<>"Debug:" THEN 250
400 DEBUG#=SEG$(VALUE$,1,1)
410 GOTO 210
420 PRINT "Program Entry Point (";START#;")";
430 INPUT "":A$
440 IF A$="" THEN 460
450 START#=A$
460 PRINT "Load Map (";L#;")";
470 INPUT "":A$
480 IF A$="" THEN 500
490 L#=A$
500 PRINT "Debug (";DEBUG#;")";
510 INPUT "":A$
520 IF A$="" THEN 540
530 DEBUG#=A$
540 DEBUG#=SEG$(DEBUG$,1,1)
550 IF (DEBUG#="Y")+(DEBUG#="y")+(DEBUG#="N")+(DEBUG#="n") THEN 580
560 PRINT "Answer Yes or No"
570 GOTO 500
580 IF L$="" THEN 620
590 OPEN #2:L$,OUTPUT
600 PRINT #2:"Auto Loader":;"Load Control File: ";C$;"Program Entry Point: ";
START#;"Load Map: ";L$ 610 PRINT #2:"Load File";TAB(18);"Load Address"
620 FSTHI=2*16^13+2*16+4
630 TWOCOMP=16^13-1
640 REFTYP=8*16
650 FOR I=0 TO 9

```

```

660 HEXDIG$(I)=CHR$(I+48)
670 NEXT I
680 FOR I=10 TO 15
690 HEXDIG$(I)=CHR$(I+55)
700 NEXT I
710 IF EOF(1) THEN 790
720 INPUT #1:F$
730 IF L$="" THEN 770
740 MEM=FSTHI
750 GOSUB 1170
760 PRINT #2:F$;TAB(18);CONT$
770 CALL LOAD(F$)
780 GO TO 710
790 CLOSE #1
800 IF L$="" THEN 1080
810 PRINT #2::TAB(31);"DEF/REF Table":
820 FOR I=2 TO 80 STEP 16
830 PRINT #2:TAB(I);"Name Addr";
840 NEXT I
850 PRINT #2
860 LSTLOW=2*16^3+2*16+10
870 TABEND=4*16^3
880 CALL PEEK(LSTLOW,S1,S2)
890 TABSTR=S1*16^2+S2
900 I=1
910 ENTRY=TABEND-8
920 IF ENTRY<TABSTR THEN 1080
930 CALL PEEK(ENTRY,S1,S2,S3,S4,S5,S6,A1,A2)
940 HEX=A1*16^2+A2
950 GOSUB 1220
960 TYP=32
970 IF S1<REFTYP THEN 1010
980 S1=TWOCOMP-S1
990 S2=TWOCOMP-S2+1
1000 TYP=42
1010 PRINT #2:TAB(I);CHR$(TYP);CHR$(S1)&CHR$(S2)&CHR$(S3)&CHR$(S4)&
CHR$(S5)&CHR$(S6);" ";HEX$;
1020 I=I+16
1030 IF I<80 THEN 1060
1040 I=1
1050 PRINT #2
1060 ENTRY=ENTRY-8
1070 GOTO 920
1080 IF L$="" THEN 1110
1090 PRINT #2::"* Denotes Unresolved External Reference";CHR$(12)
1100 CLOSE #2
1110 IF (DEBUG$="N")+(DEBUG$="n") THEN 1140
1120 CALL LOAD("DSK1.DEBUG")
1130 CALL LINK("DEBUG")
1140 IF START$="" THEN 1160
1150 CALL LINK(START$)
1160 END
1170 CALL PEEK(MEM,S1,S2)
1180 HEX=S1*16^2+S2
1190 GOSUB 1220
1200 CONT$=HEX$
1210 RETURN
1220 FOR H=0 TO 3

```



```
1230 T=HEX/16
1240 HEX=INT(T)
1250 V(H)=(T-HEX)*16
1260 NEXT H
1270 HEX#=" ">"&HEXDIG$(V(3))&HEXDIG$(V(2))&HEXDIG$(V(1))&HEXDIG$(V(0))
1280 RETURN
```

There is a problem with using this program that I haven't solved yet because I haven't gotten that far. And that is how does one load their program after it is finished? Here are some suggestions:

First, compressed object can be loaded very quickly, so you could supply a BASIC program that will perform the INIT, LOADs, and LINKs.

Another is to use the Program File facility supplied by TI. I haven't touched it yet, but I believe that to use it you load your program into memory and get it almost to the execution state. Then you run the TI program which takes the in-memory image of your program and copies it to disk. When the user executes your program, the disk copy of the program is brought back into memory and executed.

And finally, I think that it would be rather simple to write a program that would read uncompressed object files, resolve the internal references, and produce one uncompressed object file that can be loaded. Such a program is known as a Linker. If I get back to the above mentioned project, I think that this will be my solution, and if I write a linker, I'll let you know.

Mike Schultz

Special Interest Group Meeting

The assembly language SIG is now meeting on the Wednesday following the regular group meeting and starts around 7:00 pm. The meeting will again be held at the Health Care International building, just off Great Hills Drive--contact Don Lynch or Mike Schultz for directions.

If you were at the last meeting, then you know that there was some discussion about having it at a different location this month, but that will not be necessary.

This month Mike Schultz plans to show some assembly language coding techniques that he uses. He will use the AL I/O routines that he wrote for Mark's board, The Hideout, as examples. Mike has been programming in assembly language on several machines for a number of years, and I think that everyone that comes will learn something.

Newsletter Exchange

Our users group exchanges newsletters with several other recognized 99/4A Users Groups. The exchange is made with the understanding that, with proper credit to both the newsletter and author (if listed), your users group can reprint articles from our newsletter and, with proper credit, we can reprint articles from exchanged newsletters. (Please feel free to correct any typos, misspelling, bad grammar, etc.; we will do the same.)

Please send your exchange newsletters to:

Central Texas 99/4A Users Group
P.O. Box 200246
Austin, Texas 78720-0246

Classified Ads

For sale: Two 99/4A consoles, Peripheral expansion box, 32K card, TI disk drive and controller, RS232, Speech synthesizer, TE II, Extended BASIC, TI Logo, TI-Writer, Multiplan, Plato Interpreter, Music Maker, TI Invaders, and lots of other software. All manuals and literature. All in excellent condition, sold as package only. \$350.00. Contact Edwin B. O'Quinn; 923 Manchester Dr.; Conroe, Tx 77304; 409-539-2677

For sale: Several /4A systems with the following equipment: Console, 10" color monitor, Peripheral Expansion Box, RS232, Disk controller and drive, 32K, External disk drive, printer, cassette recorder, joysticks, and speech synthesizer. Want to sell as complete systems, asking \$575 or best price by November 15. May sell individual items. Contact Scott Walker; P.O. Box 16408; Lubbock, Tx 79490.

For sale: Console, Peripheral Expansion box, disk controller and drive, 32K, RS232, TI FORTH manual and diskette. Make offer, will consider selling individual items. Contact Danny Moreno, 463-1930 before 5 PM.

HAS YOUR P-BOX BEEN TOO NOISY? Well, it isn't too loud you say? WHAT'S THAT? I CAN'T HEAR YOU OVER THE P-BOX! Has this ever happened to YOU? If it has (or even if it hasn't but you're tired of the LOUD fan in your P-Box) I can help. I will replace your fan with a new QUIET fan for only 15.00 (plus tax) AND even return your old fan back to you! You may ask, "Why so cheap?", and I will tell you. I am not out to rip-off your pocketbooks. I am just trying to help out my fellow 4A'ers, so if you are interested call:

Mark Milam
836-3301 after 6:00 pm

Meetings Calendar

Meetings of the Central Texas 99/4A Users Group are held monthly at the Pizza Inn, 3000 Duval (near the UT) on the second Thursday of each month. Meetings begin at 7:30.

The following list of meeting dates were compiled from my trusty Dr. Who 1985 calendar. Should any of the dates prove to be faulty, please blame it on the Doctor's poor sense of time (Time Lords confuse easily, you know.) Should there be any mistakes, I'm sure my readers will let me know.

November 14 December 12

Meetings of the assembly language special interest group are held on the following Wednesday. This month the meeting will be held in the Health Care International Building, just off Great Hills Trail. Contact Mike Schultz or Don Lynch for more details.

Current Officers

<i>President</i>	Mike Schultz	835-2377
	4200 Harcourt Drive; Austin, Texas	78727
<i>Vice President</i>	Susan Donaldson	327-4165
<i>Treasurer</i>	Paul Dunn	258-4308
<i>Secretary</i>	Patrick O'Donnell	345-6255
<i>Librarian</i>	Mark Milam	836-3301
<i>Newsletter Editor</i>	Mike Schultz	835-2377

Correspondence for the Users Group can be sent to the address given for the President, or to the Central Texas 99/4A Users Group; Box 200246; Austin, Texas 78720.