THE GUILFORD 99'ER NEWSLETTER

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OUR NEXT MEETING

DATE: January 6, 1987. TIME: 7:00 PM PLACE: Glenwood Recreation Center 2010 S. Chapman Street.

Our program for the meeting will be a *Swap-Fest*. We will have two disk drives available and our library of Fairware and other great programs. Bring some disks along and enjoy. (We will also take up a collection for the fairware authors, so don't forget the green!)

TI SHOPPER

by Bob Carmany

The latest and most interesting update of Tony McGovern's FUNLWRITER is out and it definitely is worth looking at! The program has a new name, *FUNNELWEB*, and high-powered performance. The central menu screen now has 16 free entries with another 7 more available on the User's List. Of course, it still loads the complete TI-Writer and Editor/Assembler menus as well.

There have been some nice touches added ---*DISKO* has been enhanced with auto-repeat keys and a running byte count and there is a program that makes installing your options in both the LOAD program and User's List a snap! Besides all of that, it will still load you favorite modes program, a data-base, c-99, and much more. It is on the "fairware" market and your donations to the author (Tony McGovern, 215 Grinsell St., Kotara, New South Wales Australia 2289) are encouraged.

A second entry from Funnelweb Farms is the first part of a disk utility system called *DISKWACKER*. This program will let you see everything that is on the disk including deleted data marks. The program is menu-driven and comes with documentation. The second part of the system, *BACKTRACK*, is slated for release very soon. The two of them should allow the novice to do some "serious" disk-hacking. It is also a "fairware" offering and donations are encouraged!!

Tim MacEachern (Wycove Systems, Ltd.) has introduced Wycove Forth Version 3.0. The release is limited --- it is made without documentation. This version is consistent with previous versions (ie. 2.0 and 2.1) and the manuals for those versions are applicable to the latest release. The newest release is some 50% faster in disk access time than version 2.1 and 68% faster than TI-Forth!! It runs marginally faster than version 2.1 and much faster than TI-Forth on most benchmark programs. All of the facilities that were present in the previous versions are still present in version 3.0. In addition, customizing your basic system is much easier with version 3.0. The price is $25.00 and it can be ordered from: Tim MacEachern, P.O. Box 1105, Dartmouth, Nova Scotia, CANADA B2Y 4B8. Tim said in his latest letter that limited support would

also be available.

There are also updates (2) available for c-99 by Clint Pulley. Two seperate updates/ revisions have been issued with the latest being dated November 16th. Several of the document files have been updated as well as some the the source code. Some additional utilities have been added to make the system conform more to the standard "C" language.

All in all, there are some rather exciting new commercial and "fairware" programs available in the TI marketplace. All you have to do to find them is to look! Until next month...

FUNLWRITER

by Jack Sughrue

Where do I *begin? Funlwriter* is the most profound disk ever made for the TI/99-4A.

I have many useful disks: data bases and spread sheets and educational programs and tutorials. I have programs that shrink programs, programs that identify and list variables from programs, programs that can be merged into other programs, and even programs that make programs. I have word processors for Extended BASIC, for MiniMem, for Editor-Assembler (including that editor itself). And, yet,...

I, like so many of my brothers and sisters in this gigantic TI/99 family, am always looking for the "perfect" program.

It's here. Take out your checkbooks and immediately send a $15 or better check to Tony and Will McGovern, 215 Grinsell St., Kotara, NSW 2289, Australia. And pop down to your nearest user's group for the *Funlwriter* disk to make a copy for yourself. (It's a "Fairware" item, offered to the public under the terms of personal trust: if you like it and plan to use it, send the money; if you don't like it, pass it on. And, like so much of the "Fairware" things for TI, it's the best stuff available.)

As I said at the beginning, *How do I begin?*

First, I'll leap back a couple years. I had written an informal letter to Chris Bobbitt, the general manager of Asgard Software, discussing a TI "wish list." As a writer, my wishes centered mostly around improvements for the *TI Writer*. I wished for the ability to read Dis/Var 80 and Dis/Fix 80 files quickly on the screen. (Think about that one for a while.) I wished to be able to load automatically from Edit or Format into my PIO printer. I wished to be able to develop a better Utility system and to go from Editor to Formatter and to reFormatting (for the printing of multiple *different* files) without going back to the title screen or without reloading. I thought it would be wonderful to be able to have an environment operating off (I felt then) the E/A cart which would access the TIW cart and the DM cart somehow."

Well, all of the above is part of this extraordinary venture from The Land Down Under. Notice I said *part*. And ALL from the XB module off a menu (*Yes, including loading up the 2.3 version of DM1000, the Editor/Assembler, the TI Word Processor, and, for the fun of it, Forth!*). You are reading it right. It does all this with versions of each which are better than the originals or other updates. (For example, from the DM1000 section of the menu you can draw up the file section and get as Option 3 an instant screen read of ANY Dis 80 file; or from the word processor menu you can press SWITCH to leap instantly into the Assembler and load up an assembled file (or create or edit, just as with the cartridge AND disks).

All this, say the authors "without loss of functionality." The memory banks maintain their same buffers.

As for my own all-night testing the day I got it from Barry Traver at the New England TI Faire in Lexington, I found every aspect of it improved from the individual pieces from which *Funlwriter* evolved. The McGovern geniuses seemed to have covered everything. The docs are excellent and take up 80 sectors, which is also excellent. After you make a copy to pass on to others who will also pass it on, erase the docs and fill up your 80 sectors with utilities galore.

And everything is FAST, ERROR-PROTECTED, truly USER-FRIENDLY. I did everything I could possibly think of to mess up this environment, and, though I'm usually very good at messing up programs, I couldn't defeat this environment. It did (does) everything I thought could only be on a TI owners wish list. Am I glad I'm a TI owner. Besides having the best in-residence abilities of ANY home computer (automatic numbering, resequencing, CALL subprogramming, color, speech synthesis, and so on), my computer now has an XB cart in port that will bring to my machine what would cost IBM or Apple (if even possible) owners 500 dollars or more to buy.

Like all good tools, *Funlwriter* is also a great toy. I don't think I've had as much fun playing with anything since I

at my first set of Lincoln Logs on my seventh birthday.

You can get inside. You can change things. The McGoverns even guide you into this in their docs. You can (I did) change the environment's screen/character colors within the XB load program (which may later be changed at MOST menus in this profound creation. You can (I did) put in printer specifics (P1D and P1D.LF for the Editor and Formatter). This is also done in the loader which can then be saved forever and overrides all assembly defaults.

Although I always manage to come up with "If only this program had...." to every piece of software (and textware) I've ever reviewed, I was stunned by this software into a euphoric silence. (My wife and kids appreciated *that!*) But it didn't last long. I couldn't wait to write about *Funlwriter.* But, three days and much use and abuse (including this report) later, I still cannot think of a single change I would make in the design of this software. It is efficient, allows for considerable flexibility, does all the things I've dreamed of and many I haven't.

The McGoverns, in entrusting us with this marvelous piece of work, are hoping they'll make enough money to get some additional TI equipment to do many more things, apparently. I hope they become rich beyond their wildest dreams and make great software for the TI forever. Let's support ourselves by supporting them. Get *Funlwriter* as soon as you can, test it out, write out the most generous check you can afford, mail it to the McGoverns, and hurry back to your new, large, exciting TI environment.

Now that I've had *FUNLWRITER* as part of my system for a while, I can honestly say *I Could Not Do Without This After Having Had It.* It's better than I praised it last in my first article about it. For lots of reasons.

I've loaded almost all my E/A programs without difficulty by loading the Utility option (3) from the first menu. Then load ENTER NAME (9) from the second menu. Basically, those programs previously loaded on Option 3 of the E/A cartridge (the DIS/FIX 80 files, usually), will load from this menu's Option 4. Those programs which loaded from the E/A cartridge Option 5 in the past (the PROGRAM files, usually), will now load from this menu's Option 3. (If the process had taken the word "START" as an additional program filename, it will load in automatically with this. If the program required another "entry code" (DEF), this program will list it for you after the load filename(s) have been listed.) In short, it's easier than the E/A cart. It finds things for you. And you keep your Extended BASIC cart in the port for long life.

Examples:

Let's say you have the game *SPOTSHOT.* The files are SPOTSHOT and SPOTSHOU. (There's no mystery to this. If an E/A program file exceeds 33 sectors it automatically strings the files together by using filenames which step up the final letter(s) "or numbers" by one ASCII number. You most often see this with GAME, GAMF, GAM6, GAMH. That kind of thing. So it is with this file.) These are two strung-together program files of 33 and 17 sectors, respectively, and listed as PROGRAM or PGM on your cataloger.

Choose the Option 3 on the *FUNLWRITER* E/A (which would be Option 5 on the cart), type in SPOTSHOT following the "DSK2. " on the screen and it will load itself automatically. (The cart would have required an additional input of the word "START" under Program File.) This loads on any diskdrive and, so long as you do not have to come back to DSK1 with internal loading directions from some input, you're fine. If you only have one drive you don't have to worry about it at all.

Let's say you have the game *Entrapment.* This is a 32 sector DIS/FIX 80 file and would usually be loaded on Option 3 on the E/A cart. Load it on Option 4 here. After "DSK2. " just type "ENTRAPMENT". When a request for another input comes up, just press ENTER. The "entry code" here is the word TRAP. It will come up on the screen and give you some other options with the loaded program. Just type "R" and this program will also RUN automatically.

It's great!

The word processor portion of the *FUNLWRITER* is perfect for my needs (once the docs have been replaced by 80 sectors of programs and templates that work off the environment).

Coming out of *FUNLWRITER* with an active catalog, one could easily build in some fascinating graphics programs, like GRAPHX (particularly now that those extraordinary COMPANIONS are made for it), and never have to come out to anything else. But any kind of template or file could be stuck inside and easily added to the automatic menu.

I wore out cartridge ports on two 99s. Changing the XB to E/A to T.I.W. to DM (and not counting the constant changing of game carts and things like Personal Record Keeping). Now I keep XB in all the time. The DM 1000 is about 1000 times better than the cart. The E/A is better. The built-in screen dump is better and much, much faster. The T.I.W. is better and faster and keeps you in the mode (if not the mood). And all this is on one SSSD disk (with a Forth load and a few other things thrown in for good measure). Now with all my good stuff on disk I probably will have little need for removing my XB

cart again.

And with something so convenient as *FUNLWRITER* it becomes quickly addictive (in an *easy to use* kind of way). It's just so natural for me to load up this disk without even thinking what I'm going to do on the computer. It doesn't make any difference. The environment as I've modified it permits me to load up ANY program I own, pretty much, whether BASIC, XB, E/A, FORTH, whatever. Or look into things. Or write letters. Or create programs. Or read DIS 80 files (text or code). There's just not much I would do on my computer anymore that couldn't operate out of this environment.

If you don't have *FUNLWRITER* yet, get a copy from your users' group as soon as possible. If you do have it, remember it's Fairware. Send a check to the authors as soon (and as much) as possible.

(Editor's Note: While Jack's review is based on an earlier release of FUNLWRITER, much of what he has to say is equally applicable to the current (V3.4) version. Some of the details may have changed, thus with the current version the process of changing and customizing the User List option is much easier but in general his evaluation still holds that FUNLWRITER or FUNNELWEB, as it is now called, in many ways is the most significant piece of software that has been released for the 99/4A since the infamous Black Friday and for this reason we have elected to reprint Jack's review at this time.)

FUNNELWEB AND THE GRAM KRACKER
by Herman Geschwind

While *FUNNELWEB* (or *FUNLWRITER*) might have started off as an emulator and loader for the TI Writer Editor/Formatter and the E/A Editor and Assembler, with its option to provide a variety of loaders and "environments" for other programs, *FUNLWRITER* in its many versions very quickly progressed beyond the TI Writer "emulation" state and in its current version presents the perfect menu selection/loader interface for a wide variety of programs.

The GRAM KRACKER with its battery-backed non-volatile (G)RAM allows the permanent storage of this menu/loader system with *instant* access to a wide variety of programs and utilities at the press of a few keys. While it was possible to install previous versions of FUNL in GRAM, the most current version (3.4) makes this job much easier.

The first step is to modify the XB Loader and as such involves the same changes that would have to be made for XB cartridge operation: Line 120-Change color selection; Line 130 & 140-Change Printer Defaults; Line 340-Change Data Disk default (K=2 for a multi-drive system). For the GRAM KRACKER operation these are all the changes that need to be made. For XB operation additional load options could be installed in lines 160-330 and 380-510. Save edited LOAD file to disk.

Step number two entails booting up the XB system and testing the changed defaults. Once all defaults work properly, select FUNL option 6, "User List" and once this menu has been reached select ULINSTL. This program is the real improvement in the current version over prior ones. ULINSTL now makes the installation of additional programs a snap. By simply answering a number of questions the load environment for each program is easy to define, i.e. Program Type (L&R or memory image); Default Drive where program resides, Prompt for Diskette Swap, etc. Once all questions have been answered, the load environment will be saved to disk. In my case I opted to install the Miller Graphics Advanced Diagnostics and Diskassembler, Mass Transfer, Auto Spell Check, J. Birdwell's Disk Utility, and many more. Instead of installing utilities, it would have been just as easy to install E/A games or any other E/A program.

As a third step the FUNNELWEB documentation recommends to exercise (load) the User List and Show Directory function (FNCT 7). As a final step at this stage select LOADERS and load UPATCH as Option 4 (Load and Run). UPATCH will automatically create a file UTIL1 with the FUNNELWEB loader and environment and all the customized defaults and changes.

Step number four is to load UTIL1 with the LOADER option and to test all selections for proper functioning. If not, ULINSTL can be invoked to edit prior selections and re-do the UPATCH step.

The final step is to use a GRAM KRACKER utility (J. Peter Hoddie's GRAM PACKER) to move the UTIL1 file into GRAM7. In my case on power-up I now have the choice of DM1000 V3.5 (GRAMS 1-2), Extended Basic (GRAMS 3-6) and FUNNELWEB V3.4. The FUNNEL option in turn gives instant access to not only TIW and E/A but also a number of other programs as previously mentioned.

DISK HEAD CLEANING
by Art Byers

When asked by club members, my instinctive answer has been an immediate "NO"!!! - afterwards qualified by the old sage advice: "If it ain't broke don't fix it!".

The quick reply is backed up by two things: a great deal of personal running time on two different brands of disk drives, and the advice of one of the most respected authorities on the 99/4A, Craig Miller of Miller's Graphics.

Personal: In two years of heavy use, I have yet to clean my PERCOM drive. It performs flawlessly. When I first got it, it was used 2 to 4 hours a day, five or six days a week, for a year. It was carried to club meetings (and still is on occasion), used for copying the club library, and so forth. As long as it performs, I will not even THINK about cleaning it.

The TI drive in my new PE box has not had that kind of use as yet. I suspect that I probably use my computer more hours a week than any other club member. After many months of heavy use - the club newsletter is turned out on it etc. - I have not given a single moment's consideration to head cleaning because IT IS WORKING WELL.

Therefore I reprint, without comment, Craig Miller's advice from the May 1984 issue of the "Smart Programmer":

"My opinion on cleaning your disk drives with a head cleaning diskette is only to use it as a last resort!. If you have made sure that its not the floppy, a bad connection or an improperly closed file, then run the destructive disk test. If you have a lot of errors on a lot of different floppies than as a last resort use the head cleaner BUT follow the directions to the letter!! If they say 9 or 10 drops don't use 20 or 30 unless you want it all over the inside of your drive. If they say run the disk for 30 seconds, then don't run it any longer!

The reason I'm against these head cleaners is that they are ABRASIVE and if you use them too much you will wear out the read/write head in your drive. I know the head cleaning kit manufacturers say to clean your drive at least once a week and more often if they are used heavily, but nowhere on my kit does it guarantee NOT to hurt my drives. As a matter of fact most of them have a disclaimer and they will only replace the cleaning kit if something goes wrong. We use our computers between 6 and 15 hours a day, 6 to 7 days a week and we don't clean heads any more than ONCE or TWICE a year."

To which I say: Thank you Craig!

Based on that, the average club member should not clean his drive more often than once every four or five years!! To hammer home the "overkill" of my point, here is the Warrantee copied from a cleaning kit for sale in a local store. It is typical of them all. As all such disclaimers are very similar, I have deleted the manufacturer's name. I urge you to read and *THINK* about what it says!

"IMPORTANT NOTICE TO PURCHASER The following is made in lieu of all warranties, implied or expressed: Manufacturer's and Seller's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. The foregoing may not be altered unless in writing signed by an officer of xxxxxxx Corporation."

If reading that on the product does not make you *think twice* before using a disk head cleaner, you need your own head cleaned!!!! "Well O.K." you may say after reading this, "but I have reached the LAST RESORT and am DESPERATE enough to try a head cleaner. How do I get the disk drive to run for the 30 seconds that most cleaning kits require.?" - and you'd have a good point because the moment the head finds out there is no magnetic media in the disk jacket, but rather some wet fuzzy stuff, it will send out an error message and stop.

Here is a program to take advantage of that error message to keep the disk running until you stop it:

```
100 ! This extended basic program has appeared in many newsletters and magazines. Original source is not known-AJB

110 CALL CLEAR
120 PRINT "**WORKING!**": : : : :
130 PRINT "HOLD FCTN/4 TO STOP": :
140 ON ERROR 160
```

```
150 RUN "DSK1.ZZZ"
160 GOTO 140
```

FORTH FORUM

by Bob Carmany

This month, we are going to switch back to Wycove Forth and define a couple of words that might be of interest to you. TI-Forth has a nice little word called GOTOXY which is analogous to the TI XB DISPLAY AT. There was no corresponding word in Wycove Forth although it is relatively easy to create. If you have either version 2.0 or 2.1 any of the following three definitions will work but the last one is suggested for use with version 3.0:

```
: GOTOXY SCREEN-WIDTH @ * + CURSOR-POS !;
: GOTOXY SCREEN-WIDTH @ * + >C9CB ! ;
: GOTOXY SCREEN-WIDTH @ * + " CURSOR-POS " LITERAL ! ;
```

There are a couple of words in TI-Forth that might need to be redefined if you want to translate some of the TI-Forth screens into Wycove Forth. They deal with switching bases from Hex to Decimal or vice-versa. Actually, all these words do is toggle the base from the stack from one to the other. There really isn't a Wycove equivalent because Wycove accepts input in either base --- for Hex simply precede the number with ">". Here they are:

```
: BASE->R BASE >R ;
: R->BASE BASE R> ;
```

You might also want to switch disk access from DSK1 to DSK2 so that you can access whatever screens are on that drive. There is an easy way to do it! Just use the following definitions:

```
: DSK1 ( -- ) 0 OFFSET ! ;
: DSK2 ( -- ) 2000 OFFSET ! ;
```

Here is a short program that appeared sometime ago in MICROpendium. It is for converting XB character definitions to a form used by Wycove Forth.

```
100 ! by Barry Comer 2 Cleveland Crescent Dartmouth Nova Scotia
110 CALL CLEAR :: CALL SCREEN(2):: FOR A=1 TO 12 :: CALL COLOR9A,15,1):: NEXT A

120 PRINT " POWER TO THE FORTH! ": : : : :
130 PRINT " This program is used to    convert basic char codes to Wycove Forth char codes.": :
140 PRINT "Once you have entered the   sixteen characters press    enter,and the Forth code    will be displayed on
the    screen.": :
150 PRINT "You may enter the code right into the CHAR,or          $PATTERN commands of Wycove Forth!": : : :
160 PRINT "      PRESS ANY KEY!"
170 CALL KEY(0,K,S):: IF S=0 THEN 170
180 DISPLAY AT(12,1)ERASE ALL:"BASIC CODE?"
190 ACCEPT AT(12,13)SIZE(16)BEEP VALIDATE("ABCDEF0123456789"):C$
200 X=0 :: FOR A=13 TO 1 STEP -4 :: B$(X)=">"&SEG$(C$,A,4)&" " :: X=X+1

::NEXT A
210 PRINT "Wycove Forth code.": : : 220 FOR X=0 TO 3 :: PRINT B$(X);:: NEXT X 230 PRINT : : :"Want another (Y/N)?" 240
CALL KEY(0,K,S):: IF S=0 THEN 240 250 ON POS("YN"CHR$(K),1)+1 GOTO 240,180,260 260 CALL CLEAR :: END
```

We anticipate re-starting the Forth tutorials after the first of the year at a time and location to be named later. Although the basic language will be Wycove, the principles will apply to TI-Forth as well. If you are interested, contact me as soon as possible. Until next month -- may the Forth be with you!

MODEM TALK

by Herman Geschwind

The ROS Sysop Dan Post will be moving to a new address around the first of the year. More likely than not the phone number for the ROS board (presently 855-3088) will also change. His new number will be posted on the FIDO board as soon as he

, operational again.

We are still waiting for a fix to *Mass Transfer. While it works fine for downloading and is one of the easiest terminal programs to use, in its present version (3.9) it will not properly store TI file headers for ARC files. So please remember, for UPloads FastTerm only!*

FIDO 274-5760

A new version of *ARCHIVER* is out (V2.11). You can download it from the FIDO board (8,064 bytes). The biggest change seems to be an increase in buffer space between reads and writes. A cosmetic change is a counter that keeps you updated while the buffer fills. ARCHIVER in whatever version is a *MUST* program for you to have since almost all the files that we upload are in packed form, identified by the ARC extension.

As an exception to our rule that we normally will not duplicate uploads to either FIDO or ROS, we have uploaded the latest version of FUNLWRITER to both boards. Both FUN1.ARC (87168 bytes) and FUN2.ARC (71552 bytes) make up the complete package. We believe that FUNLWRITER or FUNNELWEB as it is now called is such a significant package that we wanted to make sure that you will be able to get it by uploading to both boards.

Another surprise offering from our friends in Canada is CHESS (37760 bytes on FIDO). The author went to the considerable trouble to translate a Z-80 assembler listing of SARGON I into TI assembler code (!). SARGUN I is one of the most powerful chess programs for a micro. CHESS was placed into the Public Domain by its author.

If you have previously downloaded Version 2.0 of c-99 and the more recent update (Rel 2.1), on FIDO you will find a disk with c-99 utilities (C99UT.ARC, 71552 bytes).

ROS 955-2088.

DM99.ARC (81k) is a resident disk manager for XB or Basic. File includes docs.

DSK1.ARC (18k): A powerful disk editor along the lines of MG's Advanced Diagnostics. Has some features that AD lacks, such as the capability to search a disk for a HEX or ASCII string. File includes docs.

FUN1.ARC(86k) and FUN2.ARC (70k) are the new FUNNELWEB files. A must.

GEN6.ARC(76k) and GEN6.DOC (18k). A collection of XB Programs.

The following files are text adventure games. Both the A and the B disk are required for the game to run. The disk-load takes a good while..no there is nothing wrong with your drive controller...just be patient and enjoy. GMS11.A (72k), GMS11B.ARC (86k); GMS12A.ARC (72k), GMS12B.ARC (61k); GMS13A.ARC (72k), and GMS13B.ARC (89k).

ORGAN.ARC(36K), a nice music program. The programmer had trouble with his spelling but the program is well thought out. Docs included.

XBTUT.ARC(70k)..an Extended Basic tutorial.

PEEKS & POKES
by Scott Darling

24K OF DATA STORAGE: If you need to work with quite a bit of data or would like to change programs, but save the data after you press CALL QUIT then you can set up the 24K of High-Memory in the PEB as a single data file called "EXPMEM2", you open this file just as you would a disk file with one exception - you must PRECEED th OPEN statement with a CALL LOAD to the location -24574 as follows:

For INT/VAR files - 24
For DIS/VAR files - 16
For INT/FIX files - 8
For DIS/FIX files - 0

Here is an example:

If you want to open up the Expansion Memory for Display,Variable 80 files this is what you'd do:

```
100 CALL INIT
110 CALL LOAD(-24574,16)
120 OPEN #1:"EXPMEM2",RELATIVE,UP DATE,DISPLAY,VARIABLE 80
```

Then continue on as you normally would.

If you want to store both data and assembly language routines at the same time do this:

```
100 CALL INIT
110 CALL LOAD(-24574,-16)
120 OPEN #1:"EXPMEM2"
130 CALL LOAD ("DSK1.ASSM1")
140 CALL LOAD ("DSK2.ASSM2")
150 CALL LINK ("START")
160 REM CONTINUE REST OF PROGRAM
```

In the above example the 24 K of high-memory was saved for use as a DATA file (DIS/VAR 80 format) then the assembly routines were loaded. The computer will look for the best place to put the routines and will adjust the pointer accordingly. After the routines are loaded, a LINK statement starts the first routine and off we go.

If that's not enough for you, you can also use the MINI-MEMORY for 4K more of storage of assembly routines! NOW that's 16K of program space, 12K of assembly routine space!

These are all of the PEEKS & POKES that I have come across for use with X-BASIC and 32K Memory Expansion (Be sure to do a "CALL INIT"). The P & Q variables are used for "PEEK" - the numbers are for "POKE" or "LOAD".

8192 , P USE (PEEK,P) IF P<> 70 OR <>121 THEN DO A CALL INIT

8194 , FIRST FREE ADDRESS IN LOW MEMORY

8196 , LAST FREE ADDRESS IN LOW MEMORY

-28672 , P P=0 SPEECH NOT ATTACHED P=96 OR P=255 SPEECH IS ATTACHED

-31572 , 0 TO 255 VARY KEYBOARD RESPONSE

-31740 , P , Q PUT IN DIFFERENT TO CHANGE BEEPS,WARNINGS, ETC

-31744 , 0 TO 15 CONTINUATION OF LAST SOUND (0=LOUD AND 15=SOFT)

-31745 , 0 PRODUCES A FROZEN SCREEN, THEN BLANKS. RESTORE WITH FCTN(-)

-31748 , 0 TO 255 CHANGE THE CURSOR FLASHING AND RESPONSE TONE RATES

-31788 , 160 BLANK OUT THE SCREEN (MUST PUSH A KEY TO ACTIVATE) , 192 NO AUTOMATIC SPRITE MOTION OR SOUND , 224 NORMAL OPERATION , 225 MAGNIFIED SPRITES , 226 DOUBLE SIZE SPRITES , 227 MAGNIFIED & DOUBLE SIZED SPRITES , 232 MULTICOLOR MODE (46 BY 64 SQUARES)

-31794 , P TIMER FOR CALL SOUND (COUNTS FROM 255 TO 0)

-31804 , X , Y RETURN TO THE TITLE SCREEN (USE "PEEK (2,X,Y)") , P CHANGE THE CURSOR FLASH RATE (0 TO 255)

-31806 , 0 NORMAL OPERATION , 16 DISABLE QUIT KEY (FCTN =) , 32 DISABLE SOUND (USE NEG DUR FOR CONTINUOUS SOUND) , 48

/SABLE SOUND & QUIT KEY , 64 DISABLE AUTO SPRITE MOTION , 80 DISABLE SPRITES & QUIT KEY , 96 DISABLE SPRITES AND SOUND , 128 DISABLE ALL THREE

-31808 , P , 0 DOUBLE-RANDOM NUMBERS (0 TO 255) NEED "RANDOMIZE"

-31860 , 4 GO FROM EX-BASIC TO CONSOLE BASIC (NEED "NEW") , 8 AUTO RUN OF DSK1.LOAD

-31866 , P , 0 END OF CPU PROGRAM ADDRESS

-31878 , P HIGHEST NUMBER SPRITE IN MOTION (0 STOPS ALL)

-31879 , P TIMER FOR VDP INTERRUPTS EVERY 1/60 OF A SEC (0 TOP 255)

-31880 , P RANDOM NUMBER (0 TO 99) NEED "RANDOMIZE"

-31884 , 0 TO 5 CHANGE KEYBOARD MODE (LIKE "CALL KEY(K,...)")

-31888 , 63 , 255 DISABLE ALL DISK DRIVES (USE "NEW" TO FREE MEMORY) , 55 , 215 ENABLE ALL DISK DRIVES (USE "NEW" TO FREE DRIVES)

-31931 , 0 UNPROTECT X-B PROTECTION , 2 SET "ON WARNING NEXT" COMMAND , 4 SET "ON WARNING STOP" COMMAND , 14 SET "UNTRACE" COMMAND , 15 SET "UNTRACE" COMMAND & "NUM" COMMAND , 16 SET "TRACE" COMMAND , 64 SET "ON BREAK NEXT" COMMAND , 128 PROTECT X/B PROGRAM

-31952 , P PEEK P=55 THEN 32K EXPANSION MEMORY IS OFF <>55 MEANS ON

-31962 , 32 RETURN TO THE TITLE SCREEN , 255 RESTART X/B W/DSK1.LOAD

-31974 , P , 0 END OF VDP STACK ADDRESS (P6+0)

-32112 , 8 SEARCHES DISK FOR ?

-32114 , 2 RANDOM GARBAGE , 13 SCREEN GOES WILD , 119 PRODUCE LINES

-32116 , 2 RANDOM CHARACTERS ON SCREEN , 4 GO FROM X/BASIC TO BASIC

-32187 , 0 UNPROTECT XB PROGRAM , 2 SET "ON WARNING NEXT" COMMAND , 4 SET "ON WARNING STOP" COMMAND , 9 SET 0 LINE NUMBER , 14 SET "UNTRACE" COMMAND , 15 SET "UNTRACE" COMMAND & "NUM" COMMAND , 16 SET "TRACE" COMMAND , 64 SET "ON BREAK NEXT" COMMAND , 128 PROTECT XB PROGRAM

-32188 , 1 CHANGE COLOR AND RECEIVE SYNTAX ERROR , 127 CHANGE COLOR AND RECEIVE BREAKPOINT

-32572 , 128 DISABLES KEYBOARD

-32630 , 128 RESET TO TITLE SCREEN

-32699 , 0 UNPROTECT XB PROGRAM , 2 SET "ON WARNING NEXT" COMMAND , 4 SET "ON WARNING STOP" COMMAND , 14 SET "UNTRACE" COMMAND , 15 SET "UNTRACE" & "NUM" COMMAND , 16 SET "TRACE" COMMAND , 64 SET "ON BREAK NEXT" , 128 PROTECT XB PROGRAM

-32700 , 0 CLEARS SCREEN FOR AN INSTANT

-32729 , 0 RUN "DSK1.LOAD"

-32730 , 32 RESET TO TITLE SCREEN

-32961 , 51 RESET TO TITLE SCREEN , 149 SETS "ON BREAK GOTO" LOCKS SYSTEM