THE GUILFORD 99'ER NEWSLETTER

OUR NEXT MEETING

DATE: July 7, 1987. TIME: 7:30 PM PLACE: Glenwood Recreation Center
2010 S. Chapman Street.

For July we are planning to have a variety of TI software to demonstrate.
Bob Carmany will give a presentation on Forth and this will be followed by
a demo of other new releases and updates. Be sure to bring formatted
diskettes (and contributions to fairware authors) with you to the meeting.

PRES PEEKS

I would like to start this month's peeks with an appology to all of you members for my missing the last meeting. You just wouldn't believe the things that can go wrong with a car!! Houston was a very nice city to visit, but I don't think I would like to live there. If you have ever been to Atlanta and think their highway system is confusing, just try Houston! We missed the twister that sat down there by a half mile. It was so black you couldn't see the white stripe in the road, but it did us no harm.

On the way home we lost our air conditioning in Mississippi, and our water pump in Alabama which made me late for the meeting. We were supposed to get back home around four o'clock Tues. but I lost most of a morning getting a new water pump put on so.....by the time we got here, you were probably gone!

I never found any computer bargin stores as I left my Computer Shopper out of my luggage. I was going to get in touch with the Houston User Group but never got to as all my information was in Greensboro. Again let me say that I am sorry about the way things turned out.

If any members are interested in a printer, there is a real buy in this month's issue of Computer Shopper. It's called the NLQ (near letter quality) 180. It is offered at $199.00 from COMPUTER DIRECT in Barrington, Ill. If any one is interested, I have the address and the phone number. It has a lifetime warrenty on the print head which is a good deal also. From the picture, it looks a lot like an Epson to me. There is also a sale that ends this month on disks. You can get 200 disks with sleeves (DSDD) for $50. with a toll free number if you want to use the card. That's 25 cents each which isn't bad. I notice that some of the User Groups around are buying them and reselling them to the members in 25 pkg. lots and are making a few bucks on them for the club. Seems to me that would be a good idea....they sell them 3 for a buck, or $10. for a

package of twenty five. In case some of you fast figurers out ther are saying "Hey, I can get them a lot cheaper buying 3 at a time", they limit how many you can buy to keep that from happening!

I have had several calls from David Bodman who is with the Computer Society wanting to have our Club take part in a Computer Fair at the Four Seasons Mall on Saturday, August 15th. I was supposed to poll the Club at the meeting and find out how many would be interested in taking part in the Fair or leave it alone. There is no cost to us and tables for selling should be very reasonable. (under 50 cents). He needs someone from our Club to be able to meet with the group that is planning this but a lot of the members that I have tried to contact are on vacation or somewhere! Hopefully, most of us can be at the July meeting and we can discuss it then.

Hopefully, after July most members will be over vacations and we can buckle down to some serious computing.   There are quite a few new programs that are arriving each month. A lot of them are coming from Australia. Those guys down under sure know the TI! Makes you wonder just what the programmers for TI were doing with all their time doesn't it?

If your module port is still burning your hand and/or causing your programs to lock up by overheating your modules, you can do what I have been doing to mine and that is taking that heat generating power supply under your port out of the console and mounting it somewhere out of sight behind your bench. I just finished doing one for my Grandson's console and for a new wrinkle, I mounted the LED separate from the power board and ran some small wire up to a corner of his bench and now he can see the LED at a new place when his console is on. It sure makes for a cool console when you move the heat generator out.   I haven't had a lock-up since I moved it. (Caused by heat, that is).

For you with modems, the Opus board (274-5760) has had a few interesting riddles on the board each week when you sign on. They are mind grabbers, and I think you would be interested in trying to solve them. I havent gotten the righ answer yet!! I would like to see the users use the bullitin board more than they are. It can be a very good source for all types of programs and there is no charge since you don't have to make a long distance call to get it.

We were hoping to get George McCormick to give us a demo on adding the 32K memory to the console, but George is being utilized by his Church through July and that should come first. Bob has agreed to give us a talk and hopefully a demostration in Forth which should be interesting.

For you that are interested in happenings at large, Mike Dodd, the new K-TOWN Pres., gives a good report on his visit to the Boston Fayah he attended. I will have the newsletters at the meeting and anyone that is interested may borrow them. See you all at the July 7th meeting. (Submitted by "Mac" Jones)

TI SHOPPER

Every once and awhile, a product comes along that is a bargain at almost ANY price. The recent printer introduction from STAR comes as close to filling that expectation as any that I have seen!

The NP-10 is one of the newest printers from STAR Micronics. You can find it advertised at a price of between $159 and about $200 (retail is $279). It was designed to fill the void created by discontinuace of both the 10X and the SG-10. It does exactly that! It combines just about all of the features of both of them -- and ads a few of its own. It has Elite and Italic character fonts built in (Pica is standard) as well as a full set of international characters.   It will print in expanded, proportional, condensed, emphasized, bold styles as well as some of them in combination! For that special touch, it also has an NLQ mode that is suitable for all but the most formal correspondence. It has 7 different graphics capabilities built in including single, double, and quad density graphics.

On the more "operational" front, it will accept both fan-fold (sprocket feed) or single sheets, has both forward and reverse micro-feed (for aligning paper without turning off the printer), and automatic sheet feed.

I have used mine for about a month and it is really a superb bargain at anything less than retail! Uh yes, it prints at 100 CPS in draft and 25 CPS in NLQ modes.

In the software market, Will and Tony McGovern have been busy again! The latest version of FUNNELWEB (updated through 5/14) has added a file marker and taken care of some minor "bugs" in the program. The documentation has beeen updated as well. The updated files are available on the BBS for those of you who would like them. Incidently, the version number is still 3.4.

THE COMPUTER SHOPPER is filled with bargains on disks, cables, modems, and other "generic" computer equipment. The disk prices range anywhere from $.19 to $.35. The only "catch" to these offers is that there is usually a minimum purchase order and most of the companies add several dollars for shipping charges. Look at the ads carefully, most of them have at least a $25 minimum order!

One of the items of interest in the Computer Shopper is the report of a repair service for TI equipment. Armadillo Bytes, 1125 Easton Road, Dallas, TX (214)-328-9257 is opearted by Richard Fleetwood and Bruce Palmer. Both have repaired consoles, cards and peripherals for several years. Bruce was once a technician who worked for TI in Lubbock when TI still had the 99/4A production going. They offer to do most types of repairs on a console for $25, comapred to the $40 that the Ti Exchange Center will charge. They promise that if their cost should be higher than TI's, they will either return the equipment to you or ship it to TI in Lubbock. Call or write for a quote and shipping instructions. It sure is nice to know that this kind of support is still available for the 99/4A!

If you are interested in a lesser quantity of disks, TENEX has reduced the price on its bulk disks (SSSD) to $.39 each. That works out to $19.50 for a box of 50 (plus shipping).

Well, that about does it for this column. 'Til next month. . .(Contributed by Bob Carmany).

LOGO TIMES

Having carried on now for sometime about the simple wonders of LOGO, perhaps its appropriate to step back and say just a bit about how best to tackle this language.

First, there are various dialects of LOGO available for the myriad computer systems on the market. There's a LOGO for the IBM clones, for the Apple systems, for the Comodores and, in fact, there are two versions for the TI-99/4A: TI LOGO and TI LOGO II. As you might guess, the later is an enhancement, with the major difference being the ability to generate music in programs. Apparently there are other differences, and perhaps over time we'll be able to figure them all out. Perhaps some more intelligent and enterprising soul may also figure out how to download the LOGO II cartridge and make further enhancements which fully utilize the system and the more expansive hardware now available for it.

Meanwhile, we have what we have. To run TI LOGO (either version) you must have at least some form of the 32K memory expansion and a storage device, that is either tape or disk if you want to save or recall procedures and programs. In fact one nice feature about TI LOGO is the easy way in which it prompts users to save or recall programs. Another is the convenience of the Editor.

This is characteristic of the lanuage design. For those of you who have dabbled with it, you know that TI LOGO is very easy to use and can be immediately rewarding particularly in the turtle (graphiscs) mode. Because it was developed so that even young children could easily use it, LOGO prompts the user and provides friendly detailed error messages when you've gone astray. Examples are: "OUT OF INK;" and "TELL ME HOW TO FORWARD AT LEVEL 1 LINE 2 OF CIRCLE."

The built-in Editor is very easy to use. Typing either "TO" which begins all LOGO procedures, or "EDIT" gets you to the Editor and pressing the "BACK" key exits the editor and automatically processes the procedures or program definitions. These simple steps make it a breeze to toggle in and out of the Editor (that is from the Immediate Mode to the Editor Mode), to do even slight changes and quickly run them to see the effect. Again, this is one reason why LOGO gets high marks as an interactive, yet structured, yet self-directed programming language. It's truly hard for a programming language to be all of these, but that's why many folks consider LOGO fun.

Probably the software package's greatest asset is the TI LOGO manual, which in contrast to some other TI documentary efforts, is I think quite well done. In stepwise fashion, the reasonably dedicated student can learn the language feature-by-feature in well-illustrated chapters containing abundant examples. Indeed, you will learn much more, much quicker by working through the manual until its dog-eared than you are likely to learn from this column or any other source in the near or distant future. Translated in LOGOESE that means you'll have more fun too!

The manual is well-designed to progressively teach the self-instructed about even the finer points of LOGO's simple but powerful structure.

One of the best and apparently unrecognized resources of this manual is the command glossary at the rear of the text. A

bit disconcerting at first, the glossary is organized for a programmer, not a writer. It's alphabetical listings a. generalized; instead, they are categorized under the languages features, such as "Graphics Commands," or "Defining and Editing Procedures." This allows the user, especially the little or inexperienced user, to more easily problem solve by thinking of what general function you want to perform and then looking it up under the appropriate category. Again, this is characteristic of LOGO's underpinnings and TI's effort to support the concepts. Compare the manual glossary, for example, to the alphabetical listing in the TI Extended Basic manual's reference section.

The manual also contains a handy alphabetical index of commands and a separate index of concepts, topics, people and function. Additionally and not to be overlooked, is a single page quick-reference of keyboard strokes for LOGO. ONE CAUTION: always keep in mind when working in TI LOGO that the language authors did not build in any safeguard for the FUNCTION-QUIT key sequence. It is very unforgiving. It will return you to the TI title screen and any unsaved procedures or sprites or tiles will instantly vanish. Be especially careful, too, to use the shift, not function, key if your program calls for plus or equal signs (the QUIT key)!

Appropriately it is recommended that lengthy procedures of any consequence (anything you really care about saving) should be saved periodically during a work session. Do not make the mistake of thinking that because the procedure has been processed by the "EDITOR" that it is safe. It must be saved to disk or cassette if you expect to recall it for use at another time.

Like many LOGO features, the process is simple. Type "SAVE" and follow the prompts, saving either procedures, shapes and tiles or both. Pressing the "BACK" key gets you back to the Immediate mode. One note: when you save in LOGO you store everything in the workspace, depending on the route you take (procedures, shapes or both). So if you have created four procedures in the workspace, all will be saved. Thus a saved LOGO workspace named PICTURE may contain several LOGO procedures (TO HOUSE, TO TREE, TO BIRD, TO FLY) but for purposes of filing it is all one file, PICTURE.

Recalling is equally simple, with LOGO prescanning the diskette and compiling a menu of files. The space bar is used to scroll through the offerings. In saving or recalling by cassette, just follow the prompts.

In a nutshell (compared to the manual), that's how to get started with LOGO. So, go LOGO. (Contributed by Larry Spohn).

OPEN LETTER

To the TI Community:

I would like to congratulate Richard Mitchell and THE SMART PROGRAMMER --- you remember THE SMART PROGRAMMER, don't you? It is the "monthly" newsletter/magazine that you have received but one issue of since the end of February. It isn't everyone who can take over the publication of a newsletter and be six calendar months behind after only six issues!

You have to take into consideration that Mr. Mitchell must have been a student of the "Gary Kaplan" school of publication. Kaplan, you recall, was the architect of the HOME COMPUTER MAGAZINE "fade out". The parallel between the two is almost perfect. HCM published several issues on time during the transition period between the demise of 99'er MAGAZINE and the beginning of your HCM subscription. The publication interval just got longer and longer until it just "faded out" completely. The magazine was published on time, amazingly enough, during the renewal periods.

Mr. Mitchell has continued the tradition. When he took over THE SMART PROGRAMMER from Craig Miller, there was a long letter from Craig welcoming the production of SP on a "regular basis". Ironically, both SP and Super 99 MONTHLY (the other Bytemaster publication) were merged and the renewal period for both was during this transition period. While all of us innocently pondered whether or not to renew, the June, July, and August issues of SP came to us on a monthly basis. Great, the newsletter/magazine was going to be published on a monthly basis --- or that's what all of us thought!

Well, September rolled around and SP didn't! If you were lucky, you got your September issue at the end of October. It certainly didn't get any better! The October '86 issue didn't show up until the beginning of January '87, and November '86 appeared at the end of February. Then, it was very nearly three months before December '86 arrived (May 26th). I can't help but wonder when we are going to get another issue!

There have been a couple of possible explanations advanced for the erratic publication of THE SMART PROGRAMMER. Lack of material? Not hardly! Remember that the staff includes Craig Miller, Mariusz Stanczak (Forth), Steven Symkiewicz, Barry Traver, and D.C. Warren among others. Surely, there must be a more than adequate supply of material from such an editorial

.iff! That can't be the reason for the long delays.

It has also been proposed that it was just publishing inexperience that has caused the delays. Remember, though, that Mr. Mitchell produced SUPER 99 MONTHLY for well over a year. He should have been familiar with such things as operating costs, publication schedules, editorial deadlines, etc. when he chose to take over the publication of SP. I'm sure that all of this was taken into consideration when he made the decision to publish on a "monthly" schedule and when he set the renewal rates.

So, what are we left with? At the very least, a publication that bears a strong resemblance by schedule to the ill-fated HOME COMPUTER MAGAZINE. If you subscribed to THE SMART PROGRAMMER from the very beginning as I did, and if you renewed during the renewal period, your subscription will run through the 1988 before you have to think about renewing. Give it some good, hard thought! You really have something to look forward to, don't you? Remember, SUPER 99 MONTHLY was never really a monthly publication except at the very beginning and, based on such past performance, it appears that this is the same erratic publication schedule that SP is now pursuing. I would definitely not consider renewing until THE SMART PROGRAMMER lives up to the caveat on the back page of the publication: "THE SMART PROGRAMMER is published monthly . . ."

As a once-staunch supporter of THE SMART PROGRAMMER, I can no longer recommend, in good conscience, that anyone subscribe to a newsletter/magazine that is some six calendar months behind in the subscription with no real hope of becoming current. There are much better and more timely TI publications available without the aggravation of a subscription to THE SMART PROGRAMMER. HOME COMPUTER MAGAZINE is not dead --- it changed its name to THE SMART PROGRAMMER!

Bob Carmany
Guilford 99er UG

FORTH FORUM

I'm really at a bit of a loss at what to do for this month's column. If memory serves me, last month was TI-Forth so we will do a little something in Wycove this month.

One of the features that Wycove Forth provides is the access to the resident vocabulary in the Speech Synthesizer. Screen #49 supplies this facility with the SAY-WORD Forth word. Incidentally, to use more than one word, enter the addresses in reverse order with a space between each seperate address. It uses the form:

(addr ---) Ex. : "GREETING >351A SAY-WORD ;

With this example, "GREETING" has been defined as the address of the word "HELLO" in the resident vocabulary. That's pretty neat, but how do you find out what the addresses of each vocabulary word are? Well, Tim McEachern was nice enough to provide two words to handle that little problem as painlessly as possible. LIST-TREE constructs a list of the individual words (or phrases) and their corresponding addresses . LIST-WORDS executes LIST-TREE and displays the list on the screen.

For a "hard copy" of the entire resident vocabulary and the corresponding addresses, first load the printer enable screens and execute "EMIT-BOTH" in the immediate mode. Then, load screen #48. When you execute LIST-WORDS, the listing will be both displayed on the screen and simultaneously dumped to your printer for a hard copy.

Screen #54 has an example of how to use the Allophone list (in your TE II manual) to create unlimited speech capability. It uses the word, AL-LIST to create the word or phrase. There are some differences in the implementation, however. For example , to speak the words "WYCOVE FORTH" from the TE II module, you would enter the allophones as : 84 49 104 67 98 126 115 66 and 125. To use the AL-LIST word in Forth, the order is reversed:

125 66 115 126 98 67 104 49 84

to this you add the number of allophones: 9 and AL-LIST.

This is what the entire definition would look like:

: "WYCOVE-FORTH

126 66 115 126 98 67 104 49 84 9 AL-LIST ;

To activate the text-to-speech capabilities of Wycove Forth and load all of the vocabulary words that you need, just load screen #51 and the rest of the definitions will be loaded as well.

Well, that just about does it for this month. Go ahead and experiment with both the resident vocabulary and the text to speech capabilities. 'Til next month . .

CLASSIFIEDS

FOR SALE:
A STAR STX-80 Thermal printer that needs a print head (the print head is available from STAR for $21.95). The print head can be easily replaced. Along with the printer is approximate 1/2 case of thermal paper. $40 or best offer. See Bob Carmany or call 855-1538.

FOR SALE:
(1) TI99/4A Console (Black and silver model), RF modulator, power supply and documentation (Never used - just taken from box and checked).
(2) TI99/4A Console (Beige) RF modulator, power supply and documentation (Used very little).
(3) TI Program Recorder
(4) Speech Synthesizer
(5) Set of TI Joysticks
(6) Parallel interface for printer
(7) Extended Basic
(8) Software: Music Maker, Chisholm Trail, Hunt the Wumpus, Terminal Emulator, Reading Fun
Call Buddy Mann 279-7176 (Work) - 454-1525 (Home)

FOR SALE: Complete system with many peripherals and software. Call George Jordan 299-4999 (Home).

BASIC CORNER

Several months ago we challenged you to adapt or rewrite the Mini-Golf game.

One thing that is necessary before such a re-write can be undertaken is a thorough analysis of the present program. You need to know what the string and numeric variables are and in what line numbers they have been used. Additionally all the GOTO's and GOSUB's should be cross-referenced.

Our program listing this month will do all that work for. It will produce a program listing (with a nice wide margin for comments or filing) and a complete variable and line cross-reference.

Be sure to save the program to be analyzed in MERGE format before starting. The internal processing that needs to be done by the cross-referencer is formidable, so do not be dismayed that this XB program takes a while to run. (Contributed by Herman Geschwind)

MODEM TALK

OPUS (FIDO) (919)-274-5760

During the month of June there has been a good deal of upload activity. Here is a brief recap of what is new:

DSKUARC.TIP (52 K) John Birdwell's disk and file utility for the 99/4A, in my opinion the best. A menu driven program that lets you access and edit individual sectors, search for strings on a disk in either Hex or ASCII. In this new version it is possible to operate either on an entire disk or a selected file. This program also has the facility to make a byte-by-byte comparison of two disks or two files. This is something that is lacking in the otherwise very comprehensive DM1000.

PULARC.TI (87 K) A collection of programs by Clint Pulley (of c99 fame). This disk was passed out at the Boston "Fayuh" to illustrate Clint's talk. The disk has programs in Basic, E/A, Forth and c. Yes, Clint was quite an accomplished Forth programmer before he undertook the "c" project!

GPLDIS5.TI (7 K) George Mccormick uploaded this very capable disassembler from Germany (the screen prompts are in English, though). All we need now is the companion GPL Assembler!

WHEELGAM.TI (79 K) Again, we thank George Mccormick for this upload. As he said, all that is missing is Vanna. (George points out that you need to copy a CHARA1 file (get it from FUNNELWEB) to make the documentation run).

MASSARC.TIP (88 K) This is version 4.2 (the latest) of MassTransfer. I have used this version for several weeks now but have mixed emotions about it. The main change over Ver 4.1 is that MassTransfer now incorporates an implementation of Ymodem. Unlike Xmodem which uses packets of 128 bytes for transmission, Ymodem uses 1KB blocks. This means that percentage-wise the error checking overhead for Ymodem is considerably less than Xmodem which translates into a much faster net transfer speed. Unfortunately Stu Olson did not use a standard version of Ymodem with the result that the MassTransfer version of Ymodem will not work with either of our BBS's. To accommodate Ymodem, Stu had to reduce the transfer buffer from 32 to 20 sectors (more disk accesses).. After using 4.2 for a while I decided to go back to the prior version since Ymodem is not usable and I would rather have the larger transfer buffer.

ARCHIVER.TIP (6 K) Barry Boone also released a new version of his assembler-based Archiver. This version is a real improvement with two added features (1) support of single-drive packing or unpacking and (2) a directory read of an ARChived file.

FWAARC.TIP (79 K) and FWBARC.TIP (86 K) Here is the "update of the month" for Funnelweb with bug-fixes through 5/17/87. A much cleaned up version compared to the April release. No big functional changes but a lot of internal "fine tuning". Again a word of advice: Always use all of the FW files as a set and don't try to mix and match components from prior releases.

EDPARC.TIP (90 K) Enhancement packages to Extended Basic seem to be quite the rage now and hard on the heels of STAR we now have EDP, which stands for Enhanced Display Package. What sets EDP apart from STAR is that many of the features are available in a Merge File.

PAARC.TI (81 K) Take the best of the TI module "Tax and Investment Record Keeping" and "Home Budget Management" and you have some idea what PA is all about. The shareware author is using a new tack, to get the documentation you need to mail in $15. This is a great home financial package and the documentation runs to almost 100 typeset pages. Highly recommended. The disk might be free for the downloading but without the documentation you will not get much out of it.

ROUARC.TI (57 K) Ever wanted to play Monte Carlo type roulette but didn't know the difference between rouge and noir? The docs for this delightful game are a comprehensive introduction to the rules and history of roulette. Have fun!

TODARC.TI (72 K) A loader for Tunnel of Doom games. The GPL loader (selection 2 on the loader screen) of FW is required to load this program. Also included on the disk are several fairware TOD games.

BSCARC.TI (51 K) This is a disk of XB fairware programs from the Boston Computer Society.

ROS (919)-621-2623

There have been no new uploads to the ROS board. Dan is still having problems with his BBS software and he still has not received a new release. The upload and download problems are not confined to the TI, I ran into the same difficulties when I tried to download software for an IBM PC, using a PC and PC comm software. So stay tuned....

```
100 REM ##################     ! 300 DATA DIGIT,UALPHA,SIZE,A ! 570 ACCEPT AT(5,2):F$          ! 890 REM ###################
110 REM # XBASIC LISTER        ! LL,USING,BEEP,ERASE,AT,"BASE ! 580 ACCEPT AT(8,2):PR$         ! 900 REM ## SORT CROSSREFS (S
120 REM ##################     ! ","???","VARIABLE ",RELATIV ! 590 ACCEPT AT(11,2):H$         ! HELL SORT)
130 REM # PRINT ANY EXTENDED   ! E,INTERNAL,SEQUENTIAL        ! 600 ACCEPT AT(14,2):DATE$      ! 910 CALL CLEAR :: CALL SCREE
   BASIC PROGRAM WITH          ! 310 DATA OUTPUT,UPDATE,APPEN ! 610 ACCEPT AT(18,24)VALIDATE  ! N(4)
140 REM # PAGE HEADINGS, NUM   ! D,"FIXED ",PERMANENT,TAB,"#" ! ("YN"):LX$ :: IF LX$="" THEN ! 920 PRINT "SORTING CROSS-REF
BERING, DATING, AND CROSS-RE   ! ,VALIDATE                    ! 610                           ! ERENCES. ."
FERENCES                       ! 320 GOTO 350                  ! 620 ACCEPT AT(19,24)VALIDATE  ! 930 PRINT "("&STR$(REFX)&"
150 REM XBLIST VERSION 1.0     ! 330 CALL KEY :: CALL SOUND :  ! ("YN"):VX$ :: IF VX$="" THEN  ! ENTRIES)."
160 REM (C) COPYRIGHT JOHN B   ! : CALL ERR                    ! 620                           ! 940 X=1
ONAVIA 1984                    ! 340 KEY$ :: R$ :: OLDK$ :: K  ! 630 DISPLAY AT(21,2):"ALL OK  ! 950 X=2#X :: IF X<=REFX THEN
170 REM ################       ! EM$ :: V$ :: MARG$ :: X :: Y  ! ? (Y/N)"                      ! 950
180 OPTION BASE 1              ! :: Z :: I :: A$ :: H$ :: C   ! 640 ACCEPT AT(21,16)VALIDATE  ! 960 I=INT(X/2):: IF I=0 THEN
190 DIM TOK$(126),REF$(2000)   ! :: WK$ :: LN :: LN$ :: PTR   ! ("YN"):X$ :: IF X$="" THEN 6  ! 1040
200 CALL INIT :: CALL CLEAR    ! 350 VX$="N" :: LX$="N" :: PR  ! 40                            ! 970 FOR I=1 TO REFX-X :: Y=1
:: CALL SCREEN(4):: PRINT "S   ! $="" :: FIRST=-1 :: F$="" ::  ! 650 IF X$="N" THEN DISPLAY A  ! 980 Z=Y+X
ETTING UP. . ."                ! X$="" :: H$="" :: PH$="" ::   ! T(21,2):" " :: GOTO 460       ! 990 IF REF$(Y)<=REF$(Z)THEN
210 DEF RJ$(A$)=SEG$("     "&  ! DATE$="" :: PAGEND=1          ! 660 DISPLAY AT(2,2):" "        ! 1010
A$,LEN(A$),5)                  ! 360 BAS$="" :: REFX=0         ! 670 GOSUB 1400 !CENTER HEADI  ! 1000 WK$=REF$(Y):: REF$(Y)=R
220 DEF LJ$(A$)=SEG$(A$&       ! 370 SH$="## XBASIC PRINT PRO  ! NG                            ! EF$(Z):: REF$(Z)=WK$ :: Y=Y-
          ",1,16)              ! GRAM ##"                      !                               ! X :: IF Y>0 THEN 980
230 FOR I=1 TO 126 :: READ T   ! 380 LINE=80 :: LCT=999 :: TE  ! 680 REM ###################   ! 1010 NEXT I
OK$(I):: NEXT I                ! XT$="" :: I=0 :: :: MARG=0    ! 690 REM OPEN FILES            ! 1020 GOTO 960
240 DATA " ELSE ","::","!",    ! 390 FORM_LENGTH=66 :: SKIPOV  ! 700 DISPLAY AT(23,2):"OPENIN  !
IF ","GO ","GOTO ","GOSUB ",   ! ER=8                          ! G FILES. ."                   ! 1030 REM ###################
"RETURN ","DEF ","DIM ",END,   ! 400 !@P-                       ! 710 OPEN #1:F$,INPUT ,DISPLA  ! #
"FOR ","LET ",BREAK,UNBREAK,   ! 410 GOSUB 1790                 ! Y ,VARIABLE 163               ! 1040 REM ## PRINT SORTED CRO
TRACE,UNTRACE,"INPUT "         !                               ! 720 OPEN #2:PR$,OUTPUT,DISPL  ! SS-REFERENCES
250 DATA "DATA ","RESTORE ",   ! 420 REM ###################   ! AY ,VARIABLE 80               ! 1050 IF ((VX$="N")#(LX$="N")
"RANDOMIZE ","NEXT ","READ "   ! 430 REM ACCEPT PARAMETERS     ! 730 CALL CLEAR :: CALL SCREE  ! )THEN 1180 ELSE TEXT$="
,"STOP ","DELETE ","REM "       ! 440 CALL CLEAR                 ! N(4)                          !      ### CROSS-REFERENCE OF
260 DATA "ON ","PRINT ","CAL   ! 450 ON ERROR 1690             ! 740 PRINT :"PRINTING. . ."    ! "
L ","OPTION ","OPEN ","CLOSE   ! 460 CALL SCREEN(15):: DISPLA  !                               ! 1060 IF ((VX$="Y")#(LX$="Y")
","SUB ","DISPLAY ","IMAGE     ! Y AT(1,2):SH$                 ! 750 REM ###################   ! )THEN TEXT$=TEXT$&"LINE NUMB
","ACCEPT ","ERROR ","WARNIN   ! 470 DISPLAY AT(4,2):"PROGRAM  ! 760 REM # MAIN CONTROL LOOP   ! ERS AND VARIABLES" :: GOTO 1
G ","SUBEXIT ","SUBEND "        !  NAME (DSKn.xxxxxxxx)"        ! 770 IF EOF(1)THEN 870         ! 080
270 DATA "RUN ","LINPUT ","?   ! 480 ON ERROR 1690             ! 780 LINPUT #1:A$              ! 1070 IF VX$="Y" THEN TEXT$=T
??","???","???","???","???",   ! 490 DISPLAY AT(21,2):" "      ! 790 GOSUB 1470                ! EXT$&"VARIABLES" ELSE TEXT$=
" THEN "," TO "," STEP ","     ! 500 DISPLAY AT(5,1):">"       !                               ! TEXT$&"LINE NUMBERS"
,";",":",")","(","&","???","   ! 510 DISPLAY AT(7,2):"PRINTER  ! 800 REM 65535 = LAST LIN EMA  ! 1080 PRINT "PRINTING CROSS-R
OR "," AND "," XOR "," NOT     ! (E.G.RS232.BA=9600)" :: DISP  ! KKER                          ! EFS. ."
"                              ! LAY AT(8,1):">"               ! 810 IF B$="65535 " THEN 870   ! 1090 PRINT #2:" " :: PRINT #
280 DATA "=","<",">","+","-"   ! 520 DISPLAY AT(10,2):"BRIEF   ! 820 GOSUB 1240                ! 2:TEXT$ :: B$="" :: OLDK$="
,"#","/","^","???",U0$,0$,LN   ! TITLE/HEADING" :: DISPLAY AT  ! 830 GOTO 770                  ! :: L=0 :: BAS$=""
0,"EOF ","ABS ","ATN ","COS    ! (11,1):">"                    !                               ! 1100 LCT=LCT+3 :: PRINT #2:"
","EXP ","INT ","LOG ","SGN    ! 530 DISPLAY AT(13,2):"DATE T  ! 840 REM # END OF MAIN LOOP    ! "
","SIN ","SQR ","TAN "         ! O PRINT (ANY FORM)" :: DISPL  ! 850 REM ###################   ! 1110 FOR I=1 TO REFX
290 DATA LEN,CHR$,RND,SEG$,P   ! AY AT(14,1):">"               ! 860 REM # SORT AND PRINT XRE  ! 1120 WK$=REF$(I)&" " :: X=PO
OS,VAL,STR$,ASC,PI,"REC ",MA   ! 540 DISPLAY AT(16,2):"CROSS-  ! FS IF ANY                     ! S(WK$,":",1):: R$=SEG$(WK$,X
X,MIN,RPT$,"???","???","???"   ! REFERENCE LISTS FOR:"         ! 870 CLOSE #1                  ! +1,LEN(WK$)-X):: KEY$=SEG$(W
,"???","???","???","NUMERIC    ! 550 DISPLAY AT(18,2):"  LINE  ! 880 IF ((VX$="N")#(LX$="N"))  ! K$,1,X-1)
                               ! NUMBERS?(Y/N) >"              ! THEN 1180                     !
                               ! 560 DISPLAY AT(19,2):"  VARI  !                               !
                               ! ABLES?   (Y/N) >"             !                               !
```

```
1130 IF KEY$<>OLDK$ THEN OLD
K$=KEY$ :: GOSUB 1240 :: B$=
LJ$(KEY$)&R$ :: L=17+LEN(R$)
:: GOTO 1160
1140 IF R$=BAS$ THEN 1160 EL
SE BAS$=R$
1150 IF L>56 THEN GOSUB 1240
:: B$="            "&R$
:: L=16+LEN(R$)ELSE B$=B$&R
$ :: L=L+LEN(R$)
1160 NEXT I
1170 GOSUB 1240
1180 PRINT #2:" " :: PRINT #
2:"         ######### END
OF LISTING #########"
1190 CLOSE #2
1200 PRINT "LISTING COMPLETE
D"
1210 CALL LOAD(-31961,149)

1220 REM #################
1230 REM ## LINE PRINT SUBRO
UTINE
1240 IF LCT>=(FORM_LENGTH-SK
IPOVER)THEN GOSUB 1320
1250 MARG$="          " :: L
=62
1260 IF LEN(B$)=0 THEN 1300
1270 TEXT$=SEG$(B$,1,L):: IF
 LEN(B$)>L THEN B$=SEG$(B$,L
+1,LEN(B$)-L)ELSE B$=""
1280 TEXT$=MARG$&TEXT$
1290 PRINT #2:TEXT$ :: LCT=L
CT+1 :: MARG$="
   " :: L=58 :: GOTO 1260
1300 RETURN

1310 REM #################
1320 REM ### PAGEHDG SUBRTN

1330 IF FIRST THEN FIRST=0 E
LSE PRINT #2:CHR$(12)
1340 LCT=0 :: PH$=H$&" PAGE
"&STR$(PAGENO)
1350 PRINT #2:PH$
1360 PAGENO=PAGENO+1
1370 PRINT #2:" ":" " :: LCT
=LCT+3
1380 RETURN

1390 REM ###############
1400 REM ## CENTER HEADING
1410 MARG=INT(((LINE-LEN(PR$)
-LEN(H$)-LEN(DATE$)-14)/2)
1420 FOR I=1 TO MARG :: H$="
 "&H$&" " :: NEXT I
1430 H$=F$&H$&DATE$
1440 RETURN

1450 REM ###############
1460 REM ## CONVERSION SUBRO
UTINE, MERGE TO DISPLAY
1470 LN=256#ASC(SEG$(A$,1,1)
)+ASC(SEG$(A$,2,1))
1480 LN$=RJ$(STR$(LN)):: B$=
LN$&" "
1490 IF LN=65535 THEN 1680
1500 REM$="N"
1510 A$=SEG$(A$,3,LEN(A$)-2)
1520 IF A$=CHR$(0)THEN 1680
ELSE C=ASC(SEG$(A$,1,1))
1530 IF ((C<>199)#(C<>200))T
HEN 1570 ELSE L=ASC(SEG$(A$,
2,1))
1540 IF C=200 THEN B$=B$&SEG
$(A$,3,L)
1550 IF C=199 THEN B$=B$&CHR
$(34)&SEG$(A$,3,L)&CHR$(34)
1560 A$=SEG$(A$,L+3,LEN(A$)-
L-2):: GOTO 1520

1570 IF C=201 THEN 1640
1580 IF ((C=154)+(C=147)+(C=
131))THEN REM$="Y"
1590 IF C>128 THEN B$=B$&TOK
$(C-128):: A$=SEG$(A$,2,LEN(
A$)-1):: GOTO 1520
1600 PTR=1 :: V$=""
1610 V$=V$&SEG$(A$,PTR,1)::
PTR=PTR+1 :: C=ASC(SEG$(A$,P
TR,1)):: IF ((C<129)#(C<>0))
THEN 1610 ELSE B$=B$&V$
1620 IF REM$="N" THEN REFX=R
EFX+1 :: REF$(REFX)=V$&":"&L
N$
1630 A$=SEG$(A$,PTR,LEN(A$)-
PTR+1):: GOTO 1520
1640 WK$=STR$(256#ASC(SEG$(A
$,2,1))+ASC(SEG$(A$,3,1)))
1650 B$=B$&WK$ :: A$=SEG$(A$
,4,LEN(A$)-3)
1660 IF LX$="Y" THEN REFX=RE
FX+1 :: REF$(REFX)=RJ$(WK$)&
":"&LN$
1670 GOTO 1520
1680 RETURN

1690 REM ###################
1700 REM ## ERROR HANDLER
1710 CALL ERR(X,Y,Z,L)
1720 DISPLAY AT(23,2):" "
1730 IF Y=1 THEN GOSUB 1770
 :: DISPLAY AT(2,2):">>CAN'T
READ THAT PROGRAM" :: RETURN
 450
1740 IF Y=2 THEN CLOSE #1 ::
 GOSUB 1770 :: DISPLAY AT(2,
2):">>CAN'T USE THAT PRINTER
" :: RETURN 450

1750 GOSUB 1770 :: PRINT :"
UNANTICIPATED ERROR, CODE" :
: : PRINT X;"- SEE X-BASIC MAN
UAL." :: PRINT "(PROGRAM LIN
E";L;")" :: RETURN 1190

1760 REM ##############
1770 CALL SCREEN(7):: CALL S
OUND(333,131,2):: CALL SOUND
(111,110,2):: RETURN

1780 REM ###############
1790 REM DISPLAY COMMENTS
1800 CALL CLEAR :: CALL SCRE
EN(15)
1810 RESTORE 1880
1820 FOR I=1 TO 11
1830 READ B$
1840 DISPLAY AT(I#2,2):B$
1850 NEXT I
1860 DISPLAY AT(24,2):")PRES
S ANY KEY TO GO ON<"
1870 CALL KEY(0,Y,Z):: IF Z=
0 THEN 1870
1880 DATA "This program will
 print a","formatted listing
 of any","Extended Basic pro
gram,"
1890 DATA "with page heading
and","numbering, and option
al","cross-reference lists o
f","line number usage and/or
"
1900 DATA "variable name ref
erences.","The program to be
 listed","must have been sav
ed with","the 'MERGE' option
."
1910 RETURN
```