PASSWORD Security...Why & How!
by Barry Boland

We recently had a problem with a 'Crasher' on the ST South BBS which caused many users and operators headaches, pain, and anger. This message will try to explain Why, and How, you should try to maintain your password as YOUR password (and not the general Public's). Many of you will be thinking "What's the big deal? It's only a local BBS msg board." True, but bad habits can get you, and others, into trouble if/when you use more than one BBS.

I have been a user of The Source and CompuServe for over 3 years, and so I am a little more aware and concerned then most. These services cost me DOLLAR$ to use! Prime Time (8am to 6pm) on this type of a call can cost you upwards of $22.00 per/hour. They generally bill you through Visa or MasterCard, so if YOU don't keep track, a 'thief' can hit you and be gone 30 days before you even know it happened. "But I don't use those services." you say? Fine, you can still have problems if you're sloppy! Without naming names, this happened on the ST South BBS, and was all local, free use. A "Cracker" (I refuse to use the term "Hacker", as that has a DIFFERENT meaning to me) got hold of the entire user-file. This listed EVERY users name and password, so he could call in as ANY user and leave msgs. Aside from having access to a few Users who were Sig sysops with power to move/change/ERASE files on the system, this could still be bad! Even without the power to trash the operation of the BBS itself.

How would YOU like to log on and see msg's with foul language and obscene suggestions to all users, SIGNED WITH YOUR ID?! This leads to people being mad at YOU, and can (and DID) lead to False Accusations and harsh feelings which are VERY bad for personal relationships. It would even be possible for the 'Cracker' to leave illegal info, such as credit-card numbers, and pay-service passwords and 'cracking' tips, or pirated software UNDER YOUR NAME! These offenses can and have lead to official legal action by the. FBI, Banks, and Software Companies. How would YOU explain it to a Judge??

But, enough of Why, on to How to avoid such things. The FIRST, and FOREMOST thing is to be sure that ONLY you and the SysOp of the system have knowledge of your password! NEVER give your password to someone else FOR ANY REASON! If your Mother/Brother/Sister/Wife wants to call the BBS/Service, fine. But let them log-in as themselves, AND GET THEIR OWN PASSWORD. DON'T write down your password ANYWHERE! IF you MUST write it down to remember it, write it ONE place only...like on a card in your wallet. Keep it with YOU always, and don't let ANYONE else see it. Remember that this is a KEY to your honor, and possibly your money.

Make your password something which is NOT easy to guess! If it's common enough to remember easily, it's not as secure as it should be. Things like
    Your First name
    Your Last name
    Your initials
    Your birthdate
    Your 'Ham' call-sign
    Your wife's name
    HACKER; PASSWORD; BBS; SECRET; etc.
are NOT good passwords!!! These things a 'cracker' can guess in about 5 to 10 MINUTES! AVOID 1 or 2 character passwords AT ANY COST! Mix letters, numbers, and SPACES,".","*","-","/" whenever the system will allow it. If the system allows you 8 characters, I suggest you USE 8 characters. The longer it is, the harder it is to guess. How long does it take to do a FOR-NEXT loop of 0 to 256 on your Home Computer? That's how long it takes to generate EVERY ASCII code you can use in you password! Nest 8 FOR-NEXT loops within each other, and you can generate a list of ALL possible 8 character passwords! Its up to the SYSTEM not to allow the 'Cracker' that many tries, but don't make it any easier for them. I've seen people go into 7-11 stores at 3am and LEAVE THE CAR RUNNING WITH THE KEYS IN THE IGNITION! Your begging someone to make you sorry for it.

NEVER leave your password in a BBS msg...even

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    DVUG BBS:   (302)322-3999   Anytime
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For general information, you may contact

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DELAWARE VALLEY USERS GROUP MEETINGS
Plenary meetings: Delaware's Christiana Mall on Rte. 7, at I-95 Exit 4-S, in the Community Room. Enter between J. C. Penney and Liberty Travel inside the Mall.
    DELMARVA CHAPTER: Kent County Courthouse, Basement Conference Rm #25, Green & State Sts, Dover, De. Use the Green St. side entrance.
    SOUTH JERSEY CHAPTER: Deptford Municipal Bldg, Cooper Ave. and Delsea Drive, (Rtes. 534 & 47), in Gloucester County. Enter and park in rear of the building.

CONTENTS OF THE DECEMBER ISSUE OF THE DATA BUS:

NOISE on The Data Bus
by Jim Folz

Well the computer season is upon us. Soon we will elect new officers and celebrate the anniversary of the formation of the DVUG. Attendance and membership numbers will increase as we put away lawnmowers and break out the computers. This is the season for the winter sport called "Personal Computing". We hope you will continue to enjoy the sport with us in 1987. Seasons Greetings from the DVUG. Now for the news.

First, let me point out a subtle change in The Data Bus. I have tried to provide more margin for those who like to place newsletters in 3-ring binders. I have also put a median strip on the page to reduce cut-and-paste time. These changes require a new column size (48 characters). There will still be 77 lines on a page. Prospective authors take note.

Note that the December meeting at the Christiana Mall will be on 12/18/86 (Thursday). The meeting was moved since the 4th Thursday is Christmas.

IF you missed the special meeting on 11/22/86, then you missed a great time. Several new members joined us and we answered a lot of questions. We demonstrated Fast-Term on our BBS and Compuserve. We swapped some great software, too. Another special meeting is being prepared for January. Listen for details at the December meeting.

Beware of a program called "Supertrack". It seems to be a track copier but it is really a disk eater.

The Sherbrooke (Quebec) TI Users Group is trying to compile a list of book/article titles that contains info on the TI99/4(A), programs, etc. Anyone interested in advancing the effort can contact me for details.

At the last meeting at Christiana Mall, there was some uncertainty about the phone number for M. Riccio's BBS. That number is (215)289-4948.

Judy North (Newport News, Va.) asked Micropendium if anyone has a program to play Bridge. Before I became Editor, I was well on my way to writing one. It is pretty far along but needs much work. Does anyone know of a program that exists? Would anyone be interested moving the effort forward? Let me know.

The Executive Board is considering awarding software from the library to those who volunteer to bring equipment to meetings. The topic will be discussed further at the 12/18/86 Christiana Mall meeting. An Equipment Chairman is needed to coordinate the program.

The Executive Board is also considering a program where a reviewer agrees to provide a review on a program of his choice subject to Board approval. If the Board accepts, the reviewer purchases the program and writes the review. The reviewer is reimbursed when he turns in the program, the review, and the receipt. The program would then be raffled off by the club. The reviewer would receive software from the library as incentive. The intent is to minimize the risk element in software purchasing.

DVUG SOFTWARE LIBRARY NOTES
by Jack Shattuck

December's DVUG Disk-of-the-Month includes 19 programs, plus a descriptive autoloading summary, of some interesting catalogers, loaders and disk labelers. Listing their programming lines will provide invaluable information and techniques for users.

To list the Display/Fixed "CATDSK/OBJ" File, <BREAK> it as it runs. Also, to see a D/V 80 file you won't need TI-Writer if you have the DVUG 1985 catalog on disk, with the READER program (which we originally ran in The Data Bus of September, 1985, on page 10).

In working with the various printout routines, I'm reminded again of the desirability of having authors include REMarks describing the purpose of particular printer Escape codes used, to permit an adaptation for a different printer version. Other Newsletter editors, please pass along ...

I have had to despair of being able to create a Tape-of-the-Month which will satisfy beginner's needs amongst our users at Dover, Deptford and the Christiana meetings. Those seeking a pre-recorded tape are requested to contact me, or your chapter librarian in advance. With a few folks indulging for Christmas, some more rapid tape dubbers should be available at the meetings. Our new weekend get-togethers may offer a convenient opportunity, as well. Any ideas for a January Disk-of-the-Month?

DVUG members can reach me at 2 Colony Blvd., Apt.101, Wilmington, DE 19802-1414, (302)764-8619. Requests from non-members should be addressed to: DVUG, P.O. Box 6240 Stanton Branch, Wilmington, DE 19804. The Wilmington area TIBBS is (302)322-3999.

Due to horrendous weather earlier during the Fall hurricane season, not everyone got to see the Christiana presentation of Norm Seller's unique SAVEXT program. It runs in Assembly Language, and allows the user to recover a BASIC program which was being written using TI's Extended Basic module (for convenience of editing features), only to be interrupted and appparently lost due to a console lockup.

Norm's recent A/L gem, among many he has been showing us lately, permits you to switch instead to the Editor/Assembler module, run his program, and find the old BASIC program you were creating – still there, hiding under memory location pointers you couldn't access after the freeze-up. When you use Norm's SAVEXT program from DVUG's library, he suggests you prudently give your reclaimed program a different name from the original -- avoiding any unintentional overwrite merge problems.

Norm's programs in SAVEXT take a little more than one-half a SS/SD disk.

Not a few members have been ardently seeking a program to include a combined graphic and text file. That has been hard to imagine, with changes from text to bitmap graphic mode making that most unusual hybrid too elusive. Suddenly there may be several options available.

Draw 'N Paint or TI Artist had some features, but not previously absorbable into the full-length TI-Writer type file most persons had in mind. The Draw 'N Paint capabilities are excellent for graph presentations, with text thrown anywhere on your 28-column screen, which could be dumped to a full-size page-wide (72-column) version, for instance.

In previous issues of The Data Bus, using the Dave Rose Character Set and Graphic Designs files, we were able to print multiple font headlines. In each case, however, we had to exit the previously written Display/Variable TI-Writer or E/A text, go into the CSGD program and run it only after moving the printer to allow room for the heading. While it worked fine, any page copy had to be re-created or photostated instead of merely rerun from off a pre-set disk file. (In some cases, you could use a stick-down label, too, for headlines.)

New programs are noted in the November issue of MICROpendium, which is available in monthly 48-page editions at $20.50 (U.S. First Class) or $17 (Third Class)/year, with ads, listings, letters to the editor, reviews, etc. in a magazine devoted to the TI-99/4A exclusively. It can be obtained from P.O. Box 1343, Round Rock, TX 78680, and also has info on the latest Fairware. Starting in January, Regena will be writing a monthly column, too, with COMPUTE! giving up its her (its) TI coverage.

Anyway, MICROpendium notes that CSGD 3 is out with an interface to TI-Writer in 6 different font character sets. You can choose 6 or 8 lines/inch, i.e., 60 or 80 line pages, add page numbers, set a two-column format, top and bottom margins, tabs, a page number, create stationery, letterheads... and more! Available from Texaments, 53 Center Street, Patchogue, NY 11772 ($17.95, and $2 s/h) - credit cards not accepted - or via a special DVUG group purchase plan (DVUG members, contact me for info before Christmas).

Another option is that announced by the folks at Asgard Software, P.O. Box 10306, Rockville, MD, 20850, who advertise regularly in The Data Bus. It reportedly will include CSGD fonts, or a TI-Artist graphic instance or font, within a TI-Writer text file. You can even edit them with windows! Called Font Writer, and written by J. Peter Hoddie, its cost is $24.95. Asgard's reachable by phone, (301) 345-2492, CompuServe (Teledata page TGD-4), or via SourceMail TI9720, and they take credit cards.

If you didn't get Myarc's upgraded XB Version 2.11 disk yet, and you own Myarc's XB version 2.1 (or 2.0), send a blank disk for exchange to Myarc, P.O. Box 140, Basking Ridge, NJ 07920. You should have been registered previously with Myarc. (Their 9640 console version is being designated as 3.0.)

BEGINNERS TAKE HEART: EDUCATION, UTILITY TAPES

Back to Regena for a moment; some of our DVUG readers took note of an earlier Data Bus comment, and received a 5-page listing back, detailing her published software for the TI. If you provide the citation to her for programs she wrote in the back issues of COMPUTE! or related paperbacks which you own, and never typed in the programs, she can send you copies on tape or disk.

Send $3 for copying charge, plus a blank disk or cassette, and a self-addressed mailer to Regena at P.O. Box 1502, Cedar City, Utah 84720. Include $1.50 s/h costs per order, or send $5 for a tape, and she'll cover other costs. In addition to her TI acumen, she's also written for Amiga, Atari ST, C/64, IBM PC jr., MC-10, MSX, TRS-80 Model I and CoCo, Timex Sinclair and VIC-20.

Looking for other good educational software on tape? Try Tigercub Software, 156 Collingwood Avenue, Columbus, OH 43213. $1 Catalogue, which is deductable from first order. Tigercub Jim Peterson is author of Tips distributed at monthly meetings.

Another source is Kidware, P.O. Box 1664, in Idaho Falls, ID 83401, (208)529-9916, going into their 5th year of business for the TI. Each tape has two programs, selling at $9.95 each; also are available from TENEX, (800)348-2778.

＊ ＊ ＊ ＊ ASSEMBLY LOADER ＊ ＊ ＊ ＊
by Jim Rice, A9cug (Atlanta, GA)

This is an assembly loader routine that will automatically load assembly programs that require no program names (like ATARISOFT games or some of the TI games that have found their way into people's libraries on disk. Ed.) It will automatically load ANY assembly program including those with program names. After loading those with program names, it returns you to the Editor/Assembler. Just select option 4(RUN) and type the program name. It will then run.

Another way to do it is just make an Extended Basic CALL LOAD(FILENAME),CALL LINK(PROGRAM NAME). Then the program will run automatically from Extended Basic. I tried to use an external REF to get my program to run the one you select with a program name, but both programs have to be already loaded for it to work. (Self defeating, isn't it?)

There are a few things you will have to change to adapt the routine to run the specific programs you want to use with this routine. After the listing, I'll explain what you'll have to change.

Here is the listing:

```
          REF   DSRLNK,VMBW,VSBW,LOADER
          REF   KSCAN
          DEF   BEGIN
PABBUF    EQU   >1000
PAB       EQU   >F80
STATUS    EQU   >B37C
PNTR      EQU   >8356
SAVRTN    DATA  0
TDATA     DATA  >0005,PABBUF,>5000,>0000
          DATA  >000B
          TEXT  'DSK1.TENNIS'
          EVEN
CDATA     DATA  >0005,PABBUF,>5000,>0000
          DATA  >000E
          TEXT  'DSK1.CENTIPEDE'
          EVEN
DDATA     DATA  >0005,PABBUF,>5000,>0000
          DATA  >000F
          TEXT  'DSK1.DONKEYKONG'
          EVEN
CLOSE     BYTE  >01
MYREG     BSS   >20
TEN       TEXT  '1. TENNIS'
CEN       TEXT  '2. CENTIPEDE'
DON       TEXT  '3. DONKEYKONG'
          EVEN
BEGIN     LI    R0,34
          LI    R1,TEN
          LI    R2,9
          BLWP  @VMBW
          LI    R0,98
          LI    R1,CEN
          LI    R2,12
          BLWP  @VMBW
          LI    R0,162
          LI    R1,DON
          LI    R2,13
          BLWP  @VMBW
KPREP     CLR   R0
          MOVB  R0,@>8374
          LI    R4,>3100
          LI    R2,>3200
          LI    R7,>3300
          LI    R3,>2000
KCHECK    CLR   R1
          BLWP  @KSCAN
          MOVB  @STATUS,R5
          COC   R3,R5
          JNE   KCHECK
          MOVB  @>8375,R1
```

```
          CB    R1,R4
          JEQ   TLOAD
          CB    R1,R2
          JEQ   CLOAD
          CB    R1,R7
          JEQ   DLOAD
          JMP   KPREP
TLOAD     MOV   R11,@SAVRTN
          LWPI  MYREG
          LI    R0,PAB
          LI    R1,TDATA
          LI    R2,>20
          BLWP  @VMBW
          LI    R6,PAB+9
          MOV   R6,@PNTR
          BLWP  @LOADER
          JMP   CLOSEF
CLOAD     MOV   R11,@SAVRTN
          LWPI  MYREG
          LI    R0,PAB
          LI    R1,CDATA
          LI    R2,>20
          BLWP  @VMBW
          LI    R6,PAB+9
          MOV   R6,@PNTR
          BLWP  @LOADER
          JMP   CLOSEF
DLOAD     MOV   R11,@SAVRTN
          LWPI  MYREG
          LI    R0,PAB
          LI    R1,DDATA
          LI    R2,>20
          BLWP  @VMBW
          LI    R6,PAB+9
          MOV   R6,@PNTR
          BLWP  @LOADER
          JMP   CLOSEF
CLOSEF    MOV   R6,@PNTR
          MOVB  @CLOSE,R1
          LI    R0,PAB
          BLWP  @VSBW
          MOV   R6,@PNTR
          BLWP  @DSRLNK
          DATA  8
          CLR   R0
          MOVB  R0,@STATUS
          MOV   @SAVRTN,R11
          RT
          END
```

Well, that's the listing. Now I'll try to explain what you'll have to change to adapt the routine to your use. You'll want to change the program names from CENTIPEDE & TENNIS to whatever you want. You don't have to just have 2 programs, either, that was just for simplicity.

Back up in the beginning of the listing there are 2 symbols, TDATA & CDATA. To put your files in place of the two I used, you'll want to change the command TEXT 'DSK1.TENNIS' to TEXT 'DSK1.pfilename'. In the DATA statement directly above that, there is the statement DATA >000B. >000B is the length in characters of the file name DSK1.TENNIS in Hexadecimal. Change that to however long your file name is, including "DSK1.". For example, "DSK1.LOADER" would be 11 characters long, so the data statement would read DATA >000B and the text below it would read TEXT 'DSK1.LOADER'. To add more programs to the routine, copy the first line of DATA from either TDATA or CDATA (it's the same), put TEXT 'DSK1.filename' below it, put another DATA statement below it, and put an EVEN statement below it (just like in the program example).

There are few other things you have to do to

ASSEMBLY CROSS REFERENCE ...   PART 2
by Norm Sellers

(Due to space limitations, the entire Assembly
Cross Reference article would not fit into the
November newsletter. The assembly program and
Extended Basic loader that follow complete the
work. Norm asked me to pass on that the loader
will be looking for a program name "DXREF" in
line 400. Be sure to use that name for the
assembled code. Enjoy! Editor)

```
*•••••••••••••••••••••••••••••••••••••••••••••••••••
*   DSK2.AXREFB          10/18/86
*•••••••••••••••••••••••••••••••••••••••••••••••••••
*
*•••••••••••••••••••••••••••
* GET LINE TO PRINT    * R(A)
*•••••••••••••••••••••••••••
RGET    DATA BLCNTS+RGET#       * ADDR OF CNT EXCUTS
        MOV  @SRTO,RO           * IF NOT
        JNE  RGET1             *  SORTED,
        LI   RTN,SORT         *   SORT IT
        BL   @BLROUT
RGET1   MOV  @TSVIND,R10  IDX
        CLR  @LNSIND
        MOV  @TM,RO      CNT
        DEC  RO          CNT TO IDX
        C    R10,RO
        JGT  RGET3
        LI   RTN,PINDS
        BL   @BLROUT
RGET1A  LI   RTN,LBLK        * BLANK PLINE
        BL   @BLROUT
        MOVB @PRTRST,RO      * IF LINE OVERFLOW
        JNE  RGET2
        LI   RTN,PNXT        * PRNT NXT TBL VENT
        BL   @BLROUT
RGET2   LI   RTN,PRST        * PRT LIN#S TBL VENT
        BL   @BLROUT
        CB   R2,@MLNS(R9)
        JL   RGET1A
        INC  @TSVIND             IDX
        JMP  RGET4
RGET3   MOVB @ZERO,@LPLINE
RGET4   B    @BLRETN
*••••••••••••••••••••••••••
* SETUP PRINT INDEXES  * R(S6789A)
```

Continued From Page 1

Private ones.   Many systems have 'private' msgs
that AREN'T all that private. Mix Upper and Lower
case if the system makes a distinction of them!
CHANGE your password from time to time.   ANY TIME
you think someone MAY have, or COULD have, seen
your password CHANGE IT RIGHT AWAY!!
     NEVER (>> N E V E R <<) use the same password
on more than one BBS and/or Service! This is how
ST South got 'Cracked'! I know this is a pain, but
do YOU want to be accused and banned from your
local boards?
     THINK ABOUT IT!

     -Bandit- (tm)

     P.S.
     NO, "-Bandit-" is NOT my password ANYWHERE on
any BBS. CompuServe suggests things like two
unrelated words tied with punctuation - like
"RUBBER%STONE".   And   PLEASE   don't   use
"RUBBER%STONE", as you've just read it in a Public
msg. Avoid band names or record titles, too.

```
*•••••••••••••••••••••••••••
PINDS   DATA BLCNTS+PINDS#       * ADDR OF CNT EXCUTS
        MOVB @TAGS(R10),R9       * R9=TAG(I) IDX
        SRL  R9,8
        MOV  R9,@SVR9          * FOR PRST
        MOV  R9,R7        IDX   * R7=TAG(I)
        MPY  @MLEN,R7           * R8=MLEN*R7
        MOV  R9,R5             * R5=TAG(I)
        MPY  @AMLNS,R5    IDX   * R6=AMLNS*TAG(I)
        A    @LNSIND,R6    IDX   * R6=AMLNS*TAG(I)
*                               *        +LNSIND
        SLA  R6,1              * R6=(AMLNS*TAG(I)
*                               *        +LNSIND)*2
        MOV  R6,@SVR6
        B    @BLRETN
*•••••••••••••••••••••••••••
* PRINT NEXT LINE     * R(S8)
*•••••••••••••••••••••••••••
PNXT    DATA BLCNTS+PNXT#       * ADDR OF CNT EXCUTS
        CLR  R5
PNXT1   MOVB @TBL(R8),@PLINE(R5)   LD NAM TO PLINE
        MOVB @TBL(R8),@PENT(R5)    LD NAM TO SAVE
        INC  R5
        INC  R8
        C    R5,@MLEN         IF R5<MLEN
        JLT  PNXT1
        INC  R5
        B    @BLRETN
*•••••••••••••••••••••••••••
* PRINT REST OF LINE  * R(S69)
*•••••••••••••••••••••••••••
PRST    DATA BLCNTS+PRST#       * ADDR OF CNT EXCUTS
PRS1    INC  R5
        MOV  @LNSIND,R2     IDX
        SLA  R2,8
        MOV  @SVR9,R9
        CB   R2,@MLNS(R9)   CMPR IDX TO CNT
        JHE  PRS2A
        CI   R5,74
        JGT  PRS2
        LI   RTN,TOPLN       * LINE # TO PLINE
        BL   @BLROUT
        INCT R6
        INC  @LNSIND
        JMP  PRS1
PRS2    MOVB @ONE+1,@PRTRST
        JMP  PRS3
PRS2A   MOVB @ZERO,@PRTRST
PRS3    SLA  R5,8
        MOVB R5,@LPLINE
        B    @BLRETN
*•••••••••••••••••••••••••••
* LOAD DEC LINE # IN PLINE * R(S68)
*•••••••••••••••••••••••••••
TOPLN   DATA BLCNTS+TOPLN#      * ADDR OF CNT EXCUTS
        MOV  @LNS(R6),@WORK
        LI   RTN,HX2DC        * LINE #
        BL   @BLROUT         * TO CHAR DEC
        DATA 3,WORK,CHRNUM,4
        CLR  R8
        CLR  @SIGNF           * ELIMINATE
TOPLN1  CLR  RO              *  LEADING
        MOVB @CHRNUM(R8),RO   *   ZEROS
        MOV  @SIGNF,R1        *
        JGT  TOPLN2           *
        CI   RO,>3000         *
        JLE  TOPLN3           *
TOPLN2  MOVB RO,@PLINE(R5)
        INC  @SIGNF
        INC  R5
TOPLN3  INC  R8
        CI   R8,3
        JLE  TOPLN1
        B    @BLRETN
*•••••••••••••••••••••••••••
* BLANK OUT PRINT LINE * R()
*•••••••••••••••••••••••••••
```

```
LBLK    DATA BLCNTS+LBLK#       * ADDR OF CNT EXCUTS
        CB   @PRTRST,@ONE+1
        JEQ  LBLK2A
        MOV  @MLEN,RO
        MOV  RB,R1
        AI   R1,TBL
        LI   R2,PENT
LBLK1   CB   *R1+,*R2+
        JNE  LBLK3
        DEC  RO
        JGT  LBLK1
LBLK2   MOVB @ONE+1,@PRTRST
LBLK2A  MOV  @TEN,R5
LBLK3   LI   RO,37
        LI   R1,BLK
        LI   R2,PLINE
        MOV  *R1,*R2+            *
        DEC  RO
        JGT  $-4
        MOVB @ZERO,@LPLINE
        B    @BLRETN
*****************************
* TAG SORT TABLE ENTRIES *   R(34567)
*****************************
SORT    DATA BLCNTS+SORT#       * ADDR OF CNT EXCUTS
        CLR  R3                 *
        CLR  R4
        DEC  @TM                * CNT TO IDX
        C    @TM,@ONE           * IF TOO FEW TO SORT
        JLT  SOR4               *    THEN EXIT
SORT1   MOVB R3,@TAGS(R4)       * IDX
        AI   R3,>0100           * IDX
        INC  R4
        C    R4,@TM             * COMPR IDX TO IDX
        JLE  SORT1
        LI   R3,-1         I--1
SOR1    INC  R3            IDX
        C    R3,@TM        COMPR IDX TO IDX
        JHE  SOR4
        MOV  R3,RB         RB-I
SOR2    INC  RB            J-I+1
        C    RB,@TM        COMPR IDX TO IDX
        JGT  SOR1
        LI   RTN,CTAGI
        BL   @BLROUT
        LI   RTN,CTAGJ
        BL   @BLROUT
        MOV  @MLEN,RO
SOR2A   CB   @TBL(R4),@TBL(R6)
        JEQ  SOR3
        JLT  SOR2
SOR2B   MOVB @TAGS(RB),RO       SWAP
        MOVB @TAGS(R3),@TAGS(RB) TAG
        MOVB RO,@TAGS(R3)       VALUES
        JMP  SOR2
SOR3    INC  R4
        INC  R6
        DEC  RO
        JGT  SOR2A
        MOVB @TAGS(RB),R1       * FOR EQUAL ENTRIES
        SRA  R1,8               *
        MPY  @AMLNS,R1          * ALSO SORT ON
        SLA  R2,1              * FIRST LINE
        MOVB @TAGS(R3),RO      * NUMBER SAVED.
        SRA  RO,8              *
        MPY  @AMLNS,RO        *
        SLA  R1,1            *
        C    @LNS(R1),@LNS(R2) *
        JGT  SOR2B
        JMP  SOR2
SOR4    CLR  @TSVIND      IDX
        INC  @SRTD        SIGNL SORTED
        INC  @TM          IDX TO CNT
        B    @BLRETN
*****************************
* CALC TAGS(I) TO REGS *
***************************** R(345)
```

```
CTAGI   DATA BLCNTS+CTAGI#     * ADDR OF CNT EXCUTS
        MOVB @TAGS(R3),R4  IDX * R4-TAG(I)
        SRL  R4,8
        MPY  @MLEN,R4      IDX * R5-MLEN*TAG(I)
        MOV  R5,R4         IDX * R4-MLEN*TAG(I)
        B    @BLRETN            *
*****************************
* CALC TAGS(J) TO REGS *
***************************** R(678)
CTAGJ   DATA BLCNTS+CTAGJ#     * ADDR OF CNT EXCUTS
        MOVB @TAGS(RB),R6  IDX * R4-TAG(J)
        SRL  R6,8
        MPY  @MLEN,R6      IDX * R5-MLEN*TAG(J)
        MOV  R7,R6         IDX * R4-MLEN*TAG(J)
        B    @BLRETN
*****************************
* CONVERT HEX WORD TO  *
* CHAR DECIMAL         *
***************************** R(89)
HX2DC   DATA BLCNTS+HX2DC#     * ADDR OF CNT EXCUTS
        MOV  *R11+,RB          * NUM OF ARGS
        MOV  *R11+,RB          * ADDR HEX # TO CNVT
        MOV  *R11+,R9          * ADDR DEC NUM RESLT
        MOV  *R11,R1           * MAX NUM DIGITS HEX
        MOV  R9,RO
        LI   R2,>3000
        MOVB R2,*RO+           * ZERO RESULT FIELD
        DEC  R1
        JGT  $-4
        DEC  RO               * RO-LAST BYTE   ANS
        MOV  *RB,@DIVWRK+2
        CLR  @DIVWRK
DIV10   LWPI DIVWRK           * NEED 2 CNSQ REGS
        DIV  @TEN,RO          * HERE RO-DIVWRK
        LWPI MYREG            * RESTORE REGS
        SOCB @DIVWRK+3,*RO
        DEC  RO
        MOV  @DIVWRK,@DIVWRK+2
        JEQ  $+8
        CLR  @DIVWRK
        JMP  DIV10
        B    @BLRETN
*********************
* RETURN PLINE TO  *   R(3)
* BASIC            *
*********************
PARG    DATA BLCNTS+PARG#      * ADDR OF CNT EXCUTS
        CLR  RO
        MOV  R3,R1
        LI   R2,LPLINE
        BLWP @STRASG
        B    @BLRETN
*********************
* CNURT ANY FLT #  *   R(3)
* 1-65535 TO HEX   *
* WORD INTEGER     *
*********************
INTFIN  DATA BLCNTS+INTFI#     * ADDR OF CNT EXCUTS
        LI   RO,FAC            * RO- FAC POINTER
        MOVB *RO+,R1
        SRA  R1,8
        AI   R1,->40           * R1-EXPONENT COUNTR
        MOVB *RO+,R2
        SRA  R2,8
        MOV  R2,R3
        MOV  R1,R1
        JEQ  INTF2
INTF1   MPY  @D100,R2          * R3-100*LAST ACCUM
        MOVB *RO+,R11
        SRA  R11,8
        A    R11,R3
        MOV  R3,R2
        DEC  R1
        JH   INTF1
INTF2   DEC  R3                * CNVT CNT TO IDX
        MOV  R3,@I             * STORE REC # IN I
        B    @BLRETN
```

```
100 ! SAVE DSK1.DOXREF
110 DIM FN$(2)
120 DEF ADDR(A)=(A>32767)*(-
A+65536)-(A<32768)*A
130 DEF LNO$(X)=SEG$("0000",
1,4-LEN(STR$(X)))&STR$(X)
140 PRT$="RS232.BA=4800.DA=8
" ! PRINTR NAME
150 !*********************
160 !    EXTENDED BASIC    *
170 !    DRIVER FOR THE    *
180 !    CROSS REFERENCE   *
190 !    OF AN ASSEMBLY    *
200 !    SOURCE FILE       *
210 !                      *
220 !         BY           *
230 !    NORM SELLERS      *
240 !       OF THE         *
250 !    DELAWARE VALLEY   *
260 !    USERS GROUP       *
270 !    ERROR ROUTINE BY  *
280 !    TODD SELLERS      *
290 !*********************
300 CALL CLEAR :: CALL SCREE
N(13):: ON ERROR 1000
310 DISPLAY AT(5,6):"CROSS R
EFERENCE"
320 DISPLAY AT(6,7):"LISTING
 OF AN"
330 DISPLAY AT(7,6):"ASSEMBL
Y PROGRAM"
340 DISPLAY AT(8,8):"SOURCE
FILE"
350 DISPLAY AT(10,4):"1. LOA
D AND RUN XREF"
360 DISPLAY AT(11,4):"2. RUN
 XREF AGAIN"
370 DISPLAY AT(12,4):"3. SOU
RCE LIST ONLY"
380 DISPLAY AT(13,4):"4. QUI
T"
390 ACCEPT AT(15,12):SEL$
400 IF SEL$="1" THEN CALL IN
IT :: CALL LOAD("DSK1.OXREF"
)
410 IF SEL$="4" THEN STOP
420 OPEN #2:PRT$
430 IF SEL$="3" THEN PL$="Y"
 :: CR$="N" :: GOTO 460
440 CR$="Y"
450 INPUT "SOURCE LIST (Y OR
 N)":PL$
460 J=3 :: FST=0 :: LST=0 ::
 I=0 :: FUL$="N"
470 TST$="FULL, STOP"
480 DQ$=CHR$(34)
490 IF CR$="Y" THEN CALL LIN
K("CLR")
500 INPUT "ENTER SOURCE:DSK"
:FN$(1)
510 OPEN #J:"DSK"&FN$(J-2),
INPUT ,VARIABLE 80
520 IF FST=0 THEN INPUT "ENT
ER FIRST REC CNT=":FST
530 IF LST=0 THEN INPUT "ENT
ER LAST REC CNT=":LST
540 LINPUT #J:REC$
550 I=I+1
560 IF SEG$(REC$,1,1)="*" TH
EN 750
570 IF LEN(REC$)<9 THEN 750
580 IF POS(REC$,"COPY",1)=8
THEN 840
590 IF I<FST THEN 750
600 IF I>LST THEN 890
610 OP$=SEG$(REC$,8,4)
620 IF OP$="IDT" THEN 750
630 IF OP$="BSS" THEN 750
640 IF OP$="BES" THEN 750
650 IF OP$="UNL" THEN 750
660 IF OP$="EVEN" THEN 750
670 IF OP$="LIST" THEN 750
680 IF OP$="PAGE" THEN 750
690 IF OP$="TITL" THEN 750
700 IF SEG$(REC$,9,3)="ORG"
THEN 750
710 RC$=REC$
720 IF CR$="Y" THEN CALL LIN
K("ADD",I,REC$)
730 DISPLAY AT(24,4):"PROCES
SING LINE ";I
740 IF POS(REC$,TST$,1)=1 TH
EN FUL$="Y" :: GOTO 890 ELSE
 760
750 ! READ NEXT
760 EOFJ=EOF(J)
770 IF PL$="Y" THEN PRINT #2
:LNO$(I)&" "&REC$
780 IF EOFJ=0 THEN 540
790 CLOSE #J
800 IF J=3 THEN 890
810 IF FUL$="Y" THEN 890
820 J=J-1
830 GOTO 760
840 J=J+1
850 PQ=POS(REC$,DQ$,16)
860 FN$(J-2)=SEG$(REC$,17,PQ
-17)
870 PRINT "DSK"&FN$(J-2)&" N
EEDED." :: INPUT "ENTER WHEN
READY:":RDY$
880 GOTO 510
890 IF CR$="N" THEN CLOSE #2
 :: STOP
900 PRINT #2: :"FIRST=";FST,
"LAST=";LST :: PRINT #2:" "
910 IF FUL$="Y" THEN PRINT #
2:REC$: :: PRINT REC$
920 CALL LINK("GET",REC$)
930 IF LEN(REC$)=0 THEN 970
940 PRINT REC$
950 PRINT #2:REC$
960 GOTO 920
970 IF FUL$="Y" THEN FUL$="N
" :: FST=I :: REC$=RC$ :: CA
LL LINK("CLR"):: GOTO 720
980 CLOSE #2 :: STOP
990 ! ERROR ROUTINE RE-EXECU
TES ERROR LINE AFTER BREAK I
F NOT FILE ERROR (130 IS DUM
MY, REPLACED BY CUR LINE#)
1000 CALL ERR(ERRC,ERRT,ERRS
,LINN):: ON ERROR 1000 :: LI
N1=INT(LINN/256):: LIN2=LINN
-LIN1*(256)
1010 IF ERRC=130 THEN PRINT "
FILE DSK"&FN$(J-2)&" NEEDED.
" :: INPUT "ENTER WHEN READ
Y:":RDY$ ELSE PRINT "ERRC=";
ERRC;" LINE=";LINN :: BREAK
1020 INPUT "ENTER WHEN READY
:":RDY$
1030 CALL PEEK(-31954,L1,L2)
:: CALL PEEK(ADDR(L1*(256)+L
2)-4,L1,L2):: CALL LOAD(ADDR
(L1*(256)+L2)+2,LIN1,LIN2)
1040 RETURN 150
```

```
                      1986
    JANUARY              FEBRUARY
S  M  T  W  T  F  S    S  M  T  W  T  F  S
         1  2  3  4                      1
5  6  7  8  9 10 11    2  3  4  5  6  7  8
12 13 14 15 16 17 18   9 10 11 12 13 14 15
19 20 21 22 23 24 25  16 17 18 19 20 21 22
26 27 28 29 30 31     23 24 25 26 27 28
     MARCH                 APRIL
S  M  T  W  T  F  S    S  M  T  W  T  F  S
                  1          1  2  3  4  5
2  3  4  5  6  7  8    6  7  8  9 10 11 12
9 10 11 12 13 14 15   13 14 15 16 17 18 19
16 17 18 19 20 21 22  20 21 22 23 24 25 26
23 24 25 26 27 28 29  27 28 29 30
30 31
      MAY                   JUNE
S  M  T  W  T  F  S    S  M  T  W  T  F  S
            1  2  3    1  2  3  4  5  6  7
4  5  6  7  8  9 10    8  9 10 11 12 13 14
11 12 13 14 15 16 17  15 16 17 18 19 20 21
18 19 20 21 22 23 24  22 23 24 25 26 27 28
25 26 27 28 29 30 31  29 30
      JULY                 AUGUST
S  M  T  W  T  F  S    S  M  T  W  T  F  S
      1  2  3  4  5                1  2
6  7  8  9 10 11 12    3  4  5  6  7  8  9
13 14 15 16 17 18 19  10 11 12 13 14 15 16
20 21 22 23 24 25 26  17 18 19 20 21 22 23
27 28 29 30 31        24 25 26 27 28 29 30
                      31
   SEPTEMBER              OCTOBER
S  M  T  W  T  F  S    S  M  T  W  T  F  S
   1  2  3  4  5  6             1  2  3  4
7  8  9 10 11 12 13    5  6  7  8  9 10 11
14 15 16 17 18 19 20  12 13 14 15 16 17 18
21 22 23 24 25 26 27  19 20 21 22 23 24 25
28 29 30              26 27 28 29 30 31
    NOVEMBER              DECEMBER
S  M  T  W  T  F  S    S  M  T  W  T  F  S
                  1       1  2  3  4  5  6
2  3  4  5  6  7  8    7  8  9 10 11 12 13
9 10 11 12 13 14 15   14 15 16 17 (18) 19 20
16 17 18 19 20 21 22  21 22 23 24 25 26 27
23 24 25 26 27 28 29  28 29 30 31
30
```

Remember that the

December meeting

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!EXP. DATE_____!
!SIGNATURE_____!
-------------------------------------------------
```

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Continued From Page 4

add more programs to the routine. Two lines after the KPREP symbol, you'll see a command "LI R4,>3100". That's the ASCII code (in hex) for "1". You'll have to load registers 7-15 with the hex ASCII codes for 3-9. Next you'll have to put a CB R7,R1; R8,R1 ... with a JEQ following each one telling it to jump to a symbol you create. The symbol should have the commands just like the CLOAD and TLOAD symbols do..from MOV R11,@SAVRTN to JMP CLOSEF. All of that should be under the symbol YOU create. That should be all you need! Good luck, and I hope you enjoy it!

(Looks like someone added Donkeykong after Jim Rice wrote the article. Thanks to Punn, Portland, Oregon, for this article from their 2/85 newsletter. Thanks, too, to Joe Brooks, DVUG for typing this in for our enjoyment. Editor.)