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Created by Jim Ferr  
Frank Kucharski, and Scott Johnson

Public domain version 3.0

Warp SIX bbs

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# Read Me First

Public domain version 3.0  
March 2017.  
Prior version (2.5) released on June 23, 1994.

## ABOUT WARP SIX BBS

Warp Six BBS is a full featured bulletin board program written in "normal" AppleSoft BASIC, with modem drivers you "CALL" to do modem related things. This makes Warp Six BBS easy to modify to suit your needs. To make full use of Warp Six BBS, you should have some familiarity with AppleSoft BASIC and some experience editing AppleSoft programs and short text files on disk. Please take note that the documentation included with Warp Six BBS does not attempt to teach you how to program. However, programming is not necessary to get your bulletin board online -- it is advantageous when you are customizing your system.

Warp Six BBS was written during the summer of 1985, and the original Warp Six BBS went online September 12th of that year. Since that time, Warp Six BBS has been re-written and improved on countless occasions. On August 1st, 1992, Warp Six BBS was placed into the public domain by its original author, Jim Ferr. This means you don't have to pay any shareware fee and you can do with the software whatever you wish. Warp Six is still being improved now and then by Jim and by the sysops who use it, who continue to write modifications and suggest improvements.

A note from Jim  
I am grateful to the Warp Six sysops that made shareware and freeware contributions over the years. It is to those individuals that the public domain releases are dedicated. Please note I cannot accept shareware fees or donations, and my support will be limited to answering questions sent by mail or electronic mail. The software is provided "as-is" without any warranty whatsoever.

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### HOW TO UPDATE FROM VERSION 8.0 OR LATER TO PD VERSION 3.0

Please read the READ.ME file included with the UPDATER program. It will explain in detail how to do the update on a working system.

## PUBLIC DOMAIN VERSION 3.0 CHANGES

Driver changes:

* Added support to connect to the BBS system over the internet
* Users with security level 8 can now see locked files
* Added ANSI auto-detect support
* Added an increased delay when modems connect to allow better detection of emulation codes (PSE and ANSI)
* Moved externals to the ProDOS /RAM disk

Program changes:

* Users can now logon with their NAME or their ID# (for those infrequent callers who manage to lose their account info, logon as a new user, and then page you 50 times because they're not validated and can't get their mail…)
* We have added a forum queueing feature which allows users to select which forums they will read during a Quickscan or continuous Quickscan. You set the queue from the utility menu and after that your deselected forums will be skipped during scans. All forums are still active when you visit them manually.
* Added support for co-sysop security level (SL8). This gives the co-sysop(s) access to most of the sysop features but not all of them.
* Added support for a second password for co-sysops. It is a DIFFERENT one from the sysop remote password. When a co-sysop is upgraded to SL8, the system will prompt them for their new security code the next time they logon. There is also an option in the SYSOP.UTIL program for co-sysops to change their security code.
* Added a guest account for users who want to take a peek before logging on. Also for those "one time callers" who logon, look around, and decide not to call back, but neglect to let you know they don't plan to call back.
* Added a search function in the SYSOP.UTIL program to find a user by full name, partial last name, or alias. If searching by name it will display alias and ID# upon a successful find, and visa-versa.
* Added a "sysop doing user maintenance" feature which allows the sysop to enter the SYSOP.UTIL program while a user is online. Just activate the keyboard, and press Closed-Apple-Return at the main menu prompt. This is very nice for validating users on-the-spot when you have caller ID on the phone line.
* Sped up the routines that search for usernames and aliases when replying to mail and sending private mail from the forums.
* Added support for sending mail to a user’s ID# as well as their name or alias.
* Added support for replying to one of a LIST of sysops or co-sysops with the report to sysop command. A list is created in much the same style as the DATA.F files. ANY users can be added to this list, even if they have a security level lower than 8.
* Added a carbon copy feature when sending mail, replying to mail, or sending a private response from the forums. Carbon copy also supports ID#s.
* Added some memory management to all of Warp Six using the STORE and RESTORE commands that Jim spoke of in earlier versions.
* Split the WARP6.BBS file in half to make room for some of the features in this list. The new file that was "spawned" is named W6.MESSAGE. It contains all the E-mail and forum routines.
* Rewrote the SORTER program so it uses a shell sort instead of a bubble sort. This DRAMATICALLY shortens the time a sort takes. The user list is saved in either a 2 column (real names) or 4 column (alias) list. The sort command was moved to the sysop utilities (where it really belonged to begin with, IMHO). The sort routine no longer has to restart the system after a sort. You are returned to sysop utilities.
* Purge will now ask you for the maximum security level to consider. If you enter "2" then all users with SL3 and higher will be skipped regardless of how stale the account may be. This helps reduce the number of manual purges you must do. Just assign an SL higher than the purge value for friends and VIPs that you want permanent.
* COPY.UTIL has been modified and integrated into the sysop utilities. It supports copy, move, delete, lock, and unlock on BATCHES of files. Files can be selected from a list by number instead of typing them in manually.
* Updated the "waiting for logon" screen. It has a new look and some new information. The sysop no longer has to logon to see if there is mail. The screen shows how much mail is waiting and how much is new.
* Added a door game path to SYS.DATA. A door game launcher is now included. It is much simpler to add a door game to the BBS. You can disable the launcher if you don't want games.
* Modified flag entry in REC.DATA to be 15030, as a flag to indicate this system supports version 3.0 or later. UPDATER will make this change when you update from an earlier version.

## PUBLIC DOMAIN VERSION 2.5 CHANGES

Driver changes:

* Updated the answer routine in the GS.Driver to support connect result codes for 38400 and 57600 bps. Tested this with a Hayes Accura 288 V.FC + Fax. This may work with another modem if it reports '28' for CONNECT 38400 and '18' for CONNECT 57600. The IIe driver still supports a maximum speed of 19200 bps. I have discovered that although 38400 bps does not work with a normal IIgs running at 2.8 MHz, it works fine when using a TransWarp GS at 6 MHz. In other words, to use 38400 or 57600 you will need to accelerate your IIgs. If you try any other type of accelerator (ZipGS?), let me know if it works; Applied Engineering went out of business recently.
* Scott Johnson reported a cosmetic bug in the Xmodem receive routines. They were not resetting the "retries" count for the sysop display between files. This has been fixed.

Program changes:

* Updated system to support 400 users instead of 200. Changed the "200" to "400" in lines 1060 and 1850 of ADD.USER and line 8040 of ADD.A.FORUM to support this. To use version 2.5 with an existing system, you must run the BBS, get into Sysop.Utils, enter P for ProDOS command and enter:

CHAIN FORUM.UPDATE,@1000

* The FORUM.UPDATE program will explain itself and run with your okay. The program must be located in your BBS root directory (by default, /HD1/WARP6/BBS), so it can read SYS.DATA to get information on your forums. This will add capacity for additional users to your existing forums. Otherwise, as soon as any user with an ID greater than 1200 hits a forum, its system error time.
* Modified the Add.User program to give all new users one letter waiting. The system uses the COPY module to copy the "NewUserMail" file from the LOGS directory to the EMAIL directory with the correct filename for the new user. You can modify the NewUserMail file in the LOGS directory to be your generic welcome in E-Mail for new users. Also modified Add.User to force new users to enter their ID number and password when entering the system for the first time. These changes were suggested by Neal Layton.
* Added a quick hack of a utility called QUICK.SYSOP to the EXTRAS directory. You can run this program to set up fresh USERS and REC.DATA files, to start your user file from scratch. It must be run from the LOGS directory where the USERS file is located. You can change the variable assignments to customize your sysop record or do it the way I describe in the “Trouble” section of this manual.
* Modified flag entry in REC.DATA to be 17777, as a flag to indicate this system supports version 2.5 or later. The flag is used by the FORUM.UPDATE program to determine if it needs to run or not. In other words, the FORUM.UPDATE program will put this flag in REC.DATA after it is run, and if you try to run it again it will inform you that you have already updated.
* By request, I have disabled sysop (security level 9 users, really) immunity to the normal timeout. As sysop, if you call in remotely and sit idle, you'll get hung up on by the system with the best of them.
* I've added an option when downloading to automatically log you off after a download is complete. This was also by request. Thanks, Frank!
* Another sysop (Ken Gagne, I believe) reported the COPY.UTIL's input routine hadn't been converted to the CALL M3$ method; this has been fixed.
* I noticed that my E-Mail welcome message in PD version 2.4 was present, but the sysop's user record did not indicate a letter waiting, so most users will have missed reading it. It was there in the EMAIL directory. This has been fixed in version 2.5.

## PUBLIC DOMAIN VERSION 2.4 CHANGES

Program changes:

* Went back to the old method of getting input into the first string variable in memory, instead of named variables. Changed all routines at line 100 and 130 (in all BASIC programs) to do a CALL M3 (as before) and I$=MID$(RI$,1) to return input to I$ instead of "CALL M3,I$". I found some problems too difficult to fix with the named string method, so rather than leave the reliability of the system in doubt, I've gone back to the old method. This info only has ramifications to those who have made modifications to the system.
* Fixed a minor bug in Add.User that refused to let a new user not interested in the system from "not continuing".

## PUBLIC DOMAIN VERSION 2.3 CHANGES

Driver changes:

* fixed bug in word wrap.
* Removed dial routines to save memory.
* Updated GS.Driver to support 38400 bps maximum.
* Updated Xmodem RECEIVE so it ALWAYS locks received files. (Previously it would not lock files uploaded by anyone with security level 9.)

BASIC program changes:

* fixed calls today bug in LOGON program.
* updated version number in wait for call screen.
* In WARP6.BBS, fixed sysop mailbox limit when user sends E-Mail by name instead of R)eport to sysop.
* Fixed serious GOSUB bug that orphaned the "Leaving last forum/returning to main" message.
* In SYSOP.UTIL, fixed a minor problem.
* In XFER.UTIL, fixed minor problem I had already issued a fix for after the release of version 2.2.

## PUBLIC DOMAIN VERSION 2.2 CHANGES

Driver changes:

* Found a bug in new named string feature; when remote user times out, failed to move TXTPTR to the next statement, resulting in an Error 16 at line 100 and the dreaded, "A system error has occurred..." Fixed this bug.
* Removed "Answering..." from answer routine. It now simply says "Ring." And then answers the phone. This was done to save memory in the largest driver, the GS.Driver, which just fits into the same space we've been using since version 8.9.

Program changes:

* Renumbered some lines in LOGON (3000-3999 back to 2000-2999) and modified the reference to LOGON in the ADD.USER program so it chains to line 2000 again.
* Added code to LOGON to POKE an initial timeout of 1 minute at the ID number prompt (line 1410), and back to 4 minutes after the user has entered his/her password. On leaving LOGON, the timeout is set to 2 minutes to catch people with auto-logon macros who walked away from their computers. This means that the first time they get to the Main command prompt, the timeout is still 2 minutes. The timeout is reset to the system default of 4 minutes in Warp6.BBS at line 8010. (To change the timeout, do a "POKE BA + 62,1", where the 1 is the number of minutes. 30 seconds from expiry time, a "Hello" warning is printed. If no response is received, the system hangs up and resets.)

## PUBLIC DOMAIN VERSION 2.1 CHANGES

Driver changes:

* Fixed a bug in XModem receive that caused the ProDOS extension to fail every time. The old code was checking the CRC low byte first, but the new CRC routines store the high byte in that location, so the CRC would never match.
* Updated the drivers to support input to named strings, so instead of doing a CALL M3 to get input, you can do CALL M3,I$.

## PUBLIC DOMAIN VERSION 2.0 CHANGES

Driver changes:

* Updated all drivers for use with high-speed modems with support to 19200 bps with hardware handshaking. Tested with Hayes ULTRA 96 only. Other modems will also work but you'll have to figure out the correct commands for your Modem.Init file. (More on this in Modem section)
* Completely re-wrote the IIGS interrupt handler for speed. It can handle Xmodem 4K uploads from a caller connected with a 9600 bps modem using LAPM data compression (CARRIER 9600, CONNECT 19200) without losing data.
* The Super Serial Card driver will not do hardware handshaking due to a bug in the ACIA 6551 chip, so you'll have to configure your modem to disable error control and handshaking if you are using the Super Serial Card. Due to Super Serial Card limitations, I recommend you don't attempt to run the system at speeds greater than 9600 bps.
* Eliminated the GS.HSKi driver and support for oddball GS modem cables. Your cable must now conform to the specs for the remaining GS.Driver, using GPi for carrier detect. (See Modem section for pinouts.)
* Added functionality to the upper case convert flag to do lower case conversion. To get a line of input in lower case, do a POKE UC,1 before doing your GOSUB 100 or 130. Make sure you do a POKE UC,0 or POKE UC,255 to set it to full case or upper case after you are done.
* Added functionality to the hidden mode, used for password entry. Currently it echoes \* characters as the user types his or her password. To shut off echo altogether, use POKE MD,1 instead of POKE MD,255. Hidden mode (without echo or with asterisk echo) is automatically shut off after use - you don't have to explicitly do a POKE MD,0 to shut it off before getting a line of normal input.
* \*\* The two additions above were added for those interested in making Warp Six appear more like a Unix system... an exercise left to the student at this point. :)
* Re-wrote the GS.Driver to save a lot of space in memory and tackle the Zilog 8530 more efficiently. Thanks to Greg Schaefer, author of ProTERM, for assistance in this. Here's a plug for ProTERM, from InTrec Software, at (602) 992-1345: it's the best Apple II terminal program in existence. And it will soon be a Macintosh program.
* Fixed video driver support to permit full 80 column lines without cursor or scrolling problems. The default video width is now set at 79 characters, but the built-in TYPE command can display 80-character files. This was done in preparation for Internet access, which I am working on now and then. (No promises!)
* Updated error messages in the WARP6.LOADER programs to be nicer when exiting. For instance, if you launch the GS drivers on a IIe, you'll get a polite error message, and the program will ask you to "Hit Return to exit". When you hit return, it will return to the calling program, i.e. your program selector or whatever.
* Updated check for AppleTalk active on the IIGS so it now will detect the Apple II EtherTalk card, which was never released. Due to heavy interrupt activity, Warp Six BBS is not compatible with AppleTalk and will not run when it is active; a polite error message is displayed and then you are returned to the launching application or ProDOS program selector.
* The Hayes hang-up flag is no longer used. The driver first tries hanging up with DTR, then does the Hayes hang-up. Your users will only see the familiar +++ sequence if your cable/modem does not support DTR hang-up.

Program changes:

* Modified the LOGON program to support high speed modems with the addition of the following three lines:

50 POKE BA + 47,3: REM 1=300 bps 2=1200 3=2400 4=4800 5=9600 6=19200  
55 POKE BA + 449,255: REM 255=Match bps to incoming calls, 0=Fixed bps  
60 POKE BA + 450,0: REM RTS/CTS handshaking off. 255=on

* To enable the drivers for high-speed modems, you must POKE in a higher default baud rate in line 50 of LOGON. You also have to do a POKE to enable hardware handshaking (line 55) and if you wish, to force the driver to talk to the modem at a fixed baud rate (line 60). It is preferable not to use a fixed baud rate to talk to the modem if possible; on the Hayes you add the S36=5 command to the Modem.Init file to accomplish this. As well, in Modem.Init you must enable hardware handshaking on the modem if you wish to use it. (On the Hayes the &K3 command does this.)
* Here is the recommended Modem.Init for the Hayes ULTRA 96. Similar modems will have similar requirements:

AT&F&K3E0V0S0=0S7=45  
ATX4S36=5H0  
AT&C1&D2

* Added a copy utility to the system. To enter it, get into System Utils and type P for ProDOS command, then CHAIN COPY.UTIL@1000. There is no syntax checking as you enter filenames, but error checking will report any problems if you make a typo. The copy utility can copy any file that ProDOS 8 can manipulate except a directory.
* Fixed problem in line 100 of most BASIC programs that could cause Open-Apple-L to logoff to loop forever.
* Updated documentation files to be readable with AppleWorks 2.x instead of requiring AppleWorks 3.0

# New features and bug fixes for Warp Six version 3.0

* Moved the assignment of variables XA and FF to LOGON from XFER.UTIL to make updates a bit more painless in the future.
* Added some memory management to the entire BBS. It now saves a base set of variables needed to operate while a user is online and if a portion of the BBS creates a bunch of new variables (many games...) or fills up arRays (mail and forums) the BBS can now clear those from memory before moving on.
* Users can now logon by name as well as ID#.
* There is now an optional guest account with a 20-minute time limit. The sysop can select an unused account to be set up with security zero and set the system for read only in selected forums so new users can peek around before applying for an account. This cuts down on validating those "one-time users" looking for files or whatever.
* Added some intelligence to the logon procedure. It will now prompt users in some cases, such as if they select the wrong ID# by mistake. After trying their password 2 times, it will ask if they are "user x" and if not, they can re-enter their ID#. If their account was purged for inactivity, it will notify them of the possibility and asK if they wish to apply for a new account. If yes, they will be sent directly to ADD.USER.
* Added ANSI auto-detect at logon. You must still supply ANSI screens and necessary basic lines for any screens you want to add yourself just like with PSE. ANSI uses the PS flag. 0=no emulation, 128=ANSI, 255=PSE.
* Added a slightly longer pause before answering a call and before the BBS receives control back from the modem driver. This is to fix some problems "some" modems have when attempting to auto-detect PSE and ANSI. It also gives any Caller ID device you have on the BBS line time to receive the CID info between the first and second ring.
* Added a co-sysop security level (SL-8). SL-8 can now see locked files, has access to sysop utilities, and each user with SL-8 has an individual remote password separate from the sysop's.
* "Report to sysop" now supports a mutiple name list to include your co-sysops. You can include users with security level lower than 8 also.
* Added "sysop doing user maintenance" feature. When a user is online and at the MAIN menu prompt, pressing OPTION (or Closed Apple) while pressing return at the local keyboard will send the sysop to the sysop utilities. While there, the sysop has access to any functions in the menu plus a couple. Pressing "+" or "-" with this feature will increment or decrement the online user's security level by one (each time it is pressed). The user is given a polite message and asked to wait. They do NOT see the sysop working. The user is notified when the sysop returns (quits from Sysop utilities). Real nice for instant validation when you have a caller ID box on the BBS line.
* Added a "Locate user" function to sysop utilities. You can search on a user's alias, real name (last or last and first), or partial last name (contains "xxx"). Returns name, alias, and ID# for any matches.
* The sysop can copy a user to a new ID#. If you need this, use it with caution for obvious reasons.
* Purge will now ignore users with security level above a selected number (default=2). The sysop selects the level they wish EACH time purge is used. This allows users to have permanent accounts if you wish. Much less manual purging necessary.
* Added a file copy command to SYSOP.UTIL. It was in version 2.5 but you had to chain to it using the ProDOS command. Now just select from the menu. It supports BATCH copy, move, delete, lock, and unlock. Files are selected by number. 20 file maximum to each batch.
* Moved the menu command for SORT user list to sysop utilities where it really belonged anyway. Rewrote the sort routine for more speed. It now uses a SHELL sort instead of the old reliable (but S-L-O-W) BUBBLE sort. User lists will be sorted alphabetically by name or alias based on the alias flag for your BBS. Real names are formatted to 2 columns. Aliases are formatted to 4 columns.
* Added a forum queue feature. Users can select which forums they wish to read when using Quickscan or Continuous Quickscan. Users can still manually enter any forum they wish regardless of their queue selections. This feature works with 20 forums. If you have more forums than this the BBS won't crash but the user's queues will be ignored. You will be prompted when you attempt to add forum number 21.
* There is now an alias flag for EACH individual forum. If you have an alias system, you can have a real name forum for serious discussion.
* User selectable screen clear (or not) between each message in the forums.
* Fixed a bug in the forums. If a user tried to MAIL a reply from the same message twice, the BBS would log them off with an error #5.
* Users can now send mail to another user's ID#. Much faster than sending to a username. The ID# doesn't need to be searched for.
* Users can now send multiple carbon copies in email. Send carbons to usernames, aliases, or ID#s.
* Added a door game prefix to SYS.DATA and a door launcher program is included.
* Changed VALIDATION date to FIRST date on the system. This field is no longer updated when a user is validated. This allows a "flag" of sorts to see if a user account has been purged and taken over by a new user. This was needed to reset some of the new features in version 3.0 for a new user. Also good for game scores.
* Added some info to the caller status block at the top of the sysop's screen when a user is online.
* Modified the "waiting for call" screen. Now shows sysop mail waiting and how much new. I got tired of logging on just to check my mail.

I was working on a feature to attach files to mail but ran into some problems. It will not be included in version 3.0, but MAY be in a future release.

Frank Kucharski was working on the file transfer stuff and had a very hectic schedule when work on 3.0 was being done. His changes weren't going to be done in time for version 3.0 but we planned to release a new version when he was done. The project was abandoned, and Frank has sadly passed away since then.

Jim Ferr is working on the drivers and all assembly portions of Warp Six. He has made quite a few changes but not a lot of it is not real evident to the users. The biggest thing you will see is the file list in the transfer section. It is now displayed in 2 columns. Hopefully we will have this released by Christmas. (didn't happen...) I need to finish debugging, write an updater program, update the help files, and rewrite the documentation. Basically, all the fun stuff... :(

Scott Johnson - Warp Six development team member

\*\*4/20/2017 - I'm finishing this project now upon learning that a Warp Six sysop has figured out a way to put Warp Six on the internet!

# Getting Started

## Introduction

Warp Six BBS comes preconfigured to run from a single ProDOS volume like a hard disk or 800K floppy. If you are in a hurry to try the system, make sure the volume name you put the Warp Six files on is called "/HD1." As supplied, Warp Six BBS has modem-disabled drivers so you can try the system without worrying about a serial interface or modem. Warp Six requires an Enhanced IIe or a IIgs.

If you want to put the files on a volume that will not be named "HD1", change all occurrences of "/HD1" in the SYS.DATA file to the name of your hard disk. The SYS.DATA file is in the WARP6/BBS directory. If you need more information or would like to run Warp Six BBS on multiple volumes, please refer to "Setting Up Pathnames" later in this document.

Figure 1: Warp Six Files and Directories

* Startup - short Applesoft program to start the BBS (the startup program in the BBS directory will also work, if you have a clock.)
* /Warp6 - directory containing all BBS subdirectories
* /BBS - the BBS programs and menus
* /Xfer - file transfer section programs and menus
* /Logs - holds user files and system logs
* /Help - system help files
* /Gen - "general files"
* /EMail - holds private electronic mail
* /Library - empty data library
* /Doors - Door game launcher files and any door games
* /Warp6.Info
  + /Docs -- contains the documentation
  + /Drivers -- contains "live" modem drivers
  + /Extras -- extra utilities

Everything under the /Warp6 directory is required by the system when it is running, with the exception of the contents of the Library directory. The files under the /Warp6.Info directory do not have to be available when the system is running and therefore can be safely stored anywhere you desire.

## Adding ProDOS and BASIC.System

Before running Warp Six, you need to have ProDOS 8 and BASIC.System. These files are not supplied, as that would entail paying Apple Software Licensing a yearly fee, and this software is now in the public domain. Warp Six is written in AppleSoft BASIC under ProDOS 8 and can be started from any volume that contains the files PRODOS and BASIC.SYSTEM, or from the Finder on the Apple IIGS.

As of this writing, the current version of ProDOS 8 is 2.0.3 and BASIC.System is 1.5. It is usually best to use the latest version available, but Warp Six will function with older versions.

## Hardware Requirements

Computer  
Enhanced Apple IIe with extended 80 column card (128K minimum RAM) or Apple IIGS (any ROM version)

Clock  
A ProDOS compatible clock is almost essential. If you don't have a clock in your system, Warp Six BBS will run anyway. The startup program will prompt you to set the ProDOS date, but time limits will not be enforced, and the system will need the date manually entered every day. Note: If you have a IIGS, you have a built-in clock and don't need to add any hardware. Warp Six BBS does not access clock hardware directly, so it is fully compatible with all clocks that ProDOS can recognize or be patched to recognize.

Memory  
Warp Six works in the main 64K of your IIe and stores some essential files on the 64K RAMdisk which ProDOS automatically creates. It works on the IIGS without the addition of any memory card.

Disk Storage  
ProDOS mass storage device, for example, a 800K drive or hard disk. A hard disk is highly recommended. A CFFA3000 is also a good choice.

Serial Interface  
Warp Six BBS requires a built-in modem port of a IIGS or an Apple Super Serial card or fully compatible card. Warp Six BBS \*may\* work with the Applied Engineering Serial Pro or the Applied Engineering DataLink 2400, but it has not been fully tested with these products.

Modem  
Warp Six BBS is designed to work with Hayes and compatible external modems up to 19200 bits per second (bps) with the Super Serial Card or equivalent, or up to 57600 bps on a IIGS that is accelerated, or 19200 on a IIGS without an accelerator. If your modem is "fully" Hayes compatible, you should not experience any problems, provided you follow the recommendations in this document. See the “Read Me First” and “Modem” sections.

The DataLink 2400 should work with the SSC.Driver. DataLink owners should read Modem.Doc for jumper and switch setting information. The DataLink 1200 is not supported by Warp Six BBS.

A Raspberry Pi running TCPser can be used as a modem to connect over the internet. There are more details about this in the “Modem” section.

Cable  
You absolutely must have a custom cable for your external modem to work with Warp Six BBS. This isn't as difficult as it may sound, and the cable is compatible with other software. You might be able to use an existing cable or modify an existing cable. There's no need to worry about this until you are certain you will be running a Warp Six BBS. Feel free to explore the system before hacking apart your modem cable. You can refer to the “Modem” section at any time for the gruesome details.

## Configuring Warp Six BBS for your hardware

### Apple IIe Enhanced

No special configuration is required. Your IIe must be enhanced and contain an Apple Extended 80 column card, any version.

If your IIe is not enhanced, it will not work with Warp Six. To determine if your IIe is enhanced, watch the top of your screen when booting. If you see "Apple //e", you have an enhanced unit; otherwise you will just see "Apple ][". The IIe Enhancement Kit is Apple part number A2M2052. It may be hard to find, so you might have to order the necessary chips separately. In fact, it may be cheaper to buy them separately. Here are the individual Apple Service part numbers:

Part # Description Coordinates on logic board

342-0304 CD ROM D8

342-0303 EF ROM E8

338-6503 65C02 CPU B4

342-0265 Video ROM F4

### Apple IIGS

To use Warp Six BBS on a IIGS (any ROM version up to the current ROM 03), set your Control Panel so that slot 2 is "Modem Port". The actual modem port settings in your Control Panel do not matter.

## Personalizing your BBS

When you launch a new bulletin board system (or change an existing one), you want to make it your own creation as much as possible. First, you should choose a name for your system, and edit the SYS.DATA file to change the name from the default "Another BBS" to the name of your choice. Your system's name is very important, as it may be the only thing to distinguish your BBS from tens of other bulletin boards in your calling area. The name you choose should be relatively short and unique. Commas and colons cannot be contained in the system name.

The system name should fit into phrases like "Welcome to <system name>" and "Thank you for calling <system name>" as these phrases are used automatically by the system at logon and logoff. You may want to consider where the various names you are toying with fit into an alphabetical list of bulletin boards in your area. (This probably explains why so many system names start with the letter "A"). Such considerations may seem trivial - maybe they are! Once your system is established, you will get new users by word of mouth without any effort on your part.

You'll need a text editor or word processor such as Apple Writer // 2.1 (ProDOS) -- now freeware, or a similar program to edit ASCII text files. (Take a look in the data library included -- I may have included a freeware program of some description.)

When editing the SYS.DATA file, keep in mind it has a set structure. Each line is a "field," used for a set purpose. DO NOT ADD ANY COMMAS OR COLONS to the SYS.DATA file, as those characters are recognized as "field separators" when the system is using the Applesoft BASIC "INPUT" command to read the file. Here is the definition of the SYS.DATA file structure:

SYS.DATA, type TXT (normal text file)

RT$ Root Pathname for system (where programs & menus located)

FP$ Forum dir pathname (where FORUM.n dirs located)

EP$ Email dir pathname (where EMAIL, UPLOADS, GEN & HELP dirs. located)

LP$ Logs dir pathname (where user files and logs are found)

TP$ Where transfer section programs and menus are found

DP$ Door games pathname (all things door game related)

SN$ System Name (you choose this yourself)

SP$ Sponsor name or logoff message -- not used but can't be empty

RP$ Remote Password (Sysop only)

HR$ Hours/baud rate/phone number of system

FC Forum Count: total # of forums (Do not modify)

CD$ Current date in ProDOS format

CT Call Total for System (Updated automatically)

GU Guest user account number (default '9999' is inactive)

IMPORTANT: The pathnames must start with a slash, but not have a trailing slash or any trailing spaces. Pathnames should be in upper case only. The remote password (REMOTE) must be in upper case and not be longer than 7 characters. Do not modify the forum count field; the BBS maintains this number. The guest user feature defaults to inactive. There will be instructions on how to activate it later if you wish.

Here is what the SYS.DATA file looks like, as supplied:

/HD1/WARP6/BBS

/HD1/WARP6

/HD1/WARP6

/HD1/WARP6/LOGS

/HD1/WARP6/XFER

/HD1/WARP6/DOORS

Another BBS

an adventure in online communications.

REMOTE

(905) 555-1212 24 hrs. 300-57600 bps

0

23-JUN-94

0

9999

Here is a list of other "free form" text files to personalize, with some comments. You should ensure each line ends in a carriage return and does not exceed the screen width most of your callers will use (usually 80 columns.)

BANNER - file displayed at logon before caller is prompted for ID

BANNER.PSE - displayed at logon if caller has ProTERM Special Emulation (\*)

BANNER.ANSI - displayed at logon if caller has ANSI Emulation (\*)

SYS.NEWS - this file is shown to callers at logon

ABOUT.US - tell users about your BBS, for the A)bout this BBS menu item

AGREEMENT - user agreement; modify to suit your needs

NEW.INFO - tells new users about your BBS when they logon as 'NEW'

(\*) You will need documentation for the codes required for these emulations and a text editor capable of using control codes embedded in the text. These files should not be altered unless you know what you're doing.

For the next few paragraphs, I'll be describing small changes you make to some of the supplied BASIC programs to set your preferences. I must assume you know how to load, edit and save Applesoft BASIC programs. If you don't, please consult a friend, user group, manual or book on AppleSoft BASIC before attempting any changes.

Will you be running an alias system which allows users to sign in with a fake name or "handle," or a "normal" system where people are expected to use their real names? To activate aliases, you must edit the following line of the LOGON program. The variable AF should be set to 1 for aliases, or 0 for real names:

1010 AF = 0:BE = 1:CL = 3:LL = 15:TL = 10:VW = 79

In the same line, you decide if you want to hear a beep or a quiet speaker click when a user selects the Y)ell for sysop command. The variable BE stands for beep. If BE=0 then it will always click; if BE=1 it will beep during normal hours and click after hours assuming you have a clock (otherwise the system thinks it is 12:00 am all the time). The hours for beep versus click are set in line 8500 of the Warp6.BBS program:

8500 ON NOT BE GOTO 8520: GOSUB 5300: IF VAL (LEFT$(T$,2)) < 9 OR VAL(LEFT$(T$,2)) > 22 THEN 8520: REM No beeps before 9 am or after 10 pm

The times to start and stop beeps are in the "IF VAL" statement. The values 9 and 22 represent 9:00 am and 22:00, ie. 10:00 pm. You can set longer or shorter start beep / stop beep times to suit your needs.

Also in line 1010 of the LOGON program, the variable LL defines the maximum number of letters a user can receive before the system reports their "mailbox is full" (LL = 15, i.e. letter limit is 15 letters). The sysop's mailbox is reported full after it has 2 times LL letters in it.

Also in the same line (this is a good line to know about!) is the call limit per user per day in variable CL, as in how many is the maximum number of calls a normal user can call the system on the same calendar day without getting logged off with a message. The default is "CL = 8", i.e. 8 calls per day maximum, which is generous. Some users like to call three or four times per day and logoff quickly; others do everything in one shot, so the call limit is a very subjective setting. Warp Six does not have control over how many minutes per day a user can use. Your timing controls are limited to user time limit, calls per day limit and the idle timer - which is described in elsewhere in this document.

Finally, the starting time limit is 10 minutes and the full screen video width is 79 characters. These values should not be changed. In particular, 79 characters is the maximum video width supported if you want word wrap to look good on the sysop screen. The starting time limit is only used during the logon process and for new users signing on.

A bit of an explanation of security levels: Unvalidated "new" users have level 0. Validated users have level 2. Levels 3 to 7 you can use any way you like, to limit access to various forums or transfer data libraries, level 8 is co-sysops, and level 9 is Sysop. No one is immune to the inactivity timeout. A timeout is when no input is given for about four minutes. After the timeout period has expired, the system will send a brief message and a "beep" as a warning. It will then disconnect if the user does not respond within 30 seconds. In the system detail log, such calls will have a result code of 2. (RC=2). Here is an example:

# 3433 On 29-JAN-92 21:00 for 00:05 ID 1023 : LAZY JANE RC=2 BR=3

The BR=3 means the baud rate of the call was 2400 (1=300, 2=1200, 3=2400, 4=4800, 5=9600, 6=19200, 7=38400, 8=57600). At high speeds, all calls will appear to come in at your maximum bps rate, as Warp Six only reports the connect speed, not the actual carrier speed. You can view the detail log by entering a caret (^) at the main menu.

User time limits are defined in lines 2030 to 2080 of the LOGON program. The method used as a default sets TL to 30 (time limit equals 30 minutes) and adds 10 more minutes if the user is a "member," an extra 5 minutes if the user has posted more than 10 bulletins (public messages), another 10 minutes if the user has posted over 50 bulletins, and an extra 5 minutes if the user is calling at 300 baud. You can, of course, change the base time limit and the method for adding extra time under various conditions.

Do you want to give new users instant read-only access to your system, or do you want to lock them out completely until they have been "validated"? In line 1920 of the ADD.USER program there is a "GOTO" statement which gives users instant read-only access. If you delete this line or make it a REM statement, users will be told to call back in a few days. You must also edit line 1810 of LOGON -- it is currently a REM statement. To lock out new users who call back until they are validated, the line should read:

1810 IF SL = 0 THEN PRINT:PRINT"Sorry, you aren't validated yet.": GOTO 5000

Also in ADD.USER, line 2150 controls how many messages will be "new." Messages in each forum are numbered consecutively from 10,000 and go up from there. The variable RL holds the message reference number the user "read last." The statement RL = LB - 2 will make 2 messages new. If you want the user to have 10 messages new per forum, change the 2 to a 10.

2150 RL = LB - 5: IF RL < FB THEN RL = FB: REM Make 5 msgs new in each forum

In addition, you can activate a new user survey at line 2500 of ADD.USER, by changing the entire line to a REM statement.

2500 REM RETURN : REM New user survey (REM entire line to enable)

The new user survey asks users what source referred them to your BBS, and appends the answer to a file called NEW.SURVEY in your /Logs directory.

## Logging On for the First Time

Ensure you have the ProDOS date set (or a ProDOS compatible clock installed). Boot your system from the /HD1 volume or double-click on the STARTUP program from the Finder. When STARTUP runs, it will prompt you for the date if you don't have a clock, then it will start the BBS. You can use your own hard disk menu program if you prefer.

When the BBS title page comes up you will see "Awaiting Call Number 1." Log on by entering Open Apple-L (hold down the Open Apple key and hit the L key, then let go of both keys). When prompted to enter your ID number, enter 1000 and press RETURN. After a moment, the system will ask for your password. Until you change it, the password is SYSOP. Passwords are not case sensitive, as the system stores them in upper case and converts password input to upper case before comparing what you typed and what is stored in your user ID (you will see asterisks as you enter your password). If you make a mistake, hitting the left arrow or DELETE keys will allow you to backspace. Typing Control-X will erase the entire line and let you start again.

If you are logging on remotely (via modem), you will also be prompted for the remote access code. The code is 'REMOTE' until you change it (the remote access code is set in the SYS.DATA file).

## Installing "live" Modem Drivers

Although the bulk of Warp Six BBS is written in the standard AppleSoft BASIC, BASIC is not flexible enough to support fast I/O (input and output) and protocol file transfers. These tasks are left to assembly language, which is extremely fast. Warp Six BBS requires two binary files called WARP6.LOADER and WARP6.DRIVER to be present in the system's program or "root" directory. (As supplied, it is /HD1/WARP6/BBS).

To install a live modem driver, first delete the modem-disabled WARP6.LOADER and WARP6.DRIVER from the WARP6 directory, then select the live modem loader and driver that applies to you and copy them to the WARP6 directory. Ensure that you then RENAME either or both files so they are called WARP6.LOADER and WARP6.DRIVER. To copy files, use a ProDOS file utility such as System Utilities, Filer, Cat.Doctor from ProSel, Copy2Plus, or something similar.

Reminder: in the Warp6 directory, the WARP6.LOADER and WARP6.DRIVER as supplied are modem-disabled. You can always restore the modem disabled drivers from the original ShrinkIt file that contains the system.

There are two "live" modem drivers:

* GS.DRIVER, the driver for the IIGS modem port
* SSC.DRIVER, for the Apple Super Serial card (or equivalent)

Each driver requires the appropriate loader program:

* SSC.LOADER, the loader for the SSC.Driver
* GS.LOADER, the loader for either of the GS drivers

If you have an Apple Super Serial Card or Applied Engineering DataLink 2400, copy the following files from the DRIVERS directory to the /HD1/WARP6/BBS directory:

* SSC.LOADER -> copy and rename as WARP6.LOADER
* SSC.DRIVER -> copy and rename as WARP6.DRIVER

As noted, the driver you select must be renamed as WARP6.DRIVER so the system can find it. If you plan to use a IIGS and external Hayes or compatible modem via the IIGS built in modem port, copy the following files to the /HD1/WARP6/BBS directory:

* GS.LOADER -> copy and rename as WARP6.LOADER
* GS.DRIVER -> copy and rename as WARP6.DRIVER

The GS drivers always use the modem port and will check your Control Panel settings and advise you if any changes are required. Under "Slots" set slot 2 to "Modem Port." The port's actual settings don't matter and can be left as they are. Your IIGS system speed should be set for "fast" mode for use with the IIGS driver. The driver will insist you shut off AppleTalk, as it causes the modem port to lose data. If you have an accelerator, use it. There should not be any compatibility problems.

Reminder: If you have a DataLink 2400 in your IIGS, use the SSC.DRIVER.

### Setting the modem's maximum baud rate

Rather than write five or six different modem drivers, there is only one for each interface. They are both set for a default speed of 2400 baud or "bits per second" (bps). If you are using a normal 2400 baud modem without any form of error control (V.42bis a.k.a. LAPM or MNP) then this is fine. If your modem does have error control and you want to use it, you must modify these lines in the LOGON program:

50 POKE BA + 47,3: REM 1=300 bps 2=1200 3=2400 4=4800 5=9600 6=19200 7=38400 8=57600

60 POKE BA + 449,255: REM Match bps to incoming calls. 0=Fixed bps

70 POKE BA + 450,255: REM RTS/CTS handshaking on. 0=OFF

To enable the drivers for high speed modems, you must POKE in a higher default baud rate in line 50 of LOGON. You also must do a POKE to enable hardware handshaking (line 70) and if you wish, to force the driver to talk to the modem at a fixed baud rate (line 60). It is preferable NOT to use a fixed baud rate to talk to the modem if possible; on the Hayes you add the S36=5 command to the MODEM.INIT file to accomplish this. As well, in MODEM.INIT you must enable hardware handshaking on the modem if you wish to use it (on the Hayes the &K3 command does this).

Do a "SAVE LOGON" when you are done. Make sure you select the highest baud rate your modem can support, i.e., the highest DTE speed up to 19200, or higher if you have a IIgs with an accelerator.

If you are using a Super Serial Card in a slot other than slot 2, add the following line to the LOGON program, changing the number to reflect the slot the interface is in.

Note: you cannot change the slot from slot 2 when using a GS driver -- it is "hard coded" to work only with the modem port, so changing this will have no effect.

85 POKE SM,7: REM Sets modem slot to 7

Please refer to the MODEM section for precise information on modem and cable requirements.

Line 1020 in LOGON contains the DIMension statements for two string arrays. The first one, TI$(), is used for data library names and pathnames, and has 10 elements plus the zero element, which isn't used. If you want to have more than 10 transfer data libraries, increase the value in the DIM statement so it will be DOUBLE the number of libraries you will need. If you need 15 libraries, dimension 30. When you run out of space you will get an error trying to enter the transfer section. Here is line 1020 as supplied:

1020 DIM TI$(20): DIM MS$(86)

The second array, MS$(), is used to hold lines entered in the message editor. You should not attempt to change this value.

Summary of Changes you can Make to the LOGON Program

The following lines in the LOGON program control various aspects of the system. These lines can be edited to suit the system operator; most of them have already been described here. I include the complete list for your reference.

50 POKE BA + 47,3: REM 1=300 bps 2=1200 3=2400 4=4800 5=9600 6=19200 7=38400 8=57600

60 POKE BA + 449,255: REM Match bps to incoming calls

70 POKE BA + 450,255: REM RTS/CTS handshaking on. 0=OFF

1010 AF = 0:BE = 1:CL = 3:LL = 15:TL = 10:VW = 79

1020 DIM TI$(20): DIM MS$(86)

## Other Enhancements to Your System

Users can now choose who to send mail to when using the report to sysop command. The file named SYS.LIST contains the names of any co-sysops or users of ANY level who you wish to be included. As shipped, this file contains only the SYSOP. The format of the file is much the same as LIB.DATA for the libraries. This is what SYS.LIST looks like.

1  
SYSOP  
1000

The first line is how many names in the list. Following that are all the names. The last portion are the ID numbers of the users in the list. After adding more names, it might look like this.

4  
SYSOP  
John Doe (librarian)  
Jane Doe (new user validations)  
Harry MacGillicuddy (user group contact)  
1000  
1381  
1055  
1212

Warp Six will check how many names there are, display them for the user to choose from, and get the ID number of the user to send the mail to. It will allow a double sized mailbox so there is less chance of a "full mailbox" message when a user uses R)eport to sysop.

There is a guest account built into Warp Six now. This allows those "one-time callers" a way of looking around without using up system resources. It also saves a lot of time validating users who don't plan to call back. To activate the guest account, you simply log on as a new user and enter the information as follows:

Alias: GUEST  
Last name: USER  
First Name: GUEST

The BBS doesn't use anything else util you get to hotkeys. Enter anything you like until you get there. I recommend setting hotkeys OFF for the guest account but it's up to you. The system doesn't use a password for the guest account so enter anything to get past the prompt. Make a note of the ID# the system assigns.

Now change the last field in the SYS.DATA file (9999) to the ID number the system gave you. THAT'S IT! Note: Do not validate this account!

Guests will be asked for their name when they logon (reported in the user log), have a 20 minute time limit, and have a permanent 5 new messages in every forum. In all other respects they are a normal unvalidated user.

There is now built in support for online door games in Warp Six. To enable the door launcher program, read the documentation included here DOOR section. It will explain how to modify WARP6.BBS and how to go about installing the games you want online. We are working on a game pack to compliment Warp Six. It will include most, if not all, of the games that will presently run online. You will need to read the docs that come with each game to fully understand how to install some of them. Games such as Taipan and TriviaMaster have small programs that are designed to run at night to update score files. These are the hardest to install if you want them to run automatically. The games will run without them usually, but without scores what's the point?

## File Specifications

Bytes per field (including carriage return) are in parentheses ()

USERS, type TXT Record Length=175

Each variable in this file has two names, one for the "main" user, i.e., the one currently online, and one for the "aux" user, which is used for editing users in SYSOP.UTIL. For instance, the ID number is stored in the variable ID or UI.

ID/UI User ID number. Always R+1000. (5)

PW$/UP$ Password (8)

N1$/N3$ First Name (16)

N2$/N4$ Last Name (21)

UA$/AU$ Alias (18)

A1$/A3$ City (20)

A2$/A4$ Province/State/Country (3)

PH$/TE$ Phone number, nnn-nnn-nnnn (13)

FD$/DF$ Date First on (10)

LD$/DL$ Date Last on (10)

LT$/TL$ Time last on (5)

XU/X1 number of uploads (5)

XD/X2 number of downloads (5)

TD/DT calls today (2)

UH/HU user hot key setting 0=off/255=on (4)

SL/US Security Level (0-9) defined: (2)

0 = unvalidated/guest

1 = devalidated

2 = validated user

3-7 = whatever use you desire

8 = co-sysops only

9 = sysop only

MT/UT Machine Type. defined: (2)

0 = undefined

1 = Apple // or compatible

2 = Macintosh, Mac XL or Mac Plus

3 = IBM or compatible

4 = Other

BP/UP Bulletins posted (5)

ME/MB Membership flag, 0=off, 1=on (2)

TM/UM Total Mail waiting (3)

TC/TK Total Calls made (5)

Per Record Total: 21 fields, 174 bytes, 0 spare, 1 for EOR marker.

REC.DATA, type TXT

LR Last Record used in USERS file (0-200)

15030 Dummy field, indicating system has been updated to PD version 3.0

MODEM.INIT

Holds initialization strings for the modem. The first line is sent to the modem "blindly", and the driver waits one second and clears its buffer before sending subsequent lines, if any. Subsequent lines must be responded to by a '0' (OK) digital result code from the modem or the driver will return a DEVICE NOT CONNECTED error to the BBS, which will result in a beep and the message, "Modem not responding!" on the sysop screen. Each line must terminate with a single carriage return. Extra carriage returns will cause the same error.

### FORUM DIRECTORIES

INTRO, type TXT

This file is TYPED upon entry into a forum

DATA.F, type TXT (set up by the Add.a.Forum module in Sysop.Utils)

FM$ Forum name

ES Entry security (min.) 0-9

WS Write security (min.) 0-9

MO Members only flag (0-1)

BL Bulletin limit - max. number of messages in this forum (4-9999)

FD Auto-delete 1st message if FD=1, forum is full if BL reached and FD=0

FB refnum of 1st msg. posted in this forum

LB refnum of last msg. posted in this forum

TT total number of messages in this forum

FA Is alias allowed in this forum (0=real name only,FORUM 1=alias)

DATA.U, type TXT L=6

RL last bulletin read by each user, indexed by record number where R=ID-1000

Filenames for messages are in the following format:

"M"+"."+STR$(CB)

E.g., M.15844, where 15844 is the reference number of this message. CB stands for "current bulletin".

BULLETINS

The first few fields compose the bulletin header. The FROM field is INPUT into memory for the Post reply and reply by E-mail feature. Below is the header format:

(Blank Line)

From | JIM FERR

To | All

Subj | Bulletin header format

Date | 01-JUN-94 21:14

Code | xx

(Blank Line)

Message text.

GEN Directory

F.DATA Holds name of file section and number of sub-sections

TITLES Menu of sub-sections

Fn Subdirectories F1 to Fwhatever hold actual general files

GEN/Fn Directories

F.DATA Holds name of section and number of files

TITLES Holds menu of files

Fn Files F1 to Fwhatever are the files themselves.

EMAIL Directory

Like bulletins, but filenames are M.1000.1 where 1000 is the ID number and 1 is the letter number. Below is the E-mail header format:

(Blank Line)

From | JIM FERR

Subj | Private letter

Date | 02-JUN-94 21:14

Code | xx

(Blank Line)

Message text.

(Reports to sysop are identical except the name is followed by a comma and the user's ID number and the words "Private letter" are replaced with "Report to sysop".

### Modifying System "Time-out" Defaults

Timeout values can be modified with POKE statements which you can add to the LOGON program. There is no need to modify the timeout values if you add a hardware accelerator, as Warp Six BBS uses vertical blanking for timing, and this is unaffected by acceleration. Below are some lines you could add to the LOGON program to change the timeout values. The values shown here are the DEFAULT values -- they are already set in the driver so there is no need to add these lines to LOGON unless you want to change these defaults:

91 POKE BA+62,4 : REM Set timeout to 4 minutes

92 POKE BA+63,180 : REM Set wait after Control-S to 180 seconds

93 POKE BA+64,60 : REM Set time between modem OK checks to 60 seconds

As of Warp Six BBS version 8.8, timeouts use the vertical blanking signal to maintain accuracy. This means that adding an accelerator does NOT require you to change timeout values. (Hooray!)

### Programming Modifications

If you are a glutton for punishment, you can make modifications to the system. Just keep in mind the following caveats. Have a backup copy of the original unmodified program in a safe place and make incremental backups during your modifications so that if any unexplained bug should occur, you can simply go back to an older version. Test all changes thoroughly for unexpected bugs before subjecting them to your users.

To make a major addition you should write additional programs which can either be run or CHAINed from the main program. A good example of this technique is the SYSOP.UTIL program. There is more information on common modifications in the Sysop section. And now for some details…

#### Getting Input

Before getting input, do the following:

* POKE VI,x, where x is the maximum length of characters you want to accept. A value of zero will only accept a carriage return. The video width is preset to 80 columns - 2 and is stored in VW.
* POKE UC,0 to enable full upper and lower case.
* POKE UC,1 to convert characters in range A-Z to lower case.
* POKE UC,255 to convert characters in range a-z to upper case.
* POKE MD,255 to echo asterisks when taking input. (This is the hidden mode and is generally used to take password input. Hidden mode is automatically shut off when the user presses RETURN.
* POKE MD,1 to NOT echo when taking input.
* POKE HK,UH to enable hot keys if the user has the hot keys option turned on. Hot keys are automatically disabled after each character returned (the character is always terminated with a system-generated carriage return) so if you want hot keys, you ALWAYS have to POKE HK,UH before doing your GOSUB to get input.

A neat feature prevents the character the user typed as a hot key command from being displayed. You can then print an entire word at the touch of a key, as is done in the forum module. Use POKE HE,0 to disable hot key echo. You have to explicitly enter POKE HE,255 to enable hot key echo again. With echo off, you have to do a little more programming in BASIC to make the system "look" normal. (This feature can be a little slow and may disappear in the future, so let me know if you make use of it.)

* CALL M7 to clear the modem input buffer if you wish. Most times this is not desirable. The only time it might be useful is if the system has just performed a lengthy operation and the user may have hit a key accidentally or line noise may have resulted in character being generated.
* PRINT a prompt, for example PRINT : PRINT "Enter your name : "; (Note the semicolon. It is necessary to suppress the carriage return in your prompt.)

Note that the options above (except for the hot keys and mode flags) will remain as you last set them, so it is not always necessary to do each POKE.

After setting the above options, do a GOSUB 100 to get a line of input with time limit active. If the user is out of time, he or she will be logged off. If the user has five minutes or less time remaining and hasn't already been warned the system will print a message indicating the time remaining. To get a line of input with time limit ignored, do GOSUB 130. Note: time limits are only checked when the user hits Return. The system can still "time out" (and automatically disconnect) if the user doesn't enter any characters for a long period.

When control returns from GOSUB 100 or 130, the user's input will be in I$. If CR=1 then the user pressed RETURN. If you wish, do a GOSUB 170 to check for commas, colons or dashes. Then if EE=1 the user did enter one of these, so do a GOSUB 190 to reject the input, and then GOTO the line requesting the input again. (Assuming you don't want commas, colons and dashes - if you are writing the input to a random-access file, for example.)

It is possible control will not return after a GOSUB 100 or 130 to get input, if the caller drops carrier (ie. hangs up) or a control-K (kill command) is issued from the console or if the caller times out and the system disconnects. The input routine will automatically branch to the logoff code if this happens. The system is designed to fully recover after any premature disconnection and will fully save the user's stats before getting another call.

#### Output

As already mentioned, you can simply use PRINT statements to send output. In addition, there is the built-in TYPE command, which will read standard ASCII text files to the current output, filtering all unwanted control characters. All text output to the modem (either from the TYPE command or PRINT statements) is normal ASCII with the high bit clear.

E.g. PRINT D$"TYPE MY.FILE" will dump the contents of MY.FILE, regardless of its contents. D$ is set to CHR$(4) at the beginning of LOGON. The D$ is required whenever issuing a ProDOS command.

IMPORTANT NOTE: DO NOT USE ANY PR# COMMANDS AS YOU WILL DISCONNECT THE OUTPUT ROUTINE THE SYSTEM USES TO SEND DATA TO THE MODEM. (SEE EXCEPTION BELOW.)

You should never ever use IN# and input to get user input. Use GOSUB 100 or 130 exclusively. Getting input via in# and 'input' would leave your system wide open to hackers in the unlikely event of a crash. The machine language input routines must be called to get input. This provides the ultimate in security for your system: in the event the system crashes, the remote user can't input anything. With Warp Six, the INPUT statement is only used for reading text files.

There is only one output option: the private flag. If you do a POKE PF,255 before sending output, the output will only go to the modem (if active). Doing a POKE PF,0 reverses this condition. The system uses the private flag to ensure E-mail is not displayed on the console screen. Thus, you as sysop cannot read user mail unless you read it directly from disk, which is considered to be in poor taste (not to mention against the law in some areas) unless you display a prominent message telling users you will be monitoring E-mail. Note that mail directed to the sysop WILL be displayed. (There is a BASIC routine in W6.MESSAGE that handles this.)

#### Printing a Message to Your Printer

You can add a routine similar to the one below to print a text file to your printer. Add this routine to Warp6.BBS and when anyone with level 9 types an X at the forum prompt, the current message will be printed. (The routine prints the file held in the variable F$.) You can add this to any program, at any line number you wish. Ensure you don't leave out the PR# command (shown below in line 840).

810 PRINT D$"PR#1" : REM Print to printer interface or port in slot 1

820 PRINT CHR$ (9) + "80N": REM Interface card setting

830 PRINT D$"TYPE ";F$

840 PRINT D$"PR#A$8D00": REM Return control to the Warp Six driver

850 RETURN

#### Displaying the Time Remaining

To show the user the time left in a system prompt, add the following to the line that displays the prompt:

ABS(PEEK(EM)-TL);" mins. left : ";

This will display the time remaining. Note: user time limits are not enforced during message posting, or E-Mail entry. After saving the message, the next time the user hits Return he or she will be logged off if the time limit has been exceeded.

To halt program execution hit Control-Reset. Control-C will merely cause an error #255, which will be trapped and logged by the system. You can stop the system if you hit Control-C several times when BASIC is printing text. (Some programs will stop execution with the message "Sysop Break", but not if you are calling remote, for obvious reasons.) Because the system uses interrupts for modem input, an interrupt handler is allocated. Use the Quit command (Control-Q) to properly deallocate the interrupt handler and disable serial interrupts.

Check your error log frequently. (Hit # at the main menu.) You shouldn't experience many errors in normal operation.

##### Appendix A: Local commands

Active while awaiting a call:

Open Apple-L :local logon/logoff toggle. Typing Open Apple-L while the system is waiting for a call lets you logon from the keyboard. Hitting Ctrl-L while you are logged in at the keyboard is like dropping carrier, i.e.. hanging up. The logoff command works just as well; I use Open Apple-L when I'm in a hurry (for instance, I see the AA LED on my modem flashing, indicating someone is calling the system.

Open Apple-Q :quit program (disables interrupts, and removes handler)

Active while user online:

Open Apple-A :(keyboard toggle) has been removed.

Open Apple-C :sysop online/offline toggle for chat

Open Apple-K :kill call (hangup on remote caller without warning)

Closed Apple-RETURN: Gives user "Sysop doing system maintenance..." message and pauses their connection. The local system goes to SYSOP.UTILS. Upon quitting SYSOP.UTILS, control is returned to user.

##### Appendix B: Inside the "Driver" Files

Warp Six "Drivers" are binary programs responsible for handling communication between the BBS and the modem, keeping track of user time limits and various other tasks. (Only one driver can be active at any one time.) The system uses the driver through AppleSoft's "CALL" command. For example, the statement CALL M6 hangs up the modem. If you wish, you can write an entirely new BBS in AppleSoft BASIC using the Warp Six drivers. (Enjoy yourself!)

The driver is loaded into memory in an area protected from AppleSoft; the AppleSoft variables M0 to M7 define the location of routines in the driver. (These are defined at the beginning of the LOGON program.) If you will be making customizations to the system, some knowledge of the driver routines will be helpful. Below is a listing of the driver routines that can be called from AppleSoft:

Name Description

M1 Sets up the driver for use. Call this routine before any others.

M2 Waits for call or local (keyboard) command. (See "Local Commands".)

M3 Main input routine. Returns input to first variable in memory.

M4 Saves the time that the current call began. (Used for time limits.)

M5 Updates ProDOS date and time internally. (Calls MLI Get\_Time.)

M6 Displays copyright message and hangs up modem.

M7 Clears any characters from the modem input buffer.

M8 Disable all interrupts and remove interrupt handler \*

M0 Sends the MODEM.INIT file to modem, to set it up for Warp Six.

(\*) The M8 routine is for the convenience of those who would like to exit from Warp Six BBS without quitting to ProDOS. To completely remove Warp Six from memory, you should CALL M8 and then CALL 48888, BASIC.System's FREBUFR command. Once this is done, the modem driver and interrupt handler are completely removed from memory, and you can run any program you wish. Note: after the driver has been removed, you should not attempt to make any driver CALLs, naturally. Of course, you can still use the standard method of quitting Warp Six: hit Open Apple-Q at the wait for call screen.

TYPE  
Must be called from Basic.System like any other ProDOS command. E.g. PRINT D$"TYPE PATHNAME". The text file will be displayed to the screen and modem depending on whether a user is online, and how the private flag is set. Xon/Xoff is accepted during TYPE - users can pause with Control-S and resume with Control-Q or Return or Spacebar. Also, TYPE doesn't care what file type it displays; it will merrily display binary and directory files if you tell it to, but it filters the data so only printable ASCII comes out.

SEND  
Sends a file via Xmodem or Ymodem with the parameters set by POKEs (see Xfer.Util)

RECEIVE  
Similar to SEND but initiates Xmodem receive.

COPY  
Implementation of a ProDOS copy command. Can copy ProDOS 8 files (except directories). Enter the copy utility from Sys.Utils.

#### Libraries

With transfer data libraries, your bulletin board system becomes a repository of valuable information, public domain and shareware programs. As system operator, you decide how many data libraries will be on your system, and what their names will be. You also control access to the data libraries, including the security level and minimum baud rate required to enter each library and to upload in each library. Your first step in setting up your transfer section is to create the Lib.Data file.

The Lib.Data File  
The system's LIB.DATA file tells the system how many libraries you have, what they are called, and where they are located (in terms of ProDOS prefixes). LIB.DATA is in the system's root directory: /HD1/WARP6/BBS.

LIB.DATA is a standard ProDOS text file consisting of several lines of text. The first line contains a number that tells the system the total number of data libraries you have. Then there is one line holding the name of each area. Finally, the ProDOS prefix to set for each area is listed, each on a separate line, in upper case with no trailing slash. Here is an example of a properly written LIB.DATA file:

4  
Apple II Data Library  
Macintosh Library  
Science Fiction Contributions  
Apple II Technical Notes  
/W62/LIB/APPLE2  
/W62/LIB/MAC  
/W62/STORIES  
/DEV.CD.6/ESSENTIALS/TECHNICAL.DOCS/TECH.NOTES

As you can see, the file has a structure. The BBS reads the file's contents line by line. The first line contains the total number of libraries. In our example, the system sees a "4" in the first line, so it knows to read 4 library names followed by the 4 ProDOS prefixes to set for each library, respectively. The system doesn't create these directories - they must already exist and be on a ProDOS volume that is available when the BBS is running. You can create the library directories yourself, or just enter pathnames of existing directories containing files you want to become data libraries. In ProDOS terminology, each library is a "sub-directory", but I tend to call them "directories".

Caution: ensure you do not include any commas or colons in the names of the libraries. You should probably enter the ProDOS prefixes in UPPER CASE, although it isn't strictly necessary with later versions of BASIC.System.

Let's say you've set up the LIB.DATA file like the example above. When a user enters the transfer section, they are asked what transfer section to open (1 through 4) and can send a question mark to see the list of library names -- names which you previously entered in the LIB.DATA file.

The Optional Prefs.D File  
Within each library, the default "access privileges" will apply unless you create a Prefs.D file and save it in the library you want to have access privileges that are different in any way from the system defaults for the following things:

* the minimum security level the user must have to enter the library (default=0)
* what security level a user needs to upload files to the library (default=2)
* whether or not the library is restricted to members only (default=0)
* what is the minimum required baud rate for downloading (default=1)

If a PREFS.D file for the library is not found, the system defaults will apply: the system will allow all users entry to the library, including new unvalidated users, and "non-members", but will require level 3 access for uploading. As well, callers at all baud rates (300, 1200 and 2400) can download files.

If these defaults are to your liking, there is no need to create a PREFS.D file (There is a sample PREFS.D file in the "WARP6.INFO/EXTRAS" folder). You may have PREFS.D files in some libraries, but not in others. You can even define libraries on read-only volumes like CD-ROMs. Naturally, as a CD-ROM is read-only, you can't create PREFS.D files for CD-ROM data libraries, so the system defaults will apply. So, what if you don't like the defaults? You can change the defaults: they are defined in line 1040 of the Xfer.Util program, located in the Warp6/Xfer directory. The variables defined are the same as in the table after the next paragraph.

(CD ROM Note: There is a problem with old versions of ProDOS 8 and CD ROM volumes you need to be aware of. Symptom: user tries to upload a file to a library on CD and gets a message stating uploads cannot be accepted to a "locked volume". When the user does any operation that requires writing data to disk (e.g., logoff, send E-Mail, post a message) the system gets another write protect error, and crashes. Solution: daisy chain the CD ROM from a hard disk that contains at least two ProDOS partitions. If the hard disk has only one partition, the bug may cause this problem with Apple SCSI Cards. I am not sure if third party cards are affected. ProDOS 8 version 2.0.1 and later fixes this problem, but the offending code still exists in Apple SCSI card ROMs, so the problem will STILL OCCUR with Apple SCSI cards UNLESS you have daisy chained from a hard disk with more than one partition.)

PREFS.D File specifications:

ES Line 1: Entry security level (default is 0 \*\*)

WS Line 2: Write (upload) security level (default is now 2)

MO Line 3: Members only flag (0=everyone, 1=members only)

RB Line 4: \*\* New \*\* Required baud rate to download via Xmodem in this library, where 1=300 baud (default), 2=1200 baud, and 3=2400 baud. Caution: if you set this value higher than 3, NOBODY will be able to download files.

Each line must terminate with a carriage return. You can place comments at the bottom of the file after your prefixes are defined; Warp Six only reads the lines it needs. Here is an example file:

0

2

0

1

Comment: level 0 can enter, level 2 can upload, non-members okay, 300 baud ok. Baud rates: 1 = 300, 2 = 1200, 3 = 2400.

The first zero is line 1 of the file. The "comment" is also part of the file and is ignored by the system. Commenting the files will help you remember which lines mean what.

Users can list available files, get file descriptions and download, view or even upload, if they have the required security level. When listing files, the system does not display the following kinds of files:

* Files of type FND and DIR
* Files that are locked (shown only to level 8 and 9 users, with \* prefix)
* Files with names ending in ".D" (used for file descriptions)
* Files with names ending in ".H" (used to record # of times downloaded)

When anyone uploads a file, it is automatically locked by the system. This is a security measure to permit you (or any co-sysops you have) to ensure the uploaded file does not break any copyright laws and is the kind of thing you want on your system, and in this data library.

It is interesting to note that although the file is NOT visible to normal users using the L)ist files command, if any user knows the filename he or she CAN download the file. This can come in handy if you, the sysop, have a file for just one user. You can lock it and send e-mail giving the filename and which library to download it from.

To make a file visible to users without level 8 or 9 access, enter P for ProDOS command and UNLOCK FILENAME. To make a file invisible, enter P for ProDOS command and LOCK FILENAME. You can see a catalog of all files by entering P for ProDOS command and then doing a CATALOG or CAT.

When L)isting files, those with level 8 or 9 access will see the locked files as well as the unlocked ones. Each locked file will have a \* character to the left of its filename.

The .D files are description files and the .H files are "history" files used to keep track of how many times a file is accessed, i.e.. successfully downloaded or fully viewed. For example, if a user uploads a file called TREK, the system will ask the user for a description of the file and save it as TREK.D and will create a new history file and call it TREK.H. Here is the format of the .D "description" files:

line 1: Uploaded on 03-JUN-94 by JIM FERR.

line 2: (blank)

lines 3 to end: description of the file.

Note regarding .D and .H files: when a user uploads with Binary II active, the system strips off the Binary II header on the file and saves the file to the name in the Binary II header. Hence, TEST.BXY becomes TEST.SHK. If the user specified TEST.BXY as the filename, the description file will be named TEST.BXY.D and the history file will be named TEST.BXY.H. You as system operator will have to rename such problem files or else users will not see the description, and you'll have an "orphaned" history file wasting disk space and preventing others from uploading a file of the same name.

Macintosh files uploaded with MacBinary II headers will be listed as type MAC, which is really type $F2, meaning "user filetype number 2". The system tags all files received with MacBinary II headers as type $F2 and displays them with the L)ist files command as type MAC. Since the MacBinary header is saved as part of the file, when a Mac user downloads it, the attributes are sent, just like in Binary II.

##### Adding Files to your Libraries

You can make a library out of any ProDOS subdirectory, whether it already contains files, exists on a read-only volume like a compact disc or resides on normal read/write media. With locked volumes of any kind, history files are not created, and the default library preferences apply. Also, uploads are refused with a polite message.

You will probably want to compress files with ShrinkIt or ShrinkIt GS before placing them in your libraries, assuming they are Apple II files. When using ShrinkIt, it is best to add the Binary II header to the file to prevent inexperienced users from downloading it without any attributes intact.

##### Removing Files From Your Libraries

You can use the convenient R)emove command to delete any file. It will take care of deleting the file's description and history files (FILENAME.D & FILENAME.H) as well.

Note: You may find it useful to alphabetize your library directories now and then or sort them by date or some other criteria, as they will get cluttered with .D and .H files. Naturally, end users won't see these files as they must use the L)ist files command, and you won't see them unless you enter the ProDOS CAT or CATALOG command, or view the directory from outside Warp Six.

##### Enforcing Time Limits for Downloading

The system comes pre-configured to ignore time limits when downloading except:

* Downloads that will take more than 3 hours are refused (line 6160)
* During prime time, downloads that will exceed time limit refused (6170 & 6200)

Below are the lines you can modify if these settings are not to your liking:

6160 IF SL < 8 AND INT (T / 60) > 180 THEN PRINT : PRINT "More than 3 hours? No thank-you.": GOTO 1300

6170 CALL M5: IF PEEK (49043) < 17 OR PEEK (49043) > 19 THEN 6210

6180 IF SL < 8 AND INT (T / 60) > ( ABS ( PEEK (EM) - TL)) THEN PRINT : PRINT "You only have " ABS ( PEEK (EM) - TL)" mins. remaining.": PRINT "Insufficient time to download.": GOTO 6200

6190 GOTO 6210

6200 PRINT : PRINT "During Prime Time (17:00 to 19:00 EST),": PRINT "time limits on downloads are enforced.": GOTO 1300

Line 6170 defines prime time, and line 6200 tells the user when prime time is in effect.

##### Temporarily Disabling Your Data Libraries

To disable your data libraries, change the first line of your LIB.DATA file so it is a zero. The system will politely inform anyone without level 8 or 9 access that the data libraries are currently unavailable. Level 9 users will be able to navigate to any directory desired.

### DOOR

DOOR.LAUNCHER is a game menu and launcher for the Warp 6 BBS system. Starting with version 3.0 it has been incorporated right into the BBS.

The following files are needed for DOOR.LAUNCHER to function properly:

* DOOR.LAUNCHER
* DOOR.MENU or DOOR.MENU2 (the file must be named DOOR.MENU)
* DOOR.DATA

To deactivate DOOR.LAUNCHER, REM line 9950 in WARP6.BBS.

To install games on Warp Six, all your games must be in a folder of their own and each of those folders within the DOORS folder. The name of each game folder is not as important as the location. You need to set the path where your door folder resides in SYS.DATA. The default is DP$="/HD1/WARP6/DOORS"

The DOOR.MENU file is the menu that is displayed to the user in DOOR.LAUNCHER. DOOR.MENU2 is just a little fancier. Choose the one you want and name it DOOR.MENU. You must modify this menu so it contains a numbered menu of the games in your system.

The DOOR.DATA file is the file which tells DOOR.LAUNCHER how many games you have, where your games are located, and how to run them. The lines are defined as follows:

* The first line contains the number of door games you have installed.
* Each line after that corresponds to a numbered menu choice. These lines are separated into 3 parts with asterisks (\*).
  + The game folder's name
  + The filename of the program which starts the game
  + The line number to CHAIN to (usually 1000)

The default DOOR.DATA file is as follows:

1

BJ\*BLACKJACK\*1000

DOOR.LAUNCHER will return you to the BBS if line #1 is set to zero. This is a nice feature to shut the games off temporarily. You need to make the appropriate changes to the DOOR.DATA file and the DOOR.MENU file to fit your system before you can run your games.

The door launcher has the capability to launch more than one game in succession without returning to Warp Six after each game. To do this you need to modify the line in all your door games where they quit back to Warp Six. Change that line to be like the one shown below. Instead of chaining back to WARP6.BBS as a game would normally do, set the prefix to DP$ and chain to DOOR.LAUNCHER at line 2000. The following line assumes that "Q" is the game's quit command. The line number shown here is meaningless since the line could be anywhere in all the different games that are available.

10000 IF I$="Q" THEN PRINT D$;"PREFIX "DP$ : PRINT D$"CHAIN DOOR.LAUNCHER,@2000"

This line will replace or modify the line your game normally quits with. DOOR.LAUNCHER will report your users entering games, returning from them, and what time it was in the Warp Six DETAIL.LOG. To disable this, put a REM statement at the beginning of lines 1105 and 2020 in DOOR.LAUNCHER.

This program is adapted directly from a public domain launcher by David D. Miller (just.dave on GEnie). It is mostly his code. I merely modified it to make it a little more versatile and changed the READ.ME file you are reading to reflect my modifications. Jim Ferr also deserves credit for writing the Warp Six BBS system to begin with. Portions of his code are included as well.

## Sysop

### Setting up a Vote

The vote commands are listed in the sysop portion of the main menu. The system is designed to allow users to vote on one issue by selecting from a numbered menu which you create. Users vote by typing V to vote at the main menu. The system won't let a user vote twice. You inform users a vote is in progress (either by posting a message on a forum or in SYS.NEWS) so that users will know a vote is in progress.

To compile results at any time, use the compile results command, which is the equal sign. The results are saved in a file called 'RESULTS'. To view the results, get into Sysop.Utils and type P to enter a ProDOS command, then 'TYPE RESULTS' (without quotes).

To disable the vote when it has been completed, edit the Vote.Data file so that the first line of the file is contains a zero (0) followed by a carriage return. You could also permanently disable voting by deleting the Voter program from the BBS directory. The system will simply state the voting module is not available if users enter the V command.

### Adding/Changing General and Help Files

As mentioned, the general and help files are kept in the Email directory for the system, in the GEN and HELP directories. The Help file section is only one level deep, while the General file section is two levels deep:

* HELP-----F.DATA (holds name of section and number of help files)
  + INDEX (menu of available files)
  + F1
  + F2
  + and so on for each help file.
* GEN------F.DATA (holds name of area and number of subsections)
  + INDEX (subsection menu)
    - F1-------F.DATA (holds name of section & number of files in it)
  + INDEX (menu of files in this section)
    - F1
    - F2
* and so on for each Gen file. F2-------F.DATA (holds name of section & number of files in it)
  + INDEX (menu of files in this section)
    - F1
    - etc.

The F.DATA file holds FM$, which holds the file section or subsection name, as well as TT, the total number of files (or subsections). Nesting only occurs in the GEN directory, and only one level deep. The INDEX file holds the menu of the files or subsections. The files or subsections are named F1, F2 and so on. Files are always text files; subsections are always directories.

To mount a new file, increment TT in the F.DATA file by one (using a word processor or text editor), and add the name of the file to the INDEX menu. Then save the file under the appropriate file name; F5 for example, if it will be the fifth file in the INDEX menu. You will need some sort of file copy utility. (I recommend Glen Bredon's ProSEL as a good low-cost set of valuable utilities.)

To mount a new section, increment TT in the GEN/F.DATA file and add the section name to the GEN/INDEX file. Then create the section directory, Fn, where 'n' is the section number, and create an F.DATA and INDEX file in that directory, holding the section name, number of files, and menu.

I commonly do these activities remotely, getting into the Transfer section and entering P for ProDOS command and then PREFIX /W6/GEN/F2 for example, to get into general file section two. I then upload new files via Xmodem and use the C)reate text file option in Sysop.Utils to change the Titles and F.DATA files. Once you are familiar with the file formats, it's quite easy to do.

### Adding Forums to the System

There is a recommended maximum of 20 forums but you can add more if you desire. If you do choose to add more than 20 forums to your system, the forum queue feature will quit working. The system will not crash but will operate just as it did in version 2.5.

Adding forums is easy, because the process is menu driven. Choose A)dd a forum from the sysop utilities (accessible by entering \* from the Main command level). You will be prompted for the forum's name, e.g. The Main Forum, the minimum security level required for entry (usually 2), and the minimum security level required to write bulletins (again, usually 2). (Level 0 is unvalidated, 1 is de-validated, 2 is normal, 3-7 are for your use, 8 is co-sysop and 9 is sysop.)

You will be asked to set the bulletin limit, which will determine how many bulletins can be posted before one is automatically deleted. Each forum can hold hundreds of bulletins to a maximum of 9999. (The bigger the directory, the longer it will take ProDOS 8 to find each message, as messages are stored in separate files.) Feel free to experiment with the maximum number. A typical value would be 300.

Next, you will be asked which bulletin you'd like to be deleted when the limit is reached. With PD version 1.0 and later, you may not set this higher than message number 1. If you leave this at zero, messages will not be deleted when the maximum is reached, and the system will report the forum is "full", and you or your co-sysops (if any) will have to delete bulletins using the D)elete command before new bulletins can be posted in the forum that is full.

Forums contain a number of data files. The INTRO file is the opening message users see when entering the forum. (Note that they don't see this when using Quickscan.) The DATA.F file holds information about the forum. Finally, the DATA.U file keeps track of the highest bulletin number each user read last, for new, Quickscan and spool. See the file descriptions for more detail.

Here is the description of the DATA.F file, also described in Warp6.Doc:

DATA.F, type TXT (set up by the Add.a.Forum module in Sysop.Utils)

FM$ Forum name

ES Entry security (min.) 0-9

WS Write security (min.) 0-9

MO Members only flag (0-1)

BL Bulletin limit - max. number of messages in this forum (4-9999)

FD Auto-delete 1st message if FD=1, forum is full if BL reached and FD=0

FB refnum of 1st msg. posted in this forum

LB refnum of last msg. posted in this forum

TT total number of messages in this forum

FA Alias flag for forum. 1=aliases allowed. 0=real name only

To delete a forum, you must remove its menu item from the FORUM.NAMES file and delete all the files in the forum. Then you must rename any forums necessary, so they are all in sequential order from FORUM.1 to FORUM.n, where n is your last remaining forum. Finally, decrement the forum count variable (FC) in the SYS.DATA file. Example: If FC has a value of 4, change it to a 3 in the SYS.DATA. Please note: if you enter a new copy of the SYS.DATA while online, you must restart the system from the Sysop.Utils by entering P for ProDOS command and '-LOGON' (no quotes) to prevent SYS.DATA being re-written automatically by the system when you logoff.

### File transfers via Xmodem and Ymodem

You can transfer files to and from the system and any ProDOS mounted volumes attached to it via Xmodem (or Ymodem for downloads only), in the T)ransfer section. You can even upload program changes, by first setting the ProDOS prefix to the directory holding the BBS programs. To update any program, you must first delete it, then upload the new version with either ProDOS or Binary II extensions active. Note: updating programs online is not for the unwary. When downloading, Ymodem batch is very useful for getting multiple files in one session. I use ProTERM 3.0 and tend to set the BBS to send Ymodem with ProDOS extension, which doesn't add any overhead to the received file because the ProDOS information is in the Ymodem filename packet.

### Maintaining the USERS file

The USERS file maintains itself but you need to help out a bit, by validating new users, deleting stale ID's, and editing user ID's when people need to be promoted, or change their city or phone number. It's all done from the Sysop.Util program, accessible from the main command level by typing an asterisk. In fact, you can give some trusted users co-sysop status to take care of these chores for you. Just update their security levels to level 8 or higher. (Check the appropriate lines for CHAINing to SYSOP.UTIL around line 9200 in Warp6.BBS for exact security level requirements.)

The User purge function is particularly useful, allowing you to delete both new users you haven't validated up to a cutoff date of your own choosing, and stale users that haven't called after a selectable cutoff date. You can use the prompt for deletions option to ensure you don't delete someone you don't want to by mistake, and you should make a backup copy of your USERS and REC.DATA files before running the User Purge function.

Another useful function is the S)ort and create user list utility in the Utils program. Typically, you will run User.Purge and then sort a new user list, as the list is used in the E-Mail section for those who can't remember how to spell a user's name. (See the section below entitled 'Updating the User List'.)

If you want to compile statistics on your users, copy the AWORKS.CONVERT program from the /Extras directory to your /Logs directory and run it. It will create a file called 'AWORKS.USERS' containing your user file in text format that AppleWorks can import.

### Doing the System News

The opening message for the BBS is held in the file 'SYS.NEWS', and can be updated directly from the Sysop Utilities by setting the ProDOS prefix to the LOGS directory (use P for ProDOS command) and choosing the C)reate text file option, then saving your file to SYS.NEWS. (I recently fixed a bug that wouldn't let you type in full pathnames, so now you don't have to change the prefix; you can simply save to /HD1/WARP6/LOGS/SYS.NEWS or wherever your Logs directory is located.)

When saving a file you have two options, E)rase and write, which will delete any existing file with the name you chose, or A)ppend, which will add to an existing file or will create a new file if the file does not exist.

### Updating the User List

A recent addition to Warp Six allows you to automatically generate a sorted user list. This command is in the Sysop Utilities. (sort)

It's a good idea to update the user list regularly, particularly after purging any old users.

You have the option of sorting by first letter of last name (or alias) only, or a full sort, which does a full alphabetical sort. You also have the option of including or not including the sysop's name (or alias) in the list. Sort times are vastly improved using a shell sort instead of the old bubble sort used in previous versions of Warp6. The larger the user file, the more improvement you will see.

The sorting method used in version 3.0 is the "shell sort". The program reads all the usernames (or aliases) into an array and sorts the array by making several "passes" through the array. Not exactly sure how it works. It swaps multiple elements at the same time and it's screaming fast compared to a bubble sort. When no more swaps need to be done, the sort is complete, and the sorted list is written to disk. Each "pass" through the file is listed on the screen.

Due to the DIMensioning of the large arrays for the sort, the program did automatically restart the system when it was complete. This has been fixed with the addition of STORE and RESTORE commands that free the memory upon completion of the sort.

You could use AppleWorks to generate customized user lists by running the Aworks.Convert program (in the Extras directory) outside of Warp Six, from BASIC. This program is useful for transferring all the data in your USERS file to AppleWorks for generating statistics and studying trends or even printing out your own copy of the user list

## Modem

### Introduction

To avoid frustration, read this file carefully.

Warp Six BBS is designed and tested at speeds up to 19200 bps with the Super Serial Card and to 38400 bps with the IIgs modem port. Follow the instructions in "Getting Started" for modifying the LOGON program to support your modem. This document details modem and cable requirements.

You can also connect to a Raspberry Pi running TCPSER to connect across the Internet. Connection speed can be up to 19,200 through the SSC or GS modem port, with higher speeds through the GS modem port on accelerated machines (57,600 theoretical but not tested).

### Cable Diagrams

IMPORTANT: Where two signals are mentioned with the "&" sign, you should "jumper" (connect) the two signals together at that end of the cable.

#### IIGS Cables

IIGS Mini-DIN-8 male Male DB-25 (Hayes Smartmodem or compatible)

HSKo 1 ---------------> 4 & 20 RTS and DTR (handshake from cpu)

HSKi 2 <--------------- 5 CTS (handshake from modem)

TxD- 3 ---------------> 2 TXD (data from cpu)

SG 4 & 8 ------------ 7 GND (signal ground)

RxD- 5 <--------------- 3 RXD (data from modem)

TxD+ 6 unconnected

GPi 7 <--------------- 8 DCD (data carrier detect from modem)

(Note: jumpering 4 & 20 together lets you use this cable with either a standard modem or a high-speed modem. My thanks to Greg Schaefer, author of ProTERM, for this helpful addition.)

IIGS Mini-DIN-8 male Mini-DIN-8 male (Apple Data Modem 2400)

HSKo 1 ---------------- 2 HSKi (handshake from cpu)

HSKi 2 ---------------- 1 HSKo (handshake from modem)

TxD- 3 ---------------- 5 RxD- (data from cpu)

SG 4 ---------------- 4 SG (signal ground)

RxD- 5 ---------------- 3 TxD- (data from modem)

TxD+ 6 ---------------- 8 RxD+ (data from cpu)

GPi 7 ---------------- 7 GPi (carrier detect from modem)

RxD+ 8 ---------------- 6 SG (signal ground)

(Use Apple Cable M0197 (service part number [embossed on cable] 590-0552) or have one made up with the same pinouts.)

IIGS Mini-DIN-8 male DB-9 Female (USB serial adapter and Raspberry Pi)

HSKo 1 ---------------> 1 & 6 & 8 DCD,DSR,CTS (handshake from cpu)

HSKi 2 <--------------- 7 RTS (handshake from TCPSER)

TxD- 3 ---------------> 2 RxD- (data from cpu)

SG 4 & 8 ------------ 5 SG (signal ground)

RxD- 5 <--------------- 3 TxD- (data from TCPSER)

TxD+ 6 unconnected

GPi 7 <--------------- 4 DTR (carrier detect from TCPSER)

(a functional cable can be put together with off the shelf parts, but your mileage may vary. Not all mini-DIN-8 cables have a wire on pin 7 and there are at least 3 different kinds of null modem adapters. You would need a mini-DIN-8 to DB-25 cable wired as above, a hardware handshaking null modem adapter that crosses RX and TX, RST & CTS, and DTR & DCD, and finally a DB-25 to DB-9 adapter if needed depending on the USB serial adapter you have on your Raspberry Pi)

#### Apple Super Serial Card Cables

The SSC.Driver uses the DSR input line to monitor carrier detect, and DTR output to hangup the modem.

(Neat Trick: If you have a genuine Apple Super Serial Card and a "straight" serial cable, you can modify the short cable that goes from the card to the back plate of the computer to make it compatible with Warp Six BBS. To do so, use a pair of pliers or similar tool to push pins 6 and 8 in the DB-25 connector that normally sits on the back panel of the computer. Tape up pin 6 so it won't ground out and insert the line you pulled out of pin 8 into the pin 6 hole. You have successfully routed DCD into DSR, and that's really all that is "custom" about the cabling for Warp Six BBS.)

SSC DB-25 male to male DB-25 (Hayes Smartmodem or compatible)

GND 1 ----------------- 1 GND frame ground (this line is OPTIONAL)

TXD 2 ----------------> 2 TXD transmit data (from SSC to modem)

RXD 3 <---------------- 3 RXD receive data (from modem to SSC)

RTS 4 ----------------> 4 RTS request to send (for hardware handshaking)

CTS 5 <---------------- 5 CTS clear to send (for hardware handshaking)

DSR 6 <---------------- 8 DCD data carrier detect (from modem)

GND 7 ----------------- 7 GND signal ground (for all signals but pin 1)

DCD 8 (leave unconnected!)

DTR 20 ----------------> 20 DTR data terminal ready (to hangup modem)

Have the ends of this cable labelled "SSC" and "Modem", as it will not work correctly if plugged in backwards - the system will function but if a user hangs up on the system, the system won't realize it.

Make sure that NOTHING is connected to pin 8 on the SSC end. If necessary, cut the line from that end to ensure nothing is connected -- the SSC has a pull-up resistor to simulate carrier detect when that line is cut. Without carrier detect, the receiver section of the SSC is inactive, and Warp Six needs the receiver active to ensure commands are received by the modem, and to determine the baud rate of incoming calls. (Note to those with "ModemWorks(tm)" or "ProLine(tm)" compatible cables: Morgan ties DCD "high", and this is compatible with Warp Six.)

Note: Hardware handshaking will not work reliably on the ACIA 6551 chip due to a poor hardware implementation. There may be third parties with "improved" 6551 chips that will work, so the driver does support it. Unless you have one of these improved 6551 chips (and you won't unless you bought it separately) then do not attempt to use hardware handshaking.

SSC DB-25 male DB-9 Female (USB serial adapter and Raspberry Pi)

GND 1 ----------------- 1 GND frame ground (this line is OPTIONAL)

TXD 2 ----------------> 2 RXD transmit data (from SSC to TCPSER)

RXD 3 <---------------- 3 TXD receive data (from Raspberry Pi to SSC)

RTS 4 ----------------> 8 CTS clear to send (for hardware handshaking)

CTS 5 <---------------- 7 RTS request to send (for hardware handshaking)

DSR 6 <---------------- 4 DTR data terminal ready (from TCPSER)

GND 7 ----------------- 5 GND signal ground (for all signals but pin 1)

DCD 8 (leave unconnected!)

DTR 20 ----------------> 1 & 6 DCD,DSR carrier detect (to hangup)

Note: We found that you can also flip the jumper block to terminal and Hook the USB to serial adapter from your Raspberry Pi directly to the Super Serial Card using a DB-25 to DB-9 adapter if needed.

### Hardware Setup

#### IIGS Control Panel setup

Under the slots option, make sure that slot 2 is set to "Modem Port". The actual settings for the modem port are not important. Note: if you have a DataLink 2400 modem, slot 2 should be set to "Your Card" and you should refer to the SSC.Driver notes. Always make sure AppleTalk is turned off before trying to run Warp Six. The system will print an error message otherwise.

#### Super Serial Card Setup

The jumper block on the Super Serial Card should be set to the MODEM position unless noted otherwise. If your jumper block is not labelled, try it as it is. If it doesn't work, flip it around.

##### Super Serial Card DIP Switch Settings:

Switch 1 Switch 2

1 2 3 4 5 6 7 1 2 3 4 5 6 7

d u u u u u u u u u u u u d

(d means down, u means up)

Note: the only critical switch is SW2-6 which must be on (UP) to enable interrupts. If you want to set the switches differently to support another application, you can. Warp Six does not use SSC firmware.

##### Applied Engineering Serial PRO Settings

Interrupt-Request switches: (closer to the keyboard)

1-OPEN 2-CLOSED 3-OPEN 4-OPEN

Hardware handshaking switches:

1-OPEN 2-OPEN 3-OPEN 4-OPEN

Also, the cable connected should be on the pins labelled "Modem", not "Printer", and the custom cable is required, just as it is documented for the Apple Super Serial Card.

##### Modem Requirements for SSC and GS drivers

If you have a Hayes compatible modem, it must meet the following requirements to work with the SSC.Driver and/or GS.Driver:

* The modem must support disabling auto-answer with the ATS0=0 command, and must support manual answer with the ATA command. (Note: the Apple Modem 300/1200 can't do this.)
* It must hangup and return to command state when DTR is dropped. DTR is set via DIP switches or by modem commands, eg. AT&D2. Alternatively, you can enable Hayes hangup in line 40 of LOGON (see above).
* It must supply a carrier detect signal that follows that of the remote modem. (If DCD is forced TRUE always, the system has no way of knowing when someone has hung up.)

These are absolute requirements. If you wish (and this is not essential unless your modem uses DIP switches, you can pre-configure your modem before running Warp Six, using the following as a guide:

Hayes & Exact compatible Hayes 2400 Effect  
 (with DIP switches) (no DIP switches)

Set switch 1 UP Issue AT&D2&W Support DTR

Set switch 6 UP Issue AT&C1&W Follow remote DCD

Set switch 5 DOWN Issue ATS0=0&W Disable auto-answer

The BBS will set the modem up to provide digit result codes, no echo of result codes, and extended result codes with the ATX1 command. If your modem only supports 300 baud, remove the X1 command from the MODEM.INIT text file, as it will cause the system to beep and print "Modem not responding!", over and over. To exit this loop, hit Control-C while the message is on the screen. Then CALL M8 and type BYE to quit.

Hayes Smartmodem 1200 DIP switch settings:

Dip switches Explanation

1 - Up Support DTR hangup  
2 - Up Word result codes (for convenience of other programs)  
3 - Down Result codes displayed  
4 - Up Echoes characters in command state (convenience again)  
5 - Down No auto answer  
6 - Up Carrier detection enabled  
7 - Up Setting for single line telephone jack (for most people)  
8 - Down Command recognition enabled (essential)  
9 - Up Compatible with Bell 103/212A modems  
10 – Up Modem hangs up and returns to command state when DTR dropped

(If your Smartmodem 1200 has only 8 switches, simply ignore 9 and 10 above.)

DataLink 2400 DIP switch settings:

SW1 - Closed: Interrupts on  
SW2 - Open: carrier follows remote modem.  
SW3 – Open  
SW4 – Closed  
SW5 – Closed  
SW6 – Closed  
SW7 – Closed  
SW8 - Closed

Jumper settings: B-D and A-C or just B-D only.

#### Internet setup using a USB to Serial adapter with Raspberry Pi:

We did our testing with a USB/Serial adapter with a PL2303 chipset. Any adapter should work but stick to the pl2303 chipset for maximum chance for success. Testing was done on a Raspberry Pi 2 running TCPSER from "https://github.com/FozzTexx/tcpser". Again, the setup should work on any Raspberry Pi and any version of TCPSER, but this is what it was tested on.

### The Modem.Init file

This is a text file that contains initialization commands for your modem. It comes set up for the Hayes Smartmodem 2400:

ATE0V0S0=0S7=25  
ATX1H0  
AT&C1&D2

The third line should be deleted if your modem does not support ampersand (&) commands. The second line should be deleted if you have a Smartmodem 300, or your modem doesn't recognize the X1 command, which is used to enable the CONNECT 2400 result code. The first line contains commands which should work on all Hayes-compatible modems, so there should be no need to edit it.

If you want to insert commands to control the modem speaker (for instance M1 to shut it off), you may do so.

CAUTION: When editing the Modem.Init file, be sure each line ends in a carriage return and there are NO EXTRA RETURNS AT THE END OF THE FILE.

For use with the Hayes ULTRA 96, modify your Modem.Init file so it is like the one below and set hardware handshaking on and bps adjust to no in LOGON.

AT&F&K3E0V0S0=0S7=45  
ATX1H0  
AT&C1&D2

Commands Explained:

AT - precedes each command. This is the Hayes "ATtention" code.

E0 - tells modem not to echo command characters

V0 - use non-verbal (numeric) result codes. The driver can't recognize verbal result codes

S0=0 This command sets register 0 to 0, which tells the modem never to answer the phone unless manually commanded by the software to do so with the ATA command, which is issued by the SSC and GS drivers after a '2' (Ring) result. This prevents the modem from answering when the software isn't ready. This should be S0=1 for the IIc driver to enable auto-answer.

S7=25 This command sets register 7 to 25, which is the number of seconds to wait for a carrier. 25 seconds is plenty of time for most modems to make the connection; longer wastes time between false calls. You can set this to 15, 20 or 30 if you prefer. Feel free to experiment.

X1 - sets modem to provide extended result codes to indicate the baud rate of the connection. (Not valid for 300 baud modems.)

H0 - hangs up the modem

&C1 Tells the Hayes 2400 or equivalent to provide a carrier detect signal based on that of the remote modem. This allows the driver to react when a user hangs up on the system. Set to &C0 for IIc driver (if modem uses & commands).

&D2 Tells the Hayes 2400 or equivalent to hangup and go to command state when the DTR (Data Terminal Ready) line is negated. This is the preferred method for hanging up the modem. You can also set the system to use the Hayes hangup method, in which case you can delete this command from Modem.Init, or use &D0 instead. Set to &D0 if you won't be using DTR to hangup.

If you hate modem noise, you can add an M0 command to the file to shut off the modem speaker, assuming your modem accepts this command.

Commands added for high speed modems:

&F resets modem to factory default. Used with Hayes ULTRA 96

&K3 sets modem to use hardware handshaking. Must also be enabled in LOGON.

S37=45 sets carrier wait time to 45 seconds instead of 25 seconds.

Note: the carriage return at the end of each of the lines is important. After the driver sends a line, it pauses for about a second to allow the command to take effect. Then the next line, if any is sent. The driver never waits for a response after the first line, but after each subsequent line, the driver waits for the OK result code in digit format (a zero). If the zero (OK result) is not received, the driver returns an error 3 to AppleSoft, and Warp Six beeps and prints "Modem not responding!" on the sysop screen. (Hit Control-C to exit this loop.)

## Trouble

This file is intended to help you overcome typical problems, as they occur. If you encounter a problem not documented here, just remember that there is a logical explanation for every problem, if you can only find it. I have spent a lot of time debugging Warp Six software over the years, and most of the time I found bugs by thinking, rather than doing things like tracing and inserting break points.

Format: the question or problem is preceded by a greater than character (>).

If you find what you think is a bug, PLEASE report it to one of us so we can fix it. (See the Read.Me.First file for info on where/how to reach us.)

>System generates error first time it has been run, before installing live drivers.

Read Getting.Started section on "Setting up Pathnames".

>System beeps repeatedly and prints "Modem not responding!" (after live modem driver installed)

Possible causes: Modem not connected or turned on, wrong cable or card settings, or card in wrong slot. (Default is 2, set in beginning of LOGON. Cannot be changed with the IIGS driver.) Modem not fully Hayes compatible. Wrong driver selected. Missing or extra carriage returns in the Modem.Init file. Hit Control-C to exit the loop and re-read Modem.Doc.

>"Fatal error" after entering password, or logging off or entering commands.

Check the prefixes in the SYS.DATA file. See "Getting.Started" for details.

>System doesn't answer the phone

Modem not providing '2' result code (RING). Wrong driver installed (must support the fastest baud rate of the modem.) Is a "live" driver installed? Is your hardware supported? Is your modem fully Hayes compatible? Unless you have a normal 2400 baud modem, you must make a modification to a line in LOGON. (See "Getting.Started")

>System answers, but never connects or immediately hangs up

Modem not providing connect result code, or data carrier detect not being seen by the driver because you don't have a custom cable or possibly the cable you are using is incorrect for Warp Six BBS. (See Modem.Doc.) The &C1 command in the Modem.Init file may have been changed to &C0 by mistake. (This was an error in some older versions of Warp Six.) Similarly, your modem must provide an accurate indication of carrier detect. (See Modem.Doc.)

>Remote user gets garbage instead of valid data

Usually this indicates the wrong modem driver has been installed, or the remote user has not set his data format to 8 data bits, 1 stop bit, no parity. Another explanation is a high speed modem is being used but the LOGON program has not been configured correctly. Check line 60 of LOGON to ensure your modem is going to either match the baud rate of the incoming call or maintain a fixed baud rate, defined in line 50 of LOGON. For info, see "Getting Started".

>A system error has occurred...

Use the Sysop Utilities to read the ERROR.LOG file and check the Error Chart included with Warp Six BBS to determine the type of error that occurred. If you can't figure things out from there, load the program affected and list the line number where the error occurred. It is usually obvious what went wrong. If you need assistance, contact one of the authors. The ERROR.LOG file is normal text, so you can read it with almost any word processor or the built-in TYPE command in Warp Six. If the error loops over and over, break out with Control-Reset, type "CLOSE" and press return to close any open files, then "TYPE /HD1/WARP6/LOGS/ERROR.LOG" (no quotes) to see the error log. (Modify the pathname accordingly if required.)

>Modem LEDs flash a lot

This is normal. Every 60 seconds the system checks to see the modem is still ready by sending the AT command. If there is no response, it tries to reset the modem. The frequency of these checks is adjustable. See Warp6.Doc "modifying system timeouts".

>When I logoff, the system doesn't hang up - I have to. If I leave it too long, the system starts looping with the message "Modem not responding!".

See the Modem.Doc file; your modem must be set to hangup and return to command state when DTR drops, or you must change LOGON to enable the Hayes hangup command -- which is the default as supplied. (See Getting.Started or Modem.Doc.) If you are using a IIGS, make sure you have the correct driver for your cable.

>Sysop commands like Open Apple-K (kill) or Open Apple-C (chat) ignored

Sysop commands are only active when there is no caller online, or when the caller is idle at a prompt. You can abort the TYPE command in progress (for example if the user is reading a text file) with the spacebar. To abort an Xmodem file transfer in progress hit the ESC key once and wait for the current packet to finish. (This may take a few seconds, then the system will report "Transfer failed".)

>After leaving the system, I get a "PRODOS ERROR 01 RESTART" message.

You must use Open Apple-Q to quit Warp Six so the interrupt handler can be de-allocated by the software. Alternatively, you could write your own code to quit without exiting to ProDOS using the new M8 routine. (Eg. CALL M8. See "Warp6.Doc".)

>The software crashes on my computer.

Is your computer a genuine Apple product? Are you using the latest version of ProDOS and Basic.System? Although not strictly required, it is best to stay up to date, as later versions include bug fixes. If you have a patched version of ProDOS (to support a No Slot Clock, for example) don't worry about the version. Please let me know if the software crashes.

If you are launching from GS/OS, do you have anything weird installed that might steal interrupts or vertical blanking, eg. Twilight Screen Saver. If so, remove the suspect items and try the system again or boot directly from ProDOS 8.

>I called but the system call count didn't go up.

The system does not count Sysop calls in its call total for the system, nor does it count calls from unvalidated (new) users.

>My name never appears in the L)ast few callers, or there appears to be one name missing there.

Warp Six only logs sysop calls in the Detail log. The L)ast few callers command is only intended for end-users. Note that unvalidated users are not logged there either so that if one of them logged on with an obscene name, only the sysop would see it. Also, if someone calls twice in a row, his/her name is NOT duplicated in the Last few callers log.

>Every time I edit my own user record, the changes go away after I logoff. Same goes for the SYS.DATA file.

After saving changes to your own record or SYS.DATA, from Sysop utilities enter P for ProDOS command and type: "-LOGON" and hit Return. (No quotes). This will restart the system without re-writing the contents of these files from the variables in memory.

>I can't stop the program with Control-C.

To halt the program with Control-C, you may have to hit it several times. Most programs included in Warp Six will halt with "Sysop break". For obvious reasons, Control-C only works from the sysop keyboard. As well, if you are sitting idle at a prompt, Control-C will be ignored, because the modem driver is in control. Hit Control-C when a prompt is being printed, and you'll get a Break in line XXXX with the message "Sysop Break". You can use Control-Reset if you find Control-C inconvenient. After hitting Control-Reset, you should enter the CLOSE command to close any open files. (Actually, it's best you don't hit Control-Reset when a file is open, but Modem.Init is open when the system is trying to initialize the modem, for instance.) To return to the BBS after a Control-Reset, ensure you are in the root directory for your system and "-LOGON". (Don't hit control- Reset during disk access!)

>I keep getting END OF DATA errors. (Error code 5.)

Check your SYS.DATA file. Chances are it has been corrupted. Remove any commas or colons and check the fields against the structure listed in Getting.Started.

## Error Chart

AppleSoft BASIC and ProDOS Error Codes

Type: A=AppleSoft, P=ProDOS

Type Error code Description

===============================================================

A 0 NEXT WITHOUT FOR

Missing FOR, or NEXT variable invalid

P 2 RANGE ERROR

Command option too small or large

P 3 NO DEVICE CONNECTED

No device found in specified slot

P 4 WRITE PROTECTED

Write-protect tab on disk or read-only media

P 5 END OF DATA

Read beyond end of file or record

P 6 PATH NOT FOUND

No file with indicated pathname

P 7 PATH NOT FOUND

No file with indicated pathname

P 8 I/O ERROR

Disk read or write error

P 9 DISK FULL

No more space available on disk

P 10 FILE LOCKED

Attempt to write to a locked file

P 11 INVALID OPTION

Option inappropriate for command

P 12 NO BUFFERS AVAILABLE

Not enough memory to complete request

P 13 FILE TYPE MISMATCH

Wrong file type for command

P 14 PROGRAM TOO LARGE

CHAIN could find enough memory to load target program

P 15 NOT DIRECT COMMAND

Command must be used in program only

A 16 SYNTAX ERROR

Missing (), or invalid character found

P 16 SYNTAX ERROR

Bad command or filename or comma

P 17 DIRECTORY FULL

Volume directory can have 51 entries only

P 18 FILE NOT OPEN

Attempt to access a closed file

P 19 DUPLICATE FILENAME

RENAME, CREATE name already used

P 20 FILE BUSY

File already open

P 21 FILE(S) STILL OPEN

Last command didn't close file(s)

A 22 RETURN WITHOUT GOSUB ERROR

Missing GOSUB statement

A 42 OUT OF DATA

READ statement with no more DATA statements

P 49 DIRECTORY FULL

No more space available in directory

A 53 ILLEGAL QUANTITY

Operand value out of range

A 69 OVERFLOW

Number too large or small

A 77 OUT OF MEMORY

More than 10-FOR, 24-GOSUB, 36-() or too many vars

A 90 UNDEF'D STATEMENT

Line number does not exist in program

A 107 BAD SUBSCRIPT

Invalid array or subscript out of range

A 120 REDIM'D ARRAY

Attempt to re-DIMension existing array

A 133 DIVISION BY ZERO

Division by zero results in overflow

A 163 TYPE MISMATCH

Attempt to mix mode numeric with string

A 176 STRING TOO LONG

Concatenation result longer than 255 chars

A 191 FORMULA TOO COMPLEX

More than two ' IF "XX" THEN ' executed

A 224 UNDEF'D FUNCTION

Function or array not previously defined

A 254 BAD RESPONSE

INPUT statement error

A 255 Control-C (break) attempted

Control-C entered while ONERR GOTO in effect

A --- CAN'T CONTINUE

Program error or program changed; CONT invalid

A --- ILLEGAL DIRECT

Command only valid when used in program

P --- UNDEF'D STATEMENT ERROR

CHAIN, RUN

P --- BAD BRANCH ERROR

CHAIN, RUN line number invalid