# The
# ULTRA SPEED PLUS
## Documentation

# The Ultra Speed Plus!
## Operating System Package
**ver. 1.5**

*By: Robert Puff 12/88*

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*By: Robert Puff 12/88*
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Congratulations on the purchase of our ULTRA SPEED PLUS Operating System Package! The enclosed unit replaces the operating system ROM in your XL or XE computer, and gives you numerous improvements and added features. If you have not yet installed your unit, please see the installation section of this manual.

Your ULTRA SPEED PLUS Operating System unit contains not one, but three individual operating systems in one package! The three are:

1.) The ULTRA SPEED PLUS Operating System (we'll call it US+ for short)
2.) The XL-FIX PLUS Operating System
3.) The standard XL/XE Operating system

The standard XL/XE OS selection makes your computer run as it did before you installed the US+. It may be necessary to use this OS when booting some protected software that will not load correctly in either of the other operating systems.

## FEATURES

The following is a brief list of the many features of the ULTRA SPEED PLUS Operating System package. First, the US+ OS itself:

- Fast disk I/O w/modified drives
- RAMdisk support up to 2 megabytes
- Hi-speed disk I/O is switchable
- Better detection of cart swapping
- BOOTABLE RAMDISK handlers
- Reconfigure & boot any drive
- Easy 1 & 2 meg RAM expansion
- Keyboard lock
- Screen DMA toggle
- Key click toggle
- Internal BASIC toggle
- Keyboard speed adjustable
- Screen colors adjustable
- Easy cold-start without RAM loss
- Built-in mini sector copier
- Built-in configuration editor
- Reverse OPTION key when booting
- Better memory test routines
- On/Off Disk I/O sound
- Double Density RAMdisk
- 38/40 Columns switchable
- Memo-Pad mode built-in
- Eliminates discharge delay time
- Better math routines (FASCHIP)

*And in the* **XL-FIX PLUS OS:**

- Built-in Binary file loader
- Mach Menu writer
- Reverse OPTION key when booting
- Built-in Translator
- Faster keyboard speed
- Eliminates discharge delay time

## The XL-FIX PLUS OS

The XL-FIX PLUS OS contains code that makes your XL/XE look like a 400/800 computer from the program's view, so that you will be able to run programs that require the older OS without having to boot a "Translator"! Some programs that refuse to work with the Translator will work correctly with the XL-FIX +, because the code is in permanent ROM memory, not RAM. However, some programs (like Electronic Arts) will not boot in an XL or XE with a ROM-based 400/800 OS. Pressing [SHIFT] while rebooting (or booting from cold) will cause the ROM to be moved into RAM, and will then perform EXACTLY like a translator. So you have the best of both worlds!

Also included in the XL FIX PLUS OS is a version of the famous MACH-TEN binary file loader, supporting all three densities. Holding SELECT while pressing RESET will enter the menu program. A directory of the files on drive #1 will be displayed (up to 22 files). If you wish to load files from a different drive, let's say drive 2, simply hit the drive number, in this case [2]. To load a file, type the letter next to it. Remember this will only load BINARY files. (Note: This ROM loader WILL load and run .COM files, provided they do not require a DOS.) If the file is not binary, the menu will be re-displayed. You may write out a stripped-down version of this menu program to your disk, so it will load and display the list of files on that disk whenever the disk is booted. Please delete any DOS.SYS and DUP.SYS files from your disk before writing the menu program to it, as the menu program, not DOS, will boot once the menu program has been written to the disk. Type [W], followed by the destination drive number. If there are any disk errors (such as bad sectors) during any operation of the ROM Mach menu, you will be notified.

Please note that the XL-FIX PLUS functions almost identical to the older 400/800 OS, so that programs that check to determine the machine type will see a 48K 400/800. Also, since the older machines never had a parallel bus, any device using it (such as ICD's MIO) will not be accessed. The XL-FIX, as with the US+, gives you a faster keyboard speed, and

reverses the effect of the OPTION key when booting: hold it down to enable BASIC; otherwise the default is without BASIC.

## The ULTRA SPEED PLUS OS

The US+ is based on the XL/XE operating system, and thus should be compatible with most programs written for it. Unlike most other 'alternate' operating systems, the US+ contains all parallel port handlers, for all you hard disk users! A few things have been deleted from the original OS to make room for the new features. They will probably never be missed! They are:

1.) All Cassette routines
2.) The International Character set
3.) The 1200XL function key routines
4.) The Relocating Handler routines
5.) The ROM&RAM check upon bootup

In the unlikely event you need any of the above, simply flip your OS select switch to the standard OS position, and re-boot.

Now on to the features! The following are the additions and enhancements to the standard OS present in the US+:

1.) The standard SIO (Serial Input/Output) routines have been replaced with routines that will give you ultra high-speed disk I/O with the following drives: Super Archiver (1050), Happy (810 or 1050), US Doubler (1050), Duplicator (1050), Klone (1050), Density Doubler (1050), and XF-551 drive (un-modified).

2.) Built-in RAMdisk routines capable of emulating a single or double density disk, which support most all XE compatible memory upgrades ranging from 128K to 2 megabytes.

3.) The ability to use another pin on the PIA chip for easy 2-megabyte memory upgrades (without having to add a special

timer circuit).

4.) Additional functions available from the keyboard: a keyboard lock, key click toggle, turn off screen, toggle internal BASIC, color change, and key repeat rate, one key cursor control, noisy I/O toggle, and left margin toggle.

5.) Allow re-booting of computer without having to power down (so you can save your RAMdisk contents even if the program crashes!).

6.) Reassign drive numbers to certain floppy drives and RAMdisk; be able to boot from your RAMdisk or ANY floppy drive regardless of drive number.

7.) Contains a built-in menu allowing easy access to the above re-assigned drive configurations.

8.) Contains a mini sector copier capable of single and double density, primarily intended for RAMdisk usage. (This can be used to make 1-pass disk copies without having to boot any program! 192K minimum required.)

9.) Re-enables any OSS SuperCartridge on each reset, so the cartridge will always be there.

10.) The OPTION key is reversed: to boot WITH internal BASIC, hold OPTION; otherwise, the default is without BASIC.

11.) The screen colors have been modified slightly on a default text screen, for easier viewing.

12.) The self-test routines have been replaced with a more efficient memory checking program.

13.) With an optional switch you can make your RAMdisk drive #1 at any time!

14.) The way the OS detects if you changed cartridges has been improved.

15.) The "Ram-disk Write Protect" modification is supported in the RAMdisk routines.

16.) Easy rebooting if the power is turned off. Most high-density RAM chips retain their memory for a few seconds after you turn the power off. If you turn your computer on again

before they have completely lost their content, your computer may not reboot, but simply lock up. This frustrating problem has now been eliminated!

17.) The FASCHIP floating point routines have been implemented in place of the old math code. The new floating point is faster, more accurate, and eliminates the "bugs" in the old routines. Some mathematical functions are up to three times faster compared to the standard OS! Because BASIC makes heavy use of floating point, you will probably see a slight increase in speed of basic programs as well.

## USING THE ULTRA SPEED PLUS

The ultra high-speed disk I/O will increase data transfer between the disk drive and the computer by about three times the normal rate on disk drives listed above. The increased speed will be immediately apparent with disk drives that use a "track buffering" system, such as the Happy and Klone drives. With the other drives, your disk must be formatted while in the US+ before any significant speed increase is realized. When you format a disk, the US+ sends a special command to the drive to lay a certain sector layout to the disk while formatting, so the disk will be read from and written to faster. When this disk is read in standard speed, it will load slower than normal, but the data will still be all there. If you are formatting a disk for use by someone who does not have the US+, you may format it the standard way by holding SELECT or [SHIFT] as you enter the format command in your DOS. This will place the standard sector skew on your disk. Special note to XF-551 owners: the XF-551 drive will only write the high-speed format to the disk when it is formatted in double density. The drive does nothing special in single density - hopefully this bug will be corrected in future versions of the drive.

In case you have a program that does not work correctly because of the high speed (such as some protected software), you may disable the high speed I/O to that drive by holding OPTION and SELECT at the same time while the drive is

being accessed. This will disable the speed until the next RESET. If you wish to re-enable the high speed, press OPTION and START while the disk is being accessed. Pressing RESET will also re-enable the high speed. Please note that happy drives are set to fast-write, to overcome its bug with high-speed.

The US+ has a very flexible menu program that allows you to make your floppy drives or RAMdisk appear as any drive number(s) you wish, and allow a "temporary" drive 1 to be configured. To enter the menu, hold START while hitting RESET. (This may also be done by holding START while booting up.) You will see the default configuration if you have just booted from cold: Drive #4 is the RAMdisk, and all other drive numbers go to their corresponding floppies. If at any time you wish to abort a function here, simply hit [ESC]. Now let's say you only have one floppy drive, and you want your RAMdisk to be drive #2. Type [R] to change RAM drive, and [2]. your RAMdisk is now drive 2! Now hit [RETURN] to go back to your program. Here's another example: Let's say you want to boot a certain program from floppy drive #2. Type [C] to configure drives. You will be asked for the floppy drive to configure, followed by the drive number it is to assume. For this example, you would type [2], since we want to change floppy #2's number, followed by a [1], so it will become drive 1. "Drive 1" as the computer sees it will now be your floppy #2! You may now press HELP and RESET,to boot from floppy #2. Please notice that the configuring in this menu does not "swap" drives. "Drive 2" will still go to floppy #2 as well. You may truly swap floppy drives 1 and 2 by configuring floppy drive 1 to be drive 2.

Another feature of this menu is the ability to "temporarily" configure a drive to be drive #1. This can only be done when the menu is entered from a power-up, or holding HELP and START while pressing RESET as to cause a coldstart. You should see just above the prompt the message "Or type drive # to temporarily boot". This means if you wanted to boot from your RAMdisk, and your RAMdisk is set as drive #4, you would type a [4]. This will "swap" drives 1 and 4, so that accessing

drive #1 will go to your RAMdisk, and accessing drive #4 will go to what drive 1 used to be. (Sounds a little confusing, but it's easy once you get the hang of it!) Please note that this is NOT referring to actual floppy drives, but drive numbers as seen in the configuration displayed on the screen. Now let's say you only wanted to boot up DOS from your ram, and now you want to return to your old configuration. Press [SHIFT] [CONTROL] and [6]. Pressing RESET will also restore your configuration. Your ram will return to drive 4, and drive 1 will return to what it was. This does NOT reset your entire configuration; it only affects drive 1 and the drive you "temporarily" made as drive 1.

If you wanted to keep your RAMdisk as drive 1, for example, you could use the menu's Reconfigure RAMdisk function by typing [R] and [1]. Then go back into the menu when you wish to change it (to boot from a real drive). Remember anything configured in this menu (with the exception of the "temporary" configuration) will stay in memory until the power is turned off (They survive reboots with HELP & RESET). Another thing to keep in mind in case your computer does strange things when dealing with the RAMdisk, is that booting from an un-formatted RAMdisk will yield un-predictable results; it will most likely lock up the computer.

Another function in the menu is a mini sector copier. This is primarily intended for drive-to-RAMdisk and RAMdisk-to-drive copying, but could be used as a rather slow drive-to-drive copier as well. To initiate the sector copier, type [S]. Now let's say you wish to copy a double-density disk from floppy #1 to your RAMdisk. Type in the drive number that is configured for floppy #1 (hit ESC and reconfigure the drives if necessary). Now type the drive number that is configured for your RAMdisk. Insert your disk into floppy drive #1, and hit [RETURN]. Please note that the sector copier FORMATS the destination in the same density as the source, and then begins copying. If there are any errors reading the source, you will be returned directly to the menu. If there are any errors writing to the destination, you will be notified. Only sectors 1-720 are copied, so an enhanced density disk will not be fully copied.

The sector number being processed will be displayed in decimal form on the top left corner of the screen. You may use the sector copier without affecting any program you might have in memory! If you forgot to load the RAMdisk up, simply enter the menu (with START & RESET), and use the copier. The copier reads and writes a sector at a time, and uses page 4 ($0400-$04FF) for its buffer; so no program space will be affected. (Mac/65 from OSS uses page 4 for interrupt handling, so using this with Mac will probably result in a lock-up. This is, however, the only known incompatability with the sector copier.)

The built-in RAMdisk routines are designed to emulate a standard single/double density floppy drive. The number of sectors you have available to you depends on the amount of RAM you have, and the density. See the table at the end of this manual for more information. To obtain full access of your RAMdisk, it would probably be easier to use the ramdisk routines in MYDOS (by Wordmark) or SpartaDOS (by ICD). The routines in the US+ are mainly for emulating a standard floppy, but can be used to access the full ram. For example, a 256K 800XL has enough room for 767 double density sectors. Using the US+, you can format the RAM in double density with any DOS, and use the standard 720 sectors a floppy would have. Since your DOS probably dosen't know the difference between a real double-density floppy disk and your RAMdisk, there will be a few wasted sectors. To have full access of your RAMdisk using the US+, you would have to specially configure the DOS for the odd-sized disk. (See the table at the end of this manual for sizes. Please note that the only DOS we are aware of that allows easy custom configuring is the public domain MYDOS by WORDMARK. See its manual on configuring a "high capacity" drive.)

The RAMdisk defaults to single density upon power-up, but this may be changed by your DOS. Reconfigure the drive to double density if you wish, then format it. The RAMdisk only changes density when you format it, and switches to the density to which it was last configured. So to avoid any problems, always set the density before you format. (This is a

good practice for all drives!) If you use single density only, this will not necessary. Please note that the standard 130XE banks (on a 192K or greater machine) will not be cleared in a format, so as to allow the use of Basic XE (by OSS) and other software that makes use of all 128K in a 130XE software to run properly. The RAMdisk routines are designed to use the standard 130XE banks last, for the above reason. (Because of this fact, you may use two ramdisks a once: the routines in the US+, and a DOS such as DOS 2.5 with its ramdisk as drive 8!) So if you are using a 256K 800XL with Basic XE, remember to leave 512 SD or 256 DD sectors free, as to not overwrite any of your program in the standard 130XE banks that the language is using.

Your RAMdisk (using the US+) defaults to drive 4. If you do not have extra memory, or if the US+ cannot write to it, Accessing drive 4 will go to a floppy, not to any ramdisk routines. This will be reflected in the menu by the absence of the RAMdisk ID.

You may change the drive number of your RAMdisk in three different ways. The first two were described in the configuration menu section. The third is via hardware. You may install a SPST switch (not supplied) that will swap the current drive #1 with your RAMdisk regardless of configuration. This is done by running a wire from one connection on the switch to pin 10 of the GTIA chip in your computer (part # CO14805). Run another wire from the other connection on the switch to pin 3 of the same chip. (Leave both pins in their socket, only solder to the shoulder of the pins.) Adding this switch gives you the ability to change RAMdisk drive numbers without having to enter the menu, and without glitching your program. This is not included because we feel the configuration menu, combined with the "temporary" configuration function gives enough flexibility; but if you are an avid user, this might be something you would like.

Pin 17 on the PIA (part # CO14795) is now free for use by 1 and 2 megabyte memory upgrades. Doing so will permanently disable the self-test, but will still allow the

computer to boot. (You will not be able to use the standard XL/XE OS, only the US+ and XL-FIX operating systems.) The US+ eliminates the need of special hardware necessary for this function by not using any self-test code while booting.

Many new functions have been added to the keyboard. One such enhancement concerns cursor control. Normally, to move the cursor up, you would hold SHIFT and - [up arrow key), a two-hand affair. Now, you may press CONTROL 4, which only takes one hand. Also, the control character lock (established by pressing CONTROL CAPS) will allow cursor movement by simply pressing the -, =, +, and * keys (without having to hold CONTROL). To get back to normal, press SHIFT CAPS. The normal cursor movement by holding down CONTROL and pressing the arrow keys is still valid; only easier ways are now possible. This is a summary of the added cursor keys:

CONTROL 4 = Cursor Up
CONTROL 5 = Cursor Down
CONTROL 6 = Cursor Left
CONTROL 7 = Cursor Right

And while Control Lock is in effect (by pressing CONTROL CAPS):

[-] = Cursor Up [=] = Cursor Down
[+] = Cursor Left [*] = Cursor Right

The Clear Screen function has been slightly modified. The author has found it very frustrating at times when editing, to accidentally clear the screen when trying to type a close parenthesis [)] or insert a character. So in the US+, pressing SHIFT and [< CLEAR] or CONTROL and [< CLEAR] will do nothing. Clearing is now accomplished by pressing SHIFT, CONTROL, and [< CLEAR]. Not very hard to get used to, and is worth the time and frustration saved! The only program that is incompatible with this arrangement is the older orange Action! cartridge (by OSS). The newer black cartridge with the yellow label corrects their error, however.

Most of the special functions the 1200XL users had with their function keys are now available. Pressing CONTROL 8 will "lock" all keys on the keyboard with the exception of RESET, OPTION, SELECT, and START. Pressing CONTROL 8 again will "unlock them". This is helpful to prevent mischief when you have to leave your computer for a little while.

It is well-known that turning the screen off will speed up the execution of a program by 10-40%. It also speeds the loading of some programs. Now you can temporarily turn off the screen by pressing SHIFT CONTROL 8. The screen may be restored by pressing any other key. (Recommended key is SHIFT CONTROL A, since this produces no key character.)

You can now have direct control over the internal BASIC. By pressing CONTROL 9, you will toggle its status. If it was on, it will be off the next time you hit RESET. The change does not take effect until RESET is pressed. This is nice when you are done working in BASIC, and you want to go to DOS to do some copying (eliminating BASIC will increase your buffer space). Press CONTROL 9, then RESET. You will now come back to your DOS menu instead of BASIC. Note: If you go the opposite way; from BASIC off to on, you should type "NEW" and [RETURN] when first entering BASIC to reset BASIC's memory pointers.

The "click" you hear each time you press a key can now be turned off. No longer do you have to turn down the volume! Simply hit SHIFT CONTROL 9! Press it again to re-enable the key click. Please note that the bell (control 2) is NOT disabled with the click.

The US+ increases the keyboard repeat rate, which allows for faster screen editing. In the event you use a program that also increases the key repeat rate, you might get a cursor that moves at the speed of light! To restore keys to the standard rate, press CONTROL 0 (zero). This will also restore the screen colors to the standard colors. (By standard, we mean the same as is in the standard XL/XE OS.) To reestablish the fast keys, and improved screen colors, press SHIFT CONTROL 0

(zero).

The "beep... beep" sound you hear as you read and write to your disk may be switched by pressing SHIFT CONTROL 7. This will work with all programs using the ROM SIO routines.

You may change the default left margin of your text screen to 0 for a full 40 columns by pressing CONTROL HELP. Pressing those keys again will restore the margin to 2 again. This setting will remain until you reboot the system.

A brief summary of the special function keys:

SHIFT HELP = Toggle left margin
SHIFT CTRL 7 = Toggle disk I/O sound
CTRL 8 = Toggle keyboard Lock
SHIFT CTRL 8 = Turn off screen
CTRL 9 = Toggle internal BASIC
SHIFT CTRL 9 = Toggle key click
CTRL 0 = Normal keys & colors
SHIFT CTRL 0 = Restore keys & colors

Please note that the above functions accomplished with the 7, 8, 9, 0, and HELP keys may be done at any time; not just during screen editing. They are a part of the keyboard interrupt. They might not take effect instantly if you are in the middle of disk I/O, since the processor is spending all of its time with that, but when it gets a free moment, it will process the keyboard command. If you are using a program that uses its own keyboard handler and interrupt (Such as un-modified SpartaDOS with its keyboard buffer), these functions will not be available. If using the un-modified SpartaDOS 3.2, type KEY OFF at the command processor prompt to disable its keyboard routines. You will now have access to the above key functions. See the end of this manual on how to modify SpartaDOS so the above is not necessary.

You now have the ability to reboot without having to turn off your computer, even if your program crashes! This is extremely useful when going between programs on your

RAMdisk. Simply hold down HELP, and hit RESET. Keep HELP held down till you release the RESET button. Your computer will now act as if it had just been turned on, and clear the lower 48K of memory; but the RAMdisk memory and the RAM under the OS will stay intact. If you are using a program or hardware (such as the Supra hard disk) that utilizes the help key upon bootup, you may also reboot by pressing SHIFT ESC, and then the RESET key (The SHIFT ESC keys need not be held down as with the HELP). Either way produces the same result.

There is a small quirk with the OSS SuperCartridges (MAC/65, Action!, Basic XL & XE) that occurs when the computer is first powered up. Occasionally the cartridge will seem to not be there, and your DOS will go right to the menu. This is caused by the bank selecting hardware in the cartridge. The US+ corrects for this by sending a command to the cartridge to "wake it up" whenever you reboot by pressing HELP RESET or SHIFT ESC and RESET. This has no adverse effect on anything else.

The US+ supports "The RAMDISK WRITE PROTECT" by Computer Software Services in its RAMdisk routines. If the write protect is on, an error 144 will be generated if a write occurs. An error 139 will be returned on a format command. The RAMDISK WRITE PROTECT is invaluable if you heavily use your RAMdisk (which happens when you use the US+!). It will protect all extra memory except the standard 130XE banks, or including them if you prefer. That way you can make sure no program ever overwrites your memory!

The memory test routines (accessed by booting without a drive) have been improved. The whole 64K of primary memory is tested, along with any extra memory. Make sure your RAMDISK WRITE PROTECT is turned off when executing this test. When the memory test initially comes up, your total memory size along with the status of built-in BASIC and OS ram is displayed. Press START to initiate the test, or press RESET to reboot. The lower 64K of memory is cleared; but any extra memory will not be altered as long as you first stop the

memory check by pressing OPTION. So even though your extra memory is tested, it is not changed as long as you exit properly.

If you have a bad RAM chip, you will be notified of the location and bit. The location is for the most part of little concern; however, the bit number can pinpoint exactly which chip is bad. There are 8 bits of data in each byte, numbered 0 thru 7. The memory test displays the bits in reverse order; from 7 to 0. A 1 indicates a bad bit. So if you get a bit pattern of 00100000, you would know bit 5 is bad. Now on the XL machines, U9 thru U16 correspond to bits 0-7. On the 130XE, U9 thru U16 correspond to bits 0-7 for the primary 64K, and U26 thru U33 are for the extended memory. If you got the bad byte message during the check of the extra ram in a 130XE, you would know by the above bit pattern that RAM chip U31 should be replaced.

The US+ utilizes more of your computer's hardware than is normally used. Because of this, the "Extended Circuit Test" has been included in the memory test routines. If this test fails, please call us for further instructions at (716) 429-5639. To do a complete test of your system, hold START during the Extended Circuit Test. It will then repeat this test indefinitely; leaving this test for five to ten minutes should be sufficient. Press OPTION to exit the test.

If you hold START down while entering the self-test (by typing 'BYE' in BASIC), you will enter into memo pad mode. This is basically just for playing around with text data, perhaps to get a feel for the graphic keys, etc. To exit, press RESET (it will NOT reboot).

One special note on disk accessing: The US+ configuration will take priority over any parallel bus device, so that you may, for example, boot from your RAMdisk even if you have a hard drive set as drive #1. The US+ does not directly access the memory in the MIO (by ICD) as a RAMdisk; the MIO's configuration editor should be used for this.

The ultra high-speed disk routines and RAMdisk are accessed through the standard ROM SIO interface at $E459 and $E453. Some programs (such as SpartaDOS) use their own interface, and will not support the capabilities of the US+ unless modified. This is very unfortunate that these programs did not use the standard interface, or provide for a way to use the standard. We have come up with a patch for SpartaDOS 3.2 to overcome this problem. (See the section at the end concerning this modification.) If you know of any programs that do not take advantage of the high-speed disk routines, give us a call. We may already have found a patch for your particular program.

The only known problem with the US+ is when booting the 850 interface without a drive (a VERY rare function used!). Hold down OPTION and SELECT when booting to correct this. The 850 interface performs correctly under all other situations, and has no problems booting its handler when a program calls for it (such as a terminal or BBS program).

## Table of RAMdisk storage/sectors

| Computer: | Storage/Density: | ComputerStorage/Density: | |
|---|---|---|---|
| 128K 130 XE | 511SD 255DD | 256K 800 XL | 1535SD 767DD |
| 320K 130 XE | 2047SD 1023DD | 512K 800 XL | 3583SD 1791DD |
| 576K 130 XE | 4095SD 2047DD | 1024K 800 XL | 7679SD 3839DD |
| 1088K 130 XE | 8191SD 4095DD | 2048K 800 XL | 16383SD 8191DD |
| 2112K 130 XE | 16895SD 8447DD | | |

The above table gives you an idea of the number of sectors you can access in a given density with the US+. Please bear in mind that most disk operating systems do NOT support more than 720 sectors on a disk. MYDOS and SpartaDOS are the only two that we are familiar with that will handle non-standard drives easily. So to make full use of your RAMdisk, it would be easier to use those DOS's and configure them for your system. The US+ may not access your extra memory in the same order as the RAMdisk routines in your DOS, so you may

not get a meaningful directory when mixing RAMdisk routines (the ones in the US+ and in your DOS). The routines in the US+ are intended to work by themselves, for emulating a standard floppy drive. Formatting a RAMdisk drive configured with the US+ will most likely give you the same 707 free sectors you get when formatting a standard disk. You may, however, write your own programs to access the added capacity of the US+ routines.

## Modifying SpartaDOS

For those who use SpartaDOS, we have provided a patch so that the capabilities of the US+ may be fully used. SpartaDOS by itself does give you the high-speed disk I/O with some disk drives, but does not allow itself to be booted from a RAMdisk, allow the keyboard functions (unless a KEY OFF is done), or allow high-speed with the XF-551 drive. There was not enough room left over in the US+ OS for the patches, so we included them in the XL-FIX + OS. Follow these procedures to create a modified SpartaDOS 3.2 master disk:

1.) Boot up SpartaDOS 3.2d in the XL-FIX OS with BASIC.
2.) Get a blank disk ready. Type DOS [RETURN], and XINIT [RETURN]. This will load the formatter program.
3.) Select X32D type DOS, and follow the procedure outlined in the manual on formatting a disk. Remember to format your blank disk, not the original!
4.) After the disk has been formatted (density does not matter), press [ESC]. Now type CAR [RETURN] to return to BASIC.
5.) Type these characters: ? USR(53232,1) followed by [RETURN]. The number 1 identifies the drive containing the disk you just created. Replace it with a different number if you are not using drive 1. Please note this modification does nothing with SpartaDOS X - Since it is in ROM, there is no way to modify it.
Both mods will disable the keyboard buffer upon power-up, so a KEY OFF is not necessary.

The modification will patch the DOS, and rename it to

X32Z.DOS. The modified DOS will work in other operating systems. The patch basically makes Sparta use the ROM SIO for disk I/O, and disables their keyboard buffer. We have not found any compatibility problems with this modified DOS.

After performing step 5, a number will be displayed. A 1 indicates all went well. Any other number is a disk error; refer to your SpartaDOS manual. Make sure your disk is not write protected and is in the correct drive.

## COMMAND SUMMARY

The following are the functions that affect the Serial I/O routines:

SELECT+OPTION: Disables high-speed if pressed while doing disk I/O.
START+OPTION: Re-enables high-speed if pressed while doing disk I/O.
SHIFT+CONTROL 7: Toggle disk I/O sound.
START+RESET: Enter configuration editor menu.
SHIFT+CONTROL 6: De-configure temporary configuration set in menu.

The following are miscellaneous functions in the US+:

HELP+RESET: Re-boot computer just as if it had been turned off then on without losing the extra memory's contents.
SHIFT+ESC and RESET: Same as above HELP+RESET.
CONTROL HELP: Toggle left margin between 0 and 2.
CONTROL 8: Lock/Unlock keyboard
CONTROL 9: Toggle BASIC (Only takes effect when RESET is pressed).
CONTROL 0: Restore original colors & keyboard. (Opposite of SHIFT+CONTROL 0.)
SHIFT+CONTROL 8: Turn screen DMA off. Turn back on with any other key.
SHIFT+CONTROL 9: Toggle keyboard click.

SHIFT+CONTROL 0: Enable default screen color and fast keyboard. (Opposite of CONTROL 0.)
SHIFT+CONTROL CLEAR: Clear screen key in screen editor.
CONTROL 4: Cursor up (same as CONTROL -).
CONTROL 5: Cursor down (same as CONTROL =).
CONTROL 6: Cursor left (same as CONTROL +).
CONTROL 7: Cursor right (same as CONTROL *).

# INSTALLATION INSTRUCTIONS

Required Materials:

1.) 15-40 watt Pencil Soldering Iron
2.) 6 inches of Rosin-core Solder
3.) 1 Phillips Screwdriver
4.) De-soldering Iron (optional-see below)
5.) 1/4" Drill

Get your soldering iron plugged in and warmed up. You will be disassembling your computer, and replacing a chip on your computer's motherboard with the US+ module, and making four simple solder connections.

1.) Disconnect all cables going to your computer.

2.) Turn your computer up-side-down, and unscrew all screws on the bottom. Set the screws aside, and turn your computer right-side-up.

3.) Carefully lift up the top. The 800XL will have a connector for the keyboard attached to the motherboard on the right side. CAREFULLY pull this directly up and out. The 130XE's keyboard is separate, but needs to come out. Carefully pull its connector out.

4.) Now remove the metal RF shield. On the 800XL, there are

different ways of securing the shield. Unscrew all screws visible, then lift the whole assembly out of the plastic bottom. (You may need to pull on the joystick end to get the ports out.) You may find screws or tabs around the edges. Unscrew the screws, or bend the tabs straight up. Now lift off the top shield. On the 130XE, there are tabs located around the edge of the shield. Bend them so they are parallel with the closest edge, and lift the shield out.

5.) Now locate the 28 pin Operating System chip labeled CO61598. On the XL, it will be close to the SIO port; on the XE, it will be located in the middle close to the front. Note which way the notch on the chip is oriented, and remove the chip. (If the chip is not socketed, you need to de-solder it from the board. Most XE machines do NOT have sockets. De-soldering requires some skill as to not destroy the small traces on the circuit board. Have a competent person do it, or call us for information on our installation (716 - 429-5639). Install the socket provided in place of the chip.

6.) Now set aside the chip you pulled out. You will no longer need it. Insert the US+ module into the socket, with the wires coming out the left side.

7.) Locate the 16 pin 74LS138 chip on your board. On the XLs, it should be below the cartridge port. On the XEs, it will be between two 40 pin chips in the right side. Connect the shortest wire coming from the US+ module to this chip pin 7 (see insert).

8.) Find the 16 pin 4051 chip that is located at U25. On the XLs, it is just below the US+ module; on XEs, it is the chip closest to the keyboard connector. Orient the 16 pin chip connected to the US+ module so that its notch lines up with the 4051's notch. Stack this chip on top of the 4051. Now solder pins 8 and 16 (the two corner pins) to the pins 8 and 16 of the 4051.

9.) Locate the 40 pin ANTIC chip (CO12296 or CO21697). On the XL and XE, it is located on the lower right side. Connect

the wire coming from pin 1 of the US+ module's 16 pin chip to this chip pin 34 *(see illustrations, pages 24 & 25).*

10.) Solder the remaining wire coming from pins 4 and 5 of the US+'s external 16 pin chip to pin 14 of the ANTIC (CO12296 or CO21697).

11.) Drill a 1/4" hole in the back of our computer to mount the OS select switch. Just to the left of the SIO port is a good place. Insert the switch, and screw the nut on the outside firmly.

12.) This step is optional. To install a "RAM drive 1" switch (not provided), drill another hole for it, and mount a SPST toggle switch (Radio Shack #275-645 is recommended). Connect one terminal of this switch to the GTIA chip (CO14805) pin 10, located in the bottom left on XL machines, and directly in the center of 130XEs. Connect the remaining switch terminal to pin 3 of this same chip (see insert).

13.) Now assemble your shield back on to the motherboard, and re-connect the keyboard. (Do this carefully!)

14.) Put the top on the computer, and screw everything back together.

15.) Boot it up! If you don't get anything, power down, and check your wiring. If you installed the "RAM drive 1" switch, make sure it is not turned on. Strange things occur when you boot from an unformatted RAMdisk! If you can't figure out the problem, give us a call at (716) 429-5639 Monday through Friday, 10AM-5PM EST.

Your OS select switch has three positions. The middle is the original XL/XE OS, one side is the US+, and the other side is the XL-FIX. If you desire to switch operating systems while the power is on (to save RAMdisk contents), hold RESET while flipping the switch to the desired OS. Then let up on the RESET key. This works fine on the XL computers; on the XE however, the RAM contents MAY be affected. There is no way

around it, except to save the contents of your RAM before changing to another OS.

You may want to run the memory test in the US+ OS to insure everything is working properly.

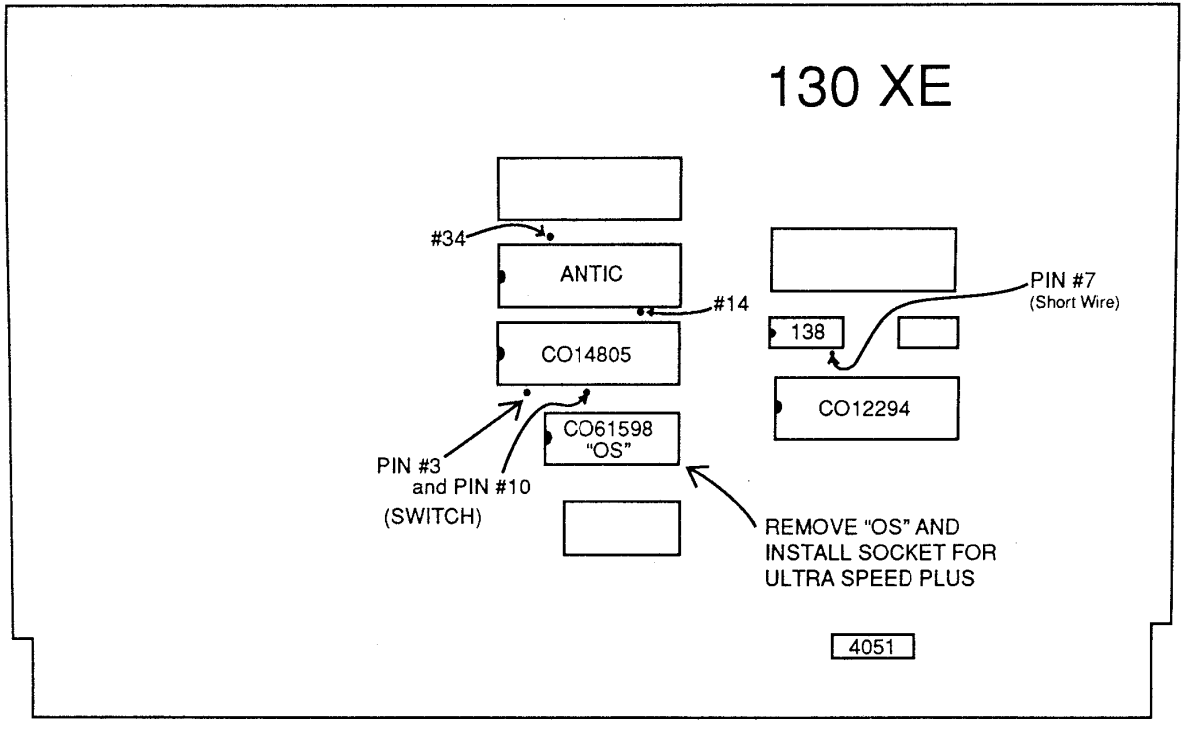
Enjoy! If you have any further comments, questions, or ideas, please don't hesitate to call us!

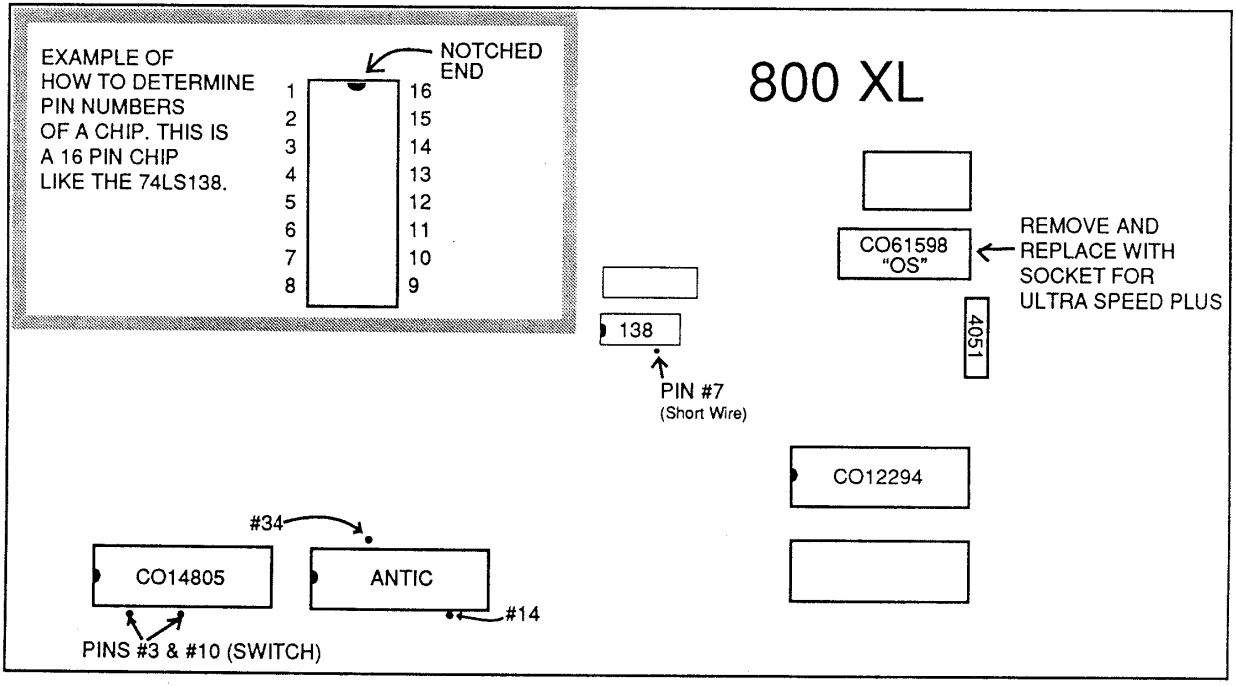
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*By: Robert Puff 12/88*
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12/09/88


130 XE
#34
ANTIC
#14
CO14805
CO61598
"OS"
PIN #3
and PIN #10
(SWITCH)
138
CO12294
PIN #7
(Short Wire)
REMOVE "OS" AND
INSTALL SOCKET FOR
ULTRA SPEED PLUS
4051


EXAMPLE OF
HOW TO DETERMINE
PIN NUMBERS
OF A CHIP. THIS IS
A 16 PIN CHIP
LIKE THE 74LS138.
NOTCHED
END
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
800 XL
CO61598
"OS"
REMOVE AND
REPLACE WITH
SOCKET FOR
ULTRA SPEED PLUS
4051
138
PIN #7
(Short Wire)
CO12294
#34
CO14805
ANTIC
#14
PINS #3 & #10 (SWITCH)