MaxPac 8241 XRA1/2/3

User Operation and Maintenance Guide

Operating and Maintaining Your MaxPac 8241 XRA1/2/3 Transportable Workstation

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Part Number: 209-0063-0

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Regulatory Approvals

EN60950, EN55024, EN55022, FCC, Part 15, EN61000-2-2 & EN61000-2-3.

Warnings

Changes or modifications to this device that are not approved by the party responsible for compliance could void the user's authority to operate the equipment.

Each type of MaxPac system should be re-shipped only in the Explorer case and/or other packaging materials in which the system was first delivered to the customer. Damage caused by shipping systems using unapproved Explorer cases and/or other packaging materials is NOT covered by MaxVision's warranty.

To reduce the risk of electrical shock, do not attempt to open the device unless instructed to do so. Do not use any tool for purposes other than instructed.

A Lithium Ion battery is included with the system motherboard. This battery is used for the Real Time Clock (RTC) circuit. The expected lifetime of the battery is approximately 5 years. There is a danger of explosion if this battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the motherboard manufacturer. Dispose of used batteries according to the manufacturer's instructions.

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Chapter 1: Quick Start Setup for MaxPac 8241 XRA Systems

Documentation Conventions

Icons

- The information icon is used to annotate important information.

- The exclamation icon is used to annotate cautionary information.

Fonts

- *Italics* font is used for emphasis, book titles, commands, and path and file names.
- **Bold** may be used to emphasize text, highlight menu items, and denote the titles of dialog boxes.
- **Menu > Command** identifies the path used to select a menu command.
- `Courier` font is used for program listings and for any text messages that the software displays on the screen.
- **Note:** describes important information, warnings, or unique commands.
- “Select” means click the left mouse button on the indicated item.
- “Click-left” (or just “click”) means click the left mouse button on the indicated item.
- “Click-middle” means click the middle mouse button on the indicated item.
- “Click-right” means click the right mouse button on the indicated item.
- “Double-click” means click twice consecutively with the left mouse button.
- “Drag-left” (or just “drag”) means press and hold the left mouse button on the indicated item, then move the cursor (pointer) to the destination and release the button.
- “Shift-click-left” means press and hold the <Shift> key then click the left mouse button on the indicated item.
- “Ctrl-click-left” means press and hold the <Ctrl> key then click the left mouse button on the indicated item.

Inspecting the Shipment

MaxPac systems are packaged to withstand the roughest of treatment during shipping. Any boxes, foam core padding, and anti-static bags should be stored safely away in case you need to ship the system for any reason in the future. Inspect the box the system arrived in. If there is any unusual damage to the box, make note of the damage on the delivery form and contact MaxVision support (see *Appendix D for more details*).

Re-Shipping the System

Note: MaxPac 8241 XRA systems are always shipped in an associated Explorer case. If you wish to re-ship the system, you must use the Explorer case and/or other packaging materials in which the system was first received. Damage caused by shipping systems using unapproved Explorer cases (including Explorer cases intended for use with other MaxPac systems) and/or other packaging materials is NOT covered by MaxVision's warranty.

Unpacking the System

MaxPac 8241 XRA systems are always shipped in an associated Explorer case. Depending on the configuration of your system – up to four disk drives – the Explorer/MaxPac combination weighs between 90 lbs and 100 lbs (including the packaging). If you are unable to lift this weight safely, you should obtain assistance in unpacking and moving the system.

1) Place the cardboard packing box containing the Explorer case and MaxPac system on the floor. (Some configurations are shipped without the cardboard packing box to aid in handling.) Remove the packing slip from the outside of the box or Explorer case and save it for later use as discussed below.
2) Clear an area on a desk or table on which to place the MaxPac system.
3) Place the Explorer case flat on its back on the floor and open it (Figure 1-1).

Figure 1-1

Figure 1-2

4) With the aid of a colleague, carefully tip the case such that its lid is on the floor as shown in Figure 1-2.
5) You may prefer to have assistance for this step. Carefully slide the MaxPac out of the case as illustrated in Figure 1-3.

Note: This process can be GREATLY facilitated by taking hold of the handles on top of the Explorer case and tilting the case forward towards the lid resting on the floor. This will cause the MaxPac to gently slide out of the case.

Figure 1-3

6) Slide the MaxPac all the way out until it is resting on the lid of the Explorer case.

7) Gently lift the MaxPac system. Keeping your back straight, bending at the knees and using your legs as much as possible, take the system out of the box and place it on the cleared area noted in point (2) above.

Check the Packing List and Confirm Documentation

1) Check the allotted compartments of the Explorer case containing the keyboard, mouse, power cord, documentation packet, and any special-order cabling or other items.

2) Check the packing slip to ensure that everything is as you expect with regard to the main system. Pay particular attention to any special options you may have requested, such as memory upgrades or specific graphics or sound subsystems.

3) Check the contents of the envelope containing the documentation associated with your system. In addition to this manual along with any user guides and manuals associated with special upgrade options (such as graphics cards) you may have ordered, a basic MacPac 8241 XRA documentation pack will include:

- Windows® (XP, X64 edition, etc) license and CD-ROM.
- Motherboard manual.
- Recovery DVD (see also *Appendix A*).

Setting-Up Your MaxPac

Location

Your MaxPac 8241 XRA system needs to be positioned in a location with the capacity to safely support at least 60 lbs to 70 lbs depending on its configuration. The system should be unobstructed so as to permit the free flow of cooling air through the intake fans and exhaust vents located at the sides of the unit.

Power Requirements

MaxPac 8241 XRA power supplies are auto-sensing 100 to 240 VAC, 50 to 60Hz units. Ensure that the supplied power is sufficient, stable, and without spikes or surges for operation of your MaxPac and other required equipment.

Tilting the System

1) Place one hand underneath the system and the other hand on top of the system (Figure 1-4). Press down lightly with the hand on top of the system while gently pulling the bottom of the system forward with your other hand.

Figure 1-4

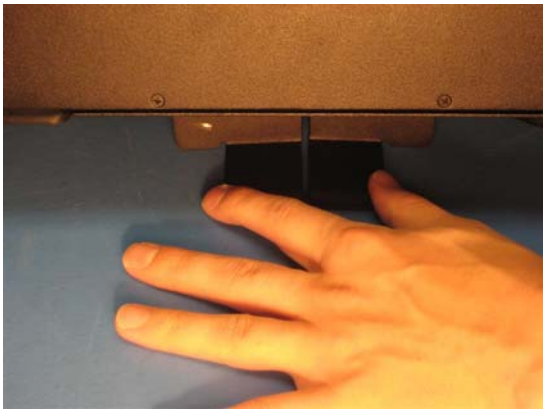


Figure 1-5

2) Squeeze the scissor legs together and pull them down so that the legs are supporting the systems weight. Make sure to release the legs so that they snap into place. (Figure 1-5)

Accessing and Connecting the Keyboard, Mouse, etc.

1) Remove the keyboard, mouse, and power cable from the Explorer case (Figure 1-6).

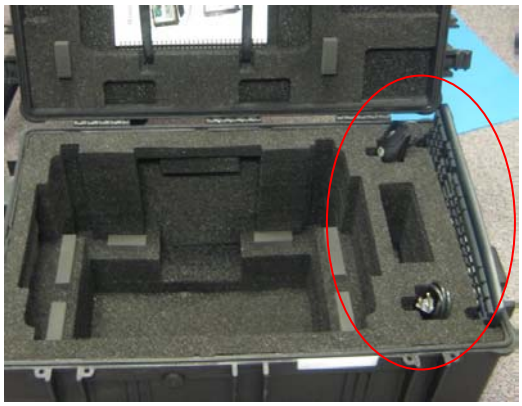


Figure 1-6

Figure 1-7

2) Plug the keyboard into the PS2 connector in the lower right-hand corner of the main interface panel, which is on the right-hand side of the system (Figure 1-7).
3) The mouse may be plugged into the PS2 connector located next to the keyboard connector as shown in Figure 1-8. Alternatively, you may remove the green USB-to-PS2 connector from the end of the mouse cable and then plug the mouse into one of the USB ports located just above the two PS2 ports (Figure 1-9).

Figure 1-8

Figure 1-9

4) Plug the power cord into the main power input port, which is located on the left-hand side of the system, and then plug the other end of the cable into a suitable power outlet. Observe the main (hard) power switch to the right of the power input port (Figure 1-10)

Figure 1-10

Opening the Screens (Dual-Screen System)

1) If you have a dual-screen system, press down on the release catch located at the lower left-hand side of the system (Figure 1-11).

Figure 1-11

Figure 1-12

2) While continuing to press down on the release catch, pull the second screen away from the system; unfold this second screen completely as shown in Figure 1-12.

Note: You may hear a squeaking noise when you unfold the second screen. This is caused by the polyurethane clutch and is part of the friction mechanism that holds the screen steady. Do NOT apply any lubricants to this mechanism, because they may degrade the polyurethane.

Opening the Screens (Triple-Screen System)

1) If you have a triple-screen system, press down on the release catch located at the lower right-hand side of the system (Figure 1-13).

2) While continuing to press down on the release catch, pull the left-hand screen away from the system until it is completely unfolded (Figure 1-14).

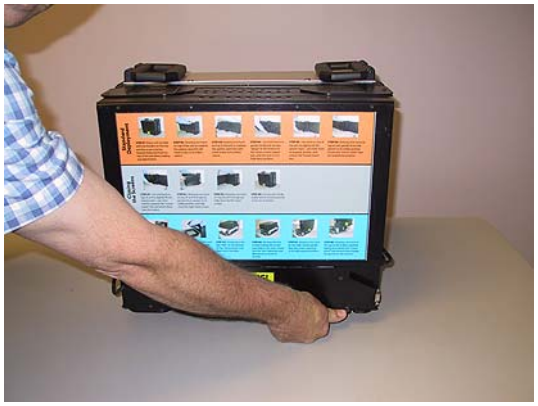


Figure 1-13

Figure 1-14

Figure 1-15

Figure 1-16

3) Now pull the left-hand edge of the right-hand screen away from the system (Figure 1-15). Continue to pull this screen until it is completely unfolded (Figure 1-16).

Note: You may hear a squeaking noise when you unfold the second and third screens. This is caused by the polyurethane clutches and is part of the friction mechanism that holds the screens steady. Do NOT apply any lubricants to these mechanisms, because they may degrade the polyurethane.

Powering-Up Your MaxPac

1) Ensure that the main (hard) power switch – the switch located just to the left of the main power input connector – is in its ON position (Figure 1-17).

Note: When the unit is being moved or serviced, ensure that the main power switch is in its OFF position.

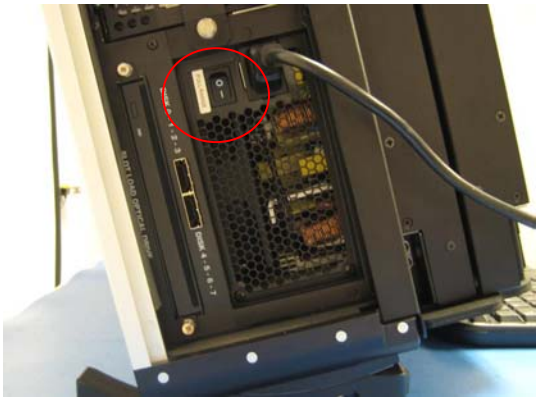


Figure 1-17

Figure 1-18

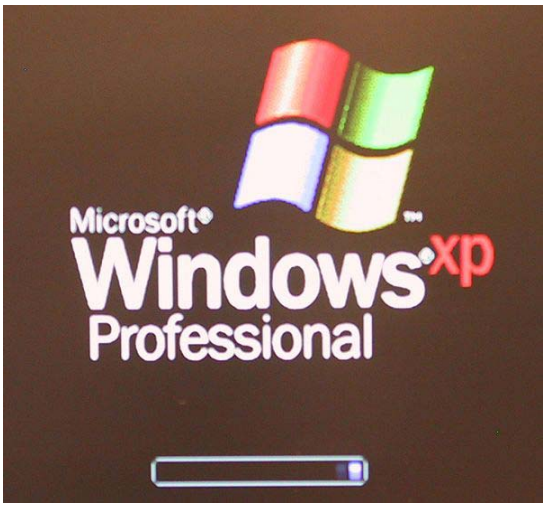
2) Press and release the soft power switch located at the top of the system immediately behind the display screen (Figure 1-18)

3) Due to extensive system initialization and verification checks, the BIOS boot-up process can take a significant amount of time, especially in the case of systems with large amounts of memory. In the case of a system containing 8 GB of RAM, for example, it can take 45 seconds before all three LEDs above the numerical keypad on the keyboard flash to indicate that the system is at a point where information should start to appear on the main display.

Note: If nothing appears on the main display, the fact that the three LEDs flash on the keyboard indicate that the system is alive.

Logging On for the First Time

1) Following the initial BIOS boot-up sequence, you will be presented with the Windows XP Professional Startup screen:

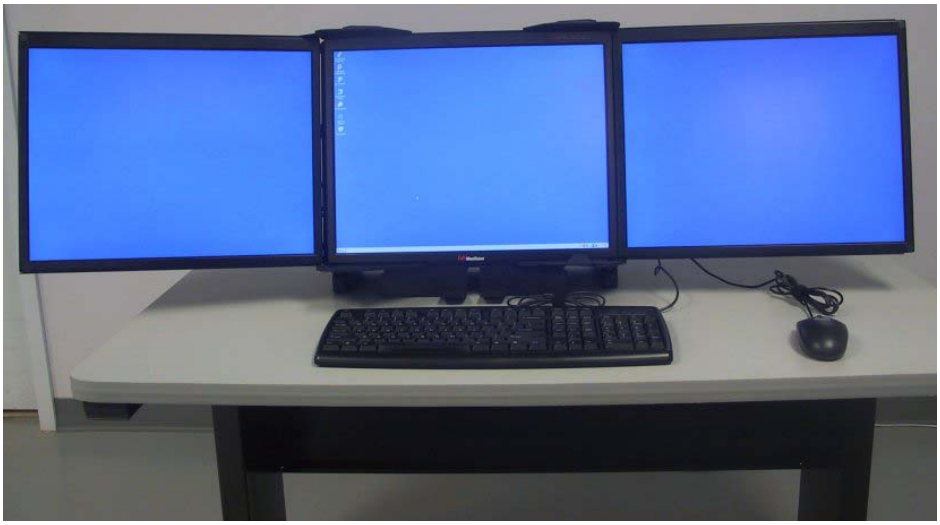


2) After a few seconds – and assuming this is the first time you have powered-up your system – you will be presented with the Windows XP Professional Setup Wizard dialog. Follow the on-screen instructions provided by the setup wizard; these will include:

   - Accepting the license agreement.
   - Confirming (or modifying) the region and/or language settings.
   - Entering your company name and organization name.
   - Entering the product key (that is, the OS license number). This license number will be found on the OS license sticker attached to your machine. This sticker will be located on the base of the machine (in this context, the term "base" refers to the bottom of the system when it is standing on the table as illustrated earlier in this manual).
   - Entering the name you wish to be associated with this system. Assuming that you intend to connect your system to a network, this is the name that will appear on the network, and thus it must be unique to your network (you may wish to obtain this name from your network administrator).
   - Entering a password for the system and confirming it.
   - Specifying the date and time zone settings associated with your system's location.
   - Specifying your network settings (it is strongly recommended that you select the default **Typical** option, otherwise you should leave this step to your network administrator).
   - Entering the names of your workgroup and computer/network domains (ask your network administrator to provide you with these details).

3) Once you have completed all of the steps presented by the setup wizard, click the **Finish** button, which will cause the system to automatically reboot itself.

4) Observe the default MaxVision desktop appear on the screen:



5) Note that, upon this first reboot, all three screens may not initially be active (although the screen drivers are loaded for both graphics boards, in rare cases they may not be enabled and/or properly configured). Alternatively, the screens may all be active, but they may be improperly ordered such that the mouse cursor leaps from screen to screen in a non-intuitive way.

   In such a case, right-mouse-click on a blank area of an active screen/desktop, select the **Properties** item from the resulting pop-up menu, then select the **Settings** tab, and then set up the three screens as shown in Figures 1-19 and 1-20.

If the ordering of the screens is not as shown below, simply drag the screen icons into the correct position. Ensure that the center screen (number '1') is set to be the primary display. When you've finished making chances, click the **Apply** button.

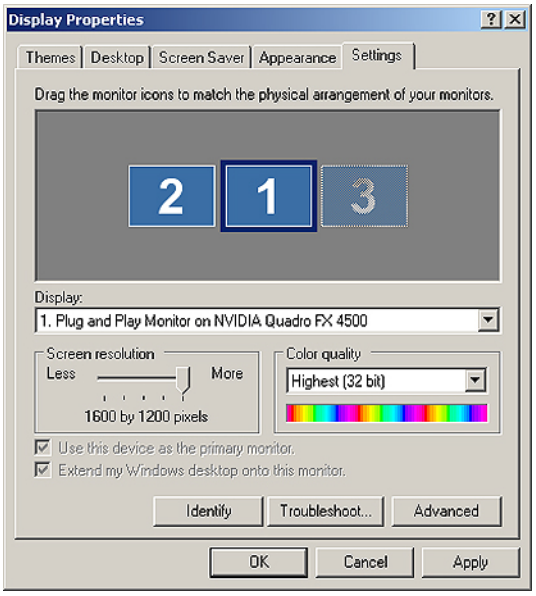


Figure 1-19

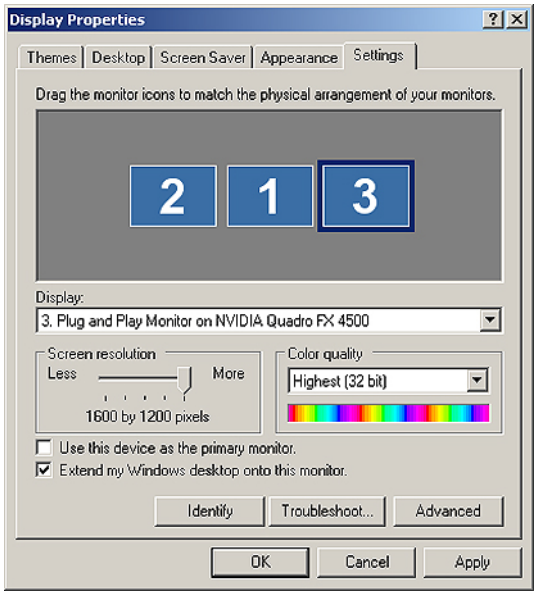


Figure 1-20

Registering/Activating Your OS

1) At some stage after you've powered up your system for the first time as discussed in the previous section, a small **"xx days left for activation"** pop-up will appear in the lower right-hand corner of the screen:

2) Clicking on the "X" will dismiss this pop-up (it will return to bug you later). Alternatively, clicking on the body of this pop-up will result in the **"Let's activate Windows"** dialog appearing on your screen.

3) Select one of the three options (**Activate over the internet**, **Activate by phone**, or **Remind me later**), then click the **Next** button and follow the on-screen directions.

Note: It is recommended that you register and activate your OS as soon as possible. After the 30 day grace period has expired, the system won't even let you logon until you do register and activate the OS.

Shutting Down the System

In order to shut the system down gracefully you must perform the following steps:

1) Close down any applications that are currently running.
2) Use the **Start > Shut Down** command.
3) Select one of the following options in the pull-down menu:
   - **Restart** Shutdown and restart the system.
   - **Shutdown** Shutdown the system.
   - **Log Off** Log off the current user session.
4) Click the **OK** button.

"Dos and Don'ts"

1) Always disconnect the external AC power source when removing or installing system components (and always turn the main power switch to its OFF position before you disconnect AC power).
2) In the case of extreme dust conditions, it is imperative that you use (and maintain) the oil-based "Baghdad Filters" supplied with your system (see also the discussions on maintaining these filters as presented later in this manual).

Chapter 2: Setting-Up the Software/Devices/Network/RAID Array

Setting-Up the Network

In the majority of environments, it is sufficient to use the Windows XP defaults for the network. Simply connect the network cable (Figure 2-1) and the system should auto-detect the presence of the network and the data/communications light next to the network cable connector should start to flash.

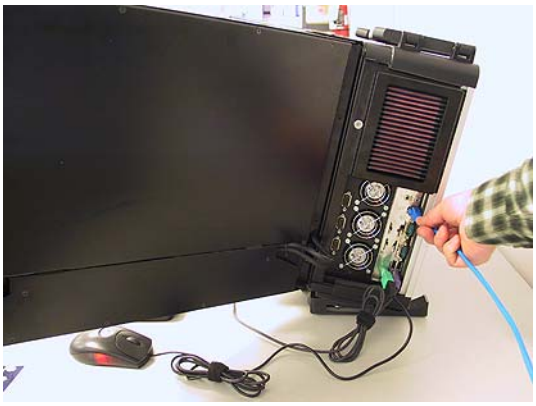


Figure 2-1. Connecting the network cable

The easiest way to test your network connection is to invoke your web browser and visit a website such as **www.MaxVision.com**. In the event of any problems or special requirements, you should first consult your on-site IT representative (if the problems persist, contact MaxVision support as discussed in *Appendix D*).

Setting-Up the Graphics

When you receive your MacPac dual/triple-screen X-Class system, you will find that the graphics subsystem has been pre-installed with the following (recommended) characteristics:

- **Color Quality:** Highest (32-bit)
- **Resolution:** 1, 2, or 3 x 20.1” displays: 1600 x 1200

Irrespective of the configuration, the graphics on your system will have been custom pre-configured to suite your particular requirements.

MaxPac systems are available with a variety of different graphics cards depending on your unique application. The standard configuration for a triple-screen system, for example, is to have the center and right-hand displays controlled by a PCI Express-based NVIDIA Quadro FX4500 graphics card, while the left-hand display and projector port are controlled by a second PCI Express-based NVIDIA Quadro FX-series board.

Note: OpenGL™ acceleration is now available all displays controlled by the PCI Express-based NVIDIA Quadro FX series controllers. This allows the user to run applications requiring OpenGL acceleration on all displays as long as all are controlled by the same NVIDIA Graphics driver.

If you do have a special graphics card, you may consult the manual associated with this card (this manual will be included in your documentation package as discussed in Chapters 1 and 2) or contact MaxVision support (as discussed in *Appendix D*) for more information.

Adjusting the Screens

In the case of a dual-display or triple-display configuration, each screen has a set of controls mounted on the top of the display (Figure 2-2). (In the case of a single-display system, these controls are located on the left-hand side of the unit next to the CD/DVD optical drive.)

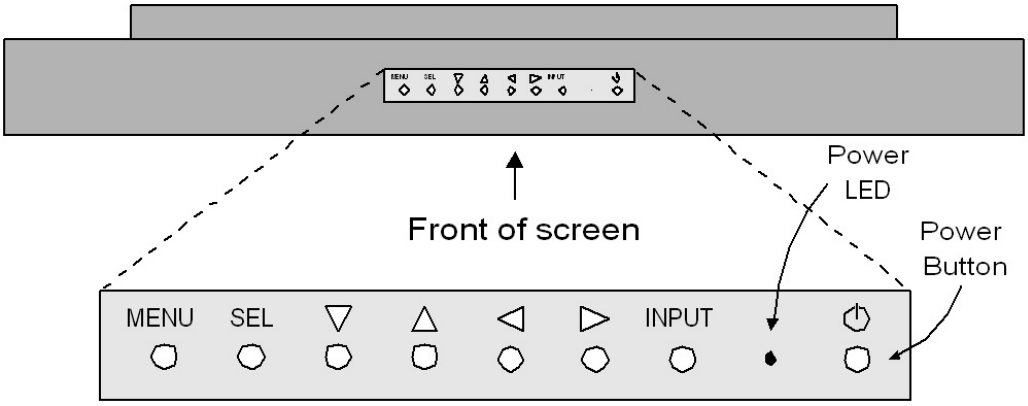


Figure 2-2. Top-down view of screen controls on dual- and triple-display systems

Observe the power button located to the right of the power light-emitting diode (LED). This is an independent power button for the display/screen.

Pressing the **MENU** button will bring up a series of items on the screen. Use the up/down buttons to move between these items; press and release the **SEL** button to select that item; and use the right/left buttons to vary the settings.

Some custom configurations allow the display to be driven from multiple sources. In this case, pressing the **INPUT** button selects between digital and analog inputs. These custom configurations will come equipped with a special documentation addendum that details the actions of the **INPUT** button; in the case of standard configurations, the source should always be set to “Digital.”

Configuring the RAID Array (with Separate System Drive)

Note that these discussions reflect system configurations with a separate system drive as illustrated in Figure 2-3. Configurations that have the system partition established on the RAID array itself (leaving a hot-spare drive) are discussed later in this chapter.

When you take possession of your MaxPac 8241 system, the RAID system will already have been established, initialized, and verified. The instructions in this section are intended to address those rare situations where you need to replace a degraded/failed drive or you wish to rebuild the RAID system from the ground up.

Your MaxPac system can contain up to four SATA hot-swappable hard disk drives presented in a 3-drive disk caddy. This caddy is located on the upper left-hand side of the main chassis. The numbering of the disks is as shown in Figure 2-3. In the case of a typical RAID 5 system, the upper disk is the system disk, while the lower three disks are used to implement the RAID data array.

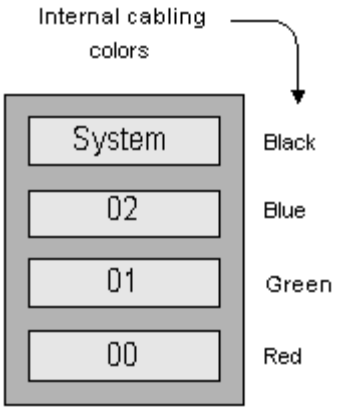


Figure 2-3

Installing the Web-Based 3ware Software

If you reload your operating system, then you will also need to reload the appropriate RAID driver followed by 3ware's *3DM 2* web-based RAID management application as follows:

1) Power-up the system. The operating system will see the RAID controller as a new device and will therefore prompt you to load the appropriate driver from the 3ware CD, which is provided with your system.

2) Insert the 3ware CD. The auto-play function will bring up the **3ware Escalade Menu** as shown in Figure 2-4. Initially you should ignore this menu; don't dismiss it, but instead use the operating system's **Device Manager** utility to look for the 3ware driver on the CD and install it.

Figure 2-4

3) Once the 3ware driver has been loaded, return to the **3ware Escalade Menu** and click the **Install 3DM 2** button.

4) Approve the license agreement in the ensuing pop-up dialog.

5) Following acceptance of the license agreement, you may be presented with the operating system's standard **Welcome to New Connection Wizard** dialog. In this case, use this dialog to setup your network connection.

6) Following this wizard, 3ware's 3DM 2 software will be installed (when prompted to do so, allow the installation script to place a 3DM 2 icon on your desktop).

Building a New 3ware RAID 5 Array from Scratch

The discussions in this section assume that you have an existing system disk and – for one reason or another – have installed three new/empty data disks.

1) Start to power-up the system. When you see the BIOS message *"<Alt-3> to access 3ware BIOS Manager"* (Figure 2-5) press and hold the <ALT> (alternate) key and – while still holding this key – press the number "3" key. This will invoke the 3ware BIOS manager; in most cases, you will be presented with a warning screen as shown in Figure 2-6.

Figure 2-5

Figure 2-6

2) Press any key to continue, which will take you fully into the **3ware BIOS Manager**. Observe that the **Create Unit** option is selected by default. Use <Alt-A> to select all of the drives; asterisk **"*"** characters appear to the left of each drive's port number to indicate that the drive has indeed been selected (Figure 2-7)

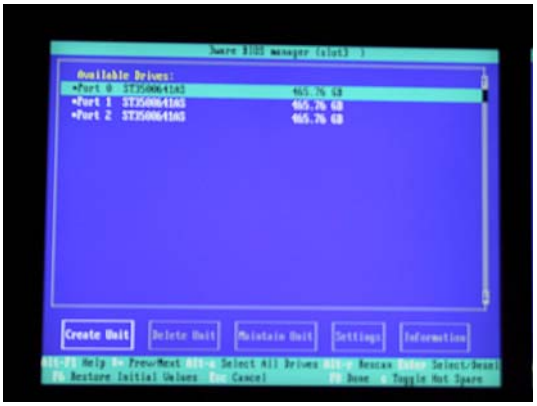


Figure 2-7

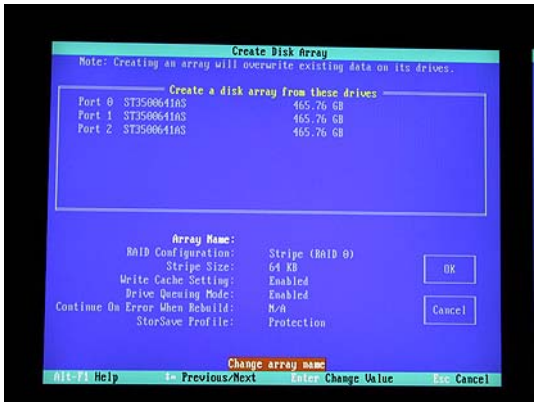


Figure 2-8

3) Ensure that the **Create Unit** item is still selected (the white box shown to the bottom left of the screen in Figure 2-7), and then press the <Enter> key to invoke the **Create Disk Array** screen (Figure 2-8).

4) Use the up/down arrow keys to highlight the **RAID Configuration** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-9).

5) Use the up/down arrow keys to highlight the **RAID 5** option, and then press the <Enter> key to select this option.

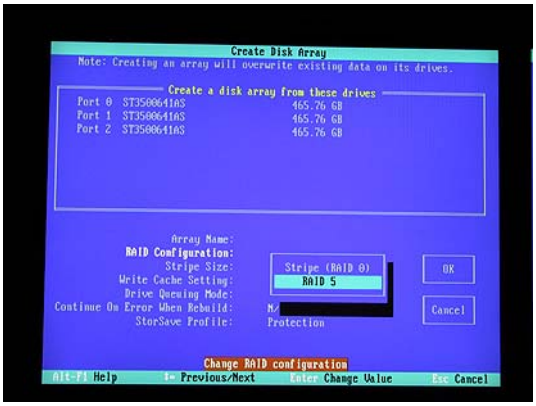


Figure 2-9

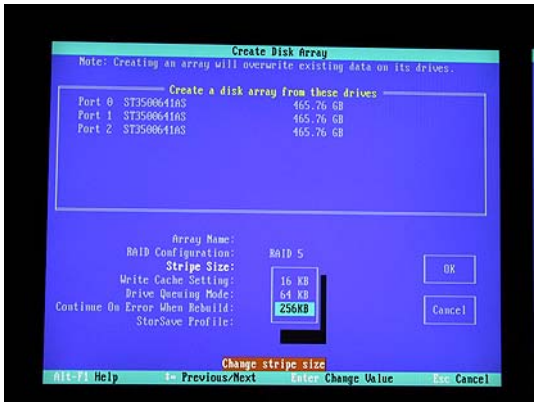


Figure 2-10

6) Use the up/down arrow keys to highlight the **Stripe Size** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-10).

7) Use the up/down arrow keys to highlight the **256 KB** option, and then press the <Enter> key to select this option.

8) Use the up/down arrow keys to highlight the **Write Cache Setting** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-11).

9) Use the up/down arrow keys to highlight the **Enabled** option, and then press the <Enter> key to select this option.

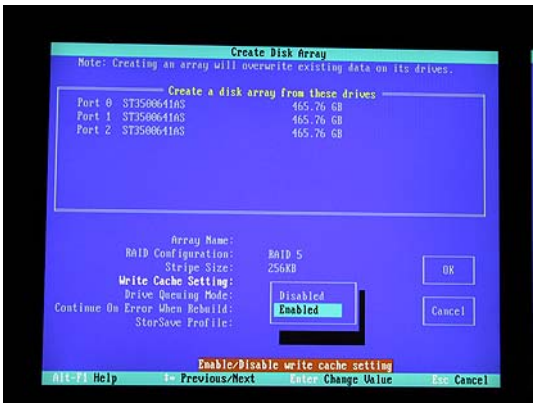


Figure 2-11

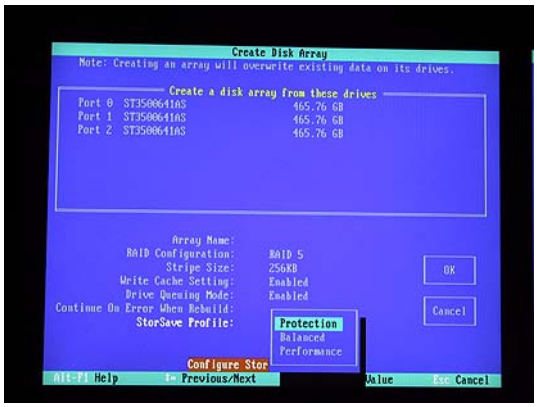


Figure 2-12

10) Use the up/down arrow keys to highlight the **StorSave Profile** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-12).

11) Use the up/down arrow keys to highlight the **Protection** option, and then press the <Enter> key to select this option.

12) Use the up/down/right/left arrow keys to highlight the **OK** item (Figure 2-13) and then press the <Enter> key to save your changes.

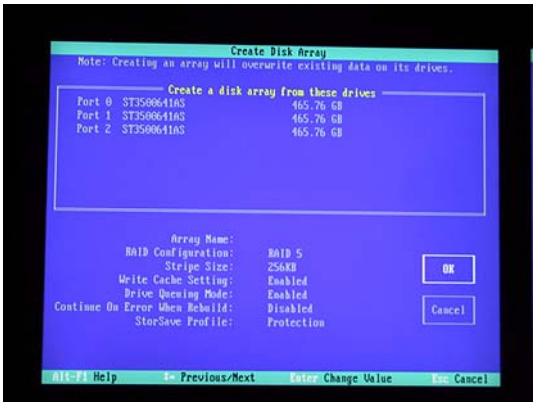


Figure 2-13

Figure 2-14

13) You will be presented with a warning dialog as shown in Figure 2-14. Press the **Y** (yes) to allow the write cache to be enabled (note that this mode significantly improves performance, but it can result in a loss of data in the event of a power failure, so MaxVision STRONGLY recommends the use of an uninterruptible power supply (UPS) with your system).

14) At this point, you will be presented with a summary description of the RAID array you have defined (Figure 2-15).

15) Press the <F8> key to request that your array be established and to exit the 3ware BIOS setup utility.

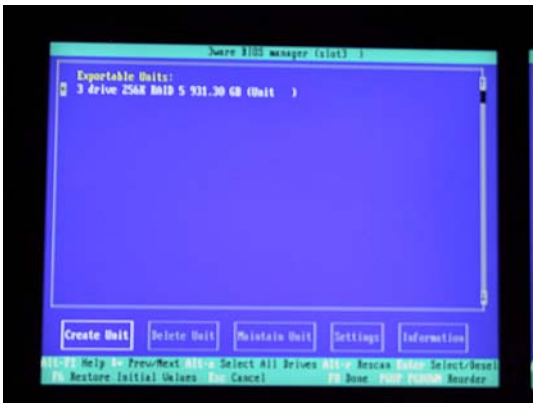


Figure 2-15

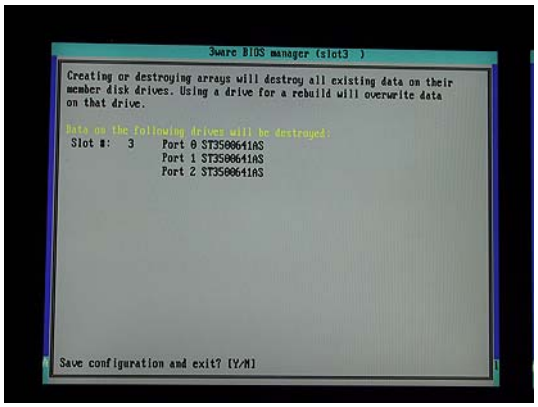


Figure 2-16

16) You will be presented with a warning screen as shown in Figure 2-16. Press the **Y** (yes) key in order to establish your array and exit the 3ware BIOS setup utility. The system will automatically reboot itself in order to make your new RAID array available to the operating system. During the boot process you will see the BIOS report the existence of your new RAID array.

17) Once the system has booted up into Windows®, right-click on the **My Computer** icon and then select the **Manage** option. In the ensuing **Computer Management** dialog, click on the **Disk Management** item. As you have just created a new RAID array, this will automatically launch the **Initialize and Convert Disk Wizard** as shown in Figure 2-17.

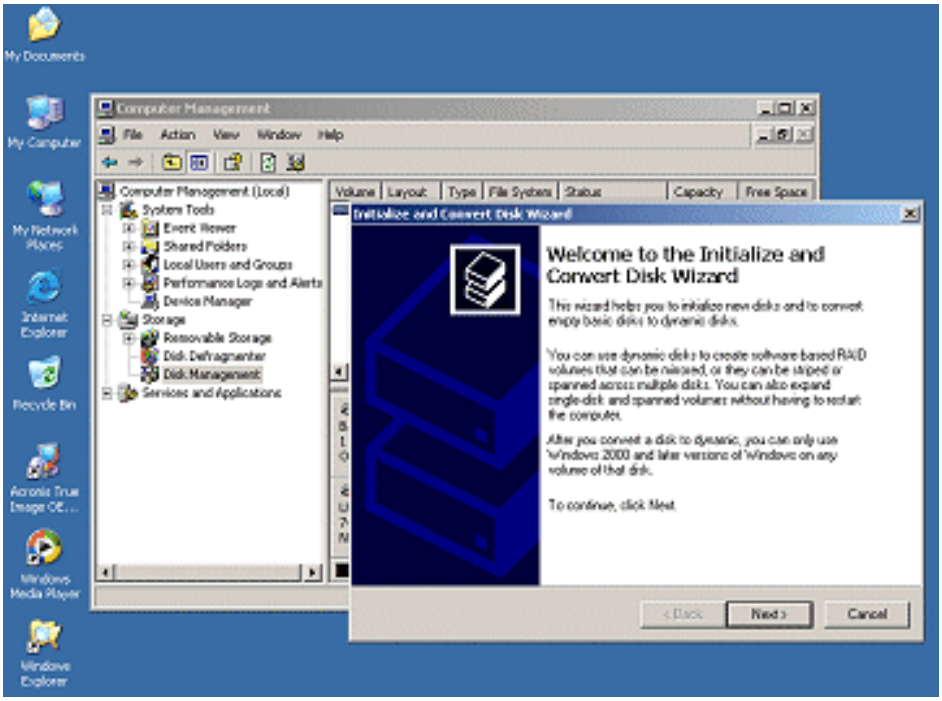


Figure 2-17. The Initialize and Convert Disk Wizard

18) Click the **Next** button to be presented with the **Select Disk to Initialize** screen. Click the **Disk 1** item as shown in Figure 2-18.

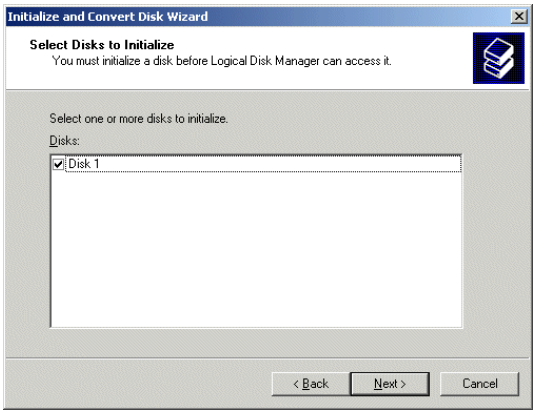


Figure 2-18

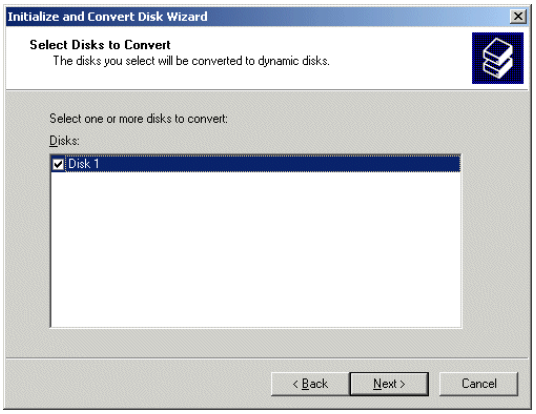


Figure 2-19

19) Click the **Next** button to be presented with the **Select Disk to Convert** screen. Click the **Disk 1** item as shown in Figure 2-19.

20) Click the **Next** button to be presented with the **Completing the Wizard** screen as shown in Figure 2-20, and then click the **Finish** button to perform the operations and exit the wizard.

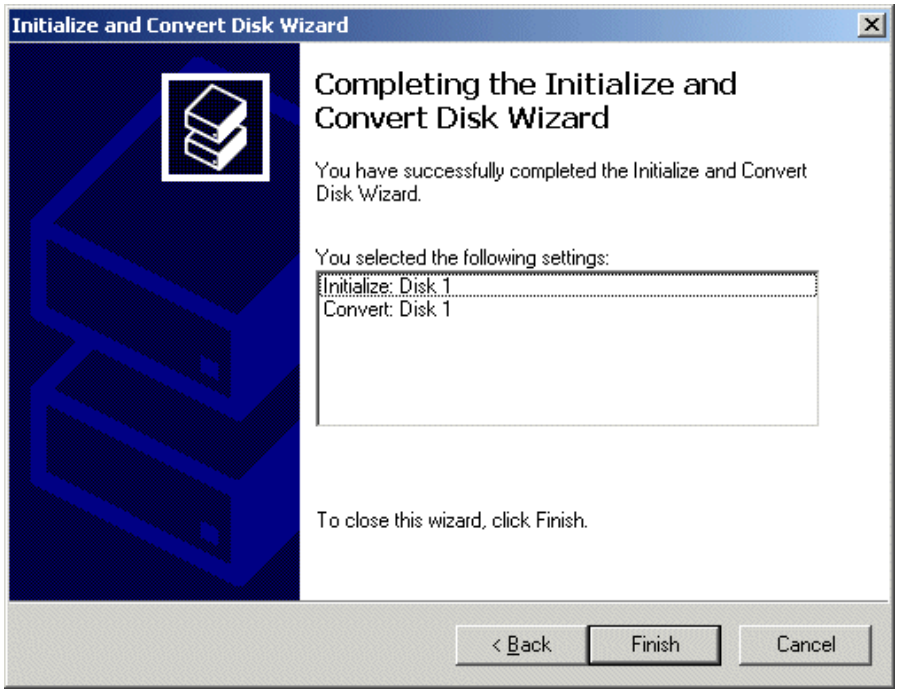


Figure 2-20. The Completing the Wizard dialog

21) Observe that the **Disk Management** area of the **Computer Management** dialog now shows **Disk 1** as being a Dynamic disk that is – as yet – unallocated as shown in Figure 2-21.

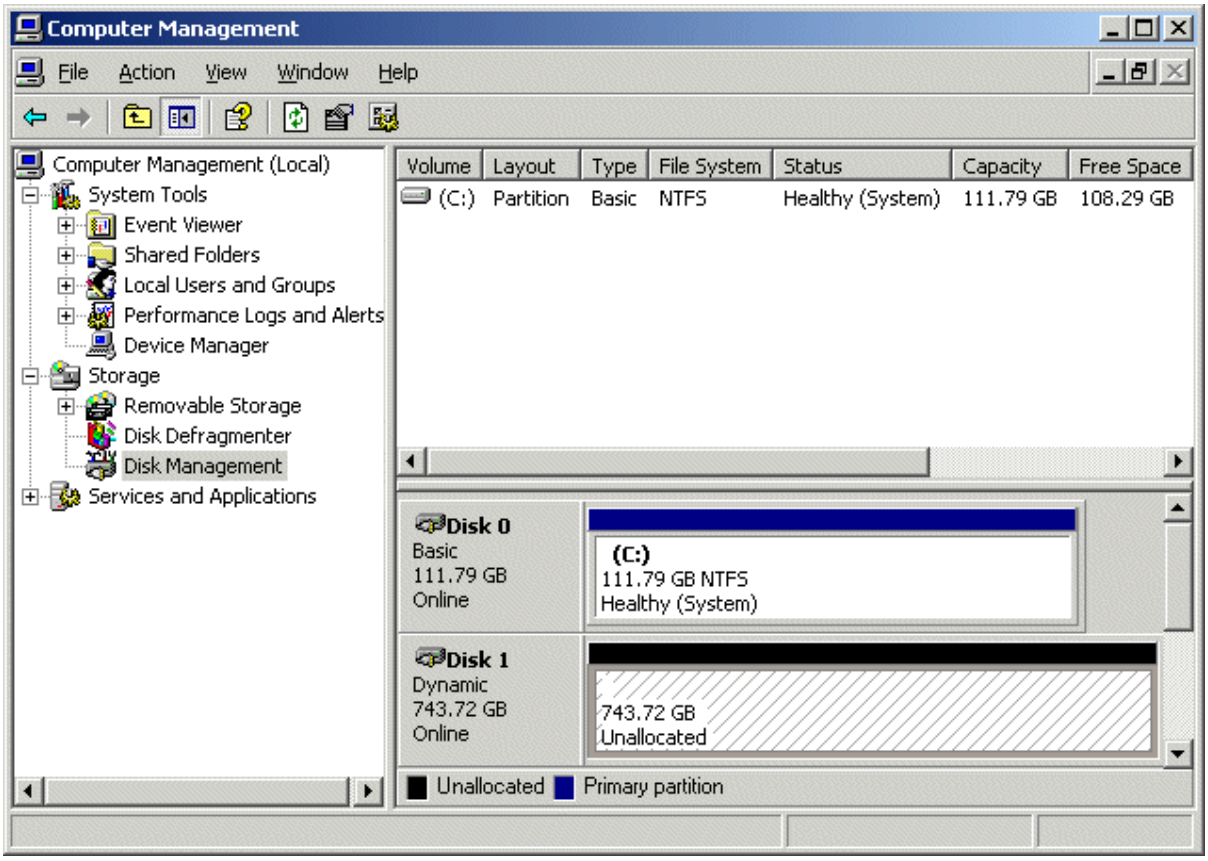


Figure 2-21. Disk 1 is – as yet - unallocated

Note: In the case of the system used in this example, the system disk was 120 GB in size, while the three data disks used to form the RAID array were each 400 GB in size.

Observe in Figure 2-26 that **Disk 1** is shown as being approximately 800 GB in size, where 800 GB equates to 2/3 of the 3 x 400 GB capacity of the data disks (the remaining 400 GB is used to provide the RAID 5 redundancy).

22) Now, right-click on the **Disk 1** item in the lower-right-hand portion of the screen, and then select the **New Volume** option from the ensuing pop-up menu as shown in Figure 2-22.

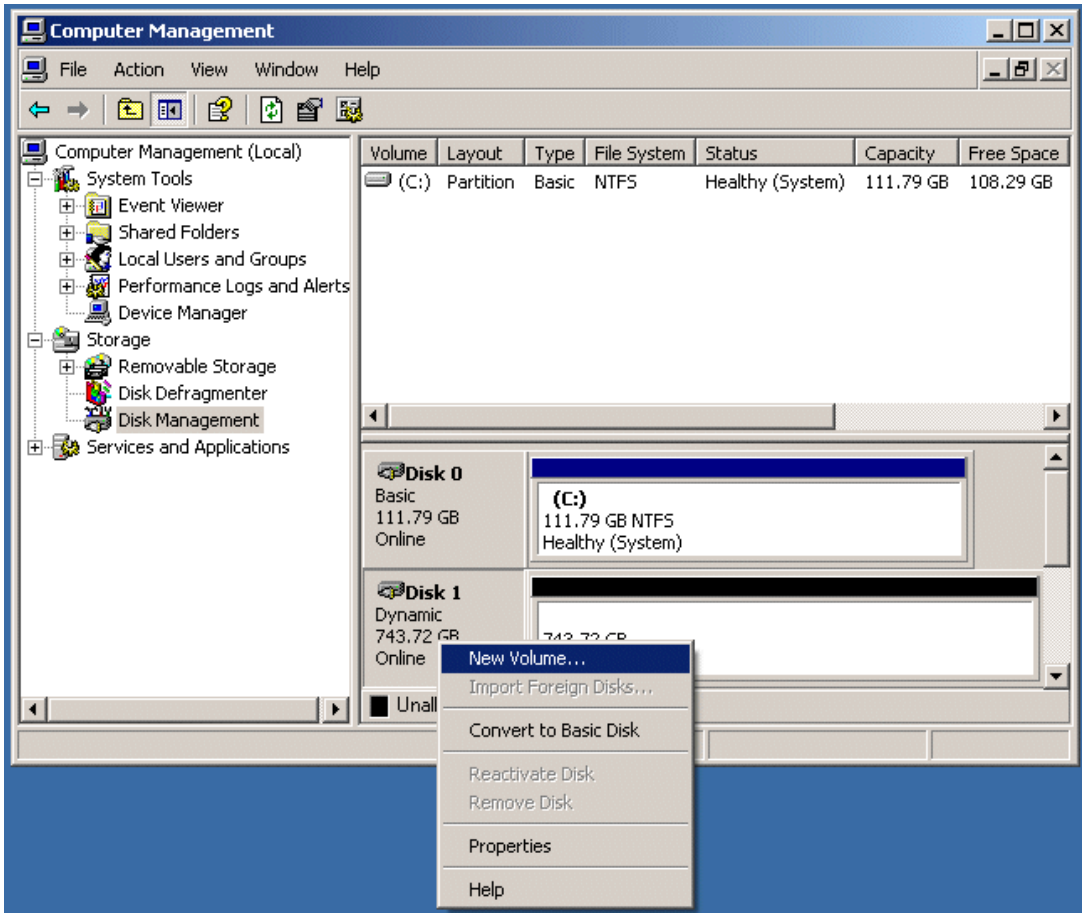


Figure 2-22. Select the New Volume option

23) Observe the **New Volume Wizard** appear as shown in Figure 2-23.

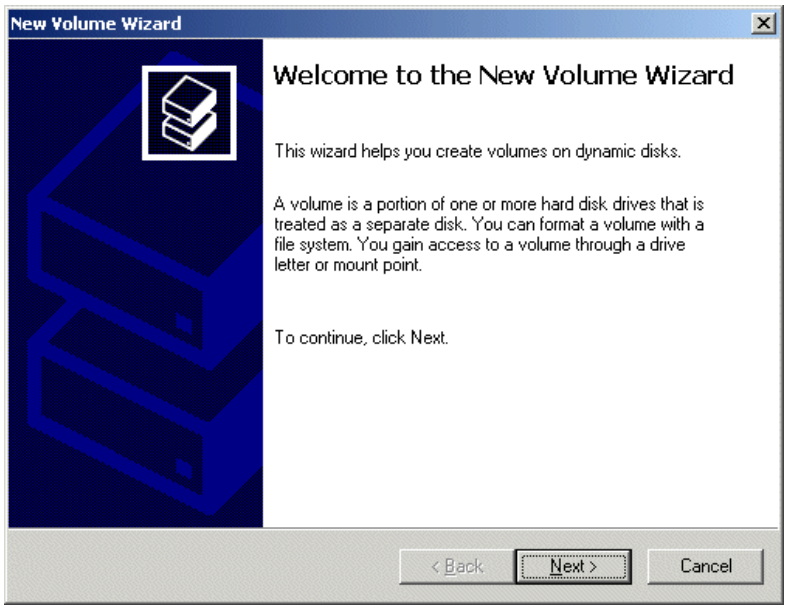


Figure 2-23. The New Volume Wizard

24) Click the **Next** button to be presented with the **Select Volume Type** screen. Click the **Simple** option as shown in Figure 2-24.

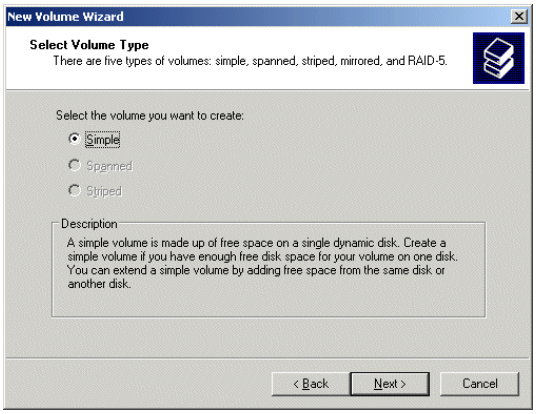


Figure 2-24

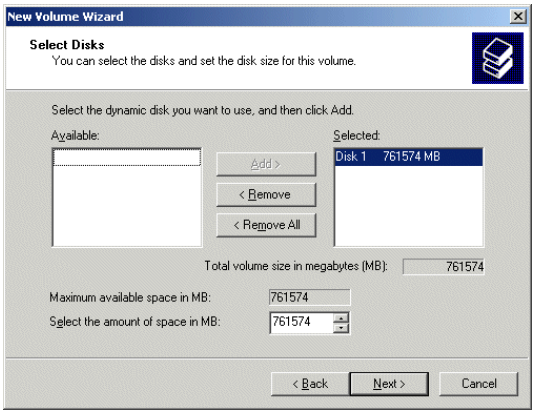


Figure 2-25

25) Click the **Next** button to be presented with the **Select Disk** screen. Ensure that the **Disk 1** item is selected and appears in the **Selected** column on the right-hand side of the dialog as shown in Figure 2-25.

26) Click the **Next** button to be presented with the **Assign Drive Letter or Path** screen. Ensure that the **Assign the Following Drive Letter** item is selected and accept the default letter presented by the system (or enter a different letter if you require) as shown in Figure 2-26.

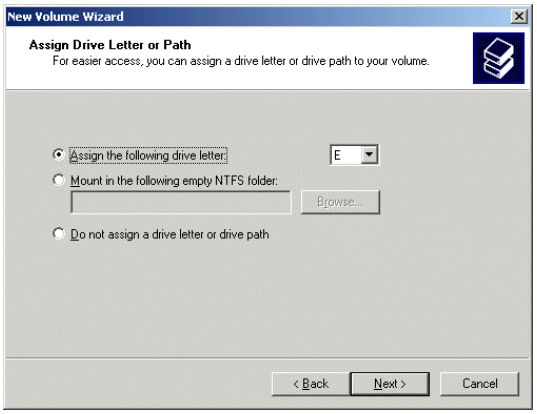


Figure 2-26

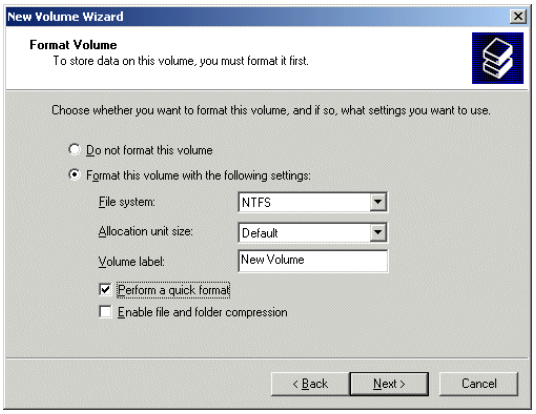


Figure 2-27

27) Click the **Next** button to be presented with the **Format Volume** screen. Click the **Format this volume with the following settings** item as shown in Figure 2-27. Ensure that the settings are **File system** = **NTFS**, **Allocation unit size** = **Default**, and **Volume Label** = user defined (the default is "New Volume"). Also ensure that the **Perform a quick format** item is selected.

28) Click the **Next** button to be presented with the **Completing the New Volume Wizard** screen as shown in Figure 2-28.

29) Click the **Finish** button to perform all of the operations and exit the wizard.

30) Observe that the **Disk Management** area of the **Computer Management** dialog now shows **Disk 1** as being **Dynamic**, **Online**, and **Healthy** as illustrated in Figure 2-29.

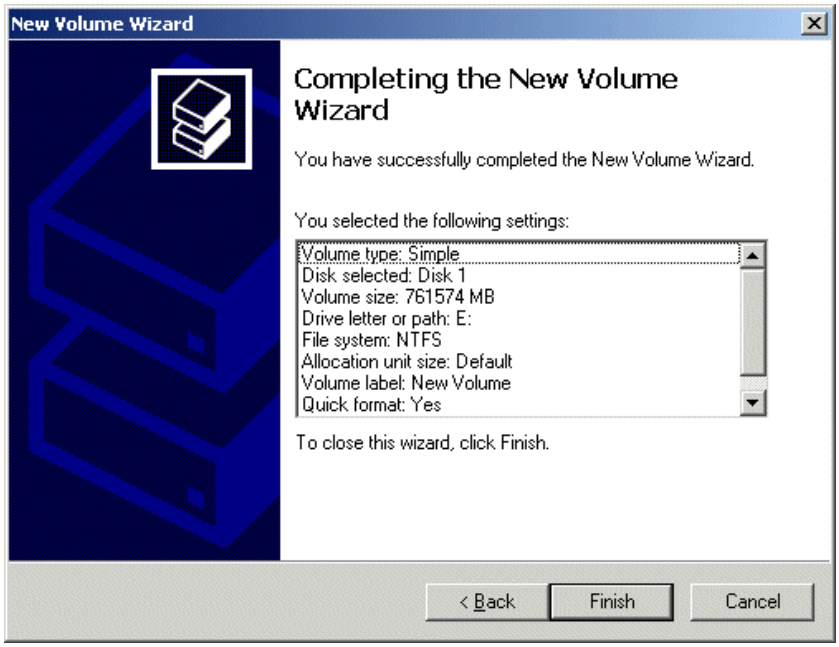


Figure 2-28. The Completing the Wizard dialog

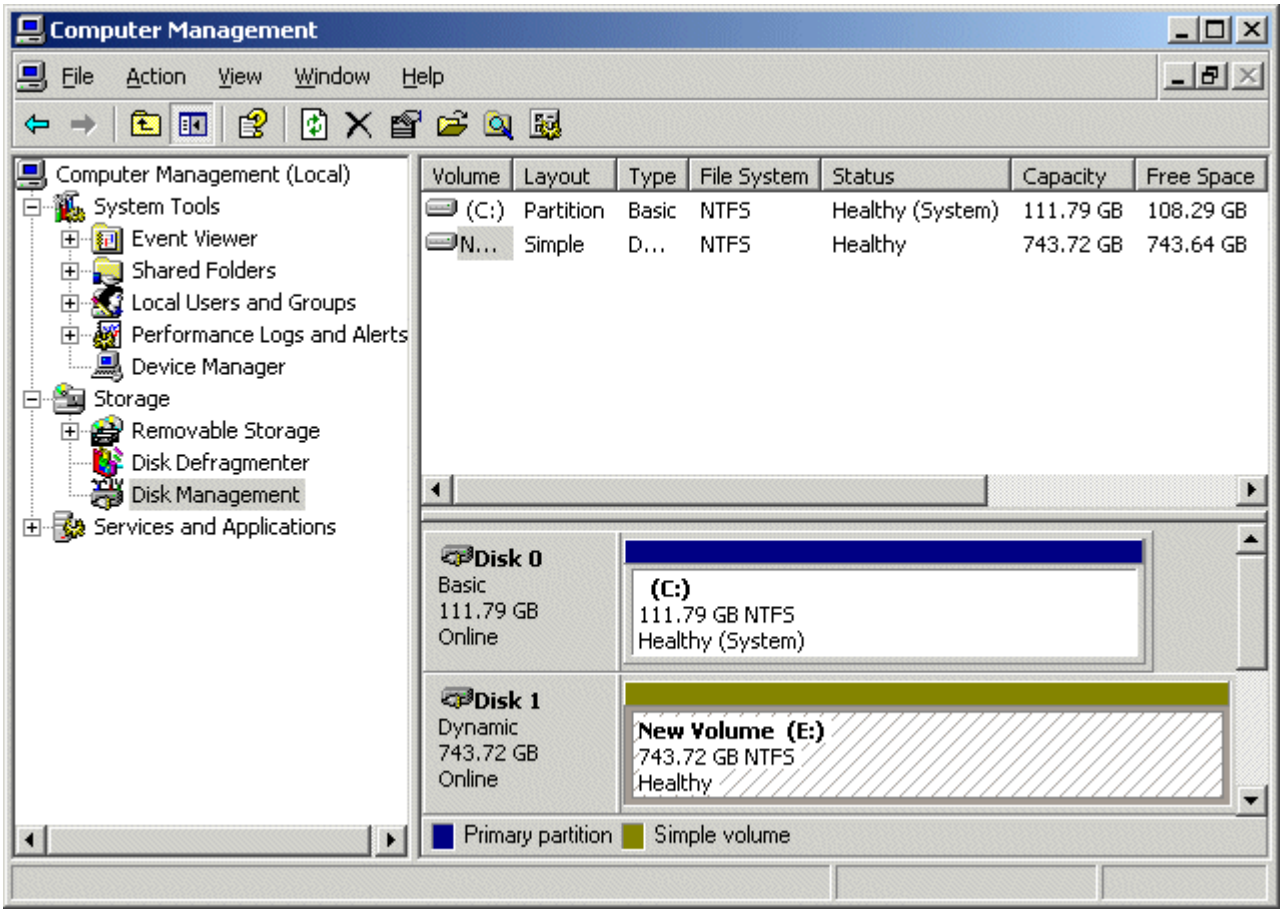


Figure 2-29. Disk 1 is now shown as being Dynamic, Online, and Healthy

Rebuilding an Existing (Failed) 3ware RAID 5 Array

The discussions in this section assume that you originally have a good, working RAID 5 array. In this case, if you double-click the **Connect to 3DM 2** icon on your desktop and login to the ensuing webpage using the default password (which is **3ware**), you will see that the status of your array looks something like that shown in Figure 2-30.

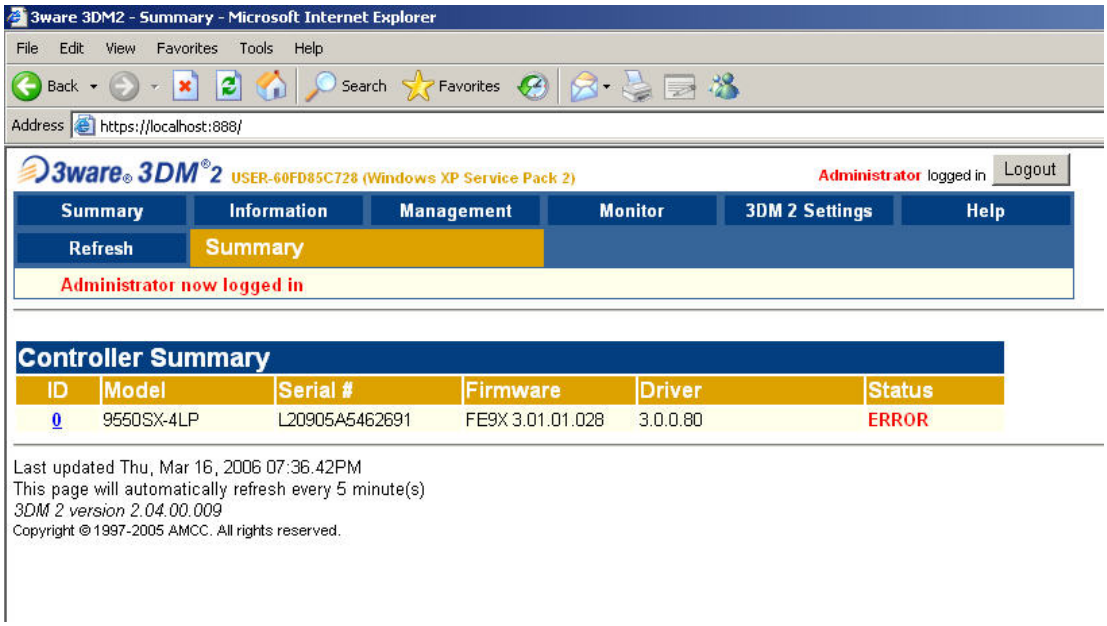


Figure 2-30

Once you have observed this good array, exit out of the 3DM 2 web interface. At some stage, one of the disks in the array may start to degrade or go completely off-line. For the purposes of these discussions, we are going to power down the system, physically remove Disk 01 from the array (thereby simulating a catastrophic failure on this disk) and power up the system back up again.

1) Power down the system and remove the center data disk (Disk 01) as shown in Figure 2-31.

Figure 2-31

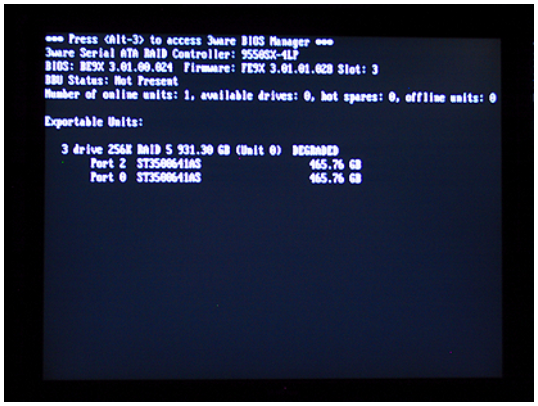


Figure 2-32

2) Power the system back up again. The BIOS detects the fact that there is a problem with the RAID array and displays an appropriate message (Figure 2-32). Press the <Pause Break> key to freeze the display; from this (and Figure 2-3) you will be able to determine which drive has failed.

3) Press and hold the soft power key in order to power the system down.

4) Remove the failed drive and replace it with a good drive of the same type and capacity (remember that we only removed the drive above in order to simulate a catastrophic failure scenario).

5) Power the system up again all the way into windows.

6) Double-click the **Connect to 3DM 2** icon on your desktop and login to the ensuing webpage using your administrator password (note that you may need to contact your IT department in order to obtain this password).

7) After you have logged in as the administrator, you will see a status of **ERROR** in the 3DM 2 interface (Figure 2-33).

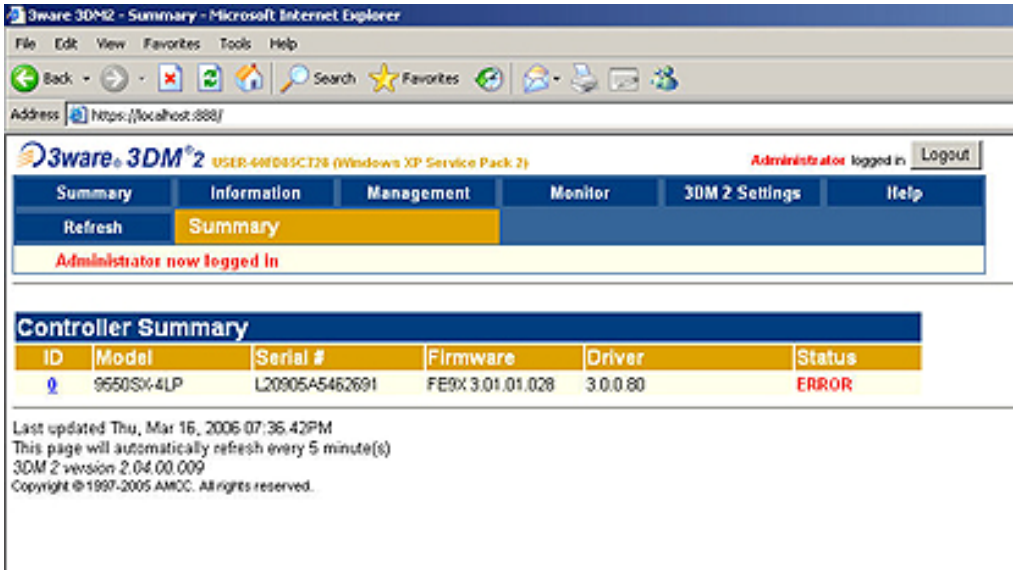


Figure 2-33

8) Observe that the system reports the two good drives as being in a DEGRADED unit as shown in Figure 2-34.

9) Depending on the past history of the disk (whether or not it was previously part of a 3ware RAID array) the system may report that the new disk is INOPERABLE as illustrated in Figure 2-34. Alternatively, the system may report the new disk as being AVAILABLE as illustrated in Figure 2-35.

   Assuming that the new disk is reported as being INOPERABLE, click the checkbox associated with that unit (**Unit 1** in this example) and then click the **Delete Unit** button. Observe that the system will present you with a confirmation dialog as shown in Figure 2-34. Click the **OK** button, and observe that the new disk is now reported as being AVAILABLE as illustrated in Figure 2-35.

10) Click the checkbox associated with the two good drives (shown as **Unit 0** in this example) and also click the checkbox associated the new replacement drive (shown as **Port 1** in this example) and then click the **Rebuild Unit** button associated with the two good drives as illustrated in Figure 2-36.

11) Observe the ensuing pop-up dialog box as shown in Figure 2-37. Click the checkbox associated with the new drive, and then click the **OK** button.

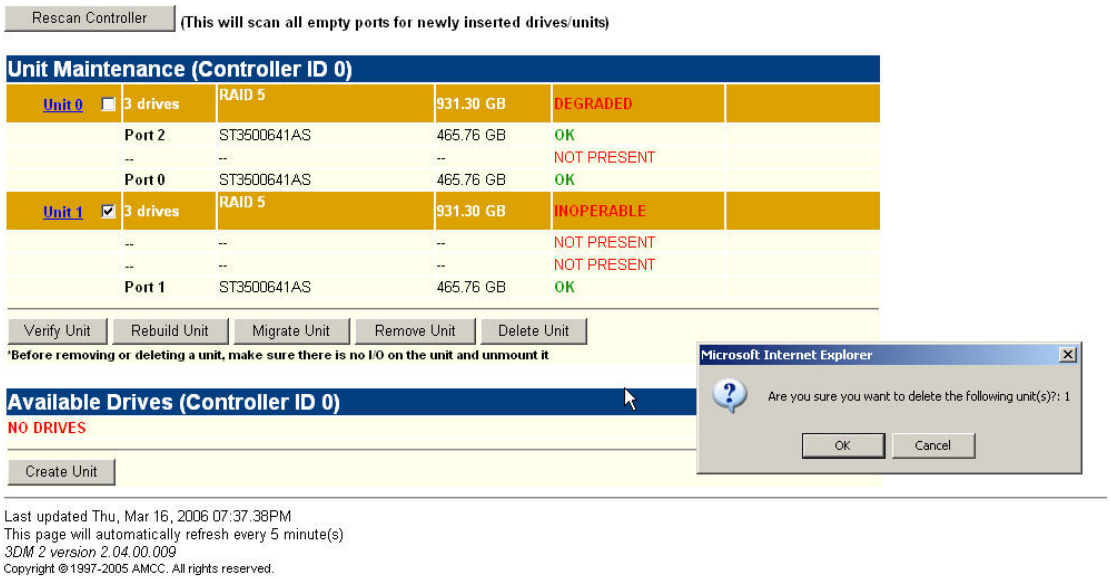


Figure 2-34

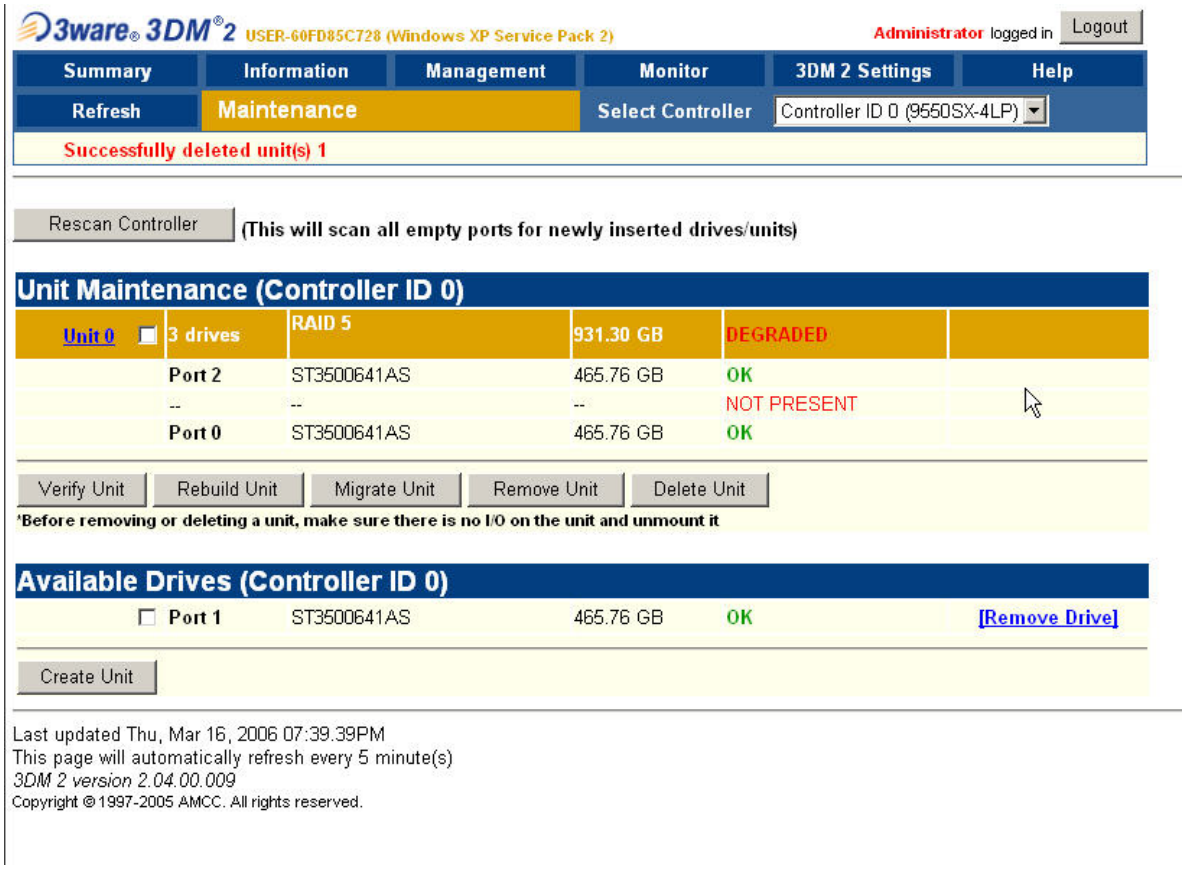


Figure 2-35

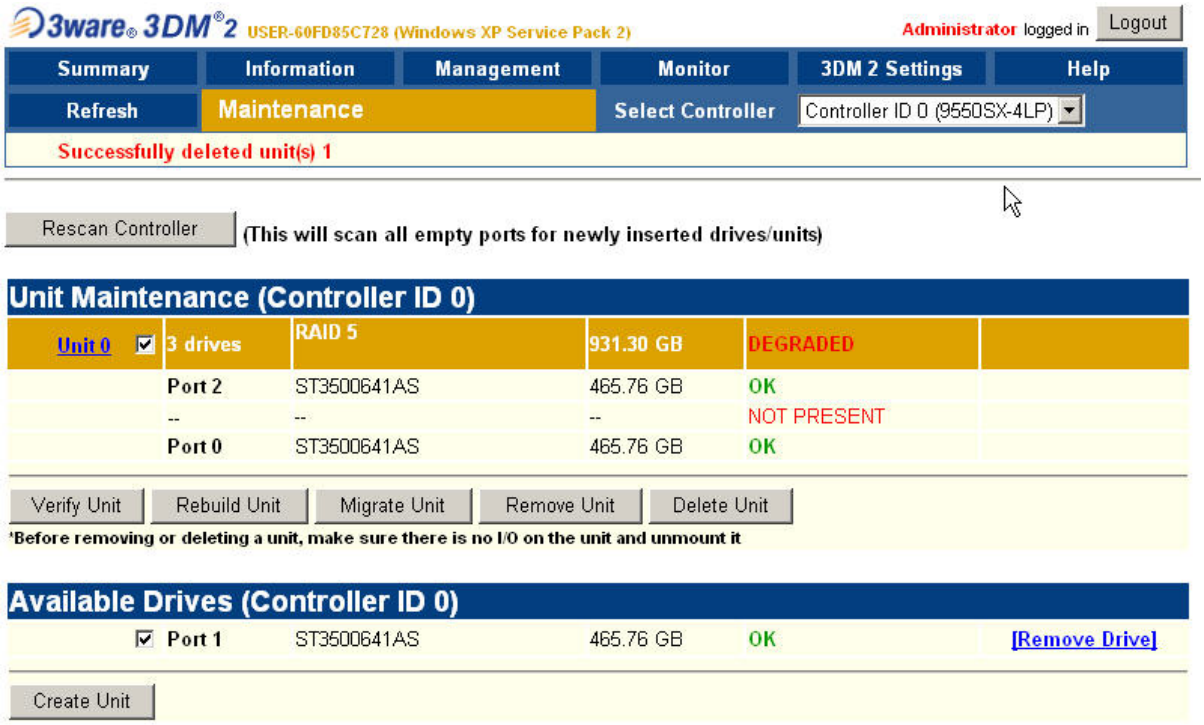


Figure 2-36

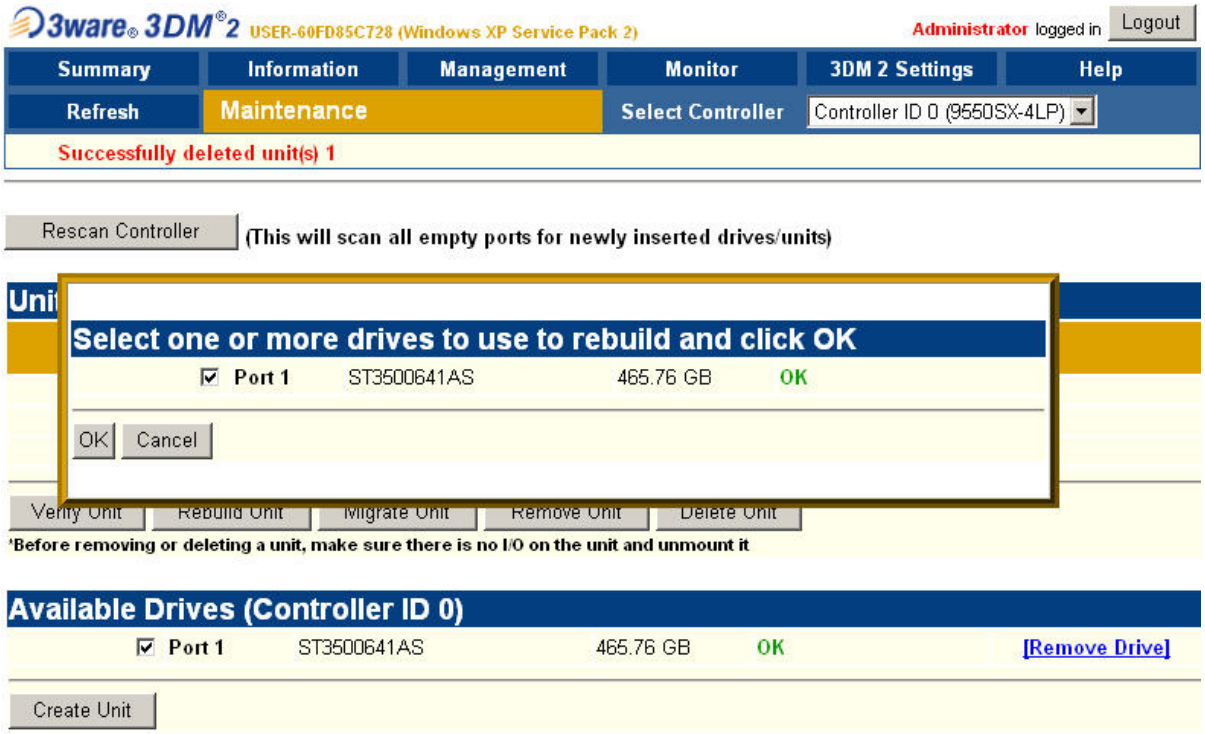


Figure 2-37

12) Observe that the replacement drive has now been incorporated into the RAID 5 array as illustrated in Figure 2-38 (note that this array is still shown as being DEGRADED).

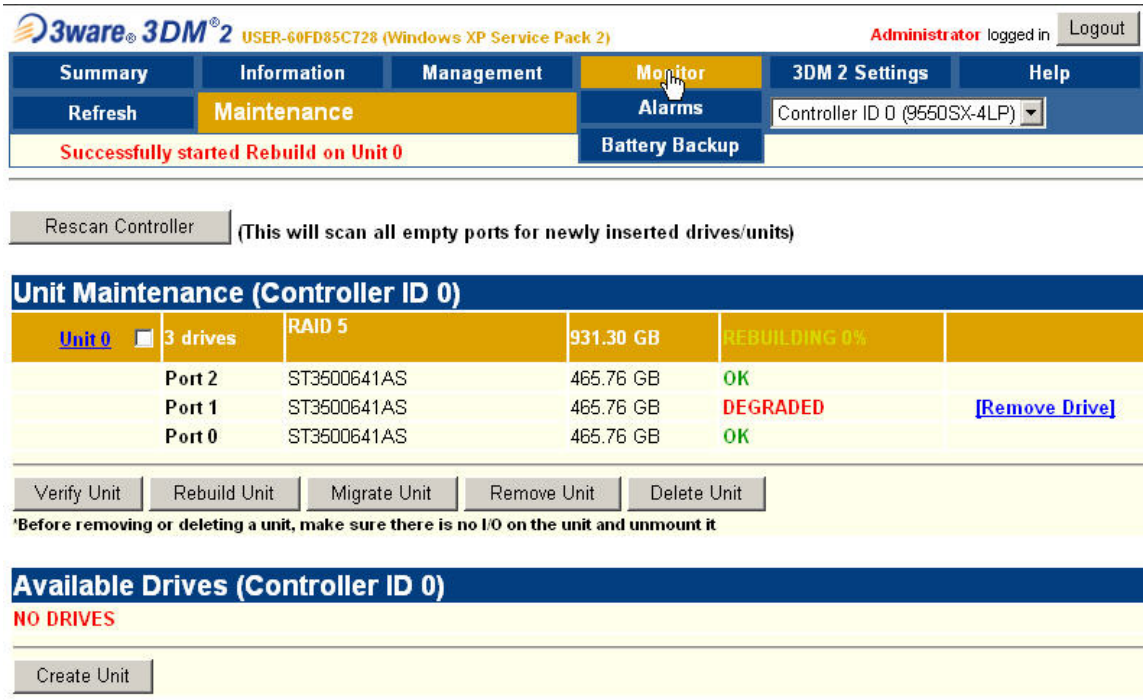


Figure 2-38

When the new disk has been fully integrated into the array, the interface will reflect the completion of the rebuild.

Note: This rebuild process can take a significant amount of time (14 hours in the case of our example using 400 GB disks).

Note: The rebuild process is performed in the background, so you can continue to use your system while the rebuild is taking place.

Configuring the RAID Array
(with Hot Spare and System Partition on RAID Array)

Note that these discussions reflect system configurations that have the system partition established on the RAID array itself (leaving a hot-spare drive) as illustrated in Figure 2-39. Configurations with a separate system drive are discussed earlier in this chapter.

When you take possession of your MaxPac 8241 system, the RAID system will already have been established, initialized, and verified. The instructions in this section are intended to address those rare situations where you need to replace a degraded/failed drive or you wish to rebuild the RAID system from the ground up.

Your MaxPac system can contain up to four SATA hot-swappable hard disk drives presented in a 3-drive disk caddy. This caddy is located on the upper left-hand side of the main chassis. The numbering of the disks is as shown in Figure 2-39). The main array – including the system partition –

occupies disks 00, 01, and 02, leaving disk 03 as the hot-spare (note that this is the initial/default configuration; once the hot-spare disk has been deployed as discussed below, the failed-and-replaced disk will assume the role of the new hot-spare).

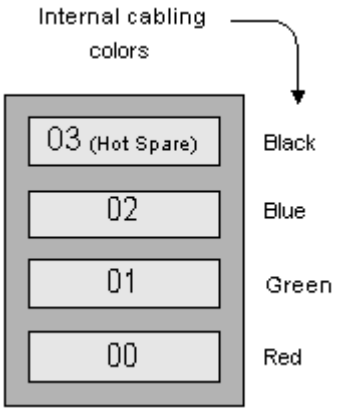


Figure 2-39

Establishing the Array and Reloading the System Image

These discussions assume that you are reestablishing a system from the ground up, and that you have four new disks in your disk caddy.

1) Start to power-up the system. When you see the BIOS message *"<Alt-3> to access 3ware BIOS Manager"* (Figure 2-40) press and hold the <ALT> (alternate) key and – while still holding this key – press the number "3" key. This will invoke the 3ware BIOS manager; in most cases, you will be presented with a warning screen as shown in Figure 2-41.

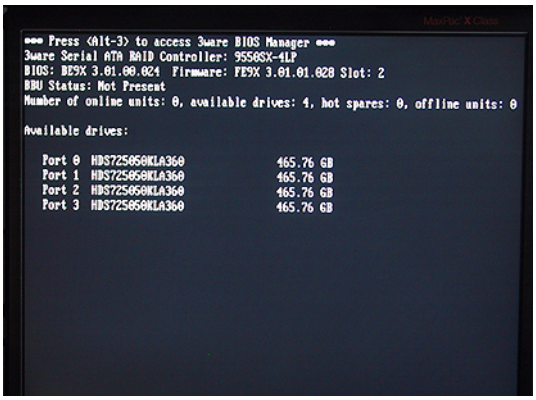


Figure 2-40

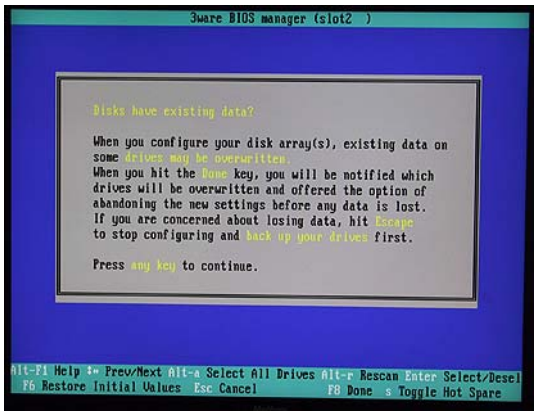


Figure 2-41

2) Press any key to continue, which will take you fully into the **3ware BIOS Manager**. Observe that the four disks are shown on the screen, but no drives are initially selected (Figure 2-42).

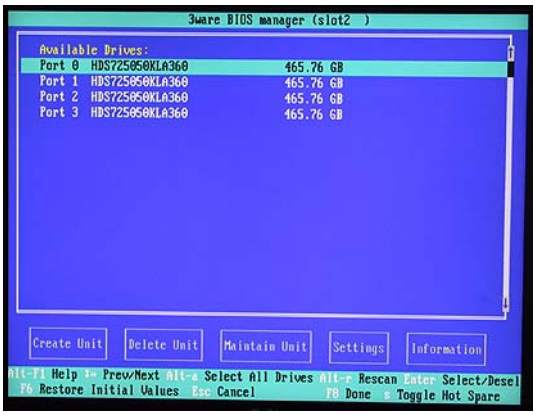


Figure 2-42

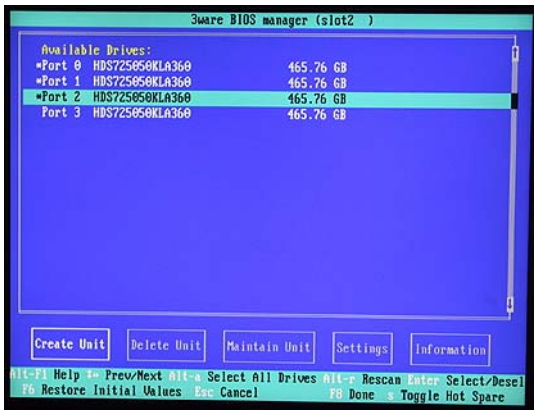


Figure 2-43

3) Use the up/down arrow keys to highlight disks 00, 01, and 02 in turn; as each disk is highlighted, press the <Enter> key to select it (selected disks are indicated with an asterisk '*' character as shown in Figure 2-43). (Note that the reason disk 03 is not selected is that this is being reserved as the hot-spare.)

4) Use the <Tab> key to highlight the **Create Unit** option (Figure 2-43), then press the <Enter> key to key to invoke the Create Disk Array screen.

5) Use the up/down arrow keys to highlight the **RAID Configuration** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-44).

6) Now use the up/down keys to highlight the **RAID 5** option and then press the <Enter> key to select this option.

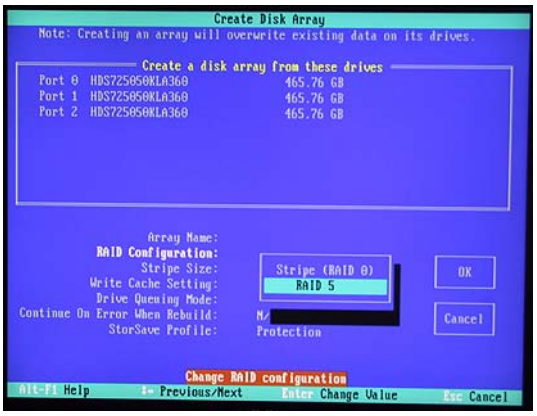


Figure 2-44

Figure 2-45

7) Next, use the up/down arrow keys to highlight the **Stripe Size** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-45).

8) Use the up/down arrow keys to highlight the **256 KB** option, and then press the <Enter> key to select this option.

9) Use the up/down arrow keys to highlight the **Write Cache Setting** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-46).

10) Use the up/down arrow keys to highlight the **Enabled** option, and then press the <Enter> key to select this option.

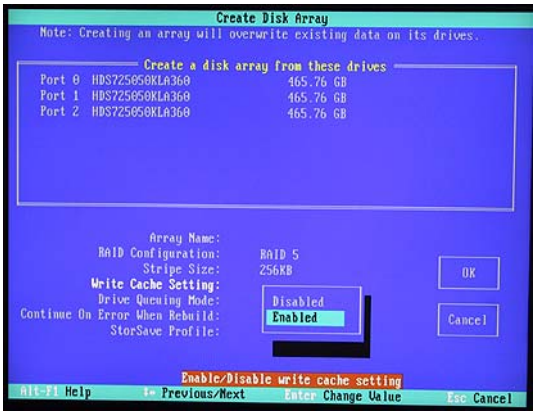


Figure 2-46

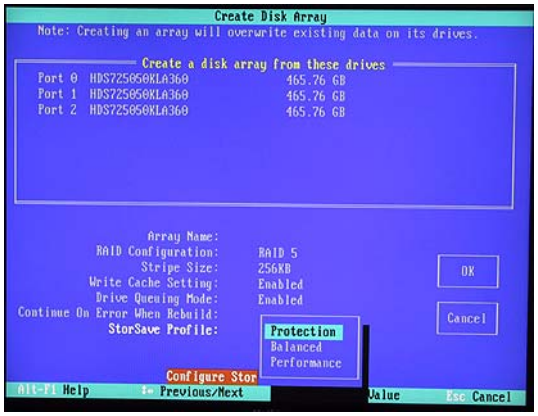


Figure 2-47

11) Use the up/down arrow keys to highlight the **StorSave Profile** item, and then press the <Enter> key to access an associated pop-up dialog (Figure 2-47).

12) Use the up/down arrow keys to highlight the **Protection** option, and then press the <Enter> key to select this option.

13) Use the up/down/right/left arrow keys to highlight the **OK** item (Figure 2-48) and then press the <Enter> key to save your changes.

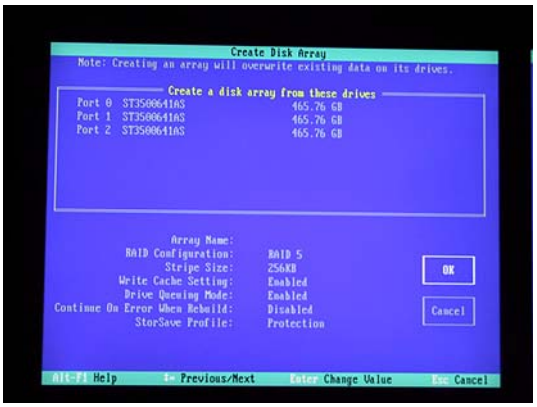


Figure 2-48

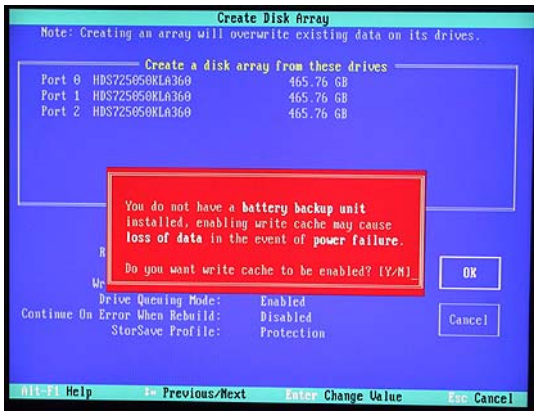


Figure 2-49

14) You will be presented with a warning dialog as shown in Figure 2-49. Press the **Y** (yes) key to allow the write cache to be enabled [note that this mode significantly improves performance, but it can result in a loss of data in the event of a power failure, so MaxVision STRONGLY recommends the use of an uninterruptible power supply (UPS) with your system.

15) At this point, you will be presented with a summary description of the RAID array you have defined (Figure 2-50).

16) Observe that this screen shows the array (3 drives) and the remaining uncommitted drive. Use the up/down arrow keys to highlight the uncommitted drive and press the <Enter> key to select it (the fact this has been selected will be indicated with an asterisk '*' character).

17) Now press the 'S' key to designate this selected drive as being the hot-spare (an annotation will appear next to the drive confirming this status).

Figure 2-50

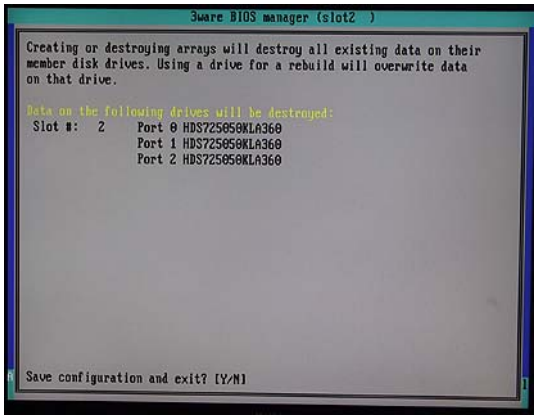


Figure 2-51

18) Press the <F8> key to request that your array be committed and to exit the 3ware BIOS setup utility.

19) You will be presented with a warning screen as shown in Figure 2-51. Before you do anything else, ensure that the bootable recovery DVD supplied in the accessory pack is in the system's CD/DVD drive. In the case of a multiple DVD image, ensure Disk #1 is in the drive. Then press the **Y** (yes) key in order to establish your array, exit the 3ware BIOS setup utility, and automatically reboot the machine.

Note: If you are using an image CD/DVD you've created yourself as discussed in *Appendix A*, and if that CD/DVD (or the first CD/DVD in a set) has the Acronis *Bootable Rescue Media* software on it, then simply insert this disk in the drive and proceed to point 20 below.

Alternatively, if your CD/DVD does not have the Acronis *Bootable Rescue Media* software on it, then first insert the bootable recovery DVD supplied by MaxVision in the drive and reboot as discussed in point 20 below. However, before proceeding to point 21, remove the bootable recovery DVD supplied by MaxVision from the drive and replace it with the first disk from your own image.

20) The system will automatically reboot itself from the recovery disk in the DVD drive. Following the Acronis splash, you will be presented with the **Pick a Task** page in the Acronis True Image application (Figure 2-52).

Figure 2-52

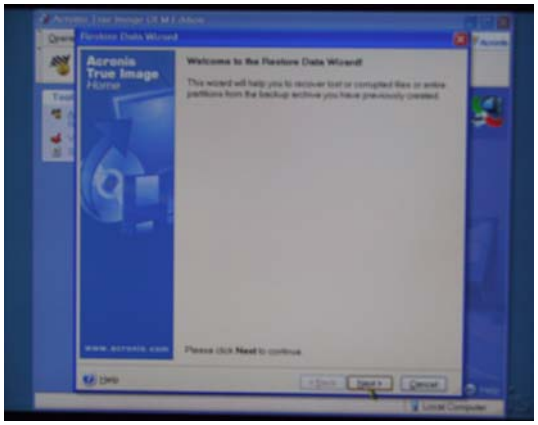


Figure 2-53

21) Click the **Recovery** item to be presented with the first page from the **Restore Data Wizard** (Figure 2-53).

22) Click the **Next** button to be presented with the **Archive Selection** screen (Figure 2-54).

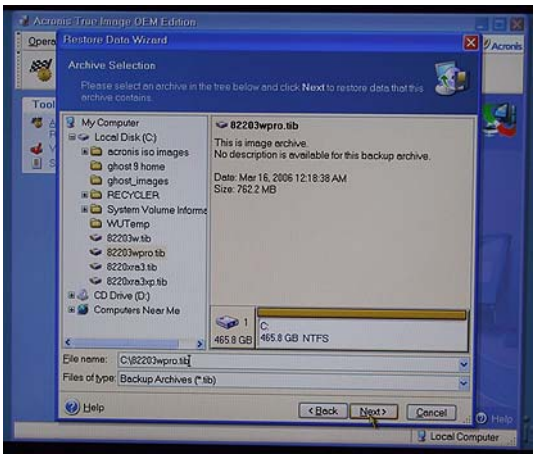


Figure 2-54

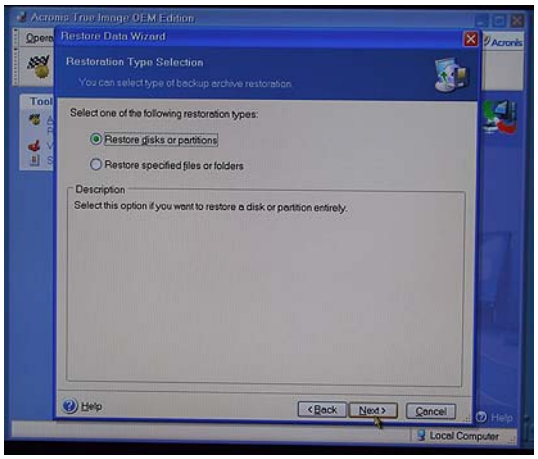


Figure 2-55

23) Ensure that the **CD Drive** item in the left-hand selection pane is expanded (if not, click the '+' icon next to this item) and then use the mouse to click on the image (*.tib) file you will see there (Figure 2-54).

Note: In the case of a multi-CD/DVD image set, the system will present you with a message saying that this is not the last created volume in the archive and requesting you to insert the last created volume. In this case, replace the current CD/DVD with the last disk from the set, click on the *.tib file on this disk, and proceed to point 24 (at some stage you will be prompted to return to the first disk).

24) Click the **Next** button to be presented with the **Restoration Type Selection** page (Figure 2-55).

25) Select the **Restore Disks or Partition** item and then click the **Next** button to be presented with the **Partition or Disk to Restore** page (Figure 2-56).

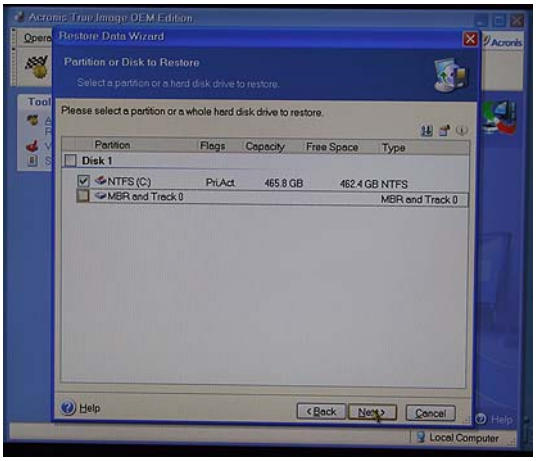


Figure 2-56

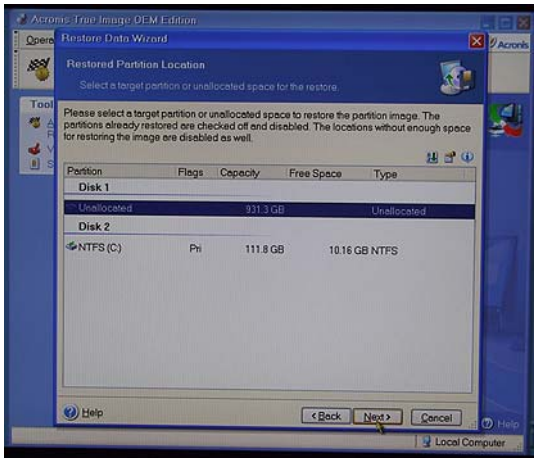


Figure 2-57

26) Select the **NTFS (C)** option (a tick-mark indicates that the option has been selected) and then click the NEXT button to be presented with the **Restored Partition Location** page (Figure 2-57).

27) Select the **Unallocated** (Disk 1) item and then click the **Next** button to be presented with the **Restored Partition Type** page (Figure 2-58).

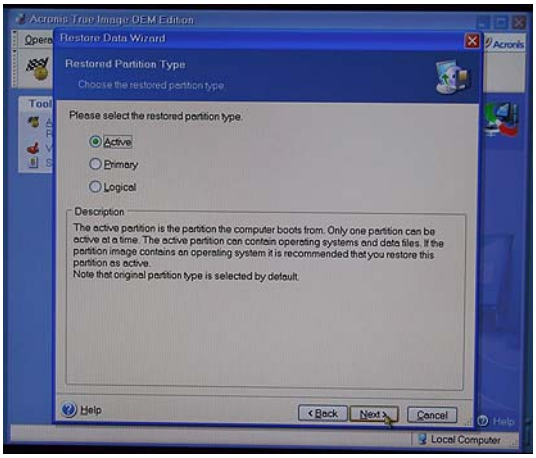


Figure 2-58

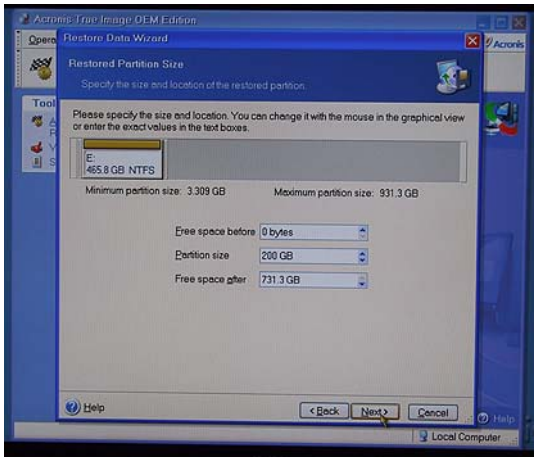


Figure 2-59

28) Select the **Active** item and then click the **Next** button to be presented with the **Restored Partition Size** page (Figure 2-59).

29) We have chosen to establish a 200 GB system partition in this example; the remaining "Free Space" will automatically be allocated to the data portion of the RAID 5 array. Click the **Next** button to be presented with the **Next Selection** window (Figure 2-60)

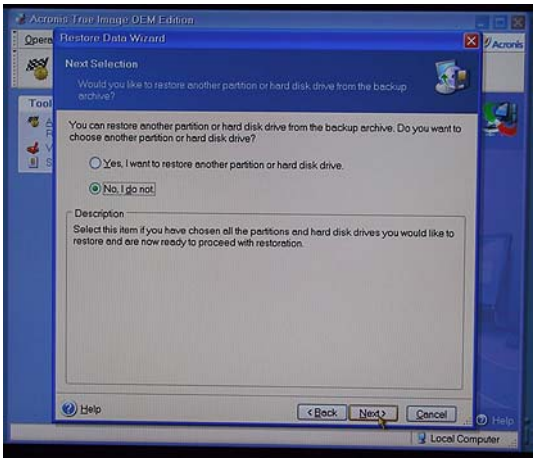


Figure 2-60

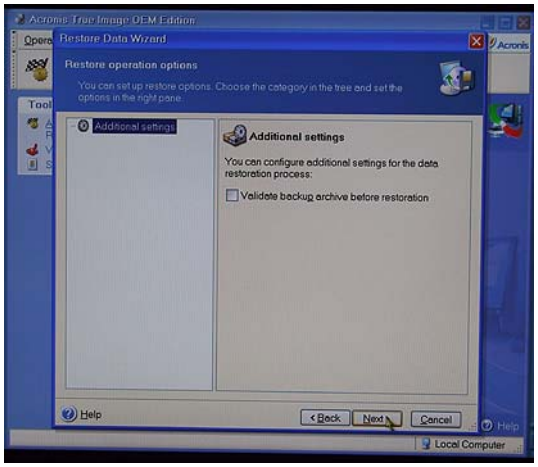


Figure 2-61

30) Select the **No, I Do Not** option and then click the **Next** button to be presented with the Restore Operation options page (Figure 2-61).

31) Simply click the **Next** button to be presented with the **Restore Data Wizard** summary screen (Figure 2-62)

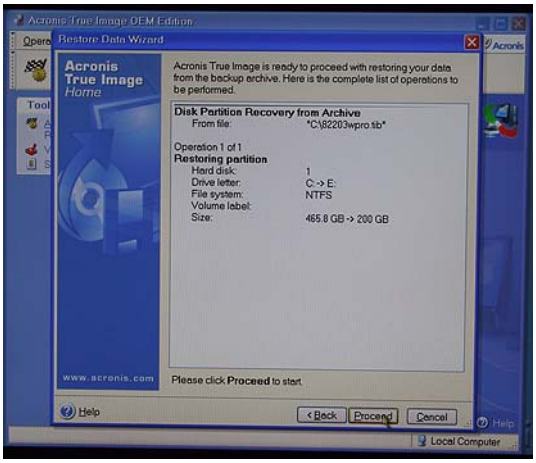


Figure 2-62

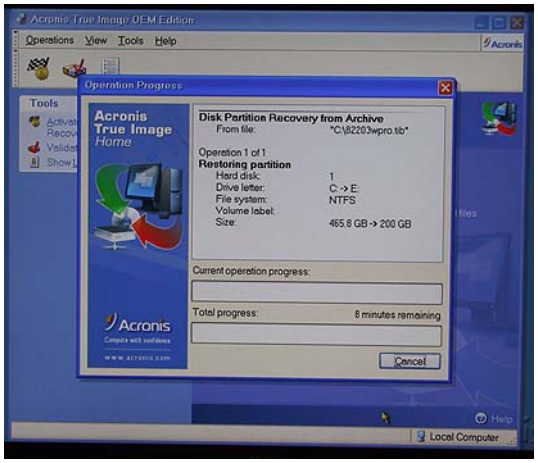


Figure 2-63

32) Click the **Proceed** button to initiate the restoration, at which time you will be presented with the **Operation Progress** dialog (Figure 2-63), which will reflect the status of the restoration. (In the case of a multi-DVD image, the system will inform you as and when to insert subsequent DVDs).

33) Once the restoration process has been completed, eject the DVD from the CD/DVD drive, power-down the system by holding the Soft-Power button on top of the center display for approximately five seconds, and then power-up the machine using the Soft Power button to boot-up into Windows.

Note: Once you have re-loaded the original MaxVision-supplied image, you will also have to re-run the initialization procedures – including re-activating/re-registering your OS license – as described earlier in this manual.

34) After the system has booted up into Windows (and you've re-run the initialization procedures as noted above), right-click on the **My Computer** icon and then select the **Manage** option. In the ensuing **Computer Management** dialog, click on the **Disk Management** item (Figure 2-64).

35) Right-mouse-click in the **Unallocated** area and select the **New Partition** item in order to be presented with the **New Partition** Wizard as shown in Figure 2-65.

36) Click the **Next** button, then select the **Perform a Quick Format** option (ensure the File System type is set to **NTFS**), and then click the **OK** button. The **Computer Management** window will reflect your newly formatted partition (Figure 2-66).

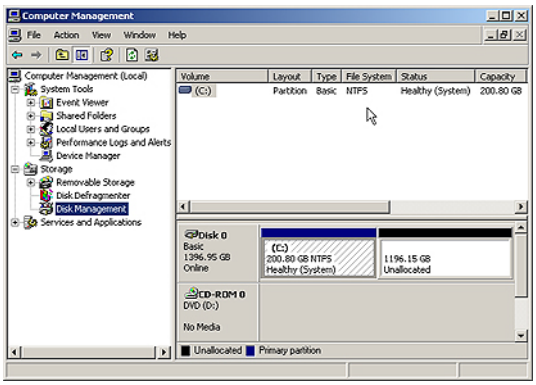


Figure 2-64

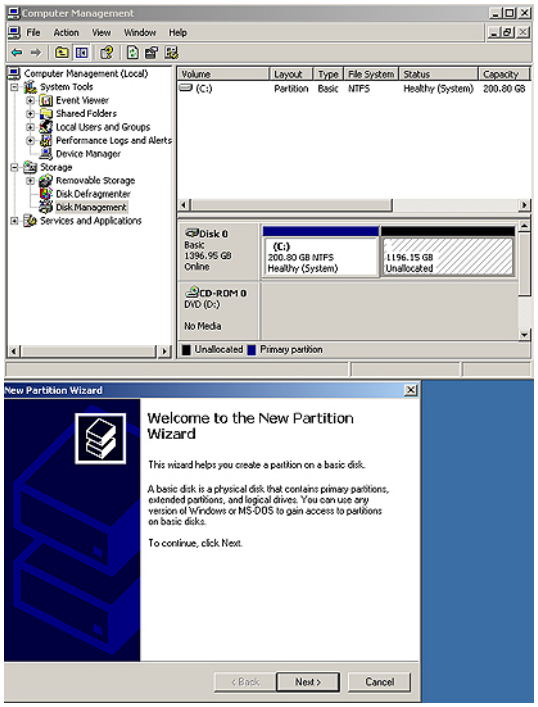


Figure 2-65

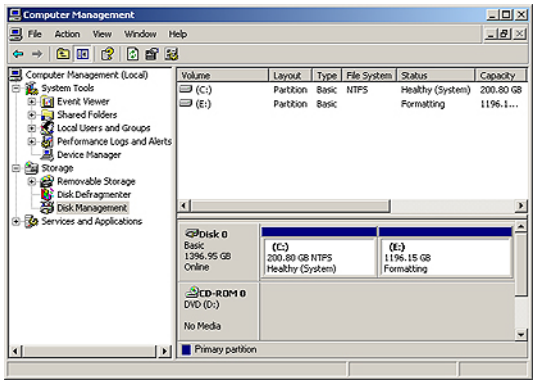


Figure 2-66

Rebuilding an Existing (Failed) 3ware RAID 5 Array

The discussions in this section assume that you originally have a good, working RAID 5 array (consisting of 3 drives for the array and 1 Hot Spare). In this case, if you double-click the **Connect to 3DM 2** icon on your desktop and login to the ensuing webpage using the default password (which is **3ware**), you will see that the status of your array looks something like that shown in Figure 2-67.

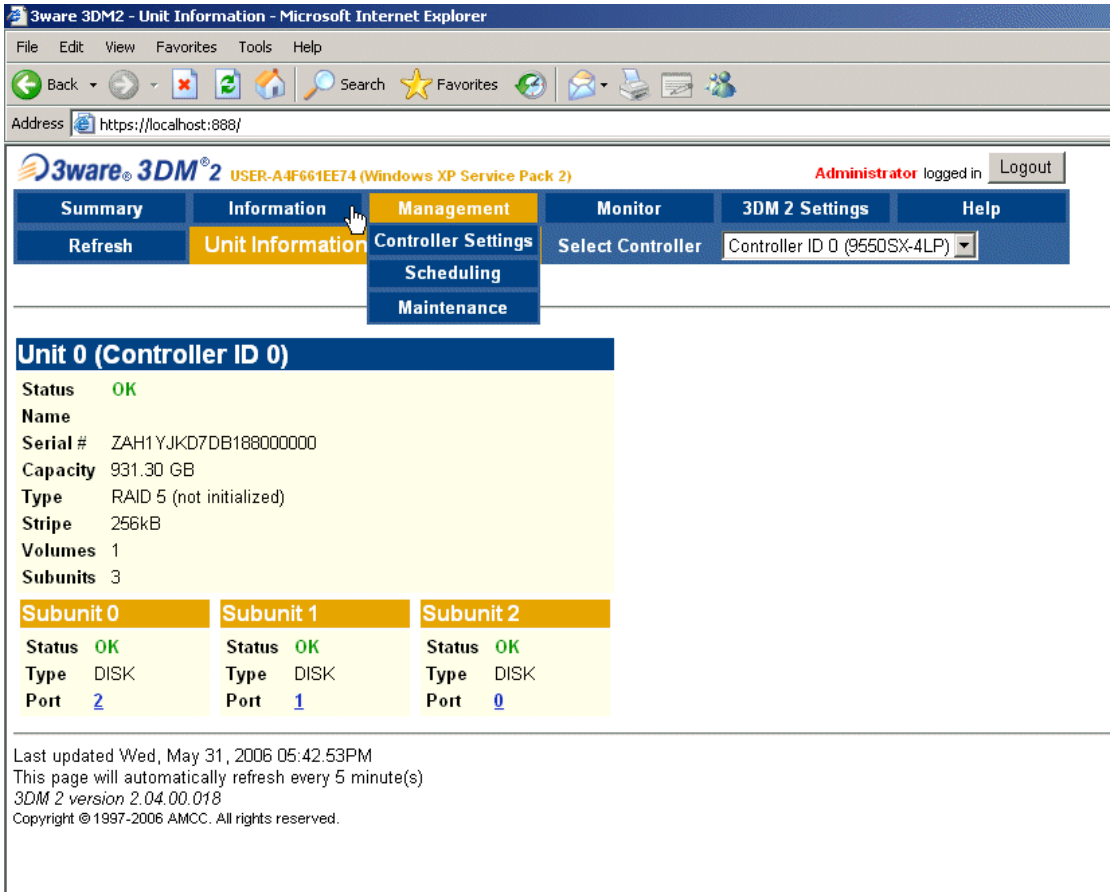


Figure 2-67

Once you have observed this good array, exit out of the 3DM 2 web interface. At some stage, one of the disks in the array may start to degrade or go completely off-line. For the purposes of these discussions, we are going to power down the system, physically remove Disk 01 from the array (thereby simulating a catastrophic failure on this disk) and power up the system back up again.

1) Power down the system and remove the center data disk (Disk 01) as shown in Figure 2-68.

2) Power the system back up again. The BIOS detects the fact that there is a problem with the RAID array and displays an appropriate message (Figure 2-69). Press the <Pause Break> key to freeze the display; from this (and Figure 2-39) you will be able to determine which drive has failed. (In the case of our example, the RAID array is shown as being "Degraded" and only Ports 0 and 2 are shown as being available.)

3) Press the <Pause Break> key again to un-freeze the display. The system will automatically bring the hot-spare drive online and integrate it into the array.

4) As soon as possible after the array has been reconstructed as discussed in point 3, power down the system, remove the failed drive (in this case it was previously removed to simulate the failure), and replace it with a good drive of the same type and capacity.

Figure 2-68

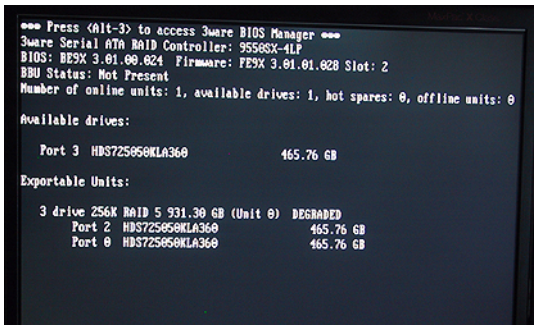


Figure 2-69

5) Start to power-up the system. When you see the BIOS message *"<Alt-3> to access 3ware BIOS Manager"*, press and hold the <ALT> (alternate) key and – while still holding this key – press the number "3" key. This will invoke the 3ware BIOS manager; in most cases, you will be presented with a warning screen; press any key to continue, which will take you fully into the 3ware BIOS Manager.

6) Observe that this screen shows the array (3 drives) and the remaining uncommitted drive (the new drive you've just added to the system). Use the up/down arrow keys to highlight the uncommitted drive and press the <Enter> key to select it (the fact this has been selected will be indicated with an asterisk '*' character).

Note: If this drive was ever part of a previous 3ware RAID array, it will show up as a "Failed Array" comprising only a single drive. In this case, use the <Tab> key to select the **Delete Unit** option and then press the <Enter> key to select this option and delete the drive as an array.

7) Now press the 'S' key to designate this selected drive as being the new hot-spare (an annotation will appear next to the drive confirming this status).

8) Press the <F8> key to exit the 3ware BIOS utility and automatically reboot the system.

9) Power the system up all the way into Windows.

Chapter 3: Module Replacement and Upgrade Procedures for MaxPac 8241 XRA Systems

Introduction

The instructions in this chapter describe how to replace and upgrade various modules in your MaxPac unit.

Note: Generally speaking, you should only access the MaxPac internals under the direction of MaxVision support. In some cases, performing unauthorized procedures or using components that have not been tested and approved by MaxVision may invalidate your warranty.

Note: Power-down your MaxPac system (shut down Windows® and then turn the hard power switch to its Off position) and then remove the power cable before performing any of the procedures discussed in this chapter. Also please be aware of static discharge when working on your MaxPac. In General, touch the metal part of the chassis to discharge any static prior to handling any delicate electronic parts.

Note: When accessing the system internals and/or performing module upgrade procedures, you are quickly going to end up with a lot of screws and other small items. In order to keep track of things and to prevent misplacing any parts, it is strongly recommended to have a plastic container divided into small compartments and to label these compartments as you work.

Required Tools and Techniques

Most of the module replacement and upgrade procedures discussed in this chapter can be performed using only a pair of #1 (small tip) and #2 (regular tip) Phillips screwdrivers. However, some procedures will require additional tools as discussed in *Appendix C*.

Note: It is extremely important that you use only high-quality tools so as to avoid any slippage and stripping of screw heads and threads. Furthermore, in order to avoid any slippage, it is VERY important to apply adequate force in the form of **firm and steady pressure**. See *Appendix C* for details on the tools required to service the system.

Note: It is highly recommended that you use magnetized screwdrivers so as to prevent screws from dropping inside the case and/or aiding in retrieving them if they do drop inside the case. (If your screwdriver isn't already magnetized, you can make it so by repeatedly "stroking" the blade with a permanent magnet.

Names and Types of Screws

MaxPac X-Class systems use a variety of different screw types. In order to help you follow the instructions in this chapter, details on these screws are provided in *Appendix C*.

Opening the Display Assembly into its Service Position

In order to replace and/or upgrade modules inside the MaxPac system, it is necessary to open the display assembly into its service position as discussed below.

1) Lay the system flat on the table on top of a piece of firm, non-abrasive foam (or similar material) capable of supporting the system's weight as shown in Figure 3-1. Observe that the displays should be in the closed position and facing upwards.

Figure 3-1

Figure 3-2

2) Use a Phillips #2 screwdriver to remove the two 10-32 1/4" black countersunk screws – one on each site (on the top-side of the system close to the handles) – holding the screen assembly to the chassis (Figure 3-2).

3) Use a Phillips #2 screwdriver to remove the two 10-32 silver truss head screws on the top of the system (Figure 3-3).

Figure 3-3

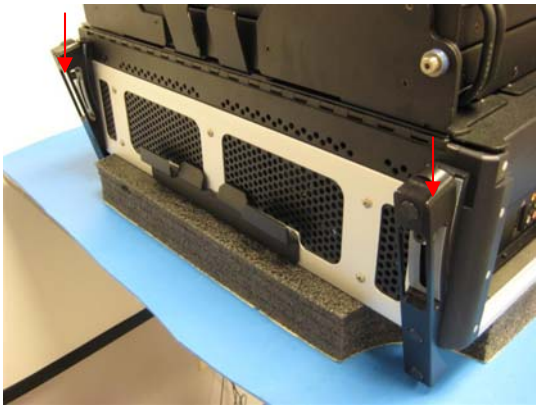


Figure 3-4

4) Press the feet down into their fully "tilted" position as shown in Figure 3-4 (this is necessary to allow the display assembly to fully hinge up).

5) Walk around to the other side of the system (so you are facing the bottom of the system) and lift the screen assembly as shown in Figure 3-5.

6) Squeeze the integrated support stands together as illustrated in Figure 3-5.

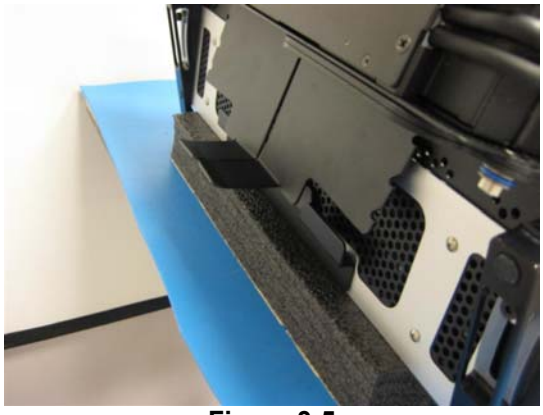


Figure 3-5

Figure 3-6

7) Pull the support stands down to their maximum extended (service) position as illustrated in Figure 3-6 (ensure that, when you release the supports, their spring mechanism expands them back into their locked position).

8) Return to facing the top of the system and use a Phillips #2 screwdriver to remove the nine 6-32 1/4" black countersunk screws holding the inner chassis cover (Figure 3-7).

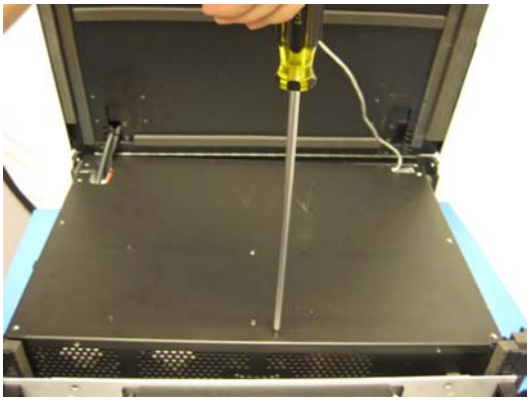


Figure 3-7

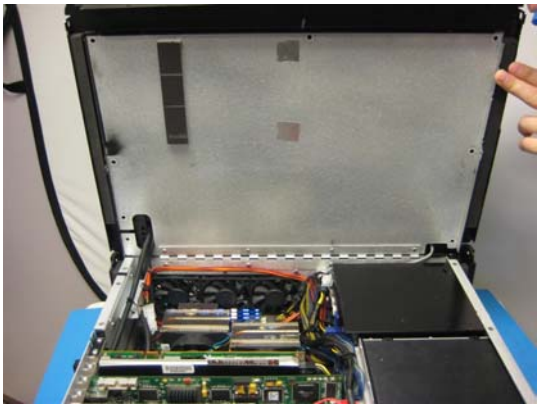


Figure 3-8

9) Observe that the inner chassis cover is hinged. Gently raise the inner chassis cover to its vertical position leaning back against the display assembly (Figure 3-8).

Separating the Inner Chassis from the Outer Chassis

1) Open the display assembly into its service position as discussed earlier in this chapter.

2) To remove the inner chassis, the display power cables, display data cables and soft power cable must be disconnected.

3) Cut any cable ties that are holding the display power and data cables in place as shown in figures 3-9 through 3-11

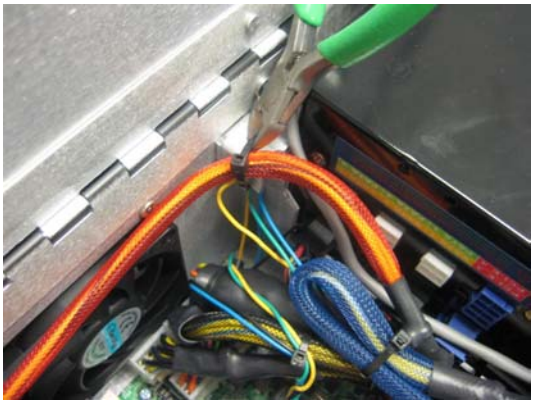


Figure 3-9

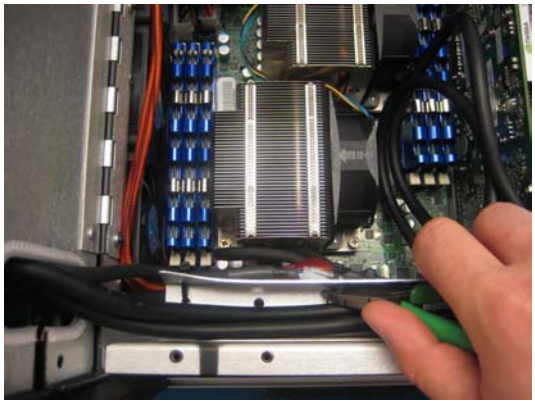


Figure 3-10

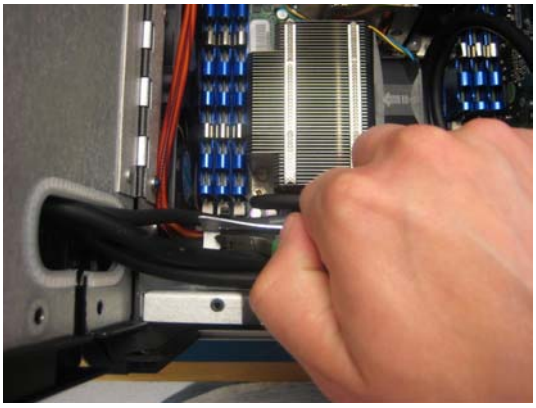


Figure 3-11

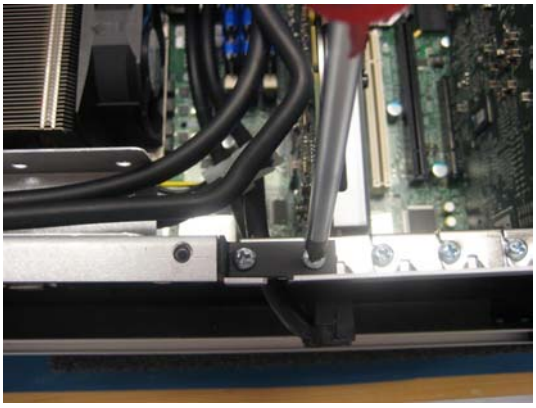


Figure 3-12

4) Remove the shadowbox mending bracket as illustrated in Figure 3-12 and Figure 3-13. Then remove the screw holding the display port cable bracket (Figure 3-14).

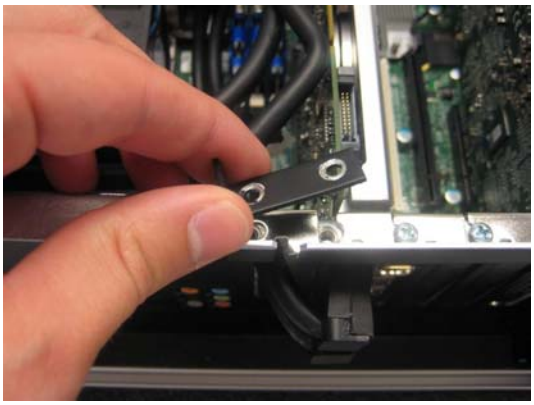


Figure 3-13

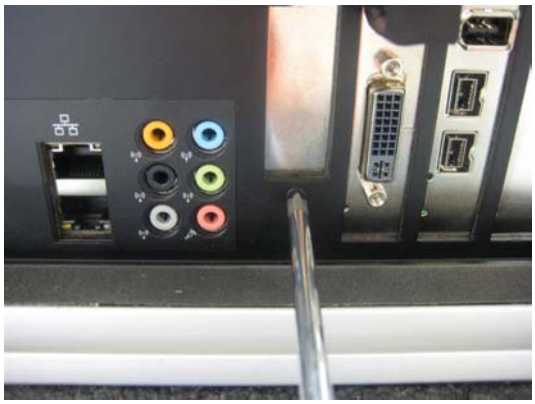


Figure 3-14

5) Remove the display port cable bracket and disconnect the display port cables (Figures 3-15 and 3-16).

Figure 3-15

Figure 3-16

6) Slide the display port cables through the gap in the shadow box. Bend the sheet metal if need be to avoid damaging the cables. (Figure 3-17)

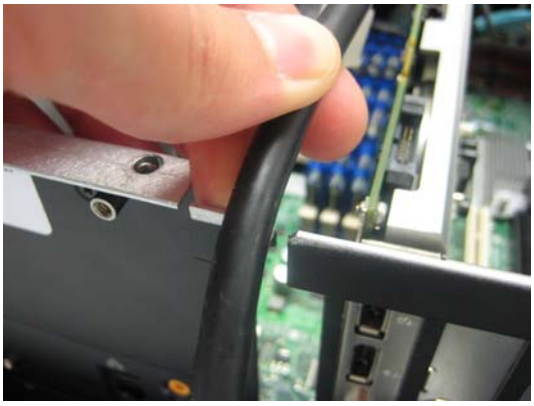


Figure 3-17

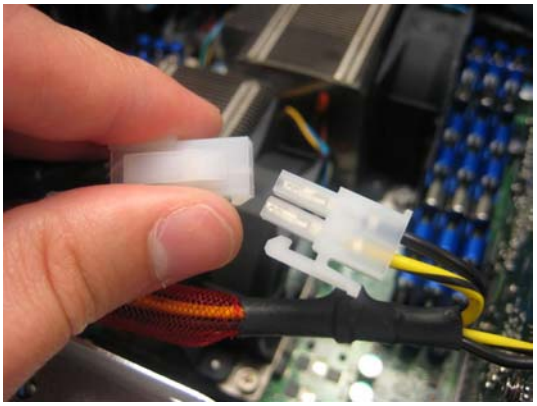


Figure 3-18

7) Disconnect the display power cables from the internal power ports as illustrated in Figure 3-18.

8) Slide the display power and display port cables through the gap in the lid as illustrated in Figure 3-19. Then disconnect the power switch from the top of the chassis as illustrated in Figure 3-20.

Figure 3-19

Figure 3-20

9) You will need a second person to hold the monitor assembly while you lift the inner chassis out of the outer chassis Figure 3-21.

Figure 3-21

Figure 3-22

Note: As the weight of the inner chassis is removed, the display assembly and outer chassis will topple over if not being held securely

10) Next, the display assembly should be rotated down as illustrated in Figure 3-22.

Separating the Screens from the Outer Chassis

1) Remove the inner chassis from the outer chassis as discussed earlier in this chapter.
2) Install a screw to keep the displays closed over the outer chassis (Figure 3-23). Then flip the system over where the screens are on the bottom (Figure 3-24).

Figure 3-23

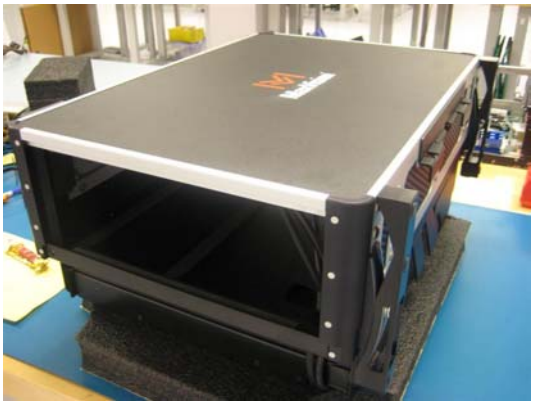


Figure 3-24

3) Unscrew the screw previously installed and lift the outer chassis up using a supporting block (Figure 3-25 and 3-26).

Figure 3-25

Figure 3-26

4) Unscrew the 16 screws holding the outer chassis to the display assembly (Marked in red in Figure 3-27). Then pull the display cables through the hole of the lid (Figure 3-28).

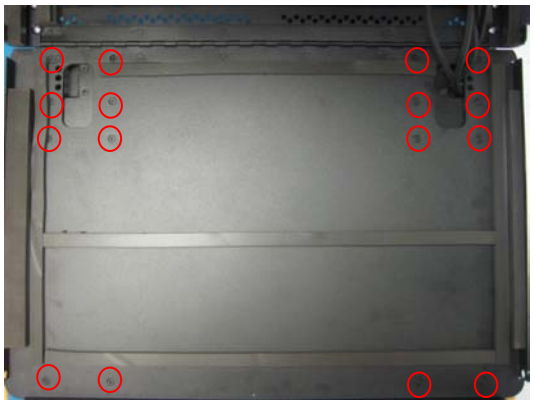


Figure 3-27

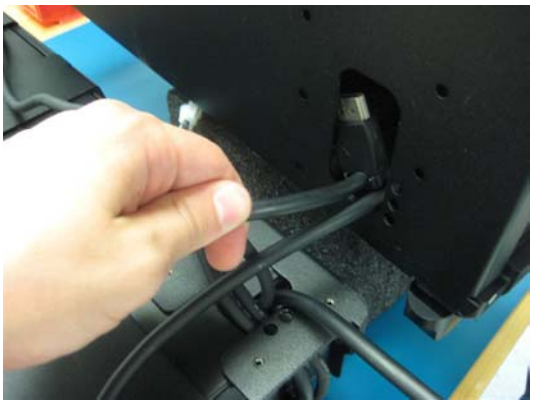


Figure 3-28

5) Remove the scissor leg support and set it aside (Figure 3-29).

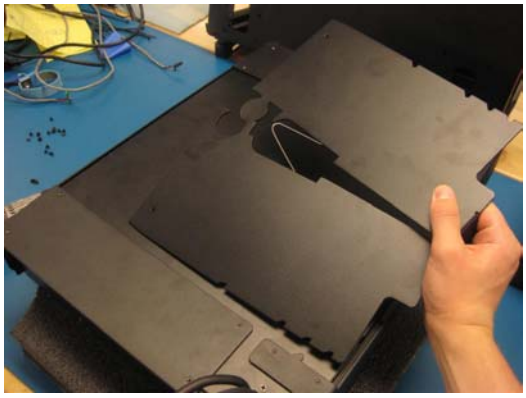


Figure 3-29

Replacing the LCDs

1) Remove the displays from the outer chassis as previously discussed.
2) Remove the two screws holding the bottom left bracket holding the display cables together (Figures 3-30 and 3-31).

Figure 3-30

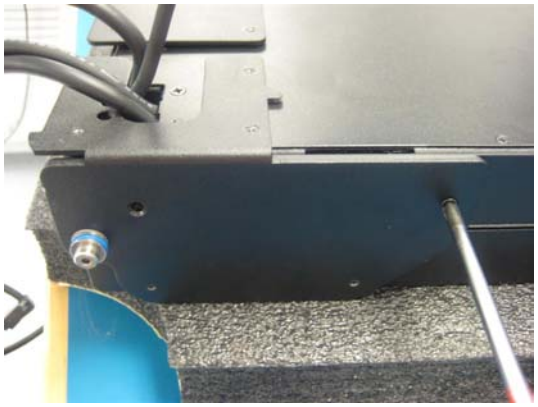


Figure 3-31

3) Open the pivoting bracket to allow the cables to be released. (Figure 3-32).

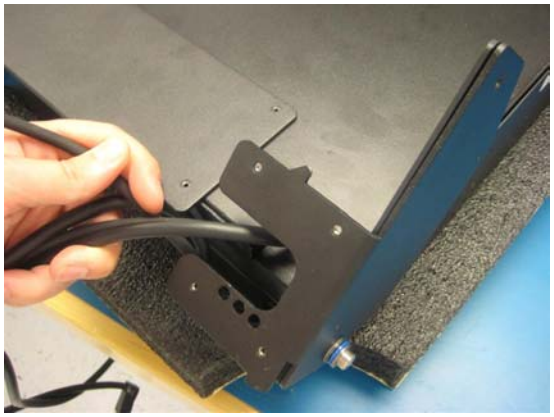


Figure 3-32

4) If replacing the main screen, remove the bottom bracket on the right side as well (Figures 3-33 and 3-34).

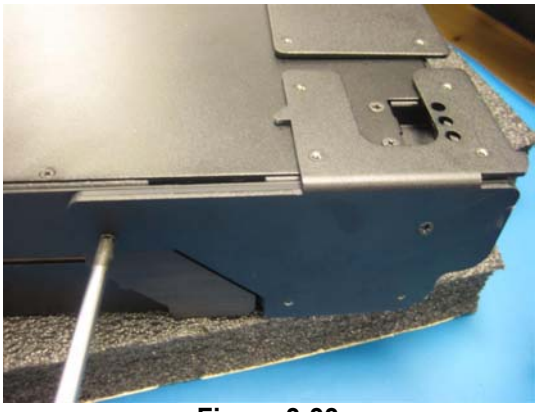


Figure 3-33

Figure 3-34

5) Remove the bracket and shim (Figures 3-35 and 3-36).

Figure 3-35

Figure 3-36

6) Turn the assembly around and remove the top brackets (Figures 3-37 and 3-38).

Figure 3-37

Figure 3-38

7) Open the top left bracket, and remove the top right one. Remove the shim as well (Figures 3-39 and 3-40).

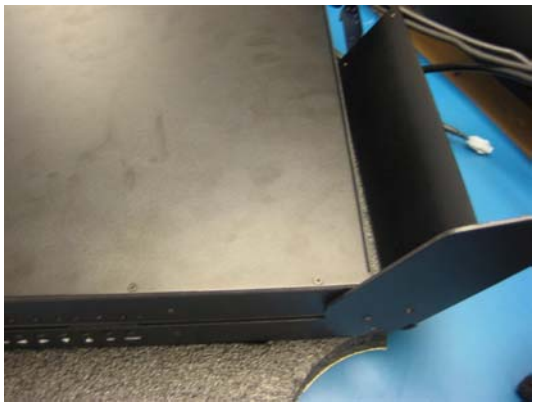


Figure 3-39

Figure 3-40

8) The main screen assembly can now be removed and replaced with one supplied by MaxVision. (Figure 3-41).

Figure 3-41

9) If removing a secondary display, fold the displays open, and start removing the bottom bracket holding the display. (Figures 3-42 and 3-43).

Figure 3-42

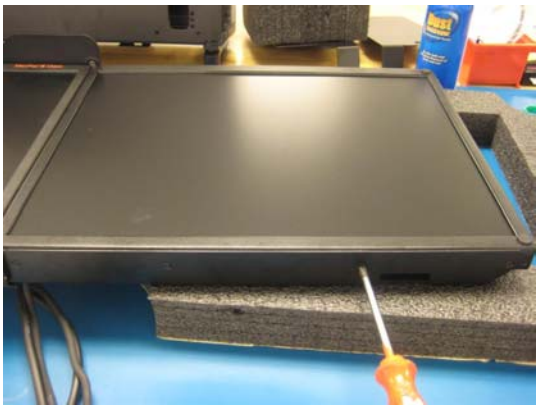


Figure 3-43

10) Turn the assembly around and remove the top bracket holding the display, and the display can be removed and replaced with a display assembly provided by MaxVision (Figures 3-44 and 3-45).

Figure 3-44

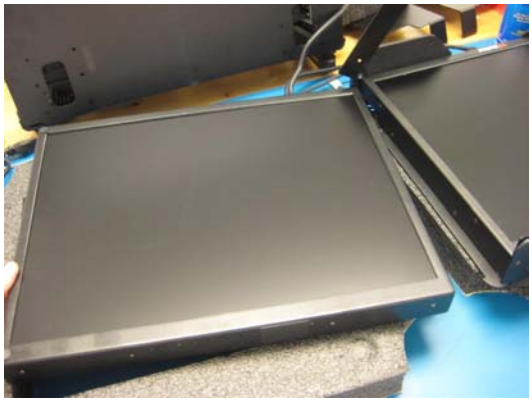


Figure 3-45

11) Perform the above steps in reverse order to assemble the system back together.

Memory

Note: Due to the fact that high-end computer systems can experience a host of memory compatibility issues and problems, you should only use replacement and/or additional memory sticks supplied by MaxVision.

Note: The MaxPac 8241 supports Fully Buffered DDR3 memory (4GB) or un-buffered memory (2GB). However, un-buffered and fully buffered memory cannot be mixed. The MaxPac 8241 uses DDR3 1333MHz. What separates fully buffered memory from regular DDR3 is a chip on each module called the AMB (Advanced Memory Buffer), which buffers all data/address/command requests to the DRAM devices. This buffering allows up to 24GB of memory to be installed in the MaxPac 8241. FB-DIMMs REQUIRE that memory sticks be used in pairs, with each pair having the same size/capacity/speed.

Note: In the event that you begin to experience problems with the memory that is already resident in your MaxPac, you must first determine which stick has failed under the direction of MaxVision support.

Note: The BIOS will always report the true amount of physical memory that is present in the system. This may be as much as 24 GB. However, the actual amount of memory that can be seen by the system is determined by the main operating system (OS). With regard to the 32-bit Windows® XP Professional operating system, for example, in the case of a MaxPac 8241 XRA2 (dual-screen) configuration, the maximum amount of memory reported in the **System Information** dialog is 3 GB; by comparison, in the case of a MaxPac 8241 XRA3 (triple-screen) configuration, the maximum amount of memory reported in the system information dialog is 2 GB. (Further note that even when the OS reports 3 GB for the dual-screen configuration, the maximum amount of shared user space is actually only 2 GB.) However, with regard to the 63-bit Windows XP Professional x64 Edition of the operating system, the **System Information** dialog will accurately report the true amount of physical memory (which can theoretically be up to 128 GB) and all of this memory will be available to the applications.

1) Open the display assembly into its service position as discussed earlier in this chapter.
2) In order to remove and replace a memory stick, gently press down-and-out on the two plastic “rabbit-ears” at either side of the stick which will cause it to pop out (Figure 3-46), and then remove the stick from the system (Figure 3-47).

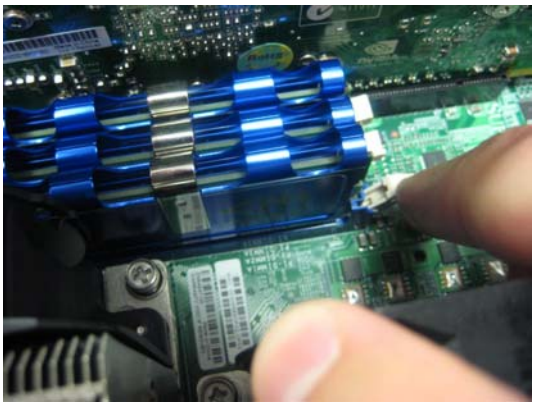


Figure 3-46

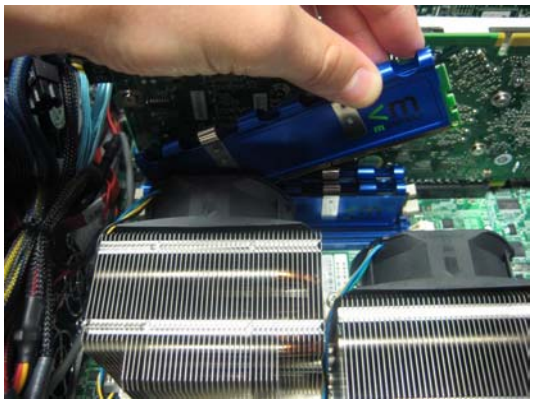


Figure 3-47

3) Observe that the memory sticks are keyed such that they can only be inserted one way. Take the new (replacement) memory stick sent to you by MaxVision support and gently press it down into the original slot on the motherboard.
4) Return the system to its initial condition by reversing the order of the operations discussed at the beginning of this section.

PCI Cards (General)

1) Open the display assembly into its service position as discussed earlier in this chapter.
2) If you are replacing an existing PCI card, use a Phillips #2 screwdriver to remove the 6-32 screw attaching the card's retaining bracket to the inner chassis. If you are adding a new card, remove the corresponding blanking plate screw as illustrated in Figure 3-48.

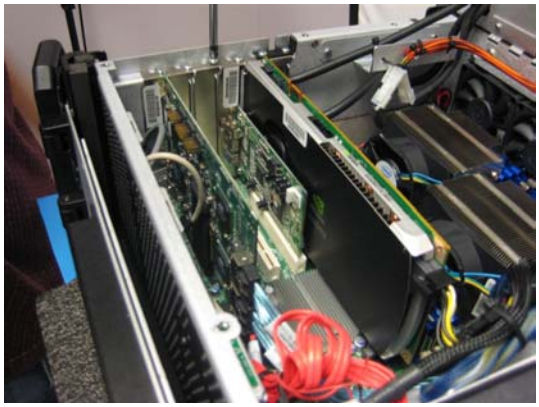


Figure 3-48

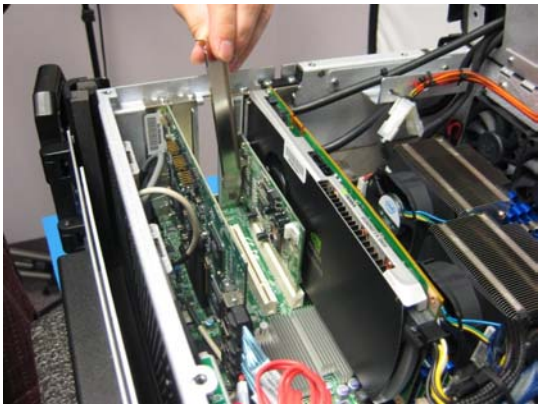


Figure 3-49

3) Gently pull out the blanking plate (or old card) as shown in Figure 3-49.
4) Slide in the new (or replacement) card into its respective slot as shown in Figure 3-50. Check to make sure the cables are routed underneath longer cards as illustrated in Figure 3-51. (see notes below).

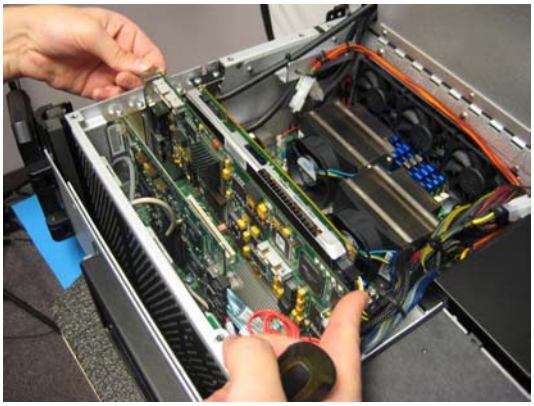


Figure 3-50

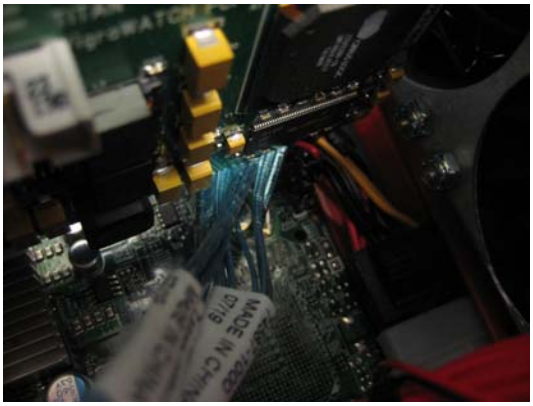


Figure 3-51

5) Secure the new (or replacement) card to the shadowbox of the inner chassis using the same screw that was securing it before.

Note: It is important to ensure that cables are attached to the new card in the same positions as they occupied on the original card (if needed).

Note: Ensure that the tongue on the new/replacement card's faceplate lines up with the slot in the chassis (you may have to bend the tongue slightly in the case of a new card).

Graphics Card

In the case of a dual-screen MaxPac system, the graphics for both screens will be handled by a single PCI Express card discussed in the following section. By comparison, in the case of a triple-screen system, the center and right-hand screens will be driven by the Primary PCI Express card, while the left-hand screen will be driven by a second PCI Express graphics card. The unused port of this card can also be used as a projector port.

1) Open the display assembly into its service position as discussed earlier in this chapter. Disconnect the display port cables from the graphics card (Figure 3-52).

Figure 3-52

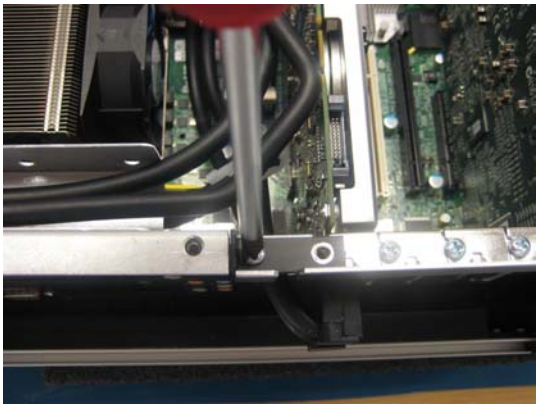


Figure 3-53

Figure 3-54

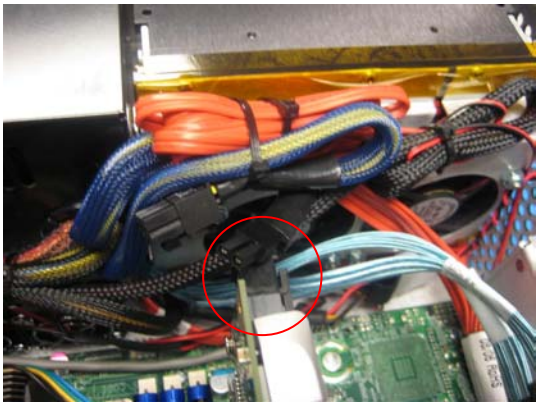


Figure 3-55

2) Remove the shadowbox mending bracket by removing the two screws holding it down (Figure 3-53 and 3-54).

3) Some PCI Express cards may have an auxiliary power connector. If so, disconnect it as highlighted red in Figure 3-55.

4) Gently pull the old card out.

5) Take the new/replacement PCI Express card and incorporate it into the system by performing the steps described above in reverse order.

6) The same process can be used to replace a secondary graphics card, except the shadowbox mend bracket will not need to be removed. Only the screw holding the graphics card bracket to the shadowbox will need to be removed.

Note: Ensure that the tongue on the new/replacement card's faceplate lines up with the slot in the chassis (you may have to bend the tongue slightly in the case of a new card). In this system there is no plastic latch holding the rear of the PCI Express card. The foam attached to the hinged inner lid of the MaxPac will hold pressure to the back of the card when properly secured.

Note: When removing the video cables keep track of the order of the connections to the PCI Express card. The right-hand display is connected to the top connector and the center display is connected to the bottom connector of the PCI Express card. In the case of a triple-display system, the left display connector (which is a different shape to the other two) is attached to the bottom DVII connector of the secondary PCI Express graphics board.

Note: In this system there is no plastic latch holding the rear of the PCI Express card. The foam attached to the hinged inner lid of the MaxPac will hold pressure to the back of the card when properly secured

Hard Drive Magazine (also Individual Hard Drives)

1) Undo the knurled screw holding the middle binding bar (Figure 3-56) and then remove the binding bar (Figure 3-57).

Figure 3-56

Figure 3-57

2) Gently pull on the magazine handle to extract the magazine from the inner chassis (Figure 3-58).

Figure 3-58

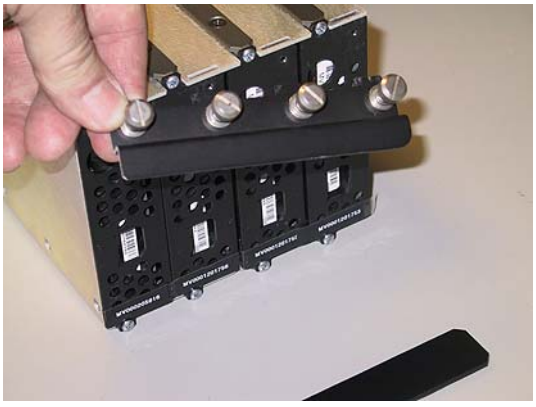


Figure 3-59

3) In order to replace an individual drive, turn each of the four knurled screws attached to the upper binding bar until they pop out and then remove the upper binding bar (Figure 3-59). Note that the upper binding bar has tabs that are inserted into slots of the main drive cage.

Figure 3-60

4) Gently grasp the drive in question and pull it out of the magazine (Figure 3-60).

Note: These disks are hot-swappable, so you can replace individual drives while the magazine remains resident in the system. When the upper binding bar is removed the 4 slots in the main drive cage may slide back. Make sure that when replacing the upper binding bar that the tabs go into these slots.

Note: In order to easily identify these disks, MaxVision serial numbers are affixed to the bottom edge (the small white strips shown toward the bottom of the drives in Figure 3-60). Recording the positions and serial numbers of your disks for each MaxPac is advisable.

Optical Drive (CD/DVD)

1) Note that it is not necessary to open the display assembly into its service position in order to perform this procedure.
2) Undo the two knurled attaching the CD/DVD drive to the outside of the system's main chassis (Figure 3-61).

Figure 3-61

Figure 3-62

3) Gently remove the CD/DVD drive from the system (Figure 3-62).
4) Take the new CD/DVD assembly as supplied by MaxVision support and incorporate it into the system by performing the steps described above in reverse order.

Optical Drive (CD/DVD) Backplane

1) Open the display assembly into its service position as discussed earlier in this chapter.
2) Remove the CD/DVD drive as discussed in the previous topic.
3) In order to access the backplane, the power supply must be removed. This is discussed later in this chapter.
4) Remove the main power connector as illustrated in Figure 3-63 (The adhesive holding the connectors in place will need to be cut or removed in order to prevent damage to the connectors).

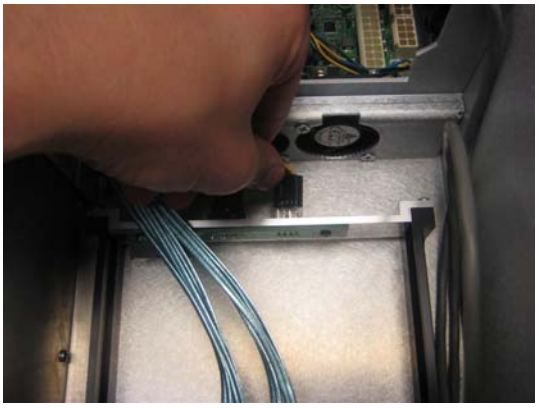


Figure 3-63

Figure 3-64

5) Remove the SATA cable as illustrated in Figure 3-64.

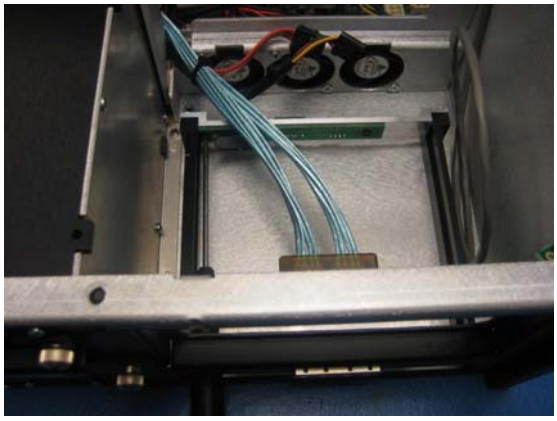


Figure 3-65

6) Use a Philips #1 screwdriver to remove the two screws attaching the CD/DVD backplane to the main chassis as illustrated in Figure 3-65
7) Gently remove the CD/DVD backplane as illustrated in Figure 3-66.
8) Present the replacement CD/DVD backplane supplied by MaxVision support to the inner chassis and perform the steps described above in reverse order.

Note: If the replacement CD/DVD backplane does not come equipped with a protective layer of Kapton tape, remove this tape from your original backplane and reattach it to the new backplane.

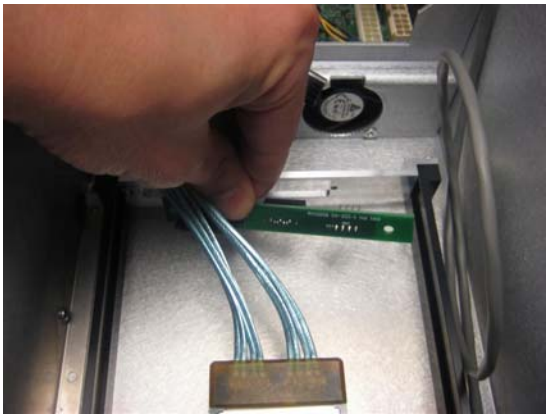


Figure 3-66

External Cooling Fan Assembly

1) Open the display assembly into its service position as discussed earlier in this chapter.
2) Disconnect the external cooling fan assembly's power supply cable from motherboard. Simply pull it away using your fingers as shown in Figures 3-67 and 3-68.

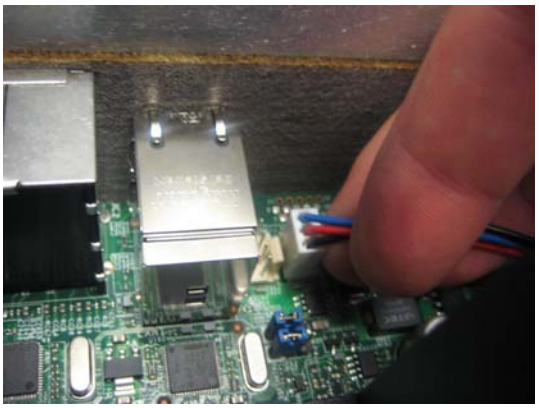


Figure 3-67

Figure 3-68

3) All three fans must be treated as a single assembly, so remove the twelve self-tapping Plastite screws (4 per fan) attaching the fans to the internal chassis (Figure 3-69) and then gently lift the fan assembly away from the inner chassis (Figure 3-70).
4) Present the replacement fan assembly supplied by MaxVision support to the inner chassis and perform the steps described above in reverse order.

Figure 3-69

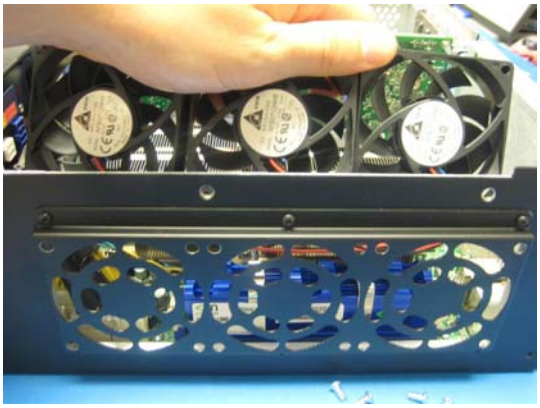


Figure 3-70

CPU Cooling Fans

1) Open the display assembly into its service position as discussed earlier in this chapter.
2) There are two screws on either side of the cooling fan assembly. Use a Phillips #2 screwdriver to loosen these captured screws (Figures 3-71 and 3-72).

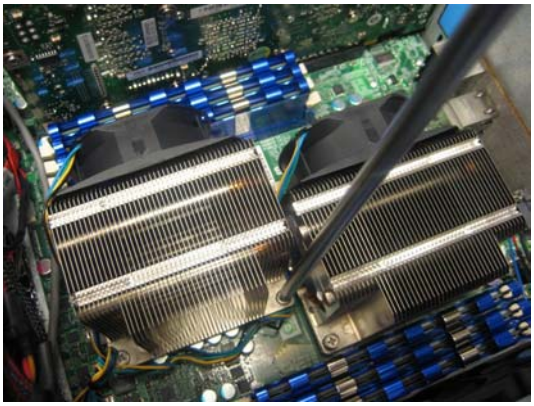


Figure 3-71

Figure 3-72

3) The two power connectors of the CPU fans are tie-wrapped together, remove the tie-wrap before attempting to remove the heatsink. Gently lift the cooling fan assembly away from the chassis as illustrated in Figure 3-73.

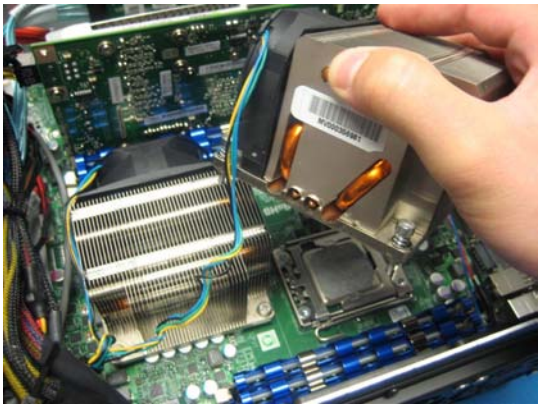


Figure 3-73

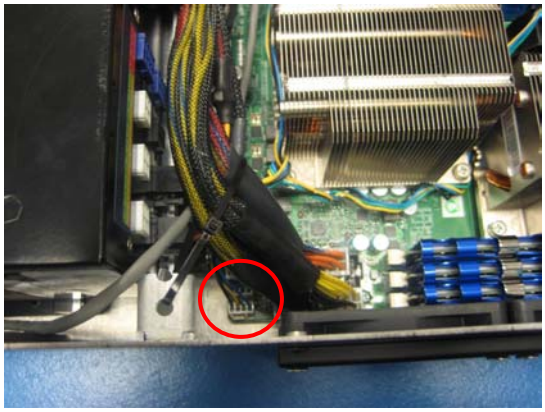


Figure 3-74

4) Each fan has its own power connector that is attached to the main motherboard. Disconnect the power connector associated with the failed fan (Figure 3-74).

5) Present the replacement fan assembly supplied by MaxVision support to the CPU and perform the steps described above in reverse order. Ensure the fan assembly in screwed in with equal pressure on all side and the fan power connector is replaced prior to powering up the system to avoid CPU damage.

Main Power Supply Unit (PSU)

Depending on the problem you are experiencing – and as directed by MaxVision support – you may need to replace the entire power supply as discussed below.

1) Open the display assembly into its service position as discussed earlier in this chapter.

2) Cut the tie-wraps securing the motherboard power cables as illustrated in Figure 3-75 and 3-76. Also cut the tie-wrap securing the 6-pin PCI-E power cables (Figure 3-77).

Figure 3-75

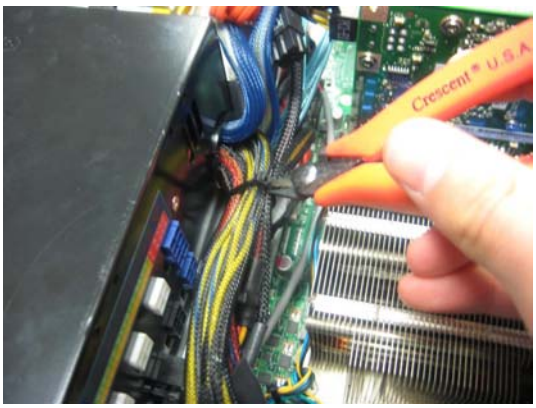


Figure 3-76

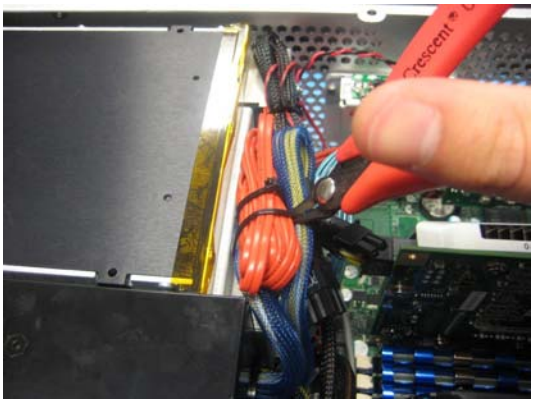


Figure 3-77

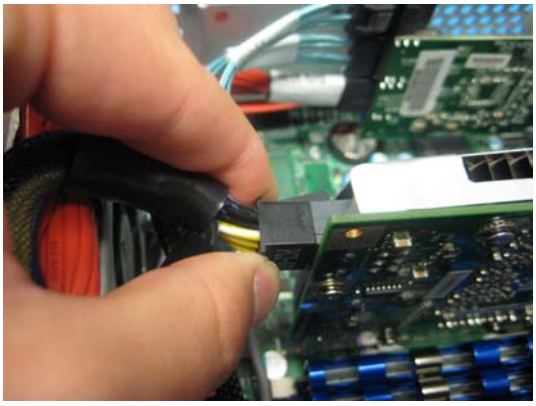


Figure 3-78

3) Disconnect the PCI-E cables from the graphics cards by releasing the connectors clip as illustrated in Figure 3-78.

4) Disconnect the ATX 23-pin power connector from the motherboard. Pull the connector up while using a flat-blade screwdriver to push the top of the release catch (facing the bottom of the chassis) into the body of the connector (Figures 3-79 and 3-80).

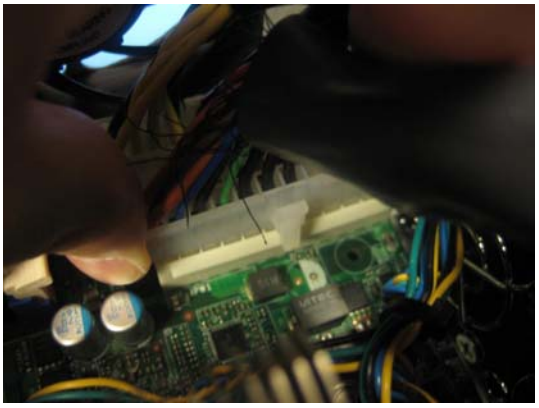


Figure 3-79

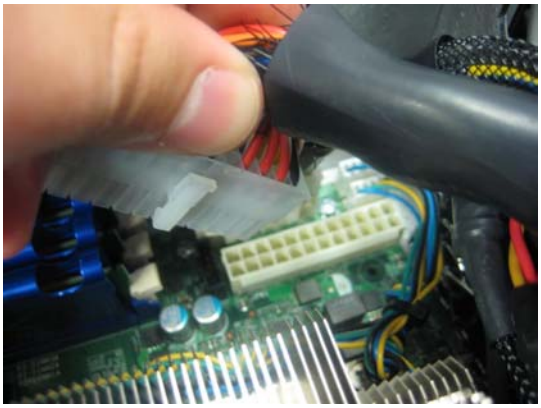


Figure 3-80

5) Disconnect the two EPS12V 8-pin (4 x 2) power connectors from the motherboard. Pull the connector up while using a flat-blade screwdriver to push the top of the release catch (facing the interior of the chassis) into the body of the connector (Figures 3-81 and 3-82).

Figure 3-81

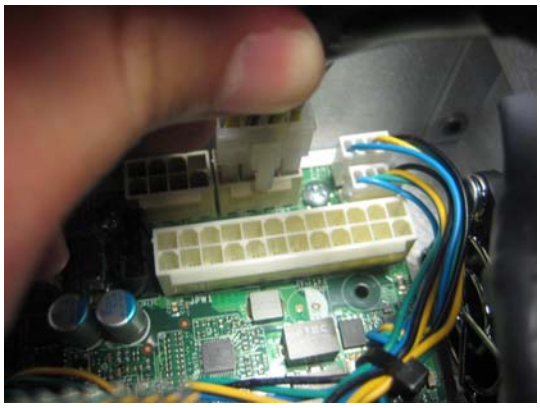


Figure 3-82

6) Disconnect any additional connectors from the back of the power supply (Display power cable, SATA Backplane power cable, and/or the optical and audio power cable) as illustrated in Figure 3-83 and 3-84).

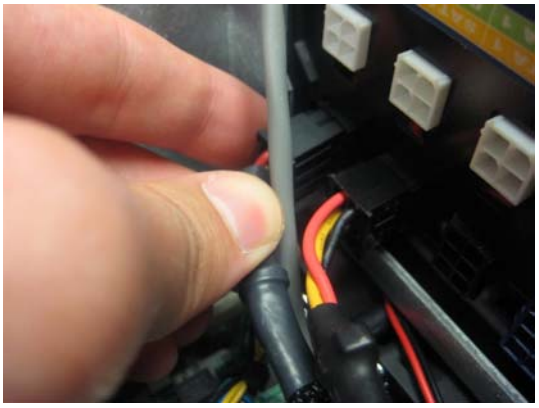


Figure 3-83

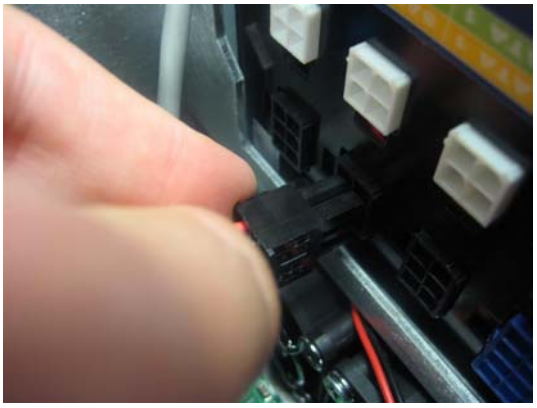


Figure 3-84

7) Use a Phillips #2 screwdriver to remove the three screws (marked in red) attaching the power supply unit to the side of the inner chassis (Figure 3-85) and lift the power supply from the system (Figure 3-86).

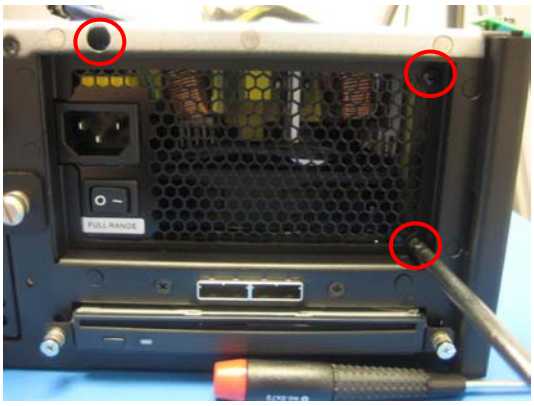


Figure 3-85

Figure 3-86

8) Take the new main power supply unit supplied by MaxVision support and incorporate it into the system by performing the steps described above in reverse order.

Motherboard

Replacing the motherboard is non-trivial. It is easy to damage the motherboard unless one has the appropriate tools and training. For this reason, you must either return the MaxPac system to MaxVision or be factory trained by MaxVision personnel (see *Appendix D* for more details about contacting MaxVision support and returning your MaxPac to MaxVision).

1) Open the display assembly into its service position as discussed earlier in this chapter.

2) Separate the inner chassis from the outer chassis as discussed earlier in this chapter.

3) Remove all the PCI-E and PCI cards as discussed earlier in this chapter.

4) Turn the system upside down and remove the 6 screws holding the bottom motherboard plate as illustrated in Figure 3-87 (Marked in red).

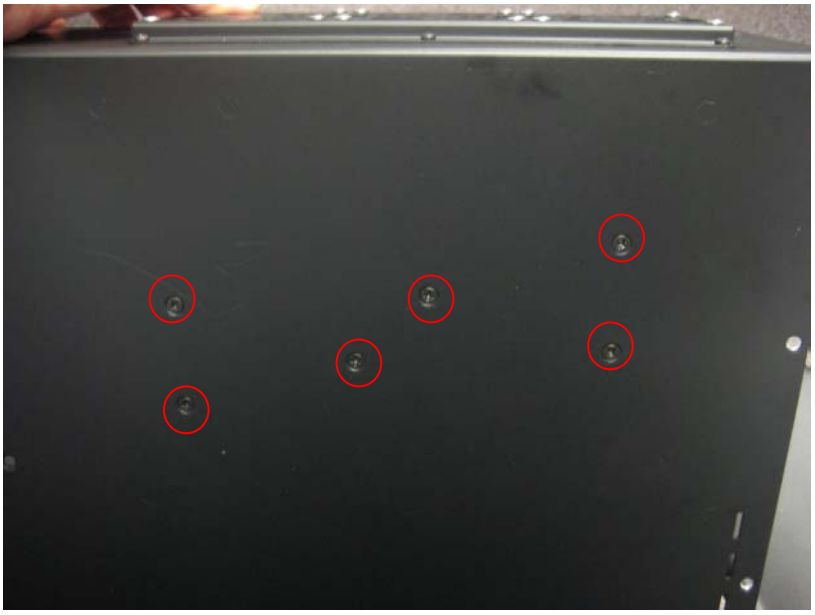


Figure 3-87

Figure 3-88

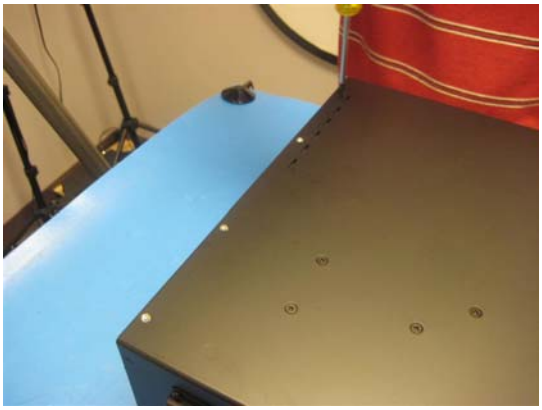


Figure 3-89

5) Remove the screws from the sides and bottom of the shadow box as shown in Figure 3-88 and 3-89. Then remove the shadowbox and set it aside.

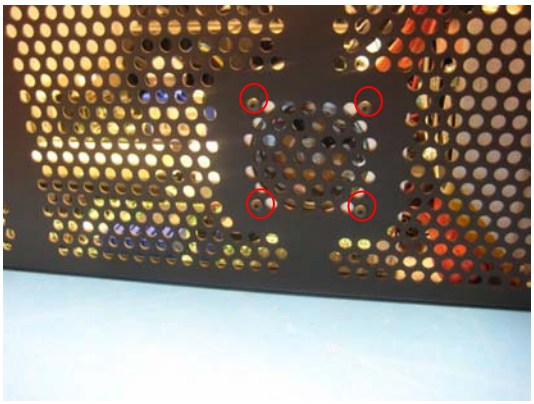


Figure 3-90

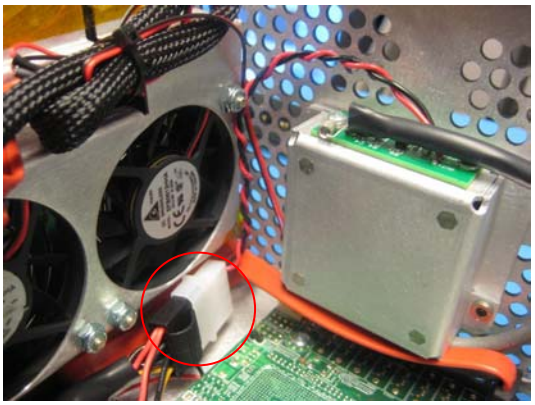


Figure 3-91

6) Remove the screws holding the speaker assembly in place and disconnect the power cable (Figures 3-90 and 3-91).

7) Remove the audio header cable and the grounding screw from the motherboard as indicated in red in Figure 3-92. Set the audio assembly aside. Then disconnect SATA cable that was running underneath the audio assembly, the soft power switch, and the hard drive fan cable (Figure 3-93).

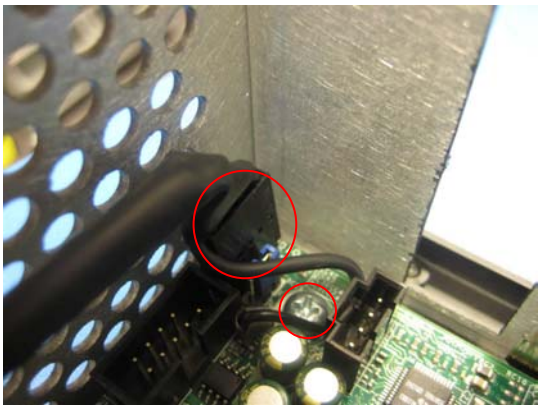


Figure 3-92

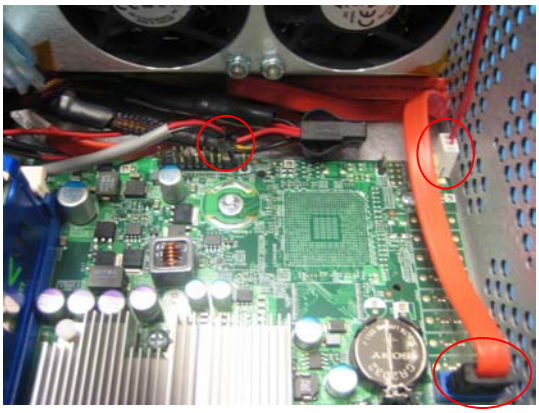


Figure 3-93

8) Disconnect the ATX 23-pin power connector from the motherboard. Pull the connector up while using a flat-blade screwdriver to push the top of the release catch (facing the bottom of the chassis) into the body of the connector (Figures 3-94 and 3-95).

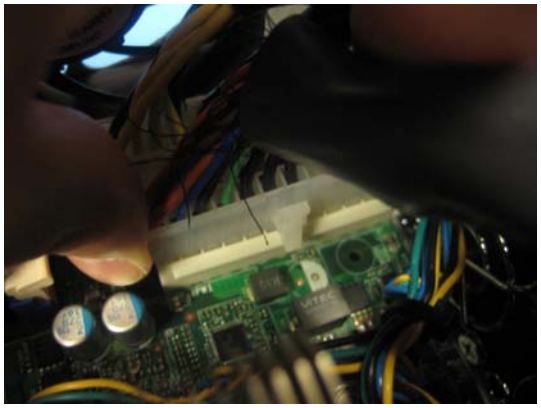


Figure 3-94

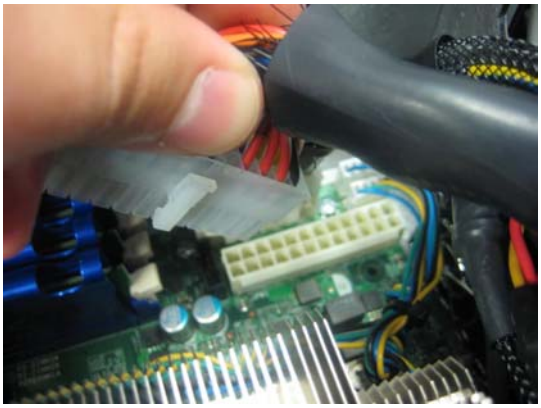


Figure 3-95

9) Disconnect the two EPS12V 8-pin (4 x 2) power connectors from the motherboard. Pull the connector up while using a flat-blade screwdriver to push the top of the release catch (facing the interior of the chassis) into the body of the connector (Figures 3-96 and 3-97).

Figure 3-96

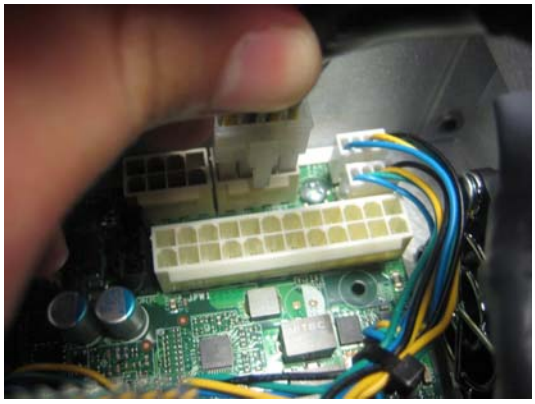


Figure 3-97

10) Disconnect the internal dual USB cable as shown in Figure 3-98. Then disconnect the fan headers of the power supply fan assembly and the system fan assembly as illustrated in Figures 3-99 and 3-100.

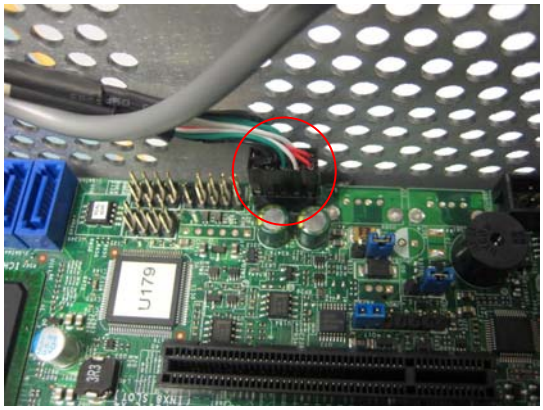


Figure 3-98

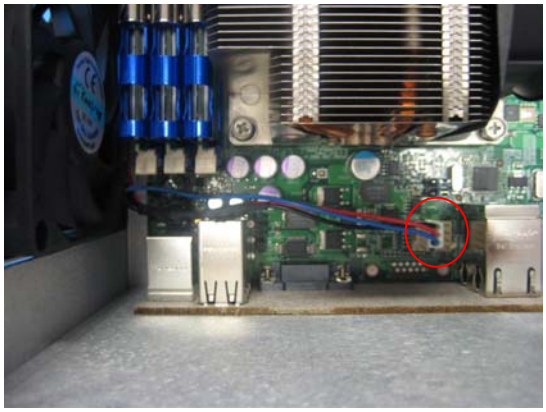


Figure 3-99

11) Remove the eight screws holding down motherboard as illustrated in Figure 3-101

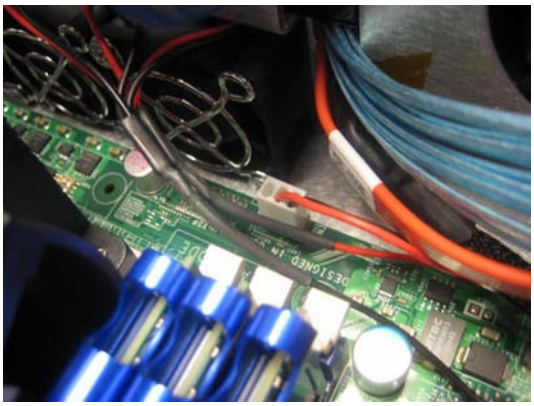


Figure 3-100

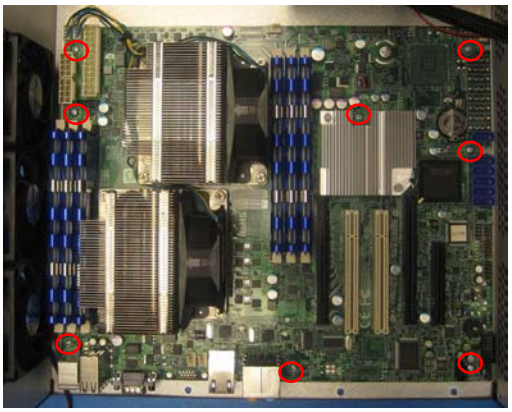


Figure 3-101

12) Remove the motherboard from the chassis and set it on a protective surface. Disconnect the CPU fan cables as marked in red (Figure 3-102). Start removing the CPU heat sinks as illustrated in Figure 3-103.

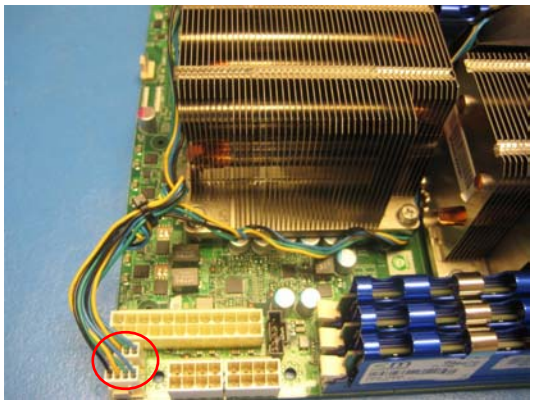


Figure 3-102

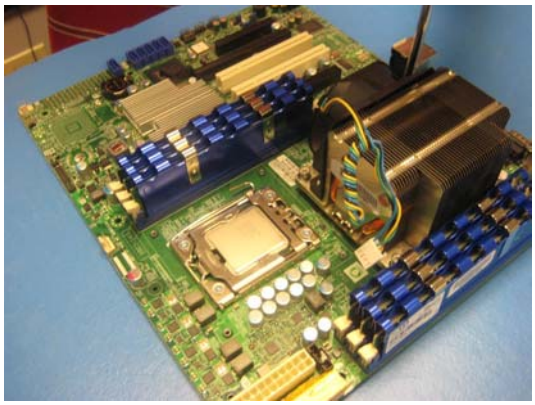


Figure 3-103

13) Under the direction of MaxVision support carefully remove the CPU from its socket as illustrated in Figures 3-104 and 3-105. Observe the keying of the CPU into its socket (marked in red).

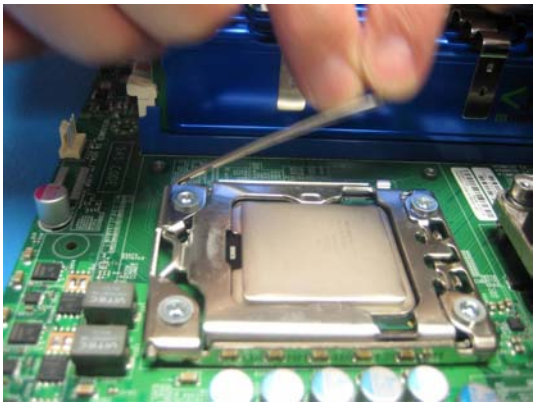


Figure 3-104

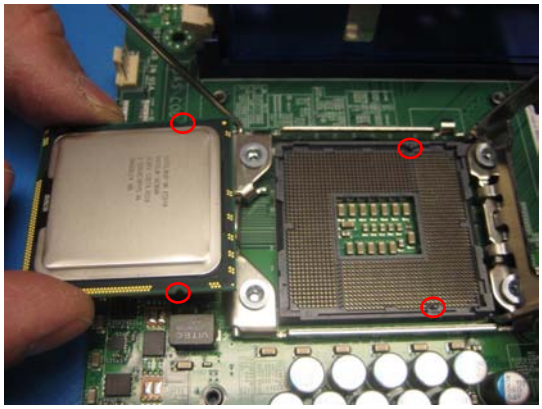


Figure 3-105

14) Remove the memory modules as described earlier in this chapter. Gently assemble the CPUs and memory into the replacement motherboard. Follow the above steps in reverse order to reassemble the machine.

Note: EXTREME CARE must be taken not to damage in any way the delicate pins used in the CPU sockets. Once bent these pins cannot be straightened resulting in the total loss of the motherboard.

This type of damage is not covered under the MaxVision Warranty (this motherboard is valued at almost $500). Always remove the protective CPU pin covers from the new motherboard and install them onto the suspect or bad motherboard before any additional handling of the motherboard. The installation of the pin protector is illustrated in Figure 3-106.

Figure 3-106

Appendix A: Creating and Using Backup Images (Including Restoring Your OS)

Introduction

Every MaxVision system comes equipped with a *MaxVision Recovery DVD*. In addition to an image of your operating system, this disc also contains a copy of the *Acronis True Image*™ application from Acronis (www.acronis.com). *Acronis True Image* is a superb tool for operating system (OS) deployment, software distribution, back-up, and disaster recovery. In particular, this utility allows you to make reliable backups of your system drives, including applications and critical data. There are two primary scenarios that need be considered as follows:

Restoring the MaxVision-supplied Image

This is the worst-case scenario. It assumes that your system has undergone some catastrophic failure such that – under the direction of MaxVision support – you are going to replace your primary hard drive(s) and/or restore the original MaxVision-supplied image. In this case, you will lose any applications and data that you have installed, loaded, or created on your main “C:” drive/partition.

Note: If you do re-load the original MaxVision-supplied image, you will also have to re-run the initialization procedures – including re-activating/re-registering your OS license – as described earlier in this manual.

Creating Your Own Image

This scenario assumes that you have added new applications, loaded or created new datasets, and generally configured and customized your MaxVision system the way you like it. At this stage, before you deploy the system, it is strongly recommended that you use the *Acronis True Image* application to create an image of the system. Similarly, as you add additional applications or generate additional datasets, it is strongly recommended that you create periodic backup images. This greatly facilitates your ability to return the system to a “known good state” should any problems arise (such as a virus attack or a hard drive failure) at some stage in the future.

For the purposes of this example, we will assume that you are writing your image to CD media (as opposed to DVD), and that the image will occupy two CDs.

1) Power-down the system.
2) Ensure that the bootable recovery DVD supplied in the accessory pack is in the system's CD/DVD drive. In the case of a multiple DVD image, ensure Disk #1 is in the drive.
3) Power-up the system. This will automatically launch the Acronis application as shown in Figure A-1.

Figure A-1

Figure A-2

4) Use the mouse to select the Acronis item as shown in Figure A-1.

5) Following the splash screen (Figure A-2), under the **Pick a Task** heading, select the **Backup** option (the top item) as illustrated in Figure A-3.

Figure A-3

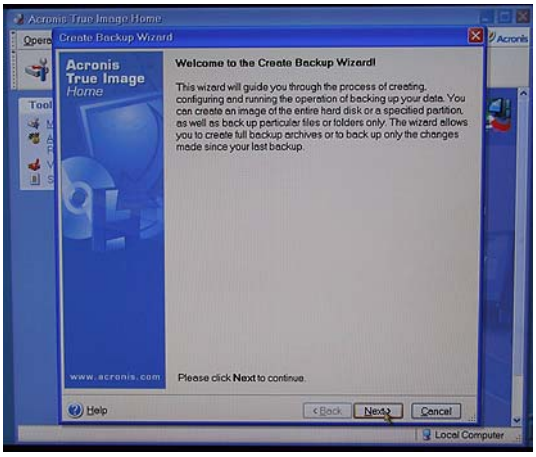


Figure A-4

6) Follow the actions depicted by the screenshots shown in Figures A-4 through A-18.

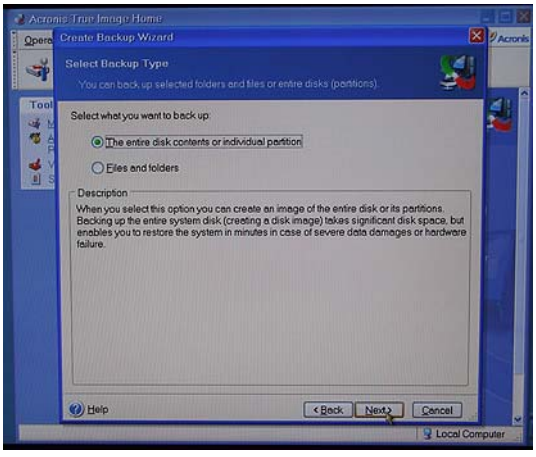


Figure A-5

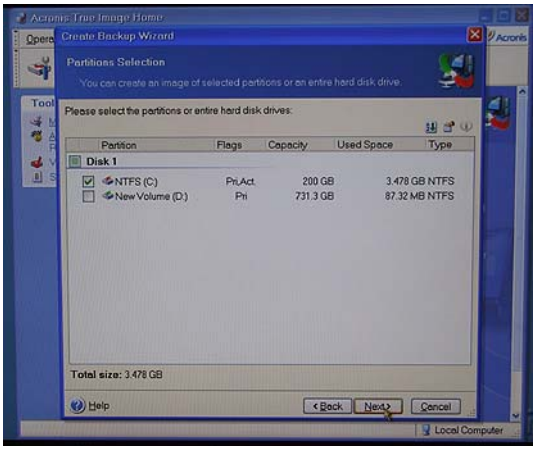


Figure A-6

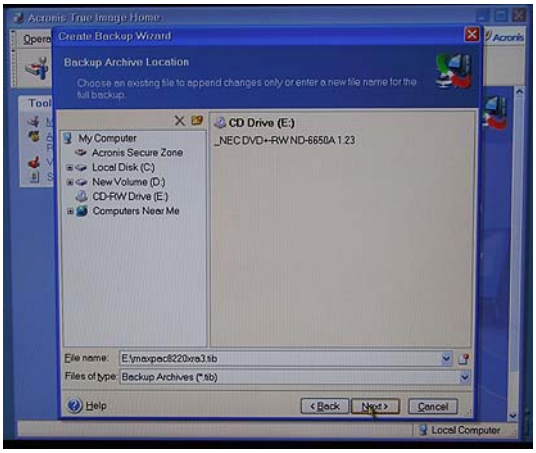


Figure A-7

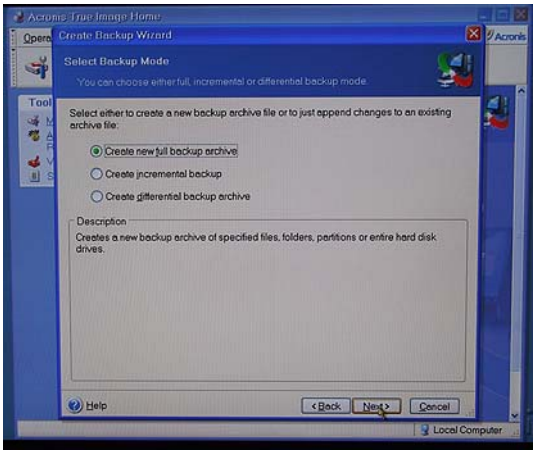


Figure A-8

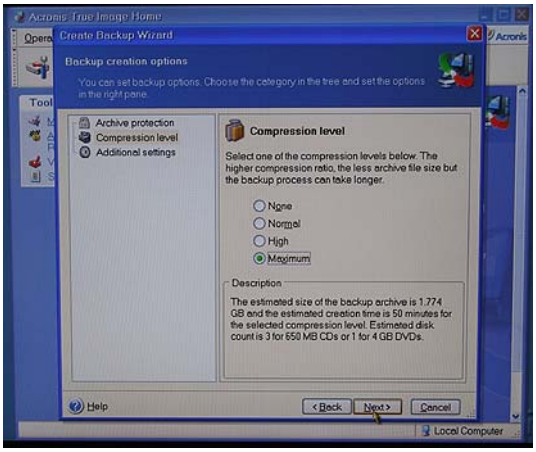


Figure A-9

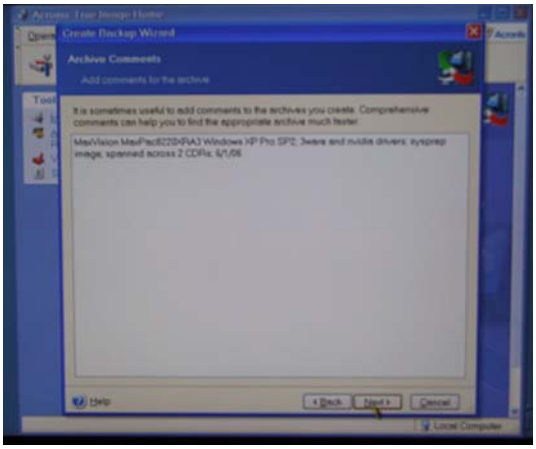


Figure A-10

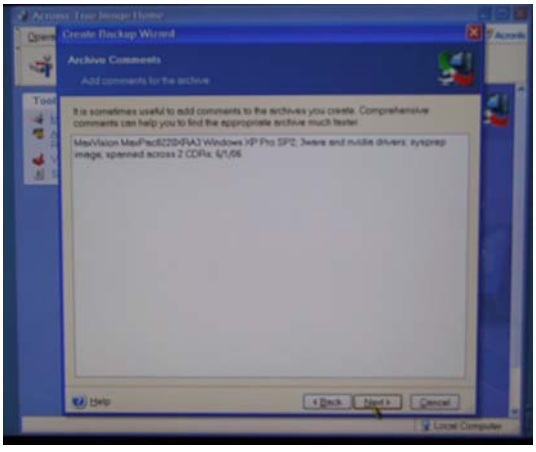


Figure A-11

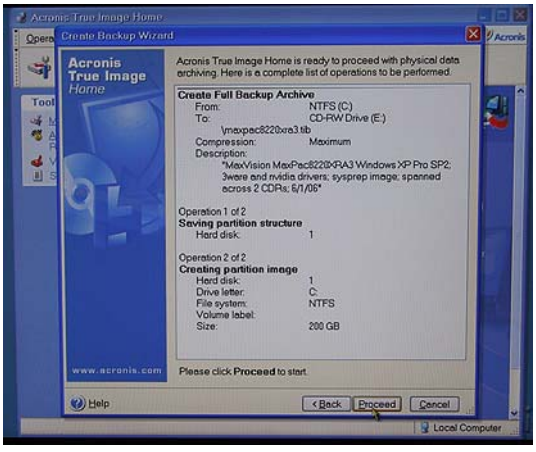


Figure A-12

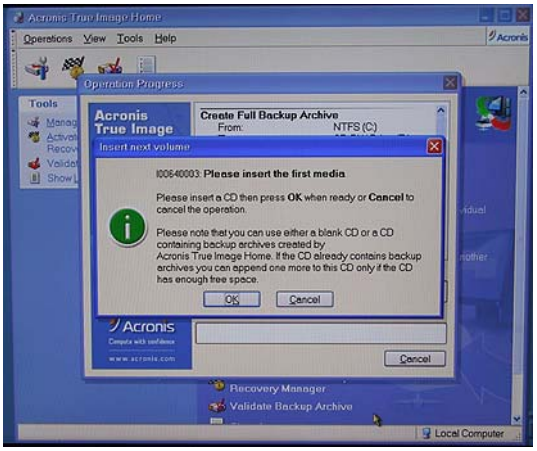


Figure A-13

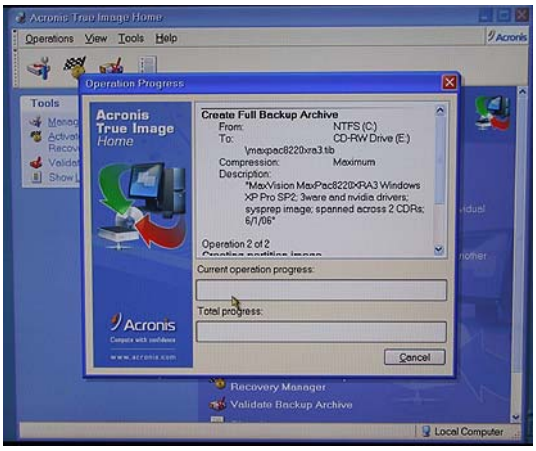


Figure A-14

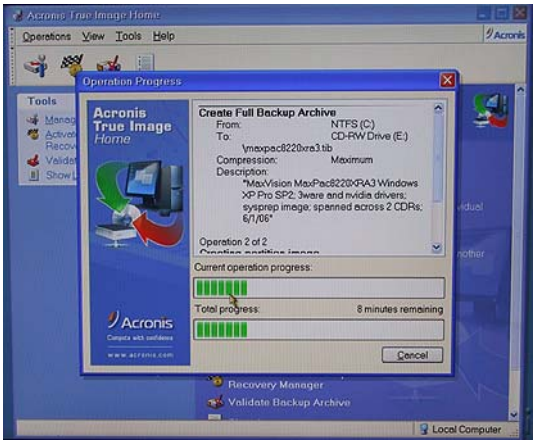


Figure A-15

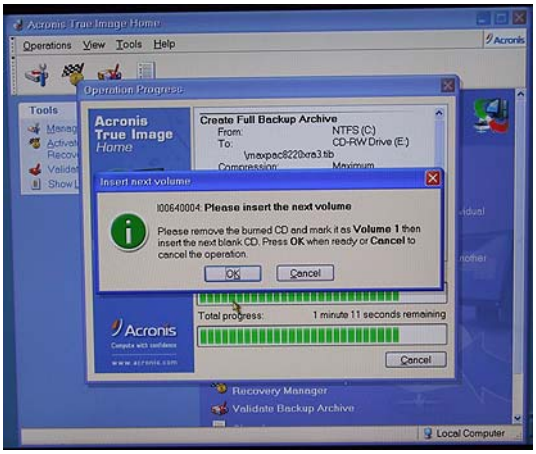


Figure A-16

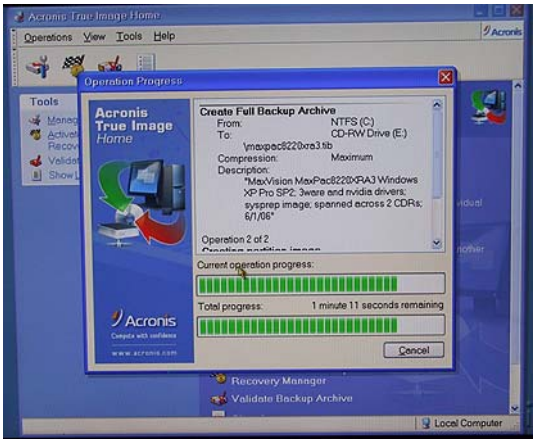


Figure A-17

Figure A-18

Restoring Your Own Image

Note: If you do re-load an image (containing the OS) that you have created yourself following your original activation and registration of the OS, you will NOT be required to re-activate and re-register the OS so long as you are restoring the image to the original machine. However, you will be required to re-activate and re-register the OS if you re-load the image onto a different machine. Prior to shipment from MaxVision the Microsoft SYSPREP utility is used to clear out the license number and other settings following system test. If you create your own image, and if SYSPREP is not run, and you subsequently load your image onto another MaxPac system, then Microsoft will require activation before use (no 30 day grace period). At this time, you will need to supply the correct OS license number for the MaxPac and activate prior to use (this procedure may vary depending on the version and license type of Windows used).

For the purposes of this example, we will assume that you are restoring your image from CD media (as opposed to DVD), and that the image occupies two CDs.

1) Power-down the system.
2) Ensure that the bootable recovery DVD supplied in the accessory pack is in the system's CD/DVD drive. In the case of a multiple DVD image, ensure Disk #1 is in the drive.
3) Power-up the system. This will automatically launch the Acronis application as shown in Figure A-19.

Figure A-19

Figure A-20

4) Use the mouse to select the Acronis item as shown in Figure A-19.
5) Following the splash screen (Figure A-20), under the **Pick a Task** heading, select the **Restore** option (the top item) as illustrated in Figure A-21.
6) Follow the actions depicted by the screenshots shown in Figures A-22 through A-40.

Figure A-21

Figure A-22

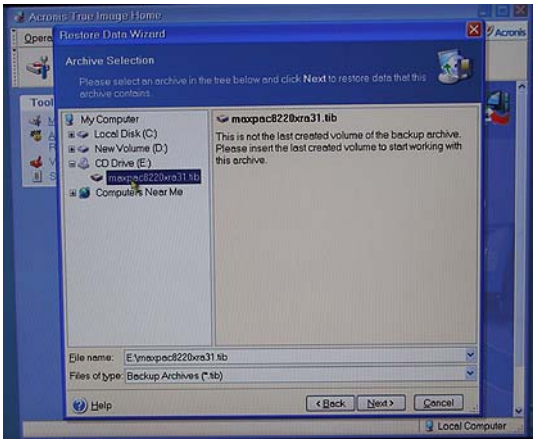


Figure A-23

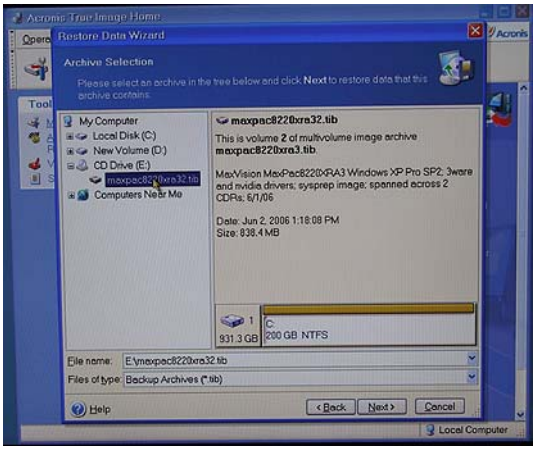


Figure A-24

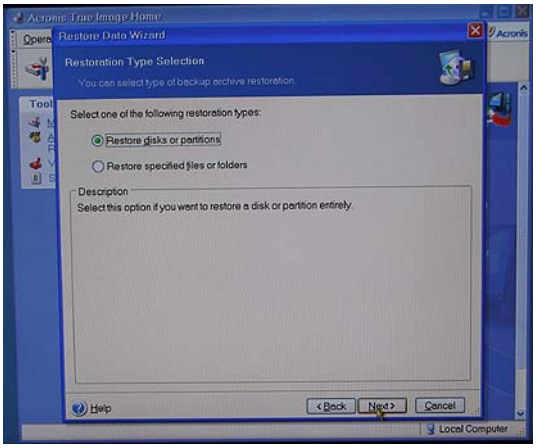


Figure A-25

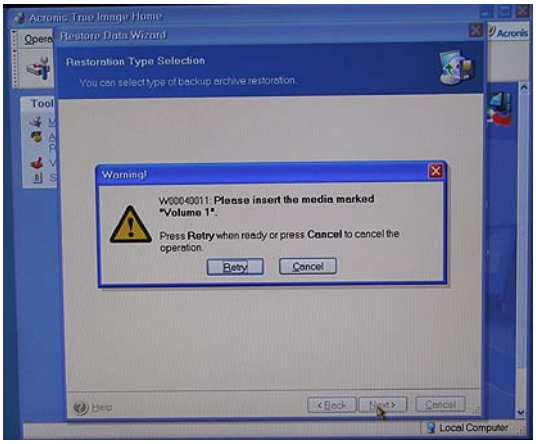


Figure A-26

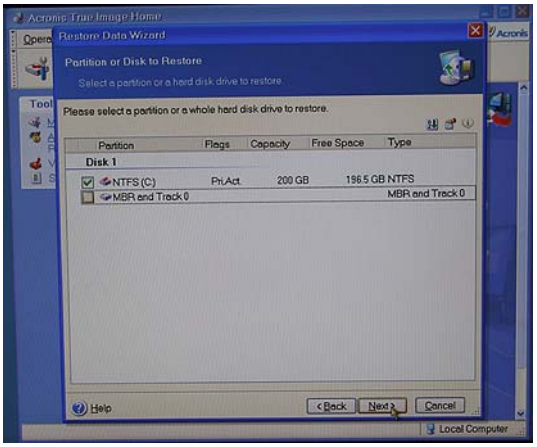


Figure A-27

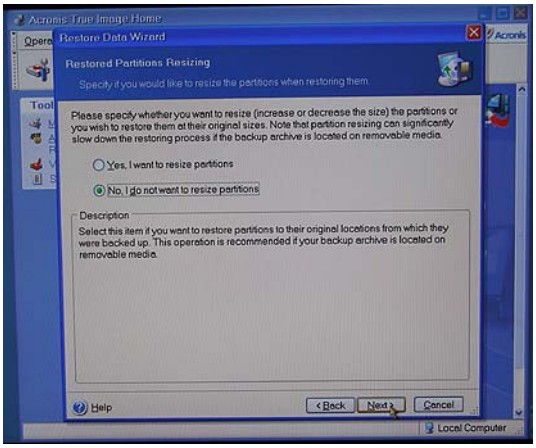


Figure A-28

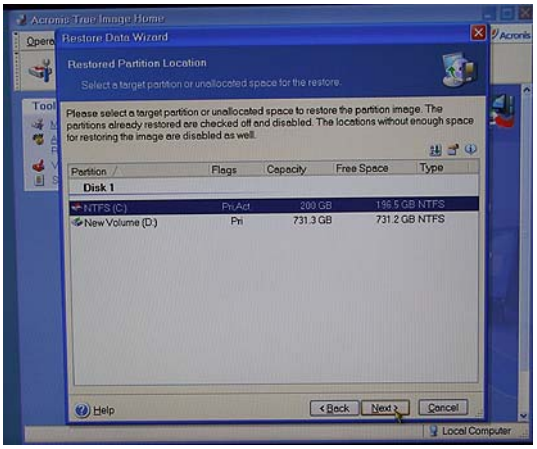


Figure A-29

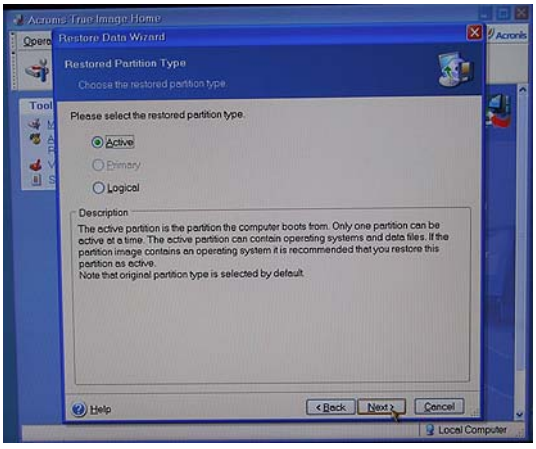


Figure A-30

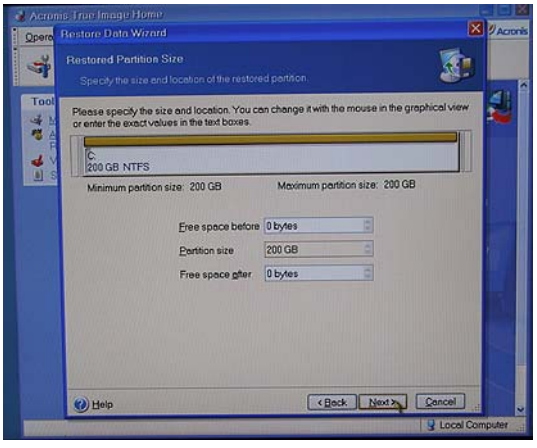


Figure A-31

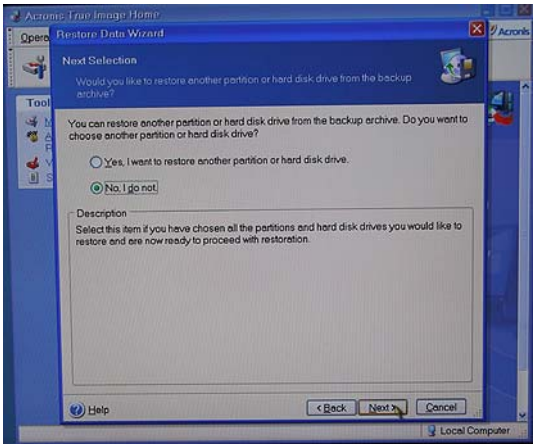


Figure A-32

Figure A-33

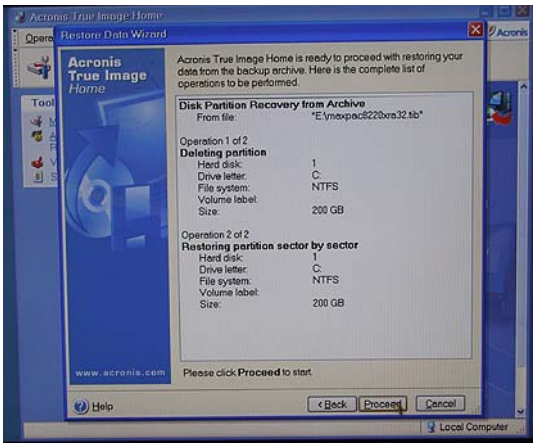


Figure A-34

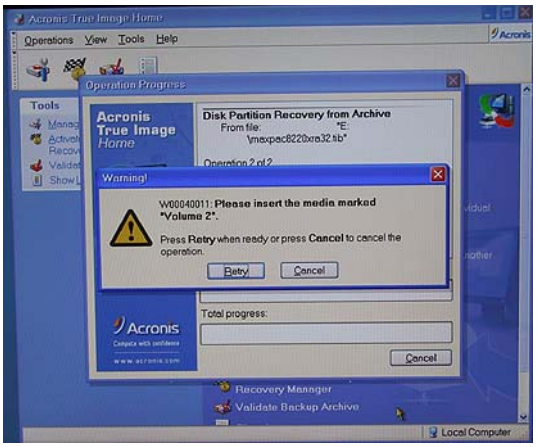


Figure A-35

Figure A-36

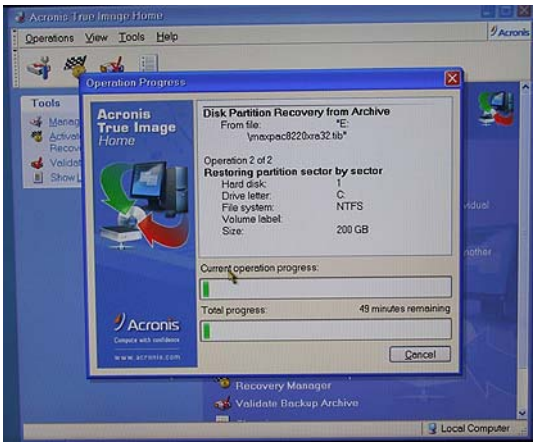


Figure A-37

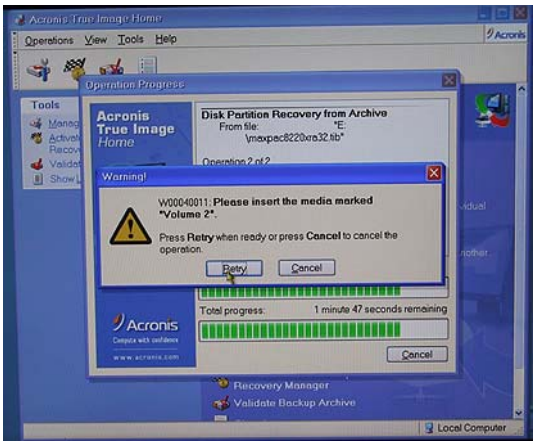


Figure A-38

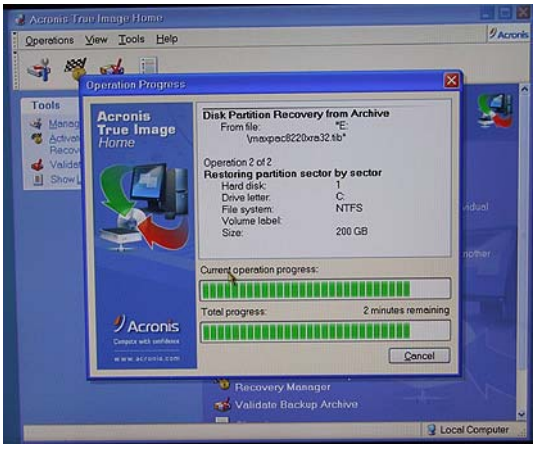


Figure A-39

Figure A-40

Appendix B: Regular System Maintenance

Cleaning Interior Dust

You should periodically check your system for the presence of interior dust and clean the enclosure as required. (The frequency of such checks will be strongly dependent on your situation. Perhaps not surprisingly, systems deployed in a desert environment, for example, will typically require such cleaning more often than systems located in less rigorous settings.)

In order to clean the interior you should perform the following steps:

- Shut down the system and unplug the power cord.
- Open the display assembly into its service position as discussed in *Chapter 4*.
- Using a commercially available compressed air PC cleaning product, blow the accumulated dust out of the unit. Pay special attention to air passages, grills, and heat sinks.
- Close up the system.

Replacing the Lithium Battery

A Lithium Ion battery is included with the system motherboard. This battery is used for the Real Time Clock circuit. The expected lifetime of the battery is approximately 5 years.

There is a danger of explosion if this battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the motherboard manufacturer. Dispose of used batteries according to the manufacturer's instructions.

In order to replace the lithium battery you should perform the following steps:

- Shut down the system and unplug the power cord.
- Open the display assembly into its service position as discussed in *Chapter 4*.
- Remove and replace the lithium battery according to the manufacturer's instructions.
- Close up the system.

Maintaining (Cleaning) the "Baghdad Filter"

1) Observe the filter on the top of the main chassis (Figure B-1). This filter is located over the air intake vent (any uncovered fans act as exhausts).

   The filters should be cleaned as mandated by local conditions (a good rule of thumb is when the filters look physically dirty).

   The filter is attached to the main chassis by four thumb screws and a filter frame.

2) Unscrew the knurled knobs holding the filter frame and remove it as shown in Figure B-2 (this may require the use of a Phillips #2 screwdriver) and then remove the filter frame (Figure B-2) and the filter itself (Figure B-3).

Figure B-1

Figure B-2

Figure B-3

3) The filter recharge kit (MaxVision Part Number 228-0002-0) comprises a pump spray cleaner and an aerosol spray containing replacement oil (Figure B-4).

Figure B-4

4) Place the filter on a working surface that is protected by some form of absorbent, disposable material (Figure B-5).

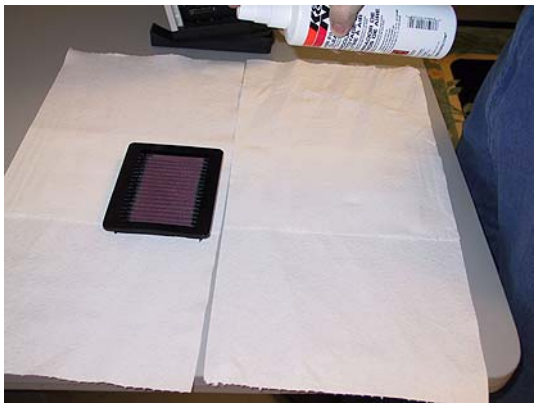


Figure B-5

Figure B-6

5) It is recommended that you first tap the filter on the work surface to dislodge any large embedded dirt particles, and then gently brush it with a soft bristle brush. Next, spray the cleaner onto both sides of the filter (Figure B-6), leave for ten minutes, and then rinse the element using a low-pressure water source (tap water is OK).

Note: Always apply the water from the "clean" side of the filter element.

Note: The use of other cleaning materials (including high-pressure air) may damage and/or reduce the effectiveness of the filter.

6) Shake off any excess water and then let the filter dry naturally.

7) Spray replacement oil on the "dirty" side of the filter element (Figure B-7). Keep the nozzle about three inches from the filter. Note that the cotton in the filter element will absorb and distribute the oil into an even film; thus, it is important to use only a single pass for each area of the filter and to not over-spray the filter.

Note: The filter oil is a compound of mineral and animal oil blended with special polymers to form a very efficient barrier. Red dye is added to show just where you have applied the oil (this red color will eventually fade, but the oil will remain and filter the air).

Figure B-7

8) Let the filter stand for 20 minutes and then touch-up any spots that do not visibly show the red dye contained in the oil.

9) Reattach the filter to the main chassis by securing the knurled knobs of the filter frame (Steps 1-3 in reverse order).

Resetting the Motherboard BIOS

In the event that your motherboard BIOS is corrupted or lost completely (this could be caused by failure of the lithium battery, electrostatic discharge, a major power surge, or user error), you may reset the BIOS as follows:

1) Power the system down completely (a simple **Start > Turn Off Computer > Restart** command is typically NOT recommended or sufficient) and then initiate the power-up sequence as discussed in *Chapter 1*.

2) Due to extensive system initialization and verification checks, the BIOS boot-up process can take a significant amount of time, especially in the case of systems with large amounts of memory. In the case of a system containing 8 GB of RAM, for example, it can take 45 seconds before all three LEDs above the numerical keypad on the keyboard flash. This is your cue to enter the BIOS setup utility, which you achieve by pressing the <Delete> key on the keyboard. Note that the system may not immediately respond to your pressing this key, which may be buffered until higher priority initialization tasks have been completed. Once the system does respond to this key, you will be presented with the **System Overview** screen of the **BIOS Setup** utility as shown in Figure B-8.

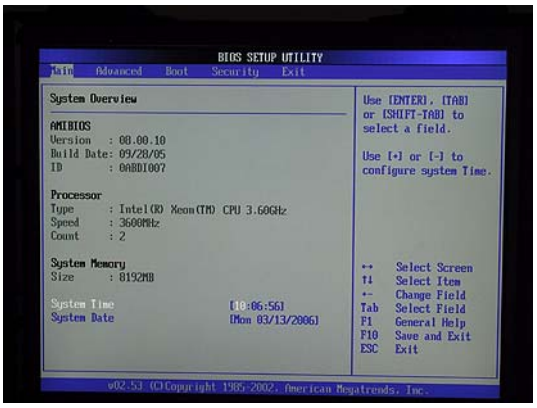


Figure B-8

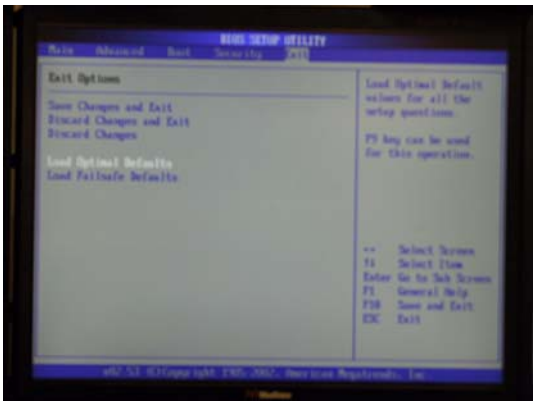


Figure B-9

3) Use the left/right arrow keys to select the **Exit** tab, and then use the up/down arrow keys to highlight the **Load Optimal Defaults** item (Figure B-9).

4) Press the <Enter> key to select this item. You will be presented with a confirmation screen as shown in Figure B-10.

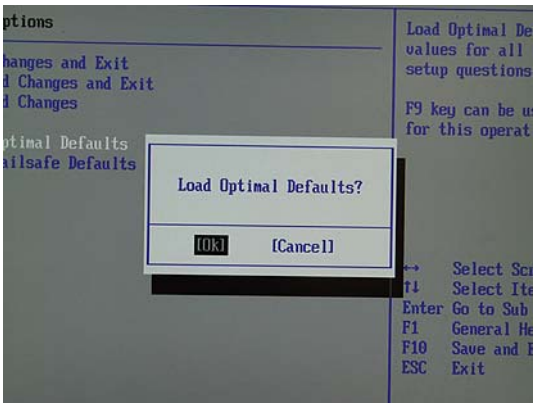


Figure B-10

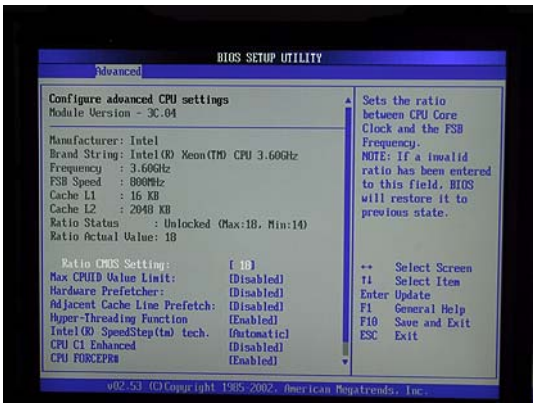


Figure B-11

5) Use the arrow keys to select the **OK** option, and then press the <Enter> key to select this item and to load the optimal defaults for your system.

6) Press the <F10> key to save and exit the BIOS. This will cause a confirmation form to appear on the screen. Use the arrow keys to highlight the **OK** option, and then press the <Enter> key to save your changes to CMOS and exit the BIOS Setup utility.

Appendix C: Screws and Required Tools

Screws

The various screws used in a MaxPac 8241-Series X-Class system are illustrated approximately full size as shown in Figure C-1

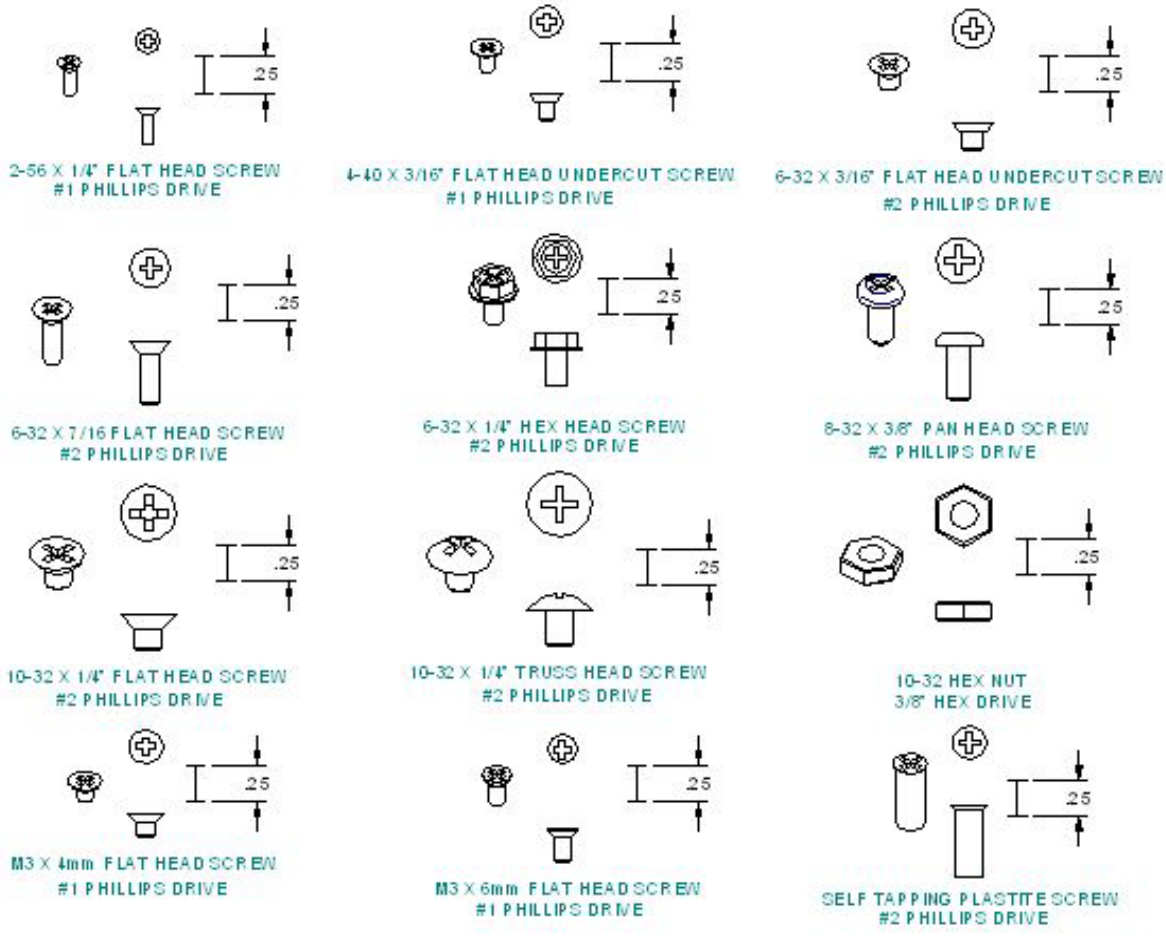


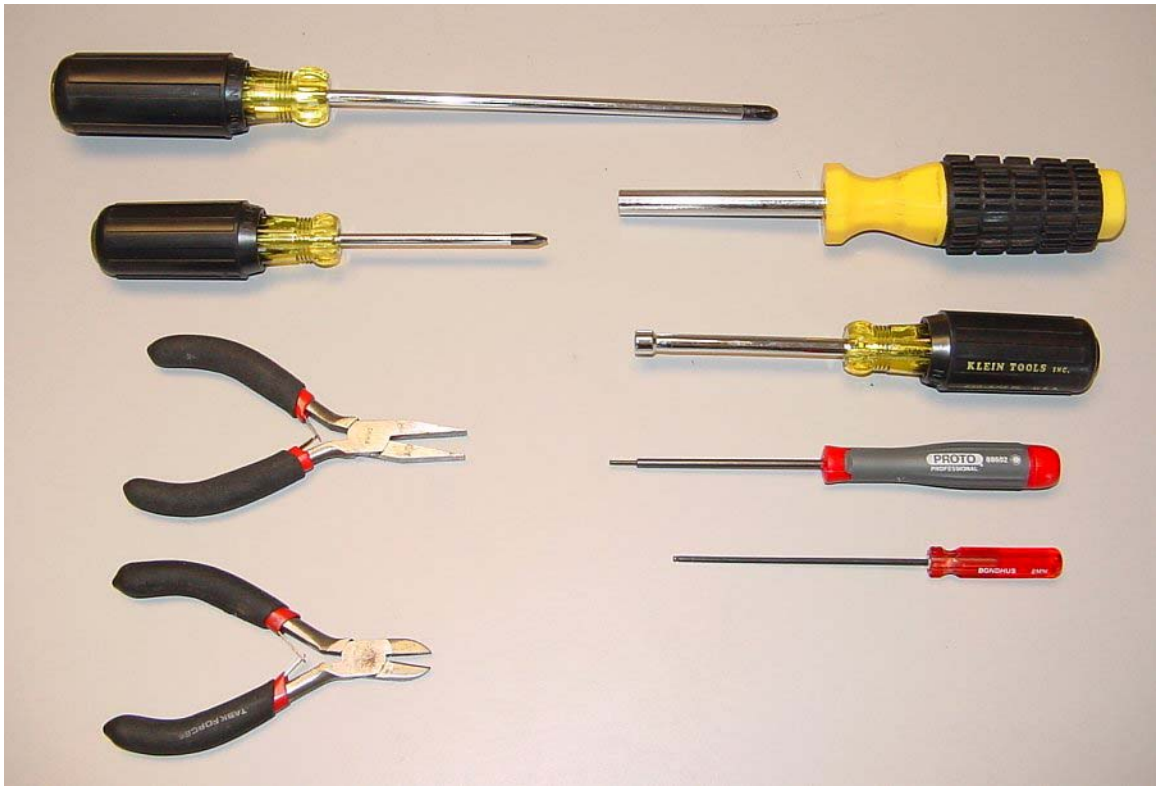
Figure C-1. Screws used in MaxPac 8220-Series X-Class systems

Required Tools

Note: It is extremely important that you use only high-quality tools so as to avoid any slippage and stripping of screw heads and threads.

Note: It is highly recommended that you use magnetized screwdrivers so as to prevent screws from dropping inside the case and/or aiding in retrieving them if they do drop inside the case. (If your screwdriver isn't already magnetized, you can make it so by repeatedly "stroking" the blade with a permanent magnet. Using a high quality universal screwdriver with replaceable Phillips #1 and #2 bits is a good idea to ensure that your bits are always in excellent condition.

Most of the module replacement and upgrade procedures discussed in this chapter can be performed using only a pair of #1 (small tip) and #2 (regular tip) Phillips screwdrivers.



For some procedures, however, needle-nose pliers will be of use, and you may have to cut cable ties on occasion.

Also, in order to replace a display or the video distribution board you will need an appropriate Allen key/tool.

Also, in order to remove the external video front plate assembly, you will need an appropriate Allen key/tool.

Appendix D: Contacting MaxVision Support (RMA and Serial Numbers)

Repairing/Replacing Products/Accessories

MaxVision will repair or replace products/accessories due to defects in material or workmanship, or any failure of the hardware system to conform to written specifications. Warranty repairs will be performed at MaxVision's service center. Any replacement parts/products shall be new or refurbished. Any repaired or replaced product will not extend the original warranty term of the product. Additionally, this warranty period will not be extended as a result of the purchase of any additional parts/products from MaxVision Corporation.

Contacting Technical Support and RMA Numbers

During the warranty period, MaxVision will provide technical support for hardware diagnosis via email (maxvision.support@maxvision.com or support@maxvision.com) or the technical support and customer service hotline (800-532-5805). If MaxVision's technical support determines that the product is defective, MaxVision will issue a *Return Material Authorization (RMA)* number to the customer. The customer is required to ship the product referencing the RMA number on the outside of the original (or equivalent) packaging with a copy of MaxVision's RMA form if provided. The return shipment must be sent insured and prepaid to:

MaxVision Corporation
495 Production Avenue
Madison, AL 35758
USA

Attn: Support

MaxVision will ship the repaired or replaced product to the customer with freight prepaid if the customer's address is within United Stated of America (excluding Alaska, Hawaii, Puerto Rico and U.S. possessions). Shipments to other locations will be shipped at the customers expense. MaxVision must receive notice of all events before the warranty period expires. NOTE: MaxVision will not be responsible for data on the hard-disk drive. Before you ship the product(s) to MaxVision, please back up your data from the hard-disk drive(s)or any other storage device(s) in the product(s).