CharisMac Engineering

ANUBIS User's Manual

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ANUBIS FORMATTER (continued)

ANUBIS MOUNTER

OPTIONAL SOFTWARE MODULES

Table of Contents

The Legend

ANUBIS (A- NU-BIS) – The Egyptian god of security who supervised the weighing of the soul, closely watching the scales to see if the pans balanced.

His judgement was of vital importance as it was the final test of truth. (Egyptian Mythology)

Introduction

HOW TO USE THIS GUIDE

This guide provides installation and operating instructions for the CharisMac formatter / installer / driver / utility software, and for optional software including CharisMac RAID. Because these software packages can erase storage media, it is essential that first-time users follow the guide carefully to avoid any accidental loss of data. Users who have substantial formatting experience can skip to the installation instructions, then go to the *Formatter*, *Mounte*r, and *Optional Modules* sections for detailed information. Users with less experience can refer to *Appendix C* to become more familiar with storage media issues.

Manual organization:

- How To Use This Guide
- What Does This Software Do?
- Installing Software
- Connecting Devices
- Auto Initialization Example
- The Anubis Formatter
- HFS+ (Extended Format Capabilities)
- The Anubis Mounter
- Optional Software Modules
- Troubleshooting
- Glossary
- Appendix A - Supported Drives
- Appendix B - Third party cards
- Appendix C - General Media Explanation

Conventions Used in This Guide

***NOTE**: This symbol calls your attention to important notes. Accompanying text is in italic print.*

NOTE: This symbol calls your attention to notes warning of potential loss of data. Accompanying text is in bold print.

WHAT DOES THIS SOFTWARE DO?

This software allows you to:

- Format storage media
- Initialize storage media
- Test and configure most drives and media
- Partition storage media
- Mount devices on the desktop
- Unmount devices from the desktop
- Access SCSI, SSA and Fibre Channel PCI Nubus cards
- Pick whether or not a device should be automatically mounted at system start-up
- Password protect data
- Assign media as the “start-up” drive (the drive/media the Mac will first look for and from which operation will be controlled)

In addition, CharisMac has developed features which provide convenience for you and greater safety for your data:

- Automatic recognition of device type
- Automatic recognition of Macintosh type
- Automatic or manual formatting operations
- Multiple partitions with ease
- Password protection of partitions or entire media
- Read/Write optical drive support
- Auto-optimization for each device type
- “On-the-fly” error recovery
- Second-level warnings and bail-out opportunities to minimize inadvertent loss of valuable data
- Removable media support

Anubis is a powerful tool which allows you to access all the features described above (and more) and use them to format, initialize, or configure most storage devices.

Introduction

The Mounter is a driver loading utility. System 7 users can make the Mounter accessible in the pull-down menu under the Apple icon (explained in *Installing Software*). System 6 users open the Mounter just as they do any other application. The Mounter provides quick access to a limited set of Formatter Utility tools for removable drives, allows drivers to be loaded for removable media devices on any connected SCSI bus, and complete on-line help as well. The Mounter is used to mount and unmount SCSI devices, and for limited media configuration; the driver loading process scans the SCSI bus at start up, identifies drives, determines whether a driver needs to be loaded, and mounts capable volumes.

Optional Software Modules

If you purchased the optional software modules also documented in this manual, you will be able to perform other functions including:

- RAID
  - •Disk Mirroring
  - •Disk Spanning
  - •Disk Striping
- Power Control
  - •Data Transfer Optimization
- Turbo MO
  - •Optical Data Writing Performance Enhancement
- UDF/DVD-R
- Optical Disk Access by ISO-Conforming Computers

For a detailed explanation of storage media, the SCSI interface, and formatting and partitioning media, refer to *Appendix C* at the back of this guide.

BEFORE YOU START

Register Your Software

Take a minute to register online through our website: http://www.CharisMac.com. Registering your software allows us to provide technical support as well as notify you of changes or updates to the software.

SYSTEM REQUIREMENTS

Software

Macintosh System 6.0 and Finder 6.0, or later, are required, system 8.1 is recommended. If you do not have the required versions, you can get them from an authorized Apple™ dealer or an on-line service.

Firewire hard disks require Mac OS 9 or newer, Firewire Enabler and Firewire Support version 2.4 or newer.

Hardware

The software will run on all Macintosh computers.

The software can be used on most fixed and ejectable Winchester drives, read/write optical, and other ejectable media drives. See *Appendix A* for a more complete list of compatible drives. (There are many drive distributors who buy their base mechanism from a primary manufacturer and market the drive under their own label. Your drive label may not appear in *Appendix A*, but may still be supported.)

Anubis requires a Macintosh with built-in Firewire ports for operation with Firewire hard disks.

Getting Started

INSTALLING SOFTWARE

For best performance, this software should be installed on a hard disk.

Hard Disk Installation

1. Insert the CharisMac Installer CD-ROM in your system's CD-ROM drive.
2. Double-click on the CD-ROM icon to open the disc.
3. Open the folder labeled Anubis Utility and double-click on the Anubis Installer file icon.
4. Follow any on-screen instructions. When the installer promts you, enter the password that is stamped on the outside of the envelope that your CharisMac installer CD-ROM came in. The password will be case sensitive, so be sure to enter the password exactly as shown.
5. The installer will promt you to select a location to install the software, select the desired location on your hard disk and click 'Install' to continue.
5. When the installer has completed, you will be asked if you wish to register your copy of Anubis. Clicking 'Register Now...' will launch your default web browser and connect to the software registration page on the CharisMac website. We urge you to register your copy of Anubis to be eligable for upgrades and technical support. If you do not wish to register right away, click 'Cancel.'
6. Finally, you will be prompted if you wish to Continue with any further installations or Quit. Click Quit to leave the installer.

CONNECTING DEVICES

Firewire

With Firewire devices there is no need to worry about ID conflicts, termination or other issues that are common with ATAPI and SCSI device connections. Due to hot swappability, Firewire devices can be connected in any number of ways, connect device then power up, power up device then connect, etc. There really is no right or wrong way to connect Firewire devices.

SCSI

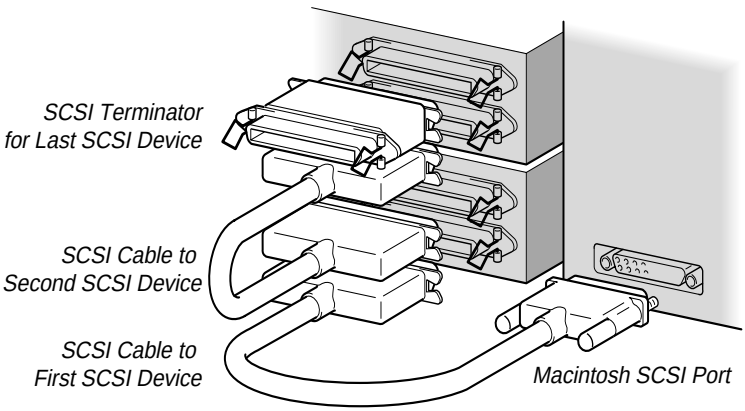
Check that all SCSI devices you connect are set to a unique ID. The Mac internal hard drive is typically ID 0; the Mac SCSI host is ID 7. Standard SCSI buses support 8 IDs; wide SCSI buses support 16 IDs. Some devices fragment each ID into “sub-addresses” called LUNs (Logical Unit Numbers). CharisMac software supports all of these buses. See the device manufacturers documentation for ID setting instructions.

Connect SCSI devices beginning at the computer and working outward to the last device. The SCSI bus should be terminated appropriately at the last device and should not exceed 18 feet total length including internal cabling. (Check with your supplier to make sure your drive is not internally terminated. If so, it must be at the end of the SCSI bus.)

NOTE: Power-down the system before making any connections.

Refer to the Troubleshooting section if you encounter problems.When using external SCSI devices, always turn them on before you start your Mac; always turn them off after you shut down your Mac.

Initializing Example



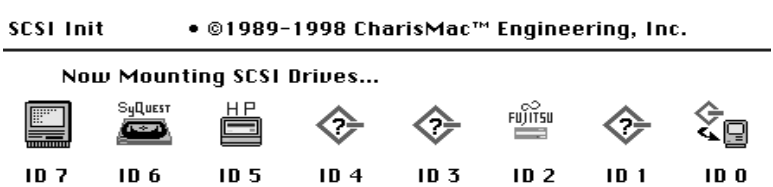
AUTO INITIALIZATION EXAMPLE

This section contains a step-by-step example of using the Automatic Initialization sequence to prepare media for use. This is the most commonly performed operation. The full capabilities of the Formatter Utility and the Mounter are explored in the sections following this one.

Auto-Initializing Removable or Fixed Media

Auto Initializing will check the media for defective blocks, erase any directories currently on the media, install the driver (with the drive icon you select), and allow the drive to be named. (Automatically prepares the media for use, prompting and informing you as it progresses.)

1. Start up any SCSI devices. Start tape or ejectable disk drives with no cartridge or disk inserted.
2. Start your Macintosh and keep an eye on the screen. After "Welcome to Macintosh," you should see the CharisMac Scanning Window. This window tracks the Mounter initialization routine (init) as it scans SCSI buses and reports the ID and name of devices it detects. If you have multiple SCSI buses, the mounter looks at each independently.



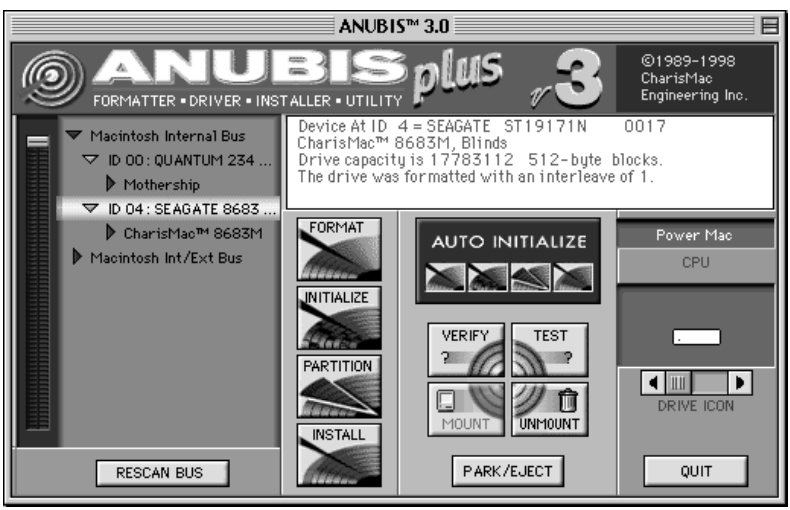
3. Double click the Anubis Utility icon to open it.

NOTE: To safeguard your data, CharisMac will not initialize or format the disk it is operating from, or the start-up disk of the computer.

Initializing Example

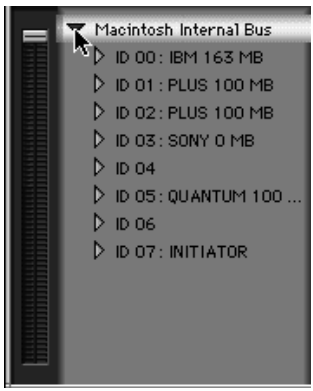
NOTE: FORMATTING media completely erases previously stored data. This erasure cannot be undone. INITIALIZING media erases directory structure and installs a new driver and partition map.

4. The Anubis main menu showing available SCSI buses and formatting options will appear. If all buses are not displayed, check SCSI IDs, connections, and terminations, then restart the process.



The area on the left side displays SCSI buses (internal, external, SCSI cards), devices, and volumes. The slider helps you navigate the list.

5. Select the SCSI bus the target device resides on by clicking the ▶ immediately to its left. The window will now display SCSI IDs, device types, and partitions on the selected bus.

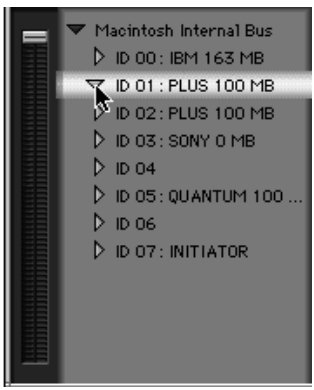


6. If you are initializing a cartridge, insert it in the drive now. Wait for the access light to go off, indicating the drive is done spinning up.

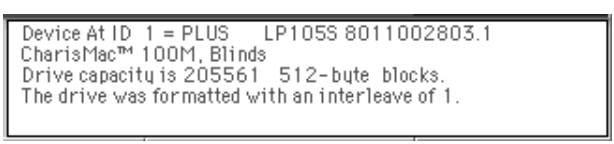
NOTE: If the cartridge has not been initialized before and you see the message "This is not a Macintosh disk. Do you want to initialize it.", reply NO. Then, quit the application and move the Anubis Extension from the System Folder to the desktop. Restart your computer. Return to this procedure and initialize the media. Remember to return the extension to the System Folder after you have initialized the media.

Initializing Example

7. Click on the ▶ button of the drive/ID containing the media you want to initialize. The display will highlight the selected drive/ID. If the ID has LUN sub-addresses, they will be displayed.

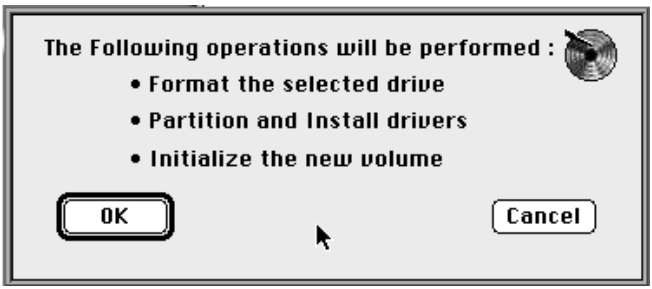


The message display will provide information about the selected drive.

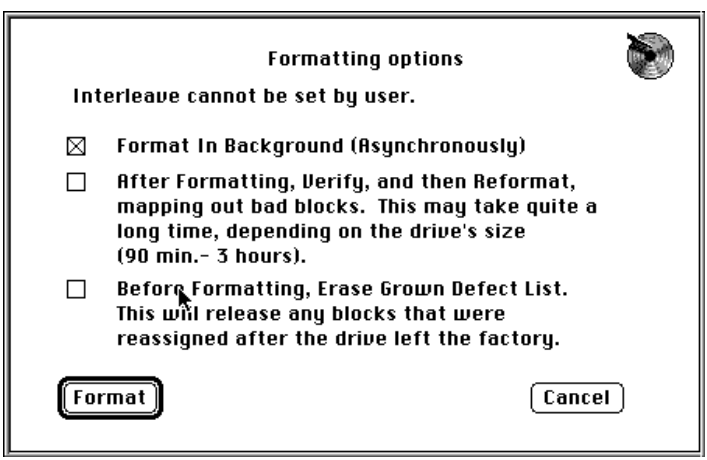


8. Browse the Drive Icon window until you find the Icon you want to use for the to-be-initialized drive.

9. Click the Auto-Initialize button on the Main Menu. The Formatting Options window will appear.



10. Click OK to begin formatting and initializing the media. A formatting options window will appear.



Initializing Example

11. Format in background – If you enable this option, formatting will take place in the "background," leaving your Macintosh free for other duties. While background formatting is running, do not try to access that device or rescan the bus.

12. Select the "After Formatting..." option if the disk or cartridge is worn or its usability is suspect.

13. Select the "Before Formatting..." option to release blocks found to be bad in a previous formatting operation. The released blocks will be rechecked, and mapped unavailable if again found to be bad.

NOTE: Media is tested when formatted, defective blocks (bad data storage areas) are occasionally found. These blocks are mapped and made unavailable for use. The "After" and "Before" options pertain to such bad blocks. You don't have to select either option; you can simply proceed by clicking on "Format."

14. Click on the Format button. A "data erasure warning" window will appear. Click **CONTINUE**.

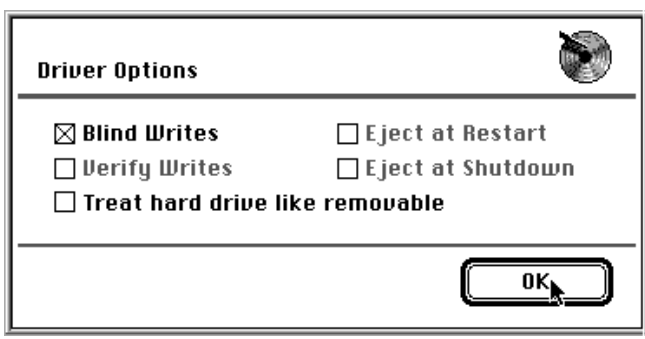
    Once you've clicked **CONTINUE**, current time and an estimate of format-complete time will be displayed (as a reference, Auto Initializing a 128 Meg optical disk takes about 10 minutes, format times vary from drive to drive). When the formatting portion is complete, a Partitioning window will appear.

15. Select "All Mac OS" to set up the media as a single volume (one partition), (If you want to partition the media into more than one volume, see *Auto Format and Initialization* in the *Anubis Formatter* section.) then click **OK**.

16. A "data erasure warning" window will appear.

Click **CONTINUE**.

17. When formatting is complete, Anubis will ask you to name the newly formatted disk or cartridge. Enter a name, then click OK. A driver options window will appear.



Blind Writes – When enabled, runs a write test when installing a driver, ensuring that the drive is fast enough to use the blind write feature.

Verify Writes – When enabled, data written to the drive is verified. When disabled, data is not verified (faster operation).

Treat hard drive like removable– When enabled, removable hard drives are polled and automounted just like ejectable media drives.

Eject at Restart – When enabled, ejectable media at this ID will be ejected at system restart.

Eject at Shutdown – When enabled, ejectable media at this ID will be ejected at system shutdown.

18. Once the media appears on the desktop, quit the

Anubis Formatter

Formatter.

NOTE: When using removable media drives, always unmount the drive from the desktop before ejecting the disk or cartridge. Some drives will automatically eject media when unmounted.

THE ANUBIS FORMATTER

This section provides detailed explanations of the functions available through the Anubis Formatter and accompanying pull-down menus.

1. Start up the SCSI device. If it is a removable media drive, start with no cartridge inserted.

NOTE: If you insert a cartridge or disk which contains a driver other than the Anubis CharisMac driver in your SCSI device, then power up your Macintosh, the Macintosh will load the driver from the cartridge or disk rather than the Anubis CharisMac driver. When you attempt to configure the cartridge or disk, you may get an error message. This is why we recommend starting with an empty drive or media with the Anubis CharisMac driver.

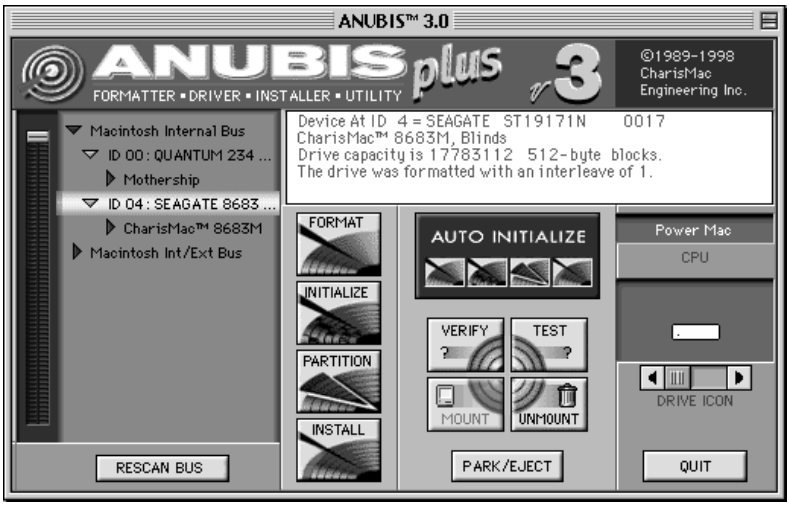
2. Start your Macintosh. Double click on the Anubis Formatter application to open it. If you choose, you may start up from a hard drive and run the Anubis application from a floppy.

NOTE: To safeguard your data, Anubis will not initialize or format the disk it is operating from or the start-up disk.

NOTE: Formatting media completely erases previously stored data. This erasure cannot be undone.

3. The Formatter main menu showing your SCSI buses, IDs, partitions, and more will appear. If not, check SCSI ID settings, cable connections, and terminations, then rescan the SCSI bus. Buttons that control unavailable choices are grayed out. (For example, you are prevented from formatting the disk containing the start-up system software.)

Anubis Formatter



4. If you are working with ejectable media, insert cartridges or disks in the drive now. Wait for the access light to go off, indicating the drive is ready.

5. Click on the ▶ button of the drive/ID containing the media you want to configure or test. If the ID accesses Logical Unit (LUN) locations, click on the appropriate LUN. Use the Mount button if the device did not mount automatically.

The remainder of this section describes the functions available through the main menu and associated pull-down menus.

RESCAN BUS

Rescan Bus

Click to perform a second SCSI bus scan (Anubis performs one while opening). If you just inserted a cartridge, the rescan will find it. If you have devices connected that aren't found, recheck connections, terminations, cabling, and ID settings.

Search/ID Reporting

As the SCSI search is performed, the computer being used is reported as well as the SCSI ID of each connected device. The example to the right shows:

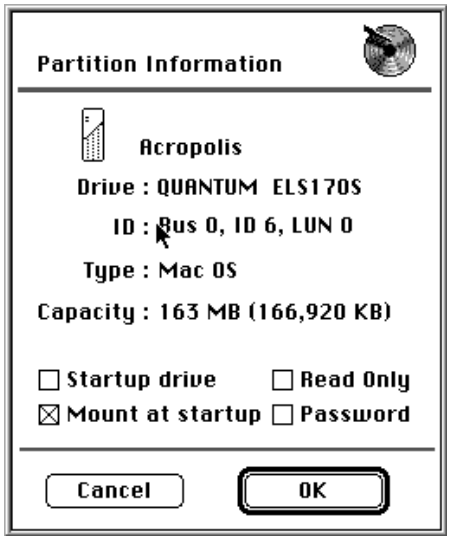
Mac internal bus

Mac external bus

PCI SCSI Card

- Quantum 810 at ID 00
- IBM at ID 01
- IDs 2 & 3 vacant
- IBM at ID 04
- Seagate at ID 05
- ID06 vacant
- Initiating device at ID 07

Clicking on an ID ▸ displays the volumes (partitions) at that ID. Double-clicking on a volume (partition) name brings up the information window for that volume.



Startup drive - When enabled, sets this drive to be the startup or controlling drive for the Macintosh.

Mount at startup - When enabled, this drive will mount at startup rather than wait to be manually mounted. If the volume is password protected, you must enter the password before you can change this option

Read Only - When enabled, sets this drive so that data may be read from it, but not written to it. If the volume is password protected, you must enter the password before you can change this option

Password - When enabled, the Mounter will ask you to enter and then confirm a password. Once protected, the volume will not allow any changes without the password. The password is also required to change this option or to change the password.

Message Window

Click on the device name next to the ID number to display device information in the message window.

```
Start-up volume --no changes are allowed.
Vendor/Model= QUANTUM  ELS170S      3.09
Model = CharisMac™ 166M
Drive capacity is 333936  512-byte blocks.
The drive was formatted with an interleave of 1.
```

Format & Init Options

Several formatting options allow you to set up a drive to work with most Macintosh computers. An explanation of each follows:

Clicking the **[AUTO INITIALIZE]** button automatically performs all the functions needed to set up a drive. Bad blocks can be isolated. Any data present is erased. (See the preceding *Initializing Example* section)

Clicking the **[FORMAT]** button formats the drive but skips the initialization function (does not create a Mac mountable volume). Bad blocks can be isolated. Any data present is erased. (Performs a Physical Format.)

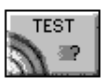
Formatting options are available under the “Options” selection in the menu bar at the top of the Mac screen. See *The Pull Down Menus* further on in this section.

Note: IDE based hard disks do not allow a low-level format command like SCSI drives. When an IDE drive is selected the Format button will be greyed out. This also includes Firewire based hard disks which also use IDE hard disks for thie actual drive mechanism.

Clicking the **[INITIALIZE]** button erases any directory on the drive and allows the drive name to be changed.

Bad blocks are not isolated by this function. Any data present is erased. (Performs a Logical Format.)

Clicking the **[INSTALL]** button installs the Anubis CharisMac driver only. Bad blocks are not isolated. Any data present is preserved (in most cases). It is safest to back up data before installing a driver.



Clicking **[TEST]** performs a read/write test of all or part of the selected drive. Test data may be logged and used to map out bad blocks.Write tests erase any data present. (Refer to *Drive Test Utility* in this section.)

Other Utility Functions

Additional utility functions available from the Main Menu, usually used after the formatting process is complete, are explained below.

Clicking the **[PARTITION]** button allows a drive to be split into parts, or partitions, each capable of mounting and storing data separately. After partitioning, the drive will be initialized. (See *Partitioning The Drive* for detailed partitioning options.)

Clicking the **[VERIFY]** button performs a READ test on the drive without affecting any data present. Any errors found are reported and can be logged to disk if you select that function from the pull down menus.

Clicking the **[MOUNT]** button places the formatted drive in the desktop directory (the drive icon will appear on the desktop). Any data present is not affected.

Clicking **[UNMOUNT]** removes the formatted drive

from the desktop (the drive icon will disappear from the desktop). Any data present is not affected.

Clicking the **[PARK/EJECT]** button "parks" the head away from the media in most drives for safe moving or shipment and ejects the media from the drive.

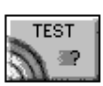
Click **[QUIT]** whenever you want to leave Anubis™ and return to the desktop.

Drive Test Utility

The Drive Test utility is run from the Main Menu and provides several test options, auto mapping of bad blocks, and a logging feature.

NOTE: During the Test Log process, any data present is erased irrevocably. However, Anubis™ will not allow you to accidentally erase the startup volume.

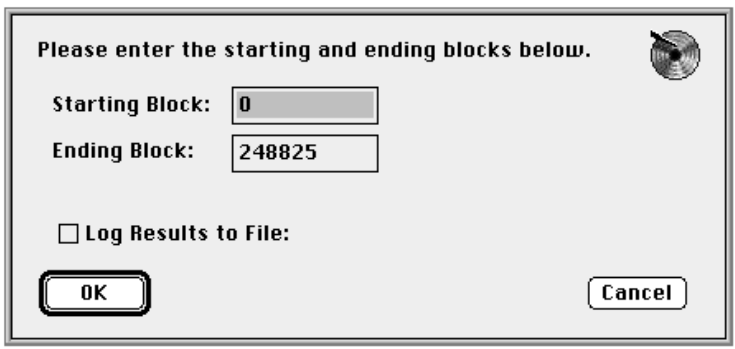
Starting Test



To start the Test utility, select the drive to be tested by clicking on the button next to its ID number, then click the **[TEST]** button.

A menu allows you to test a specified section of the drive and/or select the logging feature. (See Test Log)

To test the entire drive, click **[OK]** to continue.



Test Log

The test log feature generates a list of bad blocks found during testing. The list may be printed if desired. To open a log, click "Log Results To File" and supply a directory path and file name.

Auto Mapping

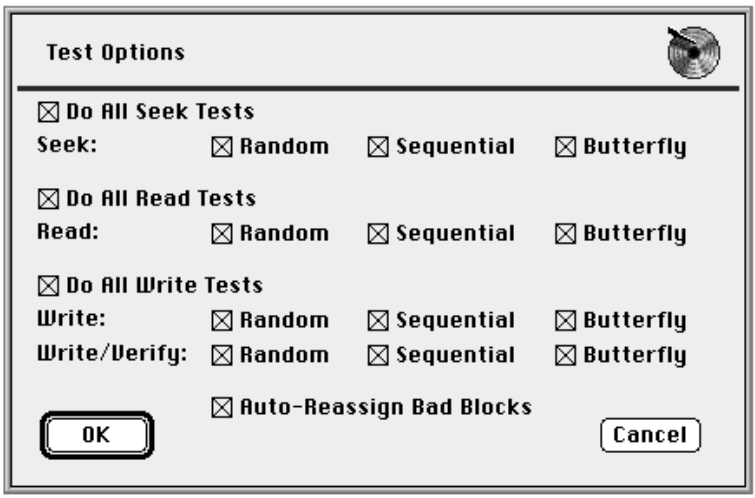
After you determine blocks to test, to log or not, and click OK, the Test Options window appears. Anubis™ will automatically map and reassign bad blocks during a test. To use this feature, click on the "Auto-Reassign Bad Blocks" button in the Test Options Menu.

Test Options

The Anubis™ utility provides four tests: Seek, Read, Write, and Write/Verify. Each of these tests can be run in a random, sequential, or butterfly fashion by clicking on the appropriate button in the Test Options Menu.

As tests are performed, a running account of how the test is proceeding is displayed in the Message Window

of the Main Menu.



Seek - tests the ability of the drive mechanism to find specific blocks on the storage media.

Read - tests the drives ability to read data from the storage media.

Write - tests the drives ability to write data to the storage media.

Write/Verify - tests the integrity of the storage media and drive mechanism by writing data, reading the data back, then comparing the two for differences.

When RANDOM is selected with any of the test options, the test is performed “randomly” on the storage media, jumping anywhere between front and back.

When SEQUENTIAL is selected with any of the test options, the test is performed “sequentially” from one end of the storage media towards the other.

When BUTTERFLY is selected with any of the test options, the test jumps from front to back in decreasing

fashion, testing the mechanisms ability to go from one end of the storage media to the other.

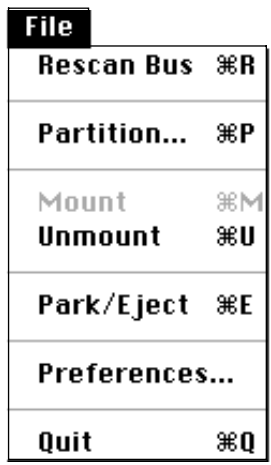
Stopping Test

To stop the Test utility, simply click the mouse button to return to the Main Menu.

THE PULL-DOWN MENUS

Pull-Down menus directly access utility features.

The File Menu



Rescan Bus – Performs a scan of all active SCSI buses.

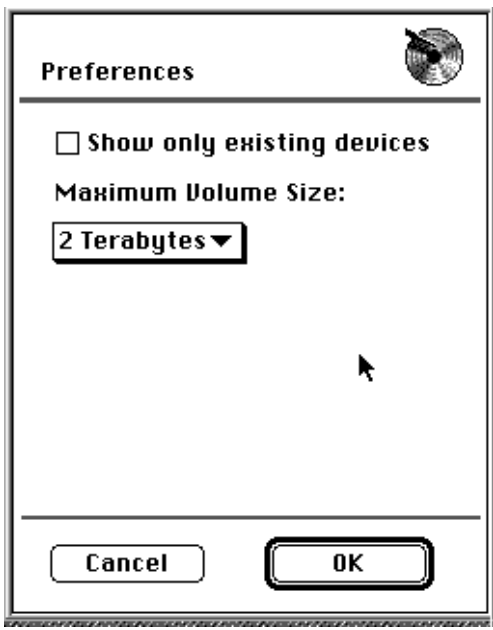
Partition – Displays the partition manager window (see Partitioning The Drive later in this section).

Mount – Mounts selected drives or partitions.

Unmount – Unmounts selected drives or partitions.

Park/Eject – Parks the head of the selected ejectable media drive and ejects the media.

Preferences – Displays the Preferences window.



Show only existing devices – If this option is selected, only bus IDs with active devices will be displayed when scans are done.

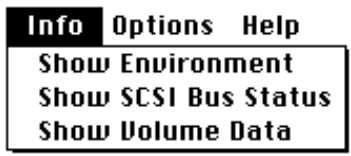
Maximum Volume Size – Depending upon their vintage, Macintosh Operating Systems have limitations on the maximum size volume they can recognize. This entry allows you to set Anubis preferences in accordance with your operating system:

- System 6 - 2GB
- System 7 - 4GB
- System 7.5.3 or later - 2 TeraBytes

The Edit Menu

The Edit Menu reflects the same functions as in most Macintosh applications.

The Info Menu



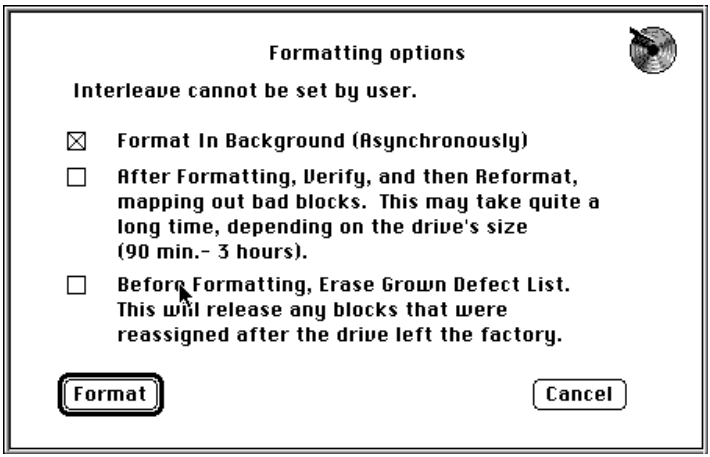
Show Environment – Provides detailed information about the computer running the Anubis™ utility.

Show SCSI Bus Status – Provides troubleshooting data. A "1" in any field displayed indicates a possible problem with the SCSI bus.

Show Volume Data – Provides detailed information about the selected device.

The OPTIONS Menu

Format Options – Displays the Format Options menu:



Format in background – If you enable this option, formatting will take place in the "background," leaving your Macintosh free for other duties. While background formatting is running, do not attempt other access to that device or rescan the bus

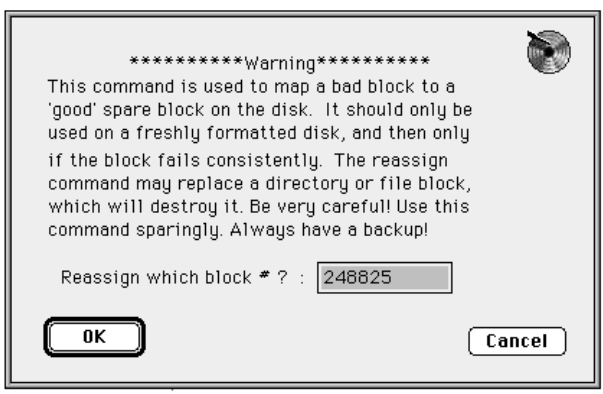
After Formatting – Click the box ☐ in the Formatting Options Menu to have Anubis™ automatically check the drive media after formatting and "map out" or isolate any bad blocks found. This is useful for worn drives where the media has become damaged through normal use over time.

Before Formatting – Click the box ☐ in the Formatting Options Menu to have Anubis™ erase any list of bad blocks that might be present. This is useful for new or used drives when you want to "start from scratch", building a new bad blocks list.

See also *Formatting Options* under the *Auto Format & Initialization* section of this manual.

Reassign Block – This command is used to reassign a bad block found during a TEST or VERIFY operation. You should use this command on a freshly-formatted drive only since reassigning a block on the storage media may erase data in the designated block.

When you choose Reassign Block from the OPTIONS Menu, a window is presented allowing you to enter the number of the bad block.



Anubis Formatter

NOTE: Reassigning blocks can erase any data present. Use cautiously on drives containing stored data.

Drive Cache – Provides access to an ON/OFF switch to enable the drive cache feature (when available). The cache feature may be turned off at any time independent of media presence.

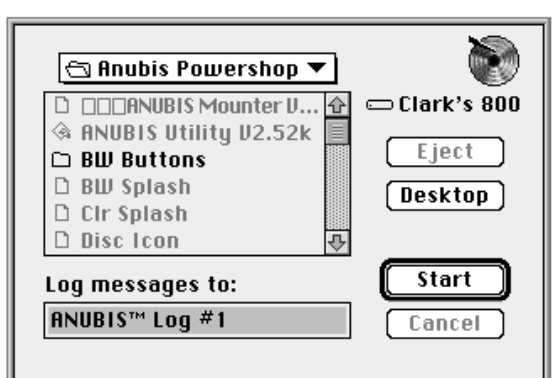
Blind Writes – Provides access to an ON/OFF switch to allow a write test while installing a driver. The test ensures that the drive to be formatted is fast enough to use this feature.

Verify Writes – Toggles (on/off) whether the selected device will receive the Verify portion of the Write pass. May cause loss of data (back up recommended).

Turbo MO– Optional. See the *Optional Modules* section later in this guide.

Log To File – Allows you to log an entire session with Anubis™ to disk. All information normally displayed in the Message Window during any process is stored in a file that may be read with any word processor or utility that will allow viewing of ASCII text files.

Selecting the LOG TO FILE command from the Options Menu accesses the standard Macintosh hierarchical method of choosing the destination folder and name of the log file



After you have completed logging a session, choose "Close Log File" from the pull down menu to stop logging.

Reboot – Allows you to reboot the system without shutting down the computer.

Shutdown – Allows you to power-down the computer, closing all open applications. The system prompts you to save any files that have not been saved to disk.

UDF/DVD-R– Optional. See the *Optional Modules* section later in this guide.

The HELP Menu

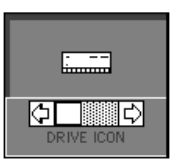
The HELP Menu provides quick access to brief explanations of most of the features of the Anubis™ utility. Pull-down menus not active with the utility are grayed-out.

Anubis Formatter

AUTO FORMAT & INITIALIZATION

Selecting Auto Initialization from the Main Menu performs all formatting and initialization functions in order, prompting you during the operation. You may escape any process by clicking a **[CANCEL]** button, or **[CONTINUE]** or **[OK]** to move to the next step.

NOTE: During the Auto Init process, any data present is erased irrevocably. Anubis protects the start-up drive by disabling data affecting functions when that drive is selected.



Choosing a Drive Icon

Anubis™ allows you to choose the drive icon you wish to display on the desktop. Before you begin, use the scroll bars to select the desired icon; leave it displayed in the window.

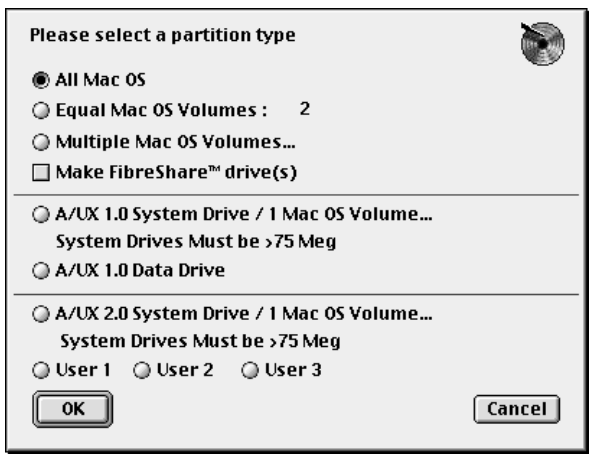
Formatting Options

Before you begin auto initialization, you can choose to access the Format Options menu (under the Options head in the menu bar) and set Before, or After formatting options. Refer to the *Pull Down Menu* section.

Click on the Auto Initialize button to begin the process. Read the following descriptions of initializing, partitioning, etc. to understand what the Auto Initialization process incorporates. See also the Auto Initialization example earlier in this manual.

Initializing The Drive

The **[INITIALIZE]** button is used to erase any directory, install the driver with selected drive icon and allow the drive to be named. Clicking the **[INITIALIZE]** button displays the Partition Type screen shown below.



All Mac OS - selects a single partition.

Equal Mac OS Volumes - selects two equal partitions.

Multiple Mac OS Volumes - allows you to customize partition sizes and name each. Selecting this option displays the Volume Name & Sizing Screen shown on page 33.

Make FibreShare Drive(s) - allows you to create volumes for use with the FibreShare serial storage network management software.

NOTE: When creating volumes for use with FibreShare the partitions will not mount onto the Mac's desktop. These volumes will only be accessable through the FibreShare sdistributed lock management software.

To set volume size:

1. Type a desired partition size in the Size window and click **[OK),** or
2. Use the arrows to size incrementally depending upon the kilobyte or megabyte toggle position, or
3. Type a percentage size in the Percentage Size window and click **[OK]** or,
4. Select *Set To Min Size* to select the minimum sized partition allowable or, *Set To Max Size* to select the maximum size partition allowable.

A/UX 1.0 System Drive - these selections are available with drives larger than 75Mb. Creates an A/UX 1.0 system drive.

A/UX 1.0 Data Drive - use this option to create an A/UX 1.0 user volume.

A/UX 2.0 System Drive - available with drives larger than 75Mb. Creates an A/UX 2.0 system drive. User 1, 2 & 3 options are used to create A/UX user volumes.

A/UX 3.0 Data Drive - available with drives larger than 75Mb. Creates an A/UX 3.0 data drive.

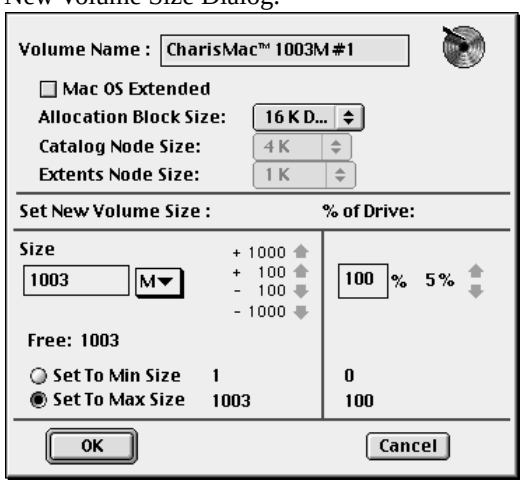
User 1, 2 & 3 options are used to create A/UX user

volumes. See *Partitioning Schemes* later in this guide.

Naming The Drive

After formatting, if All Mac OS is selected, Anubis™ prompts you to enter a name for the drive. Enter a name or leave the default. You can change a name later at the desktop if desired.

If Multiple Mac Os Volumes is selected you will see the New Volume Size Dialog.



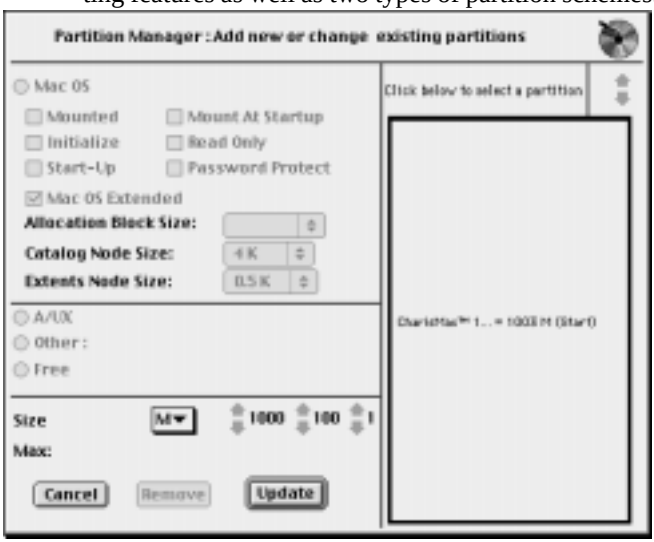
Mac OS Extended- See Section titled *HFS+ (Extended Format Capabilities)* for further explanations regarding this format.

Set New Volume Size- Set the sizes of the new partition by setting the physical size of the partition or by entering the percentage of the drive. Click **[OK]** to continue.Continue until all space on the drive has been accounted for.

Anubis Formatter

PARTITIONING THE DRIVE

Clicking the **[PARTITION]** button in the Main Menu displays the Partition Manager window. The Partition Manager window provides access to several formatting features as well as two types of partition schemes.



Partitioning Schemes

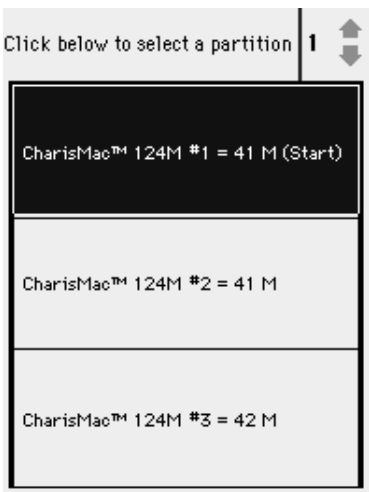
Partitioning schemes available are: Macintosh, which supports many volumes, and Apple UNIX 1.0, 2.0 & 3.0. (2.0 and 3.0 must be used on large drives of 75Mb or more.)

Quick Process

A quick “vanilla” formatting process is selected by clicking on the button next to the desired partition scheme (Mac or A/UX), then **[OK]** to continue. Anubis™ will complete an Auto Init process and return you to the Main Menu. (The default configuration is a single partition, all-Mac operating system.)

Partition Sizing

When partitioning is desired, Anubis™ provides two methods to select partition size. To change an existing partition, you must first click on it in the illustrated window, then click on Remove. Then, using the mouse, click and drag in the Partition Sizing window to size a desired partition.



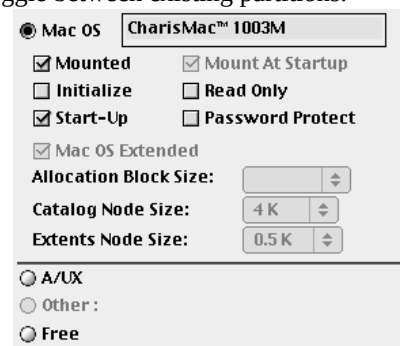
You may also use the arrows in the Partition Manager window to size partitions. Click in the window to select a partition, then click on the arrows until the desired size is displayed in the partition window. The total disk space available is also displayed.

The 1000, 100, and 1 selectors increment in MegaBytes when “M” is selected, or in KiloBytes when “K” is selected. When partition size is set, enter a name for

the partition. Then, click in the unconfigured area of the window to select a second partition. Size and name it as you did the first.

Other Formatting Options

The Partition Manager window provides other convenient options. Each option may be used on individual partitions. Use the arrows above the Partition Size window to toggle between existing partitions.



Mounted - selects whether a partition will be mounted immediately after an update.

Initialize - selects whether the partition is to be initialized immediately after an update.

Start Up - When selected, this volume will be the start-up volume.

Mount At Startup- selects whether a partition is mounted on the desktop (accessible) at startup.

Read Only - when selected, makes the partition read only (data may not be written, only read).

Password Protect - when selected, requires a password be entered to access the partition.

Mac OS Extended - when selected, allows the user to

create volumes that work with system 8.1's Extended or HFS+ capabilities. Allocated Block, Catalog Node and Extents Node sizes are explained in the section titled, *HFS+ (Extended Format Capabilities)*.

A/UX **--** when selected, the partition is for Apple Unix access.

Free - when selected, releases the partition selected in the Partition Sizing window for resizing.

Select partition options as desired, then click on Update to enable your selections. The volumes will be initialized and a driver installed on each. The formatter window will report when the process is done. Select the device and click on Mount to mount the configured volumes on the desktop.

Volumes may be unmounted independently from the desktop by dragging one, the other, or both to the trash. The Anubis Mounter control panel will mount and unmount volumes independently as well.

HFS+ (EXTENDED FORMAT CAPABILITIES)

Creating HFS+ Volumes

Anubis supports HFS+, also called Extended Format, capabilities of Mac OS 8.1. The Extended Format capabilities allow users to create more allocated blocks on a volume causing the size of the allocated blocks to shrink. Smaller allocated block sizes means that there will be less wasted space on a drive when small files are present.

A drive that is partitioned into several logical volumes can have both HFS and HFS+ volumes.

NOTE: Volumes with Extended Format capabilities will not mount on system versions prior to Mac OS 8.1. Under older systems Extended Format volumes will show a mounted volume with a single Apple READ ME and nothing else. The data still resides on the drive and will be available again upon using system 8.1 or newer.

To create an HFS+ volume follow these steps:

1.) Launch the Anubis Utility

2.) Select the drive that you would like to initialize by clicking on it in the SCSI list

3.) Click on the Initialize button

4.) A dialog box will appear. Select what partition type you would like, All Mac OS, Equal Mac OS Partitions or Multiple Mac OS Partitions and click OK.

5). Click Continue at the warning dialog

6.) The volume naming dialog will appear, name the volume. To create a Extended Format partition click the checkbox “Mac OS Extended.” The other

options will become useable.

Allocated Block Size: The allocated block size feature allows changing the size of the allocated blocks to the intended use of the volume. For small files use smaller allocated blocks, with larger files use larger allocated blocks. This keeps wasted disk space to a minimum.

Catalog Node Size: The catalog node size popup menu allows changing the size of all nodes in the catalog tree. This is important for future Mac OS releases that will allow up to 255 character filenames.

Extents Node Size: This popup menu allows the user to change the size of all nodes in the extents tree. The extents tree keeps track of file fragments on the hard disk.

If you aren't familiar with these features, we recommend leaving all popup menus to the default settings.

After setting up the volume click OK

7.) Continue setting up partitions until the drive is full

8.) The driver options dialog box will appear. Select the driver options and click OK. Anubis will write the driver and icon to the drive and it will mount.

Anubis Mounter

THE ANUBIS MOUNTER

The Mounter scans all the SCSI buses on system startup, notes what removable drives are at what IDs, loads the appropriate driver for removable drives (if a mountable cartridge is not inserted), and mounts removable drives upon cartridge insertion (the Mac will get a driver from the cartridge if one is already inserted at startup). The Mounter allows you to access controls to mount, unmount, and perform limited configuration on the selected drive or bus.

The Mounter Window

Selecting ANUBIS™ Mounter from the APPLE Menu or opening the Mounter by double-clicking causes an immediate SCSI bus search and status update. All connected devices are displayed in a scrolling window at the left side.

The **Help** button provides access to a thorough on-line help function. Use it as quick reference whenever you have an operating question.

Click on the Prefs button to choose how the Mounter will operate at startup. In the Prefs dialog box, click on the selecting box of any function you want active.

Scan and Mount at Startup – When selected, enables the Anubis™ Mounter initializing and driver loading routine at startup.

Show Window at Startup – When selected, enables the SCSI bus status window at startup.

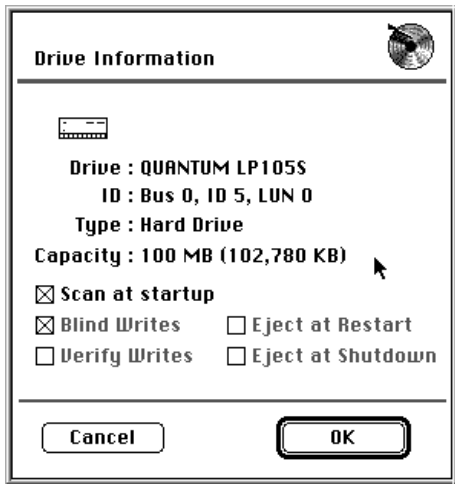
Show Only Existing Devices – When selected, causes Mounter SCSI/Drive/Partition display to show only those IDs with currently active drives or devices.

To mount a volume (make it appear on the desktop), first select the appropriate bus and ID, then the drive, then click on the **Mount** button.

To unmount a volume, first select the appropriate bus and ID, then the drive, then click on the **Unmount** button.

Optional Modules

With a bus, an ID, a LUN, a drive, or a partition selected, click on the **Info** button to display information about the selected "topic." (Or double-click the name itself.) ID information is shown below.



Scan at startup – When enabled, the removable media drive will mount at startup.

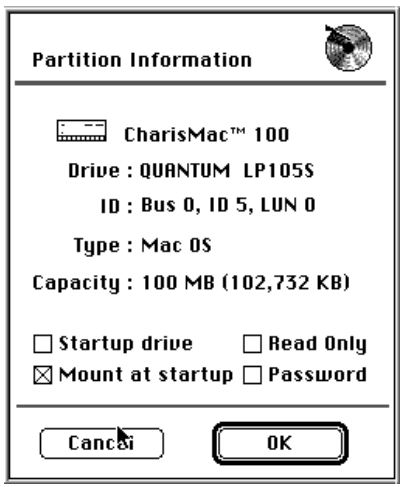
Blind Writes – When enabled, runs a write test when installing a driver, ensuring that the drive is fast enough to use the blind write feature.

Verify Writes – When enabled, data written to the drive is verified. When disabled, data is not verified (faster operation).

Eject at Restart – When enabled, ejectable media at this ID will be ejected at system restart.

Eject at Shutdown – When enabled, ejectable media at this ID will be ejected at system shutdown.

The info window displayed below is for a partition. It also allows you to determine certain parameters.



Startup drive **-** When enabled, sets this drive to be the startup or controlling drive for the Macintosh.

Mount at startup **-** When enabled, this drive will mount at startup rather than wait to be manually mounted. If the volume is password protected, you must enter the password before you can change this option

Read Only **-** When enabled, sets this drive so that data may be read from it, but not written to it. If the volume is password protected, you must enter the password before you can change this option

Password **-** When enabled, the Mounter will ask you to enter and then confirm a password. Once protected, the volume will not allow any changes without the password. The password is also required to change this option or to change the password.

Optional Modules

OPTIONAL SOFTWARE MODULES

This portion of the manual applies only if you purchased the optional software listed below:

- RAID
- Power Control
- Turbo MO
- UDF/DVD-R

CharisMac RAID

CharisMac RAID (Redundant Array of Independent Devices) is a high-end, data storage utility that provides three important capabilities:

- Mirroring - Mirroring allows you to select a primary disk to which you will write data, and a "Mirror" disk as well. When data is mirrored, it is automatically written to both disks, providing an immediate backup of your data. Because two write operations are occurring, the write operation requires twice the time.
- Spanning - Spanning lets you select two cartridges/drives which the computer will see as a single, larger storage device. Data is written to each sequentially; data blocks are not divided between the two devices. There is no speed advantage, but you do achieve a larger area.
- Striping - Like Spanning, Striping lets you select two or more cartridges/drives which the computer sees as a single device. Unlike Spanning, when writing or striping data, the computer alternates between the devices. The computer supplies data faster than a single device can record it, keeping both devices busy and providing a great performance advantage. The advantage is more pronounced for Macintosh computers with

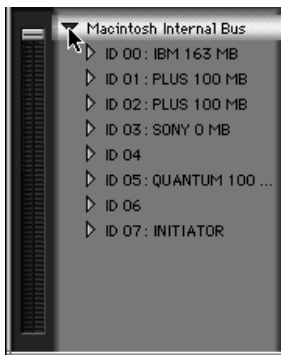
multiple SCSI buses because CharisMac RAID is able to stripe across buses.

1. Open the RAID application by double-clicking on the program icon. The following application window will appear:

The area on the left initially displays available SCSI buses (internal, external).The slider allows you to scan if the information does not fit completely.

2. Select the bus by clicking the ▶ to its left. The win-

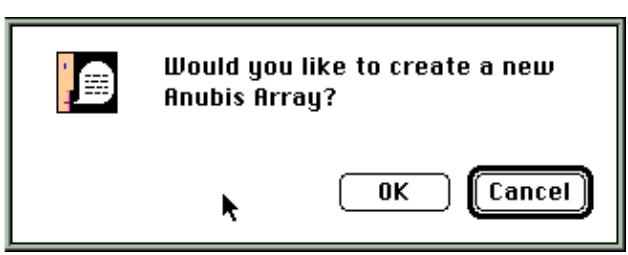
dow will display the SCSI IDs on the selected bus.



To set up a RAID disk array -

1. You must have at least two hard drives or ejectable media drives, formatted, but with no data currently stored on them.

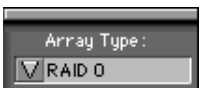
2. Select the initial hard drive by double-clicking it, or highlighting it in the window and clicking the **Add Driv**e button. (You can also select the initial drive by highlighting it, then clicking **New Array**.) The following message will appear:



3. Click on **OK**. Select additional devices by double-clicking them, or highlighting them and clicking

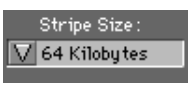
on Add Drive. As each drive is selected, a ✓ will appear next to it.

4. If you change your mind and don't want to add a drive to an array, highlight the drive name and click on **Remove Drive** (or just double-click again on the drive you want to remove).



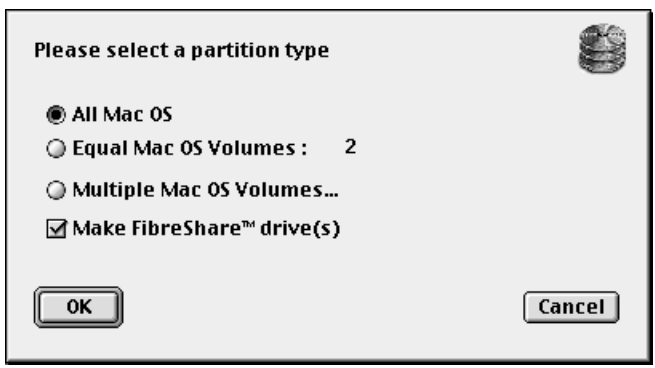
5. When you have completed adding drives to the array, use **Array Type** to choose one of the following:

   • Spanning - two or more drives look like one.
   • Type 0 - Striping
   • Type 1 - Mirroring



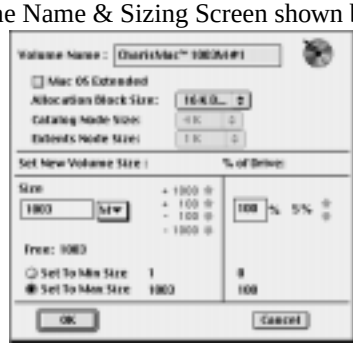
6. If you selected a Type 0 array, you can also select a segment size (amount of data written to each drive).

7. Select **Build Array** to begin array construction. As in the Anubis Utility, you will be presented with the following dialog box:



8. Select whether you would like All Mac OS, Equal Mac OS Volumes or Multiple Mac OS Volumes. If you intend to use the array with FibreShare then select the Make FibreShare™ drives checkbox.

9. Selecting Multiple Mac OS Volumes displays the Volume Name & Sizing Screen shown below.



CharisMac RAID allows the ability to create HFS+ partiitions, for further information regarding the cre-

ation of HFS+ volumes, please read the *HFS+ (Extended Format Capabilities)* Section.

NOTE: Volumes with Extended Format capabilities will not mount on system version prior to Mac OS 8.1. Under older systems Extended Format volumes will show a mounted volume with a single Apple READ ME and nothing else. The data still resides on the drive and will be available again upon using system 8.1.or newer.

Once all available space on the drives has been allocated then the array will be built. After the array is built, the new arrays icon(s) will appear on the Mac's desktop and data about it will appear in the Raid control panel message window. The name of the array will appear in the ARRAYS window. Building an array generally takes under a minute.

CharisMac disk arrays are "relocatable." If you move a disk array from one SCSI bus to another, the software will recognize it automatically.

To mount a RAID disk array -

You can mount an array by selecting the array to be mounted in the scrolling array window then clicking on **Mount Array** button. An array can also be mounted by mounting the first drive in the array or the "head" drive through the Anubis or mounter SCSI utility.

To delete a RAID disk array -

You can delete an array and separate the drives into individual units again by highlighting the array volume, then clicking on **Delete Array**.

NOTE: Deleting an array destroys all data stored on the drives. Drives must be initialized before reuse.

NOTE: Most Macintosh models will realize performance advantages when striping data. The increase depends upon the drives being used and the Macintosh computer and is also affected by the quality of the SCSI cables (shielded Ack and Req lines and a shielded braid are recommended). The greatest performance increases can be realized by striping data across the internal and external SCSI buses of dual-bus Macs or any other third party SCSI, PCI, SSA or Fibre Channel cards.

When you have finished building one array, you can go on to another, or click on **Done** and then quit the application.

Hardware Arrays -

Some hardware based array controllers can also be used with CharisMac RAID software. Refer to the user's guide that accompanied your hardware controller for additional information. If you use a hardware controller additional Array Types are available:

- Level 3 - Striping with a hardware controller
- Level 4 - Striping with a parity segment on one drive
- Level 5 - Striping with parity across all drives

The Parameters window displays information pertinent to hardware based arrays. See the hardware controller documentation.

Power Control

Power Control is a performance-enhancing utility. It allows experienced users to view and optimize internal drive settings and mode page parameter options which directly affect the way a drive handles data.

NOTE: CharisMac Power Control has a friendly user interface. Each Mode Page is explained in the on-line Help. Nevertheless, parameters should be modified ONLY by experienced users. Data loss and/or degradation can occur if parameters are improperly set.

BACK UP ALL DATA BEFORE USING!

When you open Power Control all drives currently on the SCSI bus are displayed. When you select a particular drive, the current settings for the highlighted Function of that drive are shown in the Parameters window, and explained in the Help window. Initially, these settings are those determined by CharisMac through regression testing to be optimum for the active drive.

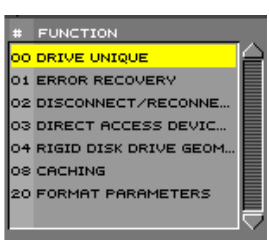
Parameters which are user-selectable are selected and changed through the Function and Parameter windows. (Non-user selectable parameters are also shown for informational purposes.) The Help feature tracks your Function and Parameter selections, providing topical help at all times.

If you change and save parameters, they will become the default for the utility. (Upon re-opening, Anubis will use your settings to configure drives.)

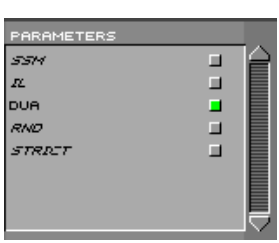
Optional Modules

The full Power Control menu is illustrated below.

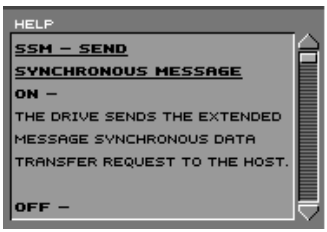
In the illustration, the selected drive is at SCSI address 0, LUN 0 (the internal drive). When a drive is selected, functions supported by that drive appear in the Function window.



The Function Window allows you to select a supported drive function that you may choose to modify. If the list is too long to fully appear in the window, the scroll bar allows you to examine all list entries. When a Function window entry is selected, parameters associated with that Function appear in the Parameters window.



The Parameters Window allows you to enter a Hexadecimal or Decimal value (numeric values are displayed and entered in either value, depending on your choice) or to enable or disable a parameter (indicated by a lighted or unlighted “LED”.



The Help Window tracks the active selections in the Function and Parameter Windows, presenting topical help at all times. The scroll bar allows you to view the entire help entry if it isn't fully visible in the window aperture.

The Settings Selector allows you to quickly set all of a devices functions and parameters:

- User - revert to your last saved User entries.
- CharisMac - revert to CharisMac defaults.
- Current - revert to last setting (you've made changes but haven't saved them).
- Device Default - revert to the factory defaults.

Choose whether numeric values are shown in Hexadecimal or Decimal format.

When you've made your selections, click SAVE to save them. Click QUIT to exit Power Control. (If you quit before saving, your new entries will be ignored.)

Turbo MO

If purchased, Turbo MO appears under the pull-down Options menu.

Turbo MO– In typical application, three separate operations are required to write data to an optical disk. 1) Erase the area to which data is to be written. 2) Write the data. 3) Verify the written data to be correct.

With the increased quality and reliability of computers and media, it is possible (and only marginally less safe) to eliminate or modify the erase and/or verify steps described above. TurboMO allows you to do just that, increasing the speed of your write operations.

NOTE: Turbo MO may be incompatible with other optical driver or utility software. For safest operation, start your Mac with CharisMac Anubis formatted cartridge in the optical drive (if you will subsequently access the cartridge from other Macintosh computers).

When a disk is formatted for TurboMO, TurboMO keeps track of disk areas which need to be collected and erased, and, during CPU idle time, performs an erase on those areas. When background erases are occurring, you see a growbar tracking the operation. This background pre-erasure process speeds writing operations considerably and keeps the disk ready for write operations. To speed them even more, you can toggle the Verify Writes option (of the Options Menu) Off. With TurboMO enabled and Verify Writes disabled, writing operations can proceed at maximum speed with one pass required to write data to the disk.

After you enable TurboMO and make your Verify Write selection, you must perform an Auto Initialization on the disk as described earlier. With TurboMO enabled, the disk is formatted as usual, after which a logical format, or initialization, is also performed and the disk is then erased.

When formatting is complete, you will be presented with a screen which prompts you to choose between

two compatibility modes: Faster or Compatible.

FASTER: If you choose the Faster compatibility setting, the driver is optimized for maximum speed in the active optical disk drive. However, the disk may no longer be compatible (without re-initialization) with other disk drives and driver software. If you do not anticipate using the disk in other drives, this is a practical option to increase performance (especially for high disk activity operations).

COMPATIBLE: If you choose the Compatible setting, the disk is formatted to be used in other drives (most situations), in addition to the currently active one. Even so, you should be sure that the CharisMac driver is loaded when writing data to the disk using another disk drive as data corruption may inadvertently occur.

Once you have made a compatibility choice, the Auto Initialization process continues with a complete erasure of all data on the disk. If your drive supports the Erase All command, the entire disk will be erased through only one or two SCSI commands. If the drive does not support Erase All, it will be erased in blocks of about 2.5MB at a time (which takes a little longer).

Once final erasure is done, the disk is set up for TurboMO operation (and will be automatically recognized as a TurboMO formatted disk upon drive insertion).

NOTE: Do not attempt to install another vendor's driver over the TurboMO driver or data corruption may occur.

The disk characteristics you choose are saved on the disk. If you wish to view them, highlight the disk on the desktop and select the *Get Information* command. If displayed, the following terms indicate:

- TurboMO - Cartridge is running under TurboMO.
- Verify - Verify Writes feature is enabled.
- Blinds - Blind Read and Write features are enabled.
- Asynch - Cartridge is currently running on a

Macintosh that supports SCSI Manager 4.3 Asynchronous SCSI transfers.

- 0:4:0 (example) - Equates to Bus:ID:LUN.

If you are running under the TurboMO driver and a non-TurboMO disk is inserted in the drive, the driver automatically reverts to normal Macintosh transfers.

NOTE: If a TurboMO disk running under the compatibility option is inserted in a drive using a non-TurboMO driver and data is then erased, the Turbo-MO driver may perceive areas of the disk which have not been pre-erased. If so, the driver will perform housekeeping, getting the disk to an "all erased" state prior to allowing operation (or mounting if the disk has just been inserted).

UDF/DVD-R

If purchased, UDF/DVD-R appears under the pull-down Options menu as an available choice (not grayed-out).

UDF/DVD-R– (Optional Feature, purchased separately) Installs CharisMac implementation of International Standards Organization cross-compatibility standard, allowing disks to be accessed by ISO-conforming computers.

TROUBLESHOOTING

This list of symptoms and causes is provided to assist in isolating the most common problems encountered when using SCSI utilities.

1. Drive doesn't show up after drive search.

- Is the drive turned on?
- Is the drive terminated correctly?
- Are cables tightened securely?
- If using two drives on the same bus, are they assigned different ID's?

2. Intermittent drive errors.

- Is the drive terminated correctly?
- If a Macintosh IIfx computer, is the termination supplied by Apple being used?
- Are cables tightened securely?
- If an optical drive, is the enclosure keeping the drive cool enough?

3. After insertion of removable cartridge, drive won't mount.

- Reboot with INIT in System Folder.
- Reboot with formatted cartridge in drive.

4. Icon for removable drive is different than usual.

- INIT in System Folder may be loading a CharisMac driver; this is normal operation.
- Driver may have loaded from cartridge.

5. After formatting, drive won't boot.

- Make sure drive is selected with “Set Startup” in Control panel under Apple menu.
- Driver may be corrupted; install a new driver.
- Verify system folder is present and complete/ uncorrupted.
- Open Mounter and verify “mount at startup” is set.

6. Screen is black; no video.

- Is monitor power on?
- Is power light or LED on monitor lit?
- If multiple devices are connected, are they using the same ID?

7. Drive doesn't work with certain cartridges.

- Other vendor's driver not compatible with 1024K media. Startup with mounter/INIT in System Folder and no cartridge in drive to load the CharisMac optical driver.

8. Macintosh starts to boot; happy Mac appears, then nothing or flashing disk.

- System or Finder corrupted; re-install new System and Finder from Master disks.
- INIT may be conflicting with another INIT; remove all INIT's except CharisMac INIT.
- Check termination for possible multiple terminations in chain.
- Try booting from floppy startup disk.

9. Macintosh starts to boot then nothing or error sound with "sad" Mac.

- Run CharisMac utility from Master disk and install a new driver.
- Check for different SCSI ID's.
- Check termination for possible multiple terminations in chain.

10. Drive comes up as "This Disk Is Bad."

- Check termination for possible multiple terminations in chain.
- Re-install driver or run Apple's Disk First Aid.

This list of symptoms and possible causes are provided to assist you in isolating the most common types of problems encountered when using the CharisMac utility/driver/disk formatting software.

11. When a cartridge formatted with another formatting product is inserted into the drive, the cartridge does not mount on the desktop.

- Open the Anubis Formatter or the Mounter and try to mount the cartridge. If it does not mount, restart your Macintosh while the drive is running with the problem cartridge inserted. The Mac will retrieve the manufacturers driver from the cartridge and use it until the Mac is restarted. See the descriptions of driver retrieval in the *What Does This Software Do* section on page 2 of this guide.

12. When a cartridge was ejected, it became unreadable.

- If drive is powered down prior to ejecting, the directory may be corrupted because the Mac caches directory information and the update may not be written to the drive prior to its having been turned off. To avoid this problem, unmount the drive from the desktop by placing its icon in the trash before ejecting the cartridge.

13. Using SCSI manager 4.3, I don't think the drive is running as fast as it should.

- Is drive installed with Parity and Unit Attention jumpers installed?
- Is a good quality SCSI cable being used (shielded Ack and Req lines as well as shielded braid)?
- Is the drive terminated correctly?

14. Using Turbo MO on another mechanism (such as a Service Bureau or friend's drive), it does not seem to be as fast.

- Other drive may not support erase command.
- May be using their driver. Reboot with Turbo MO cartridge in drive.

Appendix A

GLOSSARY

Anubis – the Egyptian God of security.

Blocks – a very small section of the storage media.

Boot Drive – the disk drive, internal or external, from which you first start the Macintosh. Also called the startup drive.

Bus – a data or communications link, serial or parallel, over which information or "data" is passed electrically.

Button – refers to a screen-graphic which enables or disables a function when clicked with the mouse.

Driver – is short for device driver. A device driver is a low-level software routine that tells a computer how to talk to a particular device.

ECMA- European Computer Manufacturers Association.

Firewire- also known as IEEE 1394, allows the connection of a wide range of devices, from digital video cameras to hard disks and CD-RW drives.

Format – refers to the process of laying down tracks on the storage media to prepare it to receive data.

Icon – a small descriptive illustration representing a file, drive, application, utility, etc.

INIT – an acronym for initialization. Init as used in the Anubis™ utility is the process of installing the driver in the system at boot time.

Interleave – a term referring to the sequence in which sectors are laid or formatted in tracks on the storage media.

ISO- International Standards Organization.

Map – a section of the storage media usually contain-

ing 1 or more blocks numbered sequentially.

Mount – the process of making storage media or other devices available to the Macintosh. When mounted, the media or device icon will appear on the Desktop.

Partition – refers to a section or volume of storage media, or to "dividing" the media (partitioning) into separate areas, each capable of running a different operating system.

SCSI – an acronym for Small Computer Standard Interface. The interface is usually accessible via a connection on the back of the Macintosh or storage device.

Select – to select something on the Macintosh usually refers to "clicking" on a button or icon with the mouse. The selected item usually turns black or "reverse" contrast to indicated that it is "selected."

System Folder – the folder containing copies of the System and Finder files, and other related system files.

Termination – refers to a resistive element placed at one end of a communications bus to reduce noise and signal echo on the bus.

TurboMO- driver software which increases the speed of write operations to media.

Volume – A desktop mountable storage area, may be a partition of a hard disk or removable disk or cartridge (see Partition).

Working Disk – refers to a copy of the Master or original disk. The Working Disk is used in the day-to-day use of the program thereby saving the Master disk for making copies only as the Working Disks wear out.

Appendix A

APPENDIX A: SUPPORTED DRIVES

Anubis™ supports the following drives:

Removable Optical Media SCSI Drives

- Panasonic 1Gb, 128Mb, PD Drives
- Maxoptix Tahiti I,II,IIm, 1Gb, III, IV, 2.6Gb
- Sony 650, 600, 128Mb
- Matsushita 650Mb
- NEC 1Gb
- IBM 128Mb, 230Mb
- Olympus 3.5" 128Mb, 230Mb, 650Mb, or 1.36Gb
- Philips 230Mb, 2.6Gb
- Ricoh 600Mb
- Most 128Mb,256Mb
- Fujitsu 128Mb, Dynamo 3.5" 128Mb, 230Mb, 650Mb
- Epson 128Mb, 230Mb
- Hitachi 2Gb, 2.6Gb

Removable/Winchester (SCSI)

- SyQuest Iota Series 42Mb; 44Mb, 88Mb, 105Mb, 135Mb, 200Mb, 230Mb, 270Mb, EZ Flyer, SyJet, Quest
- Iomega, Insite I325 VM 20Mb Floptical, Bernoulli, Zip and Jaz drives
- Castlewood ORB

Fixed Media Drives/Winchester (SCSI, ATAPI)

- Fujitsu
- Hewlett-Packard
- Miniscribe
- Rodime
- Wren
- Conner
- Microscience
- Freecom Firewire HD
- Seagate
- Maxtor
- Quantum
- Sony
- Micropolis
- IBM
- DEC

***NOTE**: Anubis™ may support other drives not listed at time of printing this guide.*

MAXOPTIX (TAHITI I, II, III) DRIVE NOTES

SCSI ID Select Jumper: W3

ID select jumpers at position W3 are used to set SCSI identification. Jumpers Ø through 2 comprise a 3-bit binary number of which switch Ø is the least significant bit. For example, jumpering bits Ø & 1 assign SCSI ID 3.

Terminator Jumper: W2-A

Termination is made by supplying power to resistor networks with jumper W2-A when the drive is the last or only drive on the SCSI bus. Remove this jumper when the drive is not the only or last drive in series.

Special Note for Tahiti IIM, III users

If you are using a Tahiti IIm drive with a ROM revision level 'A' you will need to set jumper 4 on the first switch bank to OFF. If you are using a Tahiti IIm drive with a ROM revision level 'B' you will need to set jumper 4 on the first switch bank to ON. Tahiti III users should use the 'B' ROM settings as above on the IIM.

Special Note for Tahiti III users and TurboMO

If you are using a Tahiti III drive with the CharisMac TurboMO software you must change all jumpers on Bank 2 to the "off" position.

Appendix B

MICROPOLIS DRIVE NOTES

ID select: Jumper pin locations are on the printed circuit board (3.5" drives) and on the end of the drive near the 50-pin SCSI connector (5.25" drives). Positions ID0 through ID2 are used to set SCSI bus identification. Jumpers 0 through 2 comprise a 3-bit binary number of which Jumper 0 is the least significant bit. For example, jumpering bits 0 and 1 assigns SCSI ID 3.

Jumper: PTY

No jumper at PTY enables parity checking (the default setting for Micropolis drives from the factory). A jumper is needed in the PTY position for all non-AV Macs. *Normally set CLOSED for any Mac other than the AV Macs.*

Jumper: WP

A jumper at WP selects write protection (on AV series and 4100 series drives). Normally set OPEN for Macs. A jumper at WP on non-AV or 4100 series drives selects SCSI-1/SCSI-2 operation. *Normally set OPEN (SCSI-1) for all Macs.*

Terminator Power

5.25" Drives	W6	W8	W5
3.5" Drives	W1	W2	W3
Drive powers internal term.	On	Off	Off
Bus powers internal term.	Off	On	Off
Drive powers SCSI Bus	Off	Off	On
Drive doesn't power Bus	Off	Off	Off

NOTE: To use SCSI manager 4.3 asynchronous transfers, drives require no jumper on the PTY location (PTY enabled). If more than a couple devices are on the bus, W3 (3.5" drives) or W5 (5.25" drives) must be jumpered, supplying termination power to SCSI Bus.

FUJITSU DRIVE NOTES M2511A, M2512A

SCSI ID DIP Switch: SW1- 2 thru 4

An ID select DIP switch (SW1) at the rear of the drive is used to set SCSI identification. Switches 2 through 4 comprise a 3-bit binary number of which switch 4 is the least significant bit. For example, setting switches 3 & 4 to ON sets SCSI ID 3 (factory default is 0).

Terminator Pack

Termination is made by a resistor pack located at RP1 on the PC board socket near the SCSI 50-pin connector. Remove this pack when the drive is not the last drive in series and terminate externally.

Other: DIP SW2- 1 thru 8

SW1: SCSI Parity Check; normally set **OPEN** (disables parity check on SCSI bus).

SW2: Synchronous transfer mode; normally set **OPEN**.

SW3: Device Mode; normally set **OPEN** for Mac.

SW4: Spindle auto stop; normally set **OPEN**.)

SW5: Auto Initialization; normally set OPEN (auto initialization disabled).

SW6: Reserved; normally set **OPEN** (for factory use only).

SW7: Mac Mode; normally set **CLOSED**.

SW8: Reserved (Diagnostic command); normally set **OPEN** (for factory use only).

Appendix C

APPENDIX B: SCSI Adapter Cards

The CharisMac software described in this manual supports all SCSI Manager 4.3 compliant nubus and PCI cards.

NuBus SCSI Accelerator Cards

Nubus based Accelerator cards are high performance SCSI speed enhancements.

- If you are using a Nubus SCSI card and your Macintosh fails to boot, disconnect all drives and cables from the Card and reboot. If the Macintosh still fails to boot, check to see that the fuse on the card is not blown (if it has one). Also verify you have properly terminated the SCSI bus.
- After installing the card, you should clear your Macs Parameter Ram by holding down the <Open Apple/Command>, <option>, <p>, and <r> keys during a reboot. Continue to hold the keys down until you hear the "third chime."

SCSI ID Expanders (LUN Support)

The SCSI ID Expanders offer expansion on any computer system that implements a SCSI bus.

- If you are attaching the SCSI Expander to a card, you must enable the Logical Unit Numbers (LUNs) on the card if not already enabled.
- The SCSI Expanders ID switch must be set to an unused SCSI ID. This refers to the Host Side of the SCSI Expander only. The SCSI Expanders Device Side contains the "expanded" devices that do not conflict with the ID used on the Host Side.
- The SCSI Expander may be used on either the native or the Third party SCSI bus. If you are using the native bus, you must use the CharisMac Anubis software to support LUNs.

PCI Adapter Cards

All current Macintosh's are PCI-based. CharisMac software has been fully optimized to support these PCI based Macs.

SCSI Manager 4.3 and PCI cards

No special installation considerations are needed for PCI cards to fully support SCSI Manager 4.3. Upon startup the card loads all needed driver software.

PCI card Installation

PCI based cards are very similar in installation to the standard nubus cards.

- If you are using a PCI card and your Macintosh fails to boot or show devices disconnect all drives and cables from the PCI card and reboot. If the Macintosh still fails to boot, Zap the parameter RAM as discussed below. Also verify you have properly terminated the SCSI bus.
- After installing the PCI card, you should clear your Macs Parameter Ram by holding down the <Open Apple/Command>, <option>, <p>, and <r> keys during a reboot. Continue to hold the keys down until you hear the “third chime.”

SCSI Card Technical support

Please refer to the Card Installation Guide for additional information on the MAC SCSI accelerator cards and any help you might need in installing the cards. Troubleshooting and technical support information is included in the Card Installation Guide, also. Should you need to call for technical support please call the card manufacturer first then they will conference with CharisMac Engineering if additional help is needed.

Appendix C

APPENDIX C: General Media Explanation

This appendix provides a general explanation of storage media, the SCSI interface, and media formatting and partitioning.

Your Mac - Your Macintosh computer is a powerful tool. Still, in order to get the Mac to do the work – word processing, graphic design, spreadsheet manipulation, whatever... that you want to accomplish, you need a couple of things beyond the basic computer with built-in floppy disk drive:

Application Software – the program that guides the Macintosh, and you, through the tasks you have to accomplish to write your novel, design your skyscraper, or forecast your company operating budget for the upcoming year.

Storage Media – when you complete a project, you need a place to store it. The storage media can be floppy disks (cumbersome and not reliable), a hard disk internal to the computer, or a hard disk or ejectable-media drive (cartridge, magneto-optical, etc.) external to the computer.

Some of the different types of ejectable-media drives are:

- 5.25" Optical (600, 650Mb, 1, 1.2, 1.3Gb, in 1024k & 512k b/sec sizes)
- 3.5" Optical (128Mb, 230Mb, 650Mb, 256Mb in 512k, 1024k, or 2048k b/sec sizes)
- Syquest Removable (44, 88, 105, 200, 230, 270, 310Mb, 1.5, 4.7)
- Bernoulli (150Mb, 20Mb Floptical)
- Iomega Jaz and Zip drives
- Castlewood ORB

Most users buy an internal hard disk for their computer and store both their application software and finished project files on it. There are a couple of dangers associated with this: 1) Your hard disk is quickly filled to

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