

*Universe Master*TM

*The Premier File
Management System*

For the Apple[®] IIgs

AB92680301

Universe Master™

The Premier File Management System for the Apple IIgs®

**Written by D. Proni
© 1992 Econ Technologies, Inc.**

Second Printing, August 1992

**Econ Technologies, Inc.
P.O. Box 195356
Winter Springs, FL 32719
(407)-365-4209**

License

This warranty applies to the original retail purchaser only. To obtain the warranty offered, the enclosed Registration Card must be completed and returned to Econ Technologies, Inc. within 30 days of purchase. Econ Technologies, Inc. retains title to Universe Master (the "Software") and to the Universe Master User Manual (the "Manual"). The Software may only be used on a single computer, and you may make one copy of the disk for backup purposes only.

Econ Technologies, Inc. warrants that, under normal use, the disks on which Universe Master is stored (the "Software") is free from defects in materials and workmanship for a period of 30 days from the original date of purchase.

Econ Technologies, Inc. makes no warranty or representation, either express or implied, with respect to the manual or the software; their quality, performance, merchantability, or fitness for a particular purpose. As a result, the software and manual are sold "as is," and you, the retail purchaser, are assuming the entire risk as to their quality and performance.

The Software and the Manual are fully copyrighted works. You may not decompile, reverse engineer, disassemble or otherwise reduce the Software to a human perceivable form.

Under no circumstances, including negligence, shall Econ Technologies, Inc. be liable for any incidental, special or consequential damages that result from the use or inability to use the Software or related documentation, even if Econ Technologies, Inc. or an Econ Technologies, Inc. authorized representative has been advised of the possibility of such damages. Some states do not allow the limitation or exclusion of liability for incidental or consequential damages so the above limitation or exclusion may not apply to you. In no event shall Econ Technologies, Inc.'s total liability to you for all damages, losses, and causes of action exceed the amount paid by you for the Software.

GS/OS is a copyrighted program of Apple Computer, Inc. licensed to Econ Technologies, Inc. to distribute in combination with Universe Master. Apple software shall not be copied onto another diskette (except for archive purposes) or into memory unless as part of the execution of Universe Master. When Universe Master has completed execution, Apple Software shall not be used by any other program.

Apple Computer Inc. MAKES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, REGARDING THE ENCLOSED COMPUTER SOFTWARE PACKAGE, ITS MERCHANTABILITY OR ITS FITNESS FOR ANY PARTICULAR PURPOSE. THE EXCLUSION OF IMPLIED WARRANTIES IS NOT PERMITTED BY SOME STATES. THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY PROVIDES YOU WITH SOME SPECIFIC LEGAL RIGHTS. THERE MAY BE OTHER RIGHTS THAT YOU MAY HAVE WHICH VARY FROM STATE TO STATE.

Credits

Software Design and Development

D. Proni

Manual Design

Karen Aziz Proni

Copyright

Copyright 1992 Econ Technologies, Inc.
All rights reserved.

Trademarks

Apple IIgs and Finder are registered trademarks of Apple Computer, Inc.
AppleWorks GS is a registered trademark of Claris Corporation.
All other brand and product names are trademarks of their respective companies.

Universe Master

Table of Contents

Section 1: Getting Started

- 1-1 Welcome
- 1-1 What Universe Master Can Do For You
- 1-1 What Universe Master Is Not Intended To Do
- 1-2 What You Need
- 1-2 Installing Universe Master

Section 2: The User Interface

- 2-1 User Interface - An Overview
- 2-2 The Online Volume Display Region
- 2-3 The Map View Area
- 2-4 The Map View Area Buttons
- 2-6 Folder Selection
- 2-7 The Command Buttons
- 2-8 The Menu Bar

Section 3: Tutorial

- 3-1 How To Use The Tutorial
- 3-2 Source Lists and Destination Lists
- 3-3 Source Lists
- 3-3 Destination Lists
- 3-4 Exercise 1 - Getting a Printout
- 3-8 Exercise 2 - Simple Backup Script
- 3-14 Exercise 3 - Restore Lost Files
- 3-19 Exercise 4 - Advanced Script Generation
- 3-21 Exercise 5 - Script Execution
- 3-24 Exercise 6 - Chained Backup Scripts
- 3-27 Exercise 7 - Redundant Backups
- 3-33 Exercise 8 - Archival Backups

Section 4: Command Buttons Reference

- 4-1 The "Copy" Command Button
- 4-3 The "Delete" Command Button
- 4-5 The "Backup" Command Button
- 4-11 The "Restore" Command Button
- 4-14 The "Catalog" Command Button
- 4-15 The "File Info." Command Button
- 4-20 The "Recover" Command Button
- 4-22 The "Print" Command Button

Universe Master

Section 5: Menu Bar Reference

- 5-1 The "File" Menu
- 5-3 The "Edit" Menu
- 5-6 The "Scripts" Menu
- 5-14 The "Folders" Menu
- 5-19 The "Volumes" Menu
- 5-36 The "Windows" Menu

Section 6: Data Loss Survival Guide

- 6-1 Be Prepared
- 6-1 Before The Crash
- 6-1 Precaution #1: Know Your Data
- 6-1 Precaution #2: Organize Your Data
- 6-2 Precaution #3: Backup Your Data
- 6-3 Precaution #4: Backup Your Data
- 6-3 Precaution #5: Keep Your File System Intact
- 6-3 Precaution #6: Keep Unused Blocks Zeroed
- 6-4 Precaution #7: 'Shutdown' Your System
- 6-4 Precaution #8: Keep A Spare System Disk
- 6-5 After The Crash
- 6-5 Recovering Deleted Files

- 6-8 The Unrecognizable Volume
- 6-10 The Corrupt File System
- 6-12 Adopting Orphans
- 6-15 Dealing With Bad Media
- 6-17 Marking Bad Blocks
- 6-18 Extracting Readable Files

Appendix A: Effective Data Organization

- A-1 Effective Data Organization
- A-1 Partitioning
- A-2 Dividing
- A-2 Putting It Together

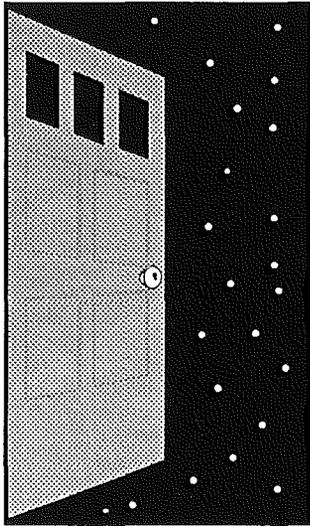
Appendix B: Universe Master Shortcuts

- B-1 Menu Bar Shortcuts
- B-1 Button Shortcuts
- B-2 Checkbox & Radio Equivalents

Appendix C: File System Errors

Appendix D: File Type Assignments

Index



Section 1

Getting Started

Vertical line on the left side of the page.

Section 1- Getting Started

Welcome

Thank you for purchasing Universe Master! We hope that this product will help you get the most out of your hard drive system. We feel that Universe Master is a must for anyone with a IIgs and a hard drive. Please be sure to return the registration card. By doing so, you'll be able to receive technical support, and notices of future updates and products. All suggestions, praise, and criticism, regarding this, or any other Econ Technologies product, is welcomed.

We set out to develop software that we felt was sorely needed in the IIgs market. A year of development went into Universe Master, and we are very pleased with the results. As the development of Universe Master progressed, we continued to add more and more features. As soon as each feature was added to the program, we immediately began using them in our daily routine. The last thing that the programmers at Econ Technologies do before leaving for the day is double click on their script icons in order to backup all files that have been modified. By being not only the developers of Universe Master, but also regular users of it, we've been able to create a quality product that we are proud to bring to Apple IIgs owners. We have many other projects for the IIgs on the drawing board, so keep an eye on Econ Technologies! We'll be bringing more quality software and hardware products for your Apple IIgs!

What Universe Master Can Do For You

Universe Master is a full featured disk maintenance utility. Its main features are: file recovery, disk repair, data backup, and disk optimization. Universe Master will let you gain control of your data in a very efficient and easy manner. These functions are accomplished through a very user friendly graphic interface. If you create and modify files on a regular basis, you will love the script capabilities; backing up your data becomes as easy as double clicking from the Finder™. Even the casual user can benefit from Universe Master; damaged or deleted files may be recovered with the file recovery functions. However, Universe Master is not restricted to backup scripts and file recovery functions. Read this manual to learn about the many functions Universe Master has to offer.

What Universe Master Is Not Intended To Do

Universe Master is not intended as a replacement for the Finder; you cannot launch applications from Universe Master. Instead of adding capabilities to Universe Master that are already available through the Finder, we chose to offer you other options that are not available. Universe Master works best in a system with a hard drive. It can be used with a floppy based system, but you will not realize the full benefits and the optimal results achieved with a system that includes a hard drive. If high prices have kept you from purchasing a hard drive in the past, look again. There are many good hard drives available for very reasonable prices, including our own line of Pegasus internal SCSI hard drives.

Universe Master

What You Need

Universe Master runs on an Apple IIgs with at least 1.5 mb of RAM and System Software 6.0. It was developed entirely under System 6.0 and takes advantage of its many features. If your computer is running an earlier version than 6.0, you will need to upgrade to 6.0, since Universe Master will NOT work with earlier versions. See your favorite Apple II dealer for the complete System Software 6.0 update.

Universe Master will work with any block device; hard disks, hard disk partitions, floppy disks, CD ROMs, RAMs disks and network servers. However, the recommended minimum system configuration requires a hard disk. You may use Universe Master on a floppy based system, but you will be missing out on most of the outstanding features, not to mention you'll be doing a lot of floppy disk shuffling.

Installing Universe Master

Installing the Universe Master application is very easy if you follow these steps:

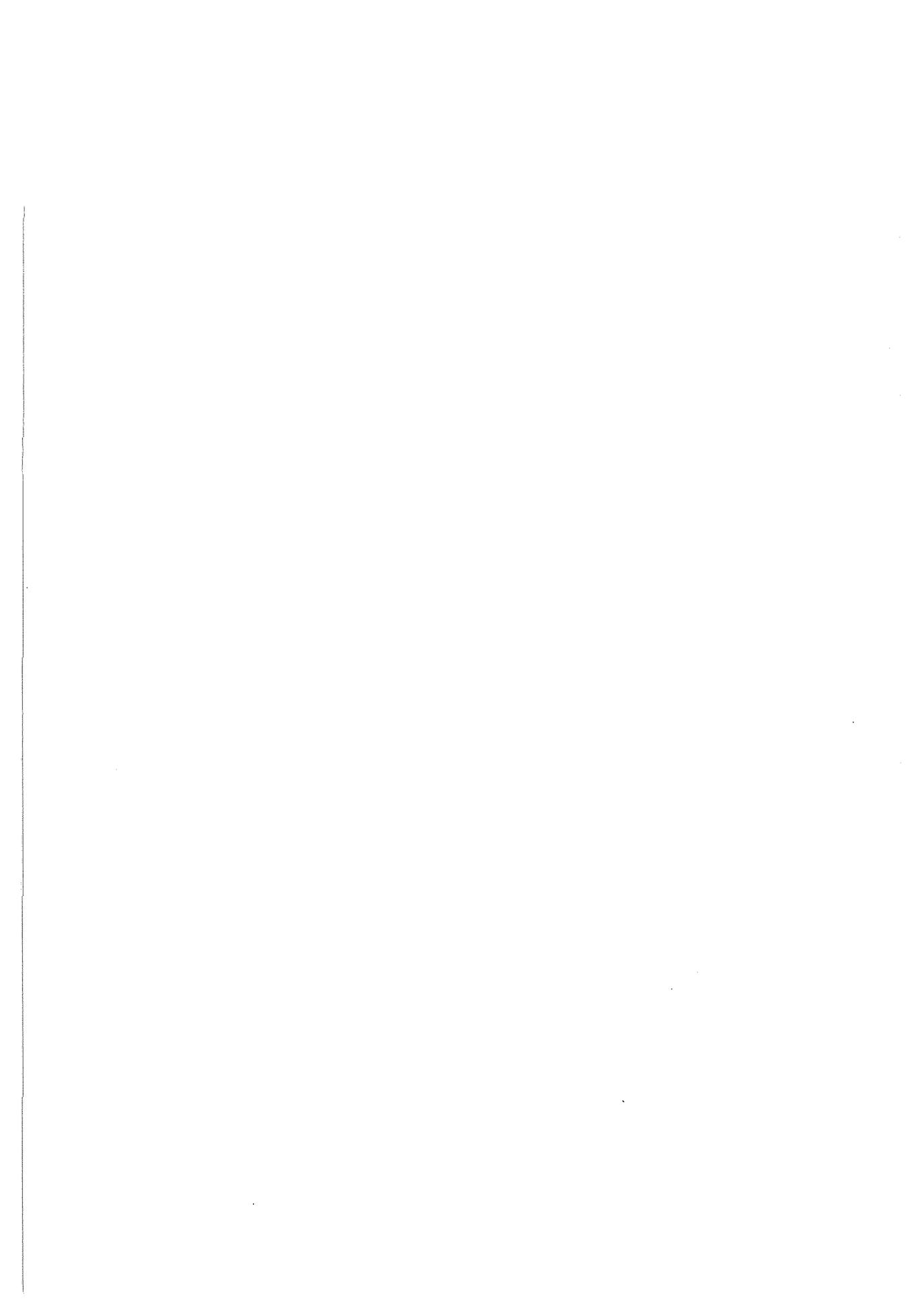
1. Insert the Universe Master disk into your computer's disk drive. An application named "Install.UM" will appear on your computer's desktop.
2. Launch the application "Install.UM" by double clicking on its icon.
3. The Universe Master installer will prompt you to enter your name and the name of your organization. These names will get recorded permanently onto your Universe Master application, so choose something appropriate.
4. After entering your name, and organization name (if applicable), press the "Continue" button. If you wish to quit the installation process, press the "Quit" button.
5. Next, the Apple IIgs Installer will appear. There are two items you will be installing: "UniverseMaster" (the application), and "UMTutorial". The tutorial contains the files necessary to go through the tutorial as described in this manual. We strongly recommend that you work through the entire tutorial.
6. Click on the "UniverseMaster" name that is located on the left hand side window of your screen. You must now choose a location for your Universe Master application. Using the window and buttons found on the right hand side of your screen, find a location where you would like to store the Universe Master application. You can also create a new folder at this point. When you have finished choosing a location for Universe Master, and the window on the right hand side of the screen is open to that location, press the "Install" button.

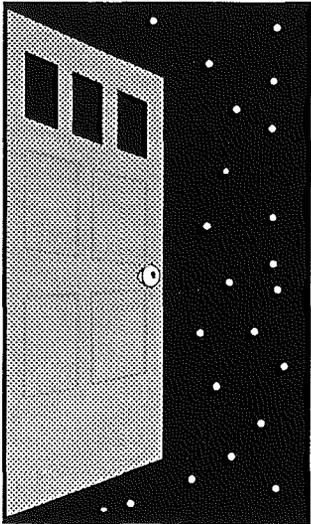
The Installer will now copy the Universe Master application to the selected folder. It will also install some icons and fonts on your system disk. These are required by the Universe Master application.

Section 1- Getting Started

7. Click on the "UMTutorial" name that is located on the left hand side window of your screen. You must now choose a location for your tutorial folders and files. Using the window and buttons found on the right hand side of your screen, find a location where you would like to store the tutorial files. You can also create a new folder at this point. When you have finished choosing a location for the tutorial, and the window on the right hand side of the screen is open to that location, press the "Install" button.

8. Press the "Quit" button to exit the Apple IIgs installer.





Section 2

The User Interface



Section 2 - The User Interface

User Interface - An Overview

The Universe Master window is a modeless dialog that cannot be closed or resized; it can only be moved. The Universe Master window is further divided into three regions: the *command buttons*, the *online volume display*, and the *hierarchy map view area* (the *map view area*.) The online volume display region displays all volumes that are currently online. The map view area displays a hierarchy of the selected online volume. The command buttons perform actions on the folders selected in the map view area. Each of these regions is discussed briefly in the following paragraphs.

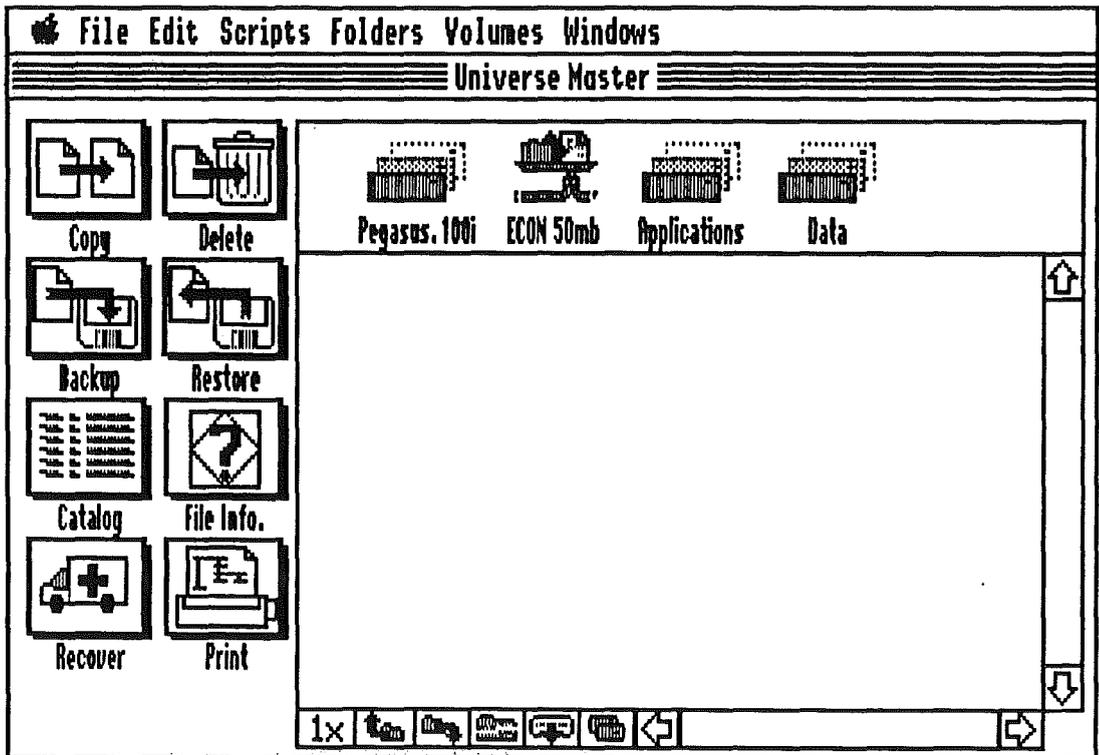


Figure 1. The Universe Master User Interface. Normally, all buttons are dimmed at this point, but we've edited this figure to show you all the buttons in their active state.

Figure 1 shows the Universe Master User Interface. Please note that there are two distinct sections of the user interface; the menu bar, which resides at the top of the screen, and the Universe Master window, which occupies the remainder of the screen. This chapter gives a basic description of the user interface provided by Universe Master, and the functions associated with the menu bar and the Universe Master window. A good understanding of these concepts is essential to fully comprehend Universe Master's features.

Universe Master

The Online Volume Display Region



Figure 2. The Online Volume Display Region.

This region displays the icons and names of all the block devices currently online. These might include hard disks, hard disk partitions, floppy disks, CD ROMS, RAM disks and network servers. These devices are typically referred to as *volumes*. The online volume display region displays a maximum of five volumes at a time. If there are more than five volumes online, right and left arrows will appear to allow you to scroll back and forth through all the volumes.

A volume is selected by clicking on its icon or name. Once a volume is selected, the icon is grayed, indicating that the volume is currently selected. Next, a small message box appears at the bottom left side of the Universe Master window, below the command buttons. It displays the message "Loading Map" (see figure 3), followed by a number. The number merely indicates the number of folders that have been scanned and it is there to let you know that Universe Master is scanning the folders.



Figure 3. This message is displayed after a volume has been selected from the volume display region.

As the message is displayed, Universe Master scans the selected volume and builds a volume hierarchy map in memory. After a map is built in memory, it is saved to disk so that subsequent openings of the volume will be performed much faster. Once a volume is completely scanned, the message box disappears and the volume hierarchy map is displayed in the map view area.

Section 2 - The User Interface

The Map View Area

The map view area occupies the main portion of the Universe Master window. It resides below the online volume display region. If necessary, you can scroll horizontally and vertically in order to view its full contents. When a volume is selected, Universe Master displays all its folders in the map view area. The reason that only folders are displayed is because the Universe Master window is *folder oriented*. The only two types of items you will ever see in the map view area are folders and the selected volume. Operations are performed on a folder, or a set of folders, not on individual files. However, some operations allow you to define a criteria for what types of files within a folder to use. Figure 4 is a sample illustration of a hierarchy map, as displayed in the map view area.

It is very important to have your data organized properly in order to take full advantage of Universe Master. Refer to Appendix A to learn more about effective data organization.

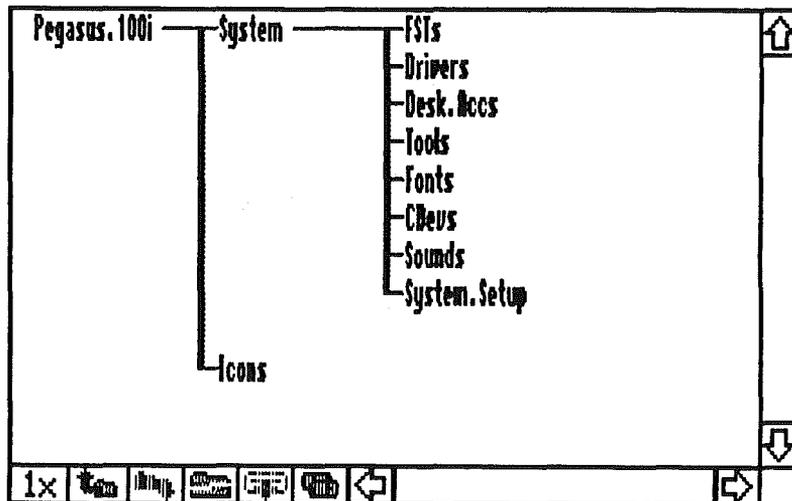


Figure 4. A hierarchy map is displayed in the map view area.

The name of the volume selected is the first item to appear in the map view area. It is displayed in the upper left corner. All folders contained in the volume are listed in the column to the right of the volume name, and linked with a vertical line. These folders are said to be in the same level of the hierarchy. These folders are the children of the volume; the volume is the parent. In turn, folders are also parents to any folders contained in them. This relationship is graphically depicted by the use of horizontal and vertical lines, as shown in figure 4.

Universe Master

In figure 4, "Pegasus.100i" is the selected volume. The folders "System" and "Icons" are the immediate children of "Pegasus.100i". The folders "FSTs", "Drivers", "System.Setup", "Desk.Accs", "Fonts", "Tools", "CDevs", and "Sounds" are the children of the folder "System", as well as also being the children of "Pegasus.100i". The folder "System" is the immediate parent of the folders "FSTs", "Drivers", "System.Setup", "Desk.Accs", "Fonts", "Tools", "CDevs" and "Sounds". The folder "Icons" does not have any children, since no folders are contained in it. The volume "Pegasus.100i" has a total of ten children.

"Pegasus.100i" is in the highest level of the hierarchy, sometimes called the *root folder*. The folders "System", and "Icons" are in the next highest level of the hierarchy. The folders "FSTs", "Drivers", "System.Setup", "Desk.Accs", "Fonts", "Tools" and "CDevs" are in the lowest level of the hierarchy. Because of the way that Universe Master displays the hierarchy in the map view area, each column represents a level of the hierarchy. The leftmost column, which only contains the volume name, is the highest (root) level. The rightmost column, after scrolling as far to the right of the map view area as possible, is the lowest level.

The Map View Area Buttons

There are six special buttons to the left of the horizontal scroll bar; zoom, contract, expand, rebuild, eject, and rescan.



Figure 5. The six map view area buttons; zoom, contract, expand, rebuild, eject, and rescan.

The first button used with the map view area is the zoom button. It toggles between 50% and 100% magnification of the hierarchy. The names at 50% magnification will not be readable, but you can get a good overall view of how your data is structured. This will help you spot areas where data organization might be improved.

When viewing very large and complex hierarchies, it is difficult to scroll all about the map view area in order to see the entire hierarchy. The expand and contract buttons are designed to help in this situation. Pressing the contract button the first time causes the lowest level of the hierarchy (rightmost column) to be displayed as a square block, instead of listing all folders. This square block is a *branch indicator*. It indicates that there is a branch, containing one or more folders in the location of the block indicator. Pressing the contract button subsequent times causes the next lowest level of the hierarchy to be displayed as a branch indicator, and all lower levels not to be displayed at all. The highest and second highest level of the hierarchy (columns 1 and 2) cannot be displayed as a branch indicator.

Section 2 - The User Interface

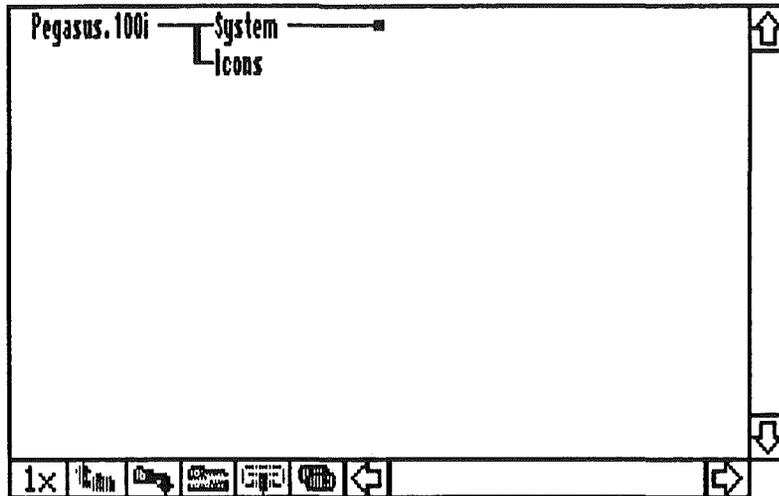


Figure 6. The same hierarchy displayed in Figure 4, after the contract button has been pressed once.

Figure 6 shows the hierarchy after pressing the contract button once (see figure 4 for original hierarchy). The expand button simply reverses the actions of the contract button. Each time the expand button is pressed, the current level of the hierarchy being displayed as a branch indicator is expanded to display its folders. You can continue to press this button until the hierarchy is fully displayed once again.

The rebuild button completely rebuilds the hierarchy map and saves the new map to disk. This is helpful if another task has modified your volume hierarchy. For example, a desk accessory which can modify the contents of a volume has just created a new folder. In this case, Universe Master will not recognize the new folder unless you manually rebuild the map by pressing the rebuild button.

The eject button, when active, will allow you to eject the device where the volume you are viewing is stored. This button is only active if the volume is stored on ejectable media (e.g., a floppy disk).

The last button, rescan, will rescan all devices online and create a new volume list. This is useful if you have a 5.25" drive, or similar device, which will not automatically inform Universe Master when a disk is inserted or ejected.

Universe Master

Folder Selection

Folder selection is achieved by clicking on the name of a folder. When a folder with children is selected, all of its children (immediate or otherwise) are also automatically selected. All other folders are automatically dimmed to signify that they are not selected. In figure 7 the folder "System" has been selected. Notice that all folders to the right of "System" are also selected. Also notice that the volume Pegasus.100i and the folder "Icons" are dimmed (not selected).

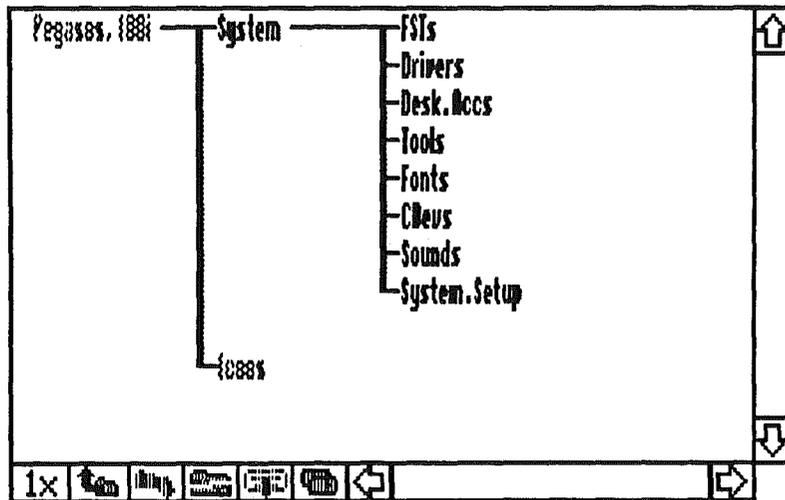


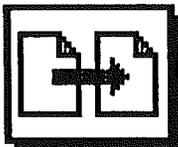
Figure 7. The folder "System" has been selected.

To select ALL folders in a volume, you must select the name of your volume from the map view area. To deselect a folder (and all its children), hold the shift key and click on the folder. Just as selecting a folder automatically selects its children, deselecting a folder automatically deselects its children. This underscores the importance of good data organization; similar data should be grouped together, so that operations on them can be done by simply choosing the folder or folders that contain them.

Section 2 - The User Interface

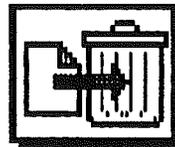
The Command Buttons

The eight buttons on the left side of the map view area are called the *command buttons*. They are active when there are folders selected in the map view area. When a hierarchy map is first displayed, the entire volume is automatically selected for you in the map view area, and thus the command buttons become active. When the entire contents of the map view area are deselected, or no volumes have been opened since Universe Master was launched, the command buttons are dimmed since no folders are selected on which to perform operations. The command buttons are: "Copy", "Delete", "Backup", "Restore", "Catalog", "File Info.", "Recover", and "Print". To 'execute' one of these commands, simply click on the button, and Universe Master will prompt you for the necessary information in order to perform the command. The details of these eight command buttons are explained later in this manual, but following is a brief description of each.



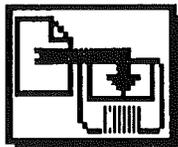
Copy

Fig. 8a. Makes a copy of the selected folders, and the files contained in them.



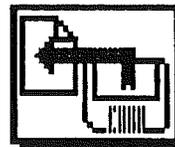
Delete

Fig. 8b. Deletes selected folders and the files contained in them.



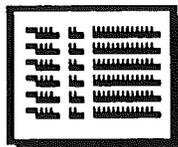
Backup

Fig. 8c. Offers backup of the selected folders and the files contained in them, allowing various criteria to be defined.



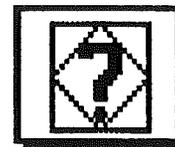
Restore

Fig. 8d. Restores folders/ files previously backed up.



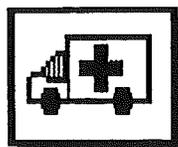
Catalog

Fig. 8e. Lists all the files in the selected branch.



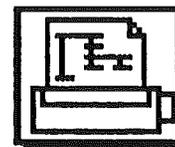
File Info.

Fig. 8f. Displays specific attributes about the files contained in the selected folders, and provides a means for altering some of their attributes.



Recover

Fig. 8g. Recovers files that have been deleted within the selected folders.



Print

Fig. 8h. Allows you to obtain a hierarchy or catalog printout of the selected items in the map view area. Several options are available.

Universe Master

The Menu Bar



Figure 9. The Menu Bar.

The menu bar at the top of the screen offers six main options: "File", "Edit", "Scripts", "Folders", "Volumes" and "Windows". The menu bar offers additional options not available from the Universe Master window. When selected, the menu bar options will prompt you for the information needed to carry out an operation. The menu bar is completely independent from the Universe Master window, and totally disregards any and all of its contents. Following are diagrams of the menu options available, along with a short description of each.

File		
New...	⌘ N	Creates and opens a new text file, using the Universe Master text editor.
Open...	⌘ O	Opens an existing text file, using the Universe Master text editor.
Save	⌘ S	Saves the contents of the currently active window to disk.
Save as...		Saves the contents of the currently active window to a different name.
Close	⌘ W	Closes the frontmost window.
<hr/>		
Copy one file...		Makes a copy of a single file on disk.
Delete one file...		Deletes a single file on disk.
Encode one file...		Encodes a single file by compressing and/or encrypting it.
Decode one file...		Decodes a single file that has been compressed and/or encrypted.
<hr/>		
Quit	⌘ Q	Quits the Universe Master application.

Section 2 - The User Interface

Edit

Undo	⌘ Z	(Not supported by Universe Master.)
Cut	⌘ X	Removes any selected data and places it in the system clipboard.
Copy	⌘ C	Copies the selected data.
Paste		Pastes the contents of the system clipboard.
Clear	⌘ V	Removes the selected data from the active window.
Select All...	⌘ A	Selects all the selectable data in the active window.
Preferences...		Opens the Universe Master preferences window for customization.

Scripts

Chain...		Allows for chaining of two or more scripts.
Edit...		Allows for modification of existing scripts.
Backup...	⌘ B	Allows for selection and execution of an existing backup script.
Restore...	⌘ R	Allows for restoration of files previously backed up.

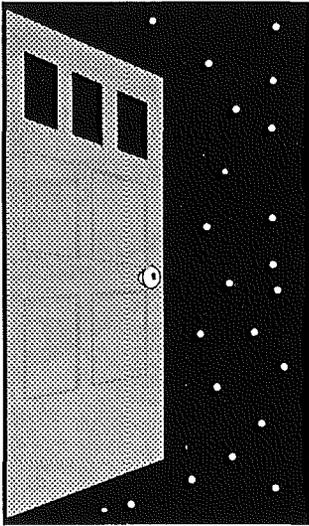
Folders

Create...		Allows you to create and name a new folder in any desired location.
Sort...		Sorts folder entries on disk.
Edit...		Invokes the low level folder editor.

Universe Master

Volumes	
Summary...	Displays information about the volumes currently online.
Erase...	Allows for erasing of the selected volume.
Initialize...	Allows for formatting of the volume selected.
Rebuild volume...	Reconstructs key components of the volume's file system.
Zero unused blocks...	Writes zeroes to unused blocks on selected volume.
Edit blocks...	Invokes the low level block editor.
Optimize...	Optimizes the selected volume.
Duplicate...	Duplicates an entire volume from one device to another.
Verify media...  M	Scans the media for physical defects.
Validate file system...  F	Analyzes/repairs the structure of the file system on the selected volume.

Windows	
Stack	Stacks all open windows in a staggered display.
Home	Returns all open windows to their original positions.
Universe Master	Brings the Universe Master window to the front.



Section 3

Tutorial



How To Use The Tutorial

In order to gain the full benefits of this tutorial there are a few rules you must follow:

1. Since each exercise builds on skills learned in previous exercises, you should go through the tutorial in the order in which it is presented.
2. Follow the examples exactly as they appear in order to achieve the desired results.
3. Note that under each numbered step, a more detailed explanation on how the step is performed is given. Read both the step, and the explanation following the step, before you attempt it.
4. You should have installed the tutorial folders and files when you installed Universe Master. If you didn't perform this step during the installation, try reinstalling Universe Master.
5. Have a couple of blank or unformatted floppy disks handy.
6. Read the following descriptions of *source lists* and *destination lists*. You will encounter these lists often.

Universe Master

Source Lists and Destination Lists

Many of the windows that appear after pressing command buttons contain source lists and destination lists. These lists follow the Apple standard interface, so you can select entries on these lists like you would with any other program. Figure 10 shows the source list and destination list used in the "Copy Branch" window.

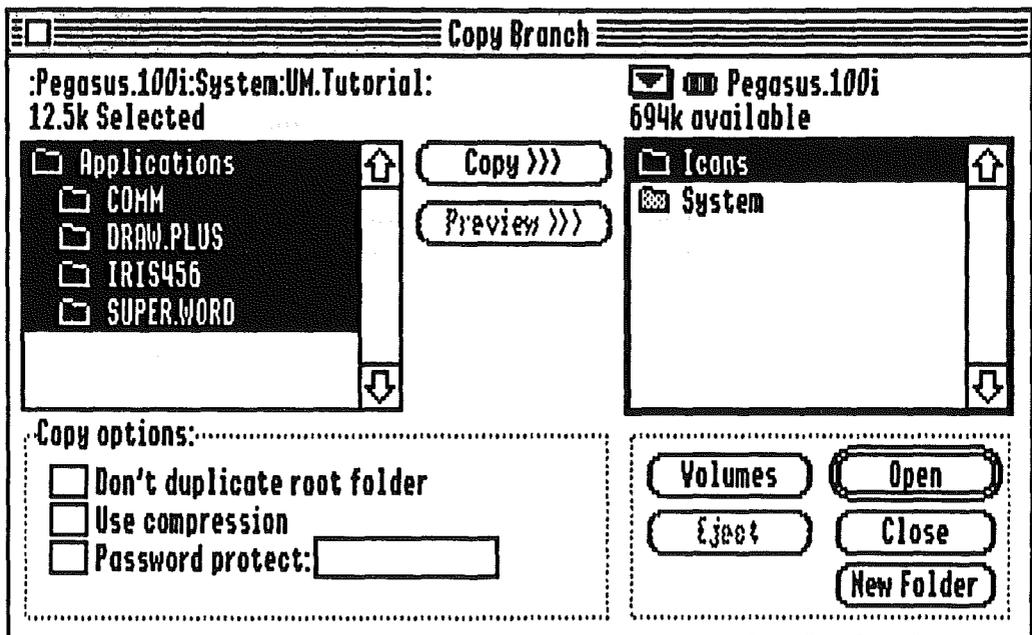


Figure 10. The source list is located on the left side of the screen. It contains the folders "Applications", "Super.Word", "Draw.Plus", "Iris456", and "Comm". The destination list, on the right side of the screen, contains the folders "Icons" and "System".

Source Lists

Above the source list are two lines. The first one is the pathname for the selected branch. The second line lists the number of bytes selected. Source lists are always found on the left side of the window. A source list displayed in Universe Master will usually contain all the folders and files in the branch that was selected in the map view area. When the window first pops open after the command button is pressed, all items in the source list will be highlighted (selected) by default. However, you can choose to have a different set of folders selected. To select a range of continuous folders, select the first folder in the range by clicking on it, and then select the last folder in the range by holding down the shift key while clicking on it. You could also press both keys while dragging the cursor through the desired range of folders; the window will automatically scroll if you drag the cursor past the top or the bottom of the source list. To select folders that are not in a range, hold down the Apple key while clicking on the desired folder. Select your ranges first, and then your single folders, while holding down the Apple key.

Destination Lists

When performing many of the operations offered by the command buttons, you will need a destination in which to place the 'results' - be it copies, backups, etc. You choose this destination from the destination list, which is typically found on the right side of the window. Use the small button located on top of the destination list to walk up the hierarchy. Pressing this button causes a pop up menu to appear, allowing you to travel up through the hierarchy. As usual, several buttons underneath the destination list give you more ways of locating a destination folder:

- "Volumes" Lists the volumes currently on-line in the destination list.
- "Eject" Ejects the current disk.
- "Open" Opens the selected folder or volume and displays its contents in the destination list.
- "Close" Closes the current folder and displays the contents of the parent folder.
- "New Folder" Creates a new folder inside the currently open folder.

Universe Master

Exercise 1 - Getting a Printout

1. Launch Universe Master.

Double click on the Universe Master icon in order to launch it.

2. Select the volume where the UM.Tutorial folder is located from the volume display region.

You specified the location where the UM.Tutorial folder was to be located during the installation process. First, find the online volume display region; it is located at the top of the "Universe Master" window and it contains volume icons and names. Next, select the appropriate disk by clicking on its icon.



Figure 11. "Pegasus 100i", the system disk, has been selected.

In our examples we have stored the UM.Tutorial folder in our system disk. After you select the appropriate disk, you will see a small message box on the bottom left hand corner of the Universe Master window. It will display the message "Loading Map:" followed by the number of folders that have been scanned. The hierarchy map view area will now display the hierarchy of your system disk.

3. Select the "UM.Tutorial" folder.

In our examples we will be working with the branch of your disk hierarchy that begins with the "UM.Tutorial" folder, and includes all its children. To select the "UM.Tutorial" folder simply click on its name. Figure 12 shows how the entire "UM.Tutorial" branch looks. This branch is too large to completely fit in the map view area, so you must use the scroll bars to view all the folders.

4. Click the "Print" command button.

The Print command button is located on the left side of the Universe Master window. After you've clicked on the Print command button, the "Print Volume" window appears. There are two types of printouts you can get with the print command, *hierarchy* or *catalog*. On the left side of the window you will see two large buttons labeled "Hierarchy" and "Catalog". A hierarchy printout looks similar to the display in the map view area. A catalog printout lists all the files in the selected branch. Each file is grouped according to the folder it resides in.

Section 3 - Tutorial

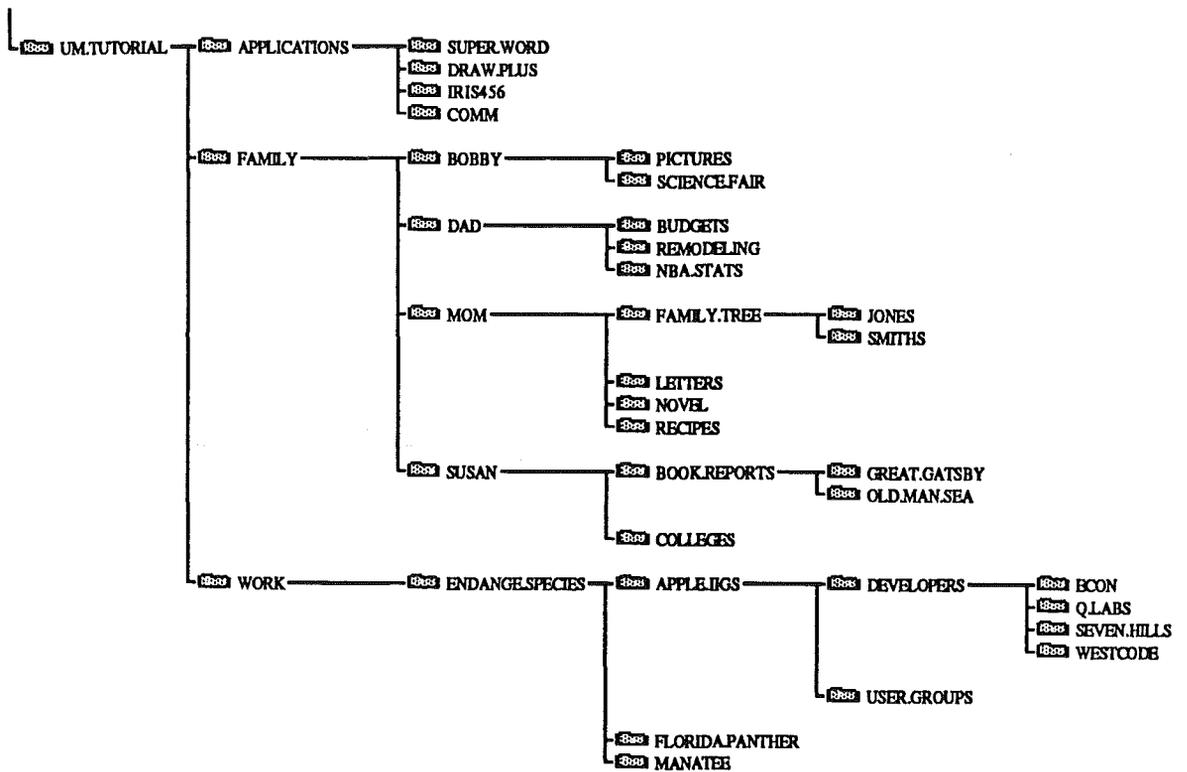


Figure 12. The "UM.Tutorial" branch.

Universe Master

5. Get a hierarchy printout.

By default the document type selected is "Hierarchy". Leave all settings as they are and click on the "Go Print" button. If you are using an ImageWriter printer, we suggest you set the quality to "Fast". Your printout will span across several pages, the exact number depending on the size of the selected volume. Look at your printout, specifically the UM.Tutorial branch. Figure 12 shows the entire UM.Tutorial branch. (We've done some manual cut and paste to make it all fit in a page!) The hierarchy printout will print all folders in the selected volume, regardless of the branch you have selected in the map view area.

6. Get a catalog printout.

A catalog printout provides a lot more information on the selected branch. This type of printout will only print the branch selected in the map view area. On the left hand side of the "Print Volume" window is an area called "Document type". The default is "Hierarchy", but change this setting to "Catalog" by clicking on the "Catalog" icon or name. After you've clicked the "Catalog" icon, the "Print Volume" window will look like this:

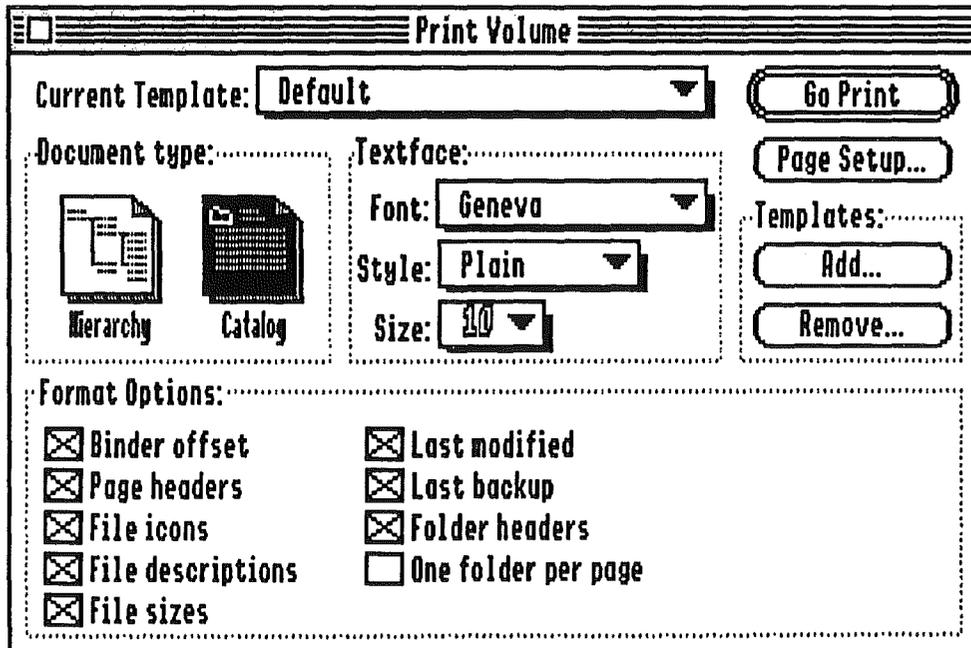


Figure 13. The "Print Volume" window after the catalog option has been selected.

Section 3 - Tutorial

Leave all other settings as they are and click on the "Go Print" button. Now compare the two printouts you have. You may have noticed that there are many options that allow you to customize your printout. These are all explained in Section 4.

Universe Master

Exercise 2 - Simple Backup Script

To acquaint yourself with the backup and the restore options we will take you through a simple backup of some of the files in the UM.Tutorial branch. Have a blank or unformatted floppy disk handy.

1. If you are using a blank formatted disk, use the Finder to rename it to "UM.Backups" so that our figures will match with yours.
2. Launch Universe Master.
3. Select the appropriate volume from the volume display region.
4. Select the "Developers" branch.

Click on the "Developers" folder in order to select it, and all its children. We will be backing up five folders: "Developers", "ECON", "Q.Labs", "Seven.Hills", and "Westcode". Enclosed in these five folders are 11 text document files that will also be backed up. If you have ever opened any of these folders they will also contain a Finder.Data file. You will notice that after the "Developers" branch has been selected, all other folders become dimmed (not selected). The map view area will now look something like this:

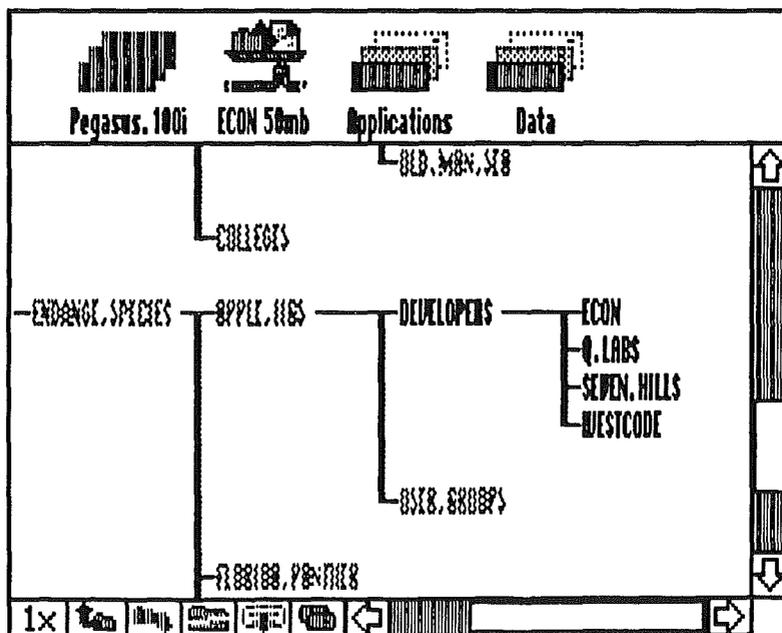


Figure 14. The map view area after the "Developers" branch has been selected.

Section 3 - Tutorial

5. Click the "Backup" command button.

On the left side of the Universe Master window are eight command buttons. Click the "Backup" command button. This action will bring up the "Backup Generator" window (See figure 15).

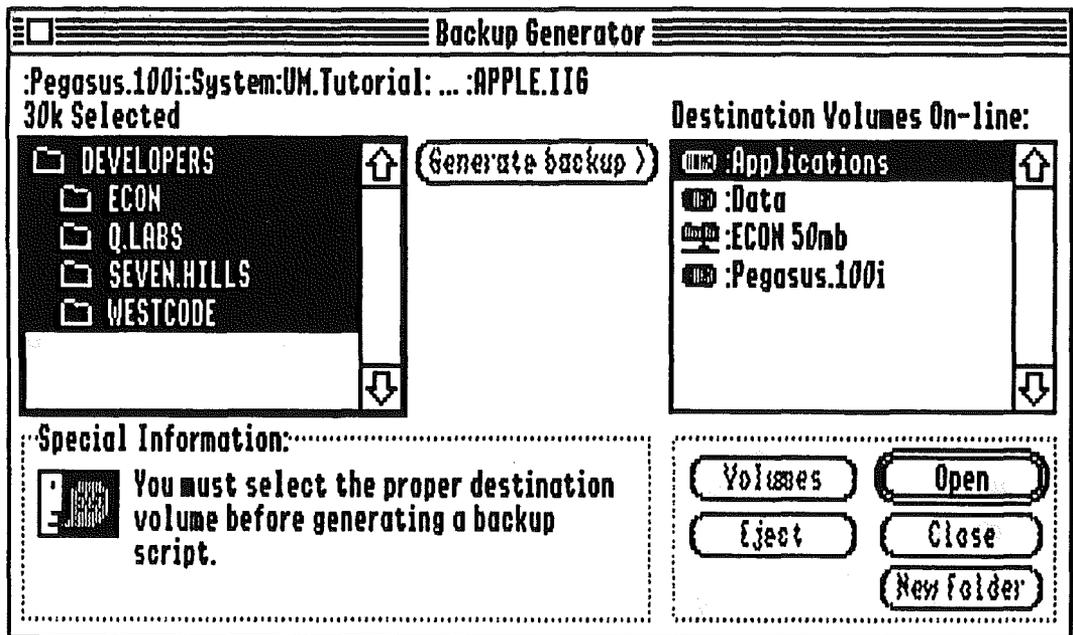


Figure 15. The "Backup Generator" window.

Notice several things about this window: on the top left hand corner you will find the pathname where the folders you chose are located. Underneath this pathname, you will see the number of bytes selected. Below the number of bytes selected, is a list containing the selected folders. All these folders are already selected for you. This is the *source list*. (See the beginning of this tutorial for a description of source lists and destination lists.) Across from this list, on the right side of the window, is the destination list. It contains possible destination volumes. By default, the topmost destination is already selected for you. However, we will choose another destination in the next steps.

6. Place your disk in the floppy drive.

If the disk is not formatted for GS/OS you will be asked to initialize it. If you initialize the disk be sure to name it "UM.Backups".

Universe Master

7. Locate and select the destination.

Notice that after you inserted the "UM.Backups" disk, Universe Master automatically opened it and displayed its contents in the destination list. Since this is where we want to place our backups you will not have to do anything special to locate the destination.

8. Create a folder for your backup.

Press the "New Folder" button to create a folder. A dialog window will prompt you to name the new folder. Type "Developer.Bkups" and click on the "Okay" button. After this dialog window closes, notice that the name of your backup folder now appears above the destination display list. When you create a new folder it is automatically opened for you. The top region of the "Backup Generator" window will now look similar to figure 16.

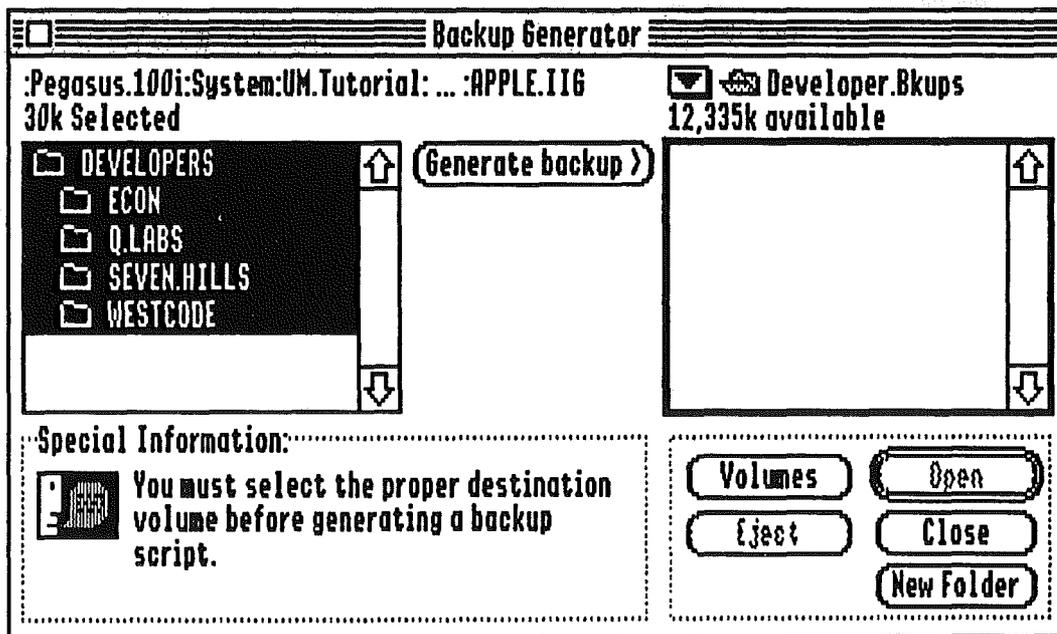


Figure 16. The "Backup Generator" window after a new folder, "Developer.Bkups", has been created.

9. Perform the backup.

To perform your backup, click on the "Generate Backup" button. The "Backup Criteria..." window, as shown in figure 17, appears.

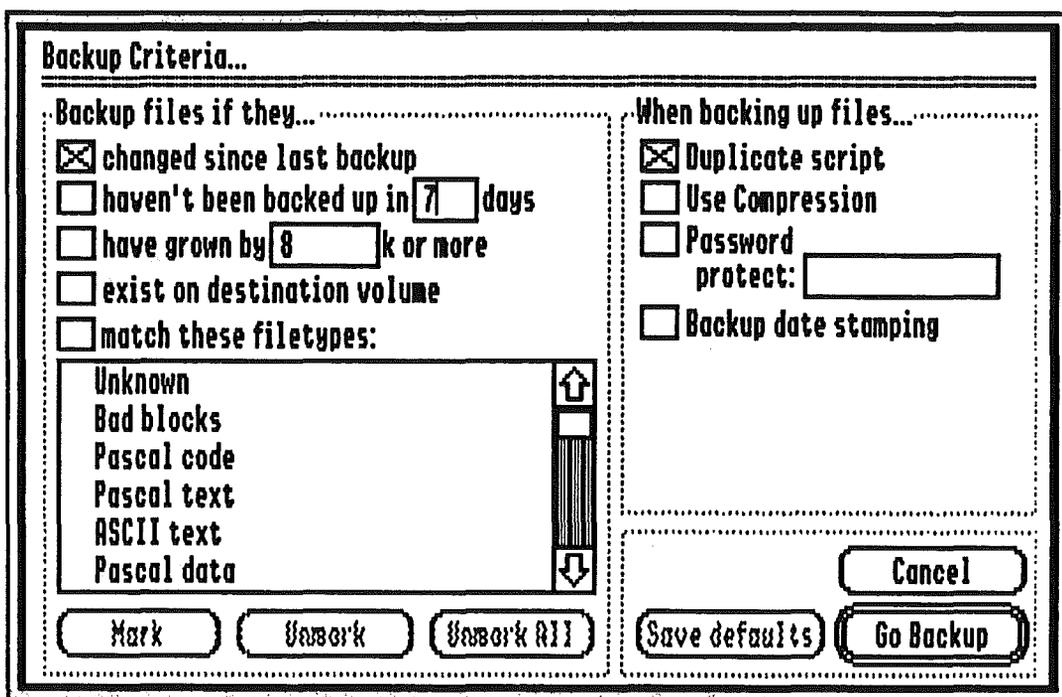


Figure 17. The "Backup Criteria..." window.

You can now customize your backup options. We will leave all default options as they are for this backup. The selections that are checked by default are these:

"Backup files if they..."
 changed since last backup"

This will cause all files to be backed up, since by definition a file whose backup doesn't exist has changed since the last backup.

Universe Master

"When backing up files..."

Duplicate script

Each time you perform a backup, Universe Master generates a script and saves it in a special folder. This script is then interpreted to perform the backup. By duplicating this script, another copy of it is stored with the backed up data. The reason for duplicating the script is that should the original script become lost or damaged you will have a backup. For example, if you back up to floppy disks and your hard drive crashes and damages the original scripts, you will have a backup script on your floppy disk in order to restore the data.

Next, click on the "Go Backup" button. A small window will appear and prompt you to name the script (figure 18a). Name the script "Developers.Bkup" and click on the "Okay" button.

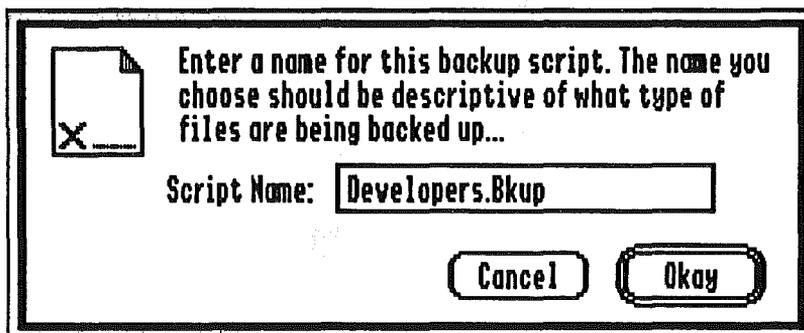


Figure 18a. The new script is being named "Developers.Bkup."

Universe Master now creates the script and asks you if you wish to execute it (figure 18b).

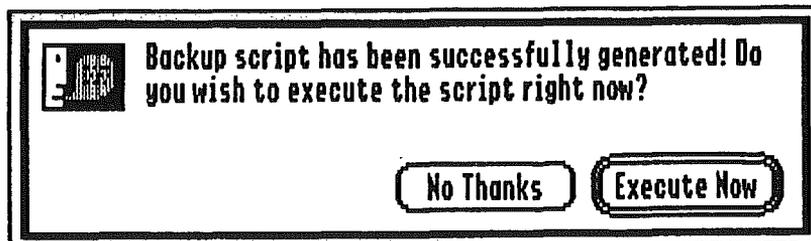


Figure 18b. A Backup script can be executed immediately after creation.

Section 3 - Tutorial

Press the "Execute Now" button. As Universe Master performs the backup it displays a status window that shows the filenames as they are backed up. After the backup is finished, Universe Master automatically closes the "File Backup" window and returns you to the "Backup Generator" window. Close this window by clicking on the close box located on the top left corner of the window.

10. Using Universe Master, eject the "UM.Backups" disk.

Select the UM.Backups disk from the online volume display region. At the bottom of the map view area, and to the left of the horizontal scroll bar, you will find the map view area buttons. (Figure 5 on page 2-4 shows these buttons.) From left to right, the fifth button is the eject button (See figure 19). Click on the button to eject the disk.

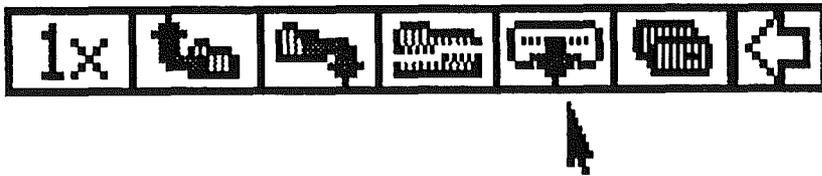


Figure 19. The eject button is the fifth one from the left.

11. Exit the Universe Master Application.

Universe Master

Exercise 3 - Restore Lost Files

To perform this exercise you will need to complete Exercise 2, since we will use the backup disk created there. First you must 'lose' the files in order to restore them, so this exercise is divided into two steps: A. Delete the files; B. Restore the deleted files

A. Delete the files

- 1. Launch Universe Master.***
- 2. Select the volume where the UM.Tutorial branch is located.***
- 3. Select the "Developers" branch.***
- 4. Click on the "Delete" command button.***
- 5. Verify the folders to be deleted!***

On the left hand side of the window that appears after the "Delete" button is pressed, is a list of the folders to be deleted. Verify that it looks like figure 20.

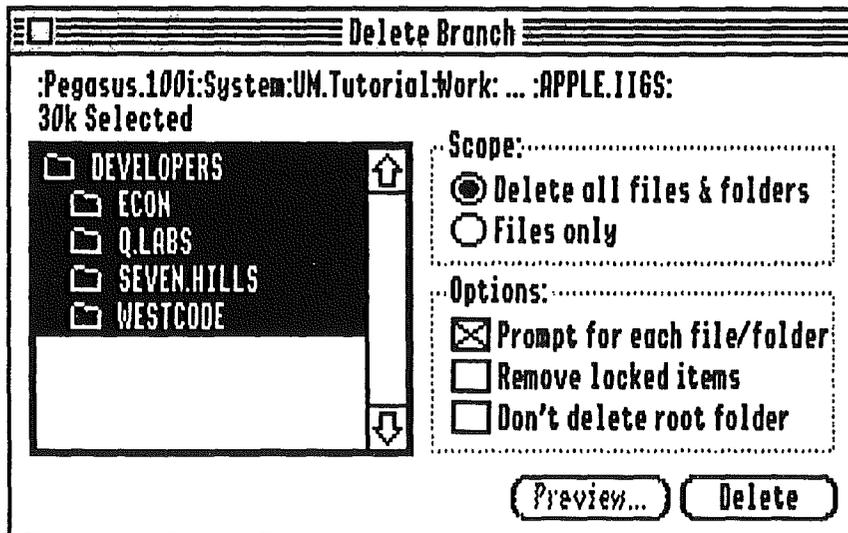


Figure 20. The "Delete Branch" window. The folders "Developers", "Econ", "Q.Labs", "Seven.Hills", and "Westcode" are selected for deletion.

Section 3 - Tutorial

If your window does not look like the one in figure 20, start the exercise from the beginning.

6. Choose your Scope and Options.

On the right hand side of the window, under the heading "Scope:" are two choices: "Delete all files & folders" and "Files Only". Choose "Files Only" by clicking on its radio button. Beneath the scope is another heading; "Options:", and three choices, one of which is "Prompt for each file/folder". Deselect the "Prompt for each file/folder" option by clicking on its box so that it is no longer checked. You should now have no options chosen and the "Scope" and "Options" region will look like figure 21.

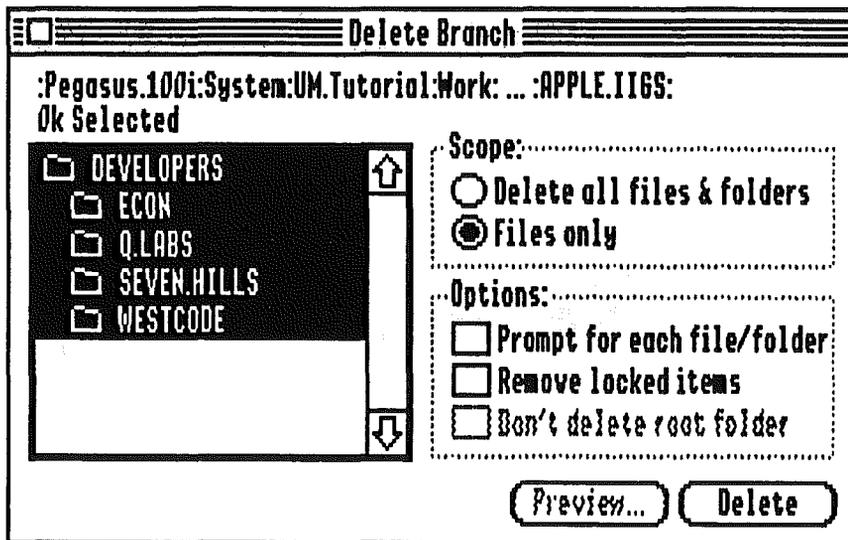


Figure 21. The "Delete Branch" window with the "Developers" branch selected, scope of "Files only" selected and no other "Options" selected.

7. Delete the files.

Click on the "Delete" button located at the bottom right side of the window. A status window displays the filenames as they are deleted. When Universe Master returns to the Universe Master window, the "Developers" branch will still look the same. This is because only the files were the deleted, not the folders themselves.

Universe Master

B. Restore the files

1. Select "Restore" from the "Scripts" pull down menu.

The "Scripts" pull down menu is located on the menu bar, above the Universe Master window. Pull down the menu and select "Restore..."

2. Locate and select the volume where the backup script resides.

After selecting "Restore" from the pull down menu, a dialog appears and prompts you to "Select restoration script:". At this point we could either select the script Universe Master saved in the special Backup.Scripts folder, or select the duplicate script that was saved with our backup data. We will use the duplicate script for our example. Insert the UM.Backups disk into the disk drive. This disk was created in the last exercise. The window now looks like figure 22.

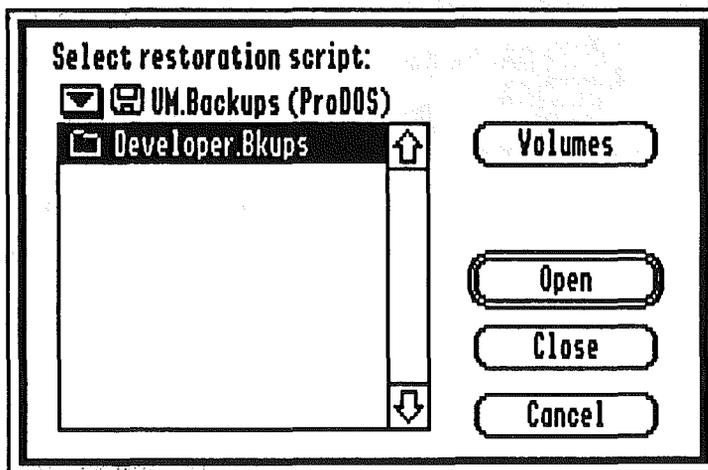


Figure 22. Select the restoration script from this window.

Section 3 - Tutorial

3. Open the restoration script.

The restoration script and the backup script are one and the same. The only difference is the context in which Universe Master is using the script. When the script is being generated (during backup), and when it is idle, we call it the backup script. When Universe Master uses this script to restore data, we call it the restoration script. Select "Developers.Bkup" by clicking on it once. Click on the "Open" button in order to continue with the restoration. The "Restoration Criteria..." window will appear (see figure 23.) The dialog tells you where Universe Master is getting the restoration files and where their destination is.

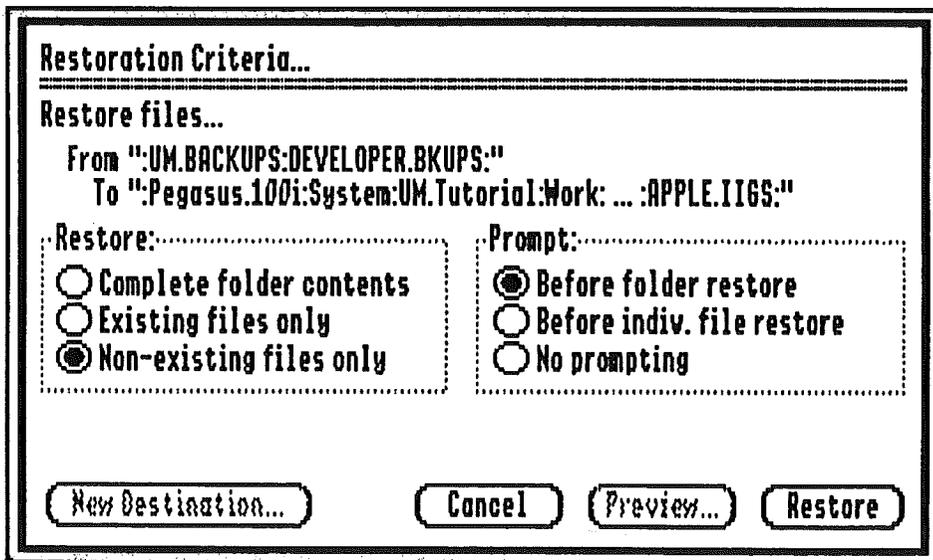


Figure 23. The "Restoration Criteria..." window.

Universe Master

4. Check Your Options.

Three choices in the "Restore" region are available:

- "Complete folder contents"
- "Existing files only"
- "Non-existing files only"

In our example, since the files were lost, our best choice is "Non-existing files only". The "Non-existing files only" option is the default, so it is already selected. This means that only the lost files will be restored.

The "Prompt" region gives you three choices: "Before folder overwrite"; "Before indiv. file overwrite"; and "No prompting". Prompting occurs when a file that is being restored already exists in the destination; Universe Master prompts you with an "Are you sure you want to overwrite?" dialog. For safety, the default selection is "Before folder overwrite". You will not need to check or uncheck any selections from this window, since the desired selections are the the defaults.

5. Restore the files.

Finally, press the "Restore" button. Universe Master scans the script and pops up a dialog that lists filenames as the files are being restored. When the restoration is complete, Universe Master returns you to the Universe Master window.

In these two examples we used a floppy disk to store our backups, but we could have just as easily stored our backup folder in any of our online volumes. Be sure to label your backup disks properly. If you ever need to restore data from a floppy disk, a well labeled disk will make the process easier.

6. Exit the Universe Master Application.

Exercise 4 - Advanced Script Generation

In this example we will create backup scripts for later execution. Have the UM.Backups disk handy. You should have completed the previous two tutorial exercises before proceeding with this one. First we'll delete the contents of the UM.Backups disk, and then we'll generate the backup scripts.

1. Launch Universe.
2. Insert the UM.Backups disk into the disk drive.
3. Select the UM.Backups disk from the online volume display region.
4. Delete the contents of the UM.Backups disk.

Be sure you've restored the files that were backed up onto this disk (Exercise 2). Press the "Delete" command button. At the "Delete Branch" window, deselect the option "Prompt for each file/folder". The "Delete Branch" window should now look like figure 24. Press the "Delete" button. A small dialog window informs you of the progress of the delete function.

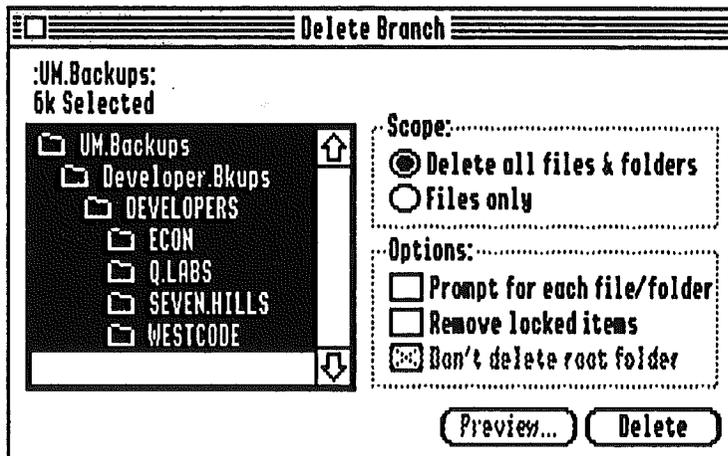


Figure 24. The "Delete Branch" window.

Universe Master

5. Select the volume where the UM.Tutorial folder is located from the online volume display region.

6. Create the backup scripts.

In our fictional scenario, the Smith family uses the GS for various tasks. Each member of the family has their own folder in which to keep their files. Since Mrs. Smith uses the computer primarily for her home based business, and she must often import massive amounts of data to sort through, she has asked that each member of the family make and keep a backup of their respective files on disk, because she might need the space temporarily for her work. We will be creating four backup scripts: Mom.Backup, Dad.Backup, Susan.Backup, and Bobby.Backup.

Select the branch that starts with the folder "Bobby".

Press the "Backup" command button.

From the "Backup Generator" window:

Select and open the "UM.Backups" disk for your destination.

Create a new folder named "Bobbys.Stuff".

Press the "Generate backup" button.

From the "Backup Criteria" window:

Under "Backup files if they..." have the following option checked:

changed since last backup

Under "When backing up files..." have the following options checked:

Duplicate script

Use Compression

Press the "Go Backup" button.

When prompted, name the script "Bobby.Backup".

Press the "Okay" button to generate the backup script.

We don't want to execute the backup script now, so click on the

"No Thanks"

button when asked "Do you wish to execute the script right now?".

Close the "Backup Generator" window.

In a similar manner, generate a script for each of the three other family member branches: "Dad", "Mom", and "Susan". Name the folders "Dads.Stuff", "Moms.Stuff", and "Susans.Stuff". Name the scripts "Mom.Backup", "Dad.Backup" and "Susan.Backup". Do not execute any of the scripts.

7. Exit Universe Master.

Exercise 5 - Script Execution

It might interest you to know that as soon as the backup and script options were written and tested by our software development staff, they began using these options to back up the Universe Master source code! With a well structured hierarchy, and a well thought out script, backing up large amounts of source code required one simple thought at the end of the day: double clicking on the script icon from the Finder! We'll now learn the two methods to execute a script; from the Universe Master menu bar, and from the Finder, as we mentioned above.

Method 1: Using the Finder

1. Locate the Universe Master application on your disk.

When you installed Universe Master, you specified where you wanted the application stored. Go to that location and open the folder named "Backup.Scripts". This is the folder where Universe Master keeps all backup scripts created. If you are using the "View by Icon" option, your screen will look similar to figure 25.

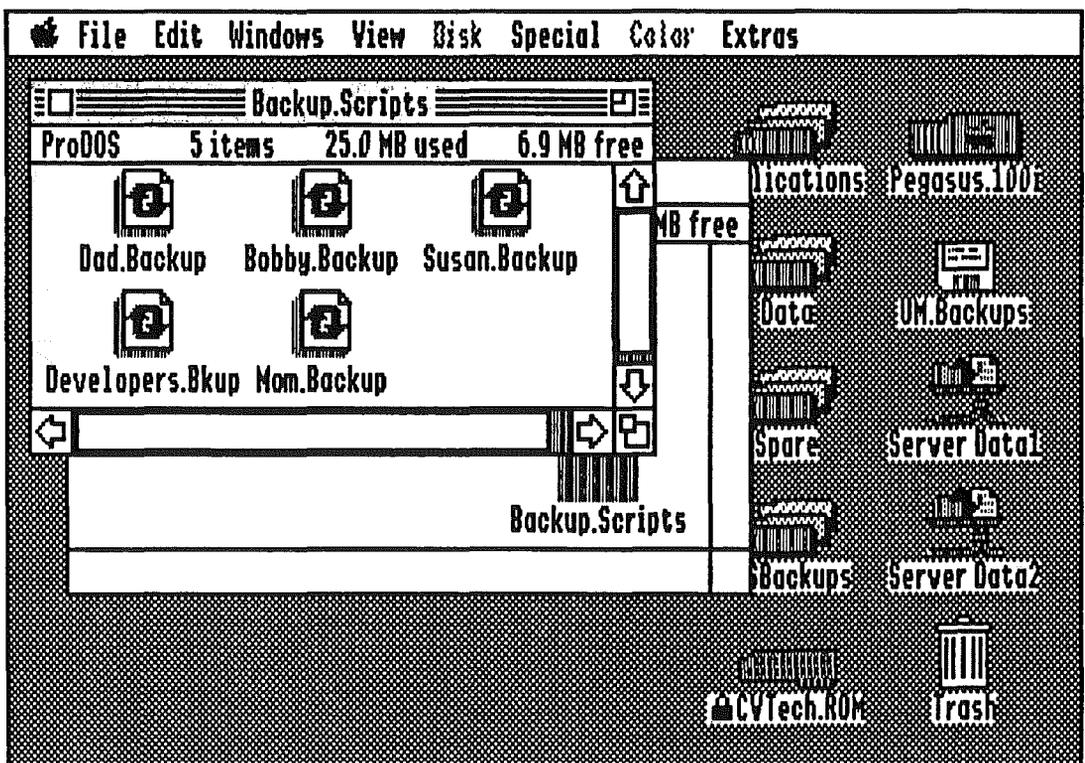


Figure 25. The "Backup.Scripts" folder has been opened using the Finder.

Universe Master

2. Double click on "Bobby.Backup" to execute the script.

A small window will pop up and inform you that an application can't be found. This is normal, since the Finder has not yet associated the Universe Master application with the document icon you have just double-clicked. Press the "Locate" button and proceed to "locate" the file "UniverseMaster" (this is the actual application). Once you have located the application, the Finder will permanently remember this association and this step will be unnecessary. Universe Master will then perform the backup, prompting you to insert the disk if it hasn't been inserted yet.

3. Perform the "Dad.Backup" script by double clicking on it.

This time, the Finder remembers where the Universe Master application is located and you need not supply it.

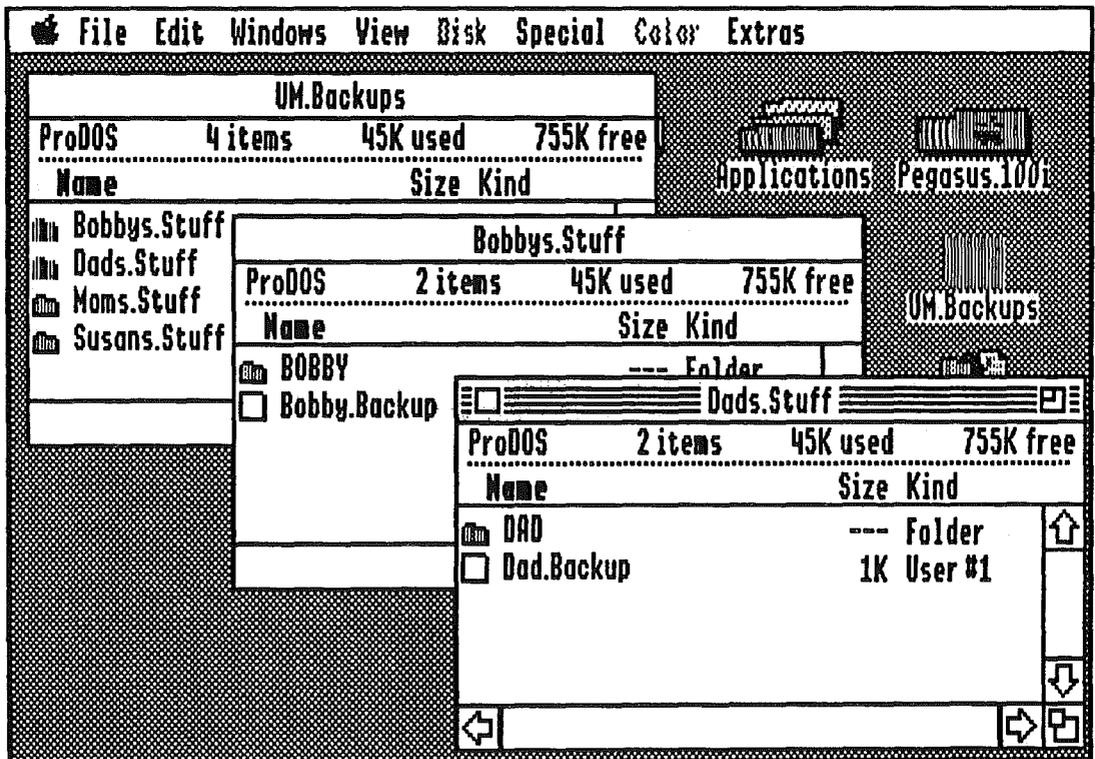


Figure 26. The folders "Bobbys.Stuff" and "Dads.Stuff" each contains a duplicate backup script.

Section 3 - Tutorial

4. Close the "Backup.Scripts" window and examine the results.

Select "View by Name" from the menu bar, then open the "UM.Backups" disk, and the folders "Bobbys.Stuff" and "Dads.Stuff". Figure 26 shows the contents of the folders when viewed with the Finder.

Notice that the duplicate backup scripts (Dad.Backup and Bobby.Backup) are located in these folders. If you open the other two folders, "Moms.Stuff" and "Susans.Stuff", you will see that they are empty, since we haven't performed these backups yet.

Method 2: Script Execution From Universe Master.

1. Insert the UM.Backups disk in the disk drive.

This step could just as easily be done anytime after Universe Master has been launched.

2. Launch Universe Master.

3. Pull down the "Scripts" menu from the menu bar and select "Backup..."

4. Locate and select the "Mom.Backup" script that is in the "Backup.Scripts" folder.

5. Press the "Open" button to execute the script.

If you didn't do step 1, Universe Master will prompt you to insert the volume "UM.Backups".

6. Repeat steps 3, 4, and 5 for the "Susan.Backup" script.

7. Use Universe Master to see all the files in your UM.Backups disk.

- a. Select the UM.Backups disk from the online volume display area.
- b. Press the "Catalog" command button to view the filenames.
- c. There will be 16 files on this disk that were backed up.
- d. Close the window by clicking on its close box.

8. Exit Universe Master.

Universe Master

Exercise 6 - Chained Backup Scripts

In this exercise we will link the four backup scripts that were created in Exercise 4.

1. Launch Universe Master.

2. From the menu bar, pull down the "Scripts" menu and select "Chain".

Figure 27 shows the window that appears after this selection is made.

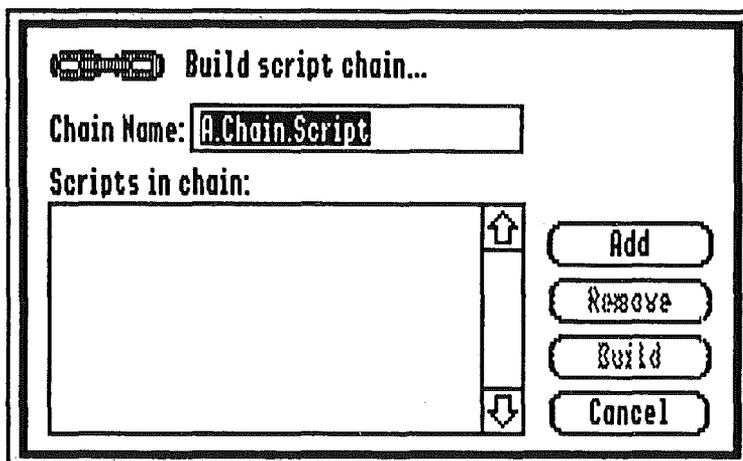


Figure 27. The "Build script chain" window.

3. Name the script "Family.Bkups".

Near the top of the window, following "Chain Name:" is the edit field where you must enter the name. Enter "Family.Bkups"

4. Add the four scripts created in Exercise 4.

These scripts are "Mom.Backup", "Dad.Backup", "Bobby.Backup", and "Susan.Backup". Press the "Add" button located on the right side of the window. Figure 28 shows the window that appears. Select the script "Mom.Backup" and press the "Open" button. The window will close, and return you to the previous window. Notice the script "Mom.Backup" has been added to the list. In a similar fashion, add the "Bobby.Backup", "Dad.Backup", and "Susan.Backup" scripts. The "Build script chain" window now looks like figure 29.

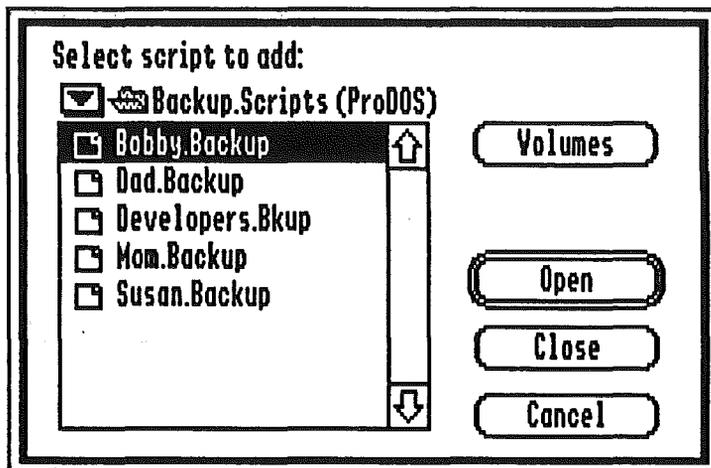


Figure 28. Select the scripts to be added from this window.

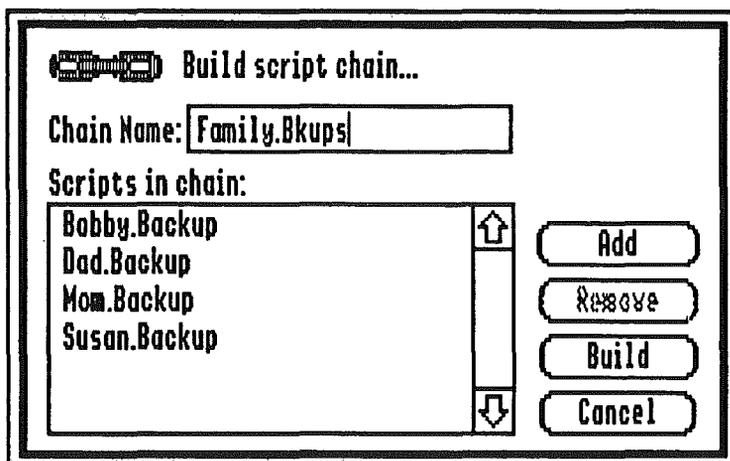


Figure 29. All four scripts have been added.

Universe Master

5. Build the script chain.

Press the "Build" button to build the script chain. When Universe Master is done it will display the message shown on figure 30. Press the "OK" button to continue.

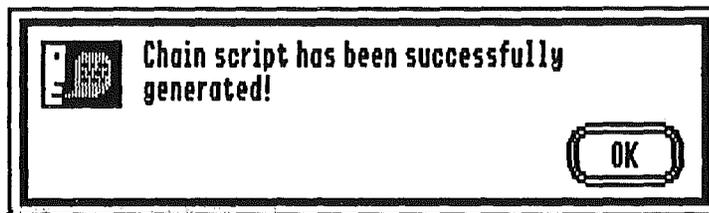


Figure 30. The script has been created.

6. Execute the chain script.

There are two ways to execute chain scripts: From the Scripts menu bar selection, or by double clicking on its icon from the Finder. We will use the former, so pull down the Scripts menu bar selection, and choose "Backup". Double click on the "Family.Bkups" script to execute it.

7. Exit Universe Master.

That's how easy building and executing script chains can be! Now, instead of executing four different scripts, the Smith family need only execute one, the "Family.Bkups" chain script.

Exercise 7 - Redundant Backups

In the previous exercises, we learned how to create scripts to backup the different types of data stored on your hard disk. We then learned how to chain those scripts together so that a large amount of data could be backed up in one step. Now we will explore a new concept in performing data backups, *redundant* backups.

Redundant backups refer to the duplication of your backup data onto several different volumes. The idea behind performing redundant backups is to protect yourself if anything bad ever happens to your primary backup data. If faced with the situation where you need to restore important data, the last thing you want to discover is that something bad has happened to your backup disks! Having redundant backups lessens the likelihood of this happening.

In this example, we will be creating two scripts to backup the same data. One will be our primary script, the other will be our secondary (redundant) script. They will then be chained together so that both scripts will be executed at the same time whenever we perform our backups.

1. Launch Universe Master

2. Create two disks named "Primary.Backups" and "Second.Backups"

If you will be formatting a disk from scratch, simply insert it into the drive while Universe Master is running. You will be informed that it is unreadable and asked if you want to initialize it. Clicking "Initialize" will open the standard initialization dialog. This dialog allows you to name the disk and choose the file system. Press "Initialize" button to complete the formatting process.

If you want to use a disk that is already formatted (but wish to disregard the data on it), insert the disk and select "Erase" from the "Volumes" menu. You must then select the desired volume from the list of online volumes. After doing so, you can enter a new name for the disk and then press the "Erase" button.

3. Select the "Work" branch in the "UM.Tutorial" branch.

This selects the folder "Work" and all its children as our source branch. All files stored within these folders will be subject to the backup.

4. Click the "Backup" command button.

5. Open the "Primary.Backups" disk as your destination disk.

Universe Master

6. Click the "Generate Backup >" button and define your criteria.

You should generate the script with only the following options selected:

- changed since last backup**
- duplicate script**

Optionally, you may wish to enable file compression and password protection of the data.

7. Click "Go Backup".

8. Name the script "Primary.Bkup".

After naming the script, press the "Okay" button to continue. When asked if you wish to execute the script, reply "No Thanks". We will be executing it later.

9. Generate a script for your secondary backups.

Normally you would want to repeat steps 4 through 8 to generate another script that backs up to your "Second.Backup" disk. The resultant script should be named "Secondary.Bkup". In this case, however, we will take a few alternate steps to familiarize yourself with some additional Universe Master functions.

10. Duplicate the "Primary.Bkup" script and name it "Secondary.Bkup".

To do this, select "Copy one file..." from the "Files" menu. A standard file dialog will ask you to select the file you wish to copy. You may have to navigate to find the "Backup.Scripts" folder that is located in the same place where you've installed Universe Master. Open this folder. You should see an entry for the script "Primary.Bkup" which you've just created (figure 31). Select this entry by clicking on the "Open" button.

Now you will be asked to enter the name for the copy of this file. Note that you can navigate around to place the copy anywhere on the volume (or any other volume). In this case, however, we want to place the duplicate in the same folder as the original, which is the "Backup.Scripts" folder. Name the file "Secondary.Bkup" and click the "Save" button (figure 32). You have now duplicated the original script.

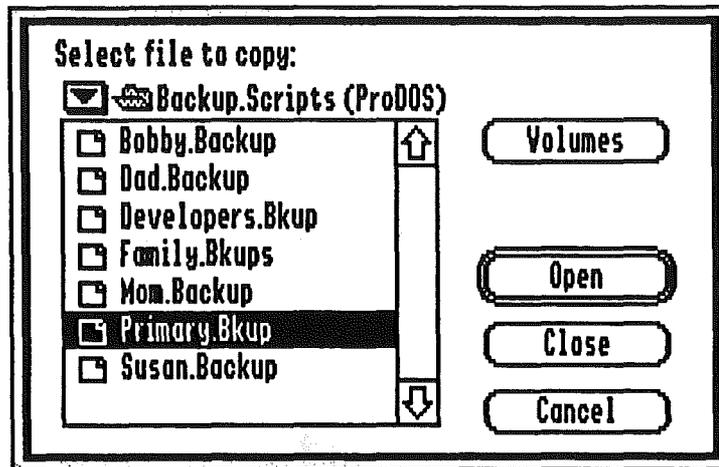


Figure 31. Standard file dialog used to select file to copy.

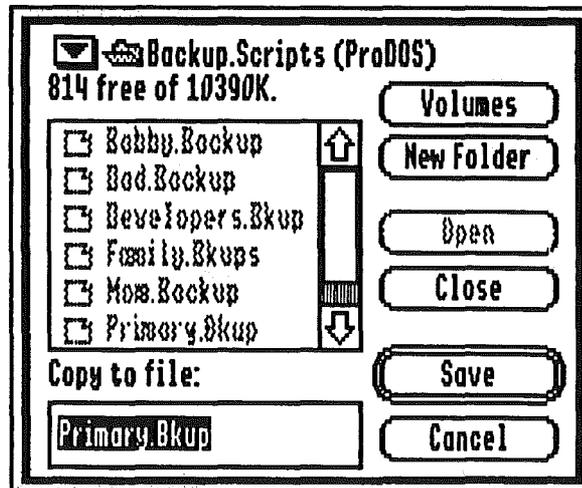


Figure 32. Standard file dialog used to name and place the destination file.

Universe Master

11. Edit the duplicated script.

Select "Edit" from the "Scripts" menu. You should see all of the available scripts in a standard file dialog. Select the duplicate that we just created, "Secondary.Bkup".

The "Backup Script Editor" dialog will appear (figure 33). This is the Universe Master script editor which allows you to change the parameters under which backups are performed.

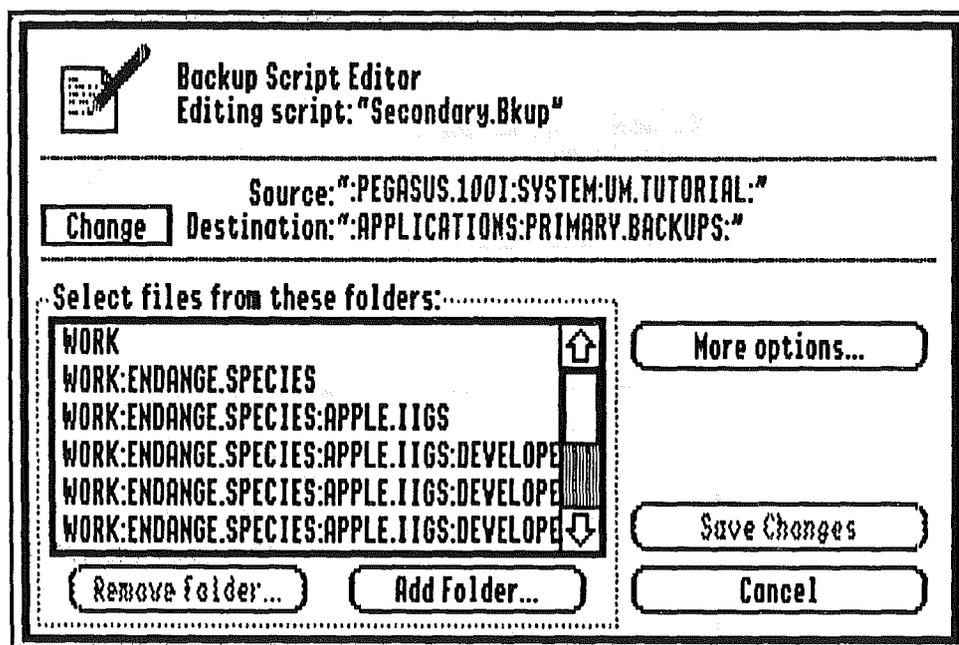


Figure 33. Backup script editor.

12. Assign a new destination for this script.

Click the "Change" button which appears next to the destination pathname at the top of the window. You will be presented with a standard file dialog. Open the disk you created named "Second.Backups" (be sure the disk is online) and click "Accept" to make it the new destination. The destination path for this script has now been changed.

Section 3 - Tutorial

13. Change the backup criteria for this script.

Click on the "More Options" button. This brings up the "Backup Criteria" dialog which you've seen when generating scripts. All the criteria in effect for this script will be set in this window. You will want to leave everything the way it is with the exception of the option that reads:

haven't been backed up in 1 days"

You should check this option and enter '1' for the backup period. Click the "OK" button when you are done doing this. The backup criteria for this script have now been modified.

14. Save the changes to this script.

Click the "Save Changes" button. Your script will be updated and the editor dialog will be closed for you.

What we have accomplished so far is to create two scripts that will back up the same data to two different floppy disks. The first script will backup modified files each and every time it gets executed. The second script ("Secondary.Bkup") will only do this once a day no matter how often we execute it. The premise here is that our secondary backups, although important, should only be performed once a day to keep the process streamlined.

The last step in creating a redundant backup system is to chain the two scripts we've created using the chain editor (discussed in the previous example).

15. Chain the scripts "Primary.Bkup" and "Secondary.Bkup" and name the chain "Work.Chain".

Select "Chain" from the "Scripts" menu. This opens the script chain editor discussed in example six of this tutorial. Add both the "Primary.Bkup" and "Secondary.Bkup" scripts by clicking the "Add" button. The order in which you add them is not important.

When both scripts have been added, name the chain "Work.Chain" because the scripts contained in the chain are backing up the "Work" folder branch. Click "Build" when done. Your chain has now been generated.

16. Execute the "Work.Chain" script.

Do this from either the "Backup" function under the "Scripts" menu or by launching the script from the Finder. When a script is executed, Universe Master will prompt you to insert the appropriate disk if it is not already online.

Note that when we execute the chain the first time, both scripts will copy all of the files to our destination disks. Subsequent backups will only backup the modified files. While the "Primary.Bkups" script will always backup files that have been modified, the "Secondary.Bkup" script only does so once per day.

Universe Master

You may want to experiment by modifying some of the tutorial files. This can be done by selecting "Open" from the "File" menu, selecting one of the files in the original "Work" branch, then saving them back to disk by selecting "Save" under the "File" menu. When you execute the "Work.Chain" script again, only the primary backup will be performed. You will have to wait until tomorrow to see the secondary backup performed again...

16. Exit Universe Master.

Exercise 8 - Archival Backups

Until this point we've been concerning ourselves with performing backups to prevent loss of data. While this type of backup is very important and very useful, it has one drawback: all backed up data gets overwritten by more recent data. While this may appear to be a trivial drawback, it is often necessary to refer back to older versions of your file, not because of massive data loss but because it contains some valuable information that has long since been overwritten.

The process whereby older copies of data are maintained is commonly referred to as *archiving*. Many institutions have entire departments devoted to archiving their computer data. Archiving files is a rather lengthy a tedious process and thus many smaller companies and individuals forego the experience because it is too difficult.

Universe Master is not an archiving utility. Such a utility would maintain the archive as a library and would allow you to 'check out' files from a specific time period. Unfortunately, such a utility does not exist for the Apple IIs. Luckily, however, Universe Master's script based approach to backing up files can be used to mimic a true archival system.

This example will show how to create a basic archival system that will keep a unique copy of your data for the last three days. With such a system in place, you can instantly refer back to a version of a file you are working on that is up to three days old. Thus, if you determine that some modifications you've made were not necessarily improvements, you can revert to an older version and start over.

While this example is simple and limited to only three days, it can be easily expanded into an extensive backup system. You can even get creative and integrate your redundant and archival backup systems together. The permutations of such a system are endless.

1. Launch Universe Master

2. Create a disk named "Work.Archives"

This disk will contain an archive for all the files contained in the "Work" branch. Of course, if we were archiving a considerable amount of data, we would have to use a destination device much larger than a floppy disk.

3. Select the "Work" branch in the "UM.Tutorial" branch.

Universe Master

4. Build and execute a backup script for the selected branch.

Click the "Backup" command button, bringing up the "Backup Generator" window. Open the "Work.Archives" disk as your destination. Next, click "Generate Backup >" and proceed to the "Backup Criteria" window. For the sake of this example, make sure that the settings you select match those in figure 34. Note that "modified since last backup" is deselected. This is done so the files will always be copied when running the archive scripts. This is for example purposes only; normally you would want to keep this option selected.

Click "Go Backup" and name the script "Work.Archive1". You should execute the script at this time.

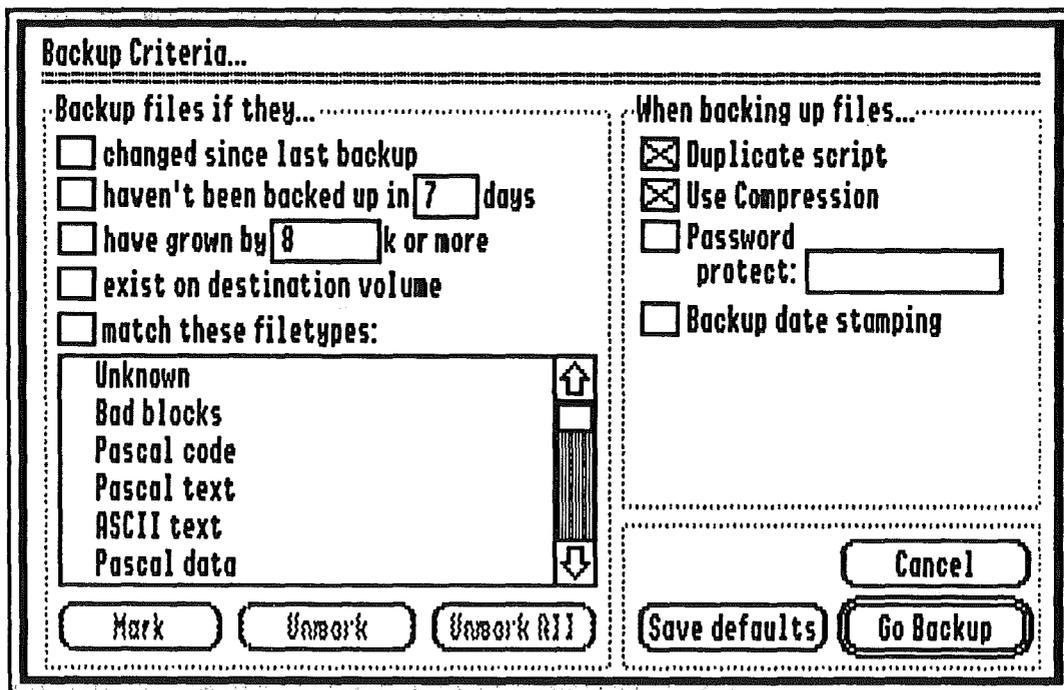


Figure 34. "Backup Criteria" window with options selected for archival backup.

5. Open the volume "Work.Archives".

Do this by clicking on the 3.5" disk icon that appears in the online volume display. You may have to scroll left or right to see it. Its hierarchy should now be visible in the Map View Area.

Section 3 - Tutorial

7. Build and execute a script to backup this branch.

Do this by clicking the "Backup" button with the "Work" branch selected. In case you are wondering, yes we are building a script that will backup our previous backups.

From the "Backup Generator" window, open the "Work" folder on the "Work.Archives" volume as our destination (figure 35). We will be nesting our archives within the same hierarchy branch so that all our data is kept in one place.

Next, click "Generate Backup >" and define your backup criteria by choosing only two options:

- haven't been backed up in 1 days"
- Duplicate script"

Enter "1" as the number of days for the backup period. We will not be using compression, since the backup is already compressed. Click "Go Backup" and proceed to name the script "Work.Archive2". You should also execute the script at this time.

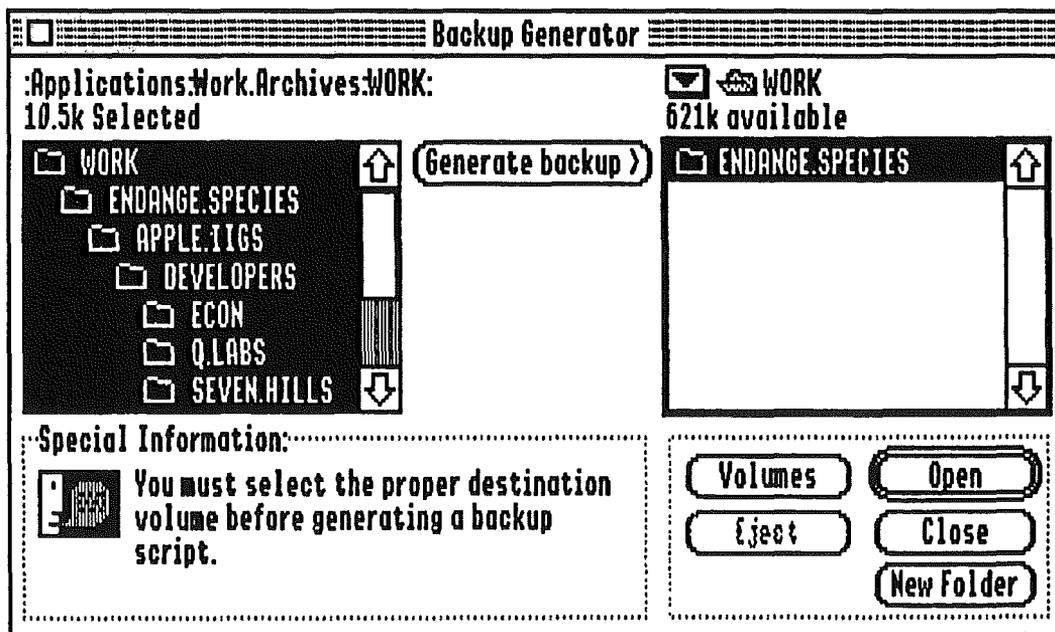


Figure 35. "Backup Generator" window with "Work" folder as destination.

Universe Master

8. Build another script to backup the previous script's backups.

This requires that you select the "Work" folder branch located within the "Work" folder branch on "Work.Archives" i.e. the path of the selected branch is ":Work.Archives:Work:Work:" (no, this isn't a typo!).

Once again, the destination for this backup should be nested within the result of the previous backup i.e. open the ":Work.Archives:Work:Work:" folder in the destination list of the "Backup Generator" window.

You should use the same criteria as the previous script. Be sure you have set the backup period to one day. When done, name the script "Work.Archive3" and execute it once it has been generated.

9. Review your resultant hierarchy.

The hierarchy you have created on the "Work.Archives" disk should appear as in figure 36. Notice that the files have been backed up into three nested hierarchy branches, each one parented by "Work". These three nested branches represent the last three days worth of archives. The deeper you go into the nest, the older the data stored within that branch.

10. Link the three scripts together via a chain.

First, open the chain editor by selecting "Chain" from the "Scripts" menu. Next, add the three scripts to the chain by clicking the "Add" button and selecting each one in the **in the following order**: "Work.Archive3", "Work.Archive2", and "Work.Archive1". The order is **VERY** important since we need to backup our oldest data first (figure 37). Name the chain "Work.Archive" and click the "Build" button. Your archive chain is now complete! You may watch it in action by executing the chain just as you would any other script.

11. Exit Universe Master.

We have now generated a chain script that will keep the last three days worth of changes backed up in the nested hierarchy of figure 8c. Once a day, when this chain gets executed, the middle level of our nested hierarchy gets backed up onto the lowest level. The highest level of our nested hierarchy then gets backed up onto the middle level. Lastly, our original data gets backed up onto the highest level. Note that since the first script we created did not specify a backup period, our original data will always be backed up when we run the scripts. On the other hand, the two lower levels in the archive will be 'shifted down' only once per day.

Using this scheme to archive your data, you can get quite creative. For instance, you may want to keep the last seven days worth of work by nesting seven levels deep just as we did above. After that, you might want to 'shift' files down the backup archive only once a week and thus nest a further three levels to keep the last four weeks worth of work. You can even go further by nesting another 11 levels and keeping the last year's worth of work. Of course, you don't have to nest at all.; You can place the contents of each archive period on a different volume and thus have Universe Master prompt you for which disk to insert. The possibilities are endless!

Section 3 - Tutorial

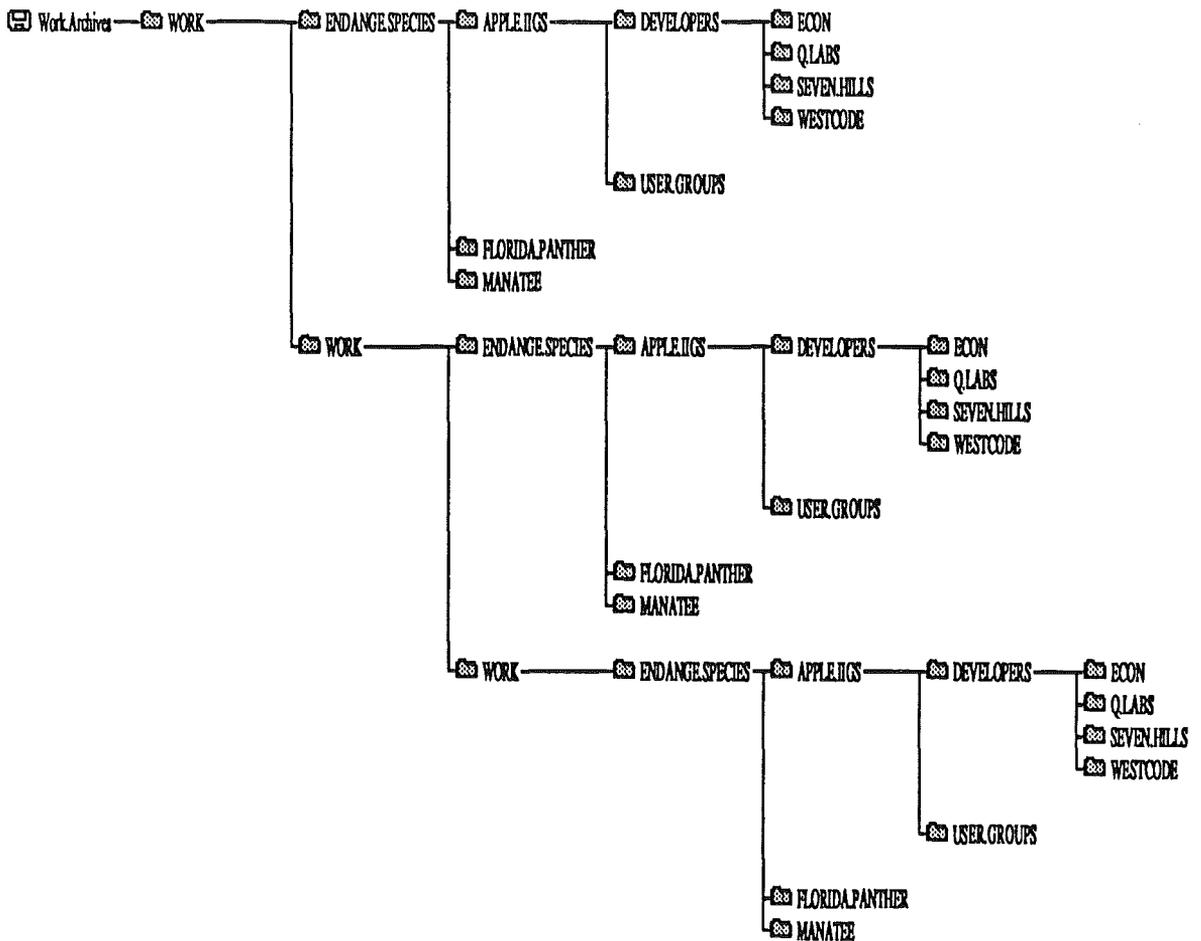


Figure 36. Hierarchy map of nested archive branches.

Retrieving archived data is another matter. Remember that only the highest level of the archive was derived from your original data. If you need to revert to the most recent backup then the traditional means of restoration are applicable. However, older files within the archive were derived from the next most recent group of files. If you blindly restore using one of their scripts, you will be overwriting the more recent data, which is probably not what you intend to do. If you ever need to revert to older files, you will have to do so by one of two ways. The first method is to 'manually' do so by choosing "Decode one file..." from the "File" menu. This is great if you need to revert to a small number of files. The second method is to choose "Restore" from the "Scripts" menu and clicking the "Change" button to reassign the destination before you attempt a restore. This is better if large numbers of files need to be reverted at a time.

Universe Master

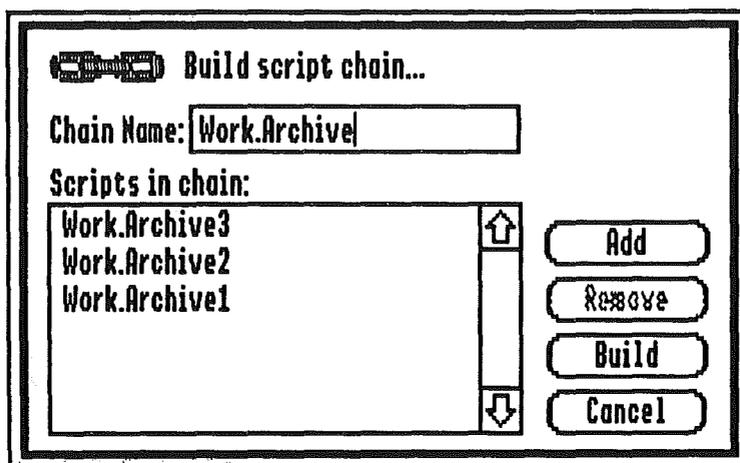
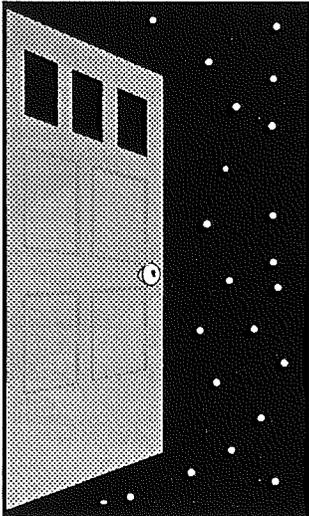


Figure 37. The script chain editor. Note the reverse ordering of the chained scripts.



Section 4

Command Button Reference



Section 4 - Command Button Reference

The "Copy" Command Button

The "Copy" command button acts on the folders currently selected in the map view area. After pressing this button, the "Copy Branch" window appears (see figure 38). The three main regions of this window are the source list, the destination list, and the "Copy Options" region. The source lists and destination lists, in conjunction with the buttons located on the bottom right hand side region, work as expected. See *Source Lists and Destination Lists*, page 3-2, for more information.

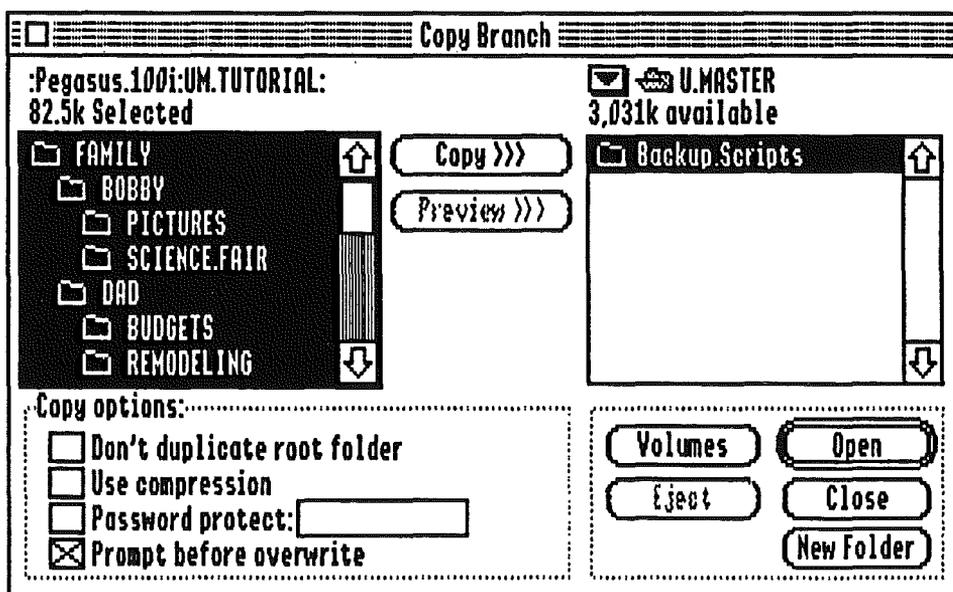


Figure 38. After pressing the "Copy" command button, the "Copy Branch" window appears.

The "Copy Options" Region

Three choices are available in this region:

Don't duplicate root folder"

This choice is only available when the root folder is selected. When this box is checked, Universe Master will not make a copy of the root folder (the root folder is the first one listed in the source list).

Use compression"

Makes a copy of the files in a compressed form.

Universe Master

" Password protect"

When this option is checked, Universe Master makes a copy of the files in an encrypted form. If you check this box, you must also supply a password in the edit field to the right of the option. The password you supply is used to encrypt the file's data. You must remember this password in order to decode the encrypted files in the future.

" Prompt before overwrite"

Before any file is overwritten, a prompt notifies you and gives you a choice not to overwrite the file. By default this option is checked.

The "Copy >>>" Button

Once a destination has been chosen, the "Copy>>>" button becomes active. Pressing this button causes the copy function to begin execution.

Section 4 - Command Button Reference

The "Delete" Command Button

The "Delete" command button acts on the folders currently selected in the map view area. After pressing this button, the "Delete Branch" window pops up (see figure 39). At the top of the window is the pathname of the selected branch, and the number of bytes selected. On the left side of the window is the source list. It lists all folders contained in the selected branch. By default they will all be selected. On the right side of the window are two regions, the "Scope" region, and the "Options" region.

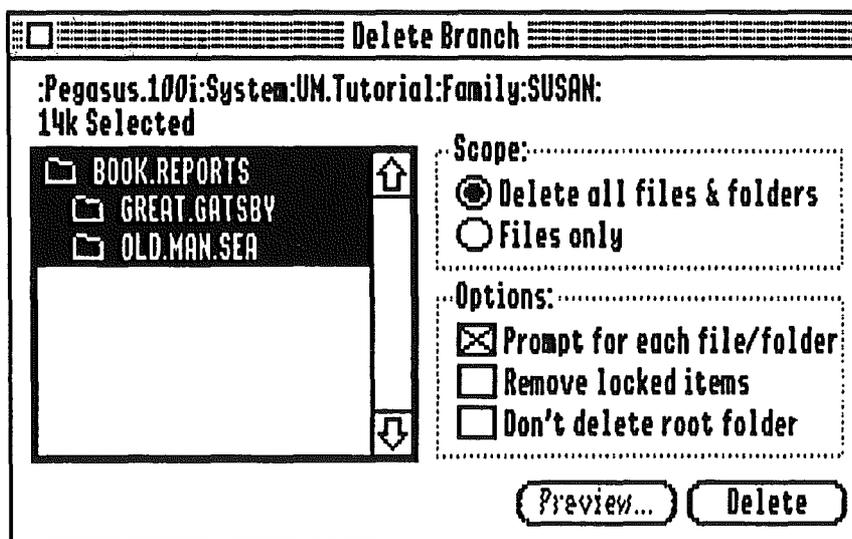


Figure 39. The "Delete Branch" window. The default scope is "Delete all files & folders", and the default option is "Prompt for each file/folder".

The "Scope" Region

This region contains two radio buttons:

Delete all files & folders

Both the folders and the files contained in them will be deleted. This action only applies to the selected folders/files.

Files only

Only files contained within the selected folders will be deleted. The folder structure itself will be left intact.

Universe Master

The "Options" Region

There are three choices here that can be checked on or off:

Prompt for each file/folder"

When checked, you will be prompted for each folder selected with "Delete the folder '*Foldername*' and all its contents?" You can then press one of three buttons; "Cancel", "Skip", or "Delete".

Remove locked items"

Universe Master will not delete locked files, unless this box is checked.

Don't delete root folder"

When checked, Universe Master will leave the root folder intact. However, its contents will still be deleted. If not checked, the root folder itself will be deleted along with other selected folders.

Section 4 - Command Button Reference

The "Backup" Command Button

Simpler, easier, and more elegant data backup is what the "Backup" command button will help you achieve. If you learn the information contained here and apply it properly, daily backup can be as easy as double clicking an icon.

The "Backup Generator" Window

When the "Backup" Command button is pressed, the "Backup Generator" window pops up (see figure 40). The top line of this window contains the pathname of the branch that is currently selected in the map view area. The next line contains the number of bytes that are selected. On the left side of the window is the source list, and on the right side is the destination list. After the source files and a destination for them have been selected, you must press the "Generate backup >" button located in the center of the window. This causes the "Backup Criteria..." window to appear.

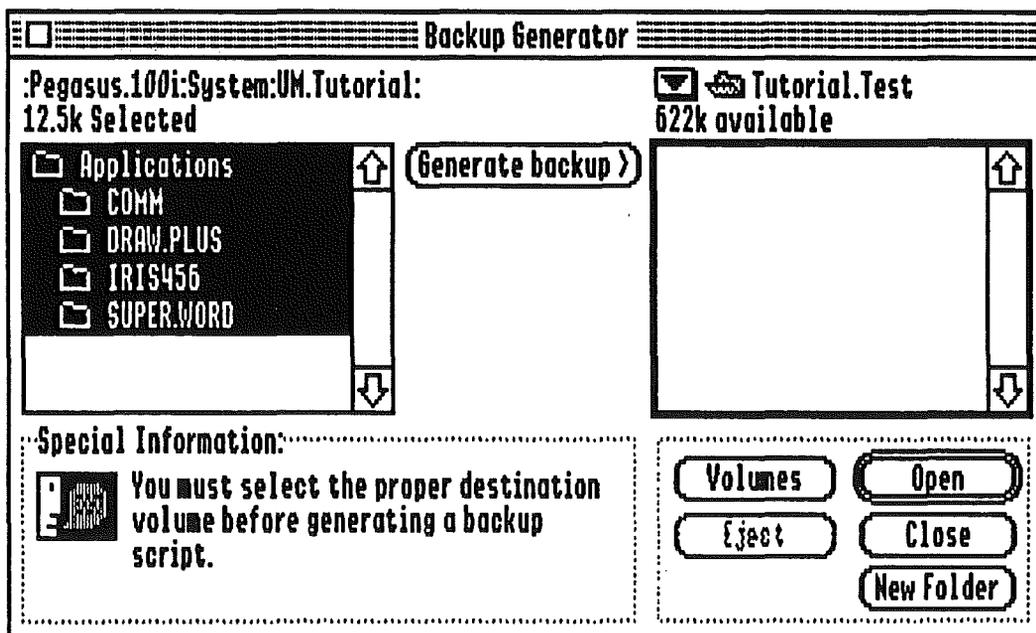


Figure 40. The "Backup Generator" window. The source list is on the left side of the window, and the destination list is on the right side of the window. Pressing the "Generate backup >" button, located between the two lists, brings up a window where the desired criteria can be defined.

Universe Master

The "Backup Criteria..." Window

This window has two main regions containing check boxes that allow different settings to be toggled on or off. (See figure 41.) On the left side of the window is the "Backup files if they..." region. In this region you can define what criteria Universe Master should use to determine when a file needs to be backed up. On the right side of the window is the "When backing up files..." region. This region provides four options that if selected will execute each time a file is backed up.

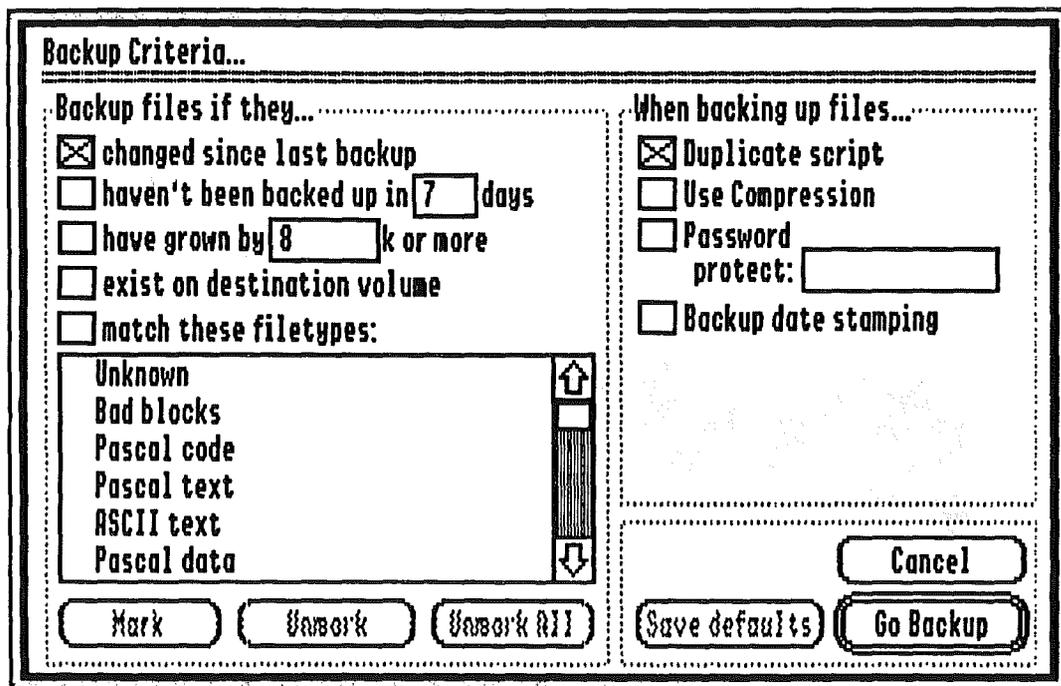


Figure 41. The "Backup Criteria" window.

Section 4 - Command Button Reference

The "Backup files if they..." Region

Several options are available to choose from:

changed since last backup "

When this option is checked, only files that have been modified since the last time they were backed up will be backed up. To determine if the file meets this criteria, Universe Master compares the modification date of the file that is selected against the modification date of the file with the same name that resides in the destination folder. If there is no file with the same name in the destination folder, the source file automatically meets this criteria.

haven't been backed up in _____ days "

If the box next to this choice is checked, then you must also type in a number of days in the edit field that precedes "days." You can enter any number of days from 0 to 999. If something besides a valid number is entered, Universe Master will use 0 for the number of days. Universe Master will back up the files only if the specified number of days have elapsed since the last backup. For instance, if you specify 7 days and enabled this option, the files in the script will only be backed up once a week regardless of how many times the script is executed.

have grown by _____ k or more "

If the box next to this choice is checked, then you must also type in the number of desired kilobytes in the edit field that precedes 'k'. Any number from 0 to 99999 can be entered. If something besides a valid number is entered, Universe Master will use 0 for the number of kilobytes. Notice that the number you enter is in kilobytes. For instance, if you enter the number 10, then the number of bytes Universe Master will be using for comparison is approximately 10000 (1k bytes = 1024 bytes). Universe Master determines how many bytes the file has grown since it was last backed up by finding the difference between the size of the file to be backed up and the backup file found in the destination folder. If this difference is greater than or equal to the number entered in the number of bytes edit field, then the file meets the criteria. If no backup file is found in the destination the source file automatically meets this criteria.

exist on destination volume "

Universe Master looks in the destination volume for a file with the same name as the one to be backed up. If such a backup file exists there, then the source file meets the criteria.

match these filetypes "

The filetype of selected source files is compared to the filetypes marked in the window below this choice. If the filetype of the selected source file is one of the filetypes marked, then the source file meets this criteria. In order to toggle the status of a filetype (marked/unmarked) you can double click on it, or select the filetype and then click on either the "Mark" button or the "Unmark" button. A check mark will appear to the left of all files that are marked. Clicking on "Unmark All" unmarks all currently marked filetypes.

Universe Master

The 'When backing up files...' Region

This region gives you four options on how the files that meet all criteria are to be backed up. The options are enabled by means of check boxes. The four available options are:

Duplicate script "

Universe Master places all scripts that you create in the "Backup.Scripts" folder located with the Universe Master application itself. When scripts are executed, they are executed from within this folder. Selecting the "Duplicate script" option tells Universe Master to place a copy of the executing script along with your backed up data. This ensures your ability to restore data even if your original scripts become lost or damaged.

Use Compression "

When this option is selected, the files will be backed up in a compressed format. Compressing files greatly reduces the amount of disk space they occupy. The algorithms used by Universe Master result in an average compression rate of 50%.

Password protect: _____ "

This option allows you to encrypt your backups by supplying a password. When this option is selected you must supply a password in the edit box next to "Protect:". When the password is entered you will not see the letters that you are actually typing (for security reasons), so avoid typographical mistakes or misspellings. An additional prompt for the password comes up when you attempt to close the "Backup Options" dialog by pressing the "Okay" button located on the bottom right hand of the dialog window. This is to verify that you know your password and that no errors were made when entering the password. If both passwords match, the window will be closed. If they do not match, a dialog window informs you of this and the "Backup Options" dialog window remains open. At this point, you can type your password in the edit box once again.

WARNING! Once files are encrypted, the only way they can be retrieved in a readable format is by decrypting them by using the same password. Files that are encrypted must be decrypted using Universe Master. If you forget your password you will not be able to decrypt your files! We cannot help you if this happens, since we don't know the password either! This option should be used with great care. If you generate a script with password protection enabled, you must supply the password each time you run the script. You must also supply the password when editing a previously created script that has the password protection option enabled.

Section 4 - Command Button Reference

Backup date stamping

When this option is selected, Universe Master adds a resource to the files being backed up which records when the backup is taking place. When cataloguing hierarchies using the "Print" command button, you can specify that this date is printed next to each file. This feature will give you immediate indication of when a file was last backed up. You can also determine when a file was last backed up by using Finder's file information dialog and viewing the file's comment field.

WARNING! We do not suggest you backup date stamp any ProDOS 8 files since doing so would render these files unusable to ProDOS 8 applications.

Generating Backup Scripts

To generate the script you must press the "Go Backup" button located on the bottom right of the "Backup Generator" window. Next you will have to supply a name for the script and press the "Okay" button (see figure 42). Universe Master then generates and saves the script and asks, "Do you wish to execute the script right now?" (See figure 43) Pressing "Okay" at this point causes Universe Master to scan the script and perform the backup. After the backup has been performed, Universe Master returns to the "Backup Generator" window.

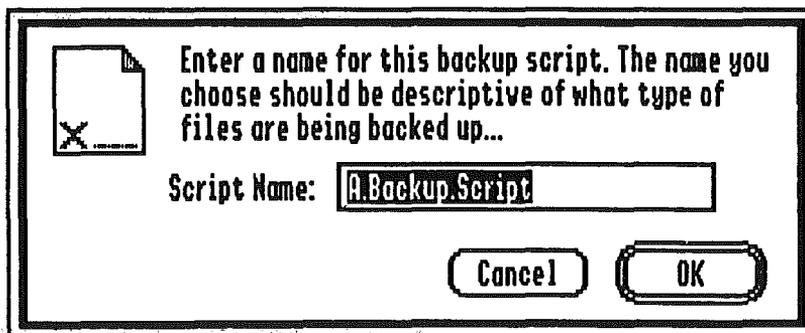


Figure 42. Each script must be named.

Universe Master

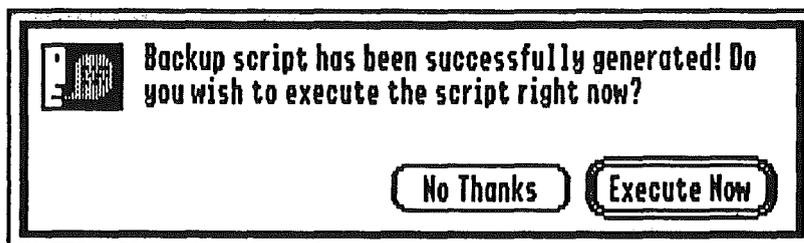


Figure 43. A script can be executed immediately after its creation.

Executing Backup Scripts

There are three ways to execute your backup scripts:

1. Immediately after creating the script, answer "Okay" to the "Do you wish to execute the script right now?" prompt (see figure 43).
2. Use the "Backup" function in the "Scripts" menu .
3. Double click on the script icon from the Finder.

Section 4 - Command Button Reference

The "Restore" Command Button

This button allows you to restore previously backed up files. For any restoration to take place, the branch currently selected in the map view area must be the branch where the original files resided, or a subset of it. If the entire branch was lost, you must use the "Scripts" menu bar option in order to restore your lost data. The "Restore" command button gives you the flexibility of restoring files to a single folder, or a subset of folders that the original backup encompassed.

The "Restore Files" window, which appears after the "Restore" button is pressed, allows you to choose the script to use in restoring your data (see figure 44). Every time a new backup script is created, Universe Master saves it in the "Backup.Scripts" folder (located where the Universe Master application resides). Additionally, if you specified the option "duplicate script" when the script was created, there will also be a copy of the script stored with the data that was backed up.

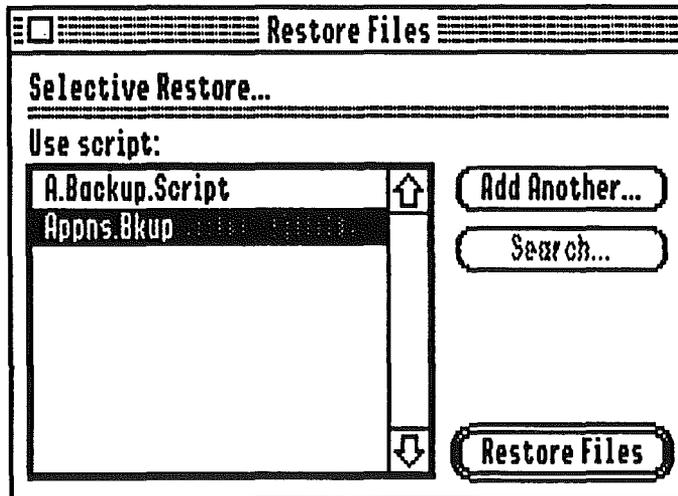


Figure 44. The "Restore Files" window allows you to choose the script to be used for restoration.

Universe Master

In the left side of the "Restore Files" window is a list of scripts that was saved by Universe Master. You can choose one of these scripts to restore files by double clicking on it, or by clicking on the script name once, and then clicking on the "Restore Files" button. To use a duplicate script, press the "Add Another..." button. Duplicate scripts are stored in the same location where the backup is stored. Select your script from the source list that appears after pressing the "Add Another..." button and open it. This script is then added to the list in the "Restore Files" window so that you can choose it.

Once you select the correct script, press the "Restore Files" button located at the bottom of the window. If the script chosen does not restore to the selected branch, an error message will appear and no action will occur. If the branch selected is the correct one for the script, a "Restoration Criteria" window will pop up next.

The "Restoration Criteria..." window

The "From" and "To" at the top of this window shows you where the backed up files reside, and where they will be copied. There are two regions in this window that provides you "Restore" and "Prompt" options (see figure 45).

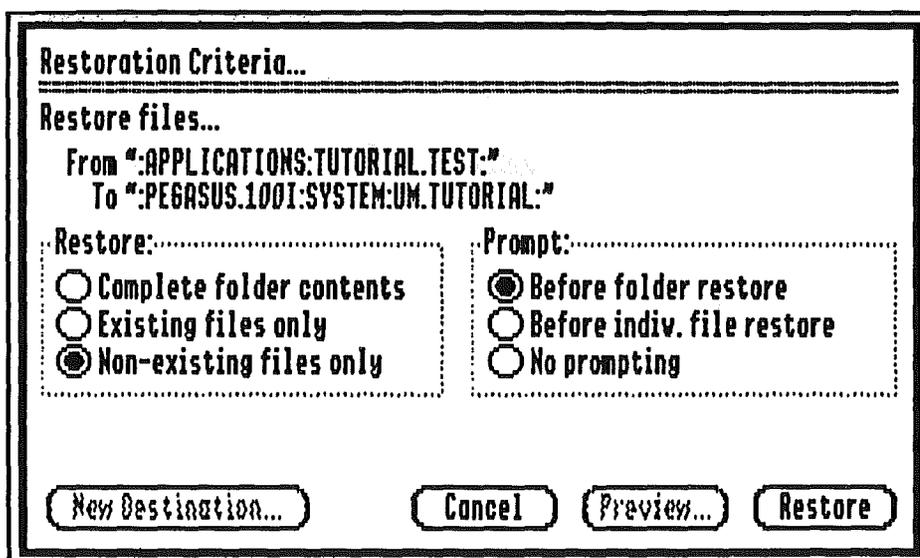


Figure 45. The "Restoration Criteria..." window.

Section 4 - Command Button Reference

"Restore Options"

Complete folder contents"

Universe Master will attempt to restore every file that was backed up with the script.

Existing files only"

The only files to be restored are those that already exist in the branch where the restored files are to be copied. These files are overwritten with the backup files.

Non-existing files only"

The only files to be restored are those that do not exist in the branch where the restored files will be copied.

"Prompt Options"

Before folder overwrite"

You will be prompted before existing folders are to be restored.

Before indiv. file overwrite"

You will be prompted before each existing file is overwritten.

No prompting"

Folders and their contents will be overwritten without any prompting. Use this option carefully!

Universe Master

The "Catalog" Command Button

To view the files in the selected branch, choose this option. It will display the folders and files in a format very similar to the Finder's when viewing "by name" (see figure 46). This option will let you view, in a scrollable window, all folders and all file names. For files, their size and type will also be displayed. The entire contents of the selected branch will be displayed, regardless of the number of levels in the branch selected.

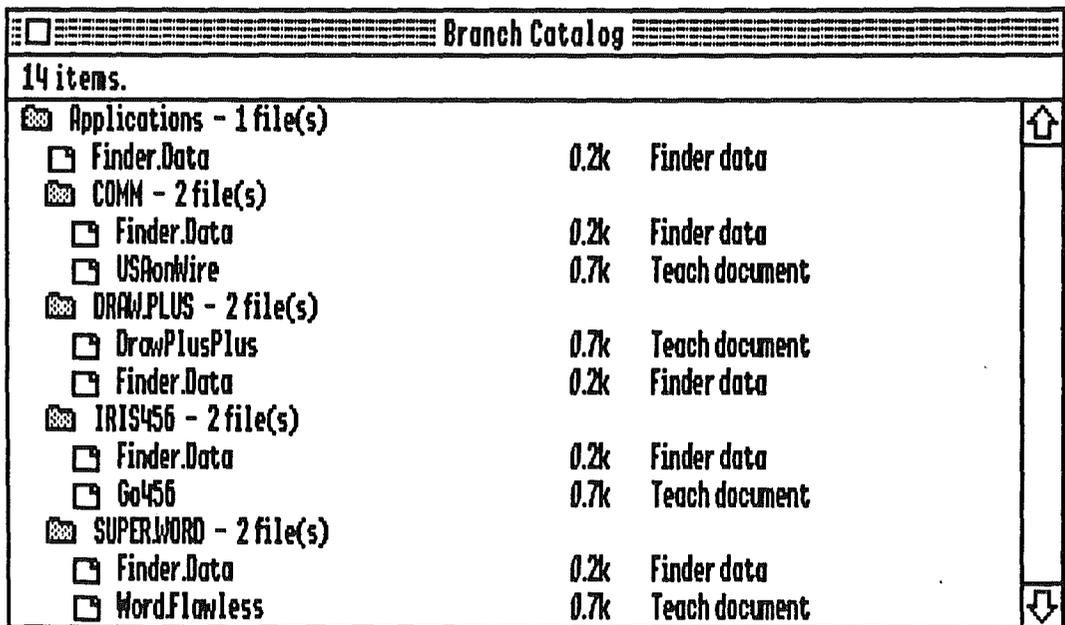


Figure 46. The "Branch Catalog" window.

Section 4 - Command Button Reference

The "File Info." Command Button

After the "File Info." command button is pressed, the "Information Center" window appears (see figure 47). The main function of this window is to allow you to view and change information regarding the selected folder branch. Following is a discussion on each of the regions of the window, as well as the buttons located on the bottom right hand side of the window.

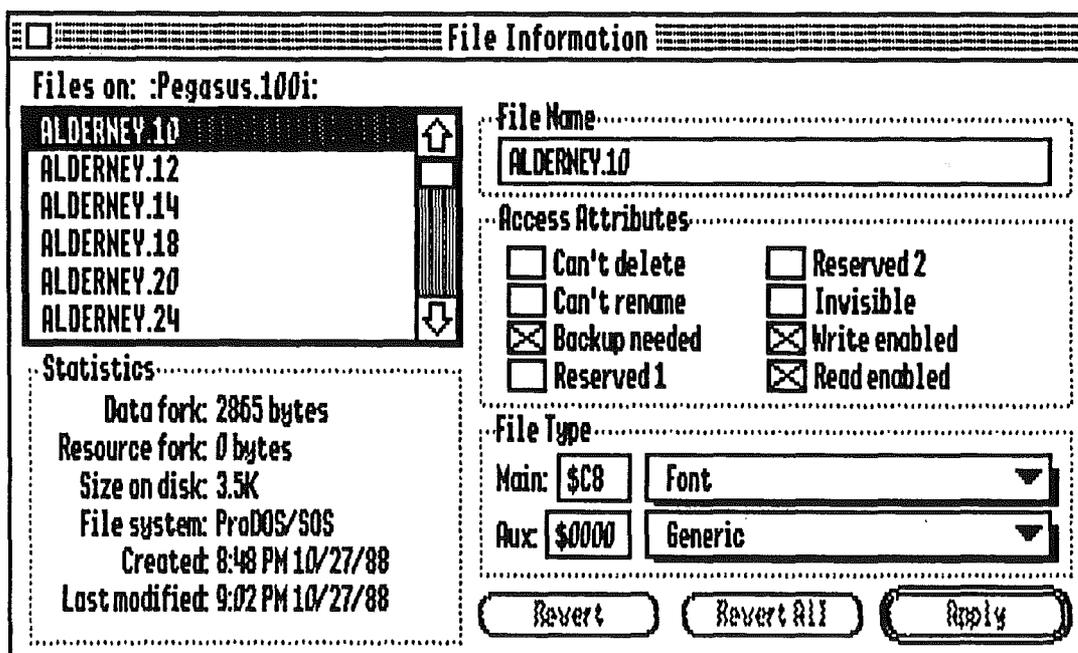


Figure 47. The "File Information" window..

The Filenames List

On the top left hand side of the window is displayed "Files on:", followed by the complete pathname for the folder currently selected in the map view area. Underneath this message is a list with the names of all the files contained in the selected branch. Select a file from this list to view the information. The information contained in the other regions of the Information Center window will pertain to the selected file.

Universe Master

The Access Attributes Region

In this region are displayed eight different attributes of the selected file. Next to each attribute is a check box that allows you to toggle it on or off. Following is an explanation on each of the attributes and what action is taken when they are turned on.

Can't delete "

Prevents the selected file from being deleted.

Can't rename "

Prevents the selected file from being renamed.

Backup needed "

This attribute is used by the operating system to signify that the file needs to be backed up. Certain utility programs look at this attribute to determine which files to back up, and then reset the attribute after backing them up. Universe Master does not check this attribute to perform any operations whatsoever, so you need not worry about setting it on or off for the purposes of using Universe Master to backup your files.

Reserved1 "

This attribute is not currently defined by the operating system, but is included here because it might be defined in the future.

Reserved2 "

This attribute is not currently defined by the operating system, but is included here because it might be defined in the future.

Invisible "

When this attribute is on, it indicates that the file cannot be viewed or selected by applications. Some applications ignore this bit and show the file anyway. Universe Master has a "preferences" setting which determines whether or not invisible files will be shown. See the section on the Universe Master menu bar, under "Edit", for more information on setting preferences (page 5-3.)

Write enabled "

The file can be overwritten/modified.

Read enabled "

The file can be read.

Section 4 - Command Button Reference

The "File Type" Region

The attributes in this region are the *Primary* file type and the *Auxiliary* file type. These attributes are defined by Apple to denote what documents may be used with which applications. The primary file type denotes a more general grouping of the files, and the auxiliary file type further subdivides files by different applications. For example, the primary file type of a document layout created in Appleworks GS is "Desktop Publishing", and its Auxiliary type is "Appleworks GS Page Layout".

Changing of these attributes is NOT recommended unless you have good reason to do so, and fully understand the functions of file types and how changing them affects files. The average user should not have much reason to change file types. We have included this option because it is often used by programmers, and might occasionally be needed when a file is downloaded from a bulletin board.

If you are certain you must change a file type, it is easily done from this region. There are two ways to change either the primary file type or the auxiliary file type. The small box next to "Primary:" and "Aux:" can be edited by clicking the cursor inside it and making the desired changes. The second way to make a change is by bringing up the pop up menu that is immediately right of the first edit box. The pop up menus contain all defined file types. Selecting a primary file type from the pop up menu causes the contents of the auxiliary file type edit box, and its accompanying pop up menu, to change to reflect the aux file types currently defined for the given primary file type.

The "Statistics" Region

The Statistics region is for informational purposes only, no changes can be made there. There are six types of information displayed for the currently selected file:

"Data Fork"

The size of the Data Fork, in bytes.

"Resource Fork"

The size of the Resource Fork, in bytes.

"Size on Disk"

The size that the file occupies on disk, in bytes. This differs from the sum of the data fork and resource fork, since there is additional overhead in storing data on disks.

"File System"

The file system under which the file is stored.

Universe Master

"Created"

The date the file was created.

"Last Modified"

The date the file was last modified.

The "File Information" Buttons

At the bottom right hand corner of the "File Information" window are four buttons: "Revert", "Revert All", "Help", and "Apply" (see figure 48). We now explain the functions of each of these buttons:



Figure 48. The "File Information" buttons.

"Revert"

If none of the attributes of the currently selected file have been changed, the "Revert" button is dimmed, and pressing it will not result in any action. However, if any attributes of the currently selected file have been changed, pressing the "Revert" button causes all attributes of the selected file to return to their original settings. The "Revert" button works ONLY on the currently selected file (the file highlighted in the filenames window). To revert all changes made since the "File Information" window opened, see "Revert All".

"Revert All"

If no changes were made to any of the files since the "File Information" window opened, the "Revert All" button will be dimmed, and pressing it will not result in any action. However, if any attribute in any of the files was changed, pressing the "Revert All" button causes all changed attributes of all files to return to their original settings.

"Apply"

Any attribute changes made to the files in the filenames list do not become effective until the "Apply" button is pressed. When the "Apply" button is pressed, a dialog window pops up and displays the files being changed. It is at this point that Universe Master makes the changes to the files on disk. Once the "Apply" button is pressed, you cannot revert your changes by pressing the "Revert" or "Revert All" buttons. There is only one way in which to revert any changes made once the Apply button is pressed: Select the files, 'manually' return all attributes to their original settings, and apply the changes again by pressing the "Apply" button.

Section 4 - Command Button Reference

Exiting the "File Information" Window

To exit the "File Information" window, just click on the close box at the top left corner of the window. If any changes were made but not applied, a dialog window will warn you and provide an opportunity to either apply the change, leave the "File Information" window without applying the changes, or cancel to return to the "File Information" window as if you never tried to leave.

Universe Master

The "Recover" Command Button

The "Recover" command button allows you to recover files that have been deleted. After pressing this button, the "File Recovery" window opens up (see figure A).

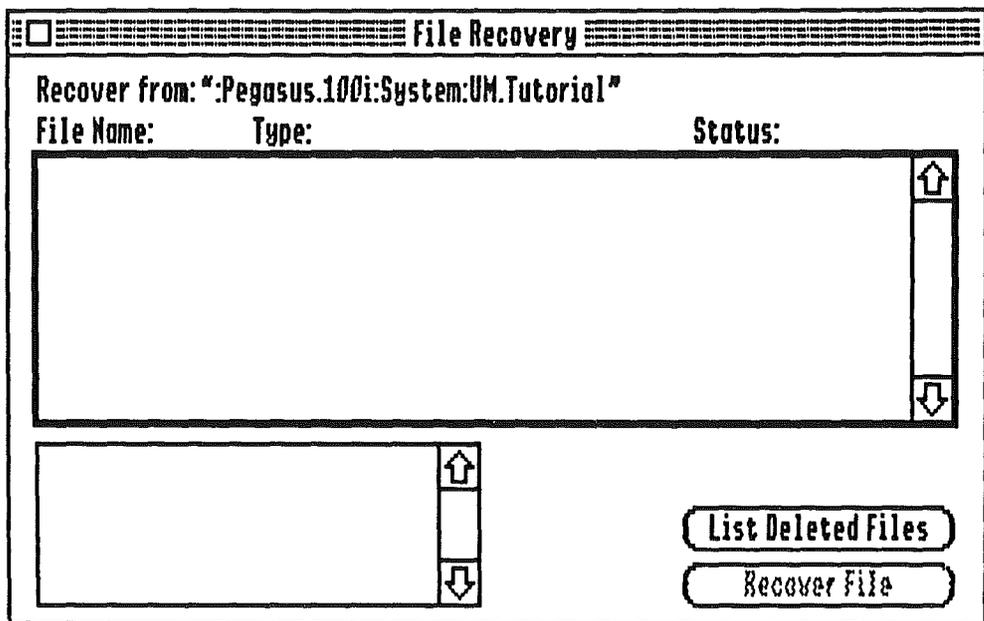


Figure A. The "File Recovery" window.

After pressing the "List Deleted Files" button, at the bottom right side of the window, Universe Master scans the current branch looking for files that have been deleted. If any are found, they appear in the list located at the top of the window (see figure B for sample list). This list provides the file name, file type, and status of the deleted files found in the branch. Below this list is another smaller list that contains the pathname of the file that is currently selected. You can select any of the deleted files in order to view its pathname and attempt to recover it.

There are three possibilities for the status of a file: "Intact", "Partially Intact", and "Unrecoverable." A file that is intact has what appears to be a valid file structure. However, only after attempting to recover this file, will you really find out the integrity of the data. The file structure of a partially intact file is partially damaged. In this case there is guaranteed loss of data, but some portions of it may be salvageable. An unrecoverable file is damaged beyond recovering.

Section 4 - Command Button Reference

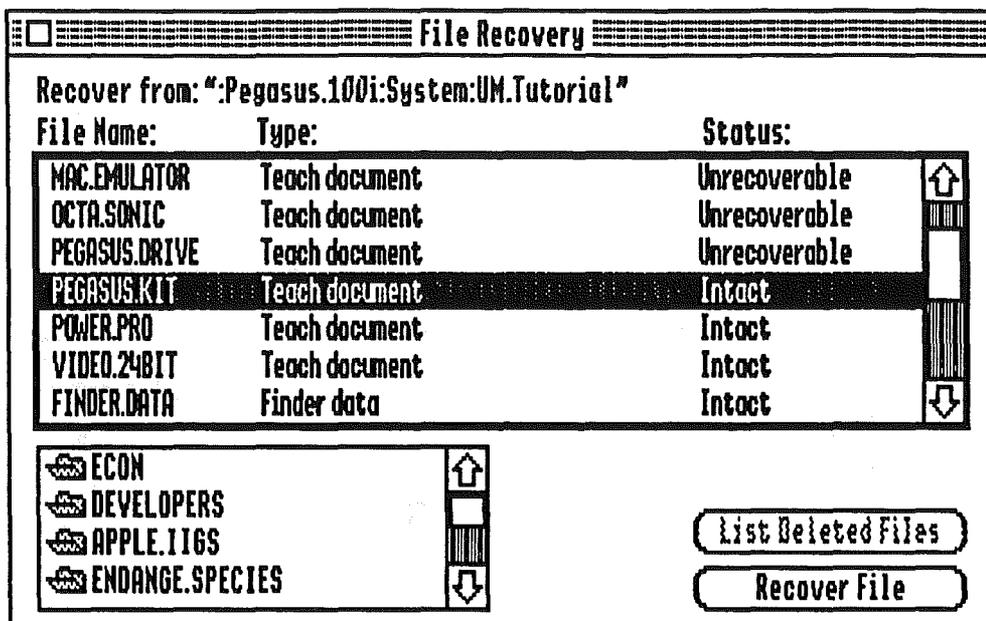


Figure B. The "File Recovery" window after the "List Deleted Files" button has been pressed, and Universe Master has listed the files found.

Recovering a File

You can only attempt to recover files that are intact or partially intact. Select the desired file by clicking on its name, then press the "Recover File" button located at the bottom of the window, on the right hand side. After pressing this button a window pops up to allow you to designate a destination for the recovered file, as well as a name. You cannot recover to the same volume where the deleted file is located (this could potentially damage the deleted file by overwriting it before it is recovered!) We suggest you open a new folder, "Recovered.Files", in another volume, and save any recovered files there temporarily. When finished selecting a destination and name, press the "Save" button to perform the recovery.

Universe Master

The "Print" Command Button

The "Print" command button allows you to print the contents of the folders selected in the map view area. There are many options available to customize this printing. Once the "Print" command button is selected, the "Print Volume" window appears (see figure C). Next we describe all the options available in this window.

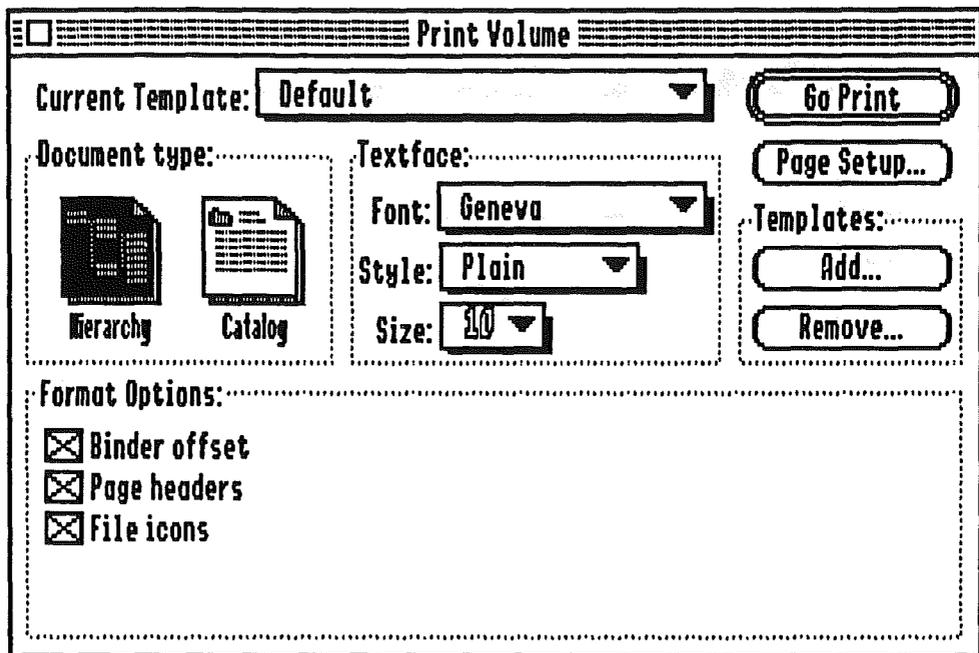


Figure C. The "Print Volume" window.

"Current Template:"

Pull down the "Current Template" menu to see the templates available to choose from. Universe Master provides you with three templates; "Default", "Standard Hierarchy", and "Standard Catalog". When you choose a template, all the settings will automatically change to those of the template. Templates save you from having to reset all the settings every time you want to print a certain type of document. Once you decide which settings work best for your needs, use the "Add" button to create a template for future use.

Section 4 - Command Button Reference

Any changes made to the settings take effect immediately and become permanent. For example, if you go into the "Print Volume" window, open a template, modify several settings, and exit the "Print Volume" window, then this template will have been permanently modified; next time you open this template it will have all the changes that were previously made.

The "Document Type:" Region

Two large buttons appear here for you to choose either "Hierarchy" or "Catalog". Selecting the hierarchy document type will make the printout look very similar to the hierarchy displayed in the map view area. All folders will be printed, even if there are any branch indicators present in the map view area.

If the Catalog document type is chosen, both folders and files are displayed in a printout. Along with being able to print the filenames when catalog is chosen, you will have additional choices available in the "Format Options" region (see figure D). See the "Format Options" following for additional clarification.

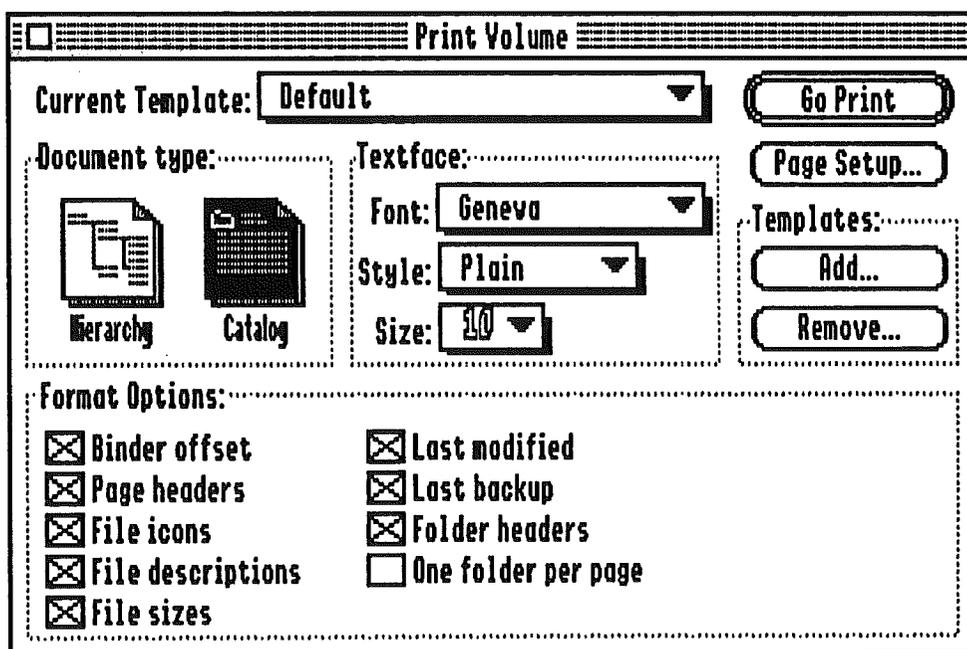


Figure D. The "Print Volume" window with the document type of "Catalog" selected. Note the additional format options available.

Universe Master

The "Format Options" Region

Depending on whether the document type selected is 'Hierarchy' or 'Catalog', various options are presented in the "Format Options" region. The first three options will always be available whether the document type is hierarchy or catalog. These choices can be toggled on or off by means of check boxes:

Binder Offset

Shifts the document to the right on the page to allow for binder placement without loss of readability.

Page Headers

Prints a page header at the top of each page. A page header consists of the date, time, listing type, volume name, volume type, and page number.

File Icons

Prints an icon to the left of each filename.

If the document type is 'Catalog', you have an additional six check boxes:

File descriptions

Prints the type of the file next to the filename (i.e., "Spreadsheet", "ASCII text", "Binary", "Database", etc.)

File sizes

Prints the size of each file in bytes.

Last modified

Prints the date when the file was last modified.

Last backup

Prints the date when the file was last backed up by Universe Master. Files only get stamped if the "Backup Date Stamping" option was enabled when building the backup script.

Folder Headers

Prints a header beneath the folder name listing the number of files contained in the folder, the amount of space they occupy (in bytes), and the parent path (where the folder is contained).

One Folder Per Page

Limits the maximum amount of folders listed in a page to one.

Section 4 - Command Button Reference

The Textface Region

In this region you can customize the printout to your liking by choosing the font, style, and size you prefer. Simple pop up menus allows you to make your selections.

The "Go Print" Button

Selecting the "Go Print" button causes a print job dialog to appear. The choices available in this window vary with the type of printer setup in your computer system. You should be familiar with these settings, since they appear under different applications. Pressing the "OK" button after you are done changing settings will begin the printing process. A dialog menu appears and shows the status of the printing process. At this point you can press Apple-period to cancel the process.

The "Page Setup" Button

Pressing this button will open the print style dialog that allows you to choose various options, depending on your printer setup.

The "Templates" Region

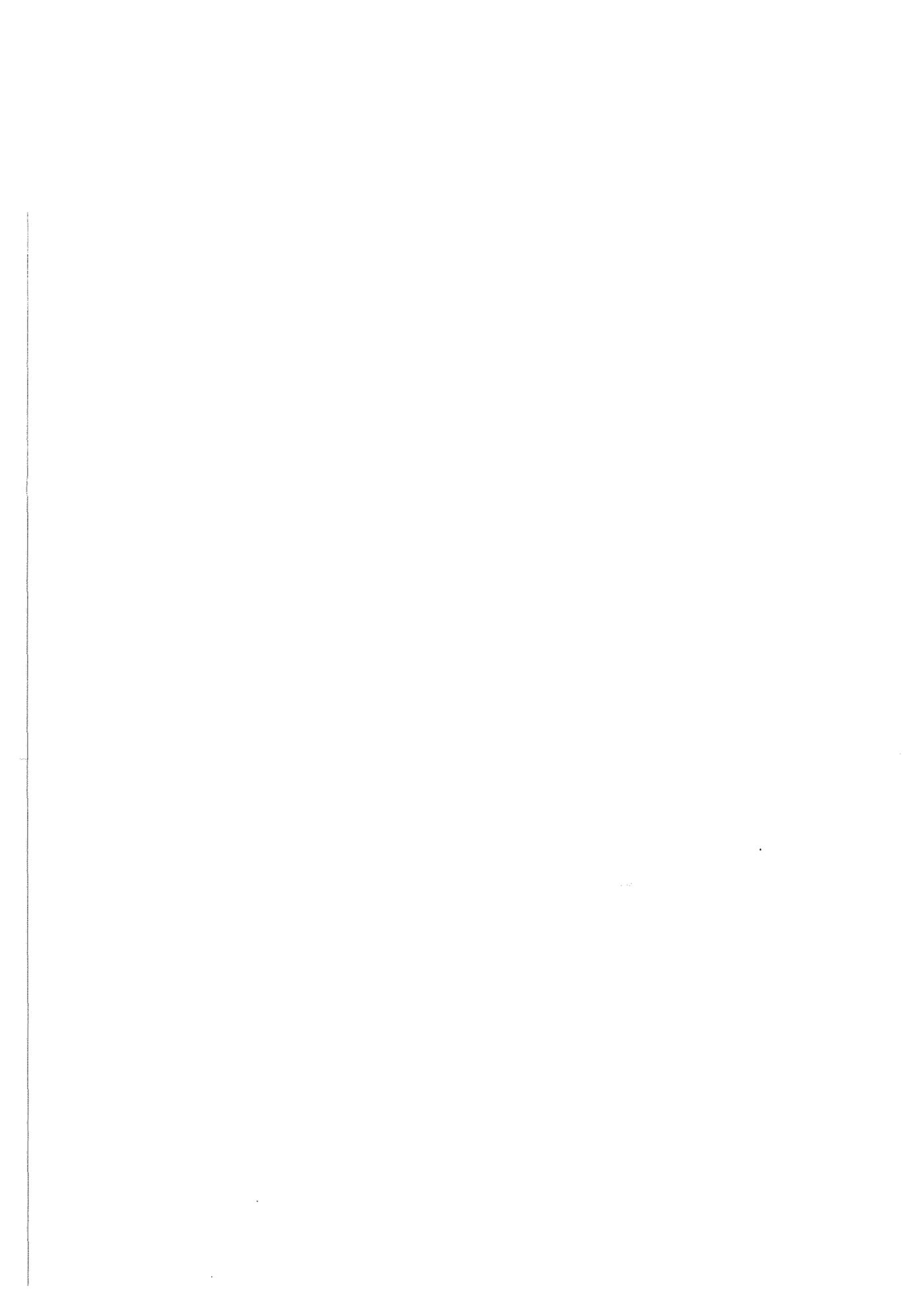
The templates regions allows you to create a new template, or remove an existing one, by means of the "Add" button and the "Remove button".

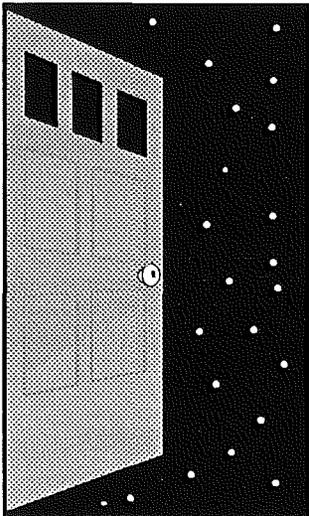
"Add..."

When the "Add..." button is clicked you will be prompted for a name under which to save the current settings. Once you are familiar with how the printouts will look depending on the settings, and you find one or more combination of settings that you would like to use regularly, you can use the add button to permanently save these settings in a template. If you change any settings while using a template, these changes are automatically saved in the template. If you make a change but don't want to alter the template permanently, be sure and revert any changes you've made by manually selecting and deselecting options.

"Remove..."

"Remove..." will permanently remove a previously created template. A window pops up and displays all existing templates. You simply select the template you want removed and press the "delete" button.





Section 5

Menu Bar Reference

Section 5 - Menu Bar Reference

The "File" Menu

File	
New...	⌘ N
Open...	⌘ O
Save	⌘ S
Save as...	
Close	⌘ W

Copy one file...	
Delete one file...	
Encode one file...	
Decode one file...	

Quit	⌘ Q

"New..."

Creates and opens a new text file, using the Universe Master text editor. Useful for writing memos, etc.

"Open..."

Opens an existing text file, using the Universe Master text editor. Useful for writing memos, etc.

"Save"

Saves the contents of the currently active window to disk. Presently, only the text and hex block editor support this.

"Save as..."

Saves the contents of the currently active window to a different name. Presently, only the text editor supports this.

"Close"

Closes the frontmost window. All modeless windows support this.

"Copy one file..."

Makes a copy of a single file on disk. The file to be copied is first located using a standard file dialog. Once the file is opened, another file dialog allows you to select a destination and name for the file.

"Delete one file..."

Deletes a single file on disk. The file to be deleted is first located using a standard file dialog. Opening the file causes the deletion process to begin. Before the file is deleted you will be prompted.

"Encode one file..."

Encodes a single file and saves it to any desired name. A standard file dialog pops up and prompts you for the file you wish to encode. After selecting and opening this file, another window pops up (figure 49). At least one of the options must be checked. If you choose to encrypt the file, remember that you must supply the password for decoding the file in the future. After pressing the Okay button, another standard file dialog appears where you must name the file, and select a destination for it. You can overwrite the original file if so desired.

Universe Master

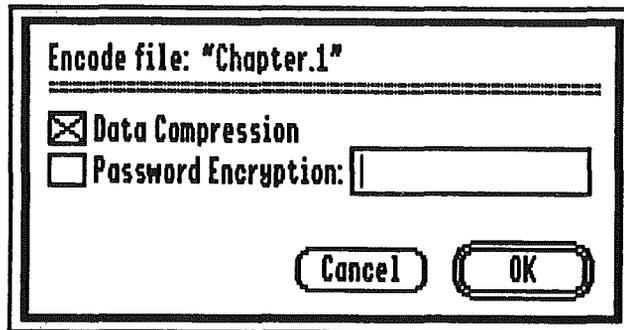


Figure 49. Two options are available when encoding a file: "Data Compression" and "Password Encryption".

WARNING! Once files are encrypted the only way they can be retrieved in a readable format is by using the same password to decrypt them. Files that are encrypted must be decrypted using Universe Master. If you forget your password you will not be able to decrypt your files! We cannot help you if this happens, since we don't know the password either! This option should be used with great care.

"Decode one file..."

Decodes a single file that has been compressed and/or encrypted (as a result of a backup or the "Encode single..." function). You must first select the file from the standard file dialog, and press the "open" button. If you password protected the file, you will be prompted to supply this password in order to decode the file. Next, select the destination from the standard file dialog, and name the new decoded file. Press the "Save" button in order to perform the decoding. Note that you can decode to the same name as the encoded file.

"Quit"

Quits the Universe Master application. This option will quit the application and return you to the Finder, or whatever application launched Universe Master.

The "Edit" Menu

Edit	
Undo	⌘ Z
Cut	⌘ X
Copy	⌘ C
Paste	
Clear	⌘ V
Select All...	⌘ A
Preferences...	

"Undo"

This option is not supported by Universe Master.

"Cut"

Removes any selected data and places it in the system clipboard. Only the text editor supports this.

"Copy"

Copies the selected data and places it in the system clipboard. Only the text editor supports this.

"Paste"

Pastes the contents of the system clipboard over the currently selected text or at the current cursor position.

"Clear"

Removes the selected data from the active window.

"Select All"

Selects all the selectable data from the active window.

"Preferences..."

Three types of preferences can be defined from this menu selection; "General", "Hierarchy Display" and "Screen Colors". The pop up menu at the top region of the dialog allows you to see and modify the settings for each of the three preferences.

"General" Preferences

Shown in figure 50 is the dialog window, with the choices for "General" preferences being displayed. The choices available are as follows:

Sort folder entries

When checked, Universe Master will sort the contents of any folder alphabetically. This sort is performed in memory and does not actually change the order of files on disk.

Recognize invisible files

When checked, Universe Master will recognize files marked as invisible

Universe Master

Suppress event sounds

When checked, Universe Master will not play sounds for certain types of events. This will not turn all sounds off, since many sounds (such as disk insert/eject) are beyond Universe Master's control.

Quick window updates

When checked, Universe Master will only update the contents of the frontmost window. This is helpful for non-accelerated systems, but results in unsightly displays.

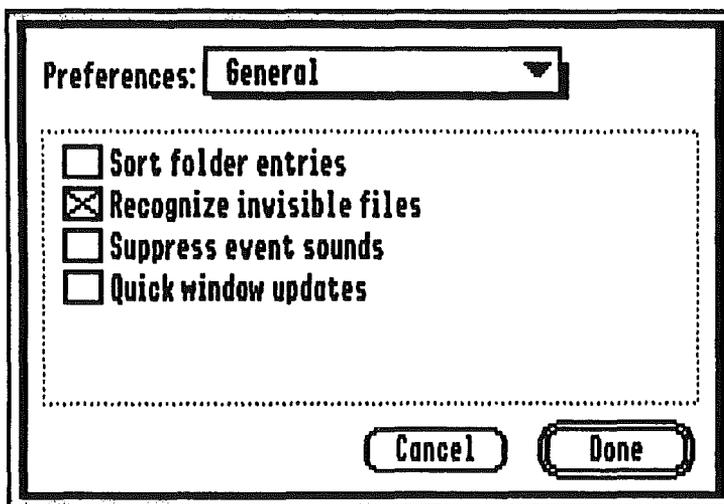


Figure 50. The "Preferences" dialog. Four check boxes are available for "General" preferences.

"Hierarchy Display" Preferences

The "Hierarchy Display" preferences, as shown in figure 51, provides you with the following choices:

View Width

The maximum number of columns to be displayed at one time in the map view area. The "View Width" pop up menu provides two choices; "3 Columns", and "4 Columns".

Font Family

All fonts available in your system will be displayed from this pop up menu.

Font Size

Three choices are available here; 8, 9, and 10.

Section 5 - Menu Bar Reference

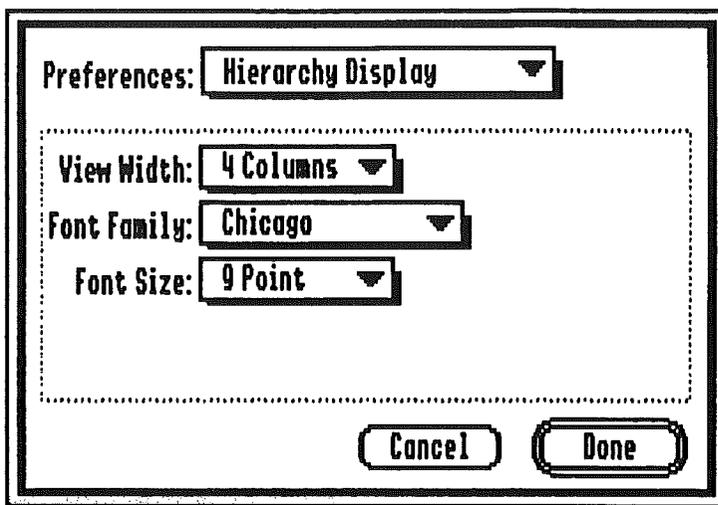


Figure 51. The "Hierarchy Display" preferences.

"Screen Colors" Preferences

The "Screen Colors" preferences dialog, as shown in figure 52, allows you to assign any color from the palette to any of the following eight: "Field Text", "Highl. text", "Highl.bkgnd", "Framing Rect.", "Window titles", "Title bar", "Title stripes", and "Alert frame".

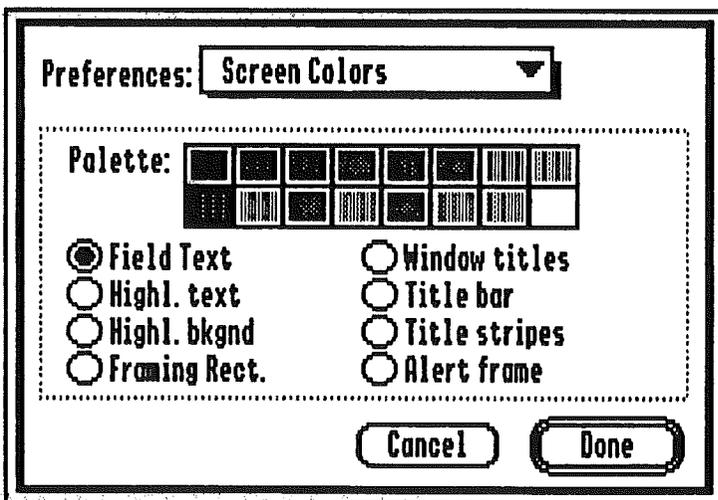
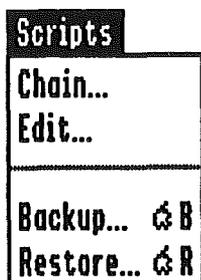


Figure 52. The "Screen Colors" preferences.

Universe Master

The "Scripts" Menu



"Chain..."

Once you've generated two or more scripts to use on a regular basis, the chain option is an excellent way to streamline the backup procedure. Two or more scripts can be "chained" so that once you execute the chain script, Universe Master will consecutively execute each script in the chain. After selecting this option, the dialog window in figure 53 appears.

"The Build script chain..." Window

From this window you can name the script chain by entering the desired name in the edit field to the right of "Chain Name:". To add scripts to the chain, press the "Add" button. Universe Master will display all scripts in the "Backup.Scripts" folder. You can select scripts from this folder, or use the standard "Volumes", "Open", and "Close" buttons to locate and open/add other scripts. After each script is added, Universe Master will return you to the "Build script chain..." dialog. If you wish to remove any scripts, select it from the list in the "Build script chain..." dialog, and press the "Remove" button. After all desired scripts have been selected, press the "Build" button and Universe Master will build a chain script. A chain script is executed the same way a regular script is executed: by double clicking on the script icon from the Finder, or by using Universe Master's "Backup" option from the "Scripts" menu.

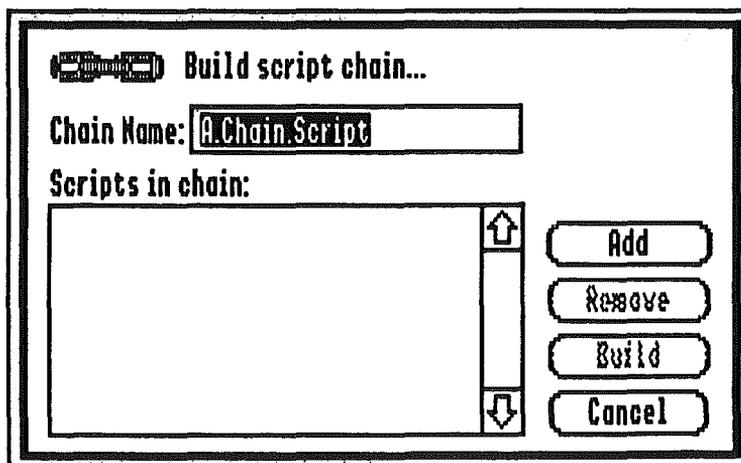


Figure 53. "Build script chain..." window.

Section 5 - Menu Bar Reference

"Edit..."

This option will let you modify existing scripts. Chain scripts may not be modified; however, individual scripts which may be part of a chain can be modified. A standard file dialog first appears and asks you to "Select script to edit". By default, the "Backup.Scripts" folder is open, and its files listed. You can select one of these scripts, or use the standard "Volumes", "Open", and "Close" buttons to locate other scripts. You can then open the script to modify it. Figure 54 shows the "Backup Script Editor" dialog that appears when you open the script.

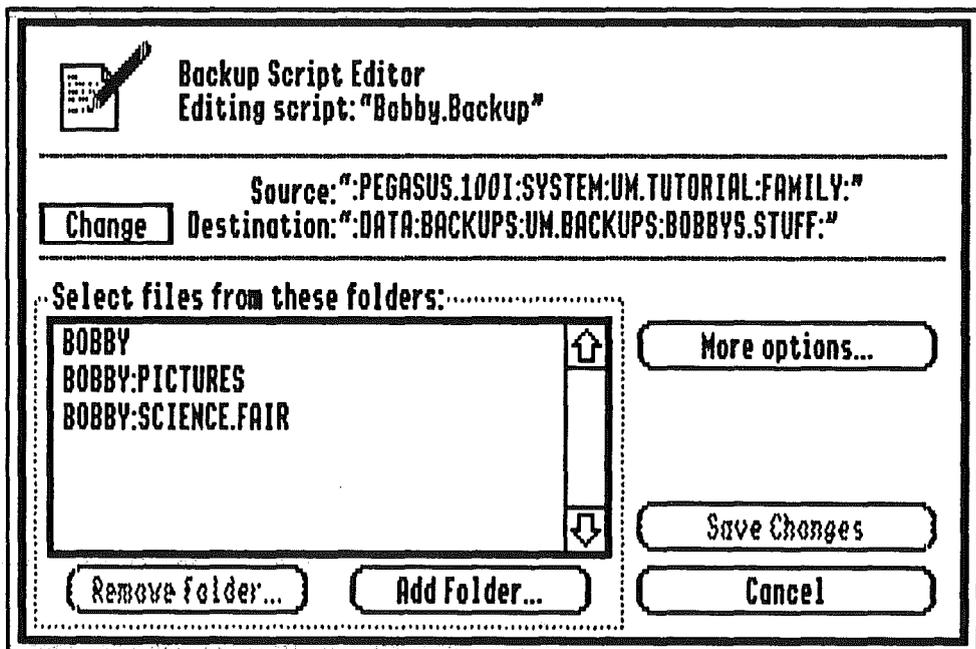


Figure 54. The "Backup Script Editor" window.

The "Backup Script Editor" Window

At the top region of the dialog you will find the name of the script being edited. Right below this is the source and destination of the backup files. The "Change" button to the left of "Destination:" allows you to change the destination. After pressing the button, a standard dialog allows you to select a new destination.

The "More options..." Button

The "More options..." button, upon pressing, brings up the "Backup Criteria..." window. This is the same window found when performing a backup via the "Backup" command button, and it is shown in

Universe Master

The "Backup Criteria..." Window

This window has two main regions containing check boxes that allow different settings to be toggled on or off. On the left side of the window is the "Backup files if they..." region. In this region you can define what criteria Universe Master should use to determine when a file needs to be backed up. On the right side of the window is the "When backing up files..." region. This region provides four options that if selected will execute each time a file is backed up.

The "Backup files if they..." Region

Several options are available to choose from:

changed since last backup

When this option is checked, only files that have been modified since the last time they were backed up will be backed up. To determine if the file meets this criteria, Universe Master compares the modification date of the file that is selected against the modification date of the file with the same name that resides in the destination folder. If there is no file with the same name in the destination folder, the source file automatically meets this criteria.

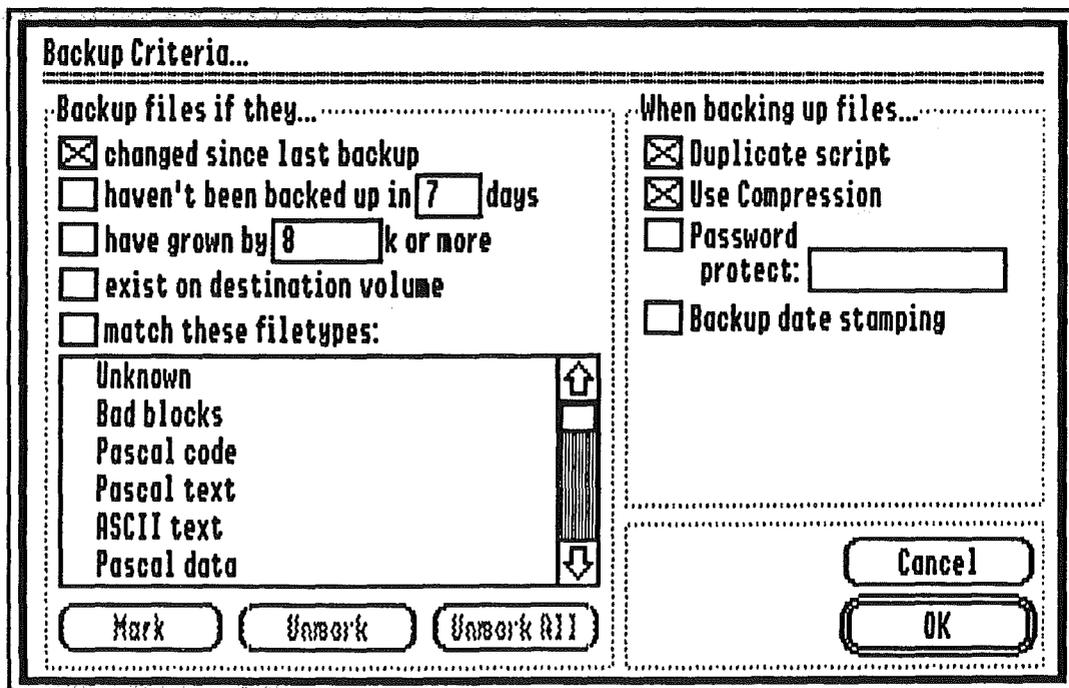


Figure 55. The "Backup Criteria..." window.

Section 5 - Menu Bar Reference

haven't been backed up in _____ days "

If the box next to this choice is checked, then you must also type in a number of days in the edit field that precedes "days." You can enter any number of days from 0 to 999. If something besides a valid number is entered, Universe Master will use 0 for the number of days. Universe Master will back up the files only if the specified number of days have elapsed since the last backup. For instance, if you specify 7 days and enabled this option, the files in the script will only be backed up once a week irregardless of how many times the script is executed.

have grown by _____ k or more "

If the box next to this choice is checked, then you must also type in the number of desired kilobytes in the edit field that precedes 'k'. Any number from 0 to 99999 can be entered. If something besides a valid number is entered, Universe Master will use 0 for the number of kilobytes. Notice that the number you enter is in kilobytes. For instance, if you enter the number 10, then the number of bytes Universe Master will be using for comparison is approximately 10000 (1k bytes = 1024 bytes). Universe Master determines how many bytes

the file has grown since it was last backed up by finding the difference between the size of the file to be backed up and the backup file found in the destination folder. If this difference is greater than or equal to the number entered in the number of bytes edit field, then the file meets the criteria. If no backup file is found in the destination the source file automatically meets this criteria.

exist on destination volume "

Universe Master looks in the destination volume for a file with the same name as the one to be backed up. If such a backup file exists there, then the source file meets the criteria.

match these filetypes "

The filetype of selected source files is compared to the filetypes marked in the window below this choice. If the filetype of the selected source file is one of the filetypes marked, then the source file meets this criteria. In order to toggle the status of a filetype (marked/unmarked) you can double click on it, or select the filetype and then click on either the "Mark" button or the "Unmark" button. A check mark will appear to the left of all files that are marked. Clicking on "Unmark All" unmarks all currently marked filetypes.

Universe Master

The 'When backing up files...' Region

This region gives you four options on how the files that meet all criteria are to be backed up. The options are enabled by means of check boxes. The four available options are:

Duplicate script "

Universe Master places all scripts that you create in the "Backup.Scripts" folder located with the Universe Master application itself. When scripts are executed, they are executed from within this folder. Selecting the "Duplicate script" option tells Universe Master to place a copy of the executing script along with your backed up data. This ensures your ability to restore data even if your original scripts become lost or damaged.

Use Compression "

When this option is selected, the files will be backed up in a compressed format. Compressing files greatly reduces the amount of disk space they occupy. The algorithms used by Universe Master result in an average compression rate of 50%.

Password protect: _____ "

This option allows you to encrypt your backups by supplying a password. When this option is selected you must supply a password in the edit box next to "Protect:". When the password is entered you will not see the letters that you are actually typing (for security reasons), so avoid typographical mistakes or misspellings. An additional prompt for the password comes up when you attempt to close the "Backup Options" dialog by pressing the "Okay" button located on the bottom right hand of the dialog window. This is to verify that you know your password and that no errors were made when entering the password. If both passwords match, the window will be closed. If they do not match, a dialog window informs you of this and the "Backup Options" dialog window remains open. At this point, you can type your password in the edit box once again.

WARNING! Once files are encrypted, the only way they can be retrieved in a readable format is by decrypting them by using the same password. Files that are encrypted must be decrypted using Universe Master. If you forget your password you will not be able to decrypt your files! We cannot help you if this happens, since we don't know the password either! This option should be used with great care. If you generate a script with password protection enabled, you must supply the password each time you run the script. You must also supply the password when editing a previously created script that has the password protection option enabled.

Section 5 - Menu Bar Reference

Backup date stamping"

When this option is selected, Universe Master adds a resource to the files being backed up which records when the backup is taking place. When cataloguing hierarchies using the "Print" command button, you can specify that this date is printed next to each file. This feature will give you immediate indication of when a file was last backed up. You can also determine when a file was last backed up by using Finder's file information dialog and viewing the file's comment field.

WARNING! We do not suggest you backup date stamp any ProDOS 8 files since doing so would render these files unusable to ProDOS 8 applications.

When done making your selections in the "Backup Criteria" window press the "Okay" button to return to the main script edit window..

The Folder Region

At the bottom of the "Backup Script Editor" dialog are two buttons: "Remove Folder...", and "Add folder". To remove a folder from your source you must first select it from the source list (located above the buttons) and then press the "Remove Folder" button. To add a folder to your source press the "Add Folder..." button. A dialog will appear, where you may select a folder to be added.

After all desired changes have been made to the script, press the "Save Changes" button. If you wish to leave everything as it was before editing the script, press the "Cancel" button.

"Backup..."

Allows for selection and execution of an existing backup script. A standard file dialog pops up and prompts you to select a backup script from the "Backup.Scripts" folder. You can also select a script from another folder by using the "Volumes", "Open", and "Close" buttons to locate and open it. After selecting the script, press the "Open" button and Universe Master will execute it.

"Restore..."

Allows for restoration of files previously backed up. A standard file dialog pops up and prompts you to select the backup script that was used to backup the original files. After selecting the script, press the "Open" button. The "Restoration Criteria..." window (see figure 56) appears and allows you to choose the "Restore options" and the "Prompt options".

Universe Master

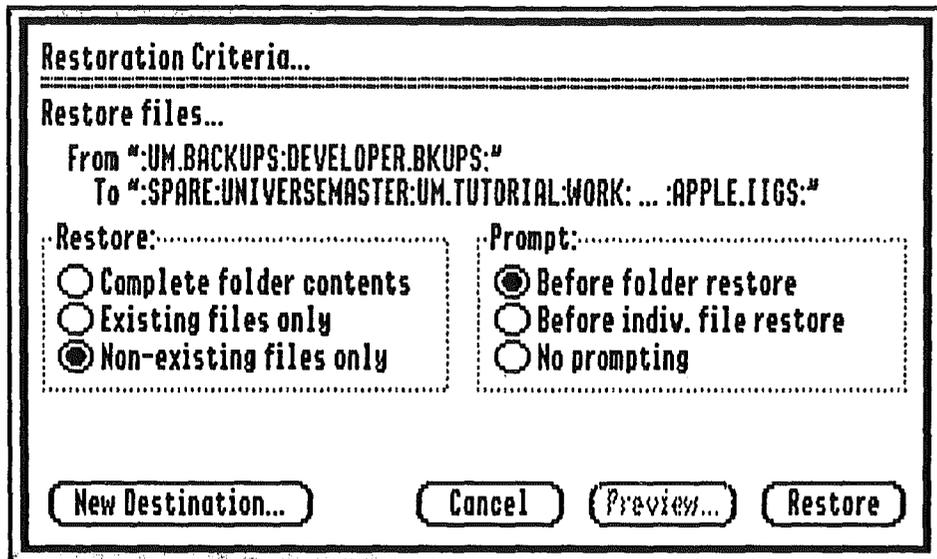


Figure 56. The "Restoration Criteria..." window.

"Restore" Options

Complete folder contents"

Universe Master will attempt to restore every file that was backed up with the script.

Existing files only"

The only files to be restored are those that already exist in the branch where the restored files are to be copied. These files are overwritten with the backup files.

Non-existing files only"

The only files to be restored are those that do not exist in the branch where the restored files will be copied.

Section 5 - Menu Bar Reference

"Prompt" Options

Before folder overwrite"

You will be prompted before existing folders are to be restored.

Before indiv. file overwrite"

You will be prompted before each existing file is overwritten.

No prompting"

Folders and their contents will be overwritten without any prompting. Use this option carefully!

You may also select a different destination than that of the original files by pressing the "New Destination" button. After this button is pressed, a standard file dialog pops up where you can select the new destination and then press the "Accept" button. After pressing the "Accept" button, the window closes and returns you to the "Restoration Criteria..." window, with the new destination path being displayed at the top of the window.

When done making all your selections, press the "Restore" button and Universe Master will perform the restoration, and return you to the Universe Master window.

Universe Master

The "Folders" Menu



"Create..."

Using the standard file interface, this item allows you to create and name a new folder in any location so desired. You first select the location for the new folder (by means of the standard "Volumes", "Open", and "Close" buttons), press the "New Folder" button, enter a name for the folder, and press the "Okay" button. You can create as many new folders as you wish. When finished, press the "Done" button to exit this option.

"Sort..."

This option allows you to sort files in any desired location, offering three sort criterias. You first select the location to be sorted and press the "Accept" button. Figure 57 shows you the dialog that appears. On the left side of the dialog window is the list containing all items that will be sorted. When you are done sorting, you can view the sorted results in this list. On the right side of the window you can define the "Sort Criteria".

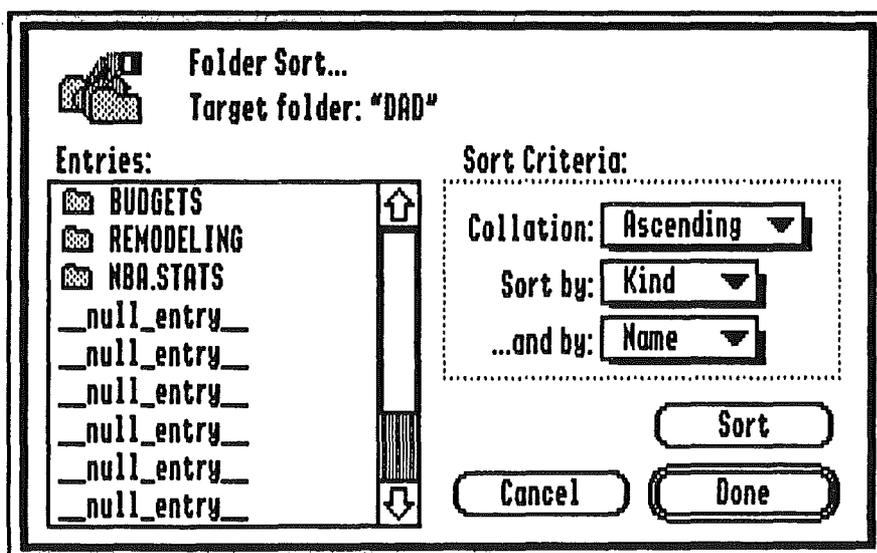


Figure 57. The "Folder Sort..." dialog window.

Section 5 - Menu Bar Reference

Sort Criteria

"Collation"

"Ascending" - Files to be sorted in ascending order.

"Descending" - Files to be sorted in descending order.

"Sort by"

"Name" - Use filename for primary sort.

"Kind" - Use file kind for primary sort.

"Size" - Use size of file for primary sort.

"Date" - Use last modification date of file for primary sort.

"...and by"

"Name" - Use filename for secondary sort.

"Kind" - Use file kind for secondary sort.

"Size" - Use size of file for secondary sort.

"Date" - Use last modification date of file for secondary sort.

When you are done selecting the sort criteria, press the "Sort" button and Universe Master will perform the sort, and display the results in the list. When finished with sorting, you can press the "Done" button to exit this function.

"Edit..."

WARNING! You should not use this menu option to modify attributes unless you are familiar with the ProDOS file system. This option allows the knowledgeable user to perform a low level edit of the folder structure in order to correct errors in one or more of its entries.

You must first select the desired folder (using the standard "Volumes", "Open" and "Close" buttons), open it and press the "Accept" button. You are then presented with a window that allows you to scroll through the folder structure, one entry at a time (see figure 58).

On the left side of the window is displayed the following information:

"Absolute block"

The directory actual block number on the media in which this entry is stored.

Universe Master

"Relative block"

The relative block number in the directory thread in which this entry is stored.

"Entry"

The relative entry number in the ProDOS file system, there are 13 entries per block. The very first entry in a directory thread cannot be edited by this function.

"Inactive Entry/Active Entry"

Indicates whether this entry represents a deleted file.

Entries in "BUDGETS"	
Absolute block: \$2394	Storage type: \$57
Relative block: \$0000	File name: January
Entry: 1 of 12	File type: \$50
Active Entry	Aux. type: \$5445
	Access: \$E3
	Creation date: 4/9/92
	Creation time: 2:10 PM
	Mod. date: 4/9/92
	Mod. time: 2:10 PM
	Key pointer: \$2395
	Head pointer: \$2394
	Blocks used: \$0005
	EOF: \$000200

Revert Entry Apply

Figure 58. Folder entries may be edited from this window.

Section 5 - Menu Bar Reference

On the right side of the window are thirteen fields representing the fields of each folder entry as actually stored on disk. These fields are as follows:

"Storage type"

The method in which the data is stored on disk. Note that the low four bits indicate the filename length.

"File name"

Up to fifteen characters denoting the name of this entry.

"File type"

The general type of data stored in this file.

"Aux. type"

The specific type of data stored in this file.

"Access"

Access attribute flag. Each bit in this byte has a specific meaning.

"Creation date"

Date the file was created.

"Creation time"

Time the file was created.

"Mod. date"

Date the file was modified.

"Mod. time"

Time the file was modified.

"Key pointer"

Block number where the first block of the file structure for this entry is stored.

"Head pointer"

Block number of the first directory block of the directory thread that contains this entry.

"Blocks used"

Number of blocks in use by this entry's file structure. Note: If this entry has an EXTENDED storage type, this number DOES NOT reflect the total number of blocks used by this file.

Universe Master

"EOF"

Logical number of bytes used by this entry's file structure. Note: If this entry has an EXTENDED storage type, this number DOES NOT reflect the total number of blocks used by this file.

Six buttons are located on the left side of the screen, below the list (see figure 59). Use the arrows to scroll through the entries. Once you make a change to one of the attributes you may press the "Apply" button to make the change permanent. If you wish to "undo" any changes you have made, press the "Revert Entry" button. Note that the "Apply" button will make permanent the changes made to any and ALL entries of the folder structure. However, the "Revert Entry" button causes the current entry only (the one being displayed) to revert to the state it was in when you first invoked the "Edit" option from the "Folders" menu.

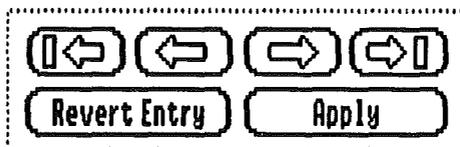
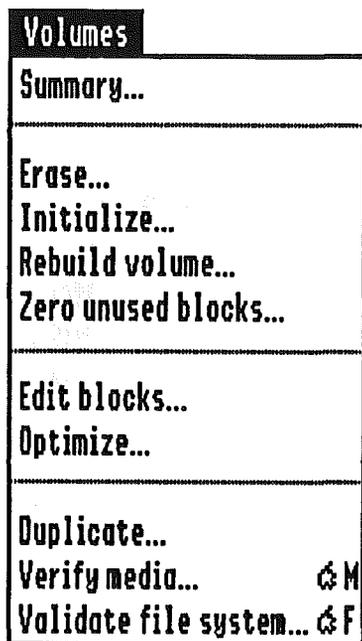


Figure 59. These six buttons reside on the left side of the window, below the list of files.

Section 5 - Menu Bar Reference

The "Volumes" Menu



"Summary..."

This function displays information on the volumes currently online. The summary window that appears displays basic information of the online volumes (figure 60). Information for any offline volumes will also be displayed, but dimmed. There are five entries for the online volumes:

"Device"

The name of the device (i.e., ".APPLEDISK3.5A", ".CONSOLE").

"Volume"

The name of the volume mounted on the respective device (i.e., "Applications", "Data").

"File System"

The file system that the volume was formatted under (i.e., "ProDOS/SOS", "AppleShare").

"Total Blks"

The storage capacity of the device, in blocks.

"Blks Free"

The number of blocks on the device that are not in use.

Universe Master

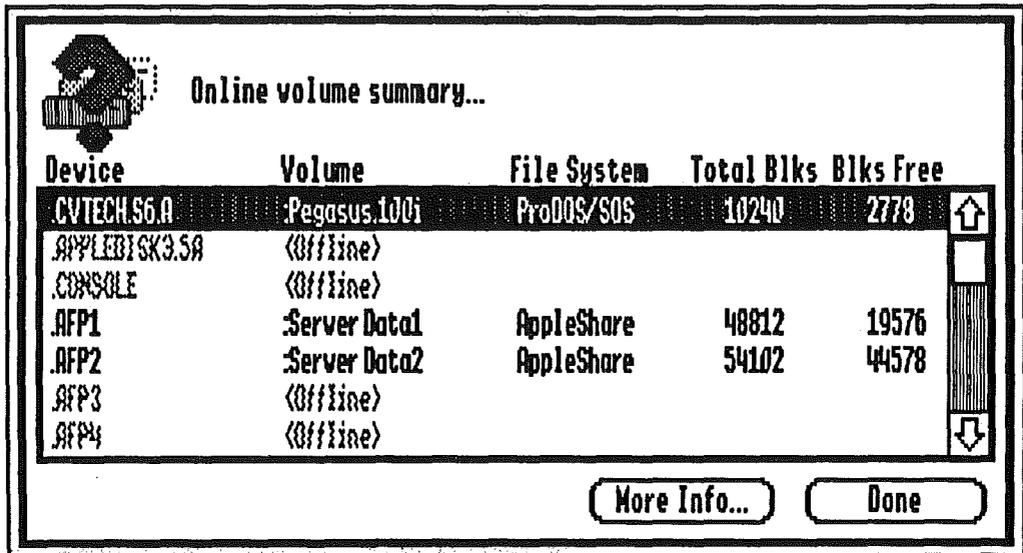


Figure 60. The "Online volume summary..." dialog window.

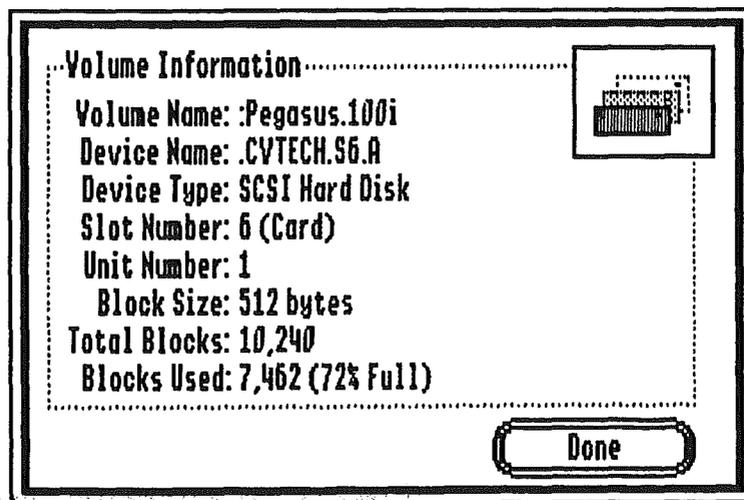


Figure 61. The "Volume Information" dialog window.

Section 5 - Menu Bar Reference

To obtain more information on any of the online volumes, press the "More Info..." button. The "Volume Information" window that appears (see figure 61) displays the following information regarding that volume:

"Volume Name"

Logical volume name.

"Device Name"

GSOS device name assigned by the device's driver.

"Device Type"

The type of device, e.g., Hard Disk, RAM Disk, etc.

"Slot Number"

The slot number in which a device's interface is located. Whether or not the interface is a card or a built-in port is also indicated in parenthesis.

"Unit Number"

A number associated to a specific device by the device's interface.

"Block Size"

The number of bytes stored per block on the chosen device, usually 512.

"Total Blocks"

The total block capacity of the device.

"Blocks Used"

Number of blocks claimed by files and folders on this volume, and the percentage of total blocks that it represents.

"Erase..."

Allows you to erase the entire contents of the volume you select.

WARNING! Pressing the "Erase" button causes Universe Master to re-initialize the root folder and the volume bitmap. This is functionally the same as deleting all entries in the root folder, including folders and their children. If a volume is accidentally erased, "Rebuild Volume" (described in this menu option) can usually restore the volume. If files have been copied to the volume since it was erased, you will have to do an orphan scan instead of a "Rebuild Volume" (see "Validate File System" under the "Volumes" menu) to possibly recover lost files.

Universe Master

The window that appears allows you to select the volume you wish to erase. There are two buttons available here: "Accept" or "Cancel". "Cancel" exits the erase window. "Accept" pops another window that allows you to name the volume and define the type of file system to place on the volume. This window also shows the size of the volume. Two buttons at the bottom of the window allow you to either "Cancel" the function or continue and "Erase".

"Initialize..."

Allows you to format the entire volume you select. Initialize will physically format the selected volume.

<p>WARNING! All data on the volume will be lost. This function should only be used in two cases: To initialize a new volume or reformat a volume that is giving data errors.</p>

The format window that appears allows you to select the volume you want to format. There are two buttons available here: "Accept" or "Cancel". "Cancel" exits the initialize function. "Accept" pops another window that allows you to assign a new volume name, and the file system to place on the volume. This window also shows the size of the volume. Two buttons at the bottom of the screen allow you to either "Cancel" the function or continue and "Initialize".

"Rebuild volume..."

This function reconstructs some critical components of the file system. It is **NOT** used for disk maintenance and should only be used in the situations listed below. Its purpose is to make a volume that has been damaged so badly that it is not recognizable to GSOS, recognizable once again. For this reason, "Rebuild volume..." lets you choose any device to be reconstructed, even if there is no volume mounted on the device. Once a volume has been reconstructed and made recognizable, you can use "Validate file system" (under the "Volumes" menu) to determine if there are any additional problems.

There are only three situations in which this function should be used:

1. To make a volume bootable.

A ProDOS volume stores special information in blocks 0 and 1 which enables it to boot. Regardless of whether or not a bootable system exists on the volume, you should either get an "UNABLE TO LOAD PRODOS" message or the standard Apple IIgs boot screen when attempting to boot a volume. If neither is the case, then this special information in blocks 0 and 1 have possibly been corrupted and you should use Universe Master to make the volume bootable again. Universe Master does this by placing the proper information in blocks 0 and 1.

2. GS/OS cannot recognize the volume stored on the particular device.

This usually occurs when the volume header gets corrupted. The volume header contains information such as the volume name, volume size, the bitmap location, and various other information regarding

Section 5 - Menu Bar Reference

the file system stored on the device. Universe Master can make a volume recognizable to GSOS by restoring this header to a generic state.

3. When the root directory of a volume has become corrupted.

The ProDOS file system uses blocks 2 through 5 on the device to store the volume's root folder. If any one of these blocks becomes overwritten or damaged in some other way, you will not be able to access any files on the volume. Universe Master can reconstruct a root folder by scanning the entire volume for child folders with a parent reference to blocks 2, 3, 4, or 5. If it finds such a folder, it creates an entry in the root folder that references the found child. This usually results in total volume reconstruction. However, any files stored in the root folder will not be recoverable (this is a good reason to avoid storing files in the root folder).

Reconstructing The Volume

The first window to appear after you choose the "Rebuild volume..." option allows you to select the volume you wish to reconstruct. Next, press the "Accept" button and the window in figure 62 appears. Three check box selections appear in this window:

"Make volume bootable"

When checked, Universe Master places boot code in blocks 0 and 1 of the specified device.

"Restore root folder"

When checked, Universe Master completely reconstructs the root folder of a volume, rebuilding the volume header and all folder entries. Folder entries are reconstructed by scanning the device for folder structures that are children to the root directory. This function is the most common repair method that is used when a volume is unrecognizable to GS/OS and/or the root folder has become damaged.

"Rebuild volume bitmap"

When checked, Universe Master completely rebuilds the volume bitmap based upon the file and folder entries in the root folder. This is done by traversing each and every file and folder structure on the volume and marking the blocks used by those structures in the volume bitmap. If a volume needs to be reconstructed, and you are reasonably assured that the volume bitmap has not been damaged, you can deselect this option to considerably increase the speed at which reconstruction is performed.

Note: After any volume reconstruction it is suggested that you use the "Validate file system" function to validate the integrity of the file system on the volume.

After checking the desired selections, press the "Rebuild" button. Universe Master rebuilds the volume, showing you the progress with a dialog, and returns you to the Universe Master window.

Universe Master

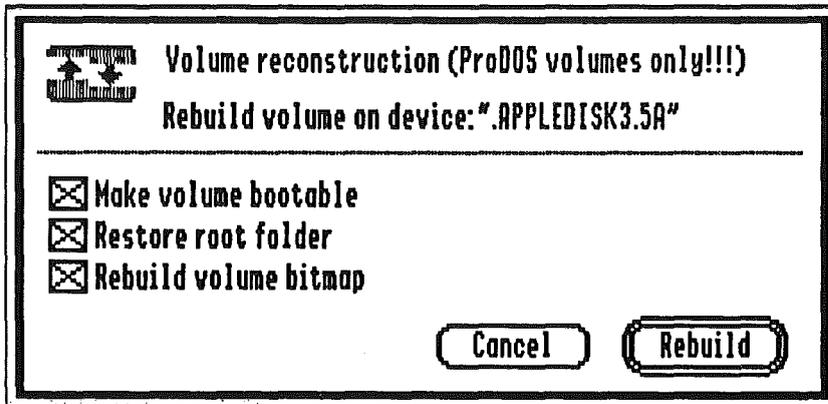


Figure 62. The "Volume reconstruction" dialog.

"Zero unused blocks..."

Fills all blocks that are unclaimed by any file with zeros. This function will get rid of any erroneous file remnants from data that has been previously stored on the volume. Having unused blocks frequently zeroed is helpful if the situation arises where you need to rebuild a volume or hunt for orphaned files. This is because having unused blocks filled with zeroes will prevent Universe Master from detecting erroneous data as valid orphaned structures.

The window that appears contains a list where you select the desired volume and then press the "Accept" button. A message will warn you that any deleted files or orphan structures will be unrecoverable; this is normal and is explained in the above paragraph. After pressing "Continue", Universe Master will zero the blocks and return you to the Universe Master window.

This function is a regular part of disk maintenance and should be performed on a regular basis.

Section 5 - Menu Bar Reference

"Edit blocks..."

WARNING! The block editor is an option that must be used with great caution! This option gives you the ability to perform a low level edit of the data blocks stored on the selected volume.

After this menu selection is chosen a window appears where you must first select a volume from the list displayed. Next, you must press the "Accept" button, which brings up the window shown in figure 62. This window displays the contents of one block, and allows for its modification.

Blocks on "Pegasus.100i"			
Block #:	◀ \$000000 ▶	Quick Jump	<input type="checkbox"/> Marked
000:	013880034C1C0978	8643C903088A2970	'880BL xBCI000)p' ↑
010:	4A4A4A4A09C08549	A0FF844828C8B148	'JJJJ @BI BH(H1H'
020:	D03AB00EA9038D00	08E63DA54948A958	'P: 00)0 .0f=%IH)['
030:	486085408548A05E	8148999409C8C0EB	'H'000H ^1H0& H0k'
040:	D0F6A2068C32098D	390999F2098D4009	'Pv"0<2 =9 0r =@ '
050:	9D7F0ACA10EEA909	8549A986A000C9F9	'0 0J0n) 0I)0 .Iy'
060:	802F85488460844A	844C844E8447C884	'0/0H0' 0JL0N0G0H0'
070:	42C88446A90C8561	854B202709B066E6	'B00F)00a0K ' 0ff'
080:	61E661E646A546C9	0690EFAD000C0D01	'0f0ff%FI000-. 0 0'
090:	0CD052A904D002A5	4A186D230CA8900D	'0PR)0P0%J0m00(0 '
0A0:	E648A5484AB006C9	0AF071A004844AAD	'fK%KJ00I0pa 00J-'
0B0:	2009290FA8B14AD9	200900D88810F6AD	')0(1JY P(00v '
0C0:	16B14A4A6D1F098D	1F09A011814A8546	'01JJm0 0 01J0F'
0D0:	C8B14A8547A90085	4AA01E84488461C8	'H1J06). 0J 00K0aH'
0E0:	844D202709B035E6	61E661A44EE64EB1	'0M ' 05f0f0\$NfN1'
0F0:	4A8546B14C854711	4AD018A201A900A8	'J0F1L0G0J00"0). (' ↓

Figure 62. The block editor window.

The first column in the window represents the displacement into the block. The next two columns give the hexadecimal representation of the data stored on the block. The last column gives the ASCII representation of the data stored on the block. On top of the window, after "Block #:", is the block number on the device you are editing. The left and right arrows decrement and increment the block number respectively. The field where the block number is shown can be edited to allow you to jump to the desired block. You can enter decimal or hexadecimal numbers, but you must precede

Universe Master

hexadecimal numbers with a dollar sign, such as "\$1A". Press the return key to perform the jump.

The "Marked" check box allows you to mark the block you are editing for later reference. Checking the box adds the block to the "Quick Jump" menu. The "Quick Jump" menu displays all block numbers that have been marked. Selecting any one of its items will quickly load the respective block number into the block editor, making that block the current block to be edited.

Editing The Block

To edit a byte, simply click on it and enter the desired values from the keyboard. You can select a range by dragging the cursor through the range. Any values that you enter when a range is selected will affect the entire range. For example, if a range is selected and you press "00", the entire range will be zeroed. You can use the mouse or the arrow keys to navigate through the blocks.

Saving Changes

All changes are stored in memory until you select "Save" from the "File" menu. If you attempt to close a window without saving changes, you will be asked if you wish to "...leave without applying changes?" Your options are "Cancel", "Leave" or "Apply".

"Optimize"

This option will not be available in version 1.0. If you purchased version 1.0 you will receive an update that includes "Optimize".

"Duplicate..."

This functions performs a block level copy of the data stored on one device to another device. There are three reasons you would use this function:

1. To duplicate an entire volume, since it is faster than a file copy.
2. To duplicate a volume on which you will be performing activities which may lead to data loss or data corruption. For example, if you were performing an "Optimize" on a volume and your computer loses power, your data could be seriously corrupted. If you "Duplicate" your volume prior to optimizing the disk, you will have a complete copy if you should need to restore the disk image.
3. If you have a volume that is damaged due to a physical problem with the media, you can duplicate the volume to another device, and attempt to recover data from the new device.

Section 5 - Menu Bar Reference

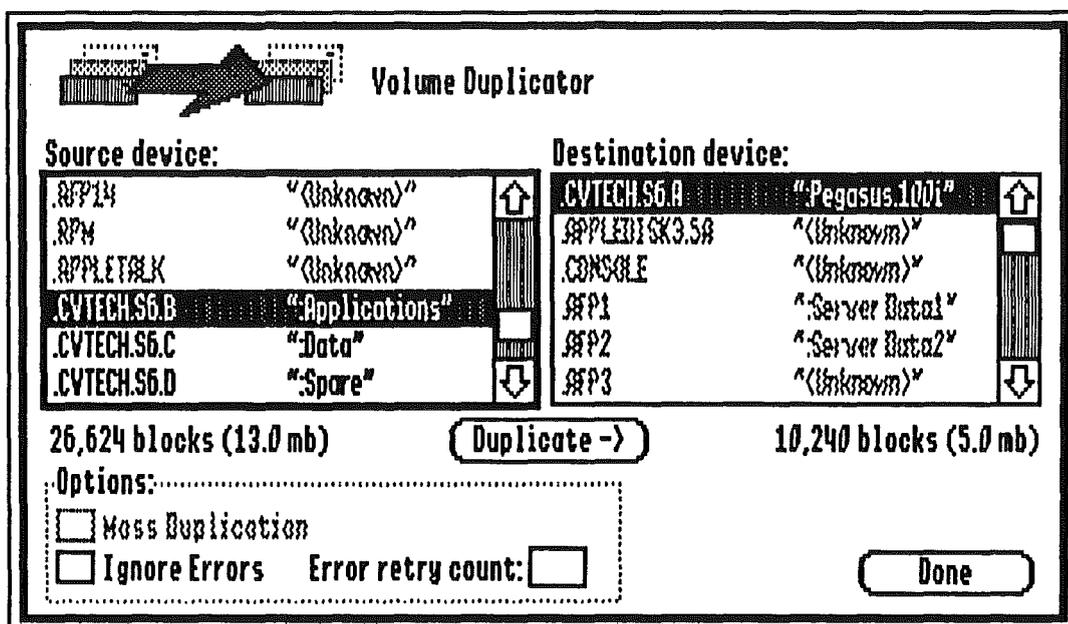


Figure 63. The "Volume Duplicator" window.

Figure 63 shows the "Volume Duplicator" window. On the left side is the source list, and on the right side is the destination list. You must first select your source and destination. Below the source list are three options:

"Mass Duplication"

If this option is enabled (checked) and there's enough free RAM on your system to contain the entire disk image, then the duplicator will keep the disk image in memory allowing you to quickly duplicate multiple copies of a single source volume.

"Ignore Errors"

If you are duplicating a volume that has damaged media, this will result in Universe Master ignoring block read errors. Universe Master will write blocks full of zeros on the destination for each block that cannot be read on the source.

"Error retry count"

The number of times Universe Master will attempt to read a block that is returning I/O errors. This is useful in some cases where the media damage is marginal, i.e., it may return errors on one attempt to read, but perform perfectly on another.

Universe Master

After you are done selecting your source, destination, and options, press the "Duplicate" button and Universe Master will perform the function and return to the "Volume Duplicator" window. Press the "Done" button when you have finished the duplications.

"Verify Media..."

Checks for physical errors on the chosen volume; i.e. scratched disk surfaces, magnetic influences, crashed heads. The first window to pop up allows you to select the volume to be verified. You can then press one of two buttons: "Accept" or "Cancel". When the "Accept" button is pressed another window appears (see figure 64). On the left side of this window is the "Options" region, and on the right side is the "Bad Blocks" region.

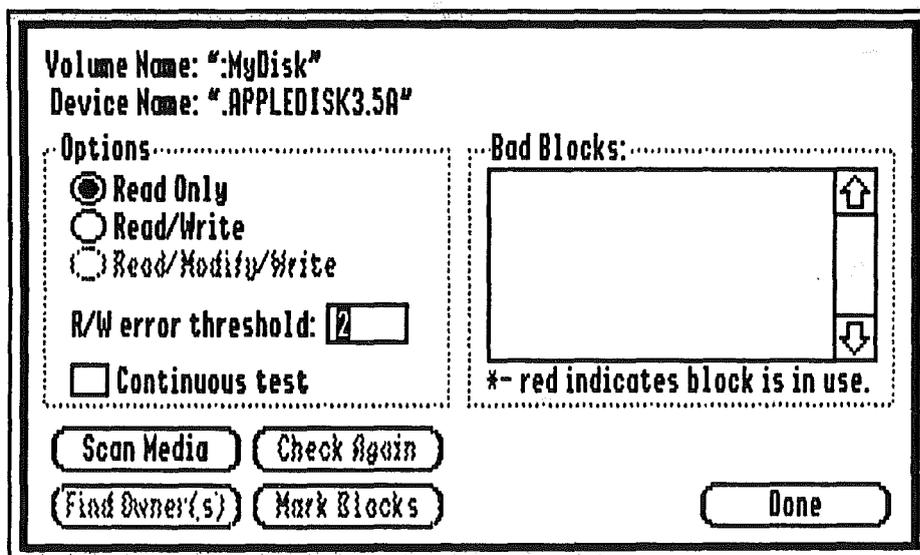


Figure 64. The media scan window.

The "Options" Region

Five options are available from the "Options" region for verifying the media:

"Read Only"

This option will only verify that the volume can be read from. It will not damage any of the data.

Section 5 - Menu Bar Reference

"Read/Write"

This option verifies that the disk can be read and written to. This option could potentially damage your data if there are indeed physical problems with the disk - so use it carefully!

"Read/Modify/Write"

This option could also potentially damage your data. It verifies each and every single block on the volume. The data on each block is read into memory, after which Universe Master writes a known bit pattern onto the block, reads this pattern back in and checks that it has not been altered in any way, and finally replaces the original data that was on the volume. Should there be a problem with the block, the final attempt to restore the original data could fail and your data will be corrupted - so again, use this option with care!

"R/W error threshold: _____"

The number in the edit field indicates the number of attempts Universe Master will make to read or write a block of data. By default this number is set to 2, but you may change it to any number from 1 to 9.

"Continuous test"

When checked, Universe Master will continuously test each and every block on the device, until the "Stop" button is pressed from the status window Universe Master displays as it performs the verification (see figure 65).

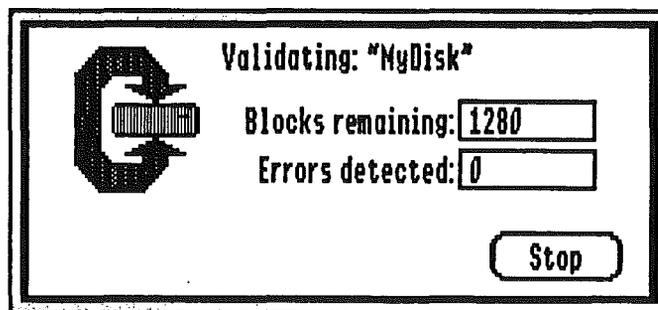


Figure 65. Universe Master displays this window as it verifies the disk.

The "Bad Blocks" Region

The "Bad Blocks" region contains a list that will display information on any bad blocks found during a media scan. It will list the block number, the number of times the error has been encountered, and the type of error. See figure 67 for an example of a bad block list after bad blocks have been found.

Universe Master

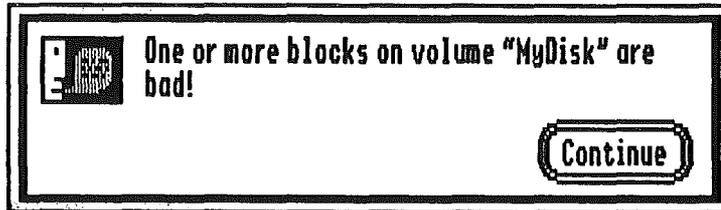


Figure 66. If bad blocks are found, this message will be shown.

Bad Blocks:			
658	:1	Read Error	↑
680	:1	Read Error	
714	:1	Read Error	↓

*- red indicates block is in use.

Figure 67. This "Bad Blocks" list three blocks with read errors.

Verifying the Media

To begin the verification press the "Scan Media" button located under the "Options" region. A small window pops up and displays the number of blocks remaining and the number of errors detected (figure 65). When this verification is finished, a message will appear telling you if any errors were found. If any errors were discovered, the dialog shown in figure 66 will appear and you should press the "Continue" button. If no errors were found, the message "All blocks on volume *volumename* are good."; press the "Okay" button to close this message window. If any errors were found, you can use the other three buttons under the "Options" region:

"Check Again"

This button will perform the same verification again. By performing the verification more than once you can get an idea of whether an error is marginal (i.e., a magnetic error might show up in one verification but not in another). If the same block consistently checks as bad, you might want to mark the block (see "Mark Blocks" below) so that it will not be used anymore.

Section 5 - Menu Bar Reference

"Find Owner(s)"

This button will find the owners of the bad blocks. That is, which files have data residing in the blocks. If strange or inconsistent errors show up when using these files, then a media error is probably the problem. The window that appears and shows you the owners of the bad blocks (see figure 68) gives you the choice, through the "Recover" button, to attempt to recover the data. However, the data might be beyond saving so there is no guarantee it can be recovered (have you been backing up your data regularly?).

Pressing the "Recover" button causes the standard put file dialog to appear, which allows you to select a location where the file's data will be recovered to. This location can be on any volume except the one that contains the damaged blocks. Press the "Save" button when done with the recover.

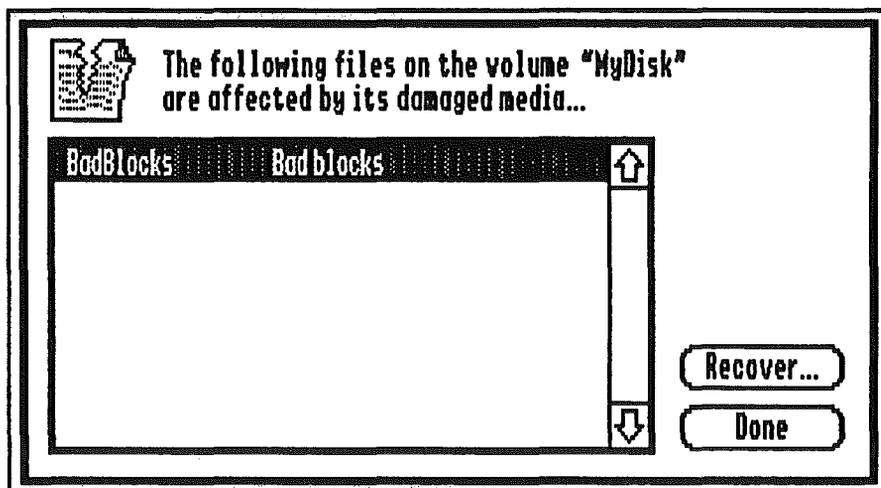


Figure 68. This list shows the files that have data residing on the bad blocks. After the first scan, the bad blocks were marked. This is the results of performing the scan a second time and using the "Find Owners" option. Universe Master created a file named "BadBlocks" and made it reference each block that was detected as bad.

"Mark Blocks"

Use this button to mark bad blocks so that the operating system will not attempt to use the bad blocks in the future. If the bad blocks are on a floppy disk we suggest you backup the entire disk onto another disk or hard drive, and throw out the suspect disk. You could format the bad floppy disk and this might get rid of your problem - but it is up to you to decide if you want to take the chance of losing data in the future, or spend 75 cents on a new disk.

Universe Master

Press the "Mark Blocks" button to execute this function. Universe Master will create a file named "BadBlocks", whose file structure references each block that has been detected to be bad. This prevents other data from being written to the bad blocks.

When you are finished working with this function, press the "Done" button.

"Validate file system..."

With this option you can check the logical integrity of folder structures and file structures. The first step is to select one of the volumes in the list being displayed and press the "Accept" button. Figure 69 shows the next window to appear.

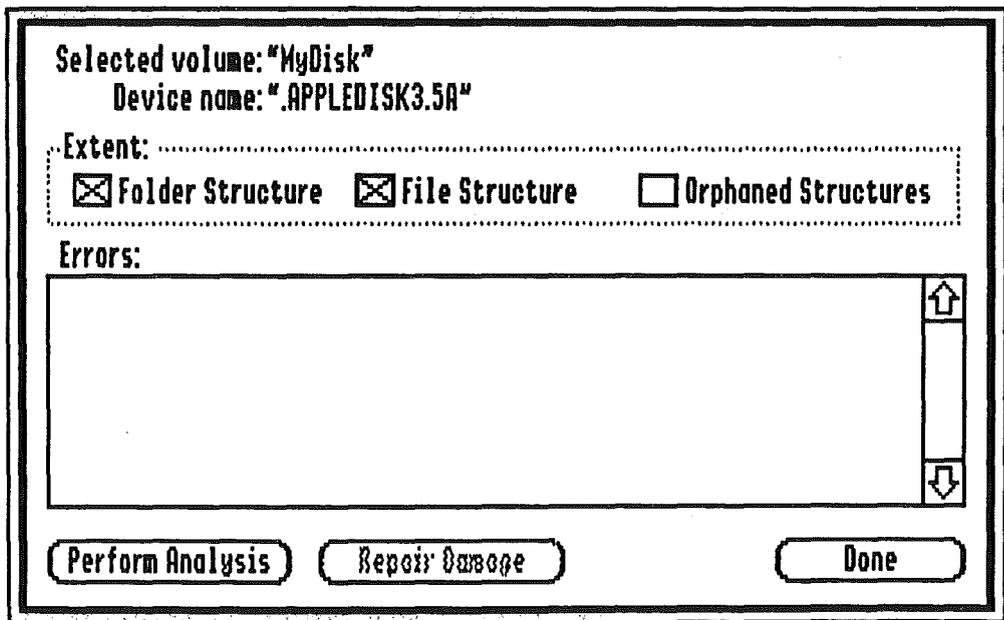


Figure 69. The main window for the "Validate file system" function.

At the top of the window is the name of the selected volume and device. Following this is the "Extent" region. Three check boxes are available in this region:

Folder Structure

Causes Universe Master to check the logical integrity of all folder structures when performing the analysis. This includes checking the validity of any file/folder entries within the folders being scanned.

Section 5 - Menu Bar Reference

File Structure"

Causes Universe Master to check the logical integrity of all file structures when performing the analysis. When this option is checked, the "Folder Structure" option is automatically selected, since folder structures must be checked as part of checking file structures.

Orphaned Structures"

Causes Universe Master to look for orphaned structures folder and file structures.

When you have made your "Extent" selections, press the "Perform Analysis" button. Universe Master will then traverse the entire file system (all the data stored in the volume) to perform the analysis.

When finished with the traversal, Universe Master displays the following information on the status of your volume: "Folders Traversed", "Files Traversed", "Blocks Validated", and "Errors Encountered" (see figure 70). Press the "OK" button to close this window. Any errors found will be displayed in the list located below the "Extent" region. All possible errors are listed in Appendix C.

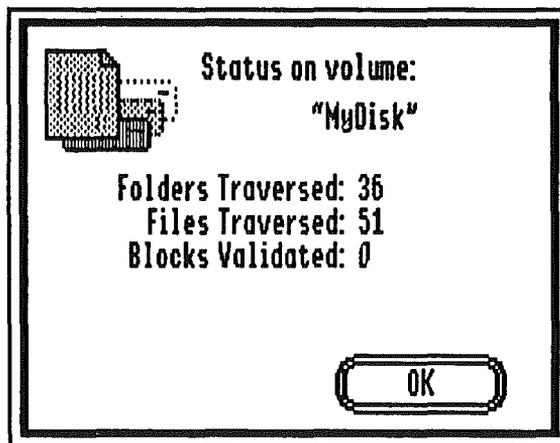


Figure 70. This window displays the status of the volume that has just been scanned.

Universe Master

If any errors were found, and you wish to correct them, press the "Repair Damage" button. Universe Master attempts to perform the repairs and, depending on the results, displays one of four messages:

1. "All of the errors have been repaired on this pass. You must still click "Perform Analysis" again to see if any other errors have been uncovered as a result of these repairs..." (See figure 71.)
2. "Some repairs have been made but there are *x* errors that had to be ignored to allow for these repairs. Click "Perform Analysis" again to repair any remaining problems with the file system.
3. "Some repairs have been made but there were *x* errors that could not be repaired. Consult the Universe Master manual for what course of action you may take."
4. "There were *x* errors that could not be repaired. Consult the Universe Master manual for what course of action you may take."

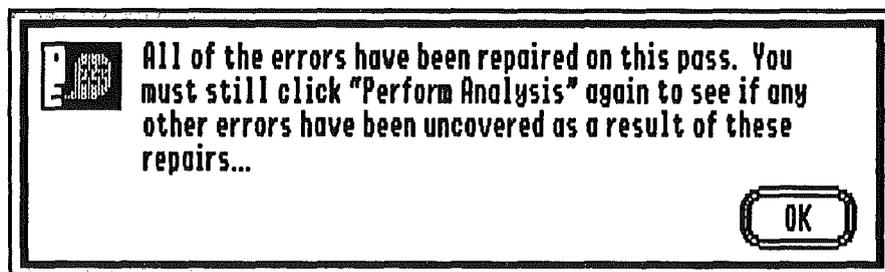


Figure 71. One of four possible messages to be displayed after an attempt to "Repair Damage".

Unrepairable Errors

If either the third or fourth message as described above was displayed when you performed the analysis, it means that Universe Master has encountered errors that it doesn't know how to repair. The error messages themselves should give you an indication of where the problem lies. This allows you to make an attempt to manually correct the file system.

Making repairs manually requires an in-depth knowledge of the ProDOS file system, which is beyond the scope of this manual. However, if unrepairable errors are encountered and Universe Master reports a specific file or folder name as the cause, you can usually repair the file system by deleting the suspect entry. Keep in mind that by deleting the entry, **YOU WILL BE LOSING DATA**. You should thus first attempt to remove any important files from the volume before you delete the suspect entries.

Section 5 - Menu Bar Reference

Deleting damaged file or folder entries is not as straightforward as it may sound. You cannot simply choose "Delete one file" from the File menu because this function asks the operating system to delete the file. GS/OS may refuse to delete a damaged file or folder because of the very fact that it is damaged. The sure way of deleting a file or folder is to follow the steps below:

1. Select "Edit" from the "Folders" menu.
2. Open the parent folder of the entry you wish to delete and click the accept button.
3. Scan through the entries in the folder, looking for the file or folder you wish to delete.
4. When found change its storage type to "\$00".
5. Save the changes by clicking the "Apply" button.
4. Validate the file system again. This will cause the volume bitmap to be corrected to its proper state.

Remember that manually editing the file system can cause serious damage to your volume. If you have any doubts, don't act hastily, feel free to give our technical support a call to verify that the changes you

Universe Master

The "Windows" Menu

"Stack"

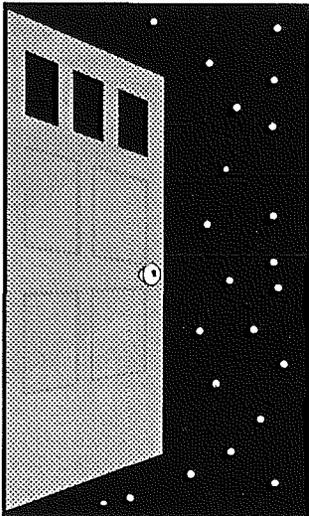
Stacks all windows so that you can see all currently open windows.

"Home"

Places all windows at their original location.

"Universe Master"

Makes the Universe Master window active and brings it to the front.



Section 6

Data Loss Survival Guide

Section 6 - Data Loss Survival Guide

Be Prepared

Losing data on your hard drive (or any media, for that matter) is a fact of life. Be it an accidentally deleted file, a mild file system corruption or a total hardware failure, it is going to eventually happen. There are two keys to walking away from a data loss experience (*DLE*) with your sanity:

- 1) Prepare yourself for the eventuality*
- 2) Keep a cool head when it finally happens*

This section presents a few pointers on what to do before and after a DLE. Read it now, familiarize yourself with what it has to say, and most importantly, follow its instructions! When DLE finally strikes, you'll be able to stare it in the face and (hopefully) walk away laughing.

Before The Crash...

The following precautions are a set of simple, down-to-earth steps that everyone can take to prevent data loss. Don't wait for a hard disk crash before you take these precautions seriously! Adopt them now and you will save yourself a lot of trouble and aggravation when DLE strikes.

Precaution #1: Know Your Data

Having a large capacity hard disk means one thing: a LOT of files. With a typical 100mb hard disk, you can easily store thousands of files. With this many files in one place, it is unlikely you'll be able to keep track of each and every one of them. If a group of files becomes damaged or disappears, how will you realize it if, you don't know what files are out there?

Using Universe Master, you can obtain volume printouts quite easily. While printouts of an excessive number of files can take a while, it is recommended that you obtain such a printout approximately every other month. You may want to do this more or less frequently, depending on how much you use your system and how many new files you add to your hard disk. The Universe Master "Print" function allows for binder offset printouts so you can keep a list of all your files in a nice three ring notebook.

Precaution #2: Organize Your Data

Keeping your data organized is critical, not just for using your hard disk, but for maintaining it. This includes recovering from any DLE related problems. We've seen many instances where Apple IIs users have kept hoards of semi-related files in single folders. For instance, many people like to collect SHR graphics or digitized sound files. For some this amounts to literally hundreds or thousands of files. What's alarming is that many times these files are all placed in the same folder! If anything were to happen to the integrity of that single folder, all of the files within it could become permanently lost!

Universe Master

Another common problem is to keep too many files in the root folder of a volume. The way most file systems are organized, the root folder of a volume is very vulnerable to file system corruption. To make matters worse, a file system repair utility (such as Universe Master) is less likely to recover a damaged file in the root folder than in any other folder of your volume.

Once again, the Universe Master "Print" function can play a major role in keeping your data organized. Printing the volume hierarchy can instantly convey whether or not your files/folders are nicely organized. One immediate indication of a disorganized volume is a hierarchy that is skewed in either the vertical or horizontal direction. A balance between the width and depth of a hierarchy is quite desirable.

Precaution #3: Backup Your Data

This is absolutely the most important precaution you can take to protect your data. It is the best way to avoid any kind of data loss, whether it's caused by file deletion, logical corruption or total hardware failure. But don't just stop there; Backup your backups! Then backup the backup of your backups! Don't treat your backups as second class data! Remember that if you lose your original data, you will have to rely upon your backup to restore it. There are different ways to perform backups; *incremental* backups, *redundant* backups, and *archival* backups. These kinds of backups are NOT mutually exclusive. You could perform all three in conjunction with each other. You can also mix/match different types of backups.

An *incremental* backup is performed in regular intervals, and backs up every file that has changed since the last backup. For example, if you use your computer every day, you should backup every file that has changed, at least once a day. If you do a lot of work on your computer, and make a lot of modifications/additions to your files, you may want to backup your data several times throughout the day. Universe Master makes this very easy. (The programmers at Econ backup their data as much as ten times a day!)

A *redundant* backup means having multiple (identical) copies of your backup data. Universe Master provides an easy mechanism for performing redundant backups. In fact, it is the only backup utility for the Apple IIgs to explicitly support redundant backups. The tutorial in Section 3 of this manual gives two different examples for setting up a redundant backup system.

In addition to incremental and redundant backups, you can also *archive* your backups. This entails backing up your backups, without overwriting the files you archived before. This would allow you to revert to several older versions of your data, and would be extremely useful if your data becomes corrupted without your knowledge until sometime later.

Data corruption not only refers to the situations we have mentioned, but also to 'user corruption'. For example, you've been working on a large spreadsheet and Monday morning you introduce some new numbers. You have been backing up your data daily, and also archiving your backups. Archived backups are kept as far back as two weeks. That is, you have backups of your spreadsheet for each day of the last two weeks. On Friday you find out that the numbers you introduced on Monday were invalid, and therefore your spreadsheet is now

Section 6 - Data Loss Survival Guide

corrupted. You decide it would be easier to revert to the file prior to the introduction of the invalid numbers, than to attempt to correct the current spreadsheet. All you would have to do is "Decode single" or "Copy single" from Universe Master, and choose the appropriate file and destination.

Precaution #4: Backup Your Data

We cannot over-emphasize the importance of doing this! Other backup systems for the IIGs have pretty much taken the 'all or nothing' approach to backing up data. This is not only tedious and time consuming but it punishes those who frequently backup their data. Universe Master allows you to backup just what you need and provides a VERY simple mechanism for doing so... just double click your backup script icon from the Finder!

Another key to successfully backing up your data is to strictly follow precautions #1 and #2. Knowing what files you have on your disk and having them nicely organized will greatly facilitate the backup/restore process. Using the Universe Master "Print" function, you can get frequent printouts of all your files. With the "Last Backup" option enabled, your printout will show when each file was last backed up. This can give you immediate indication of whether or not you are adequately (and frequently) backing up your data.

Precaution #5: Keep Your File System Intact

In many cases, a major file system corruption begins life as a small problem. Progressive use of a slightly damaged file system could lead to more and more damage until the whole situation escalates into a major crash. The Universe Master file system analysis functions are designed to catch problems in the making as well as full blown corruptions. However, you must frequently perform the analysis to determine whether a small problem exists. It is recommended that you use Universe Master's "Validate File System..." function at least once every other week in order to keep the status of your file system in check. If you are a frequent user (several hours a day) you should perform this scan more frequently. A quicker method of analyzing your file system is to use "Validate" in the Finder's "File" menu. It doesn't perform as thorough a job as Universe Master and thus should not be used in place of Universe Master. It can, however, be used more frequently than Universe Master, perhaps at the start of each computing session. The key is not to wait until a major data loss arises to find out that you have problems with your file system!

Precaution #6: Keep Unused Blocks Zeroed

One of the first things you will want to do after installing Universe Master is to validate the file system of each on-line volume to make sure your file system is in good order. Once you have determined that your file system is okay, you should "Zero Unused Blocks...", a function which is located under the "Volumes" menu. This actually writes zeroes to every block on your hard disk that is unclaimed. This seemingly trivial operation is important for one purpose... recovering lost data that has become detached (*orphaned*) from the file system.

Universe Master

Orphaned files and folders (or as we call them, structures) are the result of a major file system corruption. These files and folders exist on the media, but no parent folder is pointing to them. The orphan scan option of the "Validate File System..." function looks at all unclaimed blocks on a volume for what appears to be a valid file or folder structure. This works great if the volume is "clean", i.e. has had its unused blocks zeroed prior to the corruption. However, a 'dirty' volume will have the remnants of old files and folders that have long since been deleted and/or partially overwritten. In many cases, even a reformat will not get rid of these remnants.

When Universe Master encounters such a remnant, it may treat it as just another orphan, and that could spell trouble for your real data. This is because the remnant may be claiming the same blocks your 'real' data is! Universe Master has no way of knowing which orphan is the rightful owner of the blocks, so ownership basically gets determined by the order in which Universe Master encounters orphans. The fundamental point here is that you should zero your unused blocks fairly often. About once every two weeks should be adequate.

Precaution #7: 'Shutdown' Your System

While this precaution may seem out of place, it is quite important for maintaining a valid file system. You should never turn off your computer while an application is running. And by all means, you should **NEVER** turn off your system while it is accessing a device! Always exit back to Finder and choose "Shutdown" from the "Special" menu (or the equivalent function in whatever program launcher you use). If the application you are running provides a "Shutdown" option, then it isn't necessary to quit back to Finder.

Why "Shutdown"? Performing a formal shutdown will assure you that any information that is stored in memory, but needs to be written to disk, will indeed be written to disk. Is there always something in memory that needs to be written to disk? Not necessarily, but why take the chance? Just taking these few extra steps before you turn your computer off can prevent problems in the future! (Incidentally, if you own a RamFAST SCSI card you should **NEVER** turn off your computer without first performing "Shutdown".)

Precaution #8: Keep A Spare System Disk

You should always keep a bootable system disk with enough tools and drivers to access your hard drive and to execute Universe Master. If and when a file system crash occurs, it may just happen to your boot volume! You may need to rely on your spare system disk to get your system up and Universe Master running.

Your spare system disk should be a 'no frills' system disk. You don't need any fancy fonts, extensions, INITs or DAs on it, just the necessary components to boot your system and run Universe Master. Build the disk now, make sure it works, and label it appropriately. Then keep it in a safe place, near your computer.

Section 6 - Data Loss Survival Guide

After The Crash...

Okay, its happened. Something has gone wrong with your disk and now your computer is behaving erratically. A file may be missing, folder entries may be coming up garbled, or GS/OS may refuse to recognize one of your partitions. Whatever it is, take a deep breath and be calm. Don't rush and try to fix your disk without considering what you are going to do and how it is going to affect the disk and data in it. If you're calm and you think about your problem, you can usually get yourself out of trouble with a minimal loss of data.

This section presents several common problems that you may encounter. It then provides a method for repairing the problems. Unfortunately, file system problems come in all shapes, sizes and varieties. The methods presented here may not suit your exact problem, nor may any of the examples even resemble your situation. These examples provide a foundation for the methods you must employ to correct file system problems. If you are totally lost and don't know what to do, give our technical support a call. We will gladly try and step you through the process.

Recovering Deleted Files

One of the nice things about the ProDOS file system is that most information regarding a file is kept around after it has been deleted. This holds true at least until another file is written to disk, an operation that may overwrite the portion of the disk where the old file was stored. If another file's data overwrites all or part of the data that once was contained in the deleted file, the deleted file will not be fully recoverable. In such a situation, however, the data may be partially recoverable if the new file did not completely overwrite the old. This can be valuable for retrieving portions of text or word processing documents, giving you at least a starting point from which to reconstruct your data. If, however, a new file is placed in the folder where a deleted file once existed, chances are that the deleted file's entry will be overwritten, thus destroying any chance of recovering the file.

Okay, now that we have that out of the way, what does it mean? Basically, if you accidentally delete a file, and you catch yourself doing it after the fact, **don't write to the volume** where the deleted file resides! **Don't do anything with that volume!** If you have other documents that need to be saved before you quit your application, save them to another volume (not the same volume where the file that was deleted resides). If you're in Finder and you have a bunch of open windows, don't open any new windows that have never been opened before (opening a new window creates an invisible file called "Finder.Data" that the Finder uses to describe the open window...). By all means, **don't copy any files!** You should immediately launch Universe Master!

When Universe Master is up and running, the first thing you should do is to hold the OPTION key down and click on the volume where the deleted file resides (this prevents the hierarchy map from being written back to disk). Locate the folder in which the file was stored and click on it. If the folder has a lot of children, you may want to hold the APPLE key down while you are clicking on it. This prevents its children from being selected. When you have selected the folder that contained the file, click on the "Recover" command button.

Universe Master

When the "File Recovery" window appears (figure 72) you basically have one option available: click the "List Deleted Files" button. This sends Universe Master looking for deleted file entries in this folder. If any are found, they will be listed in the window. With any luck, the file you just deleted will be displayed and its status will read "Intact" (figure 73).

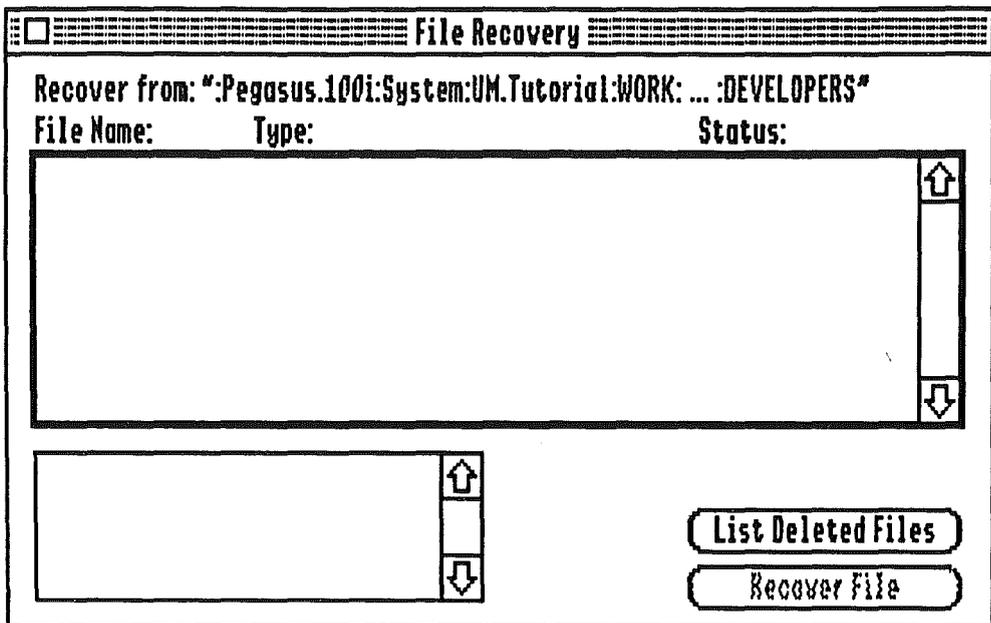


Figure 72. "File Recovery" window with no files listed.

To recover the file, click on its entry in the window so it becomes highlighted, then click the "Recover File" button. A standard file dialog will appear asking you where to place the file. You can even change the name of the file as you are placing it elsewhere. You have to choose another volume since recovering it onto the volume where it was deleted could cause it to overwrite itself!

Note that just because a file's status reads "Intact" doesn't mean it really is intact. It just means that the blocks once claimed by this file are not being used by any other file. It is possible that another file has written over these blocks and then was deleted. It is for this very reason that Universe Master will not let you recover files in place since you may destroy your chances of recovering other deleted files that are truly intact.

You can now proceed to quit Universe Master, and launch the application that created the file you have just undeleted. As mentioned earlier, the file might not be completely intact. The more 'computer time' that elapses between the time a file is deleted, and the time you attempt to undelete the file, the higher the likelihood the file will not be recoverable.

Section 6 - Data Loss Survival Guide

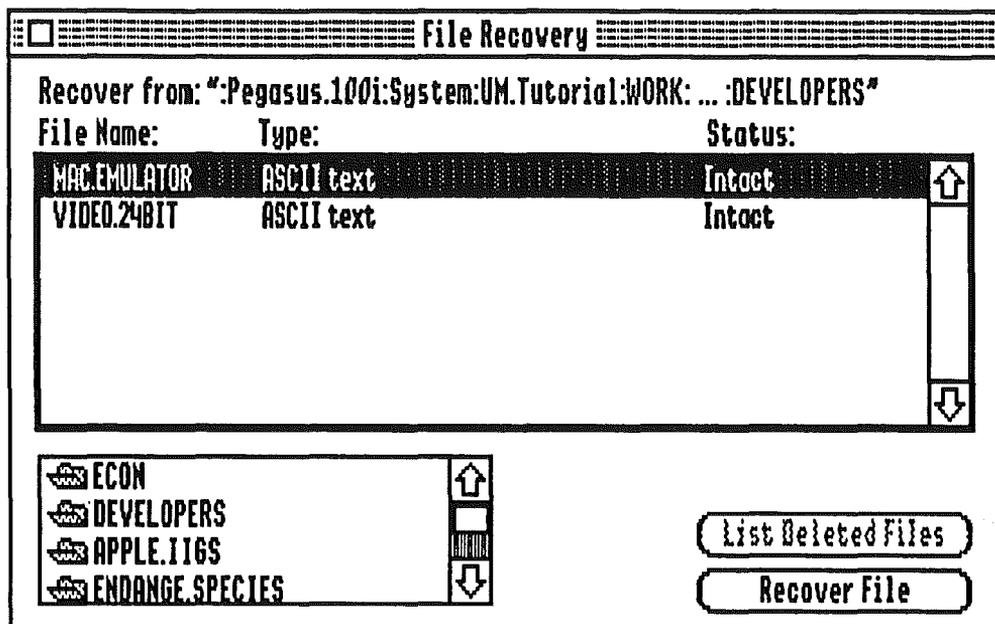


Figure 73. "File Recovery" window with deleted files listed.

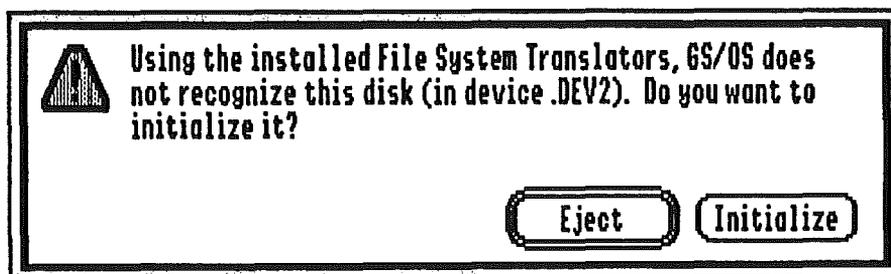


Figure 74. Standard GS/OS message indicating the volume is unreadable.

Universe Master

The Unrecognizable Volume

Something terrible has just happened. While you were using your favorite application, the lights dimmed. Your computer made some strange noises, a bunch of neat colors appeared on the screen, then the computer started rebooting. The problem is, you were saving a file to disk as it happened! To make matters worse, when Finder comes up you get the message "Using the installed File System Translators, GS/OS does not recognize this disk (in device .D2). Do you want to initialize it?" (figure 74). **DO NOT INITIALIZE!** Now, remember that you have data on this disk, and that initializing it will **ERASE** all data. Make a note of the device this disk is in (reported inside the parenthesis of the dialog), click "Eject" and then proceed to launch Universe Master.

What has just happened is that the special information that describes this volume to GS/OS has been corrupted on the disk. This makes GS/OS think that the volume has not been formatted since a formatted volume would contain the proper data. Fortunately, Universe Master can fix this!

When Universe Master comes up, select "Rebuild Volume..." from the "Volumes" menu. A dialog appears that lists all online devices (figure 75). You may notice that this device list appears a bit different from other device lists in Universe Master. This list will let you choose any device that has a driver, regardless of whether a volume has been mounted on that device. If your damaged volume was a hard disk, this fact does nothing for you. If, however, your damaged volume is removable media, such as a floppy disk, you are in luck. This is because if you insert your disk within Universe Master, Finder or any other modern System 6 application, you will immediately be presented with the "Do you want to initialize..." dialog. When this device list is open however, all device scanning is disabled allowing you to insert your media and select its appropriate device. If you are unsure of what device to choose, refer back to the note you made when you were first presented with the "Do you want to initialize..." dialog (if you didn't make a note, quit back to Finder and look again).

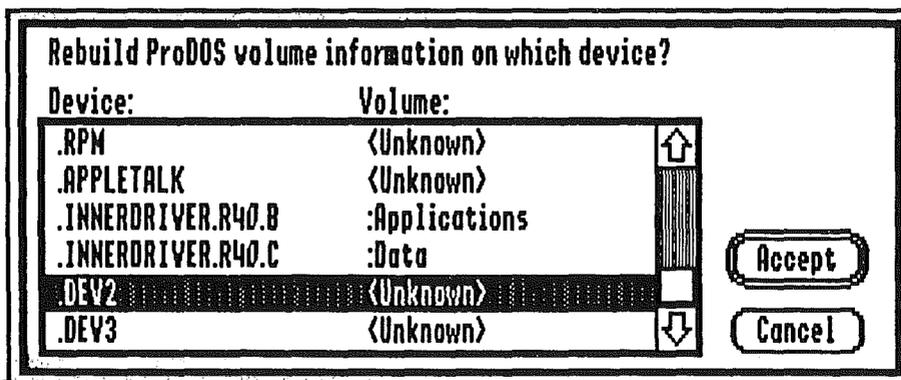


Figure 75. Device selection for rebuilding volumes. Note that even devices with no volumes mounted are selectable.

Section 6 - Data Loss Survival Guide

Once you have chosen the device, you will get a warning stating that this operation should not be performed on an intact volume. This is okay since your volume is definitely not intact anymore. When you get past the warning, another dialog appears offering you a choice of options (figure 76). All options are checked by default and you should leave them this way unless you have a very peculiar reason not to. Double check the device name which is displayed at the top of the dialog. If it really is the device that you want to rebuild, click the "Rebuild" button.

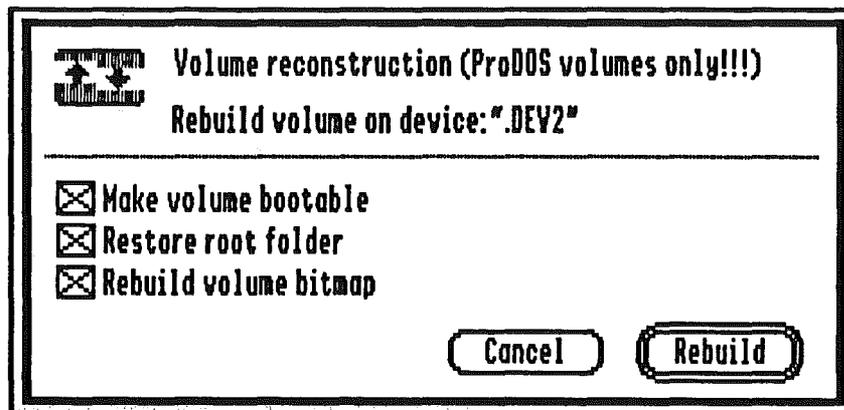


Figure 76. "Volume Reconstruction" dialog with default options selected.

Next, you are asked to enter a name for this volume. Here you can see how bad the damage is. If the default volume name is full of garbage, then it is pretty bad. Regardless, enter the name you want to assign this volume and click "Okay".

The next step involves sitting back and watching the thermometer bar race across the screen. Actually, if there are a lot of files on this volume, it could take quite a while. When all is done, you will be instructed on Universe Master's success by an alert dialog. Clicking "Okay" returns you to the main Universe Master window where (hopefully) your salvaged volume will appear as an icon (you may have to scroll the icon list to see it). If this is the case, you will now want to analyze the file system (next example).

If the volume doesn't show up, you may need to shutdown the system and reboot. If you reboot the system and the Finder reports the same error message as before, you may be in trouble (did you backup your data?). You may want to try and "Erase" the volume (from the "Disk" menu in Finder or the "Volumes" menu in Universe Master), followed by an orphan scan in Universe Master (see example later). If that doesn't work, a reformat will be required, followed by a restoration of your backups (you did backup your data, right?).

Universe Master

The Corrupt File System

When using GS/OS applications you may eventually run into the message "Disk HD1 may be damaged. Please move data to another disk!" (or a similar one) when trying to perform a file operation. This could occur in Finder when opening a folder, within an application when trying to save a file, or any number of places where a disk operation is being attempted (figure 77). You should first make a note of which volume is reported as bad and then avoid performing any additional disk access to that volume. If the error occurred inside an application, and you have files that need to be saved, try saving them to another disk, preferably a floppy disk.

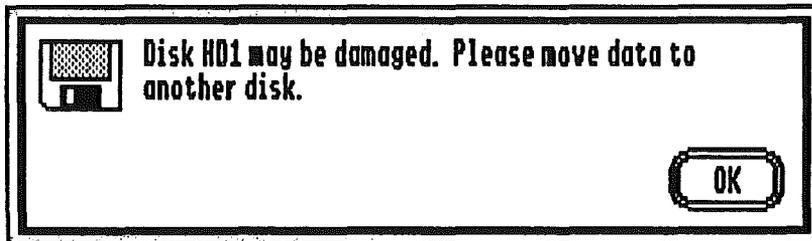


Figure 77. Standard GS/OS error message indicating a damaged file system.

Once you have saved your data, wait a few seconds and then **TURN YOUR POWER OFF!** This goes contrary to the warnings we've given you about always performing a formal shutdown, but this is an extraordinary circumstance. The reason you want to turn your system off is that the error may not have anything to do with the data on disk, but may pertain to some memory inside your computer being accidentally trashed (usually by a buggy application). If such is the case, performing a formal shutdown may cause GS/OS to update the data on your disk with some of the trashed blocks in RAM. This isn't always the case, but why take a chance?

After you have shutdown your system, wait 20 seconds and then turn it back on. If you can successfully boot into Finder (or whatever program launcher you are using), go immediately to Universe Master. If you are presented with error messages at any point along the way, you will have to resort to booting from your backup system disk and may also need to run Universe Master from a floppy disk.

Once Universe Master is up and running, select "Validate File System..." from the "Volumes" menu. Choose the volume that was reported bad by the original error message (you should have made a note of the bad volume). When the file system validation window appears, click the "Perform Analysis" button. Universe Master will scan each and every file/folder on the volume, looking for any kind of file system damage. If no errors are detected, then the problem you encountered probably was caused by a corruption of data in RAM, not on your volume. However, if errors are reported, Universe Master will display each error and the affected files/folders within the window's error list (figure 78). At this point you can proceed to repair the damage by clicking the "Repair Errors" button, but before you do so give the situation a little thought...

Section 6 - Data Loss Survival Guide

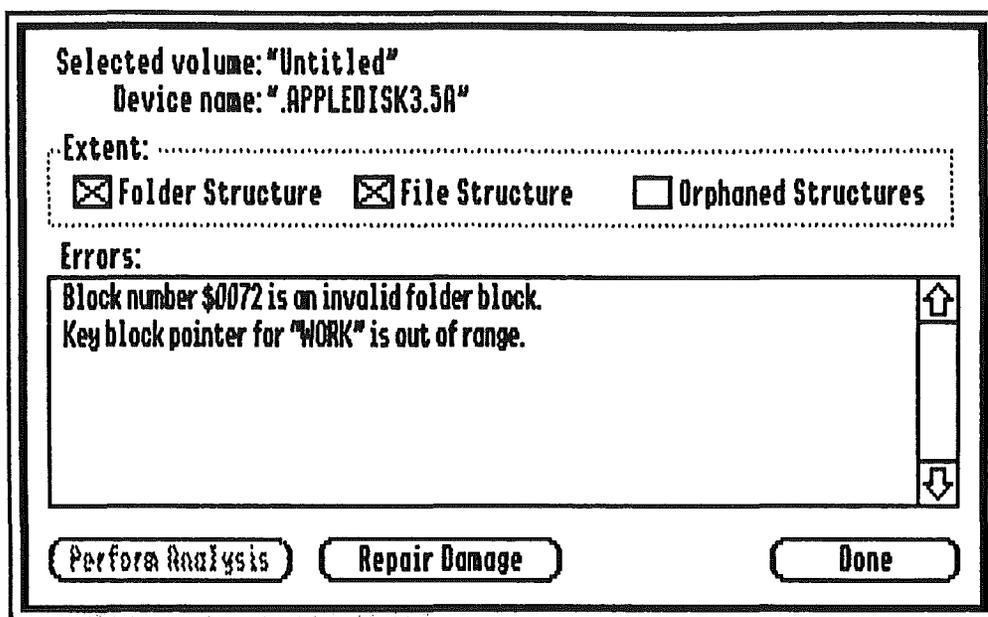


Figure 78. File system validation window after an analysis has been performed.

Many times when a file system is corrupted, the damage is isolated to a single folder or group of folders (and all their children, of course). Looking at the list of errors that Universe Master reports will give you an indication of exactly where on the volume the damage has occurred. If there are other folder branches outside of the scope of the reported errors, you can usually retrieve information from those branches without any ill effects. Bearing in mind that any attempt to repair a file system could actually make things much worse, ask yourself if there are any files within the non-affected folder branches that need to be backed up. Excellent tools for determining what has been affected and what needs to be backed up are the volume printouts you've been getting from Universe Master (you have been making periodic printouts, haven't you). Having a hierarchical listing and a catalog listing of your volume's contents will give you an instant indication of what has been damaged and what can be safely retrieved. If you determine some files in unaffected branches need to be backed up, attempt to back them up now. You can always leave the "Validate File System..." function and return later.

If you choose to backup some files, keep away from the damaged folder branch that Universe Master reported. Even if there are very important files in the damaged branch, your best bet is to hope that Universe Master will repair the file system and you will be able to retrieve them later. Don't risk losing otherwise recoverable data in pursuit of what's obviously been damaged!

Universe Master

Once you are ready to repair the file system, choose "Validate File System..." from the "Volumes" menu and click "Perform Analysis" again. After the errors are reported, click "Repair Errors" again. When Universe Master is finished, it will indicate that you should repeat the process by clicking "Perform Analysis". Repeating this cycle several times may be necessary, as repairing the original errors may uncover additional problems with the file system. In fact, it is most likely you will have to go through the cycle three to four times before everything is intact again. If Universe Master runs into problems, it will let you know about them. When Universe Master cannot repair a file system, a reformat of the volume is inevitable.

Assuming that Universe Master has repaired all errors, it is not yet time to continue using the volume as if nothing ever happened. You will have to spend some time checking out many of the files and folders within the affected folder branch, making sure that their data is intact. This will involve launching applications and loading many data files. You can concentrate only on the files in the immediate vicinity of the reported damage, and don't have to check files that are stored deep within a folder branch (unless errors were reported deep inside that branch). This is because nesting folders will typically isolate file system damage to one or two hierarchical levels. If any individual files appear to contain bad data, you can always restore them from your volume backups.

Once you have determined that all your data is intact (and restored that which wasn't) you can consider yourself in the clear and may continue doing whatever it was that you were doing before all these problems began.

Adopting Orphans

Orphan structures are files and folders that have become disjoint from the file system. It is easy for this to happen since all it takes is one folder entry to become corrupted (figure 79). When this occurs, files, folders or even entire folder branches may mysteriously disappear! They still exist, however, and may still be intact. All that needs to be done is to find them on the disk and 'adopt' them back into the file system.

There is one special case when attempting to 'adopt' orphans is not a good idea - when the folders that have become orphaned are located in the root folder of the volume. In this case, the orphan scan facilities of Universe Master may not be able to correctly rebuild the folder structure, even though reconstruction should be a simple matter. If this is the case, it is recommended that you try to "Rebuild Volume Info" from the "Volumes" menu. This function stands a greater likelihood of adopting folders orphaned from the root folder.

To scan a volume for (and possibly adopt) orphans, you need to invoke the "Validate File System..." function from the "Volumes" menu (figure 80). You should check the "Orphan structures" option at the top of the window. When ready to begin, click the "Perform Analysis" button. Universe Master will first validate the file system of the chosen volume and then look for orphans. This is important because a valid file system is critical to successful adoption of orphan structures. If Universe Master encounters errors with the file system that it cannot repair, you will have to deselect the "Folder structures" and "File structures" options and run the orphan scan by itself. Keep in mind that after any orphans have been adopted on a volume with a bad file system, you should consider this volume unsafe to use and must immediately extract any valuable data. A reformat afterwards will probably clear everything up and you may then replace your data on it.

Section 6 - Data Loss Survival Guide

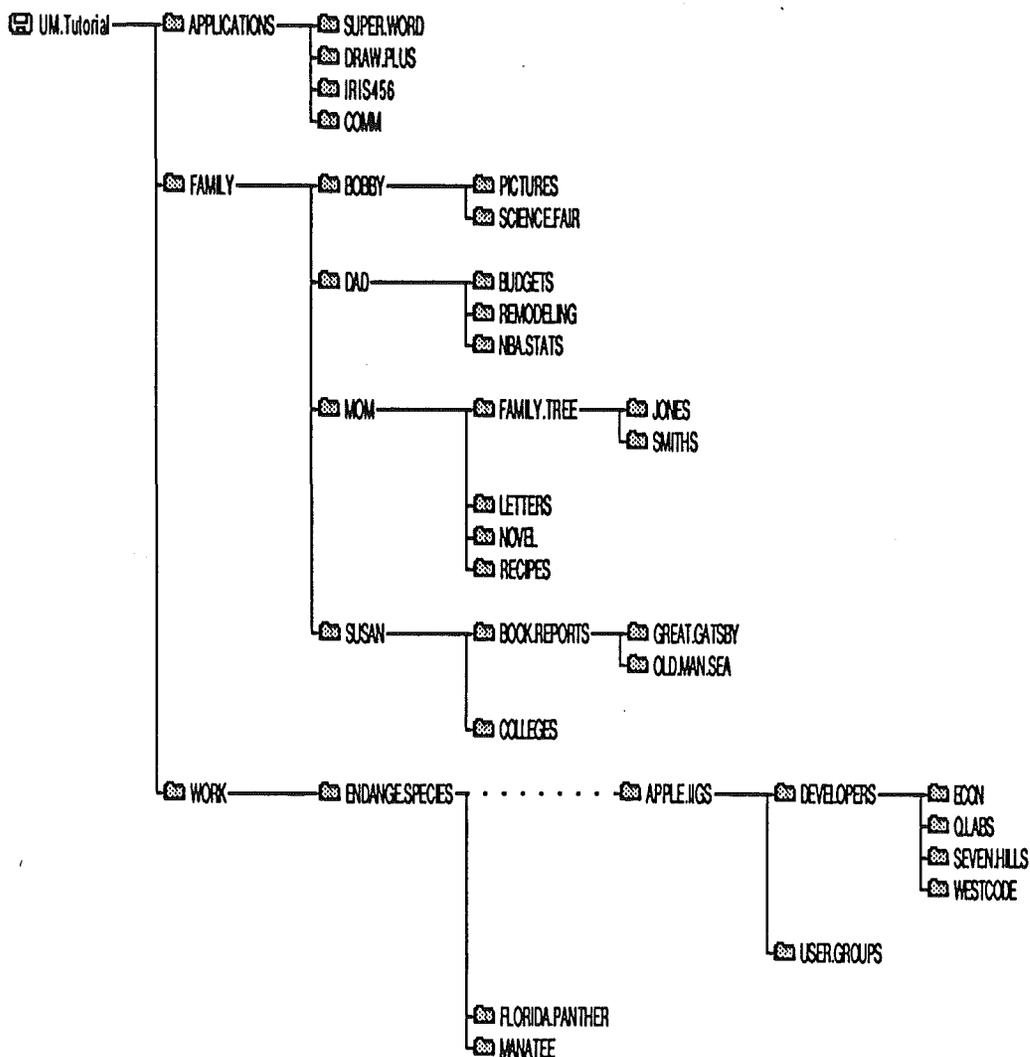


Figure 6h. Topography of a file system hierarchy that has a disjoint branch ("Apple.IIGs"). This branch is considered an 'orphaned' branch since it has no parents.

Universe Master

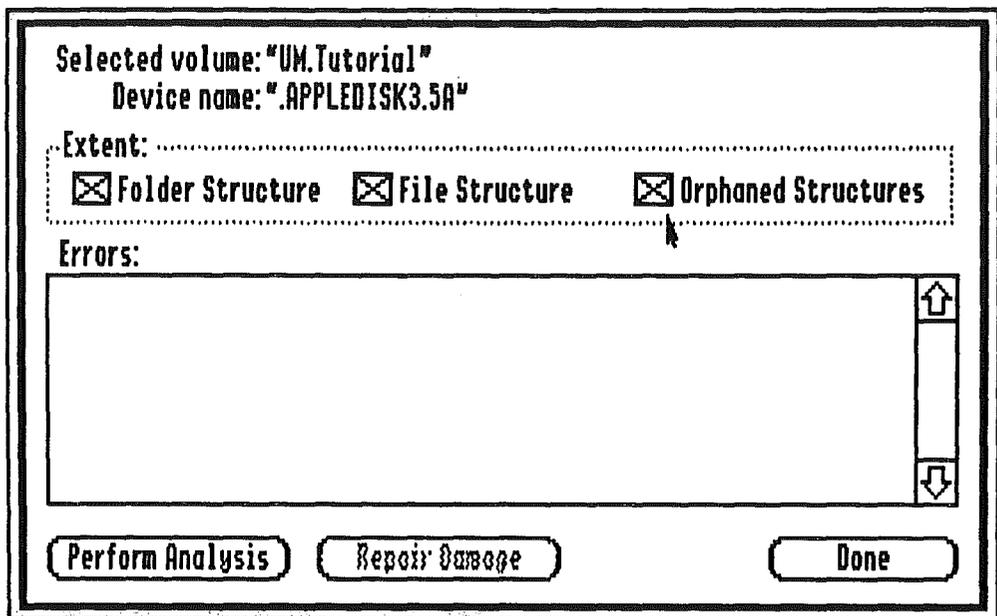


Figure 80. File system validation window prior to analysis.

When Universe Master adopts orphans, it tries to determine where on the volume those files/folders originally resided. Many times it cannot, however, because all links to those structures have been lost. What Universe Master does in this case is create a folder named "Orphan.Files" in the root folder of the scanned volume. This is the orphan branch. All orphan structures that could not be correctly placed in their original locations will be placed in this folder. In many instances, these files will not have their proper names either, because their filenames could not be readily determined. In this case, it is up to you to identify the correct names for these files and folders and to move them to their original locations. Once all valuable data has been relocated from the orphan branch, you should delete this branch and zero unused blocks.

Section 6 - Data Loss Survival Guide

Dealing With Bad Media

Running into a problem with the physical media is usually much more rare and much harder to detect than a damaged file system. Bad media usually results from ageing media, scratches on the media surface, spilled fluids on the media or an external magnetic influence. Because hard disks are enclosed in a sealed environment, they are much less subject to media damage than removable media.

When media damage occurs, the only way to detect its presence without running a media scan utility (such as Universe Master's "Verify Media..." function) is to try and load a file (or open a folder) which owns one of the damaged blocks on the media, or to save a file that will be written to the damaged blocks. When this happens, your application will report an error such as "Getting errors while saving the file 'MyFile' to volume 'HD2'. Error Code = \$27" (figure 81). This is a good indication that one or more blocks on the media are bad.

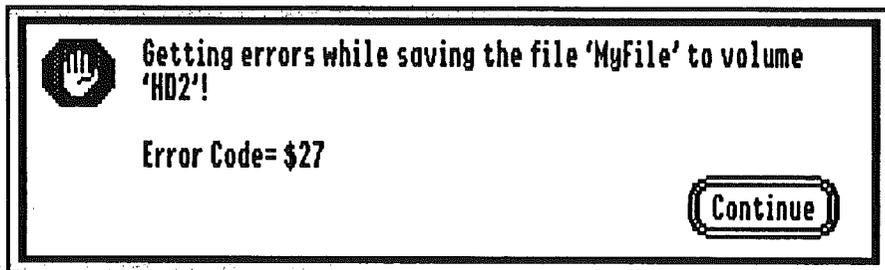


Figure 81. Typical I/O error message (application specific) that indicates possible media damage.

When you encounter bad blocks, there are only two courses of action you should take: 1) Try and mark the blocks so that GS/OS will not try and place any data on them or 2) Extract all the information you can from the disk and then throw the disk away. Unfortunately, there is no way to repair damaged media, so no matter what you do, you will always have a damaged disk. Exactly which option you choose to use depends on the type of media that has been damaged.

Marking the bad blocks involves creating a file on the disk and naming it "Bad.Blocks". This file is structured so that it uses all of the bad blocks on the disk. Of course, you can never read or write to this file, but that's okay since you don't want to do this. Having a file occupy the bad blocks assures that GS/OS will never try and use those bad blocks for anything else. The drawback of this scheme is that media damage that occurs to removable media, such as a floppy disk, usually gets worse. Marking the bad blocks may work for a while, but eventually will not be adequate and may lead to additional loss of data. The only exception is when the damage occurs to fixed media such as a hard disk. Damage to these devices is rare and may arise due to a sudden jolt causing the read/write head to 'crash' into the media's surface. Once the damage is done, it is unlikely to get worse. In this instance, marking the blocks is a feasible solution.

Universe Master

In most circumstances, since media damage on hard disks is rare, you will want to try and extract information from the bad disk onto a good one. You can do this by individually copying the files that are still readable or by performing a block-by-block duplication onto another device. Once the disk image has been duplicated, you can attempt a file system repair on it. The later approach may be necessary if portions of the file system on the damaged disk are affected by the bad blocks.

Regardless of which approach you are taking to handle the errors, the first thing you will want to do is launch Universe Master and select "Verify Media..." from the "Volumes" menu. You will have to choose which volume you want to verify, which should be the volume which was reporting the errors. Once a volume is chosen, the "Verify Media" window will appear (figure 82).

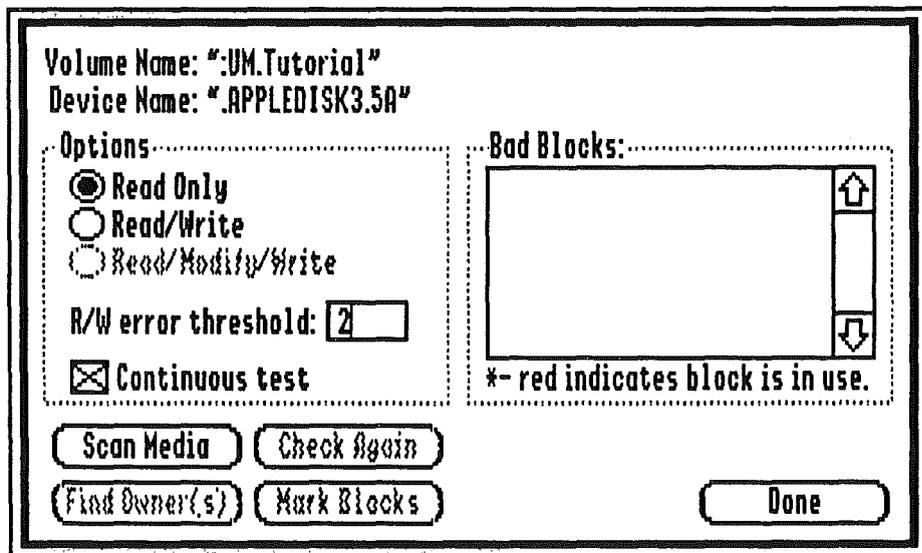


Figure 82. Media scan window, used for detecting bad blocks.

The default settings for this window are adequate to determine which blocks are bad. If the problems you are encountering are inconsistent and erratic, i.e. they only occur some of the time, you may want to click the "Read/Write" radio button so that the media will be tested more thoroughly. You may also want to check the "Continuous test" option so that Universe Master will repeatedly loop through the device looking for errors. When you are ready to begin, click the "Scan Media" button. Depending on the speed and size of the device you are testing, this operation may take a while. You may want to consider walking away from your computer for a while.

Section 6 - Data Loss Survival Guide

When at least one pass of the media scan has been performed, you can halt the scan by clicking the "Stop" button or pressing the ESC key (it may take a few seconds to respond so be patient...). The number of errors encountered and the affected blocks will be itemized inside the error list. Entries that appear in red indicate that a file on the disk is currently claiming those blocks. If there are files affected by the bad blocks, your next course of action will be to click the "Find Owner(s)" button.

When owners are scanned (and found), Universe Master opens another window that displays each of the files that are affected by the bad blocks. This list may or may not be conclusive, depending on whether or not any of the bad blocks affect the file system on the damaged disk. If folder blocks are affected, Universe Master will let you know about it. In addition to letting you know what files are affected, Universe Master provides the option of recovering the affected files. By no means will these files be recovered intact, but they will be partially retrieved allowing you to piece them back together (provided they were simple documents). Regardless of whether you intend to mark the bad blocks on this volume or try and extract the readable information, you will want to make a note of these files.

Marking Bad Blocks

The first step in marking the bad blocks is to remove any affected files. If the above scan for owners turned up some affected files, you will want to exit the "Verify Media..." function and choose "Delete one file" from the "File" menu for each bad file. Of course, if you think you can reconstruct any of the affected files, then you should have attempted file recovery from the owners list in the previous step.

The next step is to make sure that the file system on the bad disk is intact. Choose "Validate File System..." from the "Volumes" menu and proceed to validate the file system as discussed in the previous section, "The Corrupt File System". If any unrecoverable errors occur due to a folder block being unreadable, it is strongly recommended that you forego trying to mark the bad blocks and move on to extracting the readable files!

Once your bad files have been deleted, and you have validated the file system, you can reenter the "Verify Media..." function and click "Scan Media" again to obtain a list of bad blocks. Once the bad blocks have been listed, you can proceed to marking them by clicking "Mark Blocks". The "Bad.Blocks" file will be created for you fairly quickly. After you have done this, click "Find Owner(s)" to verify that the only file on the disk that uses bad blocks is indeed "Bad.Blocks". If there are additional files, then you will have to repeat the process all over again. If, regardless of what you do, you cannot get rid of the affected files, or you get errors while trying to mark the bad blocks, give up on this approach and move on to extracting the readable files!

Universe Master

Extracting Readable Files

If you need to resort to extracting files from your damaged disks, there are basically two ways to go about doing this. First, you may try to manually copy the files from the damaged media to a 'safe' volume. The second method would involve performing a block-by-block duplication of the bad volume onto a good volume and then trying to restore the file system on the duplicated volume.

Copying files manually is very straightforward and can be accomplished using Finder, Universe Master or any other file copying utility. You will need to keep away from any files or folders that are affected by the damaged blocks, since trying to copy them will abort the entire process (you should have made a note of affected files when you scanned for file owners in the previous steps...). Universe Master is an excellent tool for this since you can deselect the branches of the hierarchy that are affected by the bad blocks (figure 83).

Choosing to duplicate the volume is more useful if portions of the file system have been affected by bad blocks. In this case, you know there are files on the disk that may be intact but there is no way to get to them since one or more folder blocks that contain their entries have been clobbered. The duplication process involves copying all the good blocks to another volume. Any bad blocks will simply be written to the new volume as blocks full of zeroes. Thus you can perform a "Validate File System..." on the new volume (possibly performing an orphan can) to gain access to the lost files or folders.

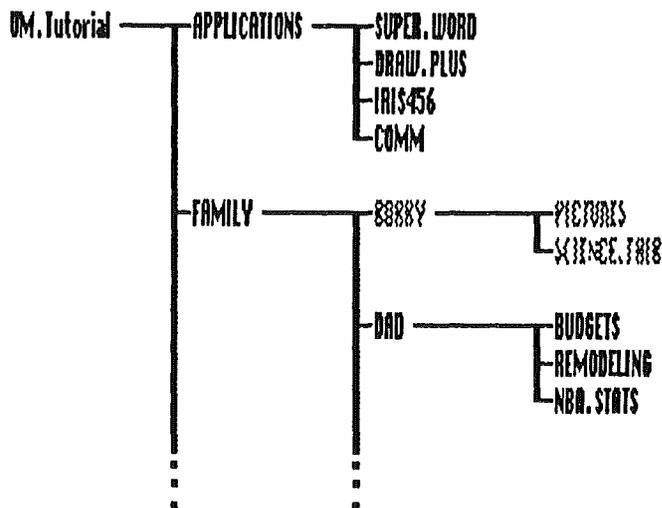


Figure 83. The "Bobby" branch has been deselected since it has bad blocks.

Section 6 - Data Loss Survival Guide

To duplicate a volume, select "Duplicate" from the "Volumes" menu. You will be presented with the duplicator window which shows two lists, each containing the name of all online devices (figure 84). The duplicator will let you duplicate a volume of any size onto any other volume of any size. Keep two things in mind when duplicating a volume: 1) the destination volume will become completely overwritten by the source data, losing any of its contents, and 2) if you choose a source volume larger than a destination volume, then all additional blocks will be ignored and thus lost.

The first step is to highlight the source and destination volumes in the left and right lists respectively. It is recommended that both volumes be the same size, but that isn't necessary. To duplicate a volume that has bad blocks, you will want to increase the "Error retry count" to a high number such as 16. This tells Universe Master to try reading any encountered bad blocks 16 times on the slight chance that one of those tries might be successful. When ready to begin, click the "Duplicate >>>" button.

When duplication is complete, run the new volume through the "Validate File System..." function under the "Volumes" menu. This may or may not restore the file system to its original form and it may or may not restore all of the lost files. One thing is for sure, the volume will be in a better state than your original disk!

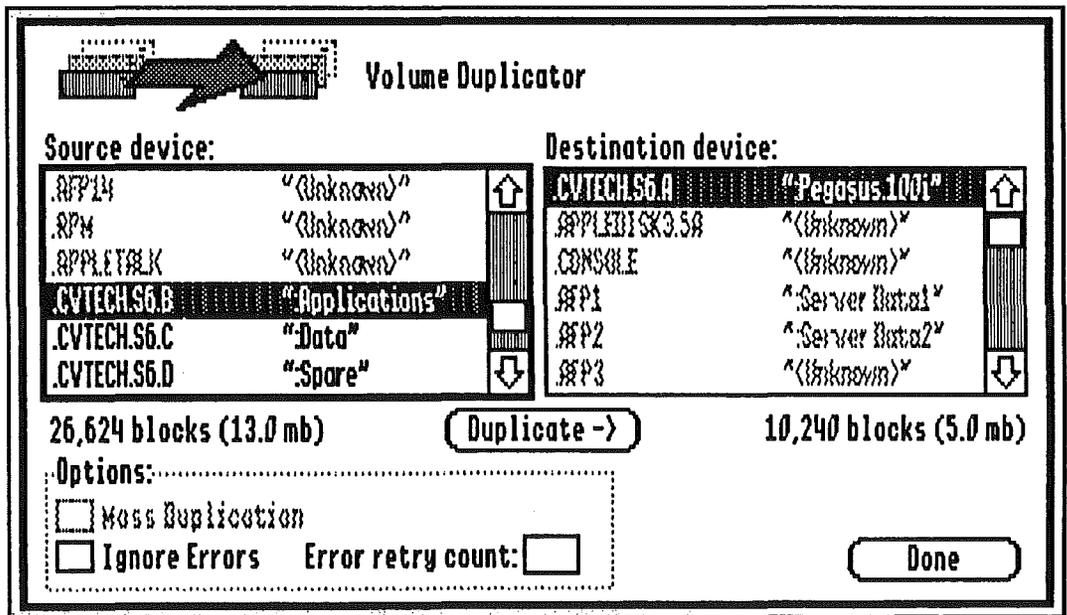
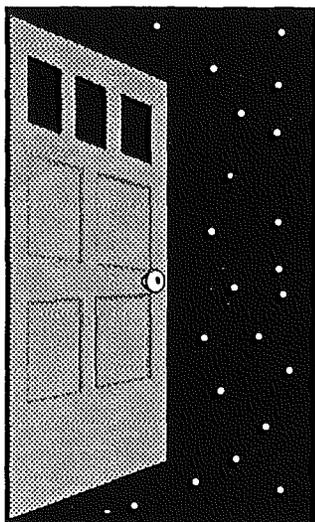


Figure 84. The duplicator window.





Appendices

Effective Data Organization

Having a hard drive installed on your system is both a blessing and a curse. It's a blessing since you can now have all your data files and applications stored in one place, instantly accessible. No more fumbling around looking for the right floppy disk. Not to mention the tremendous speed benefits offered by virtually ALL hard disk drives.

The curse of a hard disk is that, with so much available storage, it is easy to misplace or mismanage your data files. If you're not careful, you will find yourself not remembering where you saved a file, saving multiple copies of the same file (or application), or collecting 'junk' files. After letting your hard drive go like this, it begins to become a real hindrance and could lead to accidental loss of data ("I know I have another copy of this file, so let me just drag it to the trash...").

Fortunately there is one simple rule that, if followed, will preclude your disk drive becoming out of hand and unmanageable. This rule is called "Partition & Divide", so named because it requires that you partition your hard disk by function and divide the data on each partition.

Partitioning

Partitioning a hard drive is a fairly simple concept. It involves taking a single storage device of a limited size and dividing it up into two or more logical volumes of smaller sizes, the sum of which adds up to the device's physical capacity. For instance, a 100mb hard drive may be divided into four partitions, the first two being 20mb each and the last two being 30mb each. Virtually all hard drives you can buy will come pre-partitioned for you.

The P&D rule, as we will refer to it, requires that you 'partition by function'. This means that when you create a partition, you do so with the storage of specific types of files on it in mind. For instance, virtually all hard disks will use the first partition as the "System" partition, i.e. the place where the operating system and its related files are stored. This is the partition you will normally boot from. The P&D rule will have you reserve this partition for 'System' files AND NOTHING ELSE! This would include Fonts, Desk Accessories, INITs, Control Panels, Drivers, etc. Since it is reserved for system files, it makes sense to size the partition appropriately. For most users, a 5 - 10mb system partition is adequate since that will store a lot of fonts, DAs, INITs, etc.

The partitioning rule will apply to all partitions on your hard disk. The next likely partition would be "Applications", where you would store your commercial programs such as AppleWorks, HyperCard Igs, etc. Once again, this partition would be used ONLY for commercial applications and should be sized appropriately. You usually will want to leave some extra room to allow for the installation of additional programs. Usually, a 20 - 30mb size is appropriate.

Other partitions should be created based upon how you will be using your computer. For instance, if you apply your Apple Igs to both work and home use, you might want to create "Work.Data" and "Home.Data" partitions where you would store work and home related documents, respectively. If you like to collect shareware and

Universe Master

freeware programs from bulletin boards, you may wish to create a "Shareware" partition. Kids in the house? A "Games" or "Education" partition might be in order. Lastly, if you have a large hard disk with some extra space to spare, we suggest you create a "Backup" partition.

Now for some explanations. The partitioning component of P&D physically separates different types of data/applications from each other. Aside from appealing to your organizational tastes, this is VERY important for data security. For instance, suppose a shareware (usually not very well tested) program you just downloaded from a bulletin board has gone haywire. Instead of showing you the contents of picture files on disk, it decided to write random blocks of information to your disk drive. If you have been following the P&D guidelines, the damage caused by this rouge application will be limited to one partition. Your "System" partition will be intact (allowing you to reboot), "Applications" will be untouched (foregoing a reinstallation of your applications), and provided you placed all your precious data files on their own partition (and treated it as sacred), you will not have lost anything important. Only the "Junk" partition where you were experimenting with this new program will have been damaged and, worst case, there would be no great loss if you reformatted it!

It is also useful if you have a spare partition that you can use for data backups. "What?", you say, "Backup data on the same device it is originally stored on?". Yes! Backing up onto another partition can be quite effective and reliable. First of all it is fast. Being able to backup data quickly will ensure more frequent backups on your part. Secondly, its reliable. Today's hard disk drives are so reliable, you stand a good chance of never having a hardware failure that would damage the media on the device. The vast majority of hard disk 'crashes' are actually 'soft' crashes meaning garbage data has been written to the disk in precisely the 'wrong' place so as to make file retrieval impossible.

With this reliability in mind, backing up to another partition is quite safe and actually preferred. This is provided you don't run applications on the backup partition or do anything other than backup files. Of course, you should not rely solely on the backup partition for your backups. You can use another device such as floppy disk, removable hard disk, tape drive etc. for additional redundancy, only you would use them less frequently than your backup partition (say, once a week).

Dividing

Once you have created partitions (by function) on your hard disk, it is time to address the 'Divide' component of P&D. This rule will have you further subdivide the information stored on a given partition through the use of nested folders. One common pitfall is to use folders to an extent but not to nest them (nesting refers to creating a folder within a folder...). For instance, you may create a folder called "AW.Files" (for AppleWorks documents) and begin to store your AW files within it. Next thing you know you have hundreds of files in one folder and have no idea what is contained in them. This is because you started giving them names like "Letter1", "Letter2" ... just to avoid duplicate filenames!

A proper P&D approach to this problem would be to create a folder named "Documents" and place inside it several folders, say "Home.Budget", "Work.Budget", "Personal.Letters", "Resumes", "Vacation.Plans", etc.

Appendix A

You can further divide this folder 'tree' by nesting additional folders. For instance, you could create the folders "FY.90", "FY.91", and "FY.92" and place them inside the "Work.Budget" folder. This technique uses folders to isolate and identify different kinds of data. This way, if you needed to refer back to the 1990 budget, you would know exactly where to look.

The previous example brings up a good point. You should organize your files by the type of data, not the type of document. It would have been just as easy to create a folder named "AW.Files" (for AppleWorks files) and place inside it the folders named "SS.Files" (for spreadsheet documents), "WP.Files" (for word processing documents) and "DB.Files" (for database documents). This would be a bad approach, however, since our 1990 budget may have consisted of both a spreadsheet and wordprocessing document. In this case we would have to look in two different places to get the information we need!

Putting it Together

Granted, P&D requires a fair degree of thought. Instead of just placing a file in any old folder, you have to think about where it belongs in the whole scheme of your stored data. You may even have to create an entirely new folder branch to accommodate a new type of data. The benefits, however, make it well worth the effort as you will begin efficiently using your hard disk. An efficiently utilized hard disk will actually offer greater capacity since less space will be wasted. It will also offer greater performance since you can get to your data much faster!

Universe Master Shortcuts

The Universe Master user interface provides several keyboard based shortcuts, making several operations much more fluid. This section introduces you to the conventions followed by Universe Master for providing keyboard modification of window contents.

Menu Bar Shortcuts

Many functions on the Universe Master menubar have a keyboard equivalent. When pulling a menu down, you will notice some items have an '⌘' character and regular character beside them to the right. This indicates that when pressing the ⌘ key in conjunction with the regular key, that item will be invoked. For instance, pressing ⌘-N will open a new editor window just as if 'New' were selected from the 'File' menu. Pressing ⌘-W will close the window just as if "Close" were selected from the "File" menu (or the close box were clicked with the mouse).

To learn the keyboard equivalents for menu items, simply browse each menu by pulling it down and look for the ⌘ key designations to the right of each item. Not all items will have a keyboard equivalent. These items will have to be selected the traditional way, i.e. using the mouse.

Button Shortcuts

Most of the Universe Master windows will have keyboard equivalents for standard push buttons that appear in the window. This allows you to 'press' a button through a single keystroke rather than a point and click with the mouse.

The most global and uniform shortcut is the 'default' button designation. Default buttons will have a double border around them and will stand out from any other buttons around it. It will always be the 'return' or 'enter' key as an equivalent. For instance, you will frequently see a dialog or alert with the "Okay" button double framed. This means you can press 'return' or 'enter' to select this button.

The second most global and uniform equivalent is the 'exit' button. This is not designated in any visible way other than to have a name such as "Cancel", "Done" or "Stop". The keyboard equivalent for such a button will usually be the escape key, labeled "esc" on the keyboard. The one exception is when a standard file dialog is active. In this case, "esc" is equivalent to the "Close" button with ⌘-. (⌘-period) equating to the "Cancel" button.

Universe Master

In many other instances, a button will have the first letter of its name as an equivalent. For instance, a button labeled "Add.." may have the "A" key as an equivalent, a "Remove..." button may have "R" as its equivalent. This type of equivalence will not always be available, however. Any window that has a line edit field (a place where you enter names, numbers, passwords, etc.) will not have this 'first letter' equivalence. The reason is simple: you must be able to enter keystrokes into the line edit fields and any button equivalents will intercept those keystrokes. In such cases, however, 'default' and 'exit' buttons will still have their keyboard equivalents.

Checkbox & Radio Equivalents

Whenever a group of checkboxes or radio buttons appears, there will be keyboard equivalents capable of selecting each individual item. This is accomplished by combining the ⌘ key with a numeric digit, the digit representing the checkbox's or radio button's displacement within the group. For instance, the "Copy" command window has four checkboxes at its base: "Don't duplicate root folder", "Use compression", "Password protect" and "Prompt before overwrite". In this case ⌘-1 , ⌘-2 , ⌘-3 and ⌘-4 will toggle each one of these checkboxes respectively.

File System Errors

This Appendix lists all of the errors that Universe Master could possibly report when analyzing a file system in the 'Validate File System...' function. Listed below are the error messages as reported by Universe Master along with the internal error codes that Universe Master uses to identify these errors.

If you encounter errors when analyzing a file system, you should look up the description for that error in this Appendix. The descriptions below give an insight into what is going wrong and what to look out for after the repairs have been made.

Error Messages

Error \$001: "Volume bitmap is damaged & unreadable. Reformat is required!"

This error occurs when the volume bitmap could not be read due to bad blocks on the device's media. There is no recovery from this problem, other than to duplicate the volume onto another device and try the repairs again. Fortunately, media errors on hard disks are rare.

Error \$101: "Root folder is unreadable due to damaged media."

The first block of the root folder thread could not be read due to bad blocks on the device's media. As in error \$001 above, there is no recovery from this problem other than to duplicate the volume and try again.

Error \$102: "Block number \$xxxx is unreadable rendering root folder partially intact"

One of the root folder blocks (excluding the first block) could not be read due to bad blocks on the device's media. In this case, recovery is possible since the block can be skipped over. Some files are likely to be orphaned by this repair so an orphan scan is necessary. Any repairs made by Universe Master should be considered temporary, allowing you to copy important files to another device before attempting a reformat.

Error \$103: "Root folder thread is logically corrupted in block number \$xxxx."

The root folder thread is not logically linked in either the forward or reverse direction. Recovery from this problem is almost always assured and can be considered permanent.

Universe Master

Error \$108: “Block \$xxxx, owned by <filename>, is marked free.”

Error \$10F: “Blocks \$xxxx through \$xxxx, owned by <filename>, are marked free.”

A file is claiming one or more blocks that are marked free in the volume’s bitmap. This is one of the most common forms of file system corruption. It is easily fixed and the volume may be safely used afterwards. It is possible that because of this condition the data in the specified file may have been overwritten. You should check the integrity of this file as mentioned previously.

Error \$201: “Block number \$xxxx is an unreadable folder block.”

A block within a folder thread could not be read from the device. Since the folder is not the root folder, Universe Master can repair this problem by laying down a new thread segment that works around the bad blocks. You will need to perform an orphan scan after these repairs are made. You will also want to “Verify Media...” from the “Volumes” menu so you can mark the bad blocks as used. If this error occurs on removable media you may wish to consider not using the media anymore.

Error \$202: “Block number \$xxxx is an invalid folder block.”

A folder thread is not linked properly in either direction and/or has been severed. Universe Master can repair this problem most of the time. You may want to perform an orphan scan afterwards just in case Universe Master could not find all of the severed links. Once repaired you can continue using this volume.

Error \$301: “Dangling reference to folder <foldername>.”

A reference to a folder (in what would be the folder’s parent) contains an invalid pointer to the folder thread. This is one of the more common forms of file system corruption. Universe Master scans the entire volume looking for the ‘real’ folder thread and, if found, resolves the reference to it. After repairs, it is safe to continue using the volume.

Error \$303: “Key block pointer for <filename> is out of range.”

The key block pointer for this file entry refers to a block that doesn’t exist on the volume. If the storage type indicates a sapling, tree, or folder structure, Universe Master will scan the entire volume looking for the data that this file entry is trying to point to. If the data can’t be found, or the storage type indicates another file structure, Universe Master will delete this file entry. Afterwards, it is safe to continue using this volume.

Error \$304: “Storage/file type mismatch for the apparent folder entry <foldername>.”

The file type for this entry indicates a folder but the storage type specifies otherwise (or vice versa). Universe Master tries to determine if it really is a folder and, if so, matches the storage/file type to indicate a folder structure. Otherwise, the filetype is changed to \$00 indicating a generic file. This error is not too common and usually results from ‘human’ tampering with the fields in a file entry.

Error \$309: “The file <filename> is referencing block \$xxxx which is out of range.”

A block referenced in a file's index block is out of range. This pertains to a data block within the file as opposed to Error \$303 which pertains to the key block of the file's structure. Universe Master tries real hard to find the actual block that needs to be referenced but it is unlikely to succeed. In this case, Universe Master allocates a free block and references it in place of the illegal block reference. After this repair is performed, you will have to determine on your own whether the integrity of the file has been maintained. If the file was a document, you can try to load it into the application for which it was created and see if there is any loss of data. If the file was an application, you can try to execute it and see if all of its functions operate properly (it will most likely crash if it is damaged).

Error \$404: “Bad file entry for <filename>.”

Generic error reporting that one or more non-critical fields of the reported file entry are bad. This usually occurs due to a bad filename, creation date or modification date. The repair is fairly trivial and the volume can be safely used afterwards.

Error \$405: “Folder head pointer for <filename> is invalid.”

The reference to the head of the folder thread for the specified file is not the same as the actual folder head. Universe Master performs its repair by updating the head field entry for this file.

Error \$406: “Parent entry reference in the folder <foldername> is invalid.”

A folder's parent entry reference does not match what Universe Master actually traversed. This repair is fairly simple and the volume can safely be used afterwards.

Error \$407: “File count mismatch in the folder <foldername>.”

The folder header has an entry which indicates the number of entries in the folder. In this case, Universe Master did not encounter the same number of entries. Universe Master will adjust the file count field to reflect the actual number of files encountered.

Error \$501: “The files <filename1> and <filename2> are both claiming block \$xxxx.”

The two reported file structures are overlapping, both making claim to the same block. When this occurs, there is one of two conditions that may hold true: one of the two files is rightfully claiming the block or neither file is rightfully claiming the block. Universe Master handles both cases the same way. It splits the reference by allocating another block and assigning it to the second file. It then copies the data found in the shared block to the newly allocated block. When this happens, at least one file is guaranteed to be corrupted, and maybe both files are bad. You will have to determine the integrity of both files using the technique described in Error \$309 above.

Universe Master

Error \$502: "Block \$xxxx is marked in use but is unclaimed."

Error \$50F: "Blocks \$xxxx through \$xxxx are marked in use but are unclaimed."

The single most common form of file system corruption, this error indicates that one or more blocks are marked as used in the volume's bitmap but no file is claiming them. This is a possible indication that a file or folder structure has become 'detached' from the file system. After making repairs, you should perform an orphan scan to hunt for detached structures. Either way, using the volume after repairing this error is quite safe.

Error \$601: "Block \$xxxx appears to be an orphaned directory block."

The specified block number appears to be a folder block. Universe Master will try to reconstruct its folder thread and re-attach it to the file system. If it cannot identify the proper location for this structure, Universe Master will create a folder named 'Orphan.Files' in the root directory and will place the orphan structures within that folder. Note that it is quite possible that what Universe Master thinks is a folder structure is actually nothing at all, so be prepared for some meaningless folders.

Error \$701: "Block \$xxxx appears to be an orphaned file index block."

The specified block number appears to be a file's index block. Universe Master will reconstruct the file structure and create an file entry in the 'Orphan.Files' folder discussed under the previous error. Universe Master has no way of determining the file name or file type of this structure so it arbitrarily assigns a name and type to the file. You will have to determine the name and type of the file on your own. Note that it is quite possible that what Universe Master thinks is a file structure is actually nothing at all, so be prepared for some meaningless files.

File Type Assignments

The Apple IIGs differentiates between the data stored within files by assigning a unique filetype to each file. This filetype assignment allows applications to identify the files applicable to them. For instance, a word processor will only allow you to load files with a 'Word Processor' file type.

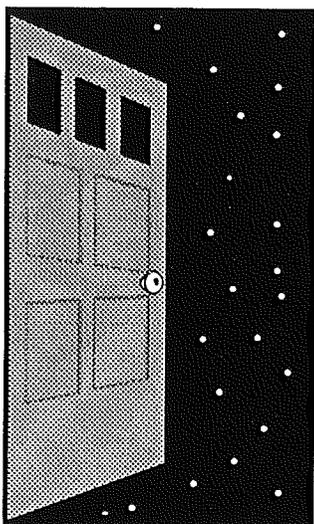
There are up to 256 unique filetypes that may be assigned to any file. Each different filetype is used to differentiate the type of data stored in the file as in the word processor example in the previous paragraph. However, applications often need to know which specific application a type of document was created for. For instance, AppleWorks GS needs to be able to identify word processing documents created with AppleWorks GS. To perform this distinction, the Apple IIGs relies on auxiliary file types.

Below is a table that lists several popular application documents and the file types/auxiliary file types associated with them. This table is useful when converting files to other file/aux. types. Whenever Universe Master lists a choice of filetypes, they will be presented in the order that they are presented here (which is ascending, by primary file type). This table only lists the more popular file type assignments and is by no means complete.

<u>Primary File Type</u>	<u>Auxiliary File Type</u>
\$00 Unknown	- All
\$01 Bad Blocks	- All
\$04 ASCII Text	- All
\$06 Binary	- Application Specific
\$0F Folder	- All
\$19 AW: Data Base	- Application Specific
\$1A AW: Word Processor	- Application Specific
\$1B AW: Spreadsheet	- Application Specific
\$42 File Type Descriptor	- Application Specific
\$50 GS Word Processor	\$5445 Teach
	\$8010 AppleWorks GS
\$51 GS Spreadsheet	\$8010 AppleWorks GS
\$52 GS Data Base	\$8010 AppleWorks GS
	\$8011 AppleWorks GS Template
\$53 Drawing	\$8002 Graphic Disk Labeler
	\$8010 AppleWorks GS
\$54 Desktop Publishing	\$8010 AppleWorks GS
\$55 Hypermedia	\$8001 Tutor-Tech
	\$8002 Hyperstudio
\$59 Communications	\$8010 AppleWorks GS
\$B0 Source Code	- Language Designation
\$B3 GS/OS Application	- Launch Information

Universe Master

<u>Primary File Type</u>		<u>Auxiliary File Type</u>	
\$B6	Permanent INIT File	-	Load Information
\$B7	Temporary INIT File	-	Load Information
\$B8	New Desk Accessory (NDA)	-	Load Information
\$B9	Classic Desk Accessory (CDA)	-	Load Information
\$BA	Tool		
\$BB	Driver	-	Load Information
\$BD	File System Translator	-	Load Information
\$C0	Super Hi-Res Image	\$0000	Paintworks
		\$0001	Packed SHR
		\$0002	Apple Preferred
		\$0003	Packed PICT
\$C1	Super Hi-Res Picture	\$0000	Super Hi-Res Screen Image
		\$0001	PICT
\$C6	Script	\$8002	Universe Master Backup Script
		\$8003	Universe Master Chain Script
\$C7	Control Panel	-	Load Information
\$C8	Font	\$0000	QuickDraw II Font
\$CA	Icon	-	
\$D5	Music Sequence	-	
\$D6	Musical Instrument	-	
\$D7	MIDI Data	-	
\$D8	Sampled Sounds	-	
\$E0	Archival Library	\$8002	Shrinkit (NuFX) Document
		\$800B	AutoArc Document
\$FC	AppleSoft BASIC Program	-	
\$FF	ProDOS 8 Application	-	



Index



A

Access Attributes, 4-16, 5-17
Adopting Orphans, 6-12
APPLE Key, 6-5, B-1
Archives, 3-33, 3-37
Auxiliary File Types, 5-17, 4-17, D-1

B

Bad Blocks, 5-29, 5-30
Bad.Blocks, 6-15
Bad Media, 6-15
Backups
 Archival, 3-33, 6-2
 creating a folder, for, 3-10
 Incremental, 6-2
 Primary, 3-27
 Redundant, 3-27, 6-2
 Secondary
 See Redundant
Backup Command Button, 2-7, 3-9, 3-28, 4-5
Backup Criteria (window), 3-11, 3-20, 3-34, 4-6, 5-8
Backup File Selection, 4-7
 Backup Period, 4-7, 5-9
 File Growth, 4-7, 5-9
 Filetype Matching, 4-7, 5-9
 Modified Files, 4-7, 5-8
Backup Generator (window), 3-9, 3-10, 3-20, 3-35, 4-5
Backup Needed Bit, 4-16
Backup Options, 4-8, 5-10
 Compression, 4-8, 5-10
 Date Stamping, 4-9, 4-24, 5-11
 Duplicate Script, 4-8, 5-10
 Encryption, 4-8, 5-10
Backup.Scripts (folder), 3-21
Backup Scripts, see Scripts
Backup Script Editor, 3-30, 5-7
 changing destinations, 3-30
Bitmap, 5-23
Block Editor (window), 5-25

Block Device, 1-2, 2-2
Block Size, 5-21
Blocks Free, 5-19
Blocks Used, 5-17, 5-21
Bootable Volumes, 5-22, 5-23, 6-4
Branch Catalog (window), 4-14
Branch Indicator, 2-4
Build Script Chain (window), 3-24, 5-6
Button Shortcuts, B-1

C

Can't Delete Bit, 4-16
Can't Rename Bit, 4-16
Catalog Command Button, 2-7, 4-14
Catalog Printout, 3-4, 3-6
Chain Scripts, see Scripts
Children (folders), 2-3
Checkbox Equivalents, B-2
Command Buttons, 2-1, 2-7
 also see individual names: Copy, Delete, Backup, Restore, Catalog, File executing, 2-7
 Info., Recover, Print
Compression, 4-8, 5-2, 5-10
Continuous Test, 6-16
Contract (button), 2-4
Copy One File, 5-1
Copy Branch (window), 3-2
Copy Command Button, 2-7
Corrupt File System, 6-10
Creation Date/Time, 5-17

D

Damaged Disks, 6-15
Damaged Root Folder, 5-23
Data Corruption, 6-2
Data Loss Experience (DLE) 6-1
Decode One File, 3-37, 5-2
Delete Branch (window), 3-14, 3-15, 3-19, 4-3
 Options, 3-15, 4-4
 Scope, 3-15, 4-3

Universe Master

Delete Command Button, 2-7, 3-14, 3-15, 3-19, 4-3

Delete One File, 5-1

Deleted Files, 4-20

Deleting Damaged Files, 5-35

Deselecting Folders (in map view area), 2-6

Destination Lists, 3-2, 3-3, 3-9

 Eject button, 3-3

 New Folder button, 3-3

 Volumes button, 3-3

Device Name, 5-19, 5-21

Device Selection, 6-8

Device Type, 5-21

Disjoint Branch, 6-13

Dividing Data, A-1

Duplicate Scripts, 3-12, 3-22, 3-23, 4-8

Duplicate Volume, 5-26, 6-16, 6-18

E

Edit (on Menu Bar), see Menu Bar, Edit

Editing Blocks, 5-25

Editing Scripts, see Scripts

Eject (button), 2-4, 2-5, 3-13

Encode One File, 5-1

Encryption, 4-8, 5-2, 5-11

EOF, 5-18

Erase, 5-21

Error Messages, C-1

Error Retry Count, 5-27

Executing Scripts, see Scripts

Expand (button), 2-4

Extracting Files, 6-18

F

File (on Menu Bar), see Menu Bar, File

File Info. Command Button, 2-7, 4-15

File Information (window), 4-15

File Name, 5-17

File Recovery (window), 4-20, 4-21, 6-6, 6-7

File Statistics, 4-17

File Structures, 5-33

File System, 6-10

File System Errors, C-1

File System Validation (window), 6-11, 6-14

File Type, 4-17, 5-17, D-1

File Type Assignments, D-1

Find Owners, 5-31

Finder™, 1-1

 Dropings, 6-5

 Locate button, 3-22

 used to execute scripts, 3-21

Folder Editor (window), 5-16

Folder Structures, 5-32

Folders

 creating one to store backup data, 3-10

 deselection in map view area, 2-6

 Edit, 5-15

 in map view area, 2-3

 on Menu Bar, see Menu Bar, Folders

 range selection, 3-3

 selection in destination lists, 3-3

 selection in map view area, 2-6

 selection in source lists, 3-3

 single selection, 3-3

 Sort, 514

Fonts, 4-25, 5-4

G

Generating Scripts, see Scripts

H

Head Pointer, 5-17

Hex Editor, 5-25

Hierarchy Display, 5-4

Hierarchy Map View Area

 see Map View Area

Hierarchy Levels, 2-4

Hierarchy Printout, 3-4, 3-5

Home, 5-36

I

Ignore Errors, 5-27
Initialize, 5-22
Installing Universe Master, 1-2
Install.UM (file), 1-2
Intact Files, 4-20, 6-6
Invisible Files, 4-16, 5-3
Isolated Damage, 6-11
I/O Errors, 6-15

K

Key Block pointer, 5-17

L

Last Backup, 6-3
Levels (of hierarchy), 2-3
Loading Map (message), 2-2, 3-4
Locate (button), from Finder™, 3-22

M

Map View Area, 2-1, 2-3, 3-18
 buttons, in, 2-4
 Contract button, 2-4, 2-5
 Eject button, 2-4, 2-5, 3-13
 Expand button, 2-4, 2-5
 Rebuild button, 2-4, 2-5
 Rescan button, 2-4, 2-5
 Zoom button, 2-4
Marginal Errors, 5-30
Marking Blocks, 5-26
Marking Bad Blocks, 5-31, 6-15, 6-17
Mass Duplication, 5-27
Media Damage, 5-28, 5-30, 6-15
Media Scan (window), 5-28, 6-16
Menu Bar, 2-1, 2-8
 Edit, 2-9, 3-30, 5-3
 Cut, 2-9, 5-3
 Copy, 2-9, 5-3
 Paste, 2-9, 5-3
 Clear, 2-9, 5-3

Select All, 2-9, 5-3
Preferences, 2-9, 5-3

File, 2-8, 5-1

New, 2-8, 5-1
Open, 2-8, 5-1
Save, 2-8, 5-1
Save as, 2-8, 5-1
Close, 2-8, 5-1
Copy one file, 2-8, 3-28, 5-1
Delete one file, 2-8, 5-1
Encode one file, 2-8, 5-1
Decode one file, 2-8, 5-2
Quit, 2-8, 5-2

Folders, 2-9, 5-14

Create, 2-9, 5-14
Sort, 2-9, 5-14
Edit, 2-9, 5-15

Scripts, 2-9, 3-16, 3-23, 5-6

Chain, 2-9, 3-31, 5-6
Edit, 2-9, 3-30, 5-7
Backup, 2-9, 3-23, 5-11
Restore, 2-9, 3-16, 5-11

Volumes, 2-10

Summary, 2-10, 5-19
Erase, 2-10, 3-27
Initialize, 2-10
Zero, 2-10
Optimize, 2-10
Verify media, 2-10
Rebuild volume info, 2-10
Validate file system, 2-10
Edit block, 2-10

Windows, 2-10

Stack, 2-10
Home, 2-10
Universe Master, 2-10

Menu Bar Shortcuts, B-1

Modification Date/Time, 5-17

Universe Master

O

Online Volume Display, 2-1, 2-2
Online Volume Summary (window), 5-20
OPTION key, 6-5
Orphan Structures, 5-24, 5-33, 6-3, 6-4, 6-12
 adopting, 6-12
Orphan.Files, 6-14
Owners, 6-17

P

Parent (folders), 2-3
Partially Intact Files, 4-20
Password Protect, 4-8, 5-2, 5-10
Partitioning Data, A-1
Preferences, 2-9, 5-3
Preferences (window), 5-4, 5-5
ProDOS 8, 4-9
Print Command Button, 2-7, 3-4, 4-22
 hierarchy printout, 3-4, 3-5, 4-23, 6-1,
 6-2,6-11
 catalog printout, 3-4, 3-6, 4-23, 6-1,6-2,
 6-3, 6-11
Print Document Type, 4-23
Print Format Options, 4-23
Print Templates, 4-22, 4-25
Print Textfaces, 4-25
Print Volume (window), 3-6, 4-22, 4-23

Q

Quick Jump, 5-26
Quit, 5-2

R

Radio Button Equivalents, B-2
Read Enabled Bit, 4-16
Read Only, 5-28
Read/Modify/Write, 5-29
Read/Write, 5-29, 6-16
Rebuild (button), 2-4, 2-5
Rebuild Volume, 5-21,5-22,6-8

Rebuilding Volume Bitmap, 5-23
Recover Command Button, 2-7, 4-20, 6-5
Recovering Deleted Files, 4-21, 6-5
Redundant Backups, 3-27
Renaming Files, 4-15
Repair Damage, 5-34
Rescan (button), 2-4, 2-5
Restoration Criteria (window), 3-16, 3-17, 4-12,
 5-12
 Prompt Options Region, 3-18, 4-13,
 5-13
 Restore Options Region, 3-18, 4-13,
 5-12
Restoration Script, 3-17
 also see Scripts
Restore Command Button, 2-7, 4-11
Restore Files (window), 4-11
Restoring Files, 3-14
Restoring Root Folder, 5-23
Root (folder), 2-4, 5-23, 6-2
R/W Error threshold, 5-29

S

Screen Colors, 5-5
Scripts
 also see Duplicate Scripts
 Backup, 3-17
 Chain, 3-24
 adding scripts, 3-24
 execution, 3-26, 3-31
 execution of, 3-12, 3-13, 3-21,
 3-22, 3-23, 3-31
 generation of, 3-19, 4-9
 naming of, 3-12, 4-9
 on Menu Bar, see Menu Bar, Scripts
 Primary, 3-27
 Redundant, 3-27
 Restoration, 3-17
 Secondary, 3-27
Selecting Folders (in map view area), 2-6, 5-3
Shutdown, 6-4, 6-9

Slot Number, 5-21
Sort Criteria, 5-15
Sorting Entries (in RAM), 5-3
Sorting Entries (on disk), 5-14
Sounds, 5-4
Source Lists, 3-2, 3-3, 3-9
 Close button, 3-3
 Open button, 3-3
Stack, 5-36
Storage Type, 5-17, 5-35
System Disk, 6-4

T

Total Blocks, 5-19, 5-21
Tutorial
 how to use, 3-1

U

UM.Tutorial Branch (figure), 3-5
UMTutorial (file), 1-2, 1-3
Undeleting Files, 4-20, 4-21
Unit Number, 5-21
Universe Master Window, 1-2, 2-1
Unrecognizable Volumes, 6-8
Unrecoverable Files, 4-20
Unrepairable Errors, 5-34
User Corruption, 6-2
User Interface, 2-1

V

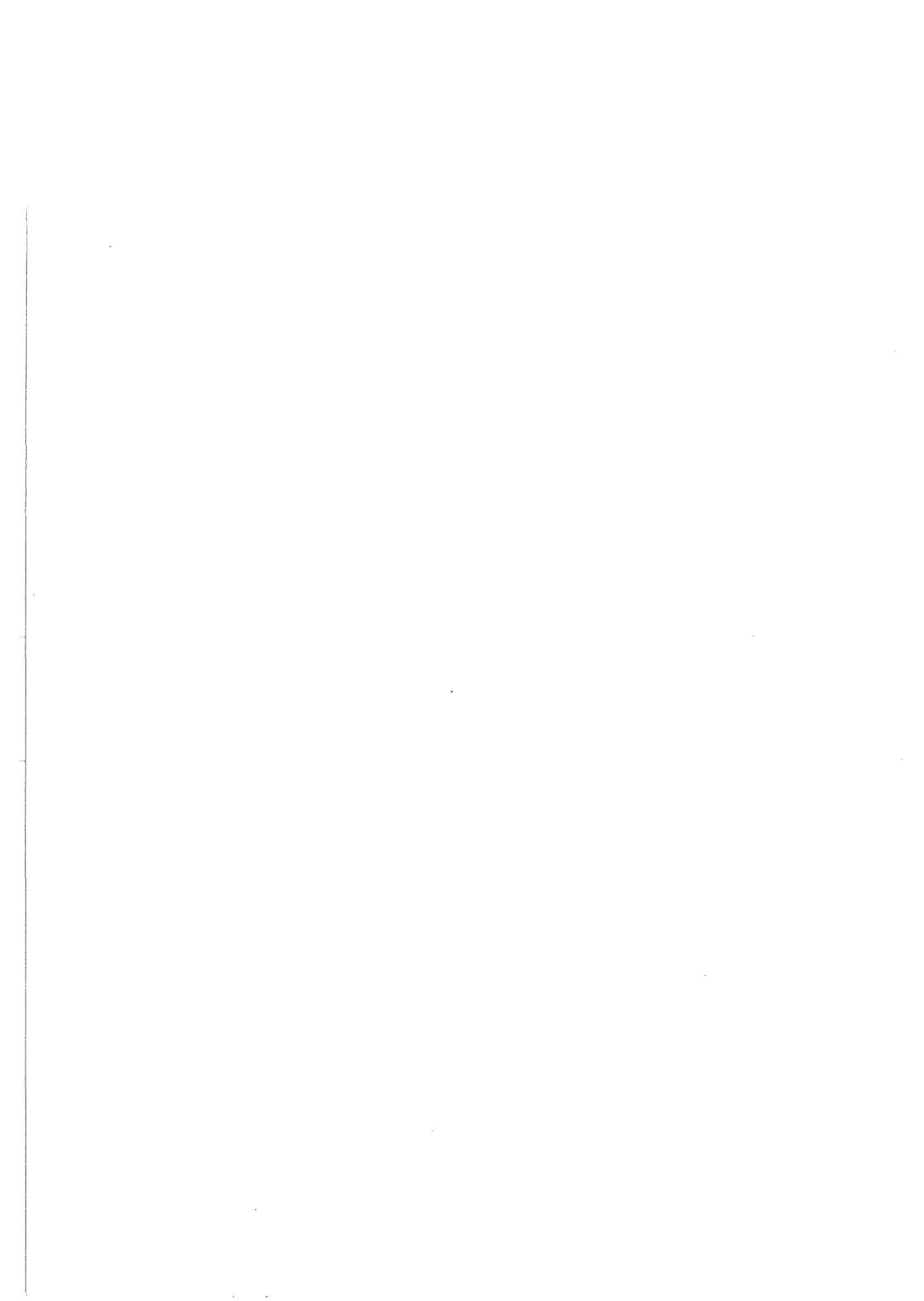
Validate File System, 5-32, 6-3, 6-10, 6-12
Verify Media, 5-28
Volume Duplicator (window), 5-27, 6-19
Volume Hierarchy Map, 2-2
Volume Information (window), 5-20
Volume Name, 5-19, 5-21
Volume Reconstruction (window), 6-9
Volumes, 2-2
 on Menu Bar, see Menu Bar, Volumes
 selecting all folders in a volume, 2-6

W

Window Updates, 5-4
Windows
 on Menu Bar, see Menu Bar, Windows
Write Enabled Bit, 4-16

Z

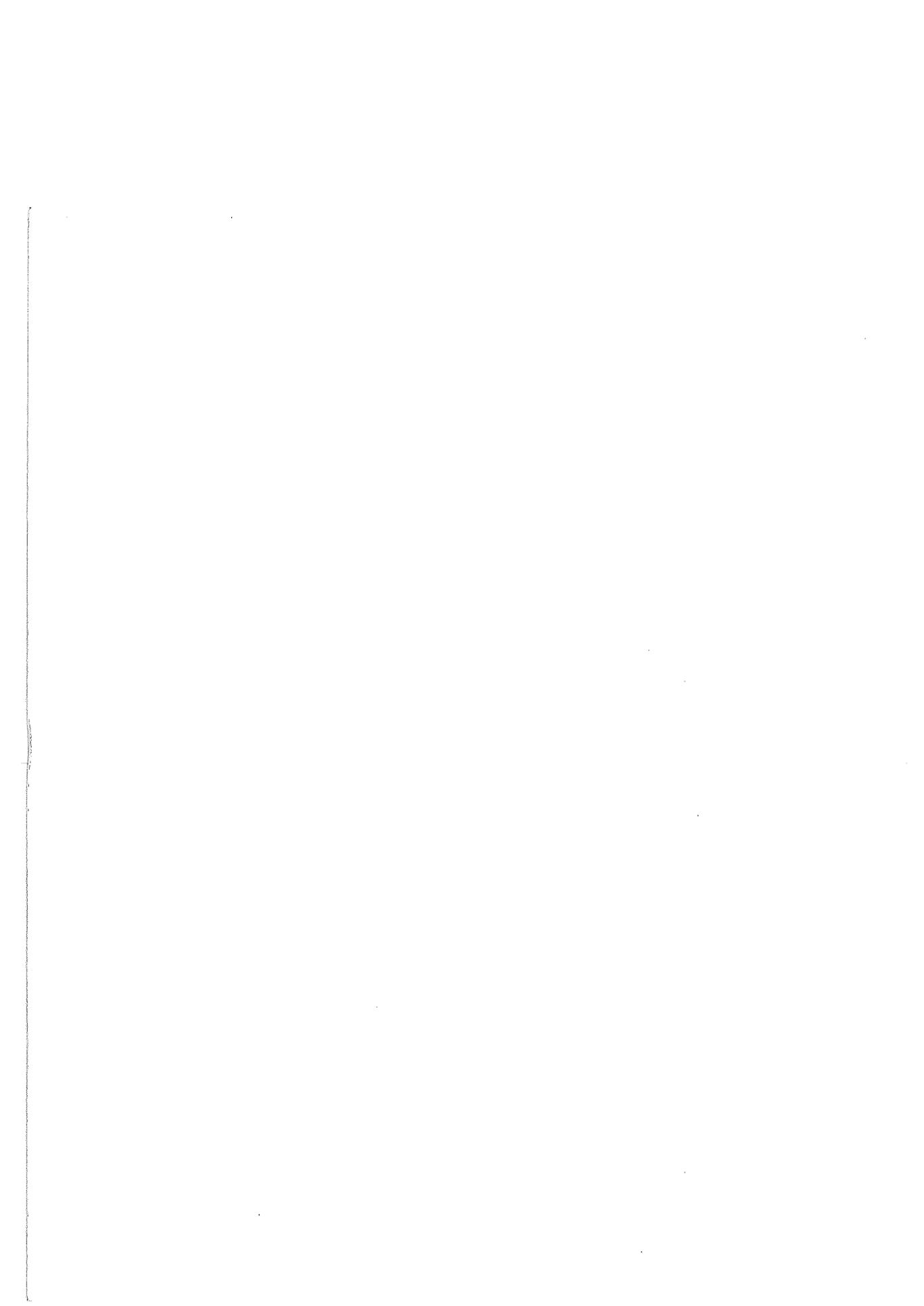
Zero Unused Blocks, 5-24, 6-3
Zoom (Button), 2-4



Notes

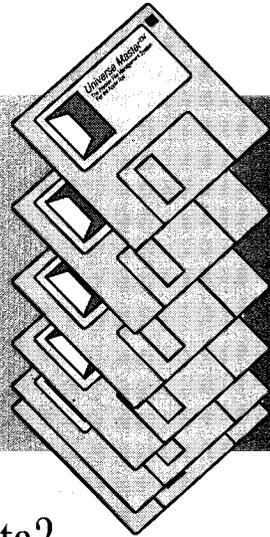
Notes

Notes





Don't own a hard disk drive without it!



Why take chances with your precious data?

Universe Master™ offers a whole new world of hard disk management technology for your Apple IIgs. Designed to give you unparalleled command and control over the efficiency, organization and security of your hard disk, Universe Master provides these outstanding features:

- ❖ Seamless, savvy, user-friendly, graphical interface which merges functionality and flexibility with unbeatable simplicity.
- ❖ Data backup! Backup files, folders or entire volumes based on a wide variety of user selectable criteria. Once designated, subsequent backups are as simple as a double-click from the Finder™ desktop!
- ❖ Data organization! Get control of your hard disk by instantly viewing any volume's hierarchy. Move files/folders around, delete unwanted items, compress rarely used files and even get printouts showing an entire volume's file organization.
- ❖ Data security! Insurance is a nice thing to have, especially when dealing with your important files. With Universe Master, you'll be able to recover deleted files, repair damaged directories, or reconstruct damaged volumes; averting the dreaded reformat and subsequent loss of data.
- ❖ All this and more! Universe Master provides a host of other features: file attribute modification, data encryption, text file editing, block level editing, file system analysis, disk optimization, folder level editing, folder sorting, orphan recovery... just to name a few.

Another Apple II enhancement from...

ECON
TECHNOLOGIES

AB92GS0301

P.O. Box 195356 Winter Springs, FL 32719