

Utility Works®

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UtilityWorks® Reference

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UtilityWorks® Reference

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1. Apple Icon

1.1 About UtilityWorks

This item is a single dialog describing the UtilityWorks program, including Shareware and trademark notices. Click OK to exit or Copyrights to view copyright notices.

1.2 Help

This item presents a single dialog giving some basic information on setting up the program and refers to this documentation file for more information. Click OK to exit.

1.3 Speed Up

This item provides a capability of setting the QuickDraw II speed up options as you desire. You are presented a dialog that allows you to either utilize or not utilize the hardware shadowing and fast port speed up options. The defaults are hardware shadowing on and fast port off. Fast port is nominally off unless you are using System Disk 6.0 or later because of a bug in QuickDraw II on System Disk 5.0 which results in incorrect handling of color palettes when DrawPicture is called (used in UtilityWorks for display of Object Oriented Graphics and printing). If you are not concerned about these special cases you can turn fast port on for best performance. Some current NDAs do not function properly in the presence of hardware shadowing. You should turn hardware shadowing off if you are using any such NDAs. Please note that even though UtilityWorks may request one or both of the speed up options, GS/OS may not grant the requested speed up option because it has not been loaded due to a minimal memory configuration. Also note that UtilityWorks must close all windows when changing the hardware shadowing mode, but not the fast port speed up mode. You will be prompted before UtilityWorks actually closes the windows.

2. File

2.1 New

Opens a new window for entering and editing text information. As soon as the window is opened, you can begin entering information from the keyboard. Use the Option key and Option-Shift keys to enter alternate characters (use the Key Caps capability of the View Fonts... item in the Document menu to see the correspondence of the various special characters to the Apple IIGS keyboard). (Make sure the use of alternate characters is selected in the Control Panel NDA). Making changes to already entered text is easy. Select the text you want to change with the mouse as discussed earlier under Using the Text Editor Features. Use the keyboard or menu items to Copy, Cut, Paste, or Clear the selected text. Select desired font, font size, and font style for the current selected text from the Select Font... menu item. Select color of fonts for the current selected text from the Select Color... menu item. Change the ruler settings for the entire window (ruler settings apply to the full window and not to individual selections) using the Select Ruler... menu item. The Select Ruler... menu item allows control of left and right margins, paragraph indentations, line spacing, and text justification (left, right, centered, and full). Tabs are preset to occur every 80 pixels (or approximately every 8 characters, depending on the font characteristics). Resulting Edit Text windows can be printed or saved as a file to disk. UtilityWorks 0.9.2 and later opens New windows as fully zoomed windows and permits use of the Apple Extended Keyboard special keys.

2.2 Open

You can use this item to view any file that appears in the file selection dialog. Each file is displayed in a separate window, which may be scrolled (if the contents exceed the window size), zoomed, grown, shrunk, or moved about on the Desktop. Any number of files displayed in windows may appear on your Desktop. Text based files may be opened as either standard (i.e.; non-editable) windows or fully zoomed Text Edit windows, depending upon the "Open Text Files in Edit Windows" setting in the Options... menu item. The window's Information Bar contains a description of the file as contained in the Finder's file descriptor files, or a simple three character file type mnemonic if the file descriptor files have been purged. The Information Bar for 3200 files and Animation files contains help information for displaying the files when in 320 mode. This item currently opens the following file types and displays them on the SHR screen:

Text (\$04 or TXT) files are displayed after detabbing and stripping off low-ASCII control characters (high-ASCII characters are nominally passed unchanged, permitting display of special and foreign characters and printout of Mouse Text characters). Detabbing is most useful for text files generated as compiler source files. The Tabs for text files are assumed to be every 8 characters in the line. If a text file has any lines longer than 255 characters, the entire file will be word wrapped to 80 characters per line for display. UtilityWorks Version 0.8 implements a soft word wrap (i.e.; no carriage returns or other special characters are inserted in the text file - the internal text file remains exactly as input). This permits easy adjustment of the word wrap for both text and graphics printout. Graphics printout will now be properly word wrapped regardless of the font size used. The Options... item in the Utilities menu provides a capability to convert all high-ASCII characters to low-ASCII characters to permit reading those Text files whose information content is contained in high-ASCII (for instance the ProSel documentation files). This capability should only be used for those files that require it. Even though the High ASCII > Low ASCII option can be saved as a default, I do not recommend doing so. Many files that use high-ASCII characters have serious problems if this is done. UtilityWorks itself will reset this option if you use non standard fonts or if you display sample fonts (which contain high-ASCII characters). Note: The High ASCII > Low ASCII option must be selected before opening the file. This option will not in general alter the contents of existing windows, except in certain instances when printing the contents of a window.

Binary (\$06 or BIN) SHR picture files with a file length of 32 K. Binary SHR picture files are commonly used by Apple IIGS slide show programs. These files are displayed in the same manner as the unpacked picture files discussed below. BIN SHR picture files are not an approved Apple format, but nonetheless are used by many programs. Unfortunately, the BIN file type is a common file type used for both programs and other types of graphics, and only 32 K BIN files have been made selectable to minimize the chance of selecting a non-SHR graphics image. If you are certain that a nonselectable BIN file is really a SHR file, you can view the file by converting its file type to the \$C1 unpacked file type using the Set File Type... menu item discussed below. Note that the selection criteria is based upon file length (32 K),

and not blocks contained in the file on the disk (nominally 65 blocks). This is done because GS/OS may write any file as a sparse file. SHR files containing areas of black pixels will be written as a sparse file if they are written by GS/OS, but not if they are written by ProDOS 16. Unfortunately some commercial programs look for 65 block BIN files and not 32 K length BIN files, which can result in BIN SHR files written by GS/OS being unviewable by these programs.

AppleWorks word processing (\$1A or AWP) files are displayed after extracting the header information and decoding the text information. AppleWorks 3.0 files are supported. Carriage returns, spaces, and left margins (on printout) are inserted as determined from the AppleWorks formatting information. Tabs are assumed to occur in the positions indicated in the AppleWorks header data. Multiple rulers, which can occur in AppleWorks 3.0 files, are ignored. The AppleWorks word processing files are therefore displayed (and printed) in a very legible, formatted form, unlike many other utility programs that display AppleWorks files.

Teach (\$50, Aux Type \$5445) files are a new Apple Standard file format for files generated using the Text Edit Tool. These files preserve all font, font size, font style, font color, and ruler information. To preserve all ruler information, teach files are displayed within a window of the same size that existed when the file was saved, unless that size would place the window's boundaries beyond the screen's boundaries.

AppleWorks GS Word Processing (\$50, Aux Type \$8010) files are displayed in a similar manner to standard AppleWorks files. The resulting output will be very legible, but will not appear in exactly the same format that the AppleWorks GS program would produce.

WordPerfect Word Processing (\$A0) files are displayed in a similar manner to standard AppleWorks files. The resulting output will be very legible, but will not appear in exactly the same format that the WordPerfect program would produce.

Source (\$B0 or SRC) files are displayed in an identical manner to TXT files. Tab positions are determined by examining the auxiliary file type to determine the APW language type. Tab positions are assumed to be identical to the default Byte Works (ORCA/M) SYSTABS for that language type.

Packed (\$C0 or PNT) files (all Apple defined types including Aux Types \$0000 and \$8000 (PaintWorks), Aux Type \$0001 (PackBytes used by 816/Paint), Aux Type \$0002 (Apple Preferred used by many programs including Deluxe Paint II), and Aux Type \$0003 (Packed QuickDraw PICT File). All files are displayed in the same manner as the unpacked picture files discussed below. Palettes contained in the files will be used if they exist, otherwise default palettes will be used (see discussion below on mode change). PaintWorks files are double screen height and are totally unpacked. Apple preferred format is also totally unpacked, and may consist of part of a screen or multiple screens. Use the scroll bars to scroll throughout the picture with these multiple screen files. When Apple Preferred pictures are printed, the equivalent of up to two screens will be printed (the remainder of the picture is ignored). When PaintWorks files are printed, the entire image will be printed. When PaintWorks or Apple Preferred

pictures are saved (as unpacked pictures), the equivalent of a single screen will be saved. This saved image will correspond to that portion of the total image currently in view in the front window. The top of the saved image will correspond to the top of the picture in the front window, unless the top of the picture is less than 200 lines from the bottom of the picture. In this latter case the top of the saved image is 200 lines from the bottom of the picture.

Unpacked (\$C1 or PIC) files (including full unpacked picture (Aux Type \$0000), unpacked QuickDraw PICT (Aux Type \$0001) and SHR 3200 Image (Aux Type \$0002) files) are displayed in a graphics window. 320 resolution files are displayed in 640 resolution mode using the default system palette. (See the 320 Mode Menu Item to switch to 320 resolution for display using the palettes contained in the file). 640 resolution pictures are displayed using the palettes contained in the file, provided the file is in the front window. If the file is not in the front window, the picture is displayed using the default system palettes (if either a text file or 320 graphics file is in the front window) or the palettes from another 640 graphics file if this other file is in the front window. The resolution of the file (320 or 640) is displayed in parenthesis in the window title following the file name.

3200 files (either **\$C1**, **Aux Type \$0002** files, or **TXT (\$04)** or **BIN (\$06)** files whose name ends in “.3200”) are converted to a 320 SHR monochrome (16 levels of gray) picture for display and printout. The full 3200 color picture will be displayed if you press Command 3 (Open-Apple 3) while in 320 mode if the 3200 picture is in the front window. This will show the full range of colors possible with 3200 color pictures. Press the mouse button or any key to return to the normal display.

3201 files (either **TXT (\$04)** or **BIN (\$06)** files whose name ends in “.3201”) are converted to a 320 SHR monochrome (16 levels of gray) picture for display and printout. The full 3200 color picture will be displayed if you press Command 3 (Open-Apple 3) while in 320 mode, as described above for 3200 files.

GIF files (either **TXT (\$04)** or **BIN (\$06)** files whose name ends in “.GIF”) are converted to a 320 SHR picture for display and printout. Quite often the palettes used will cause the menu bar to become obscured in 320 mode. You may have to use Command-I (Open-Apple-I) to clear up the menu bar, or perhaps even use keyboard equivalents to switch out of 320 mode.

Animation (\$C2) files are displayed in a window with full animation, when they are viewed in the proper mode (usually 320 mode) and when the window is the front window. You can stop the animation at any point for viewing, printout, or saving to disk merely by pressing the space key. Pressing any other key will resume the animation.

Font (\$C8 or FON) files are displayed showing a sample of all characters contained in the font file (including foreign and special characters), as with the View Fonts menu item. Unlike the View Fonts menu item, however, this feature will enable opening and viewing any font contained on any disk or any directory (not just those contained in the Boot Disk’s *:SYSTEM:FONTS: directory). UtilityWorks will also install this font (and the font family if it doesn’t currently exist) in the Font Manager’s list of fonts. This then permits you to use the View Fonts menu item to view other styles of

this new font if so desired. Note that this routine permits you to install any font into the Font Manager's list of fonts as long as it is not an obvious duplication of a font that already exists. Family number, family name, style, and size data for any new font are checked against the existing fonts. If this data is identical the new font is not added. If the new font's family name already exists, but its family number is different from the existing family number for this family name, the new font's family number will be changed to the existing number. (Note, no change is actually made to the font file - just the information in memory). If the new font has the same family number as an existing font, but a different family name, the new font's family number will be changed to an unused family number. These latter tests and actions are necessary because use of font family numbers and font family names has not been well controlled, and there is much duplication in the use of font family numbers. Developers of new fonts should submit them to the Font Clearinghouse (administered by A2 Central) for assignment of numbers to avoid these problems in the future. If your memory is limited, you may not be able to create large sizes of fonts. You will be warned if this happens, and in such cases the default system font will be displayed. UtilityWorks cannot open TrueType Fonts. TrueType fonts must be installed by Pointless to be used by UtilityWorks.

Icon (\$CA or ICN) files are displayed as picture screens. In constructing the Icon screen, you will briefly see all icons in the file flash in the upper left hand corner of the icon window, but only if the hardware shadowing speed up option is turned off. The window will then be redrawn to show up to 10 rows of 6 icons each, for a total screen capacity of 60 icons (any remaining icons in the file are ignored). Each large icon and corresponding small icon are displayed side by side. The icon program name (truncated to 12 characters) and file type (displayed only if the program name is 8 characters or less) are displayed immediately below the icons.

Unpacked GraphicWriter (\$E1) files are displayed exactly like BIN files, and have the same selection criteria.

Publish It! font (\$F7) files are displayed exactly like the \$C8 font files, and are in fact installed into the Font Manager's list of fonts in the same manner as \$C8 font files.

Printshop GS color graphics (\$F8, Aux Type \$C323) files are displayed in the center of a SHR screen with a white background. The Printshop GS Palette is used if the Printshop GS color graphics file is displayed in 320 mode.

Applesoft BASIC (\$FC or BAS) files are displayed as fully decoded Text files, and may be printed as a BASIC listing or saved to disk as a Text file.

All of the above files are displayed in standard Apple windows. You can zoom the windows, grow or shrink the windows, move the windows, scroll the contents of the windows, or move any window to the front by clicking on it. With text based files, clicking on the vertical arrow will cause the display to move up or down a single line. Clicking on the vertical bar will cause the display to move up or down a full visible page minus one line (regardless of whether the window is zoomed or not). When entering this routine the user is presented with a standard dialog allowing him to choose what file is to be displayed. Only files of the above types appear in the dialog. Files can be selected from any directory on any active device. During the display of the file, the file name (as well as the desired mode for Graphics files) will appear in the window title. An Information Bar appearing immediately below the window title contains a description of the file type, or a simple three character file type mnemonic if the file descriptors have been purged. Proportional spacing is defeated to allow columns of information to be properly displayed, except in Text Edit windows. Scroll bars are adjusted to the length of the document. All files displayed in a window (including the catalog, device, and prefix windows) are stored in memory in one of three formats depending on whether the window contains text, picture (pixels), or drawing command information. These standard formats permit easy incorporation of additional file types and information windows as development of this program continues.

Files are read from disk and processed to form the standard internal files. Therefore, there will be a slight delay before the actual display occurs. The program posts a wait cursor during this time. The delay is most appreciable for lengthy AppleWorks files. However, once the file is in memory, scrolling of the documents is very rapid because only the visible region is drawn to the display. Any number of files and windows may be displayed simultaneously on your screen, subject only to the memory limitations of your computer. This gives you the powerful capability of having several AppleWorks or Text files, as well as pictures, simultaneously displayed on your SHR resolution screen. By appropriately placing the windows you can switch back and forth with ease.

UtilityWorks version 0.9H and later permits the selection of either individual files or multiple files with the Open... menu item. With UtilityWorks version 0.9I and later the multiple file selection dialog will appear unless you press the Command (Open-Apple) key as you click the mouse on the Open... menu item. The multiple file selection dialog looks almost the same as the individual file selection dialog, except that it includes an Accept button. This Accept button is used to indicate that you have made all of the desired multiple file selections. The Open button can still be used with this dialog if you only make a single file selection. Make multiple file selections using the shift and option keys as described in the previous File/Directory Selection Dialog discussion.

If you are using System Disk 5.0.3 or later, you can use the following keyboard equivalents for both the individual and multiple file selection dialogs used with the Open... routine. (These equivalents cannot be used with the File/Directory Selection Dialog, however).

Key	Action
Esc or Command-Up Arrow	Close
Tab	Disk
Command-period	Cancel
Command-o or Command-O or Command-Down Arrow	Open
Command-n or Command-N	New Folder

NOTE: The maximum document size that can be displayed in a single non-editable text window is about 1800 lines (or the equivalent of about 30 8-1/2 X 11 pages) with the standard system font, or considerably less with fonts larger than Shaston 8. This is a limitation of the display. The entire document is in memory and can be completely printed out or saved to disk as a text file. To view the entire document on the screen, change the text window to an Edit Window using the Edit Text... menu item.

2.3 Close

This routine closes the current front window and disposes (deletes) all of its associated handles, thereby freeing whatever memory was associated with the window. The same effect can be achieved by clicking on the window's close box. Pressing the Option key while selecting the Close menu item closes all windows.

2.4 Save

This menu item is activated if a Text Edit window is the Front Window and the file displayed is an original Teach file or a new file. Selecting Save will save the Text Edit window as a Teach file to its original pathname. The user is prompted to select a pathname if the window is a New window and therefore does not have an original pathname.

2.5 Save As

This routine will save the file represented by the front window in one of four formats depending on whether it contains text information, Text Edit information, picture information, or object-oriented graphics information. If the front window contains text information, it will be saved as a standard text \$04 (TXT) file. Note that this provides an easy way of converting AppleWorks files to text files. There are three options that may be used when saving text files. The Quick Save option saves the exact text image in memory with no detabbing or removal of control characters. The Standard Save option detabs (i.e., inserts spaces to the next Tab location) the text image in memory and strips off all control characters. The Strip Returns option removes all carriage returns contained within every paragraph of the text image, in addition to detabbing the text image and stripping off all control characters. The Quick Save option is much faster than the other two options because it does not have to create a new text image in memory. The auxiliary file type of the saved file contains the number of records in the file in conformance with standard practice, except for Text Edit windows saved as text files, where the auxiliary file type is set to zero.

If the front window contains Text Edit information, the user is given the opportunity of saving the information as either a standard text file or as a Teach \$50 Aux Type \$5445 file. If saved as a text file, all font, font size, font style, font color, and ruler information will be lost. Teach files preserve all of this information, as well as information on the current window size.

If the front window contains picture information it will be saved as an unpacked \$C1 (PIC) Aux Type \$0000 file. This provides a capability of converting packed picture file types into the standard unpacked files required by many programs. You can use the Set File Type... menu item to change the file to the BIN file type required of several programs. If the front window contains a multiple screen picture, only the single screen portion of the picture discussed in the above picture formats will be saved. Scrolling the picture will determine the part that is actually saved.

If the front window contains object-oriented graphics information it will be saved as an unpacked \$C1 QuickDraw PICT Aux Type \$0001 file.

The catalog, devices, prefix, memory, and computer info. windows can also be saved as standard text files. As future windows are defined, they will also be capable of being saved in one of these four formats.

When this menu item is selected, a custom Standard File Selection dialog box appears which allows the user to choose the directory the file is to be saved to and the file name it is to be saved under. If that file name already exists in that directory, the user is warned and has the option of overwriting the file or returning to the name selection dialog box. The default name is the original file name.

2.6 Get Info.

The Get Info. routine displays all relevant information about any specific file you select with a Standard File Selection dialog. The information includes practically all of the information contained in the Catalog. The "size" entry is the sum of the end-of-file positions for the data fork and resource fork. The "on disk" entry is the sum of the number of blocks contained in the data fork plus resource fork plus one converted to KBytes. If the file has an rVersion resource, the version number and version data entries are displayed. If the file has an rBundle resource and associated rIcon resources, the icon for this file is displayed. If the file has an rComment resource, the Comment is displayed. The comment appears in a Text Edit window which can be modified and saved by the user. You can enter any comment information you desire, even if no rComment exists in the selected file. If no rComment exists and you desire to add an rComment to a file, UtilityWorks will add a resource fork to the selected file (if one does not already exist) and add your rComment. You will be warned when adding an rComment to a file that does not have a resource fork makes the file unreadable by any ProDOS 8 application. (A Remove Resource routine has been added to UtilityWorks to remove resource forks from files to make them once again readable by ProDOS 8 programs). Please note that rComments cannot be attached to \$F9 and \$FF files, and UtilityWorks will not let you add rComments to these file types. rComments are a very handy means of adding short notes to your files to keep track of what is in them.

2.7 Copy

This routine will copy user selected files and subdirectories from one directory to another on the same or different disks. When this menu item is selected a file/directory selection dialog will appear. Select the files and directories (left hand portion of the dialog) to be copied to the indicated directory (right hand portion of dialog). Files that are Read disabled will not appear in the dialog. Selection of a directory for copy will result in all files in that directory, as well as all files in all directories treeing from that directory, being copied to the destination pathname, unless there is insufficient room in memory for the 64 K memory block that is used to store directory tree information. Appropriate directories will be created if they do not already exist on the destination disk. If a given file already exists, you are given a choice as to whether or not it should be overwritten or left unchanged. If the destination disk is write protected, a warning message appears (except with 5 1/4 in. disks where write protection cannot be determined until you actually begin to write to the disk). The Copy routine gives the user an easy method of copying all files on a given disk to an appropriate subdirectory on a hard disk, while maintaining the same tree structure. Just select all files and directories (or just those you wish to copy) from the root directory of your source disk, then choose the desired destination pathname on your hard disk and initiate copying. All desired files will be automatically copied. If older versions of these files already exist on your hard disk, you may want to delete them first to avoid the potentially many file overwrite queries. Press Unsort if you want files copied in directory order or press Sort if you want files copied in alphabetical order. Files are copied in the order they appear in the file selection dialog. Files in all selected subdirectories are copied in directory order. To copy files to a new (non existing) directory, simply select the appropriate parent directory in the directory selection dialog, then press the New Folder button and enter the new directory's name. You will then be automatically positioned to this new directory.

This file copy routine is extremely fast compared with equivalent P8 and P16 file copy routines because it fully utilizes the GS/OS session capabilities. DO NOT turn your computer off or reboot while in this routine. Directory information is cached and not written to disk until completion of this routine to achieve a very high speed copy. Normal and error program exits have been protected, and the directory information will be written before exit. But directory information will not be written if you turn off the computer or reboot it. You can terminate program execution early by pressing Command-period (".") (Apple-period). This will not be an instantaneous termination because the current disk read or write operation will be completed before the routine is terminated. The name of the current file being copied is displayed in a window to indicate progress of the copy operation.

Files are normally copied only between disks having identical file system IDs (e.g.; ProDOS to ProDOS, Macintosh to Macintosh, etc.). However, an option is provided to copy between disks having different file system IDs (e.g.; AppleShare to ProDOS) if so desired. The Copy routine will use as much Apple IIGS memory as is available up to the size of the smallest disk involved in the copy. It will attempt to read the entire file to memory before writing it to the destination disk, but can get by with as

little memory as a single block whose size is defined by the file system in use (i.e.; 512 bytes for ProDOS, 256 bytes for DOS 3.3 etc.).

As mentioned in the file selection dialog description, the Data Fork and Resource Fork buttons can be used to copy or update just the data fork or resource fork of an extended file without changing the other fork. However, in most instances you will want to select the Accept button which will copy both forks. If the source file is an extended file and a previous destination file with the same name is a standard file, the destination file will be changed to an extended file before the copy is initiated. This feature permits you to add a resource fork to a standard file (use the Resource Fork button if you don't want the previous data to be changed, use the Accept button if you want the previous file to be totally replaced).

The Backup button provides a limited capability for backing up individual or multiple files and directories as long as they will fit on a single disk. (This capability is not nearly as powerful as the true Backup capability, which uses image files on multiple backup disks as described below). Only those files that are Read enabled and whose backup bit is set are displayed. GS/OS automatically sets any file's backup bit whenever it is created or changed, thereby providing an indication that the file needs to be backed up. If the Backup button has been pressed, opening and closing other directories on this device will likewise display only those files whose backup bit is set. Cycling to other devices will cancel this Backup option. Selecting any directory for copy when the Backup button has been pressed will result in only those files in the selected tree branch that have changed since the last backup being copied. As each file is copied (i.e.; backed up) its backup bit is reset (cleared). (The backup bit reset is NOT performed in the normal file copy). Make sure you have enough room on the destination disk or you will get a disk full error.

2.8 Move

This routine will move user selected files or subdirectories from one directory to another, but only on the same device. Move files is much faster than Copy files because it does not actually change the physical location of the file or subdirectory on the disk. It merely changes appropriate directory information on the disk, which effectively moves the file or subdirectory(i.e.; changes its pathname). All files and subdirectories selected in the left hand portion of the dialog will be moved to the directory indicated in the right hand portion of the dialog. Note that you cannot move a directory to a pathname that already contains that directory (for instance you cannot move the SYSTEM:directory to a directory that contains SYSTEM, such as SYSTEM:SYSTEM.SETUP:). You can easily move files to a new (non existing) directory by using the New Folder button in the same manner as discussed above under Copy.

2.9 Delete

This routine will delete the user selected files or subdirectories. Delete will delete all selected files and subdirectories. BE VERY VERY CAREFUL!! You may not be able to recover a deleted file. The Delete routine obeys the file's access control privileges, and will not delete any file or subdirectory that has been destroy disabled. (Destroy disabled files will not appear in the selection dialog). If a file is destroy disabled, you must use the Set File Access... menu item in the Utilities menu to change the file's access control privileges before you can delete it. Also, as a safety measure, no subdirectory may be deleted unless it is empty. Therefore to delete a subdirectory you must first delete all files and subdirectories contained in that subdirectory.

Delete also provides the capability of deleting an extended file's data fork or resource fork without deleting the entire file. Just press Data Fork or Resource. Pressing Data Fork with a standard file will delete the entire file and pressing Resource with a standard file will have no effect.

2.10 Rename

This routine will rename the user selected files or subdirectories to names selected by the user. Rename disabled files will not appear in the selection dialog. Any legal name can be entered into the name entry dialog box. The JudgeName call (if System 6 is present) is used to ensure that the entered name is consistent in syntax with the selected file system. If there are syntax errors, a suggested alternative name is presented. A brief statement of the syntax rules for the designated file system will also appear in the dialog. For instance, Rename can be used to rename UtilityLaunch to START. This routine merely changes the file or subdirectory name and makes no other change to the file.

2.11 Verify

This routine will verify user selected files and subdirectories. Errors are reported. Files and subdirectories to be verified are selected in the dialog. Read disabled files will not appear in the dialog. Like the above Copy routine, if a subdirectory is selected, all files in all subdirectories treeing from that subdirectory will also be verified, unless there is insufficient room in memory for the 64 K block containing directory tree information.. The current file being verified is indicated in a window to reflect the progress of the Verify operation. Press Command-period (Apple-period) to terminate the verify at the next disk read. The Verify routine verifies both data forks and resource forks of extended files.

2.12 Page Setup

This is the standard Page Setup dialog. Use it to print in landscape etc. when in graphics print mode. This dialog has no effect when printing in text mode, except that the paper length information is used to inform the ImageWriter of the paper length for issuing form feeds. (Note that the lines per page in the Options... menu item must also be appropriately set).

2.13 Print

This routine will print the contents of whatever window is on top (excluding modal dialogs and alert windows, as well as NDAs which you may have activated). Windows displaying text information may be printed in either text or graphics mode. If the window contains text information (including Text Edit information), you are presented with a dialog box to choose either text or graphics printing. The first time you choose text printing, you are asked to select the character device to be used for text printing. The selected device will be retained in the defaults resource if you save the defaults subsequent to making this selection. The selected character device may be changed at any time by using the Character Device... menu item. Normally you will select the slot 1 serial printer (the default), but if you have a networked configuration you may want to select the AppleTalk port. Note: When using the Text print option with AppleTalk you can print to either a LaserWriter or an ImageWriter II, but when using a LaserWriter you have to select the RPM (not AppleTalk) driver and the ImageWriter Emulator from the LaserWriter CDev in the Control Panel NDA. You can also select the modem port or any other character port if you so desire. The advantages of text printing are that it is much faster and columns are properly aligned (i.e., no proportional spacing) from line to line, which is important if you have tables or other columnar information. With UtilityWorks version 0.9D and later, columns in all standard windows are also properly aligned when printing in graphics mode as long as the spacing is set at nonproportional or character 0 spacing, or you are using a nonproportional font, such as Courier. Note that columnar alignment will probably not be achieved with Text Edit windows printed in text mode because Text Edit tabs are set at a multiple of pixels, not characters. Tabs should be used to achieve columnar alignment with Text Edit windows printed in graphics mode, since spaces will not properly align columns unless you are using a nonproportional font family such as Courier. The different handling of tabs and spaces between Text Edit windows and standard windows may cause some alignment problems if you are not careful. With Text Edit windows, a tab character will move you to the next tab position, where each tab position is 40 pixels (about 0.5 inches) from the previous position regardless of font size. With standard windows, tab positions are typically spaced a set number of characters apart, usually every 8 characters or so, regardless of font size. The results are vastly different.

The advantages of graphics printing are that the printed image is prettier and any font in your SYSTEM:FONTS: directory (or loaded by UtilityWorks) can be used. Word wrap is now implemented in both text and graphics mode on any line exceeding the page width. In graphics mode the word wrap is adjusted to the length of the actual

text appearing on each line whether you are printing in landscape or portrait mode. With UtilityWorks version 0.9D and later, printing standard windows in graphics mode will result in essentially “what you see is what you get” (WYSIWYG) (with of course the word wrap adjusted to the paper size). Word wrap for Text Edit windows when printing in graphics mode will occur exactly as shown in the window on the screen. Zoom the window, or enlarge the window as much as possible to fully utilize the entire page width for printed text. Note that due to limitations in the graphics print routine, character spacings and text justifications for Text Edit windows will not exactly occur as shown on the screen. Full justified text in Text Edit windows will appear as unjustified text when printing in graphics mode. There are also some print limitations that occur with Text Edit windows when switching font styles in the middle of a line. Color fonts in 640 mode use dithered colors to achieve an apparent 16 different colors. Printed color fonts in 640 mode will generally appear satisfactory, however best results will be achieved if you print Text Edit documents containing colored fonts in 320 mode. (Note: you must adjust the font colors to the 320 color palette, as described under the Select Color... item).

The catalog, devices, prefixes, and memory windows, as well as the computer info. window, are treated as text windows and can be printed in either text or graphics mode. When printing a catalog or computer info. window in graphics mode, either print in landscape or choose a smaller font size to print in portrait to achieve best results and avoid distracting word wrap. Picture windows can only be printed in graphics mode. Whenever graphics printing is selected, a printer setup dialog box is presented to allow you to choose quality of print, color printing, etc. Make sure you select Color printing if you are using a color ribbon and desire the printout to appear in color. Select the higher qualities of print to get the best quality of printout, and select the lower qualities of print to get a faster printout. UtilityWorks version 0.9H or later no longer requires that pictures be displayed in the proper mode to achieve color printout using the correct palette as long as you are using System Disk 5.0.3 or later. (Note: If you are using versions of the System Disk up through 5.0.2 or if you are printing to a LaserWriter Printer, make sure that the picture is displayed in the proper display mode for the picture (either 640 mode or 320 mode). It will be printed just as it looks on the screen (within the limitations of your printer)). Unlike most other menu items, the print related menu items are functional in either 640 mode or 320 mode. (although in 320 mode only picture printing is allowed). Note that most pictures are generated in 320 mode because of the larger selection of colors. Use the 320 (640) Mode menu item to switch modes.

When Text printing is selected, all formatting is essentially the same between the displayed and printed files (with the exception of the word wrap). Unlike Graphics printing, Text printing should be compatible with printers other than the ImageWriter. The Text printing routine normally uses only four ImageWriter unique commands, and these can be defeated using the Printer defaults of the Options menu. If the ImageWriter default is set, the ImageWriter reset sequence will be issued when printing begins to make sure the printer exits from graphics print mode (such as may have occurred with previous graphics printing). This will also reset the ImageWriter fonts to their default conditions. A buffer clear command is also issued to clear the printer of any extraneous characters that may be present before printing begins. (This buffer clear removes the extraneous ImageWriter II character that often prints at the left

hand corner of the first line when printer power is first turned on). If the ImageWriter default is set, a page eject (top of form) sequence is issued for every new page. If the ImageWriter default is not set, the program will issue carriage returns to get to the top of the next page. If in Page Setup the user selects other than US Letter (8 1/2 X 11 in.) page size, paper length information is also sent to the ImageWriter. If US Legal (8 1/2 X 14 in.) is selected, a 14 in. paper length is sent to the ImageWriter. (Make sure you also change the lines per page in the Options... menu item to 84). If A4 Letter (8 1/4 X 11 2/3 in.) is selected, a 297 mm paper length is sent to the ImageWriter. If International Fanfold is selected, the user is presented with a dialog box to enter the paper length in mm, which is then sent to the ImageWriter. If any other page size is selected in Page Setup, the paper length indicated in Page Setup is sent to the ImageWriter. When printing the Computer Info window, commands are issued to the ImageWriter to print in a condensed near letter quality font (15 CPI or 120 characters per line) to avoid word wrapping of the tabular data. Other than these cases, all control characters are stripped from the document being printed. High ASCII characters are passed to the printer unchanged to permit printing of Mouse Text and other user defined special characters in text mode, and special characters and foreign characters in graphics mode (unless the High ASCII > Low ASCII default in the Options menu item was selected for this file). The program issues a carriage return at the end of each line, and optionally issues a line feed (the issuance of a line feed is the default with version 0.7 and later, and is probably required with most printer configurations). The Options menu item provides the capability of not issuing a line feed if so desired. If you get double spacing, disable the line feed option. If all lines are overprinted on top of one another enable the line feed option. UtilityWorks version 0.7 and later no longer uses the Text Tools for printing in text mode. Greater flexibility and networkability are now provided when printing in Text mode through use of the GS/OS character FST capabilities.

In Text printing mode a word wrap algorithm is activated for any line exceeding 96 characters (or whatever you select as the number of characters per line in the Options menu item). The algorithm looks backwards from the 96th character to find a space. If it doesn't find a space within 18 characters it merely uses the entire 96 characters and continues the remainder of the line on the following line(s). The number of characters per line is temporarily changed to 120 when printing the Computer Info window.

Printing can be canceled in either mode by pressing Command-Period (Apple-Period) (the Command or Open-Apple key along with the "." key). This will almost immediately stop the printing in Graphics mode. In Text mode it will immediately stop the transfer to the printer, but the printer itself has quite a bit of buffer memory (especially if you are using an ImageWriter II with the 32K buffer option). Printing may only be able to be stopped quickly in Text mode by actually turning the printer off.

When printing has been completed in either mode, a top of form command is issued (in Text mode the command is issued only if the ImageWriter default is set, otherwise carriage returns will position the paper to the top of the next page). The Print routine should not hang if the printer is powered off (it transfers data just as if the printer was on), but it will hang if the printer is on but deselected (just reselect the printer if this happens).

Printer defaults may be changed in the Options menu item. For Text printing you can select whether ImageWriter unique commands should be used. If your printer is not ImageWriter compatible disable the ImageWriter default. In either Text or Graphics mode you can also select whether or not to print a header on each page. The header can optionally contain the date, the time (only if the date was also selected), the file name (title), and the page number. The page number will print only if there is enough room left on the line after printing the date, time, and title. In Graphics mode the header will always be printed in the default system font. You can also set the default characters per line (includes the left margin spacing, if any) and lines per page used for Text printing. It is recommended that the standard program defaults be used for printing on normal US Letter fan fold paper with an ImageWriter II. The defaults are 96 characters per line (assuming 12 CPI fonts) and 66 lines per page. If your printer is using 10 CPI fonts then set the characters per line to 80. UtilityWorks will attempt to center the text on the page by adjusting the left margin if the document being printed contains fewer than 96 characters per line. Left margins for AppleWorks documents are obtained from the AppleWorks file itself. These margins are adjusted if the document will not fit properly on the page.

Two keyboard equivalents can be used to perform either Graphics printing or Text printing without using the Graphics/Text print dialog that appears for certain text based files when the Print menu item or Command-P keyboard equivalent is selected. Use Command-R to directly perform Graphics printing and use Command-T to directly perform Text printing. Command-T will only be functional for those files that can be printed in Text mode.

2.14 Launch

This routine will launch any SYS or S16 (ProDOS 8 & 16 system) file or any BAS (Applesoft BASIC) file directly from UtilityWorks without use of UtilityLaunch. When this menu item is selected, the user is presented with a dialog box to choose the file he wants to launch (execute). Files from any active device can be selected for execution. I/O Redirection is supported (see Set Prefix... discussion below). After execution of the selected program completes, the operating system returns control to UtilityWorks.

The launching speed of this menu item is faster than the Finder, but slower than the UtilityLaunch. As you may note in using it, the problem is not in the launching but in the reload and restart. UtilityWorks requires numerous desk tools that can take appreciable loading time. It also takes more time to load UtilityWorks from disk, although through use of ExpressLoad and multiple dynamic segments this difference is minimal. As a result of the above considerations, I have implemented a separate UtilityLaunch program. UtilityLaunch should be used to achieve best performance. It will launch UtilityWorks on request to provide the extensive UtilityWorks utilities whenever desired.

UtilityLaunch permits both the UtilityWorks type of launching, as well as a menu type of launching, with the menu presented on a SHR screen. It also has the capability to change slots, speed (including TransWarp GS speed and ZIP GS speed), colors, display (color or monochrome), and modem and printer parameters upon launch of any program. It can also boot devices, autostart programs, blackout the monitor's screen after a preset period of non-use, and launch SYS, S16, EXE, BAS, BIN, and TXT (EXEC) files. It accommodates up to 50 separate menus with up to 40 simple buttons or 16 icon buttons to each menu screen. The menus themselves are easily constructed by UtilityLaunch using a file selection dialog box. No entry of pathname or filename information is required - the program does it for you. The resulting menus can also be easily rearranged by simply pointing and clicking the mouse. A capability has also recently been added to permit generation of menu entries that will directly launch IBM MSDOS programs in conjunction with the PC Transporter, as well as provide startup paths to SYS programs.

2.15 Quit

As the name implies, this routine shuts down the UtilityWorks program and returns to the calling program or GS/OS. I/O Redirection is supported, and UtilityWorks can set the I/O Redirection paths/devices that will be passed to UtilityLaunch for use in launching other programs (see Set Prefix... discussion below). If the contents of any Text Edit windows have been altered, a dialog will appear asking the user if he wants to save the window.

3. Edit

3.1 Undo

Used only by New Desk Accessories (NDA's). This item will become undimmed whenever an NDA is in the top window.

3.2 Cut

Used by Text Edit windows and NDAs. This item cuts the current selection to the Clipboard. The current selected text is deleted.

3.3 Copy

Used by Text Edit windows and NDAs. This item copies the current selection to the Clipboard. The current selected text is unchanged.

3.4 Paste

Used by Text Edit windows and NDAs. This item copies the Clipboard to the current insertion point, or deletes the current selected text and replaces it with the contents of the Clipboard. An intelligent cut and paste algorithm is used.

3.5 Clear

Used by Text Edit windows and NDAs. This item clears the current selected text.

3.6 Select All

Selects all text in the current Text Edit window.

3.7 Grab Picture

When Grab Picture is selected a cross cursor appears. Align this cursor at the corner of a rectangular screen area that you desire to grab. Press the mouse button and drag the mouse to the opposite corner of the rectangular area. You will see a “rubber band” outline of this area. Release the mouse button when you are satisfied with the selected area. The standard arrow cursor reappears, but the indicated area has been copied to the Clipboard as well as to an internal handle that is used for creation of new icons. You can see the picture that was grabbed by selecting the Show Clipboard item.

3.8 Show Clipboard

Displays the contents of the clipboard in a window. Use Print to print out the contents and Save As... to save the clipboard to disk in the standard UtilityWorks formats (text and unpacked QuickDraw PICT files). Clipboards may be of two types, Text and Picture. The Show Clipboard option will display the Text and Picture clipboards in separate windows (if both exist). The Text clipboard is word-wrapped at 80 characters per line. The Picture clipboard contains drawing commands that are drawn to the Picture clipboard window. Either clipboard may be printed in the normal manner as long as it is the front window. This capability has been verified using both Text and Picture clipboards generated by AppleWorks GS and Text clipboards generated by UtilityWorks. It is in fact a convenient way of getting proper Text files from AppleWorks GS. Many other programs use their own private clipboards that are not compatible with Apple standards. UtilityWorks cannot read these clipboards.

3.9 Icon Editor

This routine provides the capability of merging icons from two or more separate icon files into a single icon file, as well as the capability of deleting one or more icons from any icon file. The Icon Editor also permits the creation of new icons from screen images. The Filename, Pathname, file type, and auxiliary type designations for any icon (used by the Finder) can also be set to any desired value. If you have previously done a Grab Picture, you are given a choice of either importing that picture to create a new icon or selecting the icon files you desire to edit. Newly created icons from screen images must first be saved if they are to be merged with other icon files. If you select importing the icons, you will be shown a dialog displaying the large and small icons resulting from grabbing the screen image. The large icon will be the actual size of the grabbed image unless it exceeds the approximate size of a UtilityLaunch Icon Button, in which case it will be reduced to fit within a UtilityLaunch Icon Button. An entire screen image could actually be selected for creation of an icon, and the image will be shrunk to fit within the dimensions of a UtilityLaunch Icon Button. The small icon constitutes an even greater amount of shrinkage. This extreme shrinkage of a screen area often results in small icons that are virtually unusable. The user is therefore given the choice of replacing this created small icon with a standard small icon - just click on Set Small.

If the user has either not previously grabbed a picture, or if he selects to not import this picture, a Standard File Selection dialog will appear. To merge multiple icon files merely select the desired icon files from the Standard File Selection dialog that appears when this menu item is selected. Selecting only a single file will permit editing of all icons in that single file. All icon files to be merged must be contained in the same directory. Use the << and >> buttons to cycle back and forth among all icons contained in the icon or merged icon file. Press Delete to delete the Icon that is currently being displayed. Never delete all icons in a file.

The user can now select the various information used by the Finder. The Pathname entry is only used if you desire the Finder to Launch an application whenever that icon is double clicked in the Finder. UtilityWorks will automatically provide the proper pathname as long as you select the desired program to be launched in the Standard File Selection Dialog which appears when you press Set Pathname. The File Name entry will result in the Finder showing the current icon for any file whose name matches the File Name value. A wild card (*) may also be used to force match regardless of what the file name may be. To use the wildcard, first enter it in the File Name Edit Line. Then click on the Set File Name button and click on Cancel. This will set the Icon's name to the value entered in the Edit Line. The Finder uses the file type and auxiliary type information to identify which file types and auxiliary types this icon is associated with. A zero entry in either field is the equivalent of a wild card. Pressing the Set Type button will produce a file type selection display just like the Set File Type item.

An example of using these various fields is the UtilityWorks Text Icon contained on the UtilityWorks distribution disk. This icon is intended to launch UtilityWorks whenever a Text File is double clicked. The Pathname must be set to the valid

UtilityWorks pathname (in my case :HARD1:SYSTEM :UtilityWorks.GS). The file type must be set to Text files (\$04) and the auxiliary type to the \$0000 wildcard to match all auxiliary types. The File Name is set to the * wildcard to match all file names. The other icon on the distribution disk is the UtilityWorks Icon. This icon is designed to be displayed whenever the Finder directory contains the UtilityWorks.GS program. As such, only the file name is set to UtilityWorks.GS, the File Type is set to the S16 type of UtilityWorks, and the Auxiliary Type is set to the \$DB07 type of UtilityWorks. The Icon Editor provides you an easy method of changing these various fields.

UtilityWorks version 2.0 added a capability to read rIcon resources with the Icon Editor. You can now either select Finder Icon Files or any extended file for use with the Icon Editor. Whereas multiple Finder Icon files can be selected and combined, only a single extended file can be selected. You will be notified if the selected extended file contains no icons. rIcons contain no pathname, filename, or file type/auxiliary type information. Therefore this information will be blank when reading in extended file icon resources. You should enter the appropriate information before saving the selected icons as a Finder Icon file. The Icon Editor automatically determines whether a given icon is a large icon or small icon, and displays it accordingly. To sequence through just large icons (skipping all small icons) hold down the Option key while clicking on the << or >> buttons. To sequence through just small icons (skipping all large icons) hold down the Command (Open-Apple) key while clicking on the << or >> buttons. You can click on the Set Small button to choose a default small icon. Please note that you must choose both a large icon and small icon to save resource icons as a Finder Icon file.

When you are satisfied with your various icon settings you can save the resulting icon file to any directory. It is advisable not to overwrite the previous icon until you are very sure that the changes you made are correct.

3.10 Create rBundle

This Create rBundle routine creates an rBundle for any selected S16 application (or any file type if the Command key is depressed while selecting this menu item). rBundles are new to System 6. The Finder uses rBundles to determine which icon to display for any given file, and which program (if any) to launch when an icon is selected. These rBundles are stored in the new Desktop file that is created in each disk's Icons folder. Many new applications designed for use with System 6 will contain their own rBundles that specify the icons to use for the application itself plus any documents it claims. UtilityWorks and UtilityLaunch now both contain rBundles that identify the icons to use for both UtilityWorks or UtilityLaunch, as well as the files they own such as UL.Menu, UL.Boot, and UWGS.Backup files. The first time you execute these programs with the new System 6 Finder, the Desktop file will be updated with this new rBundle information. The rBundles allow applications to vote on who should handle specific documents. For instance UtilityWorks can open many different types of Graphics and Text documents and can save these documents in one of several formats. As an example, UtilityWorks can open and display WordPerfect files. If UtilityWorks is present, selecting a WordPerfect document with the Finder should result in UtilityWorks being launched to display that file - that is unless WordPerfect itself is present, in which case the user would probably prefer WordPerfect be launched to display the file. The Finder resolves these apparent conflicts by allowing each application to vote on specific files. If an application can only open a file (for instance UtilityWorks can only open WordPerfect files) it is given the lowest priority for that file type. If an application can write to the file it is given a higher priority. If an application can write to the file in the original file format it is given an even higher priority. If an application owns a file (for instance WordPerfect owns WordPerfect document files) it is given highest priority. Therefore, in the above example, if both UtilityWorks and WordPerfect were present and had appropriate rBundles, selecting a WordPerfect document would result in WordPerfect being launched because it has a higher priority.

Unfortunately, most applications do not currently have rBundles. Therefore, if UtilityWorks were to claim a number of the documents it can open at the lower priority, it would still be the highest priority for these documents because the true owner applications do not have a rBundles to claim the documents. To get around this problem, UtilityWorks provides a capability to create a voting rBundle for any S16 application you desire. UtilityWorks has a default rBundle that claims only the documents it owns (namely its UWGS.Backup files). A separate Finder Preferences menu item has been added to allow UtilityWorks to expand its own rBundle to add any or all of the documents it can open.

To use Create rBundle first select the S16 program or other file type you want to add the rBundle to. Create rBundle works with existing Finder Icon files. Now Select the Finder Icon file(s) for the S16 program or selected file. Sequence through the icons until you arrive at the icon for the S16 program or selected file. It is very important that the first icon you select is for the selected program or file. Make sure that the filename and file type information is correct, and make sure that the radio button claiming ownership of the file is selected. Now press Add to rBundle. Continue sequencing

through the Finder Icon file until you identify all documents you want to claim. For each such document, verify the filename and file type information. Choose the appropriate voting priority, then press Add to rBundle to add that document to the program's rBundle. When you have finished this process, click Save to actually save the rBundle in the program's resource fork, and press Cancel to exit without saving. Executing the program will add the new rBundle to the Finder's Desktop file, and activate all of your document selections. Please note that the current System 6 Finder does not implement voting priorities. The selected rBundle may not be recognized if another rBundle already exists that covers this file. Please be very careful in adding rBundles to files other than S16 programs. Any file containing an rBundle will not be recognized by ProDOS 8.

3.11 File Editor

The File Editor allows you to view and change information within any file, as long as the file has appropriate read and write access privileges. (Access privileges of course can be set with the UtilityWorks Set File Access menu item).

IMPORTANT!!!! Do not use the write mode of this routine unless you know what you are doing. You can ruin a file very easily.

The user must first select the file he desires to edit. If the file is an extended file he is asked whether he wants to edit either the data fork or the resource fork. A display now appears that shows the contents of the first 256 bytes of either the data fork or the resource fork. The pathname appears at the top left of the dialog and the decimal value of the first byte contained in the display appears at the top right of the dialog. If all of the file has not been read into the buffer, the remaining bytes to be read are also indicated (in decimal) at the top right of the dialog. The contents of each display line are the same as indicated for the Compare routine's difference display. The Hex location of the first byte, 16 Hex values representing the 16 successive bytes of the file beginning at the Hex location, and an ASCII representation of the 16 bytes. The buttons at the bottom of the display perform the following functions. The OK button exits the routine. The Print button prints the contents of the dialog, minus the buttons, in graphics mode. The <<, <, >, and >> buttons move the starting byte of the display by respectively 128 bytes to the left, one byte to the left, one byte to the right, and 128 bytes to the right. The appropriate arrow buttons will be dimmed if you are at either the beginning or the end of the buffer contents. Use the arrow buttons only for moving around within the current buffer. The read button will also move within the current buffer or read in a new buffer contents from the file depending on the user's selections. The Read dialog has two modes, a read mode and a find mode. In the read mode (i.e.; if you press the Read button within the dialog) any Edit Line inputs made to this dialog will be interpreted as the byte to go to within the current file. If the selected byte is within the current buffer, that byte becomes the starting byte of the display. If the selected byte is not within the current buffer, a new buffer of information is read from the file, beginning at the selected byte. If the selected byte is beyond the end of the file, the last buffer of information from the file will be read, and the display will show the last 256 bytes of the file. Read locations are always expressed in bytes, and may be expressed as either a decimal value or a Hex value (if you use a leading \$). The Find button will attempt to locate an input string or value within a file beginning from either the start of the display or the location of the last item that was found. The search is only performed within the current buffer contents. Any input ASCII string of up to 12 characters can be used for the search. Optionally a Hex value can be used. The Hex value must be preceded by a \$ and may consist of from one to four Hex digits. The Hex search is most useful for locating specific instructions or pointers to memory locations within the file. Please note that the Hex data is input as a Hex value, not string, and will appear in inverse order to the order in memory. Just remember that all words, long words, etc. within the Apple II are stored least significant byte first. Therefore a Hex input search value of \$01020304 would actually be looking for the Hex string 04030201. If the search item is found, the display will be centered around the found item, with the found item highlighted in green. The process can be repeated to find

more matches. If no further matches are found, the user is so notified. Erroneous inputs will usually result in a system beep.

Changing bytes within a file is very simple. Simply click on the starting byte (either the Hex value or the ASCII value) in the display that you want to change. A new dialog will appear that allows you to make easy changes to either individual bytes, words (2 bytes), long words (4 bytes), or strings (up to 66 consecutive bytes). The current value of the selected byte appears in a number of formats. The value of the single byte is shown in individual Edit Line boxes in three formats, namely Hex (00 to FF), ASCII (A to Z, etc.), and Byte (decimal value 0 to 255). In addition the mnemonic for the 65816 instruction represented by that byte is also displayed. The value in any Edit Line box may be changed, as long as you do it in the proper format for that value. To change any value, merely enter the new value in the Edit Line, press the button adjacent to the Edit Line indicating the type of data entered (e.g.; ASCII) to convert the value, and then press OK to actually install the new value in the buffer. Entry errors will usually result in a system beep. Additional formats are available in this dialog. You can enter either a Hex Word (\$0000 to \$FFFF) or decimal Word (-32,768 to 32,767), a Hex Long Word (\$00000000 to \$FFFFFFFF) or decimal Long Word (-2,147,483,648 to 2,147,483,647). All of these multiple byte formats begin with the selected byte and continue for either two or four bytes. Remember that these multiple byte data types will always appear in the file in inverse order because the Apple II stores the least significant byte first. The dialog also provides a capability for entering strings and numbers in a variety of different formats, selected with the Set Type button. Click on Set Type to sequence to the next string type. Holding down the Command (Open-Apple) key while clicking on Set Type will sequence to the previous string type. The default is a Pascal string, where the selected byte is interpreted as a Pascal string length byte. Since the limit of the String Edit Line is 64 bytes, any string longer than 64 bytes will appear as a ?. To use the String input, enter the string exactly as you want it to appear, making sure you delete any existing text in the Edit Line, Press the Pascal String (or whatever string type you choose), and Press OK. Upon exiting this File Change dialog, the specific bytes that have been changed will be highlighted in green. The Pascal string is very useful for setting permanent Startup Paths in P8 programs. Several other string types are currently supported as indicated below:

String Type	UtilityWorks File Editor Format
• Pascal String	Length Byte followed by up to 64 ASCII characters.
• Text String	Up to 64 ASCII characters with no length information (also equivalent to an Integer Math string).
• C String	Up to 64 ASCII characters terminated by a character (0).
• GS/OS String	Length Word (2 bytes) followed by up to 64 ASCII characters.
• IEEE Single	Sign bit, followed by 8 bit biased exponent and 23 bit fraction
• IEEE Double	Sign bit, followed by 11 bit biased exponent and 52 bit fraction
• SANE Comp	Sign bit followed by 63 nonsign bits
• IEEE Extended	Sign bit, followed by 15 bit biased exponent, an explicit one's bit, and 63 bit fraction
• Fixed	32 bit signed value with 16 bits of fraction
• Frac	32 bit signed value with 30 bits of fraction
• Binary	The value of a byte represented as 8 binary digits (0s and 1s)

Pressing Write will write the current buffer contents to the current file. A warning dialog will appear first to make certain you really want to write to your current file. Make certain you have a backup copy for any file you change. It is advisable to always create a new file for the changed data, and thoroughly test it out to make sure the changes are functioning correctly.

3.12 Block Editor

This routine functions in much the same manner as the File Editor, except that it works with individual blocks of a selected disk rather than an individual file.

WARNING!!!! The Block Editor is even more dangerous than the file editor. Never write to any block unless you thoroughly understand what you are doing. You can very easily destroy your directory structure if you don't know what you are doing.

The user must first choose the disk he wants to edit with the Device Selection dialog. You can choose the boot disk if you desire, but you can only view its contents - you can't write to it. If you desire to write to your boot disk, you must first boot up from another disk.

The operation of the Block Editor is almost identical to that of the file editor. Only the differences will be described here. The initial display contains the selected disk in the upper left hand portion of the dialog and the decimal location of the first byte and block in the upper right hand corner of the dialog. Only a single block is written into the buffer, so the extent of find operations is obviously very limited. The size of the block is dependent on the file system of the disk being read. With ProDOS it is for instance 512 bytes. Pressing Read will allow you to select the starting block (not byte) in either Decimal or Hex. The Find function works exactly as with the Text Editor. Changing the value of any byte also works exactly as with the Text Editor. The Write button will write a single block to the disk. Again, **BE CAREFUL!**

3.13 Resource Editor

The Resource Editor routine provides a capability to edit resources in any extended file (i.e.; file containing a resource fork). The user is first requested to select a file using the Standard File Selection dialog. If the file contains any resources a dual list appears in a dialog which contains the resource types contained in the file in the left-hand list and the resource IDs contained in the file for the selected (highlighted) resource type. First select the desired resource type then select the specific resource ID you desire to edit. Next choose the desired operation to perform. Delete deletes the resource from the file. Edit presents a HEX/ASCII display essentially identical to that used in the File Editor. Make any desired changes in this display. Press Write to change the resource and press OK to return to the Resource List. Copy copies the selected resource to another file. After pressing the Copy button, a Standard File Selection dialog will appear. Select the destination file from this dialog. New Type changes the resource type and New ID changes the resource ID. With either New Type or New ID, enter the desired new resource type or new resource ID in the dialog that appears. Press OK to make the change or Cancel to return without making any changes.

3.14 Compare

This routine compares both the data forks and resource forks (if the file has a resource fork) of all selected files and subdirectories from the source directory with files and directories having the same name in the destination directory. The user is first given the choice of skipping the compare for any two files that have identical creation and modification dates and times, data fork lengths, resource fork lengths, and file types and auxiliary types. This option speeds up the compare process for files that are most likely identical. Please note that two files could still be different even though their file info data is identical. Likewise, two files can easily be the same even though some of their file info is different.

The user is first required to select the files and directories he desires to compare using the UtilityWorks File/Directory Selection dialog. It is best to have the disk containing the fewer number of files selected in the left hand dialog to minimize the number of files that can't be found to compare. Select the files and subdirectories you desire to compare in the left hand dialog and select the directory in the right hand dialog that contains the files you desire to compare against. You can compare two files with different names (e.g.; UtilityLaunch and START) in the following manner. First select the desired file in the left hand dialog, making sure you select only one entry. Select the directory containing the file you desire to compare against in the right hand directory. Now press Show Files and select the file with the different name in the right hand dialog. This procedure will always work unless the right hand directory also contains a file with the same name as the left hand dialog selection.

When your selections have been made, click OK and the comparison will begin. A status window indicates the files currently being compared. If the comparison is successful the next file will automatically be compared. If the corresponding file can not be found in the right hand directory, a dialog will appear indicating that the file does not exist in the second directory. If the files have any differences, a dialog will appear that indicates the first byte that differs in either the data fork or the resource fork. The User is now given the choice of either continuing to compare the remaining files or taking a look at the differences that exist in the two files.

If the user chooses to view the differences, he is presented with a modal dialog that shows 128 bytes of data surrounding the first difference in both files. The left hand dialog pathname appears at the top left of the screen and the associated data for that file appears in the top half of the screen. The right hand dialog pathname appears at the top right of the screen and the associated data for that file appears in the bottom half of the screen. The data in each half of the screen is organized in the following manner. Each section contains 8 lines of data with each line representing the contents of 16 successive bytes of data. The leftmost item in any line represents the starting location within the file of the first byte in the line expressed in Hex. The 16 following items represent the Hex values of each successive byte. The rightmost information in each line represents the ASCII equivalent of the 16 bytes for reference purposes. Any byte differing in the two files is highlighted in green in both the top and bottom half displays. A group of buttons at the bottom of the screen provide further control of this data. Pressing OK will leave this dialog and continue with the file comparison.

Pressing Print will produce a graphics printout of the differences display. The <<, <, >, and >> buttons will move the contents of the display respectively 64 bytes to the left, one byte to the left, one byte to the right, and 64 bytes to the right. Checking both the top and bottom buttons will move these two displays in lock step. Checking just the top or the bottom will move only that portion of the display, leaving the remaining portion unchanged. This is very useful to see if files once again align after one file is moved a few bytes with respect to the other file. Whenever either file is moved, the display must be redrawn. This can take a few moments because the display is actually a window containing almost 300 separate controls that QuickDraw must update.

Files being compared are actually read into two separate buffers. In most cases (depending of course on the size of the two files and the amount of memory in your computer), the entire file will be read into memory before the compare begins. With very large files and with limited memory configurations, the two files will be read into memory in successive chunks with a compare performed after each chunk has been read into memory. Where it is obvious that the two files differ (for instance if the files have different file lengths), but the difference has not been found in the initial buffer read, the user is given the choice of continuing the read until the difference is found or skipping to the next file. In all cases the File Difference Display will only show those differences that are contained in the current buffer contents.

The File Compare routine is most useful for comparing a new version of a program with an existing version on a hard disk. Quite often when programs, or even Apple's System Disk, are updated, only a few of the many files contained on the disk will actually be changed. You can use the File Compare routine to see exactly what files have really changed, and only update (Copy) those new files to the hard disk.

4. Search

4.1 Find File

This routine will search any user specified tree branch for a file that matches the input request. You should enter the starting directory and the desired file name to search for, and UtilityWorks will search all directories treeing from the starting directory for occurrences of a file with that name. The search is case insensitive for ProDOS devices and case sensitive for other devices. A note alert appears if the file is found. You can either stop at this time or continue the search for further occurrences of the same filename in other subdirectories. If you quit when the match is found, prefixes 8: and 9: will contain the pathname of the directory containing the file. This will result in the next activation of a file selection dialog to be automatically set to this directory.

A wild card capability has been added to the file search. An asterisk (*) can be used at either the beginning or end of a input file name to indicate that any characters will form an acceptable match. For instance, inputting *.DOC will find all occurrences of files that end in the characters ".DOC" (e.g.; UWGS.DOC and Launcher.DOC). Similarly inputting UWGS.* will find all occurrences of files that begin with the characters "UWGS." (e.g.; UWGS.CONFIG and UWGS.MENU.0). The JudgeName call (if System 6 is present) is used to ensure that the entered name is consistent in syntax with the selected file system. If there are syntax errors, a suggested alternative name is presented. A brief statement of the syntax rules for the designated file system will also appear in the dialog.

UtilityWorks can handle up to 695 files in any given subdirectory and a very large number of separate subdirectories on any given disk. The actual number of subdirectories that can be handled depends upon the number of characters in the names of the subdirectories and the number of levels of subdirectories. A 64 K block of memory has been set aside to store directory tree information.

4.2 Find String

This routine will search the front window for occurrences of any user specified string, and select the text associated with the match. The Find String routine will only operate upon Text Edit windows. If you wish to perform a search on other types of text windows, first change them to a Text Edit window using the Edit Text menu item. Enter the string to be used for the search. The search is not case sensitive for standard alphabetical characters, but does match any imbedded spaces. The search is performed from the current insertion point or end of the current selection to the first match or end of the file. A new selection is made only if a match is found.

4.3 Find Again

This routine repeats the Find String search from the current insertion point or end of the current selection. The previously entered search string is used for the search. A new selection is made only if a match is found.

4.4 Search Tree

This routine will search all selected text based files in a directory, tree branch, or entire disk for occurrences of any user specified string. The user is first presented with a File Selection Dialog to choose the files or directories he desires to search. The user then enters the search string in the same manner as the Find String item above. All selected files are then searched in sequence. If the specified search string is not found in any of the selected files, an advisory message will appear. If the string is found in any file, that file will be displayed in a Text Edit window, with the first occurrence of the text string selected. All files containing matches will be opened as Text Edit windows. Following completion of the tree search, the user can find additional occurrences of the specified search string in any file by using the Find Again item described above.

5. Path

5.1 Show Prefixes

This routine shows what paths all 32 GS/OS prefixes are set to. The boot prefix (*:) is also displayed as is the @ prefix. The @ prefix is set to the folder where the application lives (prefix 9) unless the application was launched from a server, in which case the @ prefix is set to the user folder on the server. The GS/OS separator ":" is used for both the first 8 prefixes (ProDOS 16 short prefixes) and the remaining 24 prefixes (GS/OS long prefixes).

5.2 Set Prefix

This routine will set GS/OS prefixes 0 through 31 to any legal value. UtilityWorks will normally only modify prefixes 0, 1, 8, 9, and 13 unless this routine is used. The ":" separator is used as with the Show Prefixes item.

Prefix 8 is used as the prefix for the Open... menu item. If prefix 8 is not a valid prefix, prefix 0 will be used for the Open... menu item, provided that it is a valid prefix. Prefixes 8 and 0 (provided the pathname will fit in prefix 0) will be set to the pathname of the directory containing the file that is opened (i.e.; displayed). Prefix 9 is the prefix for the file selection dialog and prefix 13 is the prefix for the directory selection dialog. Be very careful in setting prefixes 0 and 8. They are used by GS/OS and the Toolbox. If they are set to a prefix contained in a disk currently offline, GS/OS may become very confused and refuse to do anything unless the offline disk is put back on line.

When Set Prefix... is selected, you will be given a choice of selecting either any standard pathname or any character device as the prefix. If you choose to use a pathname, you will be presented with a standard directory selection dialog, and you can choose any pathname from any active block device. If you choose to select a character device, you will be presented with a dialog containing all currently available character devices. This latter capability has been provided mainly to support I/O Redirection. With System Disk 5.0, prefixes 10 through 12 are used to designate input/output devices or paths. GS/OS nominally sets all three to .CONSOLE, but you can change them to any desired pathname or device. Prefix 10 is Standard In, prefix 11 is Standard Out, and prefix 12 is Error. For instance you could change prefix 12 to the Serial printer to print all error messages, while still using the console (keyboard) for input and console (RGB monitor) for standard output. These settings will be passed by UtilityWorks (and the UtilityLaunch if you are using it) to subsequent applications launched by either of these programs.

5.3 Show Tree

This routine will display the directory tree (i.e.; an indented listing of all folders or subdirectories contained in the selected tree branch). The user is first asked to select the disk or starting directory. Any on-line disk or directory may be selected as the starting directory. UtilityWorks then analyzes the disk to find all subdirectories treeing to the selected starting directory, and displays this information in a window. As with other UtilityWorks windows, this information can be printed (in either text or graphics mode) or saved to disk as a TXT file. Unlike many other windows, however, the fonts may not be changed from the default system font. Clicking the mouse on any directory name will cause the pathname of that directory to be set as the default directory for the Open... standard file selection dialog as well as the file/directory selection dialog used for file operations. This provides a convenient way to quickly change default pathnames. When you click the mouse on a directory, the resultant pathname will appear in the Information Bar. The desktop may contain multiple copies of the Tree window for the same or different disks, but all of these Tree windows will be automatically closed if you switch the display to 320 mode.

5.4 Catalog

This routine will display a catalog of any user selected directory. The catalog can be displayed in two different formats, a standard format (the default) and an expanded format (obtained by holding down the Command (Open-Apple) key as the Catalog menu item is selected). The standard catalog entry is displayed and printed on a single line. The expanded catalog entry will consume two to three lines on the display and in the printout. Two lines are displayed for standard files and three lines are displayed for extended files.

The following information is displayed in the expanded catalog:

First Line:

Name	File name. The file name can be longer than 15 characters, and may consist of both upper case and lower case characters..
Type	File type, both a three character mnemonic and the Finder's file descriptor, provided the file descriptor files have not been purged from memory. For example the file PRODOS has the following file type information: (SYS): ProDOS 8 application.

Second Line: data fork information

Blocks	Number of blocks (decimal value) that the file's data fork occupies on the disk. If the file is a standard file this is also the total number of disk blocks occupied by the file. The number of bytes per block varies depending on the file system in use. ProDOS, for instance, has 512 bytes per block.
EOF	The data fork end of file (i.e.; the size of the data fork in bytes (Hex value)). If the file is a standard file this is also the size of the total file in bytes. Note that since GS/OS can write sparse files, a file can contain considerably more bytes than might appear possible from the number of disk blocks occupied by the file.
Modified	Date & time file was last modified
Created	Date & time file was created

Access	<p>Access control settings as follows</p> <p>D = file may be destroyed</p> <p>N = file may be renamed</p> <p>B = file has not been backed up</p> <p>I = file is invisible file</p> <p>W = file may be written to</p> <p>R = file may be read from</p> <p>If any of the above letters do not appear, the opposite conditions are indicated. For instance, if the Access entry is completely blank, the file is visible and has been backed up, but may NOT be read, written to, destroyed, or enabled.</p> <p>Note: UtilityWorks supports all Access controls except file invisibility. Files are always visible to UtilityWorks.</p>
Type	File type (in Hex).
Auxtype	File auxiliary type, becoming heavily used as extension of Type. The file descriptor information on the first line is derived using a combination of Type and Auxtype.

Third Line: resource fork information (if any)

Blocks	Number of blocks (decimal value) that the file's resource fork occupies on the disk.
EOF	The resource fork end of file (i.e.; the size of the resource fork in bytes (Hex value)).

The following information is displayed in the standard catalog:

Name	File name. File names longer than 15 characters are truncated to 15 characters with a trailing ">" character appended.
Blocks	Total number of blocks occupied by the file (includes resource fork blocks for extended files). Extended files are indicated by a "*" symbol appearing to the right of the Blocks entry.
EOF	The data fork end of file for a standard file and the sum of the data fork end of file and resource fork end of file for extended files.
Modified	Same as expanded catalog.
Created	Same as expanded catalog.
Access	Same as expanded catalog.
Type	Three character file type mnemonic.

Auxtype Same as expanded catalog.

As is typical of most Catalogs, I have added the disk's count of Blocks Free, Blocks Used, and Total Blocks at the end of the display. Any number of directory entries can be displayed (limited only by your available memory).

At program startup, the standard catalog of prefix 1 may be displayed if that option has been selected in the Options menu. The default has been changed to NOT display the catalog at startup.

5.5 Backup

This routine will backup (copy to another device) all files on any selected disk or path (full backup), or only those files whose backup bit is set (partial backup). The backup routine is most useful for backing up a hard disk, but can be used to back up any block device formatted in any file system recognized by GS/OS. For example, it could be used to backup an AppleShare file server. The backup is always made to 3.5" disks, and the backup disks always use the ProDOS file system regardless of file system of the source device. The source device can even be a 3.5" drive if desired; however, for any given backup, the source must be contained on a single disk. If two free 3.5" disk drives are available for backup, the backup routine will use both of them and automatically alternate between them when writing backup information to achieve improved performance. After any given disk is written and optionally verified, it will be ejected and the backup routine will look in the alternate device (if available) for the next backup disk. All backup information is written in GS/OS session mode for improved performance, and the backup is really very rapid, provided disks have previously been formatted and named. When creating your first backup, it is not necessary to previously format and name the disks - the backup routine will automatically do it for you, but it will take additional time. If the backup routine finds a previously unformatted disk in the next 3.5" drive, it will automatically format the disk with the proper interleave for best performance. It will also appropriately name the backup disk (UWGS.BU.01 to UWGS.BU.mn, where mn is the total number of required backup disks). If the backup routine finds an appropriately formatted disk in the next 3.5" drive that does not have the correct disk name, it will ask for permission to destroy the disk. If permission is granted, the disk is wiped and renamed, otherwise you are asked to insert a usable disk in this drive. If the drive already contains an appropriately formatted and named disk, the backup proceeds automatically with no user intervention.

Before beginning a discussion of how to initiate a backup, it is appropriate to give a brief overview of how UtilityWorks performs a backup. UtilityWorks first analyzes the disk to be backed up and extracts all directory information which will be used either during the backup or for the proper restoral of files. A typical analysis might take a minute or so. All relevant directory information for both standard and extended files, including option lists, is extracted. This directory information is written, as a series of files, to the first backup disk (UWGS.BU.01) immediately after the analysis is completed. If you catalog this first disk you will find approximately 20 files whose file names are fairly descriptive of the information they contain. These files have been saved in a compact format that permits very easy and rapid reconstruction of directory and file pathnames and directory information. UtilityWorks 1.0 and later incorporates Apple's file type and auxiliary type assignments for UtilityWorks backup files. The file type is \$E0 (LBR) and the auxiliary type is \$8009 (known as UtilityWorks document). (Registered UtilityWorks users who desire to use this information for other purposes can request a detailed description of these files). At this point UtilityWorks has all of the information it needs to begin construction of the image files, and knows logically precisely where each file will be placed. What it does not know is physically where the file will actually be written, because the files are written as sparse files whenever they contain blocks of zero data. Therefore, UtilityWorks keeps track of the starting and

ending file position on each backup disk, and writes this information to every disk in a DiskDirectory file. At the completion of the backup you are asked to reinsert the first disk so that UtilityWorks can write the completed DiskDirectory to the first disk. This permits UtilityWorks to easily tell you what disk to insert for a selective file restore. If for some reason the backup is aborted before this information is written to the first disk, all is not lost. Just use the file copy routine to copy the DiskDirectory from your last backup disk to your first backup disk. All information backed up until the time of the abort can then be restored. At the completion of the backup, UtilityWorks also checks to ensure that the final information written to disk actually appears exactly where UtilityWorks thinks it should. An error message will appear if it does not, and you should not rely on the backup information because an error has occurred somewhere in the backup process.

UtilityWorks will open as large an Image Buffer as possible (up to 800 K) for improved performance, although it will operate with a very small Image Buffer if required. In limited memory configurations, it may not be possible to completely back up hard disks with many files and directories in a single pass. If you get a memory error during analysis of the source disk, or if the backup routine tells you that sufficient memory may not be available for restore (restore requires slightly more memory than backup), you will have to perform the backup in two or more passes (you are informed of actual or potential memory problems before the backup actually begins, so you will not waste a lot of time if this happens). You can perform a full backup of your largest path and then perform a second partial backup of the full disk, which will pick up all remaining files. Alternately you can individually perform full backups of each path treeing from the disk's root directory. This will result in only the files contained in the root directory not being backed up, and these files can be backed up with the File menu's Copy item. A one megabyte Apple IIGS configuration can, however, backup a fairly large disk drive. With my Apple IIGS set to the equivalent of a one megabyte system, I am able to easily backup my largest hard disk partition consisting of 2028 files in 106 directories.

To initiate the backup you are first asked to select the starting directory of the source disk (the disk being backed up). This is normally the root directory (disk name) of your source disk, but you can select any directory. You are then asked whether you want to Verify each backup disk after it is written. I highly recommended that you do so to ensure that you have a valid set of backup disks, unless you don't have sufficient additional memory to perform this Verify. In this latter case you should use the Bulk Verify menu item to accomplish the Verify operation. The advantage of the Verify while Backup option is that if a verify error is detected, the user is allowed to progress with the Backup from the beginning of the faulty disk rather than having to repeat the entire backup as is the case with the Bulk Verify. (Note that if a verify error is detected during Verify while Backup on the first disk only, the backup operation must be repeated or the required reference files will not be rewritten). At this point you are asked whether you want a full backup or a partial backup. A full backup will backup all readable files (files that are not read enabled (such as the RX.File of Glen Bredon's Apple.RX virus detector) will not be backed up) in the selected directory tree regardless of the setting of the backup bits. You should always begin with a full backup of a disk. At the conclusion of a successful backup, the backup bits of all files that have been backed up are cleared. This information is then used in successive partial backups. Partial

backups only backup those files that have changed since a previous backup. Normally you will find that only a few files on your hard disk change from day to day, and the partial backup is very fast when compared to a full backup. When you select a partial backup, you are asked to insert the first disk (UWGS.BU.01) of your last backup. The purpose of this step is to extract the date and time of your last backup. ProDOS (in all of its variations) will normally time tag (i.e.; change the modification date/time to the current date/time) not only any file whose contents is changed, but also the file's parent directory and all of the predecessor directories back to the root. (Actually System Disk 5.0 does provide a capability for defeating this time tag option (and UtilityWorks itself does defeat it, but only when restoring files previously backed up in order to achieve improved performance)). By only looking at those directories and subdirectories that have a modification date subsequent to the last backup, partial backups become extremely fast. If UtilityWorks does not find your last backup disk, or if you select Skip in response to the request to insert this last disk, UtilityWorks will examine every directory and subdirectory in the selected tree to see if any files have their backup bits set.

Normally I would recommend a full backup every one to two weeks, and a partial backup daily or every couple of days. For a reasonably sized hard disk a typical time for a full backup is around a half hour. A partial backup (particularly when using the date of your last backup) is usually very fast (mine are typically less than a minute or two). Always keep your last full backup. I have provided two options for partial backups, individual backups and compound backups. The only difference is whether you elect to clear the backup bits after a partial backup. If you elect to clear the backup bits, subsequent partial backups will in general be faster because you don't have to re-backup files previously backed up. However, you will have to save each and every set of partial backup disks generated since your last full backup to ensure that you have a backup for every current file. If you elect to not clear the backup bits, you only need retain the last full backup and the current partial backup, because all files changed since the last full backup still have their backup bits set. (Make sure you extract the date information from the first disk of your last full backup if you are doing such a compound partial backup).

The following steps are the same whether you are performing a full or partial backup. You are now told approximately how many disks you will need for the backup. This is only an approximate number because at this point the program does not know how much space will be saved due to writing sparse files. It is possible to require at most one disk more and typically one to several disks less than the indicated number. Make sure you have an adequate number of disks. If you elect to continue, UtilityWorks will begin reading files and writing image files (a single image file per 3.5" disk). The files being read and written are indicated in a status window. As can be seen by the speed in which these file names are flashed in the window, the backup is very fast. Your main job at this time is to feed disks to the computer. Pay particular attention to the device name (first or second drive) to insert the disk into. If you goof the program will tell you. Just reinsert in the correct device. That's about all there is to the backup process - it's really much simpler than I have described. Make sure you label you disks. The first full backup requires the most time because you are probably formatting new disks or allowing the program to rename existing formatted disks. Subsequent full backups should go very quickly.

Note: Unless you have a very large extended memory, UtilityWorks will automatically purge all unused memory, including unneeded UtilityWorks dynamic segments and the file descriptor files, whenever the Backup routine is executed. You will also be asked if you want to clear the Desktop and close all open windows. I strongly recommend you do so to provide the maximum possible memory for UtilityWorks. (See previous discussion on Memory Utilization).

5.6 Restore

This routine will restore all backed up files, or only a user selected set of backed up files, to a destination disk. UtilityWorks 1.0 and later will restore backup files which were created using either Apple's new file type and auxiliary type assignments for UtilityWorks backup files or the previous designations. The destination disk can be either the original disk or a new disk, and need not have the same capacity as the original disk. It must, however, have a large enough capacity to hold all files being restored. The file systems used on the source disk and the destination disk may also be different as long as they are supported by GS/OS (if the file systems are different, the option lists will not be restored). For example, it is possible to backup all files from a file server via AppleShare and restore these same files to a ProDOS hard drive, or vice versa. In this instance, the Backup and Restore could be performed even though the File System Translators (FST) for these two devices are different. The option lists in such a case will reflect the default value established by the corresponding FST as the file is created/written.

As files are restored, the file name, file type, auxiliary type, create date and time, modification date and time, access bits (except for the backup bit), data EOF, and resource EOF will all be restored to their original values. This is also true of the option list as long as the file systems of the original source device and the current destination device are identical. Data blocks and resource blocks of restored files may be either the same value or a smaller value than the corresponding blocks contained on the original source disk. This is due to the fact that restored files are written by GS/OS as sparse files whenever possible. This capability did not directly exist with the earlier ProDOS 16 or ProDOS 8 operating systems. Even though the block lengths may be different, these sparse files will be read by any of these operating systems in an identical manner to the original files. Restored files will have their backup bit set, but the parent directory and all predecessor directories will NOT be time tagged, because UtilityWorks inhibits this time tagging of all directories for improved performance on Restore when using the ProDOS file system. In all other instances UtilityWorks activates time tagging of all appropriate directories. If a disk that has been selectively restored is subsequently partially backed up, these previously restored files will only be backed up if the previous backup date option is NOT used for the partial backup.

The Full Restore, described below, will first create all subdirectories that do not already exist on the destination device. The Selective Restore, on the other hand, is only capable of creating a single level of subdirectories that do not already exist on the destination disk. If the Selective Restore is unable to create the full original path, it will create a new tree structure emanating from the destination disk's root directory. (You can always generate any missing subdirectories manually using the Move... item in the File menu. Create the missing subdirectories with the New Folder button in the Move... dialog, and then select this entire restored tree structure to move to the original subdirectory which you have just created). Note: With the Selective Restore only, if a subdirectory is void of any selected files, but has other subdirectories treeing from it that contain files to be restored, the first subdirectory will not be created, and must already exist on the source disk if the file is to be restored to the original pathname. Again, with a Full Restore all missing directories will be created. With a Selective

Restore, only a single level of missing subdirectories (i.e.; the parent directory of the file being restored) will be created. All predecessor directories must already exist for the file to be restored to the original pathname when using Selective Restore.

Full Restore is significantly slower than Full Backup, but then a full disk restore should seldom be required. It mainly provides you with excellent protection should you ever accidentally erase or clobber your hard disk. The Selective Restore is typically much more frequently utilized to restore individual files or groups of files that may have become clobbered or destroyed. Selective Restore utilizes a very easy to use dialog that is almost identical to the previously discussed File Selection dialog. The list of backed up files in the selected directory is shown. Subdirectories are indicated by a : symbol. To view the backed up files in any subdirectory, either double click on this subdirectory entry, or click on this subdirectory entry and use the Open button. To drop to the next lower directory, either use the Close button or click on the current directory name at the top of the list of files. You can select multiple files and subdirectories for restoral using the same procedure as with the File Selection dialog (i.e.; using the shift and/or Command (Open-Apple) keys in conjunction with the mouse). When you have selected all of the files and subdirectories you want to restore, merely press the Accept button to initiate the restore. The restore routine will tell you what disk to insert unless the file to be restored is contained on the first backup disk. A given file may span more than one backup disk. If this is the case you will be asked to successively insert all specific disks that are required. Because you must insert specific disks, it is very important that you appropriately label each and every disk at the time of backup. Make absolutely certain that you do not mix disks from different backups or different hard disk partitions, or garbage will be restored to your file. If you are careful in labeling and handling you backup disks, you will find that the Selective Restore is very rapid and very easy to use.

When you select the Restore item from the Path menu you will be asked whether you want to restore to the original directory or to a new directory. If you choose new directory, you will be asked to select the directory you desire to use as the initial directory for the restoral. You will then be asked whether you want to do a Full Restore or Selective Restore. If you choose Selective Restore you will be asked to insert the first backup disk (UWGS.BU.01) into the first 3.5" drive used for restoral. The directory information on the first backup disk that was previously saved is then read. You will then be presented with a File Selection Dialog that allows selection of any files and/or subdirectories that were previously backed up. This dialog appears very similar to the Standard File Selection dialog. The list of files will appear sorted or unsorted depending on the last setting of the Sort/Unsort button in the File/Directory Selection dialog. If the list is sorted, keyboard entries can be used to make selections in the list of files. Select the files and/or subdirectories that you want restored and the program will indicate the appropriate disk(s) to insert. As with the backup routine, the restore routine will alternate between two 3.5" drives if you have at least two free 3.5" drives. If you select Full Restore the program will begin automatically restoring all files previously backed up. As reading of individual backup disks is completed, the disks are ejected, and you will be asked to insert the next disk if it is not already in the next drive. As with the backup routine, the restore routine will free up as much memory as possible to create room for the directory arrays and Image files.

Note: The restore will replace any non-open file regardless of its access privileges. The Restore routine will not let you restore an already open file. For instance, you cannot restore UtilityWorks itself because its file is open while it is executing. GS/OS, unlike earlier operating systems, also keeps some of its files open at all times. If you attempt to restore an open file you will get a warning, and the restore operation on that file will be skipped. The remaining restore operations will be completed. If you need to restore some GS/OS files on your Boot disk, temporarily Boot your system from another GS/OS System Disk, and then perform the necessary restore. A separate UWGS.Restore program has been provided on the UtilityWorks distribution disk to facilitate this operation. UWGS.Restore is a stripped down version of UtilityWorks that only performs the Restore function. It is small enough to be renamed START and replace the current START program (normally the Finder) on your Boot disk.

5.7 Catalog Data Base

This routine writes an ASCII file that can be read by most Data Base programs, including AppleWorks and AppleWorks GS. This file contains full Catalog information on any selected tree, including full Catalog information on all files on an entire disk if you select the root directory as the starting directory. The starting directory is selected in the same manner as with the Backup routine. The disk is then analyzed, and you are asked to select the destination directory and name of the ASCII file to be written. Each record of the ASCII file corresponds to a file on the cataloged device and contains the following 15 data base categories:

1. Directory Pathname
2. Filename
3. Data Blocks
4. Resource Blocks
5. Data EOF
6. Resource EOF
7. File Descriptor
8. File Type
9. Auxiliary Type
10. Modification Date
11. Modification Time
12. Creation Date
13. Creation Time
14. File Access
15. Storage Type

The Catalog Data Base routine purges memory in the same manner as the Backup and Restore routines. Dates, times, file descriptors, and file access information appear in the same form as shown in the Catalog window. The file descriptor will only appear if the addition of the file descriptor will not cause the total length of the file's data base information to exceed 255 characters. The Catalog Data Base routine is very useful in helping establish an exhaustive data base of all of your files using the full capabilities of a powerful Data Base program.

5.8 Undelete

This routine will attempt to restore user selected files or subdirectories previously deleted in any selected ProDOS directory. The user is first requested to select the desired disk and directory using the directory selection dialog. The Undelete routine, unlike other routines, will only work with ProDOS disks. The user is next presented with a dialog containing a list of all deleted files and subdirectories still present in the selected directory (up to a maximum of 256 previously deleted files and subdirectories). This dialog appears very similar to the Standard File Selection dialog. The list of files will appear sorted or unsorted depending on the last setting of the Sort/Unsort button in the File/Directory Selection dialog. If the list is sorted, keyboard entries can be used to make selections in the list of files. Select all files and subdirectories you desire to undelete and press OK. A file or subdirectory may not be capable of being exhumed even though it appears in the list of deleted files because some of its blocks may have been reused by other files. Undeleting is most successful if it is performed immediately after deleting the file, with no intervening disk writes that may use some of the blocks freed up by the deletion of a file or subdirectory. You will be notified if the file cannot be exhumed because some of its blocks are currently being used by other files. The file still may not be restored correctly if several intervening file writes and deletes have taken place, even though you receive no error message. This is because blocks previously used by the file you are attempting to undelete may have been used by a new file and subsequently released when that new file was deleted. Check any undeleted file carefully to make sure it has been restored correctly. Undeleting a subdirectory will only exhume the subdirectory itself, and no files within the subdirectory. To restore the files within the subdirectory you must select the exhumed subdirectory and then select the files within the subdirectory you wish to undelete.

The Undelete routine will not undelete files on your boot disk. This is necessary because you may be altering blocks that are being used by GS/OS. Undeleting files on your boot disk can be accomplished by temporarily booting from another boot disk.

5.9 Remove Resource

The Remove Resource routine allows you to completely remove a resource fork from a file to make it recognizable by ProDOS 8 programs. The Delete routine will delete a resource fork. That removes all resources in the resource fork and sets the resource fork file length to zero. But the file still contains an empty resource fork, which makes it unrecognizable to ProDOS 8 programs. Use Remove Resource to completely remove the resource fork. Remove Resource will only work with ProDOS files.

6. Device

6.1 Show Devices

This routine displays all block devices currently recognized by GS/OS. The disk name of all GS/OS disks is also displayed, as well as the file system currently in use on each device. A blank disk name means that there is either no disk in the indicated device, or the disk is not formatted with a recognized operating system. Provision has been made to display up to 32 block devices. Complete details on all devices can be obtained from the Computer Info. item in the Utilities menu. The currently selected first device is indicated by the symbol > to the left of the selected device in the device window. The currently selected second device is indicated by the symbol >> to the left of the selected device in the device window. If a single symbol >> appears with no symbol >, then the first and second devices are the same.

6.2 Character Device

This routine allows you to select the current (default) character device. Saving the defaults subsequent to making this selection will save the selected device. This device becomes the device used for all Text printing. If the character device has not already been selected with this menu item or previously saved in the defaults, it must be selected the first time you perform a Text printout. The default value for the character device is the serial printer, but you can choose any character device you desire, including a modem or an AppleTalk device.

6.3 Deactivate

This routine allows you to remove one or more devices from the device poll. The device poll is used by many UtilityWorks routines making disk accesses to see what disks are currently on line. Unfortunately, some devices such as 5.25 in. drives take an inordinate amount of time to return their status. If you are not currently using any 5.25 in. drives connected to your Apple IIGS, you might want to deactivate them to speed up the polling process. To accomplish this just select the device you wish to deactivate in the Device Dialog that appears when this menu item is selected. Repeat to deselect additional devices. Another alternative method to eliminate the polling is to effectively take these 5.25 in. drives off line by setting slot 6 in the control panel to "Your card".

6.4 Copy

This routine copies one user selected disk to another provided that the destination disk is at least as large as the source disk. A warning message will be displayed if both disks are not the same size and formatted with the same file system unless the copy is being made to a SCSI tape backup device. This program will prompt you for permission to format disks that have not been previously formatted (see format description below). This routine will operate using as little memory as a single block, whose size is determined by the file system the disks have been formatted in, but operates most effectively when the entire source disk can be read into memory. The program will attempt to get as much memory as possible up to the disk size (800K for 3.5 in. disks, 140K for 5.25 in. disks). If this much memory is available the program permits generation of multiple copies of the source disk (with or without formatting) without rereading the source disk. The copy is a bit for bit copy of the original disk unless read errors occur. Blocks with read errors (such as some copy protected disks) will be skipped in the copy process. The disk copy is fastest with 3.5 in. disks if both the source disk and the destination disk are formatted with 2:1 interleaving. Disks formatted with 4:1 interleaving are copied appreciably slower, but this interleaving should probably be used if the disk is destined for use under ProDOS 16 or ProDOS 8, rather than GS/OS. You can copy a 2:1 formatted disk to a 4:1 formatted disk and vice versa as long as they are both 800K disks. 400K (single sided) disks should only be copied to other 400K disks, and cannot be used with the new Apple IIC Plus internal drive. These 400K single sided disks will work fine with the Apple IIGS drives, however.

With appropriate drivers, this routine can be used to copy a hard disk or hard disk partition to a SCSI Tape Backup device. Following copying to the Tape Backup device, the user is presented with the option of clearing the backup bits of all files contained on the source disk. Make certain the backup tape has been ejected before proceeding with clearing the backup bits.

The device Copy routine described here also supports single device copy (source and destination device identical). After each portion of the source disk has been read, you will be prompted to insert the destination disk into the same device. Formatting will be performed if required. If sufficient memory is available, the entire source disk will be read before writing the destination disk. Multiple disk swaps are supported if there is not sufficient memory to hold the entire disk image. To maximize the amount of memory available, eliminate the :RAM5 disk (requires a power off condition or use of UtilityLaunch's Resize RAM after Reset option to accomplish elimination of :RAM5). Also disable (using the Utilities menu's Select DAs... menu item) any unnecessary CDAs, NDAs, temporary and permanent initialization files, drivers and FSTs. Don't go overboard here - some are required for GS/OS operation. You will need to reboot the computer for the disabling to take effect. Also close all open UtilityWorks windows to maximize available memory. To see how much memory is available for holding the disk image, open the memory window described below and examine the Largest Block. It should be at least 32K larger than the size of the disk being copied for the disk to be copied in a single pass. A memory purge routine has

been added to UtilityWorks and UtilityLaunch to assist the user in maximizing the amount of available memory (see discussion in the Utilities menu below).

As with the file Copy and file and device Verify, pressing Command-period (Apple-period) will cancel the copying operation, however this will not occur until completion of the current GS/OS read or write command. With sufficient memory, the entire contents of a disk can be read or written with a single command. Therefore, there can be a considerable delay from requested termination to actual termination.

The destination disk will be ejected following the disk Copy operation if the disk is a 3.5 in. disk.

6.5 Format

This routine formats the user selected disk. You are asked to select the device you wish to format. You are then asked to select the file system and formatting options. Any legal disk name for the selected file system will be accepted. The JudgeName call (if System 6 is present) is used to ensure that the entered name is consistent in syntax with the selected file system. If there are syntax errors, a suggested alternative name is presented. A brief statement of the syntax rules for the designated file system will also appear in the dialog. With ProDOS formatted disks it is best to select a 2:1 interleave for optimum performance when using GS/OS. For disks to be used on other computers or with other operating systems, the user should experiment to determine the formatting options that are best for him.

6.6 Bulk Format

This routine will format multiple 3.5 inch disks with a minimum of user intervention. Bulk Format formats all disks using the ProDOS file system and 2:1 interleave. All disks are named "untitled". If two 3.5 inch drives are available, both will be used, with the formatting alternating between the two drives. If a disk has already been formatted in the ProDOS file system, it is wiped (erased) and renamed, but not reformatted. If the disk has a different disk name, permission is requested before erasing it. Formatting will automatically continue until the user inserts no more blank disks into the 3.5 inch drives. Disks are ejected after they have been formatted.

6.7 Erase

This routine erases a user selected, previously formatted, disk. As with format, the user enters the name to be assigned to the disk to be erased. The JudgeName call (if System 6 is present) is used to ensure that the entered name is consistent in syntax with the selected file system. If there are syntax errors, a suggested alternative name is presented. A brief statement of the syntax rules for the designated file system will also appear in the dialog. For previously formatted disks, erase is the fastest way to obtain a "clean" disk. It merely erases the disk directory and bit map information. It should be emphasized that it is extremely difficult to recover files that are lost by erasing a disk - so be very careful. Erase is also an alternate way of changing the disk name if you don't mind losing the information on the disk. If the disk has not been previously formatted, you will be given an opportunity to format it.

6.8 Rename Device

This routine renames any selected block device. It changes the device name, and not the disk name of the disk contained in the device. (Note that the disk name can be changed with the following Rename Disk item). Just select any desired device name and it will be used until the system is rebooted again. For instance you can change the device name of .APPLEDISK3.5A to .BOBSDEVICE. When naming a device, do not insert a leading period because the program will automatically do this for you. Also make sure you do not select a device name that already exists.

6.9 Rename Disk

This routine renames the user selected disk. Enter the new disk name that you desire. The JudgeName call (if System 6 is present) is used to ensure that the entered name is consistent in syntax with the selected file system. If there are syntax errors, a suggested alternative name is presented. A brief statement of the syntax rules for the designated file system will also appear in the dialog. It should be pointed out that, unlike Copy, Format, Erase, and Verify, Rename Disk is not a true device call. It operates on a pathname rather than a device name, and can become very confused if two disks with an identical disk name are on line. With two or more identically named disks on line, Rename Disk will always rename the highest numbered device, which may not be the selected device. It is best to avoid this problem by never putting two identically named disks on line, and promptly removing disks that have just been copied (which are obviously identically named). With System 6.0 and later, Rename Disk will properly rename a disk even if there are two or more identically named disks on line.

6.10 **Verify**

This routine verifies a user selected disk. Verify will display the block number of any block that cannot be read (as typically occurs with copy protected 3.5 in disks). Press Command-period (Apple-period to cancel the verify at the next disk read (this could take some time with large amounts of memory available).

6.11 **Bulk Verify**

This routine operates much like the Bulk Format and verifies multiple 3.5 inch disks with a minimum of user intervention. This routine is particularly useful in verifying Backup disks.

6.12 **Eject**

This routine will eject all removable media (except 5 1/4 inch disks) connected to your Apple IIGS.

7. Utilities

7.1 (320) 640 Mode

This routine permits you to change to SHR 320 display mode to display 320 mode pictures or Text Edit windows. This change will only occur if the front window contains a 320 mode picture or Text Edit window (otherwise this menu item is dimmed). The Devices, Prefixes, and Memory windows are closed prior to mode switch to minimize the number of windows that must be redrawn after mode switch. You can always retrieve these windows by selecting the Show Prefixes, Show Devices, or Show Memory menu items upon return to 640 mode. Mode switch (both ways) can take an appreciable amount of time if a large number of windows are present. It is advisable to close any unneeded windows before switching modes. All windows are shown as full screens in 320 mode format. To see windows below the top window select the desired window in the Window menu. Alternately, you can close the front window (by using the close item in the Files menu or by clicking on the window's close box) or shrink the window by using the window's grow box and then click the lower window forward. This latter technique will also leave all windows on the desktop. You can revert back to 640 mode by selecting the 640 Mode menu item.

The menu bar that appears in 320 mode contains only those menu items that are active in 320 mode (UtilityWorks version 0.9L or later). These menu items include Speed Up..., Close, Page Setup..., Print..., Quit, Undo, Cut, Copy, Paste, Clear, Select All, and 640 mode, as well as all open windows in the Window menu. Selection of other menu items is not feasible in 320 mode because many of the complex dialogs used will not appear properly in 320 mode.

Whenever pictures are displayed in either mode, the palettes are switched to those contained in the file being displayed. This may make the menu difficult or impossible to see. In these cases you can control the program through Command (Open-Apple) keys as follows:

New...	Command-N
Open...	Command-O
Close	Command-W
Save	Command-S
Print..	Command-P
Quit	Command-Q
Undo	Command-Z
Cut	Command-X
Copy	Command-C
Paste	Command-V
Select All	Command-A
Find String...	Command-F
Find Again	Command-G
Set Mode	Command-M
Eject	Command-E

If the picture appearing in the front window uses only palette 0 (most pictures do use only this one palette), it is possible to initialize the Apple icon in the menu bar to the normal default screen colors, while still preserving the colors in the picture. Simply press Command-I to initialize the Apple icon's normal colors in either 320 mode or 640 mode.

7.2 Options

This routine presents user selectable UtilityWorks options. Printer Options include Printer type (ImageWriter or other), Print Title, Print Page Numbers, Print Date, and Print Time (used to establish header contents), and insertion of a line feed character after every carriage return. Other Options include opening all text-based files in fully zoomed Text Edit windows (thereby avoiding the necessity of having to use the Edit Text menu item to convert standard windows to edit windows), conversion of High ASCII characters to Low ASCII characters (you should not normally set this item as a default - see discussion of text files under the File menu's Open... item), whether or not you want a full set of messages displayed, whether or not you want continual polling, and whether or not you want the menu bar clock disabled. If you do not select showing all Information Messages, you will get a reduced set of messages displayed, principally during file and disk operations. For example completion messages such as "Files Successfully Copied" and some warning messages such as "Format Disk..." will not be displayed unless the "Show all Info.Messages" item is selected. Messages deleted are only non-essential messages. Ample opportunity exists to abort the associated actions with subsequent dialogs. Select any of these items by clicking on the associated box to make an X appear. You can also select the number of characters per line and the number of lines per page. Click on the associated box (or use the tab key) and type in the number desired.

This routine also defines the initial windows established upon program loading. To initially display the Catalog, Devices, or Prefixes windows on the desktop check the associated boxes. If none of these boxes are checked the program will load to a bare desktop. These window defaults will only take effect on the next program loading if the values have been saved.

After you have made your selections in this dialog you have three choices. Click Cancel to leave without any changes being made. Click OK to leave with your selected defaults in effect for the duration of this run only. Click Save to permanently make your selections the program defaults. Saving the defaults will result in resource parameters being written to the resource fork of the UtilityWorks.GS (or whatever you may have renamed it) program file. These defaults will be read in whenever you run the program. Note: If you already have a configuration file (UWGS.CONFIG) established by versions of UtilityWorks prior to version 0.9, the default data in this file will be ignored. You must reenter the default parameters. Merely select what you want and Save.

The Password selection is used to remove the Shareware alert dialog box that appears every time UtilityWorks is run. Registered owners of UtilityWorks are given a password to be entered into this box. Simply enter the password and press Save to permanently record your password. Make sure you delete whatever text is in the Password box before you enter the Password. Note: Do not distribute copies of UtilityWorks that contain the password in the resource fork. You can copy the file without the resource fork data by using the Data Fork Button in the Copy... menu item. Alternatively, you can delete the resource fork data from a copied file by using the Resource button in the Delete... menu item.

7.3 Finder Preferences

The Finder Preferences routine allows you to add to the UtilityWorks rBundle a claim for any of the documents that UtilityWorks can open. Simply select (check) those file types that you want UtilityWorks to open when that particular file type is selected from the Finder. When you have completed your selections, click OK to modify the UtilityWorks rBundle or click Cancel to exit without change. Now launch UtilityWorks from the Finder and the new rBundle information will be added to the Desktop file. UtilityWorks slightly modifies its rVersion number every time the rBundle is changed so that the Finder will recognize the change. Make sure you select only those file types you want UtilityWorks to handle. I do not recommend that you select Applesoft BASIC files. Doing so will prevent Applesoft programs from being executed from the Finder (instead they will be opened and displayed as a program listing in a UtilityWorks window).

7.4 Computer Info.

This routine displays, in a Text window, the Apple IIGS memory capacity and itemizes the version numbers of all tools, drivers, and FSTs. The memory portion of this display indicates the total amount of memory available in your computer. (Note: Current memory status is indicated in the Memory window described below). The date/time of this computer information is also displayed on this same line. The Apple IIGS ROM version number is next displayed, followed by device and FST information. Device information includes the device name, the device slot (including internal (int) or external (ext) designation), the device unit (in the specified slot), the device type, the total number of blocks on the device (if it is a block device), and the version number of its driver. With System Disk 5.0, unit numbers for linked devices (e.g.; partitioned SCSI disks) are indicated in two parts, a physical unit number and a logical unit number. For example, a SCSI hard drive which is the first device in slot 7 and has three partitions will appear in the display as external slot 7 units 1-0, 1-1, and 1-2. (ProDOS 8 and earlier versions of GS/OS will recognize these units as slot 7 units 1, 2, and 3 (unit 3 is not recognized by ProDOS 8)). FST information includes the FST name, the file system identification, the maximum size of disks handled by this FST, and the version number of the FST. The next information displayed is the operating system identification and version number. The final information displayed is the Tool names and version numbers. Nonexistent tools on your System Disk will be identified as N/A. The first time this routine is executed will require a few additional seconds to load in all remaining tools not normally used by UtilityWorks. Since the information in this window normally exceeds 96 characters per line, it is printed in 15 CPI fonts when using an ImageWriter.

7.5 Show Memory

This routine will display a small memory status window near the top of the desktop. This memory status display indicates the amount of free (currently unused) memory, the largest block of free memory, and the total amount of available memory (including memory that can be purged) for use by UtilityWorks. This window is constantly maintained current, regardless of whether it is the top window or a lower level window. A low memory condition requiring release of the Out-of-memory Queue will be indicated by the symbols >> and << appearing in the memory status window.

UtilityWorks version 2.0 adds an extra line of information to the Memory Window. This line shows the breakdown of how the currently used memory is divided between UWGS (UtilityWorks), System (GS/OS Operating System, Loader, Tools, Drivers, etc.), Setup Files, and Desk Accessories. This gives the user a better idea of how much of his memory is being consumed by Setup files and Desk Accessories. If you are in a low memory situation, disable unneeded Setup files and Desk Accessories using the Loader Actions menu item in the Utilities menu.

7.6 Purge Memory

This routine will purge the Apple IIGS memory of all purgeable handles and then compact the remaining memory. You are given a choice of whether or not to remove the file descriptors and the UtilityWorks dynamic segments. Maximum memory will be obtained if you do remove the dynamic segments and file descriptors. This routine can be used to maximize the amount of memory available to UtilityWorks for such operations as disk and file copying, or opening (displaying) very large files. The maximum amount of available memory can be achieved by launching UtilityWorks from UtilityLaunch with the UtilityLaunch's restart from memory option disabled. The Purge routine also moves the Clipboard to disk, disposes of an internal icon handle, and compacts all TextEdit data structures to maximize the amount of available memory.

7.7 Set File Type

This routine allows the user to change the file type and aux type of any selected file. When this menu item is selected, the user is asked to select the files whose file type and/or auxiliary type is to be changed. For each selected file, a dialog containing a dual list will appear. The left hand list displays the available file types. The file's current file type is displayed at the top of this list. This current file type is also set as the default file type. Both file type mnemonics and file type hex codes are displayed to allow ease in selecting the desired file type. Select whatever file type you want and press New File Type. The keyboard can be used to make selections from the target list (the list with the heavy outline). The leading "\$" character is ignored when performing a keyboard match. The Apple-defined list of available aux types (current as of System Disk 5.0.2) for this file type will now appear in the right hand list. The current aux type will be displayed at the top of this list. If the current aux type is an Apple-defined aux type for this file type, the current aux type is also set as the default aux type. Select the new aux type you want, or select the keyboard entry. Now press New Aux Type to actually change the previous aux type. If you selected the keyboard entry you will be presented with another dialog in which you should enter the hex value of the aux type desired. Press Accept to write the new file type and aux type to disk.

Note: The \$8000 aux type for Icon files and Type \$BC Load files can be used to deactivate these two types of files with System 6.0. This capability is very handy, for instance, in selecting what Icon files the System 6 Finder should initially use.

7.8 Set File Access

This routine allows the user to change any of the access bits (except the backup bit which is changed below) of any selected file. The file selection dialog permits the selection of multiple files for access bit modification. For each file in sequence, the user is presented with a dialog to enable or disable the destroy, rename, write, and read access control bits. The user can also set or reset the file visibility bit. UtilityWorks respects the destroy, rename, write, and read access control bits, but ignores the invisibility bit - all files are made visible. The current setting of these bits is indicated by the initial setting of the radio buttons (and is also indicated in the Catalog for this directory). Just press the radio buttons corresponding to the access control bit selections you want, then press OK to write these selections to disk.

7.9 Set File Date

This routine allows the user to set the creation and modification date and time for any file. You must first select the file(s) you want to change. For each selected file you are presented a dialog that indicates the file's current modification date and time as well as its creation date and time. Input the desired month, day, year, hours, minutes, and seconds for both the modification date and the creation date. Months go from 1-12, days from 1-31, years from 00-99 (i.e.; 1900-1999), hours from 0-23, minutes from 0-59, and seconds from 0-59. Please note that seconds are not recognized in file directories by current versions of GS/OS. Check boxes below each entry can also be used to zero the time values, set the modification date and time to the creation date and time or vice versa, or set the date and time to the Apple IIGS's current date and time. Press OK to make the change or Cancel to skip this file.

7.10 Clear Backup Bits

This routine allows the user to clear the backup bit of any selected file. Multiple files and directories can be chosen through use of the file/directory selection dialog. (Note: The Backup routine and the file Copy routine can also clear backup bits). The user will be presented with a file selection dialog which only displays those files in any directory whose backup bit is set. Be careful in using this routine. Subsequent partial hard disk backups will miss backing up any file whose backup bit has been cleared by this routine. Its main function is to prevent the partial disk backup routine from automatically backing up files you want excluded. For instance, if you have a very large PC Transporter file, you may want to clear its backup bit prior to a partial disk backup to avoid a very large partial disk backup. This routine can also be used to clear all backup bits of a disk that has been fully backed up using the File Copy routine or Device Copy routine (e.g.; when copying all files from one disk to another disk of equal or greater size than the original disk).

7.11 Install DAs

This routine will install any desired CDA or NDA that has not been previously installed. This gives you the capability of installing CDAs and NDAs located in any directory on any device at any desired time, rather than having to install all of your CDAs and NDAs at system startup. You will first be presented with a file selection dialog showing available Desk Accessories. Select the Desk Accessories you want to install. You can select Desk Accessories from any directory on any disk. Desk Accessories can be installed regardless of whether they are enabled or disabled. UtilityWorks will not install Desk Accessories that have already been installed.

7.12 Install Driver

This routine permits you to install a device driver at any time. Drivers for such devices as Apple 5.25" disk drives can be inhibited from loading using the Loader Actions menu item. With slot 6 set to Disk Port and the Apple 5.25" device driver inhibited, you can avoid lengthy slot 6 polling that occurs with many S16 programs. The 5.25" drive is still available for P8 programs because they don't use the GS/OS device drivers. If you have a program that requires this 5.25" device driver, you can easily install the driver using this menu item. To use this item simply select the desired driver to install from the Standard File Selection dialog. UtilityWorks can install most non-supervisory GS/OS drivers except for SCSI drivers that for the most part must be installed during the boot process. UtilityWorks will not install a device driver if it has already been installed.

7.13 Install Init

This routine permits you to install any Temporary or Permanent Init at any time. For instance you can run the ZIP GS Temporary Init at any time you want to restore your default ZIP GS settings. Not all Inits can be installed while a Desktop application like UtilityWorks is being executed. For instance the CloseView DA (really a Permanent Init) patches QuickDraw II and other tools, and hence probably cannot be installed successfully by UtilityWorks. To use this item simply select the desired Init to install from the Standard File Selection dialog. UtilityWorks will not install a Permanent Init if it has already been installed.

7.14 Loader Actions

This routine will activate or deactivate any selected desk accessory (CDA or NDA), initialization program, control panel, driver, or File System Translator. This routine uses a capability implemented in System Disk 3.2 and later, whereby the above listed file types are not loaded by the Loader if the high order bit of the Aux Type for these files is set. The user is first presented with a dialog of the type of action he wants to initiate. For instance he may choose that he wants to disable selected Desk Accessories. The appropriate boot disk's SYSTEM:DESK.ACDS: file selection dialog is then presented. Only those files that are currently enabled will appear in the list of selectable files. The user should now select those Desk Accessories he wants disabled and press Accept. These selected Desk Accessories will be disabled (not loaded) at the time of the next boot. A similar procedure also applies for the initialization files, the control panels, the drivers, and the FSTs depending on whether the user wants to enable or disable these files. The proper boot disk directories automatically appear and only those files that are currently disabled or enabled, as appropriate, will be displayed for selection. The user is not restricted, however, to these directories and may use any directory or disk he so desires. This capability provides an easy way of activating only those desk accessories, etc. currently required. A complete set of desk accessories can be installed on your hard disk, and this routine can then be used to activate only that subset currently required. Boot time will also be significantly shortened if only a minimal number of Desk Accessories are currently active. The user can also use this capability to control activation of Desk Accessories that conflict with one another or with selected programs.

8. Document

8.1 Edit Text

This routine allows the editing of any text window, except special windows such as those that display Catalog, Devices, Prefixes, Memory, Computer Info., or Sample Font information. (These latter types of windows could always be saved as a text file, then reread and edited if you so desired). Selecting Edit Text causes any editable window to be converted to a Text Edit window. All text is automatically word wrapped to the window width, so there is no need for a horizontal scroll bar. Zoom or grow your window to the desired size, and the text will automatically wrap to that size. You can edit the text information in the window as described under the New menu item.

8.2 Select Ruler

This routine allows you to select the display ruler for the front window if it is a Text Edit window. You can select the left and right margins and paragraph indentations in tenths (approximately) of an inch. The default margins and indentations are 0. UtilityWorks will only allow up to two inch margins, and the left and right margins can never cross. You can select the line spacing (i.e.; single space, space-and-a-half, double space, and triple space, assuming standard font size). You can also select the type of justification (i.e.; left, right, centered, and full). Left-justified text lies flush with the left margin, with ragged right edges. Right-justified text is flush with the right margin, with ragged left edges. Each line of centered text is centered between the left and right margins. Fully justified text is blocked flush with both left and right margins; spaces are padded with extra pixels to fully justify the text. The ruler settings apply to the entire window, and not to just the selected text.

8.3 Select Color

This routine allows the selection of text and background colors in any Text Edit window. The selected text will be changed to the new color settings, or if no text is selected, all text entered after the current insertion point will reflect the new color settings. Choose the desired foreground (i.e.; text character) and background colors. The colors in 320 mode differ from those used in 640 mode. The center of the dialog indicates an approximation of the colors that will appear in 320 mode if the corresponding radio button for either foreground color or background color is selected. If you desire to print in color using an ImageWriter II, you should select the appropriate 320 colors for foreground and background, then switch to 320 mode to do the actual printing.

8.4 Select Font

This routine allows the selection of any font for use in any Text Edit window. The selected text will be changed to the new font, font size, and font style, or if no text is selected, all text entered after the current insertion point will reflect the new font setting. You are presented with a dialog to choose the desired font, font size (intermediate sizes can also be entered and the fonts will automatically be scaled) and font style (e.g.; plain, bold, underline, italic, outline, shadow). If the selected font is a TrueType font that has already been loaded by Pointless, and if a bit-mapped version of that font size does not already exist, Pointless will generate a new font in the desired size. As the font is generated, the Pointless wait circle is filled in.

8.5 View Fonts

Displays any font selected by the user in a window. The font must be in the SYSTEM:FONTs: directory of the boot disk, or must have been previously installed in the Font Manager's list of fonts by either the Open... menu item of the Files menu or the following Load Fonts... item. The program will display either a sample of all font characters, Key Caps, or the contents of the front window (if the front window is a text window, but not if it is a Devices, Prefixes, or Memory window) in the selected font. The user is presented with a dialog box to choose the desired display. If the selection is either the front window or a sample of all font characters, the user can select either proportional (the default), nonproportional, or character 0 width spacing. If the front window is a picture window, or a Devices, Prefixes, or Memory window, only the sample of all characters or Key Caps can be selected. The Sample option displays a sample of all characters contained in the font. The Key Caps option displays each font character's relationships to the keys on the keyboard. Key Caps also permits viewing of the keyboard characters that result when the shift, option, and option-shift keys are depressed at the same time as a character key, as well as the diacritic (foreign) characters that result from pressing the Option key simultaneously with one of the character keys e, i, n, u, and ` followed by a specific character key (a, e, i, n, o, u, y, A, E, N, O, U, or space). Just press the appropriate radio button (normal, shift, option, option-shift, or option-combination (diacritic)) to see the various character mappings to the keyboard or the diacritics. Select All Characters to see all characters (including the alternate character set and all foreign/special characters) contained in the font displayed in a window using the selected font size and style. Select Key Caps to see the correspondence of the font characters to the keys on the keyboard, or to see the diacritics. The five rows of characters in the window correspond to the five rows of keys on the keyboard, except for the diacritics which show the resultant characters. (Key Caps is especially useful with fonts that involve unusual characters, such as Cairo). Intermediate font sizes can also usually be selected. Use Print Window (Graphics printing) to print the fonts (either one of the samples or the front window) in the selected font size and style. The font name, size, and style will always be printed in a header at the top of the page using the default system font, if the Sample or Key Caps option is selected. This ensures an intelligible title for fonts that do not print standard alphabetical characters. At the conclusion of this routine the program will revert to the standard (default) fonts. However, the window (the front window or sample window) will remain in the selected font until changed by another View Fonts.

When printing in larger fonts it is probable that text will be word wrapped. You may want to print in landscape mode with larger fonts to achieve more characters per line. The program also leaves a couple of lines spacing at the top and bottom of the page for good appearance with standard fonts. This spacing is decreased with larger fonts (> size 12) and even further decreased with very large fonts (> size 20), but considerable space may still appear at the top and bottom of the page. Any remaining text is typed on the following page(s). The program has been verified to work with fonts as large as size 72. In minimal memory configurations, larger font sizes may not be able to be loaded when requested. In these cases a warning message will appear and the default System font will be used.

Text files and Key Caps are normally displayed in a special nonproportional font where each character is the width of the number "0". This gives best appearance and columnar alignment for columns of numbers; however, some characters (e.g.; m followed by p) may run together with some fonts. The font spacing of any text file can be changed by using View Fonts to select the same font and style from the font dialog (the System default font is Shaston.8), and then selecting either proportional, nonproportional, or character 0 spacing from the Font Spacing dialog box. Nonproportional spacing makes each character the width of the widest character. View Fonts provides an effective means of viewing (and printing, if so desired) any text file in various fonts, font sizes, and font styles. You can select font sizes that do not already exist, and these new sizes will be created using the existing members of the selected font as the basis. Just enter the desired new size in the Other Size box of the Choose Font dialog. All font styles are also supported, including plain, bold, italic, underline, outline, and shadow.

If the selected font is a TrueType font that has already been loaded by Pointless, and if a bit-mapped version of that font size does not already exist, Pointless will generate a new font in the desired size. As the font is generated, the Pointless wait circle is filled in.

8.6 Load Fonts

This routine will load all selected fonts from any directory on any disk into the Font Manager's list of fonts. You will be presented with the standard UtilityWorks File Selection dialog. Just select whatever fonts you want loaded and press Accept. This routine functions in a similar manner to the File menu's Open item when reading font files, except that Load Fonts permits loading of multiple fonts and does not display the font samples. Load Fonts will not load TrueType Fonts. You must use Pointless to install TrueType fonts.

8.7 Print Fonts

This routine automatically prints a sample of all font families contained in either a designated directory or in the Font Manager's list of fonts. The user is given the choice of printing either the existing fonts or those contained in a directory. If the latter is selected, the user must then choose the directory whose fonts are to be printed. This latter capability is very useful for generating samples of fonts contained on your font disks. One sample from each font family will be printed in size 14 and plain style. Two font samples per page will be printed, and each sample contains a title (printed using the standard system font) indicating the font family name and the font family number. The sample is printed on eight lines, and includes both the standard character set and the alternate character set, but not foreign characters. Make certain your printer is turned on before selecting Print Fonts.

If a given TrueType font has already been loaded by Pointless, or if a TrueType font has a corresponding bit-mapped font from the same family currently in the *:System:Fonts directory, the Print Fonts routine will print the TrueType version of this font if a size 14 version of this font does not already exist. As the font is generated, the Pointless wait circle is filled in. TrueType fonts will only be used if you choose to print a sample of all font families contained in the Font Manager's list of fonts. Print Fonts will not recognize TrueType fonts contained in any directory.

9. Window

9.1 to 9.n (titles of all active windows)

The Window pull-down menu contains a menu item for each UtilityWorks active window. It does not include any NDA windows that may be open. The title of each window appears in the pull-down menu, with the front window indicated by a check appearing to the left of the title. Selecting any menu item in the pull-down menu will immediately bring that window to the front. The Window menu is extremely useful when you have a large number of open windows on your desktop, especially when they are fully zoomed as they typically are in 320 mode. You don't have to move the windows around to find the one you want to click on to bring to the front. Merely click on the desired window in the Window menu.

With UtilityWorks version 2.0 and later, pressing the Option key while selecting a window from the Windows menu will close that specific window.

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