Creating Pippin CD-ROMs

version 004

Abstract: This technical note describes the hardware, software, and procedures required to make Pippin-ready CD-ROMs though either modification of already released CD-ROM titles, or in creating brand new CD-ROMs.

Please send questions and comments via e-mail to pippindev@apple.com.

1   Introduction

All CD-ROM titles to be played on Pippin Power Players must be "Pippinized" in order to successfully run on a Pippin. This technical note describes the hardware, software, and procedures required to make Pippin-ready CD-ROMs though either modification of already released CD-ROM titles, or in initializing a brand new CD-ROM title.

2   Required Equipment

Ensure that all required equipment, either hardware or software, is readily at hand before beginning the CD-ROM "pippinizing" processes. Do not begin these procedures if you do not have all equipment immediately available.

2.1   Hardware

The following hardware is required to complete these procedures:

❐ Power Macintosh 6100/66 or higher. AV Power Macintosh models are optional.

❐ external hard drive with a minimum of 200MB

❐ CD-ROM duplicating device (e.g., Yamaha CDR-100 or any other duplicating device). 4x speed duplicating device models are recommended, although lower speed devices will work as well.

❐ SCSI/SCSI connectors short extender cable

❐ SCSI/SCSI-2 connectors short extender cable

❐ SCSI connector terminator

❐ SCSI-2 connector terminator

❐ Pippin Power Player testing unit with external SCSI connector cable

❐ Applejack controller

❐ TV monitor

❐ Blank CD-R disks (preferably gold dye type)

The following hardware is *optionally* required to complete these procedures:

❐ keyboard and adapter cable

❐ external memory card, if needed for development.

❐ AV cable +/- S-video cable

❐ modem

❐ printer

❐ network cables or other necessary networking hardware

2.2 Software

Ensure that the following software is readily available before beginning this procedure.

☞ All software versions listed are minimum levels; higher levels are also acceptable.

❏ *System 7.5.1* (or higher) must be installed on the Power Macintosh.

❏ CD-ROM drivers are packaged with *System 7.5.1*. Specifically, the following extensions must be present on the Power Macintosh before beginning this procedure:

- Apple CD-ROM

- Apple Photo Access

- Audio CD Access

- Foreign File Access

- High Sierra File Access

- ISO 9660 File Access

☞ In general, it is best to have the latest CD-ROM drivers installed on your Power Macintosh. If using *System 7.5.1*, install *Update 5.1.1*. If using System 7.5.2 or later, *Update 5.1.1* is not necessary.

☞ If using enhanced multimedia CD formats, ensure that you have the appropriate additional CD driver extensions installed.

❏ CD-ROM duplicating software, such as *Toast CD-ROM Pro™ 2.5.6*.

❏ *SCSIProbe 3.5* (shareware) or any other volume mounting utility.

❏ *ResEdit 2.1.3* or any other resource editing application.

❏ Hard Disk formatting application, such as *Hard Disk Tool Kit™ 1.75* by FWB or *APS PowerTools™ 2.8.1*.

❏ *Pippin System Folder* (available from Pippin SDK).

❏ Demo or application software to be installed.

❏ Authentication software, if necessary. (See "Authentication" Technical Notes.)

❏ *AppleJack 2.2.0* application and system extension if customizing the Applejack Controller (available from Pippin SDK). (See "Applejack Input Device Driver" Technical Notes).

3 Setting Up

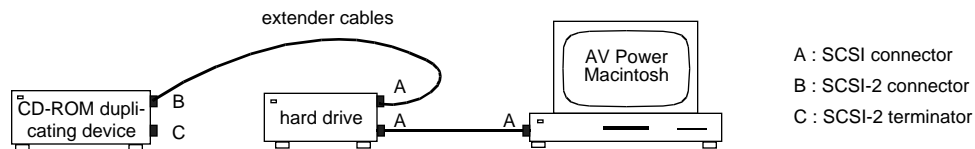The following subsections provide a step-by-step procedure to make "Pippin-ready" CD-ROMs.

☞ Do not skip steps! Work carefully to ensure that the specified procedure is properly implemented.

3.1 Hardware Configuration

Configure the Power Macintosh, external hard drive, and CD-ROM duplicating device as follows:

1. Set SCSI ID on the external hard drive to an unused value other than existing SCSI IDs (i.e., typically, a Power Macintosh's internal hard drive has a SCSI ID set to "0"; the internal CD-ROM is usually set to "3"; the CD-ROM duplicating device can be set to "1").

2. Using the SCSI/SCSI cable, attach one end to the back of the Power Macintosh; attach the other end to the external hard drive's SCSI connector.

3. Using the SCSI/SCSI-2 cable, attach the SCSI end of the cable to the remaining SCSI connector on the external hard drive; attach the SCSI-2 end of the cable to the CD-ROM duplicating device.

4. Place the SCSI-2 terminator on the open SCSI-2 connector on the CD-ROM duplicating device.

Figure 1   Hardware Setup

☞ See CD-ROM duplicating device manual for any other special setup requirements.

3.2 Preparing External Hard Drive

The external hard drive must be formatted or partitioned before beginning the "Pippinizing" procedure. Ensure that the following steps are carefully carried out. Do not skip any steps.

1. Using *SCSI Probe 3.5* (or higher) control panel, mount the external hard drive (i.e., first select "Update", then "Mount" to mount the external drive).

2. Using *Hard Disk Toolkit™ 1.75* (or higher), select the external hard drive ID from the listed SCSI IDs.

3. Select "Format" to format the selected hard drive. When the application queries what type of partition is desired, select "Standard Partition" and highlight "Maximum Macintosh".

4. Partition size should not be greater than 640MB, since writable CD-ROMs are that same size. Ideally, create a partition that is CD-ROM size.

4   Creating a "Pippin-Ready" CD-ROM

Follow the appropriate process in the following sections to create a "Pippin-ready" CD-ROM:

- To modify an already released CD-ROM, follow the procedure in section 4.1.

- To create a brand new "Pippin-ready" CD-ROM, skip to section 4.2, "Creating a New Pippin CD-ROM," on page 8.

4.1   Modifying a Released CD-ROM Title

Before beginning this procedure, ensure that all configuration steps as outlined in section 3, "Setting Up," have been completed. You cannot proceed with this procedure if any steps in section 3 and its subsections have been skipped.

1. Insert released CD-ROM in Power Macintosh CD drive.

2. Drag and drop the entire volume of CD-ROM title to newly formatted partition on the external hard drive.

☞ Do not use "Select All" to copy volume because hidden files could potentially be left behind in the copy process. By dragging and dropping, you are ensured that *all* files/folders and/or paths within the volume are duplicated to the partition.
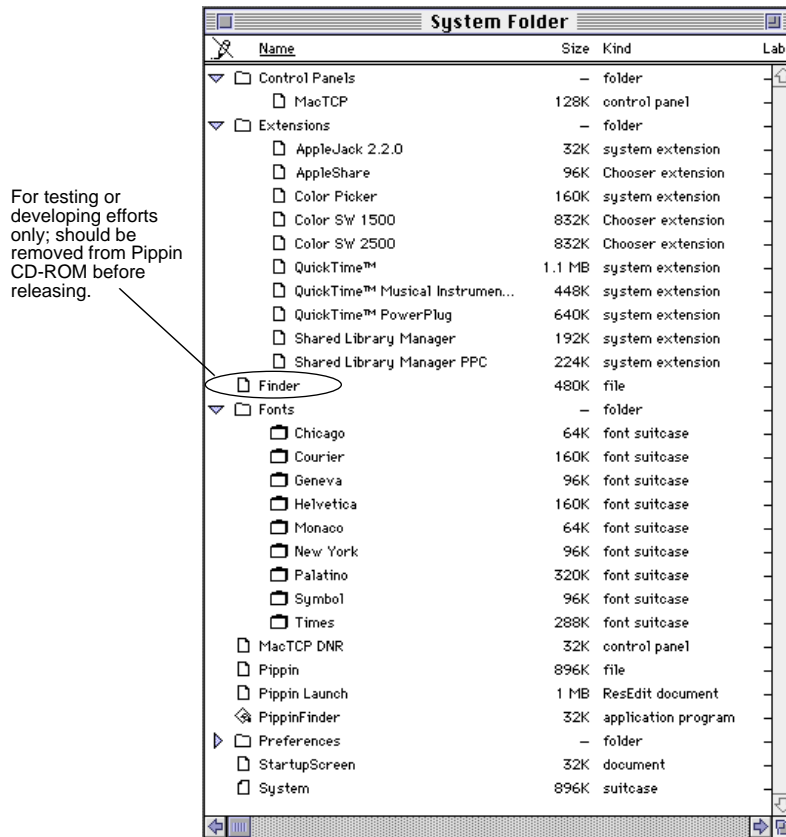
---

3. Using *ResEdit 2.1.3* (or higher), find any hidden files or folders within the copied volume, and make them visible on the external hard drive.

4. Rename the volume folder of the recently copied volume (in the partition) by adding "old" to the end of the volume name.

5. Press "Select All" files within the volume folder of the recently copied volume (in the partition).

6. Drag and drop all selected files to the "root level" of the partition (on external hard drive).

7. Rename the partition to the same title name as the original volume name.

8. Launch the title to test that the copy process was successful.

☞ Sometimes titles are developed with specific requirements of using a hard drive to launch. In such cases, use a utility such as *DiskLocker™ 1.3* to lock your hard drive before testing the title. Launch the application from the "locked" hard drive partition. If the application still does not launch properly, you may want to recheck the development work of the title. Once the testing is successful, remember to "unlock" the hard drive before preceding.

---

9. Drag and drop old empty volume folder to the **Trash**.

10. Drag and drop **Pippin System Folder** into the title volume partition (available from Pippin SDK).

11. Ensure that the following minimum file set exists in the **Pippin System Folder** (if not, contact Pippin development at pippindev@apple.com):

Figure 2   Pippin System Folder with Appletalk (Minimum File Set)

For testing or developing efforts only; should be removed from Pippin CD-ROM before releasing.

☞ Note that although the **Finder** file is included in Figure 2, the **Finder** is not included in the license and should not be released with the Pippin end-product. Refer to sections 4.3.1 through 4.3.3 to see how and when to properly remove the **Finder** from your Pippin CD-ROM.

12. If any additional software, preferences, and/or extensions are needed to run the title (e.g., networking software, modem software, Applejack application and system extension, ADB device software, Pippin Launch, etc.), add them to the title volume partition at this time.

☞ If additional software needs to be installed with an **Installer** file, be sure to install the software onto the Pippin, and not the Power Macintosh, or else the **System Folder** components will not get installed.

13. Ensure that the **Pippin System Folder** is called "System Folder".

14. Create a new folder in the **System Folder** called "temp".

15. Drag and drop the **PippinFinder** file into the **temp** folder.

16. Unmount and shut down the external hard drive.

17. Attach the external hard drive to the Pippin test unit by connecting the available external SCSI cable to the hard drive.

18. Attach an Applejack controller to the Pippin test unit, or, optionally, attach a keyboard adapter and keyboard to the Pippin test unit.

19. Place a SCSI terminator on the extra SCSI connector slot on the external hard drive, if necessary.

20. Boot the hard drive with the Pippin test unit connected.

☞ If having difficulty booting the hard drive, restart the drive after adding a SCSI terminator.

21. Configure the title to run on the Pippin with the *final* Pippin configuration.

22. Launch the title on the Pippin to test all title capabilities. Expanded memory should not be used during testing of the title capabilities, and memory allocations should be efficiently used and kept to a minimum.

23. Test thoroughly.

☞ Do not skip the final testing step. Test *all* title capabilities. At this stage of the process especially, it is crucial to determine whether the title is going to work on a Pippin, or not. If the title does not work, then the developer must figure out why and how to make the title work before proceeding with this process.
For assistance, contact Pippin development at pippindev@apple.com.

24. Upon successful thorough testing, continue with section 4.3, "Front-End Interface Configuration," on page 9.

4.2   Creating a New Pippin CD-ROM

Before beginning this procedure, ensure that all configuration steps as outlined in section 3, "Setting Up," have been completed. You cannot proceed with this procedure if any steps in section 3 and its subsections have been skipped.

1. Drag and drop all new title files from wherever they have been stored on the Power Macintosh to the "root level" of the newly formatted partition on the external hard drive.

2. Ensure that any hidden files have also been copied (use *ResEdit 2.1.3* (or higher) in needed).

3. Rename the partition to coincide with the title name.

4. Launch the title to test that the copy process was successful.

☞ Sometimes titles are developed with specific requirements of using a hard drive to launch. In such cases, use a utility such as *DiskLocker™ 1.3* to lock your hard drive before testing the title. Launch the application from the "locked" hard drive partition. If the application still does not launch properly, you may want to recheck the development work of the title. Once the testing is successful, remember to "unlock" the hard drive before preceding.

---

5. Drag and drop the **Pippin System Folder** into the title volume partition (available from Pippin SDK).

6. Ensure that the minimum file set shown in Figure 1 on page 4 exists in the **Pippin System Folder** (if not, contact Pippin development at pippindev@apple.com).

☞ Note that although the **Finder** file is included in Figure 2, the **Finder** is not included in the license and should not be released with the Pippin end-product. Refer to sections 4.3.1 through 4.3.3 to see how and when to properly remove the **Finder** from your Pippin CD-ROM.

---

7. If any additional software, preferences, and/or extensions are needed to run the title (e.g., networking software, modem software, Applejack system extension and application, ADB device software, Pippin Launch, etc.), add them to the title volume partition at this time.

☞ If additional software needs to be installed with an "Installer" file, be sure to install the software onto the Pippin, and not the Power Macintosh, or else the System Folder components will not get installed.

---

8. Ensure that the **Pippin System Folder** is called "System Folder".

9. Create new folder in the System Folder called "temp".

10. Drag and drop the **PippinFinder** file into the **temp** folder.

11.   Unmount and shut down the external hard drive.

12.   Attach the external hard drive to the Pippin test unit by connecting the available external SCSI cable to the hard drive.

13.   Attach an Applejack controller to the Pippin test unit, or, optionally, attach a keyboard adapter and keyboard to the Pippin test unit.

14.   Place a SCSI terminator on the extra SCSI connector slot on the external hard drive, if necessary.

15.   Boot the hard drive with the Pippin test unit connected.

☞   If having difficulty booting the hard drive, restart the drive after adding a SCSI terminator.

---

16.   Configure the title to run on the Pippin with the *final* Pippin configuration.

17.   Launch the title on the Pippin to test all title capabilities. Expanded memory should not be used during testing of the title capabilities, and memory allocations should be efficiently used and kept to a minimum.

18.   Test thoroughly.

☞   Do not skip the final testing step. Test *all* title capabilities. At this stage of the process especially, it is crucial to determine whether the title is going to work on a Pippin, or not. If the title does not work, then the developer must figure out why and how to make the title work before proceeding with this process.
For assistance, contact Pippin development at pippindev@apple.com.

---

19.   Upon successful thorough testing, continue with section 4.3.

4.3   Front-End Interface Configuration

Since there are many ways to configure a title's front-end interface, deciding on a strategy of how a developer wants the title to be launched is very important. The following subsections outline just three ways to configure titles' launching mechanisms. Of course, many other customized mechanisms will be attempted and are possible by engineers. However, a key point to note is that what works for one title will not always work for another title since each and every title is unique, and has very different requirements.

Use one of the following described interface configuration mechanism that best suits your title's needs, *or* design your own, with the understanding that such a chore may be far more time-consuming than may first seem to be.

☞   If you are unsure about which interface option to use, simply choose one and attempt it. If the final launch test fails, select an alternative option. If you exhaust

---

all options, contact Pippin development at pippindev@apple.com with a description of your processes and problem.

4.3.1   Option: Launching Title with an "Alias" of Title

By using this interface configuration mechanism successfully, the title application will launch automatically upon inserting the CD-ROM title into the Pippin test unit.

☞ Some titles will not allow an "alias" to launch the title, thus requiring the developer to select another option.
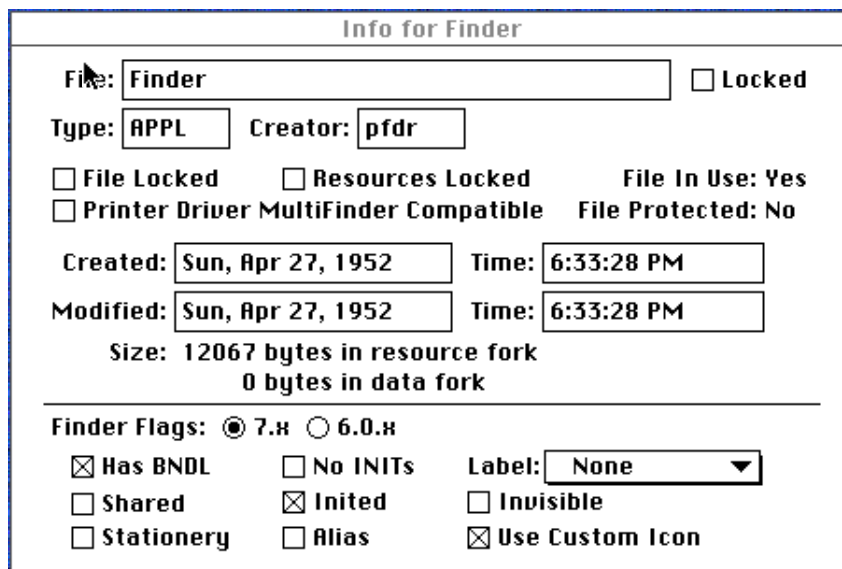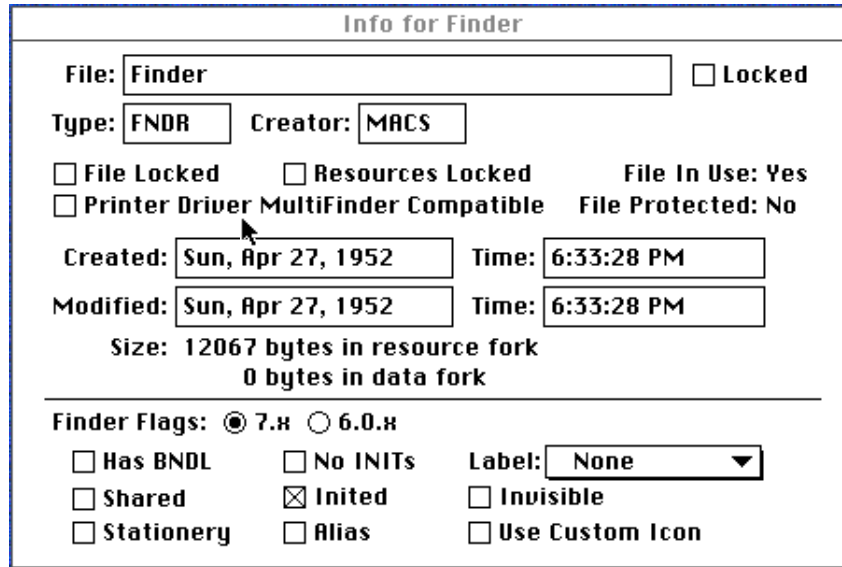
1. Make an "alias" (press ⌘m) of the title application file (located in the volume title partition of the external hard drive).

2. Drag and drop the alias file to the **Startup Items** folder within the **System Folder**.

3. Drag and drop the (Macintosh) **Finder** file and the **temp** folder to the **Trash**.

4. Rename the **PippinFinder** file to "Finder".

5. Open the new renamed **Finder** with *ResEdit*.

6. Under "File" in the Menu bar, select "Get Info for Finder", and a window similar to Figure 3 will appear.

Figure 3   "Info for Finder" Window BEFORE changes made

7. Change *Type* from "APPL" to "FNDR" and Creator from "pfdr" to "MACS". Also, under "Finder flags", deselect "Has BNDL" and "Use Custom Icon", as shown in Figure 4.

Figure 4   "Info for Finder" Window AFTER changes made

8. Close and save the new **Finder** file.

9. If any additional software, preferences, and/or extensions are needed to run the title (e.g., networking software, modem software, Applejack system extension and application, ADB device software, Pippin Launch, etc.), configure them at this time.

10. Configure hardware as desired (e.g., customizing Applejack controller, ADB devices, etc.).

11. Reboot the Pippin to test whether the title is automatically launched.

12. If the title launches upon reboot, retest all title capabilities. (If the title will not launch, proceed with another interface configuring option.)

13. Test thoroughly.

☞ Do not skip the final testing step. Test *all* title capabilities.

14. Upon successful thorough testing, continue with section 5, "Final Steps: Pressing the Newly Pippinized CD-ROM," on page 15.

4.3.2   Option 2: Launching Title with Application in "Startup Items"

By using this interface configuration mechanism successfully, the title application will automatically be launched upon inserting the CD-ROM title into the Pippin test unit.
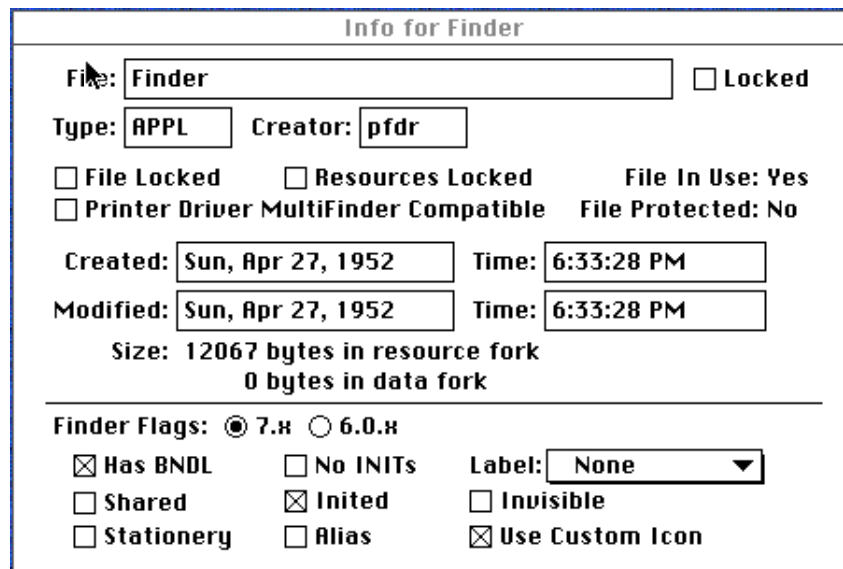
☞ Some titles will not allow the application file to launch from a location other than the "root" on the volume; thus requiring the developer to select another option.

1.   Drag and drop the title application file to the **Startup Items** folder within the **System Folder**.

☞ This mechanism will not work if your title requires other components to also be in the **Startup Items** folder within the **System Folder**.
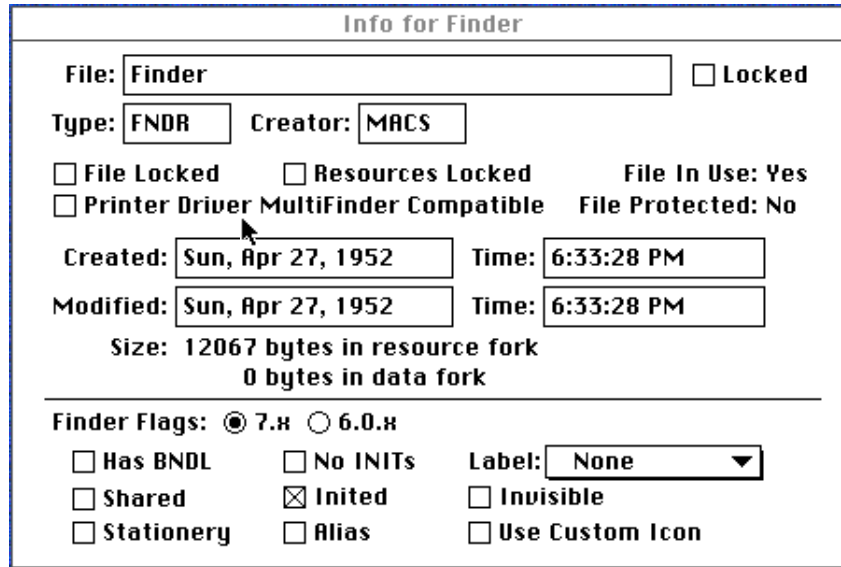
2.   Drag and drop the **PippinFinder** file from the **temp** folder to the **System Folder**.

3.   Drag and drop the (Macintosh) **Finder** file and the **temp** folder to the **Trash**.

4.   Rename the **PippinFinder** file to "Finder".

5.   Open the new renamed **Finder** with *ResEdit*.

6.   Under "File" in the Menu bar, select "Get Info for Finder", and a window similar to Figure 5 will appear.

Figure 5   "Info for Finder" Window BEFORE changes made

7.   Change *Type* from "APPL" to "FNDR" and Creator from "pfdr" to "MACS". Also, under "Finder flags", deselect "Has BNDL" and "Use Custom Icon", as shown in Figure 6.

Figure 6   "Info for Finder" Window AFTER changes made

8. Close and save the new **Finder** file.

9. If any additional software, preferences, and/or extensions are needed to run the title (e.g., networking software, modem software, Applejack system extension and application, ADB device software, Pippin Launch, etc.), configure them at this time.

10. Configure hardware as desired (e.g., customizing Applejack controller, ADB devices, etc.).

11. Reboot the Pippin to test whether the title is automatically launched.

12. If the title launches upon reboot, retest all title capabilities. (If the title will not launch, proceed with another interface configuring option.)

13. Test thoroughly.

☞ Do not skip the final testing step. Test *all* title capabilities.

---

14. Upon successful thorough testing, continue with section 5, "Final Steps: Pressing the Newly Pippinized CD-ROM," on page 15.
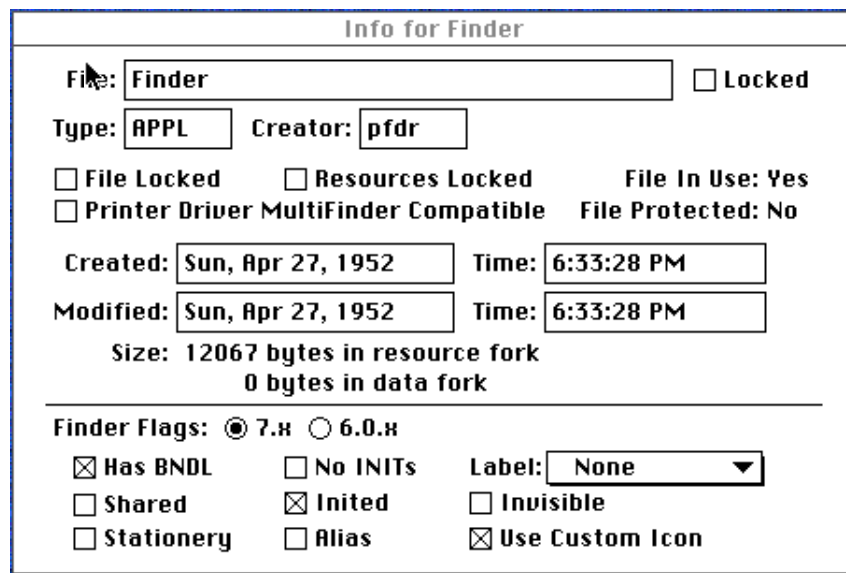
4.3.3   Option 3: Pippin Launch

By using this interface configuration mechanism successfully, a custom user interface is modified according to the requirements of the title.

1. Reconnect the external hard drive to the Power Macintosh following the steps defined in section 3.1, "Hardware Configuration".

2. Drag and drop the **Pippin Launch** file to the **System Folder** (available from Pippin SDK).

3. Drag and drop the **PippinFinder** file from the **temp** folder to the **System Folder**.
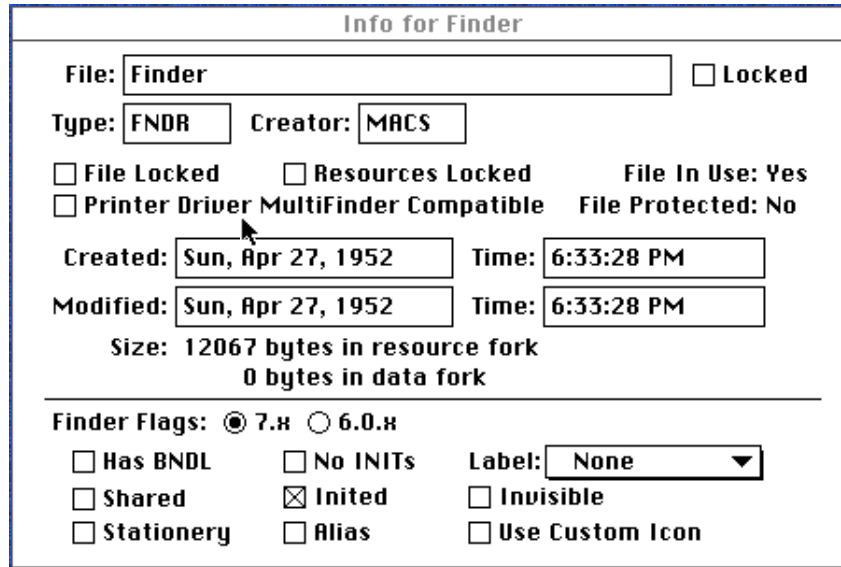
4. Drag and drop the (Macintosh) **Finder** file and the **temp** folder to the **Trash**.

5. Duplicate the **PippinFinder** file (press ⌘d).

6. Rename the **PippinFinder copy** file to "Finder".

7. Open the new renamed **Finder** with *ResEdit*.

8. Under "File" in the Menu bar, select "Get Info for Finder", and a window similar to Figure 7 will appear.

Figure 7   "Info for Finder" Window BEFORE changes made

9. Change *Type* from "APPL" to "FNDR" and Creator from "pfdr" to "MACS". Also, under "Finder flags", deselect "Has BNDL" and "Use Custom Icon", as shown in Figure 8.

Figure 8   "Info for Finder" Window AFTER changes made

10. Close and save the new **Finder** file.

11. If any additional software, preferences, and/or extensions are needed to run the title (e.g., networking software, modem software, Applejack system extension and application, ADB device software, Pippin Launch, etc.), configure them at this time.

12. Configure hardware as desired (e.g., customizing Applejack controller, ADB devices, etc.).

13. Double-click on **Pippin Launch** file.

14. Use *ResEdit 2.1.3* to configure **Pippin Launch** as desired. (See "Pippin Launch" Technical Note available at http://www.pippin.apple.com.)

15. Launch the title on the Pippin to test all title capabilities.

16. Test thoroughly.

☞ Do not skip the final testing step. Test *all* title capabilities.

17. Upon successful thorough testing, continue with section 5.

5   Final Steps: Pressing the Newly Pippinized CD-ROM

Assuming that all steps in proceeding sections have been properly followed, you may begin the final steps: the pressing of the newly Pippinized CD-ROM.

1. Inactivate AppleTalk on the Power Macintosh.

2. Disable networking on the Power Macintosh (i.e., LocalTalk should be selected).

☞ Disabling networking connections is crucial to do *before* continuing this procedure. Networking interruptions will interfere with the CD-ROM mastering process.

---

3. Reconnect the external hard drive to the Power Macintosh following the steps defined in section 3.1, "Hardware Configuration".

4. Insert a blank, unused, unpressed gold dye type CD-R disk into the duplicating device.

5. Launch *Toast CD-ROM Pro™ 2.5.6* (or higher).

6. Ensure that "Macintosh HFS CD-ROM" (or "Mac Volume" for higher versions of *Toast CD-ROM Pro*) is displayed in the Toast application window. If not, select "Macintosh HFS CD-ROM" from the "Format" menu.

7. Click on the "Data..." button.

8. Select title volume from the displayed list of volumes.

9. Ensure that the "Bootable" option is tagged on the bottom of the displayed window.

10. Ensure that both CD writer and CD is tagged for synchronized speed from the "Recorder" menu and specifies either 4x or 2x, depending on the CD-ROM duplicating device.

11. Click on the "Search..." button to ensure that the Power Macintosh is seeing the CD-ROM duplicating device. (If not seen, double check all SCSI connections.)

12. Click on the "Write CD..." button to write to the blank CD-ROM.

13. Click on the "Write Disk..." button from within the next window.

14. The CD-ROM pressing begins. The time to press a CD-ROM varies anywhere from 2 to 60 minutes or more (largely dependent on the speed of the CD-ROM duplicating device).

15. Using the newly pressed CD-ROM, conduct a final test on the Pippin testing unit using the new CD-ROM to launch the title.

16. Test thoroughly.

☞ Do not skip the final testing step. Test *all* title capabilities. If errors are found, redo the process and press another CD-ROM.