Macintosh System Software Update

Apple FDHD™

Your Macintosh computer is equipped with an Apple FDHD™ (floppy drive, high density), Apple's latest advance in disk drive technology. The Apple FDHD gives you fast performance and increased storage capacity in a 3.5-inch disk drive. Using new high-density (HD) 3.5-inch disks, the Apple FDHD allows you to store up to 1.4 megabytes of data on a single disk.

Your Apple FDHD can read and write information on disks that are formatted for both Macintosh and MS-DOS computers. In addition, it can use data and applications on 400K and 800K disks formatted for Macintosh computers.

This update provides information on how to use the Apple FDHD, tips on caring for high-density disks, and a set of specifications for the disk drive.

Before you begin

Before you continue reading this update, you should be familiar with basic Macintosh skills and vocabulary. If using the mouse, choosing commands from menus, and selecting and dragging icons are unfamiliar to you, read the owner's guide that came with your computer or your *Macintosh System Software User's Guide* before continuing.

In order to take full advantage of your Apple FDHD, you need two things. First, you need to use System 6.0 or later. (You can use your computer with System 5.0, but you will not be able to take advantage of the features of the Apple FDHD. Do not use HD disks with any System older than 6.0.)

Second, in order to take advantage of the drive's ability to read and write data on high-density disks, you need 3.5-inch HD disks. You can purchase these disks from your authorized Apple dealer.

If you're working with a combination of HD and 800K or 400K disks, it's important that you recognize the difference between the HD disks and other disks.

To identify an HD disk, look at the disk with the label side facing up. The letters *HD* appear near the metal cover on this side of the disk. In addition, each HD disk has a small square hole in the upper-left corner (across from the write-protect tab). Be careful not to confuse your HD disks with 800K and 400K disks. You can find more information on these disks in the section "Working with Combinations of Apple FDHDs and Other Disk Drives" later in this update.

Using the Apple FDHD

You use the Apple FDHD as you would use any 3.5-inch disk drive. This section tells you how to

- insert and eject disks

- initialize disks for both Macintosh and MS-DOS computers

- use Apple File Exchange to initialize disks for use with MS-DOS computers

- protect the data on your disks from accidental erasure

- work with combinations of Apple FDHDs and other disk drives

- use the Apple FDHD to transfer data between Macintosh and MS-DOS computers

Inserting and ejecting disks

To insert a disk into an Apple FDHD, slide the disk into the slot in the front of the drive, metal end first, label side up (see Figure 1). When the disk is most of the way in, the drive's internal mechanism automatically pulls the disk into place.

- **Figure 1**   Inserting a disk
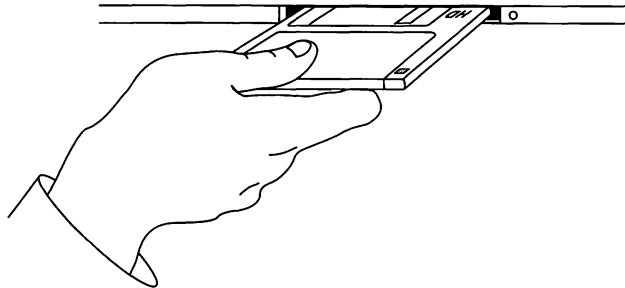
You can eject a disk in several ways:

- Select the disk's icon in the Finder and choose Eject from the File menu. You can also press Command-E to eject the selected disk.

- Drag the disk icon to the Trash (don't worry, this doesn't erase your disk). Dragging a disk to the Trash ejects the disk and removes its icon from the desktop.

- Press Command-Shift-1 to eject a disk in drive 1 (the rightmost drive on Macintosh computers, the uppermost on others). Press Command-Shift-2 to eject the disk in drive 2, and so on.

- Choose Restart from the Special menu to restart your Macintosh and eject disks from all attached drives, or choose Shut Down from the Special menu to eject all disks and shut down the computer.

See your *Macintosh System Software User's Guide* for more information on ejecting disks.

Initializing disks in an Apple FDHD

When you put a new disk into a disk drive, the drive needs to prepare that disk for use with the computer. This preparation is called *initializing* the disk. The sections that follow tell you how to initialize disks for use with Macintosh and MS-DOS computers.

Initializing disks for Macintosh computers

The process for initializing Macintosh HD disks is basically the same as the process for initializing 800K and 400K disks.

To initialize a new 3.5-inch HD disk, follow these steps:

1. **Insert the HD disk that you want to initialize into an Apple FDHD.**

   A dialog box appears telling you that the disk is not readable (because it hasn't been initialized). See Figure 2.

■ **Figure 2**   Initialization dialog box

> This disk is unreadable:
> Do you want to initialize it?
>
> [Eject]   [Initialize]

2. **Click Initialize to initialize the disk, or click Eject to cancel the initialization and eject the disk.**

   If you click Initialize, a second dialog box appears warning you that the process will erase the disk (see Figure 3).

   HD disks that have been initialized in a 400K or an 800K drive are treated as uninitialized disks in an Apple FDHD. This dialog box reminds you that if you have data on an HD disk that was initialized as a 400K or an 800K disk, initializing the disk will erase that data.

■ **Figure 3** Warning dialog box

```
┌─────────────────────────────────────────┐
│ ┌─────────────────────────────────────┐ │
│ │   /\    This process will erase all │ │
│ │  / ! \  information on this disk.   │ │
│ │ /____\                              │ │
│ │                                     │ │
│ │ ( Cancel )            (( Erase ))   │ │
│ └─────────────────────────────────────┘ │
└─────────────────────────────────────────┘
```
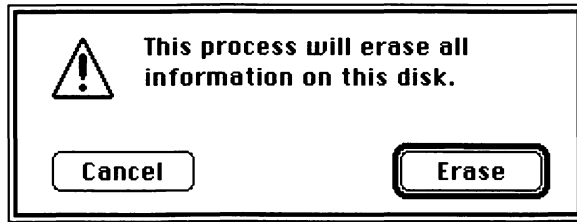
3. Click Erase to continue initializing the disk, or click Cancel to stop the process and eject the disk.

If you click Erase, a dialog box appears asking you to name the disk (see Figure 4).

■ **Figure 4** Dialog box to name a disk

```
┌─────────────────────────────────────────┐
│ ┌─────────────────────────────────────┐ │
│ │ [ ⎯⎯↑ ]  Please name this disk:     │ │
│ │         ┌─────────────────────────┐ │ │
│ │         │ Untitled                │ │ │
│ │         └─────────────────────────┘ │ │
│ │                (( OK ))              │ │
│ └─────────────────────────────────────┘ │
└─────────────────────────────────────────┘
```
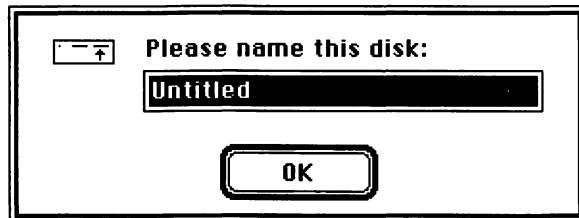
4. Type a name for the disk and press Return.

To avoid confusion, give each disk a different name.

The Macintosh initializes the disk. As the initialization proceeds (for about a minute), messages inform you of the progress.

When the disk is initialized, its icon appears on the Finder desktop with the name you gave it underneath the icon.

Once you have initialized the 3.5-inch HD disk, you can use it in any Apple FDHD.

If you have an initialized HD disk that you want to reinitialize (erasing everything on that disk), follow these steps:

1. **Select the icon for the disk.**

2. **Choose Erase Disk from the Special menu.**

3. **Click Initialize when the dialog box appears, and wait while the drive reinitializes the disk.**

The Apple FDHD can initialize and erase (reinitialize) 400K and 800K disks as well as HD disks. Simply insert the disk into the Apple FDHD and follow the prompts on the screen. If you're reinitializing the disk, begin by selecting Erase Disk from the Special menu, then follow the prompts on the screen.

Initializing disks for MS-DOS computers

The Apple FDHD in combination with Apple File Exchange allows you to initialize and reinitialize disks for use with MS-DOS computers. Apple File Exchange is an application on your System Utilities disk that enables you to transfer files for use with different applications across different operating systems. You can initialize both HD disks (1440K) and normal-density disks (720K) in an Apple FDHD.

Follow these steps to initialize a disk for use in an MS-DOS computer:

1. **Before you insert your uninitialized disk, open the Apple File Exchange application by double-clicking its icon.**

2. **Insert the disk you want to initialize into your Apple FDHD.**

   If you insert an HD disk, the dialog box in Figure 5 appears. If you insert a normal-density disk, the dialog box in Figure 6 appears.

■ **Figure 5**   Apple File Exchange dialog box for HD disks

```
┌──────────────────────────────────────────────────┐
│ ┌─────┐     Apple File Exchange cannot            │
│ │  □  │     read this disk. Do you wish to        │
│ └─────┘     initialize it?                        │
│                                                    │
│ ◉ 1440K      ┌──────────────────────────┬──┐       │
│              │ MS-DOS                   │⬆ │       │
│              │ Macintosh                ├──┤       │
│              │ ProDOS                   │  │       │
│              │                          ├──┤       │
│              │                          │⬇ │       │
│              └──────────────────────────┴──┘       │
│                      ┌───────────┐┌───────────┐    │
│                      │ Initialize ││   Eject   │   │
│                      └───────────┘└───────────┘    │
└──────────────────────────────────────────────────┘
```
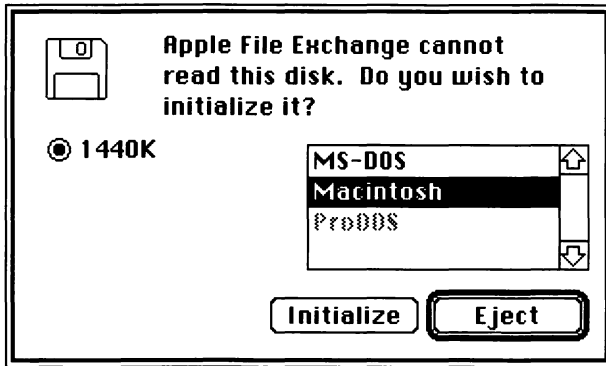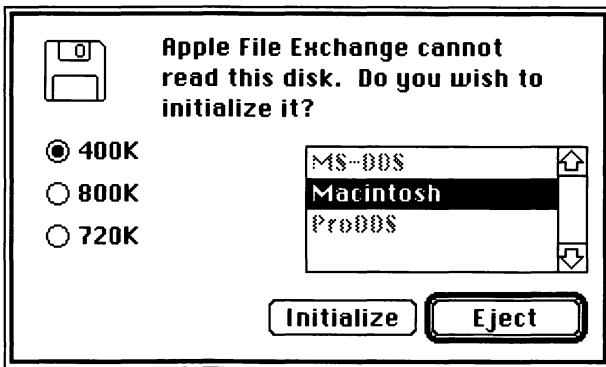
■ **Figure 6**   Apple File Exchange dialog box for normal-density disks

```
┌──────────────────────────────────────────────────┐
│ ┌─────┐     Apple File Exchange cannot            │
│ │  □  │     read this disk. Do you wish to        │
│ └─────┘     initialize it?                        │
│                                                    │
│ ◉ 400K       ┌──────────────────────────┬──┐       │
│              │ MS-DOS                   │⬆ │       │
│ ○ 800K       │ Macintosh                ├──┤       │
│              │ ProDOS                   │  │       │
│ ○ 720K       │                          ├──┤       │
│              │                          │⬇ │       │
│              └──────────────────────────┴──┘       │
│                      ┌───────────┐┌───────────┐    │
│                      │ Initialize ││   Eject   │   │
│                      └───────────┘└───────────┘    │
└──────────────────────────────────────────────────┘
```

3. **If you're initializing a normal-density disk, click 720K. If you're initializing an HD disk, 1440K is already selected. Go on to step 4.**

4. **Click MS-DOS in the box on the right side of the dialog box.**

5. **Click Initialize.**

   Apple File Exchange begins to initialize your disk. After about a minute (depending on what type of disk you initialize) a dialog box appears asking you to name your disk.

6. **Type a name for your disk and press Return.**

   The name you type must be a valid MS-DOS volume name. See your MS-DOS documentation for information on volume names.

   After you name your disk, the disk name appears above the box on the right of the Apple File Exchange window.

7. **Choose Quit from the File menu.**

   Your initialized disk is ejected.

You can also reinitialize disks for use with MS-DOS computers using the Apple FDHD and Apple File Exchange. The process is similar to the process for initializing disks. Follow these steps to reinitialize a disk for use with an MS-DOS computer:

1. **Open Apple File Exchange by double-clicking its icon.**

2. **Insert the disk you want to reinitialize into your Apple FDHD.**

3. **Choose Erase Disk from the File menu.**

4. **Click MS-DOS in the dialog box that appears.**

5. **Click Erase.**

   After about a minute, a dialog box appears allowing you to rename your disk.

6. **Type a new name for your disk and press Return.**

   The name you type must be a valid MS-DOS volume name. See your MS-DOS documentation for information on volume names.

7. **Choose Quit from the File menu.**

   Your reinitialized disk is ejected.

Protecting your disks from accidental erasure

All 3.5-inch disks come with a write-protect tab in the upper-right corner. This tab allows you to write-protect the disks so that computers cannot make changes to information, erase any information, or write new information on the disk. Computers can, however, read information from write-protected disks.

To write-protect a disk so that the information on it cannot be changed, slide the write-protect tab toward the edge of the disk.

Later, if you want to make changes to the information, slide the write-protect tab away from the edge of the disk (see Figure 7).

■ **Figure 7**   Write-protect tab


Locked   Unlocked
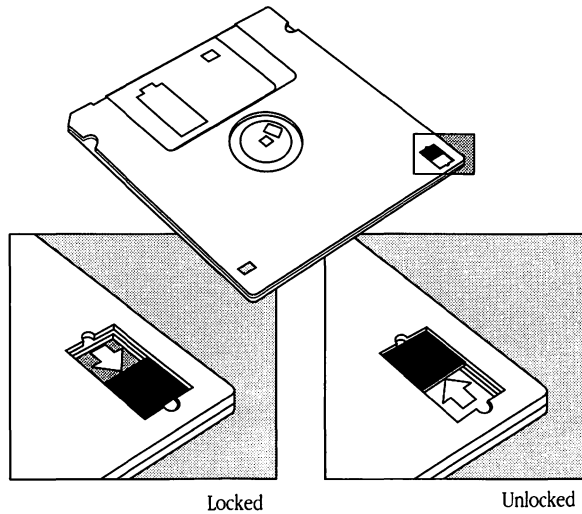
Working with combinations of Apple FDHDs and other disk drives

In addition to using HD disks, the Apple FDHD can also use 800K and 400K disks. The Apple FDHD can read and write information on these disks just as the 800K and 400K disk drives would. The Apple FDHD can also recognize the difference between HD disks and 800K or 400K disks, and it can properly initialize any of these disk types.

The reverse, however, is not true. Because HD disks have a different magnetic surface from 400K and 800K disks, you should not use HD disks in 800K and 400K disk drives. These drives cannot reliably read or write information on an HD disk, and they cannot properly initialize these disks for use in an Apple FDHD. Figure 8 shows you which combinations of disks and drives you can use.

■ **Figure 8**   Disk and disk drive compatibility for formatted disks
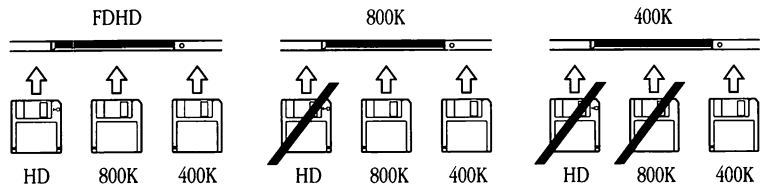
△ **Important**   Do not put an HD disk into an 800K or 400K disk drive. These disk drives cannot reliably read or write information on HD disks, and they cannot properly initialize an HD disk for use in an Apple FDHD. △

Keep the following important points in mind whenever you work with a combination of Apple FDHDs and 800K or 400K drives:

■ If you accidentally put an HD disk into an 800K or a 400K drive, you will be asked if you want to initialize the disk. Be sure that you eject the disk. Initializing the disk will destroy any data you have stored on that disk.

■ If you put an HD disk initialized as a 400K or 800K disk into an Apple FDHD, a dialog box will appear telling you that the disk is not properly formatted for use in the Apple FDHD. You can then choose either to initialize the disk as an HD disk (erasing any data you might already have on the disk) or to eject the disk.

- Even if your HD disk is new and uninitialized, do not initialize the disk in a 400K or an 800K disk drive. HD disks initialized in these drives cannot be used in an Apple FDHD (not even as 800K or 400K disks). If you put an HD disk initialized as an 800K or a 400K disk into an Apple FDHD, the Apple FDHD will recognize the disk as an improperly initialized HD disk, and a dialog box will appear asking you if you want to initialize the disk.

Because Apple FDHDs and other disk drives look the same when installed in your Macintosh, and because the disks themselves look very similar, it's easy to get confused if you use more than one type of disk and drive. If you're using a combination of HD and 800K or 400K disks and drives, consider these suggestions to avoid confusion:

- Indicate clearly on the label of each HD disk that the disk should be used in Apple FDHDs only. (HD disks made by Apple come with an icon on the metal door that reminds you not to put the disks into older disk drives.)

- Be sure to warn anyone who might use your disks or equipment that the HD disks should be used in Apple FDHDs only.

By following these tips, you'll be able to take advantage of the increased storage and other features of the Apple FDHD without confusion.

Using the Apple FDHD to transfer data between Macintosh and MS-DOS computers

Aside from providing you with increased storage space, the Apple FDHD also allows you to work directly with information on 3.5-inch disks formatted for MS-DOS compatible computers.

The Apple FDHD can read information from both 720K and 1.4 megabyte, 3.5-inch MS-DOS formatted disks. You can simply slide your MS-DOS formatted disk into the Apple FDHD in your Macintosh and go to work on the data stored on the disk.

Used in combination with Apple File Exchange, the Apple FDHD provides the easiest method of moving information between MS-DOS and Macintosh applications. For more information on the Apple File Exchange utility, see the *Macintosh Utilities User's Guide*.

Caring for disks

Apple's 3.5-inch disks are quite durable. You can safely slide them into your shirt pocket, drop them into your briefcase, or slip them into a business envelope and mail them anywhere (be sure to label the envelope as magnetic media). There are, however, a few basic handling instructions to keep in mind.

You should always keep your disks

- dry

- away from extreme temperatures (don't put them on top of your computer or leave them on your car seat)

- out of direct sunlight

- away from anything that contains a magnet, such as a telephone or audio speakers (magnets can scramble the information on a disk)

The metal covering on 3.5-inch disks protects the magnetic surface inside the disk (where the information is stored) when the disk is out of the disk drive. When the disk is in the drive, the metal door slides to the side to allow the drive access to the information on the magnetic surface. Do not slide the door to the side when the disk is out of the drive. You might expose the magnetic surface to dust and fingerprints, which could damage information stored on the disk.

△ **Important**   Always make backup copies of any disks that contain information you can't afford to lose. △

Specifications

The Apple FDHD uses two magnetic heads to enable it to read and write information on both sides of a disk's magnetic surface. The drive has electronics that allow it to process the data signal and control the disk speed, head positioning, and other drive functions.

Encoding method	MFM (Apple's format for Macintosh HD disks and the format for MS-DOS disks)
	GCR (for Macintosh 800K and 400K disks)
Formatted data capacity	1440K for 2 MB MFM mode (Macintosh and MS-DOS HD disks)
	720K for 1 MB MFM mode (MS-DOS normal-density disks)
	800K for GCR mode (Macintosh 800K disks)
Data transfer rate	500 Kbits per second in MFM mode
	489.6 Kbits per second in GCR mode
Disk rotational speed	300 rpm in 2 megabyte MFM mode
	600 rpm in 1 megabyte MFM mode
	394 to 590 rpm discretely variable in GCR mode
Number of cylinders	80
Number of tracks	160
Number of read/write heads	2
Ambient operating temperature	10°C to 40°C (50°F to 104°F)
Power	12 volts: 600 mA maximum 5 volts: 200 mA typical