DART™:
Disk Archive/Retrieval Tool
Version 1.5

File   Edit

DART™ Version 1.5

Source
- ◉ **Drive 1**
- ○ Drive 2
- ○ DART™ File

[Eject]

Destination **Ready**
- ○ Drive 1
- ○ Drive 2
- ◉ **DART™ File**

[Eject]

Disk Type: Macintosh, 800K

File Name: Install 1.image

Compression: ○ Fast ◉ Best

☐ Format Disk
☐ Multiple Copies

Status

Insert Source Disk in first drive.

[Start]

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DART™:
Disk Archive/Retrieval Tool

Version 1.5

Contents

About This Manual

The DART™ User's Guide describes the use of the utility *DART™: Disk Archive/Retrieval Tool,* designed for use with your Macintosh® Computer. DART can be found on the disk included with this package.

This manual describes how and when to use DART, and gives you a better understanding of how it can be used as an effective tool for disk archival and duplication. You should already be familiar with the basic operation of your Macintosh computer before continuing on with this guide. If you need basic operating instructions for your Macintosh, refer to the Macintosh System Software User's Guide for more information.

How to use this manual

Read the chapter descriptions below to find out which sections you would find most useful.

· Chapter 1 tells you about some of the typical uses for DART, as well as some differences between DART and other programs that perform similar functions. Chapter 1 also explains the disk formats that DART can be used with, and provides some background information that you may find helpful in understanding how the application works.

· Chapter 2 shows how to install the software on floppy disks, hard disks, and gives information on running DART from a compact disc.

· Chapter 3 describes the characteristics of DART's main window, and how the different controls and options can be used to customize the making of disks.

Appendices

· Appendix A describes the structure of information on a disk.

· Appendix B discusses "checksums" and how they can be useful in verifying the authenticity of a disk.

· Appendix C documents the types of Apple events supported by this version of DART, and how they can be used to convert older disk image files to DART 1.5's compressed format.

Uses for DART

This chapter gives you an understanding of some of the uses for DART and how you can use DART to create files and duplicate disks.

What is DART?

DART Application

DART™: Disk Archive/Retrieval Tool is a utility that enables you to duplicate and archive floppy disks. DART does this in one of two ways: either by copying the contents of one disk onto another, or by placing an exact image of the disk's contents into a single file for later use.

An Analogy

To better understand DART, consider the following analogy: when you use a camera to take a picture of something, you typically will save the negatives that the photo processor returns to you so that you may later make more copies of some of those pictures. In normal circumstances, the pictures created from that negative will be identical to the originals that you received.

Scene	Camera	Negative	Developer	Pictures
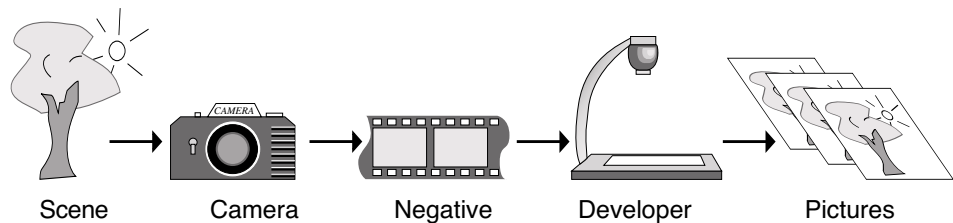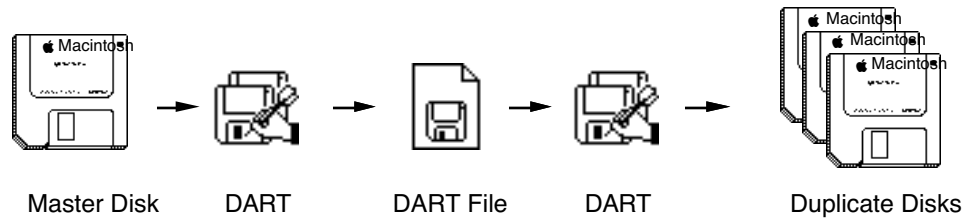
Figure 1-1

DART achieves a similar result with disks. When DART creates a *DART File*, that file can be used by DART much like the negative is used by the photo developer. As long as you have the DART File, you may create as many duplicates of the disk as you need. These disks will contain the exact same files and information as the original master disk. Since the information on the disk is digital, duplicates will be exact copies of the original masters. The negatives by themselves aren't useful to look at, but rather they are used to create the pictures when they are processed. Like negatives, DART Files contain all of a disk's files and formatting information in a special form, but the files cannot be used directly without being transformed back into a disk first.

Just as you use a camera to take a picture of an entire scene instead of just the subjects in that scene, DART will retain all of the files and the special formatting information contained on the source disk. This can be beneficial in situations where you need to do more than just save copies of the files from a disk.

Chapter 1: Uses For DART

DART is most useful when you save the DART Files onto a mass storage device (such as a hard disk) for later retrieval, or when someone else has already created a collection of these files for you (such as on a compact disc). User Groups, Libraries and Support Personnel will find DART an invaluable tool for keeping "golden masters" of their most frequently used disks.

Differences Between DART and Other Utilities

Backup Utilities

DART *can* be used to "backup" floppy disks, but is not as versatile a backup tool as other commercially available utilities. Backup utilities are often much more useful for this purpose and will provide options that are designed to intelligently recognize which files have been changed on a disk before backing them up. On the other hand, DART doesn't make any assumptions about the information on a disk; this is actually one of the features of the tool that allows it to be used with disks that the Macintosh cannot normally read such as (Lisa™ and Apple II disks). DART stores the disk's contents in such a way that it can rebuild the entire disk, not just the files that were on it.

File Compression and Grouping Utilities

Some utilities allow the grouping of many individual files into a single package for ease of storage and distribution. While these utilities are closer in function to DART than backup utilities, they are usually only useful for Macintosh-formatted disks, and they don't normally retain all of the disk's other formatting information. You typically would use a file compression utility when archiving a file, and use DART when archiving an entire disk. The "disk image" file created by DART is compressed in order to conserve space, so its size is usually comparable to that obtained by using a separate utility to archive the individual files on the disk.

Chapter 1: Uses For DART

Disk Types Recognized By DART

GCR and MFM   Most 3.5" floppy disks are formatted using one
of two low-level encoding methods. The two
most common types are GCR (Group Code
Recording) and MFM (Modified Frequency
Modulation). DART has the ability to recognize
all Macintosh 3.5" disks, as well as Apple II,
Lisa, MS-DOS, and several other 3.5" disk types.
A Macintosh equipped with at least one
FDHD™/SuperDrive™ can read, write and format
all of the following types:

Disk Type	Size (kilobytes)
Macintosh Single-Sided	400
Macintosh Double-Sided	800
Macintosh High Density	1440
Lisa Office System	400
Any other Single-Sided GCR[1]	400
Apple II Pascal (3.5" only)	800
Apple II ProDOS	800
Any other Double-Sided GCR[2]	800
Lisa Diagnostic Disks	400
Macintosh Diagnostic Disks	400, 800 & 1440
Apple II Diagnostics	800
Macintosh A/UX	800
MSDOS Double-Sided	720
Any other Double-Sided MFM[3]	720
MSDOS High Density	1440
Any other High Density MFM[3]	1440

[1]Disk Type will be identified as "Lisa"
[2]Disk Type will be identified as "Apple II"
[3]Disk Type will be identified as "MS-DOS"

Table 1-1

Macintosh systems that do not have a FDHD/SuperDrive can read, write and format the following types of disks.

Disk Type	Size (kilobytes)
Macintosh Single-Sided	400
Macintosh Double-Sided	800
Lisa Office System	400
Any other Single-Sided GCR[1]	400
Apple II Pascal (3.5" only)	800
Apple II ProDOS	800
Any other Double-Sided GCR[2]	800
Lisa Diagnostic Disks	400
Macintosh Diagnostic Disks	400 & 800
Apple II Diagnostics	800
Macintosh A/UX	800

[1]Disk Type will be identified as "Lisa"
[2]Disk Type will be identified as "Apple II"

Table 1-2

FDHD™/SuperDrive™ Support

When Apple introduced the Macintosh IIx computer, a new type of disk drive was incorporated into the design of the system that enabled it to read and write MFM formatted disks. This allowed programs such as Apple File Exchange to be able to read disks that were originally created on MS-DOS computers. DART enables computers that are configured with the FDHD to archive those disks in the same way that the other (GCR) disk types can be archived.

Chapter 1: Uses For DART

The FDHD disk drive is capable of reading and writing all of the previous disk types (single-sided and double-sided) as well as the newer High Density format. The High Density (HD) format is capable of storing up to 1.4 megabytes of data on one disk, almost twice the storage capacity of a double-sided disk.

With the High Density format, information is stored on the disk using thinner "tracks" of information, which are placed closer together than double-density tracks. This method of writing and reading disks requires newer technology than is present in single or double-sided drives, so Macintosh systems that are not equipped with the FDHD disk drive are not capable of using the High Density disks properly.

High Density Symbol

High Density disks are usually marked with the HD symbol to identify that they are capable of holding more information than other (single or double-sided) disks. Most of the High Density disks will also have an extra hole located on the top-left of the plastic shell. This hole is on the opposite side of the write-protect whole, and it does not have the sliding tab typically found on 3.5" disks for changing the write status of the disk. This hole is often referred to as the Bonus Hole.
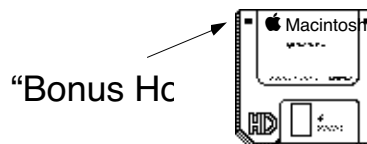
"Bonus Ho

Figure 1-2

This hole is very important for Macintosh FDHD disk drives, because the presence of this hole is what signals the FDHD that a High Density disk has been inserted. In fact, the FDHD will only read and write disks with the bonus hole in the High Density format, since this is the only reliable format allowed for that type of disk. This can present some frustrations when High Density disks are used in non-FDHD disk drives.

The older single and double-sided disk drives are not configured to *sense* the bonus hole, and will unknowingly allow High Density disks to be formatted as single or double-sided instead. If a High-Density disk is formatted as a single or double-sided disk in an older drive and then inserted into a FDHD, the Macintosh will attempt to read the improperly-formatted disk in its normal High Density mode. Since there is no High Density information on the disk, the Macintosh will report that the disk has not been initialized or is damaged, even though there may still be valid data on the disk in the lower density format.

DART will check to see which drives are installed on a system before attempting to create a disk to make sure that the disk can be duplicated successfully. If a High Density or MS-DOS DART File has been selected as the source and there are no FDHD drives connected to the computer, then DART will inform you that it cannot use that source for duplicating.

A Word About Copy Protection

Copy Protection

Copy Protection is a term used to describe any of several different methods that some manufacturers of software use to curtail the illegal and unauthorized copying of their products. There are many different methods used to "copy protect" a disk, but most can be put into two categories: that which utilizes non-standard digital information on the master disk, and that which uses standard disk information to achieve the desired results.

Those disks which are copy protected with the first method will often alter the low-level information on a disk in certain areas which are not normally used by anything but the Macintosh Operating System and internal disk drivers. This particular method will usually cause DART to encounter read errors when attempting to read the area of the disk that is protected. Since DART is not designed to "defeat" copy protection, only standard methods of reading, writing and formatting disks are used by the program.

Disks that utilize more generic methods of copy protection may be duplicated by DART with no special procedures necessary. Be sure before using DART that you check the license agreements pertaining to your software before making archival backups or distributing software.

The DART disk that you received is not copy protected, and you are encouraged to make a backup copy of your original disk for safekeeping.

Installing DART

This chapter provides instructions for installing DART on your Macintosh computer system.

Installing DART using Floppy Disks

DART comes on a single floppy disk that is already configured for use in most Macintosh computer systems. Simply insert the disk with DART on it in your computer, then double-click on the DART application in order to start.

The DART disk is pre-configured with a System Folder containing the most recent System Software at the time the disk was made. It's possible that your computer may require a newer version of the System Software than DART was configured with, as would be indicated in a dialog box on your screen when you try to start up. If this is the case, you may need to update the System Software on the DART disk before proceeding. To update the System Software on the DART disk, see the Macintosh System Software User's Guide and follow the procedures outlined for your particular computer.

• You will normally want to keep your original DART disk locked as a safeguard against the possibility of accidental erasure, but you may leave the disk unlocked if you desire.

Using DART from a Compact Disc

DART is a very useful tool when used in combination with a compact disc, due to the fact that many DART files can be maintained on a single, unalterable disc.

DART was designed to run without special considerations from a compact disc. All you need to do is double-click on the application or one of the DART files that is on the disc.

Some compact discs come with a special *launcher* or *engine* which is used to navigate through the disc. These compact discs may have their own methods of starting DART; to be sure, refer to any manuals or documentation that may have come with the compact disc for more information regarding its use.

Installing DART on a Hard Disk

DART is a stand-alone application that requires no special files (other than itself) in order to run properly on your Macintosh. For this reason, installation on a hard disk is quite simple:

1) Create a new folder to contain DART on your Hard Disk by selecting "New Folder" from the File menu while using the Finder (if you wish DART to be in its own folder), then

2) Copy DART to the Hard Disk by dragging it to the location on the disk where you want it to be placed.

If you need a better understanding of copying files using the Macintosh, see the Macintosh System Software User's Guide for more details on this process.

Using DART

This Chapter explains how to use DART, and gives information about some of DART's controls and optional features.

Getting Started

Starting DART

To start up the application, double-click on DART or one of the DART Files that has already been created by the application. If you're running System 7.0 or later, you can also start up by dragging a DART or Disk Copy™ file icon onto the DART application icon.

DART   DART Files   Disk Copy File

Figure 3-1

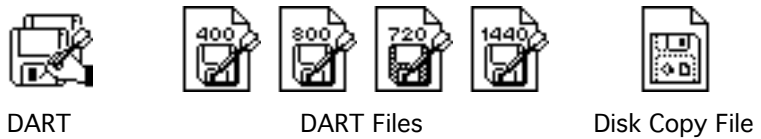- Note: If you're using MultiFinder™ or System 7.0 on your Macintosh, DART can already be running when you double-click on one of its files. This will tell DART to use that file as the source.

Source and Destination

DART uses the concept of a *source* and a *destination* to designate the disks to be copied or mastered. A valid source or destination can be any of the following:
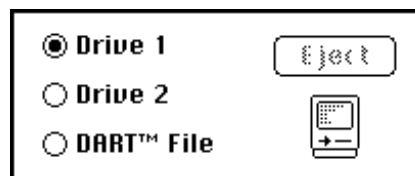
Figure 3-2

DART will normally allow only one DART File designation for any transfer; in other words, the source and destination are not allowed to be DART Files at the same time (unless you are converting an older disk image file to DART 1.5 format with the **Save As...** command, described later in this chapter.) This activity would actually be no more than simply copying a file, a task much better suited for the Finder.

Macintosh systems with only one floppy drive can have the source and destination both set for Drive 1. DART will prompt you for each disk as it is needed for the transfer process. It is important to note that DART recognizes the source disk as the one which is write-protected, and the destination disk as the one which is write-enabled. For this reason, DART always checks the write protect status of each disk before proceeding, regardless of the source and destination designations.

The Main Window

The main window displayed on the screen while DART is in use is organized into five sections, as shown below:

Source Loca

Destination Loc

Disk/File In

Destinatio Options

Progress Informa
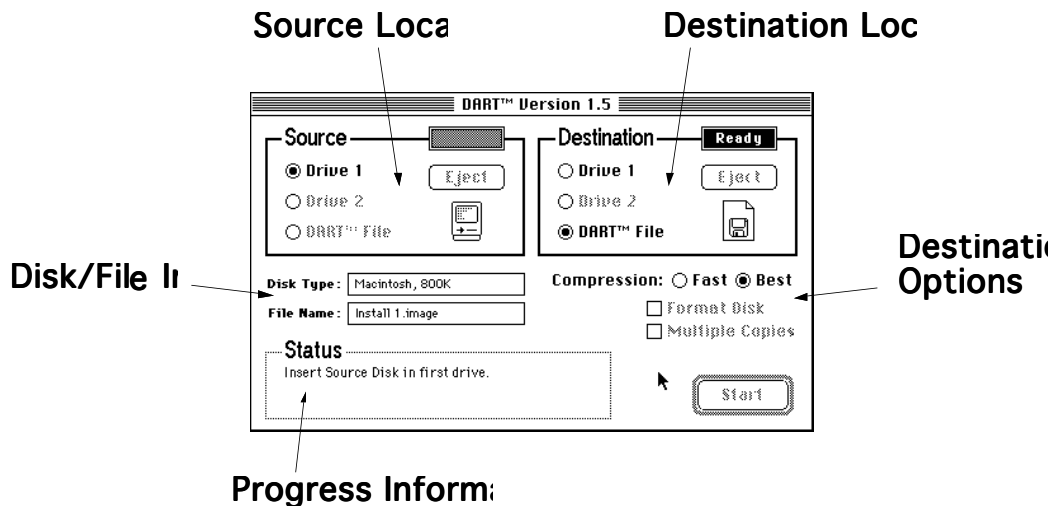
Figure 3-3

Moving the Main Window

DART's main window can be moved anywhere on the screen (or screens) that you wish. DART will remember the last place the window was moved to and store this information in a file called DART™ Prefs. If you're running System 7.0 or later, this file will be placed in the Preferences folder inside the System Folder. Otherwise, the file will normally be placed in the same folder that DART is in, but if the file cannot be put there successfully, it will be placed in the System Folder on the default drive. Upon starting up, DART checks to see if the main window location is valid. If there is a problem placing the window in the specified location, DART will center the window on the main screen automatically (the main screen is the one with the menu bar on it.)

DART™ Prefs File

Option-Drag If you wish to move the window temporarily without DART remembering the new location, hold down the option key on the keyboard before dragging the window around. If you want DART to center the window on the main screen the next time it starts up, simply move the DART™ Prefs file or throw it away. DART will not create this file unless the window is moved without holding the option key down.

DART Controls

Source and Destination In the Source and Destination boxes, DART makes use of radio buttons (see below) to designate the actual location of the source and destination disks/files. Only one radio button can be active at a time; clicking on one of them selects that location, and automatically deselects the others.

◉ Drive 1

○ Drive 2

○ DART™ File

Figure 3-4

Chapter 3: Using DART

Whenever a source (either a file or a disk) is presented to DART, the disk's type is ascertained and the possible destination drives are scanned for functionality. For example, if you have two disk drives but only one of them is capable of handling MS-DOS disks and that type of disk is inserted in the source drive, the destinations will be limited to that disk drive and a DART File. This is due to the fact that only FDHD disk drives can read and write MS-DOS format. Standard double-sided disk drives are not capable of reading and writing this type of disk properly, so any drives connected of that type are not valid for use as a destination.

It's important to realize that standard double-sided disk drives cannot recognize MS-DOS or High Density disks. If one of these types of disks is inserted into a standard double-sided disk drive, it will not be readable on that system – DART will not be able to read any information from that disk, and will not be able to use that disk as a source disk.

A potential problem can result when you attempt to use DART to create a single or double-sided disk and you insert a High Density disk in a standard double-sided drive. Since the standard double-sided drive cannot sense the bonus hole that normally indicates the special High Density media, the disk will be formatted and used as a standard double-sided disk. This is a problem that only you can prevent, because the double-sided drive simply has no way of identifying which type of disk has been inserted into it.

Destination File Options

Compression: ○ Fast
　　　　　　 ◉ Best

When the destination is a DART file, the type of compression to use on the file can be selected. `Fast` compression (standard run-length encoding, or RLE for short) takes very little time, but generally results in larger DART files. The `Best` option implements a modified version of the Lempel-Ziv data compression algorithm, with adaptive Huffman encoding (LZH for short.) This option produces much smaller files, but takes more time. The selected compression option remains in effect for the current transfer process and subsequent transfers, until you change it.

Destination Disk Options

☐ Format Disk
☐ Multiple Copies

When the destination is a disk, DART has two options that can be enabled before starting the transfer process – Format Disk and Multiple Copies. These options are in effect for the current transfer process and will reset to their "off" condition after the current transfer process is completed.

Format Disk

Format Disk is used to tell DART to do a low-level format of the destination. Formatting the disk may be required whenever you wish to make sure that the special sector and track marks on the disk are re-written, or when the disk has never been formatted before. Formatting sets up the disk to receive the information that is normally written to and read from the disk when you use applications and save documents, and tells the computer exactly where to store that data. Formatting may also be required if you attempt to use a disk as the destination that once had a copy-protected application on it. Copy-protected disks usually cannot be used as the source.

Formatting a disk that has already been formatted (and is not copy-protected) is not usually required, and may be undesirable in some cases. This is most noticeable when the disk that you are creating will be used on a non-Macintosh computer (such as a Lisa or a IIgs computer). The difference lies in the *interleave* of the disk (see Appendix A for more information on interleave). Each computer's disk drive is optimized for a particular interleave factor. If the disk is formatted using a drive with a higher or lower interleave than the drive it will eventually be used on, the disk will read and write slower than normal. For best results, format the disk first on the computer that it will be used on, then create the disk with the Format Disk option turned off.

Multiple Copies   Multiple Copies is used to make many copies of the same disk. With this option turned on before the transfer process begins, DART will continually prompt you for the next disk until you press the period (.) key while holding down the ⌘ key.

File Menu   The **File** menu contains four options: **New**, **Open**, **Save As…**, and **Quit**. **New** is used to create a new destination DART file, and is functionally the same as pressing the DART File button in the Destination box. **Open** is used to open existing DART or Disk Copy image files, and is functionally the same as pressing the DART File button in the Source box. **Save As…** allows you to save the current Source file as a new DART 1.5 file. **Quit** is used to quit the program.

Edit Menu   The **Edit** menu contains the standard Edit commands **Undo**, **Cut**, **Copy**, **Paste** and **Clear**. These items currently have no particular meaning for DART, so while DART's window is active, these items are not available. To use these menu items, click on a desk accessory window to bring it to the front.

Transfer Process

Start Button

To start the transfer process, simply click the Start button. Both the Source and Destination must be in the "Ready" state before this button is active, however. The source must be assigned (Drive 1, Drive 2 or DART File) and identified (disk must be in place, or a file selected) before the Source is considered "Ready." Likewise, the destination also has to be assigned and in place to be considered "Ready." DART displays the following indicator in the source and destination areas to identify when the Source and/or Destination is ready:

Figure 3-5

Once the Start button is pressed, DART begins creating the disk or image file using the specified options, prompting you to switch disks whenever that is necessary. (You can cancel at any point by pressing the period key while holding down the ⌘ key.) After all of the disk image has been transferred successfully, DART will report "checksum" information about that disk. (If the destination was a DART File, the amount of storage saved through data compression will also be reported.) Checksum information can be used to uniquely identify a particular disk. For more information about this feature, please refer to Appendix B.

Chapter 3: Using DART

Structure of a Disk

This Appendix will help you better understand the way information is stored on a disk.

Structure of Information on a Disk

Tracks and Sectors   Disks are magnetic media that store
information in the form of a stream of bits. In
order to access the information in a random
fashion, this information is subdivided into
groups called *blocks* or *sectors*, and each sector
has a fixed amount of information in it. To read
or write information to the disk, the
computer's Operating System will ask the disk
driver to transfer one or more blocks of
information from or to the disk. Information is
always transferred in complete sectors to
utilize the disk drive efficiently. The sectors
on the disk are organized side-by-side into
concentric rings (or tracks).
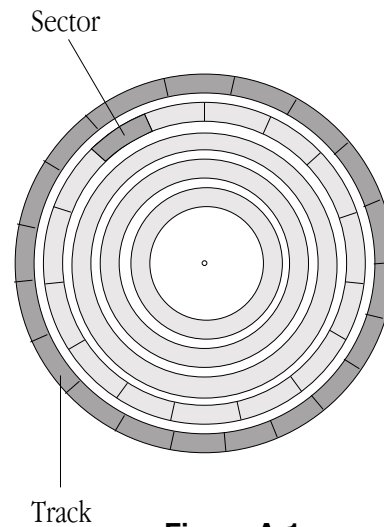
Sector

Track

Figure A-1

In each of Apple's microfloppy 3.5" drives, the sector size is always 512 bytes. The number of sectors in a given track will vary from one track to the next in order to accomodate a similar density of information in all tracks (this does not apply to MFM and High Density disks). A common analogy for sectors would be the pages in a book. A disk is like a book, the sectors are like pages in the book, and files on the disk are like chapters in the book. All of the pages are the same size (like disk sectors), but the files on the disk (like the chapters in the book) may require anywhere from a partial sector to many sectors. The size of the page does not change the information in the chapters any more than the sector size changes information in the files.

Tags Each sector of information on non-MFM disks has associated with it special information called *tag* data. This information was designed to help verify the integrity of the file system and recover lost files by data recovery programs. Included in this information were fields such as file number, resource or data fork, and modification date of file. In theory, this was a good idea; in practice, it didn't work all that well and was costly to include in drives. As a result of this, the concept of tag data was dropped for all new drive technology after the double-sided drive was introduced.

Tag information was especially important for Lisa disks, as the Operating System would not function properly without this information being intact.

Appendix A: Structure of a Disk

Interleave

In many disk drives, the data moves by the read/write heads faster than the drive's controller can process the information continuously. This poses a problem when a series of contiguous blocks are read or written, because these drives can normally read or write only one sector before having to pause momentarily to process the information that was just read. While the data is being processed, the disk surface is still moving past the read/write heads. If several adjoining blocks are needed, the disk has to spin through extra revolutions to get to the next blocks.

To remedy this situation, sectors on the disk are laid out in an *interleaved* order. The drive will process the first sector's information as the next sector on the disk nears the read/write head. On a drive/disk combination where the interleave factors match, the drive is finished processing the first requested sector just before the next requested one reaches the read/write head. This enables the drive to read the next sector without having to rotate the disk to get to it.

Disks with contiguous sectors arranged side-by-side are said to have a 1:1 interleave. When sectors are interleaved by one, they have a 2:1 interleave, by two, 3:1, by three, 4:1, etc. Macintosh disk drives use a 2:1 interleave, while most Apple II disk drives use a 4:1 (although some Apple IIGS™ Systems can be configured for 2:1).

Generally, you will want to keep the interleave factor matched between disks and disk drives as much as possible, so it makes sense to know the source and destination interleave factors in advance of making a disk. DART does not change the inherent interleave factor of a disk that has already been formatted unless you turn on the Format Disk option. If you want to make sure that a disk has the same interleave as the drive it will be used on, format the disk on the destination computer before creating the disk with DART, and *don't* use the Format Disk option unless you really need to.

Checksums

This Appendix will help you better understand checksums.

Appendix B: Checksums

Checksums

What is a checksum?

Checksums are numbers that are derived by applying a special formula to a series of data. This fornula is designed such that any change in the data series (either through a re-order or transformation) will cause the checksum that is derived from the data to change as well.

In the case of DART, checksums are used to help verify the contents of a particular disk. When DART creates a file or disk, two checksums are computed for the data on the disk: one for the regular sector information and one for the tag data. DART will report these checksums to you in the message area when the transfer process is complete. These checksums can be written down for future reference.

Using the checksum information, you can verify that two disks are exactly the same. Note that "exactly the same" is *not* the same thing as "contain the same files," since the disk structure and size could still be different.

Checksum Algorithm

The algorithm that DART uses to compute the checksum information is as follows:

```
checksum = 0 (32 bit checksum)
loop counter = buffer size ÷ 2 (buffer size in 16-bit words)
point to start of buffer

loop: get next 16-bit word from the buffer
      zero-extend the word ($0000xxxx)
      add the zero-extended word to the checksum (32-bits)
      rotate the checksum (32-bits) right one bit
          (C[i-1]=C[i], C[31]=C[0])
      decrement loop counter
      if loop counter ≠ 0 then go back to loop
```

Many thanks to Steve Christensen for this algorithm.

Apple Event Support

This Appendix documents the Apple event types implemented in version 1.5 of DART when running System 7.0 or later, and explains how these events can be used to automate the conversion of older disk image files to DART 1.5 format.

Appendix C: Apple Event Support

Apple event support

Uses for Apple events in DART 1.5

Many user groups, support personnel, and software librarians have sizeable archives of disk images created by Disk Copy or earlier versions of DART. As more disk images are added to the collection, the space available for their storage becomes limited. Converting these files to DART 1.5's compressed format can substantially reduce the amount of storage required, but converting hundreds of disk images "by hand" is an impractical, time-consuming solution.

Using Apple events and program linking under System 7.0, you can tell DART to convert a single file or hundreds of files automatically. A new set of files can be created, leaving the old ones intact, or you can replace the existing files entirely. The copy of DART that you use for the conversion process can be running on your own Macintosh, or on a remote machine across a network.

Supported events DART supports the "required" set of Apple events: open application (`'oapp'`), open document (`'odoc'`), print document (`'pdoc'`), and quit application (`'quit'`). Refer to *Inside Macintosh, Volume VI* for further information on these events. In addition, DART accepts a custom "convert document" event (`'cnvt'`) to convert a single file. You can process any number of files by sending multiple `'cnvt'` events to DART. A HyperCard™ stack which implements this process under script control is included on your DART disk.

The `cnvt` event When DART receives a `cnvt` event, it examines the two required event parameters to see if they contain valid pathnames (a source file pathname specifying the file to be converted, and a destination file pathname specifying the name for the new file.) If the destination file doesn't exist, a new file is created; if the file already exists, a temporary file is created that will replace the existing file if the conversion is successful. DART then converts the file. If no errors occurred, DART returns the size of the new file (in bytes) as a character string, in the `keyErrorString` parameter of the reply Apple event. If an error occurred, the error code is returned in the `keyErrorString` parameter.   The result of the reply Apple event is always `noErr`, since DART deals with any errors it encounters; you can distinguish between a successful conversion and an error by noting that file sizes are positive numbers, while error codes are negative.

Event Class: `'DART'`

Event ID: 'cnvt'

Event Parameters

Description	Req	Keyword	Type
Source File (full pathname)	req	'dsrc'	typeChar
Destination (full pathname)	req	'ddst'	typeChar

Reply Parameters

Description	Req	Keyword	Type
New file size (or error code)	req	'errs'	typeChar

Possible Errors

Error	Description
paramErr (-50)	not a file that DART can open!
errAEWaitCanceled (-1711)	transfer was aborted with cmd-.
internal error (-10001)	bad header info was encountered
internal error (-10002)	uncompressed data was wrong size
internal error (-10003)	checksums didn't match!
others...	various File Manager errors