

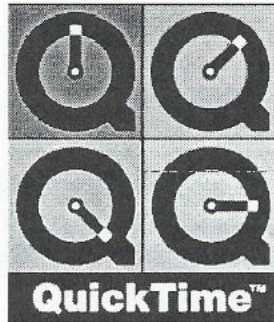


QuickTime™

Introduction

The Apple™ Macintosh™ is well known for its excellent integration of text and graphics. QuickTime™ extends this high level integration to dynamic elements such as sound, video and animation. Mainstream Macintosh applications will now be able to add sound, video and animation as easily and consistently as they now do text and graphics.

QuickTime is an extension to the Macintosh system software that provides an exciting new software architecture for the integration of these dynamic data types. This means that time dependent elements can be integrated quickly and easily into the existing Macintosh environment.



Major components of QuickTime

- System software.
- File formats.
- Apple Compressors.
- Human Interface standards.

A technical description of these components follows.

1. System Software

The system software component of QuickTime consists of three major pieces:

- The Movie Toolbox is a set of high-level system software services that make it easy for applications to incorporate support for movies in their applications.
- The Image Compression Manager (ICM) shields applications from the intricacies of compression and decompression through device and algorithm-independent services.
- The Component Manager allows external resources (e.g. digitiser cards, VCRs, system software extensions) to register their capabilities with the system at run-time.

2. File Formats:

Movie. The term "Movie" refers to *all* dynamic data. For example, a movie could be a presentation slide show, or a dynamic bar chart of data, or a graph of lab data over time. The Movie file format is a container for this dynamic data. A movie contains groups of homogeneous data, called tracks. A simple movie might contain a video track and a sound track of any compression type. QuickTime takes care of synchronising these tracks when the Movie file is played. The Movie file format will have full Clipboard and Scrapbook support, which means that users can cut and paste Movies as simply as they cut and paste text and PICT images today.

PICT extensions. Users will be able to compress a still image using any compression scheme registered with the Component Manager, and play back or "decompress" that still image using any existing, unmodified application, as long as the QuickTime extension is in the System Folder. With preview support, applications will be able to save a small 4-5 K "thumbnail" of the picture along with the image itself. This will allow users to quickly browse through still image libraries (e.g. using the preview version of the standard file dialogue box in QuickTime).

3. Compressors

In QuickTime, Apple is providing a basic set of software compression/decompression schemes that meet a range of compression needs for still images, animation and video. These schemes are designed to playback with reasonable performance from hard disk and CD-ROM on any colour-capable Macintosh. These compression schemes are a built-in feature of every colour-capable Macintosh, much like LocalTalk. New software or hardware-based compression/decompression schemes can be added to the system by merely adding a component file to the System Folder. There are three QuickTime compressors:

Photo Compressor. Compresses full-colour images and typically gives compression ratios in the range of 10:1 to 25:1 with no visible picture degradation.

Animation Compressor. Displays animations at acceptable speeds on low-end Macintosh computers, and allows

complex animations to be previewed on a Macintosh without first having to lay them off to videotape one frame at a time.

Video Compressor. Provides compression ratios of between 5:1 and 25:1. An average video sequence compressed with this scheme could play back at 15 frames-per-second at 160x120 pixels on a Macintosh IIsx, although the scheme is by no means restricted to this size.

4. Human Interface

In QuickTime, Apple is specifying several standard human interface elements:

Standard Movie Controller

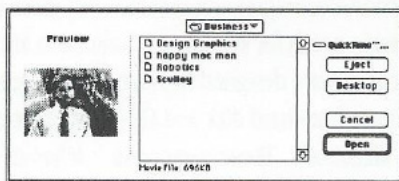
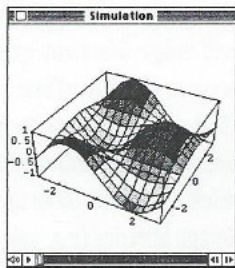
The movie controller is a system software component that provides a consistent way of controlling movies. The standard controller allows a user to:

- Turn sound on/off.
- Play or stop a movie.
- Get an indication of where in the movie you are

Interactively jump/scroll around the movie.

- Step-forward and step-reverse through the movie.

The extended standard file dialogue box is another standard system call that allows applications to invoke a dialogue box (e.g. for the Open... menu item) that includes a preview window for still images and movies.



Standard File Dialogue with Preview

Applications

Macintosh developers are already working on incorporating QuickTime functionality into their next-generation products.

Some current developments are listed below.

Mainstream applications (e.g. word processors, spreadsheets, databases)

- Compress and display high-resolution still images
- Annotate documents with audio or video notes
- Cut and paste Movie files
- Playback movies with standard controller
- Save dynamic data (e.g. a presentation slide show) into the Movie file format
- Dynamic help systems

Exploring the boundaries of the architecture

- Developing new plug-in compression schemes (e.g. fax, MPEG and DVI).
- Creating new media types (e.g. MIDI, interactivity, lab data).
- Creating truly international products that adapt to the native language (e.g. French, Spanish, Kanji).
- Adding transitions and filters to movie data.

New application categories

- Videoconferencing and store-and-forward video mail
- Low-cost movie editing
- Dynamic CD-ROM magazines
- and much more...

For more information about developing on the Macintosh using QuickTime, please contact :

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QuickTime will be made available to customers through dealers, bulletin boards and user groups at the end of 1991.

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