

# Technical Note QT510

## Movie Toolbox Q&As

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This Technical Note contains a collection of archived Q&As relating to a specific topic--questions sent the Developer Support Center (DSC) along with answers from the DSC engineers. Current Q&As can be found on the [Macintosh Technical Q&As web site](#).

[Oct 01 1990]

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## QuickTime rotation and skew aren't implemented

Date Written: 1/22/93

Last reviewed: 7/2/93

We can't apply the rotation and skew effects to a QuickTime 1.5 movie. We've created an identity matrix, applied `RotateMatrix` to the matrix, set the matrix to the movie using `SetMovieMatrix`, and played the movie. The movie didn't rotate but the `movieRect` rotated and the movie scaled to the `movieRect`. Is there anything wrong with what we're doing?

Rotation and skew will give you correct results for matrix operations but they haven't been implemented into QuickTime movie playback yet. Scaling and offset transformations now work with movies and images; rotation and skew are important future directions. Meanwhile, you can accomplish rotation and skewing by playing a movie to an off-screen `GWorld` and then using `QuickDraw GX` to display the rotated or skewed off-screen `GWorld`.

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## QuickTime 1.6 fixes GetMoviePosterPict bug

Date Written: 1/11/93

Last reviewed: 6/14/93

I'm opening a movie document and using `NewMovieFromFile` to get a movie. When I try to get the poster for the movie I get back a `paramErr` (-50) from the `GetMoviesError` call and a `NIL picHandle` from `GetMoviePosterPict`. If I use QuickTime 1.0 everything works fine but QuickTime 1.5 gives me the `paramErr`. Am I doing something wrong or is there a bug?

You're hitting your head against a QuickTime 1.5 bug that (as far as we can tell) has no reasonable workaround. It has to do with asking for the `PICT` from a movie at a time (movie time) that falls in between differentiated frames of the same size. The problem has been identified and fixed in QuickTime 1.6.

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## Multiple EnterMovies and ExitMovies vs ExitToShell

Date Written: 3/16/93

Last reviewed: 6/24/93

The QuickTime 1.0 documentation says I can `EnterMovies` multiple times, as long as I balance each `EnterMovies` with `ExitMovies`. But the article in issue 13 of `develop` says, "Don't call `ExitMovie`. `ExitToShell` does this for me." So now the only call I have to use is `EnterMovies`. But this seems to destroy the balance of these routines. What should I do?

Good question. I should have mentioned something about the case in which multiple `EnterMovies`. The way `EnterMovies` works is that it creates a new QuickTime environment if the current `a5` world doesn't have one already. If the current `a5` world already has one from a previous `EnterMovies` call, then nothing is done except that a counter is incremented to keep track of the number of times `EnterMovies` has been called. The original reason for this was to account for DAs which use an application's `a5` world. By doing this, if an application has called `EnterMovies` already, the movie toolbox knows that it doesn't have to reinitialize when the DA calls `EnterMovies`. Then, when the DA calls `ExitMovies`, it decrements the counter and as long as all `EnterMovies` and `ExitMovies` calls are balanced, the Movie Toolbox won't dispose of the QuickTime world until the last `ExitMovies` call is made.

The reason we suggest not to call `ExitMovies` is that `ExitToShell` will automatically call `ExitMovies` for you. By doing so, you can avoid some of the problems that developers have had with disposing of movie structures improperly and in the wrong order. Letting `ExitToShell` do the final cleanup avoid these problems because the entire `a5` world and heap is disposed of as well.

But, if you've nested `EnterMovies` and `ExitMovies` calls, this is what we recommend:

1. If you're writing an application, call `EnterMovies` and don't call `ExitMovies`. This way, any external that

uses the same a5 world and calls `EnterMovies` and `ExitMovies` will simply increment a counter and then decrement the counter and do nothing else.

2. If you're writing an external that runs under someone else's application, you have two choices:
  - i. Call `EnterMovies` and never call `ExitMovies`. This causes QuickTime to initialize once during the first call to any of your externals. The counter will keep incrementing whenever you call `EnterMovies` but the final `ExitToShell` will still clean things up. The counter is a long so unless your external gets called more than 2 billion times, don't worry about an overflow problem.
  - ii. Call `EnterMovies` in the beginning of each external and `ExitMovies` at the end of each external. This can cause a lot of wasted CPU time if the main application (or someone else in the a5 world) didn't call `EnterMovies` first because each of the `EnterMovies` calls in your externals will require QuickTime to reinitialize. The reason for this is that you balance every `EnterMovies` and the corresponding `ExitMovies` will dispose of the QuickTime world. This can be very bad if you external gets called often. On the other hand, if your external has an initialization routine and close routine that is called before and after all your other routines, you can call `EnterMovies` in the initialization routine, and then call `ExitMovies` in your close routine. Of course, each of the routines called in between could call either `EnterMovies` and `ExitMovies`, or not call either of them at all. But, this depends on your implementation.

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## Check whether 'vdig' supports off-screen digitizing

Date Written: 1/7/93

Last reviewed: 6/14/93

When we try to digitize frames (grabbed using QuickTime) into an off-screen pixmap, our `VDGrabOneFrame` call crashes. How would you suggest I digitize into an off-screen pixmap?

You need to check whether or not the 'vdig' resource supports digitizing to off-screens by calling the `VDPreFlightDestination` call! If the `VDPreFlightDestination` call with an off-screen destination fails, then you need to digitize to a window on the digitizing device, and then copy (using `CopyBits` or your own algorithm for speed) the image from the window to your off-screen. Some 'vdig' resources don't support digitizing to off-screen directly because their hardware does the digitization asynchronously. So, your application will have to do some extra work in some cases. (You should always preflight your destination before setting it with `SetPlayThruDestination`.)

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## Techniques for controller to go to beginning or end

Date Written: 11/24/92

Last reviewed: 3/1/93

The controller constants have been left out of the latest `Movies.h` header for `Goto` beginning and ending commands. Only `mcGotoTime` is left. Is it OK to use these constants or is there a newly defined and accepted way to do this now?

Scanning the interfaces, we can't locate a time when the controller had actions to go to the beginning or end. In any case there are two ways of accomplishing the same objective: The first is to use the `MCActionGotoTime` and pass the zero to go to the start of the movie and the result from `GetMovieDuration` to go to the end of the movie. The code to do this gets a little bit cumbersome since you have to pass a `TimeRecord`. This may be why our favorite is the second method.

Second, to go to the start, call `GoToBeginningOfMovie` followed by `MCMovieChanged`. And to go to the end, call `GoToEndOfMovie` also followed by `MCMovieChanged`. The following routine shows how to accomplish what you want:

```
void DoGotoEnds(short direction)
{
    WindowPtr window;
    DocRecHandle wHndl;

    if (window = FrontWindow()) { /* don't bother if no movies to play */
        if (IsAppWindow(window)
            && (wHndl = (DocRecHandle)GetWRefCon(window)) ) {
            switch (direction) {
                case gotoBeginning:
                    GoToBeginningOfMovie( (*wHndl)->wMovie);
                    break;
                case gotoEnd:
                    GoToEndOfMovie( (*wHndl)->wMovie );
                    break;
                default:
                    return; /* do nothing if came here on error */
                    break;
            }
            MCMovieChanged ((*wHndl)->wPlayer, (*wHndl)->wMovie);
        }
    }
}
```

Doing this you let the Movie Toolbox take care of all the details and the results are the same. `MCMovieChanged` is needed in order to make the controller aware of the different state.

As a bonus, the following code shows (in a different scenario) how you can fill in the time record necessary for the `MCActionGoto` call in case that's the route you want to take:

```

/* selects the whole movie for editing */
void DoSelectAll(void)
{
    WindowPtr window;
    DocRecHandle wHndl;
    ComponentResult err;
    TimeRecord tRec;

    if (window = FrontWindow()) { /* don't bother if no movies to play */
        if (IsAppWindow(window) && (wHndl = (DocRecHandle)GetWRefCon(window)) ) {
            if ( MCIEditingEnabled((*wHndl)->wPlayer)) {
                tRec.value.lo = tRec.value.hi = 0;
                tRec.base = 0;
                tRec.scale = GetMovieTimeScale((*wHndl)->wMovie);
                if ( err = MCDoAction((*wHndl)->wPlayer,
                    mcActionSetSelectionBegin, &tRec)) {
                    DebugStr("\pError trying mcActionSetSelectionBegin");
                }

                tRec.value.hi = 0;
                tRec.value.lo = GetMovieDuration((*wHndl)->wMovie);
                tRec.base = 0;
                tRec.scale = GetMovieTimeScale((*wHndl)->wMovie);
                if ( err = MCDoAction((*wHndl)->wPlayer,
                    mcActionSetSelectionDuration, &tRec)) {
                    DebugStr("\pError trying mcActionSetSelectionDuration");
                }
            }
        }
    }
}

```

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## Getting QuickTime playback frame rate on the fly

Date Written: 11/24/92

Last reviewed: 6/14/93

I need both to get and set frames/sec for my frames-per-second playback rate menu. `GetMovieRate` and `SetMovieRate` seem too transient to use since the movie has to be currently playing and the effect leaves once it stops. The `PreferredRate` calls look good but are only scalars. How do I get the real frames/second and how do I actually set a rate that the controller will honor when the Play button is pressed?

At the moment there are no facilities to ascertain the real frame rate while the movie is playing. The view from engineering is that with enough interest and good reasons for this to be a feature, it may get into a future version of QuickTime but at the moment it can't be done.

Setting the rate is even more remotely in the future. As you know, the movie toolbox drops frames as needed to keep pace with the passing of time. This is a self-regulating process and there's no way to tell the toolbox how many frames you want to see because it may not be able to deliver based on certain conditions.

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## Interleave QuickTime 1.5 movie sound and video data

Date Written: 11/20/92

Last reviewed: 3/1/93

Our product's sound/video synchronization is way off with QuickTime 1.5; it worked perfectly with QuickTime 1.0. The video can't keep up with the sound, especially on the full-screen movies. The movies are playing much slower with 1.5. Isn't QuickTime 1.5 supposed to make movies play faster?

Your movies probably aren't properly interleaved. When you add sound to a movie using `SoundToMovie`, the sound is added to the end of the video data. We recommend that sound and video be interleaved so that the hard drive doesn't have to spend extra time seeking between media that store video and media that store audio on a hard drive. The data handler prefers to be able to sequentially read through a movie file. This is especially important for slower Macintosh models that don't have the extra CPU and SCSI access speed to spare.

QuickTime can accommodate for some noninterleaved data by caching an entire sound track of a movie if small enough. However, the size of a cache is internal to QuickTime and can't be depended on. It's possible that different QuickTime versions could have different cache sizes since we've been recommending that video and sound movies be interleaved. The result could be that the extra disk-seeking time has caused sound and video to be out of sync for slower machines such as the Macintosh LC.

One way to check interleaving is to resave the movie using Movie Converter (or some other program that flattens movies) in a flattened format. Movie Converter uses QuickTime's `FlattenMovie` call to do this. The steps Movie Converter takes are: choose Save As, select Make Movie Self-Contained, and Save to a new movie file. This new movie should play back with correct video and sound sync.

You can actually see the problem if you examine the movie with MovieShop, a program that lets you deal with QuickTime movies at a movie data level. For example, if you select the Play information button that's in the window after you open a movie, the program will display a time graph showing you where the video and sound data are saved in the continuous data stream. If the movie is interleaved, the green (for video) and red (for sound) indicators are interleaved. If the movie isn't interleaved, the green indicators are clumped together in the beginning of the file, and the red indicators (for sound) are at the end.

The latest version of MovieShop and documentation is available on this issue's CD. MovieShop and information relating to this Q&A are discussed in the article "Making Better QuickTime Movies" in this issue.

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## Saving a movie's active selection

Date Written: 11/2/92

Last reviewed: 6/14/93

I have a movie with two video tracks: Track #1--Enabled, Duration=10; Track #2--Disabled, Duration=20. I set the movie's active segment to (0, 10) and saved the movie resource to a movie file. When I open the movie in MoviePlayer, the movie is played for the time value of 20, ignoring the active segment and there being one enabled track with a duration of 10. Short of creating a new movie from a selection of the above mentioned movie, is there any way to get MoviePlayer to do what I'd expect and not ignore the active segment and play past the enabled track's duration?

The active selection isn't saved along with a movie. Therefore, no application will be able to restore and play back the active segment. You'd have to create a new movie from the selection in order to get MoviePlayer or any other application to play that selection only. If users will be using your application to play back the movie, you could store information regarding the active segment in a user data atom inside the movie. You could then have your application load the user data atom if it exists inside a movie when it's opened, to restore the selection. That would be the only way to save the active movie selection.

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## How to get movie frame time parameter for GetMoviePict

Date Written: 9/9/92

Last reviewed: 3/1/93

How do I find the correct time values to pass to `GetMoviePict`, to get all the sequential frames of a QuickTime movie?

The best way to find the correct time to pass to get movie frames is to call the `GetMovieNextInterestingTime` routine repeatedly. Note that the first time you call `GetMovieNextInterestingTime` its flags parameter should have a value of `nextTimeMediaSample+nextTimeEdgeOK` to get the first frame. For subsequent calls the value of flags should be `nextTimeMediaSample`. Also, the `whichMediaTypes` parameter should include only tracks with visual information, 'vide' and 'text'. Check the Movie Toolbox chapter of the QuickTime documentation for details about the `GetMovieNextInterestingTime` call. For a code example, see the revised [SimpleInMovie](#) on your developer CD. The routine to look at is called `DoGetMoviePicts` in the file `SimpleInPicts.c`.

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## Determining QuickDraw video media pixel depth

Date Written: 8/18/92

Last reviewed: 6/14/93

How do I get the pixel depth of the QuickTime video media for a given track?

To find the video media pixel depth, you'll need to retrieve the media's image description handle. You can use `GetMediaSampleDescription` to get it, but this routine needs both the video media and the track's index number. It's not obvious, but a media's type is identified by its media handler's type. Thus, you can walk through a movie's tracks by using its indexes until you find video media, at which point you have both the track index and video media.

The following sample code does the trick:

```
Media GetFirstVideoMedia(Movie coolMovie, long *trackIndex)
{
    Track    coolTrack = nil;
    Media    coolMedia = nil;
    long     numTracks;
    OSType   mediaType;
    numTracks = GetMovieTrackCount(coolMovie);
    for (*trackIndex=1; *trackIndex<=numTracks; (*trackIndex)++) {
        coolTrack = GetMovieIndTrack(coolMovie, *trackIndex);
        if (coolTrack) coolMedia = GetTrackMedia(coolTrack);
        if (coolMedia) GetMediaHandlerDescription(coolMedia,
            &mediaType, nil, nil);
        if (mediaType = VideoMediaType) return coolMedia;
    }
    *trackIndex = 0; // trackIndex can't be 0
    return nil;    // went through all tracks and no video
}

short GetFirstVideoTrackPixelDepth(Movie coolMovie)
{
    SampleDescriptionHandle imageDescH =
        (SampleDescriptionHandle)NewHandle(sizeof(Handle));
    long trackIndex = 0;
    Media coolMedia = nil;
    coolMedia = GetFirstVideoMedia(coolMovie, &trackIndex);
    if (!trackIndex || !coolMedia) return -1; // we need both
    GetMediaSampleDescription(coolMedia, trackIndex, imageDescH);
    return (*(ImageDescriptionHandle)imageDescH)->depth;
}
```

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## QuickTime 1.5 fixes GetMoviePict grayscale images -157 error

Date Written: 8/27/92

Last reviewed: 6/14/93

Trying to read any single frame (except the first) from a grayscale (4, 16, or 256 grays), QuickTime movie gives a -157 error (invalid pixel depth). I do "framehandle = GetMoviePict(damovie, daunitnum)" and test if it's 0. If so, then I do "io = GetMoviesError()" and it gives me the -157 error. GetMoviePict is working fine for all color and black/white movies. It just doesn't work on "Animation" grayscale and "Video" grayscale movies. Is this a bug?

With QuickTime 1.0, grayscale images cause a -157 error with GetMoviePict; some grayscale images may work if the color tables are custom made (ImageDescription structure clutID is 0). However, QuickTime 1.5 fixes this problem.

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## Determining whether a movie is set to loop or not

Date Written: 8/11/92

Last reviewed: 3/11/93

How does Simple Player determine whether a movie is set to loop or not? Movie files that are set to loop seem to have a string of 'LOOP' at the end of the 'moov' resource. Does Simple Player check 'LOOP'?

Simple Player identifies whether movies are set to loop by looking within the user data atoms for the 'LOOP' atom, as you've noticed. It's a 4-byte Boolean in which a value of 1 means standard looping and a value of 0 means palindrome looping. Your applications should add the user data 'LOOP' atom to the end of the movie when a user chooses to loop. We recommend this method as a standard mechanism for determining the looping status of a movie. If the 'LOOP' atom doesn't exist, there's no looping. The calls you need to access this information are GetMovieUserData, GetUserData, AddUserData, and RemoveUserData, as defined in the Movie Toolbox chapter of the QuickTime documentation. For more information see the Macintosh Technical Note "Movies 'LOOP' Atom and Friends."

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## Passing a refCon to the movie controller action filter proc

Date written: 7/22/92

Last reviewed: 6/14/93

Is there a way that the action filter proc of a QuickTime movie controller component can have a user reference field so that I can know which movie-"object" the movie controller is referring to? There are local variables associated with a particular movie that I would like to access from the action filter proc; currently there's no way to reference back to the variables in my program except through globals.

This was a difficult task under QuickTime 1.0, requiring you to stuff some sort of pointer in the movie user data fields. The good news is that at developer requests, QuickTime 1.5 includes a new call in the Movie Controller suit allowing you to pass and receive a long value when you set up your filter proc as follows:

```
pascal ComponentResult MCSetActionFilterWithRefCon (MovieController mc,
MCActionFilterWithRefCon blob, long refCon) = {0x2F3C,0x8,0x2D,0x7000,0xA82A};
```

The proc is of the form:

```
pascal Boolean userPlayerFilter(
    MovieController mc,
    short action,
    void *params,
    long refCon);
```

The proc returns TRUE if it handles the action, FALSE if not. The "action" parameter identifies the action to be executed; "params" is the set of potential parameters that go with the action; and "refCon" is any long value passed to MCSetActionFilterWithRefCon.

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## Problem with disabling a movie video track

Date Written: 5/29/92

Last reviewed: 6/14/93

When I disable a track in a movie, another random track becomes disabled as well. Is this a QuickTime bug?

This was a QuickTime 1.0 bug, but it's fixed with QuickTime 1.5. With QuickTime 1.5 it's no longer necessary to work around the bug, since disable now works.

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## 'pnot' resource format for QuickTime-like preview in dialog box

Date Written: 3/6/92

Last reviewed: 1/11/93

I would like to implement the preview/thumbnail feature in the Standard File dialog, just like the extension included with QuickTime. Is that code available separate from QuickTime? If not, could I at least get information on how the preview is created?

To implement your own preview/thumbnail feature, simply duplicate the Standard File dialog, add the necessary 'DITL' resources, and install a custom filter procedure for handling preview commands. On the System 7 CD there's an example, `StdFileSample`, that shows exactly how to create a custom file dialog. The Macintosh Technical Note "Customizing Standard File" describes how to do this as well. For generating and displaying the preview, you can use the following `PreviewResourceRecord`, found at the end of the `ImageCompression.h` file:

```
struct PreviewResourceRecord {
    unsigned long    modDate;
    short           version;
    OSType          resType;
    short          resID;
};

typedef struct PreviewResourceRecord PreviewResourceRecord;
typedef PreviewResourceRecord *PreviewResourcePtr, **PreviewResource;
```

This is the format for the 'pnot' resource, which defines the preview for the movie file, usually pointing to a 'PICT' resource. It's all you need to generate QuickTime-compatible preview without using QuickTime.

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## QuickTime alias and FSSpec system services under System 6

Date Written: 3/3/92

Last reviewed: 6/14/93

I recall reading that QuickTime includes an implementation of the Alias Manager for System 6, but I haven't found any precise description of what's included. Is it a bare minimum to support QuickTime? Or is the full Alias Manager there? Also, is there any way I can use the FSSpec interface to the File Manager, or must I revert to the System 6 interface?

When QuickTime is installed, most of the Alias Manager is available in System 6, with these exceptions:

- `NewAlias` will accept a `fromFile` parameter, but it never creates a relative alias.
- `NewAliasMinimalFromFullPath` and `ResolveAliasFile` aren't available.
- `ResolveAlias` and `UpdateAlias` will accept a `fromFile` parameter, but ignore it.
- `MatchAlias` may be called, but the `kARMMultVols`, `kARMSearchMore`, and `kARMSearchRelFirst` flags aren't available. If you pass them in, they'll be ignored. Furthermore, if you pass in a `matchProc`, it will never be called.
- The System 6 Alias Manager won't mount network volumes.

To summarize, in System 6 the Alias Manager doesn't handle relative aliases, multiple volume searches, "searchMore" searches, and network volume mounting. On the bright side, nearly all calls are present. Aliases created in System 6 are compatible with System 7 aliases, and aliases created in System 7 will work in System 6.

Unfortunately, QuickTime doesn't currently install an Alias Manager `Gestalt` selector, since it's only a partial implementation. You can check for the Alias Manager using `Gestalt` and, if it isn't present, look for QuickTime (using `Gestalt`): if QuickTime is present, assume you have an Alias Manager, subject to the limitations listed above.

QuickTime also makes extensive use of the FSSpec data structure introduced in the System 7 File Manager. Nearly all the FSSpec calls are available in System 6 when QuickTime is installed. The following calls are available in System 6, and should behave as documented for System 7: `FSPMakeFSSpec`, `FSpOpenDF`, `FSpOpenRF`, `FSpCreate`, `FSpDirCreate`, `FSpDelete`, `FSpGetFInfo`, `FSpSetFInfo`, `FSpSetFLock`, `FSpRstFLock`, `FSpRename`, `FSpCatMove`, `FSpOpenResFile`, `FSpCreateResFile`, and `FSpGetCatInfo`. `FSpExchangeFiles` isn't available when using the QuickTime System 6 version of the FSSpec calls.

Again, the `Gestalt` selector for the FSSpec calls isn't installed when QuickTime is there. This means that the `gestaltFSAttr Gestalt` selector may not be present, and `gestaltHasFSSpecCalls` may not be set, even if `gestaltFSAttr` is present.

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## Displaying thumbnail PICT

Date Written: 2/21/92

Last reviewed: 1/5/93

How can I display the thumbnail of the PICT instead of some generic icon when I create QuickTime PICT files? This would really help with distinguishing files when someone wanted to create a movie and had a lot of these PICTs around.

You need to follow these four steps:

1. Get the thumbnail. You can use either the `MakeThumbnailFromPicture` or `MakeThumbnailFromPictureFile` routines as listed in the `ImageCompression` interface file. It will pass back the `PicHandle` for the thumbnail. To install into the Finder, you need some resources (ICN#, ics#, icl8, ics8, icl4, ics4).

2. Make the thumbnail into a 'icsx' format to store it as a resource. (Please see `MakeIcon` on the Developer CD. It is not modified for pichandles so you may have to add a `DrawPicture`. Basically, you need to create a `GWorld` and create the appropriate 16- or 32-bit image.)
3. Add icons to resource. You can use the basic Resource Manager's `WriteResource` and `AddResource` calls to add the resource.
4. Set Finder bits: Stuff icon resources into the file itself with resource ID `kCustomIconResource`, and set the `hasCustomIcon` bit.

```
{ myCInfoPBRec.ioFlFndrInfo.fdFlags :=
  BOR(myCInfoPBRec.ioFlFndrInfo.fdFlags, $0400) }.
```

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## QuickTime 1.0 FS6Patch elucidation

Date Written: 2/10/92

Last reviewed: 6/14/93

The `FS6Patch` description in the QuickTime 1.0 CD Read Me file says, "There is a known bug with HFS on System 6." What specifically is this bug? According to the Read Me file, "The exact situation under which the problem occurs is somewhat rare." What is the exact situation? "If the patch is not necessary, it will not install itself." What criteria is used to determine necessity?

With QuickTime 1.5 the patch has been incorporated into the QuickTime file instead of being a separate file, but the functionality, described below, is the same.

When closing or flushing a file that has multiple open paths to a given fork, it is possible that the blocks marked as available for the other paths can also be allocated to the other fork. If this happens before the other paths are closed, blocks will be mapped to more than one fork, potentially trashing at least one of them.

The condition that can trigger this condition is multiple writeable paths to the same fork. Once this is satisfied you would need to make some changes to the fork, close the path, use any of the other paths to modify the fork, access the other fork and modify data. If all these things happen you could see the damage to one of the forks (the second-to-last being accessed).

The code that loads the patch checks the system first; the range where the patch is used is `6.0.4 < system < 7.0`. The version of the ROM is also used to decide when to install. If the ROM indicates the machine is later than the Macintosh IIfx, then a fix in ROM is assumed. The last check is to see if the code being patched is already in RAM (the assumption is that being in RAM means fixed). If so, the patch doesn't get used.

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## QuickTime track and movie sound volume

Date Written: 2/3/92

Last reviewed: 1/11/93

What do the values of a movie's or track's volume represent? Is there no way to make a track louder?

Here's the scoop: The volume is described as a small fract 8:8 and its values go from -1 to 1 with negative values as placeholders. The maximum volume you can get is `0x0100` with the minimum being 0 (or any negative value). The advantage of using negative volumes is that you can turn off sound while maintaining the level of volume. For example, -1 and 0 both equate to no volume, but the -1 implies that 1 should be the volume when sound is turned back on, whereas the 0 does not.

The volume for a track is scaled to the movie's volume, and the movie's volume is scaled to the value the user specifies for the speaker volume using the Sound control panel. This means that the movie volume represents the maximum loudness of any track in the movie.

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## SetMovieRate and controlling movie playback rate

Date Written: 1/27/92

Last reviewed: 1/11/93

QuickTime is a joy! But I've run aground with `SetMovieRate`. I am trying to change the rate at which a movie plays back, but if I call `SetMovieRate` the movie starts playing immediately, the controller goes wild, and the next time I hit the play button it ignores the previous rate. How can I control my playback rate?

`SetMovieRate` takes effect immediately that is why your movies start playing as soon as you make the call with a rate not zero. Also calling the movie toolbox directly to change the state of a movie associated with a controller is a sure way to confuse the controller, causing the controller, for example, to show the play button when the movie is playing.

QuickTime 1.5 introduced a change in the movie controller which makes it use the current preferred movie rate when the user hits the play button. To change the normal playing rate you'll need to call `SetMoviePreferredRate` and let the controller do the rest.

Note that with QuickTime 1.0 the movie controller plays movies at rate of one (`0x00010000`) whenever the user hits the play button, regardless of the current preferred rate.

For details on filter procedures, controller actions, and the movie controller in general, see the "QuickTime Components" chapter of the *QuickTime Developer's Guide*.

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## Clipping QuickTime movie posters

Date Written: 12/10/91

Last reviewed: 1/11/93

Our application uses the movie poster as a still frame in a cell, similar to using a PICT. If a user sizes the cell width so that it's narrower than the poster, even though we clip the drawing to the cell size, QuickTime posters draw their full width, writing over whatever is in the way. Pictures clip through DrawPicture; why doesn't ShowMoviePoster stay within the clipping region?

ShowMoviePoster, as well as the movie and preview showing calls, uses the movie clipping characteristics rather than the destination port's clipping region. You must set the movie's clipping region to obtain the results you want. An easier way to do this is to get the picture for the poster by calling GetMoviePosterPict, and then simply use DrawPicture to display the poster. Because this is just a picture, the clipping region of the port is honored. This way you don't need different code for movies and pictures.

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## PutMovieIntoHandle and data forks

Date Written: 12/10/91

Last reviewed: 6/14/93

I save PICTs to my document's data fork by writing the contents of the PicHandle. To save movies, do I convert the movie to a handle, and then save that as I would with PICTs? I just want the file references, not the data itself.

To save movies that are suitable for storage in a file, use PutMovieIntoHandle. The result of this call can be saved in the data fork of your files, and then you can call NewMovieFromHandle to reconstruct the movie for playback or editing.

You should also read the documentation regarding the Movie Toolbox FlattenMovie procedure, which creates a file that contains the 'moov' resource and the data all in the data fork. The advantage here is that the movie file you create using FlattenMovie can be read by any other QuickTime-capable application.

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## QuickTime and sound channel deallocation

Date Written: 12/2/91

Last reviewed: 1/11/93

Our QuickTime application gets a Sound Manager error -201 after playing movies in succession, apparently because sound channels used in the previous movies have not been reclaimed. How does QuickTime decide to deallocate sound channels? It doesn't seem to happen in my "while (!IsMovieDone(theMovie) && !Button())" play loop.

Sound channels are released by active movies when they notice that some other movie needs them. This is currently done only at MoviesTask time. Before entering your loop to play a single movie, you can do one or both of the following:

- Preroll the movie you're about to play and check the error. If preroll returns -201, call MoviesTask(0,0) to give the other active movies a chance to give up their sound channels. A subsequent preroll of theMovie should return noErr.
- Call SetMovieActive(otherMovies, FALSE). Deactivate the movies that you aren't playing to force them to give up their resources.

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## Standard controller with MCCut or MCClear

Date Written: 11/25/91

Last reviewed: 1/11/93

When I select all frames in QuickTime and then do an MCCut or MCClear, the standard controller gets larger and redraws itself at the top of the movie. Is this a situation I should be prepared to handle or a bug? Does the controller behave strangely when the selectionTime of a movie is -1 or when the duration of the movie is 0?

The behavior you're observing is to be expected if the controller is attached to the movie. In this case, the controller goes to wherever the bottom left corner of the movie box takes it. If the movie loses all its "visible" parts, the movie controller will jump to the top of the window. The only way to get around this is to detach the controller when the movie box is empty; this is also something to keep in mind for the cases when the movie contains only sound, since pure sound movies have no dimensions. You can find sample code showing how to do this on the *Developer CD Series* disc, in the SimpleInMovies example that accompanies the QuickTime article in *develop* Issue 7.

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## MCSetClip and clipping with the movie controller

Date Written: 11/15/91

Last reviewed: 6/14/93

I use SetMovieDisplayClipRgn to set my movie clip, but the movie doesn't obey my clipping. Does the movie controller component ignore this clipping?

You probably are directly modifying a movie that is attached to a controller without notifying the controller of the changes. The controller uses the display clip for its own purposes, such as for badges.

If you want to do clipping with the movie controller you must use `MCSetsClip`. `MCSetsClip` takes two regions. The first clips both the movie and the controller. The second clips just the movie, and is equivalent to the movie display clip. If both clips are set, the controller does the right thing and merges them as appropriate. If you don't want one or the other of the clips, set them to zero.

In general, if you are going to do something to a movie that is attached to a controller you must either do it through the controller, using the action calls, or you must call `MCMovieChanged`. Otherwise, the controller would need to constantly poll the movie to see if its state changed. Clearly this would be Evil and Slow.

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## How to get the first video frame

Date Written: 10/11/91

Last reviewed: 6/14/93

Stepping through QuickTime movie video frames in the order they appear in the movie is simple using `GetMovieNextInterestingTime`, except for getting the first frame. If I set the time to 0 and rate to 1, I get the second frame, not the first. In addition, the video may start later than at 0. How do you suggest finding this first frame of video?

To get the first frame under the conditions you describe, you have to pass the flag `nextTimeEdgeOK = $2000` to `GetMovieNextInterestingTime`. What this flag does is make the call return the current interesting time instead of the next, if the current time is an interesting time. You need to do this because there's no way to go negative and then ask for the next interesting time.

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## Status of rotating matrix support

Date Written: 10/11/91

Last reviewed: 1/11/93

What's the status of `RotateMatrix` and its use with `SetMovieMatrix` and `SetTrackMatrix`?

`RotateMatrix` works fine. But rotating matrixes are not supported for movies or images. So, although `RotateMatrix` will give you the correct mathematical result, unless you are using the matrix to transform something else (as with `TransformFixedPoints`) it has little use.

Rotation is a very important direction that is sure to get more attention in the future.

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## QuickTime 1.5 supports user-defined media types

Date Written: 10/10/91

Last reviewed: 1/11/93

Can I add a media to a QuickTime movie that is not video or audio? If so, is there anything special I need to do to add text notes that can potentially accompany each frame in my "movie," which can follow the video frames if a user edits the movie in any way?

QuickTime version 1.0 allows for only video and sound media. There's no way to install your own type, even in a case so obvious as the one you mention. Adding other media types is a high QuickTime priority and is likely to make it in a future release, but currently there's no mechanism to do it.

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## QuickTime file audio retrieval

Date Written: 9/17/91

Last reviewed: 6/14/93

How can I retrieve audio from QuickTime files in 1-second chunks? I need a sound equivalent of `GetMoviePict`.

QuickTime 1.5 allows you to retrieve sound from a movie (or a single track from a movie) using the call `ConvertMovieToFile`. The developer QuickTime 1.5 CD contains a sample that shows how to do this; the path is "QuickTime 1.5: Programming Stuff: SampleCode: ImportExportMovie."

With QuickTime 1.0, you must write your own audio extraction routine, using `GetMediaSample` to collect the sound data by hand and the `SoundDescription` data structure to (1) find frequency, format, and other details, (2) help you figure out how many samples you need for a second, and (3) fill in the resource data fields.

See the QuickTime documentation for detailed information on `ConvertMovieToFile`. The best source of information on sound resources and such is the Sound Manager chapter in *Inside Macintosh* Volume VI.

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## QuickTime Movie Toolbox "globals" are stored in system heap

Date Written: 6/6/91

Last reviewed: 6/14/93

According to the QuickTime Movie Toolbox documentation, "The Movie Toolbox maintains a set of global variables for every application using it." How much global memory is required? Our application is shy on global data space.

The information maintained is not kept with the application's global variables. The handle created by the `EnterMovies` call is stored in the system heap, not in the application heap. You don't have to worry about how much space to allocate in your application. This initialization does not affect your A5 world either.

`EnterMovies` initializes everything, including setting up the necessary data space and creating a handle to it. When you're done, be sure to make a call to `ExitMovies` to clean up the QuickTime data.

If an application makes multiple calls to `EnterMovies`, a different set of "globals," or data area, is set up for each call. A call to `ExitMovies` should be made before exiting the area that made the call to `EnterMovies`. For example, an application that uses QuickTime will call `EnterMovies` and set up the QuickTime world. Then an external may be called upon that wants to use QuickTime. This external would have to make a call to `EnterMovies` to set up another QuickTime world for its use. Before leaving, the external should call `ExitMovies` to clean up after itself. The application can then continue to use QuickTime with the original world it set up.

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