

**Version 5.4.1**

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# **User Manual**

**[www.bensoftware.com](http://www.bensoftware.com)**

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# ***Introduction***

Welcome to BTV!

BTV is an application for the Macintosh that allows you to easily view and capture video from any video input source. It works with any Macintosh compatible video input source such as video input cards, TV cards, built-in video, USB, DV, and FireWire video sources.

# Viewing video

## Viewing modes

Live video can be displayed either in a window that can be resized and dragged around the screen, or full screen on an entire monitor.

You can adjust the size and mode of the video display using the 'Video size' menu:

| Video size                 |    |
|----------------------------|----|
| 192 x 144                  | ⌘1 |
| 320 x 240                  | ⌘2 |
| 384 x 288                  | ⌘3 |
| 640 x 480                  | ⌘4 |
| ✓ 768 x 576                | ⌘5 |
| Custom size...             | ⌘9 |
| Go to full screen mode     | ⌘0 |
| Fill the screen with video | ⌘F |
| Video sizes...             | ⌘E |

There are five preset video sizes. Initially these sizes are set up depending on the capabilities of your video hardware (the menu shown above shows the default sizes for PAL format video). These video sizes apply to both window mode and full screen mode. You can enter your own values for these preset sizes by choosing 'Video sizes...' from the menu.

When you switch to full screen mode, the 'Go to full screen mode' item changes to 'Go to window mode', allowing you to switch back to window mode.

When in full screen mode you can select the 'Fill the screen with video' option - BTV will attempt to fill the screen with as much video as possible (depending on your screen resolution and capabilities of your video hardware).

## ***Full screen resolution***

There are two resolutions to consider for full screen video: monitor resolution and video resolution. The video resolution you are using is fixed and depends on your video hardware and the video format. Your monitor has several different resolutions for you to choose from. When you go to full screen mode BTV automatically switches your monitor to the desired resolution, and switches it back again when going to window mode..

If you are using a video source with a maximum size of 640x480, such as from a USB camera or NTSC format video, a monitor resolution of 640x480 should be used so that the video completely fills the screen.

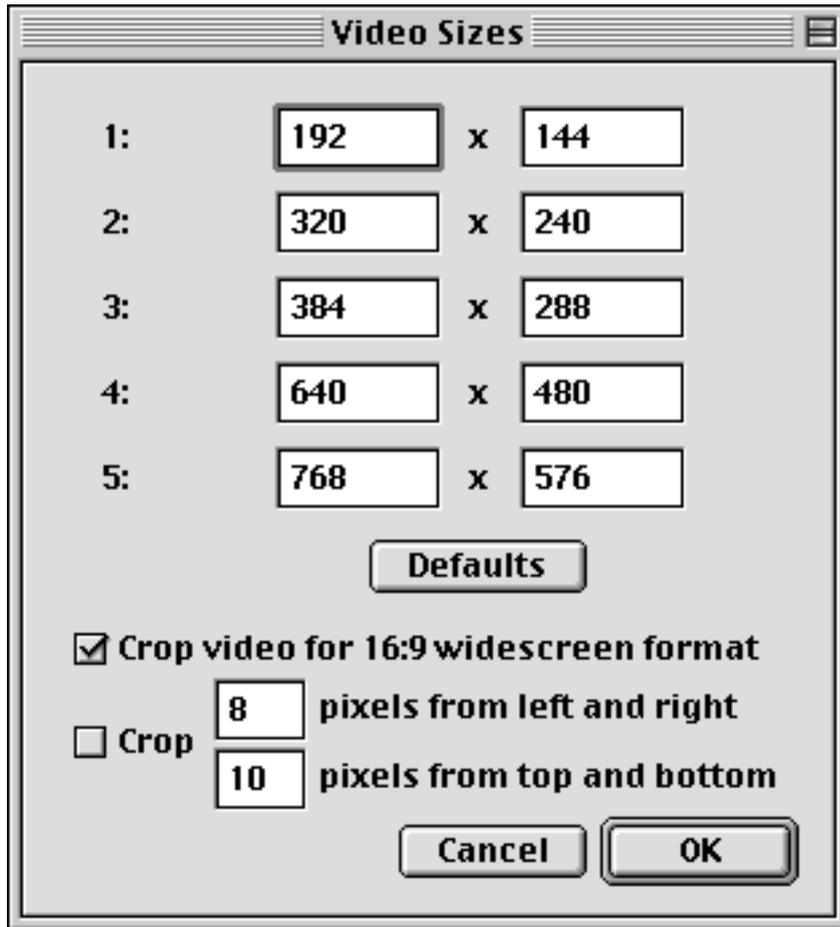
If you are using PAL format video then a monitor resolution of 800x600 should be used and the video displayed at the maximum size of 768x576 centered on the monitor. This results in a small black border around the edge of the video but will give you the best viewing quality.

Initially, BTV automatically attempts to choose the best monitor resolution, but you can change the monitor settings at any time from under the 'Monitor settings' tab in the preferences (see page 45).

## ***Viewing 16:9 widescreen video***

Video normally has an aspect ratio of 4:3, however widescreen video has a wider aspect ratio of 16:9. Since most video inputs are designed to work with 4:3 video, when viewing widescreen video there will be black borders at the top and bottom. BTV can crop the top and bottom of the video to remove these borders. You can turn this option on and off by going to 'Video Sizes' under the Video Size menu (see the picture below).

If you are viewing widescreen video from a DV source on a widescreen monitor (such as the Apple Cinema Display) you can display the video fullscreen by doing the following: select any widescreen monitor resolution in the preferences, turn on cropping for widescreen video in the Video Sizes window (below), and then switch to full screen mode and select 'Fill the screen with video' from the Video Size menu. This setup only needs to be done once.



### ***Multiple monitor support***

If you have more than one monitor attached to your computer you can view full screen video on any monitor.

You can choose which monitor is used to display full screen video under the 'Monitor settings' tab in the preferences (see page 45).

### ***Disabling screensavers***

When viewing full screen video it is desirable to disable any screensavers installed on your system so that your viewing is not interrupted. This is done by shifting the mouse position periodically, therefore tricking the screensaver into thinking that the machine is being used.

Note that for screensavers to be disabled in this way the mouse must be hidden.

# **QuickTime Movies**

## ***The QuickTime Movie file format***

Invented by Apple Computer, the QuickTime Movie file format is the industry standard file format for the storage, transfer and playback of time-based media on Macintosh Computers, and it is also widely used on the PC. It is a very flexible file format that has ability to store many different types of time based media such as video, sound, text, video effects, MIDI data, time code, and animations. BTV creates QuickTime movie files containing video and sound.

Virtually all video-related Macintosh software works with QuickTime files, so you can to capture video with BTV and then open it with another video application.

## ***References***

Movies do not necessarily contain all of its data in a single file; one movie may contain references to several other movie files, or references to data elsewhere in the movie. This is useful because it allows data to be included in movies without increasing the movie's file size, since the data isn't actually in the movie itself but rather just pointed to by a reference.

BTV creates references when it splits movie captures into several files (see page 25).

## ***Transferring movies to a Microsoft Windows PC***

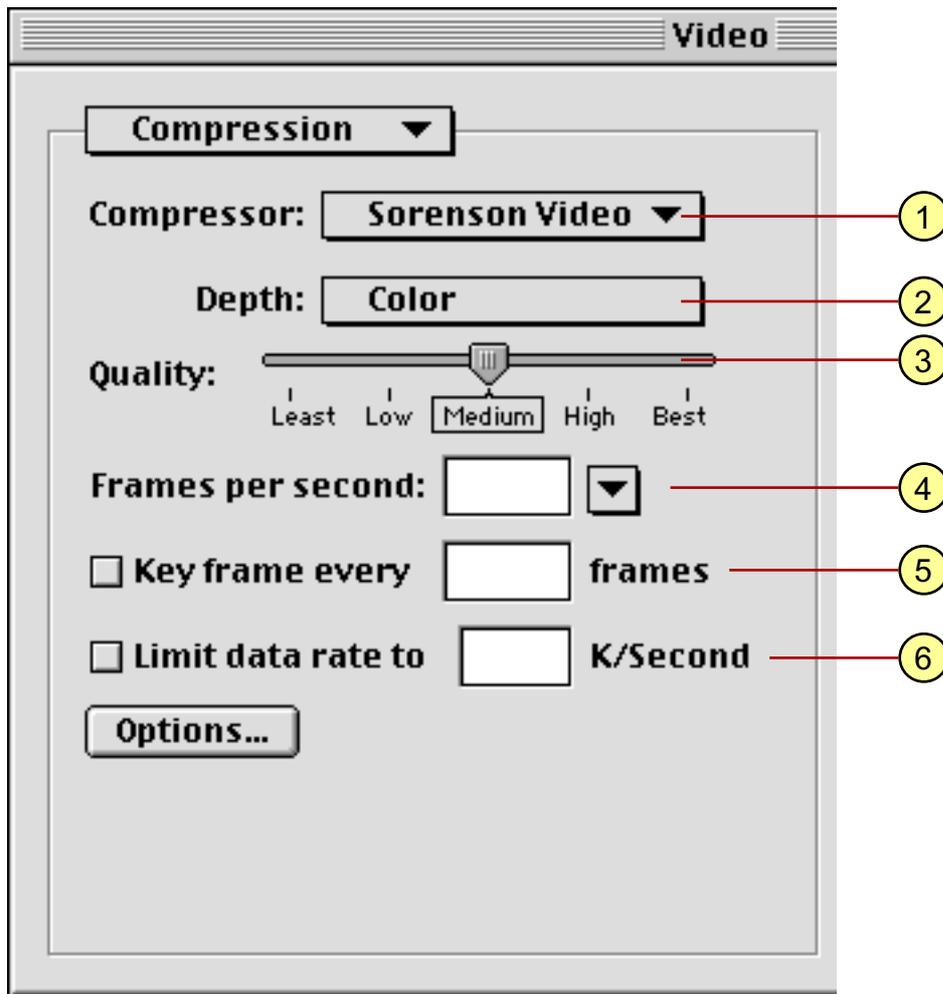
If the PC has QuickTime installed it will be able to read any movie file or image file created by BTV. When transferring files to a PC always make sure that you have added the 3 character file extension (.jpg .mov etc) to the end of the file name so that the PC can recognise the file type. File extensions can be added for you automatically if this option is set in the preferences (see page 37).

# Capture format settings

## Video format settings

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There are a variety of video capture format settings which are available by selecting “Video settings...” from the Settings menu. You will see the following window (below is the left hand side of the window; the right hand side contains a small display of the current video input):



Note that these settings only apply to recorded movies, not live video viewing. All settings are explained below.

## ① ***Spatial compression***

Spatial compression is a method of reducing the storage space needed for an image (or a frame of video in this case) while maintaining image quality as much as possible. There is always a tradeoff between storage space and image quality.

Compression methods are referred to as “codecs” because they specify both a *compression* and a *decompression* scheme.

Spatial compression can significantly reduce the size of captured files, and can improve capture and playback speed since the rate of transfer of data to and from the hard drive is reduced. A measure of the amount of compression provided by the codec is the compression ratio. For example, if a compressed image uses half its original storage space then the compression ratio is 2:1.

Under the Compressor menu in the Video Settings window (above) there are a number of different compression codecs. The compression codec chosen here applies to video capture, not live video viewing.

See below for detailed information about each compression codec available.

### ***Lossless and lossy compression***

Spatial compression codecs are either lossless or lossy. A lossless compression codec is one that does not lose any data when it compresses an image – the original image can be perfectly reconstructed from the compressed data. Conversely, a lossy compression codec is one that loses data when it compresses an image – the original image can never be reconstructed perfectly from the compressed data.

Lossless compression codecs are suited for computer-generated images where there are large areas of constant colour. Lossy compression codecs need to be used to obtain good compression ratios for a photograph-type image, such as one in a stream of live video. Most spatial compression codecs are lossy.

When capturing video it is almost always better to use lossless compression instead of no compression at all; it can reduce the file sizes, therefore reducing the load on the hard disk and computer, with no loss of image quality. It works by exploiting spatial redundancy within the image. For example, a completely black frame of video would be stored as one large black area instead of many individual black pixels.

### ***Applying compression more than once***

Each time an image is compressed by a lossy compression codec it loses some quality, so it is desirable to keep the number of times it is compressed as low as possible. If you are capturing video (or images) that are likely to be recompressed by a lossy compression codec in the future it is a good idea to choose a lossless (or at least high quality lossy) compression codec for the initial compression. This produces high file sizes initially but ensures that the quality of the final output is as high as possible.

## **② Colour depth**

Some compression codecs support many different colour depths. Generally, the lower the colour depth the smaller the resulting file sizes. Colour depths are named by the number of colours that are used in the image. Here is a complete list of depths that could be available, depending on the compression codec:

|                      |          |
|----------------------|----------|
| Black and white      | (1 bit)  |
| 4 Greys              | (2 bit)  |
| 4 Colours            | (2 bit)  |
| 16 Greys             | (4 bit)  |
| 16 Colours           | (4 bit)  |
| 256 Greys            | (8 bit)  |
| 256 Colours          | (8 bit)  |
| Thousands of colours | (16 bit) |
| Millions of colours  | (24 bit) |
| Millions of colours+ | (32 bit) |

Sometimes the available options are named just “Colour”, or “Greyscale”. In this case “Colour” means either 8, 16, 24, or 32 bit colour (depending on the compression codec) and “Greyscale” means 8 bit greyscale. There is also sometimes an option named “Best Depth”, in which case video is captured at the highest depth available.

32 bit images do not contain any more colour information than 24 bit images, so 32 bit images are no higher quality than 24 bit images. The difference is that 32 bit images contain an extra 8 bit “Alpha Channel”. This Alpha Channel holds transparency information, so when displaying the image on top of another image the Alpha Channel determines how the two images are combined.

### ③ **Quality**

All lossy compression codecs have a quality setting. The higher this setting the better quality the resulting image, but the more storage space is used. For compressing video to be sent over the Internet it is necessary to turn down the quality setting so that the resulting movie is small.

### ④ **Frame rate**

You can enter a desired frame rate in the Video Settings window for captured video..

If you leave this box empty, video is captured at the maximum possible rate. The maximum rate you will be able to obtain depends on your video input hardware, the speed of your computer and hard disk, and the type of compression codec in use.

Reducing the frame rate proportionally affects the file size of the captured video, so for transmission of video over the internet it is advisable to limit the frame rate so that the file size of the resulting movie is small.

### ⑤ **Temporal compression**

Depending on the content, video can have a high level of temporal redundancy, that is, very often one frame is quite similar to the next frame. Temporal compression exploits this redundancy to reduce the file size of the resulting movie. The success of temporal compression depends very much on the content of the video; if adjacent frames are very similar then file sizes can be significantly reduced but if adjacent frames in the video are generally quite different then the video is not suitable for temporal compression.

Temporal compression works by using “key frames” at regular intervals, followed by several “delta frames”. The key frames contain the complete video image, the delta frames only contain the portions of the image that have changed since the last key frame.

For compression codecs that support temporal compression you can enter a key frame rate in the Video Settings window. Note that the key frame rate that you enter here is the minimum key frame rate that is used; if the compressor codec decides that more key frames should be used it will do so (for example, if there is a segment of the video with a low temporal redundancy many key frames will be used but a different segment of the video with high temporal redundancy only the specified rate of key frames will be used).

## ⑥ ***Limiting the data rate***

Some compression codecs allow you to enter a value to limit the data rate (also referred to as the “bit rate”). This is useful when creating a movie that will be transferred or streamed over the Internet, so that you can make sure that the file size of the resulting movie is small. When you enter a value in this field the codec will automatically adjust its quality setting during compression to try to obtain the desired data rate.

## ***Available video compression codecs***

The number of compression codecs you have available in BTV depends on the version of QuickTime that is installed on your computer. Below is a list of codecs that are available if you have QuickTime 4 or later installed on your computer:

### **None**

No compression at all, so results in very large inefficient files. It is preferable to use a lossless compression codec instead, such as the Animation codec at maximum quality. Supports all colour depths. Does not support spatial compression.

### **Animation**

Best suited for computer-generated animations with broad areas of constant colour. It is lossy at quality settings below maximum, but at the maximum quality setting it is lossless and therefore generally used as an intermediate work format. Supports all colour depths. Supports temporal compression.

### **Component video**

Fast compression and decompression, lossless, but low compression ratio (2:1). Sometimes referred to as the “YUV” codec. Good as an intermediate storage format but not as a delivery format. Supports 24 bit colour only. Does not support temporal compression.

### **Video**

Very fast compressing and decompressing with reasonable compression ratios. Suitable for capturing video to the hard disk with high frame rates but unsuitable for compressing video for transmission over the Internet. Supports 16 bit colour. Supports temporal compression.

### **DV-NTSC and DV-PAL**

Used with digital camcorders. DV-NTSC is used by devices manufactured in the US and Japan, and DV-PAL is used by devices manufactured in Europe. Some DV camcorders offer a “Progressive Scan” feature that records each frame as a single non-interlaced image instead of two separate interlaced fields. This is vastly superior for viewing video on a computer monitor so it should always be used when filming DV footage that will be viewed on a computer. DV compression is similar to JPEG compression but is more efficient. Supports 24 bit colour only. Moderate decompression speed and compression ratios. Does not support temporal compression.

### **Sorenson**

Produces highly compressed video ideal for transfer or streaming over the Internet. Achieves higher image quality at lower data rates than other similar compression codecs. Very efficient at data rates ranging from 2 to 200 KBps. Very slow to compress and required quite a fast computer for smooth playback, especially if the video size is large or the data rate is high. When using Sorenson you should make sure that the horizontal and vertical video dimensions are a multiple of 4. Supports 24 bit colour only. Supports temporal compression and data rate limiting.

### **Motion JPEG A and Motion JPEG B**

Commonly used by hardware Motion JPEG compression cards. (There is very little difference between the A and B variants). Compresses the two fields of interlaced images separately, as opposed to Photo JPEG which is for non-interlaced images. Often used as storage formats for large files that need to be archived with good quality; it is lossy but at maximum quality the image degradation is minimal. Quick to compress and decompress, with reasonable compression ratios. Supports 24 bit colour, and greyscale. Does not support temporal compression.

### **Photo JPEG**

Generally used for high quality still non-interlaced images but it is too slow to decompress to be used for video playback. Useful for intermediate high quality storage of video with good compression ratios. Works well for slide-show type movies that require a low frame rate and high quality compression. Supports 24 bit colour, and greyscale. Does not support temporal compression.

### **Cinepak**

Designed in 1990 for the Macintosh computers of the day, this codec is therefore very quick to decompress on modern computers (it is quite slow to compress however). It is a good choice if the video has to be played back on older computers, but otherwise other codecs (such as Sorenson) offer higher quality at lower bit rates. Suitable for Internet transfer or streaming. Uses a compression ratio of at least 10:1, supports 8 and 24 bit colour, and greyscale. Supports temporal compression and data rate limiting.

### **H.261**

Designed originally for video conferencing, so it is optimised for low data rates and for video that contains a small amount of motion (high temporal redundancy). Quick to compress and decompress, with very high compression ratios. Suitable for Internet transfer or streaming. Supports 24 bit colour only. Supports temporal compression and data rate limiting.

### **H.263**

Similar to H.261 but optimised for video sizes of 352x288, 176x144, or 128x96. It is better than H.261 at higher bitrates.

### **Indeo Video 4/5**

Primarily designed for Windows, so can be used to transfer video between Mac and PC without requiring QuickTime to be installed on the PC. High image quality and high compression ratios, but quite slow to compress and decompress and image quality of Sorenson is generally better. Supports 32 bit colour only. Supports temporal compression and data rate limiting.

### **Graphics**

Similar to the Animation codec, but only for 8 bit images. It is usually better than the Animation codec for 8 bit images but it is slower to decompress. Supports temporal compression.

### **BMP**

Used for still images; inappropriate for video playback. Does minimal compression, supports most colour depths. Does not support temporal compression.

### **Planar RGB**

Lossless compression, therefore low compression ratios. Supports 8, 24, and 32 bit colour depths. Does not support temporal compression.

## Still image format settings

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The same spatial considerations apply to still images as to frames of video, but of course the temporal considerations do not. While video frames are compressed with a certain codec and then stored in a QuickTime Movie file, a single image is stored in its own file of a specified format.

Image file formats available in BTV are:

### **PICT**

The standard Macintosh image file format. Lossless compression, so produces quite large files. Supports all colour depths.

### **JPEG**

Very widely used lossy image compression format that produces high quality images at low file sizes (there is a quality setting to adjust the amount of compression). You should always use this format for photographic type images that will be transferred over the Internet or put on web sites. Supports 24 bit colour, and greyscale.

### **TIFF**

Traditionally used for images produced by scanners, this is a widely used file format. Can choose either lossless compression, or no compression at all. Produces quite large files, supports most colour depths.

### **BMP**

Microsoft Windows Bitmap file format. It is lossless; use this when you want to transfer lossless images to a PC. Supports most colour depths.

### **PNG**

Designed as a replacement for the popular GIF file format (which is a very useful format but is protected by a patent so that any manufacturer of software that produces GIF files has to pay a licence fee to the inventors of the format). PNG works well for computer generated images with a limited number of colours, but also can be used for photographic type images. It is lossless and supports all colour depths.

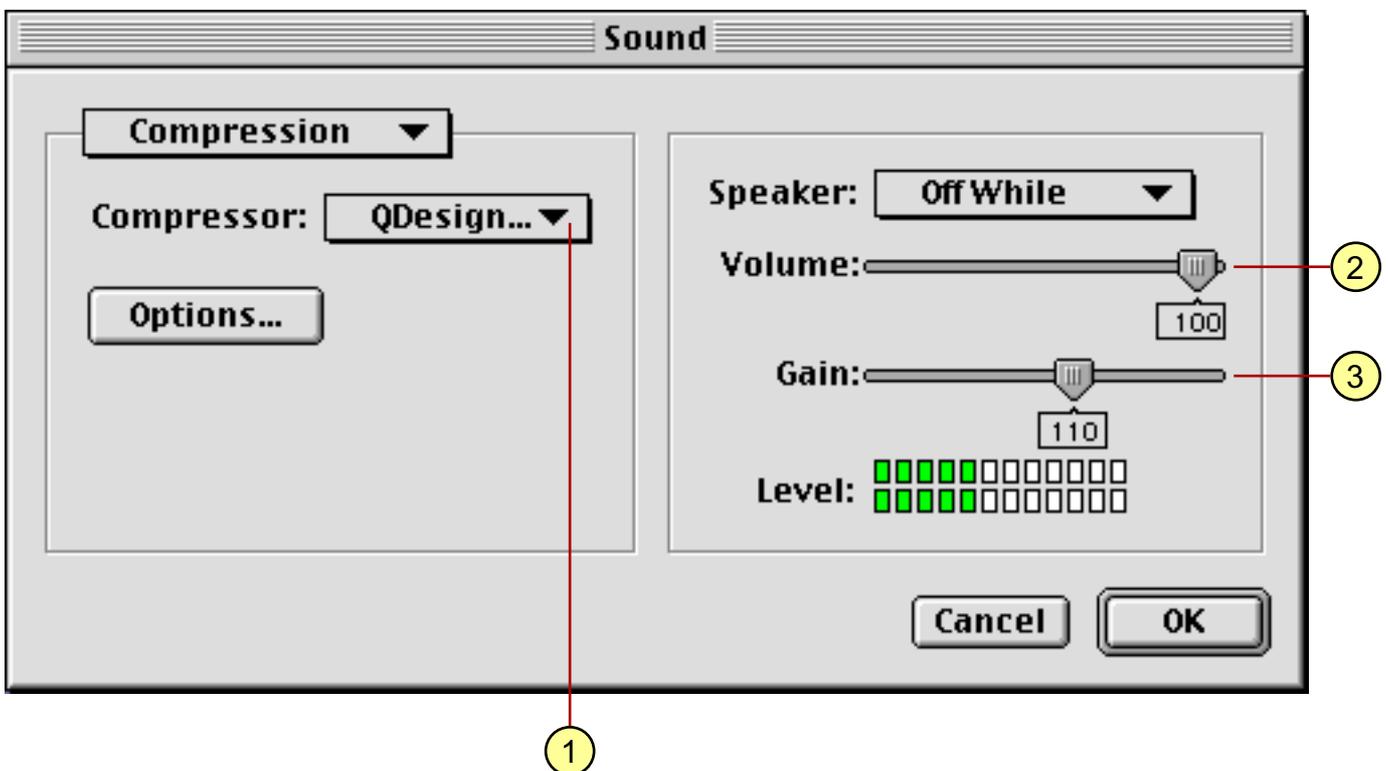
## PSD (Photoshop)

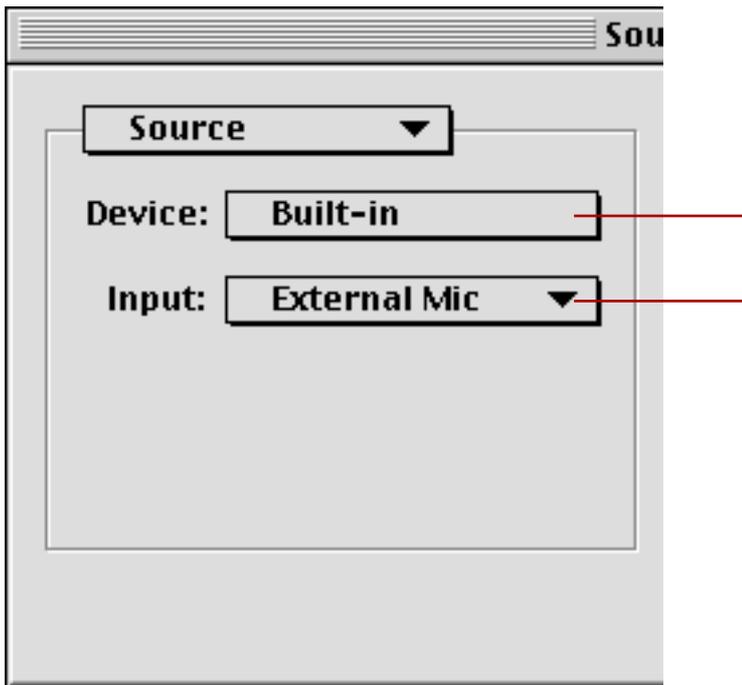
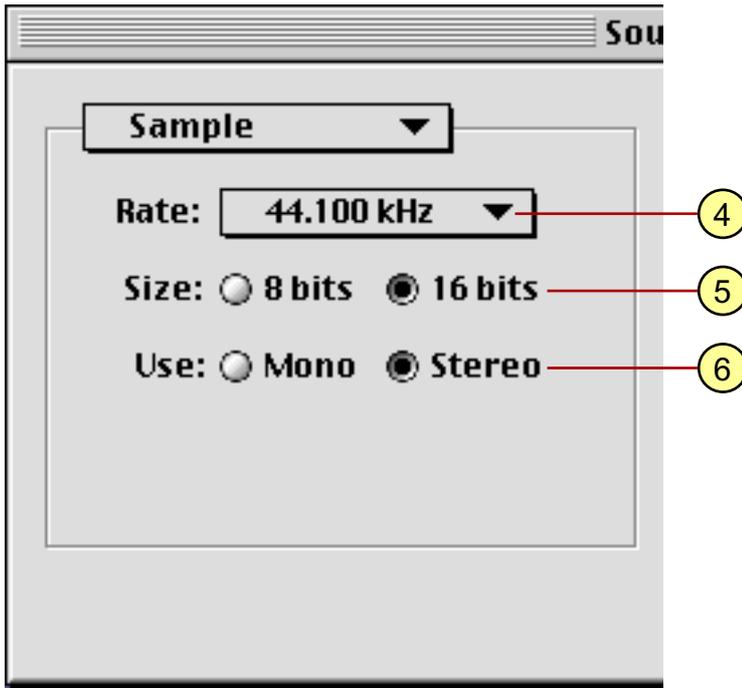
This is the native file format for the very popular industry standard image editing application, Adobe Photoshop. Convenient to use if the images are to be imported straight into Photoshop after capture. Lossless compression, supports 8, 24 and 32 bit colour

The JPEG, TIFF, PNG, BMP and PSD file formats are all commonly used on Windows PCs and so should be readable on any PC with graphics software, even if it does not have QuickTime installed on it. BMP and JPEG files should definitely be readable as these are standard formats on the PC. Make sure when transferring the images to a PC that you have added the three character file extension (.jpg .tif .png .bmp or .psd) to the file name so that it can recognise the file type.

## Sound format settings

There are a variety of settings for sound capture, all of which are available by selecting “Sound settings...” from the Settings menu. You will see the following window:





Use these controls to select the sound input source from which you would like to record sound. The number and type of options you have in these menus depends on your sound hardware.

## ① **Sound compression**

This is similar to image compression in that sound compression reduces the data rate of digital audio at the expense of quality, but since sound is continuous (not discrete, like frames of video) it cannot be temporally compressed and all sound compression schemes are lossy.

The best sound compression schemes work on a principal known as “Perceptual Encoding”. The idea is that the codec removes the data in the sound that humans cannot hear, therefore significantly reducing the amount of data while maintaining sound quality. Perceptual Encoding schemes can achieve very high compression ratios (10:1 or higher) without much loss of quality.

The audio codecs available in BTV that use perceptual encoding are called “QDesign Music” and “Qualcomm PureVoice” (see below for more information about these codecs).

## ② **Sound channel volume setting**

This volume affects the volume of live sound but does not affect the volume of captured sound.

## ③ **Gain**

This gain setting allows you to compensate for the volume of your sound source if it is too high or too low. This setting does affect the volume of captured sound.

#### 4 **Sample frequency**

Sound is continuous variations in air pressure that is converted to an analogue electrical signal by a microphone, and finally sampled and stored by the computer. When a sound wave is recorded on a computer it undergoes sampling. That is, at regular intervals the value of the sound wave is measured and stored, so that the computer builds up a digital representation of the sound wave.

The higher the sample frequency the more of the audio spectrum is accurately recorded.

Using low sample rates cause noise to be introduced into the signal and reduces the range of audio frequencies that can be represented by the samples, so it is desirable to use a high sampling rate.

The sampling rates available depend on your sound input hardware. Typical sample rates are 11kHz, 22kHz and 44kHz. 44kHz is the sample rate used in audio CDs and it can accurately reproduce the entire audio frequency range of human hearing.

#### 5 **Sample size**

The other factor that determines the quality of sampling is the sample size. Each sample is stored on the computer as a number of bits. The higher the number of bits used to store a sample the more accurate the sampling is. Using a low number of bits introduces what is called “quantisation noise” into the sound. Audio CDs use 16 bit sample sizes.

#### 6 **Mono / stereo setting**

Recording in stereo uses two sound channels and therefore uses more storage space, so if you are using a mono sound source it is best to switch this setting to mono

## ***Available sound compression codecs***

The number of compression codecs you have depends on the version of QuickTime that is installed on your computer. Below is a list of codecs that are available if you have QuickTime 4 or later installed on your computer:

### **None**

No sound compression. The sound is recorded with the sample rate and bit depth specified without loss of quality, producing high data rates.

### **QDesign Music**

Excellent for music. Very high compression ratio and high quality. Good choice for internet transfer and streaming.

### **Qualcomm PureVoice**

Excellent for voice. Very high compression ratio and high quality. Good choice for internet transfer and streaming.

### **ALaw 2:1**

An Internet standard for compressed audio everywhere except in the US and Japan. Low compression ratio and low quality. Generally not recommended.

### **uLaw 2:1**

An Internet standard for compressed audio in the US and Japan. Low compression ratio and low quality. Generally not recommended.

### **MACE 3:1 and MACE 6:1**

Older Macintosh compressors. Low quality. Generally not recommended.

### **IMA 4:1**

Good quality reproduction of music and other audio content. Supports 16 bit samples only. Relatively low compression ratio.

### **32 bit Floating Point and 64 bit Floating Point**

Increases the sample size to 32 or 64 bits. This allows for more accuracy when converting to other sample sizes and applying effects, therefore producing less quantisation noise.

### **24 bit Integer and 32 bit Integer**

Increases the sample size to 24 or 32 bits. Only specialist professional audio hardware uses 24 or 32 bit audio.

## Settings for sending files over the Internet

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Although the speed of internet connections are getting faster all the time, the majority of people around the world use modems for connecting to the internet. Sending large files (such as movies and images) over a slow modem connection can take a long time, so it is necessary to make the file sizes of your movies and images small before you send them over the internet. The following settings are suggested:

### Settings for still images

Use the JPEG format for still images. This produces small files and since JPEG is such a popular file format (on both Mac and PC) there should be no problem with viewing the file at the other end.

### Settings for video

#### *Video compression*

Use the Sorenson codec at medium to low quality. This produces small file sizes at higher quality than any of the other compression codecs available.

#### *Video frame rate*

Limit the frame rate of the capture by typing in a value for the frame rate in the Video Settings window. This can make a big difference to the file sizes so use the lowest frame rate that is acceptable.

#### *Video size*

Use the smallest video size that is acceptable. Halving the video dimensions results in four times fewer pixels in the image, so this makes a big difference to the file size of the movie.

### Settings for sound

#### *Sound compression*

If the sound is speech then use Qualcomm PureVoice; if the sound is music then use QDesign Music. Both allow you to adjust the bit rate (quality setting), so choose a medium to low bit rate.

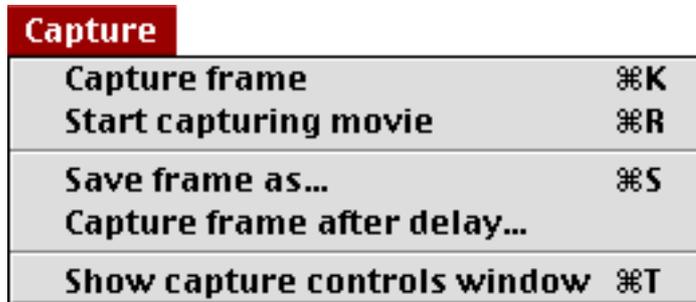
*Sound sample settings*

Use 16 bit, 22KHz sampling. This gives you reasonably high quality and small file sizes with the above sound compression codecs.

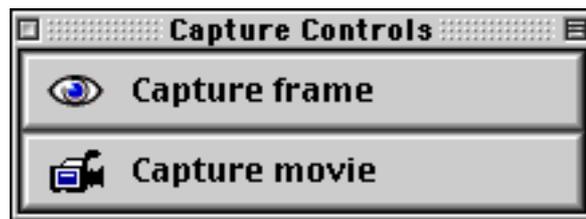
Remember when sending files to a Windows PC to include the three letter file extension that tells the PC what type of file it is. For JPEG files the extension is .jpg and for movie files the extension is .mov. BTV can add these file extensions for you if this option is turned on in the preferences (see page 37).

# Capturing movies and images

All options for capture are available from the Capture menu:



Selecting ‘Show capture controls window’ from the menu displays a floating window that contains frame capture and movie capture controls.:



## Capturing still images

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When you choose ‘Capture frame’ from the Capture menu or from the floating window, an image is captured from the video input and saved straight to the hard drive with an automatic name and destination. The destination and naming settings that you have defined in the preferences are used (see page 39).

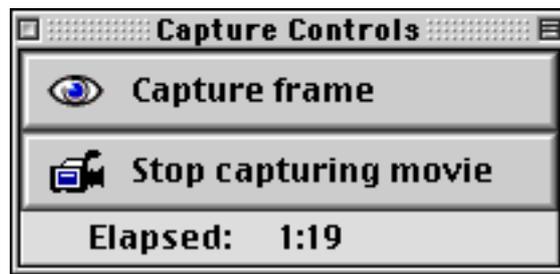
Alternatively, choosing ‘Save frame as...’ from the Capture menu displays a window allowing you to choose a destination for the file, as well as the file format and other options.

## Capturing QuickTime Movies

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When you start capturing a movie it is saved to the destination(s) that you have supplied and an automatic name is created for it. For information about adjusting the movie capture settings see the preferences (page 42).

During video capture the Capture Controls window shows the elapsed time:



If you have many hard disks connected to your computer you can define up to three destinations for video capture; when the first is full the second is used and when that is full the third is used.

When the capture has been split into several files an index is added to the files so that you know the order in which they were captured. For example, if the main file name is "My Movie" then the other files are named "My Movie-01", "My Movie-02" etc. You can only open the first file but it contains the data of all the files.

## Video capture performance

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Processing digital video involves moving, calculating and storing extremely large amounts of data compared to other kinds of computer files. To get the most out of your computer you should:

- Turn off Virtual Memory (using the Memory control panel in the Control Panels folder under the Apple Menu).
- Turn off AppleTalk (using the Chooser under the Apple Menu).
- Eject all removable disks.
- Make sure that you are using the latest version of the driver software from the manufacturer of your video input device.
- Never use no video compression. If you use no video compression then the amount of data that your computer has to move around and store to the hard disk is very large, resulting in low frame rates. If you want no loss of quality then it is always better to use a non lossy compression codec (such as Animation at maximum quality) rather than no compression at all, since it results in a lower data rate and produces a smaller movie file. Alternatively you can use a fast lossy codec at a high quality setting, such as Motion JPEG A or Video.
- Use the compression codec that is supplied by your video input device, if it supplies compressed video. Some devices supply video in compressed form, such as DV sources which supply DV-PAL or DV-NTSC, USB sources which commonly supply Component Video, and some PCI sources which supply Motion JPEG. You can set the compression codec by choosing 'Video Settings...' from the settings menu (see page 8). Doing this ensures that you get the optimum frame rate and no image degradation due to recompression of the video. To see if your video input hardware supplies compressed video select 'Video hardware information...' from the Apple menu and this shows a window that displays the default codec.
- When you capture video make sure that BTM is the only application loaded, and that you have a minimum number of third party (non-Apple) extensions installed on your computer. You can disable extensions using the Extensions Manager (in the Control Panels folder under the Apple Menu).

- For best performance make sure you defragment your hard drive regularly. Defragmenting your hard drive makes all the free space continuous, so that the hard drive mechanism doesn't have to waste time moving to free areas of the drive during video capture. Defragmenting can be done with most good disk utility software.

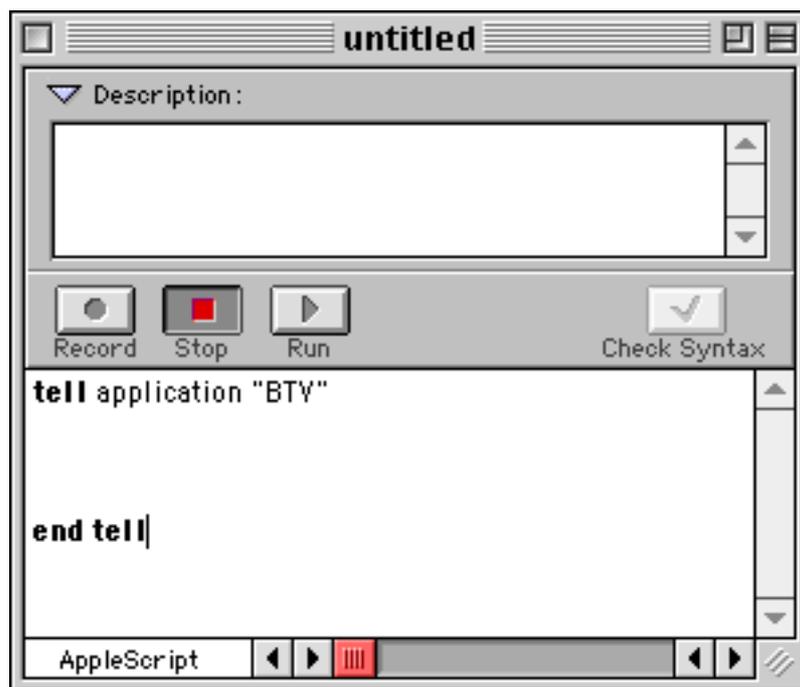
# AppleScript

## Basics

---

AppleScript is a way of controlling an application either from a written script or from another application. Once you get the hang of it it is easy and quick to write your own scripts that can control BTV. To write scripts use Apple's 'Script Editor' application (it is installed as a part of the Macintosh operating system and should be in the folder 'Apple Extras' on your hard drive).

Once you open the Script Editor you should see a window like the one below. The 'tell' and 'end tell' commands are needed to define which application you are controlling, in this case BTV. Everything you want to tell BTV goes between these commands.



To see all available commands choose 'Open Dictionary...' from the File menu in Script Editor and select BTV. Script Editor will show you all commands with a brief description of each one.

## Launching BTV

---

The two commands that you can use to launch BTV are **activate** and **launch**.

If you tell BTV to **activate** it loads up and come to the front. In fact, any time you tell BTV to **activate** it comes to the front.

If you tell BTV to **launch** it loads up in the background with no open windows and awaits further instructions. The **launch** command is useful if you want to define the viewing mode (full screen or window mode) before BTV switches to the mode that was last used.

## General commands

---

### **quit**

Tells BTV to quit.

### **print**

Tells BTV to print an object. In this case, the object can be the video input window (which is window 0), for example:

```
print window 0
```

### **full screen mode / window mode**

Sets the video display to full screen mode or window mode

### **pause / resume**

Pauses or resumes the video display

### **hide mouse / show mouse**

Hides or shows the mouse cursor. Only available in full screen mode.

## **mute on / mute off**

Turns the sound mute on or off

## **set volume**

Sets the computer speaker volume to a value between 0 and 7, for example:

set volume to 5

## **blank other monitors / show other monitors**

Turns on or off monitor blanking

## **set width to / set height to**

Sets the current video dimensions. For example:

set width to 640

set height to 480

In window mode this resizes the window to the specified size; in full screen mode this adjusts the video display and centres it in the monitor.

## **capture frame**

Captures a frame of video to the hard drive. Uses the current setting for frame capture that are set in the preferences. You can optionally specify a path and/or file name for the destination file, and specify whether you want any previous file to be overwritten with the new image file:

capture frame

capture frame as "Hard disk:image1"

capture frame with overwrite

## **copy**

Copies a frame from the video input to the clipboard. This only works if BTV is the front application so you need to use the activate command before using the copy command.

## **start recording**

Starts recording a movie. As with frame capture you can optionally specify the file name and/or path:

```
start recording  
start recording as "My Movie"
```

## **stop recording**

Stops a movie record operation.

## **set video input device**

Sets the current video input device to the name specified. To see the names of all video input devices available on your system go to 'Video Settings...' under the Settings menu and look at the source options. The name is not case sensitive.

```
set video input device "built-in"
```

## **Moving windows**

---

Each window have a position and bounds property; the position property is a point that defines the top left corner of the window, the bounds is a rectangle that defines the complete bounds of the window. For example:

```
set position of window 0 to {400,100}
```

This sets the position of the video input window to the coordinates {400,100}. Note that the top left of the main monitor is {0,0}.

Each window has a unique number - window 0 is the video input window.

## Channel changing

---

If you have a TurboTV, ixTV or ixTV/FM card then you can control channel changing with AppleScript.

### Setting the channel

You can set the channel by number using the channel command or by name using the channel name command, for example

```
channel 4  
channel name "BBC 1"
```

### Getting the current channel

You can determine what the current channel is by using the get current channel command. This returns the number of the current channel. For example, the following command increases the channel number by 1:

```
channel (get current channel + 1)
```

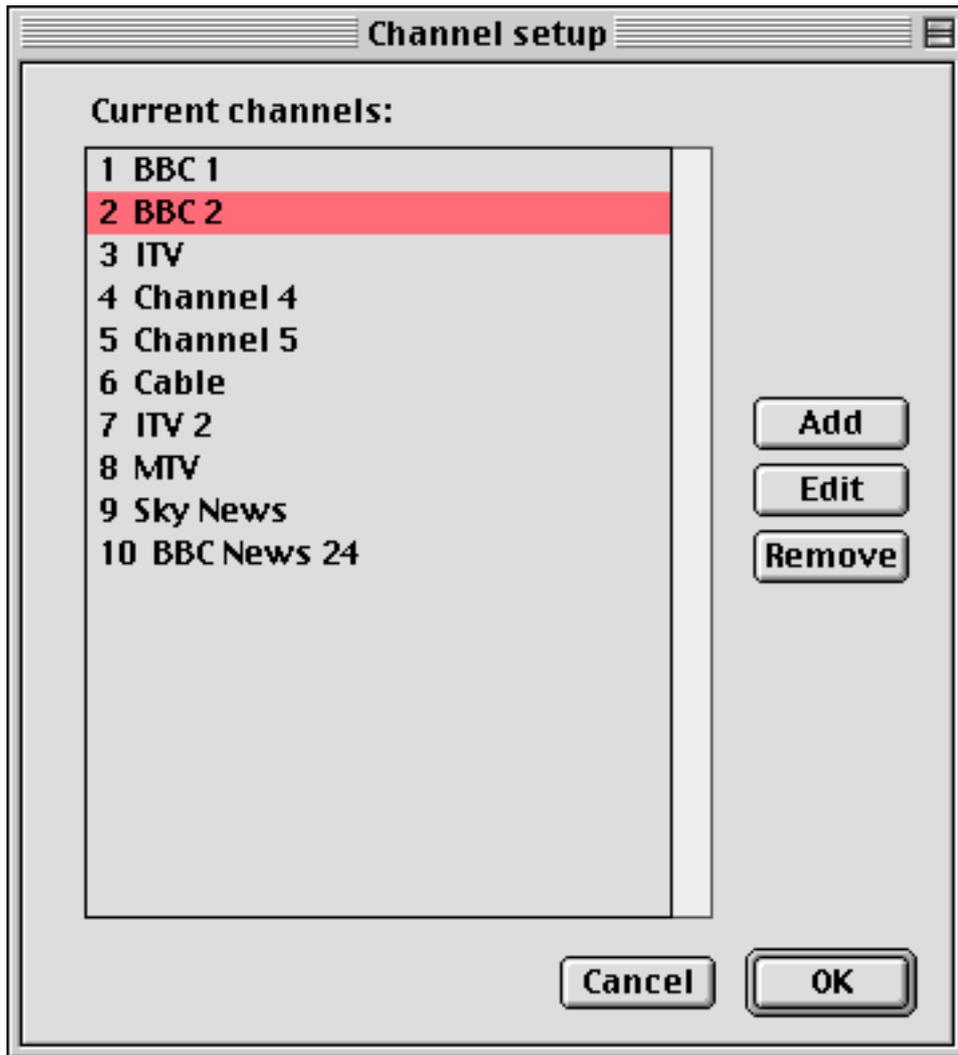
## ***Channel changing with the ixTV card***

If your video input is an ixMicro ixTV, ixTV/FM, or TurboTV tuner card there will be an extra menu in the menu bar called 'Channel':

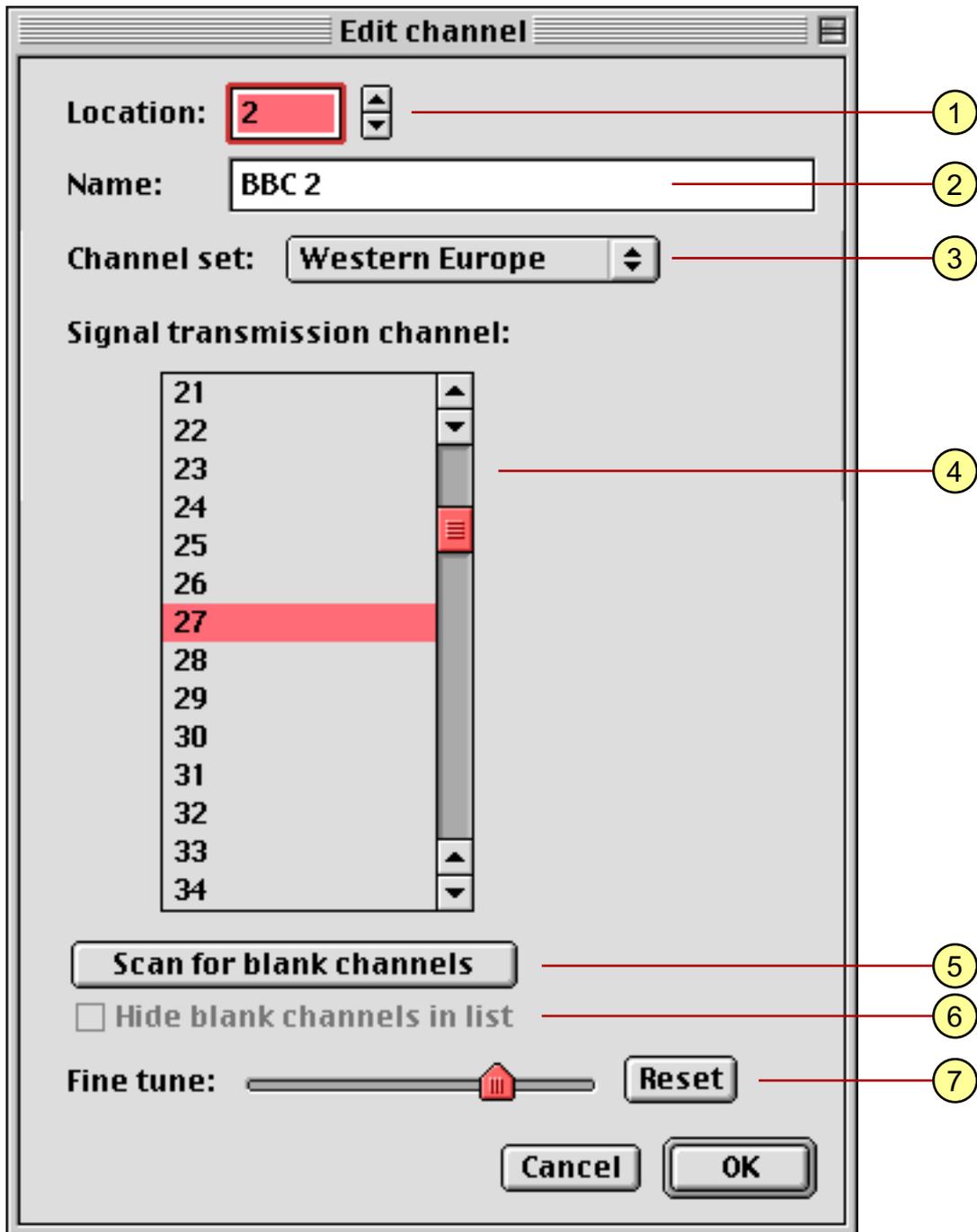


In the above menu 10 channels are set up and can be selected either from this menu or using the number keys on the keyboard. Channel 10 can be selected by pressing 1 quickly followed by 0.

To set up channels choose the 'Channel setup...' option from the bottom of the menu. You will get this window:



From this window you can add a new channel, or edit or remove an existing channel. When you click the 'Add' or the 'Edit' button you will get the following window that allows you to set up the the channel:



**1 Location**

There are 100 locations to store channels. You do not have to number the channel sequentially; you can use any location you like from 0 to 99.

**2 Name**

This can be any name you like to describe the channel. It can be up to 29 characters long.

### ③ **Channel set**

This defines the set of frequencies that are used for the signal transmission channel number. Choose the one that best matches your input signal. The choices are:

- US
- US cable
- Western Europe
- France
- Japan
- Japan cable
- Australia
- Russia

### ④ **Signal transmission channel**

Each TV station transmits its signal on a particular signal transmission channel. These signal transmission channels are different for each channel set. If you know the signal transmission channel for a particular TV station you can simply select it from the list, otherwise you can go through the list looking for TV stations.

### ⑤ **Scan for blank channels**

This goes through each signal transmission channel and looks for a TV station. If no TV station is found then the channel is removed from the list. Therefore, after this operation is complete only the signal transmission channels that transmit a TV station are available in the list.

### ⑥ **Hide blank channels in list**

Once blank channels have been removed from the list with the 'Scan for blank channels' function, this option turns on and off the display of the blank channels in the list.

### ⑦ **Fine tune**

Use this function to adjust the tuning to get the best possible video and sound quality. Hold down the Apple (command) key while using this control to adjust the fine tune twice as much as normal.

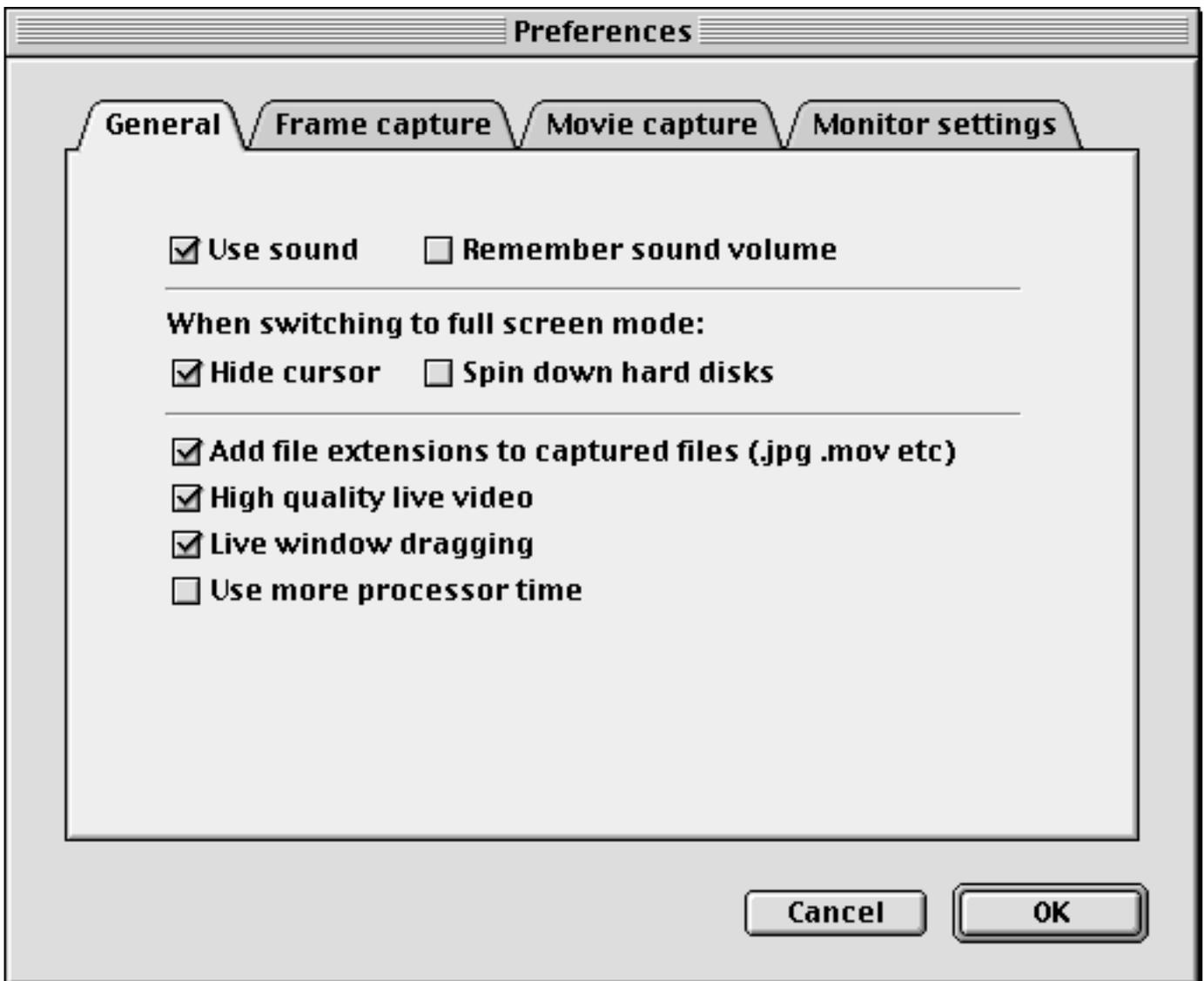
# Preferences

The preferences window is available by selecting 'Preferences...' from the Settings menu. There are four sections:

- General
- Frame capture
- Movie capture
- Monitor settings

## General

---



**Use sound**

This option controls whether the computer's sound hardware is initialised. You can turn this option off if you don't use your computer for playing sound while watching video.

**Remember sound volume**

This option controls whether the computer speaker volume is to be remembered the next time you use BTV.

**Hide cursor**

If this option is on then the mouse cursor is hidden when switching to full screen mode.

**Spin down hard disks**

If this option is on then the computer's hard disk(s) is spun down when switching to full screen mode.

**Add file extensions**

When this option is on BTV automatically adds three-character file extensions to the names of all files that are created. These file extensions are needed by Windows PCs to determine the file type, so if you are sending files to a PC then this option should be on.

**High quality live video enabled**

This setting tells the video hardware to play the video in high quality mode. This option is mainly applicable to DV video sources although it might be used for other video hardware as well. If your video hardware supports this setting turning then turning it on increases playback quality at the expense of performance. Note that this option only applies to playback and not capture.

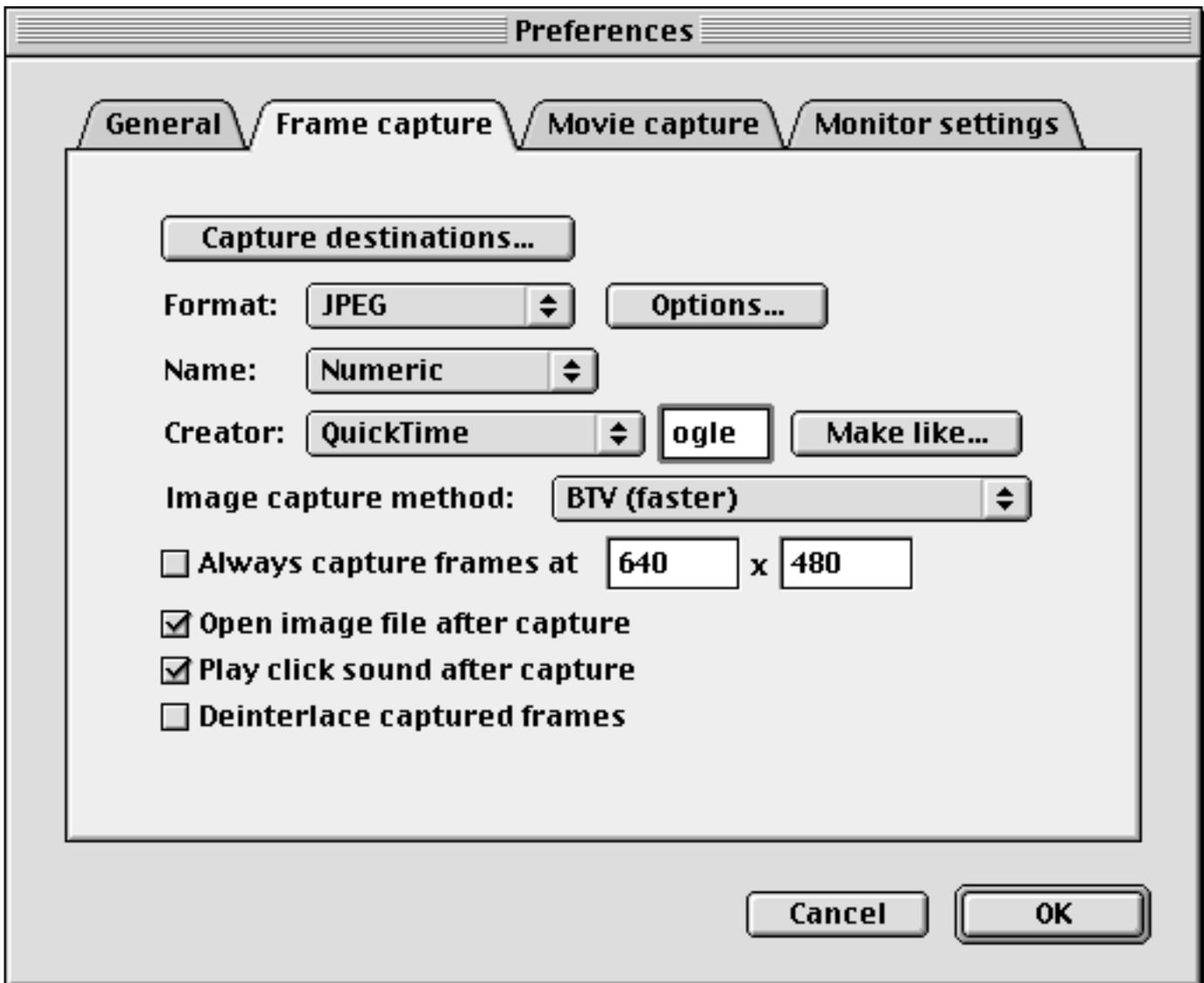
**Live window dragging**

Turning the option on enables all windows to be drawn and updated as they are dragged.

**Use more processor time**

When this option is on BTV uses as much processor time as possible to ensure smooth playback of video. This is only for playback; it automatically happens during capture.

# Frame capture



## Capture destinations

Clicking this button shows a window allowing you to choose the capture destinations. See below for a full explanation of capture destination options.

## Format

This pop-up menu allows you to choose the format of the image files. For full details of all available image formats see page 16.

## Options

Clicking this button shows a window allowing you to adjust the settings for the particular image format that is selected. The number and type of settings available vary depending on the image format, but generally include colour depth and other relevant settings such as quality.

**Name**

This option selects the type of automatic name used for saving image files. If 'Data stamped' is chosen then the filename contains the date in the format "day|month hour|minute|second", if 'Numeric' is chosen then the files are incrementally numbered "001", "002" up to "9999".

**Creator**

The creator is a four-character code that defines the application that owns the file, so that if you double-click on the file it automatically opens in that application. You can define the creator for image files by selecting one listed in the pop-up menu, typing in the code, or clicking the 'Make like...' button and selecting a similar file or the desired application.

**Image capture method**

There are three different ways to capture an image. These are labelled in this menu as:

- **QuickTime:** Uses the standard QuickTime frame grabbing method to capture an image. This should work reliably but is inefficient and therefore likely to be slow (it is especially slow when used with USB devices).
- **BTV:** Uses BTV's own routines to capture the frame which is often significantly faster than the QuickTime method.
- **Directly from screen:** This is very fast but if there are other windows in front of the video or the video is partially off screen then this will appear in the captured image. There is no loss of quality when capturing from the screen but the maximum colour depth of the captured image is determined by the color depth of the screen. You can use this method to capture frames even during a movie capture; since the image comes from the screen it doesn't affect the video input at all.

**Always capture frames at..**

You can make all captured frames a set size by entering the size here. This applies to normal frame captures as well as frames captured during time lapse. If you don't specify a size here then captures will be at the current size of the video input window.

**Open image file after creation**

If this option is on then the image file is be opened after it is created.

**Play click sound after capture**

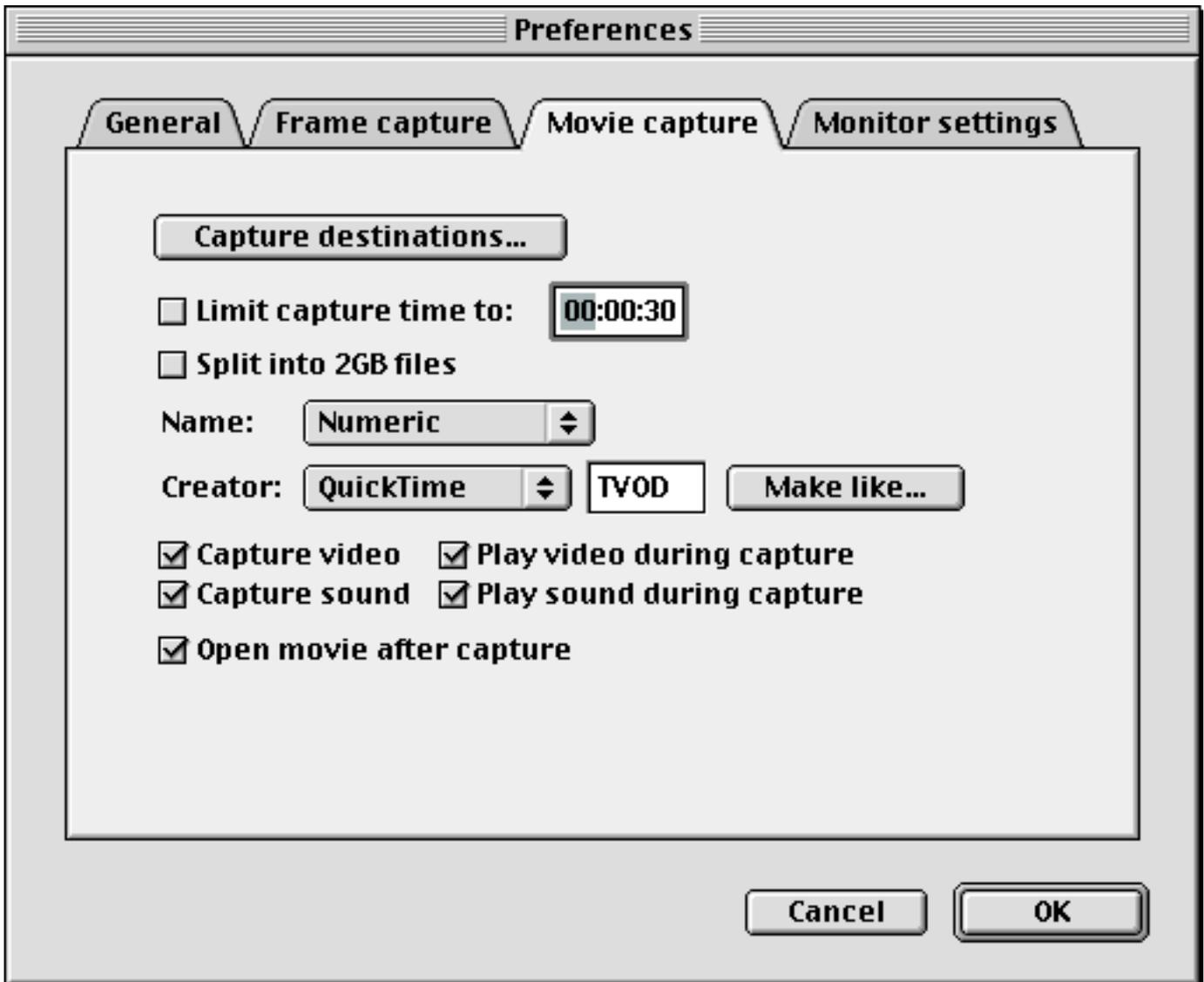
If this option is on a click sound is played when a frame is captured.

**Deinterlace captured and exported frames**

Analogue video (PAL, NTSC and SECAM) is interlaced, that is, each frame of video is made up of two fields on alternate horizontal lines. DV video can also be interlaced. Since there is a time delay between the two fields, if there is motion in the frame this will show up as jagged lines in the area of the motion. If this option is turned on BTV Pro will automatically deinterlace frames captured from the video input. This is done by eliminating the odd field and creating a new odd field by interpolating pixels in the even field.

## Movie capture

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### **Capture destinations**

When you click this button a window is shown allowing you to choose the capture destinations. See below for a full explanation of capture destination options.

### **Limit capture time**

You can enter a time here to limit the total capture time. When the time has elapsed the capture is automatically stopped.

### **Split into 2GB files**

When this option is on then the captured movie is automatically split into separate 2GB files.

If you have OS9 and QuickTime 4 or later installed on your computer and you are capturing to an HFS+ disk (sometimes called a “Mac OS Extended” format disk) then you can capture files larger than 2GB in size. If not, then captures are automatically split into separate 2GB files even if this option is turned off. Even if you can capture larger than 2GB files, it is difficult to transfer these files over networks to other computers, so this option is useful in these circumstances.

When the capture has been split into several files an index is added to the files so that you know the order in which they were captured. For example, if the main file name is “My Movie” then the other files are named “My Movie-01”, “My Movie-02” etc. You can only open the first file but it contains the data of all the files.

### **Name**

This option selects the type of automatic name used for saving image files. If ‘Data stamped’ is chosen then the filename contains the date in the format “day|month hour|minute|second”, if ‘Numeric’ is chosen then the files are incrementally numbered “001”, “002” up to “9999”.

### **Creator**

The creator is a four-character code that defines the application that owns the file, so that if you double-click on the file it automatically opens in that application. You can define the creator for image files by selecting one listed in the pop-up menu, typing in the code, or clicking the ‘Make like...’ button and selecting a similar file or the desired application.

### **Capture video / Capture sound**

These options control whether sound and video is captured. One of them must be on. Note that for DV video sound and video are interleaved in the data stream and it is not possible to capture one without the other.

### **Play video during capture / Play sound during capture**

These options allow you to control whether sound and video are played during capture. Generally, turning these options off increases capture performance resulting in higher frame rates (smoother, less ‘jerky’ video).

### **Open movie after**

If this option is on then the movie file is be opened after it is captured.

## Capture destinations

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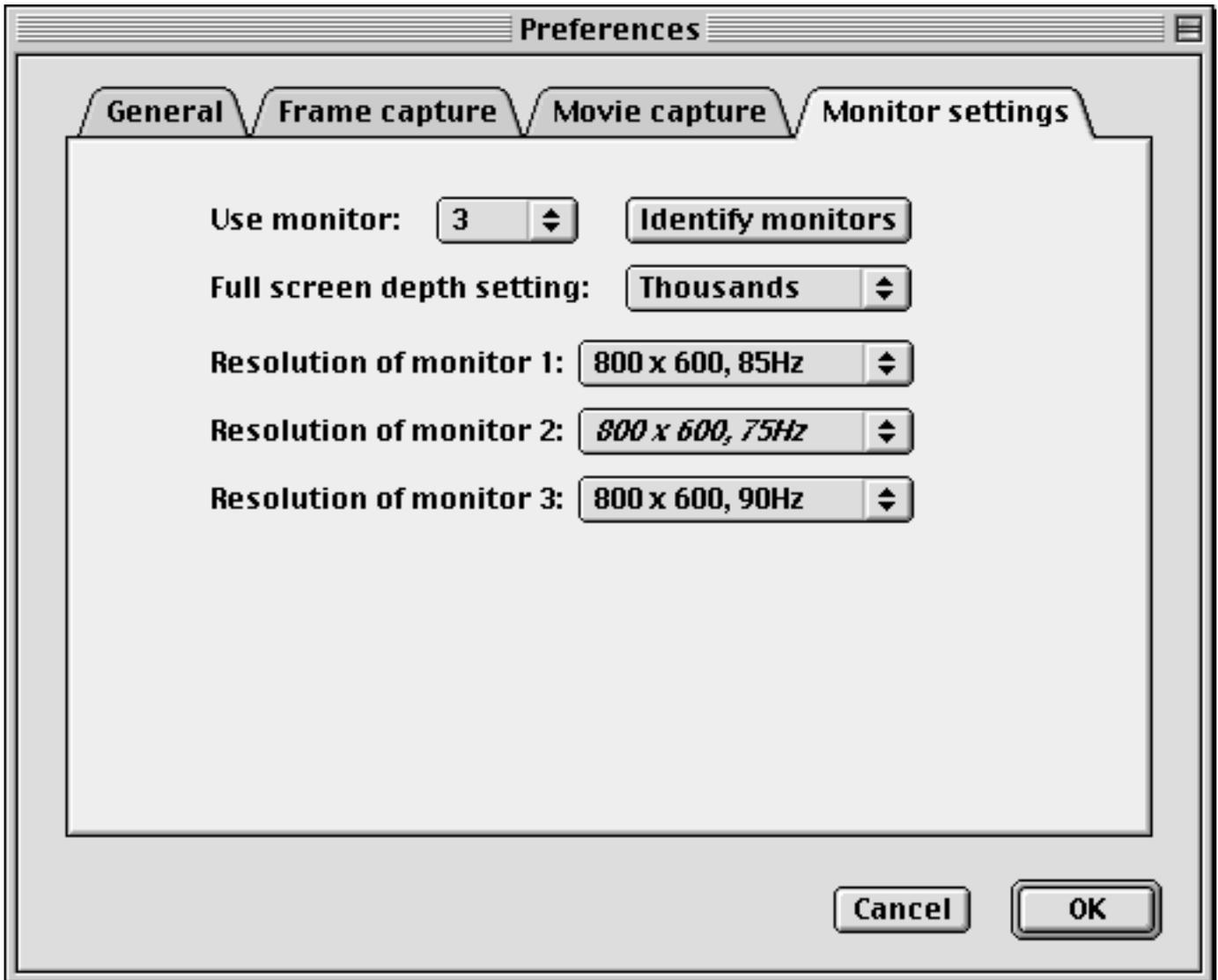
This window is available from the frame capture options and movie capture options in the preferences - it allows you to choose destinations for capture movie and image files.

If you have many hard disks connected to your computer you can use the movie capture destinations to capture to up to three of your hard disks in a row; when the first is full the second is used and when that is full the third is used.

When the capture has been split into several files an index is added to the files so that you know the order in which they were captured. For example, if the main file name is "My Movie" then the other files are named "My Movie-01", "My Movie-02" etc. You can only open the first file but it contains the data of all the files.

## Monitor settings

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### **Use monitor**

This pop-up menu allows you to choose which monitor is used for full screen video.

### **Identify monitors**

Pressing this button displays numbers on each monitor to identify them.

### **Full screen depth setting**

The monitor is switched to this colour depth when viewing full screen video. Depending on the particular video hardware in use, most users should choose Thousands or Millions; the 256 option is included for completeness and to retain compatibility with certain older video input devices.

**Resolution menus**

There is a pop-up menu for each of your monitors allowing you to choose the monitor resolution for full screen video. If the resolution is shown in italics it needs to be confirmed the first time it is used to make sure that it is supported by your monitor.