Version 5.0.1

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User Manual

www.bensoftware.com

Contents

Part 1: Introduction

Welcome to BTV Pro!

BTV Pro is an application for the Macintosh that allows you to view, capture and edit video, create stop-motion animations, and also has advanced capture features such as frame averaging, time lapse and motion detection. It works with any Macintosh compatible video input source such as video input cards, TV cards, built-in video, USB, and FireWire video sources.

Part 2: Using BTV Pro

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:

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.

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 Pro 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 larger sizes of video such as PAL, DV-PAL, or DV-NTSC, a monitor resolution of 800x600 should be used. This results in a small black border around the edge of the video picture.

Initially, BTV Pro automatically chooses 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 65).

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 65).

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.

Keyboard shortcuts

There are many keyboard shortcuts available for control of a variety of different functions. All keyboard shortcuts are customisable and you can view and change them by selecting the ‘Keyboard shortcuts...’ item under the Settings menu.

Keyboard shortcuts can use any combination of the Control, Alt, and Shift keys with most other keys on the keyboard. The Apple key (sometimes called the Command key) cannot be used in keyboard shortcuts because it is reserved for menu items.

A few keyboard shortcuts are reserved and cannot be changed:

Holding the Control key and pressing a number cuts that many pixels off the edge of the video display. This is useful for cutting off any noise that appears at the edge.

Number keys on their own are used for selecting TV channels (if you are using an ixTV or TurboTV tuner card).

Part 3: 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 Pro 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 Pro and then open it with another video application. Also, BTV Pro can open any QuickTime movie made by any other 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.

If you have a movie that contains references to other files then all the files must be present for the movie to be played back properly. When you open such a movie BTV Pro attempts to find all the files; if any of the files cannot be found you will be asked to find them manually.

To make a movie self contained with no references to other files, select 'Save as...' from the File menu and turn on the 'Flatten' option.

BTV Pro creates references when you use copy-and-paste operations to edit movies (see page 40). It also uses references when it splits movie captures into several files (see page 28).

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 Pro. 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 57).

Fast Start movies

This is a method of saving a QuickTime movie in such a way that it can be played back from the hard disk at the same time as it is being downloaded from a network (such as the Internet). You can create Fast Start movies by using the 'Export Movie...' command from the File menu.

Streaming

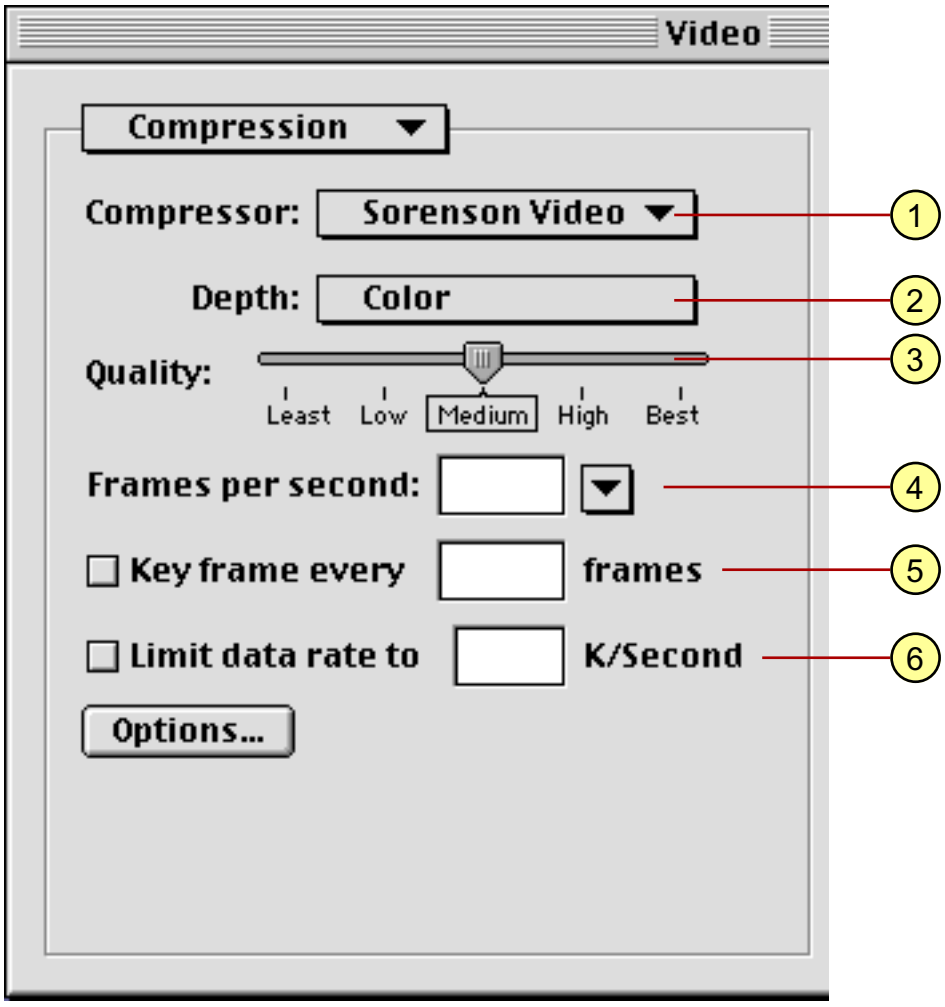
Streaming is the process of playing a movie while it is being received over a network from a remote location (for example, over the Internet). This is different from Fast Start movies; the streamed video is transferred over the network in real time and is not saved to the computer's hard disk. Streamed video is broadcast by a Streaming Server.

To create movies in BTV Pro that can be streamed by a Streaming Server, first choose suitable video and sound compression codecs (see pages 9 and 24). Then export the movie as a Hinted Movie. This adds an extra Hint Track to the movie that enables the Streaming Server to stream the movie over the network. To export the movie choose "Export movie..." from the File menu.

Part 4: Capture format settings

Video format settings

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 *com*pression and a *dec*ompression 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 whenever frames are being added to movies: normal video capture, adding individual frames to movies, motion detection capture and time lapse capture.

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 loose 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 looses 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 looses 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 is it 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. This frame rate applies to normal video capture as well as motion detection capture.

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 of 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 Pro 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

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 Pro 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.

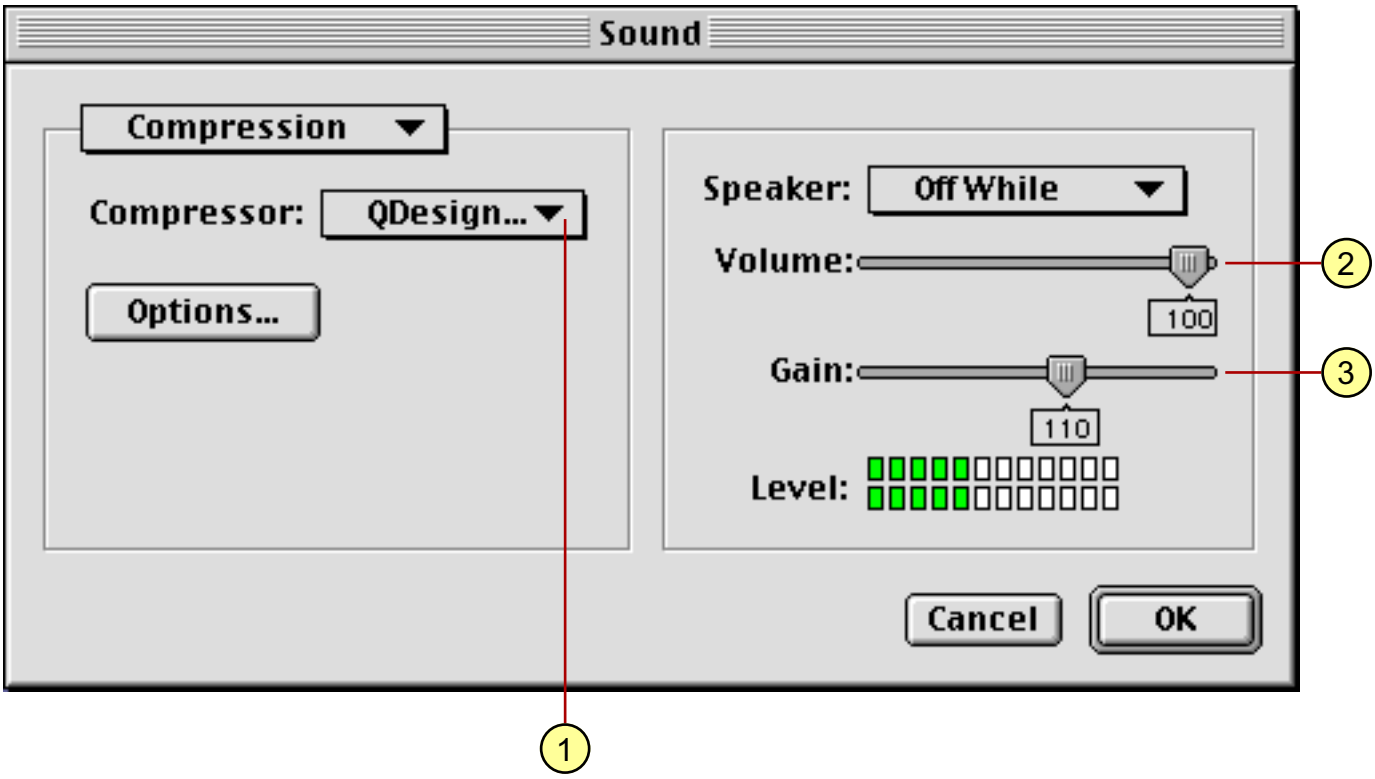
PNG
Designed as a replacement for the popular GIF file format (which is a very useful format but is protected by a patent so that any manufacturer of software that produces GIF files has to pay a licence fee to the inventors of the format). PNG works well for computer generated images with a limited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

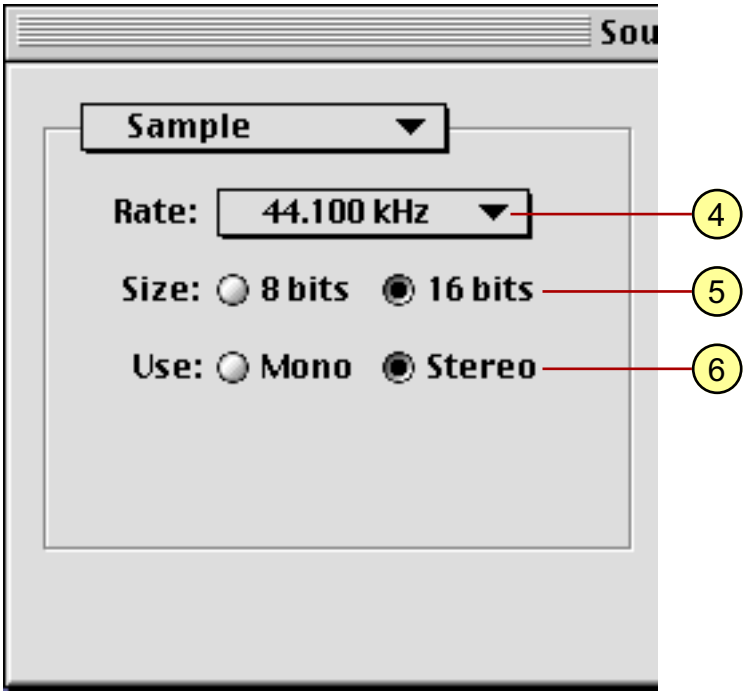
PSD (Photoshop)
This is the native file format for the very popular industry standard image editing application, Adobe Photoshop. Convenient to use if the images are to be imported straight into Photoshop after capture. Lossless compression, supports 8, 24 and 32 bit colour

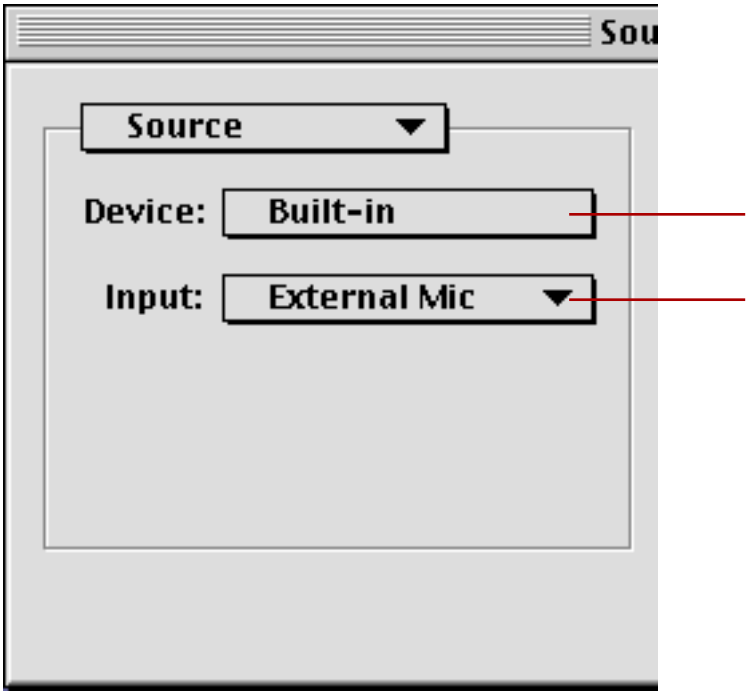
The JPEG, TIFF, PNG, BMP and PSD file formats are all commonly used on Windows PCs and so should be readable on any PC with graphics software, even if it does not have QuickTime installed on it. BMP and JPEG files should definitely be readable as these are standard formats on the PC. Make sure when transferring 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 setting

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 Pro 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.

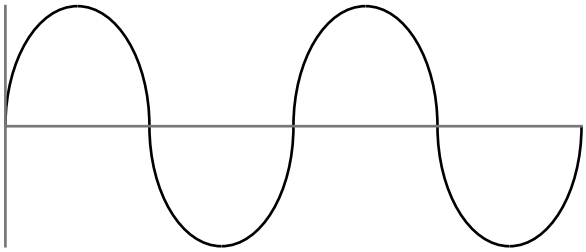
③ *Gain*

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.

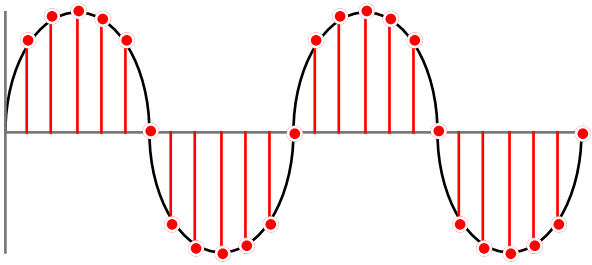
4 *Sample frequency*

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.

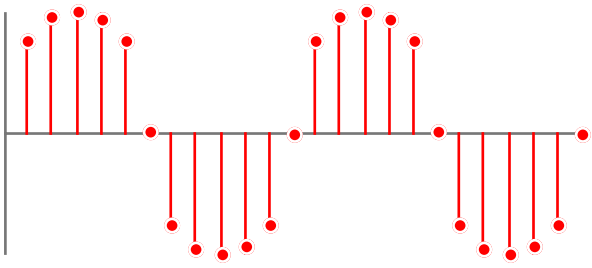
A sound wave might look like this:



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:



After sampling, the sound wave is represented by a series of discrete samples:



As you can see from above, the information between the samples is lost. The lower the sampling rate the more information is lost. This introduces noise 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 is 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

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.

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.

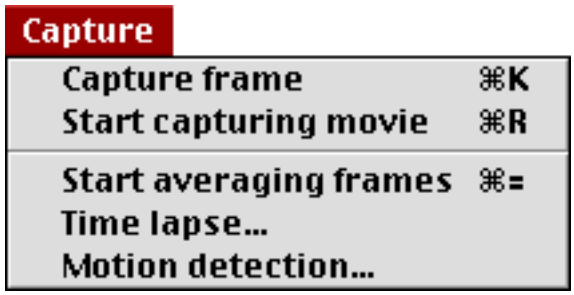
* The above compression setting require a lot of processing time, so if you are applying the compression on-the-fly as the movie is captured then you will get low frame rates unless you are using a very fast computer. In this case you can capture video in an intermediate format that is quick to compress, and then use the Export command (under the File menu) to compress the movie to your final compression settings.

As an intermediate format you can use Component Video, Animation (at maximum quality), Video (at high quality), or Motion JPEG A (at high quality) for video compression, and no sound compression.

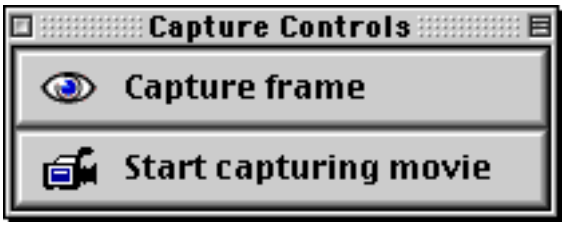
Remember when sending files to a Windows PC to include the three letter file extension that tells the PC what type of file it is. For JPEG files the extension is .jpg and for movie files the extension is .mov. BTV Pro can add these file extensions for you if this option is turned on in the preferences (see page 57).

Part 5: Capturing Movies and images

All options for capture are available from the Capture menu:



There is also a floating window that contains frame capture and movie capture controls. This is available from the Window menu:



Capturing still images

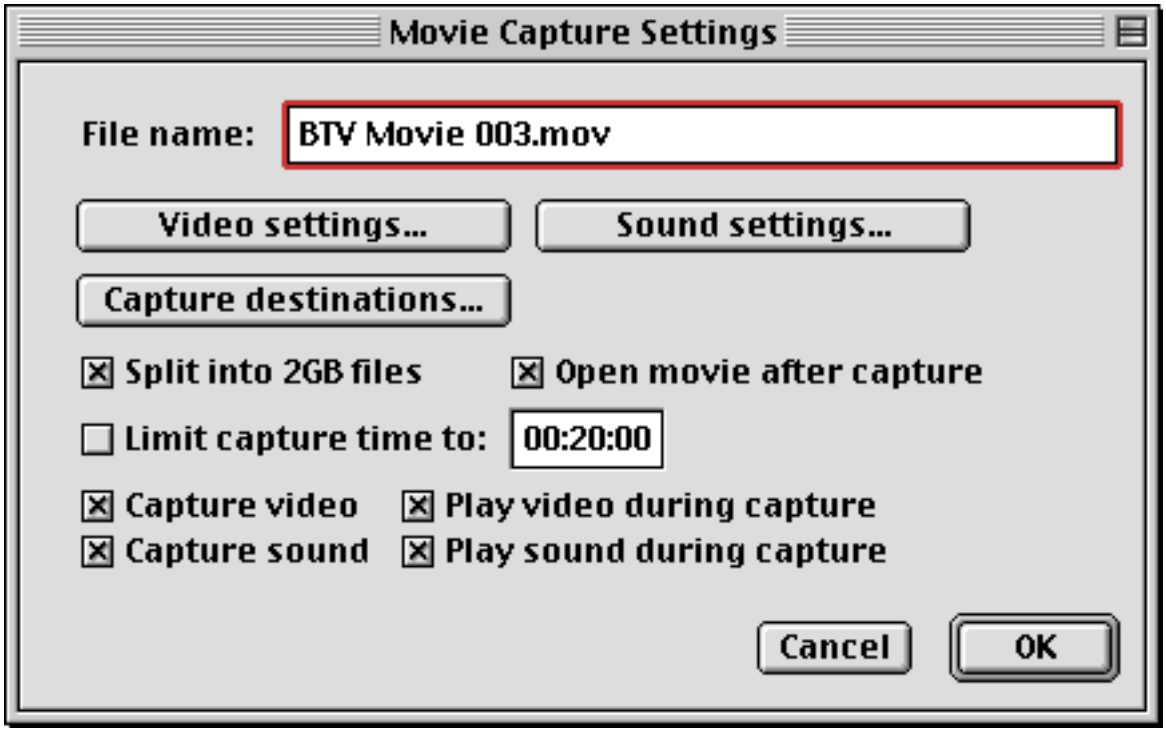
When you choose ‘Capture frame’ from the Capture menu or from the floating window, an image is captured from the video input and saved straight to the hard drive with an automatic name and destination. The destination and naming settings that you have defined in the preferences are used (see page 59).

Alternatively, when the video input window is at the front, choosing ‘Save’ or ‘Save as...’ from the File menu will display a window allowing you to choose a destination for the file, as well as the file format and other options.

Capturing QuickTime Movies

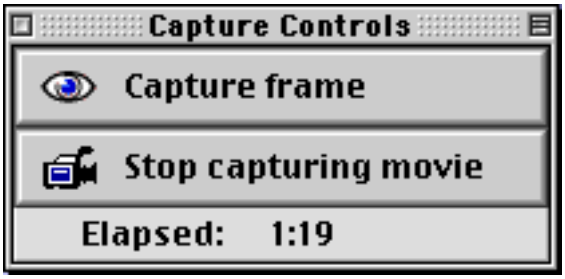
When you start capturing a movie it is saved to the destination(s) that you have supplied and an automatic name is created for it. For information about adjusting the movie capture settings see the preferences (page 61).

There is an option in the preferences to display a settings window before every capture. This allows you to adjust all the capture settings before every capture:



These settings are the same as the movie capture settings available in the preferences. For more information about any of these settings please see the preferences section of this manual (page 61).

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.

Frame averaging

The frame averaging feature takes a number of frames from the video input and blends them together to produce a single image. This can eliminate noise on a still image capture and is useful in a number of situations such as capturing noise-free still images from a digital camera, capturing clean images from a noisy VHS video, or even to remove a moving element in a video sequence (for example, if a sequence of video shows a street with a person walking down it then averaging all the frames removes the person and reduce any video noise in the image of the street).

Frame averaging works because the image is constant but the noise is quickly varying so over many frames it averages to zero. See the following examples:

A TV signal with bad reception.

Averaged over 40 frames

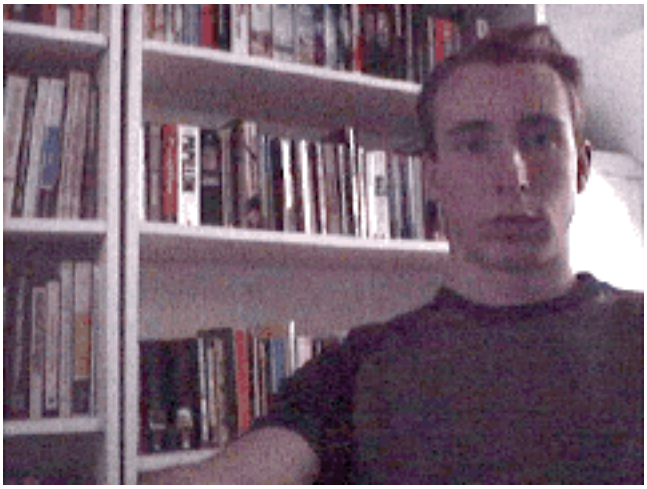
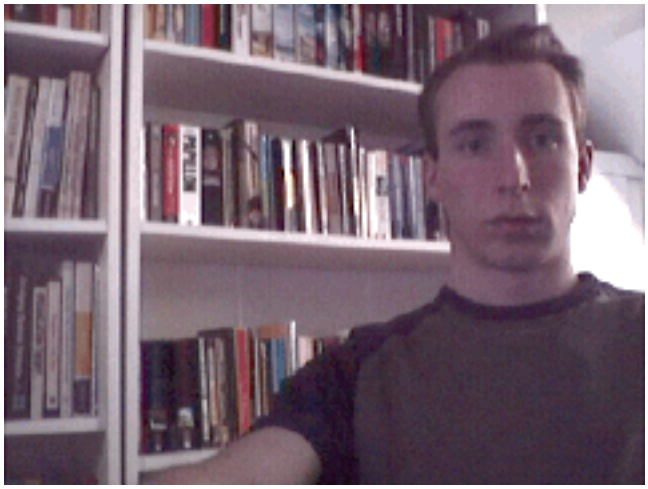


Image from a USB digital camera in low light



Averaged over 50 frames

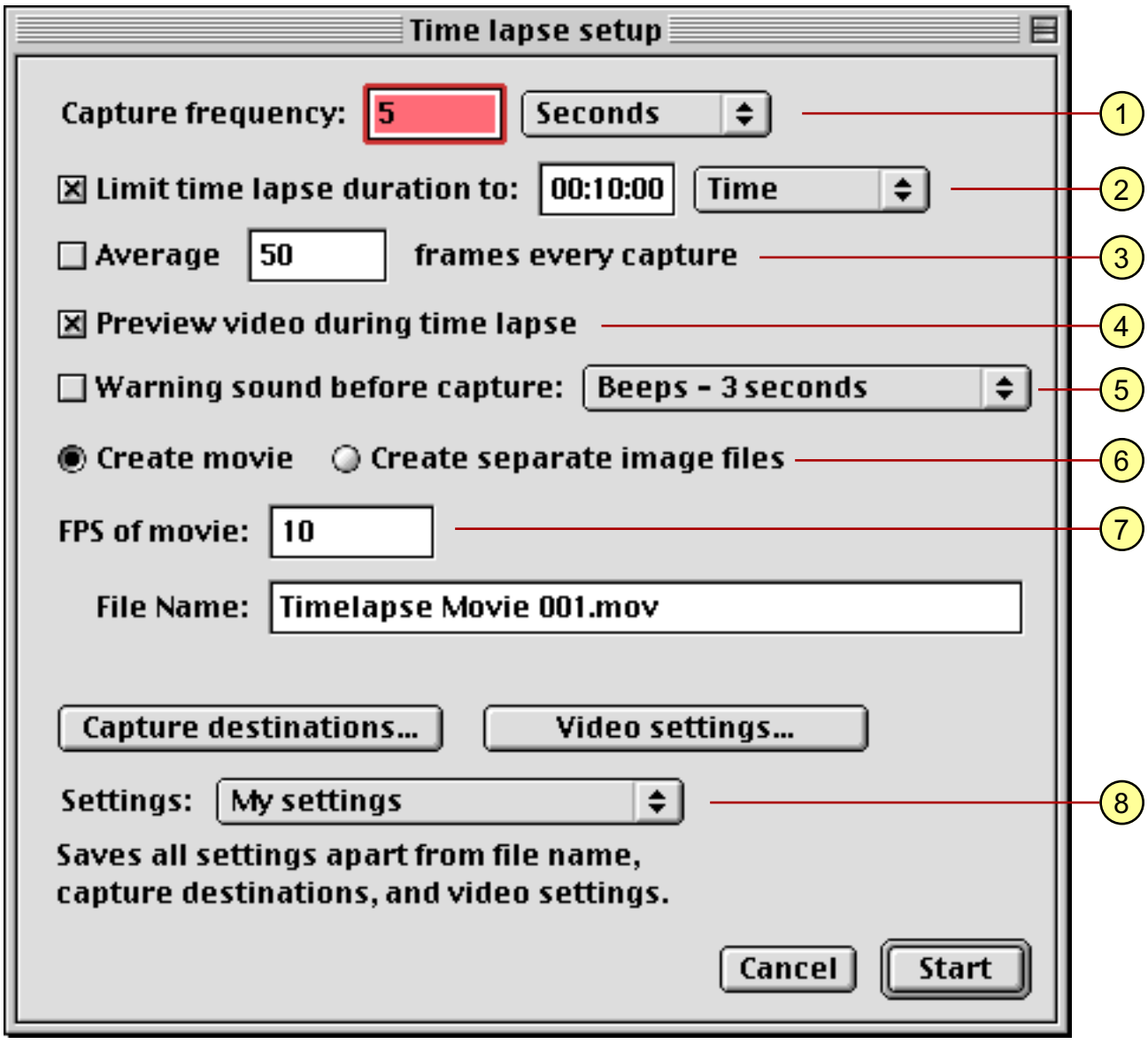
It is also worth noting that due to the removal of noise the file size of the averaged image is often significantly smaller than the size of the normal still capture.

The number of frames used for averaging is adjustable in the preferences (see page 59).

BTV Pro also has a feature to average a number of frames in a movie rather than the live video input. This gives more control over exactly which frames are used in the averaging process. To do this, select a portion of an open movie and select ‘Average selected frames’ from the Movie menu. For more information about manipulating QuickTime movies see page 38.

Time lapse capture

The time lapse feature schedules the capture of a number of frames over a period of time at precise intervals. To start a time lapse select ‘Time lapse...’ from the Capture menu; you will get this setup window:



1 **Capture frequency**
This determines how often a frame is captured. From the popup menu you can choose either ‘Time’ to enter the time between captures in the format hours:minutes:seconds, or ‘Seconds’ to enter the number of seconds between captures.

(2) **Time lapse duration**
You can choose to limit the duration of the time lapse. From the popup menu you can choose either ‘Time’ to enter the duration in the format hours:minutes:seconds, or ‘Frames’ to enter the number of frames that you want to capture. If you do not limit the duration then the time lapse will continue until it is stopped manually.

(3) **Averaging**
You can choose to average a certain number of frames every capture. If the averaging goes on too long (longer than the time between frame captures) it will be stopped so that the time lapse does not get behind schedule.

(4) **Preview**
This option controls whether the video is played to the window during the time lapse capture. Turning this option off shortens the time it takes to average frames and slightly increases the accuracy of the time lapse.

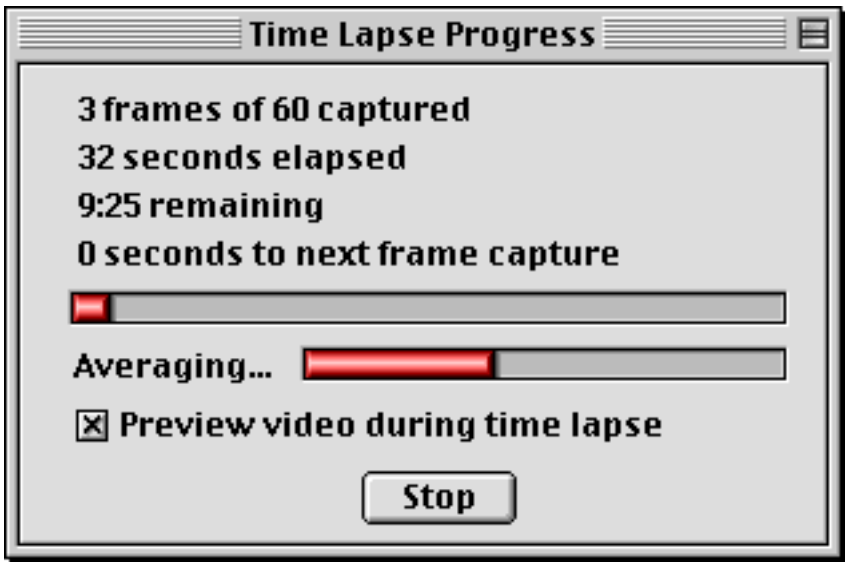
(5) **Warning sound before capture**
If this option is on BTV Pro will play an audio warning before each frame capture. From the popup menu, you can choose either a vocal countdown (“three, two, one”), or a number of beeps before the capture.

(6) **Create movie / separate image files**
You can choose to create either a movie with the captured frames, (in which case the normal movie capture settings are used) or you can choose to create separate image files (in which case the normal frame capture settings are used).

(7) **FPS of movie**
If you are creating a movie, this defines the FPS (frames per second) of the frames in the created movie.

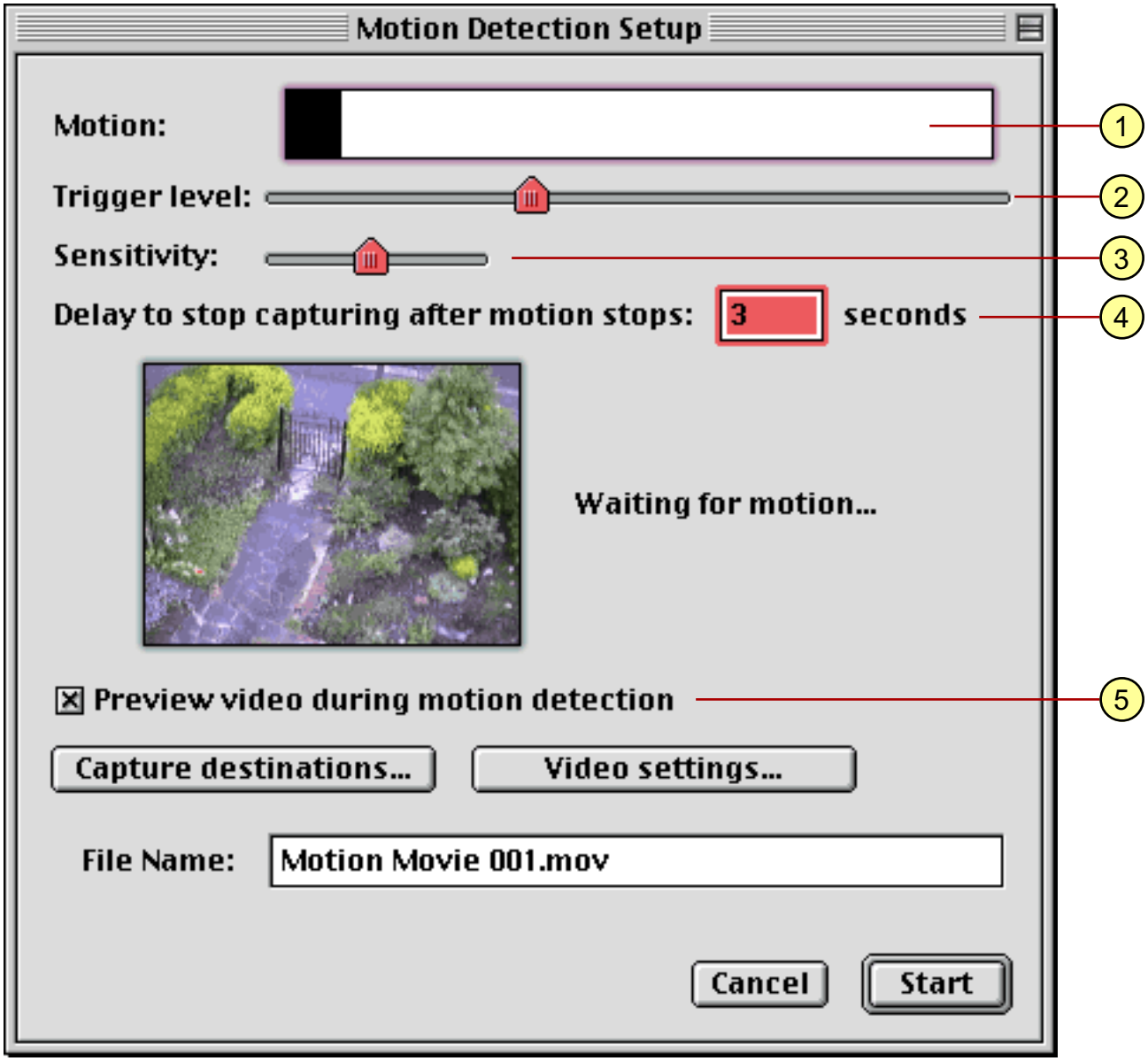
(8) **Settings**
This popup menu allows you to create sets of different time lapse settings.

During the time lapse there is a progress window like the one below that shows you the number of frames captured, elapsed time, remaining time, countdown to next frame, and averaging progress (if you are averaging frames every capture). There is also an option to turn on and off preview at any time during the time lapse:



Motion detection

This feature constantly analyses the video input and only captures video when there is motion. To start a motion detection capture select ‘Motion detection...’ from the Capture menu; you will get this setup window:



1 **Motion bar**
This bar indicates the amount of motion in the video.

2 **Trigger level**
When the amount of motion in the video goes above this trigger level video is captured.

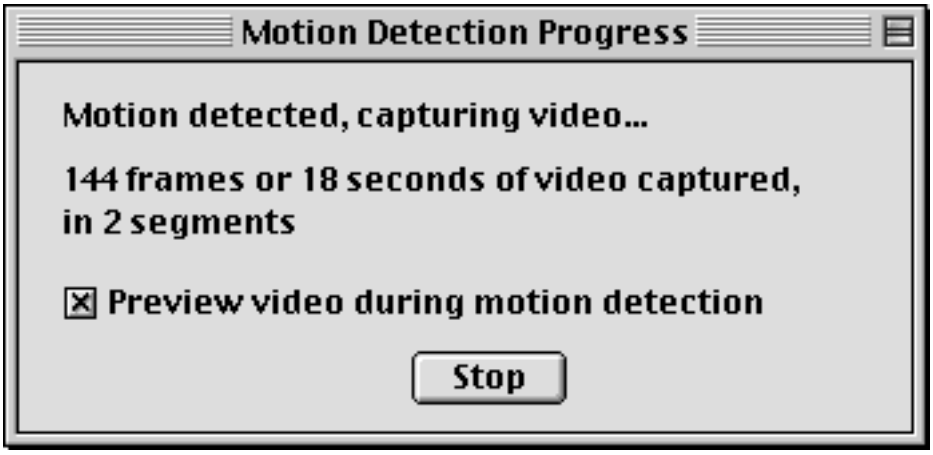
③ **Sensitivity**
Increasing the sensitivity produces a larger effect for the same amount of motion. At the highest setting it is extremely sensitive, so very small amounts of motion can be detected.

④ **Delay to stop capturing**
Once motion is detected and video is being captured, this delay controls how long to wait before stopping the capture after the motion has stopped.

⑤ **Preview**
This option controls whether the video is played to the window while it is captured. Turning this option off gives you better responsiveness and capture performance.

When motion is detected, video is captured at the frame rate and with the compression settings specified in the Video Settings window (click the 'Video Settings...' button in the motion detection window above for these settings). Since analysing the image for motion requires quite a lot of processing time a fast computer is needed to get a high frame rate.

During the motion detection, a progress window displays the number of frames captured, the amount of time captured, and the number of separate segments. There is also an option to turn on and off preview at any time during the motion detection:



Video capture performance

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).

• 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 9). 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.

• If you are using compression codecs that require a lot of processing time (such as Sorenson video) then you will get a low frame rate when using them for on-the-fly compression. In this case you can capture video in an intermediate format that is quick to compress, and then use the Export command (under the File menu) to compess the movie to your final compression settings.

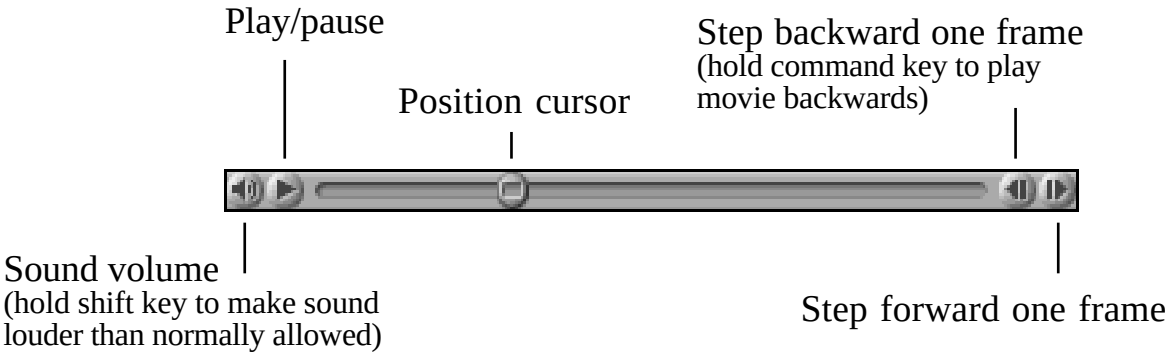
• When you capture video make sure that BTV Pro is the only application loaded, and that you have a minimum number of third party (non-Apple) extensions installed on your computer. You can disable extensions using the Extensions Manager (in the Control Panels folder under the Apple Menu).

• 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.

Part 6: Manipulating movies and images

Opening QuickTime movies

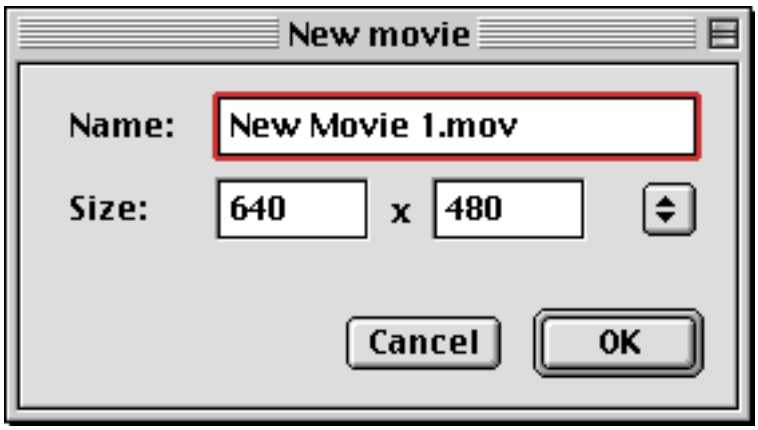
You can open a movie file by using the open command in the file menu, by dragging a movie file onto the BTV Pro icon in the Finder, or by capturing a movie from the video input. When you open a movie it is displayed in its own window with a QuickTime controller. The appearance of the controller depends on what version of QuickTime is installed on your computer, but the functionality is be the same. It will look something like this:



You can use the arrow keys on the keyboard to step through the frames of the movie, and the space bar to start and stop the movie. There are also shortcut keys to fast forward and rewind the movie - choose ‘Keyboard shortcuts...’ from the Settings menu for a list of all keyboard shortcuts.

Creating QuickTime movies

You can create a new movie by selecting ‘New movie...’ from the File menu. This window is displayed allowing you to name the movie and set the dimensions:



The pop up menu on the right contains some common movie sizes for convenience.

When a new movie is created it uses a temporary file on the scratch disk. You can choose which of your hard disks is used for the scratch disk in the preferences. This temporary file is needed to store any data that you add to the movie, and is not needed after you save the movie normally.

Saving and Exporting QuickTime movies

By default, movies are saved normally, possibly containing references to other movies (for more information about references see page 7).

When you choose ‘Save as...’ from the file menu to save a movie, there is an option called ‘Flatten’. If this option is checked then the references in the movie are resolved and the resulting movie is entirely self-contained, with no references. Saving the movie in this way has the added advantage that all tracks are re-interleaved for optimum playback performance and any unused data in the movie is removed.

For information on how to save individual frames from a movie, see ‘Saving and exporting image files’ on page 43.

Copy-and-paste editing

You can edit movies using simple copy-and-paste or drag-and-drop operations. To select a portion of a movie hold down the shift key as you drag the position cursor or as you step through frames:

Now a portion of the movie is selected and you can use the copy command (in the Edit menu) to copy it to the clipboard, and the paste command to paste it into another movie (or to a different place in the same movie). Alternatively you can drag and drop from one movie to another.

When you edit in this way, you are placing references to the source movie into the destination movie, rather than the actual movie data itself. If you need to reuse portions of the same movie several times, using references saves disk space. The disadvantage with using references is that movies may not play properly if they refer to other movies that are missing. for more information about references see page 7.

Stop-motion animation

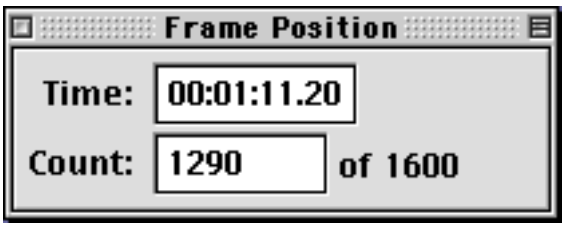
To make a stop-motion animation in BTV Pro simply create a new movie and start adding frames to it. There is an option in the Movie menu to add frames, or there is a keyboard shortcut available so that you can add a frame to a movie with a single keypress (go to ‘Keyboard shortcuts’ under the settings menu to see and adjust the keyboard shortcuts).

When you add a frame to a movie it is compressed using the compression settings set in the Video Settings window (under the Settings menu). Note that if you choose the compression codec that is supplied by your video input hardware then no recompression is performed; the raw data directly from the video input hardware is added to the movie. This is mainly relevant for DV sources: in this case, if you choose DV compression in the Video Settings window, then no recompression is performed when adding frames to a movie. This ensures that there is no image degradation when adding frames. To see if your video input hardware supplies compressed video select ‘Video hardware information...’ under the Apple menu - this displays the default codec.

Frames are added to movies with the fps (frames per second) set in the preferences (see page 61).

The Frame Position floating window

If you select ‘Frame Position’ from the Window menu this floating window appears displaying time code and frame count:



The time code is in the format hours:minutes:seconds.frames. This information is updated as the movie is played or as the movie position cursor is dragged.

You can enter a time value or frame count into this window to jump to a specific time in the movie.

The frames value displayed in the timecode is calculated from the fps you have specified in the preferences (see page 61).

Note that when this window is open movie playback will be slower since calculating the frame count takes time.

The undo command

An undo/redo feature is available (from the Edit menu) for any edit function that is performed.

It should be noted however that if you add a frame to a movie and then use the undo function, the frame is removed from the video track but the actual image data remains (unused) in the movie file. To remove all unused data from the movie file go to ‘Save as...’ in the File menu, turn on the ‘Flatten’ option, and save the movie.

Output to FireWire

If your computer has a FireWire connection and you have a DV camcorder that supports DV input then you can output a DV stream to the camcorder via FireWire.

You can turn on and off output to FireWire using the ‘Output to FireWire’ option in the Movie menu. When output to FireWire is on then there are two additional options in the Movie menu:

• Also play to window: plays the movie to the window as well as to the camcorder. Turning this option off increases performance.

• Sound on: outputs sound to the camcorder as well as video.

Opening image files

BTV Pro can open image files of many different formats including PICT, JPEG, GIF, Photoshop, TIFF, PNG and BMP. You can then copy and paste them into movies and they are automatically resized and recompressed before being added to the movie.

Saving and exporting image files

BTV Pro can save image files in many different formats including PICT, JPEG, Photoshop, TIFF, PNG and BMP (the number of formats available depends on the version of QuickTime that you have installed on your computer).

To save an open image choose ‘Save’ from the File menu, and to export an image file (either from an open movie at its current position or from an open image) choose ‘Export image...’ from the file menu.

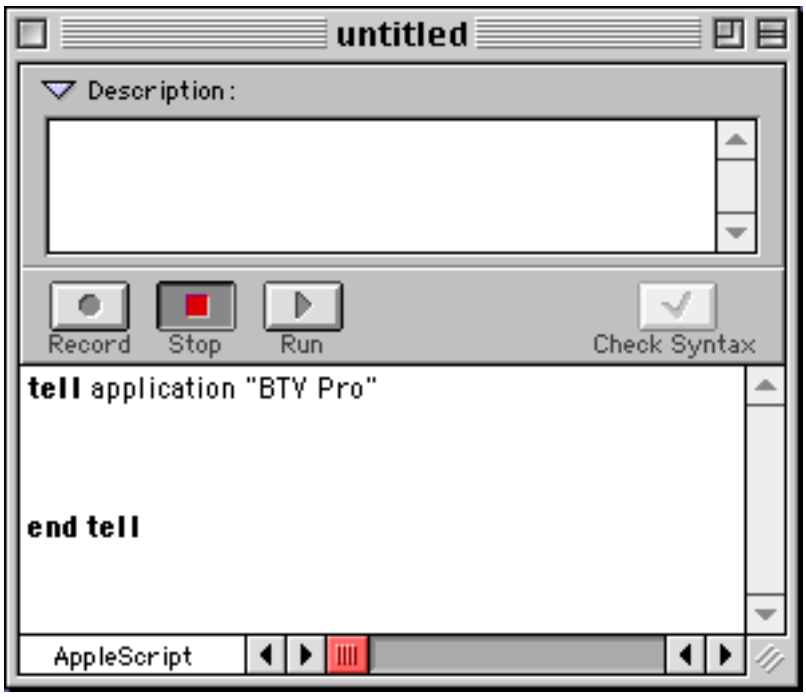
You will be able to set the file format and other settings relating to the file format (such as quality setting for JPEG images, for example). The only difference with saving and exporting is that the image is open after it is saved, but it is not opened after it is exported.

Part 7: 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 Pro. 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 Pro. Everything you want to tell BTV Pro goes between these commands.



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

Concepts

An **object** is any distinct item that can be modified or interrogated using AppleScript. Movies, images and windows are objects.

Each object has a number of **properties**. Each property defines a different characteristic of the object. For example the window object has properties including name and position.

Objects can be referred to by name or by number. Whenever you open a movie or an image it is assigned a unique number so that it can be identified. Also, each window has a unique number.

To make things easier, “movie 0” refers to the most recently opened movie, “image 0” refers to the most recently opened image, and “window 0” refers to the video input window. So if you are working with only one movie (or image) at a time then you don’t have to worry about the numbers.

If you are working with more than one movie (or image) at a time then you can either refer to the movies by name or by their unique number. An easy way to get the movie number is to remember the return value from the open command:

```
set movieNum to (open file “Hard disk:Movie name.mov”)
```

Launching BTV Pro

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

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

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

General commands

quit

Tells BTV Pro to quit. If there are open movies that need to be saved BTV Pro displays a window for each movie asking if you want to save it before quitting. To prevent the display of these windows you can specify a saving method when issuing the quit command. The three possibilities are:

```
quit saving yes
quit saving no
quit saving ask
```

open

Tells BTV Pro to open a file (it could be a movie file or an image file). For example:

```
open file “Hard disk:Documents:Movie1.mov”
open file “Hard disk:Documents:Image1.jpg”
```

The open command returns the movie number if you opened a movie, or the image number if you opened an image.

save

Tells BTV Pro to save a movie, for example:

```
save movie 1
save movie “Movie name”
```

close

Tells BTV Pro to close an object. The object can be a movie, an image, or a window. For example:

```
close movie 1
close window 0
```

When closing a movie you can specify a saving method:

```
close movie 1 saving no
```

print

Tells BTV Pro to print an object. The object can be a movie, an image or a window.

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, for example:

```
capture frame
capture frame as “Hard disk:image1”
```

copy

Copies a frame from the video input to the clipboard (scrap). This only works if BTV Pro 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.

add frame to

Adds a frame to a movie from the video input, for example:

```
add frame to movie 0
```

play

Plays a movie, for example this plays the most recently opened movie:

```
play movie 0
```

stop playing

Stops playing the movie that is currently playing. You do not need to specify the movie.

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”
```

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)
```

The convert command

The times for some of the properties of movies are expressed as a list of format {hours,minutes,seconds,frames}.

If you want to deal with seconds or frame numbers instead of this time format, you can use the convert command to convert this time format to and from a number of seconds, and to and from a number of frames. For example:

```
convert time {0,3,0,10} in movie 0 to seconds
```

This returns the number of seconds that corresponds to the time 3 minutes and 10 frames in the movie.

```
convert time {0,10,0,0} in movie 0 to frames
```

This returns the frame number that corresponds to the time 10 minutes in the movie.

You can also use the convert command to convert between seconds and frames, for example:

```
convert frame number 100 in movie 0 to seconds
```

This returns the number of seconds corresponding to the frame number 100 in the movie.

The convert function is useful for setting the current time of the movie when you want to easily set a particular frame number or a particular number of seconds. For example:

```
set current time of movie 0 to (convert frame number 200
in movie 0 to time)
```

The get and set commands

These commands are used to get and set the properties of an object. To view all properties for the objects go to Script Editor, choose 'Open Dictionary...' from the File menu and select BTV Pro. Below are some examples of commands that involve common properties that are likely to be useful:

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}

Playing Movies

This can be done with the play movie command (described above), but also each movie has a play status property that is true if the movie is playing or false if it is not. This can be used to check if a particular movie is playing, or to start and stop a movie. The following example stops movie 0 if it is currently playing, and starts it if it is not currently playing:

```
if (get play status of movie 0) is false then
        set play status of movie 0 to true
else if (get play status of movie 0) is true then
        set play status of movie 0 to false
end if
```

Setting the current time of movies

Each movie has a current time and a current seconds property. The current time property is expressed as a list of format {hours,minutes,seconds,frames}, the current seconds property is expressed as a number of seconds. You can convert between the different formats using the convert command. For example:

```
set current time of movie 0 to {0,10,2,0}
set current seconds of movie 0 to 0
set current time of movie 0 to {0,0,0,0}
set current time of movie 0 to (get duration of movie 0)
set current time of movie 0 to (convert frame 100 in
movie 0 to time)
```

Setting FireWire output status

Each movie has a firewire output status property that can be set to true or false to turn on and off output to FireWire for the movie. To use this property the movie must contain a DV stream and your computer must have FireWire output hardware.

```
set firewire output status of movie 0 to true
set firewire output status of movie 0 to false
```

There are two further options for FireWire output, defined by the firewire output preview status and firewire output sound status properties. The firewire output preview status property defines whether the video is played on the computer as well as output to FireWire, and the firewire output sound status property defines whether the sound is also output to FireWire with the video:

```
set firewire output preview status of movie 0 to false
set firewire output sound status of movie 0 to true
```

Setting the loop status of movies

Each movie has a loop status setting that defines if the movie is set to loop or not. If true, the movie will start again from the beginning when it gets to the end.

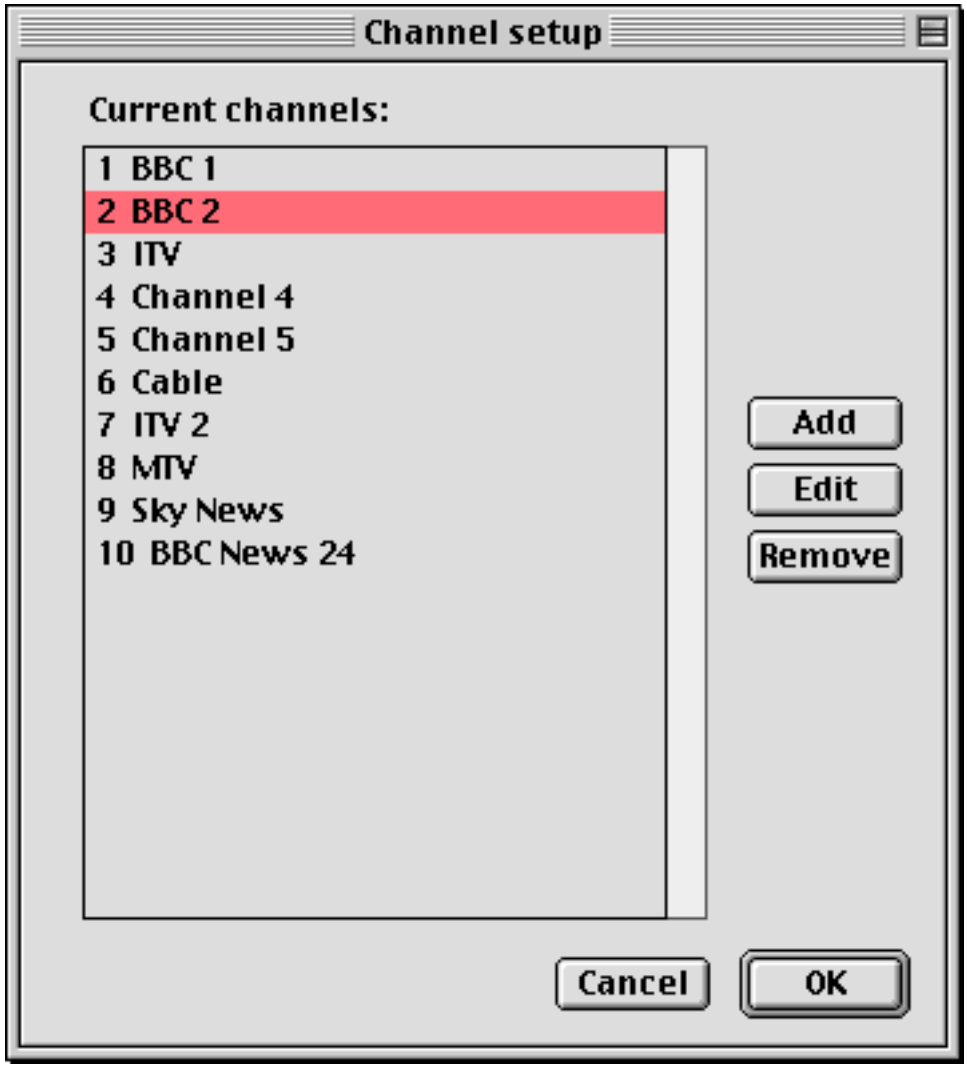
```
set loop status of movie 0 to true
set loop status of movie 0 to false
```

Part 8: Channel changing with the ixTV card

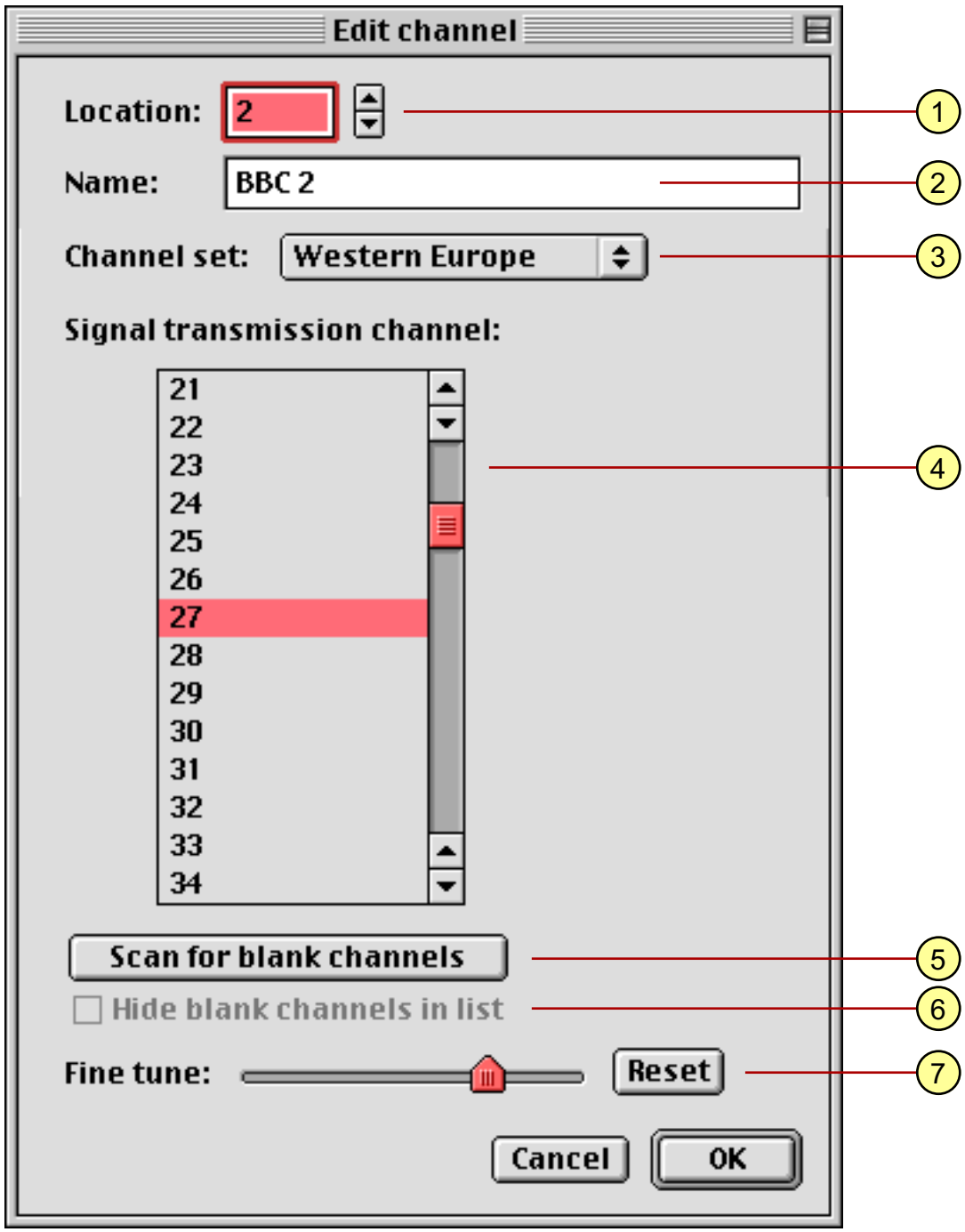
If your video input is an ixMicro ixTV, ixTV/FM, or TurboTV tuner card there will be an extra menu in the menu bar called ‘Channel’:

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*

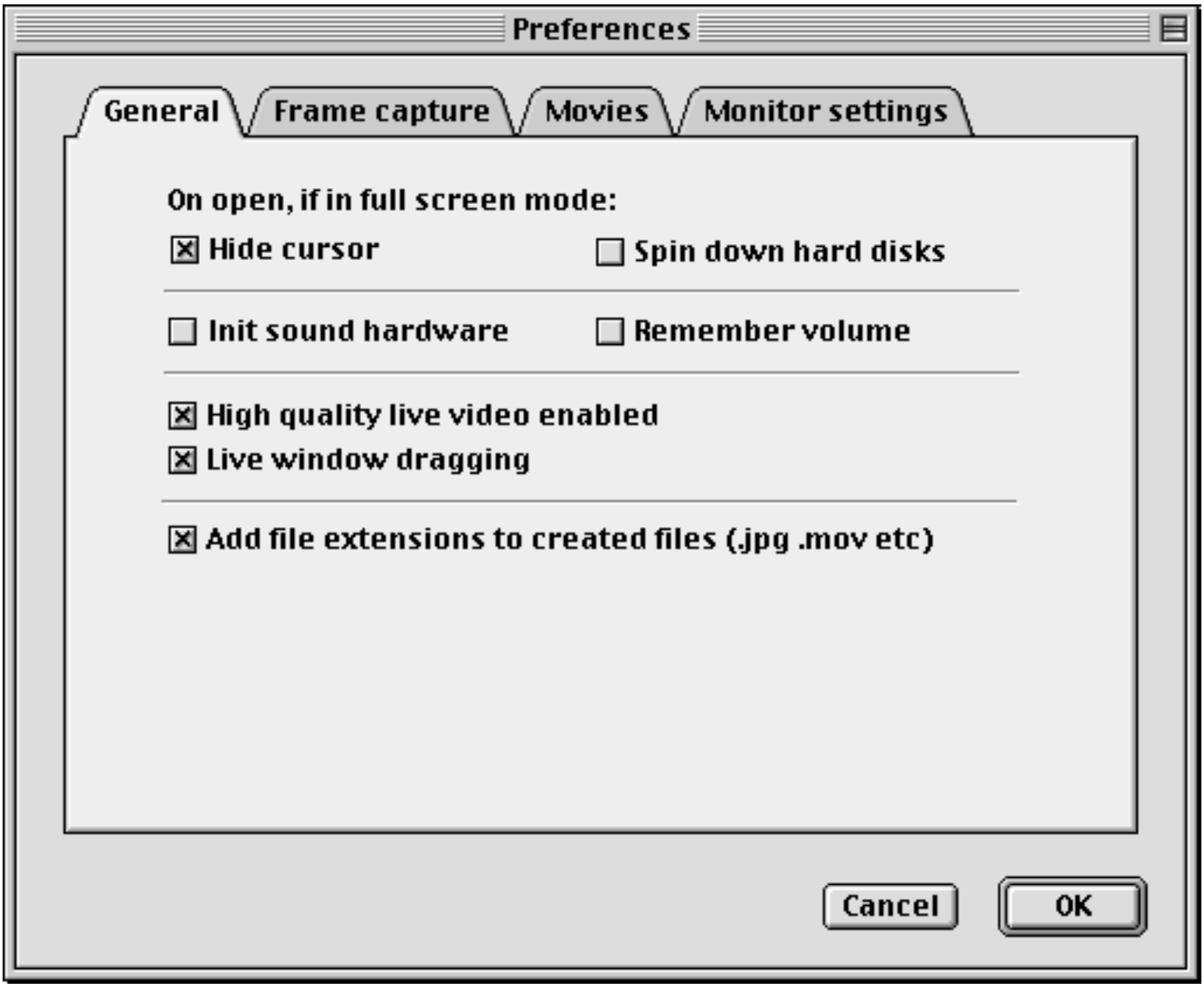
Use this function to adjust the tuning to get the best possible video and sound quality. Hold down the Apple (command) key while using this control to adjust the fine tune twice as much as normal.

Part 9: Preferences

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

- General
- Frame capture
- Movies
- Monitor settings

General



Hide cursor
If this option is on then the mouse cursor is hidden when BTV Pro is opened in full screen mode.

Spin down hard disks
If this option is on then the computer's hard disk(s) is spun down when BTV Pro is opened in full screen mode.

Init sound hardware
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.

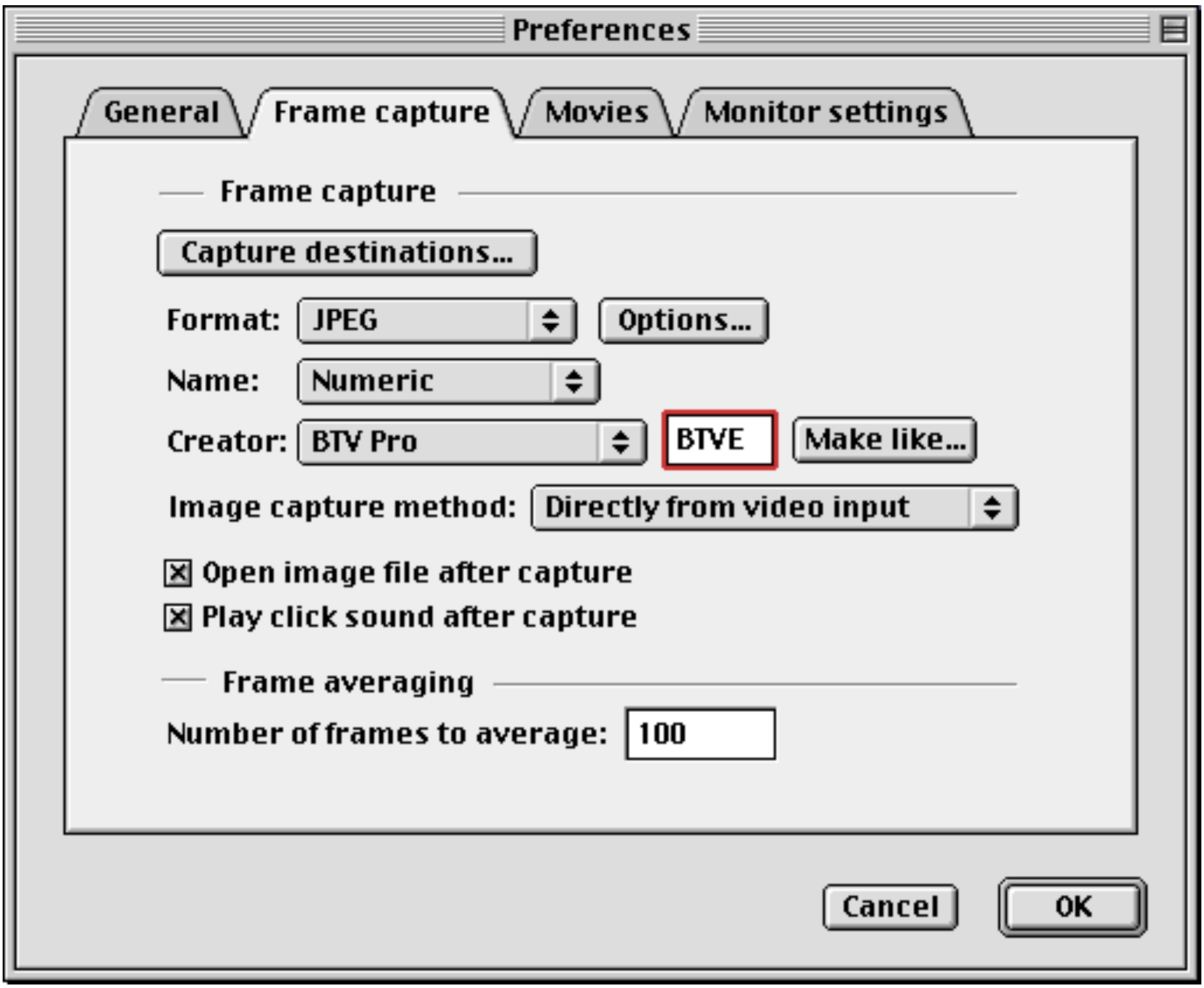
Remember volume
This option controls whether the computer speaker volume is to be remembered the next time you use BTV Pro.

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.

Add file extensions
When this option is on BTV Pro 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.

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 17.

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 “999”.

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).

• Directly from video input: Uses a faster method than the standard QuickTime frame grabbing method to capture an image. Use this instead of the above if it works reliably on your hardware.

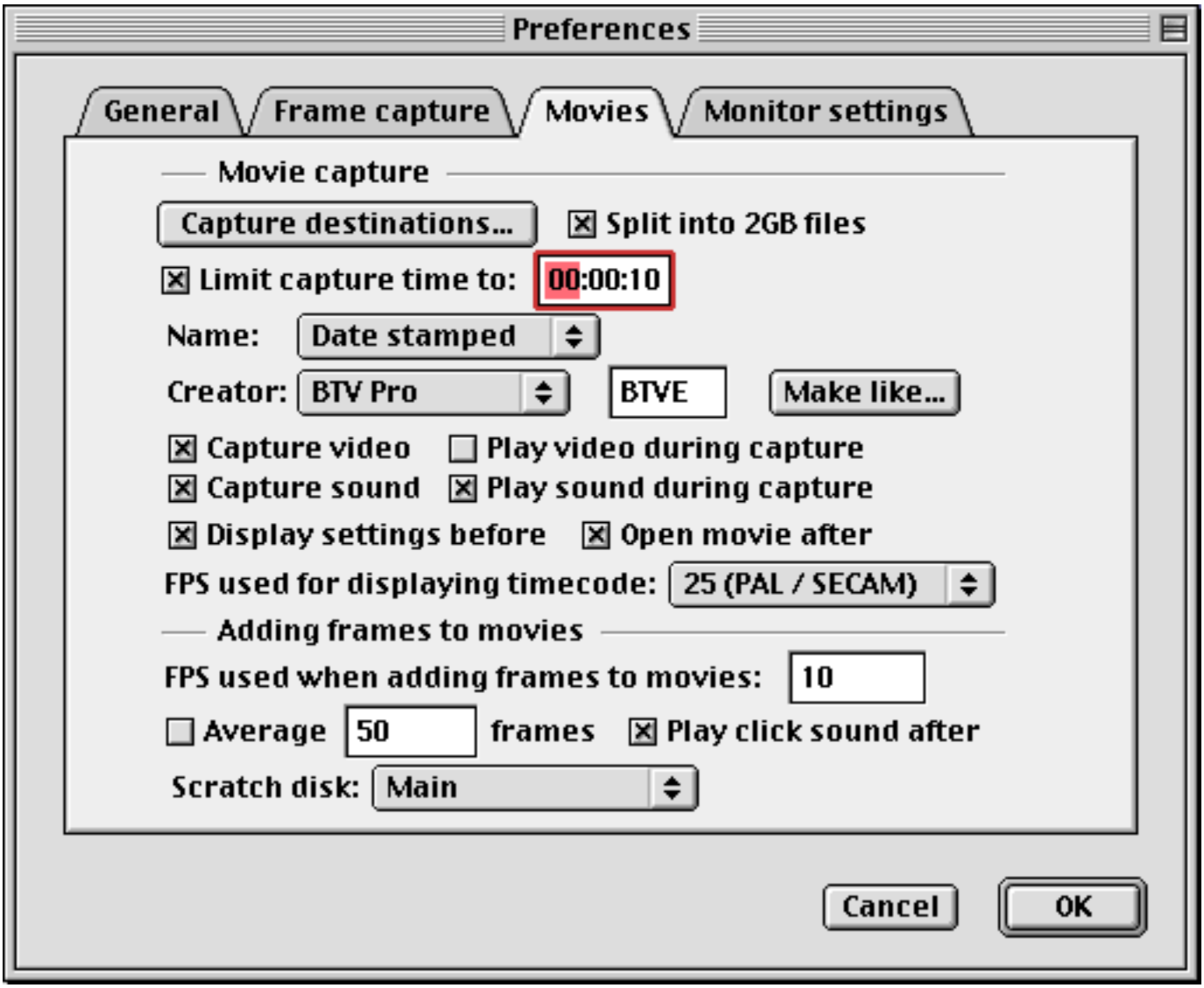
• Directly from screen: Captures the image directly from the screen. This is very fast but if there are other windows in front of the video, or the video is partially off screen at the time of the capture, then this affects the captured image. You can use this method to capture frames even during a movie capture; since the image comes from the screen it doesn’t affect the video input at all.

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.

Number of frames to average
Determines the number of frames used for the frame averaging feature. Enter 0 to average frame indefinitely.

Movies



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.

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 very 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.

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.

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 “999”.

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.

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).

Display settings before
When this options is on all capture settings are displayed and can be adjusted before every movie capture.

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

FPS used for displaying timecode
Time code is displayed in the Frame Position window in the form hours:minutes:seconds.frames. This fps setting is used to calculate the frames value in the timecode. Set this depending on what video format you are using (PAL and SECAM use 25 fps, NTSC uses 29.97 fps).

FPS used when adding frames to movies
This FPS setting is used whenever a frame is added to a movie; it defines the duration of the added frame.

Average
You can turn this option on and enter a value to average a certain number of frames when an image to a movie. This is useful for creating animations with clean, noise-free frames.

Play click sound after
If this option is on then a click sound is played whenever you add a frame to a movie.

Scratch disk
If you have more than one hard disk connected to your computer this pop-up menu allows you to choose the disk that is to be used for temporary files. A temporary file is used whenever a new movie is created (such temporary files are not used for normal video capture).

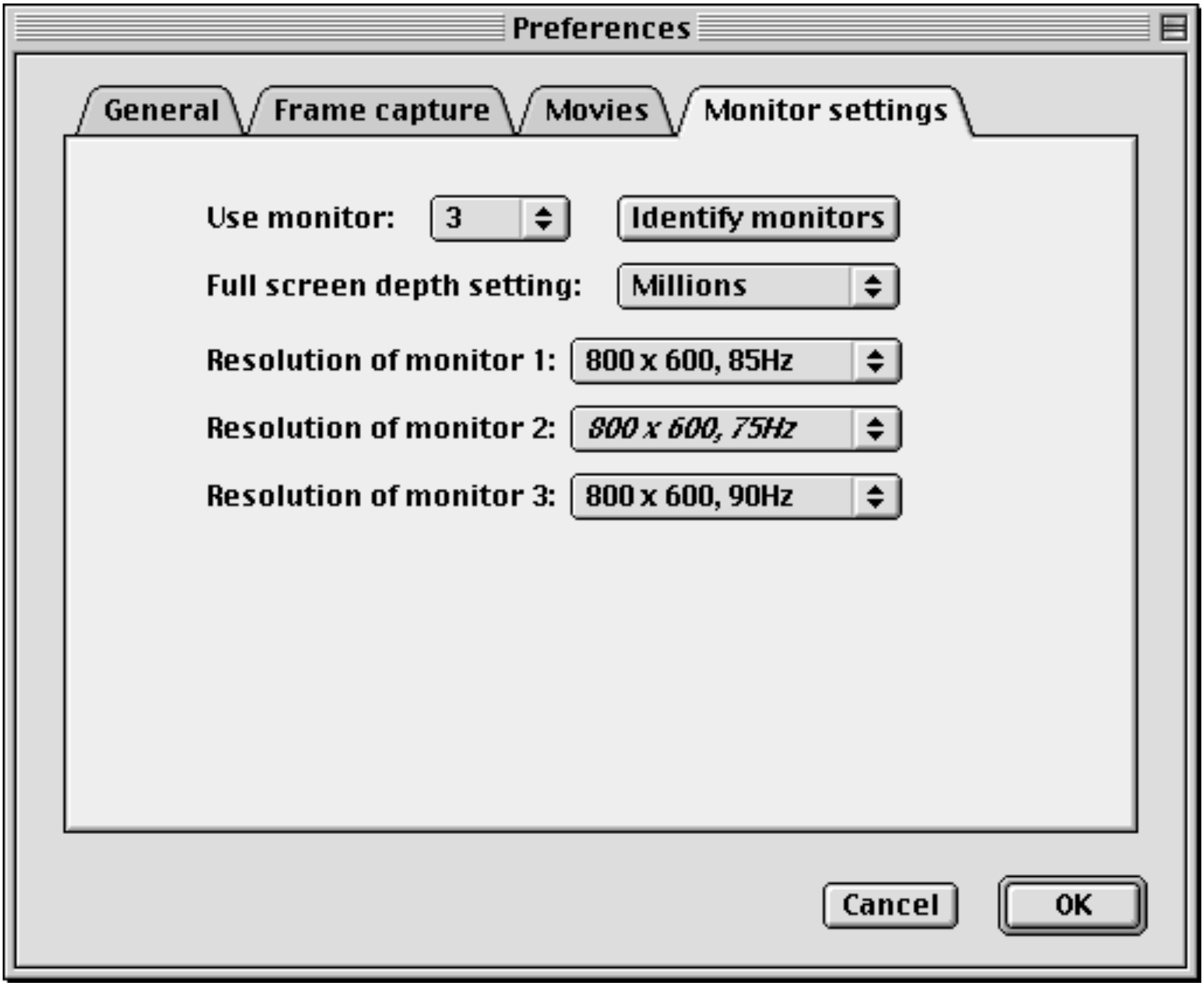
Capture destinations

This window is available from the frame capture options and movie capture options in the preferences, as well as in the Time Lapse and Motion Detection setup windows. 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



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.