

## Workshop: Video editing with Broadcast 2000c

# THE FINE ART OF CUTTING

In this workshop Tim Schürmann shows us how to edit videos once they've been transferred onto a Linux system. For this we'll be using the free video editing program Broadcast 2000c.

To stave off the boredom that the mere mention of holiday videos instils, it's a good idea to enhance your video before inviting the in-laws round to watch it. Since modern cameras usually store films in digital form, it seems like a good idea to transfer them into the computer and edit them there. By making use of the corresponding video editing programs, videos can also be professionally enhanced by adding a few skilfully placed effects.

Under Linux, there are now two video editing systems courting the favour of users. One is the relatively simple to use, commercial program MainActor from the company MainConcept (<http://www.mainconcept.de>). The competing candidate goes by the name of Broadcast 2000c and is now available in its third version. Unlike MainActor, Broadcast 2000c is in fact available free on the Internet. It may not be quite so simple to use, though, which is a good enough reason for a little workshop, to help make your first tentative steps into Broadcast a bit easier.

### Requirements

To be able to use Broadcast you will first need a video source. This can be a video camera or a video recorder. Your computer will also need to have a suitable hardware interface. Broadcast can cope with both TV cards for **analogue** sources and FireWire cards for **digital** sources. In either case Linux must support the corresponding hardware.

If you wish to use an analogue camera or a video recorder, the way to go is to use a TV card. You should find how to operate this under Linux in the manual for your distribution under the heading of "Installing the TV card". Incidentally, unlike MainActor, Broadcast is unable to edit video materials read in by *dvgrab*.

On the software side you will need XFree86, which should not be Version 4.0.0. Users of SuSE Linux 7.0 will be affected by this problem; the only remedy for this is to change to a different version (e.g. the older version 3.x). Otherwise Broadcast refuses to start. You may need to consult the documentation on your distribution about this. Furthermore, the

Enlightenment Sound-Daemon (the package *esound*) must be installed on your system. This software should not only come with all the most common distributions, but should also be installed as standard.

### Installation

Provided Broadcast comes with your distribution, you can use the corresponding package management tool. Otherwise you can find a ready-made rpm archive at <http://www.heroinwarrior.com>. Make sure before starting the program that both your selected interface card (TV or FireWire card) as well as your sound card will work under Linux.

### Start

If your distribution has no entry for Broadcast in the start menu, you can call up the program by opening a terminal window, entering *bcast* and then pressing Return. If your hardware has been installed correctly, four windows will now open: Bcast: Video out is responsible for a preview of the edited video material, Bcast: Levels shows the volume of the sound, Console lets you add effects to the video or sound material and the main window takes on the central role of the arranger.

### A question of attitude

The basic settings of Broadcast can be found in the main window under the Settings/Preferences... menu

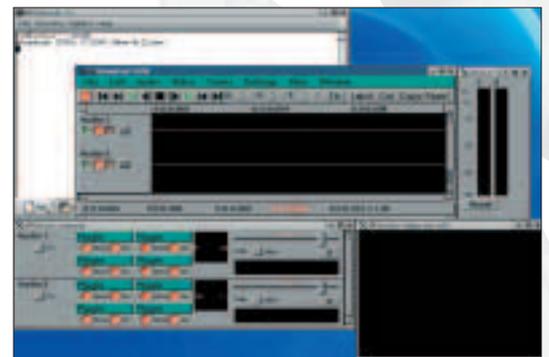


Figure 1: When Broadcast starts for the first time, four windows open

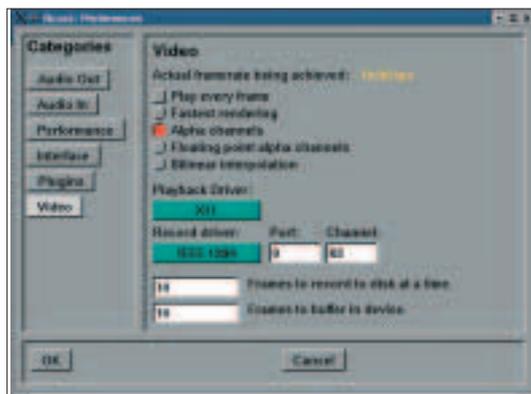


Figure 2: You must set these values when working with a digital camera and a FireWire interface

item. Click in the left-hand area on the button marked Audio In. OSS should now be set under Record Driver. This is the right value if the sound is to be read in via your sound card. Generally, this is the case for all analogue sources. If you have a digital video camera, which transfers your data to the computer via a FireWire card, at this point you should select the value IEEE1394. Once the sound source has been correctly configured, it's time for the image: click in the left-hand section on Video and under Record driver and select the desired recording source. In the case of a TV card this is Video4Linux, and for a FireWire card it's IEEE1394 (see Figure 2).

If you want to record the contents of the desktop, the selection to make at this point is *Screencapture*. But this latter only makes sense in very rare cases (e.g. for training videos) and, on the grounds of speed, should only be done at low screen resolutions. By the way, *LML3* stands for a special video editing card, which is distributed by the firm Linux Media Labs ([linuxmedialabs.com](http://linuxmedialabs.com)) on the Internet. Once you have made all the settings for the recording, close the settings window with a click on OK.

## Quiet, please...

Before the video material can be read in, first create a new project via File/New.... In the window which pops up, enter the values shown in Figure 3.

The dimensions of your video (Track Size, Output Size) will depend on the material involved or on the size in which you later wish to output the video. The standard PAL resolution is 720x576 pixels. This is also used for digital video material. Owners of a digital camera should therefore select this resolution. If, during recording or playback, you find there are misfires or jumps, as an alternative you could also use a resolution of 352x288 pixels. This format is also used on VideoCDs and because of its smaller size it is a lot less greedy in terms of memory. After clicking on OK, the data entered here will be used as initial values.

To start recording, click on the red symbol at the far left of the toolbar in the main window. A new

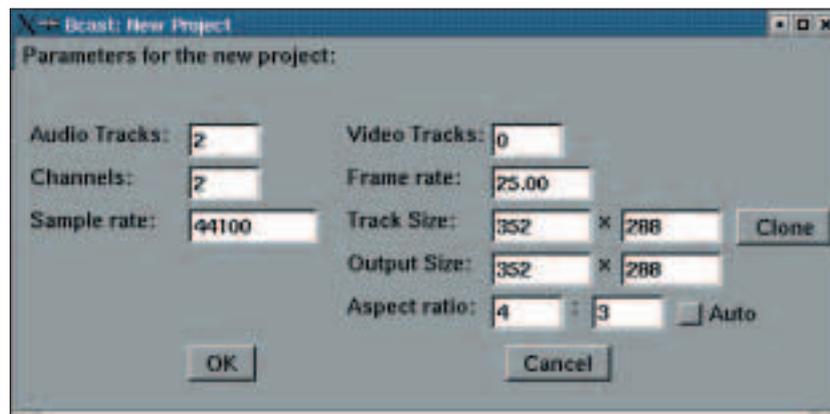


Figure 3: A new project is created. For the project in this article, you should select these values

window will then appear, prompting you to enter a filename. The video film which is then recorded will be saved later in this file.

Under the input box, there is a button to define the memory format. Quicktime should be specified here as standard. Apple's memory format for video films acts as the standard format in Broadcast. Please note that in all other formats offered here either only the sound (WAV and PCM) or images (as a series of individual image files – JPEG list) are recorded. For our purposes, you should retain the default setting at this point.

The rest of the buttons inside this window can be used to make detailed settings for the recording activity. Those working with analogue video material may be interested in the Video/Options settings. Here you can choose between different compression methods, which may have a positive effect on the hard drive space required. However, too powerful a compression will also be detrimental to image quality. If you've picked IEEE1394 as the recording source then this item will not be available to you: digital video is already compressed on the video tape in the so-called DV format and is therefore copied by Broadcast directly from the camera onto the hard drive. You should take note though, that one second of film in DV format takes up 3.5Mb of space.

After clicking on Do it, a window will then open which offers symbols similar to those on a video recorder. If you're using analogue material, which is played into the computer via a TV card, you must first select the correct input for the TV card. Click on the Channel button in the Video in window then click Add.... Again, a window will open, in which you can set the data of the channel thus created. Under Title, enter any name you like; under Norm select PAL; and under Frequency table select PAL\_EUROPE. Under

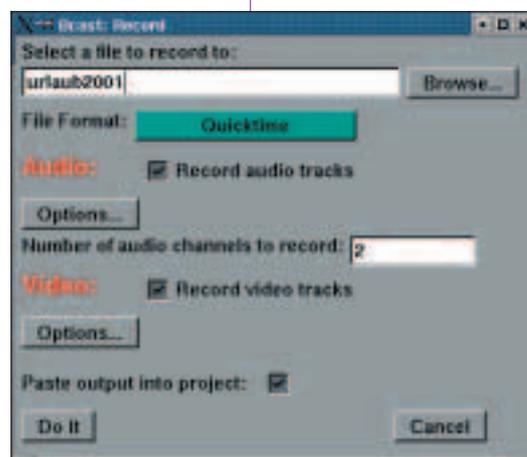


Figure 4: In the case of analogue video material you have to give details of the format in this window prior to recording

**Analogue video** The images in the film are recorded in the form of an electromagnetic signal on appropriate storage media, such as a magnetic videotape.

**Digital video** Unlike analogue video, the film's images are stored as a sequence of ones and zeroes. This allows the video material to be saved on the hard drive as a file and edited using the computer.

**PAL** British transmission standard for colour TV signals.

Source you should finally set the input or channel from which you would like to record the video material.

Which value must be selected here depends on your TV card and should be described in the associated instructions. Now click on *OK*, mark in the window *Channels* the newly created entry and click *Select* – which selects the channel. Close the window by clicking on *OK*.

**...and action!**

In order to start recording, first put your camera into playback mode and then click on the symbol with the red circle. To stop recording, click on the symbol with the black box. If you wish to tell Broadcast to only

record for a specified length of time, first set the Recording Mode to Timed and under Duration enter the appropriate period of time. You can then start the recording by



Figure 5: By using these two windows, you can store your video material on the hard drive: with the left one you control the recording, and the right shows a preview of the image just recorded

clicking the recording symbol.

Owners of a digital camera, who are reading in their film via a FireWire card, should take note that Broadcast doesn't co-operate perfectly with all devices. In our test there were some problems with Sony Digital 8 cameras: Broadcast flatly refused to read out the video material. Unfortunately the documentation has nothing to say about which cameras work and which don't – all you can do here is give it a try.

Before the film is saved, you can watch it with the aid of the other symbols in the preview window. Only when you feel it is satisfactory should you save it with a click on the Save button. Otherwise all you need do is start recording again.

As soon as your film has been saved, it should have been added directly into the main window. Before you start editing there, you should firstly also record a second film. We will be fading these two video clips into each other, for practice.

**Image for image**

If you've already recorded the two films and they're not shown in the main window, first create a new,

empty project via File/New... and load both videos via File/Append.... Contrary to Load, Append adds a video to the existing ones; Load on the other hand creates a new project, containing the single file selected by the user. Either way, there should now be two videos displayed in the main window.

Each film is laid down on a track of its own; these are provided with the name "Video" and an incremental number. If you've added the videos via Append you should find two video tracks with the names Video 1 and Video 2. Similarly, in the main window you will find tracks for the sound ("Audio"), which are incrementally numbered in the same way. You can change the name of a track to suit your own requirements: to do this, simply click on the track name and enter a new one.

Like a proper reel of film, a video also consists of individual images or frames. With the PAL standard used in the UK, the speed is 25 frames per second. Broadcast shows videos within the main window like film reels playing out. The start time is always shown on the left and the end is on the right. Since it can become fairly tedious with long films to get from one end of a film reels to the other, Broadcast supports various stages of enlargement: you can set these on the top edge with the triangular symbols (marked X, Y and T). Simply try out all the buttons here to see what happens. The time strip under the toolbar serves as an aid to orientation on which you can also read off later how long the finished edited film will run. Finally, one more tip: if you click on the *Fit* button in the toolbar the enlargement factor is automatically adjusted so that all videos fit easily into the main window.

Before we come to the actual editing of our videos, let's take another look at the bar at the left edge of the screen. Not only is the name of a track listed here, but there are also four symbols for each track. If the green rectangle is selected, this track will be picked during playback. In the same way, the red button says that an editing or recording function just executed should also be applied to this track. You can change the time bar in the right-hand section via the button marked with a D: if this is selected, in the case of a video track the individual images of the video saved there, or in the case of a soundtrack, the frequencies will be shown. Before selecting this button you should consider the fact that this type of display, especially on slow computers, can require a great deal of computing time.

**Editing**

As already mentioned, both of our videos are to be played one after the other in the finished film, with a small fade leading from the first video into the second. There are two ways of doing this. If all you want is for the first video to slowly disappear and at the same time for the second one to fade in, you can



Figure 6: This is how the two videos added to the main window should look before editing

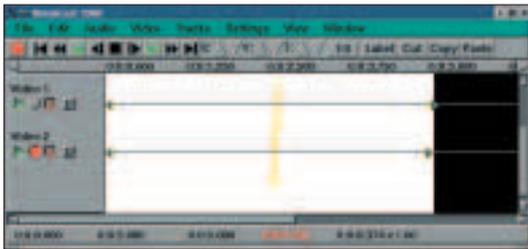


Figure 7: The marked film area (white). Also note the deselected recording button on the left side for video 1

use a menu function. For this to be applied, both films must be immediately one after the other in the same track. First, decide on the sequence. On all tracks, except for the track holding the second film, deselect the small red recording symbol already mentioned – by doing so you are making sure that only the second film will be cut out. On each film the start and finish should be marked by two small blue rectangles. Double-click between the two blue rectangles on the track of the second film: the latter should now be marked white.

Alternatively, but a bit less precisely, you can also achieve this by first going to the start of the film with the mouse pointer, pressing the left mouse button, holding it down, dragging the mouse to the end of the film and then releasing the mouse button. Now click on the Cut button in the toolbar. Since we wish to add it to the track of the first film, deselect the red recording button again in all tracks, except for the track holding the video material for the first film. Now place the white mark, with a single mouse click, immediately behind the blue triangle on the end of the first film. Click on the button marked Paste in the toolbar, and the video which was previously cut out should now have been added behind the first film.

In order to assign the fade, mark both videos with



Figure 8: By cutting and pasting, the second film has been moved into the track of the first film

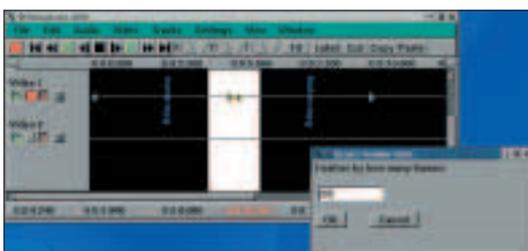


Figure 9: The area marked white states which videos are affected by the fade function from the menu. We are specifying 25 images as the duration of the fade

the mouse. All you need do is include both videos in the marking (Figure 9). Now select the menu item Video/Feather Edits. A window now opens in which you can define the duration of the fade in images. For one second select 25 images. After clicking OK the fade will be calculated. To look at the film, first rewind it to the beginning with the video recorder symbols and start it with a click on the green triangle. The preview is outputted in the window of the same name. On slow computers, the result can be a bit jumpy on playback. This is because Broadcast calculates the fade in real time.

Provided your film has audio tracks, you should repeat the procedure with the corresponding audio tracks. Here, too, you can fade the sound in and out – although the associated command is hidden behind the menu item Audio/Feather Edits.

## The second way

The fade described above is adequate for simple cases, but special effects cannot be done like this. In order to realise somewhat more extravagant fade effects, we need the film back on two different video tracks again. To do this you can either cut out the second film again and paste it onto its own original track, or create a new project and import both films again.

Again, decide on the sequence of the two videos. You should also ensure that only the recording head of the track for the second film is activated. Mark the video, cut it and paste it a little before the end of the first film. The videos should now be on two different tracks, offset from each other slightly (Figure 10). The entire overlapping area will later act as the fade. Please note that Broadcast has inserted a blank space at the start of the now offset second film.

Move the playback to the beginning and start it. You will note that the video on the lower track is always played back completely, while the one lying on top of it is only partly played back. This is because Broadcast stores the films as if they were in a stack – the same applies to the audio tracks. The sequence can be altered via the menu items Tracks/Move tracks up or Move tracks down. In the first case all tracks for which the record button is selected are moved up by one track, and in the second case they move down. In this menu you can also delete tracks or add them to each other (Concatenate tracks). For our example, make sure that the second film is located on a track below that of the first film (Figure 10).

The “console” is responsible for adding effects. If you cannot see this, select Window/Show Console. In this you will find precisely one unit for each track with four green buttons and a slider. Each of the four buttons can record one effect, which will be applied



Figure 10: For a more complex fade the second film should be placed offset with respect to the first film

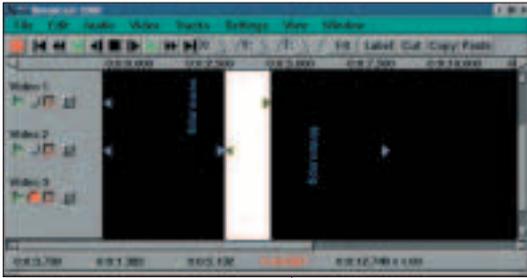


Figure 11: The area marked white shows how long and at which point our more complex fade should occur

to the whole track. Here is an example: click in the Video 1 area on the first button at top left and select Attach.... Another window opens, from which you can pick one of the effects on offer in the left-hand list, e.g. Whirl. Click on Attach to assign the effect to the track and close the window via Do it. With some filters a settings window will now be displayed. Start playback in the main window in order to view the results of the effect. You can get rid of the effect again by clicking in the console on the corresponding button and selecting Detach from the menu.

### Consolidation measures

Effects can thus be assigned to individual tracks with the aid of the console. Unfortunately this always affects the whole track and not an individual area, which is what we need for our fade. We are going to

manage this with what seems at first glance to be a somewhat unusual trick: we divert the video material onto a third track, on which there is a film which is exactly as long as our fade. Since we are laying the third track right at the bottom, the fade will then be played back in place of the other two videos. For our example this looks as follows: use Video/Add track to create a new, blank track. Make sure that this track is beneath all other video

tracks and that the recording button is selected on this track only. Now mark the area in which the fade is to take place (the area in which the videos overlap).

From the menu, select Video/Paste Transition. A window opens in which you can select an effect for the fade. For our example select from the left-hand list *BandWipe*, click on *Attach* and then on *Do it*. In the main window the fade is marked as a green box.

If you were to start playback now, nothing would change compared with the previous situation: the effect which was laid on the new video track does not yet "know" which video material it should use. To tell it, click in the console on the first green button (top left) of the area belonging to the first video and select Attach.... In the right-hand list mark the Video 3 entry, click on Attach under this list and then on Do it (Figure 14). By doing this we are making the track

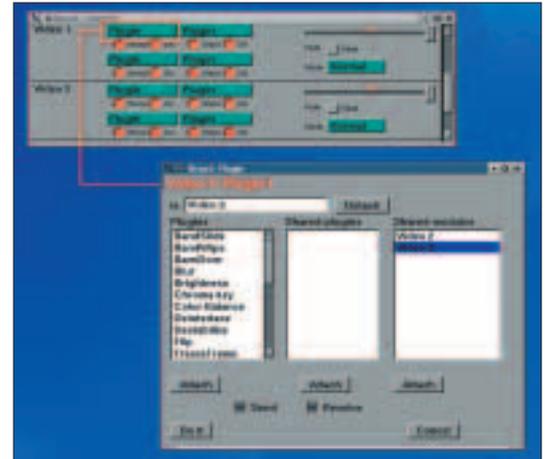


Figure 14: With these settings, you are making track 1 send the material saved on it to track 3

with the first video send its material to the Video 3 track. The effect saved there can then produce the fade from the material received.

### Project management

Now save the project via File/Save as.... Please note that at this point, Broadcast is only saving the arrangement of tracks and/or effects, not the actual videos. These remain in their original condition and can also be used several times. Unfortunately this also has the drawback that the original films must always stay in their positions on the hard drive.

To create a finished video from the arranged film, use the menu command *File/Render*. A window opens which displays the same structure as the window shown when recording the video raw material.

If you've made all the necessary settings (don't forget to activate Render audio tracks and/or Render video tracks), you just need to click on Make it so!, and Broadcast calculates the finished film. You can play this back with an appropriate playback program on any computer. Please bear in mind that this computing process may take quite some time.

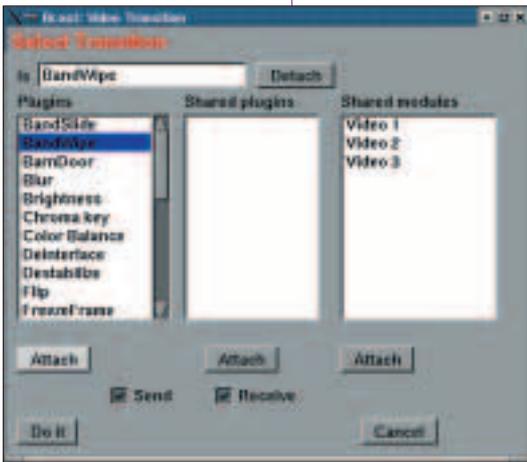


Figure 12: For the complex fade, select BandWipe. By clicking on the Attach button, you assign the effect

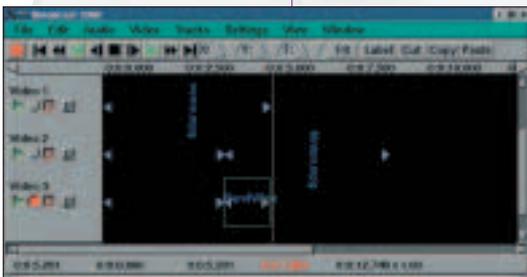


Figure 13: The BandWipe fade is shown in the main window as a small green box. It is the same length as the previous white marking

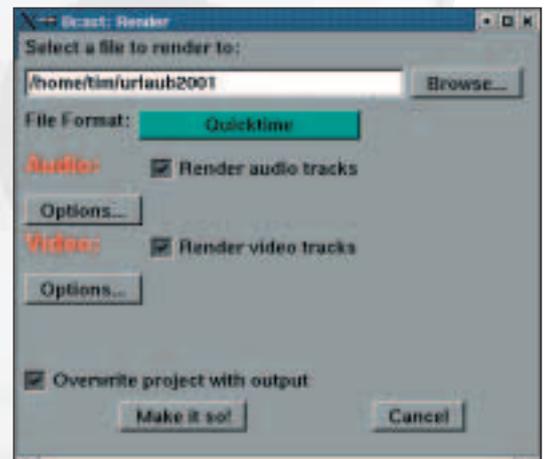


Figure 15: This window appears when rendering the finished video