



DIGITAL VIDEO BASICS

First steps with Kino

Andy Channelle sits in the director's chair to lead you through capturing film with Firewire.



Got a camcorder? Get digital. This tutorial will show you how to capture video over a Firewire connection ready for processing and editing. You'll need the excellent open source package *Kino*, which, despite its KDE-suggestive initial capital letter, is a Gnome application. You'll need to install some other packages – see the What You Need box on page 83 – to go from raw footage on a digital camcorder to finished masterpiece on your TV.

The latest stable version of *Kino* is 0.75 and is available in a variety of flavours from <http://kino.schirmacher.de/article/static/1>. *Kino* has a fair amount of dependences so installing it via an integrated package manager (*YaST*, *APT*, *Yum*, etc) might prove less of a hassle than rolling your own.

A few words about power

Capturing, editing and rendering digital video puts a strain on different parts of a computer system, but a reasonably up-to-date PC should be able to cope with most things you can throw at it. Using Firewire to grab your video clips means that the CPU is hardly stretched at all, but a faster hard disk will ensure you don't drop any frames (where the computer can't keep up with capture and lose some frames). The more critical

issue here is disk size: digital video (DV) files can be huge, and the process of getting everything on to DVD takes up even more space. Bigger is better and I would recommend having at least 20GB of free space – perhaps even on its own partition – available for editing short home movies. On average, ripping in raw DV format should yield about one hour of footage per 15GB of space, while compressed formats will consume a great deal less space.

Where CPU grunt really comes into its own is in the rendering of effects and, especially, transcoding files from one format to another – and there is almost no way you can go from raw footage to finished product without some type of transcoding. So while the Firewire system takes on the job of capturing – and on an Athlon 2800+ CPU I was able to capture while both *Evolution* and *OpenOffice.org* were running – transcoding and effects rendering is going to take some time regardless of the muscle you throw at it.

There are a few assumptions that will have to be made for the sake of space and time. We will, for example, assume that you have a Firewire card or port on your Linux box and a suitable device to plug into it. Firewire support is pretty robust in Linux now, but advice on which devices are and are not

Manufacturer	Model	Compatibility
ADS Technologies, Inc.	ADS PYRO Webcam API-200	Works
ADS Technologies, Inc.	ADS PYRO Webcam API-200	Works
ADS Technologies, Inc.	Pyro 1394 Webcam API-203	Works Great
Apple Computer, Inc.	iSight	Somewhat
Basler Vision Technologies	A301f	Works Great
Basler Vision Technologies	A302f	Works Great
Basler Vision Technologies	A602f	Works Great
Canon, Inc.	DV-HV20(i)	Works Great
Canon, Inc.	Elura	Works
Canon, Inc.	Elura 2	Works Great
Canon, Inc.	Elura 40MC	Works Great
Canon, Inc.	Elura 50	Works Great
Canon, Inc.	GL1	Works
Canon, Inc.	mv	Unknown
Canon, Inc.	mv 3i MC	Works Great
Canon, Inc.	mv100	Works

Check here for camcorder compatibility. Let's hope your model falls into the (thankfully large) 'Works Great' group.

supported, in terms of both playback and interface, is available at www.linux1394.org. Chances are that with a recent distribution based on the 2.6 kernel there should be no problems in ensuring the computer can 'see' the camcorder.

That said, I did encounter a problem with *Kino* in Xandros 3 in that it needed read and write access to the file `/dev/raw1394` in order to interface with my SonyDCR-TRV266E. Working around this simply involves adding the usernames of those who need access to the device to the group 'disk'. This can be done by editing the file `/etc/group` so that the 'disk' entry looks

something like this:

```
disk:x:6:andy, someone_else, an_other
```

This will need to be done as root. With that done we can get to work and fire up *Kino*.

Capturing video

Upon launching *Kino*, select the Capture tab on the right-hand side of the screen. The interface is not overly complicated, but it has some unique elements that you won't find in your average word processor.

1 Toolbar

The toolbar has the usual tools for opening, cutting and pasting as well as a few *Kino*-specific options. The first of these is the Save Still Frame button, which will save a shot of whatever's in the preview window. This tool may come in handy during the last phase of DVD creation, where a thumbnail image could be used to represent a specific film on the final production. The next two buttons are used to insert a previously captured video file before or after the currently selected file; these are used in conjunction with the Storyboard tool (see below) to create a rough edit of the work.

To the right of the clipboard tools are another useful pair of icons to either join or split sections of film. You might think that, as you capture video from the camera, it all comes in as a single stream (and indeed it is possible to do this – just go to Capture Preferences and deselect the Autosplit Files option),



AN ANNOTATED KINO INTERFACE

2 Storyboard

1 Toolbar

3 Job tabs

4 Preview

5 Application control

6 Location bar

7 Camera controls

but *Kino* is a little cleverer than that. By default the application uses the data stream from your camcorder – it's not really transferring the images at all, only numerical information – to cut the video into smaller files. The final result is that the storyboard is filled up with each shot taken. This is usually a good thing, but sometimes, for artistic reasons perhaps, you may want two shots joined together, or a longer shot split up for later manipulation.

To split a scene, select it from the storyboard, and then move the playhead (above the transport controls) to the cut point and then hit the Split icon. This is a reversible process, so don't worry if things go wrong first time.

Joining scenes together is restricted to combining a shot with the one that follows it in the storyboard. Select the first shot, and hit the Join Scene button to weld the two scenes together. This, again, is reversible.

2 Storyboard



The standard view of the storyboard simply shows a thumbnail of the first frame from each scene. Clicking on any of the icons in here will jump the playhead straight to that scene. The playhead itself gives a quick view of the relative length of a scene; each storyboard element is shown as a separate section in this playhead.

You can create a rough cut of your final film simply by moving things around, inserting or removing scenes in here. To remove a scene, select it and do Edit > Cut. You could, of course, do Edit > Paste to reinsert any cut film, but if it's bad – say the actors of your home movie need polish – you could just not paste it back in and it will eventually disappear from the clipboard. However, remember that this is non-destructive editing; the original file remains available and intact in the predefined capture location, and as the scenes are named in

numerical order, it could be later inserted in the original position – perhaps for the Special Extended Edition Director's Cut.

It is possible to expose a little more detail about the captured film by grabbing the window handle on the right of the storyboard and dragging across the main window. This will show details such as the file name, start time and duration. These figures will come in handy when it comes to editing the content and designing transitions for your film, but for now we are working on the structure as a whole so they can be safely kept hidden.

3 Job tabs



In time we will visit each of these tabs, but the one we're most interested in right now is Capture, which enables us to control the DV camera remotely and also decide what information actually should get ripped on to the computer.

The Edit tab is where scenes can be dragged around the storyboard to create a working narrative.

Timeline provides a graphical method to navigate between specific time points within a scene, for instance for splitting and removing bits of the film.

The Trim tool allows for the removal of any extraneous film at the beginning or end of a given scene. FX is where we will add transitions and process effects to our video and audio. And finally, Export is where we can choose the output formats we want once we've finished working on the movie, and also where we select the applications/applets that will take care of, for example, transcoding the sound.

4 Preview

This is where your footage is displayed during preview, capture and playback. *Kino*'s default setting doesn't show footage during capture because there is a potential for frame dropping. With a decent processor and hard disk, it should be viable to go into the options (Edit > Preferences > Display) and select Enable Preview During Capture so you can see what's happening. You can scroll through zoom options in the preview using the zoom tool in the toolbar. Changing the size of the application window will also change the size of the preview pane, though it will retain its aspect ratio – with black bars appearing on the edges where necessary.



5 Application control

When a camera is plugged in and recognised by the system, the first button in this group – AV/C – will become active. This is the AV/Control button which, once pushed, hands over control of the attached camcorder to the computer. You may then use the transport controls below to play back, rewind or fast forward without having to mess with the actual camcorder. The second button begins capturing video, while the third ends the capture process.

Remember to save the project once new video is captured or imported. The actual footage captured is saved into the location specified in the Location bar, but the information associated with it – trim points, storyboard data and so on – is saved into a small meta file. The advantage of this is that films can be edited non-destructively; that is, the footage is not 'trimmed' if you alter the entry and exit points for a clip, as this information is stored inside the metafile. So remember to back up this file if you're backing up a project.



6 Location bar

This is a space to set the destination for captured video. You can enter a path manually or hit the Folder icon to browse the file system. Once the path and file name (without extension – this will be added automatically and depends on the choice of capture format) have been defined, you can begin capturing. *Kino* will split footage into scenes and these will be saved to the disk as filename001, filename002 and so on.



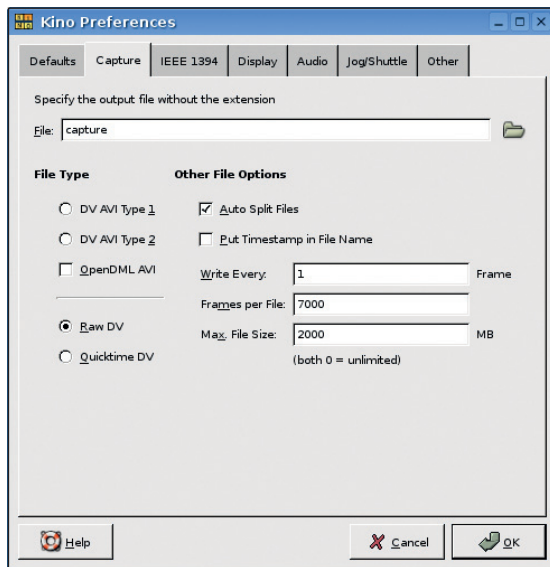
7 Camera controls

The most revolutionary thing about digital camcorders is not the quality of the captured film (though that is amazing on even a cheap device) but the fact that, once these things are connected to a Firewire port (and handed over via the Application control panel), they become just another peripheral completely under the control of your mouse. The Transport bar can (from the centre outwards) stop and start playback, advance and reverse frame by frame, rewind and fast forward, move to the beginning or end of the current scene, or go to the start or end of a tape.



Capture formats

Kino is capable of handling two formats when it comes to capturing film: raw DV and DV AVI. The latter can be split into Type 1 or Type 2 files. In addition, if dvgrab (see the *What You Need box on page 83*) has been compiled with libquicktime, it should be able to capture Quicktime DV files.



Choose from several formats to capture your film.

To define how video will be ripped, do Edit > Preferences and select the Capture tab.

Raw DV is, as you might expect, the raw digital video data and it has the extension .dv. A number of applications including *QuickTime* and *Xine* should be able to play back this format, and it is likely to provide the most faithful reproductions as it is a lossless technology, losing no data through compression, while AVI uses compression. (The payoff is that the files will be bigger.) Professional packages such as *Final Cut Pro* and *Adobe Premiere* and respected home-user editing software such as Apple's *iMovie* all use the raw DV format.

AVI comes in two types. Type 1 (DV1) creates a single file with interleaved audio and is smaller, so the developers recommend sticking with this more efficient format if the project will stay within *Kino* (or some other editing application that supports DV1). Type 2 (DV2) streams the audio into a separate file, which is more wasteful. The advantage is that this format will play back unaltered with the movie player *MPlayer* (DV1 apparently won't) and support within Windows is likely to be more consistent.

Kino is capable of grabbing files in excess of 2GB, but the developers of *dvgrab* suggest that file incompatibilities begin to increase when sizes of 1GB are grabbed. To this end, it's possible to limit the file size for individual grabs (definable in

either size on disk or frames). Simply change the numbers in the relevant boxes – by default the maximum capture size is 2GB. Should a single take exceed this limit, *Kino* will automatically split the grab into scenes that adhere to this size. If you intend to grab DV2 files greater than 1GB, the OpenDML AVI option should be selected.

By setting both of these size constraint options to zero and turning off Autosplitting it's possible to capture scenes that are limited only by the size of your storage medium and the 64-bit limits of Linux.

It's also possible in here to set *Kino* just to grab a selection of frames. This is useful for the creation of time lapse-style films. For normal capture, the setting should be Write Every 1 Frame but it is possible to change this to any number. Set at Write Every 25 Frames, *Kino* would take one image per second.

In general your choice of format should be determined by the eventual use of the footage. If, for instance, you'll send the project to friends and family over the web, through email or on a VCD (Video CD), AVI will suffice. However, if the final destination is either DVD or back on to DV tape, the purity of raw DV will give you superior results. Raw DV has the added benefit of enabling the quality to be downgraded to AVI, but the process doesn't work the other way – in other words, it's much more effective to grab using raw DV, back it up to a data DVD and then transcode it to AVI for editing if that's your intended format. You then get an exact replica of the original film.

The most notable absentee from *Kino*'s feature set is a separate audio track, which means it's impossible to, for instance, cut a reaction shot into a longer scene while retaining the original sound. This is something that the developers will address soon, but while we're at version 0.75 you will have to go to either *MainActor* or *Cinelerra* for more extensive editing options. The former is a commercial product (reviewed in LXF63), while the latter is pitched as a professional tool and has a learning curve to match.

So, once you have plugged in the device, ensured that the correct modules and permissions are available to the software and launched the application, go to the capture screen, press AV/C to take control of the camera, hit Play then Capture. And that's it. Capturing is done in real time, so either make a cup of tea while the magic happens or, if you have the power and you've selected Enable Preview During Capture in the Edit > Preferences > Display dialogue, sit back and enjoy the show.

However, this is far from the end of the show – making movies is about more than just taking raw input! Fortunately, Linux is capable of handling all our needs – stay tuned! **LXF**

NEXT MONTH

We'll take our ripped video, trim away the chaff, move frames around and define and render scene transitions in order to distinguish our efforts from the 'record and go' productions that were endemic in the age of the video recorder. Following that we'll look at output options and attempt to create an attractive DVD experience able to be played back on most domestic players.

WHAT YOU NEED

The essential tools of the video-capturing trade

To capture digital video, you'll need a PC, digital camcorder and a Firewire card or port. Faster and bigger are the watchwords when it comes to processor and memory. Everything in this tutorial can be done with open source software. Here's what you should install:

Kino Gnome's premiere video-editing package, taken to version 0.75. When installing this package through your distribution's package manager (if possible) look out for the experimental packages that add a selection of visual effects to the application. These packages are called *Kinoplus* and *Kino-timfx*.

dvgrab *Dvgrab* will probably be integrated into the *Kino* install. Because

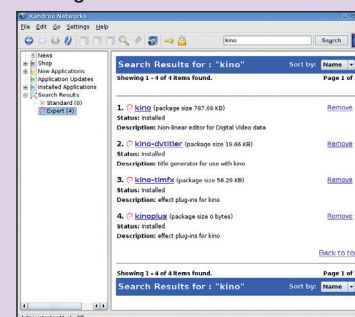
dvgrab is a traditional geeky command line application (for which *Kino* becomes a front-end) it's entirely possible to use a terminal to control a DV-enabled camcorder and grab video, but we'll give that a miss.

DVDAuthor Not used this time, but we'll be working with this in future tutorials to pull together the final output for burning film on to a DVD.

Makeisofs Again, you'll need this for the final stages of the process, but it makes sense to have it available from the start. If you have *K3B* installed, *Makeisofs* will probably be available already.

In addition to this quartet, you may want *Gimp* and *Inkscape* for creating interface graphics, *K3B* for burning the finished

project and *LAME*, the MP3 encoder, for handling audio.



We'd suggest you use a fully setup package manager to install *Kino* and its related plug-ins.