

**What is Video? An overview
of the technical parameters
and quirks with video.**

by Sean Healy

(This presentation is also online at:
skynoise.net/edu/understanding-video)

2013, Year of the Swiss Tasmanian Tiger Monkey

HELLO INTERNET.

The slow fade out of Melbourne's summer = an opportune time to re-spark the skynoise engines. It's also likely I just miss writing things longer than 140 characters. Especially since I'm just about to finish reading a 3000 page novel ([The Baroque Cycle](#), Yo!). Regardless of the roots..... expect some fruits.. scattered across the next few months - riffs about visual culture, and likely some weirder tangents too. That's what ma bones are saying. And sooner than that - some long overdue reviews:

- [Quartz Composer book](#) from ILQC
- [nVeil](#) (SVG based visual FX software)
- [Millumin](#) (interesting timeline based visual performance software)

Below - the summer that kept skynoise drooling on its pillow:

Dec 2012:

[Stereosonic](#) - Touchscreen video booth installations for an energy drink tent. (photos got animated, projected and sent online.)

[Sampology at Falls Festival](#) Dec 30 (Marion Bay) + Dec 31 (Lorne) (Mixing camera sources with Sampology's live video).

Jan 2013:



[MONA FOMA Projections](#) on a 4 storey fire escape stairwell, and custom animations for the [FALIX MO](#) cinema. Fun was had. Some keywords to throw in a blender: Chicks on

YOU HAVE REACHED..



.. the website of [Jean Poole](#), a Melbourne based video producer. Join the dots:



SEARCH

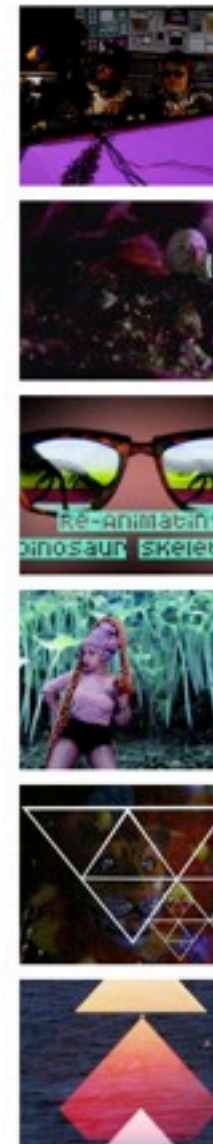
LOOKING FOR SOMETHING?

Visit the freshly organised archives, or swim in the tag cloud.

FLICKR DE JEANPOOLE



VIDI-YO!



skynoise.net





The Swiss Conspiracy



Mona Foma Projections

FalseMn



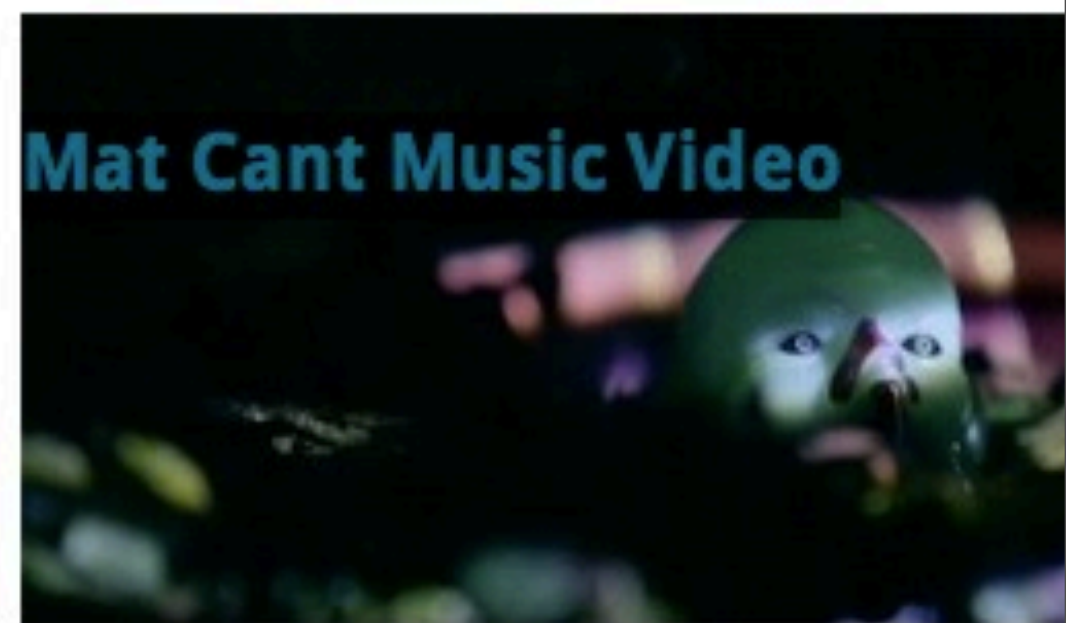
Cumbia Cosmonauts Video



Dr Seuss
Dr Seuss Meets Elefant Traks
ELEFANT TRAKS



TZU Beautiful music video



Mat Cant Music Video



Videos for 360



Animated Cats for Sampology



Video with Gotye



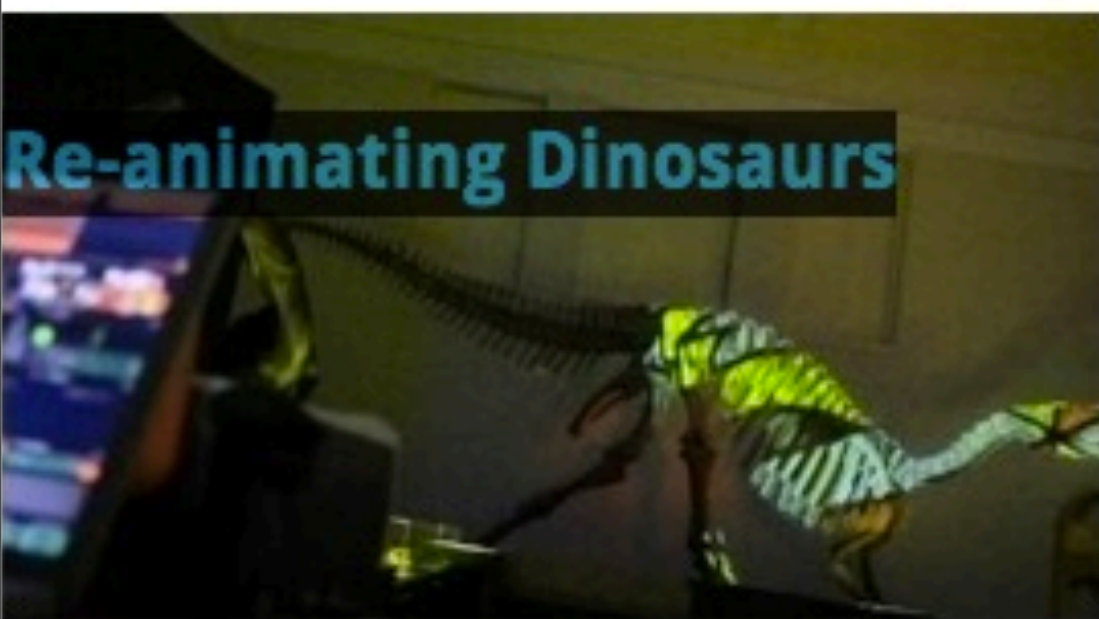
Pattern Machine



Congo Tardis Music Video



Motion Graphics for Audego



Re-animating Dinosaurs



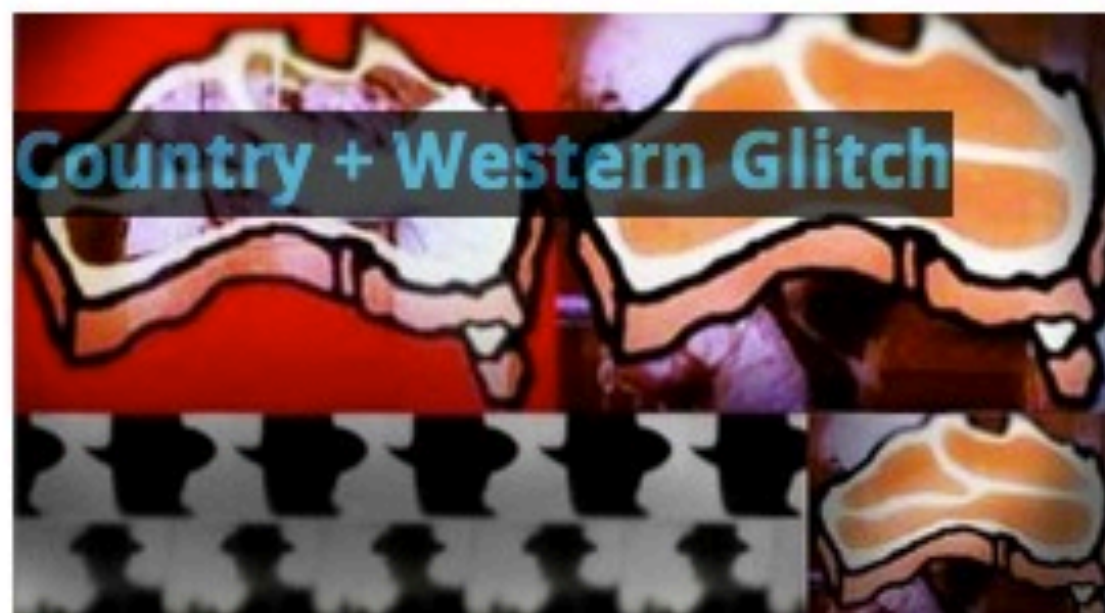
Mona Horse Bazaar Prize



Floating In Spaces Parts 1-6



Cappadocia Skies



Country + Western Glitch



Giant Idiots

What Software Do you use?



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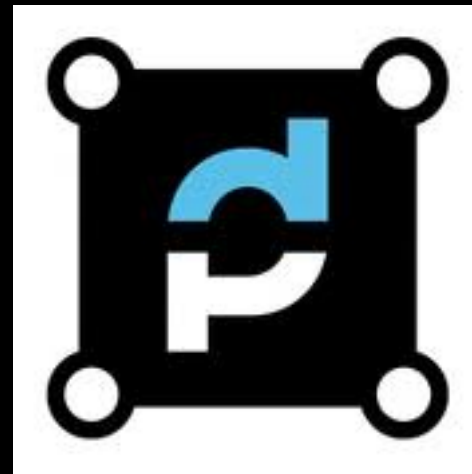
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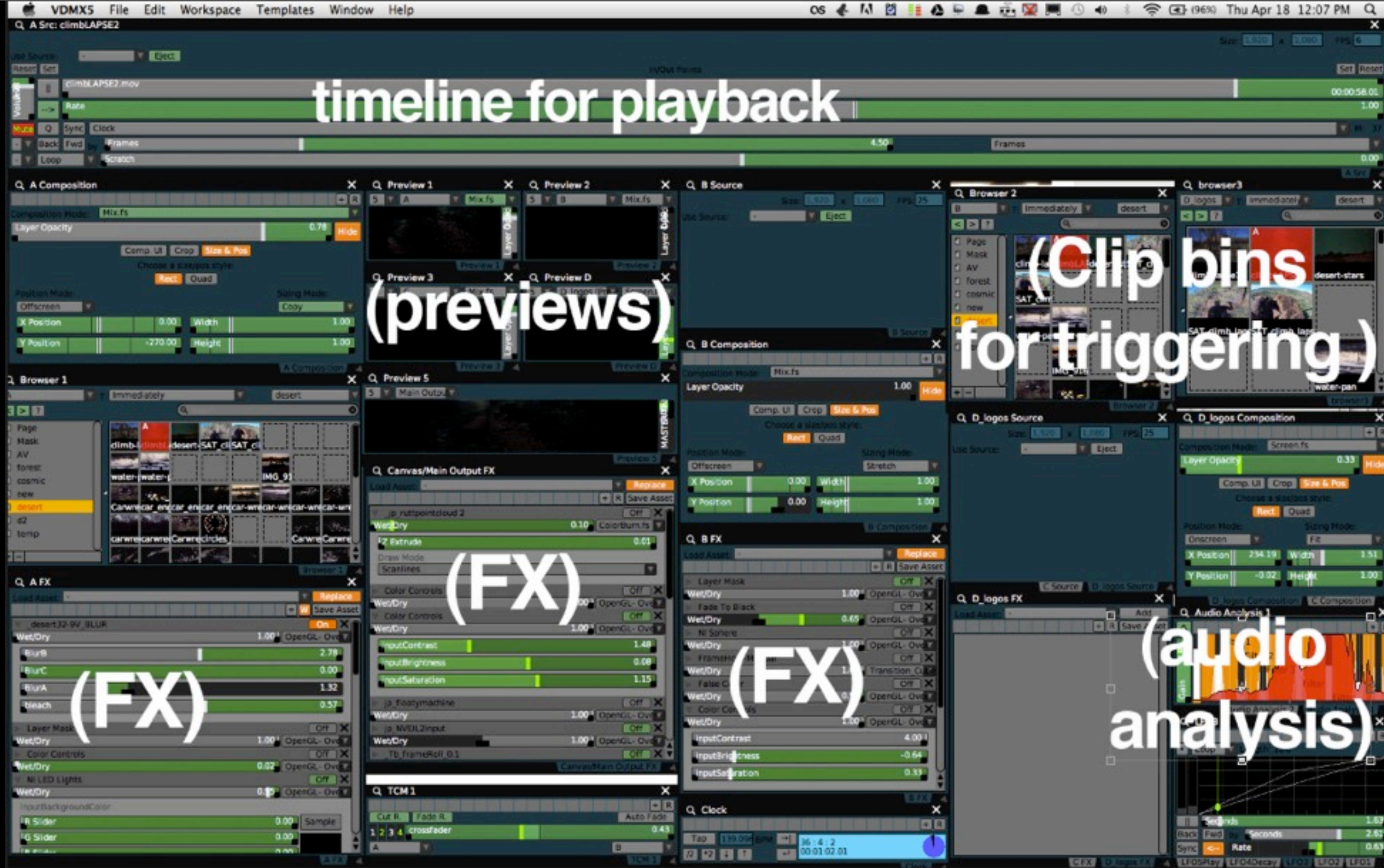


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VDMX : vidvox.net



timeline for playback

(previews)

(Clip bins for triggering)

(FX)

(FX)

(FX)

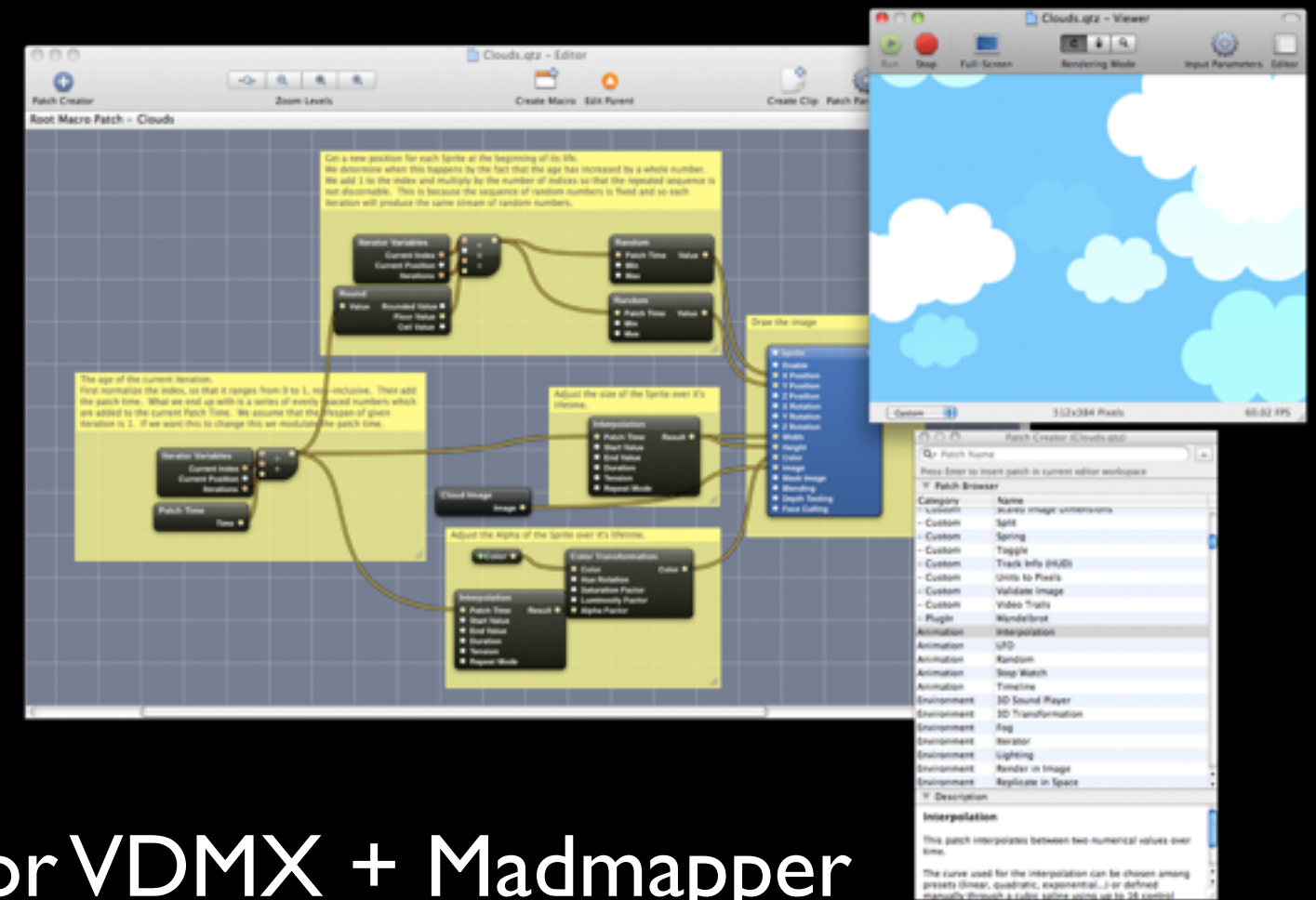
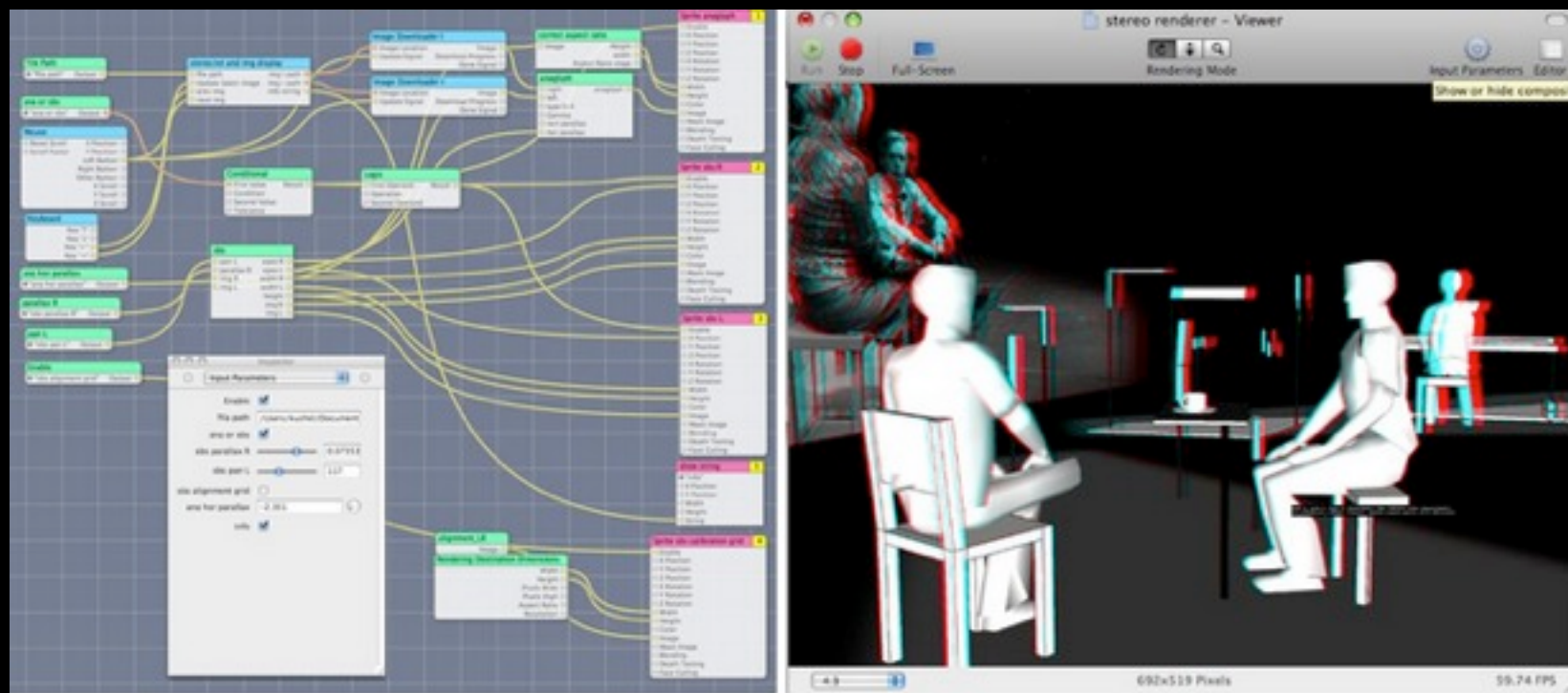
(audio analysis)

VDMX : vidvox.net

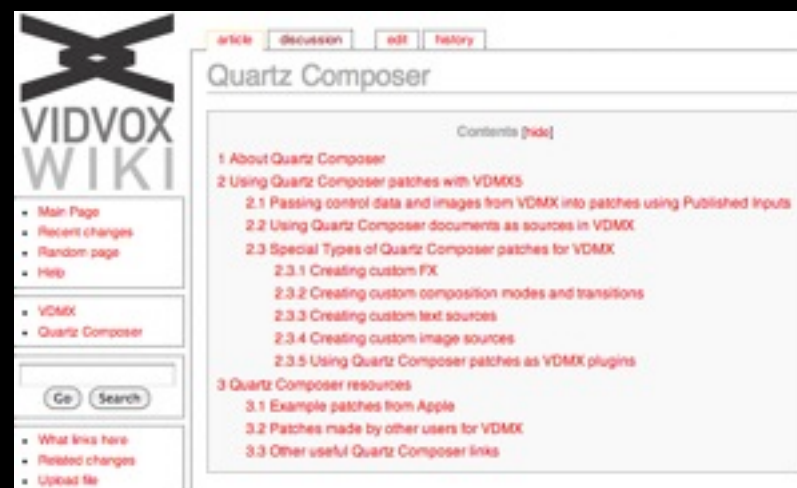


Madmapper

QUARTZ COMPOSER



- which allows building custom FX for VDMX + Madmapper



What is Video?

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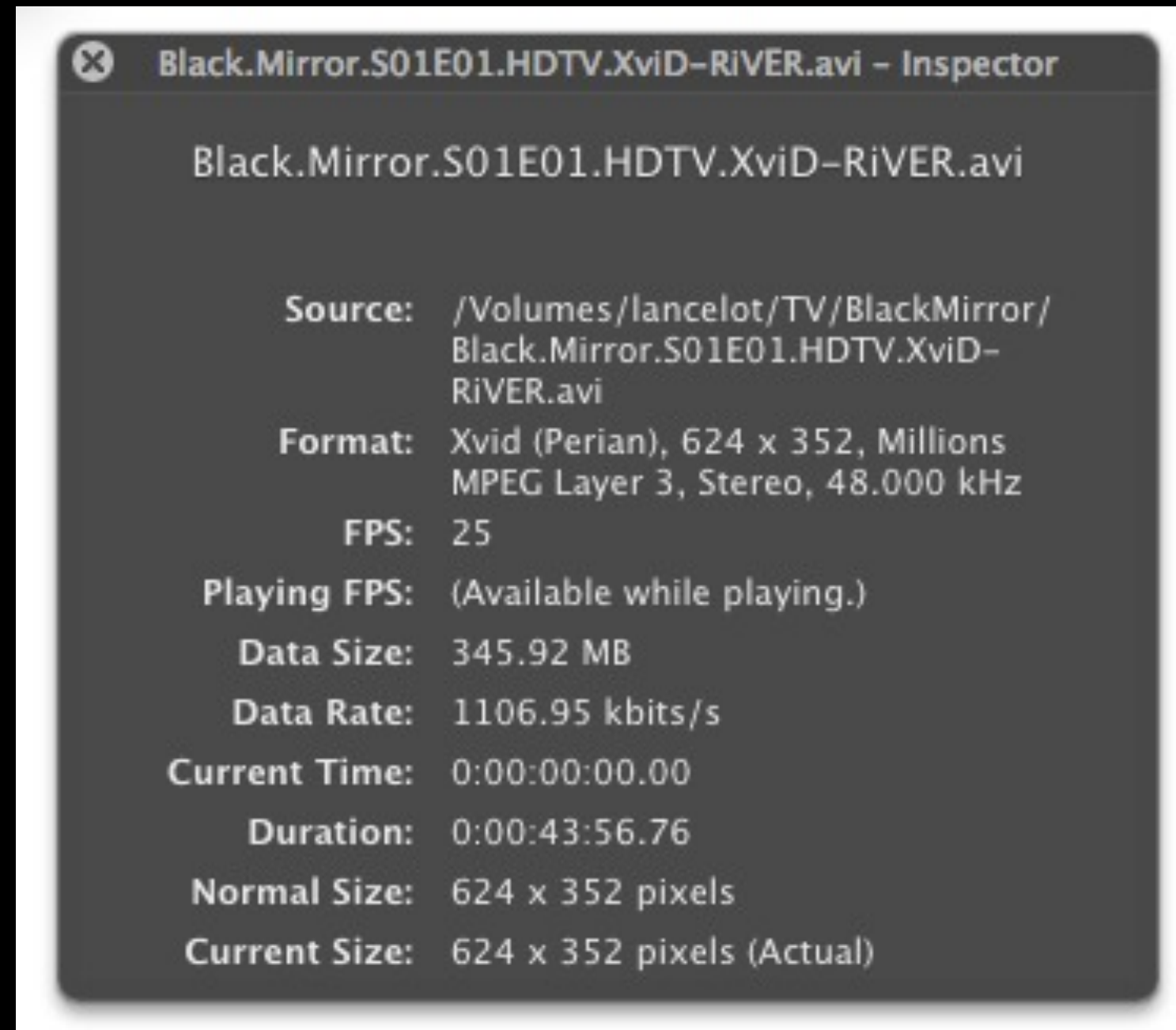
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5. iPhones and new media types.
6. Tips and questions.

What is Video?

What is Video?

(And why is it so complicated?)

(File info on mac,
found by
opening with Quicktime 7
and pressing 'command + i')



From [The Programmer's Guide To Video Systems](http://lurkertech.com/lq/video-systems)

<http://lurkertech.com/lq/video-systems> :

“programmers .. like to think of video exclusively as data in our computer memory or hard disks.

*We often .. ignore .. that video is also **transmitted** as an **electrical (analog or digital) signal over wires**, and stored on (gasp) **videotape**.*

*..if we take a moment to understand the bigger picture of video — **how it is transmitted electrically, how it is displayed by TVs and monitors..** —*

then suddenly it becomes tremendously easier to understand where these videosyncracies come from, and to predict and handle them correctly in our video software.”

"Video is the technology of electronically capturing, recording, processing, storing, **transmitting**, and reconstructing a sequence of still images representing scenes in motion."

Three things to consider
for audio/video interconnections;

the Type of Cable,
the Connectors
and the Signal Protocol.

Example Connectors

VGA (Video Graphics Array)
DVI (Digital Video Interface)
Display Port (+ mini display port)
HDMI (High Definition Multimedia Interface)
Thunderbolt
Fibre Optic
RCA / Composite
SDi (Serial Digital Interface)
S-Video (Super-video)
Component Video
CAT 5 / ethernet (eg video baluns)
USB
Firewire
Wireless systems



DVI-I (Single Link)



DVI-I (Dual Link)



DVI-D (Single Link)



DVI-D (Dual Link)



DVI-A



Video Signals:

Analogue video signals generally contain some combination of luma (brightness), chroma (colour) and sync / timecode.

Digital signals can vary more, dependent on the hardware on either end that transmits or decodes the data.

Analogue and digital signals may or may not combine audio in the same cable(s)..

What is Video?

The anatomy of a video file

While there is a wide range of video formats, in general, each format has the following characteristics.

- **A container type:** AVI and Quicktime MOV are two examples of container types.
- **The video and audio signal:** This is the actual video and audio data, which has characteristics described in the next section.
- **A Codec:** Codec refers to the software that is used to encode and decode the video signal. Video applications use a codec to write the file and to read it. It may be built-in to the program, or installed separately.

List of Most Common Containers

AVI (Audio VideoInterleave): Windows' standard multimedia container.

MPEG-4 Part 14 (known as .mp4): the standardized container for MPEG-4.

FLV (Flash Video): the format used to deliver MPEG video through Flash Player.

MOV: Apple's QuickTime container format.

OGG, OGM&OGV: open-standard containers.

MKV (Mastroska): another open-specification container that you've seen if you've ever downloaded anime.

VOB (DVDVideoObject): It's DVD's standard container.

ASF: a Microsoft format designed for WMV and WMA—files can end in .wmv or .asf

(via: <http://www.shallowsky.com/linux/videoformats.html>)

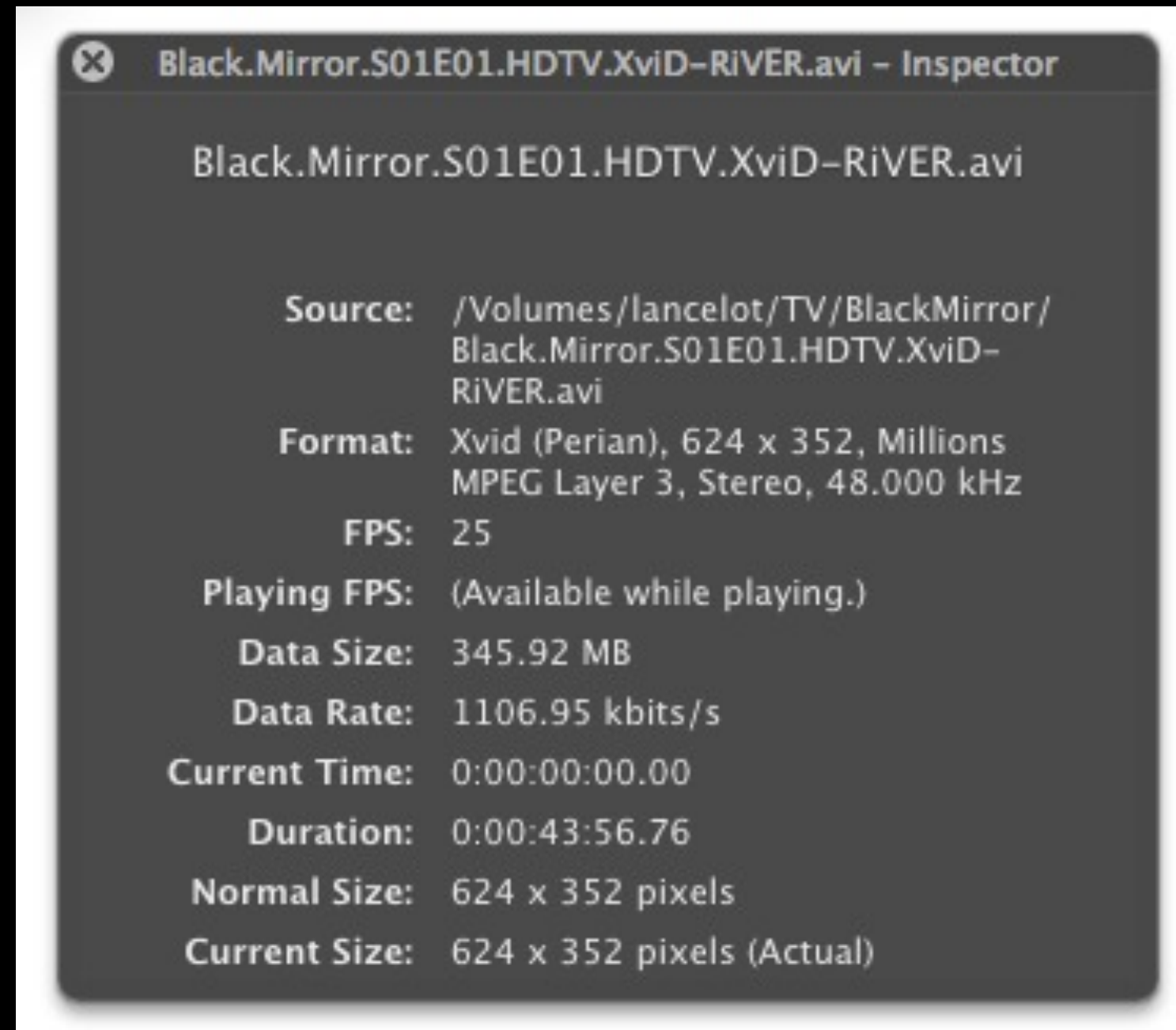
The characteristics of a video signal

Every video file has some attributes that describe what makes up the video signal.


These characteristics include:

- **Frame size:** This is the pixel dimension of the frame
- **The Aspect Ratio:** This is the ratio of width to height
- **Frame rate:** This is the speed at which the frames are captured and intended for playback.
- **Bitrate:** The bitrate or data rate is the amount of data used to describe the audio or video portion of the file. It is typically measured in per second units and can be in kilobytes, megabytes or gigabytes per second. In general, the higher the bitrate, the better the quality.
- **The audio sample rate:** This is how often the audio is sampled when converted from an analog source to a digital file.

(File info on mac,
found by
opening with Quicktime 7
and pressing 'command + i')



Free Software for Encoding Video :



SQUARED 5

*MPEG STREAMCLIP FOR MAC AND WINDOWS
and more....*

Home



- [MPEG Streamclip for Mac](#)
- [MPEG Streamclip for Windows](#)
- [DC30 Xact Driver for Mac](#)
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MPEG Streamclip: video converter for Mac & Windows

MPEG Streamclip is a powerful free video converter, player, editor for Mac and Windows. It can play many movie files, not only MPEGs; it can convert MPEG files between muxed/demuxed formats for authoring; it can encode movies to many formats, including iPod; it can cut, trim and join movies. MPEG Streamclip can also download videos from YouTube and Google by entering the page URL.


You can use MPEG Streamclip to open and play most movie formats including MPEG files or transport streams; edit them with Cut, Copy, Paste, and Trim; set In/Out points and convert them into muxed or demuxed files, or export them to QuickTime, AVI, DV and MPEG-4 files with more than professional quality, so you can easily import them in a DVD authoring tool, and use them with many other applications or devices.

Supported input formats: MPEG, VOB, PS, M2P, MOD, VRO, DAT, MOV, DV, AVI, MP4, TS, M2T, MMV, REC, VID, AVR, M2V, M1V, MPV, AIFF, M1A, MP2, MPA, AC3, ...

[Download Mac version](#)  [Download Windows version](#) 

<http://www.squared5.com/>

Free Software for Encoding Video :






HandBrake

The open source video transcoder

News | Features | Downloads | Community & H

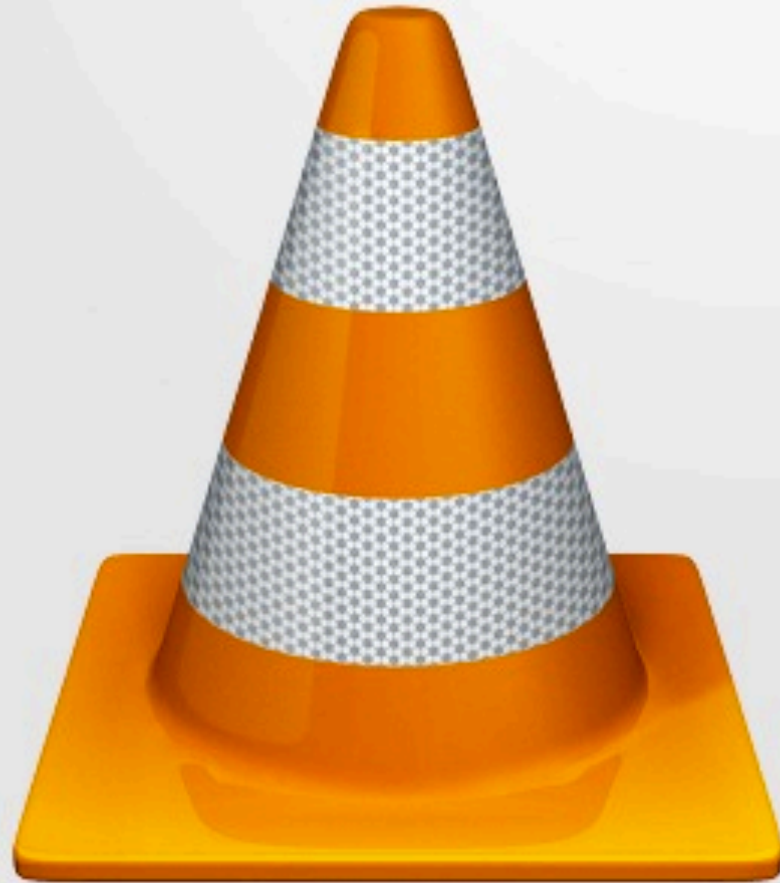
Downloads

Current Version: 0.9.9

 Mac OS For Mac OS X 10.6 / 10.7 / 10.8 Download (Intel 64bit)	 Windows For Windows XP, Vista, 7 and 8 Download (64 bit) Download (32 bit)	 Ubuntu For Ubuntu deb Available at: Ubuntu PPA page.
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<http://handbrake.fr/>

Free Software for Playing Video :



VLC media player

VLC is a free and open source cross-platform multimedia player and framework that plays most multimedia files as well as DVD, Audio CD, VCD, and various streaming protocols.

[Features](#)

[Screenshots](#)

[Skins](#)



Download VLC

Version 2.0.6 • Mac OS X • 43 MB

[Other Systems](#)

Workflow for Difficult Video Standards?

See list of video types: <http://www.fileinfo.com/filetypes/video>

M2T files (High-definition video recording format used by many HD camcorders; commonly referred to as "HDV;" uses MPEG-2 compression to store HD video data on DV or MiniDV tapes)

To playback – try VLC or

To export – import into video editing software such as Adobe Premiere, and export relevant section.

Mpeg - Muxing / Multiplexing is the interleaving of an audio and video stream into one transport stream. Mpeg files are muxed - which means they need to be demuxed for editing audio and video separately - this can be done with MPEG STREAMCLIP.

iPhone and New Media Types

- .FLV / flash files will not play back on iOS devices.
- H.264 will play back on most devices, but is very CPU intensive, so not ideal for older machines.

Think about your bit-rate for playback on different mobile devices...

Vimeo recommends 5Mbit/s for optimum web playback. Suggestions for other devices:

Sample Bit Rates

16 kbit/s – videophone quality (minimum necessary for a consumer-acceptable “talking head” picture using various video compression schemes)

128 – 384 kbit/s – business-oriented videoconferencing quality using video compression

1.5 Mbit/s max – VCD quality (using MPEG1 compression)

3.5 Mbit/s typ – Standard-definition television quality (with bit-rate reduction from MPEG-2 compression)

9.8 Mbit/s max – DVD (using MPEG2 compression)

8 to 15 Mbit/s typ – HDTV quality (with bit-rate reduction from MPEG-4 AVC compression)

19 Mbit/s approximate – HDV 720p (using MPEG2 compression)

24 Mbit/s max – AVCHD (using MPEG4 AVC compression)

25 Mbit/s approximate – HDV 1080i (using MPEG2 compression)

29.4 Mbit/s max – HD DVD

40 Mbit/s max – Blu-ray Disc (using MPEG2, AVC or VC-1 compression)

Content provided by http://en.wikipedia.org/wiki/Bit_rate#Video

Thanks.



skynoise.net/edu/understanding-video