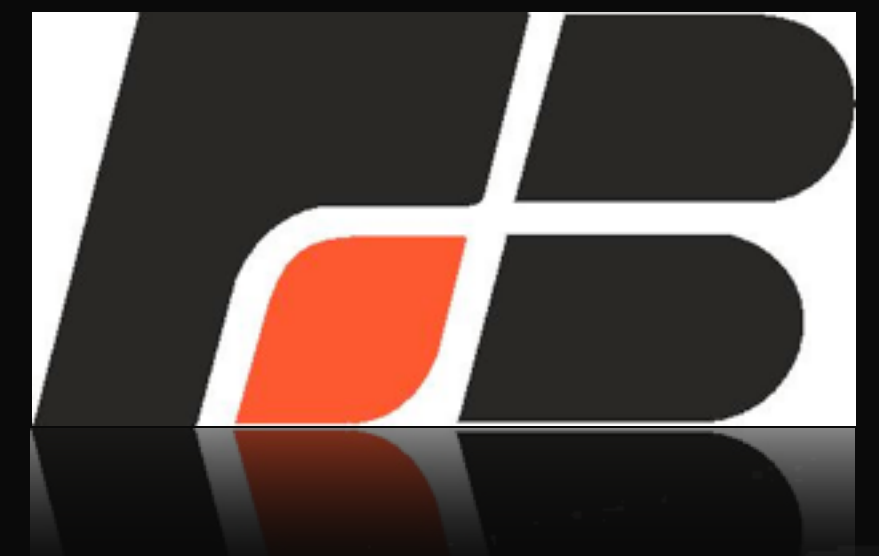


Compression Smarts: Strategies for Finishing & Online Delivery

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Overview

- **Answers**
- **Tools**
- **Foundation**
- **Production tips**
- **Codecs**
- **Data Rates**
- **Digital Masters**
- **Online Delivery**
- **Smarter Compression**





Animation
 Apple Intermediate Codec
 Apple Pixlet Video
 Apple ProRes 422
 Apple ProRes 422 (HQ)
 Apple VC H.263
 Avid 1:1x
 Avid DNxHD Codec
 Avid DV
 Avid DV100 Codec
 Avid Meridien Compressed
 Avid Meridien Uncompressed
 Avid MPEG2 50 mbit
 Avid Packed Codec
 DV – PAL
 ✓ DV/DVCPRO – NTSC
 DVCPRO – PAL
 DVCPRO HD 1080i50
 DVCPRO HD 1080i60
 DVCPRO HD 1080p25
 DVCPRO HD 1080p30
 DVCPRO HD 720p50
 DVCPRO HD 720p60
 DVCPRO50 – NTSC
 DVCPRO50 – PAL
 H.264
 HDV 1080i50
 HDV 1080i60
 HDV 1080p24
 HDV 1080p25
 HDV 1080p30
 HDV 720p24
 HDV 720p25
 HDV 720p30
 HDV 720p50
 HDV 720p60

JPEG 2000
 MPEG IMX 525/60 (30 Mb/s)
 MPEG IMX 525/60 (40 Mb/s)
 MPEG IMX 525/60 (50 Mb/s)
 MPEG IMX 625/50 (30 Mb/s)
 MPEG IMX 625/50 (40 Mb/s)
 MPEG IMX 625/50 (50 Mb/s)
 MPEG-4 Video
 None
 Photo – JPEG
 PNG
 REDCODE
 Uncompressed 10-bit 4:2:2
 Uncompressed 8-bit 4:2:2
 XDCAM EX 1080i50 (35 Mb/s VBR)
 XDCAM EX 1080i60 (35 Mb/s VBR)
 XDCAM EX 1080p24 (35 Mb/s VBR)
 XDCAM EX 1080p25 (35 Mb/s VBR)
 XDCAM EX 1080p30 (35 Mb/s VBR)
 XDCAM EX 720p24 (35 Mb/s VBR)
 XDCAM EX 720p25 (35 Mb/s VBR)
 XDCAM EX 720p30 (35 Mb/s VBR)
 XDCAM EX 720p50 (35 Mb/s VBR)
 XDCAM EX 720p60 (35 Mb/s VBR)
 XDCAM HD 1080i50 (35 Mb/s VBR)
 XDCAM HD 1080i60 (35 Mb/s VBR)
 XDCAM HD 1080p24 (35 Mb/s VBR)
 XDCAM HD 1080p25 (35 Mb/s VBR)
 XDCAM HD 1080p30 (35 Mb/s VBR)
 XDCAM HD422 1080i50 (50 Mb/s)
 XDCAM HD422 1080i60 (50 Mb/s)
 XDCAM HD422 1080p24 (50 Mb/s)
 XDCAM HD422 1080p25 (50 Mb/s)
 XDCAM HD422 1080p30 (50 Mb/s)
 XDCAM HD422 720p50 (50 Mb/s)
 XDCAM HD422 720p60 (50 Mb/s)

**Let's just answer the
question:**

“Master” version
“Online Hosting” version

“Digital Master”

- **Transcode to one codec, one frame rate**
- **High quality post codec**
 - **DNxHD**
 - **ProRes**
 - **Cineform**

Online Hosted Video

- **h.264 Codec***
- **Preferably in an MP4 Bucket (vs. QuickTime or Flash)**
- **20 mb/s for 're-encoders' - Youtube/Vimeo***
- **3-10 mb/s for Brightcove***

**There's loads more
information that those
two slides**

Housekeeping

It's a conversation

- **Ask questions.**
- **email: Jeff@JGreenbergConsulting.com**
- **Notes will be posted end of TODAY**

Survey - Primary Job

- **Producer/Managerial?**
- **Editor**
- **Jack/Jill of all trades?**
- **Forced into all of this**

Survey - Primary editorial Tool

- **Adobe Premiere Pro CS 5 or later**
- **Apple Final Cut 7**
- **Apple Final Cut X**
- **Avid Media Composer/Symphony**
- **...anything else?**

Survey - Primary compression tool

- **Adobe Media Encoder**
- **Compressor**
- **Episode Telestream**
- **Sorenson Squeeze**
- **...anything else?**

Tools (what's inside my toolkit)

Major Compression Tools

- **Adobe Media Encoder**
- **Apple Compressor**
- **Sorenson Squeeze**
- **Telestream Episode**

Open Source Tools

- **FFMPEG***
- **MPEG Streamclip**
- **VLC Player**
- **Handbrake**

Analysis tools

- **Videospec**
- **MediaInfo**
- **Invisor**
- **Bitrate calculator (such as Bitrate Pro)**

Foundations

*“The greatest sin in
compression is to compress
something twice”*

Kwai Chang Caine

Good, fast, cheap

Pick 2 (and only two)

Someone who wasn't a producer

Good

Pick 2

Fast

Cheap

Good, Fast, Cheap

- **Good + Fast**
- **Good + Cheap**
- **Fast + Cheap**

Good

Pick 2

Fast

Cheap

Good

Pick 2

Fast

Small

Good, fast, small

- **Good + Fast - Camera codecs**
- **Good + Small - delivery codecs (h.264)**
- **Fast + Small - review copy**

Workflow Tips

General Rule

**Simple=Easier to
compress**

Production Tips

- **Tripod**
- **Soft Lighting**
- **Narrow DOF**
- **Tight shots**
- **Avoid Complex Backgrounds**
- **Progressive video, please**
- **GIGO - least compressed formats**

Post Production tips

- **Straight Cuts**
- **Larger Text**
- **Blur backgrounds**
- **Avoid rapid cuts**
- **Avoid Complex Graphics**
- **Rotation/Zoom = bad**

Codecs

Two things to know

- **A COmpressor/DECompressor refers to the math formula used to make video smaller**
- **Video (and audio) are stored in Architectures (which may be easier to think of as a bucket)**

Three (four) types of codecs

- **Camera - DV25**
- **Post - Apple ProRes**
- **Distribution - WMV**
- **Hybrids - a distribution codec that's used somewhere else in the chain - h.264**

Creating a Digital Master

A Digital Master...

- **Usually Stored in a Quicktime**
- **Codec is a “Post” codec**
- **One frame size/One frame rate (conform)**
- **Acts as a “Mezzanine” file**

Post Codecs

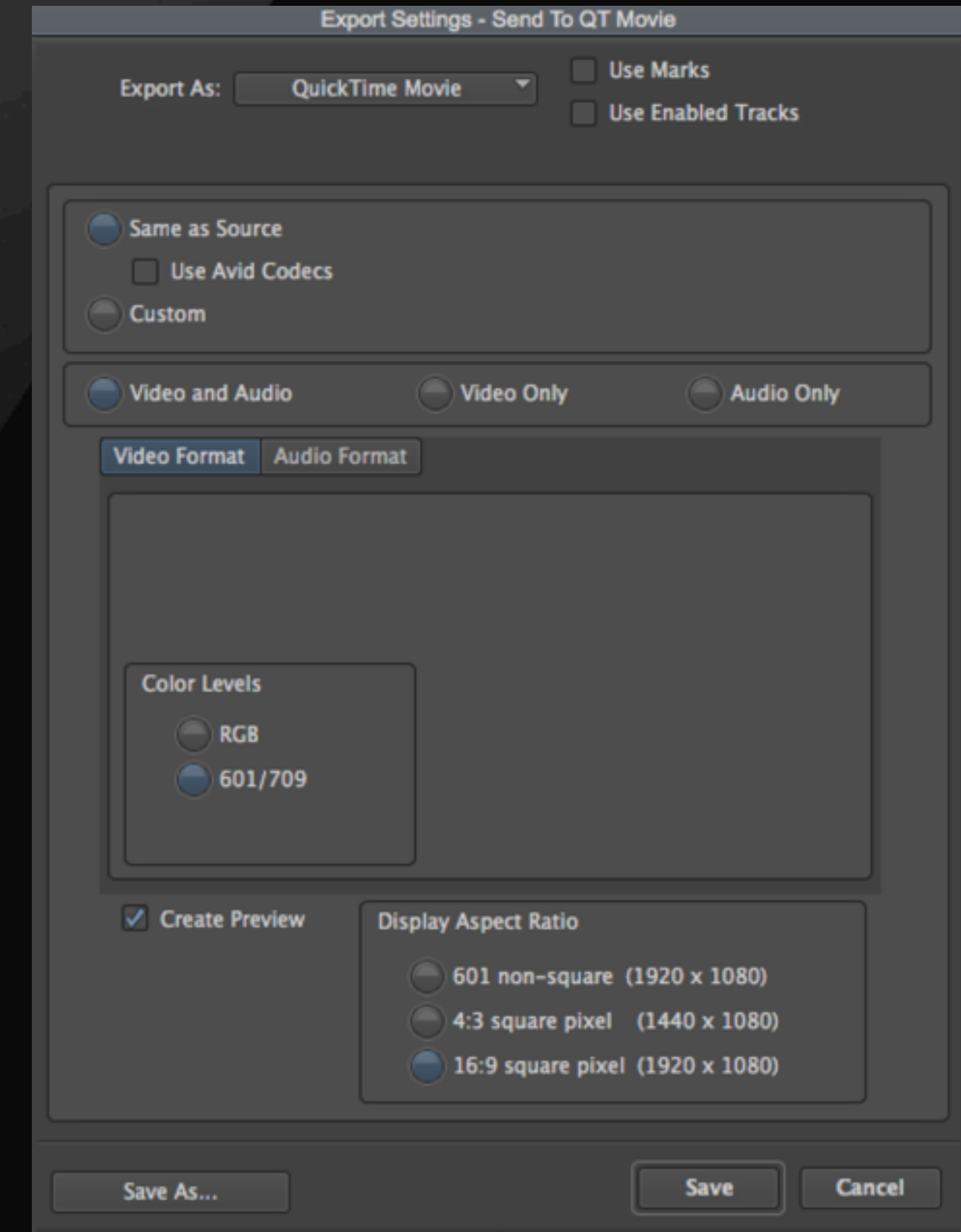
- **Large**
- ***Compression is not cumulative**
- **Can be reused as a source**

Post Codecs

- **ProRes (Mac Only)**
- **DNxHD (Cross Platform, Free)**
- **Cineform (Cross Platform, \$99)**
- **“Archival” such as JPEG-2000**

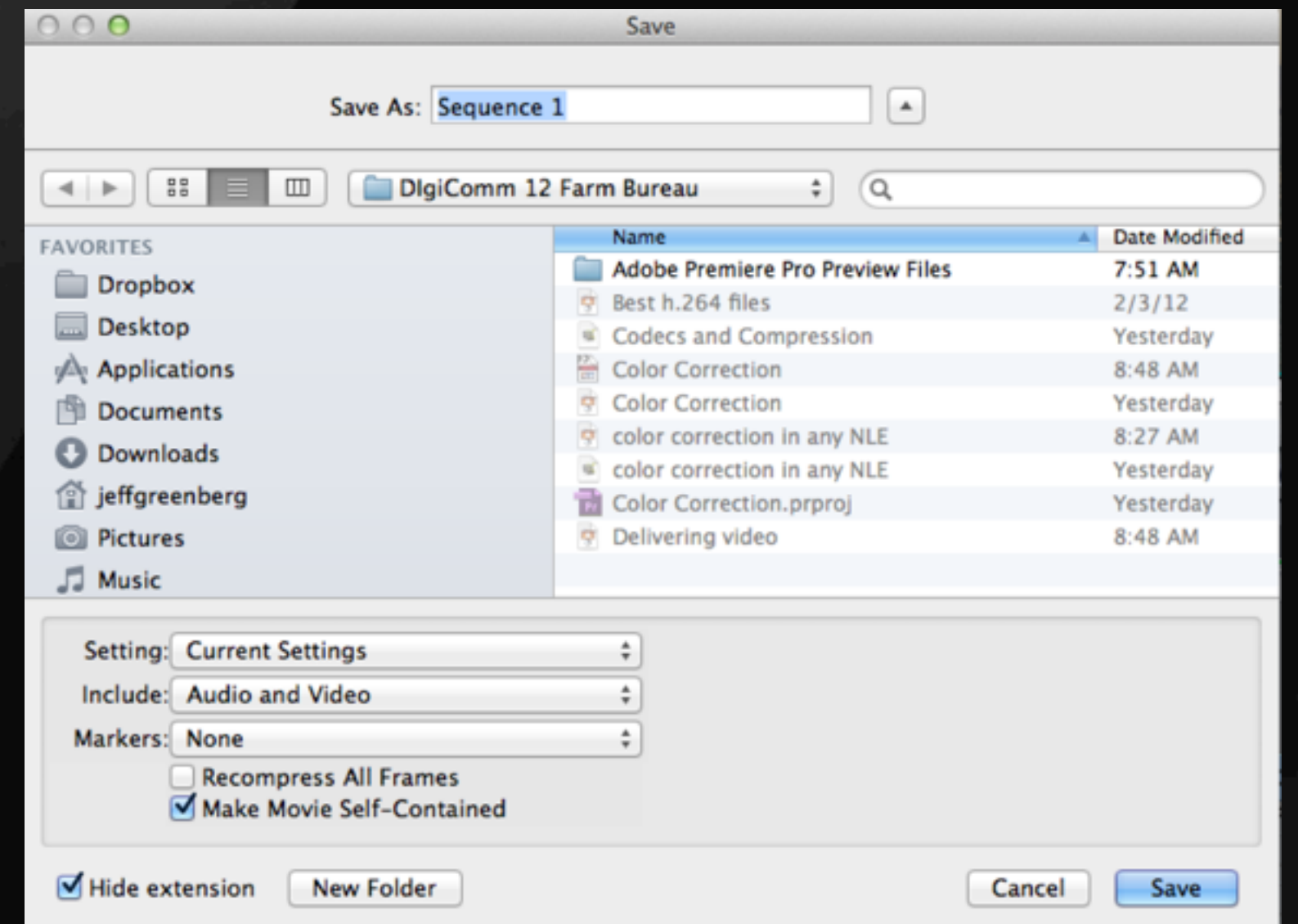
How To: Avid

- **Export QT Movie - same as source**
- **601/709 (leave the color space alone!)**



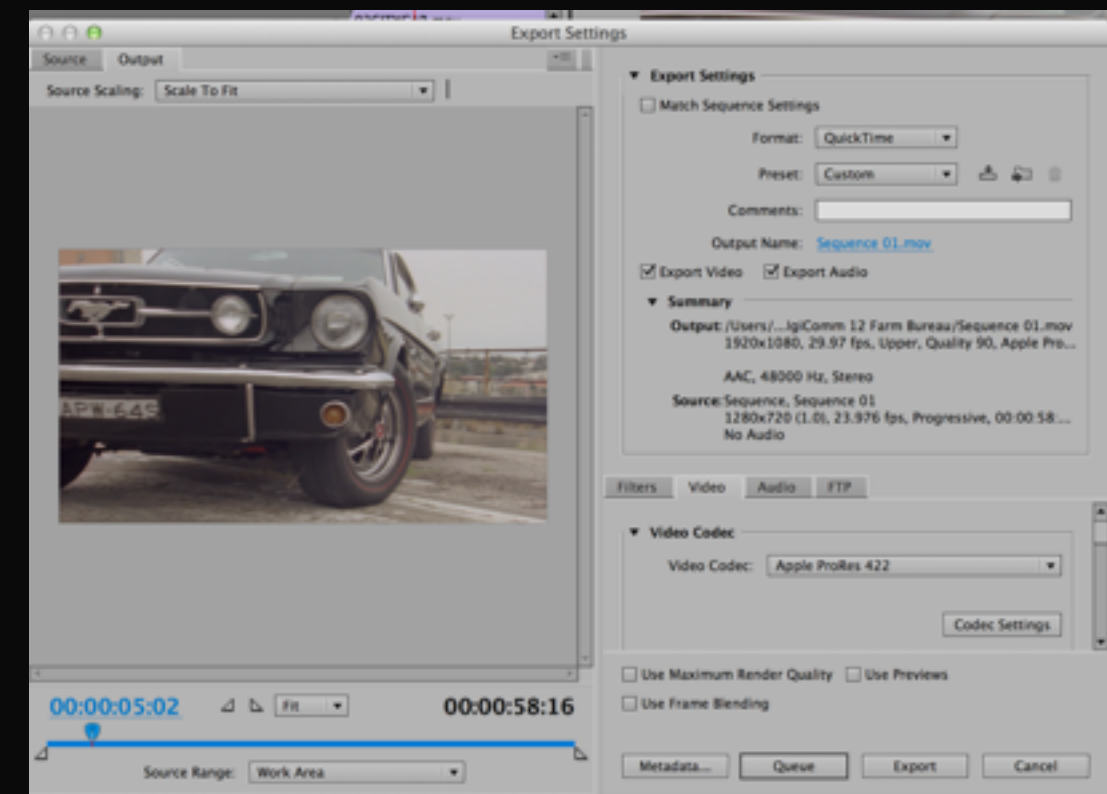
How To: FCP 7

- **Export QuickTime Movie**
- **Make Movie Self Contained**
- **(may want to switch sequence to ProRes)**



How To Premiere Pro

- **File> Export Media**
- **There WILL NOT be an appropriate preset**
- **ProRes, DNxHD, Cineform.**
- **Use frame blending if speed changes**
- **Use Max Quality if scaling**
- **Make sure Size/FPS/field order matches**



**What makes these
codecs so special?**

**..and then we have to
talk about numbers.**

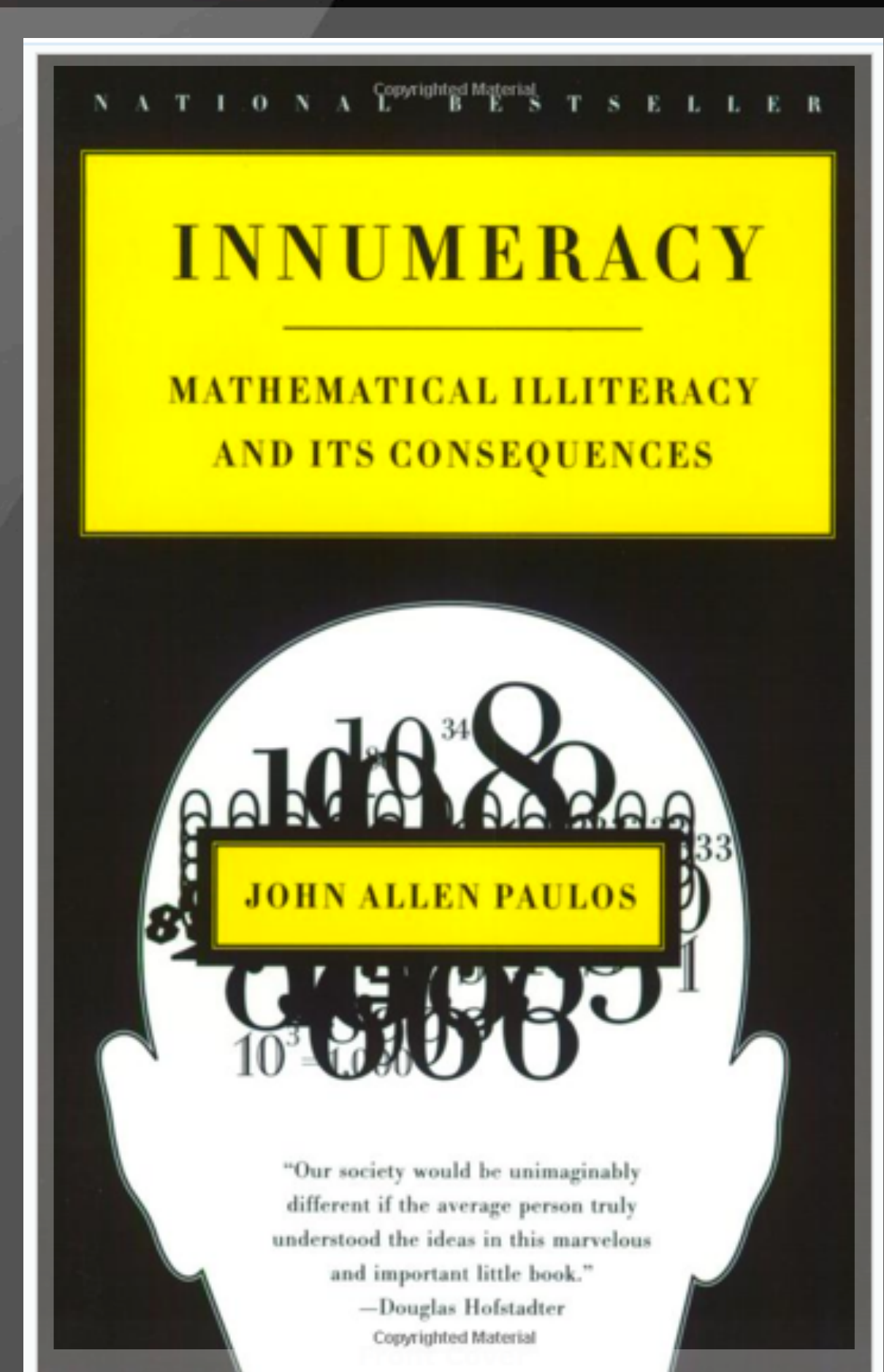
Data Rates and you

**We weren't taught
math terribly well.**

Math doesn't have to be scary

Quit apologizing for being 'bad
with math'

Go read Innumeracy
John Allen Paulos



The way it's described?

**Described by
marketing people**

**Everything is described
in megabits per second**

Sexier?
56 kilobit modem?
7kilobyte modem?

neither is also an acceptable answer, after all, it's a modem

Divide by 8
that's the secret

**You need a touchstone
of how to think
of this stuff**

Million, Billion, Trillion

**4 numbers to act as
your touchstone**

Understanding Data Rates

- **Measurement of how much data per second the video receives**
- **Larger is generally better**
- **Uh...oh....numbers**

4 numbers to understand

1	25
125	880

4 numbers to understand

1

**Mini DV
DV25
25 Megabits/Sec
5 min ~ 1 gig
1 hr ~ 12 gig**

125

880

4 numbers to understand

1

**Mini DV
DV25**

25 Megabits/Sec

5 min ~ 1 gig

1 hr ~ 12 gig

**480i SD
Uncompressed
125 Megabits/sec
1 min ~ 1 gig
1 hr ~ 60 gigs**

880

4 numbers to understand

1

**Mini DV
DV25**

25 Megabits/Sec

5 min ~ 1 gig

1 hr ~ 12 gig

480i SD

Uncompressed

125 Megabits/sec

1 min ~ 1 gig

1 hr ~ 60 gigs

1080 HD

Uncompressed

880 Megabits/Sec

1 min ~ 6 gigs

1 hr ~ 600 gigs

4 numbers to understand

Youtube SD
640x360
1 Megabits/sec
2 hrs ~ 1 gig
1hr ~ 500 megs

Mini DV
DV25
25 Megabits/Sec
5 min ~ 1 gig
1 hr ~ 12 gig

480i SD
Uncompressed
125 Megabits/sec
1 min ~ 1 gig
1 hr ~ 60 gigs

1080 HD
Uncompressed
880 Megabits/Sec
1 min ~6 gigs
1 hr ~ 600 gigs

Touchstone

1 Youtube SD	25 Mini DV
125 Uncompressed SD	880 Uncompressed HD

Quiz time:

**Pick any format - use
your touchstone!**

Post Codecs

- **ProRes 422 - 140 mb/s***
- **DNxHD - 145 mb/s***
- **Cineform - 96 mb/s***
- **“Archival” such as JPEG-2000 100mb/s***

One last note about data rates

- **It's also hardware connections to your computer (USB, Firewire, Ethernet, Thunderbolt)**
- **...and your connection to the Internet.**
- **Speedtest.net (hotel was 1.5 up/ 1.6 down)**
- **if your Video data rate exceeds the PIPE - video playback CANNOT happen in Real time.**

Optimizing for Common online delivery

We're not trying to make small files!

- **Who cares how long it takes to upload?**
- **They're going to recompress it (maybe)**
 - **Often will offer several qualities based on the end users connection/pipe**
- **FFMPEG**

Decent data rates

1920x1080	8 Mb/s
1280x720	6 Mb/s
960x540	2-4 Mb/s
640x360	1-2 Mb/s
320x240	.3-.5 Mb/s

YouTube

YouTube Rules

- **ffmpeg**
- **Over 10 min...**
- **~ 4mb/s for 1080HD**
- **Double that. No Triple.**
- **Post Codecs...are allowed.**

Vimeo

Vimeo Rules

- **Much more customizable/pro**
- **They suggest h.264**
- **Again, they're going to recompress**

Brightcove

Brightcove

- **Won't recompress your video**
- **Try the 'decent' versions given in this talk.**
- **Try also HALF and see if you're happy**

Critical note

- **Understanding your client's pipe determines RT playback**
- **Data rate MUST be under the pipe size**
- **Brightcove also has some recompression presets - your highest quality version = best starting point.**

Working Smarter

TETO

- **Test Early Test often**
- **Hardest 60 Seconds**
- **I/O in COMPRESSION Software**

Drop Folders/Droplets

- **Folders can be routed for specific targets (Media Encoder, Episode, Squeeze)**
- **Droplets provide similar capability (Compressor)**
- **Nearly all have an email/sms feature**

Noise Reduction

- **Lower quality source (noisy)**
- **NLE Based**
- **Compression tool based**

Closing

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Master Trainer

Adobe

Apple

Avid



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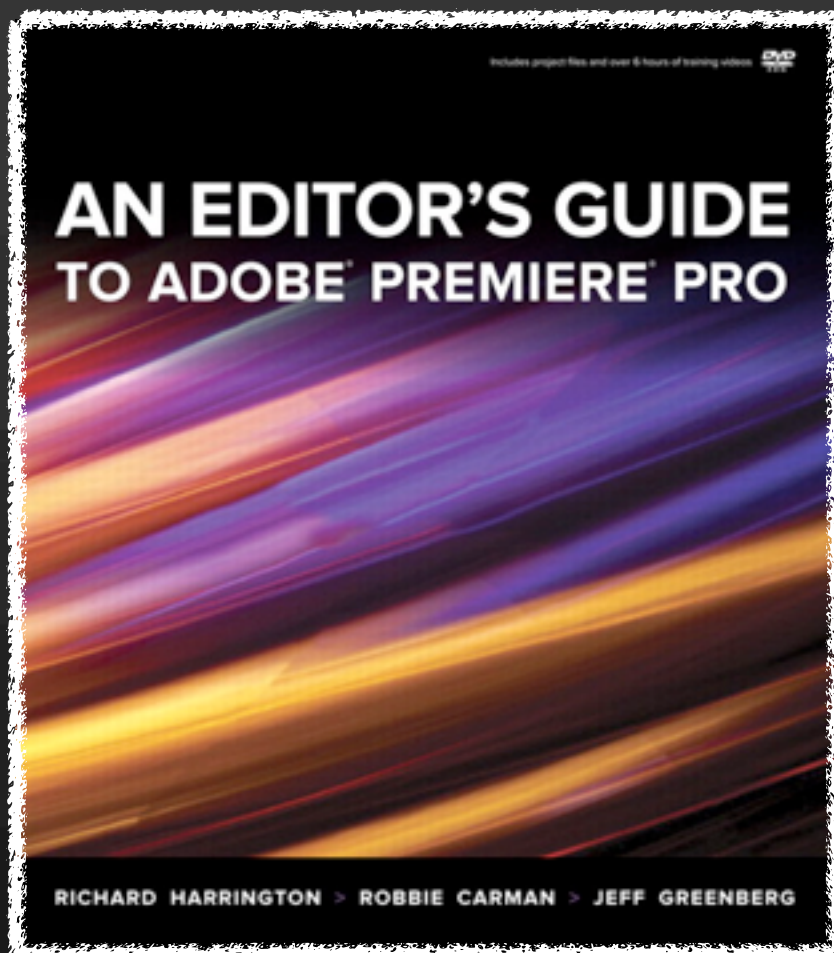
needs logos

Jeff @ Jeff I Greenberg .com

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