Back to Friday, Week 2

An Overview of Planning, Shooting, Capturing, Editing and Embedding Video for Delivery on a Computer

By Jim Bertelsen and Jim Buell

I. Managing Video and Audio on a Computer: Introduction

Managing video on a computer involves CAPTURING, EDITING, and RE-SAVING to a particular format which is nearly always different than the format you captured the video in. Typically, two or three different pieces of software are required to handle all these steps. Options vary widely (wildly even) as to the hardware and software you can use. In this document we describe some of the major choices to be made.

Working only with audio, as opposed to video, is far simpler - the only hardware is a microphone, plugged into the back of your computer, and a pair of speakers or a headphone for playback. Alternatively, if your audio is pre-recorded on another device, such as an audio tape or minidisc, you need only connect the headphone jack on your device with the line input jack on your computer. This is typically done with a minijack-to-minijack cable or a RCA/Composite-to-minijack cable. (RCA/Composite jacks and cables are color coded red and white for the left and right channels of a stereo connection. See Cables & Connections.)

Back to Top

II. What is Your Objective?

The first thing you need to decide is what type of video you want to produce. This includes both the purpose and format of the video. For example, if you want to put a lecture in streaming media format for viewing over the Internet, you might want a "talking head" next to a series of slides that advance automatically in sync with the discussion. Perhaps an inexpensive web cam that plugs into your computer's USB port could handle this job satisfactorily. Alternatively, you might want to capture the dynamics of classroom interaction. This would require a wider shot, and probably a better camera than even your high end web cam. You'll want mobility and quality to capture details that are beyond a web cam's capabilities. In this case, you'll want a video camera, or camcorder, that captures video to tape rather than a web cam tethered to your computer.

But whether you go with a web cam or a camcorder, you'll want to make sure that you plan the shooting of your video ahead of time. This may involve producing a script and/or a storyboard, taking into account lighting and acoustic considerations, familiarizing yourself with the operation of the camera and tripod, and perhaps even doing test runs so as to help your video subjects become accustomed to the presence of a camera.

Useful Links for Planning Your Video

1. Planning Your Video
2. Storyboarding
3. Storyboarding "A Recipe"
4. Collecting Video & Audio
5. Video in the Classroom

Back to Top

III. Choosing a Camera & Connecting it to a Computer

The camera you choose should be suited to your objectives for the video. Below are descriptions of three basic types of cameras that can be used to produce video to be digitized on a computer.

Also see: Building a Digital Video Capture System

Web Cam

A Web cam is a small digital video camera, tethered to your computer usually via a USB cable, although some WebCams come with their own proprietary video capture card. Often used for video conferencing over a network, they are good for shooting the "talking head" video. Picture quality is relatively poor compared to cameras that capture to tape, typically producing a somewhat grainy image and perhaps jerky motion, particularly if the frame capture rate is set at 15 fps or less. (Full motion video is typically captured at 30 fps, while animation is often displayed at 15 fps.) Web cams are therefore best suited to close-ups with little movement within the video frame. Web cams (that we know of) do not come with built-in microphones, so audio capture must be accomplished with a separate microphone for live capture, or from an audio playback device (such as an audio tape player) for capture of pre-recorded audio.

When shopping for a Web cam, check:

- The system requirements Is your computer capable of using this device?
- The maximum resolution of the camera (640X480 pixels for full screen) and the maximum frame capture rate (30 frames per second for full motion).
- Product reviews posted online. Research customer satisfaction.

Analog Camcorders & VCRs

The VHS, SVHS, VHS-C, SVHS-C, 8mm & Hi8 camcorders (and most likely your VCR, unless you have a digital VCR) are all analog video capture & playback devices. To capture video from an analog source to your computer requires some sort of capture device, which could come in the form of::

- a PCI video capture card (installed internally in desktop computers)
- a PCMCIA video capture card (easily swappable card for laptops)
- a USB video capture device (the easiest solution for desktops or laptops with a USB port, but not as fast and of lower quality than most card devices)

You will also need the right cables to connect the camera to your computer. The two main types of video cable are Composite (RCA) Video & S-Video. Your VCR probably has Composite jacks: yellow for video, white for left audio channel and red for right audio channel. S-Video provides a higher quality signal than does composite. If you use an S-Video jack for your video signal, you can still use the red and white composite jacks for audio. If your camera or VCR has only composite audio jacks, and your computer has only an audio minijack, for a few dollars you can purchase a cable with composite stereo connections on one end and a stereo minijack connection on the

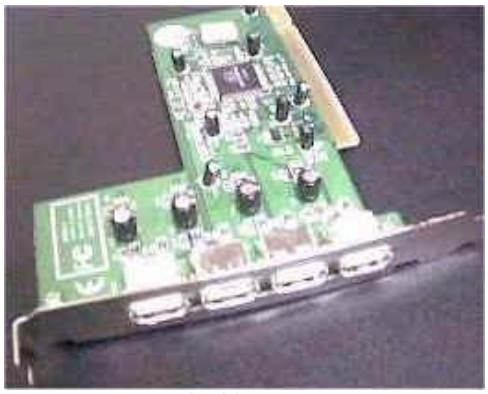
Digital Camcorder / Camera

There are (to the best of our knowledge) six types of digital camera which can record video:

- DV
- MiniDV
- Digital8
- MiniDisc
- DVD-RAM
- Still digital cameras

DV, MiniDV and Digital8 record to tape and record between 30 and 120 minutes of video. Some high end still digital cameras also can record mpeg video to removable media such as a compact flash card, IBM MicroDrive, or Sony's MemoryStick. Typically, such recordings are limited to less than a minute, but some cameras may record for a longer amount of time.

Higher resolution results in higher quality video. It's common to find video cameras with resolutions between 200,000 and 500,000 pixels. A MiniDV camcorder that takes megapixel still photos is available for a higher price. If you have a choice of cameras, it's generally better to go with the one with higher resolution, as this often outweighs other features. Other features to look for are progressive scanning, higher optical zoom (don't rely on digital zoom only), good battery life and LCD viewscreen. 3CCD cameras will produce outstanding quality, but are rather expensive.



PCI Card with 4 USB Ports
(Visible from back of many Desktops)

A WebCam that when detached from the computer can take still photos.

other.

S-Video and Composite/RCA video ports. S-Video provides higher quality.

Minijack audio ports.
Left to Right: Line-Out, Line-In, Mic

Minijack to Composite (RCA) stereo audio cable.

Most digital camcorders can output composite as well as digital video. Digital video is captured to your computer via firewire (aka IEEE1394/iLink), although USB 2.0 cameras are starting to appear. USB 2.0 is actually a faster conduit than firewire (for the moment). Video captured to compact flash cards and other non-tape media provide for speedy transfer to the computer. DVD-RAM cameras probably offer the fastest transfer and seek times. This latter type is not yet a practical solution for most, however.

See Also: MiniDV Cameras

If you use a WebCam...

- Make sure your computer meets the device's minimum requirements. (Example)

If you use an analog video device...

- Make sure you have the right type of capture device (PCI / PCMCIA / USB), the right cables and tapes. Many devices are bundled with software.
- Make sure your computer meets the device's minimum requirements. (Example)

If you use a digital camcorder...

- Make sure your computer has a firewire port and software that can capture and edit video from a digital camcorder. (Adaptec offers a single PCI card with both FireWire and USB 2.0 ports.)
- Make sure you have proper storage media for the camcorder.
- Make sure your computer meets the device's minimum requirements. (Example)

Useful Links for Determining What Device(s) to Use

1. Understanding Analog vs. Digital
2a. Types of Camcorders
2b. DV Camera Features
3. Which Camera to Use
4. Decision Tree
5a. Types of Video Tape
5b. Anatomy of a MiniDV Tape
6. Cables & Connections
7. Preparing to Shoot Digital Video: Cameras, Connections and Media

This streaming presentation was produced specifically to answer questions from some of our chat sessions. Slides were created in PowerPoint 2000, and converted to RealVideo using RealPresenter Basic.

8. Desktop Video Tips Archive

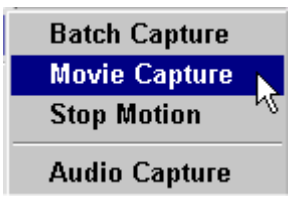
Back to Top

IV. Shooting a Quality Video

- Camcorder 101: How to Make Better Videos
- Collecting Video & Audio
- Lighting & White Balance
- Movement
- Backgrounds
- Head room, nose room & lead room
- Microphones
- Watch How to Record Yourself in the Classroom
- Video Pedagogy
- Streaming Media World Streaming Basics Shooting Video for Streaming
- Bringing Learning to Life: Tips for Making Your Movie
- Shoot Like a Pro
- Streaming Your Video on the Internet: (Part 1: Shooting)

Back to Top

V. Capturing Video to a Computer



- Three Dimensions of Digital Video
  - Presentation Size (Video Window Height and Width)
  - Frame Rate / Key Frame
  - Compression
- Flash Tutorial for Capturing a Video in Adobe Premiere 4.8
- Capturing a Video in Adobe Premiere 5.0
- Capturing Analog Video using the PowerMac 8500 and Premiere
- Video Capturing Introduction and Setup (Using Adobe Premiere 5.x for Windows)
- Digitizing Video - By Berkeley Multimedia Research Center

- Digitizing Video in Premiere for the Mac
- Getting Video into Your Computer, The Easy Way: Using a Computer with DV/FireWire Built In
- ION Resources - Streaming Media: Capturing Audio - Windows

Back to Top

VI. Editing Digital Video Files on a Computer

- Flash Tutorial for Trimming a Video in Adobe Premiere 4.8
- Trimming a Video in Adobe Premier 5.0
- iMovie: Edit
- iMovie: Effects
- Free iMovie2 Training
- Final Cut Pro Guide Picks
- Streaming Your Video on the Internet (Part 3: Editing)

Back to Top

VII. Compressing Digital Video Files on a Computer

- Video Formats and Compression Methods
- Streaming Your Video on the Internet (Part 4: Compressing)

Back to Top

VIII. Creating Streaming Media for the Web

EMBEDDING

- Embedding RealAudio into a Web Page
- Embedding QuickTime Movies into a Web Page
- Embedding Movies in a Web page

REAL

- Tutorial for Convert a Sound File to RealAudio
- RealPresenter Tutorial for Students of EdPsy 490I
- Using RealPresenter to Create Streaming Media from PowerPoint
- Flash Tutorial for Creating a RealVideo for the Web
- Real Video Tutorials and Templates from Real.com
- Audio and Video Production with Real Producer
- Demonstrations of Real Video at Various Bitrates
- Encoding 101
- Encoding, Embedding, Controlling and Uploading RealVideo
- RealNetworks.com Getting Started
- Authoring Content for RealPlayer 7
- RealNetworks Support Frequently Asked Questions Index
- RealPlayer Support Options
- RealProducer Plus 8 Review
- Real Media Guide from Berkeley Multimedia Research Center

iMOVIE

- iMovie Tutorials
- Streaming Media World iMovie Streaming for the Family
- iMovie Part 2 Editing For Streaming
- iMovie Part 3 Preparing For the Web
- Review iMovie and Final Cut Pro
- How to Show Your iMovies to Audiences Everywhere

QUICKTIME

- QuickTime is Streamable
- Streaming Media World SMIL in QuickTime

WINDOWS MEDIA VIDEO AND POWERPOINT

- Creating a Streaming PowerPoint Presentation - 56k
- Creating a Streaming PowerPoint Presentation - 300k
- Creating Synchronized Media with Windows Media On-Demand Producer
- Web Workshop - Windows Media Technologies Content Development & Deployment
- Windows® Media Technologies
- Windows Media 7 Quality Showcase

MISCELLANEOUS

- FTP-ing Your Video Files to a Server
- Software Recommendations
- Streaming Your Video on the Internet (Part 5: Publishing)

Back to Top

IX. Video in the Classroom

- Techniques for Teaching with Video
- Bringing Learning to Life with Digital Media
- Education iMovie Gallery
- QuickTime TV for Learning
- American Memory: Historical Collections for the National Digital Library
- American Presidents Archive
- Video Lesson Plans
- Instant Video Revisiting:
  The Video Camera as a "Tool of the Mind" for Young Children
- California Learning Interchange
- The Basics of QuickTime for Learning

Back to Top