

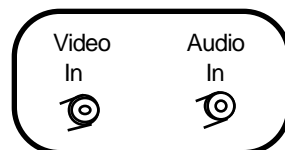
Nuts and Bolts: Video In.



This section will walk you through the nuts and bolts of the connections necessary for you to integrate videos, VCRs, audio, and computers. It is in two sections. First, getting **Video In** to your computer. Second, getting **Video Out** from your computer to a VCR or TV. Finally, it will show you how to add **Audio** to student projects. It is recommended to set up at least one workstation when students can bring video in and out from the computer. Once video in is captured at the workstation, it can always be moved back to the classroom on a Zip cartridge, etc. Similarly, a single audio dubbing station can be set up to serve many students or classrooms.

Video In

Video is generally carried into the computer through one of three ports. These ports differ in speed. One choice is to use either the **printer** or **modem port** when the input device is a tool dedicated to putting images into a computer, e.g., modular video cameras or a digital camera. The advantage of these ports is that every computer has one. The disadvantage of these ports is that they only work with dedicated devices. They generally have an liability in terms of transfer speed. A better way to import video is through an **RCA jack**. SVideo, Firewire (IEEE), or USB are great. Make sure your software will find them!



Note: Generally, video cards will have two audio input jacks for stereo applications. The illustration shows one audio input for simplicity.

This port can handle live video from a **camcorder**, recorded images (including movies) from a **VCR**, video from **laser disc player**, **television** channels from a VCR's tuner and generally anything that outputs through an RCA cable. RCA inputs are standard on a true **AV computer**. Check to see if your computer has RCA inputs like those in the illustration above in the back. If your computer is not equipped with these inputs, investigate a video input card (sometimes called a video capture card). For most computers, Mac and Windows, these run under \$200.

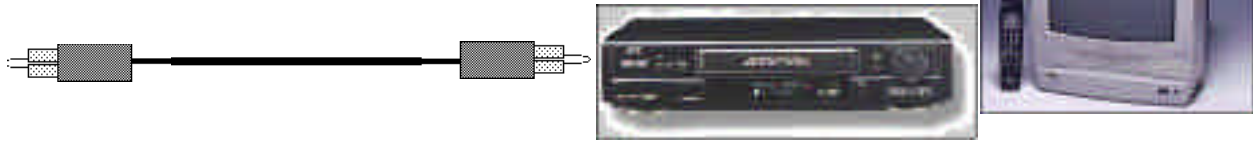
Images from broadcast television can also be brought in through a tuner card. A tuner card has an "F" connector just like the antenna connector on a television or VCR. You simply connect an antenna cable or cable TV cable to pull programs into your computer -- or to watch television on your computer monitor.

Superior digital cameras will have a video output able to plug directly into an RCA jack. This is a much faster way to pull digitized stills into the computer (although there is a tradeoff in resolution).

SchoolTECH- Triple Witching: Digital Video, Project-Based Learning, & Standards - Hall Davidson



Nuts and Bolts: Video Out.



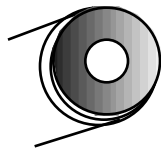
Computers have always generated video output. That is how the monitor works. However, monitors display images and text in a different way than **televisions**. Televisions literally scan in pictures one line at a time, like a paint gun with a narrow nozzle. A beam “sprays” the image across and down on the inside of the glass tube one line at a time until it is finished (in fact, that is only half the picture. A second set of lines is painted immediately after the first and the human eye combines the two sets of lines into a coherent image). Computers, on the other hand, drop in the whole image at once, like a teacher manually dropping a slide into a slide projector. That is why images of computer monitors on television often seem to roll. The television camera picks up the images dropping in on top of each other. Sometimes out of the corner of your eye, you can also see the images building and erasing themselves. To convert one kind of image into another requires a device. When your are taking an image from a computer to television, you must convert it into a scanning display. For this, a **scan converter** is used. This takes the output from a computer that usually goes to the monitor and reroutes it to a television signal, converting it as it goes. In an AV computer, the scan converter is built in and the monitor signal is converted to a television-friendly video signal (this is also why on many AV machines you cannot watch the television and the monitor at the same time---the computer chooses one or the other).

Scan converters can convert the monitor signal three ways. They are not equal in quality. These connections can also serve as inputs if your machine has the hardware.



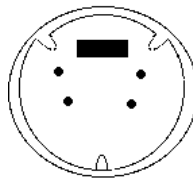
RF (“radio frequency”)

barely acceptable



RCA jack - video output

better



S-Video

best (analog)



USB video

digital -less loss



IEEE 1394
“Firewire”

digital - best

Buy a scan converter that has s-video capability. However, it requires a television or projector with s-video to take advantage of the superior display. Video or s-video signals can then be taken out to a VCR or other computer to record or display.

Nuts and Bolts:

Printing to Video

Multimedia projects can include videos of the students, animated sequences, film clips, and more. However, video takes up stupendous amounts of hard drive space. Additionally, multimedia projects often don't convert well to paper to archive or share student work. The answer is to print on video tape. This is done either with an AV computer or by connecting a standard computer to a scan converter.



1. Connect the computer and scan converter. Connect the **video out** RCA jack on the scan converter or computer to the **RCA video in** jack on the VCR (RCA male to RCA male cord).

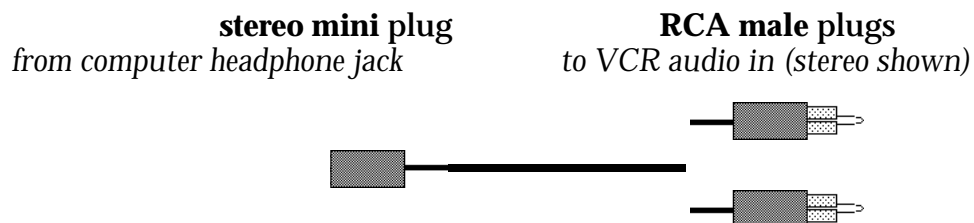
2. Set the VCR to **input** or **auxiliary** or **line** or whatever designation the manufacturer uses to turn the VCR's attention to the jacks in the back. Use the **input switch**, commonly on the remote but sometimes on the VCR. Occasionally, the **channel up/down** button will lock into the line function. *If you see a channel number on the VCR (e.g., "3"), your VCR is not tuned into the jacks in the back.*

4. Set the tape speed to **SP** (the "two hour" speed). Set the VCR/TV switch to VCR. You should see your computer on the television set connected to your VCR (not a bad trick in itself).

5. Hit **record** on the VCR. Anything you do on the computer will now be recorded on videotape to share, archive, send home, or show to teachers or students.

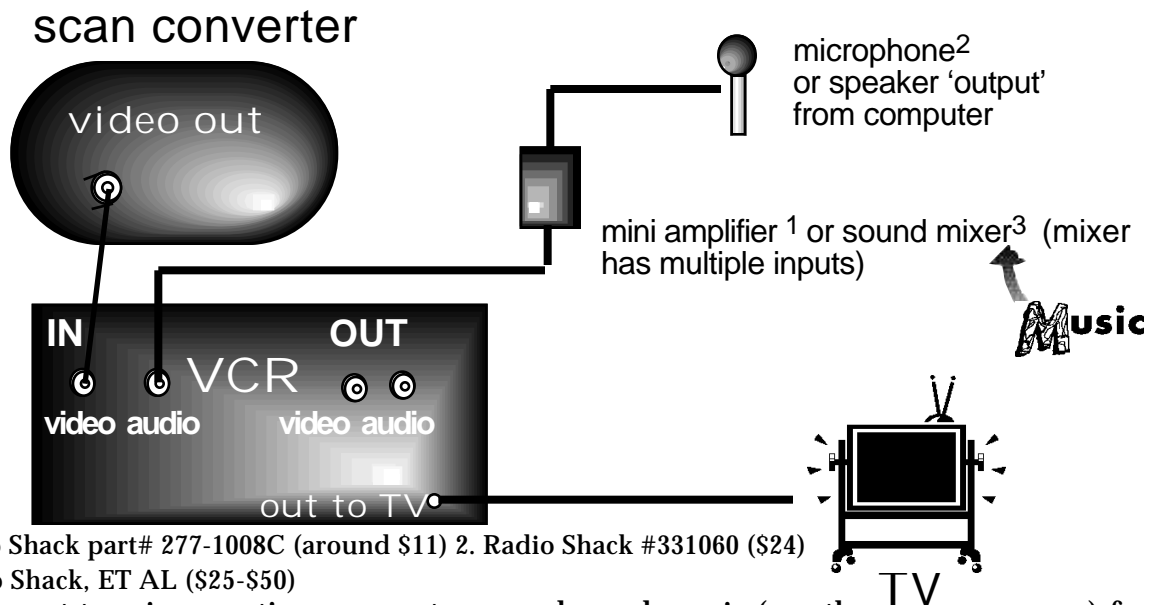
Adding Sound

If you wish to include the sounds from the computer on the tape, also connect the **headphone** output jack to the **audio in** jack on the VCR (the computer **speaker** jacks may be a little too noisy). The computer speakers (or headphones) are probably stereo. If the VCR is not stereo, just connect to the single **audio in** jack. The connector cable will look like this. If you can't get the identical cable, use adaptors to make one.



Nuts and Bolts: Printing to Video *continued*

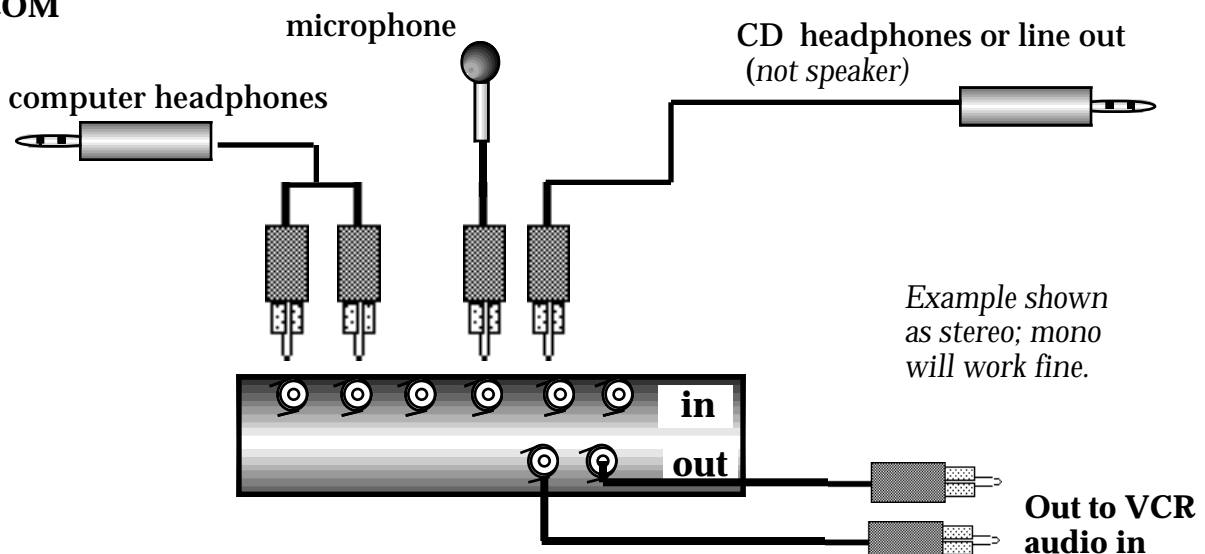
If you want to add narration instead of the sound from the computer, connect a **microphone** to **audio in** on the VCR (include a mini-amplifier as shown below). Students will be able to narrate as they watch the output from the computer on the television (turn the volume down or you may get feedback). When you **record** on the VCR, it will record the computer as video and the microphone as audio.



1. Radio Shack part# 277-1008C (around \$11)
2. Radio Shack #331060 (\$24)
3. Radio Shack, ET AL (\$25-\$50)

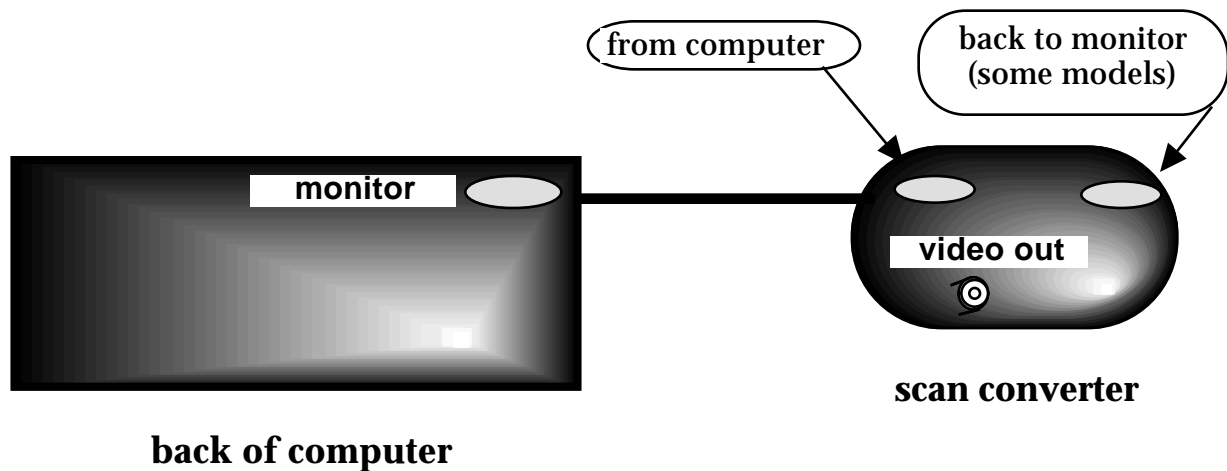
If you want to mix narration, computer sounds, and music (or other audio sources) for your soundtrack, use a sound mixer. They are inexpensive and very effective. Connect the microphone, computer speakers/headphone, and music source (a CD in the example) to the mixer inputs. Then connect the mixer output to the VCR.

FROM

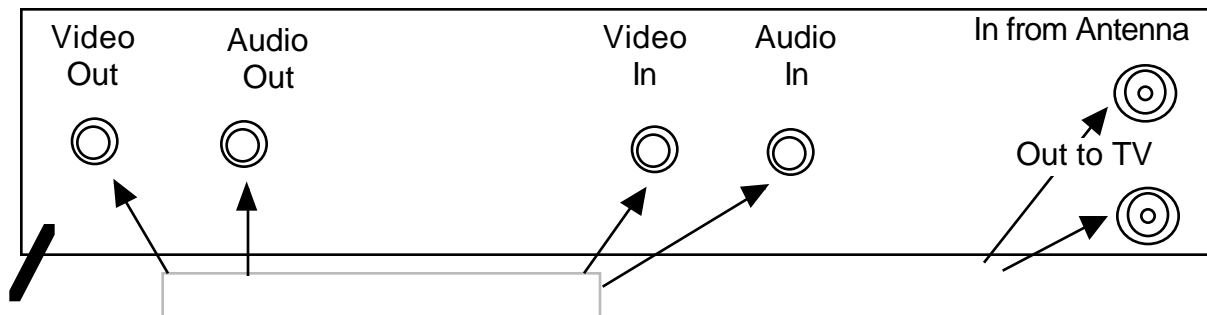


Nuts and Bolts: Printing to Video *continued*

More on scan converters: To connect the computer to a scan converter, disconnect the monitor from the computer. Connect the cable supplied with the converter from the monitor output to the computer in on the scan converter. Then connect the scan converter to the television or VCR as described above. On some models, you can also reconnect the monitor to the converter (note: VGA output from a converter will let you see a Mac on a Windows monitor!).



A closer look at the back of a VCR.



Note on changing tape speed

on the remote



Tape
Speed (press)

on the VCR



A Cable and Connector Visual Glossary

Cable

RCA to RCA Cable



mini cables

mono

stereo

coaxial cable or RF cable



Connects

VCR video/audio in and out; Apple II monitors; amplifiers to cassette players and CD players; monitors to VCRs; (most) camcorder a/v in and out, a/v computers; scan converters; laser disc players. They were also used for speaker connections on older amplifiers. AVOID these old connections. They were changed for good reason.

headphone jacks on portable cassette players, radios, CD players; audio (speaker) out on most computers; microphone jacks on camcorders;

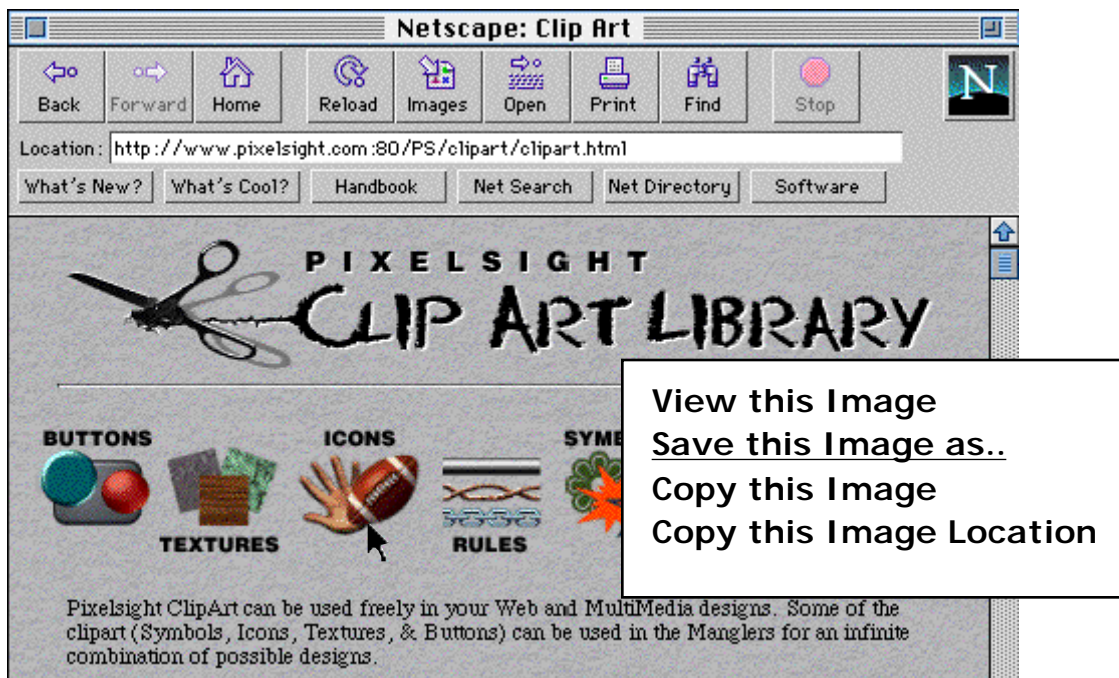
antenna connectors for TVs; cable tv connectors; VCR to TV connector



Integrating Graphics and Animations from the Web

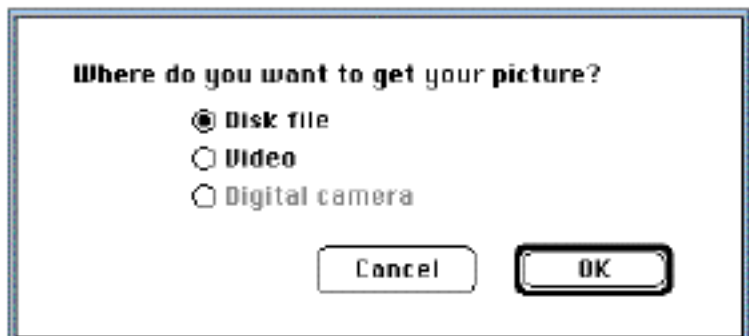


In Netscape or Explorer, highlight the graphic with the mouse. Press down the mouse key and a range of choices will appear. Choose **Save this Image as** and you will be directed to your own computer to pick a place to store the image. Give it a name you will remember and hit return. Now it is stored where you can access it. Note: It is a good idea to create a new folder or directory named "Internet Images". Otherwise images can get misplaced. It is even wise to create categorical subfolders such as "Civil War Images". Students (and teachers) can create giant collections quickly. This is another reason why it is important to rename the images. Images on the Internet may be named "cat33.gif" which does not tell you it is a picture of a cell. Rename it as "cell nucleus", etc.

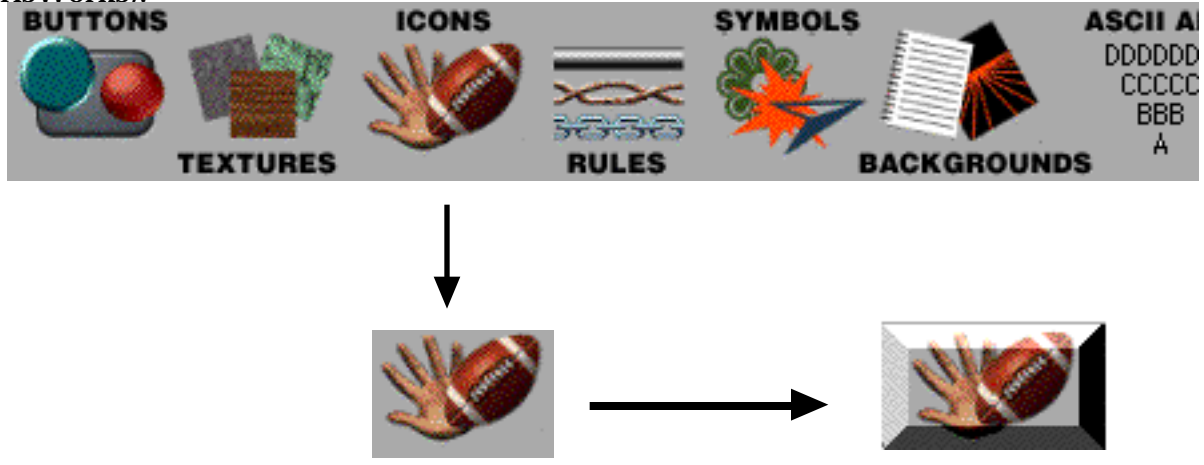


In HyperStudio, choose the **Add Clip Art** command (command A). Go to the folder where you stored the image you downloaded from the Internet and select the image by name. Place it on your card. You can now use it in a project.

Sometimes the image you select will be larger than you expected.



For example, the image wanted below was the football with the hand. It turned out to be part of a larger image. The **Save as** command retrieved something unexpected. However, in HyperStudio, it is simple to cut out the piece you wanted. Once in HyperStudio, of course, the image may be manipulated in whatever way you wish. This is true of other software programs, too. (For example, this page was done in ClarisWorks).

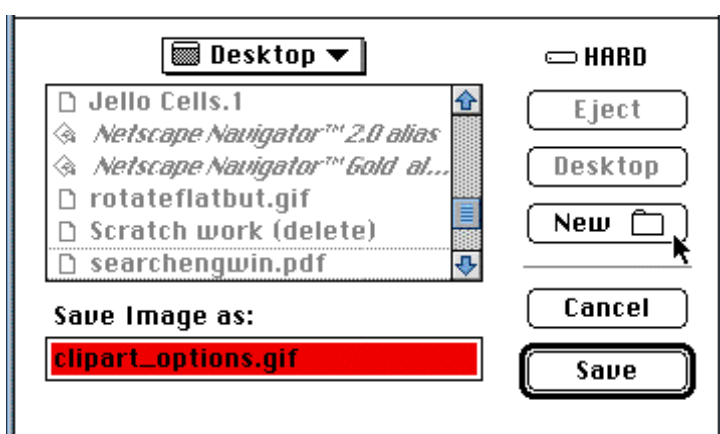



(image from <http://www.pixelsight.com:80/PS/clipart/clipart.html>)

Animations

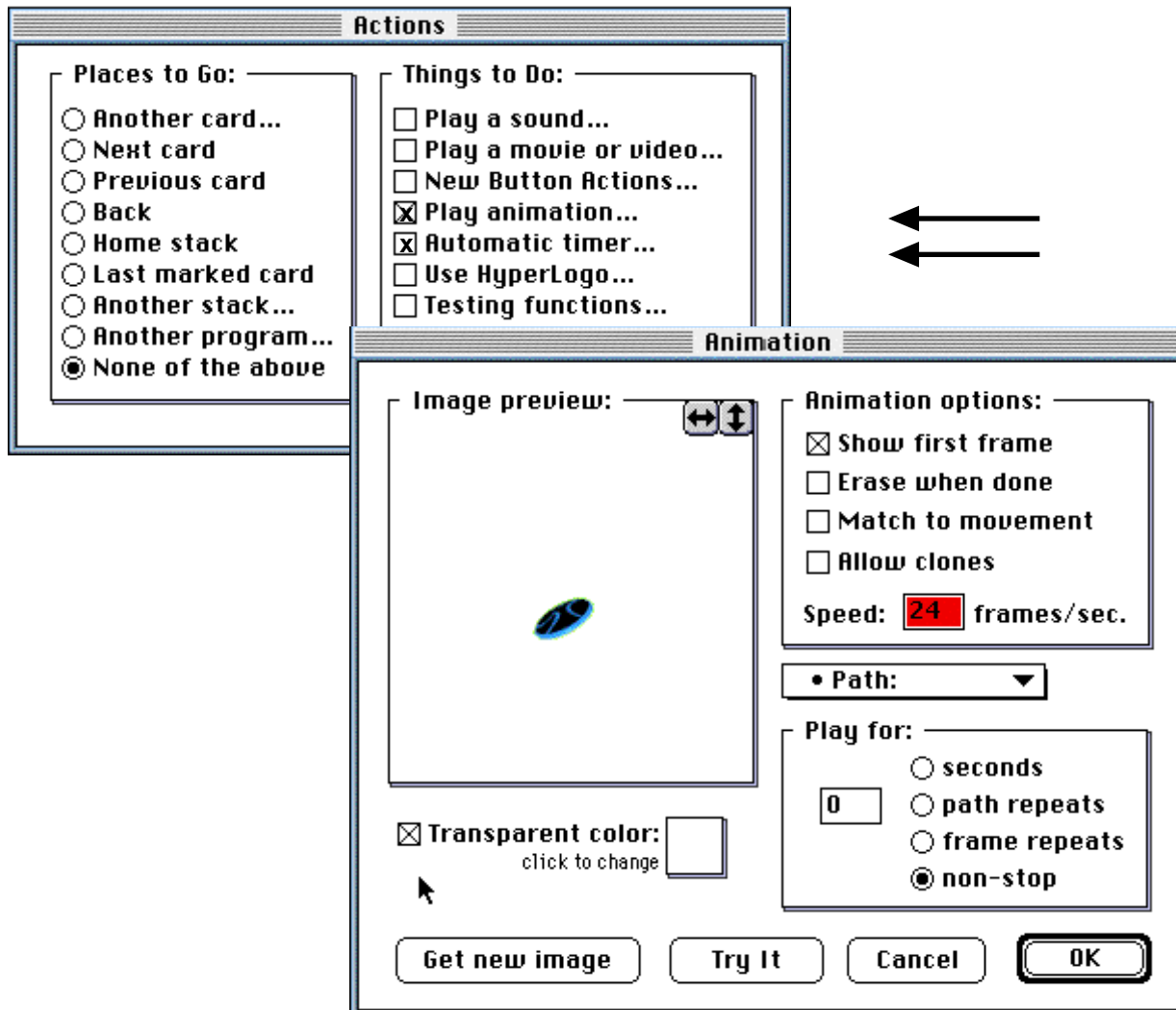
The steps are a little different if you want to download an animation from the Internet to use in a multimedia presentation. From Netscape or Explorer, again highlight the animation with the mouse. Press down the mouse key and a range of choices will appear. Choose **Save this Image as** and you will be directed to your own computer to pick a place to store the image. Give it a name you will remember and hit return. In HyperStudio, make a new button (command B). After the button has been placed, select the **Play Animation** feature from the Button Actions. You will be directed to choose an animation. Now choose the animated GIF you have downloaded. It may

now be incorporated into a student project.



If you don't want control of the animation, that is, you don't want to have to turn it on and off with a button but simply want it to move continually as an accent, choose the Invisible button feature (the button shape that looks like this: 

From the animation control, select **Show first frame**, and **non-stop**. Return to the button action menu, select **Automatic timer** and have the button activate **Do this action as soon as the card is shown**. The animation will now play continuously when the card is shown.



Resource Page

AV Computers: Older Macintoshes with "A/V" label; certain G3s
Windows Machines: Gateway (inc. laptop model), Compaq, Sony, ET AL. Be sure to check for RCA jacks in the rear (or front in some models).

Video Capture Cards: Mac: Apple brand video cards **Windows Buzz** (Iomega) \$129; Many others. **Vendors:** 800.323.2325 or www.videoguys.com; or bhphoto.com

Camcorders: Anything with video/audio outputs. Virtually all have these, including "broken" camcorders that won't record or rewind. 8mm or VHS will work. Check newer digital cameras to make sure they have the jacks (holes). Ex. Sears: RCA w/ audio dub, \$399; VHS-C has a small size but is compatible with regular (VHS) VCRs (e.g., Panasonic's camcorders)



VCRs: Anything with video and audio out and in. SVHS and Hi8 are superior, but more expensive for tape and machines. Digital machines and firewire connections are still (1998/99) not practical for generic classwork.

Tuner Cards: Mac: Apple brand **Windows:** Many options (check for bundled software)
Scan Converters: AverKey (\$80-\$249) 1.800.538.8866; www.focusinfo.com
TelevisEyes from Digital Vision (models range from \$99 - \$399); others: Consumer electronics, Infocus, and others.

Software: (both platforms)

Vendors: Learning Services 800.877.9378; Acorn Media 800.368.5812
Morph (Metatools, \$19) 800-757-7707; SmartSound (sonicdesktop.com)
HyperStudio (Roger Wagner Publishing, 1-800-HYPERSTUDIO; \$100)
Goo (Metatools, \$29) www.metacreations.com/products/goo
Adobe Premier (educator price \$130) www.adobe.com
KidPix; QuickTime Pro (apple.com; mac + PC); MovieWorks (mac)
Adobe Pagemill (ed. price around \$60) www.adobe.com
Clarisworks (now Appleworks [again])

Digital Editors: **Mac:** Avid www.avidcinema.com (\$100); iMovie; Final Cut Pro (\$900+);
Premiere

Windows: FAST, Python, and others. Avid has a Windows version. (around \$145 w/hardware) at www.avidcinema.com *Note: The Matrox Marvel is jointly marketed by Avid and Matrox;* Premiere (\$900+).

People: Nancy Smith ("Auntie Goodiebags")- claymation on the computer, AuntGoodie@aol.com, or PO Box 6262 Syracuse, NY 13217,



Hall Davidson, hall@ccd.edu or hall@deltanet.com,
Jeff Peach, teacher, morph, videos, etc., peach@oro.net
Tim Fleck tfleck@aol.com

Other: California Student Media and Multimedia Festival (www.mediafestival.org)

At: www.HyperStudio.com: **VCR as Printer:** pdf file; **Quicktime VR**

Tutorial; **VHS short length tapes:** AVA 1.818.709.1800 (Bani)

Making Multimedia Movies: www.terran-int.com/info/MMMIntro.html
(good glossary at same site); HyperStudio Journal

Soundtrack Software: SmartSound; www.sonicdesktop.com; 800.454.1900;
Sound Companion 800-877-0858; Zillion Sounds, www.beachware.com
QuickTime Pro (both platforms): www.apple.com



Great Web Sites

Date:



For Research



As Publishing



As Interactive Learning Experiences



As a Source for Lesson Plans

A Cable and Connector Visual Glossary Update



USB is a relatively new connection offers transfers rates of up to 12 megabytes per second, more than 50 times old Apple serial ports (and 12,000 times bus ports. They are “hot pluggable”, meaning you don’t have to turn off machines to make connection. Keyboards, video, and other data information can be moved through USB connections.



IEEE 1394 is know by many names, commonly by IEEE or **Firewire** (an Apple trademark). IEEE is fast--at 400 Mbps it has 30 times more bandwidth than USB. It is also hot pluggable and supports up to 63 devices and cable lengths up to 14 feet.



New **storage devices** using IEEE and USB are cheaper, faster and bigger. A 20 gigabytes drive can be as inexpensive as \$400, compared to a Zip drive (\$100+ for device, \$10+ for 100 megabytes) or Jaz (\$100 for a gigabyte of storage). These were originally serial or parallel connections. They have the advantage of being transportable mediums.

for example: 37 gigs - \$645
(www.promax.com)

