EDITING VIDEO IN THE MEDIA ARTS CENTER (MAC) LAB
A QUICK START GUIDE

BEFORE YOU START: If you are planning on working with video for more than one semester, or are planning to make long projects in a video class, we **strongly recommend** that you invest in a FireWire drive to which all your media and project files will be saved. LaCie or TekServe drives are generally reliable. We also advise students who will be using their drives for multiple purposes to create a partition specifically for video, which you can do using Mac's Disk Utility (in the Utilities folder under Applications) before you format the drive. Final Cut Pro cannot communicate with remote files – including any files stored on your server space -- at sufficient speed to work properly, so if you work from the server you will experience frequent errors; and if you work from the local hard drives you may find yourself competing for drive space, vying for specific workstations, or frequently copying and reconnecting media files from one machine to another. A FireWire drive will make your lives easier and can easily be reformatted and used for storage or backup of other files if you decide to abandon your video ambitions.

1. SETTING UP YOUR FINAL CUT PRO PROJECT: SETTINGS, PREFERENCES, SCRATCH DISKS, WINDOWS, KEYBOARD

STEP 1

When you launch Final Cut for the first time on a machine, or use the *File – New Project* menu command to create a new project, Final Cut will usually prompt you to choose an **Easy Setup** for your project. This setup will determine most of your settings and preferences. The default setup in the MAC lab is DV NTSC 48khz, which will create a project where you can work with footage that is shot on DV, in NTSC format, with a 4:3 (TV standard) aspect ratio, and with 48khz sample rate, 16 bit audio. Unless you shot your project on a PAL camera or with a 16:9 (anamorphic or wide-screen) ratio, you will want to use this default setup. There are PAL and 16:9 setups in the **Easy Setup** pull-down menu, which you can select if you shot in those formats. (Note that if you use the *New Project* command to create a new project and are not prompted to use **Easy Setup**, your project has automatically been configured to match the last existing project, but you can access **Easy Setup** through the *Final Cut Pro* menu to change the setup.) Once you hit the Setup button and the project is created, create a folder named FCP_your_username in the Scratch directory on the local hard drive or on your FireWire drive and save your project to the folder. Remember, Scratch is the only directory that you have permission to write to on these workstations, so don't try to save anywhere else or your files may disappear.

Update: If you use an HDV camera to shoot your project, make sure to use one of the HDV Easy Setups, and double-check that all the settings ***exactly match***

the settings you shot with – HDV cameras can be set to a number of different frame rates and aspect ratios.

STEP 2

Familiarize yourself with the **System Settings**, **User Preferences**, and **Audio/Video Settings**. You can access all of these under the *Final Cut Pro* menu directly to the left of the *File* menu. Click through all of the tabs and make sure that you know where different settings and preferences are controlled. Make sure that your **User Preferences** are set to 25 levels of undo and that auto-save is set to happen at least once every 10 minutes, if not more often.

VERY IMPORTANT: Then go into your **System Settings**, and click on the Scratch Disks tab. You'll see that Final Cut Pro has automatically set your Capture and Render Scratch Disks, your AutoSave vault and your Thumbnail cache to your user folder on the remote server. RESET ALL OF THESE TO YOUR FCP FOLDER IN THE LOCAL SCRATCH DIRECTORY OR ON YOUR DRIVE. You absolutely must reset the scratch disks to avoid file errors caused by remote communication. As soon as you reset the scratch disks, FCP will create AutoSave, Render and Scratch Disk folders inside your FCP folder, which is where all the files you bring into, create and modify in Final Cut will be saved.

For local Scratch users: If you are working in local Scratch and planning to use another workstation for your next editing session, you should copy the entire folder to your user folder on the remote server and then copy the entire folder to the Scratch directory of the local hard drive on the new workstation when you start your next session. (In either case, you should be backing up your FCP project files to your server folder and to some external media – CD-RW or keychain drive – at the end of every session.) By keeping the folder intact, you preserve the relative relationships of media files (Capture Scratch and Render) and project files, which should keep Final Cut from losing track of anything. If when you relaunch the project you get a message that your media and/or render files are missing, however, then you can use the *File-Reconnect Media* command to locate them. In the Reconnect Media dialog box, use the Locate option (rather than Search) to find the files manually, and browse through your drives until you find the files. If you have the Matched Names Only box checked, the clip with the matched name will be highlighted as soon as you find the correct folder. If you select the Reconnect All Files in Relative Path checkbox, FCP will also recognize the other missing media files located in the same folder. This process should relink all your files successfully – you may have to do it several times though. Please bear in mind that your server space does have a size limit, so you will run out of space eventually – keep your projects lean and clean.

For FireWire users: You can avoid everything in the paragraph above if you have a FireWire drive, since FCP is configured to communicate with fast FireWire drives, so you can just keep your files on the FireWire drive all the time and avoid all the copying and reconnecting. If, however, you experience sluggish FCP performance (unusually slow renders or autosaves, for example), then you might try copying just your project file to the Scratch directory on the local hard drive

during your edit session, then copying it back to your FireWire at the end of your session.

STEP 3
Make sure that all necessary windows are visible and aligned on the screen in the most efficient way for your workflow. You should see the **Browser, Viewer, Canvas, Timeline, Tool Palette** and audio **Levels** monitor. You can use the menu command *Window-Arrange* to quickly reset all the FCP windows in one of several standard configurations. If you don't see a **Timeline** window, that means that you have no sequences in (or active in) your project. Either double click on a sequence in your **Browser** to open up the **Timeline** window, or create a new sequence by using the key command *Command-N* or the menu command *File-New-New Sequence.* You can change the viewing options for the **Timeline** (e.g. audio waveforms, track height) using the toggle buttons and pop-up menu (which becomes visible when your cursor is over the small arrow) at the bottom left of the window. Note that you should generally not let the **Browser, Viewer,** and **Canvas** windows overlap with each other on the screen, as this can sometimes cause dropped frames during playback and output. Also note that if you need to use menu-defined (rather than window-defined) settings other than the default **Sequence Settings** for a new sequence, you MUST set them before creating the sequence. This can be done through the *Sequence-Settings* menu command.

STEP 4
The editing process involves a lot of repetition, so editors rely on key commands to work more efficiently. You can become familiar with key commands gradually by paying attention to the menus, which list the corresponding key command for every menu command that has one. You can also use the **Keyboard Layout** map under the *Tools* menu to quickly learn where the commands you use most frequently are mapped on your keyboard. If you unlock the layout tool, you can also remap the commands to different keys. This keyboard layout will be customized under the preferences linked to your username, so it won't affect the layout for other users. Also note that many FCP key commands have right-hand and left-hand equivalents. (Being right-handed, I have memorized the right-handed versions, so those are the ones indicated in this guide. The official FCP manual should have a list of left-handed versions of the same commands.)

The first key command you will probably want to memorize is for the menu command *File-Save All*. Final Cut can be buggy, so you should save your work frequently, especially before rendering (the time when FCP is most likely to crash). In Final Cut, Save All (*Option-Command-S)* saves your work throughout the project, as opposed to Save, which saves only in the active window.

2. BRINGING VIDEO AND MEDIA FILES INTO YOUR PROJECT: FILE FORMATS, IMPORTING, DIGITIZING VIDEO WITH LOG & CAPTURE

Before you start: Final Cut Pro is a nonlinear editing system. This means that any media (video, audio, images, or animations) that you want to edit with FCP has to be converted from its original state – usually an electronic signal recorded on tape – into information that can be read and re-written by FCP's program. The *digitizing* process performs precisely this conversion, while *importing* copies already-converted media into an FCP project. Since digitized media has been converted by FCP, you will be able to read and re-write it (i.e. view and edit it) within FCP until the point where you have manipulated the information so much that FCP needs to write a new file to double for the old one – which process is called *rendering.* Meanwhile, imported media often exists as files whose information is not formatted with the same standards (*codecs*) as the digitized files converted by FCP itself. So FCP usually has to conform the imported files to its own particular conversion standards before you can read and re-write them within the program. Hence most imported files need to be rendered before they can be viewed or edited, unless they are pre-conformed by the user to FCP format.
Each chunk of media that you bring into FCP does, however, retain its unique *timecode* signature, which assigns each frame of video or digital audio a chronological number, so that you can synchronize production and post across multiple devices, systems, compression ratios and formats. (Sound from CD/minidisc, still images, and footage from VHS decks or other non-controllable devices have timecode generated for them by the program when they are brought into FCP. This artificial timecode allows you to work with the media files across multiple sequences and projects, but unlike real timecode, will not enable you to re-match a media file to the original media.)

STEP 1
Once you've defined your project settings, any media that you bring into your project has to be in a **format** consistent with those settings. So if you're planning to digitize from DV tapes, make sure that they are all NTSC, shot in 4:3 ratio, and have 48khz audio – unless you defined your project as PAL, 16:9, and 44.1khz. (Also make sure you are shooting in SP, not LP – Final Cut will not digitize from a tape recorded in LP.) The same goes for importing video or audio files from the web, iTunes, or other sources. QuickTime (.mov) and AIFF (.aif) are the only file formats that Final Cut will accept for imported files, but if those QuickTimes and AIFFs have the wrong aspect ratio or audio sample rate, then you will either have to render them every time you watch them (lots of time and processor power wasted) or you won't be able to play them at all within the project. Since 44.1 khz is the standard sample rate for audio CDs, for example (as well as most everything but sound attached to video), you will run into this problem quite often.

Now, this doesn't really mean that you are radically limited in what kinds of A/V material you can bring in to FCP – it just means that you are often better off

converting the file formats BEFORE you import your video or audio. In the MAC Lab, there are several applications available that can help you with conversion. **QuickTime Pro** offers the simplest solution. Any file that you can open in QuickTime Pro can be converted to the .mov format using the menu command *File-Export.* You can also use the menu command *Window-Show Movie Properties* to get information about the way your file is encoded and what its audio sample rate is, so that you know exactly what settings you need to adjust in order to match the file to your project settings. To change the sample rate of an audio file, you can use **Peak** or **ProTools** (on the admin station) to adjust the setting and *Bounce* the audio to a new file. For video formats that QuickTime Pro does not accept, you can try the **VLC Media Player**. In VLC, you use the *File-Open Source* command to open your file, DVD disc, or streaming video URL, then check off the advanced output box and use the *Settings* dialog box to designate a file with an FCP-compatible file format that VLC will stream its output to while playing the source. (See the VLC documentation for more details on this process.) *Update: Within the next few weeks, all the machines in the MAC Lab should also have copies of Audacity (an audio editing program), ffmpegX (a powerful video and audio compression and conversion program) and MPEG Streamclip (a demuxing program) installed. These will all be in the Freeware folder under Applications. If you need to pull some video from a DVD at some point during the semester, I recommend installing Cinematize on your own computer – this open-source app allows you to choose exactly which minutes of video you want to rip from most DVDs.*

You can also import still images into Final Cut Pro in a range of formats (JPEG, TIFF, PICT). Layered PSD files will import as alpha channels. Still images import as freeze frames with a default duration of 1:00, unless you change the default in your preferences. Again, if your images are not formatted in the same aspect ratio as your project, they will have to be rendered to be viewed in the Timeline.

The key command for **importing** is *Command-I* (for individual files only) and the menu command is *File-Import,* which gives you the option of importing individual *Files* or importing a *Folder* of files.

STEP 2

To digitize footage from your DV camera or deck into Final Cut, you have to be able to use **Device Control** to communicate with the camera, and you have to be able to read the timecode from the tape in the camera into the **Log and Capture** window. FCP has to initialize device control as it's starting up, so if you are planning to digitize or output, you should have your camera/deck connected to the computer with a FireWire cable, turned on, and in playback/VTR mode BEFORE you launch FCP. If the camera is not connected properly, when you start FCP the error message "Unable to locate External Device" will come up. If you need to use the camera during your editing session, then you should check your connections and power and hit the *Check Again* button until FCP recognizes

the camera and launches. (Otherwise you can hit *Continue* and set External Video to None. If you need to connect a camera later in your session, *Save All*, quit, and relaunch FCP with the camera connected and powered on in playback mode.)
Update: Please note that the procedures for digitizing from an HDV camera are slightly different. If you are planning to shoot with an HDV camera, you should first read the FCP Help Menu special booklet on HD and Broadcast formats.

To launch **Log and Capture**, use the key command *Command-8* or the menu command *File-Log and Capture*. If your camera/deck is connected correctly, you should be able to preview the video on your tape within the **Log and Capture** window. Sometimes you will see color bars with the message No Preview Available when you first open the window. In this case you should try to play the tape using FCP device control, either with the player control buttons in the L&C window or by using the *L (Play), K (Pause),* and *J (Play in Reverse)* keys. Note that if you hit the *L* and *J* keys 2, 3, or 4 times you can play at 2x, 3x, or 4x speed. If you still can't preview the video from your camera/deck, you need to adjust the capture and/or device control settings in the other tabs of the Log and Capture window.

Once you are able to preview the video from your camera/deck in the L&C window, click into the Clip Settings tab and make sure that all the settings reflect how you want the video and audio on your tape to be digitized into your project. Your options include digitizing Video Only, Audio Only, Video with Audio linked as a Stereo Pair, and Video with Audio linked as independent Channels 1 + 2. You can change these settings on the fly as you log and capture (i.e. you can digitize different clips from the same tape with different settings).

STEP 3
At this point you have four options.

1) You can *log* all the clips on your tape without capturing them, and then tell Final Cut to *batch capture* them. This option works best if you have unbroken timecode on your tape. To log a clip, play through your footage (using the L&C window controls or key commands) until you find the point where you want the clip to start. Use the *i* key to set an in point. Then play through to the point where you want the clip to end, and use the *o* key to set an out point. Finally, use the *Log Clip* button in the L&C window or the F2 key command to log your clip. A dialog window will pop up, into which you can type a clip name, description and log notes (for example: "clipped audio" or "dialogue inaudible"). Use the tab key to navigate through these fields, and then hit return or use the mouse to press the button to log your clip. The clip will appear in the Browser with a red slash through its icon, indicating that the media to which it refers is still offline. Repeat the process until you have created clips in Final Cut for all the footage you want to use from your tape. Then click into the Browser window, use Shift-click to select all the clips from that tape, and use the

menu command *File-Batch Capture* to tell Final Cut to digitize all the footage for you. You should wait and watch FCP while it starts the batch capture to make sure that it can grab onto your first timecode reference, and you should also check on the batch capture several times while it is running to make sure that it has not encountered any dropped frames, especially if it is a large batch. If you experience a lot of timecode errors or dropped frames while batch capturing, try breaking up your batch capture into smaller batches, sorted by their *Media Start* timecode in the Browser window. Another common capture error is caused by clip names that contain characters reserved for the system, so try renaming your clips without colons, semicolons or slashes. Don't forget to Save All both before and after you capture.

2) You can log clips one by one, and use the *Capture Clip* button in the Log and Capture window to digitize each clip as soon as you set the out point.
3) You can set an in point at the beginning of your tape (or your footage if your footage does not take up the entire tape) and an out point at the end of your tape/footage, and use *Capture Clip* to digitize the entire tape. Once your footage is digitized into Final Cut, you can play through the footage in the Viewer, set in and out points at the start and end of clips you want to create, and use the *Modify-Make Subclip* menu command to divide your footage into clips.
4) You can use *Capture Now* to digitize footage without setting any in or out points. This command will start capture from whatever point the tape is cued to when you press the *Capture Now* button, and will continue capturing until you hit escape or you reach your pre-set Capture Now limit (determined in your System Settings). Not recommended unless you are digitizing from a non-controllable device.

VERY IMPORTANT: When you're capturing, make sure that you give each tape a unique *Reel* name. **DO NOT FORGET** to change the reel name every time you start capturing from a new tape. If you have timecode breaks on your tape, you need to give each segment of the tape a different reel name (for example, PortraitTape_2a, PortraitTape_2b, and so on) and make sure when batch capturing that you have manually cued the tape to the section that corresponds to the correct reel name referenced in the clips you want to capture. Knowing the right reel name for each segment of footage is essential for Final Cut to be able to connect the correct media files to your project. If you are not clear about naming your tapes, then it will create tremendous confusion in your project.

STEP 4

When you're done capturing, close the Log & Capture window. Your clips should now be listed by name in the Browser window, and you should be able to click on any clip to bring it up in the Viewer. If any clip icons still have red slashes through them, the media (i.e. the video and/or audio) that they refer to was either not digitized or is not connected. Try using *File-Reconnect Media* to find the media files. If that doesn't work, use *File-Batch Capture* to capture the clips, or

re-open Log & Capture, drag & drop your clip into the window, and hit the Capture Clip button.

Once your clips are all listed in the Browser, you can sort them using any of the characteristics displayed in the window (scroll to the right to see them all) by clicking on any of the columns (e.g. Name, Duration, Log Note, Media Start, etc.). An up arrow will sort in ascending order, a down arrow in descending order. You can also drag the columns to the left or right to change which characteristics of the clips are visible in what order. You can also use the menu command *File-New Bin* (key command *Command-B*) to create folders into which clips can be organized.

3. EDITING IN THE TIMELINE, VIEWER AND CANVAS WITH INSERT, OVERWRITE, SPLICE AND TRIM

Now that you've imported or digitized your media into your FCP project, you can actually begin editing. You can use many of the same key commands to work with your clips in the Timeline, Viewer and Canvas that you used to work with your original footage in the Log & Capture window, including *j, k,* and *l* for reverse play, pause and forward play, and *i* and *o* for setting in and out points. You can also use *Shift-i* and *Shift-o* to go to your in and out points and *Option-i* and *Option-o* to clear your in and out points. Equivalent menu commands can be found under the *Mark* menu.

The basic edit can really be reduced to a very simple equation: you have two clips; you want to join them together into a *sequence*; so you need to determine where each clip will start and end, and then determine where they will be juxtaposed. Of course, while Final Cut gives you a graphical view of your clips and how they relate to each other, you're really making decisions about their *duration*, so you're really working with time, i.e. *when* each clip will start and end and *when* they will intersect. The start and end of each clip are its *in* and *out* points. When you join two clips in sequence, the out point of the first clip lines up with the in point of the second clip. In linear editing, once your first clip is laid down into the sequence of the *Timeline*, the out point of that clip becomes the in point of the next clip you edit into the Timeline.

In practice: to begin editing, you need to bring up the first clip you want to edit into your sequence into your Viewer window by double-clicking it in the Browser. Click into the Viewer window to activate it and then play through the clip using key commands or the window player controls. Find the beginning of the footage you want to use, and set an in point. Then find the end of the footage you want to use, and set an out point. (If you want to use the whole clip, you can navigate to the beginning of the clip by using the *home* key and to the end of the clip by using the *end* key.) Next, edit your selection into the Timeline with the *Overwrite* command (the red button on the Canvas window, or the key command

Command-F10). You should now be able to play your edited clip from both the Timeline and Canvas windows. If instead of seeing the video you expect, you see a message that the media is unrendered, you may have imported media files with different settings from your project format. You can use the *Sequence-Render-All* menu command to render the media so that it is viewable within your project.

If you're satisfied with the in and out points you've set for your edited clip, set an in point at the end of the clip in the Timeline, and bring the next clip you want to work with up into the Viewer. Set your in and out points and Overwrite the new clip into the Timeline after the first clip. Next, go back and play through your sequence from the beginning. Now, you need to judge not only the effectiveness of the in and out points for each clip individually, but also how they make the cut between the two clips work. Should one clip start or end earlier? If so, you have several options for changing the cut.

1) You can use *Trim*. Click into the Timeline and position the yellow cursor on the cut. (You can use the semicolon and apostrophe keys to jump from cut to cut within your sequence.) Then use the menu command *Sequence-Trim Edit* or the key command *Command-7* to bring up the Trim window. You can now use the *–1, -5, +1* and *+5* buttons on the Trim window, or the arrow keys on the keyboard, to add and subtract frames on either side of the cut. Remember that if you have Dynamic Trimming enabled (either in the Trim Window or in your User Preferences), when you add frames on one side of a cut, the same number of frames will be subtracted on the other side. After you adjust the cut, use the play arrow on the window or the space bar on the keyboard to preview the trimmed cut. Once you're satisfied, close the Trim Window by clicking elsewhere in the Timeline.
2) If you play through your Timeline and find a segment of one clip that needs to be deleted, you can use the *Splice* tool in the *Tool Palette* window. Set an out point in the Timeline where you want to cut and delete the segment. Then move to the right of your Timeline window, where there should be a small palette with a choice of different tools. (If you don't see the palette, use the menu command *Window-Tool Palette* to bring it up.) The default is the arrow. Click onto the small razor blade. Then line the razor blade up with your in point and cut the clip. (Note that unless video and audio are unlinked or separately locked, they will be cut simultaneously.) Next, select the new segment and use the key command *Shift-Delete* to simultaneously delete the selected segment and close the gap. If you want to leave the gap, just hit delete. You can close the gap later using the menu command *Sequence-Close Gap (Control-G),* or you can use the arrow to grab the end of a clip and drag it out to fill the gap (thereby also increasing its duration).

3) You can use the *Roll* and *Ripple* tools (both accessible under the vertical figure 8 in the Tool Palette) to shift a clip's in and out points without changing its position in the Timeline.
4) Similarly, you can double-click any clip in the Timeline to bring it up in the Viewer, where you can adjust its in and out points -- as long as your adjustments do not affect other clips in the Timeline.
5) If you want to add another clip in between the two clips already edited into the sequence, you can perform an *Insert* edit. Set in and out points in Viewer and Timeline as you would for an Overwrite, and then use the yellow button on the Canvas or the key command *Command-F9* to Insert the clip between the other media before and after the in point set on the Timeline.

Each time you edit another clip into the Timeline, it changes the progression, rhythm, movement and visual dynamic of the entire sequence, so it's a common practice to re-view the sequence from the beginning (or from the beginning of a sub-sequence in longer works) in order to judge (and adjust for) the effectiveness of each edit.

4. TRANSITIONS AND EFFECTS

Video and audio transitions, generators and filters can be controlled in Final Cut from the *Effects* window (which should be set up by default as a tab in your Browser window; if not, you can open it from the menu *Window-Effects*) or by way of the *Effects* menu. Motion effects are controlled through the *Motion* tab of each clip, and can be modified globally (by changing a master clip in the Browser) or locally (by changing an edited clip in the Timeline).

TRANSITIONS

Once you have mastered straight cuts, you may want to explore the use of transitions between clips -- although it's a good idea to think seriously about whether you have a real reason to use a transition other than a cut before you apply one, since any other transition will always attract more attention to the edit than a cut would have. Video transitions built into FCP include various kinds of dissolves, fades, wipes, peels, slides and zooms. In practice, the most commonly used transitions are cross dissolves, dissolves to color ("flash frames"), and fades to and from black. Audio transitions built into FCP include cross fades to +3 decibels and cross fades to 0 decibels.

To add the default video transition (a cross dissolve) to a cut, position the cursor over the cut in the Timeline and use the key command *Command-T.* To add the default audio transition (a cross fade), use the key command *Option-Command-T.* The transitions will be added at the default length that you set in the Transitions folder in the Effects window. You can also drag and drop transitions (and other effects) from the effects window onto cuts in the Timeline. If you use certain transitions frequently, it's a good idea to copy them to your *Favorites* folder in the Effects window, so you can find them easily; you can even copy them several times and set several different favorite durations. Once applied to the Timeline, you can change the length of any transition by double-clicking on it to bring up the transition window and/or using the *Slip* and *Slide* tools (the horizontal figure eight) from the Tool Palette.

GENERATORS

Video generators built into Final Cut allow you to create Text (including scrolling and crawling credits), Color Mattes, Shapes, Bars & Tone, and Noise, which can then be saved and edited as clips. Generators can be accessed through the Effects window and also through the menu designated by the A surrounded by a square, located at the lower right corner of the Viewer window. If you select *Text-Crawling Text* from the Generator menu, for example, the Text generator will open in the Viewer window. You can click into the Control tab of the window to change the text, font, size, style, color, kerning, and leading, and the direction in which the text crawls. **Important:** Once the text is set as you like it, you need to drag and drop the generator from the Viewer into the Browser, so that it is saved as a clip. Rename the clip – generally the words of the text it contains make a useful name – and then double-click on the clip in the Browser to bring

your renamed, saved clip up in the Viewer. Then edit from your saved clip into the Timeline.

MOTION EFFECTS & MULTIPLE TRACKS

Motion effects are applied to your clips either locally (by double-clicking into a clip from the Timeline to bring it up in the Viewer) or globally (by double-clicking on a clip in the Browser to bring it up in the Viewer) through the *Motion* tab of the Viewer. Locally applied effects will only affect the specific instance of the clip as edited into the timeline, while globally applied effects will affect every instance of the clip. On this tab you can use sliders or type in numerical / percentage values to adjust various properties of the clip, including opacity, scale, position (by changing either the *center* or *anchor* points), rotation, distortion, cropping, and speed/duration (through variable or constant *Time Remap*). Most of these properties can be *keyframed*, meaning that you can set different values at different points along the duration of the clip.

For example, if you wanted to work with two superimposed layers of video, you would use the menu command *Sequence-Insert Tracks* to add a second video track (as well as additional audio tracks if necessary) to your sequence in the Timeline. You would then edit your first layer into video track *v1* using overwrite or insert as appropriate to the rest of your sequence. Then you would move your cursor to the interlocking *v1, a1,* and *a2* (and so on) track icons on the left side of the Timeline, and drag the source *v1*, *a1* and *a2* (or whatever combination of source tracks you have) from the tracks that are already full to the new, empty target tracks. If you just want to use the source video but not the sound, or vice versa, then just double click the source track icon to separate it from its companion icon – otherwise it will automatically be edited along with the rest of the source media. Once your tracks are aligned, then you can Overwrite your second clip into the second video track. It's generally not a good idea to use Insert with multiple tracks because it's easy to throw edits out of alignment, and especially to throw video and audio out of sync, unless you are very careful.

Once you have your two clips superimposed in two tracks, only the clip in track *v2* will be visible unless you adjust the opacity of one or both of the clips. To create a smoother transition from single-layer to multiple-layer video, one strategy is to keyframe the opacity. This means that you would double-click into the superimposed clip in the *v2* track of the Timeline, bring it up in the Viewer, click into the Motion tab, and open up the Opacity arrow. Then you would use the <> button to set a keyframe at the first frame the clip and set the opacity for that frame at 0, using the slider. Next you would set another keyframe about a quarter of the way into the clip, where you would set the opacity to the highest level that you want it to reach (typically 75-80%). Set another keyframe at about three-quarters of the way through at the same opacity, and then set the final keyframe at the very end of the clip, back to 0.

FILTERS
Final Cut also has a number of filters that you can use to control, correct, and process your video and audio. These are accessible through the Effects tab in the Video Filters and Audio Filters folders. Here again it will be useful for you to copy your favorite filters into your Favorites folder rather than trying to find the same filter buried deep in a nested folder every time you need it.

The most useful filters for basic editing are the Image Control video filters (e.g. Color Correction and Levels), which allow you to retouch the video image in a manner similar to, but somewhat cruder than, the Photoshop interface; and the Hum Remover (helpful for eliminating camera noise), 3-Way EQ and Low Pass audio filters, which mimic the functions of an analog mixer.

KEEP IN MIND: Effects that are applied without reason detract from, rather than adding to, the effectiveness of a video.

5. EXPORT AND OUTPUT

Once you're finished editing, you will either need to output your final sequence to tape (usually your best option for archiving) and/or export your video to another format in order to upload it to the web, burn it to a data CD or DVD, or author it to a video DVD.

EXPORTING VIDEO FOR DVD, MULTIMEDIA & THE WEB
Within any project, you can export a sequence or section of a sequence from the Timeline/Canvas, or export a clip or section of a clip from the Viewer. Start by setting in and out points at the beginning and end of the video you want to export. The menu command *File-Export* then offers you three options for exporting your video:

1. Export QuickTime Movie
This option will create an FCP-formatted QuickTime video with the same settings (size and compression) as your project. Since this type of QuickTime movie can only be opened/viewed in Final Cut Pro, this export option is most useful as a tool for mixing down sequences to import into other projects, or to re-import into the same project when you need to apply effects across an entire sequence. *Update: Once the new helper apps are installed in the lab, you can use MPEG Streamclip to quickly convert an FCP-formatted QuickTime into a standard .mov, and you can also use ffmpegX to re-compress an FCP-formatted QuickTime directly, which can speed up your export/authoring workflow when time is an issue but media storage is not.*

2. Export Using QuickTime Conversion
When you select *File-Export-Export Using QuickTime Conversion*, Final Cut opens up a Save As dialog box. Within this dialog box, you can then use the

Format pop-up menu at the bottom of the window to select your export format, which can be QuickTime (.mov), AVI, MPEG4, or MPEG2 video files, iPod movies, still images as PICT or TIFF files from any video frame, AIFF or WAV sound files, FLC (Flash compressed) video files, DV streams, or still image sequences. Each format has its particular uses, contexts and drawbacks. MPEG2s and AIFFs are used for authoring video DVDs, while QuickTimes and MPEG4s are used for the web and multimedia applications. AVI and WAV files will most often be used for transferring video from Mac to PC environments. Once you've selected the format, you can use the *Use* pop-up menu directly beneath the Format menu to choose between the default or several different pre-set export settings. You can also use the *Options* button to open up an Export Settings dialog box where you can change the settings manually. You should refer to the Final Cut Pro manual for more detail on the settings for each format and how they can be changed to reduce file size or increase video quality.

3. Export Using Compressor

Compressor is FCP's own helper application for exporting and re-compressing video and audio files. You can use Compressor in tandem with FCP as an exporting tool, or you can launch it directly from the Applications folder to compress video and audio that has already been prepared as stand-alone files. The principal advantage of using Compressor is that the application structures compression into batches. Within each batch, you can execute multiple compressions, either on the same *source media* file with different *preset* settings, or on multiple different source files. To add a new compression to a batch, just click on the plus sign at the lower left corner of the Batch window. You can then select what media file will be compressed by double-clicking in the *Source Media* field. Next, choose the compression settings by opening up the *Preset* pop-up menu. Compressor has pre-made presets for preparing video and audio as separate files for DVD authoring at different quality levels (under MPEG-2) and video/audio files for the web (under MPEG-4). To create your own presets with customized settings, open up the Preset window by clicking on Preset or using the menu command *Window-Preset*. You can then either click on the plus sign button to create a new preset, and edit it through the Encoder tab, or you can duplicate an existing preset with the page-plus sign button and adjust its settings to meet your needs. Once you're done, double click on the preset's name in the Name column and give it a name, then a description, that fit the new settings you have created. Back in the Batch window, you will also need to specify a *Destination* folder where your newly compressed file will be saved. If you will be saving most files to the same place, it's probably worthwhile to set that folder as a named and/or default destination in the Destinations window – again by using the plus sign button to create a new destination (local or remote). Finally, it's usually a good idea to also set the output filename for a compressed file in the Batch window; Compressor will automatically assign names that are quite long, since they include the source media file name and the compression preset. When you use the *File-Export-Export Using Compressor* menu command in Final Cut, FCP will launch Compressor and automatically open up a new Batch with

your active sequence or clip listed as the source media. All you need to do then is set the Preset, Destination, and Output Filename, and submit the batch.

Other Export options include AIFF and OMF sound files for mixing in programs like Peak or ProTools, and EDL (edit decision lists) and Batch Lists in several different formats, which can be used to recreate an FCP project in a different editing program.

OUTPUT TO TAPE

BEFORE YOU START: Final Cut offers two options for outputting your final sequence to tape: *File-Print to Video* or *File-Edit to Tape*. In order to use either option, your camera needs to be in playback mode, hooked up to the computer with a FireWire six-pin to eight-pin cable, and should mirror the video in your Canvas on its screen when you play through the Timeline. This means that Final Cut needs to be reading your deck or camera as an external A/V device. One way to check whether a device is initialized is through the menu command *View-External Video*: if External Video is set to None, FCP is not reading your device. There are several ways to fix this problem. First, try opening up your Audio/Video Settings (under the Preferences menu) and looking at the A/V Devices tab. If you find your camera/deck listed there, or if you can locate it by clicking on the Options buttons, then you should be OK. If that doesn't work, save all your work, quit FCP, disconnect and reconnect your camera, and then restart your camera. Finally, your camera may be in playback mode but need to be switched from Play to Record. This can usually be done through the camera's menu while the camera is in playback mode. As usual, you should also make sure that you have activated the window corresponding to the sequence you want to output when you give FCP the output command.

Edit to Tape performs a true assemble edit, whereby the in and out points set in your sequence are matched up to the corresponding timecode on the tape in your deck. In order to use ETT, you need a deck or camera that can be device controlled by FCP, and a tape that has been blacked out (a tape with a blank/black video signal recorded from start to finish so that the tape has continuous timecode). ETT is the preferred output system for archiving a project's final form, since it maintains the timecode of a final sequence, in alignment with any EDLs or batch lists you may also archive in case you need to re-create the project later. *Update: please note that you can only use Print to Video to output HDV projects; Edit to Tape will not work with an HDV camera.*

Print to Video (*Control-M*) is the method you will be using most often to output rough sequences to tape to show in class, or to archive final cuts to tape when you are using a camera or deck without device control and/or a tape without pre-recorded timecode. With Print to Video, you should also set in and out points at the beginning and end of your sequence (or section of sequence), and select the

option to Print In to Out in the Print to Video dialog box that opens up when you give FCP the Print to Video command. You also have the option to insert bars and tone, a slate and black before your sequence, to loop your sequence, and to add a trailer of black after your sequence. The standard is to output 30 seconds of bars and tone at –14 db as a reference, 30 seconds of black, the program, and then 60 seconds of black. Since Print to Video does not control the external A/V device, you have to manually cue your tape before hitting the OK button to start printing. You will then be prompted to start your recorder, at which point you need to hit record on your camera (this is sometimes a menu, not a button function) and hit OK again. The video will then start playing back to your camera. When it's done, Print to Video will automatically exit back to the normal FCP desktop, but you will need to manually stop the recording process on your camera.

KEEP IN MIND: You should render all video and audio in your sequence before export or output. If you experience dropped frames during ETT or PTV, open up your Audio/Video Settings, and look at the A/V devices. Make sure that none of the audio playback options are set to Built-in Audio – since Mac's built-in audio plays at 44.1 khz, and DV audio is 48 khz, the discrepancy can cause playback errors. You can also try un-checking Mirror on desktop.

6. TROUBLESHOOTING

One of the most important things to learn as an editor is how to solve problems independently as they come up. Like any complex piece of software, FCP has its quirks and bugs, which change as new versions are released, upgraded, and adapted to particular environments. Using Final Cut in a multi-user environment like the MAC lab also raises particular challenges. So you should make a point of becoming familiar with the resources for troubleshooting both built into the program and available online. First, through the Help menu, you can access the FCP manual, which is extensive, searchable, and also has an interactive index (click on any term in the index and the corresponding page will open). A hard copy of the manual can also be checked out from the lab assistants. Next, Apple's online support features white papers and user forums that address late-breaking and user-initiated topics (http://www.apple.com/support/finalcutpro/). Many other user forums and white papers on Final Cut are online as well, so often just searching for your question or bug on Google will yield the answers or documentation you need.