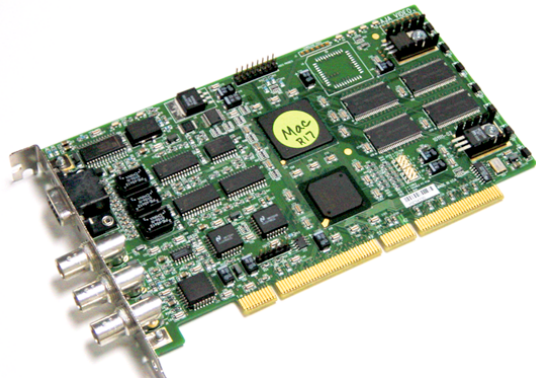AJA Video: Kona SD

Hardware Install

1 The minimum system requirements for your new Kona SD is an Apple Macintosh G4 Dual Processor 800 Mhz, 512 MB Ram, and at least two Cheetah 10K RPM hard disks for uncompressed video storage.

Final Cut Pro on Mac OS X requires the dual processor Mac to operate effectively. Under Mac OS X, performance is significantly enhanced on dual processor system.

2 The first step is to unplug the power from the back of your Macintosh. It's not mandatory to unplug the power cord, however, it might be the only way you know the power is really turned off!

If your Mac is still asleep, and not powered down, you can cause damage to your Kona SD and your Mac.
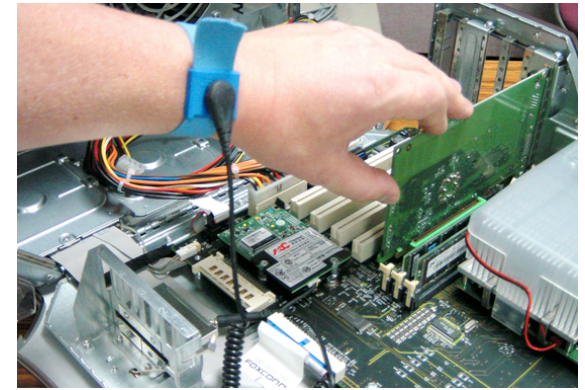
3 Connect a static wrist strap to your wrist, and the computer chassis. When you handle the Kona SD, try not to touch the gold plated edge connector or the components.

Your Kona SD features advanced electronics that can be damaged by static discharges, so a static wrist strap will eliminate this danger.
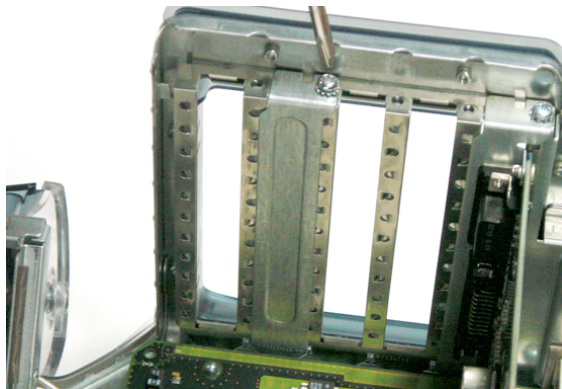
4 Remove a spare metal shield from the rear of the Mac back panel, and install the Kona SD into a free slot.

The Kona SD should insert easily, and the top of the shield will align so you can easily replace the screw to hold the card in place.

You should not need to use force, and if things don't easily snap together, check with an engineer friend!
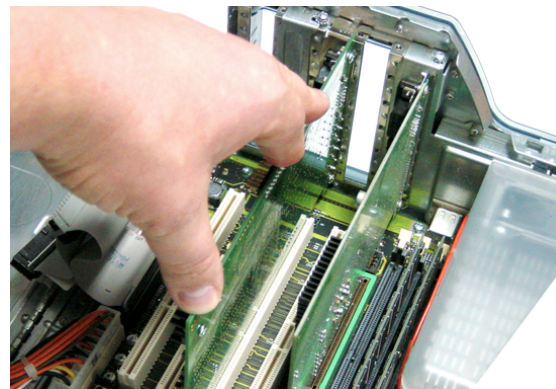
5 Now is also a good time to install the SCSI card for your disk array. You will need at least a Ultra 160 SCSI card from either ATTO™ or Adaptec™ for real time uncompressed video. See the section on disk arrays for more information.

Add any additional ram memory you need for your system as well. It's always a good idea to have plenty of ram, and at least 256MB is a good start, however, 512MB is much better.

6 Remove the static wrist strap, and close your Mac. Now you can reconnect the power cord to the Mac.

In later sections we will explain how to connect the video, audio and VTR remote cables. The last step is to set the television standard for the desktop view. This needs to be set via the System Preferences, and more information is in the Photoshop section of this manual.

Software Install

Blackmagic Installer.mpkg

1 The software for your Kona SD has been developed by Blackmagic Design, and you will find the software CD included with your Kona SD.

The first step is to insert the software CD. Once the software CD appears on the desktop, locate the installer shown above, and launch it.

2 The first thing you need to do is authenticate, or you will not be able to install the software. You need to know the administrator password for the system you're installing onto.

If you are the only user of the Mac, then this password will be the same that you normally use to log into your system.

3 Now you have authenticated, the installer will be able to place the software components into the system.

The welcome message in the installer might contain additional information about installing the software. Click the continue button when you are ready to install.
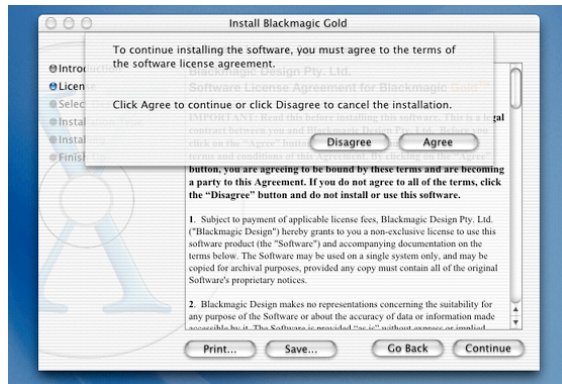
**4** Next you will see the license notice. It's important to read this.

At the bottom of the license notice is version information on each software release of the Blackmagic Installer.

When you have read the license agreement, and agree to the terms of the license, click the agree button to continue.
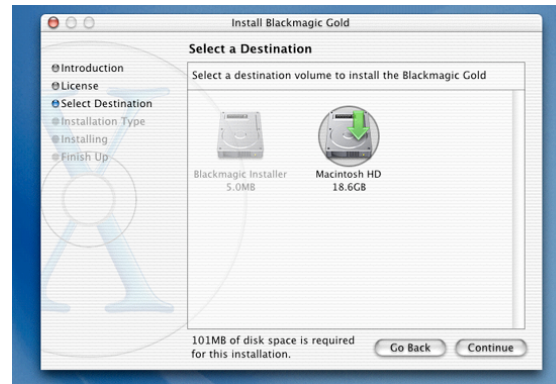
5 Next you need to select the disk you want to install the Blackmagic QuickTime driver onto.

You normally want to install on the startup disk. If you click this disk, a green arrow will appear pointing to it. This shows which disk the software will be installed on.
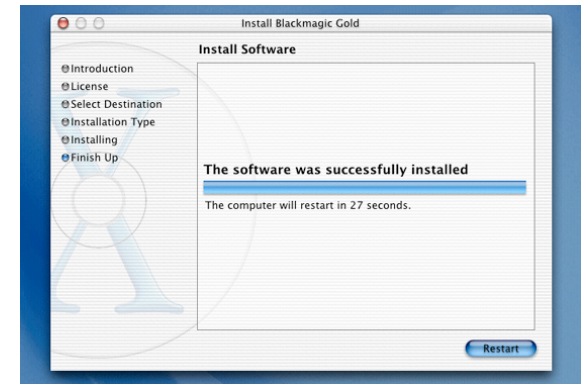
6 You'll need to restart after installing the software, but if you don't click restart, the installer will automaticly restart after a few seconds.

After your Mac has restarted, you will be ready to use your Kona SD. Check the other sections of the manual for additional information on how to connect up and configure software for use with the Kona SD.

1 The Kona SD video connectors are fully digital SDI type video cables with industry standard BNC connectors.

When connecting to the Kona SD it's a good idea use high quality video cables due to the high data rates of digital SDI video.
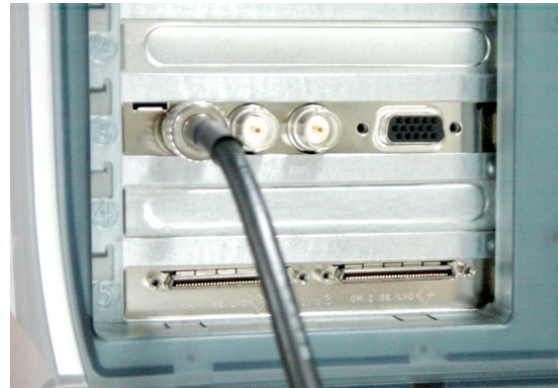

2 First connect the video output cable. This is the connector closest to the left side of the Mac when looking from the back.

This cable would be connected to your VTR SDI input, which is typically labeled blue on most digital decks. You could also connect the other end of this cable to the SDI input of a monitor, analog converter, or router.

3 Now you can connect the SDI video input cable. This is the second connector from the left.

This cable would normally be connected to the video output of your deck. You might also connect this cable to an analog to digital converter output if you're using an analog deck such as Betacam SP.
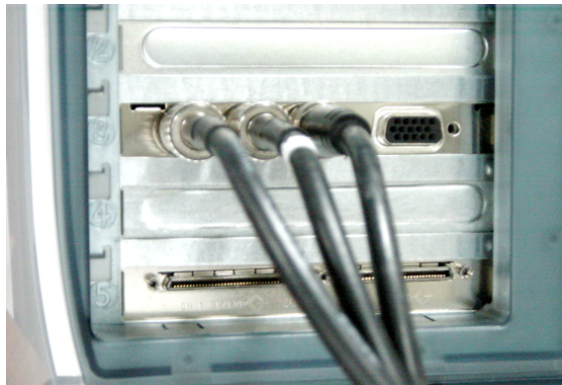
4 Now you can connect the rightmost BNC connector. This is the reference connector, and is used in large facilities, or television broadcast stations.

Reference video can be "color black", which is composite video commonly used to reference video equipment. Standard sync can also be used. Using sync will eliminate frame bars when connecting to VTR inputs.

5 If your deck is an analog type such as Betacam SP, then you will need to use an analog converter. These are available at fairly low cost, and are very good quality.

Analog decks are not that common any longer, however, if your deck is analog, you can add converters to allow digital connections. With your deck converted to digital I/O, your facility will be digital!

6 If you're connecting to an analog broadcast monitor, you can also use a converter to allow an RGB or YUV monitor to connect to the SDI digital source.

If you use the correct converter, you can get RGB and analog composite at the same time. This is great for connecting your monitor and a VHS deck for quick client dubs from the monitor feed.

1 The Kona SD features 6 channels of AES/EBU digital audio on the rear multi channel audio connector.

The first step is to connect the multi channel audio cable, that's included with the Kona SD. This will adapt to standard XLR connectors used by the audio industry for AES/EBU digital audio.
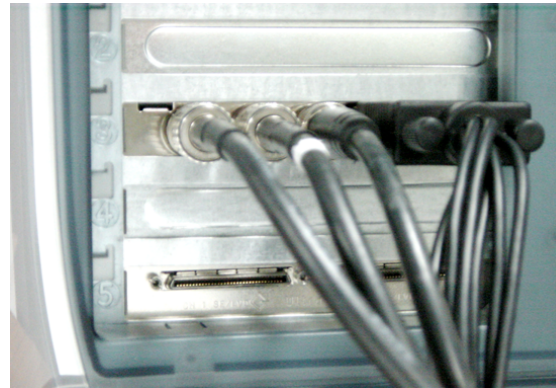
2 Because the Kona SD uses standard AES/EBU digital audio connections, you can connect directly to a Digital Betacam, DVC Pro 50 professional deck, or any AES/EBU digital audio equipment from your local music shop.
The Kona SD uses the television sample rate of 48 Khz, and input audio is sample rate converted in real time. You can also input non sync digital audio.

3 Normally it's a good idea to connect audio monitoring to the deck analog output or routing switcher.

If you need to connect to monitoring that uses the consumer SPDIF interface on an RCA connector, then you can use a low cost AES/EBU to SPDIF converter, such as the one shown from Canare™.


4 If you're connecting to an analog audio converter that requires audio word clock, the Kona SD provides this signal output on the RCA connector on the multi channel audio cable.

Because your Kona SD features audio sample rate converters on each audio input, word clock is not normally required. However, when building digital audio facilities, word clock is a very useful signal to have available.
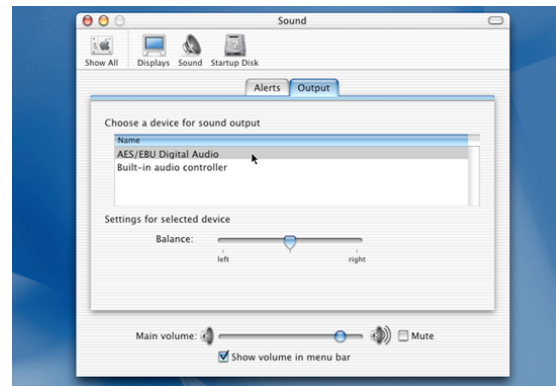
5 After your audio is connected, the next step is to tell the Mac to output audio via the Kona SD and not the built in audio.

In the System Preferences -> Sound panel, select AES/EBU Digital Audio in the output panel. You can also choose to send Mac system alert sounds out to the Kona SD. This is selected under the alert tab.
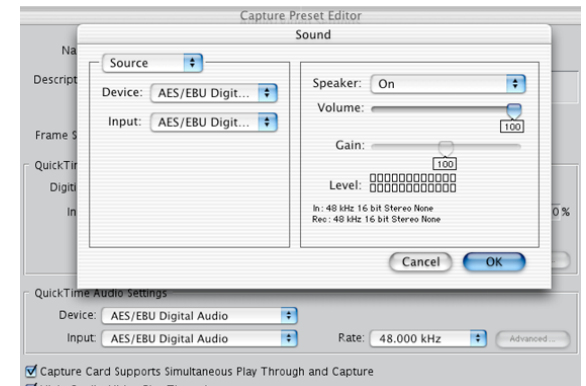
6 Audio capture settings are normally set in your QuickTime application. The above view is the settings window for sound input under QuickTime, used by most applications.

When setting audio input, use 48 Khz, 16 bit, stereo with the gain set to 100. Your software might support more than 2 channels, so check for differences. It's also important to select sound to be ON while recording.

Deck Control
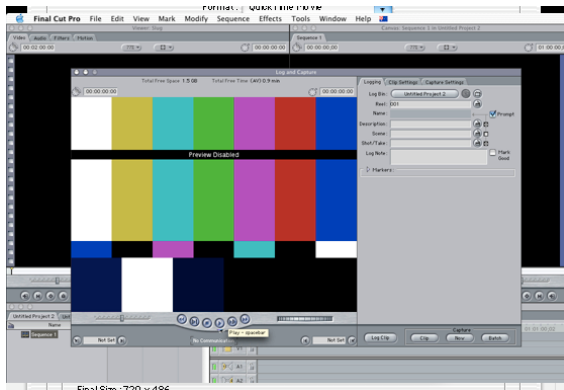
1 Device control is connected via the RS422 port, and is built into Final Cut Pro™.

The first step to setting up deck control is to add a serial port to the rear of your Mac. Macintosh computers no longer feature the RS422 serial port, as this has been displaced by the more advanced USB. There are various adapters available to add serial ports to modern Macs.
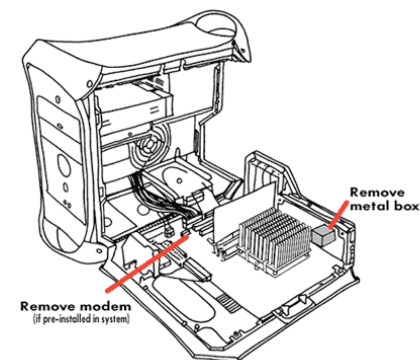

2 The first option, and the most popular, is to add a serial port in replacement of the internal modem. This has the advantage of being build in, and it leaves the USB ports free for USB dongles. Check www.geethree.com for more info.

Often a dealer will have pre installed this option for you if have purchased the system pre built as new.

3 Once this adapter has been added, you will have an old style Mac serial port on the rear panel of your Mac, and the deck control cable can plug into it.

A serial deck cable to connect this serial port to the deck is included with the Kona SD. It converts from the Mac serial port to the remote connection on the deck.

4 The other option is to use an external USB to serial converter, however this is not recommended.

There have been many problems with these converters for deck control, and we do not recommend you use an external adapter for serial deck control use.

5 Once you have decided on an option for adding an older style Mac serial port to your Mac, you can now connect the deck control cable from your Mac to the deck.

The device control port on the deck is normally located on the rear of the deck, and is a standard 9 pin D type connector. It might be labeled "Remote 1 (9P)" or similar.

6 Next you need to select the remote mode on the deck to ON. With the remote turned off you can still see time code, and transport modes on the Mac, but you cannot control the transport.

You might need to follow the Final Cut Pro settings for selecting RS422 type remote, as it normally defaults to DV control. The Final Cut Pro section in this manual explains this.

Disk Array

1   Uncompressed 10 bit video requires a higher data rate than a single disk can handle, so we use a disk array (more than one disk) to hold our video data.

Disk arrays are easy to build, however, its always a good idea to check with your dealer for the best options to suite your workflow. We do not currently recommend 4 disk Medéa disk arrays.
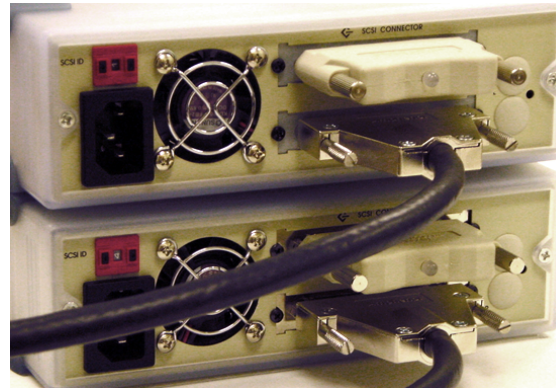
2   If you're putting together your own disk array, then you will need to use a minimum of at least two disks.

These need to be Ultra 160 SCSI type disks, and the 10K RPM Cheetah™ disks are a good model, or Barracuda™ 80 GB or larger disk are also a good option. Generally the larger the hard disk the faster it is, due to sector density.

3   If you're using separate disks, you need to add them into disk boxes, or you might use a larger disk box that can hold more than a single disk. Multi disk boxes have an internal cable for connecting more than one disk together.

If you're using separate disk boxes, then you need to connect them together externally as in step 2.


4   We recommend the ATTO Ultra 160 dual channel SCSI card (Model UL3D) for uncompressed disk arrays.

These cards have two channels so you can connect half your disks to one channel, and the other half to the other channel. The other option is to have two disk arrays, one on each channel. The card is shown here below the Kona SD.
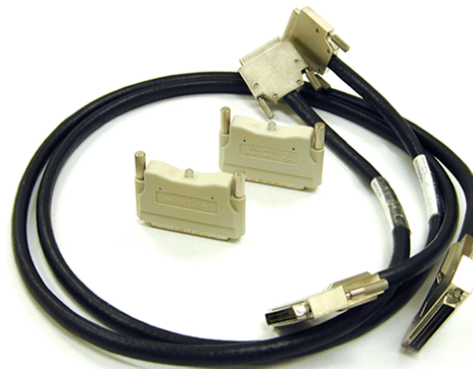
5   A single channel is enough speed for uncompressed standard definition video, however the two channels allow extra speed.

Be sure to use good quality LVD type cables and terminators. Not all 68 pin SCSI cables are LVD (low voltage differential), and this can cause the SCSI channel to slow down. Don't install any older non Ultra 160 devices on your SCSI channel as this can slow down the disk array dramatically.
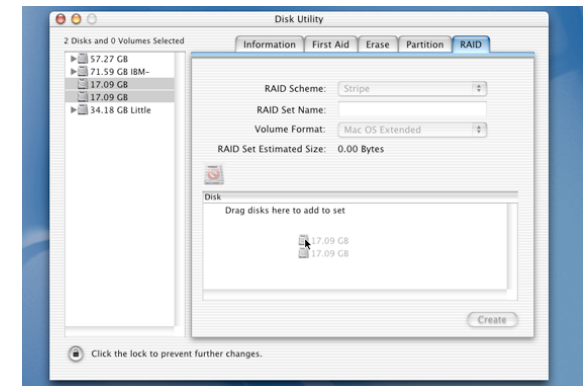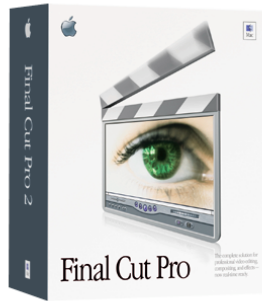
6   You also need to ensure each disk has a separate ID.

Next use Disk Utility to format the disks. Once formatted, drag the two disks from the left of the Disk Utility window into the RAID window under the RAID tab.

Select stripe for the array type, enter an array name and choose create. Your disk array should appear on the desktop ready to use.
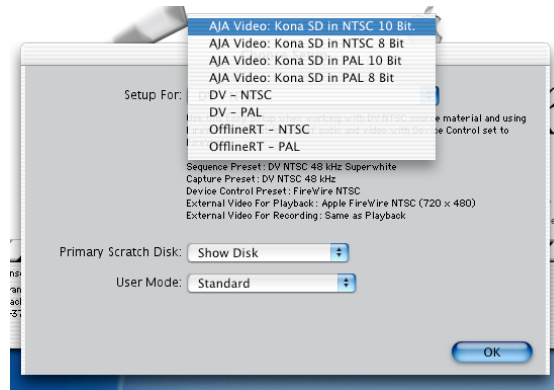
Apple Final Cut Pro™

1 Apple Final Cut Pro™ is incredibly powerful non liner editing software.

Setting up Final Cut Pro is easy if you install our easy setups. These are found on the installer CD, and need to be copied into you disk at the location Library -> Application Support -> Final Cut Pro System Support -> Plugins.

2 After you have copied the easy setups into this folder, Final Cut Pro can be easily setup with a single menu selection for either NTSC or PAL, and 8 or 10 bit editing.

When you launch Final Cut Pro, you can select Easy Setups from the Final Cut Pro menu, and select which television system and bit depth you need to use.

3 For this example, we are going to choose NTSC 10 Bit, so select the Kona SD setup for NTSC 10 bit, and select ok.

This is also where you need to choose the disk array to capture video data to. This is important, as your internal disk is not fast enough for uncompressed capture and playback.

4 Next, you will be asked for deck control settings for use with the Kona SD easy setup.

Because we cannot know which serial port option you have installed, you will have to setup the deck control manually. If you already have deck control settings for RS422, the you can select this, otherwise, click ok or create to set up deck control settings.
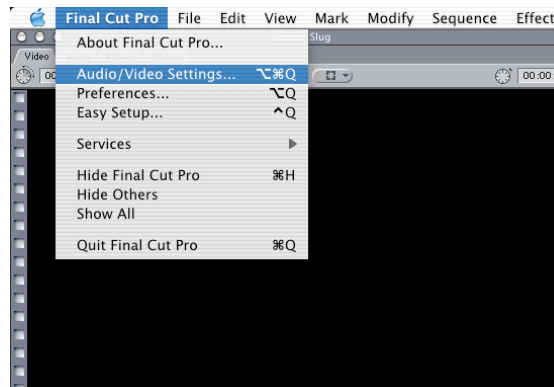
5 To set up deck control you need to select create from the window, or select Audio Video settings from the Final Cut Pro menu, after Final Cut Pro has started up.

You will need to ensure your serial port option has been installed, and you have installed any additional software for OS X that was included with the serial adapter. It's important to install the software or Final Cut Pro might not see the serial port.
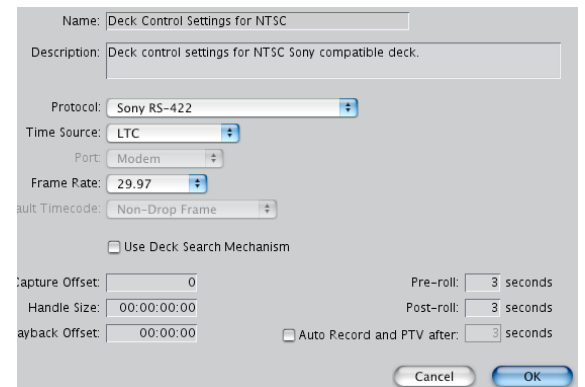
6 Settings for deck control are quite easy, and are shown in the image above. You can also name your settings for deck control

The correct setting for most decks is Sony RS-422 with LTC. You also need to select the correct frame rate, which is 29.97 for NTSC, and 25 for PAL.

After this is completed, your Final Cut Pro settings are finished, and you're ready to edit.
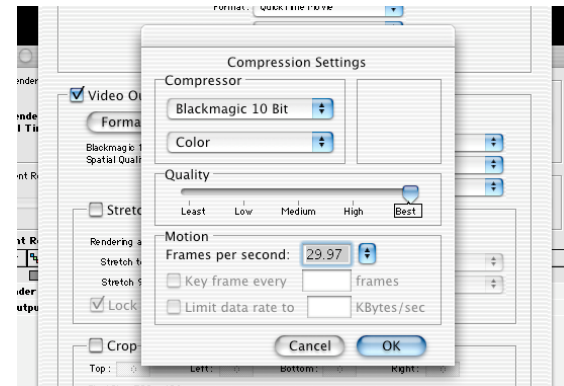
Adobe After Effects™
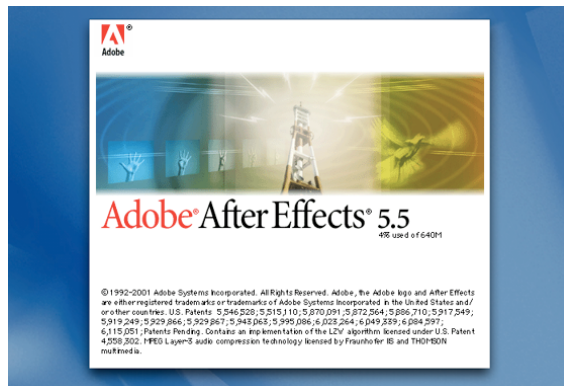
1 When using Adobe After Effects™, you can render to the Blackmagic Codec, then drop the QuickTime media files directly into the Final Cut Pro timeline. You can also design graphics using the Kona SD desktop view.

This allows you to set the position of design elements and motion paths directly into the broadcast monitor, which is a very powerful feature.
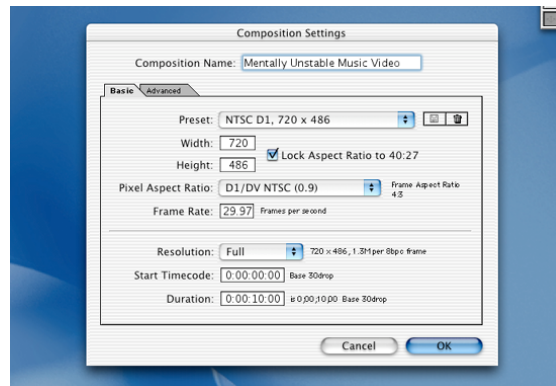
2 There is very little setup required for Adobe After Effects, and all you need to do it choose the correct composition resolution, and frame rate for the television standard you're using. You also need to render to the Blackmagic uncompressed codec.

Use 720 x 486 @ 29.97 fps for NTSC, and 720 x 576 @ 25 fps for PAL in this settings window.

3 When you render your composition, choose the Blackmagic codec. You can even add this as a preference in After Effects for every render.
You will also need to select either 10 or 8 bit. This is normally a choice based on the deck you are going to use. If you match the settings in Final Cut, you can drop rendered clips directly into the timeline.
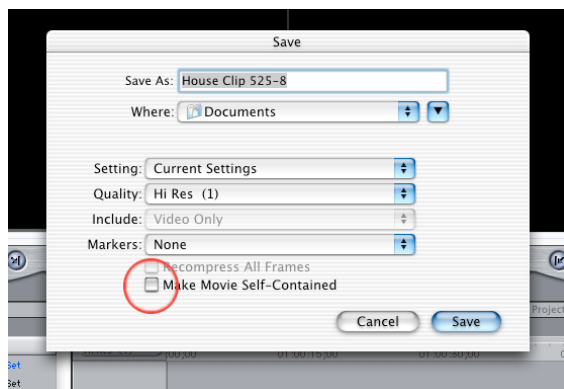
4 It's also important to get edits out of Final Cut Pro into After Effects. To do this, in Final Cut Pro, choose Export from the file menu. Turn off the setting "Make Movie Self-Contained".

This will generate a QuickTime media file that's very small, and it will export very fast. The video media will link back to the original capture files. This is a great way to export edits quickly.

5 You can also set the composition window to the desktop output. This lets you work into the broadcast monitor, so you can see the correct color.

To set this, move the composition window to the Kona SD desktop view. Then press the keys <shift> + <command> + <\> all at the same time. The window will fill the Kona SD desktop view. You can move your mouse over and adjust graphic elements and adjust motion paths live on the Mac monitor.

6 The Kona SD allows you to easily manage an incredibly fast workflow between applications. For example, you can render in Adobe After Effects at full speed in the background while playing uncompressed clips!

Imagine being able to burn a DVD for your client, while working on Photoshop graphics or viewing clips at the same time.
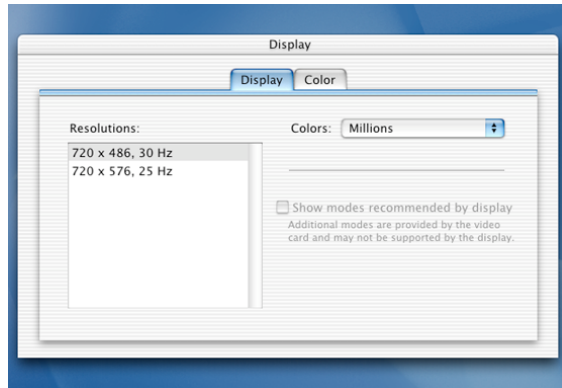
1 The desktop view is one of the most popular features of the Kona SD, and allows you to use applications such as Adobe Photoshop™ for broadcast paint, even though Photoshop was not designed for QuickTime or television use.

The first step is to set the television standard for the desktop view.
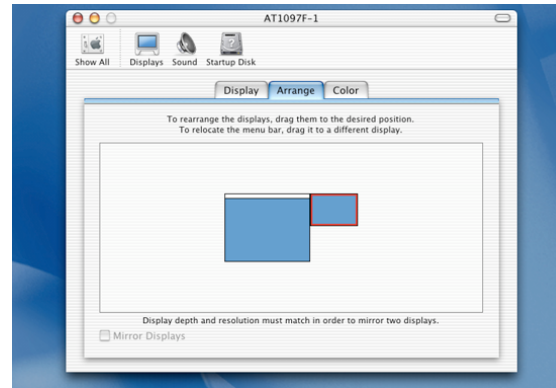
2 If your broadcast monitor is located beside your Mac, you can arrange which side of your main computer monitor the video display is placed in the desktop. Select the arrange tab and you will then see two squares representing the displays.
The smaller one is the Kona SD. You can click and drag the desktop to be either to the left or right of your main computer display.
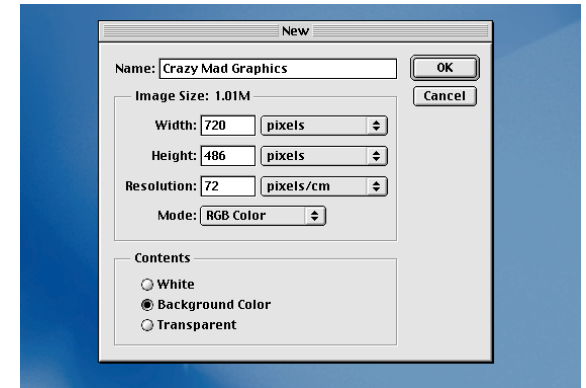
3 The next step is to create a television sized Photoshop document. Use 720 x 486 for NTSC, and 720 x 576 for PAL.

When your document is created, you can select a background color, which is always a good idea, as a transparent background will display as a chequerboard pattern, which is not good on the video output.
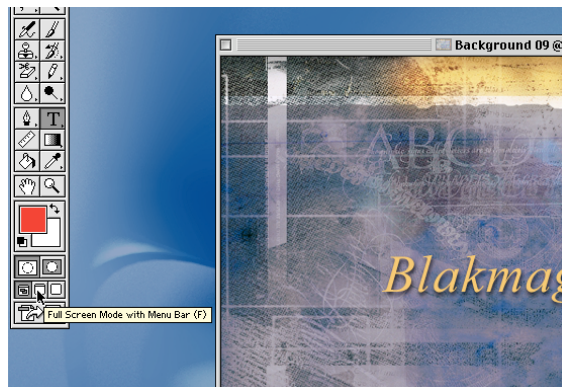
4 Now you need to drag your Photoshop document over to the Kona SD desktop. When more than 50% of the document is located on the Kona SD desktop, you can select the full screen button. This will resize the document to full screen.

Because the document is the same size as the SDI video output, it will completely fill the screen. This makes a great paint system!
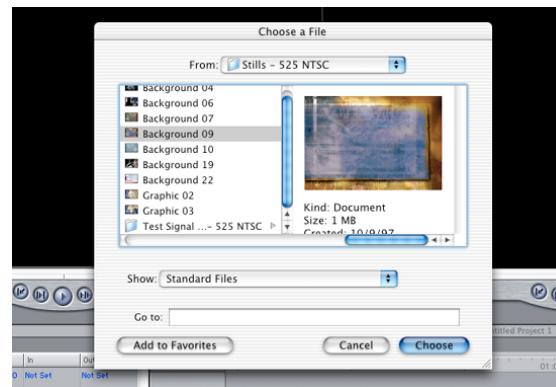
5 Any brushes or tools selected on the Mac monitor can be used on the desktop view document. You can position text and other elements and see exactly what your final image will look like in real time.

When your image is dropped into the Final Cut Pro timeline, you will see exactly what you worked with on the desktop view, and there will be no nasty surprises.
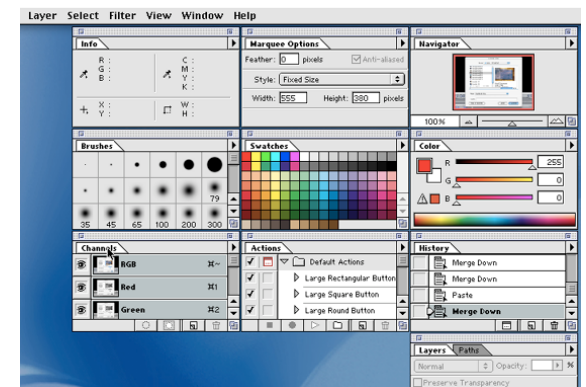
6 Try positioning a Wacom tablet in front of the broadcast monitor, for full paint flexibility. You can also drag out the Photoshop palettes for faster access to tools on the Mac desktop. You can easily move back and forth between computer and video display.

The desktop view works wth any application, including Adobe After Effects. You can animate live on the video desktop.

Kona SD Support
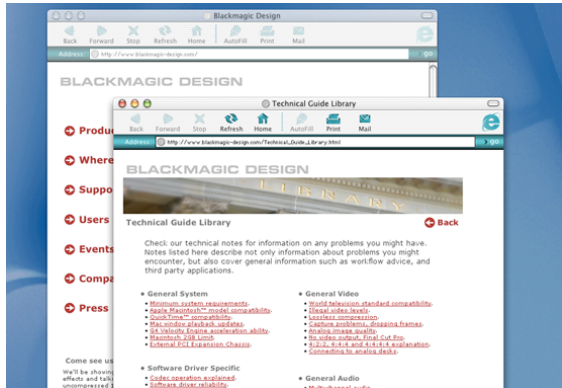
A There are three steps to getting help with questions and problems you might have with your Kona SD.

Firstly, check out the AJA Video (www.aja.com) and Blackmagic Design (www.blackmagic-design.com) web sites for the latest support information. Blackmagic Design has loads of technical and operational tips on the support page.
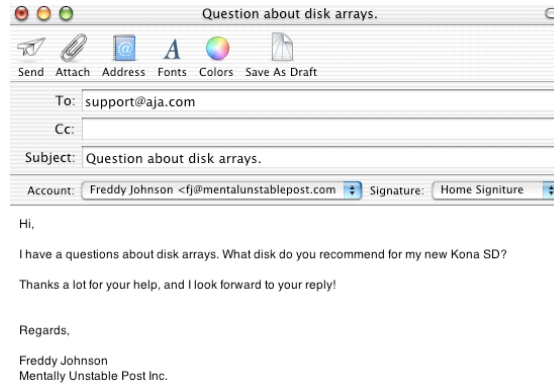
B Secondly, call your dealer. Your dealer will have the latest technical updates from AJA Video and Blackmagic Design, and should be able to give you immediate assistance.

If your dealer cannot help, then try emailing us at AJA Video (support@aja.com) or Blackmagic Design (support@blackmagic-design.com) for help.

C Call technical support at AJA Video in the US. The number to call is (800) 251 4224 within the USA, or +1 530 274 2048 outside the USA.

NOTE: Always have information about your system available before you contact us at technical support. You might like to call from next to your system, so you can easily locate information that support might ask.

Limited Warranty

AJA Video warrants that this product will be free from defects in materials and workmanship for a period of three (3) years from the date of purchase. If a product proves to be defective during this warranty period, AJA Video, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify AJA Video of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by AJA Video, with shipping charges pre paid. AJA video shall pay for the return of the product to the Customer if the shipment is to a location within the country in which the AJA Video service center is located. Customer shall be responsible for paying all shipping changes, insurance, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. AJA Video shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personal other than AJA Video representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by the use of non AJA Video parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product.

THIS WARRANTY IS GIVEN BY AJA VIDEO IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. AJA VIDEO AND IT'S VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. AJA VIDEO'S RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE WHOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WETHER AJA VIDEO OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES.