



ARRIRAW Toolkit  
for MacOSX

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## System Requirements

### Minimum Hardware and Software Configuration

- Intel Macintosh
- Mac OS X 10.7.5
- 1920 x 1200 display

### Recommended Hardware and Software Configuration (Playback)

- A Powerful Graphics Card
- MacOSX 10.9.1 (or later)
- QuickTime 7.6.6
- 4 Gigabytes of RAM or more
- Dual 1920 x 1200 displays
- High Speed storage, such as a Thunderbolt, SAS RAID, SATA RAID, Fiber-channel RAID or SAN.

### ARRIRAW Playback Requirements

ARRI's ARRIRAW file format is designed to contain raw bayer sensor data from their Alexa digital cinema camera models. Like DPX sequences, the ARRIRAW format is designed to have a single frame per file. Each file is about 6 to 8 Megabytes per file. ARRIRAW sequences will likely require machines with better than average performance. It is suggested that the most recent Macintosh computers be used in order to achieve full Playback.

Playback of ARRIRAW footage will also require systems with high speed storage. At minimum, a Thunderbolt, SATA storage array, SAS Storage array, or 4G/b based directly attached Fiber-Channel storage is suggested.

## Overview

### Final Cut Pro X

At the time of this release, there is no support in Final Cut Pro X for our software. We look forward to the time that we can fully support this package. Please contact Apple if you wish to see Glue Tools support included with future Final Cut Pro updates.

### ARRIRAW QuickTime Components

The ARRIRAW QuickTime Component will perform all of the importing, playback, de-bayer, and color correction functions to the movie. All applications that use Apple's QuickTime libraries can access all aspects of the ARRIRAW image sequences. Applications ranging from Final Cut Pro right down to iMovie, can import and play these files without any sort of conversion or preprocessing steps.

There are no direct "controls" or programs to launch in order to use these components. Your QuickTime enabled application will simply "recognize" ARRIRAW sequences as another movie format that can be used. Your Macintosh will also be "aware" of the files, much the same way QuickTime movies are already available to the system.

The Spotlight and QuickLook Plugins enable your system to work with ARRIRAW files as if they were "natively" supported. The Finder can extract specific information and thumbnails from the ARRIRAW ".ari" files as needed. A good example of this is when a "Get Info" command is done. With spotlight, you can search for camera models, encoding characteristics, or even "shot notes" from the user modifiable "description field" from the Finder's Spotlight panel. Simple shell scripts can also take advantage of the spotlight services and sift through frames for specific data.

### ARRIRAW Plugins for Final Cut Pro 7

Along with the ARRIRAW QuickTime Components, you will want to install this package for better Final Cut Pro 7 compatibility. When installed, you will see a new "Glue Tools ARRIRAW Import" menu item in the File->Import menu. Use this menu item when you are importing an ARRIRAW ".ari" sequence. It will perform a number of house-keeping steps with your Final Cut Pro project. You can also "shift select" folders containing a number of sequences to batch load a number sequences at once.

**MacOSX Compatibility with ARRIRAW**

By default, QuickTime Pro 7 is not installed with MacOSX. With the release of MacOSX 10.7.x and later, QuickTime Pro 7 is required. While this installer is provided on the MacOSX 10.6 Snow Leopard Installation DVD, Apple does not provide this installer with 10.7.x and later. Fortunately, this installer is available from Apple's website.

The download link is: <http://support.apple.com/kb/dl923>

Once you have downloaded and installed QuickTime Pro 7, you can proceed with any of our packages. Be sure to use QuickTime Player 7 in the /Applications/Support folder, to view your ARRIRAW sequences.

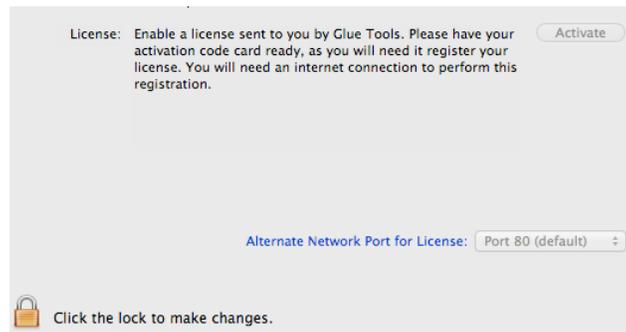
## Installation and Demo Mode

### Installation

Installation is as simple as double-clicking on the installer package, then selecting the hard disk that you want to install the software onto. Once installed, you will need to reboot your machine.

Note: If the system does not contain the proper version of Final Cut Studio, various parts of the ARRIRAWPackage will not install. If after the installation, parts of this product do not show up, please double-check that you meet the minimum requirements.

### IMPORTANT – Demo Mode



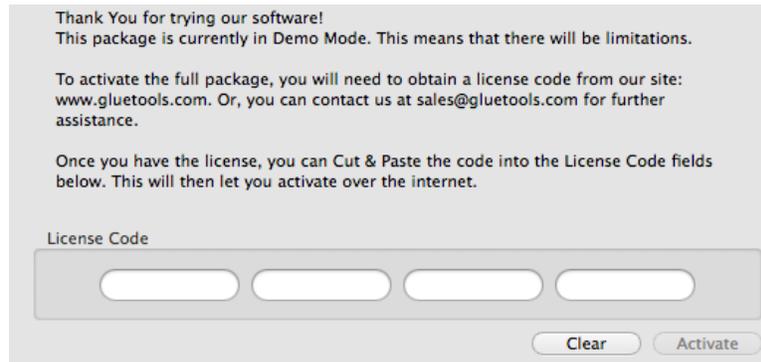
By default, the software is placed into “Demo Mode”. If a software license is not available, the software will have limitations. Look for the “ARRI Camera” Preference Pane. You should see an Info tab along the top edge of the window. Click on it to get to the licensing section.

If no license is purchased, the ARRIRAW Toolkit will render Images with a large colored bar through the center of the image. With the purchase of a license, the time limit will be removed and all of the imagery will be rendered properly.

## Licensing

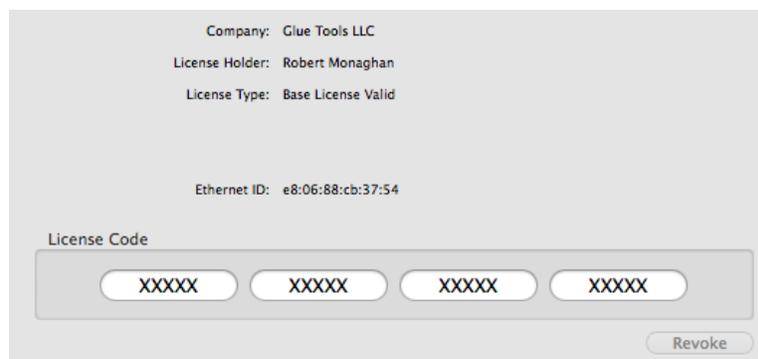
### License Activation

**Licensing must be done while connected to the Internet.** If you do not have an internet connection, you will not be able to activate the license. In many cases any type of network connection will get you up and running. Once activated, you will not be required to have a network connection, **unless you want to move the license to another Macintosh.**



To activate the license, you will need the Registration Code that was emailed to you. Open the System Preferences and click on the ARRIRAW preference pane. Cut & Paste your license code into the fields provided. Once you click on the “Activate” button, the software will verify the license with our server and create a permanent license for you. Until you decide to move the license, this will be the only time that the internet is used for licensing.

### Revoking/De-authorizing a License



If you need to move a license to another machine, you can use the “Revoke” button to deactivate the license from the machine that you are on. Just as you had done with the license activation, Open the System Preferences→ARRIRAW preference pane. Open the Info tab and click on the “Revoke” button. Once deactivated, the license will be free so that another machine can be used.

## Quick Start Guide

### Importing an ARRIRAW Image Sequence – The Correct Way

Just about everyone has used QuickTime to load a range of individual frames and convert them into a single movie. Normally, this is done by using an “Import Image Sequence” command inside the QuickTime application. Typically these images are a series of TIFF files or JPEGs with sequential frame numbers. Under normal circumstances, this works just fine. The sequences of picture files are just what they are . . . a series of still images with no other useful data.

However, this is not true for ARRIRAW “.ari” files. The ARRIRAW sequences are in fact a single movie. The difference between a ARRIRAW “Movie” and a regular “.mov” file, is that each frame is a separate file. A “.mov” file has all of its frames inside a single file. A feature that makes ARRIRAW frames different from other Image formats, is that the ARRIRAW frames contain “metadata” that is specific to the film and HD broadcast industry. Time Code, slate information, and other information etc, is stored in the image header.

So, what does this ultimately mean? It means that to properly load an ARRIRAW sequence into your favorite application, use the “Open->File...” menu, and select A SINGLE frame from your sequence. Then click on “Load” or “Ok.” The entire movie will load shortly. DO NOT use “Import Image Sequence” to load the frames.

Glue Tools has custom technology to treat these image types as a “virtual movie file” rather than a set of individual image files. This means that all of the frames in the sequence are really just a single “Movie.” It also means that when you are selecting any one ARRIRAW “.ari” file from a sequence, it is the same as opening all of the frames in the sequence.

Because of this, you no longer need to shift-select all of the frames to load them. As a result of the way this works, you are able to load metadata, Time Code and other information that would normally be associated with a QuickTime movie.

But what about the “Import Image Sequence” menu command?

Using this method of loading frames, you lose the ability to import metadata, Time Code, etc. You also lose the Playback ability, too. When importing ARRIRAW frames as an Image Sequence, QuickTime believes the sequence is just a bunch of still images, not a series of frames in a movie.

### Importing a Sequence into QuickTime Player

One of the most basic ways of using the ARRIRAW Toolkit is to take one of the frames from your sequence and drag and drop it over top of the QuickTime icon. Doing this will open the entire sequence inside QuickTime Player.

### Exporting a New Movie from QuickTime Player

For the ease of portability with other users, you can quickly and easily convert an ARRIRAW Movie to any other QuickTime Movie format. You can do this by opening the ARRIRAW sequence using QuickTime Player, and then selecting the “File->Export....” Select your codec, location and filename as you would with any other movie, and start the export. It’s that easy.

### Importing a Sequence into Final Cut Pro 7

Final Cut Pro 7 has a specially built interface to work with the ARRIRAW “.ari” files. To import the footage, select the “File->Import->Glue Tools ARRIRAW Import...”. Locate a “.ari” file, and click “Ok.” Your sequence will now appear in the browser, complete with the file’s metadata.

That’s it!

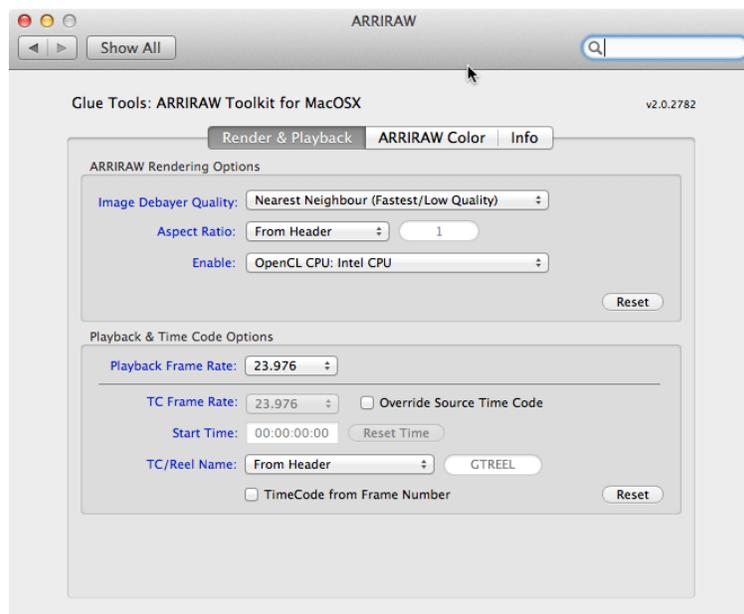
## ARRIRAW Preferences Reference

This package consists of a number of parts that make up the whole: the ARRIRAW QuickTime component, a System Preferences Pane, and a Spotlight Plugin. Each of these pieces are briefly described in turn.

### Preference Pane



The Glue Tools ARRI Camera Preferences Pane is where you can change the Global settings used by the ARRIRAW QuickTime Component. If you want to change the Exposure settings, change the Color Space from Video to LogC, or alter the Time Code settings, you can do it with the System Preferences Panel. Let's begin by opening the System Preferences, and clicking on the Glue Tools ARRIRAW preference icon.



### Render & Playback Tab

You will notice that the Presets Tab is divided into two sections: "Image & Playback Options" and "SMPTE Time Code Options."

#### ARRIRAW Rendering Options:

##### Image Debayer Quality

This pop-up menu is used to select the type of de-bayer algorithm to be used to interpolate the sensor data. Different de-bayer modes will concentrate on a specific "look" when creating an image. Some modes will simply "average" the sensor pixel values to estimate the RGB values. Other de-bayer algorithms are much more elaborate, carefully examining each pixel to best handle gradients, hard edges, and color changes. Naturally, the more elaborate the de-bayer algorithm, the more processing speed is needed by the software. On slower machines, de-bayer algorithms such as "GT Hybrid A" will significantly impact playback. However, this type of algorithm is ideal when exporting to another QuickTime movie format.

De-bayer performance is sorted by their order in the menu. The top mode menu item, "Raw Sensor Data Mode" is the fastest, as no de-bayer algorithm is being applied. "Gray Scale," "Nearest Neighbor," "Bilinear Interpolation" are the next fastest modes. The slowest yet most accurate is "GT Hybrid A" which is at the bottom of the menu.

### Aspect Ratio

This pop-up menu allows you to choose between a number of different Aspect Ratios, that the image will be displayed as. When loading the Images, you can select the 2.0 Aspect Ratio, and the images will be automatically re-sized, without any data loss.

The example image here, illustrates the concept. The example frame is an Anamorphic Image. On the left is an uncorrected 1.778 anamorphic image, while the right image has been corrected for 2.35.



### Playback & Time Code Options:

#### Playback Frame Rate

This lets you override the frame rate found inside the ARRIRAW files, and forces your Application to use the value that you choose.

#### TC Frame Rate

This lets you override the time scale that the Time Code track uses. This can be different from the playback Frame Rate. This control, combined with the playback Frame Rate pop-up can let you simulate a Tele-cine operation. i.e.: selecting a 24 FPS for the playback Frame Rate and a 25 (or 29.97) for the Time Code.

#### Override Source Time Code

When enabled, you can alter any of the Time Code settings. Many of the settings are disabled until you enable this check box. When it is disabled, Time Code is used from the Time Code metadata within the ".ari" file.

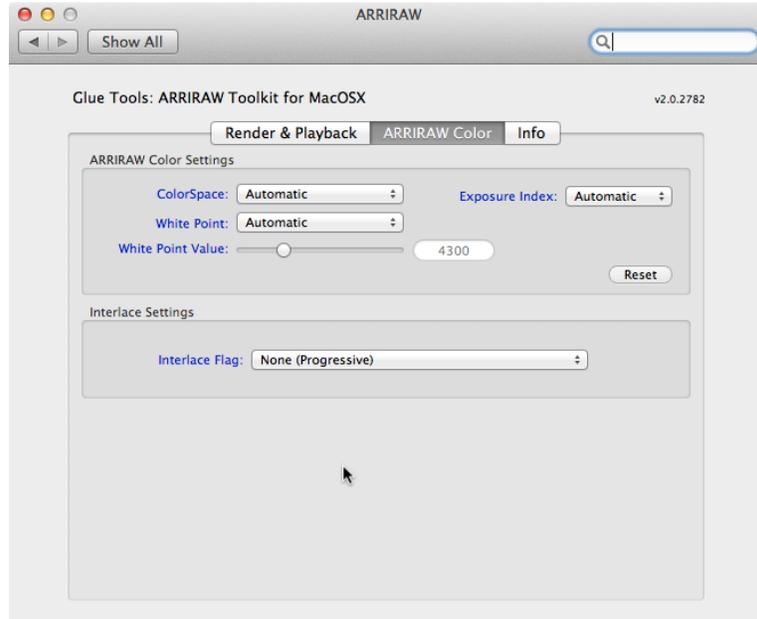
#### Start Time

When enabled, you can enter in your own Time of Day start time. You can click on the "Reset Time Code" button to bring it back to 00:00:00:00

#### TC/Reel Name

The "TC Source Labeling" Pop-up menu determines how QuickTime identifies the Time Code track. You can type in your own text into this box, or use one of a number preset options in the menu.

"User Defined" allows you to type your own description into the text field below. When selected, you are able to type in up to 12 characters, which will be used as the Reel Name. You can use either the "Root" file name from the first frame, or you can use the parent directory that the frames are stored in, as the reel name.



## ARRIRAW Color Tab

### ARRIRAW Color Settings:

#### Color Space

This pop-up menu lets you choose between the Rec 709, DCI P3 and LogC colorspaces. Again, this affects all Alexa ARRIRAW sequences.

#### Exposure Index

This pop-up menu lets you choose from a range of Exposure Index settings. By default, the setting that has been placed into the ".ari" file's header by the camera, is used. You can choose to override this, but keep in mind that this setting is Global for all Alexa ARRIRAW sequences.

#### White Point & White Point Slider

This pop-up menu and Slider lets you choose between different White Points, should the information not be available in the ARRIRAW header. By default, the setting that has been placed into the ".ari" file's header by the camera, is used. This affects all Alexa ARRIRAW sequences.

### Interlace Settings:

#### Interlace Flag

This pop-up menu lets you flag your footage to be treated as Progressive material, or as interlaced material. This doesn't perform any kind of "interlace" image processing, but rather instructs QuickTime that the material can be treated as interlaced, if needed. You can select Progressive (None), Interlaced (Bottom/Odd) and Interlaced (Top/Even). The default is Progressive (None).

### Info Tab / Licensing

In the "Info" tab, you can click on links to the Glue Tools website, as well as direct links to the Support/FAQ pages, and the Registration pages. If you wish to purchase a license for the ARRIRAW Toolkit Package, visit [www.gluetools.com](http://www.gluetools.com), go to the "purchase" page and follow the instructions there.

## ARRIRAW Final Cut Studio Reference

### Final Cut Pro “ARRIRAW Import” Plugin

Final Cut Pro users can import ARRIRAW footage with dedicated Import Panel. This panel can be accessed by selecting the “File->Import...” menu.

The ARRIRAW Import panel for Final Cut Pro provides most of the same controls that the ARRIRAW Preference Pane does. However, the panel adds the ability to extract metadata right out of the ARRIRAW file, and place the information right into your FCP project. Shot notes, color information, and other information is extracted and available in the XML that FCP generates.

### Final Cut Pro Sequence Presets

Final Cut Pro provides a set of “Sequence Presets” which allows you to quickly configure your system for different editing scenarios. Included with the package is a set of predefined Sequence Presets. These are generic presets for standard frame rates, and image sizes. As with the other Sequence Presets that Apple provides, you can duplicate and customize these to suit your needs.

Also included with these Sequence Presets, is a set of AJA Kona3 specific Sequence Presets. These presets allow you to preview your footage out through the Kona 3 hardware

## Compressor Reference

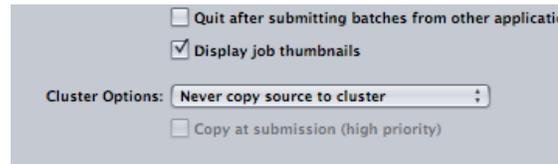
### Qmaster Setup for Compressor 3.5s and Compressor 4

Qmaster is Apples render queuing system. With it, you can harness a group of computers together, to work on a set of jobs. Ideally, you can use any of these additional computers to work on tasks that you need done, without tying up your machine. A typical job might be converting a sequence of ARRIRAW frames into a ProRes movie.

Before you can use Compressor and Qmaster with the ARRIRAW Toolkit, you will need to make some changes to your Compressor setup.

**Problem:** Rendering a QuickTime movie on a Qmaster node fails. The movie has one or two different frames that are repeated.

**Fix:** Go to the “Compressor” menu and select “Preferences.” Once the panel has opened, look for the “Cluster Options” popup menu, and select “Never copy source to cluster.”



This is important, as Qmaster was never designed to work with image sequences as source frames. Qmaster doesn't understand how to copy movies that are composed of several files. This is usually the cause of rendered QuickTime movies that have repeating frames. In order for Qmaster to work with the footage, the volume that holds the source frames must be mounted on each Cluster Node. When the render job is submitted, each of the Cluster Nodes will see the frames as “locally available,” so the copy step isn't required.

## MacOSX Reference

### Spotlight

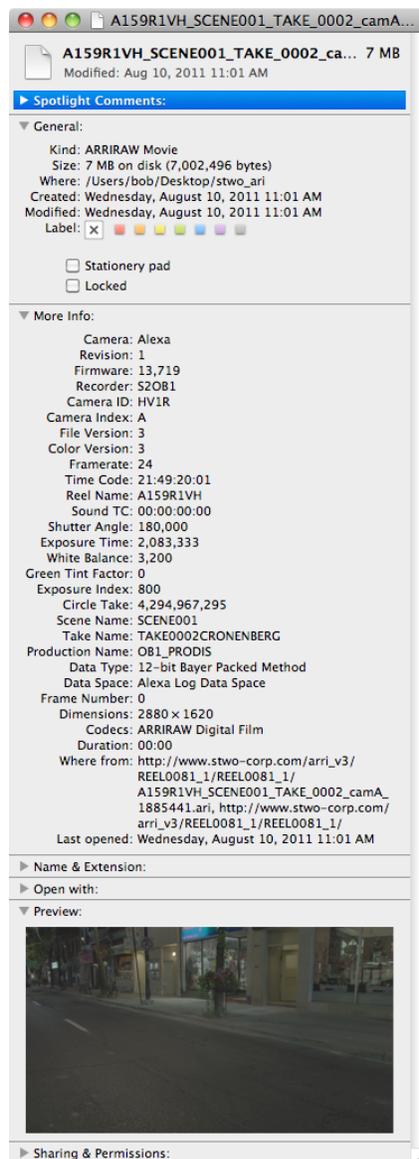
ARRIRAW files can be indexed and searched by Spotlight. Simply typing in a relevant bit of text, into the Spotlight text field, will search all of the ARRIRAW “.ari” files’ metadata on your system.

### Macintosh Finder / Get Info

Get Info (Command - I) in the Finder allows you to view the details of any ARRIRAW file, as well. Much like the Spotlight window, you can get info about a single file, that you happen to click on.

The “Get Info” panel will display ARRIRAW specific information in the header of the selected files. This is an excellent diagnostic tool when working with the ARRIRAW file format.

Here is a sample image of the type of information available in the “Get Info” window.

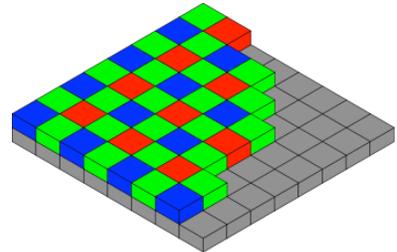


## Terminology

Here is some terminology that you may not be familiar with.

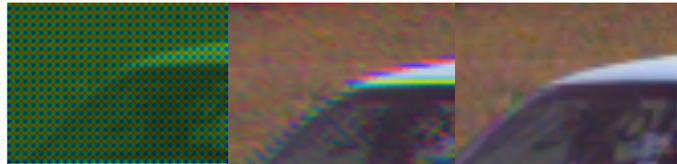
### Bayer Pattern Imagery

Traditionally, you would assume that each pixel is a combination of Red, Green and Blue channels to make each pixel. With single sensor digital cameras, each pixel is in-fact a single color. The "Bayer Pattern" was invented by Dr. Bryce E. Bayer at Kodak, who came up with the "bayer pattern" color filter array. He came up with the way each color is arranged on the camera sensor (see attached graphic). Each line on the sensor contains alternating pixels of Green and Red, and the next line below alternates Blue and Green. By using a "de-bayer" algorithm, a proper RGB image can be reconstructed.



Different types of de-bayer algorithms will reproduce different levels of image quality. Typically, "fast" de-bayer algorithms are of a poor quality. "Slow" algorithms are typically much better. (Image courtesy of Wikipedia).

Here are examples of some de-bayer algorithms. On the left, is a "Raw" Bayer Pattern. In the centre is a "fast" Nearest-Neighbour de-bayer pattern and on the right a "better" Pixel Grouping de-bayer pattern. As you can see, there will be a substantial quality difference, depending upon the de-bayer algorithm you choose.



At this time, GT Hybrid A is our best quality de-bayer algorithm. As these de-bayer algorithms get better, you can expect to see improvements as new versions are released.

## Technical Support

Support for these tools can be obtained by posting support question at <http://support.gluetools.com>.

Online support also includes an Knowledge Base section. The Knowledge Base is a great place to to find commonly asked questions questions.

Telephone Support is available Monday to Friday, 9AM to 5PM PST/PDT.