MAGIC BULLET SUITE

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THE ORPHANAGE

CREDITS

A product of The Orphanage, Inc.

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Magic Bullet® Suite v1.0 – End-User Manual

MAGIC BULLET SUITE

CONTENTS

SECTION ONE: OVERVIEW

SECTION TWO: REFERENCE

OPTICALS

SECTION THREE: APPENDICES

INDEX

MAGIC BULLET SUITE

SECTION ONE: OVERVIEW

WHAT IS MAGIC BULLET?

Magic Bullet is an all-digital pipeline for finishing digital movies. Developed at **The Orphanage,** a digital film production and post-production company (see Appendix 3), it was designed to allow ultimate creative control over digital projects while maintaining the highest possible quality, with a particular eye towards mimicking the characteristics of motion picture film.

To best understand Magic Bullet and what it can do for you, read on. If you can't wait to see it in action, skip the next two chapters and go straight to **Quick Start.**

THE HISTORY OF MAGIC BULLET

The first Orphanage original production, a short film called **The Last Birthday Card,** would become the proving ground for a new way of making movies. Director Stu Maschwitz knew the quality of the images he was getting from his shiny new **Sony DCR-VX1000** was excellent, but there was no question that the crisp, soap-opera video look of it had to go. Eventually Stu hoped to transfer the project to film, but he didn't want this to be the first time he would see his project with the 24 frames per second look he desired. In fact, he felt it was crucial to be able to create a high-quality video version of the piece that looked like film.

A desktop 24p mastering solution seemed like the only way to go, but no such thing existed. Thus Magic Bullet was born.

Please note that while Magic Bullet was invented at The Orphanage, all sales, support, and marketing inquireies should be directed to **Toolfarm** at www.toolfarm.com or (415) 626-2400.

60i, 50i, AND 24p—THE SCIENCE AND PHILOSOPHY OF THE BULLET

The refresh rate of NTSC video is conveniently driven by the U.S. standard AC power supply, which cycles at 60Hz. Most people know that video in the States runs at about **30 frames per second** (see Appendix 1), but few people outside of the professional video community understand how the interlaced fields of those frames actually present 60 new images to the viewer's eye each second.

As television was in its infancy, the natural inclination was to scan images onto the CRT screen progressively, meaning simply from top to bottom with no funny business over the course of $1/30^{th}$ of a second. The images would be recorded in a similar fashion, progressively scanned from analog tubes. However, experiments with this technique resulted in an interesting problem when fast-moving objects were photographed. As photographers know, $1/30^{th}$ of a second is a rather slow exposure time, and a lot can happen in that interval. Objects moving rapidly from side-to-side exhibited a noticeable skewing effect as they traveled to a considerably different place on screen in the time it took the scan to get from the top to the bottom. The effect is quite similar to moving your original while making a photocopy.

The solution that still lives with us 72 years later was to scan every other line in $1/60^{th}$ of a second, and then go back up to the top to scan the missing lines into place. This cut the skewing problem in half, and also resulted in a smoother motion to the eye as the viewer was now effectively presented with 60 new images per second. Each of those images is half-resolution in the vertical dimension, but that limitation is nearly impossible to perceive during playback.

This 60 field-per-second standard is known as **60i,** for 60 Interlaced images per second.

PAL video, based on a 50Hz power system, refreshes at 25 frames per second, 50 fields. In other words, **50i.**

On the other hand we have film. In the same way that the QWERTY keyboard was mechanically limited to be as inefficient as possible to prevent speedy typists from jamming up their keys, the first motion picture cameras were designed to run at the lowest acceptable frame rate. Before the days of sound this was roughly **16fps**—deemed to be the lowest frame rate at which the audience would still perceive smooth motion. The addition of an optical soundtrack mandated an upgrade to **24fps** to provide enough linear space for an optical soundtrack of acceptable quality.

Even though film is not really "scanned" during exposure in a camera or when projected, we refer to its frame rate as **24p**, or 24 progressive (whole) frames per second.

In the early eighties **Douglas Trumbull** began researching the ability of the human eye to perceive motion. His goal was to create a film format that would have a high enough spatial and temporal resolution so as to be indistinguishable from reality. The result of his experiments, called **Showscan,** was a 65mm negative shot at 60fps. Any more than that and he felt he was wasting film; any less and the audience may perceive some steppiness to the motion. Showscan is therefore a **60p** format, which has much more spatial information than NTSC video, but the exact same temporal quality.

So in one corner we have video—its NTSC incarnation representing the absolute maximum refresh rate perceivable by the human eye. In the other corner, film—steadfastly representing the bare minimum acceptable refresh rate.

What does it all mean? Here's some dime-store philosophy in the words of Magic Bullet inventor Stu Maschwitz:

> *Video's frame rate being as close to reality as we can discern jibes with our ingrained perception of how video is traditionally used: to document real-life events. The TV news, reality TV shows, and our own home movies have a documentary quality to them that subconsciously suggests to the viewer that they are seeing actual events. Even sitcoms and soap operas are less like movies than they are like simulations of being in a studio audience watching a live performance. Video clues us in that we are watching reality, and by showing us everything, it invites us to passively absorb it.*

Movies are anything but reality. Ironically, by showing the audience less (40% of the temporal information of NTSC video), they trigger a part of our brains that works to fill in the missing information. In this way film creates a more participatory experience and at the same time informs its audience that what they are viewing is an authored, narrative work. This is backed up by our historical associations as well—we have learned to associate film's flicker with storytelling and video's unflinching detail with reality.

Since before history mankind has sat around campfires and told stories, and there are those who suggest that this association with narrative and the flickering image is so deeply ingrained in our collective unconscious that it in part explains our love for movies. Whether this is true or not, applying Magic Bullet to your video instantly transforms it from feeling like just another bit of DV camcorder footage to something more.

Even if you're not buying any of that, film looks one way, video looks another. Magic Bullet does what it can to make video look like film, to whatever end you have in mind.

WHO NEEDS MAGIC BULLET?

Magic Bullet is more than a way to make your DV footage look like film. It's a true finishing process that can take your DV, Digital Betacam or HD footage all the way to an actual film print if you wish. For this reason Magic Bullet has been the post-production process of choice for numerous filmmakers, independent and studio alike. Magic Bullet was designed to be the last step in any digital production. Here are some examples.

FEATURE FILMS

As stated above, Magic Bullet has been used on many feature films that have been seen on 35mm film and video alike. Examples include Alison Anders' ***Things Behind the Sun,*** Ethan Hawke's ***Chelsea Walls,*** and Campbell Scott's ***Final.*** In all of these cases Magic Bullet provided the filmmakers with not only the best possible image quality from their DV originals but with flawless film and video output from the same digital source. And in each case the directors worked with their cinematographers to apply unique and distinctive looks to the films, enjoying the kind of creative control that previously was the exclusive domain of big-budget filmmakers.

But the Bullet is not just for indies—in the recent film ***Vanilla Sky*** starring Tom Cruise, Magic Bullet was used on a variety of video footage—both to seamlessly match it in to surrounding 35mm footage and to create unique video looks.

TV SHOWS

Magic Bullet's 24p video output is perfect for TV Shows, and can actually allow digital video to replace film acquisition in some cases. In the ABC TV Movie ***Superfire,*** the Bullet was used to match video stock footage to the production's own 35mm film shots. Armed with Magic Bullet Suite v1.0's Broadcast Spec plug-in, you can be sure that your video signal will meet NTSC broadcast standards.

COMMERCIALS

Millions of viewers watched the Nike spot ***Take Me Out to the Ball Game*** in the 2001 World Series and never once suspected that it was shot with a PAL DV camera—thanks to Magic Bullet.

MUSIC VIDEOS

Anytime budgets are tight and production value must be high, Magic Bullet can help make cost-saving digital video a viable choice. And it can help with high-end projects as well—The recent music video for Cher's ***A Song For the Lonely*** was processed though the HD version of Magic Bullet.

MOTION GRAPHICS

The ability to integrate all kinds of source media—film and video alike—in a common 24p environment at the highest quality is something any motion graphics artist would want. Magic Bullet unites disparate video sources with ease.

VISUAL EFFECTS

It's not uncommon for small elements for big-budget Visual Effects films to be shot on video, even DV. Magic Bullet can convert that video to 24p at the highest possible quality so that those elements can be used with confidence—even on film-resolution shots! And Magic Bullet's proprietary deartifacting option can drastically reduce the color artifacts that make pulling a good key off of DV bluescreens or greenscreens so difficult.

WEB

Assuming anyone out there still cares about the web, Magic Bullet can help there too. High quality deinterlacing helps reduce the strain on compression algorithms, and 24 or 12fps is a lot less data than 30 or 15!

WHAT'S INCLUDED IN MAGIC BULLET SUITE v1.0?

There are two versions of Magic Bullet Suites: **SD** and **HD,** meaning Standard Definition and High Definition, respectively. Magic Bullet SD works on all standard-definition format video (up to 720x486 NTSC and 720x576 PAL, 16:9 or 4:3 (as well as the PAL square-pixel size of 768x576). Magic Bullet HD has no resolution limit at all, so you can use it on all video resolutions including HD standards such as 1280x720 and 1920x1080.

MAGIC BULLET

Magic Bullet Suite v1.0 is named after its main component, **Magic Bullet,** which is the workhorse plug-in that converts the video sources to 24p and helps you reduce some of the artifacts present in digital video footage. You can do these operations separately, so you can use Magic Bullet to deartifact progressive scan (or faux progressive scan) footage, or you can deinterlace footage without otherwise affecting it.

The other plug-ins contained in the set are:

LOOK SUITE

Look Suite is the creative centerpiece of Magic Bullet Suite v1.0. Here you will find a selection of preset looks that you can apply to your footage, or you can design your own. The preset looks are designed to mimic a number of popular shooting styles and post-processes, but Look Suite provides you the power to create your own unique looks for your project and save them to use again or share with others.

OPTICALS

Opticals allows you to generate beautiful film-like fades to black, burns to white, and cross-dissolves.

LETTERBOXER

LetterBoxer allows you to crop your output to standard film and television aspect ratios simply and effectively, regardless of the pixel aspect ratio of your Composition.

BROADCAST SPEC

Broadcast Spec is designed for Magic Bullet projects that need to meet NTSC broadcast specifications. It has settings for DV output as well as uncompressed standard-definition output devices such as CinéWave, Digital Voodoo, or Igniter. Since many HD projects will be broadcast over Standard Definition airwaves, **Magic Bullet HD** users can also make good use of **Broadcast Spec.**

DEEPCOLOR TECHNOLOGY

Look Suite, Opticals and **Broadcast Spec** make complex and subtle color adjustments to your footage. To do this at the best possible quality, it is recommended that you use them in 16-bit After Effects projects. The 16-bit option is a powerful feature available only in the After Effects 5.5 production bundle. If you do not have the Production Bundle of After Effects, fear not. These plug-ins use The Orphanage's **DeepColor** technology, allowing them to adjust your images internally at greater than 16-bit quality and render them back to your 8-bit projects without any banding effects. Why should the Production Bundle folks have all the fun?

QUICK START

MAC OS SYSTEM REQUIREMENTS

Apple Power Mac G3 or faster (Dual-Processor G4 recommended)
Adobe After Effects 5.5 or later
128mb RAM minimum
Max OS 9.1 or later (including OS X)

For Windows syatem requirements and installation instructions please see the Readme file on your installation CD.

Magic Bullet is designed to work with digital video files in their **native resolutions and compressions.** Analog video capture devices may yield footage that contains artifacts that could confuse the Bullet. So if your footage is DV, you will get the best results with a system that captures it natively via FireWire. If your footage is Digital Betacam, DVCPRO50, Digital S, HD, or some other format, you will be best served by using an uncompressed video card such as **Digital Voodoo** or **Pinnacle's CinéWave,** among others.

INSTALLING MAGIC BULLET SUITE v 1.0

We'll bet you've inserted the Magic Bullet CD and run the installer before ever picking up this book, and that is indeed the first step in installing Magic Bullet.

The installer will find your latest copy of After Effects and drop two folders into the **Plug-ins** folder: **Magic Bullet Suite v1.0,** which contains the five Magic Bullet filters themselves, and **Magic Bullet Looks** which includes preset Look files for use with Look Suite.

Along with the plug-ins, you'll notice the **Eve3 Carbon Library** in the Magic Bullet Suite v1.0 folder. This is necessary for the plug-ins to see the dongle under both OS 9 and OS X. In addition, **Eve3 dongle drivers** for your operating system will be dropped in their designated locations—the Extensions folder for Mac OS 9 and /Library/Frameworks for OS X. You can check the install log if you're curious to see exactly which files have been installed and where.

Plug the dongle into any available USB port, which can include the extra port provided on the Mac keyboard or a USB hub. The next time you run After Effects, the plug-ins will serialize and appear in the Effects menu under the **Magic Bullet Suite v1.0** sub-menu. You should be ready to go.

If Magic Bullet does not see a dongle, it runs in **demo mode** and renders a logo over your footage. In that event, make sure your dongle is connected (is the green light on the dongle illuminated?) and drivers for your platform are installed. In most cases, running the installer again should correct any problems.

If you are not able to get Magic Bullet functioning even after re-installing, rebooting, and checking the dongle connection, contact Toolfarm support by sending email to **support@toolfarm.com** or calling (415) 626-2400.

REGISTERING YOUR PLUG-INS

After installing Magic Bullet, you will find an **applet** on your desktop used to register the plug-ins. The applet will format your personal information and let you send it via regular mail, fax, or email.

Register Magic Bullet Suite

As part of the registration process, you will need to provide your Magic Bullet **serial number,** which can be found on a label stuck to the first page of the Magic Bullet book.

In addition to receiving news on Magic Bullet updates and resources, registering will give you access to **render-only versions** of the Magic Bullet plug-ins. Use these for network rendering with the After Effects Render Slave. The render-only versions run without the dongle attached, but will not work in the regular version of After Effects.

Check the Adobe After Effects documentation for more information on network rendering.

QUICKDRAW: SETTING UP A SIMPLE NTSC MAGIC BULLET PROJECT

To get you Bulleting as soon as possible, this section will power through the from-scratch creation of a Magic Bullet project. If you have **NTSC** footage, this is the section for you. If you have **PAL** footage, skip ahead to one of the other two Quickdraw sections; one is for rendering PAL footage to an NTSC environment, the other is for bulleting PAL footage for PAL output.
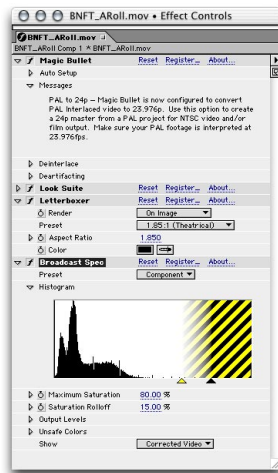
You'll need After Effects 5.5, a properly installed Magic Bullet Suite v1.0, and a piece of interlaced NTSC footage originating from a digital source. We recommend either DV footage captured via FireWire, or higher bandwidth digital footage captured through SDI using a capture card such as CinéWave, Igniter, or Digital Voodoo. You'll also need either FireWire video out or a video output card such as those listed in order to view the results of your Bulletization.

Create a new, empty Project and import your footage. Hit **command+f [control+f]** to open the **Interpret Footage Window.**

Set **Separate Fields** to **Off.**

If your footage is widescreen, make the correct adjustment in the **Pixel Aspect Ratio** menu.

Click **OK** to close the Interpret Footage Window.

Now drag your footage to the **Create Comp** button, found between the folder icon and the trash can in the Project Window.

Hit **command+k [control+k]** to access the **Comp Settings Window** for this new comp. Set the **Frame Rate** to **23.976** Frames per Second.

If your footage is widescreen, but you do not desire widescreen output, you may switch your Pixel Aspect Ratio to D1/DV NTSC (0.9) now.

Click **OK** to close the Comp Settings Window.

If you changed your Pixel Aspect Ratio, make sure your footage layer is selected and hit **command+shift+option+h [control+shift+alt+h]** now.

With the footage layer selected, find **Magic Bullet** under the **Magic Bullet Suite v1.0** sub-menu in the **Effects** menu.

Click on the **Auto Setup** button that appears in the **Effect Controls Window,**

The **dialog** that appears should bear good news. If it doesn't, the **Messages** field in the Magic Bullet effect controls may help you figure out where you went wrong.

Your footage layer defaults to **Draft** quality. In this mode, the Bullet is performing a fast, low-quality deinterlacing. This is fine for now, as we want to work quickly towards getting this thing rendering!

With the Effect Controls Window still up, apply the **Look Suite** effect from the Magic bullet Suite v1.0 sub-menu of the Effects menu.

Select **Load** from the **Preset Looks** pop-up menu in Look Suite's effect controls.

Select the **Basic** Look from the menu and click **Apply.**

Now apply the **Letterboxer** effect. Set it to the **1.85:1** preset.

Finally, apply **Broadcast Spec.** If you plan on rendering to DV, set it to the **Composite** preset. If you plan on rendering to your SDI video card, select the **Component** preset.

With your comp active, hit **command+m [control+m]** to create an item in your **Render Queue.**

Set the **Render Settings** to the **Best Settings** preset. Set the **Field Render** option to the field order that matches your video card, and select the last choice from the **3:2 Pulldown** menu (WWSSW).

Configure the **Output Module** for the NTSC QuickTime CoDec that matches your video card, and select a file name and path for your movie.

Click on **Render.**

When your render is done, view your results through your video card on an NTSC **interlaced monitor.**

QUICKDRAW: SETTING UP A SIMPLE PAL/NTSC MAGIC BULLET PROJECT

This section is for those anxious to get started with their interlaced **PAL** footage, and for whom **NTSC** video output is the primary desire.

Create a new, empty Project and import your footage. Hit **command+f [control+f]** to open the **Interpret Footage Window.**

Set **Separate Fields** to **Off.**

Where it says **Conform to Frame Rate,** enter **23.976** as the new **Frames per Second** value.

If your footage is widescreen, make the correct adjustment in the **Pixel Aspect Ratio** menu.

Click **OK** to close the Interpret Footage Window.

Now drag your footage to the **Create Comp** button, found between the folder icon and the trash can in the Project Window.

Hit **command+k [control+k]** to bring up the Composition Settings Window. Change the resolution of the comp to the NTSC resolution of your choice—probably either 720x480 or 720x486. If you do this by selecting one of the Presets, you will need to reset the Frame Rate to 23.976 Frames per Second. If you manually set the Width and Height, you will also need to manually set the correct Pixel Aspect Ratio (including choosing either widescreen or not, depending on your preference).

Click **OK** to close the Comp Settings Window.

Make sure the footage is selected and press **shift+command+option+h [shift+control+alt+h].** This will stretch the footage to fit horizontally in the comp, respecting the pixel aspect ratios of each.

With the footage layer still selected, find **Magic Bullet** under the **Magic Bullet Suite v1.0** sub-menu in the **Effects** menu.

Click on the **Auto Setup** button that appears in the **Effect Controls Window,**

The **dialog** that appears should bear good news. If it doesn't, the **Messages** field in the Magic Bullet effect controls may help you figure out where you went wrong.

Your footage layer defaults to **Draft** quality. In this mode, the Bullet is performing a fast, low-quality deinterlacing. This is fine for now, as we want to work quickly towards getting this thing rendering!

With the Effect Controls Window still up, apply the **Look Suite** effect from the Magic bullet Suite v1.0 sub-menu of the Effects menu.

Select **Load** from the **Preset Looks** pop-up menu in Look Suite's effect controls.

Select the **Basic** Look from the menu and click **Apply.**

Now apply the **Letterboxer** effect. Set it to the **1.85:1** preset.

Finally, apply **Broadcast Spec.** If you plan on rendering to DV, set it to the **Composite** preset. If you plan on rendering to your SDI video card, select the **Component** preset.

With your comp active, hit **command+m [control+m]** to create an item in your **Render Queue.**

Set the **Render Settings** to the **Best Settings** preset. Set the **Field Render** option to the field order that matches your video card, and select any one of the **3:2 Pulldown** phases.

Configure the **Output Module** for the NTSC QuickTime CoDec that matches your video card.

Select a file name and path for your movie.

Click on **Render.**

When your render is done, view your results through your video card on an NTSC **interlaced monitor.**

QUICKDRAW : SETTING UP A SIMPLE PAL MAGIC BULLET PROJECT

This section is for those who have **PAL** footage and plan on viewing their results on a **PAL** monitor.

Create a new, empty Project and import your footage. Hit **command+f [control+f]** to open the **Interpret Footage Window.**

Set **Separate Fields** to **Off.**

If your footage is widescreen, make the correct adjustment in the **Pixel Aspect Ratio** menu.

Click **OK** to close the Interpret Footage Window.

Now drag your footage to the **Create Comp** button, found between the folder icon and the trash can in the Project Window.

With the footage layer selected, find **Magic Bullet** under the **Magic Bullet Suite v1.0** sub-menu in the **Effects** menu.

Click on the **Auto Setup** button that appears in the **Effect Controls Window.**

The **dialog** that appears should bear good news. If it doesn't, the **Messages** field in the Magic Bullet effect controls may help you figure out where you went wrong.

Your footage layer defaults to **Draft** quality. In this mode, the Bullet is performing a fast, low-quality deinterlacing. This is fine for now, as we want to work quickly towards getting this things rendering!

With the Effect Controls Window still up, apply the **Look Suite** effect from the Magic bullet Suite v1.0 sub-menu of the Effects menu.

Select **Load** from the **Preset Looks** pop-up menu in Look Suite's effect controls.

Select the **Basic** Look from the menu and click **Apply.**

Now apply the **Letterboxer** effect. Set it to the **1.85:1** preset.

Finally, apply **Broadcast Spec.** If you plan on rendering to DV, set it to the **Composite** preset. If you plan on rendering to your SDI video card, select the **Component** preset.

With your comp active, hit **command+m [control+m]** to create an item in your **Render Queue.**

Set the **Render Settings** to the **Best Settings** preset. Set the **Field Render** option to **Off.**

Configure the **Output Module** for the PAL QuickTime CoDec that matches your video card, and select a file name and path for your movie.

Click on **Render.**

When your render is done, view your results through your video card on a PAL **interlaced monitor.**

SUMMARY

You've now seen the Bullet in action on your own footage. You did some weird things on the way, some of which went against your experience of how After Effects is normally used. A great next step would be to visit the **A Sample Magic Bullet Project** section, which takes you on a detailed tour of the project included on your Installer CD. Or delve into the **Reference** section for in-depth breakdowns of each of the plug-ins you just used.

What's going on? Magic Bullet is converting your interlaced video to a progressive format with a frame rate closer to that of film. This alone goes a long way towards making your footage look less like video. Look Suite is then changing the look of your footage, adding contrast and affecting the highlights a bit to create a more cinematic feel. What Letterboxer is doing should be obvious, and Broadcast Spec is stepping in at the last minute to legalize any over-saturated colors.

How do I deal with various pixel aspect ratios? What if I shot 16:9 but want letterboxed output? After Effects' default behavior really helps here. Always correctly identify the pixel aspect ratios of your footage—including its 16:9 setting. After Effects will automatically scale the layer correctly in any comp, as long as the comp itself has the proper settings. So placing PAL widescreen footage in an NTSC 4:3 comp and hitting **command+shift+option+h [control+shift+alt+h]** is all you need to do to create letterboxed output.

My NTSC footage looks a little stroboscopic when Bulleted. This is a natural by-product of converting it to 24p. NTSC footage represents motion very smoothly, and if you're used to seeing it this way, it may be jarring when you first see it at 24 frames per second. Additionally, the uneven relationship of 60 fields to 24 frames means that Bulleted NTSC footage has some slight motion irregularities. However, these irregularities are no worse than what you find in standard 3:2 pulldown, which is how all 24fps material is displayed on NTSC video. Nevertheless, you may notice this stroboscopic effect, called *judder*, on the type of motion present in panning shots, for example. In truth you will notice much the same effect on film-originated material—part of the reason that you rarely see a pan in a movie that doesn't follow an object moving at the same speed. In practice, if you shoot your NTSC footage as carefully as you would film, audiences seeing your Bulleted footage for the first time will not notice anything wrong.

Is Magic Bullet similar to other "make your video look like film" processes? It's quite different than most of them. Some other systems blend frames or merge fields to create 24p frames. This technique results in unnatural motion blur in the footage, as the combination of two video fields simulates a 360° shutter in a film camera—something which is not physically possible. Other systems that try to respect the shutter speed issue deinterlace in a destructive fashion, resorting to $\frac{1}{2}$ resolution information in motion areas of the frame. It's also very important to note that Magic Bullet is not a simple "sauce" that you apply to video in an attempt to make it "look like film." Systems like that permanently mess up the video they affect—and while the result may be something that looks less like video, it is also something that could never be transferred to film. Magic Bullet is not only a way to create a true 24p master from your video source, it is also a first step toward actually transferring your video to film.

Where's the grain? None of the Magic Bullet Suite v1.0 effects add grain to your footage. If you look very closely at high-quality 35mm film transferred to standard definition video (a DVD is a great place to do this), you will not see a whole lot of grain. In fact, in any given video source, you are likely to see as much—or more—noise as there is grain on the average DVD movie. Adding grain to video is simply not the right thing to do to make it look like film. However, adding grain to Bulleted footage would be a great way to mimic the look of a lower-fidelity film format, such as Super 8—or to match the look of some archival footage. Grain manipulation plug-ins are widely available for After Effects and can be quite handy (and don't overlook the convenient—and free—Noise plug-in that ships with After Effects), but for the general Bulleting of video, grain should be the least of your worries.

My camcorder footage doesn't look like film when Bulleted. Magic Bullet is a great thing to do to great footage, but it will not work miracles with bad footage. If you shoot it like video, chances are it will look like video, even post-Bullet. If you take some time with your lighting and camerawork, you should get amazing results from the Bullet. Don't think you have to have expensive lighting gear to do this either—*Benefits of Attraction,* the spec commercial featured in the **A Sample Magic Bullet Project** section, was shot entirely with available light and looks spectacular after Bulletization. This is mostly because it was shot according to general principles of sound film-making, but it's also partially owed to a strict adherence to the guidelines found in the following section.

PREPARING FOR THE BULLET

SHOOTING

"Shooting for the Bullet" could be a book twice the size of this one. There is a wealth of information—and just as much misinformation—on the web and in print about how to shoot DV for the best results on film. Here, straight from The Orphanage's archives of accumulated knowledge, is the short version of how you can shoot the best, most Bulletable footage.

Shoot PAL

PAL video runs at 25fps, which is much closer to 24 than NTSC's 30fps. When we Bullet PAL video we use every frame 1:1, meaning that motion artifacts are eliminated completely. On top of that, PAL has a higher spatial resolution than NTSC, so you get more pixels in your image. If you can gain access to a PAL camera, the results will in most cases be worth the trouble. Of course Magic Bullet works great on NTSC video too, but you already knew that.

Turn Down the Sharpening

If your camera has the option, reduce the internal sharpening control to almost none. The harsh, over-sharpened edges that appear on high-contrast images are a signature giveaway of video. It's worth experimenting with your camera's settings to find the best sharpening amount, but it will almost certainly be less than the default setting.

Use 1/60th or 1/50th of a Second Shutter Speeds

1/60th for NTSC, 1/50th for PAL. Film's standard shutter speed is 1/48th of a second, so yours should be as close to that as possible. The rule of thumb is to use a shutter speed that is double your shooting frame rate. If the "fast shutter" look is something you desire from a creative standpoint, Magic Bullet will be able to process the footage just fine, but you may be surprised by how stroboscopic the effect can be at 24p.

WARNING

Don't ever shoot with shutter speeds slower than double the frame rate. This is the same as shooting in a faux progressive-scan mode—you reduce your image resolution and will create a look that will not resemble film. Of course, if you are using the slow shutter speeds for creative effect, that is just fine, but you should remember to shut off the Deinterlacing component of Magic Bullet for such shots.

Shoot in 16:9 Mode

Especially if you plan on going out to film, but also if a nice, letterboxed video output is your desire. Electronic 16:9 is not as good as shooting with a native 16:9 chip, but it's better than not shooting with it. Be careful though: if a full-frame version of your project is ever needed it could be a lot of extra work to create it. 16:9 mode is for projects which are primarily intended for widescreen presentation.

Don't Shoot in "Frame Mode" or other faux Progressive Scan Modes

Magic Bullet does it's work by looking at the different fields of interlaced video. If you shoot in these modes you won't be able to use the Bullet's deinterlacing function. But if you have some footage that you've already shot this way, Magic Bullet can still help with its deartifacting tools, which work whether or not you use the deinterlacing function.

WARNING

A special note on non-interlaced NTSC footage: If you have shot some NTSC footage in a Frame Mode or other similar mode, Magic Bullet will not be able to help you convert your footage to 24p. A 30p output will probably still look great on video, but an actual film version, which must be 24p, will be very difficult to create.

Don't Overexpose

DV does not react well to blown-out areas of the frame. If a hot or overexposed look is your desire, it's far better to shoot at a normal exposure and use Magic Bullet **Look Suite** to burn it out later.

FYI

Many cameras have an option to display a zebra pattern in the viewfinder over areas that are blown out to 100% white. This is a very helpful option when shooting for the Bullet.

An ND Grad filter can help keep sunny skies from blowing out, and putting one on the camera will even do a better job than Look Suite's built-in Grad feature!

For an in-depth discussion of grad filters, see the **Look Suite** chapter in the **Reference** section.

Don't Underexpose

DV doesn't react well to dark areas either! Brightening up a dark DV shot will bring out all the compression and noise that you never knew was there.

Shoot it Plain

As an owner of Magic Bullet Suite v1.0 running on After Effects 5.5, you have the most powerful image adjustment tools in the world at your fingertips. Shoot your footage as "normal" looking as possible, and wait until you get it into a Magic Bullet project to create those crazy looks you have in mind. This gives you the power and control to change your mind about how you want it to look. This means avoiding color or diffusion filters on the camera (with the exception of the ND Grad mentioned above), and setting the white balance to the correct preset for the type of light you're using.

Shoot it Consistent

The best favor you can do for yourself is to ensure that shots in the same sequence look similar to one another. Watch not only the lighting on your foreground subject, but that of your backgrounds as well. Use presets for white balance, so that even if your battery goes dead and you lose your camera settings, you can still return to the same color balance you were using before. Use a color monitor on the set to compare playback of your last setup to the feed from the current one. Try to keep all of your similar skin tones in the same exposure range from one shot to the next—some cameras have zebra patterns in their viewfinders that help you do this. Finally, create a pre-flight checklist for your camera that combines these guidelines with your own experiences, and run through it before beginning every new shot.

As with any advice, please take the above into consideration and make your own decisions. These guidelines have worked well for The Orphanage, but there could be any number of reasons that you may need to do something different. Magic Bullet should be flexible enough to swallow whatever you throw at it, but if you follow the above guidelines you are on the road to superior results.

EDITING

Editing is the only thing that comes between your footage and After Effects, so let's make sure we do it right.

The basic rule of getting the best results out of Magic Bullet is to **avoid recompressing your footage** at any point in your post-production pipeline. This means that if you shoot DV, you are best off editing in a package that works at the native DV resolution, such as Apple's **Final Cut Pro** or **Adobe Premiere.** If you shoot Digital Betacam or some other high-bandwidth digital video format such as DVCPRO50 or Digital S, you will want to use a system that allows you to output an uncompressed version of your cut, such as Digital Voodoo, Pinnacle's CinéWave, or the Media 100. These are only a few examples, but the key here is to maintain the highest quality throughout.

DV footage is fairly heavily compressed, but the nice thing about it is that it can live inside your computer at its native compression. If you have a project with nothing but straight cuts, i.e. no dissolves or titles, most DV editing applications allow you to export a **QuickTime Reference Movie,** which is a small file that contains pointers to your original footage files. This is an ideal way to work with DV footage since these Reference Movies can be imported into After Effects where they will be treated like any other footage, saving disk space and avoiding any unnecessary recompression.

But it's unlikely that your project won't have a few fades, or dissolves, or titles, or other effects that would require **rendering,** and therefore **recompression,** in your editing application. Have no fear—there's still a way to get this material in to After Effects without any loss in quality.

A-B Rolls

The key is for us in video land to do what film editors have been doing for years—create an **A-B Roll** edit. In film terms, an A Roll and a B Roll were two separate assemblies of film delivered to an optical house that would unite them into one final piece of film.

A-B ROLL EDITING
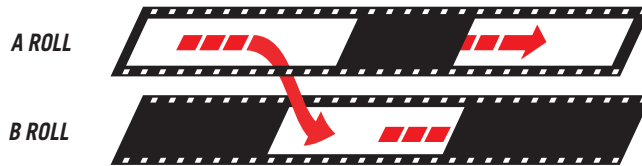
A ROLL

B ROLL

As you can see in the illustration, the idea is that your A Roll contains the bulk of your edit, and your B Roll contains any elements for transitions such as dissolves which we will be recreating in After Effects using the Magic Bullet **Opticals** plug-in. You can see that the only place that the A Roll and the B Roll overlap is for the dissolve.

The A Roll and the B Roll each contain only cuts, so they can be losslessly exported from your editing application as Reference Movies and brought into After Effects. There we can recreate the cross-dissolves and fades in an uncompressed environment; and we can even color correct each side of the dissolve separately, and give them unique looks with Magic Bullet **Look Suite.**

Of course if you are working in an uncompressed editing environment, or if you are using Apple's extremely high quality DV CoDec and are not concerned about the very minor image quality loss incurred from one recompression, then you can just export one version of your timeline and run the Bullet on it. If you don't need individual color corrections or looks on each half of the dissolves then this can be a very expedient option. But once you see how pretty those dissolves and fades from the **Opticals** plug-in are, we're sure you'll want to use them.

Exporting Your A-B Rolls

The key is simply to make sure that the A and B Rolls that you create have enough material overlapping to accurately recreate your dissolves and other transitions. In some applications this is best handled by splitting out two layers on the same timeline, in others you'll have to create two separate timelines and export them individually.

A Visual Reference Cut

You should also export a third version of your edit—**the Visual Reference Cut.** This is a version of your edit that includes all fades and dissolves, repositionings, titles, and any other effects you may have applied in your editing application. It doesn't matter that these effects will require rendering and recompressing, because we will just use this Movie in After Effects to visually confirm that we have precisely matched the timings of the effects.

Now, to see how all of this preparation pays off in a Magic Bullet Project, proceed to the next chapter, installer CD in hand.

A SAMPLE MAGIC BULLET PROJECT

Benefits of Attraction—a :30 spot for **Magic Bullet Motors.** Put your name on the waiting list now for next year's MBM Coupe! A QuickTime Movie of Benefits is on your Installer CD under Sample Files—check it out.

In this section we will go through the step-by-step process of creating a Magic Bullet project, using *Benefits of Attraction* as an example. Don't worry if we gloss over certain details—all of the effects in Magic Bullet Suite v1.0 are discussed in detail in the **Reference** section.

This section assumes that the reader has a basic knowledge of After Effects. Still, wherever possible we've explained exactly what's going on even with the standard After Effects procedures. It's the combination of After Effects' already powerful feature set with Magic Bullet Suite v1.0 that enables a Magic Bullet Artist to produce unparalleled results.

Benefits was shot on a **PAL Sony PD150p,** which is a **DVCAM** format camera. Co-directors Ryan Tudhope and Kevin Baillie desired a **1:1.85 letterboxed NTSC** final product, so they shot with the camera's **electronic 16:9 mode.** They edited in DV in **Apple's Final Cut Pro** using a 25fps PAL timeline and exported their A and B Rolls as **unrecompressed PAL DV QuickTime Reference Movies.**

SOURCE FILES

The **A and B Rolls** for Benefits can be found in here on your Installer CD:

Sample Files:Benefits of Attraction:Source Files

Open them in **QuickTime Player** and you will see that most of the program is on the A Roll, and only one shot appears on the B Roll. This is because there's only one cross-dissolve in this short piece.

Take a look inside the Source folder to see the A and B Roll files. Select the A Roll and press **command+f [control+f]** to see the **Footage Interpretation Window.**

Since the footage is PAL, you can see that its native frame rate is 25fps. But you will also see that we have reinterpreted it at **23.976fps.** This is the standard way of adapting PAL footage to the NTSC world.

This process of using the PAL frames 1:1 in a 24-frame environment does, of course, slow down the PAL footage. This may seem unappealing, but it's important to note that bouncing back and forth between 25fps and 24fps is a very common thing in Europe, where the PAL video format originates. The process is called a **Slow PAL Transfer,** and the high quality it produces is generally thought to be worth the slight slowdown.

Because directors Kevin and Ryan desired a thirty-second NTSC output, they cut their spot a little short—**28 seconds and 19 frames** to be exact—so that when their footage was slowed down to 23.976fps they would have a perfect :30 spot!

To slow down your audio to match the 23.976 video, use an audio editing program to make the soundtrack **104.2709%** of its original length, or a stretch factor of **1.042709.** For programs that think in terms of speed, such as the Pitch n' Time 2.0 plug-in for ProTools, the magic number is **95.904095904%.** After Effects itself will do a remarkably good job of this stretch if you follow these instructions: Import your audio separately from your video. Place it in your 23.976fps comp. With your footage selected, reveal the tab for **Stretch** (or select **Time Stretch...** from the **Layer Menu**) and enter **104.2709%.** Now from the **Layer Menu** select **Enable Time Remapping.** This last step is very important as it triggers After Effects to use a very high quality audio re-sambling technique.

SETTING UP A BASIC PROJECT

The Magic Bullet Flowchart project you have open may look complicated at first, but it follows a very clear workflow pattern that is essential to getting the most out of Digital Video and Magic Bullet. This diagram shows a simplified view of what's happening in this project.

SECTION ONE: OVERVIEW

MAGIC BULLET A-B ROLL FLOWCHART
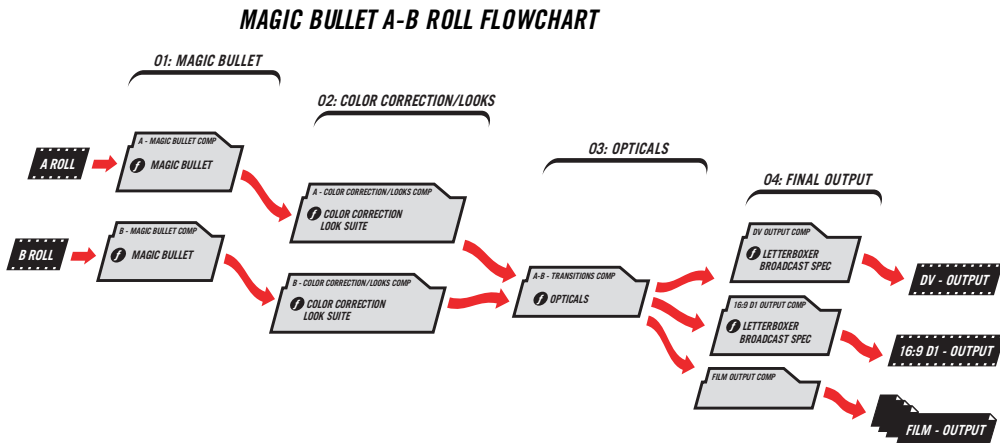
Each of the gray boxes represents a composition inside After Effects. You can see how the A and B Rolls are Bulleted and color corrected separately, and how Look Suite is applied to each. Then the A and B Rolls are united in one comp via the Opticals plug-in. From here various output compositions stem—those intended for video making use of the Broadcast Spec plug-in.

This is the basic layout for a project where you are avoiding recompressing your footage at all costs, recreating transitions inside After Effects and color correcting and Look Suiting each side of those transitions separately. However, it's possible that you could have a much, much simpler project if the above list of concerns are not as important to you. For instance, if you are working in an uncompressed environment, or a nearly lossless one, or are impressed enough with Apple's outstanding software DV CoDec that a one-time recompression doesn't bother you, and expect not to require unique color correction or looks on either side of a transition, you could take your rendered output from your Non-Linear Editor (NLE) and create this one-comp wonder:

MAGIC BULLET FLOWCHART
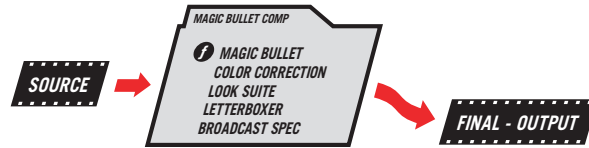
Just one piece of source footage, placed in one comp, and four Magic Bullet Suite effects applied in the sequence shown and you would be ready to output your Bulleted piece!

Benefits of Attraction follows the more complicated approach, in part because the one dissolve transitions between two very distinct looks. We'll now resume our tour through the *Benefits* Project file.

MAGIC BULLET

Open the composition called **01 A Roll Magic Bullet.** In this 23.976fps comp, the A Roll footage—the only layer—has had Magic Bullet applied. This layer is in draft mode, so the Bullet is doing its fast, low-quality deinterlacing. This allows us to work quickly, safe in the knowledge that all layers will be switched to Best quality at render time.

Opening **03 B Roll Magic Bullet** reveals a similar setup for the B Roll.

Ryan and Kevin have numbered their compositions so that the order of events is properly represented in the Project Window. This can really help keep things straight in your head when projects get complicated.

Both of these comps have the **Preserve Frame Rate** option enabled (found under the Advanced tab in the Comp Settings Window). This ensures that no matter how these comps are used elsewhere in After Effects, they will function as true 23.976fps source material.

COLOR CORRECTION AND LOOK DEVELOPMENT

Open the **02 A Roll Color Correct/Looks** comp. Here Kevin and Ryan have painstakingly sculpted the look of much of their piece, using **Look Suite** on top of some nimble application of the more basic tools that come with After Effects 5.5.

Select the bottom layer, which is the **A Roll Magic Bullet** comp. Hit the "u" key to display all the keyframed parameters on this layer. What you see are hold keyframes carefully lined up with the cuts in the A Roll of the program. These keyframes were placed by hand. Wee! The **Levels** effect is the primary tool used here to balance out the color and contrast of the shots. Ryan and Kevin also used the **Hue/Saturation** effect to make sure that the work they did with Levels didn't result in uneven saturation.

You'll see four layers above this one that are trimmed to line up with specific shots. These Adjustment Layers are masked to affect only certain regions of their shots. This kind of exacting control over your final image is one reason that After Effects is a terrific application in which to online your projects. Toggle these layers on and off to see the effects they have on their shots.

It's worth mentioning that Kevin and Ryan had very little time and money to shoot *Benefits*—a situation with which we all can empathize. They used only existing light and their entire budget was consumed by the rental cost of the Meter Maid outfit. They carefully selected their locations and shooting times to get the best possible natural light (and to avoid the need for permits!), but a few of their shots didn't quite live up to their hopes. Here in After Effects, they essentially re-lit these shots using these spot color-correction layers. This kind of post-production is incredibly expensive and luxurious on big feature films, but is easily within your grasp as an After Effects-equipped DV filmmaker. In Kevin and Ryan's case, it increases the apparent production value of their piece enormously, teaming up with Magic Bullet Suite v1.0 to create the look of an expensive car commercial.

The three topmost Adjustment Layers in this comp are where Look Suite is doing its thing. The two **Cool Look** layers provide the cold, urban look of the majority of the piece, while the **Dream Look** layer, also present in the **B Roll Color Correction/Looks** comp, provides the warm, inviting feeling for the Meter Maid's dream sequence.

You'll notice that there are no keyframes on these layers. All of the shot-by-shot color correction is handled below the Look Adjustment Layers, allowing Look Suite to work as designed as a scene-wide effect.

The sequence of events Ryan and Kevin used was this: First they picked a shot they liked from each "scene" (one from the cool part, one from the warm) and color-corrected them to taste. They then created the Look Adjustment Layers, designed their Looks, and from there on did all of their shot-by-shot color correction with the Looks turned on above. In this way they were able to tweak the individual shots while always knowing how their work was affecting the final output.

For the **Cool Look,** Kevin and Ryan began by applying the **Bleach Bypass** Preset. This got them pretty far, but they then adjusted the look a bit to suit their particular desires. This is a great way to ease yourself in to designing your own Looks from scratch.

TRANSITIONS

Now open the **05 Opticals** comp. Here you will see both the A and B Roll color correction comps, but you will notice that their visibility has been toggled off. When effects in After Effects utilize pixels from other layers, those layers need not be turned on, and that's exactly the case here. Opticals has been applied to the Solid Layer called **Opticals Solid,** and it is set to access the A and B Roll comp layers. We are actually dramatically cutting down on render time by switching these layers off in the Timeline.

Select **Opticals Solid** and hit "u". You will see a couple of clumped-together groups of keyframes. The first two provide the ten-frame fade up from black at the head of the piece, animating **Fade/Burn** from -100% to 0%. The next two, found in the Dissolve A-B stream, perform the dissolve between the A and B Rolls. The third one in that group pops us back to the A Roll after the lone B Roll shot finishes. The last group perform the quick burn-to-white that snaps our Meter Maid out of his MBM reverie.

Go to a frame between the two dissolve keyframes—frame **279** should do nicely. You should see a mix of the Meter Maid's face with the car driving down a twisty road. Notice how the highlights of each image are emphasized. Kevin and Ryan have set the Opticals effect to produce this kind of film-like dissolve. If you want to see what a normal, linear dissolve would look like here, you can temporally set the **Dissolve Film Response** slider to 0%.

As discussed in detail in the **Reference** section below, the dissolve keyframes may appear linear in the Timeline, but the Opticals effect itself is in fact internally smoothing them out for you. This feature allows you to set simple linear keyframes and still get nice eases in and out of your transitions. You can, of course, switch this feature off if you like.

This comp is also where the **Magic Bullet Motors** logo is added. We add it here because we can place it on top of the Looks and transitions.

OUTPUT

There are four different output comps in this project—one more than in our flowchart illustration. The first is **06 Film Output.** In this one, we've done nothing at all—in fact, the geometrics are compressed in the Opticals comp layer in this PAL 16:9 composition. The Render Queue item for this comp is set to write out a numbered SGI sequence, a format commonly accepted by filmout houses. You could literally render this comp, send the frames to a filmer (informing them of the format, gamma, and pixel aspect ratio), and get back a 35mm print of *Benefits.*

If you do this, please invite **The Orphanage** and **Toolfarm** to the screening!

The naming convention for the SGI files is **BNFT_DAP_[####].sgi.** DAP stands for **Digital Answer Print,** and that's exactly what your file sequence is. In the world of film, an Answer Print is what a lab creates from the cut negative, based on the color timing instructions provided by the director and cinematographer. You can see how the analogy works—with Magic Bullet, your Answer Print is a strictly digital affair, and your film print is just one possible way to view it.

Since the Film Output is a true 24fps affair, the Render Queue item for this comp is set to render a file sequence at the native 23.976fps of the project. No interlacing or pulldown options are needed in the Render Settings.

The output comps that you're more likely to try out are the DV and DigiBeta ones. These each use **Letterboxer** and **Broadcast Spec** to create slick, professional NTSC video output. In both cases Ryan and Kevin dragged their Opticals comp, which is still at the native PAL resolution of their source footage, into NTSC comps. In order to make the image fit, they used the brilliant hotkey combo of **command+shift+option+h [control+shift+alt+h]** to scale the Opticals comp layer to fit the comp in the horizontal direction.

They then applied Letterboxer, using the 1.85:1 preset to crop their piece to a cinematic aspect ratio. Letterboxer does a neat job of this, respecting the NTSC D1 pixel aspect ratio of the comp.

Why is Letterboxer not used in the Film Output comp? *When filming out frames for 1.85:1 projection, it never hurts to have a little bit of extra material top and bottom. It will be cropped by the projector's gate and the theater's screen itself, but it's always possible that the projector could be misaligned.*

Since the Opticals comp is widescreen, when fit horizontally it fails to fill the frame vertically. For this reason you will find a black Solid Layer at the bottom of each of these comps. Without this you'd get odd results in the case of the DV output comp due to the Broadcast Spec plug-in.

Broadcast Spec is used in both of these comps as well. In the DigiBeta output comp it has been applied to an Adjustment Layer and set to the **Component** preset. This preset completely eliminates illegal color values (those above 80% saturation), without adversely affecting the overall image quality. In the DV output comp, Broadcast Spec is set to its **Composite** preset. In addition to eliminating illegal colors, this preset also accounts for the restricted luminance range of analog video.

The DV output comp is set to render to the Apple DV QuickTime CoDec. The DigiBeta comp is set to render to the Pinnacle CinéWave software CoDec. If you like you can chence these to the CoDec of your choice and render your own video master of *Benefits*.

In both the DigiBeta and DV Render Queue items we have enabled 3:2 pull-down. For the CinéWave render this is not strictly necessary—with the latest versions of Final Cut Pro you can actually work with 23.976fps footage in a 23.976fps timeline and have the CinéWave hardware generate 3:2 pull-down on-the-fly when you output. This is actually the recommended way of working, but we also wanted to show you how a 23.976 comp, when rendered with 3:2 pulldown, translates perfectly to NTSC 29.97fps output.

The final Output comp is **09 Sorenson Out.** It is set to create the very Quick-Time movie that you first watched way back when we started this tour!

This ends our tour of *Benefits*. In the following **Reference** section you will find exhaustive descriptions of each of the Magic Bullet Suite v1.0 tools. Even after you've become familiar with their particulars, it may still be helpful to review how *Benefits* was put together. It is possible—and quite exciting—to online an entire digital feature film in After Effects using Magic Bullet, but this can result in a beast of a Project file. Learning the organizational techniques of The Orphanage's seasoned Magic Bullet Artists can save you time and reduce your headaches, and ensure the best possible output from your Bullet sessions.

Does this project have to be set to 16bpc? No. All of the Magic Bullet Suite v1.0 plug-ins work internally in a very high-fidelity color space, and when you work in 8-bit they dither their results back to an 8-bit image. It's unlikely that you'd even notice this. But since the effects are doing this regardless of the project's bit depth, you actually won't save much time at all by switching to 8-bit mode. And working in 16bpc really does help when applying multiple color correction layers to a fragile digital video image. We recommend always using 16bpc in your Magic Bullet projects.

If I render every one of these Render Queue items, aren't I doing a lot of redundant work? Yes. The way The Orphanage works is to render the DAP first. Once this is approved, it is re-imported into After Effects, and the video versions are output from there, using Letterboxer and Broadcast Spec—a much faster process that re-Bulleting the original footage. These video outputs from the DAP are called **Virtual Telecines,** and have been seen on cable and broadcast TV all across the world, where most viewers mistake them for film.

MAGIC BULLET SUITE

SECTION TWO: REFERENCE

Here you will find detailed descriptions of every single parameter in the Magic Bullet Suite v1.0 plug-ins, often including explanations of how they relate to traditional, non-digital filmmaking techniques.

MAGIC BULLET

Magic Bullet is the core technology of Magic Bullet Suite v1.0. It contains the patent-pending, award-winning technology developed at The Orphanage in a form that has been specifically reengineered to require as little operator intervention as possible. There are only two sliders to control the **Deinterlacing** process, and you may never have to move them from their default positions. But rest assured, this is not some "dumbed-down" version of the Bullet—this is the real thing.

Magic Bullet works in a very complicated way that, thankfully, After Effects 5.5 is sophisticated enough to support. Not all compositing or finishing systems provide plug-in developers the control that After Effects provides, and virtually no NLE programs do. In order for **Magic Bullet** to do what it does in After Effects, you must help it out by setting up your footage and your compositions properly. The plug-in itself will help you with this as much as it can, but please read this section carefully to make sure you get the best results.

The **Quick Reference Card** that comes with this book features a simplified checklist to help you properly set up a Magic Bullet project. Keep it handy near your computer to help you create project files from scratch.

Magic Bullet's main function is to convert **interlaced footage** to 23.976fps whole frames, or **24p.** So you should start with interlaced footage. This will likely be your edited project, conforming to the methods outlined in **Section One.** It's worth reiterating that this footage should be **unrecompressed,** in other words, it should be at its native size and compression format. The cleaner the footage you start with, the better the result.

IMPORTING FOOTAGE

Once your footage is imported into After Effects, you will probably need to change some of its settings in the **Interpret Footage Window.** Since **Magic Bullet** needs to perform its own deinterlacing, you need to shut off After Effects' built-in separation of field information. Do this by selecting **Off** from the **Separate Fields** pop-up menu.

Also in this window you have an opportunity to see the frame rate of your footage and change it if you wish. The three frame rates that Magic Bullet supports are **29.97fps, 23.976fps,** and **25fps.** If your footage is NTSC, it must be left at 29.97fps. If your footage is PAL, you should either leave it at 25fps for clean 25p PAL output, or reinterpret it to 23.976 for clean 24p NTSC output (with 3:2 pulldown).
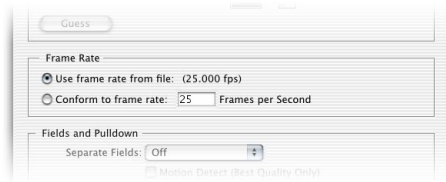
PAL FOOTAGE FOR AN ALL-PAL PROJECT

INTERPRETING PAL FOOTAGE FOR EVENTUAL NTSC AND/OR FILM OUTPUT

When you re-interpret QuickTime footage frame rates, After Effects gives you a warning about audio sync. On page 27 you will find a description of how to correct for this problem.

Lastly, make sure that After Effects has properly guessed your **Pixel Aspect Ratio.** If your footage is **16:9** you will have to manually adjust the settings in the Pixel Aspect Ratio pop-up.

Any time there's a significant step that you must observe in setting up your Magic Bullet project, we'll break it out into a **Bullet Point** so you can run through them as a kind of checklist. Here's your first one:

In the **Interpret Footage Window** (File:Interpret Footage:Main), set your footage to **Separate Fields: Off.** Make sure your **Pixel Aspect Ratio** is correct for your footage. If your footage is **NTSC,** make sure it is at **29.97fps.** If your footage is **PAL,** you can either leave it at **25fps** for clean PAL output or re-interpret it to **23.976fps** for clean NTSC output.

PLACING YOUR FOOTAGE IN A COMPOSITION

The next step is to place your footage into a comp of the same pixel size and aspect ratio. A great way to do this is to drag your footage to the **Create Comp** button in the **Project Window.** That's the icon right between the folder and the trash can.

DRAGGING FOOTAGE TO THE CREATE COMPOSITION BUTTON
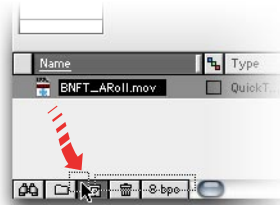
Once you've done this you again have some options. If your footage is **NTSC** you can either convert it to **30p** or **24p.**

30p is a nice way to make NTSC footage look less like video without incurring any motion artifacts, but it is a frame rate that is very incompatible with film. Only opt for 30p if your project is never destined for film output!

If you desire 30p output, you can proceed to the next step, since your comp is already at the correct 29.97fps. If you desire 24p output, open the **Composition Settings Window** and carefully type **23.976** into the **Frame Rate** field.

If your footage is **PAL,** you have already decided whether your want **25p** or **24p** output and made the correct settings in the Interpret Footage Window. So your Comp should already be at the correct settings.

> **BULLET POINT**
>
> Drag your footage to the **Create Comp** button in the **Project Window.** If your footage is **NTSC** and you desire **24p** output, change the newly created Comp's **Frame Rate** to **23.976.**

APPLYING THE MAGIC BULLET EFFECT

You are now ready to apply the Magic Bullet plug-in. Select your footage and find **Magic Bullet Suite v1.0:Magic Bullet** in the **Effect Menu.**

All this setup is about to pay off, because Magic Bullet is designed to configure itself automatically based on the specifications you've entered thus far. The first thing you'll notice after applying the effect is that your image disappears and the **Auto Setup** button is the only thing visible in the **Effect Controls Window.**

Click it.

If you've done everything correctly, Magic Bullet should display a comforting **dialog** corroborating your expectations of what the Bullet's about to do.
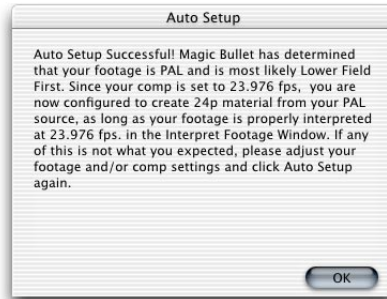
If something has gone wrong, the dialog along with the **Messages** field in the Effect Controls Window should help you figure out what you need to fix.

Even if Auto Setup fails, you can still proceed with using the Bullet. Auto Setup only changes settings for the Source Video and Field Order parameters, and you can easily set these yourself if you are familiar with your footage. Additionally, in some cases, a successful Auto Setup may not yield correct results. This could happen if your video card uses an uncommon field order or pixel size. For example, footage captured with an Aurora Igniter card will be Upper Field First, not lower, requiring you to make this adjustment manually. Please always double-check that Auto Setup has done the right thing for your particular footage.

Assuming everything's going smoothly, click **OK** and observe as the Auto Setup button stows itself and the controls for Magic Bullet appear.

Apply the **Magic Bullet** effect to your footage and click on the **Auto Setup** button in the **Effect Controls Window.** If you get a message that Auto Setup has succeeded, proceed to the next step. If Auto Setup fails, double-check that you've followed the above instructions correctly and try again, using the **Messages** field in the Effect Controls Window to help your troubleshooting.

The first parameter you'll see in Magic Bullet's **Effect Controls** is **Messages.** This is yet another place for Magic Bullet to inform you of what it's up to and whether or not it has encountered anything unexpected. Check the **Messages** now to verify that Magic Bullet is set up properly.

Check the **Messages** parameter to confirm that Magic Bullet is set up properly.

The parameters that have been set automatically all live under the **Deinterlace** twirly category. The first one, the **Do Deinterlace** checkbox, is by default always set to **On.** You should turn it **Off** if you are using Magic Bullet only for its **Deartifacting** features (see page 44). Otherwise leave it on.

If your footage is progressive and you would like to use Magic Bullet only for its deartifacting features, switch **Do Deinterlace** off and proceed to the Deartifacting section.

Once it is clicked for the first time, the Auto Setup button stows itself and turns gray, indicating that it has done its job. However, if at any time you wish to reconfirm that the Bullet its configured properly (especially after making changes to the Comp Settings), you may twirl down the Auto Setup parameter and re-click the button.

WHAT'S THE BULLET UP TO?

At this point you're probably anxious to see what all the fuss is about—what exactly is Magic Bullet doing to your footage that no other software can do? Magic Bullet deinterlaces video by examining it for the type of interlacing artifacts that are easy to spot by eye, but hard to isolate for a computer algorithm. To do this it uses a **fuzzy-logic** approach that accounts for pixels that may move a whole frame or a half a frame, potentially skipping fields as they go. Magic Bullet then examines those areas of motion and creates new pixels where the secondary field must be discarded. The creation of new pixels is based on **pattern-matching,** so that instead of a simple interpolation, you actually get smooth contours and clean diagonals. This technique of deinterlacing is the exact same patent-pending, award-winning technology that The Orphanage has been providing to its clients and using on original productions for years.

MAGIC BULLET deinterlacing

Standard After Effects Deinterlacing

NTSV DV Frame from *The Last Birthday Card*

To see it work, you must switch your video layer to which you have applied the Magic Bullet effect to **Best Quality** mode (Layer:Quality:Best, or **command+u [control-u]**, or with the toggle switch in the Timeline). In Draft Quality, Magic Bullet is saving you time by doing a very simple, fast deinterlacing. You can work very quickly with the Bullet in this mode, and know that when you go to batch render your final piece you can automatically switch your layers to Best mode in your **Render Settings.**

Toggling between Draft and Best is a great way to compare Magic Bullet's deinterlacing with what After Effects and other systems give you. Switching to Best Quality you will see the Bullet smooth out jagged diagonal lines, cut down on the noise in your image, and maintain high-frequency horizontal detail that can otherwise sizzle and freak out.

Of course the best way to evaluate how well Magic Bullet is working is in motion, so maybe take this opportunity to run off a quick RAM preview and try it out.

It's interesting to note that Magic Bullet only works where it has to, using the Motion Detection information as a guide. This means that the Bullet's rendering speed varies according to how much motion is in the frame. Magic Bullet will expend a lot less effort Bulleting a talking head or a mostly-static establishing shot than it will a crazy action shot. It's nice to know that your software isn't wasting time, isn't it?

DEARTIFACTING

We have now only explored half of what Magic Bullet can do to improve the look of your footage. The next section, Deartifacting, is where we cancel out some of the subtle imperfections in digital video that can become big problems when shown on the big screen.

The **Deartifacting Menu** defaults to **None.** This is because Magic Bullet can't reliably guess which of the settings you should use. But you should most likely use one of the three options, so read on.
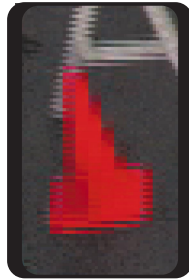
| Original DV Footage | Deinterlaced | Deinterlaced and Deartifacted |
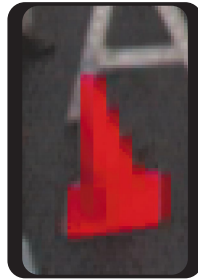
Magic Bullet's Deartifacting addresses the fact that color, an afterthought in video to begin with, still gets second-class treatment in modern digital video sources—whether they be consumer miniDV or professional HDCAM. You may be familiar with the method of identifying digital video color resolution as 4:1:1, or 4:2:2, or even 4:4:4. These are descriptions of the proportion of information in the Luminance (Y) channel (the first number) with the color (U & V or I & Q) channels (the second two). What this means practically is that in 4:1:1 video (miniDV and DVCAM among others) there is only one pixel of color information for every four pixels of luminance information! This means in your NTSC video source at 720 pixels wide by 480 tall, your color information is actually only 180 by 120 pixels!

How is this even OK? The human eye tends to perceive detail most predominantly in the luminance information, so that's where compressed formats such as DV and HDCAM concentrate most of their efforts. These systems work hard to put as much information as possible into the smallest space they can—allowing such miracles as copying digital video signals right off a tape to your inexpensive hard drive through a 1/8th-inch thick cable. Compressing data so that upright apes don't notice much is called perceptual compression, and it's a good thing most of the time.

But in some tricky cases, such as when one bright color is right next to another, contrasting one, you can definitely see artifacts of this compression technique—especially with 4:1:1 footage. Never fear—Magic Bullet to the rescue!

DVCAM, miniDV and Digital S are 4:1:1 formats. For these types of source video, select the 4:1:1 option in the Deartifacting Menu. For Digital Betacam, D1, DVCPRO50, DVCPROHD and other 4:2:2 formats, select the 4:2:2 option. For HDCAM footage and other 3:1:1 formats, select the 3:1:1 option.

BULLET POINT

Select the **Deartifacting** option that matches your source footage type.

FAQ

When should I not use the Deartifacting options? Almost never. If your footage is 4:4:4, and has been brought online using a method that maintains this, then you can leave Deartifacting set to None. Or leave it off if you're in a hurry and this fine level of quality is not important (which can be the case if you are outputting to a 4:1:1 format such as DV), since the Deartifacting process does increase render times by a small amount.

FAQ

Why is Magic Bullet not a 16bpc effect? Magic Bullet works on source footage that is almost always 8bpc. Since it doesn't perform any color correction itself, it need not take the speed hit of working in the vast color space of 16bpc. All of the other plug-ins in Magic Bullet Suite v1.0 are fully 16bpc-optimized, although they will produce great results in 8bpc projects as well.

FAQ

What's the purpose of the Draft mode Bullet? With your layer in Draft mode, Magic Bullet renders an accurate preview of what your deinterlaced frame will look like, but skips over the more time-consuming, high-quality deinterlacing procedure. Aside from providing fast feedback when working interactively in After Effects, this feature can also be handy at render time. If you want to quickly write out a QuickTime movie to check your color correction, Looks, and other effects, leaving the Bullet in Draft mode (by selecting the Current Settings Render Settings preset) can greatly speed things up.

TROUBLESHOOTING THE BULLET

Is the Bullet perfect? No. It can screw up just like any experimental robot developed by the government and mistakenly set loose in a small town. We have skipped over two sliders that you can use if you catch the Bullet producing less-than-spectacular results. We're hoping you never have to touch these sliders, but in case you do, here's the scoop.

Motion Detection Adjustment isn't the most exciting sounding slider in the world, but it's an important control for helping the Bullet isolate motion. Adjust it if you see a large difference between what the plug-in shows in Draft mode and Best mode—a clue that the Bullet isn't seeing all the motion in the frame, which can be the case in dark or heavily artifacted areas of the frame. If this is the case, scoot this slider a bit to the right. You may also need to do this on the frame right before a cut if you see "splotchy" areas in your image.

Detail Pattern Size is where you help the Bullet out when it's struggling to recreate the missing information in a motion area. This can happen in repeating patterns that tend to look bad on video anyway, such as striped shirts or knit sweaters. It can also happen in very busy areas of the frame, such as leaves on distant trees, or brick patterns on buildings. Repeating patterns like these can confuse the Bullet and cause it to leave little horizontal artifacts in your image. Reducing the Detail Pattern Size can eliminate this, but it will also tone down the Bullet's ability to reconnect diagonal lines, so you may lose smoothness on contours in the image.

In the rare cases that you find yourself adjusting these settings you will want to keyframe the values of these sliders. By placing Hold keyframes on cut points in your program you can customize the settings for a particularly problematic shot and then return to the defaults for the remainder of your project.

OUTPUT SETTINGS FOR MAGIC BULLET

This section provides a handy reference for the Render Settings you'll use in After Effects for all of the various output possibilities. Since we can't account for all of the video cards out there, we will leave the Output Module section to you. You should familiarize yourself with the field order, pixel sizes and aspect ratios, and CoDec settings that work with your video card of choice.

Here's the first example, 24p output from an NTSC project:
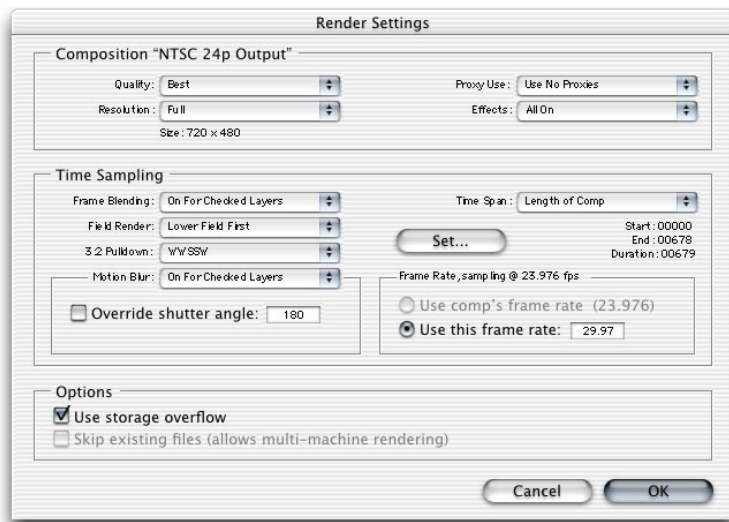
We've selected Lower Field first because that's correct for our video card—your settings may be different depending on your card. Even though we've selected a field order, it's important to remember that we're not really rendering interlaced material—we're just specifying the field order for the 3:2 pulldown. The frames that we are rendering out are true 24fps progressive frames.
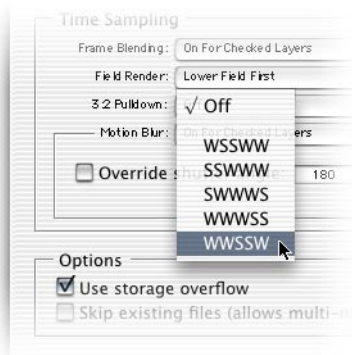
And speaking of the 3:2 pulldown, the phase of choice is the last one in the pop-up menu: WWSSW. The reason for this is that this sequence best compliments the inverse 3:2 pulldown that the NTSC Bullet performs. Selecting this pulldown phase for NTSC projects ensures the smoothest motion in NTSC output.

Of course, you could have a CinéWave or Aurora card that actually allows you to create 23.976fps QuickTime movies for playback using on-the-fly 3:2 pulldown. If that's the case, then all you need to do is set Field Render to Off. Everything else will still be as shown above.

This is also what your Render Settings will look like for NTSC output from a PAL project. The output comp should be set to the NTSC resolution that works with your card (either 720x480 or 720x486 most likely). Use **command+shift+option+h [control+shift+alt+h]** to scale the PAL layer to fit in the NTSC comp.

If you're creating 30p material from NTSC footage, here's what your Render Settings should look like:
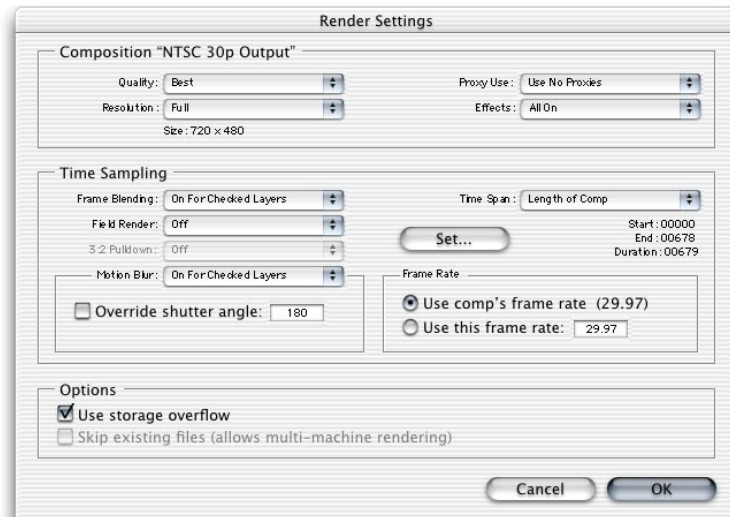
Note that Field Render is set to Off. This window is set for DV footage, but would be the same for 720x486 output as well.

Very similar is the PAL 25p video output setting:
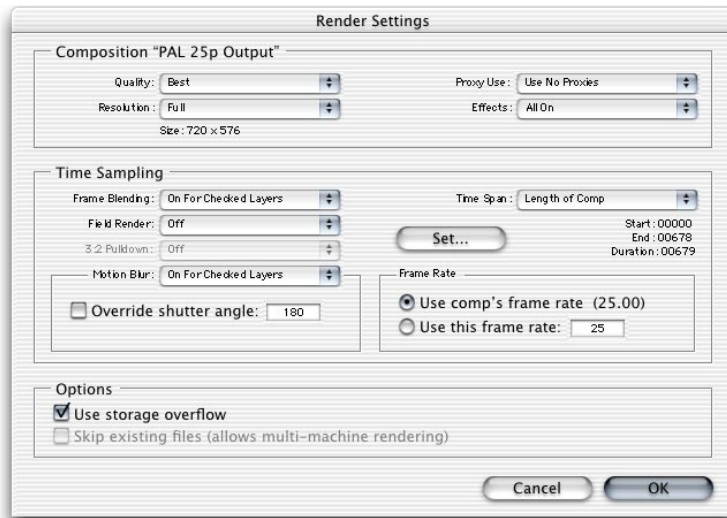
A final example is for outputting a numbered sequence of image files in a PAL 24p project:
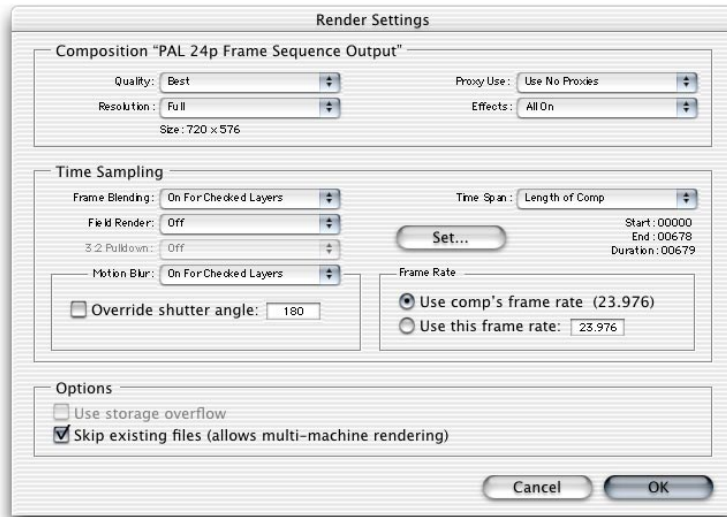
Note that Skip Existing Files is checked, allowing multiple machines to render to the same file sequence.

In general, the rules for Magic Bullet output are simple: Honor the settings of your particular video card; don't turn on field rendering unless you need 3:2 pulldown, and for NTSC projects, use WWSSW pulldown phase. Use After Effects' built-in support for converting pixel aspect ratios by always correctly identifying your footage and your comps, and using **command+shift+option+h [control+shift+alt+h]** to scale layers to fit.

LOOK SUITE

Where the other effects in Magic Bullet Suite v1.0 are highly specialized and contain few controls, **Look Suite** is a powerhouse plug-in with many controls and features. We could have split Look Suite in to about nine different plug-ins, but that would prevent the easy loading and saving of presets. So instead you'll find that Look Suite is broken up into several sections. Let's take a look at them one by one, referencing some DVDs from our library (see Appendix 2) as we go.

The first thing you'll see in Look Suite is the **Preset Looks** menu. Selecting **Load** will bring up the **Look Browser,** which allows you to select from the presets you have on disc. The default presets that ship with Magic Bullet Suite v1.0 don't do anything you couldn't do yourself with Look Suite's various controls, but they have been painstakingly set up to match some common looks found in TV and films, so that you can see right away how Look Suite can help you create extremely high-quality cinematic output from your video source. The Looks that ship with version 1.0 are the following:

Basic
This Look is the simplest simulation of the basic look of film the way most people think about it. Just about any video source will look good treated with this Look.

Basic Warm
The simplest recipe for creating a warm, inviting look. A little bit of **White Diffusion** and a subtle nudge of the **Warm/Cool** slider.

Basic Cool   Every car commercial that doesn't need **Basic Warm** needs Basic Cool—check out the Detroit scenes in ***Out of Sight*** and you'll get the idea.

Basic White Diffusion   The **Basic** Look with a hearty dose of White Diffusion. Highlights will bloom out a bit and video artifacts will be nicely concealed.

Basic Black Diffusion   The **Basic** Look with Grade 4 Black Diffusion. Less glowing than the White Diffusion, Black Diffusion reduces contrast without muddying the image. Counteracting this with a bit of **Post Contrast** creates a rich, warm look.

Basic Black and White   A rich, contrasty black and white look.

Those are the Basic Looks—they are designed to help familiarize you with the broad-strokes controls in Look Suite. The following Looks go deeper into Looks Suites abilities to emulate specific film processes and treatments common in movies, TV and commercials today:

Bleach Bypass   Made famous on films such as ***Saving Private Ryan,*** this process, also called "skip bleach" or "ENR" involves skipping the portion of standard color negative film developing in which the image silver is bleached from the negative. The silver remains on the film along with the image dyes throughout the remainder of the developing. The result is **greatly increased contrast and reduced saturation,** since essentially more black is mixed in with the dyes. The look can be beautiful, but the process is risky since you may only get one shot at it (this is your negative after all) and any miscalculations in exposure could result in important image information falling off into inky blackness. Of course, Magic Bullet's digital version of Bleach Bypass is 100% undoable, adjustable, and safe for children of all ages.

Color Reversal   Color reversal film stock is the opposite of color negative. Exposure density is converted to transparency on the film rather than darkness, so that the actual film original that ran through the camera can be projected as a positive image with cor-

rect color. This is the case with old Super-8 film for example—the film you project is the film you shot. Slide film is also color reversal. The reason most films are shot color negative is that the precious camera originals are never projected, and since a duplication process is therefore required, it is easier to make a positive copy (called an interpositive) of the negative original. Additionally, color negative film has a much wider exposure latitude, meaning that a greater range of values is present than in reversal, so duplicating it doesn't add unwanted contrast. Reversal film, contrastier to begin with, involves an extra duplication step (internegative to interpositive), so the final image is **extremely contrasty with super-saturated colors.** Some scenes in the film ***Three Kings*** were shot this way, and as with Bleach Bypass, while the look is stunning, the risk is daunting. But not for you!

No 85

No 85 means "no 85 filter," referring to the common practice of shooting indoor-balanced film (calibrated for the warmer color temperature of incandescent lights) out-of-doors (where the color temperature is much higher and therefore bluer) without the standard correction filter, which is called an 85 filter. The 85 filter is like amber-tinted shades for your camera, and it makes the tungsten-balanced film see daylight "correctly." Some cinematographers like to shoot without this filter though, and color-correct the blue cast out of the image later. They claim that this inevitably leaves traces of the blue coloration behind, especially in the shadow areas, which can give a cool edge to the blacks in the image. Magic Bullet's No 85 Look does this with the help of the **Tint Black** control.

Neo

In ***The Matrix*** the filmmakers hinted to us that the world as we know it was in fact a computerized simulation by subtly coloring all scenes that took place within the Matrix itself a greenish color, reminiscent of the green text of a computer terminal. Magic Bullet's Neo Look does this with a combina-

tion of the **Tint Black** parameter and the **Warm/Cool** slider with **Warm/Cool Hue** cranked up into the green range.

Epic

When true color was first introduced to the world of motion picture film in 1932, it was in the form of **Glorious Technicolor.** This was a three-strip process—in other words three black and white negatives were exposed at the same time, one for red, one for green, and one for blue. Not dissimilar to how modern high-end video cameras devote one photosensitive CCD chip each to the R, G and B channels, these cameras used a prism to distribute filtered light to it's three individual film gates. The three processed negatives would then be united onto one piece of print film using a process called dye transfer. The results astounded audiences, and created a recognizable look that distinguishes the early era of color filmmaking. A dash of Look Suite's **3-Strip Process** slider plus a little **Post Contrast** and **Saturation** adjustment allows the **Epic** Look to recreate this classic style.

Sepia

Moving back though history, lend your project a seriously archival feeling with the **Sepia** Look.

Warm & Fuzzy

Inspired by the film *Jerry Maguire,* this Look mixes a bit of White Diffusion with a subtle warmth.

Miami

Taking a cue from early Michael Bay films such as *Bad Boys,* this amber-grad heavy Look is also similar to the type of photography Tony Scott made popular in the early nineties. These guys taught us that the heavy use of tinted grad filters wasn't just for sunset shots anymore.

Punchy

For TV commercials and music videos where an extremely stylized look is desired, Directors and Cinematographers will push the controls of the telecine machine to eleven. This is just one example of how maxing out some of the sliders in Look Suite can still result in acceptable quality and potent imagery.

Now that you've explored some of the Preset Looks, let's take a look at the controls that you can use to create your own. A great way to get started is to apply a preset and see what its sliders look like, and then start editing it to create your own custom version of that Look. Before long you'll be cooking up Looks from scratch and saving your own libraries.

BULLET POINT

The various parameters in Look Suite are listed in operational order, meaning that the first ones happen first, on down to the very last parameter.

WARNING

Look Suite is not a color correction tool—it is designed to be used on footage that has already been color corrected to have even and consistent contrast, gamma, and color characteristics. Apply Look Suite after your favorite color correction plug-ins—this way you can use one look with no keyframes on a whole scene and get beautiful results!

Now we'll dive in to the various effects and sliders within **Look Suite.** Reading through this section carefully will not only give you all the knowledge necessary to begin designing your own looks, it may answer some nagging questions you've had about why film images look the way they do.

FOUR CATEGORIES, ONE PLUG-IN

Look Suite's many effects are broken down in to four categories: **Subject, Lens Filters, Camera** and **Post.** Each category is discussed separately below.

"DO" CHECK BOXES

In the same way that it's handy to Solo a layer in After Effects 5.5, or toggle individual effect and layers on and off to see exactly what each one is doing, it can often be very helpful to examine the individual steps of the Look Suite plug-in separately. To this end, each of the categories has a "Do" Checkbox that you can toggle on and off.

WARNING

If you toggle off one or more of the categories, After Effects will not switch them back on for you at render time! It's up to you to remember to do this. Of course, sometimes you may only need controls in one or two of the categories, and you could switch the rest off—but the truth is Look Suite is already optimized to ignore any settings that you haven't changed from the defaults, so switching off unused categories won't change your render times.

BULLET POINT

When you load a new Look all of the "Do" checkboxes are switched on for you automatically.

THE PRESET LOOKS MENU

This menu has two options—**Load** and **Save**. Selecting **Load** brings up the **Look Browser,** which allows you to view the Looks you have saved in the **Magic Bullet Looks** folder in your After Effects Plug-ins folder.
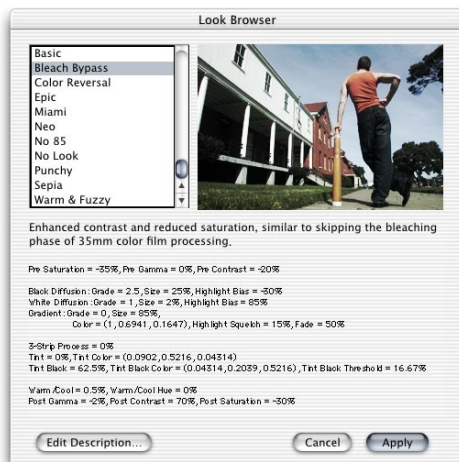
The Look Browser shows you the effect of the chosen look on a common **Thumbnail Image.** This image has been chosen to accurately represent the qualities of a Look when applied to color-corrected footage.

When you first open the Look Browser, no Looks are selected and the thumbnail image is in its raw, unfiltered state. If, as you browse through the Looks, you ever want to see the raw thumbnail image again, simply select the No Look preset that comes installed with Look Suite.

You will also see the **Description** for the selected Look displayed in the area below the Thumbnail Image. The **Edit Description** button allows you to modify this field, unless the selected Look file is locked.

The settings for every parameter in Look Suite are displayed in the Look Browser, so that you can actually see them change as you switch between Looks. This helps you learn what each parameter does and how they effect the resultant image.

Click **Load** to copy the parameter settings from the selected Look into the Look Suite plug-in.

Selecting **Save** from the Preset Looks menu will bring up the **Save Look** dialogue. Select a name for your Look and type any **Comments** that you'd like to save along with it. Click on **Save** when you're done.

If you select a name that already exists you will be asked if you want to overwrite it.

The Magic Bullet Look files are stored in your After Effects Plug-ins folder in a special folder called **Magic Bullet Looks.** They have the extension .mbl— but you never need to type this as it's added automatically when you save a Look. They are actually just ASCI text files, so they can be easily copied, edited, and sent as email attachments. Just be careful not to edit the big chunk of funky characters at the bottom of the file—that's the preview image!

If Look Suite cannot find the **Magic Bullet Looks** folder, no Looks will show up in the Look Browser. However, upon saving a new Look, a new Magic Bullet Looks folder will be created for you.

THE SUBJECT CATEGORY

The first category of parameters is **Subject.** It is sometimes handy to be able to adjust the characteristics of the image before applying the more complicated effects that come later. This is where you prep the image for the abuse it is about to take.

The first slider is called **Pre Saturation.** This works much like the saturation controls in After Effects' built-in plug-ins. Many of the Preset Looks increase the contrast of your images, and a natural by-product of that is increased saturation. This control allows you to preemptively reduce the saturation of your image to pave the way for future effects.

The next slider is **Pre Gamma.** Similar to the Gamma slider in a Levels effect, this control allows you to even out the exposure level of your image before treating it.

Look Suite's Gamma sliders have been calibrated in percentages to easily allow you to invert the values. A **Post Gamma** value of -40% perfectly negates a **Pre Gamma** of 40%.

Look Suite likes to operate on a nice, even image that's not too contrasty. If your footage already has some heavy contrast built-in, it may work better to correct this with the **Pre Contrast** slider (using the values below 0%) and then add the contrast back in after all the other effects (see page 64).

Look Suite's contrast controls are designed to never "clip," or throw away image information. If you do nothing but apply a -50% **Pre Contrast** and 50% **Post Contrast** to your image you will wind up with exactly what you started with!

With all of the Subject parameters the idea is to prepare the image by making it as even and generic-looking as possible. This will ensure that the fun stuff we do later acts on your image in the way you will expect.

THE LENS FILTERS CATEGORY

Lens Filters is the deepest category in Look Suite. It contains controls for three emulations of common filters used on motion picture cameras. The first two are **Diffusion** filters. They are called this because they diffuse, or scatter, the light that is coming into the camera. This has the effect of softening some of the harsh details in an image and is sometimes associated with a more romantic feeling. The Preset Look **Warm & Fuzzy** is an emulation of the diffusion used on the movie *Jerry Maguire,* but you can take it much farther and simulate the heavily diffused looks of *The Great Train Robbery* or the ballroom scene in *Eyes Wide Shut.*

A very subtle application of a diffusion filter may not change the mood of your footage much at all, but can cut down on some of the harshness of the video original and can even hide blemishes in the skin tones of your talent.

BULLET POINT

This is one of the great advantages of software diffusion over shooting DV with an on-the-lens diffusion filter—aside from giving you more control and flexibility, Look Suite's Diffusion effects can actually seam over some of the nasty compression artifacts of video!

One of the most common types of diffusion used on motion picture camera is the **Pro-Mist** series made by **Tiffen.** Their line includes a White Pro-Mist and a Black Pro-Mist, and Look Suite offers both **White Diffusion** and **Black Diffusion.** These effects may not precisely match the Tiffen on-the-lens filters, but they are useful in some of the same ways.

BLACK DIFFUSION

Black Diffusion adds an overall softness to your image without destroying important detail. Unlike **White Diffusion,** it blooms dark areas of your image as well as light, creating an effect that is less "bright" overall.

Diffusion filters in the real world come in varying "grades," so the slider you use to introduce Black Diffusion is called **Black Diffusion: Grade.** Filter grades are commonly expressed in increments such as half, full, double, etc.—up to about a grade 5. The **Black Diffusion: Grade** slider is calibrated to be familiar to those accustomed to discussing diffusion filters by their grade. Of course, you can select whatever value you want on the slider, dialing in your preferred diffusion amount as precisely as you wish.

When **Black Diffusion: Grade** is set to zero, none of the other Black Diffusion settings matter—no Black Diffusion is used and no calculations are performed for the effect.

Black Diffusion: Size controls the amount of image that encroaches on its neighboring picture area. A small value will create tight, distinct "bloomed" areas around highlights, whereas a large value will act more as a general contrast-reduction effect.

Black Diffusion: Highlight Bias controls how highlights react as they are filtered through the Black Diffusion. Settings below 0% will cause highlights to bloom out a bit, as they tend to do in real life. Positive values will actually cause dark areas to bloom more than light ones, which can produce a very interesting, stylized look.

WHITE DIFFUSION

White Diffusion blooms highlights and lends a glowing quality to bright areas of the image. This effect is often associated with dream sequences, or glamour shots of classic movie actresses. White Diffusion will always and only make your image brighter—an effect which you may wish to counteract with the **Post Gamma** control (see page 64).

As with **Black Diffusion, White Diffusion** is set in values known as Grades using the **White Diffusion: Grade** slider.

When **White Diffusion: Grade** is set to zero, none of the other White Diffusion settings matter—no White Diffusion is used and no calculations are performed for the effect.

White Diffusion: Size works very much like **Black Diffusion: Size,** controlling the size of the blooming effect.

Note that while larger **White Diffusion: Size** values bloom the highlights into bigger areas, those highlights then become more distributed and therefore less intense. You may need to compensate by upping the **Grade.**

White Diffusion: Highlight Bias controls what in your image is considered bright enough to be affected by the White Diffusion filter. At 50% the middle gray values (50% luminance) will be the darkest things affected. Bringing this slider down to very low settings will cause the whole image to be bloomed and brightened, whereas high values will confine the diffusion effect to the very bright highlights.

GRAD

A **Grad** (short for gradient) is a type of filter that has more tint or coloration at the top than at the bottom. Placing a grad filter on a camera is a way of controlling the light at the top portion of the frame—usually a sky. An **ND** (Neutral Density) **Grad** is a simple colorless grad used to naturally darken the upper area of an image, which can be very handy for keeping skies from blowing out or overexposing on film (or video). An **Amber Grad** is a common tool for lending a sunset-like quality to an otherwise blue sky (see *Bad Boys* and *Crimson Tide*).

⚠ **WARNING**

Although the Grad effect in Look Suite is a powerful one, it cannot bring back detail in a blown-out-to-white sky in your digital images. It is for this reason that, in order to comply with the **"Preparing for the Bullet"** guideline of not overexposing, that an **ND Grad** is one of the few on-the-lens filters that The Orphanage recommends using on your digital video camera. If you get a nice exposure on your sky, you can then use Look Suite's Grad effect to colorize it in post.

Just like the Diffusion effects, you set the intensity of the Grad by grade, using the **Grad: Grade** slider. As you increase **Grad: Grade** you will notice that the Grad effect is more pronounced in the darker areas of the image than anywhere else—this is a simulation of how actual grad filters behave in the real world. To give you extra control there is a slider called **Grad: Highlight Squelch.** This slider controls how much the Grad will actually block out very bright highlights in your image. A value of 0% will leave the highlights untouched, and a value of 100% will colorize, or squelch, them completely.

ℹ **FYI**

Setting **Grad: Highlight Squelch** very high will allow you to place color back into a blown-out sky, but it will be pretty obvious what you're up to. Lower settings on this slider give a more naturalistic look.

In photography, grads and other light-blocking filters are incremented in **Filter Factors,** which is a similar unit of measure to the **grades** of diffusion filters. A Filter Factor of 3 is equal to one stop of exposure, so when a cinematographer asks for a "6 ND," they are requesting a filter that will reduce their exposure levels by two stops. While the **Grade** slider used in Look Suite to adjust the intensity of the Grad effect is inspired by this real-life measurement, it would actually be impossible to reliably influence your images in true Filter Factor increments—so adjust your Grad to taste and try not to think too hard.

Grad: Color is where you pick the tint of your Grad. Pay attention to the luminance value of the color you select, as darker colors will have a more pronounced effect than brighter ones.

Selecting pure black as your **Grad: Color** will allow Look Suite's Grad to simulate the effect of an **ND Grad**—with the usual caveat that if your sky is blown out to pure white, there's not much we can do for you.

Grad: Size controls how far down into the image the Grad extends. At 100% the bottom of the Grad touches the bottom of the image.

Grad: Size can exceed 100% for those occasions where you want more of the middle values of the Grad to affect even the very bottom of the image.

Of all the effects in **Look Suite,** the Grad is the one you're most likely to need to adjust on a shot-by-shot basis. The **Grad: Size** slider is a great place to do this—although you may also wish to keyframe the **Grad: Grade** slider as well.

The **Grad: Fade** slider allows you to control the ramping of the Grad. At 50% (the default) you get a nice, linear Grad. Below 50% the Grad fills in more heavily towards the bottom edge, and above 50% the Grad stays potent up top but fades more gracefully away towards the bottom.

When **Grad: Grade** is set to zero, none of the other Grad settings matter—no Grad is used and no calculations are performed for the effect.

THE CAMERA CATEGORY

This category describes effects that take place within the camera—film stock types and their reactions to light. These effects are therefore calculated after the Lens Filters.

3-STRIP PROCESS

This one slider has the simple function of emulating the classic movie look that we associate with the three-strip dye transfer color process created by Technicolor in 1932. The Preset Look **Epic** uses this slider along with some **Post Contrast** and **Saturation** to specifically mimic the look of films such as *North by Northwest* and *The Searchers.*

TINT

Tint lends an overall color cast to the image, which can be a subtle effect or a very overpowering one. The **Tint Color** is, perhaps obviously, the color that you are tinting your image towards, and the **Tint** slider is a percentage from 0 to 100%. At 100% only the luminance of your original image is left—the Hue and Saturation values are taken entirely from the **Tint Color.**

TINT BLACK

Tint Black lends a color cast to the dark areas in your image. Like **Tint,** Tint Black is a color picker (**Tint Black Color**) combined with a percentage slider (**Tint Black**). There's an extra control though, called **Tint Black Threshold,** and this slider helps determine the luminance range affected by Tint Black. Higher values mean more of your image is affected, although very bright areas of the image will never be affected.

THE POST CATEGORY

Under **Post** you will find a few new controls followed by the same effects contained within Subject, but in reverse order. You may be wondering why we have these redundant controls. Have no fear, all will be explained—but first let's go over the two unique sliders in Post:

Warm/Cool is a simple, one-stop-shop for the most common color correction request—"Could we just warm that up a little bit?" As you might have guessed, Warm/Cool "warms up" or "cools down" your image by color correcting it towards or away from a nice amber tone. At 0% Warm/Cool is neutral and has no effect. Values below 0% gradually push your image towards a warm color in a gentle way that uses the midtones to affect the whole flavor of the image without changing your overall contrast level. Values above 0% push the image the other direction, towards a cyan tone that reads as cold.

You may not agree with our idea of what "warm" or "cool" is though, so we've given you an extra control. **Warm/Cool Hue** allows you to modulate the specific flavor of warmth or coolness by rotating the hue of the effect. Values below 0% will move your image towards green, and above 0% will push it towards magenta. A small positive value in a cool scene will get you a "cool" that is more blue than cyan, and a subtle nudge in the negative direction will yield a "warm" that is more golden yellow than ruddy orange.

What if I just want to use Warm/Cool as an effect, without any of the others? Go ahead—if you only adjust the **Warm/Cool** and **Warm/Cool Hue** controls, it's as if you've only applied these parts of the plug-in. In other words, no calculations are done for the rest of Look Suite, and your render times should be very fast, as if you've applied a very simple effect.

Post Gamma, Post Contrast, and **Post Saturation** work exactly like their Subject category counterparts. They can, up to a point, perfectly undo their equivalent effects in Subject—meaning a value of -50% in **Post Gamma** will cleanly correct out a value of +50% in **Subject Gamma.**

So what are these controls for? The relationships between the **Subject** and **Post** effects, and everything that happens in-between, is in many ways the heart of Look Suite's power.

You will notice that many of the Preset Looks begin with negative values in one or more of the Subject parameters, and finish with complimentary values in Post. To help understand why this is so, try this out on a piece of your own footage:

Apply a fresh Look Suite. Twirl down **Lens Filters** and **Gradient** and set **Grade** to **4.** Leave the **Gradient:Color** the default amber.

Take a snapshot of this image by hitting **shift+F5.**

Now try this: Under Subject, enter a **Pre Saturation** value of **-50%.** Under Post, set **Post Saturation** to **50%.**

Compare this new image to the snapshot by pressing and releasing F5. The Pre and Post Saturation effects have cleanly cancelled one another out, but the look of the Gradient has changed substantially.

Now try swapping the values in Pre and Post Saturation. The result should be an amber-colored grad that has a nice, subtle tone to it.

Try this same sequence using complimentary values in **Gamma** and **Contrast** as well. Note how the quality of the Gradient changes every time. You can also try bracketing any of the other Look Suite effects with these complimentary values: the Diffusion effects, the Tint effects, even Warm/Cool.

It's easy to see how, using this technique, you can turn any of Look Suite's various simple effects into a customized Look that is unique to your project. Experiment away—and if you come up with a really killer Look, email it to Toolfarm for possible inclusion with version 2.0!

OPTICALS

The optical printer was the first moving image compositing system. By rephotographing processed film in various ways its operator could produce anything from a simple dissolve to the types of visual effects composites now done almost exclusively with computers.

Computers tend to do things in a rather mathematical and boring way though, unless we tell them otherwise. **Opticals** allows you to create elegant **cross-dissolves, fades to black** and **"burns" to white** with a much more film-like look than one usually gets from a digital onlining system.

In some case you can simply apply Opticals to a Video Layer, but most often you will find that applying Opticals to its own Solid Layer will give you the most flexibility. To see how this works, read on.

BULLET POINT

Opticals is a 16 bits per channel effect. If you have the After Effects 5.5 Production Bundle, you will get the best results by using Opticals in a 16-bit project. However, if you do not have the production bundle, Opticals will still work its magic internally at greater than 16 bits per channel using The Orphanage's **DeepColor** technology.

When you first apply Opticals you will need to set the A and B Video Sources using the **A Layer** and **B Layer** pop-up menus. The "A" side of a dissolve is the first shot you see, and the "B" side is the second. If you just want to use the fade/burn, you need only choose an A Source—or just choose **None** (the default), and **Opticals** will use the layer to which it is applied, after any effect you may have applied above it.

Because Effect plug-ins in After Effects cannot generate video outside the trimmed portion of a Layer in the Timeline, it is handy to apply Opticals to a **Solid Layer** that occupies the full duration of (and is the same pixel size as) your Composition. In this case you would specify both an A and a B Video Source, which will be other layers in your Composition. These layers should be prepared according to the **Editing** guidelines above, color corrected, and treated with **Look Suite.** These layers do not need to have their video switches enabled in the Composition—only the solid does.
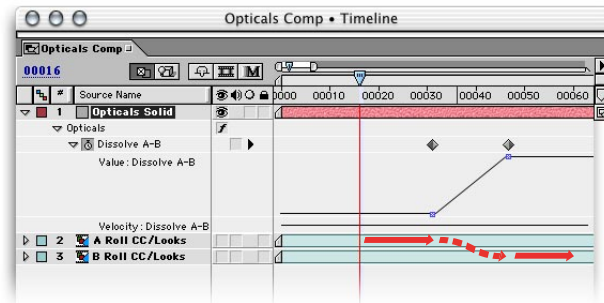
Once you have set up your Video Sources, you can perform a Cross Dissolve. To do this you need only place keyframes for the **Dissolve A-B** slider. When this slider is at 0% you are looking at the A Layer only. As you animate the slider up to 100% you increase the amount of the B Layer that gets mixed in until no more of A is visible.

The Dissolve A-B slider works with the **Dissolve Film Response** slider. The Dissolve Film Response allows you to change the visual characteristic of the dissolve. If you watch dissolves in films, you may notice that the bright areas of the A side are the last things to fade out over the B side, and the brighter areas of the B side are the first parts to become visible over the A side. This is a general rule in film—light wins out over dark. A great example of this can be seen in John Woo's 1997 film *Face/Off.* The first three shots of the films are an A-B-C dissolve (which we'll show you how to do later!). Watch as the B shot of John Travolta and the young boy (Myles Jeffrey) dissolves to the long shot of the carousel. The white stripes of the carousel are the first parts of C to appear, and the white sky behind the actors in B is the last remnant of B to linger.

Try this with your own footage. With Dissolve Film Response set to 0% you can see what a normal "linear" computer dissolve looks like. Now set it to something like 80%. If your images have pronounced highlight areas you should definitely see a difference in the in-between frames of your dissolve. Setting this value all the way to 100% will produce extreme results, so dial in a value that works for your material.

This is a nice effect and mimics dissolves in modern movies. However, there's another option here as well. Films shot with **color reversal** film stock and old **three-strip Technicolor** films have the opposite thing happening in their dissolves. The dark parts of the image win out and build up before the light parts do, just as if you were holding up two strips of film over each other in front of a light box. Examples of this can be seen all through the 1961 film *The Guns of Navarone.* To simulate this look (very appropriate if you're using Look Suite's **3-Strip Process** option), move the Dissolve Film Response slider below zero into the negative values.

While you've got your *Guns of Navarone* DVD in, roll back to chapter one and take a look at the Columbia logo. As it fades up from black notice how once again the bright portions of the image pop into view first, with the dark blue field in the background coming slower. The process is repeated when the logo fades out. Opticals replicates this effect with its **Fade/Burn** slider. At a value of 0% (the default), the result of your dissolve (if any) is shown. Animate Fade/Burn down to -100% though and watch the image perform a nice, smooth fade to black. Dark areas of the frame will fade out more rapidly than bright ones, providing a very cinematic effect. To control this, you have a **Fade/Burn Film Response** control. At its default value of 90% it produces a nice effect, but feel free to experiment. As with Dissolve Film Response, a value of 0% yields a linear fade similar to what you might get with a video editing application or a simple opacity fade.

You may also wish to perform a "burn to white." This is easily accomplished by animating Fade/Burn to 100%. The Fade/Burn Film Response control helps you adjust the look of this effect.

To make your life easier, Opticals automatically smoothes out the animation of your dissolves and fades. This allows you to achieve smooth results while only using simple Linear keyframes in the Timeline. If you wish to override this behavior simply check the **Disable Auto Ease** checkbox.

What if I just want to use Opticals for simple fades? Great—just apply it to your video layer (or an Adjustment Layer) and leave **None** as the selection for A Layer. No calculations will be done for the dissolve effect if you leave the **Dissolve A-B** slider at 0%.

ADVANCED OPTICALS

If you want to perform an A-B-C dissolve, you will need two doses of Opticals to do the job. Here's how you can do this:
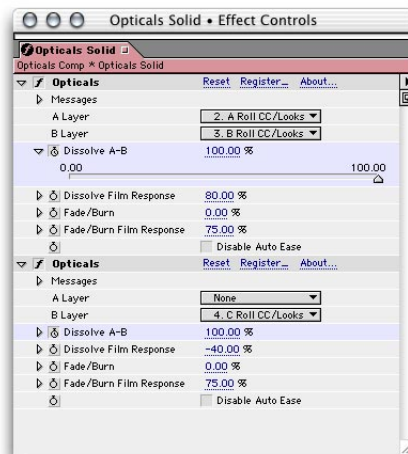
As discussed above, selecting **None** for either A or B layers causes Opticals to use the image it receives from any effects applied above it. This means that if you set up Opticals as described above, then add another Opticals effect below the first, you can set A Layer of the second Opticals to None, and select another Video Layer as the B Layer.

Now when you dissolve from A to B in the second Opticals, you are dissolving from the results of the first opticals to a third image—something you could even do simultaneously if you wished. In this way you can create very complicated visual collages with a decidedly cinematic feel.
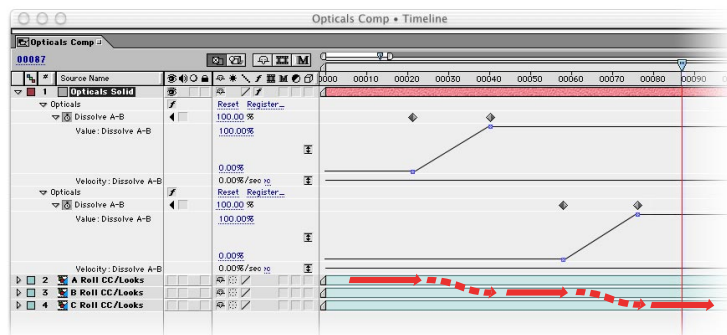
LETTERBOXER

The **Letterboxer** plug-in is the simplest of all the Magic Bullet tools. It allows you to crop your final output to any aspect ratio you desire. If you look at the sample project included on the Installer CD, you will see Letterboxer used in the video output comps to crop the image to a cinematic 1:1.85 aspect ratio.

Letterboxer works in one of two ways, either applied directly to a Video Layer or on a Solid Layer at the top of your Comp. If you apply Letterboxer to the actual layer you want to crop, you should select **On Image** from the **Render** pop-up menu. If you wish to add a Letterboxing layer to your Comp, create a new comp-sized Solid Layer and apply Letterboxer to this layer. The default Render option of **On Transparent** is what you want in this case.

The **Color** control lets you select the color of your letterbox "bars." Here you can select from a wide variety of black.

The **Preset** menu contains a list of common aspect ratios. You can select one from this list, or dial your own using the **Aspect Ratio** slider. The preset aspect ratios are as follows:

4:3 (Academy)   The aspect ratio of your TV (probably) and of uncropped 35mm film. Letterboxer works in both the vertical and horizontal dimensions, so you can use this preset to crop the sides of your wide-screen image to show an Academy "center crop."

1.66:1 (Super 16)   This is the aspect ratio of **Super 16,** a film format that shoots onto the entire 16mm negative, including the part usually reserved for a magnetic soundtrack. This is also the aspect ratio of **VistaVision,** a format derived by running 35mm film sideways through a camera, in much the same way that film threads through a 35mm still camera.

16:9 (Widescreen TV)   The widescreen format that's acceptable to consumers, convenient for engineers, and dissimilar to any previously established media aspect ratio. Who wouldn't love it?

1.85:1 (Theatrical)   Most films projected theatrically are cropped to this aspect ratio. You may hear it referred to as "flat," since it's a widescreen format that involves no distorting of the recorded image.

2.35:1 (Anamorphic)   The other common cinema aspect ratio, formerly known as **Cinemascope** and now often referred to as simply 'scope. This is the projection aspect ratio of 35mm film shot with an anamorphic lens, which squeezes the image horizontally to use the entire Academy frame to contain a widescreen image.

2.76:1 (Ultra)   What happens when you stick an anamorphic lens on an already widescreen format such as 65mm? You get some crazy-wide images on such films as *Ben Hur* and *It's a Mad Mad Mad Mad World.* These films are so wide you rarely see them at their original aspect ratios, but if you did, this is what you'd see.

Letterboxer ain't so cool. Well, OK, maybe not, but there are a couple of things about it that are kind of nifty and should save you time. The first one is that it is pixel-aspect aware. Using the amazing ability of modern computers to do *math,* Letterboxer does the right thing no matter what your comp's pixel aspect is. The other is that no matter what setting you choose for Aspect Ratio, the boundary between the letterbox "bars" and the image is always clean and sharp, not soft and anti-aliased. To effect this, Letterboxer internally runs a full emulation of MacPaint.

The values you enter for **Aspect Ratio** are the left half of the common method of denoting aspect ratios, i.e. you enter 1.85 for a 1.85:1 crop, and 2.35 for a 2.35:1. But if you wanted to enter Aspect Ratio values that don't have a "1" on the right side of the colon, you can take advantage of After Effects' ability to do simple calculations in numeric fields. For instance, for a 16:9 aspect, simply type 16/9 into the Aspect Ratio field and After Effects will convert that to 1.7778.

BROADCAST SPEC

Broadcast Spec filters images to create "broadcast safe" color and luminance values. It has presets for **Component** and **Composite** video, and does its work without adversely affecting the colors in your images. It is designed to be the very last effect you use before you render to a video-destined QuickTime file.

What exactly is "broadcast safe?" The short answer is that it's a complex set of criteria with which no single plug-in could hope to ensure compliance. But the nice thing is, when taking the linear color space of After Effects and outputting through **SDI** (Serial Digital Interface) to a format such as **D1** or **Digital Betacam,** it is very difficult to generate a truly unacceptable (or unbroadcastable) image. In fact, is actually is impossible to generate illegal luminance values. So **Broadcast Spec's** component preset (the default) concentrates almost entirely on the other half of the video equation; the chrominance (chroma) signal.

The chroma signal is similar to the saturation values in your RGB working environment. It is these values that Broadcast Spec adjusts. It would be possible to make an image "safe" by simply desaturating it overall, but this would be a tragic adjustment to make to an image that only has a few "hot spots" of illegal values. Broadcast Spec looks for saturation values that are over a certain threshold that you define and adjusts only those.

To use Broadcast Spec, apply it as a final step to your color corrected video project. In After Effects this is easily achieved by using an Adjustment Layer, but we recommend that you create a dedicated **NTSC Video Output Composition** and apply the plug-in to your finished project there. This is how the example project is set up.
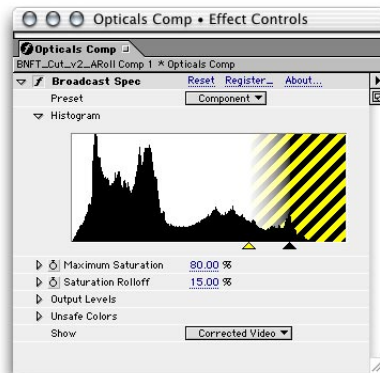
The first thing you will see is the **Saturation Histogram.** This is similar to the histogram in the After Effects **Levels** control, except that instead of showing the distribution of RGB values, it displays the saturation values. Concentrations of values at the far right of the graph indicate an image of predominantly low saturation, whereas peaks at the left end of the graph indicate high saturation pixels within the image. It is here that illegal values can crop up, and you will notice that the rightmost 20% of the graph contains a cross-hatch pattern indicating the parts of the graph above the current **Maximum Saturation** value.

UNSAFE BROADCAST COLORS DISPLAY

Fully illegal values

Legal values in the falloff range
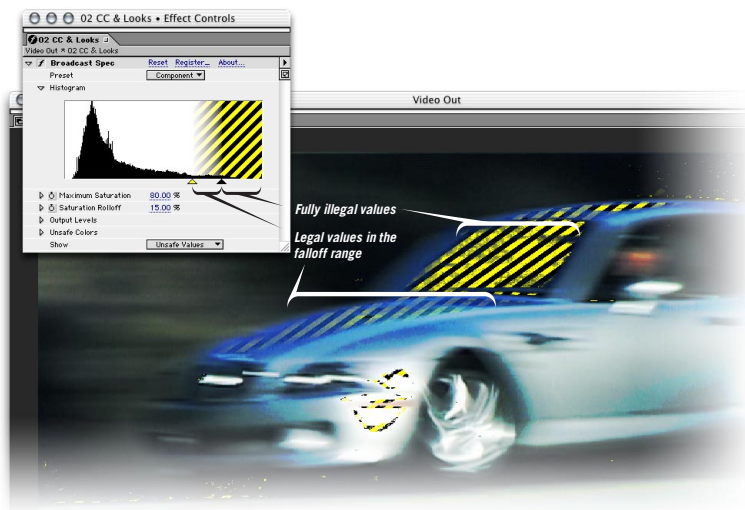
Maximum Saturation is the master slider for this plug-in. Here you define the maximum legal saturation value to allow through. Anything above this will be adjusted in saturation to match this value. With this slider at 100% you would not affect the saturation levels of the image at all. At 0% you will have a very safe black and white image. The default NTSC setting of **80%** is not as strict as it could be—to meet the most stringent specifications it should be set to **75%.** But you can get away with values up to 80%, and The Orphanage is all about pushing the limits.

Since we don't want to just linearly clip off the values of saturation at the maximum, we have another slider that works with **Maximum Saturation.** It is called **Saturation Rolloff,** and it defines a range of saturation values just below the maximum that will get subtly adjusted to provide a smooth transition into safety. The default value of **15** is a good compromise between adjusting as few values as possible and avoiding too harsh a transition to the clipped values. **Saturation Rolloff** is represented in the histogram view by a faded area of the cross-hatch pattern. All saturation values below this faded range are untouched.

The last control is the **Show** pop-up menu. The default is **Corrected Video,** which means that Broadcast Spec is displaying your affected image. The other option is **Unsafe Values.** In this mode the plug-in highlights the areas of the image that may be to high in chroma using a zebra pattern. Values that are over the **Maximum Saturation** value you've selected will be 100% zebra, whereas values within the rolloff range will be partially zebrafied. **Show Unsafe Values** is useful for setting up the plug-in and gauging how much work it is doing, but you probably won't want to render your project this way!

The **Unsafe Colors** controls allow you to specify which colors are used for the zebra pattern. Please be tasteful.

SECTION THREE: APPENDICES

APPENDIX 1: GEEK TIME

In the conversation about frame rates under "What Is Magic Bullet?" on page 1, we glossed over some important technical details. NTSC video's frame rate is 30fps, right?

Wrong!

OK, wait, I got this one—it's 29.97fps, right!

Still wrong! It's actually equal to 30,000 divided by 1001:

$$\frac{30000}{1001} \ = \ 29.97002997\ldots$$

This wasn't always the case—video in the US was once 30 lovely black and white frames per second. An attempt to introduce color television in 1951 failed because it was incompatible with existing black and white sets. It wasn't until two years later that engineers figured out how to add color and maintain backwards compatibility—and they had to jimmy the frame rate a bit to make this happen.

So NTSC video is now an elegant 29.97002997… frames per second. Thankfully though, people smarter than those who wrote or will ever read this book have decided that 29.97 is close enough to that number, so that is what we will use.

Film, by contrast, runs at a nice, simple 24 frames per second. But when it gets transferred to NTSC video using 3:2 pulldown, the frame rate becomes **23.976fps.**

$$\frac{29.97}{30} = \frac{\textbf{23.976}}{24}$$

When you watch a movie on television or DVD in the US, Canada, or Japan, you are watching it at 23.976fps (via your 29.97 display through a process called **3:2 Pulldown**). NTSC output from a Magic Bullet project is therefore also always at 23.976fps.

Sometimes 23.976 gets abbreviated to **23.98** for display purposes. You'll see this on Sony's 24p HDCAM VTR and even sporadically throughout After Effects 5.5. It's important to note that this shorthand does not mean that 23.98 is close enough to 23.976 that you can actually work at 23.98. To avoid any confusion, we will always refer to the NTSC video frame rate of film as 23.976.

The world of PAL is relatively simple. PAL video actually runs at 25fps. No math is required to emphasize this point.

For PAL projects destined for PAL video, Magic Bullet converts interlaced PAL video (50i) to 25p. For those who are shooting on PAL but plan on creating an NTSC video master, we do a slow-PAL conversion, using each PAL frame as a film frame, resulting in a slight slow down overall but maintaining smooth motion. To do this, we tell After Effects to interpret the PAL footage at, you guessed it, 23.976fps.

APPENDIX 2: DVD LIBRARY

Bad Boys

Crimson Tide

Eyes Wide Shut

Face/Off

Jerry Maguire

North by Northwest

Out of Sight

Saving Private Ryan

The Great Train Robbery

The Guns of Navarone

The Searchers

Three Kings

APPENDIX 3: ABOUT THE ORPHANAGE

The Orphanage was founded in 1999 when Scott Stewart, Jonathan Rothbart and Stu Maschwitz left George Lucas' Industrial Light + Magic and joined forces to apply their skills with digital filmmaking and visual effects to their own creative endeavors. Now with offices in Los Angeles and San Francisco's Presidio park, The Orphanage features three distinct divisions: high-end digital post production services for film and television, which includes visual effects and, of course, Magic Bullet; original motion picture, television, commercial and music video production and development; and digital filmmaking technology development and licensing. Additionally, Orphanage Spots is an Orphanage subsidiary focused on creating high-end visual effects for the music video and advertising industries.

Magic Bullet was a natural outgrowth of the primary mission of The Orphanage; to create high-quality entertainment using easily accessible digital tools. The first Orphanage film, Maschwitz's **The Last Birthday Card,** was also the first testing ground for Magic Bullet. Following that the Orphans produced **What We Talk About When We Talk About Love,** a short film based on the Raymond Carver short story and directed by Stewart. For this film they took what they learned on *Birthday Card* to the next level, acquiring a PAL Sony DCR-VX1000p to verify their suspicions that a PAL Bullet would yield superior image quality. At the time, PAL support in their editing application of choice, Apple's nascent Final Cut Pro, was incomplete. This situation helped institute another fundamental Orphanage practice—that of working closely with technology partners (such as Apple, Adobe and Pinnacle Systems) to keep pace with the rapidly evolving world of digital filmmaking. Eventually **What We Talk About** was edited in Final Cut Pro, and from that point on PAL would be the format of choice for SD Orphanage films.

By January 2000, the Orphanage would arrive at in Park City, Utah to pre-miere five digital short films at Sundance and the surrounding festivals. Whether viewing these pieces on 35mm film or through digital projection, audiences were amazed at their cinematic quality and production values. This led to several requests from the independent film community to begin offering Magic Bullet post services to the outside world. To this date, nearly two dozen features have utilized The Orphanage's Magic Bullet post services and have gone on to play at festivals worldwide including Sundance, Berlin, Cannes and Toronto film festivals. A number of these projects continued on to play in wider theatrical and cable release—and all of their film prints and video masters are direct digital Magic Bullet output.

The Orphanage has continued to perfect the Bullet throughout all of this, working with programmer Douglas Applewhite—another former ILMer—to optimize it and add new features. Every project that comes through the door of—or originates from within—the company is a further opportunity to hone the Bullet's abilities. The Orphanage looks forward to sharing these improve-ments with the public in future releases of the software.

It is the sincere hope of The Orphanage that Magic Bullet Suite v1.0 helps you do what they've been doing since day one—make the films you want to make, the way you want to make them.

For more information on The Orphanage, please visit:
www.theorphanage.com

APPENDIX 4: INTERFACE

MAGIC BULLET — p40
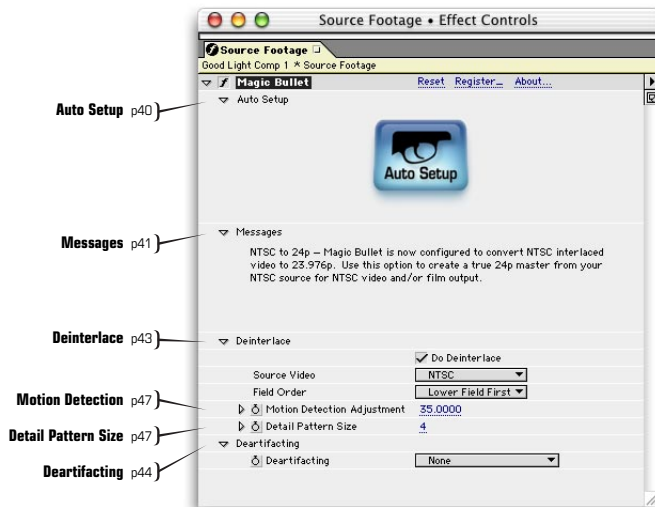
Auto Setup p40

Messages p41

Deinterlace p43

Motion Detection p47

Detail Pattern Size p47

Deartifacting p44

Source Footage • Effect Controls

Source Footage
Good Light Comp 1 ✳ Source Footage

Presets p56 — Look Suite — Reset Register... About...
Presets — Preset Looks ▾
"Do" p55 — ✓ Do Subject
Subject p58 — Subject
  ▷ Pre Saturation — 0.00 %
  ▷ Pre Gamma — 0.00 %
  ▷ Pre Contrast — 0.00 %
  — ✓ Do Lens
Lens Filters p59 — Lens Filters
Black Diffusion p59 — Black Diffusion
  ▷ Grade — 0.00
  ▷ Size — 10.00 %
  ▷ Highlight Bias — 0.00 %
White Diffusion p60 — White Diffusion
  ▷ Grade — 0.00
  ▷ Size — 10.00 %
  ▷ Highlight Bias — 60.00 %
Gradient p61 — Gradient
  ▷ Grade — 0.00
  ▷ Size — 85.00 %
  ▷ Color —
  ▷ Highlight Squelch — 15.00 %
  ▷ Fade — 50.00 %
Camera p63 — ✓ Do Camera
3-Strip p63 — Camera
  ▷ 3-Strip Process — 0.00 %
Tint p63 — ▷ Tint — 0.00 %
  ▷ Tint Color —
Tint Black p63 — ▷ Tint Black — 0.00 %
  ▷ Tint Black Color —
  ▷ Tint Black Threshold — 30.00 %
  — ✓ Do Post
Post p64 — Post
  ▷ Warm/Cool — 0.00 %
  ▷ Warm/Cool Hue — 0.00 %
  ▷ Post Gamma — 0.00 %
  ▷ Post Contrast — 0.00 %
  ▷ Post Saturation — 0.00 %

Source Footage • Effect Controls

Source Footage
Good Light Comp 1 ✳ Source Footage

Opticals — Reset Register... About...
Messages
  Opticals is ready to perform Fades and Burns.
A-B Layers p66 — A Layer — None ▾
  B Layer — None ▾
Dissolve A-B p67 — Dissolve A-B — 0.00 %
  0.00 — 100.00
  ▷ Dissolve Film Response — 80.00 %
Fade/Burn p68 — ▷ Fade/Burn — 0.00 %
  ▷ Fade/Burn Film Response — 75.00 %
Disable Auto Ease p68 — Disable Auto Ease

LETTERBOXER — p70

Presets p71

Render p70

Aspect Ratio p72

BROADCAST SPEC — p72

Presets p72

Histogram p73

Output Levels p75

Unsafe Colors p75

Show p75

MAGIC BULLET SUITE

INDEX