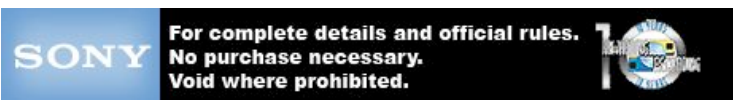


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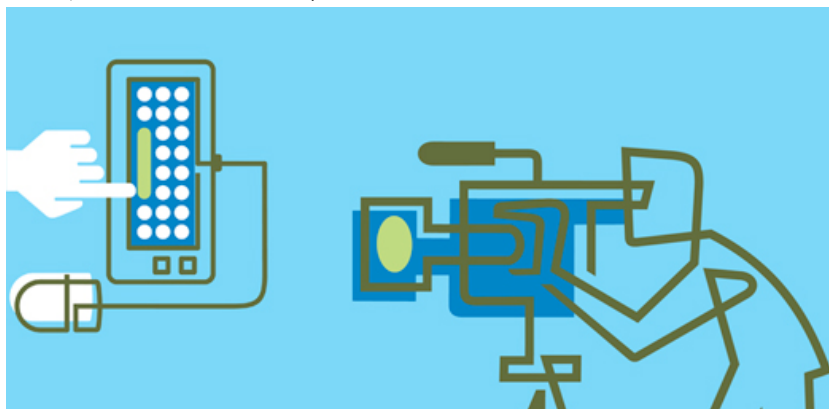
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Hands-On HD: Getting the Most Out of High Def First-Person Advice

March 1, 2006 Source: Studio Monthly



Okay, you've got the gear. (Or at least your favorite dealer lets you play with his stock.) And you understand the technology. (Or at least you figure it can't possibly be that much different from what you already know.) And maybe the doors are already opening for you to take charge on an exciting HD project. (Or maybe you've already finished one that didn't quite turn out the way you had hoped.)

However much you know — or think you know — about HD production, there's always more to be learned. Just because you're an ace HDCAM operator doesn't mean you'll instinctively be able to coax gorgeous images out of the inexpensive, option-rich handhelds that have exploded onto the market. And no matter how much experience you have in the realm of high-end post-production, tricky new formats like HDV have thrown a monkey wrench in the works. That's why we've asked production and post-production pros with real-world hands-on experience shooting and finishing HD formats, to share some of their hard-earned advice on dealing with HD footage and equipment.

Wondering what knocked your audio out of sync by two frames? See page 3. Frustrated by overscan in your viewfinder? Read page 9. Trying to figure out ways to strike that expensive RAID array from your HD post-production budget? Page 14. Getting good skin tone in post? Page 15. It's practical advice that you can put to use next time you step into an HD production. If you learn by doing, the advice gathered here will help you do it right.



Bill Megalos
 Cinematographer
 Los Angeles, CA
 Recent HD Projects: *Caravan of Dreams* (documentary)

Treat an HDV Camera Like a Three-Chip Camera

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The first thing to recognize about HDV is that it's closer to DV than it is to HD, at least with the cameras that are currently available. The 1/3-inch chip is the crux of the situation. *Therefore, take the same care and precautions you would with any three-chip camera:*

- Watch for extreme contrast ratios. In general, softer, evenlight will yield the most pleasing results.
- Avoid over-exposure at all costs. You can bring the level up in post more easily than you can fix blown-out areas (you can't).
- Try to shoot close to wide open to minimize depth of field. Use ND filters in the camera and/or in front of the lens.
- Try to shoot at longer focal lengths when possible to minimize depth of field.
- Turn down the detail (sharpness) on the camera. You might want to crank it up a touch for wide establishing shots and down for more intimate scenes. You can also explore diffusion in front of the lens.
- Try to have the subject's face brighter than the background to draw the viewer's attention to it.
- Keep the front element of your lens spotless. With the wide lenses necessitated by the tiny (1/3-inch) imaging device, you'll see the dirt or smudge when wide and backlit or with large light areas in the frame.
- Shoot tests before you begin your project. I set a look for each project, generally with a lower-gamma look for day exteriors (that I will abandon when needed, such as during magic hour) and a "normal" look for interiors. The lower-gamma look has the advantage of requiring nearly a stop more light, (thereby allowing you to open up the iris, i.e., less depth of field) which can only help in exteriors.

Hold the Camera Steady

You need to be more careful shooting in 16:9 than in 4:3. Because of the increased width, shakiness is more apparent, especially notable in roll around the axis (think of a boat rolling side to side in the ocean.) And watch your horizon. You also don't want to make any fast moves for two very different reasons. First, with the increased resolution of HD, it's best to keep pans and tilts slow, so the viewer can take in the extra detail. You want to avoid information overload. Second, because HDV is a highly compressed format (MPEG-2), there are motion artifacts with fast moves. I'm always surprised at how much you can get away with— but don't push it.

Shoot Tests and Monitor Your Footage

I can't stress enough the need to shoot tests and watch them back on an HD monitor. And here I'm going to insist on a CRT monitor, big and expensive as they are. (I've yet to see an LCD or plasma that comes close in resolution or contrast.) You need to know what the camera is doing. Chances are you won't have an HD monitor with you (otherwise, you'd be shooting on a Sony CineAlta, Thomson Viper or Panasonic Varicam, wouldn't you?), so you need to know what the viewfinder and LCD screen are really telling you.

Check your focus. HDV can be embarrassing when you finally play back your rushes. Take the time to be sure when you're shooting. Re-shoots are at worst impossible, and at best expensive and demoralizing.

Now go and enjoy your HDV shoot. Enjoy the size, freedom and relative invisibility of the camera. I've already shot in eight countries with my Sony HVR-Z1U in the six months since I've had it and I *love* breezing through customs and the way it's less intimidating to subjects.



Andy Greenberg
Senior Engineer, One Union Recording Studios
San Francisco, CA
Recent HD Projects: Dave Matthews concept spot "Blurry"

Sort Out Your Audio Sync Issues

The HD format is still evolving, so it pays to discuss some of the technical aspects up front before production. If clients start discussing surround, then we talk about all the possibilities. For example, if they're getting custom music, we ask for the stems of the

musical instrumentation so we can have a lot of fun with the mix.

The other thing that we discuss is what their palette is— it's unreal the amount of control and flexibility that you have in surround. If we take the ambience, for example, we can really add some cool perspective change, throwing a sound effect over here or over there.

It's important to focus on sync issues. This is where HD could be challenging to people. There's not just one flavor of HD. There are not only different resolutions, but seven or eight sync rates— 60i, 59.94, 30, 30p, 29.97, 29.97p, 24, 23.97. When you're on location and shooting film and you've decided to edit HD, you need to be specific about what HD format.

The first thing to consider is where it's going to air or if it's for theatrical release. The networks have different technical operations specifications (TOSs), often 30 to 40 pages long, and if you want to know how they want their 5.1, you've got to read that. PBS is different from Discovery, which is different from Fox.

Is it for theatrical or television or both? If it's both, that means different scan rates, sync rates, and aspect ratios.

Basically, if you shoot in 24p, you have to edit in 24p. You can't go from 24p to 29.97 and back to 24p again because your audio will be out of sync. If you do a Dolby E mix, you need to know that the encoder, which turns your 5.1 mix into digital information, delays by one frame and then the decoder, which turns it into an AES stream, delays it another frame. So when you go through encode/decode, you've delayed two frames. What you need to do is offset your mix two frames.

When you're talking to professionals — and it's something I've always advocated— it's okay to open the lines of communication before production starts. Just give someone like me a call and we can discuss technical things to think about while you're going through the process.



Sean Fairburn

Director/Cinematographer/HD Engineer

Role Model Productions

Recent HD Projects: *Mission Impossible III* (HD camera operator/engineer); *Closing Escrow* (camera operator/HD engineer); *Once Upon a Time in Mexico* (HD camera operator/HD engineer)

Setting Day Exterior Shots

I suggest shooting day exteriors with a Soft ND.6 Grad. In my experience, it really helps maintain the light levels in range.



Gil Hubbs

ASC, Cinematographer

The Footage Bank (an all-HD stock footage company)

Los Angeles, CA

Recent HD Projects: Stock footage

Choose a Good Color ViewFinder

Spend the money for the best color viewfinder you can get, so as soon as you turn the camera on, you immediately see what the shot is. I use the Sony HDVFC30W from Band Pro [in Burbank]. One of the things that slows down an HD production is the setting up of a monitor in a black room where you calibrate it. With a good color viewfinder, I turn on my camera and I see it.



Art Donahue

Producer/Videographer/Editor
WCVB-TV
Boston, MA

Recent HD Projects: Segments for WCVB's long-running news magazine, *Chronicle*

In HDV, Pay Attention to Frame Edges, Manual Settings

Unless you've got a studio monitor in the field, you'll be making your critical decisions for the big screen on a tiny 3.5-inch LCD. You can't see the actual frame edges on the consumer Sony HDR-FX1 LCD, but the pro Sony HVR-Z1U has an underscan switch: Allscan Mode. You need to know exactly where the edge of the frame lies, because a downconverted letterbox SD frame will have zero top and bottom crop. I've had to crop shots in post because a stray shotgun or light stand tip made it into the final image, but not the viewfinder.

Make sure you punch all four buttons along the base of these cameras (iris, gain, shutter speed and white balance) for manual operation. Leaving gain and shutter speed in auto will counteract your manual iris control. And don't put Color Bars or HyperGain on an assignable button— you could bump it shooting handheld.

In art galleries and museums, where additional lighting is not allowed, lock down the camera and use a slow shutter speed. If nothing moves, it looks great. If you have to make moves, shoot with a high-megapixel still camera and pan and zoom the stills in post. In Avid Pan and Zoom, render the moves with B-Spline Catmull.



Erik Holsinger

President/Executive Producer
Media Alchemy
Seattle, WA

Recent HD Projects: Broadcast documentaries, custom media for special venues, including multiscreen HD movies

Use Larger HD Cameras for High-Contrast Vistas

Before you shoot, consider whether or not HDV is the right choice for your show. Yes HDV is sexy, but do you need the extra resolution and additional complications in post? If you are shooting SD, then there are many great DV cameras that will do the job. However, if you need to intercut smaller handheld shots into your final HD program, then HDV is a great alternative to the larger HD systems. Every broadcast station has its own demands, so during pre-production make sure that you talk with the engineering

staff that will play your final show. Also, while you can capture some impressive images, the current HDV cameras are not flexible enough to be your only production camera. Larger HD cameras, such as Panasonic's VariCam and Sony's HDCAM, have better lenses and larger CCDs. Consequently, you'll get better results using the big HD cameras for high-contrast vistas and effect shots. If you are going to shoot in HDV, here's something to keep in mind: don't confuse the MPEG. HDV can capture more detail than SD cameras, but some creative camera work can also add unwanted artifacts and glitches to your footage. Avoid fast pans and Dutch angles— all irritants with most HDV formats. Slow and steady is still the best way to go when shooting HDV. And don't forget that tripod!

Pay attention to frame edges; understand the HD look; get a good tech; plan out your shots as if shooting film



James Weber
DP, Loosely Translated Productions
New York, NY
Recent HD Projects: *Temps*, a pilot shot with the JVC GY-HD100U

Find Your Own Tweaks Rather than Relying On Presets

The GY-HD100U has a "Cinelike" setting, and I immediately tried it. Anything that was film-like I wanted to see. But it took a lot of the reds out of the colors and made it a lot colder than I wanted. I ended up turning it off and going back to the standard setting on the camera. I'm also an editor, and I want to get the image as strong as I can in the camera knowing that, in the end, I can do whatever I want in post. I haven't used the "skin detail" function— I tried using it, and I didn't notice a difference. I did try taking the gain and popping it on the reds— I loved that when I was shooting on the streets. I shot footage of a woman who was wearing a red scarf, and it really popped when I brought the gain up almost as high as it could go. I played it back on a Sony 50-inch HDTV, and it was really sharp. But otherwise, shooting at standard 24p, I haven't moved the gain or anything.



Ken Barbet
Senior Director, Shadowbox Pictures
Yardley, PA
Recent HD Projects: Prince Tennis Racket spot

Understand the HD Look – And Get a DIT

Make sure your DIT (Digital Imaging Technician) sets up to record as much data as possible with the richest blacks and the most dynamic range in your whites. Don't try to engineer these jobs yourself. There was some confusion early on when we had ACs that had training either on the F900 or the VariCam and they'd serve as DIT, but they didn't have the engineering background to handle the Sony HDC-F950 (which records 4:4:4). The downside? There aren't very many trained professional DITs.

**Steven Poster**

ASC Cinematographer

Los Angeles, CA

Recent HD Projects: *The Loop* pilot, "Highway 1," an experimental piece for Sony and NHK**Get a Good Tech**

Get the best digital imaging technician you can find and afford. Trust him. But don't let them control the image in any way that might compromise your aesthetic needs. Tell the story just as you would if you were using film.

**Holland Haverkamp**

Cinematographer

Active Cultures Productions/ThoughtEquity.com

Denver, CO

Recent HD Projects: Stock footage for ThoughtEquity.com

Plan Out Your Shots

Doing your first HD shoot? It might be worth your while to take one of your SD creations and upconvert it, output it and watch it on an HDTV. You'll see for yourself things you do that may not translate well to the new format. You'll also see that, in most respects, what's worked for you in the past is exactly what you'll need going forward into HD. Also, make sure to learn and master the camera before you shoot. HD cameras have tons of functions and settings, and all are key.

Defects are amplified. If you're raising the format bar, you need to raise the quality and attention to detail in the rest of your production as well. Plan out your shots as though you are shooting film. Camera motion has a dramatically different effect. Generally speaking, people are watching HD on large screens compared to their SD sets— so any camera motion is amplified. Something that looked cool on that SD shoot may cause nausea in HD. Also, don't shoot 24p just to say you did. Just as bad camera motion gets amplified, bad choice of frame rate can be a problem. If you are shooting sports or high-motion subjects, and you aren't ever going back to film, 60i is the ticket.

You may want to light things that you could have gotten away without lighting in SD. This demands more flexible lighting solutions. LED lights are a good choice. Be careful not to blow out your whites; HD video is much more susceptible to this than film.

HD POST



Pat Portela
Executive Producer
Nice Shoes
New York, NY
Recent HD Projects: Spots for Amex, IBM and Kodak

Get the Final Specs Before You Post

The first step in organizing for an HD finish is to figure out how the end product will be viewed and get the technical deliverable specs from that venue. Once you have these in hand, be sure and share that information with your entire team.

The specs may seem daunting (I've seen some that are 30 pages long), but within them there are important tidbits of information crucial to the success of your HD spot. Getting this information upfront will ensure that everyone knows what's expected of them and when the time comes for delivery, your spot will meet the specifications required and be seen in the manner in which you intended.

The consequences of not following the "specs" could result in the possibility of your spot not being aired at all. Or, if you've provided an SD version of the same spot the broadcaster could try to make an inferior upres to HD with little regard for the image cropping or quality. Crucial compositional elements could be cropped out when turning the 4:3 SD into a 16:9 HD. Or worse yet, your spot could be stretched to fit. Not only will your talent appear short and fat, but think about what it might also do to your client's brand logo.



Gene Curley
Colorist
Nice Shoes
New York, NY
Recent HD Projects: *Patch* (a short film)

Don't Pump Up the Contrast in HD

The one major thing that's different in correcting SD and HD is that you don't need to add the same amount of contrast to HD because you're dealing with so much more picture. So I tend to back off, which is what I did in *Patch* [a short film], where a lot of the shots were winter with white everywhere. If I'd corrected it in SD I would have blown it out and crushed it a little more, but in high definition, I'd recommend not to do that or you'll lose too much detail. That's the point of HD, to show that detail off. I don't want to suggest that you should shoot it flat, but if you get all that detail in there, then you'll get a great looking picture out.

Before You Edit HDV, Consider Converting to Another HD Format

HDV native editing is still in its infancy. To fully utilize your footage inside of Final Cut

Pro HD, you should convert your HDV footage to a standard video format, such as DVCPRO HD, HDCAM or an uncompressed 720p format. In Final Cut, just use the Media Manager to collect, convert and resave to your new format.

Also, consider using hardware HDV conversion. If you're on deadline, you can use Miranda's HD-Bridge DEC converter to take a native HDV stream and convert it in real-time to an uncompressed 1080i or 720p stream for immediate broadcast or to master to a specific HD VTR.



John Shea
Visual Effects Artist
Nice Shoes
New York, NY
Recent HD Projects: *Patch*

Pull a Better Key

HD allows you to pull better keys, especially if you've got a lot of blues and greens. Your tracking will be a whole lot more accurate, too; you can be much more precise because the resolution is so high.

When you decide you want to finish in HD, that's where a lot of framing issues come up, especially if you didn't know that before you started shooting. If our clients didn't realize that the actual framing was going to be different for HD, we'll have to pan and scan and change things left or right to compensate. If they want to have everything 16:9, their HD and NTSC master is going to come off that, which requires that you either letterbox or chop the edges off to get a full frame 4:3. In an ideal world, if everything was shot correctly and protected for a certain standard, it would be easy to get all your standards out. Producers just have to figure out what format they're going to finish in before they start shooting.

I've done a few native HD jobs. In that scenario you just pull everything off of camera originals and go into a telecine room and do a tape-to-tape color correction, which is a pretty easy process.



Antonio M. Nacur
A/V Support (Offline and Online Editing), New Wave Entertainment
Burbank, CA
Recent HD Projects: Behind-the-scenes and special features in HD for *Stealth*, *Doom* and *Brokeback Mountain* DVDs

Cut 60i Digitized Footage in 24fps During Your Offline, Before You Bring it to the Online Suite

At New Wave, we mostly work with HDV and HDCAM footage, but we also do some work with D-5. A lot of the problems we encounter have to do with going from offline to online. Most people end up taking their stuff shot in HDV or HDCAM to 60i, which is standard def, for their offline edit. Then they want to take it up to a true HD for the online. You've got to go through an Avid Nitris or Symphony edit bay to get out 24p material. A lot of people don't realize that when you're coming from 60 to 24, and you're slowing down your footage, you're not going to be able to strictly online it. You'll need to make eye-match cuts as well. And effects that looked decent at 60i suddenly have to be recreated in the online bay. Sometimes it's more efficient to take that standard-def footage and cut it in 24 frames, even though it's not a 24p project. Even though you might get jittery picture during the offline, you've got to realize that that jittery picture is not going to translate in the online.

Save Your Editor's Sanity: If Shooting HDV, Choose a Camera with GenLock

My feeling is that the first HDV cameras that came out were lacking because they didn't even have true DV code; they take more of a field-based, instead of frame-based approach. The new Canon XL H1, though, features genlock and you can do time-code sync, so you're getting true time code. I saw some tests of it the other day and was really impressed. It's a really nice camera. The new Panasonic AG-HVX200, which is a DVCPRO HD camera, gives you genlock as well.



Lance Bachelder

Supervising Editor

O Entertainment!

El Segundo, CA

Recent HD Projects: *Santa vs The Snowman* (IMAX 3D), *Barnyard* (in development), *Beyond the Glass* (director)

Use the CineForm 2K CODEC to Simplify Post and Eliminate Extra RAID

What CineForm is doing right now can really help the HD workflow, whether you're starting with HDV or working with HDCAM content. I've been beta-testing some of the newer versions of CineForm with Adobe Premiere 2.0 and Sony Vegas, and it's saved me so much time to be able to take any HD format, whether it's 720p HDV from the JVC camera or 1080p from an HDCAM, into this beautiful 8- or 10-bit 4:2:2 format that a person can handle in real time and cut on regular SATA drives. You don't have to buy an expensive RAID array to be able to handle the files anymore.

This was a huge problem for us at O Entertainment. We have an Avid Nitris with a \$25,000 RAID array that gets filled up too fast with all those uncompressed files. On the Mac side, I know some folks are even using the DVCPRO HD codec as an offline, because of the manageable file size. I've just found that when I use CineForm's Prospect 2K codec in Premiere and in Vegas, my work holds up much better in color correction. I was just at a camera test in Burbank with the Canon XL H1 and the new Wafian HR-1 direct-to-disc capture system that takes the SDI right out of the camera into the computer with the CineForm codec. VFX guru Scott Billups said that by using the codec he got better keys out of the Canon than he gets out of an HDCAM. We're considering doing something similar on a \$5 million picture we're doing soon—shooting in HDCAM but bypassing the whole HDCAM format by taking the SDI direct out and cutting in real time in Premiere and never having to worry about huge RAID arrays. We'll continue to do camera tests, but everything about HD material using the CineForm codec and workflow seems to be indistinguishable from uncompressed HD. And the best part is that this codec is within reach of everyone, regardless of your budget.



Terence Curren

President, Alpha Dogs, Burbank, CA

Recent HD Projects: *Alvin and the Chipmunks* feature; *Grad Nite* feature; *Commanche Warriors* one-hour documentary for The History Channel; *The Deal* (direct-to-video); "Cigar at the Beach"; three episodes of *American Chopper*

Match Time Code Without and HDV Deck

Conforming HD had been a real problem prior to the release of Avid Symphony Nitris at NAB last year. You couldn't capture via FireWire on the Nitris, so you had to capture the output of the deck. But there's no control, so you'd have to eyeball it. Now, the Symphony Nitris gives us total conform. To assemble HDV files, we capture the HDV footage into the Avid Xpress Pro via FireWire and transcode to uncompressed HD resolution and carry the files into the Symphony Nitris. By doing so, we get away from the lossy HDV codec as soon as possible and go straight to uncompressed HD. This workflow allows us to accurately and quickly match time code. For those who are shooting HDV right now, it simplifies the whole process— and saves money because it saves us time. When someone brings out a professional HDV deck, it won't matter anymore. But until then, this is the way to go.



Siggy Ferstl

DI Colorist

RIOT

Santa Monica, CA

Recent HD Projects: *Stephanie Daley*, *Underworld: Evolution*

Improve Skin Tones Without Softening the Rest of Your Image

High-definition video is great when you can make out individual blades of grass on a football field, but not so great when you can make out every pore on a swimsuit model's face. There's no such thing as perfect skin, but low-res video obscures that fact. HD is not so forgiving. There are several ways to tackle this challenge in post. Softening the image can make the skin look better, but the rest of the image often looks worse.

At RIOT I've developed a technique on the da Vinci 2K Plus that has worked very well for reducing unwelcome detail in skin. I begin by keying the skin tones and isolating them using a layer, or channel, of color correction. If the layer mistakenly includes similar colors that aren't skin, I mask them out with a Power Window. Using my chroma key of the skin tones, I cut a matte shape and send it to the Defocus board of the 2K Plus. While Defocus is often used to soften entire images, in this case I use it just on the matte shape to feather its edges so that it blends better with the underlying image. Once I am satisfied with my matte shape, I use the 2K Plus color-correction tools to reduce the contrast of the skin tones. This minimizes a lot of blemishes without affecting the sharpness or quality of the rest of the image. With the 2K Plus Power Grade feature, I've been able to set up a process so that I can implement this technique with the press of a button. It isn't completely automated because skin tone and quality varies from person to person, so I have to adjust the chroma key and vary the amount of contrast reduction as needed. If the skin is seriously flawed, I might also apply a touch of softening with Defocus. In most cases, though, the contrast reduction is enough to effectively improve the skin's appearance.

This is a rather simple but effective technique for improving skin tones when the high level of detail in HD video proves to be too much of a good thing.



Andy Milkis

Director of Visual Effects

Spontaneous

New York, NY

Recent HD Projects: Campaigns for LG Electronics and M&Ms, Superbowl XXXVIII (for which he received an Emmy nomination), show open for *Will & Grace*

How to Deal with Those Extra Pixels

The biggest challenges I've confronted while doing HD projects have been dealing with the larger images and with the lack of a standard for frame size, frame rate and aspect ratio. To begin with, NTSC is a 720 x 486 square. 1080/24p HD is a 1920 x 1080 rectangle. On average, one frame of 24p HD is six times larger than NTSC, both in screen and file size. This means that a five-layer HD comp is the equivalent of a 30-layer NTSC comp! 30 of NTSC is roughly 1 GB. It's not uncommon to generate 30 minutes of media for a :30 spot. That translates into 30 GB for NTSC, or 500 GB for HD! If you aren't careful, significantly longer renders can kill your deadlines.

Here are some media- and time-management tips:

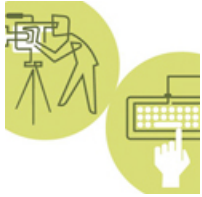
1. Set up your comp so that it's always "live." Don't rely on pre-renders that get loaded back into your comp or project. These intermediate steps take up a tremendous amount of space and will have to be archived or re-rendered. Most compositing packages have some type of disk cache that gives you the benefits of pre-rendering without having your project or comp dependent on this material.
2. Be conscious of the added detail. Use proxy or reduced-resolution settings for animation and layout of your comp, and *always* use full resolution for keying, masking and color correcting. With so much detail, you do not want to sacrifice or miss anything by doing your keying at half-res. The old tricks of hiding things in shadow, or "using a soft-edge matte," do not work as easily as they used to.
3. Standards? We don't need no %*\$@! standards! The FCC "standard" for allows for more than a dozen different flavors of digital television, only some of which are in HD. You must ask your client what resolution, frame rate and tape media they need to deliver on. You will most likely be asked to deliver a "1080/24p" master. 1080/24p is short for 1920 x 1080 at 24 or 23.976 progressive frames per second. Be sure you ask which frame rate, since you can be bitten by a loss of audio sync over time. 1080/24p is the highest resolution you can work with, and is often described as "multi-mastering," since you can make any other flavor of television from a 1080/24p master.
4. Ask about downconverting and offer to do it yourself. Undoubtedly, your show or spot will be shown to the majority of Americans who do not have HD at home. Your work will have to be downconverted from HD to NTSC. HD, with its 16:9 widescreen aspect ratio, is a rectangle, and NTSC is a square. You have two choices: A) You can downconvert your HD with a letterbox to preserve the widescreen aspect ratio of the HD original, or B) You can cut off the left and right sides of the frame, resulting in a 4:3 square. Either choice has consequences. Letterboxing makes all of your titles smaller, and this can create problems with legal supers that have to be a specific size. If the frame was not composed with the "center square" in mind, cropping the left and right sides can cause the loss of important picture information. Whichever way you go, you should discuss the implications with your client.

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