

ETERNAL FLAME

Capturing Images with Firelight or Candlelight



Stanley Kubrick, the famously introverted and innovative filmmaker, wanted to shoot his baroque-style drama *Barry Lyndon* as realistically as possible, including avoiding the artificially lit look of other period dramas. In some scenes he was able to avoid the use of electric lighting altogether; he shot several nighttime scenes indoors using candles as the only means of illumination.

In 1975, this was an extraordinary technological achievement for cinematographer John Alcott, ASC. To accomplish this seemingly impossible feat, Kubrick scoured the globe looking for exotic super-fast lenses. He procured a trio of 50mm Zeiss *f*/0.7 lenses and had Ed DiGiulio at Cinema Products Corp. retrofit them to a BNC mount for his Mitchell cameras. Alcott used 100 ISO film pushed one stop to

200 ISO (for those of you keeping score at home, 24 fps at 180 degree shutter, 200 ISO at an *f*/0.7 requires a mere 3 1/8 footcandles of light for an exposure)—and the result is as beautiful as it is amazing.

Today we have sensitivities 10,000 times greater than 100 ISO; and although *f*/0.7 lenses are extremely rare, we do have fast lenses in the *f*/1.3 to *f*/2.8 range. Combine modern lenses with fast ISOs and you can easily shoot in the light provided by a single candle.

There is a counterintuitive aspect to shooting around flames that will help to bring out the real color of the fire in your shot. As is nearly always the case, when you have a light source in the shot that is actually lighting your talent, the source itself is going to burn out to pure white when you get the right exposure on your talent. This is as true for

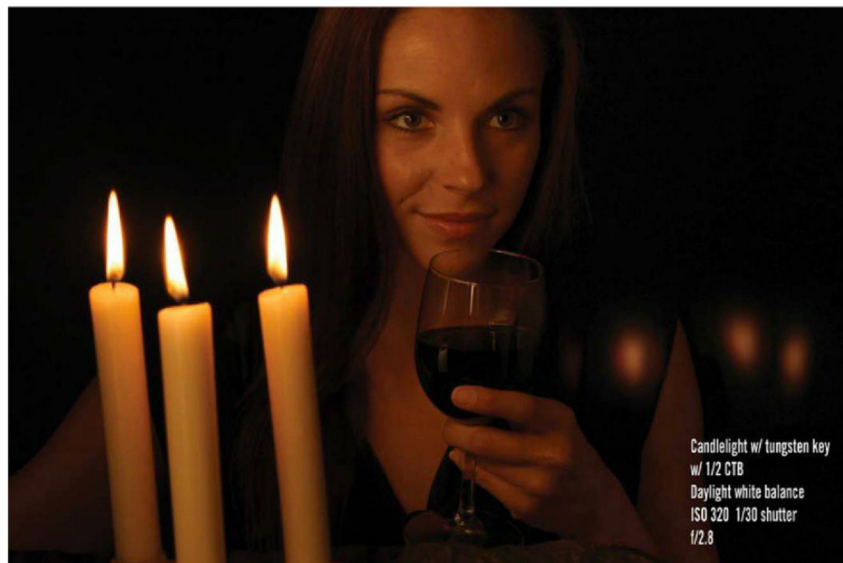
practical lamps as it is candles and flame. It is not always desirable to have that in-shot source burn out so brightly.

As I've explained before, one of the key responsibilities of the cinematographer is to understand his or her creative medium and its dynamic range. It's up to the cinematographer to know where to place the scene within the medium's dynamic range and when to employ tools that will compress the existing contrast range of the scene into the dynamic range (latitude) of his medium.

Many years ago, when I was just a wee little burgeoning cinematographer, I saw *Backdraft*, directed by Ron Howard and photographed by Mikael Salomon, ASC. The fire in *Backdraft* is a living, breathing character in the film, so it was



In this image, the lighting is provided only by the candles in the frame. They are bright enough to illuminate the model, but they burn pure white, with no detail or color in the flames themselves.



By adding a fill light, a tungsten Fresnel with 1/2 CTB (blue) gel on it shining through a large diffusion frame, and cutting that light off the candles themselves, we increase the overall level of key light and can stop down considerably—in this case by adjusting our ISO from 1600 down to 320, 2 1/3 stops. We start to see texture in the flame, and we see the wick and some yellow color in the fire itself.

important that the fire exhibit all of its true-life textures and colors and not appear simply as a white-hot shapeless mass.

To render the fire properly, Salomon used a ton of light on all of the fire sequences, bringing the base

exposure way up so that the flames would fall closer to middle gray and audiences would be able to see all of the beautiful yellows and oranges and reds within the flames. Salomon used a 250 ISO film stock for *Backdraft* but went the opposite direction from

Alcott, rating it at 100 ISO (for a stop and a third of overexposure). Further, Salomon shot the fire scenes at an *f*/4—requiring a base level of 200 footcandles, 64 times as much light as Alcott used on *Barry Lyndon*!

The approaches used by Alcott and Salomon apply to shooting by candle or firelight. Yes, you can use the actual flame as the source light for your talent, but if you want a little texture and life in the fire, you've got to increase your base lighting to compress the contrast range within the scene into your medium's dynamic range.

This is where it's counterintuitive: you're shooting a dim candlelit scene, but it requires *more* light to render those flames a beautiful orange instead of hot white.

The theoretical light from one candle on a one-square-foot surface one foot away from the flame is one footcandle (I was quite surprised by the fact that I was reading 2.8 footcandles of light from the three candles shining on my model's face—it's amazing when theory actually works out in reality); however, looking directly at the flame, taking a spot meter reading, you'll see that the flame itself is much hotter than the light emitted from it. If you expose for the light emitted from the candle, the flame will be vastly overexposed.

This situation can be improved if you use specially made candles that have two or three wicks, which have a brighter flame than standard store-bought candles. Then, by stopping down and exposing more for the heat of the flame, you'll get deeper, richer color to your fire, but you'll need to use supplemental lighting on your talent to make it feel like the candle is lighting her.

You can supplement easily with tungsten lighting, but you'll have to incorporate dimmers or color filters on the tungsten lighting to match the warmer color temperature of the fire.

Depending on the source of the flame, fire burns at about 1,500°K to 2,000°K. Some types of flames burn deeper orange/red than others. Gasoline, for instance, creates a very deep orange/red flame, much lower in color temperature than natural gas fire, which burns a rich blue (unless there's extra oxygen in the mix, in which case the flame turns yellow). Your typical paraffin wax candle burns in the neighborhood of 1,900°K at the tip of the flame, with deeper blues toward the base of the flame, where there's less oxygen and hotter temperatures. Most of the time when you see big explosions in movies, they're using gasoline in the

(continued on page 70)

Bigger, better, smarter solutions for all
the tools, technology and skills you need.



BIGGER

Smarter



Digital Video Expo is where industry pros like you gather for training, networking, and to preview the latest products that shape the way you create, store and distribute video content. See the newest innovations in digital video technology and get inspired to think big!

New! **Streaming Video Technology Showcase.** The showcase pavilion will spotlight tools, technologies and workflow solutions for delivering content to multiple screens.

Register at dvexpo.com with code **WS10** for a free exhibit hall pass and \$50 off early bird conference program rates!

REGISTER NOW ↘

CONFERENCE September 19-21, 2012
EXHIBITS September 19-20, 2012
Pasadena Convention Center, Pasadena California

WWW.DVEXPO.COM



For information on exhibiting at Digital Video Expo, contact Jackie Gospodinoff at 212-378-0493; jgospodinoff@nbmedia.com

The best post production training from the NAB Show comes to Los Angeles at the LA Post | Production Conference. This three-day training event, co-located with Digital Video Expo, focuses on evolving roles and tools in the post production process. Each day has powerful sessions to help the professionals push their skill sets further.

The first day starts with embracing new tools with sessions to help ramp up and adopt new or refresh older skills. The rest of day one and day two center on some of the best classes from the NAB Show's Post Production World. Day three is 2-hour in-depth sessions.

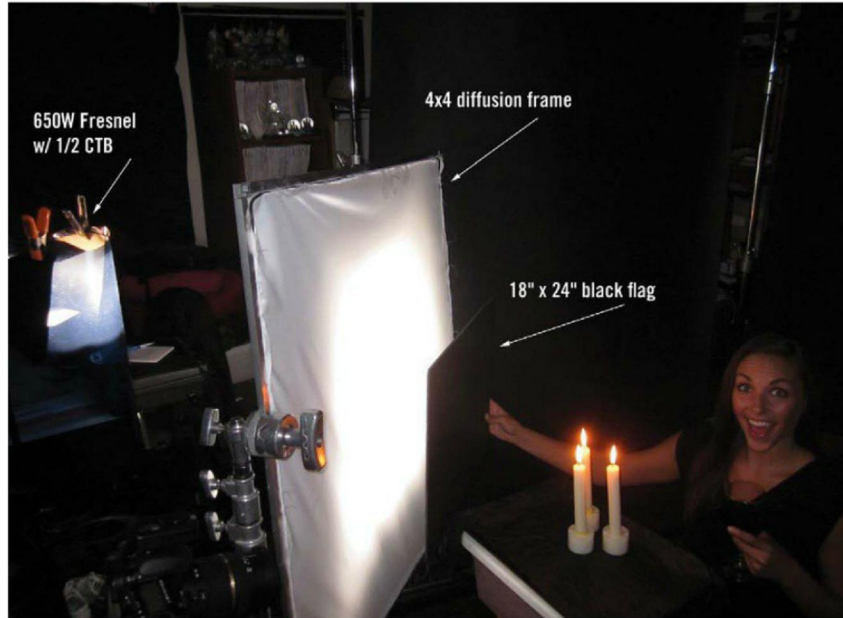


One, two, or three-day conference passes are available. Visit www.lapostconference.com and use code **WS10** for \$50 off the lowest conference program price!

Wednesday, September 19 Exhibit Hall Open 11:00 am – 6:00 pm				
	Adobe	Apple	Avid	Production & Social Media for Post Production People
9:00 am - 11:45 am	The Power is in the Keyboard: Adobe Premiere Pro Trimming and Keyboard Shortcuts	Great Third Party Tools to Extend FCP X Capabilities	In Getting it out: Advanced compression with Sorenson Squeeze and Media Composer	Building a Social Media Strategy from Scratch
12:00 pm - 1:15 pm	What's new in the CS Suite	Rethinking Editing in FCP X	Scriptsync and Phrasefind: Storyteller Tools	DSLR Basics - What You Need to Know for a Successful Shoot
1:15 pm - 2:15 pm	Lunch Break			
2:15 pm - 3:30 pm	Getting the Most out of Dynamic Linking	Media Management Secrets for Success	DSLR and Red - File Based Workflows for Media Composer	Secrets of Successful Shoots: Recording Great Audio
3:45 pm - 5:00 pm	Adobe Media Encoder: Flexible output	Getting Great Looking 3D in Apple's Motion Quickly	Multi-camera Essentials for Avid Editors	Key Interviewing Skills

Thursday, September 20 Exhibit Hall Open 10:00 am – 5:00 pm				
	Adobe	Apple	Avid	Production & Social Media for Post Production People
9:00 am - 10:15 am	In Depth: Adding Premiere Pro to your Toolset	In Depth: Adding FCP X to your Toolset	In Depth: Adding Avid to your Toolset	Building a Social Media Strategy from Scratch
10:30 am - 11:45 am	Professional Color Correction in Premiere Pro	Sound Design Techniques in FCP X	BCC: The Best Effects You've Bought But Aren't Using	MiniCams - GoPro, Replay, Contour and More for Action Shooting
1:15 pm - 2:15 pm	Lunch Break			
2:15 pm - 3:30 pm	Mastering Mixing in Premiere Pro and Adobe Audition	Color Correction in FCP X	Expert to Master: Advanced Techniques in Media Composer	Selecting the Right Lenses for DSLR shooting
3:45 pm - 5:00 pm	Motion Control 3D: Bringing Your Photos to Life in Three-Dimensions Part 1	Building Custom FCP X Effects in Motion Part 1	Advanced Color Correction Methods in MC Part 1	Production Tactics to Fit Your Budget: From Lean to Fat Part 1

Friday, September 21				
	Adobe	Apple	Avid	Production & Social Media for Post Production People
9:00 am - 11:00 am	Motion Control 3D: Bringing Your Photos to Life in Three-Dimensions Part 2	Building Custom FCP X effects in Motion Part 2	Advanced Color Correction Methods in MC Part 2	Production Tactics to Fit Your Budget: From Lean to Fat Part 2
11:15 am - 1:15 pm	Typesetting Secrets for Motion Graphics	Beyond the Basics: Compression and Delivery with Compressor	Building Heavy Composites in Media Composer: Methods and Strategies for Sanity	Advanced Lighting Tips: Doing More on a Tight Budget
1:15 pm - 2:15 pm	Lunch Break			
2:15 pm - 4:15 pm	Realistic Looking Green Screens: Tips From the Masters	Apple Motion Animation: Sophisticated Animation with Behaviors	Remapping it All: Buttons, Settings & Preferences for Media Composer Success	Secrets of Green Screen from Onset Through Post



Tungsten setup



Fire color



(continued from page 67)

explosion to get the deep orange fireball.

Using tungsten (3,200°K) fixtures is a good start, and you can get their light closer to 2,500°K or 2,000°K to better match the color of the fire if you dim them. If you don't have dimmers, use CTO or CTS color correction filters to help warm the light for a better firelight feel.

I also like to use strands of Christmas lights stretched around an open frame. The small bulbs create a very warm, soft light that nicely matches the feel of the fire/candles without imparting the "sourcey" feel you can get from a single light source. The fall-off from the Christmas lights is also very pleasing, so there's less spill to contend with.

You can cheat the color of the fire even more. With such low color temperatures from the flame, using standard tungsten (3,200°K) white balance would seem to be the right thing to do, getting a nice orange/yellow fire; however, if you adjust your white balance to daylight (5,600°K), the color of the flame will be considerably richer in red/orange and show much more depth and texture. This means that your lighting needs to be closer to 4,000°K to keep it feeling warm (as if emanating from the flame source) but not so warm as to turn your subjects into bright red tomatoes.

When you're adding light, it's important to use flags to cut the light off of the candles themselves, as that can be a dead giveaway that you're supplementing the candlelight.

These "rules" don't always apply, of course. For the opening image in this story, I shot model Becka Adams in a dark garage illuminated only by a road flare. With a daylight color setting on the camera, the color from the flare is a rich red that really adds dramatic flair (forgive the pun) to the image.

When I opened the garage door slightly to let in some daylight and stop down a bit, I got only a touch of color in the flame and lost a lot of the dramatic feel by filling with daylight. In this case, my preference would have been to shoot with the flare alone, although the second image (at left)—with more daylight fill—would, traditionally, be considered a more correct exposure. **dv**

Additional sources used in this story:

Fisher, Bob. (1991, May). "The Heat Is On in Backdraft," American Cinematographer, 72(5), 42-50.

DiGiulio, Ed. (1976, March). "Two Special Lenses for Barry Lyndon," American Cinematographer, 57(3), 276.