A GTC Workshop

Cinematic Lighting
with Ian Murray

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On Saturday 18th January, the GTC held an information packed new wave of lighting masterclass Cinematic Lighting with Ian Murray at Black Island Studios in West London. Ian was joined by a team from reflective lighting specialists Reflectric: Jonathan(Jono) Smith and Jason Clare.

Ian was one of the first DoPs in London who adopted the new reflective lighting system. He first came across the system at BSC Expo a couple years ago and an article by cinematographer Christian Berger AAC. Berger developed the reflective lighting system after a request from a long-term collaborator director, Michael Haneke, who was looking for a way to give more freedom to actors on set. By moving all the lighting fixtures outside the window and reflecting light back into the room, the actors were free to move around anywhere in the room.

As a DoP, Ian has always embraced new technology and he felt this was the right philosophy. Although he had to learn how to light in a different way, he thought it was rewarding and the naturalism and the uniqueness that the system gives sets him apart from others. He said he thought reflective lighting was painterly when he first tried it and it had almost a "biblical quality to it like a shaft of light coming into a cave". Ian began the workshop by showcasing his work using the system and sharing his philosophy to lighting.

What Is Cinematic?

Through his extensive work on commercials, Ian showed slides from his recent assignments and explained there are several factors to make images more cinematic. For example, an anamorphic lens which doesn't project a realistic image can actually make things look cinematic. A wider range of shots, say a combination of a big landscape and a close-up, can make the footage more cinematic. Being confident and not shooting from too many angles can make a film look more cinematic. Ian pointed out that it is a DoP's job to note the time of the day and inject a sense of three dimensions into two dimensions and that good lighting should be invisible and it not jump out of the story.

Using the example of a coffee advert, Ian showed us how

he used the reflective lighting system by placing the PB70, a powerful parabolic parallel beam light, under each high window of the location to bounce light on to reflectors to simulate the natural sun coming into the large warehouse type room.

One of the benefits of a reflective lighting system is that by bouncing the light back from a reflector, we can place the virtual light source much further away, thus minimizing the effect of the inverse-square law. This allows actors to move freely inside the room, without any noticeable changes of light intensity. However, it is this homogeneous parallel beam coming from afar that provides a feeling of natural light and doesn't need a cherry picker to achieve it.

There are other benefits. The PB70 is 1.2kW and yet can outperform an 18K as

Dedolight PB70

	Lux @ 5 m	Lux @10m	Lux@ 20m
PB70 1.2 Hmi	112.00	68.000	18.100
Arri 4K Hmi	7.780	1.945	486
Arri 18K Hmi	218.800	54.700	13.675

Diagram 1(slide from Reflectric presentation)

a 20 metre virtual light source (see diagram1). You can use other lights with a beam angle of up to seven degrees to work effectively with the reflective system. You can now have a parallel beam intensifier for every Dedolight focusing light range, which can boost the output by up to 600% compared to the regular spot position. Furthermore, you can plug the beamers into the mains, negating polluting diesel generators.

This is a very ecological system. Ian also added that it is fairly quick to start seeing the lights on set so the producer and the director don't rush you as much, compared to having cables and generator being set up with no lights in sight after, say, an hour or more. We have all used reflective lighting but the difference with this system is that the reflectors have four types of surfaces which are highly tuned. No.1 is the most reflective and serves to redirect the light without changing the beam size or the character and No. 4 is the least reflective and creates a much softer light. These reflector surfaces are highly efficient and 95-98% of the light can be effectively reflected. Below is a list of the four reflectors with their characteristics.

Reflector Types
Light source based on one-metre distance between the light fixture and the reflector

Reflector No.1
Virtual Light Source – 150cm behind the reflector (1.5 times the distance), exit angle 4 degree

Reflector No.2
Virtual Light Source – 47cm behind the reflector (½ the distance), exit angle 12 degree

Reflector No.3
Virtual Light Source – 12cm behind the reflector (1/8 the distance), exit angle 50 degree

Reflector No.4
Virtual Light Source – 4cm behind the reflector (1/16 the distance), exit angle 95 degree

There are also four sizes of reflectors – 1x1m, 50x50cm, 25x25cm and 7x10cm. You can reflect multiple reflectors from a single source to light different areas of a room simultaneously or put smaller reflectors inside a bigger one to create a different effect on different subjects. You can also double bounce the reflectors to extend the light source further if you don't have room in the studio between the set and the studio wall.

This system allows you to emulate natural daylight even in a confined location. You can even use the reflectors to reflect practical lights to enhance them in your location. There are two ways to control the reflectors: **Dimming** by slowly dipping the reflector into the light source when you can intuitively decide how much light you want. **Zoning** by panning and tilting the reflector when you can precisely set the light zone with much more control than a common bounce board.

In their presentation, Jono mentioned that productions that use this system require only one tenth of the wattage associated with regular lighting and that you also tend to use fewer lighting fixtures with this system. The ratio is one to seven or one to ten fewer lights, therefore it is energy saving and therefore 'green' lighting.

After the presentation by Reflectric, Ian started his demonstration using the set that had been prepared for us. It had walls on two sides, one of which had a door and the other had a window. Ian was very generous in sharing his knowledge with us, showing us his tricks in detail. In commercial shoots, which he does often, he said he would first create natural light, say the sun from the window, and then adds an accent light. An accent light isn't natural but he disguises it well to integrate it within the scene.

In his example, there was a model sitting at a table with her back facing the window. He hid a Kino tube on the edge of the table to subtly light the model's face. He sometimes uses the edge of

DoP Ian Murray with the *Sony Venice* rig

a light rather than the centre of light and often has a 1/8 Hampshire Frost or a net on the windows. Ian also drops Hampshire Frost between the subject and the light. To finally soften the light even more he often uses a Source 4 for a specific area of the set which may also be used to reflect light on a reflector. He embraces mixing light and thinks it is a part of our modern world. Colour such as red can signify 'primal', while blue can signify 'intellectual'. Sometimes he uses a double net on windows to stop down the outside and puts light-flexible black building material, as an easy way to quickly cover a larger area that you don't see, to control the ambience.

You can also put different colour gels next to each other on a PB70 to create a nice gradation, which cannot be created in post. It is interesting that by using the same light to reflect different reflectors, you don't have a problem of multiple shadows.

Ian was using a combination of the reflective lighting system and LEDs in this workshop. Jono and Jason took us through the current state of LED technology and what is available in the latest LED products from Kino Flo. LED technology has come a long way since its advent and has now become much more reliable and been used on high-end productions.

Jono and Jason pointed out (as seen in Geoff Boyle's Tungsten vs LED lighting test on skin tones) - we must remember that each manufacturer's camera responds differently to the same LED light. Each camera sensor has its own unique characteristics and responses, just like different film stocks and every manufacturers LED's from are different and can vary from batch to batch. We suddenly realise that we are faced with so many variables in the LED lights that we have been using – I certainly remember a situation where the tungsten setting looked a lot yellower than I expected.

LED lights are a discontinuous light source and tend to have blue and green spikes and frequency gaps in the full visible spectrum. It is important to get clean light, especially on facial skin tones, otherwise you could get caught out in post.

Jono and Jason further explained that clean 'white light' tracks along the blackbody curve known as the Planckian Locus, named after German physicist Max Planck who derived the equation. That is a path that the full visible spectrum light emitted by a blackbody radiator such, as the sun, takes in a colour space as its temperature changes. Jono and Jason added that

The Planckian Locus & Bi LED

Diagram 2 (slide from the Reflectric presentation)
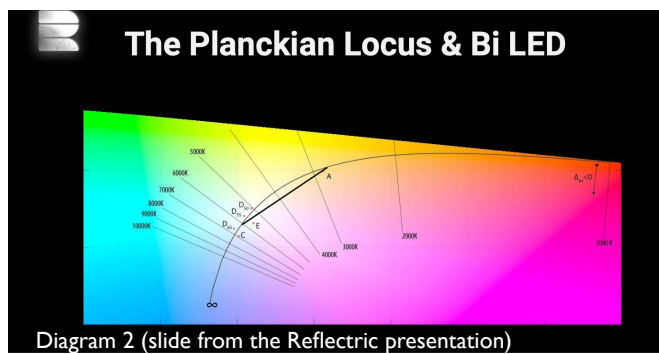
Bi-colour LEDs are most vulnerable. The straight line in Diagram 2 depicts a path that Bi-colour LED takes. This indicates that if you dim the light too low, there will be a shift in colour temperature towards a warmer tone. Ian suggested, if you were to use this kind of LED, it is better to reduce the output with ND rather than going below 10% on the lighting adjustment.

FreeStyle, a new generation of LED fixture from Kino Flo, has overcome various aspects of these issues. It is equipped with five LED chips – RGBWW, i.e. red, green, blue and two whites - namely warm white and cool white. It is these additional two white chips that can now produce 'pure white' in LED technology.

Additionally, introduced in September 2019 with True Match® Firmware 4.0, FreeStyle offers a colour space option so that you can double check what a particular colour would look like in the colour space that footage is delivered in. The options are rec709/sRGB,

P3 D65, rec2020 and ESTA E1.54 on top of Kino Flo Default(KF Default). This would be useful if you were working on a particularly colour sensitive project. Colour Space can also provide a means of matching colour points between manufacturers.

Also introduced in September 2019 with True Match® Firmware 4.0, FreeStyle can offer a revolutionary Camera LUT function. The idea is that it allows you to select the camera you are using and FreeStyle can match the particular sensor response of the camera so there won't be a colour shift, as seen in Geoff's clip mentioned earlier. In other words, FreeStyle uses LUTs to align to the camera's spectral curves, aligning the light and camera to the Planckian Locus.

The currently available options are ARRI Alexa, Sony Venice, Panavision DXL, Panasonic Varicam on top of KF Default and there will be more to follow.

It happened that Cirro Lite arranged some FreeStyle lights for my recent shoot, which I was using the ARRI Amira for. I tried out this function and compared the two settings in the Camera LUT menu – KF Default and ARRI Alexa. I took some screen grabs and examined them on a monitor. I could see that the image with ARRI setting was definitely cleaner. The skin tone was better and all the highlights on different parts of the subjects were more white. It was subtle but the image with the ARRI LUT had more definition to it than with the KF Default. FreeStyle clearly corrected the white to the Planckian Locus according to the ARRI sensor. I was surprised to see that such a small shift in colour makes such a difference in the image.

After varying the set lighting, we moved on to 'Lighting a Portrait'. Ian reminded us that the old master, Leonard da Vinci, said if the face had perfect symmetry, the ideal position to light the subject would be from 45 degree in front and 45 degree above, creating perfect loop lighting. Most faces are not symmetrical so he suggested moving the light from side by side to see which side is better for the subject. Ian referred to his three-point lighting as modelling light, separation light and softening light. Again he stressed that it is the cinematographer's job

to create a 3D feeling out of a 2D image. He began lighting with a strong back light, (separation light), then added soft side light (modelling light), and a soft three-quarter fill (softening light). Ian pointed out it is great to use a reflector as a separation light because it is easy to change and adjust. He also told us to watch out for darker skins because they can be very reflective in which case you need a bigger source to avoid the usual reflection on the forehead.

Ian then took us through various different lighting effects. One of them was a top light. Top light accentuates age and doesn't give an eye light. He mentioned an example of what Gordon Willis did on *The Godfather* where actors were lit from above and didn't have the eye light creating a more 'shifty' feeling; the audience wouldn't have a connection with the characters and have no feeling of what was going on in their minds. Conversely, Ian used a Dedolight DP2.1 Image Projection Attachment with built-in shutters to light just the eye area of the model to accentuate the face and to signify what the subject might be thinking to the audience. Another was a classic portrait with Rembrandt light with a triangle in the cheek. He also demonstrated using a Hampshire Frost frame to soften the key and a poly board for a subtle fill. Ian

added that the only time you would light from the front is for a 'beauty' shot. In this case, he would try to create a nice face shape by shaving the cheek area with the light.

Towards the end of the workshop, Ian managed to cram in 'product shot', 'car' and 'wine bottle' shots. It was interesting to see the different effects of hard light and soft light on the car body (a model). With the product shot, Ian suggested that you would want to find out what you are lighting as soon as possible as your lighting would differ a great deal depending on the texture you are filming. He also suggested that, for a colour critical shoot such as 'food' and 'beauty', it might be worthwhile bringing in those reliable tungsten lights if in doubt.

Thank you, Jono, Jason and the rest of the crew, who help create this workshop. It was one of the most informative lighting workshops I have attended. The GTC would also like to thank CVP for their provision of camera equipment and crew for this workshop and to Black Island Studios for the use of their studio space and facilities.

Due to the popularity of this workshop it is hoped to repeat the event this year.