

Digital Praxis Ltd.

The Granary  
Throcking  
Buntingford  
Herts  
SG9 9RU  
+44 (0)1763 281 699  
+44 (0)7765 400 908  
steve@digitalpraxis.net  
www.digitalpraxis.net



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# Credo

***Prepare to Believe...***

***Indie film making:***

***High Production Values via Digital Cinematography and DI Post-Production .***

Post-production is nearing completion on ***Credo***, an indie supernatural horror set in London starring Myanna Buring (*The Decent*), Clayton Watson (*The Matrix* trilogy) and actor/singer Stephen Gately (*Boyzone*), produced by Alto Films.

The film is Director Toni Harman's first feature, after a number of successful short films, and tells the story of five London students evicted from their London flat who decide to break into an abandoned Catholic halls of residence for the weekend, only to discover that they're not alone.

*Credo* is a film that focuses on the dark side of the human psyche, and the terror in facing up to one's darkest fears, written and lens'd by DoP Alex Wakeford, Toni's partner in Alto Films, and shot entirely on location in Marylebone in two principle locations: a vast, derelict Regency townhouse and an abandoned Victorian fire station.

From the outset, it was apparent *Credo* was going to be a challenge for Alto Films, as having spent the last few years growing increasingly frustrated with the roller-coaster world of film finance, Toni & Alex had decided that for this particular project they would go it alone and stand on their own feet, making the most of the resources at their disposal.

This approach meant *Credo* was always going to be a fast turnaround film, with a small crew, limited locations and limited budget.

However, from the first week of pre-production things started to snowball in the best possible way, as through Alto Film's relationship with Steve Shaw, from Digital Praxis - who has recently partnered with Axis Films to form Axis Post, a DI boutique based at Shepperton Studios - an agreement was reached whereby Axis Films and Axis Post would come on board as production partners, providing the shoot with a Panasonic VariCam HD Digital Cinematography camera, with full production package including Canon Hi Def Cine Style lenses, and the addition of specialised lenses as and when required, as well as full on-line picture post-production at their brand new state-of-the-art DI based post-production facility, Axis Post, located within Shepperton Studios.



However, the late involvement of Axis meant that pre-production camera, audio and offline workflow testing were to be minimal at best, with the 15<sup>th</sup> August set aside for all available testing to be performed, with principle photography due to start on August 21<sup>st</sup>. Seriously tight deadlines!

The initial idea was to shoot 25fps progressive, as the goal is for a theatrical release as well as video, but Alto and Steve Shaw have previously encountered problems when shooting 25fps for 24fps film deliverable, with the main problems coming from audio re-timing, with left-to-right phasing errors being introduced when re-timing and re-pitching the audio. Experience has shown that such problems do not occur when going from 24fps to 25fps for video deliverables, so a 24fps workflow ideal was settled on.

But, the first major set-back was on the camera and offline workflow test day when it appeared that the offline Avid system was unable to ingest true 24fps.

This forced the production to take a 'NTSC' approach to the shoot buy using a 23.98fps workflow. That in itself did not seem to present too much of a problem, but when it came to setting the VariCam for this rate the menus were none too helpful; especially for those who had not had hands-on experience of the VariCam before.

The main menus list basic frame rates – 24, 25, 30 – but do not mention 23.98. Luckily the staff at Axis has more VariCam experience than most and soon worked out that you have to use the frequency setting to invoke the sub-frame rates of 23.98 or 29.97. Weirdly this means setting the frequency to 60hz for the full figures, and 50hz for the sub rates – weird as the USA is 60hz based and the UK 50hz...

Having tried, and failed, to get this information from Panasonic UK the support from Axis was obviously very welcome, and further demonstrated the benefits of a production through to post-production workflow as being provided by Axis Films and Axis Post.

However, things were about to get even more confusing...

The original idea had been to record images and audio at 24fps, as for any 'film' project, but obviously the shoot had already been forced to go 23.98fps. No problem: Attach the audio DAT timecode input to the camera TC output and set that to 23.98 too.

But no, for some reason this approach just wouldn't work as it proved impossible to get the DAT to lock to the TC output from the VariCam.

After a number of further calls to Panasonic UK it was eventually discovered that the TC out from the VariCam was always 30fps (29.97 at 50hz)! This as the VariCam always records 60fps, flagging the frames needed for the selected frame rate. Therefore, as there is no 60fps timecode format, the camera always runs internally with 30fps.

It would have been a lot easier if Panasonic had made this information more readily available.

As this information wasn't found out until the end of the camera test day a second day had to be quickly rescheduled immediately prior to principle photography starting... Not at all ideal!

Luckily a knowledgeable audio sound recordist joined the team, who in discussion with Steve Shaw from Digital Praxis/Axis workout the best route forward using Locket boxes to jam-sync the camera and audio recorder, both at 29,97fps, with the VariCam flagging frames for 23.98fps. The decision was also taken to feed the audio into the camera to enable simultaneous recording of images and audio and allow for a potentially easier offline workflow.

This meant a standard 'NTSC' based Avid offline workflow could be used to maintain sync between the image and audio, with later conversion to the required deliverable framerates.

Other issue encountered during camera testing included the setting up of the dynamic range of the camera.

Previously, Alto have shot with Sony f900, using the Digital Praxis Gamma Curves for extended dynamic range, and with Viper in its amazing FilmStream mode, so have become well aware of the possibilities for extended dynamic range capture with these cameras.

The VariCam boasts a Cine Gamma mode that is reported to provide a 'film like' captured dynamic range and it was this mode that was intended to be used to use to maximise later Digital Intermediate post-production at Axis Post.

However, it soon became apparent that Cine Gamma is a poor relation to the Digital Praxis f900 CVP Gamma Curves, or Viper's FilmStream mode. It would probably have been possible to build camera setting using the various matrix and knee settings within the camera, but this is not the same as a well generated Gamma Curve (as with the Sony f900 and Digital Praxis curves) as the curve characteristics are more difficult to second guess without extensive testing – which there just wasn't time for. There was no option but to go with the inbuilt Cine Gamma Curve and shoot around the potential highlight issues.



At this point it must be made clear that the Cine Gamma setting for the VariCam is in no way inferior to other HD cameras when used for video work, but just not equal to the DR available with Viper or a f900/950 with Digital Praxis Gamma Curves.

What was amazing was the quality of the images being captured when compared to previous Sony f900 and Viper experience – they were every bit as impressive.

These camera and workflow issues also meant there was still a lot of faffing going on regarding the offline requirements as the shoot went into principle photography, with offline editor, David Wigram, have in-depth discussions with Steve Shaw as the shoot started, even though Steve was on holiday in Turkey...

In the end the offline process was very simple, even though there had been talk of needing a frame rate converter and all sorts of other faffing and messing around during attempts to talk to Panasonic and others regarding a VariCam based shoot.

As has been said, the shoot was 23.98 image, with 29.97 audio recorded to DAT, and used a Panasonic 1200 vtr from Axis to load the rushed onto a 23,98 timeline, with offline audio coming from the camera recording, which meant the timecodes for image and audio locked automatically. The DAT audio being used as a backup, and for shots where it had proved impossible to capture audio simultaneously within the camera - such as steadycam shots.

When the DAT audio was used the fact that one second of audio would always sync with one second of image makes life fairly easy, even with the different timecode rates.

Simple!

The shoot was also blessed with an outstanding cast and crew who performed above and beyond their call to duty. With a budget that would only allow a three week shoot, everyone had to rely on a boundless supply of energy, enthusiasm and adrenaline. To keep filming as quick and efficient as possible, it was common to film the final rehearsal on set, make any adjustments and then go straight for another take. More often than not, the cast nailed their performances and the crew were on top of their game which meant to shot was often got it in that first or second take. Sometimes if things didn't go right it would go into more takes, with a record of seven – albeit on the film's biggest shot of all: an epic steadycam shot which spanned three floors and involved the discovery of a multitude of gruesome corpses... It was all about timing and performance and luckily it all worked fantastically well producing *the* shot of the film.

As production were working to such a tight schedule, one of the best decisions made was setting up an edit suite on-set which was operational from the outset. At the end of each day, the editor, David Wigram, was delivered the rushes from which he'd put together an assembly edit of the scenes for the director, DoP, the producers, and anyone else interested to view, every day. This worked amazingly well particularly because the production just didn't have the time to often watch shots via playback on set. So this editorial workflow meant that David could give feedback while production were shooting, and this proved invaluable on several occasions, particularly when a re-shoot was required for technical reasons or to pick up a shot or add additional coverage to make a sequence work better.

Editing on-location truly came into its own after the shoot wrapped at 5am on Wednesday 13th September, as by 5pm that very evening production were able to watch the whole movie as an assembly edit, all two hours of it, with every scene and just about every shot included.

It amazing to be able to see a film, albeit in its roughest form, in its entirety on the same day as the shoot finished.



With such a short schedule, production were aware from the beginning that every moment of preparation was vital to the success of the film, and utilised two previsualisation tools to make the most of this: Antics 3D and Frameforge 3D. With these software packages production were able to

recreate locations in 3D and storyboard every tricky sequence long before stepping on set. It was possible to instantly determine camera positioning and height as well as the focal length of the lens for each shot, therefore making it possible to see what worked and what didn't long before cranking up the camera.

Moreover, there is nothing better than physically showing the crew a printout of the shot to be achieve, rather than spending time explaining the set ups on set just prior to the shoot.

The script was written by DoP Alex Wakeford who used the experience to push the VariCam to the limit, and being aware that the camera favours the shadow end of the curve, he was determined to shoot in the lowest light possible. A tungsten lighting package was provided by Lee Lighting, but for many scenes the main sources of illumination were often torches and lanterns which were invariably in the hands of the cast.

Myanna Buring had recently been through a similar experience on Neil Marshall's *The Descent* and was by now expert at finding the right surfaces to bounce the torch beam back to create the most aesthetically pleasing lighting on her face. This worked very well, and meant a lot of the shoot was simply lot with practical lighting - stressing the camera to the limit.

Always keen to test out emerging technology, Alto Films decided to utilise LED lighting throughout the shoot, providing much of the look of the film. Gaffer, Pete Carrier and Alex spent a day sourcing camping lanterns which would not only be hot props but also provide key lights for several scenes. Unable to find a sufficiently bright LED lantern, production bought a couple of conventional battery units and gutted them, replacing the single bulb with an array of blue LED's. When held close to the actor's face, it created an eerie glow that was ideal for a horror film.

The exposure was often boosted by further strips of LED's craftily hidden within shot, and DoP Alex soon discovered that even the slightest repositioning of the LED strips gave off a completely different light. Once this had been figured this out, it worked to his advantage, being able to light each actor differently depending on the emotion of the scene. The LED's and VariCam came into their own when a scene required only motivational light from the screen of a laptop computer. After a lot of hard work and pleading with the Assistant Director, a scene was achieved that feels completely believable and yet unique in its look.

The only slight difficulty production had with the VariCam was with its limited dynamic range in highlights, in particular with the hotspots in the middle of the torch beams. The actors soon learned to hide these hotspots with their bodies or with parts of the set.

With much of the film being shot on the second storey of a Victorian Fire Station, conventional placement of lamps outside windows was impossible so the shoot went for a street lamp look directing the lights up onto the ceilings from below. The VariCam had a little difficulty handling the highlights created on the dirty windows and it took some careful interior balancing to bring the exposure back under control. It would have been a lot easier cleaning the windows, but this would have destroyed the derelict look of the buildings so important to the film!

The shoot was monitored on three different monitors: a 23" HD Vutrix flatscreen generously provided by Stephen Bone of Frontniche, a 17" Panasonic from Axis, and an Astra waveform monitor which was mounted to the camera to double as an aid for the focus puller – also from Axis.

Axis Films also provided the shoot with a probe lens that really came into its own in a scene where we needed to get up close and personal with a Ouija Board. We were able to get the macro lens right in with the planchette as it raced around the board.

With production wrapped the focus turned to post-production, with the offline being finalised by David Wigram, and on-line & DI grading taking place at Axis Post within Shepperton Studios.

While David was slogging away performing the offline editorial, Axis Post were able to perform an initial online conform from the 'in-progress edl', updating the online as the offline progressed towards a final lock.

The online conform was performed from AAF files delivered from David's Avid, with the master VariCam tapes auto-conformed via Axis' Panasonic 1200 vtr.

Even though the offline edit was not locked at this stage the DI and grading could start as the Quantel Pablo can re-conform an edit from a new edl at any stage, using either the existing media with any grading performed thus far, or using new media where required, but automatically applying the existing settings to maintain work done on the previous online conform.

This is one of the major benefits of using the Quantel Pablo DI system as it allows you start the online and DI process well before the offline editorial has locked.



The online conform worked almost flawlessly, with only two minor issues; one source reel had been miss-labeled, but was quickly identified, and a number of source tapes had timecode that rolled over midnight, so had to occasionally manually repositioned to allow the correct timecode clips to be

conformed. All very minor, and easy to deal with.

One issue that was found post the conform was a problem bringing in the offline video as a reference for the online. The problem seemed to be associated with the 23.98fps frequency of the footage, combined with the use of QuickTime to compress the offline footage for ftp transfer over the web.

However, Axis Post were able to easily ingest the offline audio as wav files and these quickly confirmed the online autoconform had been 100% accurate, even through the changes from initial conform to the final locked offline reconform. A very easy and very creative workflow, even with the slight hiccup with the offline video ingest. - that was later sorted by changing the QT codec being used, enabling the final on-line to off-line check to be performed using images as well as audio.

Once conformed, or actually during the process of working towards the final editorial lock and final conform, the film was graded on Axis Post's iQ Pablo DI system, using a Cine-tal LCD monitor, OmniTek waveform system and Cineo3+ TI projector, using specially built film print calibration LUTs for the projected image, developed via Kodak's KDM system and the Digital Praxis LUT Builder.

As Toni Harman, director, reported, "There have been a few minor hiccups and technical challenges along the way as we mixed formats and established the best work-flow, but from my perspective, the whole post-production process has been remarkably smooth, and having only seen the film on relatively small HD screens during the shoot and offline, it was an amazing experience conforming and grading the film on a cinema sized projection screen at Axis Post."

And Alex Wakeford, DoP adds, "Overcoming potential future post issues was essential at the pre-production stage and marrying together the quirks of the VariCam's frame rate and Avid Xpress Pro was tougher than expected, but fortunately for us, the Quantel Pablo employed at Axis Post has been designed just for such challenges. From the very start, it was our intention to be adventurous with the look of Credo and we wanted to push the VariCam and iQ Pablo to the limit.

Having been slightly unsatisfied with our previous experience of HD, we decided to go for a look that eschewed the clean, sharp lines normally associated with the format and go for a style that had more texture and an organic feel to it.

We designed small LED units to lend the film an eerie and hopefully unique look, but found that they created a hue that was perhaps too blue for us. Rather than lose light levels by correcting the LED's, we compensated by gelling our tungsten "street lamp" sources with an amber that normally would have been too strong. We were then able to bring the overall saturation levels down in the DI grade until we achieved a bleak starkness that was appropriate for a horror film. A fantastic and totally enjoyable way for a DoP to manage the look of a film, making the most of each stage of the 'film' process, not just working with the camera.

Knowing that the iQ Pablo could handle a mixture of formats, we also employed a Panasonic HVX 200 camera for certain inserts and the title sequence.

The beauty of the Quantel system is that we had all the confidence in the world that we'd be able to mix different formats and frame rates allowing us to successfully output at 24 fps onto 35mm film."

One of the big processes used during the on-line to maximise the available image captured via the VariCam was to re-map the original 'video' footage into the world of data, allowing the over-range detail captured by

the camera - detail beyond video's 64 black and 940 white points - to be brought into the active image area, allowing an immediate extension of the image's dynamic range.

Combined with the use of the VariCam's 'cine gamma' mode for image capture, this gave a starting point for the online DI post-production grading that was very close to that attained via working with a DPX log image. This made the DI process a lot more creative than would be traditionally available with a 'video' based VariCam workflow, and gave a much more 'filmic' feel to the final image.

The original 720 footage was also up-res'd to 1080, and as part of the grading process was 'pushed' into 10bit LOG colour space (DPX/CIN) in readiness for the final film-out recording.

From this starting point the online DI was a very straight forward process, with most effort being made to grade the film to meet the artistic desires of Toni and Alex.

The result is a film that shows more quality on screen than the budget would suggest.

When you have the opportunity go see Credo to make up your own mind.

The final phases of the production and post-production story, including the sales process, can be followed via the film's website: [www.credothemovie.com](http://www.credothemovie.com).

ENDS

#### About Axis Films, Axis Post & Digital Praxis

Axis Films offer a full range of HD and SD equipment suitable for all needs. Axis Post offers clients true High Resolution post production with the facility's Quantel iQ DI system combining grading, DI, editing, effects, colour grading through to versioning and deliverables all in a single system. Both companies offer the very best in digital cinematography and operate in all areas of production from documentary to commercials, corporate and feature films meeting the continuing demands for the highest standards. Headquartered in Shepperton Studios, Axis has additional offices in Glasgow and Leeds. All staff are qualified camera crew, offering the best in technical advice and practical know-how.

[www.axisfilms.co.uk](http://www.axisfilms.co.uk)



Digital Praxis has become one of the industry's leading figures in digital cinematography and digital intermediate operations, with support provided globally to production and post-production operations, as well as being provided to equipment manufacturers. Steve Shaw, CEO, has numerous credits for feature film DI and grading work, as well as acting as digital film technologist in building operational workflows.  
[www.digitalpraxis.net](http://www.digitalpraxis.net)

For further information, please contact:

Steve Shaw

Digital Praxis

Phone: +44 (0)7765 400 908

Email: [steve@digitalpraxis.net](mailto:steve@digitalpraxis.net)