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Talent and Dedication Bring Indie Mystery Thriller *Ingenium* to the Big Screen
ASSIMILATE's SCRATCH Plays Key Role in Film's Consistent Look

Dedication to their craft of creativity is a requirement for indie filmmakers and this was fully demonstrated by brothers **Steffen Hacker** – director, editor, producer – and color grading artist, **Peter Hacker**, in the production of their new thriller feature, *Ingenium*. The film is an amalgamation of the typical indie challenges: multiple cameras with differing formats, resolutions, and codecs; limited time and varying work schedules; and those ever-nagging tight budget constraints. It's a story of a labor of love, using your talent, ingenuity, and tools to bring your creative vision to the big screen. Steffen and Peter discuss how they made it happen.

Steffen Hacker: *Ingenium* started out as a short film and over two years evolved into a full-feature. We began shooting the project in Bangkok at the end of 2013 using a Sony FS700 with custom SLOG settings to internal media, and a bit-rate hacked Panasonic GH2 as the second camera body.

Even with the Sony camera's powerful slow-motion abilities (large-sensor camera landscape from five years ago!) we wanted to upgrade the material to 10-bit with less compression for the rest of the film, which we planned to shoot in Germany.

Due to the low-budget nature of the project, we could not afford to rent several bodies of the same camera and basically combined whatever we could get hold of. We experimented with the other cameras until the famous "Magic Lantern Raw Hack" suddenly turned our Canon 5DMK3 into a "mini-Alexa" (at the expense of enormous bit-rates).

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By the end of filming, we had used eleven different camera models in all flavors of codecs, resolutions and wrappers: Sony FS700 and FS100, Sony F5, Panasonic GH2 and LX-100, Canon 5DMK2&3 and C300 MK1, Blackmagic 2.5K and 4K, and eventually an Arri Alexa Mini. The only common component for all these cameras was the same white balance settings most of the time.

> **This complex juggling of cameras is often the nature of a low-budget production… If I had not known my brother Peter was on board with his expertise in Assimilate's SCRATCH software, I would have been more hesitant, but having seen the color magic he is able to pull off from sub-par material I was not worried. I knew he would balance out all the footage during grading.**

This complex juggling of cameras is often the nature of a low-budget production, but it gave us amazing first-hand insights into what camera look we liked best out-of-the-box. It also created a hell of a job for color grading and finishing in post-production. If I had not known my brother Peter was on board with his expertise in Assimilate's SCRATCH software, I would have been more hesitant, but having seen the color magic he is able to pull off from sub-par material I was not worried. I knew he would balance out all the footage during grading.

Look-wise, Peter had all the freedom in the world, I just gave basic input on the moods of some key scenes. However, there was no doubt that one consistent look for the entire film would not be easy given our Guerilla style of shooting. For example, in some scenes our DPs Benjamin Nolde and Till Beckert — each shot half of the film's footage -- were able to light and detail carefully; others were more "run'n'gun" using only available light due to budget and time restrictions.

Peter Hacker: When I started seriously working on the film in early 2017, Steffen had done all the editing and it was 99 percent completed at the beginning of 2017. I took key scenes from throughout the movie and tried to find the overall Look and quickly realized there wasn't one due to the use of so many different cameras during the shoot.

After the first grading session, we decided to just make every scene in itself look as good as it gets, while trying to be as consistent as possible overall. I had to face the reality that the challenges for color grading were numerous.

The movie had around 2000 edits. Often when I started with one scene, and then moved on to a second scene, I would try to match the material from the different cameras; however, each shot may have been in a different city or country, or maybe shot even two years apart. So, lighting and backgrounds would have changed a lot. I wished we could have gone the route of XML from Premiere but that wasn't possible for several reasons. The biggest factor was that with all the different cameras and codecs, Steffen was working with a lot of sub-sequences in Adobe Premiere, which back then didn't easily translate into SCRATCH. Furthermore, he used numerous re-times and time-warps.

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Fortunately, Assimilate was willing to help us out by adding some new functions; for example, to copy grades based on the slot number / position in the CONstruct (timeline). So, we didn't need to take the scenic route, and the end result is very satisfying from having overcome all the challenges. Our biggest concern was will the movie flow?

During the next few months Steffen re-rendered the movie output as 10-bit DPX several times, for example, whenever a batch of new VFX shots was ready or when he made small changes in the edit. I then took a reference H.264 and also made the edit changes in SCRATCH by hand.

At the end of 2017 I was overbooked with jobs so I brought in color grader, Gavin Haughey, who jumped on board with *Ingenium* as his first huge task. We then split-up two reels to work on, one reel each, which at the end of the day could easily be saved and loaded back into SCRATCH even if we worked on two different workstations.

Instead of uploading large ProRes files for preview with 85-minute run times, we copied the CONstructs via Teamviewer onto the workstation at Steffen's suite so he could watch the movie without dealing with downloads. We just had to ensure everybody was working on the same folder hierarchy and drive letter. With SCRATCH's powerful media browser, remapping a DPX sequence is not a big deal, especially if you only do it once or twice a week for approval screenings.

In January 2018, I moved into a new office and we had to lay down the work on *Ingenium* for a while, and luckily the VFX also needed more time. So, we postponed the last finishing touches of the film, with all VFX included, to the end of April and had a better, larger projector-screening capability there.

Gavin and I continued to work on the reels together, saving CONstructs, importing CONstructs, and getting new DPX files from Steffen once he rendered them out from Premiere. We transferred the whole movie about seven times from Steffen's computer to our workstations. We worked completely in Rec709 and rendered ProRes444 out of SCRATCH, which was then loaded in Premiere to render as

DCP with sound and subtitles (for festivals). After a DCP test screening in a movie theater, we had one last grading and finishing session and then, finally, we made it: *Ingenium* was graded!

While it was a monumental color-grading project, with a cumbersome workflow, we were always able to keep track of everything. We were confident the SCRATCH tools were up to the task, and with our many years of post-production experience, we knew it would all come together. This film just needed some time, some screenings, some iterations, and patience to make it work. But in the end, that's what filmmaking and post-production is all about: finding solutions to challenges and always striving to get to the 100% result.

As of today I have worked on about 500 projects with SCRATCH and every job brings something new to the table. I still discover new functions in SCRATCH, which usually are easy to transfer into my daily workflow. Technical support is always there from Assimilate and they really listen and act quickly on the problems or feature requests from users. I've been able to send a request via email and the next day a new release of the software is downloadable. *Pretty awesome!*

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Steffen Hacker: The resulting graded images turned out to be cinematic, moody and dark, exactly what I love for a genre like this. Not only were all the different camera looks ironed out, but also Peter and Gavin managed to add a consistent charismatic mood and style to every scene, exceeding my hopes and expectations by far.

I also came away from this project very impressed with the real-time feedback and powerful features of SCRATCH. It had all the features I could hope for and the ability to easily share projects across multiple machines by copying CONstructs (timelines). It has secured my trust as our main grading software for professional use in commercials and feature films.

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See the trailer at:
https://vimeo.com/119604151

SCRATCH

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