CML/CMIR Tests overview

Internal report for UWE, Dec 2016

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This is a brief report for Faculty of Arts, Creative Industries and Education (ACE) at University of the West of England, concerning a set of industry-facing CML/CMIR camera and lens tests run between 2014-2016 by Professor Terry Flaxton (Director CMIR, ACE, UWE), Dr Sarah Sparke (CMIR, ACE, UWE) and Visiting Professor Geoff Boyle (Cinematographers Mailing List, CML, UWE ACE). At this point in time there have been four collaborative tests between CML and CMIR. Three of these were camera tests. This report is a comment on the overall thrust engendered in the CML/CMIR collaboration – but in this instance is specifically oriented towards the fourth of these tests that was for lenses. The report speaks about the overall conception of the tests through the specific of an examination of lenses. These collaborations were initially intended to promote the idea of Immersive Learning Environments (ILE). *Immersive Learning Environments* were defined by focused events that asked all levels of *one specific discipline* (from student to professor and trainee to professional) to join together in research. By late 2014 this later developed into Advanced Innovation Laboratories (AIE) which assembled people from *different disciplines* – and this eventually included the generalist (in the form of the audience itself, when being taught to see depth in an HDR lab at the Arnolfini in 2014). The tests carried on and eventually the lens tests which this report speaks about occurred.

> *"I can testify to any student who is willing to be proactive and get stuck in, that these events will allow their knowledge of cinematography and the way the industry works to increase more than it ever would have if they were to simply use the facilities available to them within the course." (Source: Jack Hayter, UWE alumnus and trainee Cinematographer. See p.7)*

What & Why:

The CML/CMIR tests were a response to industry practitioners' growing need for comparable information about key professional camera equipment in the face of the rapid developments in digital capture technologies. The tests are designed to provide neutral, reproducible data (primarily images) on some of the new cameras being launched, alongside data for some of the established industry favourites. The test results are used by practitioners to help in their selection of the right tool for the job.

The tests have been an integral part of CMIR activity since its inception in 2013. They produce significant information for the industry (and those about to join it), important profile-raising for CMIR, UWE, and are extraordinary learning opportunities for UWE students. The tests would not have been possible without the close professional relationship between Geoff Boyle, the Production work of Sarah Sparke and CMIR Director Prof Terry Flaxton.

Geoff Boyle is a cinematographer, highly respected technical commentator and founder of the industry forum Cinematographers Mailing List. He joined forces with CMIR in 2013 as a Visiting Professor. The key collaborative areas of research we have engaged in are the HDR (high dynamic range) labs & talks 2014, CineFest: Bristol International Festival of Cinematography 2015 and 2016, and the camera and lens tests 2014 - 2016. This report focuses on the tests carried out to date.

Where:

Each of the tests has been carried out on the UWE Bower Ashton campus, at weekends, across both days, with set-up on the Friday afternoon/evening where possible. The items to be tested, plus other requisites such as appropriate cameras for the lens tests & specific lighting, are delivered by couriers as close to the Friday as possible, and returned immediately after the tests.

How:

As with the tests run by "Which?" on domestic appliances, the CML/CMIR tests are designed to replicate real-life usage & test against real-life criteria, providing an alternative to the manufacturers' lab-test tech statements. For example, as Geoff states below:

> *"The scene brightness range is 7 stops, so taking that 7 and adding the plus and minus values will give us the usable filming range. This is very different to the values produced by a Xyla chart which as far as I am concerned **is only good for manufacturers PR blurbs and has no use in real filming situations."*** (added emphasis)
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> (Source: Geoff Boyle, writing in the January 2015 test results page of the CML site, { HYPERLINK "http://www.cinematography.net/cml-uwe-2015.html" }, accessed 20th Oct 2015)

For the CML/CMIR tests we use models, particular props, specially-commissioned (as well as the standard) test charts, tracking, robotics and specific lighting in controlled environments in order to test the cameras and lenses in ways cinematographers want to see them tested.

By whom:

Direcotr of CMIR, Professor Terry Flaxton (CMIR, UWE)
Director: Visiting professor Geoff Boyle (CML),
Producer: Dr Sarah Sparke (CMIR, UWE),
Tech manager: Dave Neal (Media Centre, UWE).
Others: professionals, students, staff. See below for case study.

Flaxton, Sparke and Boyle have a particularly useful blend of scientific/technical knowledge, and knowledge of the aesthetic and practical needs of practitioners, which is necessary to design meaningful tests. They also have the production/administrative skills and - importantly – the contacts to collate the professional equipment required [1], space and people needed for the tests to happen, and the interest in facilitating deep KE between industry and students.

TESTS

CAMERAS

In Feb 2014 we tested 9 cameras: ARRI Alexa, Canon C500, KineRAW S35, RED Dragon, SinaCAM RAW, Sony FS700, F5 and F55, and the Vision Research Flex4k (positioned as a high-speed camera).

In January 2015 we tested 9 cameras: ARRI Amira & Alexa, Blackmagic Pocket, Blackmagic Ursa, Digital Bolex, Canon C500, Sony F65, Panasonic Varicam PL and HS, RED Dragon Low Light and

[1] This cannot be overstated – the equipment tested is expensive, in some cases rare – for example we tested prototypes before release, and old, lusted-after lenses as well as the current releases. To have located and persuaded owners to lend this kit, and at no/low cost, is a substantial coup. Other externally-sourced kit is also required to run the tests eg for the lens tests we needed two appropriate cameras, track, motor, specific lights, stands, charts, etc. UWE kit is used where possible, but this tends to be only for the peripherals.

Skin (ie with DSMC® Low Light Optimized OLPF (optical low-pass filter), and DSMC Skin Tone-Highlight OLPF).

Oct 2015 we tested a set of 'affordable' – ie sub-$20k - cameras, alongside some more expensive cameras for comparison: the newly-released (Sept 2015) Canon C300 II, ARRI Amira, Sony PMW-F55 with firmware update of PMW-F55 V6.01, , JVC 4k (GY-LS300CHE), Kinefinity's KineMAX 6k (released summer 2014), Digital Bolex, IO's compact 4k SDI KITUK-PL, a classic Pro8 Super8 (a small handheld film camera), the AJA CION with new firmware, and a Panasonic 4k, the AG-DVX200.

For the next test (Jan 2016) we had initially expected to be looking at the higher end of the camera market. However, we had the opportunity to run an extraordinary lens test:

LENSES

In January 2016 we ran an extraordinary lens test covering between £2-3m of lenses, ranging from classic lenses that are considered price-less, (lenses which are treated affectionately as 'heroes' by professional/knowledgeable cinematographers), to newly released 'affordable' lenses. This test required two locations (one dark and one light controlled test environment), two teams, two cameras/set-ups, and fast accurate work to get all lenses tested in both locations, in the time available.

For those unfamiliar with lenses, this is a list to send tingles down the spine: it contains lenses which are highly respected by any cinematographer/camera operator working in a professional capacity in the fields of television and film, including blockbuster Hollywood feature film. The lenses were greeted with awe by the test crews, and handling-rights were only granted to 4 key people.

EF Mounts:

Canon CN 35mm, 85mm, 15-47mm, 30-105mm, 17-120mm

Rokinon Cine 35mm, 85mm

Zeiss Otus 85mm,

Zeiss Milvus 21mm, 85mm

Zeiss CP.2 18mm, 35mm, 85mm

Zeiss CZ.2 15-30mm

Panavision Primo 17mm, 35mm, 75mm

Schneider Xenon 35mm, 75m

PL Mounts

Cooke S4 18mm, 35mm, 75mm, 15-40mm

Cooke 5i 18mm, 35mm, 75mm

Cooke TLS 18mm, 32mm, 75mm

Cooke Ana 35mm, 75mm

Leica Summilux 18mm, 35mm, 75mm

Leica Summicron 18mm, 35mm, 75mm

Illumina Coated 18mm, 35mm, 85mm

Illumina Un-coated 18mm, 35mm, 75mm

Schneider Xenar 18mm, 35mm, 75mm

Fujinon HK 14.5-45mm

Fujinon ZK 14-35mm, 19-90mm

Arri Alura 15.5-45mm, 30-80mm

Angenieux Optimo 15-40mm, 28-76mm

Vantage Hawk Vlite 35mm, 80mm

Vantage Hawk Flare 35mm, 80mm

Vantage Hawk 1.3 24mm, 55mm

Case study: Jan 2015 CML/CMIR Camera tests PEOPLE

The CML/CMIR tests bring together many people from industry and academia, creating an immersive learning opportunity for both students and professionals.

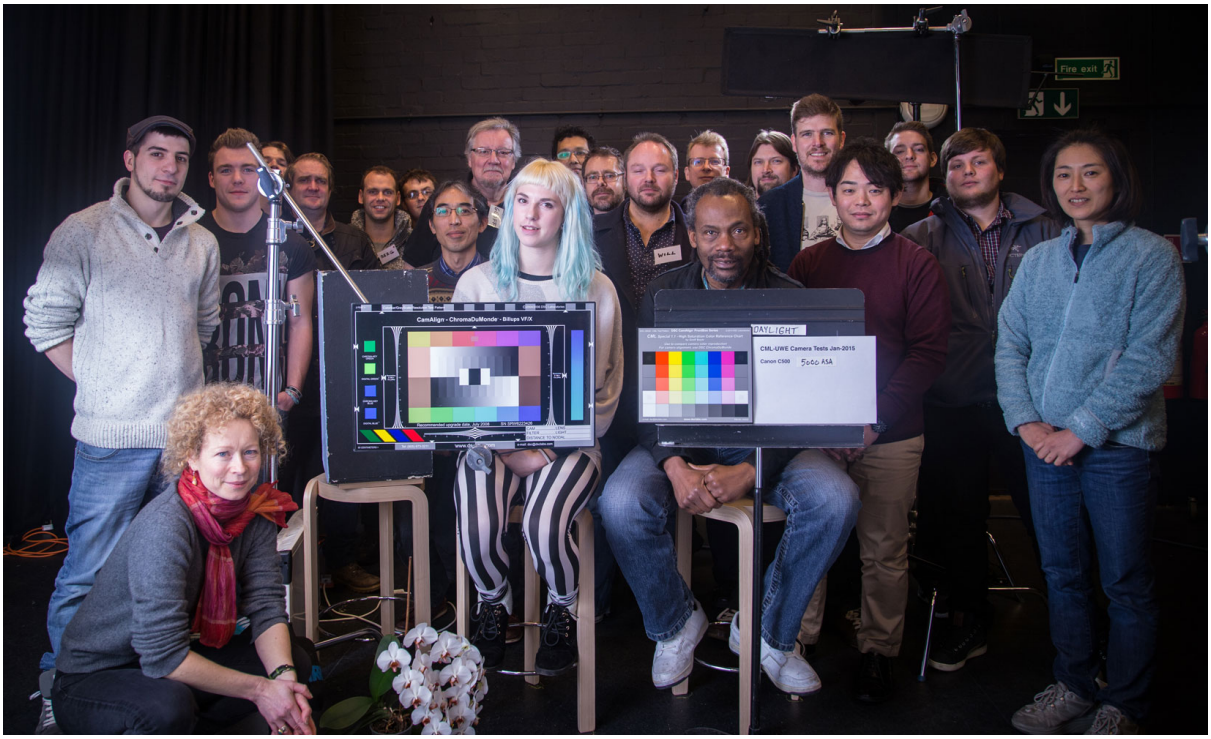

*Figure { SEQ Figure * ARABIC }: Some of the Jan 2015 CML/CMIR camera test crew, Dr Sara Sparke crouching down at front, Geoff Boyle, tall, to immediate left of white haired model*

These include key personnel who make the tests happen: Professor Terry Flaxton, Director CMIR), Geoff Boyle from CML (test Director), Dr Sarah Sparke at CMIR, UWE (test Producer), Dave Neal at UWE Media Centre and – essentially – the camera manufacturers and kit suppliers such as 24-7 Drama (Visual Impact), VMI, Films@59 and LCA.

As well as this core group, there are always others involved, interested in the cameras and in the tests as a much deeper KE opportunity. For example for the Jan 2015 over 30 people were involved in the tests. These included professional cameramen Gregg Smith, Danny Gagatt and Mari Yamamura, and DIT Josh Callis-Smith. In addition, for this test we had an AJA engineer/designer who came with their 'hot off the press' camera from California, and another from Panasonic who came with a prototype camera from Japan, accompanied by their European Marketing Manager.

Because some of the equipment that was sent to us to test was so new and exclusive we had to sign non-disclosure contracts to agree to not share details of the equipment with external sources. The fact that these manufacturers wanted their equipment to be included in these tests demonstrates how highly regarded the CML/CMIR tests are held by the professional filmmaking equipment industry.

Other professionals also attended, drawn by the idea of this opportunity to see and discuss the cameras and the tests. These included UWE staff, Assistant Camera operators, Camera Operators and a famous Director of Photography.

BENEFIT TO UWE STUDENTS

For the undergraduate and postgraduate students the attendance of all of these professionals reinforced the importance of the tests, and the opportunity to observe the professionals demonstrating what was capable of the equipment is an education not matched in any other classroom context. This close proximity to world-class professionals and equipment is a superb opportunity for them to learn more about cameras, lenses and professional behaviours and concerns, which is vitally important experience seldom matched in any other arena.

The students were able to see what the professionals were doing with and saying about the various cameras, and to observe how they interacted with each other. This cultural aspect of professional behaviours is an important element of the immersive learning environment. Involvement in the tests enriches the students' technical knowledge, enhancing their ability to understand and critique other technical information.

Due to the need for a professional, accurate, speedy workflow, and for issues of confidentiality, students are asked to apply to participate, and are selected through a rigorous process. Students who are selected and engage with the tests gain a huge amount not just in the knowledge acquired, but also demonstrate and report that the tests provide a huge boost to their enthusiasm, confidence, energy to learn, and work opportunities. To illustrate this, here is some of the feedback from two students: Sergejs Bozoks, and Jack Hayter.

EXAMPLES OF STUDENT FEEDBACK:

*Figure { SEQ Figure * ARABIC }: Jack Hayter on camera with Greg Smith. Sergejs Bozoks modelling. CML/CMIR lens test January 2016 (daylight set-up)*

For the Oct 2015 camera tests we asked 3rd year BA Filmmaking and Creative Imaging student Sergejs Bozoks to work as an AC. This important invitation was based on our knowledge of Sergejs from previous work experience opportunities: he had attended earlier CML/CMIR tests and workshops, had crewed for BIFC, and in each had proved himself useful, and keen.

Following the Oct tests, Sergejs said:

> *"After **last year's CML tests I realised how little I knew** about camera capabilities. Between then and **now I did my homework and this time assisting** Geoff Boyle as an Assistant Camera Operator, I knew what I'm looking at and what I should be looking for. This time I was able to discuss cameras, their advantages and disadvantages and comparing them on the spot one to another with Geoff and hear his "unedited" opinion. That is a one-of-a-kind opportunity.*
>
> *Now I have had a chance to have a closer look at industry standard cameras. I had a chance to go through menus and set them up. If I had to have to operate one of them tomorrow at least now I know the basics about them."*
>
> (Source: personal email from Sergejs to Sarah Sparke, highlighted emphasis by Sergejs. Permission for use given.)

Recent UWE graduate Jack Hayter, Feedback on being involved in the CML/CMIR tests:

> *"During my time on the Filmmaking course at UWE I was able to use the events organised by the CMIR and CML to develop my professional profile before my graduation. **In early 2014 I observed** the CML camera tests that took place at Bower Ashton, allowing me to meet cinematographer and visiting professor Geoff Boyle. After demonstrating a keen interest in the camera department I was offered three weeks of work experience on a feature film that Geoff Boyle was shooting later that year. I was trained as a camera assistant during the shoot and learned the ways in which a professional set works, a skill that helped me greatly during my final films.*
>
> *In my final year on the course I was able to use my relationship with Geoff Boyle and the CMIR to get involved with more opportunities, including the **2015 CML camera tests where I was given the opportunity to make a short documentary of the event** for the CML and CMIR website. I also attended Geoff's 'lighting faces' workshop after my final hand in. I used my skills at a 2nd AC to help Geoff construct his lighting set-ups during the workshop. This gave me hands-on experience that was much more valuable than sitting in a chair at the back of the room.*
>
> *After my graduation in 2015 I worked with the CMIR at the Bristol International Festival of Cinematography to help prepare for the festival and keep it running smoothly during the week. I had already built up a good working relationship with Terry Flaxton and Sarah Sparke from my previous experience with the CMIR and so I was able to take on a fair amount of responsibility in my role. I created the designs for the festival flier and created a sting video to be projected before each panel event. The most valuable aspect of the festival was being able to work as a 2nd AC during the lighting master classes. I was able to watch leading cinematographers Roberto Schaefer ASC and Nic Knowland BSC work from an on-set position and can now show that experience on my CV.*

The events that CMIR and CML carry out at UWE are like a window into the film industry for aspiring students, giving them the opportunity to be present and ask questions amongst working, industry professionals. ***I can testify to any student who is willing to be proactive and get stuck in, that these events will allow their knowledge of cinematography and the way the industry works to increase more than it ever would have if they were to simply use the facilities available to them within the course.*** *"*

(Source: personal email to Sarah Sparke. Emphasis and highlighting by Jack. Permission for use given).

NOTE: Following this email, Jack was invited to be an Assistant Camera on the 2016 lens tests, a huge responsibility which he took on with enthusiasm, accuracy and professionalism. (See photo on page 6.)

TEST RESULTS OUTPUTS:

The test results were presented initially on the CML website, for an industry (manufacturers and users) audience. The results and commentary are also presented in person by Geoff Boyle, as an invited speaker at key industry events such as at NAB (a major industry trade show by National Association of Broadcasters) in Las Vegas.

The test results trigger debate and Knowledge Exchange within the industry – some of it is map-able e.g. within the CML forums, and demonstrably influential, e.g. changes to product design as a direct response to the test results, as in the AJA Cion (one of the cameras tested).

The other key outputs are the new knowledge gained and exchanged amongst those attending the tests. Some of this is technical, and some (equally important, as stated earlier) is development of cultural capital specific to the field.

CONCLUSION:

The CML/CMIR camera and lens tests are a superb example of academic / industry research collaboration, building on the strengths of each to create a Knowledge Exchange environment which produces industry-leading data.

We are very proud to be part of this world-first programme of tests, through which we have had the chance to handle very special equipment, and the opportunity to work with people (practitioners and engineers) at the top of their game. The tests have been an opening through which I have been able to give UWE students an extraordinary opportunity, and – importantly - to raise CMIR and UWE's profile in the moving image industry and beyond.

Dr Sarah Sparke (Producer CMIR, ACE, UWE)
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