

Red and White - getting the best sound from all films

Bryan Lindop MBKS talked with Ronald Rosbeek about a revolutionary dual reader sound head which Ronald developed

“Whether ‘tis nobler to the ear to suffer the pops and crackles of outrageous sound reproduction or to arm your self with a dual red/white light reader against a sea of troubles...! “ (With apologies to Will!) By Bryan Lindop MBKS

Seeing red

Film archives and dedicated film theatres have, for the most part long ago switched to red light reader technology in order to enable them to show the latter day cyan dye tracks on 35 mm prints. The bulk of optical sound recordings in most libraries however remain on high density silver or opaque dye tracks which require a white light reader to elicit the best response.

Sounding better

While it is true to say that a perfect optical sound recording on a good black and white print will sound acceptable when played with a red light reader, it will sound so much better when reproduced using white light. It is also true to say that because we don't live in a perfect world, a proportion of archive recordings are not perfect to begin with!

There are also some types of recordings such as the variable density system which will perform below average when played with red light, but will be worse still when reproduced from a tri-pack colour stock with its tell-tale purplish hue. Save for bouts of high level modulation, such as a big band number for example, the track will spectacularly fail to reproduce correctly; dialogue will pump and low level music and effects will also struggle.

Horses for courses

This begs the question: Would you attempt to play a 78 rpm record on a high fidelity stereo disc reproducer?" You would no doubt answer, "No one in their right mind would do that!" and of course it would be absurd to even consider it. Any specialist projection facility would shudder at the very thought of showing a film with the wrong lens, so why would anyone choose to settle for second best when it comes to sound fidelity for the reproduction of a beautiful archive print?

Archives deserve better

I believe the answer has always been that because the mainstream film exhibition industry chose a specific path, it was the easiest option for archives to follow suit. Additionally, the mechanics of sound head design on a diverse range of film projectors would have made it extremely challenging to come up with a quick fix alternative. For those of us that remain committed to the conservation of the historic motion picture experience however, and we are in an ever shrinking minority, why would we even hesitate to ensure that every aspect of a films performance from every period in its history can be recreated perfectly? I challenge every archive and preservation professional throughout the world that uses only red light readers, to undertake some comparison tests. We should be saying to the world, we hold your heritage in our hands and we want to ensure that the craftsmanship of the silver screen is showcased to the very best of its capability.

A dual solution

The obvious solution is to install combination red and white light readers. Easy to suggest I hear you say, but how the heck do we go about it? I would immediately direct you to a specialist precision engineer and it just so happens that there is one available who most people in the film archive world may well already be aware of, even if you haven't already met

him. His name is Ronald Rosbeek of Rosbeek Techniek, based in The Netherlands. When it comes to bespoke engineering solutions for the film archive projection industry, Ronald is a perfectionist through and through. His capability to resolve complex technical problems and find an elegant solution for any design concept is a challenge he always enjoys.



Checking out the possibilities

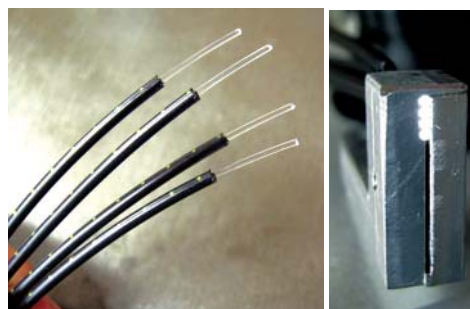
Ronald was first called in to look at the

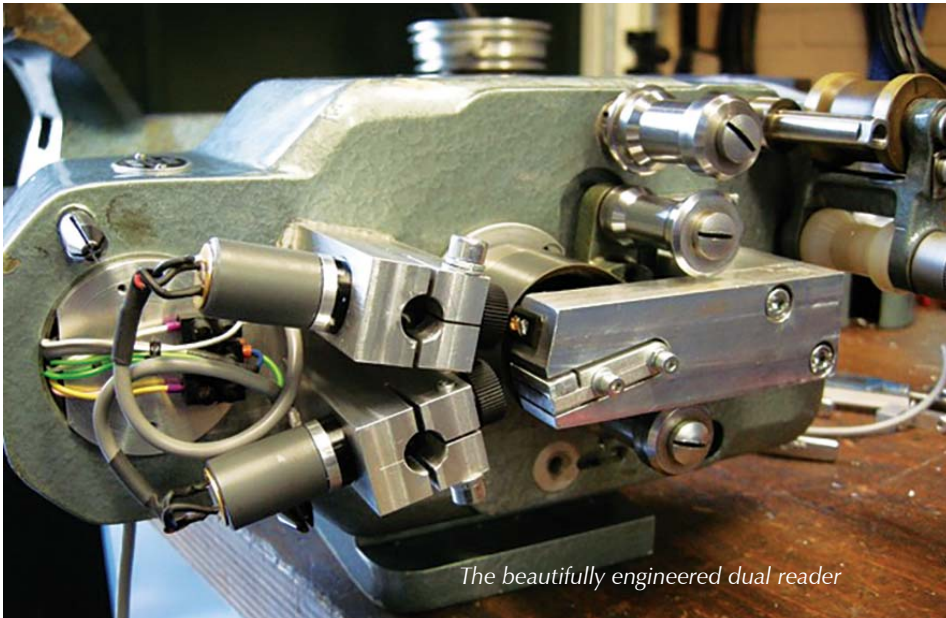
possibility of installing combination-readers

by Jan E. Olsen, Head of Projection Department at The Norwegian Film Institute. Jan is a great fan of the historic German projectors made by Bauer, citing that they are very friendly to older film material and he considers that being fully mechanical they are a most reliable choice for the future. Ronald stated, "For me this was quite a challenging job because the audio readers of these Bauer B14's were designed in the 50s with just one single optical mono-reader and I had to find space for a second one. The only way to realise this was to take the optical diodes away from the pc boards and find a new way to mount them directly behind the sound-lenses for the white and red light pick-ups. For the commercial cinema industry the red LED was developed especially for this purpose and was so small that it was possible to place it directly behind the film." He explained, "Inside, there is a bar holding 24 small LED's which give a perfect emulation of the tungsten filament that they were replacing. Nobody ever thought of constructing the same LED with white light because this was the period in film sound evolution when digital soundtracks had become the norm. The analogue track was therefore only thought of as a back-up."

White LEDs and fibres

To create a reader with white light, Ronald had to look for an existing LED with the right colour temperature of 2700 Kelvin. He found that all of the available LEDs were much bigger in size than would fit into the available space and so he decided to transport the light to its intended destination using optical fibre technology. This gave the advantage





The beautifully engineered dual reader

that all the ancillary equipment could be tucked away neatly out of sight elsewhere. The first models he produced used four fibres of 0.7mm each to create an emulation of a tungsten filament in the same way that the red LEDs did. For the later versions he used a round tube made by a third party which he found much easier to install. The white LED's work within the same range as the original red ones thereby enabling the original power supply to be retained with some small modifications. The installation was a huge success, so much so that Jan Olsen wrote an article about it for the April 2016 edition of *The Journal of Film Preservation*. He says, "I have worked with Ronald for a number of years now, and I am very impressed by his work and skills. He is a true professional in the field, and one of the very few technicians with a heart (and knowledge) for historic film formats. I encourage film archives and revival movie theatres to take advantage of his work."

At The Egyptian

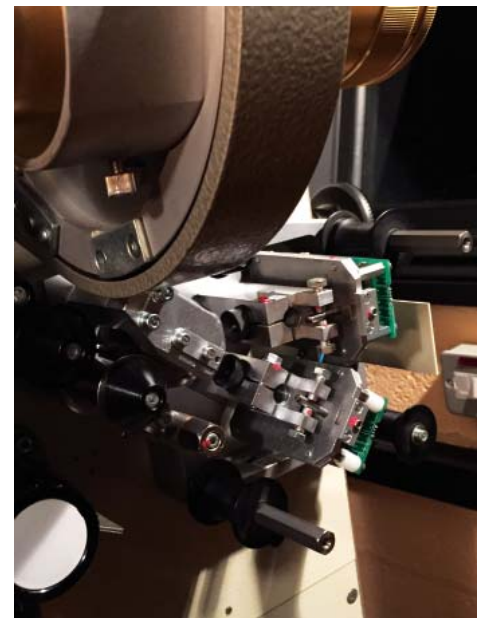
One of those unique establishments did indeed decide to take Ronald up on the challenge of converting their theatre to dual reader and he was subsequently contacted by Paul Rayton from the Egyptian Theatre in Hollywood and an order placed for two modified readers for their DP70s. Knowing that I had FP30's with dual digital/analogue readers, Ronald used my own installation as a test bed to construct an experimental switchable red light/white light reader using his fibre optic design. Because this design of analog-digital reader already had two readers, this allowed much more space inside to play with. Besides the mechanical changes

for the positioning of the digital reader bracket, space was already available to remove the CAT. 1054 digital board and put a Dolby CAT.655A analogue board in.

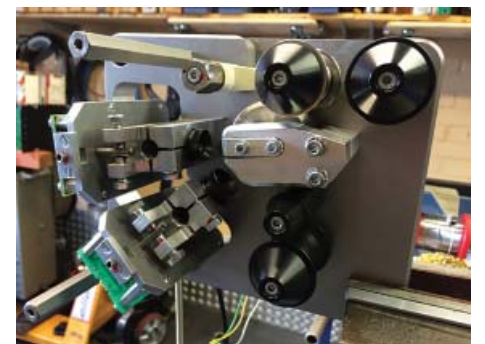
Ronald spent a day installing the beautifully crafted modification on my number one projector. The tests were outstanding and he then went on to reconstruct the pair of sound heads for the Egyptian Theatre with the same excellent results. As someone who is lucky enough to be the recipient of one of these readers, I know just how good the sound reproduction of archive tracks is now with the white reader. Every film sounds just as it should. It is especially good on poorly processed and sparkly or worn tracks and indeed, especially with variable density recordings, the results are simply marvellous.

Sounding great from the start

For Ronald, the feedback from Paul Rayton in Hollywood was the icing on the cake. Paul enthusiastically reported, "When we installed the readers, everything went fairly smoothly. The physical alignment of the reader heads was 100% compatible with the DP-70. I put the Buzz Track loop in and one was slightly off -- almost couldn't hear any error at all -- and it corrected easily and quickly. When we did the Dolby tone setup into the CP-200, it was so close we could have run a show 'as received'. That was right "out of the box" and very impressive! We listened to a reel of a Universal show from 1950 called 'Outside The Wall' with variable density as a test and it sounded GREAT. Hard to believe it was audio from 1950. We did, in fact, switch in the red light while test running the reel and could immediately notice an



The dual reader fitted to Bryan's FP30 test-bed



The re-build for The Egyptian increase in the soundtrack noise level (minor clicks or pops of one sort or another) while in the "red" mode. I think we have scored a very significant victory."

Future plans...

Ronald however is not someone who sits back and rests on his laurels. I asked him what plans he has lined up next. His reply was, "For the future I would like to design a new digital reader which will replace the upper sprocket of an FP20 / FP30 so there is again the possibility to scan SRD without the "bulky" CAT 700." So, I will watch this space with interest and if by chance he should ever require a guinea-pig to test it out again, I will be leaving my door firmly open!

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