The relationship between manufacturers and those who buy and install technology has always had its ups and downs. Products are promised for a date and delivery deadlines are missed, stock is too low to fulfil a complete order, new products don't perform as advertised, or actually perform at all in some cases. There are a myriad of reasons integrators and consultants can be let down. But don’t think this is just another excuse to bash manufacturers, it’s not, it’s a cry for a better relationship between the two groups.

In our recent roundtable Peter Fell from UK integration group Feltech revealed he’d been given a new product for a recent installation with the serial numbers 001 and 003. He had no problem getting to grips with new equipment, as that was apart of his job he said, the issue he had was with the time he could assign to explore that new bit of kit. Typically his projects (like the majority out there in the market) had very tight timescales, which either ruled out the time he would like to investigate the capabilities of the new product, or it meant he was spending time working out a new piece of kit when his time needed to be spent elsewhere, completing the installation he was being paid to do. If you are going to supply an integrator with a product with serial number 001 on it, you need to make yourself freely available to answer the hundreds of questions he/she is going to have.

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Just because this relationship hasn’t always worked as well as it should in the past does it mean it can’t be improved going forward? No, it absolutely doesn’t, as one recent example showed me. During a site visit to the newly opened Postal Museum (see pic above and read full case study on p26) in London, the integrator, DJ Willrich (DJW), spoke in glowing terms about working with the projector manufacturer Digital Projection (DP). It was a truly collaborative project between the two parties. The manufacturer had been down to the site with the integrator to perform a series of tests, before the tender had even gone out. The integrator and manufacturer worked together to make sure the right projector went into the job. It wasn’t the brightest, or newest model, or most profitable unit (from the manufacturer’s point of view), but it was the one that met all the criteria, and will give a great performance for a long time to the client. Manufacturers may be reading this thinking that sounds great, but I have sales targets to hit, I don’t always have the time to go on site visits etc. Even long-term editorial types such as I know about sales pressures and targets, our commercial team has them too. Just because the relationship between installers and manufacturers hasn’t always been great doesn’t mean it can’t be improved, it can, we just need to work together.

Paul Milligan
Editor
paul.milligan@imlgroup.co.uk
Hidden underneath London is a railway used to move mail from one end of the city to another. Paul Milligan visited the new Postal Museum to ride the same trains that used to carry the city’s post.

When we did the testing I was worried about the effect of the canopy coming down (in the trains), but it helps diffuse the sound, so you get a more immersive feel.

- Emma Harper, Postal Museum

Underground movement

Chances are if you live in London, even in a street directly above it you wouldn’t be aware of Mail Rail. It was a narrow gauge railway, with driverless, electric trains designed to carry mail not people, along a six-mile route which ran underneath central London connecting key sorting offices and railway stations, from Paddington in West London to Liverpool Street in East London. It opened in 1927 and was dubbed ‘the beating heart of the British postal service’. It cut journey times across London from more than 2 hours to just 30 minutes, and trains ran every four minutes, every day, for 22 hours a day.

By 2003 some sorting offices on the line had closed, and road transport had become cheaper than running Mail Rail so a decision was made to close it. Since then a mothball staff was kept on to keep it in good condition just in case it was ever needed again. Now that time has come, and the site is home to the Postal Museum. Instead of mail going down the railway lines, it’s now visitors to the museum who can take that journey deep underground in stalactite-filled tunnels, by sitting in specially adapted mail trains.

To find out why it is here we have to go back to 1998, when the original Postal Museum was closed down. In 2003 the body that ran that museum became an independent charitable trust called The British Postal Museum and Archive, whose main purpose was to preserve the archive, and to find a new home to house the collection. The site it found neighbours the huge Mount Pleasant sorting office in Clerkenwell. The museum is split into two venues across the road from each other. One is home to the Postal Museum and the other is home to Mail Rail, one ticket gets you access to both.

The original concept for the museum was written by design agency Hayley Sharpe three years ago. System integrator DJ Willrich (DJW) was brought on board as consultants to do a design and costing exercise to see if everything could be brought in within the project’s budget. “At that stage we also met with the ride company to look at the link in terms of control and triggers for the ride system. We then put together cable schedules and a specification that went out to tender,” says Josh Miller, director, DJW. Both sites of the museum were put out to separate tenders and DJW (a specialist in visitor attractions) won both jobs.

The Postal Museum includes a traditional museum setup, which is a mix of interactive AV elements such as touchscreens and projection, and physical artifacts (refreshed every six months to preserve the archive from the museum’s lights) such as mail trucks, red postboxes and a whole sheet of Penny Blacks (the world’s first postage stamp).

Mail Rail includes another exhibition with a series of interactive elements and the star of the
show, a 10-minute ride on mail trains. The train ride does a loop of parts of the track, and takes in two shows along the way, both of which use a combination of audio and projection to great effect. Visitors don’t leave the train during the 10-minute ride, but thanks to in-carriage ceiling speakers, external Bose loudspeakers at the two shows, and a clear Perspex roof they are able to see and hear everything happening around them. The two projected shows take place at different points during the ride, one on the side of a tunnel and one on the side of a disused platform, left exactly as it was when Mail Rail shut down in 2003.

The trains, with in-built show management system, were built by Severn Lamb, and the videos for both shows were produced by production company Centre Screen. Medialon show control also controls part of the venue. One you climb into one of the very snug carriages and pull the see-through roof down over your head, the narrated story of Mail Rail begins as the trains begin to move. The train runs almost non-stop during the day, with one to two people per carriage the whole train can fit approximately 25 in total.

The audio, heard at several moments during the ride, is a conversation between a narrator and Ray Middlesworth, an engineer on the site for 27 years. All the voices you hear in the cars are from the internal speaker but everything else is from the Bose speakers placed along the track – background noise, music etc. “When we did the testing with Centre Screen I was worried about the effect of the canopy coming down, but it works better than if there was no roof, because when you are outside you can clearly tell which sound is coming from which speaker. The canopy helps diffuse the sound, so you get a more immersive feel,” says Emma Harper, exhibitions officer, Postal Museum. The opening show begins when the train comes to a halt at the first platform.

Using five Digital Projection 8,500 lumens laser projectors and a 7thSense media server to blend and geometrically correct the images, the show is a mix of video and animation. All the projectors are fixed on a vibration mount and all cable tracks are via Unistrut into the ceiling. Starting at present day the video takes visitors back in time, through the history of Mail Rail. Because the trains are long, the show you see is repeated three times along the length of the projected surface. The projectors are actually showing images on the original surface there when the Mail Rail shut in 2003, which are white curved panels with acoustic treatment panels on them, installed to make the environment less noisy for the workers. Curved, dusty and rough surfaces are normally a huge challenge for projection, so how did DJW get around this issue? It all began in the testing phase says Miller. “When we were involved on the consultancy side we came with Digital Projection and met Ray Middlesworth, and did all the tests, to quickly determine we had the right kind of projector for the job and what would work and what wouldn’t. We did some tests projecting onto the open tunnel, but the problem we encountered was that because they have ribs that jut forward, so you would start to get shadows, to overcome that would have taken a lot more projectors on both sides of the rib. So we decided to leave the cladding where it was and just add a few bits here and there to finish it off.”

Positioning the projectors was one of the biggest challenges of the job says Miller. “Could we get all of the projectors exactly where they had to be? We didn’t have a lot of scope in terms of zoom ratios, so the projectors had to be bang on positionally. Because of the curvature of the screens choosing the right lens was key.”

A decision to use laser projection was made early on says Miller, because of a combination of factors, low maintenance, difficult site access and low heat. The latter was important to DJW because all the projectors sit in IP-rated Fibox enclosures. DJW chose Digital Projection units for a range of factors too. It was the first time DJW had worked so far underground, and the manufacturer had experience of supplying projectors for a project for London Underground. Digital Projection was also willing to engage with DJW throughout the project, “We had options for projectors, but in this instance Digital Projection made a huge effort to come down and get involved in the project. It brought different models and took part in tests,” says Miller.

The second show features three stories involving Mail Rail; an army colonel writing to

Kit list

**Audio**

- Bose FreeSpace DS 100SE loudspeakers and PowerMatch PM8250N amplifiers
- BrightSign audio server
- Cloud CX850 amplifier
- Gefen audio extender
- Sennheiser SKM2000 microphones

**Video**

- 7thSense Delta Infinity II video server
- Atlona HDMI switcher
- BrightSign HD222 video servers
- Digital Projection E-Vision laser 8500 projectors
- Extron DTP DVI 330 KVM extender
- Medialon Showmaster Pro2 show control software
- NEC V652 65-in display
- Panasonic PT-RZ470EJ LED projector
- Planar touchscreen
- 5Y HDMI extender

>
> the poet WH Auden, a young wife writing to her husband away in the navy, and a child writing to the future Queen of England. The show is projected onto a disused platform, again with walls covered in the original acoustic cladding. It is here where the 7thSense mapping abilities has to work hard, as part of the screen is an old office, complete with windows and doors, which are all part of the projected surface. No part of the image goes missing during the video, in what must have been a very difficult surface to project onto.

Audio on Mail Rail is handled by Bose loudspeakers and amplifiers, and BrightSign audio servers. With the venue consisting of nothing but tunnels you would expect the audio to be pretty difficult to manage, but that wasn’t the case says Miller. “When we did the first audio test the sound environment wasn’t as bad as we thought it would be, because of the original acoustic panels that were already built-in, that helped a great deal. What was interesting was that the sound kept fairly contained, we thought with the tunnels the sound would go on and on, but because we were firing it across the tunnels it kept it fairly tight.”

Although the original Mail Rail trains were driverless, the modern version features a driver, who is also in charge of controlling the show, as Harper explains. “The trains pass over six trigger points, as it passes over it triggers the visuals on the platform and the driver will press the relevant button to match up the audio. We had to do a lot of work to work out when that button needed to be pressed. So that when that button is pressed the visuals are matched up. ‘The audio is almost instant. There are signs along the track with numbers on to tell the drivers which button he/she needs to press next.’”

One last area of AV interest is the Time Telescope. In 2014 a company called ScanLAB Projects used 3D laser scanning technology to document a section of the Mail Rail network. Using those original scans DJW has incorporated them into a rotatable screen, as users move the screen up and down and left and right they can zoom in and out through the walls, from old scans before the renovation, to how it looks now.

After a soft opening in the summer, both sites opened in September, and early response to the museum has been great, with Mail Rail rides booked well in advance. There are now plans to run another train at the same time, just behind the first, doubling the capacity. The last word on the project goes to Ray Middlesworth, who spent 27 years in the tunnels, and was heavily involved in this museum, “The Mail Rail has taken on a new role of educating and entertaining people and it lives on.”

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- Josh Miller, DJ Willrich