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Behind The Wall

LSi reports from the first touring production of Roger Waters' iconic live show . . .

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BEHIND THE WALL

A seminal concert production returns - for the first time in a touring format . . .

words by Sharon Stancavage

photography by Todd Kaplan

SO YA, THOUGHT YA, MIGHT LIKE TO GO TO THE SHOW - (In the Flesh?)

A unique cross of rock concert, spectacle and performance art, *The Wall* has until now only been exhibited in five separate cities. In 1980/81, it was presented in Los Angeles, New York, London, and Dortmund, Germany. In 1990, it was performed in Berlin to celebrate the demise of the Berlin Wall. Now it is on tour for the first time.

Although *The Wall* was officially a Pink Floyd project, it is largely the work of Roger Waters, sole author of all but four songs on the album. It is a concept album - a rock opera about a young man named Pink, whose lifetime of suffering - a father lost to war, an overprotective mother, abusive schoolmates and a broken marriage - culminate in his separation from the world, symbolised by the giant wall.

The live show was also an expression of Waters' vision, resulting in an event that was unlike anything previously seen on the concert-touring circuit. As *The New York Times* noted in 1980: "The *Wall* show remains a milestone in rock history . . . Never again will one be able to accept the technical clumsiness, distorted sound and meager visuals of most arena rock concerts as inevitable." It added: "The *Wall* show will be the touchstone against which all future rock spectacles must be measured."

This was no mere PAR can light show: *The Wall* set a new standard for concert spectacle. Audiences saw a giant wall built and torn down onstage, along with several inflatables, a plane crash, pyro and large-scale 35mm projections.

Popular wisdom has long concluded that *The Wall* could not be toured, but production designer Mark Fisher, of London-based Stufish, who has worked on all of the show's live incarnations, disagrees. "In 1980, you would have had to load it in the day before the show. So it could have been toured," he says. The issue, according to Fisher, was not the size of the show, but the economics of the era. "Ticket sales today generate proportionally more revenue than they did in 1980 - this allows artists to pay for the stage sets of a size that they could not previously afford," he explains.

In 1980, the average ticket price was \$12.50 (£7.80 - using today's exchange rates), which is \$35 (£22) in 2011 prices. Today, the average ticket price for the tour is \$117 (£73); the potential gross ticket sales are \$257 million dollars (£161 million pounds); the cost of the production is rumored near \$60 million (£40 million pounds).

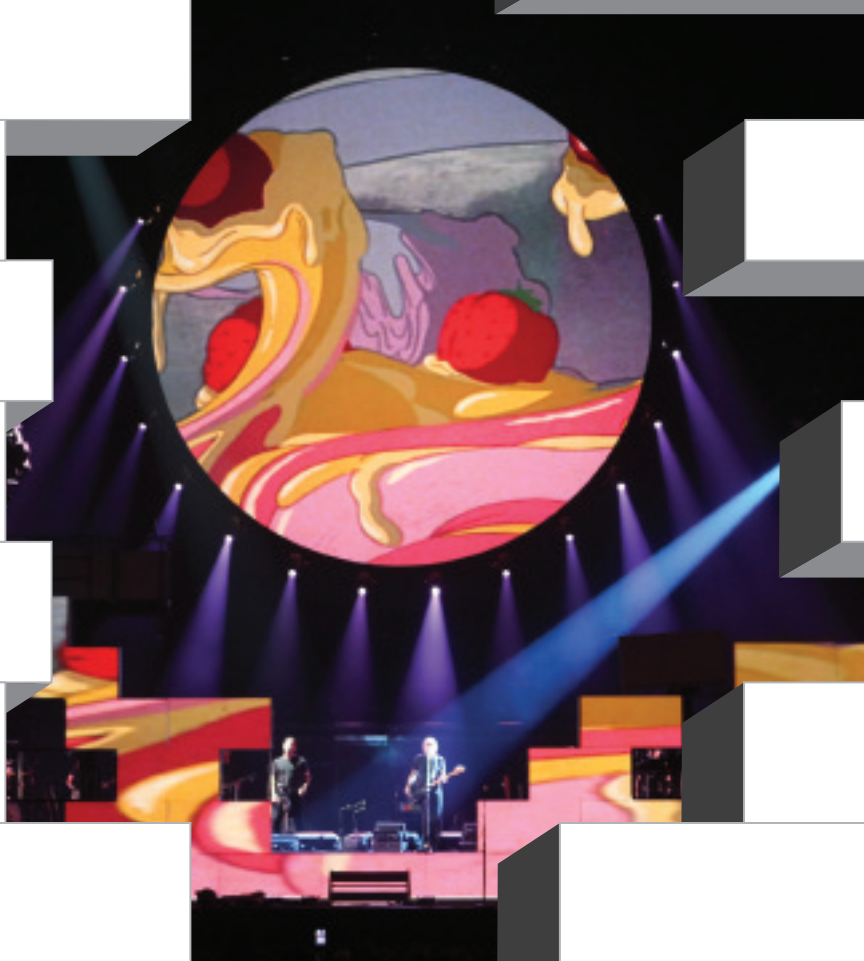
Although credited as production designer, Fisher admits that his role in this project is somewhat different. "Roger is the author of the show. My role has been much more that of being a realiser of Roger's vision and a creator of new ideas that Roger then approves of," he says. "It's at the very least collaborating, at the very most, following strict instructions," he concludes with a chuckle.

From a design standpoint, the past is indeed analogous to the present, Fisher notes: "The 2010 show is mechanically a facsimile of the original 1980 show - everything has been rebuilt, but there is nothing significantly different in the way that the thing is done - from the small print of the engineering to the fact that some of the components are sourced from the same company that we sourced them from back in 1979 when we were building it for the first time."

In 1980, the primary vendor was Britannia Row [at that time, Pink Floyd's wholly-owned staging, lighting and sound company]; this time out, scenic fabrication was handled by Tait Towers of Lititz, Pennsylvania.

Working with Fisher to complete the vision was technical director Jeremy Lloyd, who typically handles all the stadium and larger arena shows at Stufish. "Basically, we had to take paper drawings, things on transparencies and tracing paper that had been drawn by hand, and go over every single piece," he explains. It was, he adds, "a very boring, slow process." However, it did guarantee that the integrity of the original design would indeed survive.





MOTHER SHOULD I BUILD A WALL? - (Mother)

The nexus of the 240ft (73m) wide by 35.5ft (10.8m) high wall are the ramparts - the two wall sections that are in place at the start of the show. Lloyd says: "In 1980, the ramparts were built with some big plywood boxes and scaffolding - they would cut the plywood around the seating, remove loads of seats. It was a major operation, and it took a long time to complete." Today, the ramparts enable the wall to be erected in virtually any venue. They're constructed using a multi-part rolling scaffold system, lightweight decking, and a universal hardware kit that includes, according to production manager Chris Kansy, "feet, legs, shims and lots of extra bits."

Tait Towers also developed a new leg for the ramparts. Tait's director of design, Tyler Kicera, says: "No matter where the bottom point of the structure is ... we have a leg we can drop to accept that distance - that's what allows the structure to adapt to the different inclines of the different venues."

The scenic design itself also allows for adjustments of the ramparts. "They can shift the entire rampart fascias, the brick fascias, onstage/offstage by 6" (15cm). It's quite a large amount, but it means they can guarantee that the bricks line up with the stage when it's in place," Lloyd remarks. Perfect alignment is critical, since, if the middle didn't line up, "it would look absolutely terrible, particularly with the projection on the wall - you need to have as flat a surface as possible."





ALL IN ALL IT WAS ALL JUST BRICKS IN THE WALL - (Another Brick in the Wall, Part 3)

The bricks - physical, as well as metaphorical - have always been an integral part of the show. In 1980, they were constructed of corrugated cardboard painted white; for storage, they simply folded and stored flat. In 2009, when Tait Towers took on the project, Kicera says: "We went through a bunch of rounds using different materials, different thickness, plastic versions, double wall, triple wall - and, at the end of the day, we arrived at a similar solution that Mark had."

That solution was a brick constructed of die-cut tri-wall corrugated cardboard. The finish of the brick "had to be fireproof, it had to be something that dried quickly, and it had to be something that they could get hold of anywhere, so they can touch-up the bricks when they get scuffed and damaged," Lloyd notes. Store-bought white latex paint was the answer for the finish. Tait contracted a firm in Connecticut, and, according to Kicera: "Since there's a ten-percent attrition rate each night, we're still in the brick-building business."

There are a total of 245 bricks - 60" (1.5m) wide by 30" (.76m) high by 18" (45cm) deep - placed during the show. 346 bricks are used in total.

In 1980, Fisher realised that Britannia Row needed a technical partner to build the *Wall's* machinery, since the set-fabrication industry was extremely limited. "In a way, the biggest challenge back then was who we were going to get to build it," says Fisher. Research led him and Jonathan Park, his engineering partner at the time, to Genie Industries. After explaining their needs, the owner "turned over part of his factory to Jonathan," Fisher recalls. Genie built the vertical stabiliser masts used to keep the wall in place in 1980; for this tour, Tait repackaged masts produced directly from Genie.

The masts are located inside the 8ft (2.4m) high by 100ft (30m) long main stage. Lloyd says: "You place a brick, they push a button on the controller and the stabiliser will rise by the height of one brick." McLaren Engineering was also involved in engineering certain aspects of the show, including the brick stabilisers, technicians' lifts, followspot rigs, puppets, band lifts, round projection screen, and the portion of the lighting rig that handles the Barco/High End Systems Cyberlights.

In 1980, Genie also offered the solution to physically building the wall night after night. Fisher says: "Jonathan Park went to work at Genie

Industries and developed what subsequently became the double Genie - which they did not make up until then."

Tait recreated the double Genie man-lifts used by the carpenters to create the wall during the show. Five personnel lifts, with two carpenters on each, create a 100ft-wide moving platform. During *In the Flesh, Part 1*, the carpenters appear on the man-lifts, acting as flag-bearers. Fisher remarks: "That is the new scene that was added. We were struggling to find something to do at that point of the opening, and came up with that in rehearsal, and it works very well."

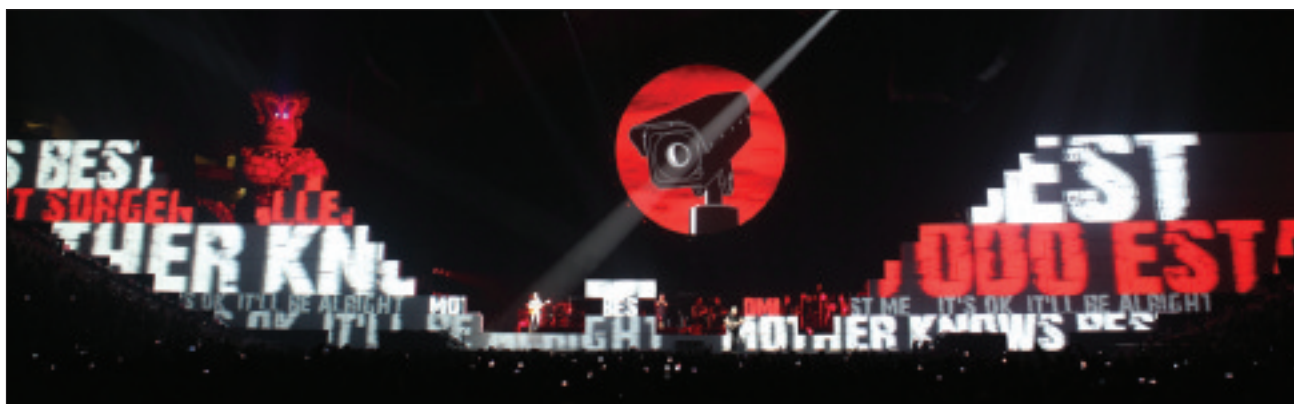
The personnel lifts are also used for the band in the second half of the show, most notably during *Is There Anybody Out There?* and *Comfortably Numb*. "Robbie, the lead singer, is taken up on a lift so he's singing from above the top of the wall, and Kenner, the guitarist, is on another lift, up on top of the wall, and they are run remotely at that point," notes Lloyd. The personnel lifts are either controlled locally or remotely via a Navigator system from Las Vegas-based Fisher Technical Services Inc.

IN PERFECT ISOLATION HERE BEHIND MY WALL - (Waiting for the Worms)

During the first act, Waters and the band are upstage of the wall, and, brick by brick, they become separated from the audience. When the wall is complete, *Hey You* and *Is There Anybody Out There?* are played entirely behind the wall - a surreal experience. "The separation that you might feel from things that might be important to you are symbolically represented by this wall, which is separating you from the band who are playing the music," is how Waters describes it.

The wall also features a hotel room, which is constructed using a drawbridge. In what Waters has said is one of his favourite parts of the show, the drawbridge is bolted down, Waters walks in, sits down and sings *Nobody Home*.

The production also features two stages. The main stage, located upstage, is 100ft (30m) long and 8ft (2.4m) high. The forestage, which is on the downstage side of the wall, is 80ft (24.4m) long and 5.5ft (1.7m) high. For this production, the forestage is covered during the first half of the show with a slip-stage unit. Lloyd says: "Tait came up with a really nice system for the decks that roll open - these little tambour covers. It's a very nice system, very compact."





TEAR DOWN THE WALL! - (The Trial)

At the end of the penultimate number, *The Trial*, the wall collapses. "In 1980, it was Mark Fisher with a toggle switch - he'd hit go, and he'd have to toggle the hammers back and forth manually, sort of shaking the wall almost by hand," explains Kicera. In fact, the first time Fisher ever saw the wall collapse from the front was during rehearsals for this tour.

In 2010, Fisher is left to his design duties, replaced by another type of Fisher - the Fisher Technical Navigator system which controls the stabilisers. "On the top of each stabiliser there is an arm, which is a pneumatic hammer. The arm is about 2.5ft (.75m) in length, from the pivot point to the tip of the arm," notes Lloyd. During the build phase of the wall, the arm is vertical. To operate it, "you can either rotate the arm forwards by about 30° and you can bring it back up to the centre, and then you can rotate it backwards by about 30°." The arm moves both upstage and downstage, which allows the bricks to fall in two different directions. "Otherwise, you'd end up with a very big pile on one side. This way, it looks quite nice falling," adds Lloyd.

Although the set design is modular and has been created by the very best in the business, it doesn't mean that it isn't a challenge to tour. "No one has done this before," Kansy says, "and it's a long day."

IS THIS NOT WHAT YOU EXPECTED TO SEE? - (In the Flesh?)

Creative director Sean Evans, editor Andy Jennison from Breathe Editing of New York, who both worked on the *Dark Side of the Moon* tour, and Waters himself, headed content creation. The initial plan was to divide the work up and send it to a number of graphic houses - a typical approach for a concert tour.



However, *The Wall* is anything but typical. "Roger is very specific, so he wants to be able to walk into the room, look at a frame, and say 'yes' or 'no.' There are also subtleties that he needs to see - it's not something that we could be sent renders of and say, 'OK, that's fine'," Evans reports.

Instead, a small group of talented individuals was assembled to work out of Breathe, side-by-side with Waters, beginning in January 2010. "He [Waters] put in a lot of hours working on this," Evans asserts.

The original footage from the film shown during *The Trial*, which featured animation by Gerald Scarfe, was located in Waters' personal AV vault, and became part of the production. "We had that source film, and we used some of that in the new show - we restored it and painted out the sides in the format we invented for this," Evans explains.

The format was dependent on several factors, including the wall dimensions and the brightness of the visuals. Evans explains: "In order to get acceptable brightness and a good image, we wound up with a resolution that is 8K wide - an IMAX screen is about 4K."

On paper, a double IMAX screen of that width appears reasonable. The reality is somewhat different, as Evans explains: "Every single frame that we have is 8,560 pixels wide - for some of the 3D sources, one frame would take half an hour to render." Rendering the images became an issue; render farms were contacted but turned down the work once they heard the output resolution and amount of work, so the team did it in-house. "We had 10 16-core desktop Mac Pros as dedicated render machines that immediately started working round clock," says Evans.

Thematically, in 1980, *The Wall* was about alienation of an artist from his fans. In 2010, the



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theme has evolved. One iconic image from 1980 featured the marching hammers. Evans notes: "We had done some versions that were very modern-looking and very photographic, and very photo-real with lots of lighting and lens flare - very dramatic. They looked great as stills and as animation but didn't look right in context with the other animation."

The hammers weren't the only images that were originally too photo-realistic. "There's a bit in *Mother* where there's this sort of blood liquid that goes across from stage right to stage left, and I had rendered that out so that it had all kinds of reflection and refraction and it looked like very realistic blood - but it just didn't make any sense in the context of the rest of the show," Evans says. The bombers seen in *Goodbye Blue Sky* were also originally very photo-realistic, and then adapted to remain cohesive with Scarfe's original style of animation.

"For *Run Like Hell*, we started doing the destroy and bend tests very early on to see if it would fly in a live environment," says Evans. This song is one of the most visually complex of the show: "It's a long process; the strobing lights are rendered out and then looped in After Effects. Then that's rendered out, and that is placed into a 3D file where the bricks are flying out. Then it's brought back into After Effects, colour-corrected and grain is added."

Waiting for the Worms also features dimensional imagery courtesy of Cinema 4D. "Waiting for the Worms is where you see a lot of what can be achieved," says Richard Turner, the show's screen technical director. "It's one of Sean's pieces that is just architectural - it's an Albert Speer-type building with columns, when the worms start coming in and out, and they track through the columns, and suddenly you're in a Scarfe world with a cityscape."

That cityscape is from the world of 1980. "In *Waiting for the Worms*, when we come into the hammer sequence, we're coming out of the old animation. We reformatted Gerry Scarfe's animation from the original show to fit our new format, and it's literally a cut between one scene and the next, so they had to work well together," says Evans.

HOW SHALL I COMPLETE THE WALL? - (Empty Spaces)

Turner, of UK-based Lucky Frog Limited, was the specialist Evans consulted to ascertain if a seamless HD projection across the 240ft by 35ft wall was possible. "What's technically possible is whatever you can afford and whatever you have the time for. Then you're into what is pragmatically possible," Turner says.

The video system requirements included the ability to do seamless projection across the wall; to mask individual bricks, and to mask around the seats in each venue. When asked if those parameters could be met, Turner's answer was 'yes' but with a caveat: "The design will require an unprecedented level of cooperation between departments."

In 1980, three 35mm projectors were used to project three separate 4x3 frames across an 80ft (24m) central section of the wall. Since then, technology has changed radically and, with the advent of media servers, complex video productions are now commonplace on tour. DLP projectors came into the concert world in the late '90s, but the Barco projectors used here, provided by XL Video's Nashville base, were not developed until 2006.

Turner determined that the wall would be divided into five overlapping sections. However,

due to the expanse of space, multiple projectors would be required. Considering rigging concerns, sightline issues and alignment times, the ideal number of Barco FLM HD20s was determined. "One has to overlay three projectors on top of one another to get what I would call the minimum acceptable brightness for this situation," he says.

The projectors, which are placed next to each other, must be rigged as quickly and as precisely as possible, giving Turner the maximum amount of time to align the system during the afternoon. "We made it easy for ourselves on the rigging front by coming up with a custom frame, so we're carrying three projectors going across on a yoke that can be twisted, turned, panned and tilted to the angle that we need." SGPS Show Rig, of Las Vegas, fabricated the frames, which were jointly designed by Turner, XL Video and Eric Pearce of SGPS. The latter company also handled all the show rigging outside of the sound rig.

The next technical challenge involved creating a seamless projected image on the wall where the surfaces intersect. Typically, this is achieved in one of two ways: by using the morph function of the projectors to blend the image, or by physically creating shutters on the projectors using gaffer tape or other physical barndoor mechanisms. Both solutions were problematic, because they result in a visual grey barrier on the overlay area. Turner says: "The normal corporate way out is to ignore it and flood the screen with a bit of light, or to make the content in such a way that you never see that. We couldn't really say that to Roger."

Turner was well aware that projection shutters were on the market. Unfortunately, those products weren't functional on the Barco FLM HD20s. Consequently, he turned to Tait Technologies in Waardamme, Belgium to create shutter plates with adjustable blades for each projector cradle. "Each blade is on two actuators, and each axis of the shutter is DMX-controlled, so we can just dial the shutter in; it's as simple as that," he says.

The alignment of the projectors proved to be the issue that kept Turner awake at night. He explains: "It had been said that the process was so laborious that it would not be possible to



build the wall to focus the projectors." As a result of that initial assessment, he was forced to envision multiple ways of doing the focus without the wall in place. These scenarios were all investigated during the first week of rehearsals in Wilkes Barre, Pennsylvania. "Eventually, the glorious Denny [Rich], our head carpenter, got it down to getting the wall up in 20 minutes to a state where we can start focusing on it."

Of course, the projections aren't limited to the wall; they can also be found on the 30ft (9m) circular screen located upstage centre. At one point, there was talk of using LEDs for the circle screen. "After Sean started working on the content, it became fairly obvious that we could save ourselves a couple of million dollars by going with rear projection instead of LEDs," says Turner. The circle screen utilises three Barco FLM R22 rear projectors that, unlike LEDs, match the front projections perfectly.

The content playback system is, as expected, complex. Six sources - five for the wall and one for the circle screen - had to be frame-accurate between all six screens, and be 100% reliable, which can be an issue with media servers. "All of the Catalysts, mBoxes, and so on, rely on computer graphic cards as the output device, and that's always been my problem with them. It's not the most synchronous of signals, shall we say, and doing multiple devices to be exactly the same timing is difficult," explains Turner.

The turning point came when Turner discovered that the alignment could indeed be done on the wall. Once he realised he would have time to align the system every day, that led him to a frame-accurate system based on six Xserves Mac computers (one per screen), a Barco Folsom Encore, VVTR software (by Gallery) and a Catalyst media server, which is used primarily for the masking key source. Image stability and synchronisation is achieved through the use of each Mac's installed Aja HDSD IO (input/output card). "It gives us a referenced video signal so that on all six screens, the start of frame is exactly the same time," he says.

To achieve the brick-by-brick projection, Turner relies on a key signal from the Catalyst which works in tandem with the keying abilities of Encore. "There is content there for every brick, all the way across, so we can cut into it and shape seats, right up to the squared ends, because there are some European stadiums they're playing next year that will have square ends."

And while it might appear that when a brick is added to the wall, the content is added, the exact opposite is true. "Catalyst provides the mask signal, which is built a brick at a time - as a brick gets put in, we take out the mask," he says. "The Catalyst mask and VVTR playback channels are routed through the Encore - the Encore sets up a key, and uses Catalyst signal to key internal black over the VVTR signal."

The Encore black as well as the whole of the video system is referenced to the house black signal provided by the video system SyncPulseGenerator (SPG), which is also sent to audio playback engineer Mike McKnight, so that his system is timed to video. "We provide the timing, but Mike then provides the time-code back to us, so that time-code is referenced to our master synchronisation signal," Turner explains.

Synchronisation between the visuals, the musicians and the audio playback is critical to the production, he adds: "Between Mike McKnight and myself, I guess we've taken extreme care that would not usually be taken, because normally you're dealing with pop songs, and a couple of frames over a three-minute pop song isn't an issue. But . . . we're into 40-minute runs, so it can turn into a couple of seconds by the end, and that's significant."

CALL THE SCHOOLMASTER - (The Trial)

Another iconic element of this production is its inflatables of the Teacher, the Wife, and the Mother, all of whom torment Pink. "This time, Roger wanted them to be far more animated," notes Lloyd. Fisher, who began his career working on inflatables for Pink Floyd's *Animals* tour, redesigned them based on sketches from Gerald Scarfe. The fabrication was done by Rob Harries of UK-based Air Artists, who was also involved in the 1980 production.

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Far left: An early Fisher/Park drafting for 'The Teacher'. Middle: On tour with the original show. Right: The new and improved model.

The domineering Teacher, who unfolds to a height of 30ft (9m) is, according to Fisher: "A complicated chap." Lloyd adds: "The Teacher has something like 12 or 14 axes of motion - arms, legs - his legs have points on his knees - his feet, his hips, his shoulders, and his head. He can rotate, and you can make it look like he's walking." Today's Teacher is a far cry from what could be technically achieved 30 years ago. "He did some really, really basic stuff in '80," adds Lloyd. "I think they literally had two motors that yo-yoed up and down to make him do that funny, gangly kind of walking thing."

The green, mantis-like Wife is configured much like the Teacher, and unfolds from above. An imposing 40ft (12.2m), Mother inflates and turns her head to follow the gaze of a surveillance camera projected onto the circular screen.

Both Teacher and Wife feature a complex winch system and state-of-the-art control. "We used a Kinesys K2 control system and had Brilliant Stages make the puppet control system," Lloyd adds. Kinesys and Brilliant, both of whom work frequently with Stufish, are located in the UK, which was a necessity for the extensive pre-production testing.

The final inflatable, the Pig, provided by Mobile Air Ships of Canada, appears over the audience during *Run Like Hell*. Lloyd says: "It's a helium-filled blimp that they can fly around the arena. That's a whole different construction method."

Another favourite moment in the show is when a plane flies in from the back of the arena and slams into the wall. Back in '80, it was rigged with steel ropes in a fairly labour intensive manner. "Today, modern technology allows us to use a high-performance synthetic static line; instead of a steel wire rope, it's made out of this material called Technora. It's exceptionally strong rope, and it's very easy to handle," says Lloyd.

THE FLAMES ARE ALL GONE - (Goodbye Blue Sky)

As in the original show, the pyro appears during *In the Flesh, Part 1*, but has increased exponentially. "Roger wanted something truly and profoundly impressive to start the show - something no-one has ever done before," says special effects designer/partner Mark Grega, from Strictly FX, of Elk Grove Village, Illinois. This impressive start of the show was called 'the opening finale'. "It's a visual exclamation point," adds Grega, who created the effect using 3D Studio Max. "With it, we could tweak the chase for timing, and the visual impact, without actually shooting it," he notes.

Waters liked what Grega created, but wanted a bit more impact. "The chase was originally designed to be 550 pieces in 12.8 seconds but Roger asked for the chase to be extended to 16 seconds once we were in rehearsals in New Jersey. Now the chase lasts all the way until the plane explodes into the wall." The result is a wall of pyro that, according to Kansy, "chases like the Bellagio fountain" in Las Vegas.

The opening song contains an astounding 730 pieces of pyro; most shows use less than 300 for a whole show. Specifically, Grega uses 100 40ft ultra-fast comets, eight 40ft ultra-fast comets with tails, 25 medium direct shorts, and 600 1/45ft silver gerbs for the chase at the end of *In the Flesh*. When the plane crashes into the wall, two Lyco cannons provide the dramatic fireballs.

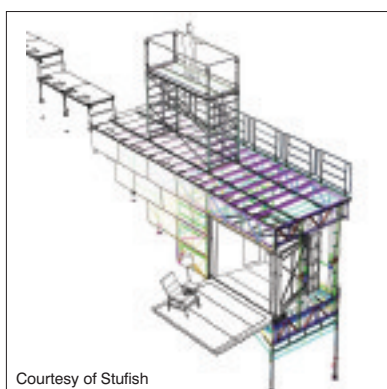
For the finale, Strictly F/X also provides custom-shaped confetti, eight truss-mount AC confetti blowers and two Le Maitre LSG foggers.

I'VE GOT ELECTRIC LIGHT - (Nobody Home)

The basic design of *The Wall* is the same as it was in the original incarnation. The same goes for the centre circle screen, but with some differences. "In '80, it had a few PAR cans around the rim, and then rear projection which was a 35mm film projector," explains Lloyd. Today, the circle screen is there, as well as rear projection. But from a lighting standpoint, technology has indeed changed.

Marc Brickman, the original lighting designer, returned for the 2010 show. Actually, "original" is probably the wrong term. "They hired me in 1980, the night before they opened," Brickman recalls, "I got a phone call saying, 'I'm Steve O'Rourke. I'm Pink Floyd's manager, and we're having a problem here.' I thought it was Colin Waters [of equipment supplier TMB] winding me up, so I replied, 'That's great. I need 25 tickets if you want me to come.' There was silence, and the voice said, 'I am Steve O'Rourke, and I am Pink Floyd's manager, and we are having a problem, and I want to know if you can come down here.' Oops. I had less than 24 hours to recue the lighting."

What with the enormous scenic installation of the wall and the extensive use of projection, the challenge has always involved finding decent lighting positions with which to integrate lighting into the rest of the production design. Brickman is a big fan of side-light and, in 1980, he used the Genie towers at stage left and right to provide it. This time, he says, he has a set of trims on which are placed 18 Philips Vari*Lite VL3500s; these provide general band coverage. He also takes advantage of the upstage circle, which features a set of 24 VL3000s around its perimeter, and the overhead circular truss, which contains 32 Barco/High End Systems Cyberlight 2.0s - 24 units placed on eight moving pods.



Left to right: The original CAD drawing for the Ramparts & Motel; The 'Motel' on the 1980 tour; and on the 2010/2011 tour.

In order to pick out the musicians from the oversized production design, Brickman chose a pair of Lycian M2 medium-throw truss spots placed on stage right and left tracks. Speaking of the latter, Mark 'Sparky' Risk, the show's programmer and lighting director, says: "The spots move downstage, as well as vertically, enabling us to position them perfectly, depending on the state of the wall build and the shots we're looking for. They also provide an exciting visual effect during appropriate moments in the show. The flexibility of their positioning allows us to light band members without creating nasty shadows on the wall." An additional four front-of-house spots are employed at each venue for additional coverage.

The rest of the lighting rig includes eight more Cyberlights on the front trusses, 12 Philips Vari*Lite VLX LED wash units distributed across the stage floor; 48 medium flood snub nose PAR cans, placed on the rear low hanging truss for backlighting the lifts, the wall, and the flags; 10 PRG Bad Boys placed on a downstage truss for forestage coverage; two Syncrolite XL10 units placed on top of the upstage chicken run, where they create searchlight effects in the opening number; 33 Martin Professional Atomic 3000 strobes - 28 with colour scrollers - distributed across the stage floor; six Gekko Kicklites, attached to the mic stands for front light on the musicians, four MDG Atmosphere hazers and four MDG Max 5000 heavy foggers.

The lighting is controlled by a grandMA 1 console which Risk says has become his "desk of choice." The lighting equipment was supplied by PRG.

JUST NOD IF YOU CAN HEAR ME - (Comfortably Numb)

For the original iteration of the project, the sound system was vastly different. "Obviously, line arrays didn't exist, and you can't even describe the speaker setup back then. Basically, you just saw horns from inside the

cabinets that were sort of loose; it was a very different system," explains Lloyd.

To handle front-of-house audio duties, Waters tapped James 'Trip' Khalaf, who also serves as the show's tour manager. Khalaf's FOH system consists of three consoles - two analogue and one digital - all provided by Clair Global, of Lititz, Pennsylvania. System engineer and crew chief Bob Weibel explains: "The console setup is two Midas XL4s. One does the primary main stage band, and the second does the smaller stage in front of the wall that they use towards the end of the show. The third console is the Yamaha PM 5D used for playback of our pre-recorded surround effects, and also used for effects returns."

Speaking of dedicated effects, Weibel says: "Roger Waters is the only artist that I've ever personally toured with where this would even make the remotest sort of sense - for most musical acts, this is completely superfluous, since their songs don't have German fighter planes, explosions or Jeeps driving left to right, or helicopters."

The surround clusters consist of: "Three separate clusters, each made up of 16 of our three-way R4 cabinets; the clusters are positioned left and right, hung midway down the arena floor and the third cluster is hung all the way back at the arena floor," notes Weibel. There are also 12 BT218 subs out in the rear arena that are used sparingly as part of the surround system. The standard R4 cabinets are powered by Crown amps, while the subs use Powersoft K10s.

For the main PA, the tour is using the prototype of a new system, the Clair I5 D. According to Weibel: "It incorporates the components from the current I5 system, in a newly designed cabinet. The primary difference is that it has two 18" drivers in the cabinet instead of one."

The cabinets all have a 90° horizontal dispersion pattern; however, there are three



From top: A custom-designed projector cradle.

The FTSI automation control station.

A Lycian medium-throw followspot and operator's chair with a Syncrolite XL10 searchlight beneath.





different vertical dispersion patterns available. "In this system, the top six cabinets are long-throw cabinets, 2.5° verticals; the next four cabinets down are the 5° vertical cabinets, and then the bottom four are the 10° vertical cabinets." Using the associated hardware, the cabinets can be positioned to make the system flatter, if necessary.

The main PA also uses eight i5 cabinets as the side PA. 12 Clair BT218 subs are located under the front of the stage, along with eight FF2 front-fill cabinets. Again, amplification is Crown, except for the subs, which use Powersoft.

Waters and his band are exceptional musicians, making the job at FOH somewhat easier. "When the band sounds good, our primary job is to make it louder, you don't have to perform a lot of magic," confides Weibel. That doesn't mean there is no outboard gear: the list includes TLA 100 tube limiters, a Crane Song STC 8 Class A tube limiter, and dbx 903 limiters. Weibel admits: "We like the way the dbx limiters sound a lot." There's also an Eventide 3000 harmonizer, a Lexicon 480 reverb, two Lexicon PCM 91s and a TC Helicon Voice Doubler.

The microphone package contains many rock'n'roll touring staples: Shure SM58s on the vocals, Shure Beta52s and SM91s on the kick drums and Shure SM57s on the snare. In addition, there are Milab DC96s on all the overheads, Audex D2s on the rack toms, while on the electric guitars there are Audio-Technica 4050s. "It's a very striking production, and I look forward to hearing the show every night," Weibel concludes.

TURN ON THE SOUND EFFECTS! ACTION!

- (In the Flesh?)

The unseen glue that holds together the entire production is provided by audio playback engineer Mike McKnight, who sits in a technology-filled cubbyhole upstage left. "Basically, when I start my computers, I'm sending time code to video, pyro, lighting, and even to the little apartment scene in *Nobody Home*, so that video plays right in his little hotel room," he reports.

Although McKnight technically does playback, it doesn't mean that the show isn't completely live. "I've been on a lot of tours where people aren't singing or playing as much - on this one, everybody is playing and it has to be to a click so the imagery happens exactly at the right time," he explains. Even in a song like *The Trial*, which includes many special effects elements, the band is still there. "There's a lot of orchestra there, but the band is playing along - there's so much going on with the

orchestra, but if you pulled the band out of it, it would be very, very obvious they weren't playing," adds McKnight.

Waters is also insistent in regards to the live aspect of the show. "Basically, everybody is playing everything on stage - there are never guitars coming out of my rig, there are never drums or anything like that, and all the background vocal parts . . . are absolutely, totally live."

Keeping the band in sync with the video is McKnight's primary role, and when the band slides off the click-track, life for McKnight suddenly becomes more challenging. "If the band make a mistake and come in four bars early, or Roger sings something in a different place and the band adjusts to him, they can't say it's the wrong place, they follow him - and once they go sideways, I have to make the computer go right with them." In that sense the computer is an unseen member of the band.

While many playback operators rely on Pro Tools, McKnight prefers a different piece of software - Mark of The Unicorn Digital Performer. He notes: "ProTools is great for one song at a time but, with Digital Performer, you can have multiple versions of each song on its own. To do that with Pro Tools you have to line them up one after another, so your bar numbers and your locations would not be correct; Pro Tools is not something you would want to use for a show like this."

Digital Performer also provides the all-important time code signal, and is running on a series of Macs. "I use two G5s, one for the A system, one for the B system, I also have some laptops - I prefer to have at least three or four systems. I have three systems running in sync together, so if any of them go down I can switch between any of the three."

McKnight uses Digital Performer to generate timecode that is then sent to a Brainstorm Electronics de-strippyzer SR15 Plus. "The de-strippyzer will take the timecode and reshape it if needed. I can then send it to five different destinations all from one box, all at different volumes, either grounded or ungrounded," he says. The ability to send the signal grounded and ungrounded is important. "Some of these other boxes that I connect to don't want ground from me - if you have a ground loop on a timecode line, it can mess up the timecode, so nothing runs in sync."

Digital Performer also provides McKnight with a virtual mixer to submix the audio elements coming from the computer to multiple outputs. "There are



five lines of surround music; five surround effects; a subwoofer channel for the wall coming down; another stereo pair of sound effects so Trip has more flexibility mixing at front-of-house; and a stereo pair of the choir," McKnight explains. All are sent to Khalaf, who then integrates them into his mix.

In McKnight's world, nothing is left to chance. "Every single day before I do anything, I duplicate the current show file, so that at the very most, I will lose a few hours of work, not the entire show," he says. McKnight does manual backups, and indeed, keeps the show on six separate hard drives. "I always travel with at least one or two of the drives with me, the other four are with production. This way, if the truck flips over, we still have a show."

Timing is also critical even in what seem to be the inconsequential moments of the show. Towards the end of *In the Flesh, Part 2*, Waters pulls out a gun and fires - a moment that seems simple, yet is not. "We spent one or two days adding machine gun sounds where he pulls out a prop machine gun and shoots it - I'm in his ears, saying 'gun two three fire' or 'stop'," McKnight reveals.

In fact, there are only three moments within the entire production that McKnight's computers are halted. "I stop the computer just before *Mother* when he talks, between Act One and Act Two. At the end of *In the Flesh 2*, when he does the shooting - once that ends, then I stop, and he talks as long as he wants in those two places," he says. Outside of those three instances, McKnight's timeline in each half is continuous.

In the end, McKnight has come to the same conclusion as Turner. "I think that me and Richard Turner are definitely the two that could do the most damage to the show, and it's not fun having a job like that, but it's the nature of the job!"

THE SHOW MUST GO ON... - (The Show Must Go On)

Roger Waters concluded the North American portion of *The Wall* in December. The tour resumes in Lisbon in the latter half of March.

Sharon Stancavage

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