STRUNG OUT ON LASERS

THE WHO'S JOHN 'WIGGY' WOLFF AND A CAST OF FELLOW PIONEERS TELL JERRY GILBERT THE STORY BEHIND LASER TECHNOLOGY'S EMERGENCE IN THE ROCK'N'ROLL TOURING WORLD...

Almost five years to the month before the Health & Safety Executive published its long-overdue PM19 Guidance Note — covering the safe use of lasers in the entertainment industry as they migrated towards first generation nightclubs — The Who introduced the effect on a large scale in a UK venue for the first time, at the unlikely Granby Halls, Leicester, on October 18 1975.

Roger Searle, who worked with The Who between 1967-86, and was then their lighting technician along with Tony Haslam, remembers the show featuring "just a single Spectra Physics 164 argon laser with no laser table — perched on a box at the back of the stage.

"Water was fed from a garden hose, power via a few yards of flex that we had borrowed... with John Wolff holding the diffraction grating in between finger and thumb."

The magic word 'laser' had been taped over and the local authorities were informed that it was a new type of follow spot, although that evidently failed to convince the then GLC, which vetoed its use at Wembley Empire Pool, the next venue on the tour. But a lot had already taken place by the time John Wolff took over the reins.

It had taken seven years for that PM19 document to be published, since the first use of an entertainment laser show is credited as being Ivan Dryer's Laserium. Prior to that the laser was probably seen for the first time in the entertainment world in the 1964 James Bond movie *Goldfinger*.

This particular wheel would turn full circle when The Who moved to Shepperton Studios, where movies such as *Star Wars* and *Alien* were in progress, and their technology migrated to Pinewood by the time Cubby Broccoli made *Moonraker*.

But by 1973, Ivan Dryer realised that movie film could not capture the intensity of the laser images created by Dr. Elsa Garmire — only live projection of these effects with a laser could generate this excitement.

Garmire, Dryer and Dale Pelton formed Laser Images Inc. using the incipient technology of X-Y scanning, to perform the first Laserium Show at the Griffith Observatory in Hollywood in November 1973. The early Laserium shows were described as "a mixture of non-representational scanned colour modulated abstract and cycloid effects, with optical effects, created by lumia and diffraction gratings".

The shows were choreographed to recorded music and the laser portion was performed live by the laserist. They typically took place in planetariums as star field projections formed an effective background. By the time it arrived at the London Planetarium in 1977, The Who's development — under John Wolff's supervision — was already into overdrive.

REVOLUTION

John 'Wiggy' Wolff, who today runs Syncrolite UK for former Showco president Jack Calmes (who sold Wolff his first laser) seems the least likely person to have started the laser revolution.

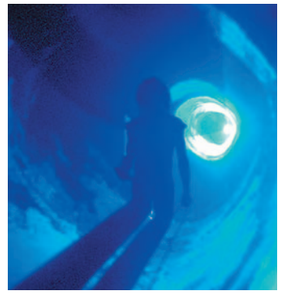
As an unreconstructed roadie for The Who he quickly found himself at the zeitgeist of late Sixties London hedonism, converging after hours on the Speakeasy Club. "'If you want to know what's going on this town,' someone advised me on my first rock'n'roll road trip to Los Angeles in 1972, 'just ask the drivers... they know everything'."

Well, Wolff was a band driver first and foremost — and he does know pretty much everything. Certainly about the late '60s, as evident from the first two hours of our interview which centered around some of the japes, pranks and stunts redolent of that era, many involving the late Keith Moon, before we got down to the serious business of coherent light.

Wolff, who had already boasted the first real lightshow in rock'n'roll, had first seen lasers in use with Led Zeppelin at Earls Court in May 1975. However, seeing Steve Jander, Showco's chief

Above left: The Who's crew in the late '70s, including John 'Wiggy' Wolff (front), Keith Smith, Mick 'Doc' Double, Alan Rogan, Roger Searle, Bill Harrison, Bobby Pridden, Dick Hayes and Keith Morris. **Right:** John Wolff today.

Below: The Who at Bill Graham's Winterland in 1976; Keith Moon watches Wiggy fire a beam in the board room at Shepperton; Roger Daltrey bathes in laser light during 'Won't Get Fooled Again'.



"1W or less was a toy. The only way to get a bright laser was with a big 4W green argon..."

laser tech, nursing the laser to about 500-750mW output at Earls Court, two years on, Wiggy was immediately energised. The Who needed to get into lasers... on a large scale.

The popular story is that Showco's Jack Calmes sold The Who their first laser — a US$36,000 purchase that Wolff would use spectacularly on 'Won't Get Fooled Again'. But one technician, Gerry Leitch, already part of the sound team that helped build The Who's Ramport Studios in Battersea, before going on to become one of the UK's leading laserists, remembers it somewhat differently — and that the laser was in part settlement of a debt owed to the band by the service company.

"The feeling I got at Earls Court was that here was a big show with one of my favourite bands and that was the best effect I had seen in a long time," remembers Wolff. "But 1W or less was a toy. The only way to get a bright laser was with a big 4W green argon."

Enter American light artist Rick Lefrak, who at the time was resident in London. "Rick and his girlfriend knocked on my door and said 'I hear you are looking for a laser... we can hire you ours.'" In fact, they had been called in after Wolff had seen one of their promotional flyers advertising lasers and holograms.

Lefrak, who originally came to the UK in 1969 as a lighting designer for a New York dance company, and ended up at the Roundhouse, can lay claim to bringing the lasers to The Who and was present on the first few tours.

His "girlfriend" was British Guianan born Alope — a hard-nosed business partner. They formed their own lighting company, Laughing Whitefish Productions, building the equipment in their Hampstead yard with local kids, with the advance money from landing a Lou Reed tour deal..

"Alope advertised that Laughing Whitefish could provide lasers and holography for the concert stage. And then Wiggy called and wanted a demo," is how Lefrak puts it. "She told him we wanted £500 to give the demo and he reluctantly agreed — she had balls of steel.

"Wiggy gave us the money and we went laser hunting — and we also found Rank Strand diffraction gratings. I can't remember the science lab that handed over a 4W argon laser to us hippies but God bless them. After a 30 minute lesson (like hook the water here, needs three-phase power there, and by the way the mirrors have to be perfectly aligned or you get nada), I headed to Shepperton where The Who and Wiggy were waiting.

"To cut a long story short, by sheer stubbornness and luck I got a beam — and lit a cigarette off it. We aimed it across the vast space and everyone gasped."

Alope handed Lefrak a diffraction grating which he held in front of the 4W Spectra Physics argon beam and a glorious fan of laser beams filled the space.

Lefrak: "Wiggy played with this awhile and we were on tour the next day in Leicester. Front page news the following day, and we were off and running. Led Zeppelin beat us but where they shot a single beam [in a transfer of Showco's U.S. production] we hit with a heavy duty show."

Wolff was a fearless visionary, says Lefrak. "His ambition and The Who's money allowed us to add more lasers, including krypton, and to build machines to imitate our hand-held grating motions. I think I added the [General Scanning G100pd] galvo scanners but I'm not sure.

Although Lefrak admits that "we made it up as we went along", he later had a hand in providing information that helped devise the US regulation of the industry. Wolff also holds a license to operate a laser in the heavily-regulated United States. In fact, Lefrak was using 20W argon lasers by the time of The Who's stadium shows — as well as many of his other shows, including the stupendous '76 American Bicentennial laser show from the Washington Monument.

Of course, none of this could have existed in isolation. *Quadrophenia* had been recorded in 1973 — two years before The Who embarked on their empirical laser adventure. Wolff had convinced the band that hiring kit was a mug's game — but soon their company, Ramport Enterprises, needed somewhere to store all their newly-acquired equipment.

"We scoured around for a freehold,' says Wolff. "I found a social centre in Battersea advertised as a church hall and when I finally found the church (as I believed it was) I knocked on the minister's door and said 'I have come to buy your church'. He smiled benevolently and told me where to find the real church hall... around the corner in Thessaly Road.

"After the excitement of thinking I had found a great place in his new church, I was full of misgivings when I saw the state of the actual building on offer. But in 1973, £15,000 for a freehold in Battersea was still a snip, we needed something urgently and Townshend said this would make a great studio [with Bobby Pridden ensuring that the sound system passed muster]."

Anecdotally, Wolff also recalls beaming lasers on to nearby Battersea Power Station when Pink Floyd's iconic pig was being photographed for the *Animals* album in December '76. "We threatened to burn a hole in the pig," he jests.

EXPERIMENTING

Another significant year was 1974 — the year The Who bought Shepperton and Wolff started experimenting with holograms (more of which next month).

One of the Shepperton-based engineering companies who assisted was Dave Watson's C&L Developments, which specialised in very precise motorised controls for the film business and was soon making all Ramport's automatic heads, control consoles and mobile carrying cases (to Wolff's designs) for shows around 1974-75.

Two pivotal members of the team, Neil Irwin and John Carr, actually helped make the ancillary laser equipment and Wolff later employed both directly along with Bernie Hunt from Ramport Studios who handled all the heavy electrical installations. They were to become key personnel in the running of The Who's shows.

Hunt eventually bought all the lasers and

Below: Gerry Leitch; Chris Matthews; Rick Lefrak in the '70s...and reunited with John Wolff in 2009.

equipment from The Who through his own company Lasefx before selling everything to Chris Matthews of Laser Creations in 1983-84.

But a decade earlier, having sourced the 4W green argon and diffraction gratings with the aid of Lefrak, and crystal glass prisms from the scientific sector, the famous beam fans were created. The number of beams in the fan was determined by the number of lines on the diffraction grating and each beam in the fan was broken down into its component colour by the prisms and each colour directed separately to the scanners or other optics.

John Wolff's creative team at the time included John 'Boffin' Watkins (also responsible for the studio's acoustic treatment) and the aforementioned Gerry Leitch.

Leitch, who had originally been brought in as a sub-contracted wireman to help build Ramport Studios before coming onboard full-time in 1974, offers a slightly different perspective on the birth of The Who's lasers.

"I remember this truck pulling up and unloading lasers," he says. "We had never seen anything like it before but we were asked if we could get it up and running — and build the FX heads. General Scanning made an X-axis and Y-axis mirror and they supplied a little box with amps and we bought two frequency generators for the X/Y signals — it was very crude."

The same crudeness, Leitch says, was incorporated into Wolff's idea of moving heads where he had a very old fashioned (and noisy) cam and gear rig, which enabled the lights to swing [in a very primitive form of what Vari-Lite would produce].

"Someone else on the team was into motor control and we managed to control it through DMX [though it wasn't used on tour]," says Leitch.

"We would supply the shows on 16-track Studer 2" tape which we would multiplex once we had programmed the show — the laser FX, the shutter movements, rotation, pan and tilt were all stored on this analogue tape machine. There were 32 boxes plugged in and demultiplexed, but everything worked.

"Wiggy had a desk made up; he was the show operator and would put faders and pan and tilt on these large rotary knobs." The later shows used stepper motors on belt drives with notches to get smooth control.

Leitch had been one of a team Wolff refers to as "the Hatfield mob" (though this collective should more accurately be referred to as the Welwyn mob) and also included tour manager Harry Williams — all brought together by Who fixer and acknowledged wide boy, Gary Skillman. Included in this was Dave Matthews, brother of the aforementioned Chris Matthews.

While Leitch's brother, Donovan, had already made his mark as an international recording artiste, Dave Matthews had helped build Ramport Studios with Harry Williams. That persuaded younger sibling Chris, with a BSc (Hons) Degree in Physics and Electronics from London University, to abandon a promising career in the aeronautics industry to make the move to south-west London, replacing Boffin, who had fallen foul of the law.

"There was no stopping us now. We were getting the best show reviews ever..."

EPOCHAL

And so to The Who's début laser show at Leicester's Granby Halls. Wolff remembers that it had been raining, and in the heat of the venue everyone started steaming. Then the laser show struck up and the place ignited.

"Everyone in the audience got up as one," he remembers. "I had a piece of cardboard and a laser at full bore. You had water from the floor to cool the laser — plumbing and electricity together, which was a lethal combination. But when we started up, Townshend was so shocked he hit the wrong chord."

Both he and Leitch recall that at the epochal Charlton F.C. gig on May 31 1976 — part of the Harvey Goldsmith-promoted, three-date *Who Put The Boot In* football stadium tour — it had also been pouring with rain ahead of the performance.

By this time they had developed the large system, with mirrors mounted on the floodlight towers, remembers Roger Searle, who says: "We also took them to the USA for the 1976 tour. The lasers were still an integral part of the show, certainly up to the farewell tour in the USA in 1982 which was the last full tour I did with them."

By Charlton they were using sine wave scanning, taking the sine waves from the back of the oscilloscope. Wolff: "We were using [the new] piezo scanning mirrors and they were dampened in oil. The mirror was barely 2mm square and it would produce 10,000 oscillations a second — even Laserium was only 500 per second. I remember I used to work the controller like an instrument."

Chris Matthews confirmed that the scanning mirror size would later reduce further — to 1mm x 1mm square. "These high power mirrors were known as a mini mirror scanning system and was adapted from a light sensitive chart recorder."

For example, to scan the letters W-H-O, which Wolff did in concert using three lasers, required the 'W' to be a section of a normal sine wave "which you could just get away with using General Scanners."

The 'O' was an equal setting of an X/Y signal — but the 'H' had to be made by a much faster scanner. "Stopping and making right angle shapes was the hardest thing to programme and get any physical scanner to follow, while freehand writing was easier because it is joined in a continuous flow," he says.

The payload soon increased dramatically and The Who were soon fielding first 11, and then 13 lasers including a mighty 60W device they had developed at Shepperton.

"I convinced the boys that because the laser was such an important part of the show we needed a spare in case it failed," says Wolff. "However, having a spare laser sitting around at such a high cost seemed wasteful so I started using it in the shows.

"Of course the doubling up of the strongest

Below: Led Zeppelin at Earls Court, 1975; The Who at Winterland; Wings with a Showco laser system on their 1976 Wings Over America tour.

effect on the touring circuit became the norm. But we still needed a spare just in case. And so it went on until we had four [Spectra Physics] 164s."

As Spectra Physics started to come out with bigger units, Wolff naturally needed to try them. "Now the impact on the shows was exponential and the sales team at Spectra UK, who never had any in stock, offered me the deal of a lifetime. I could order as many as I liked without paying anything and if I didn't need them when they arrived, they assured me they would have plenty of customers for their new stock which my order gave them."

Wolff must have thought he had won the jackpot. "I ordered half a dozen and the Spectra sales team fell of their perches."

Of course this Utopian arrangement couldn't last and Spectra soon wanted the band to take delivery, which Wolff agreed to — on a trial basis initially. "The laser part of the shows was now truly amazing and I was also getting other paid work in from other bands, including Zeppelin, as well as film work... so we held on to the six 171s I'd ordered even though it cost well over £100K."

At a board meeting, Pete Townshend said of the huge cost, that "the company has no money because The Wig has added another bunch of lights to the laser junk pile". "I wanted to believe he was half jesting," chuckles Wolff The Wig, "but there was no stopping us now. We were getting the best show reviews ever."

Gerry Leitch remembers: "Wiggy was bolting mechanical gear, built by C&L, on to the old laser tubes and we were switching mechanical solenoids with diffractions and bursts, with X and Y panning. Six were used on 'Won't Get Fooled Again' — two large frame and four small."

As for the 60W laser, this was a 921 laser which was purchased from British Gas and consisted of two Spectra Physics 171 30W argon (blue/green) tubes end to end. "It was an optical nightmare to get it to work. It was very impressive because it was a 60W laser with an output coupler at either end, with two cones roaming.

"They also had some large frame lasers gassed with krypton, up to 10W — there was no white. There was no way of combining the three colours; they just wanted raw power," states Leitch.

Wolff recalls that 60W laser well. "Abroad you could scan the audience from inside the cone. You could burn a hole in the door as a party trick — which we did to impress Mark Hamill and Harrison Ford when they were making *Star Wars* at Shepperton."

The production team on *Star Wars* asked if Wolff's team could shoot real lasers direct to film. "It was a bit too soon for laser controls to do that, however, so I think they were painted on by Industrial Light & Magic for the film.

"I first time saw [a laser] in a rock concert was when I went to see Led Zeppelin at Earls Court. I remember thinking, 'How brave is that Robert Plant? He's standing in front of this thing and it could cut him clean in half'..." Sir Paul McCartney

"*Alien* was the first direct laser film, then *Clash Of The Titans* and Michael Mann's *The Keep*. There were many other films and a stack of music videos shot using lasers, Kate Bush's videos being my favourites."

The number of mirror targets was also increasing dramatically, so much so that at Wings' September 25 1976 performance in Venice's St. Mark's Square, Wolff had mirrors everywhere — including on the feet of the carving of Jesus Christ on the front of the Basilica and a huge 1.5m mirrorball hung in the *campagnello* or bell tower.

"I needed loads of relevant positions to hang my *specchi* (as mirrors are known in Italy). As it's a UNESCO site I had to get a special papal decree."

Of course lasers in the late '70s were not the sole province of The Who, Led Zep, Wings, Pink Floyd, Blue Öyster Cult, ELO and Vangelis... these were just some of the artists who adopted them.

Rightly or wrongly, The Who are credited with pioneering the genre. And where it took a complete artic to transport The Who's large frame lasers, tables, controllers, galvos and other delicate electronic laser equipment, today's shows are compact, cheap and run technician-free.

It's a sad reflection that today people like Gerry Leitch find their roles virtually redundant. Besides, once lasers arrived in nightclubs they became chronically over-used and quickly lost their magic.

As for those old 171s, Leitch says: "You can't give them away today. We have asked whether the universities would like any of it — but if you don't use them they just die. It's sad, but maybe the public have seen enough of lasers anyway."

A far cry, then, from the days when The Who were working closely with, and part funding, holography development at Loughborough University, to which Roger Searle recalls making many trips in the old TK Bedford truck, while Wolff pays tribute to "the holographic genius that was Prof. Nick Phillips, who died last year".

JOURNEY

Looking back, John 'Wiggy' Wolff concedes that he wouldn't have accomplished such an accelerated and empirical journey without the help of some very close friends — not least his best mate, David 'Cyrano' Langston who now lives in the States. "He played a very important role in all the aspects of that Ramport Studio enterprise as well as being a constant stalwart on all things."

Riffling through the past, Wolff can scarcely believe that so much progress was made in such a compacted time frame.

"In even less time than I remembered, we moved from sliding a bit of cardboard in front of a virtually hand held 4W coherent light Spectra Physics Laser to reveal to the public the first diffracted argon beam at Granby Halls, to mounting the Royal Academy's first and most successful exhibition of lasers and holography in the Academy's history less than 18 months later."

We have saved the final word for Gerry Leitch — which summed up the whole magic of the idiom. "The point was that the laser was only used in two 90-second bursts with The Who [the first on 'See Me, Feel Me']. It was always the finale of 'Won't Get Fooled Again' when the lighting suddenly went to blackout after that two minute synth break... what more could anyone want?"

TPi

Photography: John Wolff, 'Irish' Jack Lyons, Rick Lefrak, Chris Matthews, Robert Ellis, Jerry Gilbert & Mark Cunningham

NEXT MONTH: More laser tales and triumphs from the archives of rock'n'roll touring...