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JEAN-MICHEL JARRE: WAITING FOR COUSTEAU

- Francis Reid on Digital Dimming
- Performance Lighting Technology at Heathrow
- Macabre Scenes at the London Dungeon
- Opera North at Leeds : Fallows Too, Liverpool
- Ben Duncan on Decibels
- Lighting the new Berlin Wall

AUGUST 1990

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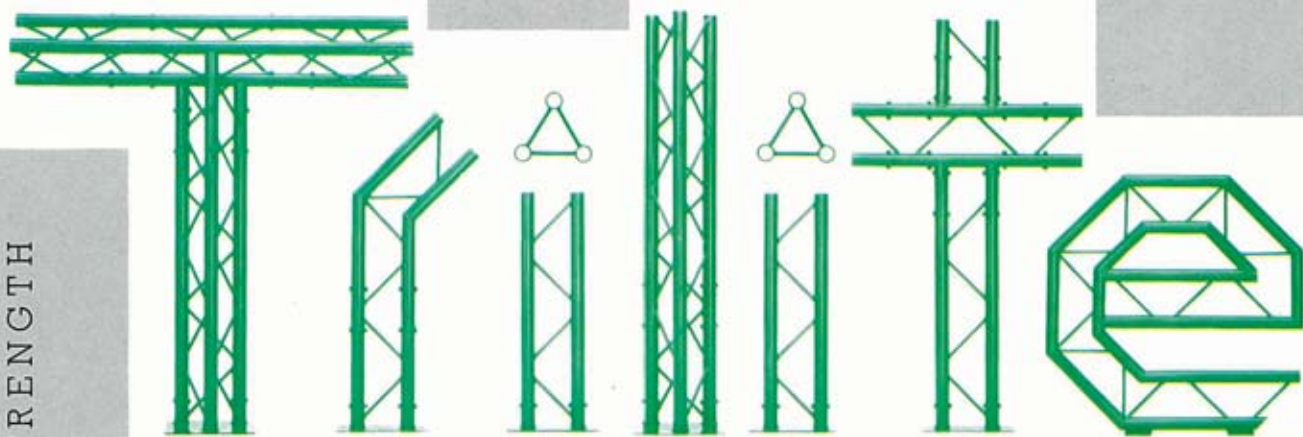
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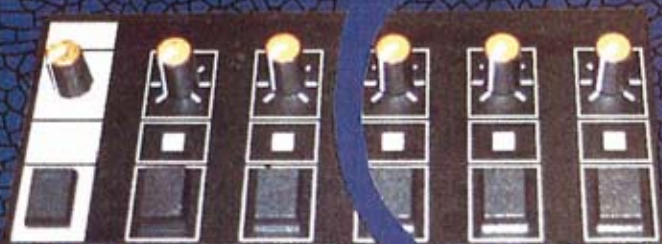


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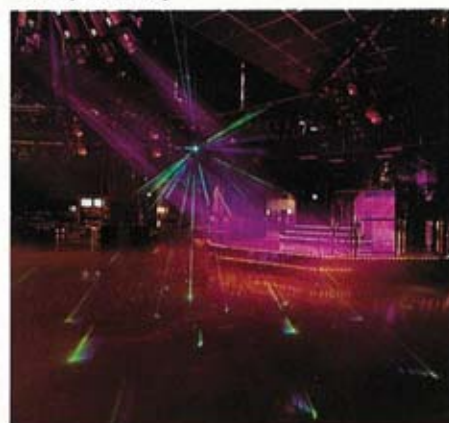
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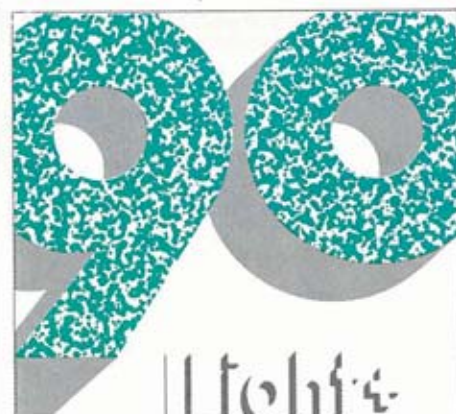
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Avitec Germany: The End Of An Era

A chapter ended in early July when one of Europe's leading companies over the past decade, German-based Avitec+Sondock GmbH, went into voluntary liquidation. Formed in 1978 by Ernst Weimer and Peter Danne, the company consistently pioneered new lighting products and design concepts in the early '80s, culminating in a series of 'Discorama' exhibition superlights in Munster, which in turn gave birth to the legendary 1983 UK Superdisco, modelled along the same lines, and coordinated by Avitec's UK company.

Managing director Tony Kingsley emphasised to L+SI that the demise of the German business had no implications, financially or otherwise, for Avitec Electronics (UK) Ltd, which had always operated independently as a privately-owned company. "Whilst we're sad to learn of the news we have always traded autonomously and con-

tinue to go from strength to strength," he said.

The only direct effect will be the availability of Lite Mover, manufactured by Avitec Productions GmbH, who are also in liquidation. "We are still holding stocks and would like to reassure existing customers that we have more than sufficient spares to maintain sold units for the foreseeable future," added Tony Kingsley. He revealed that Lite Mover production would probably continue from a UK manufacturing base, and that he understood negotiations were already at an advanced stage.

Ironically, it was the crippling research and development costs involved in bringing Lite Mover to the market that largely contributed to the downfall of Avitec's German operation, coupled with the cancellation of major orders from the Far East and Spain, we understand.

Meteorlites at the Proms



Adam Bennett, R+D engineer with the four TV dimming systems in the gallery of the Royal Albert Hall

Ronan Willson of Meteorlites Productions recently took delivery of four of Avolites latest TV 48-25 DMX Dimming Systems. All four systems were built with BAC 400 mains input connectors, and a mixture of hot-patch and CEE outputs on the patch legs, at Meteorlites request. The systems were completed in less than six weeks, in time for the load-in to the Albert Hall for the Proms. A complete Q-patch system was also supplied for the project.

Theatre Courses

The Half Moon Young People's Theatre is now preparing for its annual full-time course in technical theatre skills and a series of short courses for those already working. The courses are open to all.

The full-time course is a six month, practically-based course designed to prepare young people to seek careers as technicians in the arts and entertainment industry.

The short courses will take place on a Friday or Saturday in the autumn, and will cover Basic Techniques in Lighting Design; Creative use of Colour in Theatre Lighting; Lighting Black and Asian Performance; The use of Non-Conventional Light Sources in the Theatre; Colour Temperature; Smoke and Pyrotechnics; Soundscape Recording and Theatre Lighting for Directors. For more details on any of these courses call Dipak Mistry on 071 265 8138.

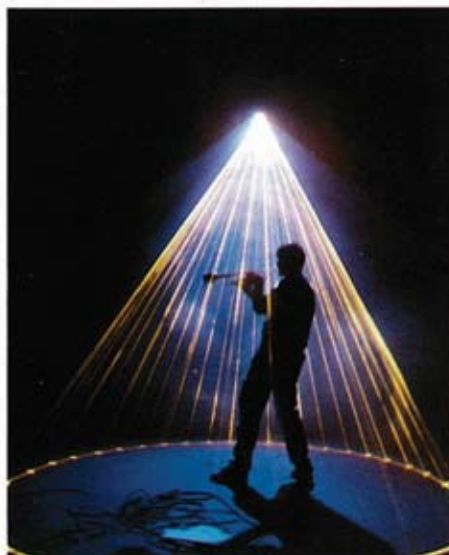
Wharfedale in Europe

In August, Wharfedale Loudspeakers will once again exhibit at Firoto in Amsterdam, which this year expects between 3.5 and 4 million dealers and other visitors during its week-long run.

Wharfedale claim to have the third largest market share of the Dutch loudspeaker market and are making similar inroads into other countries such as West Germany and Belgium.

With such a major presence at Firoto and the launch of a number of new models (notably the Diamond 4) Wharfedale is looking forward to pushing its reputation for fine speakers even further into new and existing markets worldwide.

Lasers with Soft Centres



Following the successful launch of the Starlight moving light system, Tasco, the Woolwich-based rock'n'roll hire company, are on the verge of announcing a new product based around the same technology, writes Tony Gottelier.

By feeding a laser via a fibre optic link to the Starlight head, and combining the cues from a Laser Grafix Prisma controller and their own desk, they have achieved spectacular beams of combined laser scans and strong coloured light beams. Colours, movements, positions and scanned patterns can all be synchronised for spectacular results.

Working closely with Tasco on this project were Laser Grafix who provided the whole laser content and the fibre optics, which they claim to be 80% efficient. One of their operators will go on tour with the first rig to go out which will be soon, according to Tasco's Joe Brown. "After exhaustive testing we have agreed to send a system out with Deep Purple on their world tour which starts shortly."

Starlight Design Move

At the end of last month Starlight Design, manufacturers of effects lighting, moved from their Cambridgeshire base to new headquarters in Bedfordshire. All enquiries and correspondence should be addressed to Starlight Design (Light & Sound) Ltd, Units 6-7 Hardwick Road Industrial Park, Great Gransden, Sandy, Beds SG19 3BJ. Tel: (07677) 7715.

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High Energy



Laserpoint provided the high energy laser display to enhance the Energy Marketing two-week conference in Blackpool. The company supplied an Argon/Krypton combination of lasers controlled by Laserpoint's new Aquarius controller enabling easy use of full colour, blanking and colour modulation. The positioning of downrange effects around the balcony produced beams of laser light sweeping over the audience; whilst single beams gave a shining moving fan of laser fingers and rotating 'starburst' effects.

Positioned conespinners were hit by laser beams to produce a cone of spinning light around the speakers. While the second show took the form of a synchronised display which highlighted and emphasised project images.

Celestion on Show

Major news from loudspeaker manufacturer Celestion includes the recent takeover of the Foster line of high frequency horns and tweeters. Distributed in the UK for the last 15 years by Fane, full distribution of the J44, J73, J104 and J105 will now be handled by Celestion. Together with these at the PLASA Light and Sound Show (September 9-12), there will be live demonstrations of the SR System.

Acoustic Control Systems

London-based Shuttlesound have recently been appointed as the exclusive UK distributor of Acoustic Control Systems (ACS). The system has been developed to solve the problem which venues face when presenting a range of performance types within the same space. Different performance types have different acoustic requirements. Using loudspeakers, microphones and a central processing unit, ACS is able to create variable and optimal acoustics for each performance type that the venue presents, by adding the ideal reverberation and early reflection pattern to the direct sound. The result is a venue which has suitable acoustics, whatever performances are presented.

The product, which was shown on BBC's 'Tomorrow's World' last year, fills a niche in the market according to Shuttlesound and complements their growing product range for theatre. It has provoked considerable international interest, and is considered a major step forward in electro-acoustic technology.

Jasper Whitaker is the ACS specialist at Shuttlesound and has already successfully negotiated the first installation in the UK at the Gordon Craig Theatre, Stevenage.

Discom 90

The Discom, 10th international trade fair of equipment and technology for the entertainment and leisure industry will be at the Parc des Expositions de Paris, France from October 28-30 1990.

80 professional exhibitors will feature their brand new products covering sound, lighting, special effects and services. The organisers expect more than 8,000 visitors to attend. Entrance is free and reserved for professionals. For further information contact J. Baron at Ste Infopromotions in Paris. Telephone 33 (1) 43 44 35 97.

Definitive Lasers

The Definitive Laser Company has recently completed a series of open days at their new premises at Hatfield in Hertfordshire. The open days were organised to show off the company's newly designed 'in house' effects and graphics from LaserMedia.



The Definitive Laser Company was set up by some well-known names in the laser industry that include Marlyn Weeks (MD), Lorraine Ludman (sales) Andrew Weeks (production) and Gerry Lietch (technical). The company is looking to the hire market, hence the investment in time and money in producing their own in-house effects. They can be located at Unit 1 Alpha Business Park, Welham Green, Hatfield, Herts. Telephone (0707) 266778 and Fax (0707) 268861.

dB at PLASA

Shown at PLASA for the very first time will be the entire product range from Italian sound reinforcement equipment designer, dB Technologies. Exhibited by AKG, these will include loudspeaker enclosures and mixing consoles in both powered and non-powered versions, powered monitors and wireless microphone systems. Expected to be the subject of major interest is the dB Snakeless Systems, together with the L.A.S. mixing consoles incorporating an optional onboard one second delay and the DTI approved VH 170 wireless microphone system.

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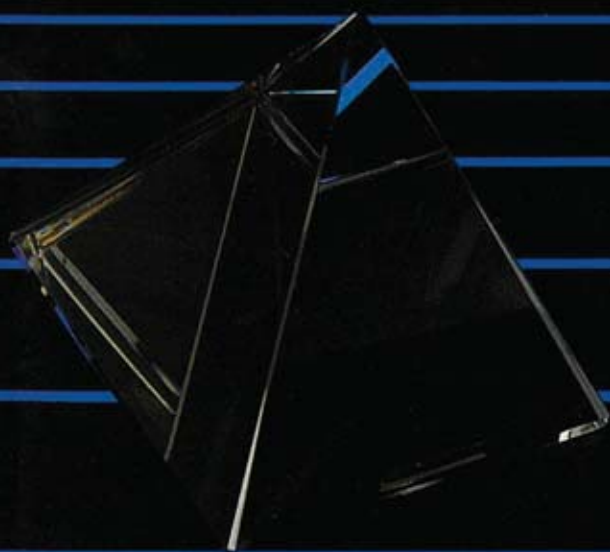
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USITT Expo 91

More than 50 per cent of available space is already sold for USITT's Stage Expo 91. The conference will be held in Boston from 20-23 February 1991 at the John B Hynes Veterans Memorial Convention Center and the Sheraton Boston Hotel and Towers.

Leading names in the entertainment technology and design business that have already committed to USITT 91 are The Great American Market, JBL, Lee Colortran, Strand Lighting and Rosco. Exhibits represent leading manufacturers and suppliers of lighting and sound equipment as well as make-up and costumes.

The theme of the 1991 conference will be *New England: A Region of Theatres*, and will include the New England Design Exhibit, a showcase of scenic costume and lighting designs from New England regional theatres. Also on display will be Tech Expo, an exhibit of innovative technical designs and technical solutions, as well as a special preview of the US exhibit for the 1991 Prague Quadrennial. Special events will feature the cultural resources of Boston and the New England region.

For further information regarding the USITT Stage Expo contact Events Production Group, 135 Fifth Avenue, 5th Floor, New York, 10010, USA. Telephone (212) 353 1951.

Camelont into Europe

Camelont AB, Swedish manufacturer of the very successful Rainbow Colour Scroller System have announced their expansion into Europe.

A new London-based office, which opened on 1 August 1990, will centralise all sales and marketing for the Rainbow worldwide. Heading the London office will be Michael Goldberg, who has distributed the Rainbow in the UK for the past two years.

Camelont will be showing at the PLASA Light and Sound Show from September 9-12 in London.

Star Performer Debuts at PLASA Show

Sound and light specialists NJD Electronics have announced the launching of several new products at this year's PLASA exhibition, (from September 9-12 at Olympia 2) including the debut of the 'Nightstar' lighting system.

NJD's managing director, Mr Kevin Hopcroft, commenting said: "We decided to book a larger stand on the ground floor to enable us to demonstrate these new products, as well as show our existing ones, and to allow easier access for customers and overseas distributors."

NJD hope the launch of the 'Nightstar' lighting effects matrix will receive significant interest from both installers and mobile disc jockeys. It comprises of 12, 18 inch polycarbonate lighting tubes, each fitted with a printed circuit board, containing an array of miniature lights. These are inserted into a central hub unit which contains a mains transformer, microprocessor controller and 12 sockets for the lighting tubes.

Other products to be launched include the new 'Logic 8000S' computer chaser lighting controller, which is available in two versions, each offering 48 independent lighting patterns, with enhanced control, linear chase and cross-fade facilities. One model will contain an in-built DP 10000 dimming pack and the other version will incorporate low voltage outputs for installation purposes. The new 'Logic 404S' will also be available in two versions. The SL3000i three channel sound to light unit has been superseded by the SL4000i which now incorporates an additional channel.

NJD are also launching a new DLP500 transcription turntable. This is stroboscopically controlled and contains individual pitch controls for 33 and 45 rpm speeds. Further details can be obtained by visiting the NJD stand, number G63, on the ground floor, adjacent to the entrance foyer at the PLASA Light and Sound Show.

Lasers Do The Business



Cambridge-based Laserpoint have recently completed several installations of their white laser system. The Palm Court in Southport has been transformed from a Victorian Bath to a tastefully decorated venue, which caters for the whole family, with tea-dances in the afternoons and dancing in the evenings, and now features an Aquarius controller and white light laser. By the clever use of gauze screens Laserpoint created three-dimensional imagery enabling the use of graphic and animation sequences to be run from disc or created live from the Aquarius controller.

The Zig Zag club in Bournemouth wanted a full colour laser display normally associated with an Argon/Krypton combination but did not have the space for two lasers, so Laserpoint installed the WhiteLight laser. With its new hardcoated optics, it typically delivers up to 4 watts and has low divergence. Combined with the Aquarius Controller using colour switching it gave the Zig Zag Club full colour. Laserpoint also installed a Pixelite videowall in a 3 x 7 configuration.

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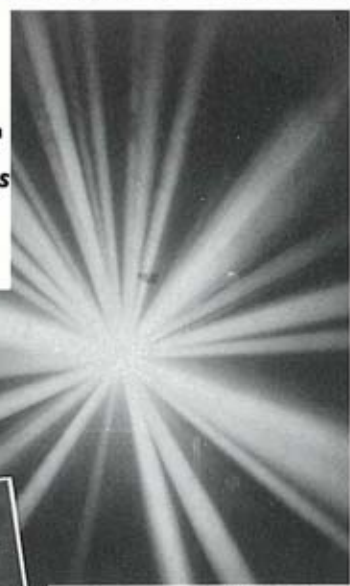
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- Colour change with or without blackout (*).
- Rainbow effect, by continuous rotation of the colour wheel (*).
- Wide range of rotational speeds.
- If required, a filter may be inserted to convert the colour temperature from 5600°K to 3300°K (useful for TV studios).

COLOUR MIXING

- Vaste range of colour available by mixing the primary colours Red, Green and Blue.
- Virtually all possible hues and levels are obtainable.

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- Two wheels with 4 Gobos each. You can project each pattern separately or in combination.
- A total of 16 different patterns are available.
- Gobos change with or without temporary blackout (*).
- An evocative rolling effect is available by shifting of two superimposed Gobos.
- Gobos are interchangeable and easy to replace.
- A wide range of Gobos is available on request.

IRIS

- Fully variable beam size.
- Iris speed is totally controllable by the operator.

PRISMS

- Three trioptic prisms create multiplication and overlapping of projected patterns.
- The prisms have 3, 5, 9 facets.

STOPPER/STROBE

- High speed stopper to cut the beam as long as required.
- Strobe effect rate fully adjustable from 1 to 7 flashes per second.

DIMMER

- Mechanical. Full adjustment of light intensity from zero to 100%.

OBJECTIVE LENS

- 1.3/250 mm achromatic doublet lens, giving the best colour and transmission performance.
- Focussing remotely controlled.

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- The SUPERSCAN can accept either analogue or digital control signals, from controller or computer.
- analogue input: 0-10 V.
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- 17 high resolution steppers motors, controlled by internal microprocessor.

CHANNELS

- 12 control channels:
- Channel functions:
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- channel 2 = Colour disk
- channel 3 = Gobos
- channel 4 = Stopper/Strobe
- channel 5 = Pan
- channel 6 = Tilt
- channel 7 = Fading Dimmer
- channel 8 = Prism
- channel 9 = Focus
- channel 10 = Red colour Mix control
- channel 11 = Green colour Mix control
- channel 12 = Blue colour Mix control

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- The equipment is manufactured according the latest safety regulations.
- Protection degree: IP 20.
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(*) Option to be pre selected directly by users.



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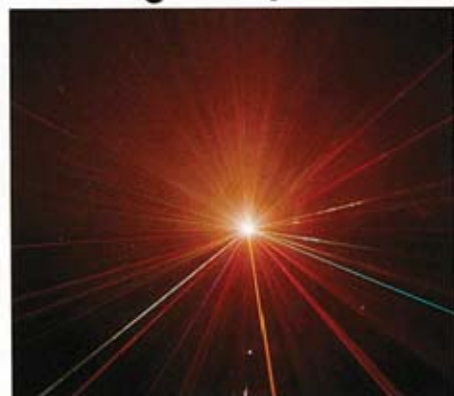
Discoscene 90

The date for this year's Discoscene exhibition has been set for Sunday 28th October. This will be the 12th successive annual show to be held in the Midlands. The venue will once again be the Pavilion Suite at the Edgbaston Banqueting Centre situated within the County Cricket ground, Edgbaston, Birmingham. This location offers exhibitors and visitors superb facilities such as ground floor access, on-site free parking, and up to 16,000 sq ft of exhibition space.

Discoscene is renowned for staging the first pilot 'Superdisco' that brought together many leading names in 1982. The show continues to have a broad profile with exhibitors from all sectors of the discotheque and leisure industries in attendance. Last year exhibitors ranged from manufacturers of mobile DJ equipment through to companies such as Bose and Universal Lasers whose products are seen in many installation settings. The exhibition will run from 12 noon until 5pm with admission to visitors being £1.50.

Exhibitor and visitor information is available by contacting the exhibition organiser, Terry Lees, on 021 707 1925

Laser Lights Square



One of Europe's leading nightclubs, the Leicester Square Empire, has announced 'a significant improvement to their lighting show', with the purchase of two Universal Argon lasers, each rated at five watts.

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Wembley Stadium has purchased eight Strong Super Trouper follow spots. Peter Miles from The Spot Co. London who made the sale and installation told L+S: "We went with Strong due to their high performance over long distances and good reliability."

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Jeff Demain, formerly with CLS Sales Ltd of Bolton has now formed his own company, trading as Spectrum PD. The company concentrates mainly on lighting product sales such as smoke machines, lamps, cables and connectors, adhesive tapes, dimming and control.

Spectrum PD also offers project design, consultancy and installation services to all levels of the industry. He can be contacted by phone on Bolton (0204) 887022 or by fax to Bradford on (0274) 590413.

Obituary

Mike Snape was recently killed in a head-on car crash near Aviemore in Scotland. He had been involved in the theatre in various ways from very early on in his career. He worked for a time in Edinburgh in both audio visual and theatre environments, and then joined Alton Towers as technical head of presentations.

After a brief period with JEM Theatrical Supplies, he returned to freelancing for such companies as Blacklight and Mushroom.

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ROCK 'N' ROLL THEATRE ON THE GRAND SCALE

Mike Lethby reports from the Berlin Wall

If this entire piece reads like a litany of hyperbole, I can offer no apology, because that's pretty much the way it was. Roger Waters' 'The Wall' show, held at the Potsdamer Platz in Berlin on July 21st, was the latest and greatest showcase of the trend to rock'n'roll as theatre on a grand scale. Much, much more than a rock show, it was a true multi-media event with a vengeance.

And, of course, it was staged in aid of charity (in this case, the World War Memorial Fund for Disaster Relief). The Fund was created by former bomber pilot Group Captain Leonard Cheshire VC, with the objective of establishing a permanent fund to provide cash for relief in the event of flood, earthquake or other calamity on a worldwide basis. Cheshire ultimately hopes to raise £500million — a symbolic figure since it represents roughly £5 for every person killed in the 20th century's major wars.

As ever, the allure of a major charity show attracted a star-studded cast. Roger Waters' guests included The Scorpions, Sinead O'Connor, Cindy Lauper, Jerry Hall, Van Morrison, Bryan Adams, Albert Finney and — as if to show that glasnost has even embraced rock'n'roll — a Russian marching band. But it would be neither unfair nor an indictment to say that this slightly implausible collection of talent actually played second fiddle to an extravagant son et lumiere which in truth you had to be there to appreciate.

Most of the world (43 countries in all) saw

or will see the show on TV, but for those gathered on the dusty Potsdamer Platz, the real thing was a great deal better. In fact, the high point of this visual feast came almost at the end when, what to me was the most gorgeous firework in history exploded over the adjacent (and hopefully deserted) park. A huge cascading cloud of white and gold stars filled the sky. The audience stood transfixed; 250,000 jaws dropped and the show was totally forgotten. When it had gone, after what seemed like an eternity, you pinched yourself to prove it wasn't a dream. Le Maitre, who supplied all the pyrotechnical effects for the event deserve credit for a spell-binding achievement.

Yet what had gone before had been hardly less impressive. Lighting designers Abbie Rosen and Durham Marengi, along with set designers Mark Fisher and Jonathan Park, painted a huge and superbly co-ordinated visual picture on the wall of white styrofoam blocks measuring some 600 feet wide by 80 feet high.

Vari*Lites, followspots, lights on cranes and cherry-pickers, a mass of fixed lights and Theatre Projects' synchronised searchlights were all deployed in an unholy alliance with four slide projectors, throwing a sequence of images onto the wall. For good measure, there was a back-projected circular screen behind the stage and two giant TV screens either side of the visually screened PA.

This firepower was matched by an equally

comprehensive PA sound production from London-based Britannia Row, who used a combination of Turbosound's new 'Flashlight' long-throw system and a huge delay system comprising Turbosound TMS-3 cabinets.

Sending it out to the world was German TV company ZDF, working in conjunction with Tony Hollingsworth's London-based Tribute Productions. Somewhere in a gridlock of OB trucks backstage, Nigel Jopson and broadcast sound engineer Nick Griffiths in the Manor Mobile layed down an album mix on a Sony 48-track digital multitrack. They also fed a partly-mixed signal to TV sound mixer Dave Richards' SSL console, sweltering in an adjacent hut.

All of that, you might suppose, sounds like a pretty well organised affair. But on digging a little deeper, you soon find that the reality was actually pretty hair-raising.

Before the show was allowed to happen, protracted negotiations were held between the various production companies, East and West Berlin authorities, West Berlin's four post-war occupying powers, the East German army and countless other interested parties. The cleaning lady from the nearest U-Bahn station was probably there as well. As you can imagine, getting a consensus out of such a sprawling committee was far from a simple process. In the end, the show date was postponed twice — and the eventual preparation time, once agreement had been reached, was curtailed to a paltry eight weeks, the latter



Fisher Park's spectacular graphics form the backdrop to The Wall. Production Arts of New York supplied the entire Pani projection package for the project which consisted of five BP6 Gold HMI projectors with blower cooling system and A32 random-access slidechanger. They were located 100m from the 'wall' on towers 18m apart and controlled from the central tower. A total of 150 7' x 7' slides were used.



Event lighting by Meteorlites and Theatre Projects highlighted the scale of the event.



Pink Floyd's pig re-born — one of Gerald Scarfe's giant inflatables.



Theatre Projects' SkyArt heads were synchronised by computer to dramatic effect.

two being on-site, which as one participant observed was 'pushing it a bit'.

But hold on; it doesn't stop there. For Britannia Row the tale was even more complicated. According to an industry source, the company's continuing connection with their former owners, the Pink Floyd (from whom Roger Waters split some years back, amidst scenes of acrimony and a lot of undignified mud-slinging) proved to be a political hot potato. The connection in question, of course, is Robbie Williams, Brit Row director and the Floyd's longstanding tour production director. Because of this, Britannia Row were regarded as 'last choice' — even though they were clearly the best-equipped European rentals firm for the job. Overcoming that particular hurdle whittled away yet more precious time. Eventually, the issue was resolved to everyone's satisfaction and the working relationship turned out to be amicable enough. Brit Row crew chief Mike Lowe laughed as he summed up the situation: "It's all been pretty bizarre, really."

To get a picture of exactly what was involved, let's take a look at the production in detail.

The PA

Britannia Row are no strangers to big events. Before 'The Wall' this summer's festival season had already taken them to Glastonbury, Knebworth, Roskilde and a string of dates with superstar Franco Rossi at the World Cup Final stadium in Italy.

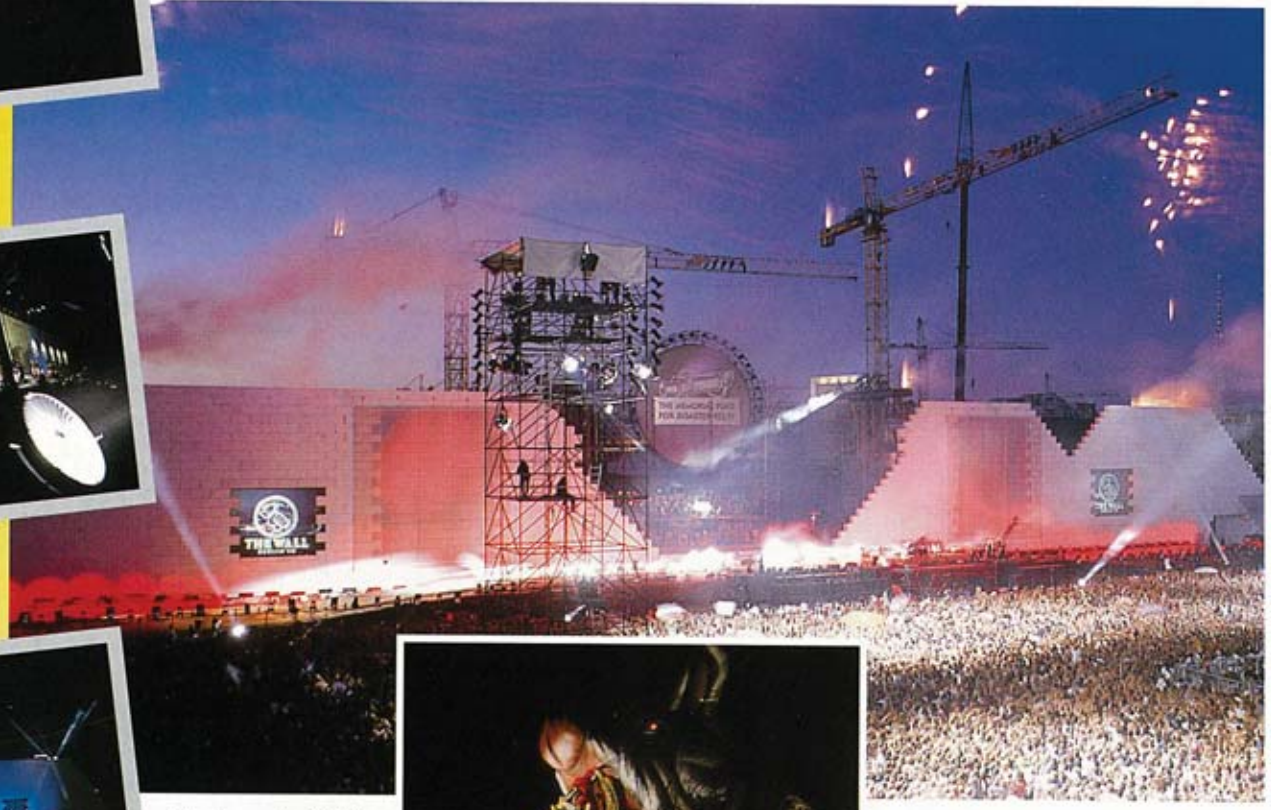
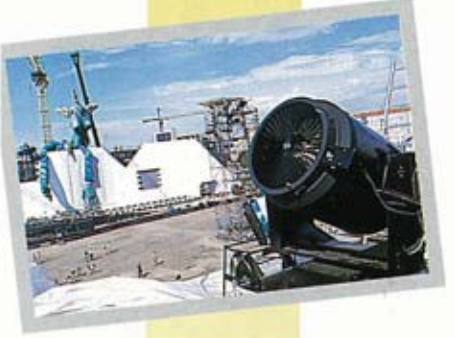
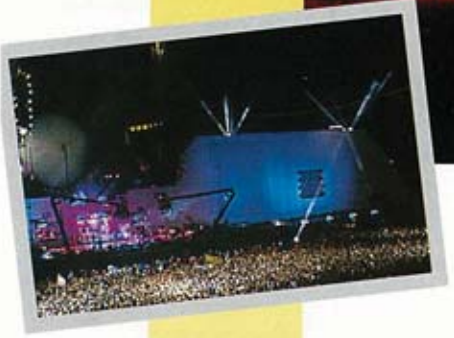
Mike Lowe observed: "It's been an incredible summer and I'll be amazed if we have another run like it."

For 'The Wall' they elected to use their pre-production rig of Turbosound's yet-to-be-released 'Flashlight' Ultra High Q long-throw system as the main FOH PA. Due for official launch at this autumn's Los Angeles AES show, the remarkably compact Flashlight was augmented by a time-aligned 11-tower delay system powered by Turbosound's familiar TMS-3 full-range cabinets. There was also a centre in-fill system in front of the stage consisting of 16 TMS-3s and 16 Turbosound sub bass cabinets.

The configuration was determined by the size and nature of the site. Roughly a quarter of a mile from front to back and fanning out in a wedge shape from the stage to around the same distance across the back, it rises gently to the centre (a point marked by the site of Hitler's bunker), then gradually falls away again.

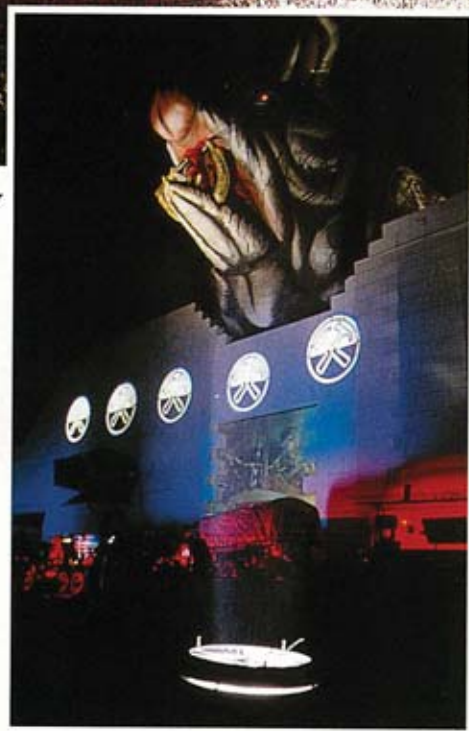
Turbosound's John Newsham — PA consultant to the show — explains: "Although there's no SPL limit, we were concerned not to let it spill out of the site too much. So we opted for three arcs of TMS-3 delay towers, spaced about 100m apart and angled down (like the main PA), to cover the site evenly and get a good SPL down the field. There's a contingency factor — we'll bring it up more if the weather deteriorates. But if it stays fine, when people come in and the air warms up the sound will reflect and 'skate out' a bit more."

Newsham and Chris Hey set the delay timings by ear with a 'click' phase checker. Two new digital delay lines from BSS — designed specifically for speaker time alignment — provided the technology: an assortment of TCS-803s on the delay towers, TCS-804s on the centre in-fill and a stereo TCS-804 on the Flashlight system. Newsham: "They're exceptionally versatile; we could take the highs and high mids back in time



Photographs: *Nik Milner*

Event Lighting: *Theatre Projects*



THE WALL: BERLIN 1990 - THE LIGHT: SKY-ART

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Like Skytracker, Sky-Art is available in the U.K. only from Theatre Projects.



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with the 12' drivers and the whole lot is adjustable in relation to the 21' bins at the turn of a knob in 'relative mode' – rather than moving them physically. It makes the array dispersion smoother, and simpler to achieve."

The Flashlight FOH system looked implausibly small at first sight. Just 24 3-way mid/high packs, flown from a point 13 metres above ground, and 18 12' sub bass cabinets, stacked at stage level in a similar curve to the mid highs, were used each side.

Their sound, though slightly different in character from the full-range TMS-3s, integrated well with the centre fill and delays because, says Newsham, "the main element of the sound, the TurboMid, gives both systems a similar dynamic – the Flashlight's dynamic just goes further down and further up in frequency."

The aforementioned centre fill comprised 16 TMS-3s and 16 Turbosound sub bass, located 70 feet forward of the main PA and time-aligned with the rest via the BSS delay line. More sub bass cabinets were added under the PA wings.

Newsham pointed to Flashlight's custom flying system as a key factor in making the PA work: "We're able to get a very narrow vertical angle between boxes – about 10 degrees, which is precisely what we need to cover the area to the first delays."

In the event, the new PA worked extremely well. Its no-compromise design will doubtless have to be marketed on a par with Stella Artois lager (i.e. it's brilliant, if you can afford it), but it seems designer Tony Andrews' goal of creating a new level of narrow-dispersion, high quality PA technology has succeeded admirably. As Nigel Jopson, recording 'The Wall' in the Manor Mobile onto a Sony 48-track digital, commented: "I can't believe

such a compact PA can produce such a good, punchy, hi-fi sound, despite being so loud."

FOH control comprised two Yamaha PM3000 desks and a Midas stretch console. Their PFLs and certain auxes were bussed together, allowing engineer Gary Bradshaw to control most of the show from one board, using the others as sub mixes. Behind Gary were two 24-track Otari multitracks which supplied pre-recorded sound effects via two faders on Gary's board – as well as the vital master SMPTE timecode for the lighting and projector operators and a musicians' click track.

Stage monitoring was a fairly complex set-up too, encompassing the main stage, performers' monitors on the Bailey Bridge in front, a full orchestra and scattered locations in and above the wall itself, used by Waters and solo musicians at various points during the show. Six TMS-3 fills and some 38 Turbosound and MSI wedge monitors were used, and Robin Fox – the monitor system's designer and engineer on the night – had at least 120 channels to contend with.

My planned after-show chat with Robin had to be abandoned since he was quite understandably in a state of shock after seeing most of his monitors mains power fail barely five minutes into the set, apparently the result of a rogue mains spike tripping a circuit breaker. But in Mike Lowe's words: "It was a hell of a system he put together."

Brit Row's remaining task was to supply the TV and recording companies with signal feeds – accomplished through 48 channels of BSS mic splitters and another 80-odd transformer buffered channels.

The Lights

In many ways the huge site provided very good value for everyone as a visual experience and the scale of Rosen, Marengi and

Fisher Park's concepts meant that it was often best appreciated from a distance.

Lighting was divided into two areas – 'stage' and 'event', each with its own lighting designer and suppliers. Abbie Rosen lit the stage with equipment from Meteorlites and Vari-Lite, and Durham Marengi handled the event side using a variety of fixed lights, Vari*Lites, followspots and Theatre Projects' SkyArt and SkyTracker computer-synchronised searchlight systems.

Adding to the complex mix were numerous lights mounted on the tower cranes which were used to hoist a truss full of 200 Thomas Par 64 long nose cans into the sky – which meant rigging at 125 feet on a moving jib 120 feet long; no mean feat!

Their efforts were integrated with Fisher Park's graphics – projected onto the wall using a carefully aligned row of slide projectors atop four towers across the site – and the back projected circular screen and video screens, showing an amalgam of clips from old Waters/Floyd films and 'The Wall' movie.

Operating the Vari*Lites were Richard Knight (event) and John Nugent (stage). Also on site was SkyTracker and SkyArt operator Sean Burke, assisted by Jonathan Wood, production electrician Nick Jones, Theatre Projects representative John 'Abo' Trewellan and a cast of thousands from Meteorlites to match their lengthy equipment list including crew chief Scot Duhig, Paul Tibbles, Joe Sherno, Nigel Holsborough, John McCullagh, John Dall and Phil de Boissiere.

For Theatre Projects, the show was the first major outing for their new SkyArts searchlights, and as the arena emptied lighting hire manager, Alan Thompson, was in celebratory mood (TP thereby winning the award for the Best Equipped Supplier for their fridge full of bubbly on the mix tower). Their complement



Turbosound Flashlight cluster with sub-bass below.



Britannia Row's Mike Lowe (left) with John Newsham of Turbosound.



Theatre Projects' SkyArt (front) with TMS-3 centre fill behind.



Turbosound wedge monitors and Vari*Lites on stage front.



The Vari*Lite control position.

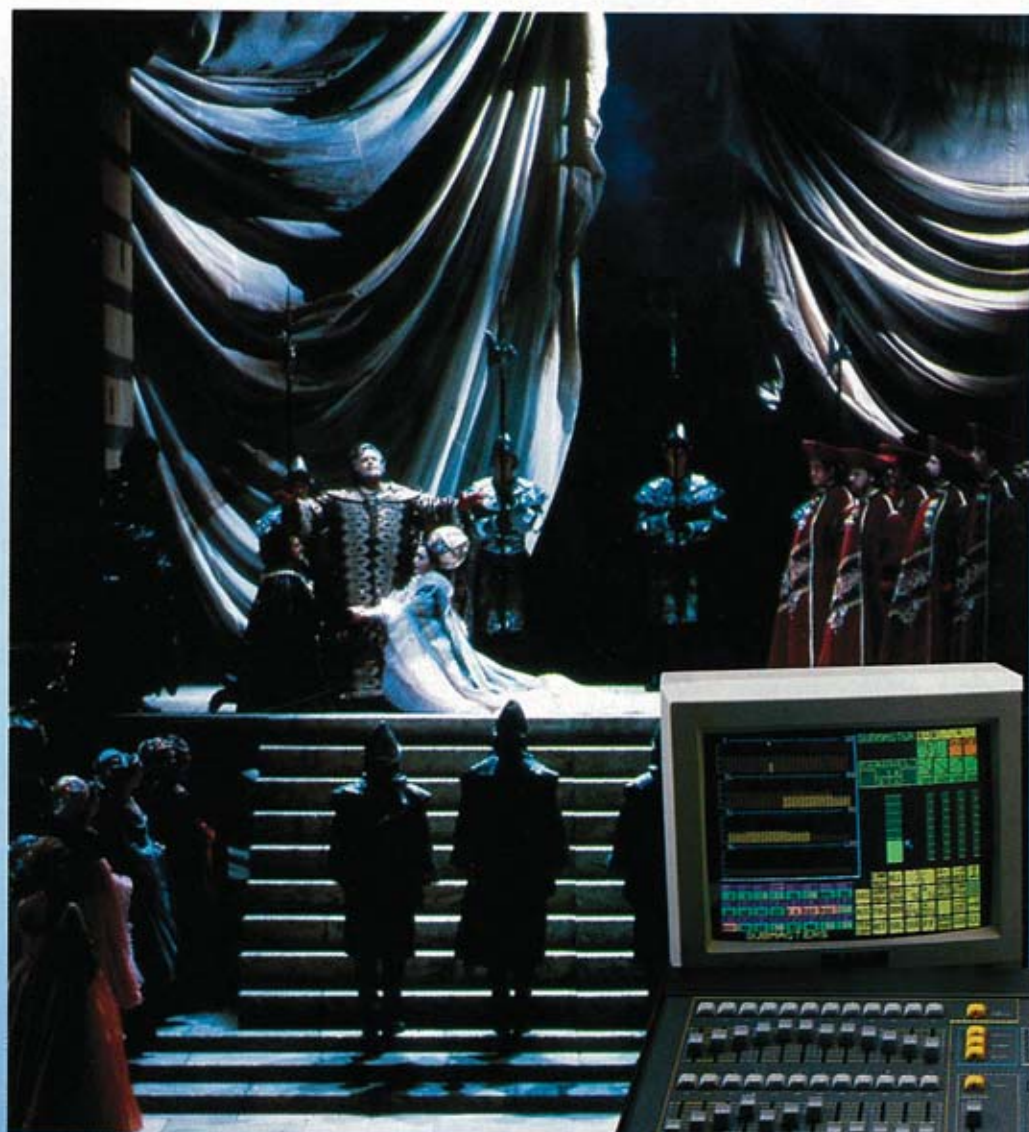


Sinead O'Connor and band during rehearsals.



Eleven TMS-3 delay towers covered the site.

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Meteorlites' stage lighting control set-up using a Celco Gold and 30 Major.

of eight SkyArts, four single-headed 4kW SkyTrackers and four 4-headed 2kW SkyTrackers, all mains powered, worked to stunning effect — the sight of multiple searchlight beams co-ordinating at one point in the night sky in a split second was a show-stopper.

Stage lighting, with Vari*Lite's on cherry-pickers around the stage adding dynamics and movement to the stark background effects, concentrated attention on musical events as the wall was built up and ultimately demolished.

If you were reminded of the Pink Floyd's recent tours, it wasn't just the circular screen, ringed by Vari*Lite's, that was responsible — the whole impression of the music serving the visuals was uncannily familiar. Waters and the Floyd may be at loggerheads, but they're still one and the same when it comes to the visual expression of their music.

Nonetheless, it was a gorgeous cornucopia of lighting and the companies involved had every right to be proud of the results.



FOH sound control with Garry Bradshaw's Yamaha PM3000's.

A Joining of Forces

Vari-Lite's Brian Croft explains that the show was symbolic for them in more ways than one.

"We've set up a new division, called the Light and Sound division of the Samuelson Group, under managing director Roger Dicks, and we're moving into a new 60,000 square feet building at Greenford, West London, which also houses Vari-Lite Europe — of which I'm now general manager and a director. Alan Thompson is general manager of the lighting department, which, in fact, is an amalgamation of the lighting part of Theatre Projects Services and Samuelson Concert Productions.

"Our involvement with The Wall is the first major joint venture we've done with Theatre Projects Services. It's a good test, because Theatre Projects have provided all the theatrical equipment which Samuelson Concert Productions doesn't have and Samuelson Concert Productions are providing all the

rock'n'roll equipment Theatre Projects doesn't have.

"It's fantastic, isn't it? I think it's the biggest show I've ever seen; production manager Keith Bradley has done a fantastic job. He used to be a sound man with Tasco way back when; we did the Stones together in 1973! In terms of scale, everything's bigger, wider, there's more production offices than you've ever seen in your life."

Croft added that his visit to the city was particularly poignant for him. "It's quite emotional for me because I was here in '61 with my wife. She was an actress, playing Portia in a modern-dress version of Julius Caesar and I was the stage manager. We went out one day and there were these guards putting up barbed wire. . .the next day, my wife went out with a friend, for a walk, until these soldiers started pointing guns at them and shooting them away — and they realised they were watching workmen building the wall. So I wanted to be here when they pulled it down again which maybe makes me the oldest man in rock'n'roll because most of the people who work with me weren't born in 1961!

The sight of a quarter of a million citizens of a self-consciously friendly Europe amassed where a minefield once divided East and West Berlin was joyous in itself.

And if the sheer scale of the show dwarfed the musical performance in a technological tour-de-force, its sponsors (from the European Commission to Peter Stuyvesant and British Airways) will have been more than satisfied — and the Memorial Fund for Disaster Relief will hopefully emerge the ultimate winner.

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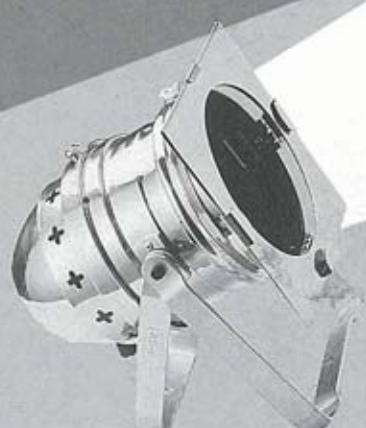


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A BRIGHT FUTURE FOR DIMMING?

Francis Reid (not an engineer) considers Digital Dimming in general and Strand's EC90 in particular

Reporting in these pages on SIEL, I wrote: Moving lights have given way to digital dimmers as the fashionable gleam in the salesperson's eye. The lucrative prize is not so much new installations, but replacing all those old analogue dimmers which have outlived several generations of control desks. Few of these old dimmer racks show much sign of any immediate intention to fail, so we users (including me) are going to have to be educated as to the benefits of change.

The result was fairly predictable: an invitation to Isleworth for a marketing lunch and a chance to visit the digiboys in their backroom where they were micro-processing Strand's R & D budget as if EC90 were the alchemist's dream come true.

Way back in the sixties, Strand produced Europe's first ever thyristor dimmer (I was their first theatre customer) and most dimmer development since then has been cosmetic rather than radical. Reductions in cost and increases in stability have been the

survival targets for the dimmer business. Maker and user have benefitted: the only loser in the game would seem to have been installation contractors struggling to connect their cables into ever shrinking racks.

But now we live in the digital age. Digital processing has long been established for desks and no one would now seriously consider sending information to the dimmer room in any other way than digitally multiplexed (although agonising over protocol looks set to continue for some time yet). So to break the digital chain when it reaches the dimmer is rather inelegant engineering.

The engineering case does not need to be argued: henceforward digital dimmers are going to be standard for all installations of any consequence. But how about operational benefits? 'Shall I see it from the box office' was the old style theatre manager's standard response to any spending request from the stage. Well, let's face it, a poster announcement that

The Latest Digital Dimming Technology Has Now Been Installed in this Theatre is hardly likely to induce a stampede of punters to the box office. But hopefully any new technology will bring improvements, however subtle, in the quality of production. So, what expectations do lighting designers and lighting managers have of the digital revolution in the dimmer room?

Reliability and Stability: There are so many variables in the lighting process that we need to eliminate the rogue ones. By and large, analogue thyristor dimmers are reliable and that is why, although we renew the control room furniture regularly, the racks in the dimmer room soldier on and on. But even the best analogue dimmers drift like a Steinway's tuning, and pot trimming does not slot happily into the average venue's schedules and budgets. So from digital dimmers we expect, as basic, enhanced reliability and inherent (no pots) stability.

Response Speed: Thyristor dimmers respond faster than any of their predecessors. But there are many situations, from cuts and bumps to flashes and flickers, where even faster would equal even better.

Output Voltage: When we wish to use spotlights designed for differing lamp voltages (e.g. 120 volt Lekos or parcans) it would be nice to be able to programme the dimmer rather than mess about with transformers or series pairing.

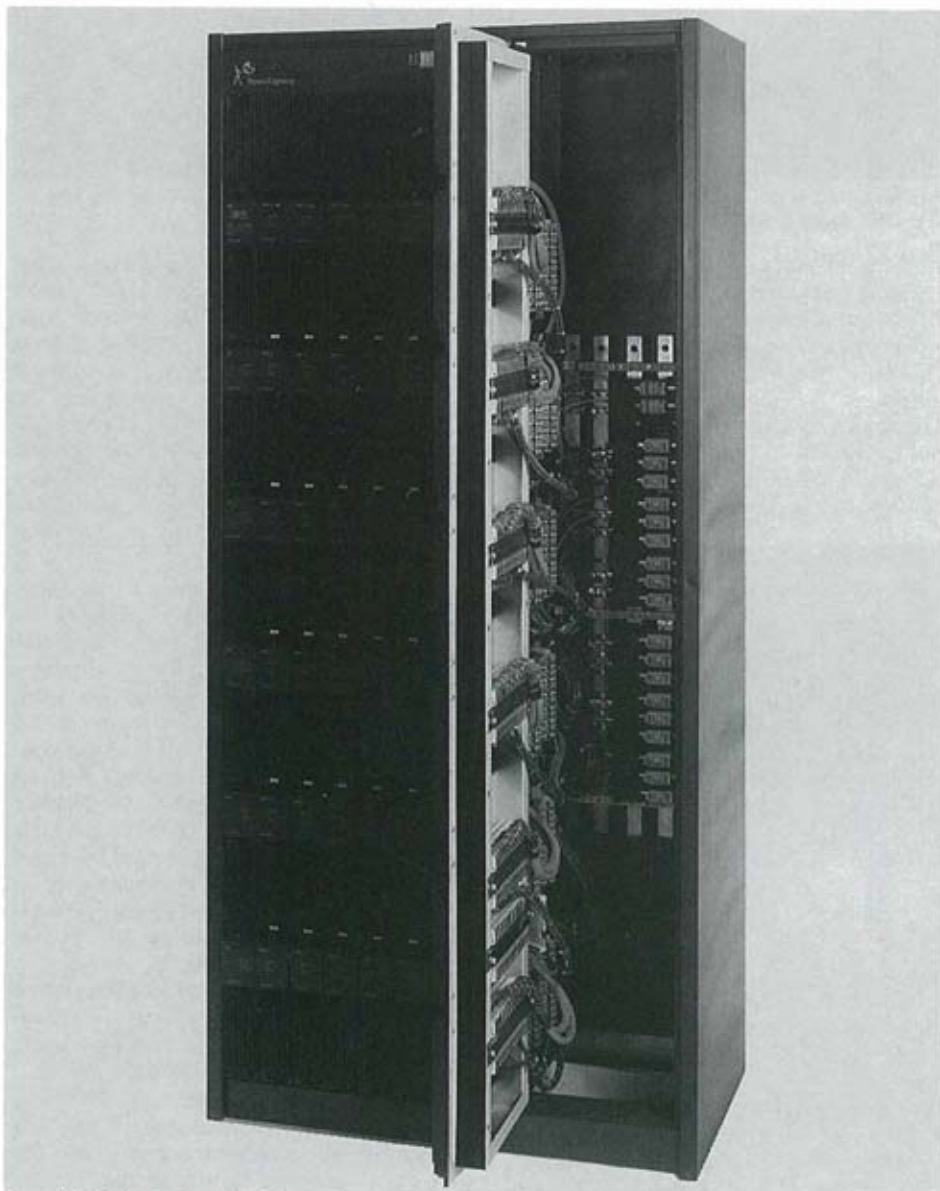
Protocol Flexibility: A new dimmer installation is liable to have to respond to different input protocols during its lifespan. Possibly, particularly in a touring house, it may receive simultaneous information from two desks with different protocols.

Dimmer Laws: We probably agonise less over dimmer curves now than in the days of my youth when Fred Bentham researched his customers by leading us one-by-one into a darkened theatre to select our preferred curve from a row of anonymous faders. However, we do expect tomorrow's dimmers to offer a choice of the standard curves plus create-your-owns.

Electronic Patching: Soft patching is becoming a regular feature of many control desks, but there is quite a lot of additional or alternative flexibility to be gained from facilities for instructing dimmer racks to re-arrange and/or combine channel numbers.

Fail-Safe Options: Analogue dimmers rarely fail and digitals will do so even less but, if and when the desk goes dead (can it still happen?) or mice eat the twin screened cable, users now have an expectation of pre-selecting their choice of what happens to dimmer output.

Fault Reporting: Dimmers have fallen behind desks in ability to monitor their own performance and diagnosing any faults. The control room VDUs display every twitch of every channel's computation agony, yet we have no indication of whether a lamp has blown or a plug been kicked out. (Strand



Strand Lighting's EC90 digital system.



Page 1 of 1 DIMMER STATUS Last rec 0 Mem used 140

DIMMER	TYPE	DIMMER STATE		TIME STATE	VOLTAGE - PHASE - CURRENT			FAN STATE				
		A	B		R	S	T	R	S	T		
01	EC90	OK	OK	00:10	240	237	236	191	189	189	OK	OK
02	EC90	OK	OK	00:10	251	248	248	123	120	120	OK	OK
03	EC90	OK	OK	00:10	251	248	248	123	120	120	OK	OK
04	EC90	OK	OK	00:10	251	248	248	123	120	120	OK	OK
05	EC90	OK	OK	00:10	243	240	240	141	138	138	OK	OK
06	EC90	OK	OK	00:10	243	240	240	141	138	138	OK	OK

DFD: DIMMER STATUS [TIME] : 10 09:36:11

Page 1 DIMMER FAULT Last rec 0 Mem used 140

LINE#	FAULT TYPE	CHANNEL
0003	NO LOAD CURRENT	020
0005	DIMMER OVERLOAD	005
0007	NO LOAD CURRENT	007

DFD: 09:19:28

Page 1 of 10 DIMMER SETUP Last rec 0 Mem used 140

0001: 16ND+/LIN/Fs	0021: 16ND+/LIN/Fs	0041: 16ND+/LIN/Fs	0061: 16ND+/LIN/Fs
0002: 16ND /LOG/N	0022: 16ND /LOG/N	0042: 16ND /LOG/N	0062: 16ND /LOG/N
0003: 32ND+/FL /S1	0023: 32ND+/FL /S1	0043: 32ND+/FL /S1	0063: 32ND+/FL /S1
0004: 32ND /US1/Fs	0024: 32ND /US1/Fs	0044: 32ND /US1/Fs	0064: 32ND+/FL /S1
0005: 50ND+/US2/N	0025: 50ND+/US2/N	0045: 50ND+/US2/N	0065: 32ND+/FL /S1
0006: 50ND+/ND /S1	0026: 50ND+/ND /S1	0046: 50ND+/ND /S1	0066: 32ND /US1/Fs
0007: 16ND+/USS/Fs	0027: 16ND+/USS/Fs	0047: 16ND+/USS/Fs	0067: 50ND+/US2/N
0008: 16ND /US3/N	0028: 16ND /US3/N	0048: 16ND /US3/N	0068: 50ND+/ND /S1
0009: 32ND+/US4/S1	0029: 32ND+/US4/S1	0049: 32ND+/US4/S1	0069: 16ND+/USS/Fs
0010: 32ND /SQU/Fs	0030: 32ND /SQU/Fs	0050: 32ND /SQU/Fs	0070: 16ND /US3/N
0011: 0031:	0031:	0051:	0071:
0012: 0032:	0032:	0052:	0072:
0013: 0033:	0033:	0053:	0073:
0014: 0034:	0034:	0054:	0074:
0015: 0035:	0035:	0055:	0075:
0016: 0036:	0036:	0056:	0076:
0017: 0037:	0037:	0057:	0077:
0018: 0038:	0038:	0058:	0078:
0019: 0039:	0039:	0059:	0079:
0020: 0040:	0040:	0060:	0080:

0001:Type 16ND+,Linear Law,Fast> 09:21:09

All EC90 dimmers can be interrogated by the lap-top personal computer (top left) on which user selectable variables are programmed. EC90 MD plus has the capacity to report, on a video display in the control room, the status of each dimmer and its load.

provided it for the Albery Theatre's MMS in 1977 . . . archaeologists may consult my final Tabs . . . but the cost reflected an absence of digits in both protocol and dimmer). So we now look for clear basic status indication in the dimmer room, plus full diagnosis available by interrogation through the method we all now use to organise our lives (including the way I am writing this) . . . a personal computer.

Ideally we want key information to be displayed in the control room, particularly no load on a plotted dimmer. And I rather favour the fault warning klaxons that sounded in the Albery electrics office and workshop.

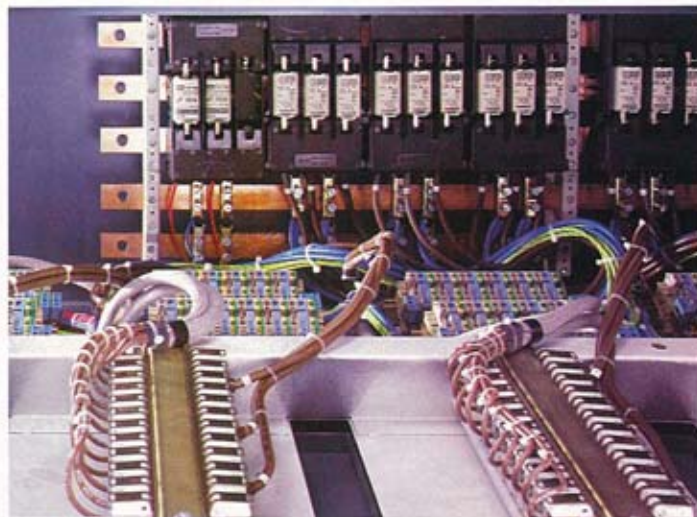
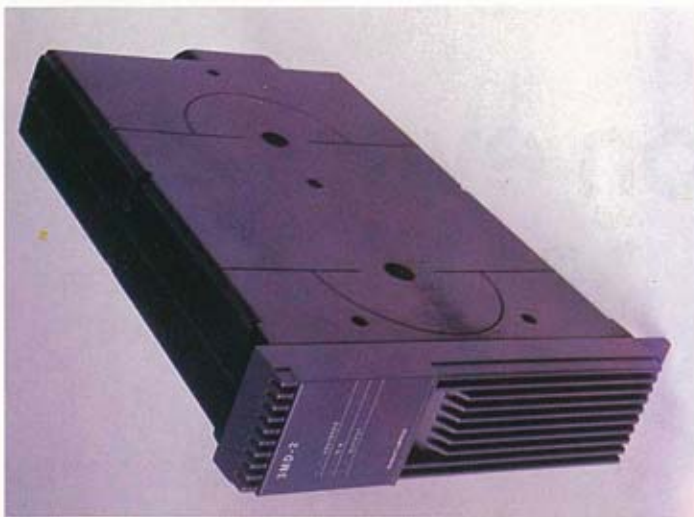
Packaging: So, package that lot and you have a radical dimmer. How about the packaging? Manufacturers tend to talk seriously to me about the need for their

dimmers to look sexy. I don't know what they're talking about. Could it be I don't relate properly to my dimmers? I have always settled happily for plain honest functionalism. No amount of glamour is going to disguise any shortcomings in environmental control or access for installation and servicing. However, Strand's EC90 seems to offer a package which is sympathetic to functional need, yet glossy enough to encourage a non-technical paymaster.

Strand EC90: EC90 offers a three-way choice essentially between permanently wired dimmers (EC90HD), plug-in modules (EC90MD) or luxury plug-in modules (EC90MDplus). Just like airline economy, business and first classes. The dimmers are digitally controlled by a 16 bit single chip processor which is long established in an environment less friendly than a dimmer rack — under the bonnet of a car. The processor controls dimmer output by digital calculation and monitors dimmer status by interrogation through feedback sensors. Traditional top and bottom adjustments are redundant. This dimmer's stability is independent of the ravages of temperature and time. And its data storage is secure from accidental hacking. All three packages have the following as standard

Protocol Input: Digital SMX, DMX512, AMX192, D54 or Analogue +10V. An additional multiplex port may be fitted for simultaneous input from a second control desk, and there is a connection port for an





optional programming terminal.

Selectable Functions: Prior to installation, or at any time via a programming terminal, the user may select any of the following dimmer laws: Square Law, S Curve, Linear, Fluorescent, non dim, or six user creations per crate. Each dimmer may be identified by up to five alpha or numeric characters via the electronic patching system. Maximum voltage output may be set to a desired level with the processor automatic re-calculating the dimmer curve.

Backup Presets: 32 backup states, containing any number of dimmers at any level plus an associated fade-in time, may be stored in the racks independently of the control desk.

Rack Reporting: Each rack has LEDs for phase indication and fan failure. Operational status reported through the optional programming terminal includes crate communications, multiplex failure, dimmer output levels and voltage levels.

Additionally the **Modular** option offers the following:

Selectable Functions: Six control keys associated with a 16 character liquid crystal display provide access to information and facilities for programming. Normal dimmer response speed may be set to a faster rate for the rapid response of small filament lamps, or to a slower rate to limit the inrush

current to large filament lamps. Dimmers may be programmed to respond to a failure of the multiplex control signal by either holding the existing state, fading or cutting to a backup state, or fading to blackout.

Rack Reporting: Additional LEDs report multiplex assignment, OK dimmer operation and output levels.

The **Luxury Modular** version has enhanced filtering and incorporates a process for voltage loss in load cables by automatically boosting its output voltage by up to 10%. Its comprehensive **Status and Fault Reporting** system provides information which may be viewed in the dimmer room on either LCDs on the racks or the screen of the programming terminal. But far more exciting is the ability of EC90MDplus to report to the control room through **Galaxy 3**.

The status information provided for each dimmer includes maximum output voltage, dimmer law, dimmer/circuit patching, dimmer response, and multiplex input assignment. And the following faults in the dimmer or at the lamp may be reported: no load, no output volts, excess DC, no control and over temperature.

The Future?

So the EC90 spec seems to measure up pretty well to the likely aspirations of dimmer users in the new decade. How will

digital dimmers in general, and Strand's EC90 in particular, fare in the market place? Well, I shall be really surprised if digital dimmers fail to become the immediate standard for all new installations of any consequence. But my guess is that refurbishing of existing dimmer rooms will hang back for a bit while we assess the cost-effectiveness of the various competing systems now emerging. From 1992 it will be vertical take-off and by 1994 analogue dimmers will be archaeology.






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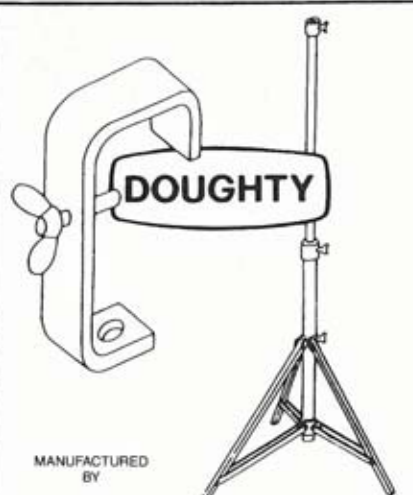
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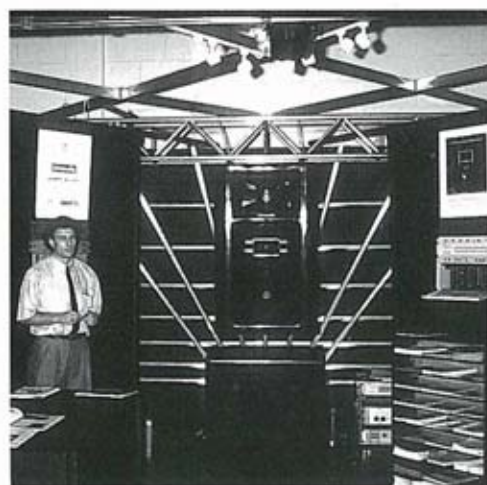
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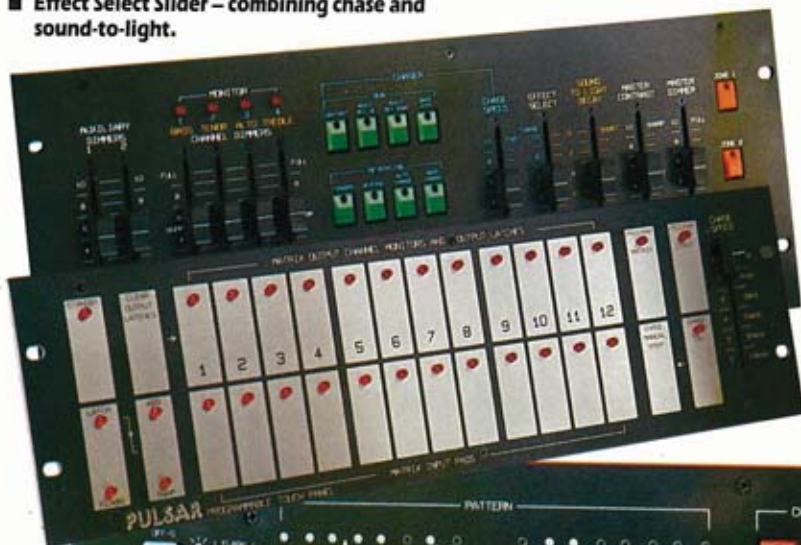


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HEATHROW SCULPTURE LAUNCH

Performance Lighting Technology aids Corporate Advertising

In recent weeks, passengers to Heathrow have arrived at Terminal One to be greeted by one of the newest and most adventurous light sculptures yet constructed. National Power are the company behind it, and the unique structure is intended to convey their corporate message in a dramatic and dynamic way.

The design, featuring pulsing and sophisticated light animation, represents a massive ball of energy. Based on the National Power logo, the central 2½ metre sphere epitomises the generation and controlled force of electricity, which is then explosively distributed to the outer network, spanning some 6 metres in diameter. The project began with what seemed like more restrictions than opportunities. The 40' high space had been an empty void from the time the building was inaugurated in 1969, and when London-based Sky Sites Ltd identified the advertising potential of the site various conditions governing placement, height, weight and time considerations were all imposed.

When Lowe Howard Spink, National Power's agency, considered using the space they recognised that the demanding restrictions would require an innovative design. To solve the problem they contacted designer Duffie White of

Vectovision Limited who decided to create a three dimensional visualisation of the corporate image for National Power. The concept was to portray the generation of electricity through a light sculpture that had a central ball of energy which would pulsate and radiate energy to a surrounding network.

The design integrated the National Power logo as the central sphere. As the light sculpture was programmed to alternate between lighting effects of a ball of energy and the illumination of a spherical logo, the company identification was linked with their business of generating electricity. Vectovision were not limited by any preconceptions of what the 'sign' should be and opened up the potential for the usage of new techniques and technology, and the introduction of theatrically-based lighting control systems.

Once the original design received initial approval, the company took their design concepts to creative display company Absolute Action, to start the difficult task of developing a final design that could be achievable while still retaining the dynamics of the creative design. It was evident from the outset that expansive creativity needed to be controlled and brought to fruition within the various constraints already listed,

many of which — in retrospect — have actually served to enhance the overall finished effect. The conclusion was that no single technique could meet all the requirements, which resulted in the use of a complex integration of 300 linear feet of neon tubes, three dimensionally formed neon sections, 9000 fibre optics, 60 selective colour spectrum linear lights and 54 sequenced strobes.

The illumination of the sphere was to be internal, of a controllability to allow both subtle cross-fading of colours as well as dramatic switching, and of intensity that would blast through strongly in the reasonably high ambient light conditions prevailing on site. Strobes were to feature the sense of electricity shooting out into the icosahedric structure in a specially dense configuration. Low voltage dimmable neon was chosen to depict both the logos fixed to the external face of the sphere, and the boldly skeletal lines of the icosahedric shape.

Realising a two dimensional, dual message logo in three dimensions is an unusual challenge, and this problem was resolved by the use of fibre optics in two systems per fascia to present the National Power name and slogan in the triangular sign structure at the base of the sculpture.



Terminal One at London's Heathrow: a new image for National Power.

For the same reason, tremendous skill was required to shape the neon logos in three planes without causing either glass fatigue or visual distortion in the process.

In consideration of the critical weight constraints, it was decided to use light and airy clear polycarbonate tubes to create the majority of the triangular shapes and spokes which formed the icosahedron. However, it was essential to ensure that these were specially fabricated to provide the maximum stability, both to render the structure strong in construction, and also resilient enough during the process of raising and lowering it from the ceiling not to flex unduly and thereby shatter the glass

neon tubes mounted on them.

Given that the whole structure had to be brought to site in sections, considerable thought had to be given to the process of both production of the various component elements and their subsequent assembly on site. It was probably this factor alone that had the greatest bearing on how the whole light sculpture achieved its final design.

The icosahedron, made up of 20 equilateral triangles and comprising 30 X 10' lengths in total, were to be connected at their apices by 6-way nodes both to each other and the energy spokes radiating outwards from the sphere. These elements presented no significant design problems,

since they were by their very nature natural candidates for component assembly.

The sphere, however, was another matter. Obviously, it had to be segmented, both to enable entry to site in the first place, and to allow internal access for maintenance; but design integrity dictated that the maximum sized segments should be used as were feasible, and for which material dimensions were viable. For this, a special mould had to be designed and built.

Initially, the intention had been to fabricate the sphere from a specially fire-retardant perspex material that possessed opalised diffusion properties that were ideal
(continued on page 58)

Logistics and Control Close-Up

It was on 14 May that Philip Norfolk and Bev Bingham of Lighting Technology Group went to Absolute Action's offices in Wandsworth to discuss 'lighting a plastic ball eight feet in diameter'. "This sounded like the type of project we would enjoy doing so we duly arrived, not quite ready for what we were about to see," explained Norfolk.

"Basically, we were required to complete two tasks: illuminate the semi-translucent sphere internally in red and blue with a high enough light level for the colours to stand out in daylight, and to provide wiring for every electrical item on the structure which hangs 10 feet below the power supply," continued Philip Norfolk.

"Bev designed the inner lighting effect by applying his knowledge of fluorescent technology to the problem. The dimmable Transtar fluorescent chokes would be mounted remotely from the tubes in order to keep the weight of the overall structure down, and the two types of tubes used would be Northlight (with Rosco Supergel No.68) and Radar Red (with Rosco Supergel No.20). These combinations produced the maximum output of light nearest to the colours specified by the designers.

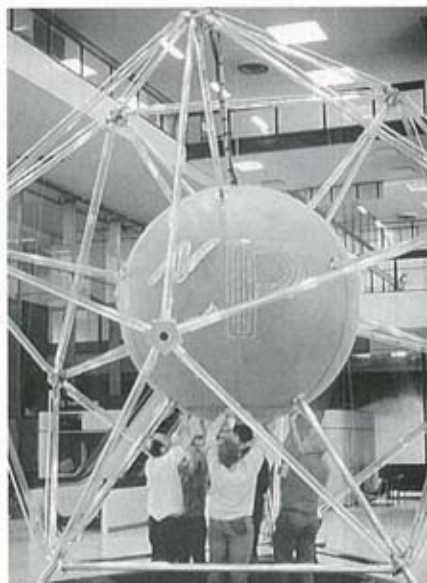
"My task was to gather together all the different electrical elements involved and wire them to a control system that would provide the flexibility to do whatever the designer required.

"Wiring started in earnest on the 28 May as Kieran of K. I. Electronics of Bath and I set about wiring some 1,440 connections involved in the remote running of the 60 fluorescent tubes. The connector system we used was the Harting Elektronik Han 42 DD which offered the connection reliability we required and could be supplied within two days. We were acutely aware that any error in the wiring of the fluorescent system would be almost impossible to rectify on site, so only after three days and two nights of work and intensive testing prior to delivery were we as sure as could be that it would work 100 per cent time. As the first night on site arrived all the multi-core cables were ready as was the wiring loom on the inner lighting support structure.

"Six nights of work followed, each one bringing its own triumphs and disasters, with three other wiring systems to join to ours more than once it was a case of their plug no fitting our socket! Finally, on 28 June after a massive 36 hour shift by Kieran of K.I. and John MacPhail of A.L.S., the light sculpture was finished."

L+SI asked Philip Norfolk how they'd come to choose Advanced Lighting System's Enigma Micro system for control.

"I approached John MacPhail regarding the Enigma controller and it was immediately



clear that this would do everything we wanted. When you approach ALS to buy one, you are not only asked how many channels, but also how many neon, non-dims, strobe channels, and effects you require. So although this means that you need a reasonable idea of what you want to control before starting — you get exactly what you want for the job."

All Enigma controllers have this type of 'custom software', making it unique for its task. (Operating software may be changed via disk from ALS). Apart from accessing individual channels via their zone group (neon, dim, etc.), another interesting feature is sequence programming which runs as follows: there are 64 master sequences, each with 64 'steps'. This may not sound awe inspiring until you realise that each step may contain a 'sub-sequence'.

These sub-sequences are like building blocks, e.g. ball chase, neon chase, and may then be used to create complex 'master sequences' giving the designer more time to experiment. This is ideal when working on a structure with many different variables or 'layers' that must interact, as it is not until you actually see different effects that you can tell if they work or not.

The overall concept at Heathrow was to have the central sphere pulsing and crossfading through colours to represent the actual generation of electricity. The self-sequencing strobes, running from inner to outer, signified the electricity being sent to the 'National Grid' — the outside neon infrastructure which 'chased' to show transmission to the sub-stations — the aluminium pentagonal nodes. Also being

sequenced were the neons for the logo and two sets of fibre optics that were overlaid to give the name and the slogan in the same space.

The controller itself is in a 19 inch 'back box' that lives in the ceiling void and the monitor and front end control panel are brought to site for programming and then taken away again. For reasons of weight and heat, the dimmers and dimmable Transtar ballasts are also located in the ceiling void.

The sculpture has been running since the 28 June with only minor modifications to the sequence programme since then. Originally it had been planned to shut down from 12 midnight to 6am and for this purpose the Enigma software had been modified to automatically boot-up and bypass the normal operator's access code. Due to the over-rating of all component parts this shut-down was soon considered unnecessary and the light sculpture now runs continuously, although Heathrow reserve the right to shut it down at any time.

Regarding testing, Phil Norfolk told L+SI: "I don't think regulations exist to cover this exact type of structure, but when the inspector gave his verification we definitely got the feeling that he would have accepted lower standards than those we had worked to — a nice vote of confidence, really!"

And why the use of fluorescents? "Our first consideration was the temperature that the sphere would withstand. Our first choice had been class 2 — non-flammable perspex — but the fire authorities wouldn't have it and insisted on a class 1 plastic material. Although this was totally flameproof it would lose its structural strength at 85 degrees celsius and to create strong colours that would stand out against the ambient light would have taken seven or eight kW of Tungsten — it was out of the running! There was also the deterioration of gels to consider as maintain access was limited."

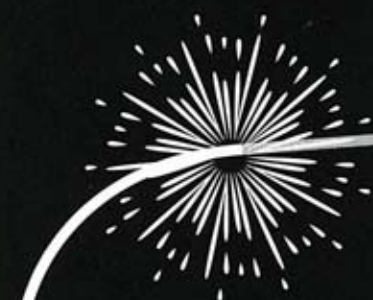
To create the strong blue from fluorescent tube was not too difficult as they emit a high component of blue light naturally, and Northlight tubes with Supergel No.68 were used. Getting red from fluorescents is not so easy, and specialist radar red tubes were sourced, and gelled with Supergel No.20.

So, has this unusual and innovative project taken entertainment technology into another 'sphere'?

Designer P. McDuffie White, who spent 20 years as a theatre director, told L+SI: "I hadn't realised all the possibilities until the construction was up and we began programming. It's the computer technology that really makes the animation work.

"From the start it was my objective to use existing entertainment technology to really capture the imagination of the viewer."

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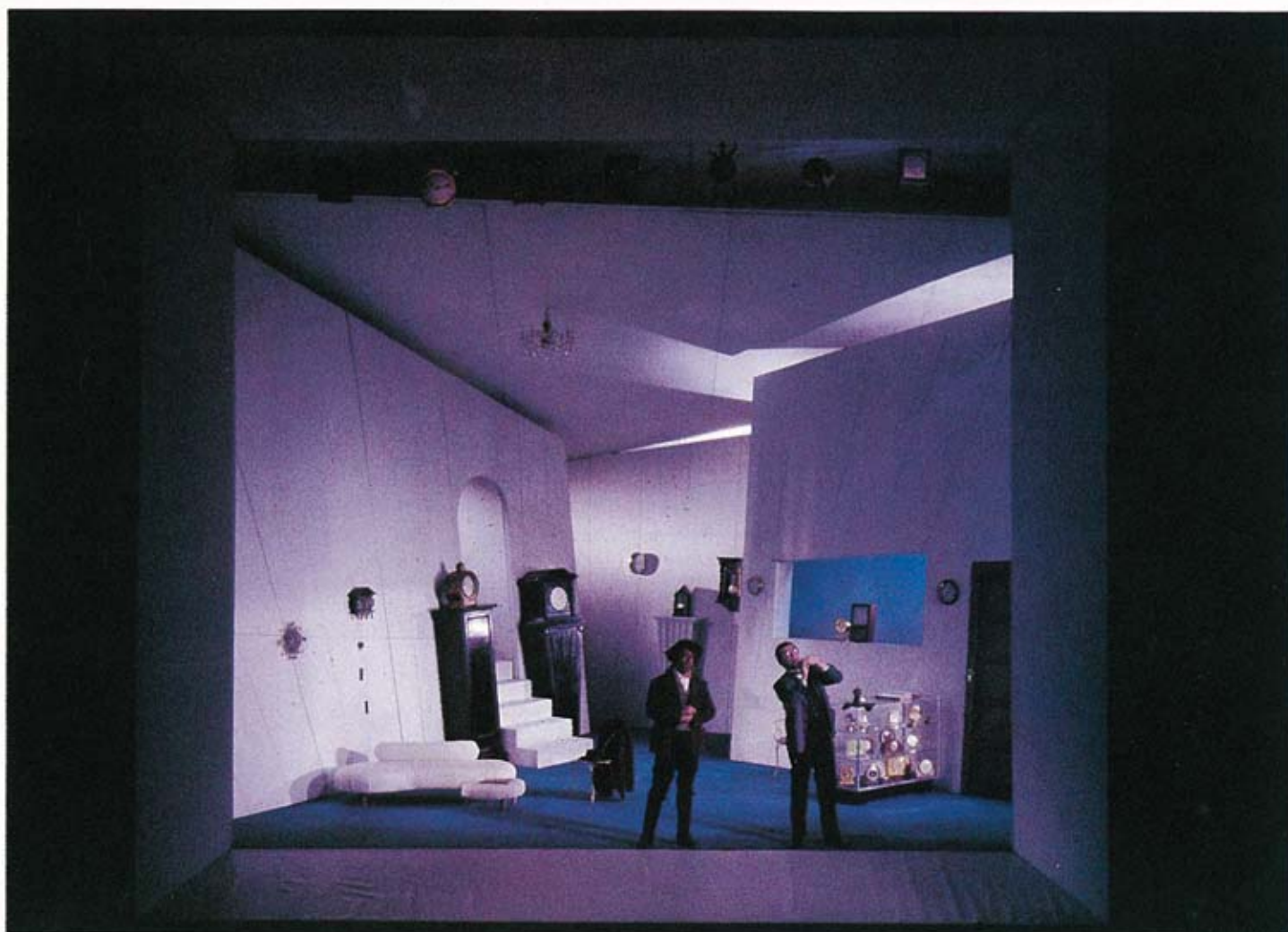
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PRACTICAL AND DIFFERENT

Ruth Rossington discovers there is no shortage of ideas at Opera North



The Toledo clockmaker's shop – primary set for 'L'Heure Espagnole'.

Photos: Dave Whittlestone.

"With Opera the music is first and foremost – anything that contradicts the music is totally unacceptable". It was with this in mind that Ian Sommerville set about designing the lighting for the Opera North double bill. Having listened to these operas some 30 times plus, there was no shortage of ideas. Ian Sommerville refuses to take an insular view when considering ideas for his productions, drawing not only on his experiences in theatre, but also from numerous rock videos and shows. When not listening to opera, Ian enjoys bands like AC/DC!

Ian has been employed as permanent 'Chief Electrician' to Opera North for the last five years, having spent the previous nine years working with Scottish Opera. His role as lighting designer has spanned both posts – designing for the last seven years of his career. It was during his time with Scottish Opera that he joined Zenith Lighting (now SCP) for a 16 week attachment. At the time Zenith were using the six lamp bar and 'meat rack' system. Realising the advantages of such a system led him to pioneer their use in touring theatre and he introduced them into the Opera North touring rig soon after his arrival. This, and the use of touring dimming racks with multipin outputs, has

obviously been invaluable in improving load-in and set up times. Ian Sommerville, with a typical Scots temperament, doesn't suffer fools or problems gladly. If one of the crew screw up, they are likely to see the cheerful smile disappear to be replaced with a volcanic eruption of 'advice'; the same goes for equipment. "There are a lot of very clever boards around – when they work! Every component of our rig is built to touring specifications, we haven't got the time for unnecessary problems," he told me.

The Grand, Leeds, is home base for Opera North (a touring repertory company) and their long-standing relationship has been responsible for many notable productions. Built in the 1870s, the 1550 seat theatre provides an ideal setting, although the Dock doors – some 30' above street level – necessitate the use of chain hoists for lifting the 'meat racks'. Everything else fits into the well-used lift. A more recent collaboration was their first commercial venture, the production 'Show Boat' staged by Opera North and the RSC. This ran for three weeks at The Grand and three weeks at the RSC, Stratford. Due to its huge success the biggest show to tour the UK will be playing the London Palladium for two months and touring for a further six

months under Arts Council management.

The two pieces selected for the double bill were fundamentally very different. The first **L'Heure Espagnole** (The Spanish Hour) was Maurice Ravel's first opera, a farcical comedy written in 1907 and, incidentally, his first work for the stage. The story revolves around a Toledo clockmaker's wife, who frantically tries to make use of the one hour that her husband spends setting the municipal clocks, for her romantic liaisons.

Unfortunately for Concepcion, the seconds are ticking away and she must still dispose of Ramiro the only customer in the shop. She asks him to carry one of the grandfather clocks to her bedroom and Ramiro, strong as an ox, willingly complies. Concepcion, temporarily free to entertain her lover has her plans further frustrated by the arrival of another suitor! The farce continues with the constant re-arrangement of lovers, 'packaged' in grandfather clocks, by Ramiro, whose immense strength (aided by very neat false exits in the set) eventually wins the admiration and affections of Concepcion.

I asked Ian Sommerville what aspects of the piece have played a part in his design. "For the Ravel, I was influenced by the feeling of being in a brightly-lit Spanish room as the day moved from afternoon to

early evening," he told me. "There is a strong atmospheric influence in the music. It's very strong — you only have to listen to it once to feel it."

L'Heure Espagnole has a most bizarre and unnerving set. Brilliantly white, slanting walls with a positively Art Deco feel, together with furniture and clocks on the walls that are pure kitsch, provide the ideal 'core' for a lighting designer to work from. Appearing enclosed by its three walls and ceiling (which obviously imposed major restrictions in lamp fixing positions), the asymmetry of the set created spaces between ceiling and walls thus allowing Ian Sommerville both to light the set and cast shadows from the wall clocks that would add to the already imposing lines of the set.

With the set only taking 75% of the stage he was able to use the remaining area to site five 5kW fresnels, 10 pars, two 1k Sil profiles and seven 650W fresnels, all on stands and focused just off parallel with the floor, with one of the 5kW tungstens emulating the falling afternoon sun through the 'hatch'.

Ian Sommerville pointed out that the use of the Thomas M16 Lite Batten was important as the larger aperture gives a better spread and the unit is a more convenient size for touring. He also noted that the ventilation is a vast improvement on other units tried.

These 'flying' battens were used to light

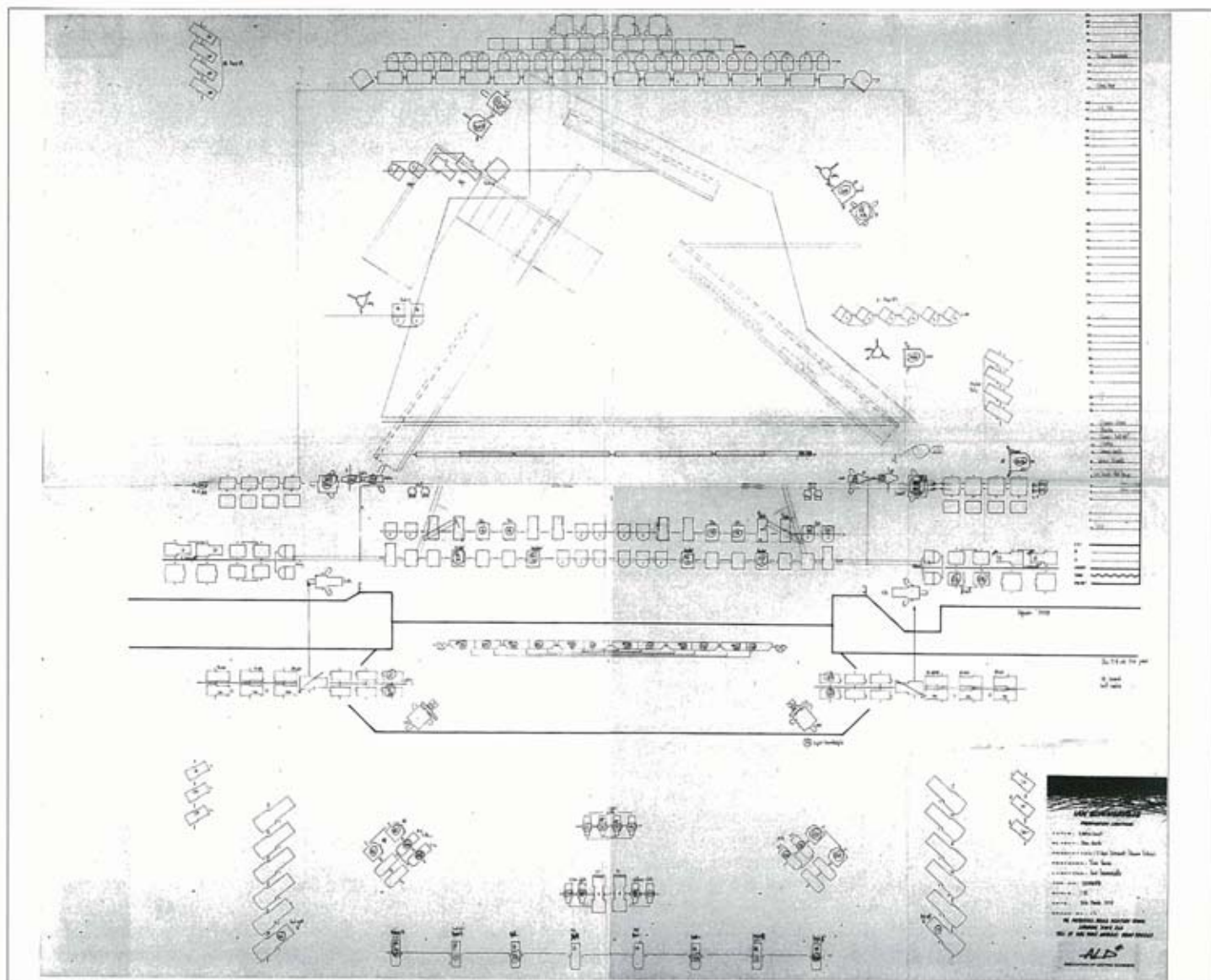
the down stage 'cloths' which themselves were flown in. Lite battens were also used as footlights during a dance sequence to throw multiple shadows onto a flat, very effective in creating a great amount of action from only five performers. Four off par 16 (Birdies) were making another appearance in an obtrusive down stage position where their size and output made them ideal. Also to contend with were six more strange clocks that were raised and lowered by means of a 'Heath Robinson' array of pulleys and strings, a puppeteer just off-stage, a neon sign and the closed-circuit TV camera and two monitors — that enabled the performers to follow the conductor — which also had to be hidden in the wings.

After a remarkably fast change over during the intermission, the curtain opens to Puccini's only comic opera **Ghanni Schicchi** written in 1917. Ian Sommerville takes up the story. "If anyone has ever designed an almost unlightable set, then it must have been this one. It is encased in a black box with ceiling and walls which extend downstage almost as far as the proscenium arch. It was a bit like trying to light the Pharaoh's tomb from the outside. However, this was achieved by using fluorescent tubes rigged downstage on the floor and on the set and by a lot of extra profiles rigged just out in front of the proscenium fairly low down to achieve a candlelit feel.

The Puccini piece is full of musical climaxes. Many of the lighting cues reflect this. It's a wonderful opera full of swelling romantic themes. The emphasis was to create a warm, pretty light quality as opposed to a more functional and naturalistic one."

Ghanni Schicchi is unusual in that although it is set around the death of an uncle in his austere black bedroom, and all the characters, except Schicchi, are dressed in black mourning robes, it is in no way a tragic or black comedy — more a humorous lesson in false morality and greed. Upon learning that poor uncle Buoso has left his prized possessions to the monastery, the con man Schicchi is asked by the family to help and he suggests that he impersonate the deceased and have the will re-written. Everything is going well until Schicchi — in Buoso's guise — starts leaving possessions 'to my very dear friend Ghanni Schicchi with a quiet reminder to the relatives re the penalties of fraud. Schicchi later justifies his actions to the audience by the fact that his daughter and Rinuccio (one of the relatives) are now able to be married.

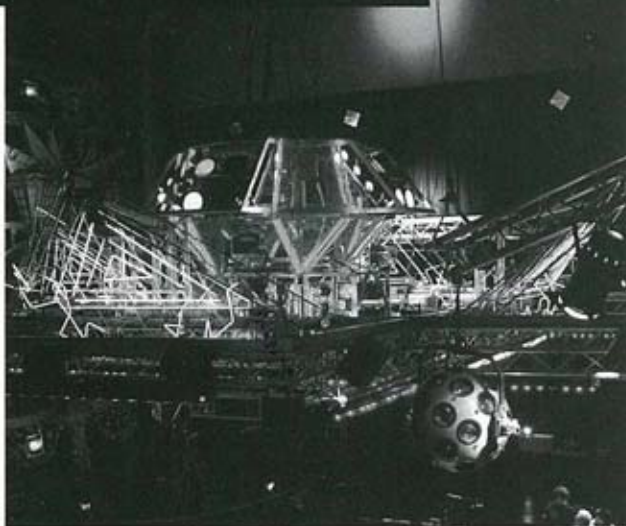
One of the most interesting lighting cues in this piece is the scene where the relatives are evenly spaced across the down stage area, dressed in their black robes with their faces lightly powdered. The 12 fluorescent tubes (gelled with Lee 141 bright blue) that were spaced across the front of the stage at



The 'open' set of the Ravel created stage positions for floor stands.

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The fluorescent tubes provided an unobtrusive source of fill light.

floor level, lifted their faces away from the blackness of the room to great effect. The remaining 12 fluorescent tubes were later used for a very soft fill light when gelled with Lee 204 warm colour correction. Having experimented with F. tubes last year, Ian Sommerville and the in-house design team 3-D Services decided to mount them in a roadworthy package. All the ballasts, load resistors and indicator lamps that ensure a perfect fade are mounted in a flight-cased rack. Drive current is from a patched dimmer module and output to the tubes is a small multipin connector. The tiny multicores then run to the six off 'canoe'

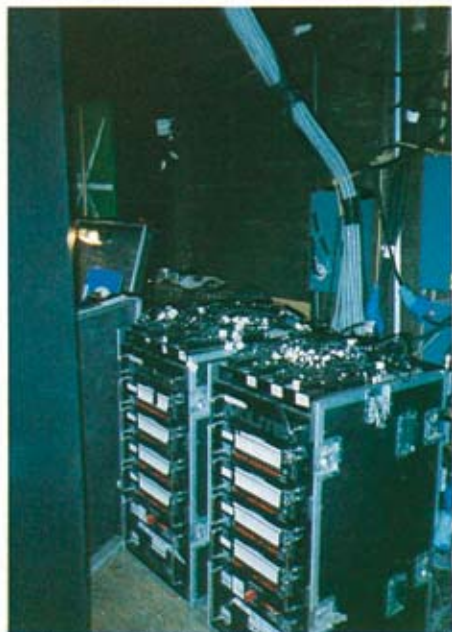
style reflectors which house four tubes each — two along/two high. These silvered reflectors painted matt black on the outside were not perceptible when placed end to end in front of the proscenium arch. The rest was key lighting by individual instruments. "I like to achieve a balance as too much light lacks cohesion," Sommerville told me, "all my designs are based around specific types of lamps for different tasks. As I don't rely on washes, I would have to admit to having some trouble with colour, although I'm getting better through trial and error. I usually try to use a deep saturated blue somewhere along the way. It's sort of

my trademark. However, white light is usually the base I start from. I'd rather start with white sometimes, make the light work, and then add some colour later." For this, he had to make use of all the remaining space in the wings and front of house positions on all four levels.

Another strong effect was the two pattern 252 FX Projectors with flame disks against the billowing scarlet drape — symbolic of Dante's Eight Circle of Hell to which Schicchi was condemned.

Both sets made use of a 4" wide frame i.e. a flat strip that extended across the stage, up the sides and across to form a complete band, all in white for the Ravel, and black for the Puccini. These performed a variety of functions when lit by carefully shuttered profiles. Colour on the white would form a frame, in darkness it would be lost altogether bringing the action up-stage to the forefront. In bright white it would provide a neutral working stage area used in conjunction with back-drops that were flown in giving more than one set without a change over.

This will be the last production using the Avolites QM500T console. Opera North have been intrinsically involved with the development of this and the new TD model of which they will be taking delivery in August for the production 'Ariane and Bluebeard' — being lit by Nic Chelton. I am sure the efforts of Ian Sommerville and his crew were appreciated by the entire audience (with the exception of the chap in the dress circle watching the demise of England against W. Germany on his TV walkman!). Keep up the good work, we do appreciate it!



The heart of the Opera North touring rig.





Colours used to 'frame' the set.

The production was lit by Ian Sommerville directed by Martin Duncan designed by Tom Cairns

Crew: Colin Smith, Dave Whittlestone, Stuart Lister, Mike Bottomley, Will Scarnel.

Equipment List

Control: Avolites QM 500T desk
 2 x 48 way Avolites rack
 1 x 24 way fluorescent dimming system built by 3D Productions

1 x 12 way supplementary rack

Lantern Breakdown:

34 x Par 64 No 1
 32 x Par 64 No2
 16 x Par 64 No 5
 26 x Sil profile 1k 30d
 2 x Sil profile 2k 30d
 2 x Sil profile 2k 15d
 8 x Leko 6 x 9
 9 x Harmony profile
 32 x ADB 1k fresnel
 16 x ADB 2k fresnel

5 x Lee Baby 5k fresnel
 7 x Thomas 650w fresnel
 10 x M16 battens
 3 x Pat 252 FX projector
 2 x Unpainted flame disc
 2 x slide carrier
 4 x Par 16 Birdie
 24 x fluorescent tube

Details of fluorescent control circuit: 'Transtar' Ballast in series with 5k 23 watt resistor and 28 volt 0.7 watt mimic lamp.



The 'impossible' set of Ghanni Schicci.



The concept of the neutral frame and backdrop proved fast and effective.

DECIBEL GAMES

Ben Duncan presents a readable tutorial into the foibles of decibels, plus some handy tables to hang on the workshop wall

Let's forget about dBm, dBu and dBV for the moment. Decibels (dB) are fundamentally a means of expressing ratios, so we'll begin from that angle. A ratio is a numeric abstraction used to compare the sizes of two objects, signal levels or whatever, without referring to their actual size. For example, if an amplifier's output is 100 times bigger than its input, the output to input ratio is 100:1, though this says nothing about the actual signal level — it could be any number of watts or volts. We can also express this as a x100 amplification. In decibel language though, we say the output is +40dB or '40dB up', referred to the input. But why invoke a set of fancy dB numbers just so that we can express an amplification of 100 times? The answer is, believe it or not, to make the audio engineer's sound life simple; decibels exist in order to banish tedious calculations.

In audio systems and acoustics we need to handle a very wide range of signal magnitudes. For example, the lowest microphone signal levels and highest amplifier outputs span a range of 1,000 million! By using decibels, we can simplify a monster ratio such as 2,371,373, to a cool -127.5dB, which is less of a mouthful.

In fact, with decibels, we need never go above three figures — the entire range of physical magnitudes we need to cover is encompassed by 180 decibels. Because the numbers are simpler, mistakes are less likely; if you slip a decimal place on 120dB, you'll get 12.0dB which is all too obviously an error. But that monster number (er . . . was it now 2,371,373 or 2,731,373?) is all too easy to confuse.

Signal Chain

Figure 1 shows a simple audio signal chain in a studio (by adding a few processors, we could make it considerably more complex). Each stage of amplification, from the microphone through to the power amp multiplies the original signal coming out of the mic, whereas the faders and front-end pad attenuate, or divide down the level.

The problem is to discover the overall amplification (or attenuation) between the mic input and the amp's output. As you can see, any amount of complexity results in a fairly horrendous equation if we use ordinary numerical ratios. Figure 2, meanwhile, presents the same situation but with the amplification and attenuation expressed in decibels.

Because dB are a logarithmic quantity, there's no multiplication or division required — we simply add up the figures; it's like adding up your groceries and subtracting a few 10p discount coupons. The only snag is that the answer (+54dB) may not mean very much — at least until you learn to think in dB.

In the meantime, use the table (see figure

3) to get an idea of the ballpark numeric ratio. The overall amplification is actually x501, and fanatical readers can check this by tapping (54 + 20 × Antilog) into a scientific calculator (figure 4). With this knowledge we can arrive at the mic's output level (V_{in}), provided we know (perhaps from the console's output meters) the voltage elsewhere in the chain. Say we know that the amplifier's output is 22 volts. Then the mic signal is 22/501 = 0.043mV = 43mV. But more on this later, when we look at decibel scales.

Manipulating Decibels

Learning to think in decibels is made easier (we hope) by the tables in figure 3. Table A concentrates on the key decibel numbers — their ratios are easy to remember with a little practice. Once you've assimilated these, you can go on to attack table B, which fills in the gaps. The main scale from 10 to 130dB is particularly easy to remember because it has a distinct pattern of alternate 1s and 3s. You'll also find it helpful to note the following:

- 1) Adding 20 to any decibel number multiplies it by 10.
- 2) Subtracting 20 from any decibel number divides it by 10.
- 3) A negative (-dB) number, which represents signal attenuation, can be represented as a division (e.g. -6dB = ÷ 2), but often it's more convenient to multiply the reciprocal, so -6dB can be equally presented as '×0.5'. Table A gives some further examples.

Thus far, decibels are easy sums you can tot up in your head, or on the back of a Marlboro packet (cough, choke), which is good news for the practical engineer doing a rough check on levels in his studio. But

for more accurate work, you need only dig out your scientific calculator and wipe the dust off those special function keys. Figure 4 shows you how, and offers actual examples. The log scale is to the base 10 — not 'Ln' or 'natural log'. And on some calculators, Antilog (the reciprocal of log) is accessed by pressing 'inv' (inverse), then 'log'.

Decibel Scales

So far, we've looked at decibels in their abstract, ratiometric format. The dB is undedicated — if we wanted, we could use it to express bets on horses, or the probability of getting a hit single. In recording studios, decibels become all the more useful if we give them the absolute qualities of a unit, like volts, watts or pascals (sound pressure), so they can become part of a scale, measuring a useful quantity.

To do this, we need to decide that so many decibels equals so many volts (or whatever). Now because dB can be positive or negative, and extend infinitely in either direction, the most sensible reference point is halfway, at 0dB (zero dB). And quite simply, this is where the words 'zero level' originate from — it's any voltage (or quantity of something) that we decide to make equal to 0dB for the purposes of establishing a scale. All other levels refer back to the zero level according to their respective ratios: smaller levels are minus (-dB), bigger ones plus (+dB).

For example, if we make 1 volt = 0dB, 2 volts will be +6dB, whereas ½ volt will be -6dB. Trouble is, how do we remember next week that +6dB = 2 volts, and not 0.00139v or 73.637v? And more to the point, how does the rest of the cosmos get to know about this wonderous, yet entirely arbitrary definition?

Figure 1 — A typical PA chain — with numerical ratios

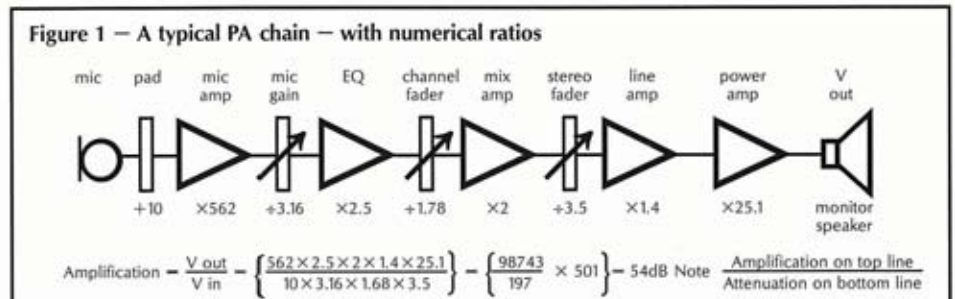


Figure 2 — The same PA chain — but expressed in decibels

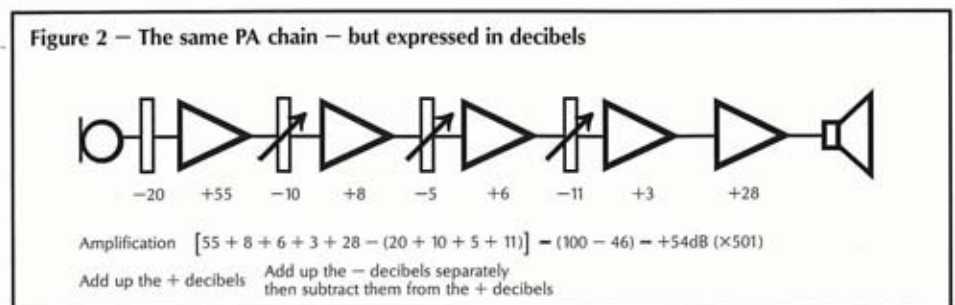


Table A			Table B		
dB	Approximate ratios		dB	Exact ratios	
	-dB	+dB		-dB	+dB
0	+1	×1	0	×1	×1
3	+1½ (×0.7)	×1½	1	×0.89	×1.12
6	+2 (×0.5)	×2	2	×0.66	×1.26
10	+3 (×0.3)	×3	3	×0.66	×1.41
20	+10 (×0.1)	×10	4	×0.60	×1.58
30	+31 (×0.03)	×31	5	×0.56	×1.78
40	+100 (×0.01)	×100	6	×0.5	×2.0
60	+1000 (×0.001)	×1000	7	×0.45	×2.24
			8	×0.40	×2.51
			9	×0.35	×2.82
			10	×0.316	×3.16
			20	×0.1	×10
			30	×0.032	×31.6
			40	×0.01	×100
			50	×0.0032	×316
			60	×0.001	×1,000
			70	×0.00032	×3,160
			80	×0.0001	×10,000
			90	×0.000032	×31,600
			100	(etc)	×100,000
			110		×316,000
			120		×1,000,000
			130		×3,160,000

Figure 3

The answer is to use the capital letter V (for 1 volt) — so the dB scale built upwards and downwards from one volt is christened dBV. And looking back to figure 2, dBV are readily sussed; just read off the ratios as a voltage. Thus 2dBV = 1.26 volts, +dBV is around 31 volts, and -60dBV = 0.001 volts (1 millivolt).

We can now tackle the mysteries of dBu, dBv and dBm, which are more widespread than dBV — in fact, they're the standard scale for most pro-audio work.

History being full of quirks, which once set in concrete can't readily be amended, dBu, dBv and dBm all have the bizarre distinction of equalling 0.775 volts (or 775 millivolts) at their zero level, which is hardly the world's most convenient number, because (groan!) a whole new set of figures have to be learned. In fact, growing awareness of this setback led to a proposal to make more use of dBV (it makes life easier for newcomers), but the original dBm scale dates back over 60 years, and equipment manufacturers can be quaintly conservative over matters like this, despite handling the leading edge of electronics technology! In other words, dBu, dBv and dBm will be with us for the foreseeable future, so we may as well join in. The table in figure 5 displays dBu/v/m versus actual signal voltages. Meanwhile, a range of levels at key points in the signal chain are given alongside.

Next question: 'If 0dBu, 0dBv and 0dBm all equal 775mV, what's the difference between the three? Well, dBm was originally defined in terms of power (rated in watts). In fact, 0dBm = 1 milliwatt. It's tied in with an archaic interconnection standard which had 600 ohm termination resistors, an idea taken from the telephone technology of the 1920s. It's no coincidence that the voltage needed to dissipate 1mW (1 milliwatt or 0.001 watts) across a 600 ohm resistor is 775mV. So that's where this seemingly arbitrary number comes from . . . !

Today though, we've progressed beyond dumping power into 600 ohm resistors.

In modern equipment, the rule is 'low impedance into high' and load impedances are, as a rule, high enough to dissipate negligible power. More important, the actual impedance is indeterminate — it varies from unit to unit, and from studio to studio. This is where the dBu comes in: 0dBu equals 775mV regardless of whether it's measured across a 250 ohm mic, a four ohm speaker, a line input with a 100k input impedance, or an open circuit. 0dBm, on the other hand, strictly equals 775mV only when it's measured across 600 ohms.

Today's 'low into high' impedance loading practice means 'n'dBm is effectively identical to 'n'dBu. At the same time, when a manufacturer rates a line level output in dBm, it generally means the output is capable of sustaining the stated level into a 600 ohm load i.e. says the output current is pokey enough to drive lots of daisy-chained equipment and/or long cable.

This leaves dBv. Notice the little 'vee'. Originally, the small 'v' replaced 'm' to signify that it was a voltage scale, not power. But when dBV (big 'vee') was introduced the small 'v' was changed to a small 'u' to prevent confusion through the misuse of upper and lower case regularly propagated by sloppy copywriters and plain misprints. Judging by the number of times dB is mis-spelt Db, dBu is a safe and sensible replacement for dBv!

Now what about zero level? Though the term was originally derived from zero dB, today zero level is not necessarily 0dBu or 0dBm — or even 0dBv. Instead, various sectors of the audio business have voted for their own, idiosyncratic zero level standard e.g. -10dBu (Oriental FX and home studio equipment), +4dBu (PA and recording setups) and +8dBu (broadcast studios). These are all average signal levels, as read on a 'VU' meter.

Sound and Power Levels

The voltage in any electrical circuit is analogous to pressure and so sound pressure (which corresponds to perceived loudness) is the acoustic equivalent of voltage. Sound Pressure Levels (SPLs) could be measured in

pounds per square inch, but for sound we use a much smaller metric unit, namely the pascal. Like the levels in electronic circuits, sound pressures also encompass a wide range, so decibels are once again a handy tool to handle routine calculations and comparisons. In fact, because our perception of sound intensity is logarithmic, dB are a particularly apt scale, and even make intuitive sense, to the extent that politicians and country solicitors (gulp) know what 'decibels' (of the sonic variety) are, and that 120dB is likely to be a breach of the peace, whereas 85 decibels are decent, legal and splendid. But that's jumping the gun. First, we have to establish a zero level which equals so many pascals. This scale is known as dBSPL. SPL stands for Sound Pressure Level. The main difference is that the zero level was originally set not at a convenient, easy to remember level (like 1 pascal), or even at an inconvenient one, but at the lowest audible level. As a result, sound decibel levels are usually positive, so there's no need to use + and - signs. I say usually because -dBSPL now exist.

After the zero level was established, psycho-acoustic researches discovered (oops!) that at mid-band frequencies, our hearing is more sensitive than was originally envisaged: the threshold of sound perception is actually a negative figure (around -10dB_{SPL}) at 3kHz, under ideal conditions. Incidentally, 0dBSPL = 0.0002 pascals, but there's no need for a conversion table, because most readers will already be familiar with sound levels expressed in decibels alone; only acoustic researches and microphone designers need to convert pascals into dBSPL and vice versa.

Figure 4 Decibel Conversions

- A) To convert any ratio (or number) 'N' into dB:
- 1) Enter $N \times \text{Log} \times 20$
 - 2) Add minus if required for 'divide by'
 - 3) e.g. $72 \times \text{Log} = 1.8573$,
 $(1.8573 \times 20) = 37\text{dB}$
whilst $\div 72$ would be -37dB
- B) To convert 'N' dB to a numerical ratio:
- 1) Enter $(N + 20) \times \text{Antilog}$
 - 2) Add \div sign if $- \text{dB}$
 - 3) e.g. $-23\text{dB} + 20 = 1.15$
 $(1.15 \times \text{Antilog}) = \div 14.1$ (or $\times 0.07$)

Turning now to new power levels, watts have different dimensions from volts or pascals. The crucial thing to remember is that an XdB rise (let's call it 6dB for example) in volts or SPL also spells a 6dB rise in power, but the numeric ratio is different — it's the square of the voltage ratio.

So, if we wind up a fader by 10dB, the mixing desk's output voltage, the amplifier's power output and the SPL in front of the speaker will all increase by 10dB. But in numeric terms, while the SPL and voltage have increased by 3.16 times, the power has increased $(\times 3.16)^2 =$ ten times. Conversely, a power reduction of -10dB effectively divides the power by ten. That one's easy to remember! The table in figure 6 illustrates this. But note that voltage ratios are being discussed. In fact, power dBs are almost never used in Pro-Audio.

Decibel Facts

How many dB double the level? This is an old trick question, and you should fire back with another. 'Which level do you refer to?' To double a signal voltage, or the acoustic SPL (as read out on the SPL 'decibel' meter), we add 6dB, whilst to double the perceived acoustic level (i.e. what we actually hear), we need to add 10dB.

Although plain decibel ratios were originally confined to comparing signal levels, including noise, or describing amplification and attenuation along the signal chain, they've received increasing use in technical specifications and reviews.

For example, you may see the distortion of a mixer quoted as -80dB. In the more familiar percentage terms this works out as $(0.001 \times 100)\%$ that's 0.01%. Or you may see some other parameter, such as 'slew rate' described as being 6dB better, meaning twice as good. Because the pattern of decibel numbers aligns with the broadly logarithmic relationships between what's measured and what we actually hear, all sorts of audio specifications can be usefully described and more readily assessed when they're presented in decibel format.

When talking levels at the console, it's common practice to leave the dBu (or dBm) out of a sentence, so long as the 'plus' or 'neg' are left intact. If someone says 'the limiter output is 3', the word 'plus' makes it obvious they're referring to a decibel scale, and the fact that it's the dBu or dBm scale may be usually assumed. Conversely, for

Figure 5 - dBu and dBm

dbu/ dBm	Typical PA Voltage levels contrasted				
	DM	CM	DI	LL	LS
+40	77V				■
+30	24V		■		■
+25	13.8V		■		■
+20	7.7V		■		■
+15	4.4V		■		■
+10	2.4V		■	■	■
+5	1.4V		■	■	■
+2.2	1 volt		■	■	■
0	775mV		■	■	■
-5	550mV		■	■	■
-10	250mV	■	■	■	■
-15	140mV	■	■	■	■
-20	77mV	■	■	■	■
-25	44mV	■	■	■	■
-30	25mV	■	■	■	■
-35	14mV	■	■	■	■
-40	8mV	■	■	■	■
-45	4.5mV	■	■	■	■
-50	2.5mV	■	■	■	■
-55	1.4mV	■	■	■	■
-60	77µV	■	■	■	■
-70	250µV	■	■	■	■
-80	77µV	■	■	■	■
-90	25µV	■	■	■	■
-100	8µV	■	■	■	■

Note: To convert dBu/dBm to dBV, subtract 2.2dB (+ 2.2dBu = 0dBV).
To convert any dBV level to dBu or dBm, add 2.2dB (0dBu = -2.2dBV)

Key to levels
DM = Dynamic mic
CM = Capacitor
DI = feed
LL = Line
LS = Loudspeaker

pure decibel ratios, it's normal to leave + and - out, and to state instead whether it's amplification or attenuation.

You can also boost your credibility as a sound engineer by writing the decibel's abbreviation correctly. In adverts, with sloppy copywriting and Japanese and American instruction manuals, you'll see DB, Db and db in print, but the one written by educated people is emphatically dB - small 'd', big 'B'. This might seem stuffy, but we're talking about a deci-Bell, as a tenth of a Bell. It's an honour to the world's first audio engineer, the first man to wield a microphone, a famous Scotsman who became a US citizen - Alexander Graham Bell.

Figure 6

Power Ratios	
0	×1
1	×1.26
3	×2
6	×4
10	×10
20	×100
30	×1000
40	×10,000

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BOOKS

Sound for the Theatre

Graham Walne
A & C Black, London
£12.95 ISBN 0 87830 1194

The author's aim for this book is 'to assist managers, students, technicians and performers in their work; to explain the terminology and technology of theatre sound in a single volume; to provide a comprehensive work of basic reference and to keep the language simple without shrinking from explaining some of the most complex problems that can be encountered'.

It is the latest re-write of a book first published in 1981 and it is a sign of the pace of change of both the technology and the perceived importance of sound systems that most of the book is new. As the author himself acknowledges, most of the mathematics for acoustic calculations has been around for many years, it is only in the last decade that the technological tools and the project budgets (sometimes) have become available to design sound systems to suit. Since 1981 the other major change has of course been the 'digital revolution' and Graham Walne has sensibly added only an 'introduction' to digital audio since frankly digital techniques have only rippled the surface of the way we design sound systems today; the 2001 edition of this book is likely to be radically different!

The first thing that strikes you is the clarity of the undoubtedly computer-set layout in variations of Helvetica with a very large number of diagrams and photographs, at least one on each spread. There is a problem with photographs in a book like this, of course, in that whatever products you choose to illustrate there will be people saying 'why did he choose that? It's a piece of junk.' The truth is that it pays to have your products photographed well and often; Turbosound and AKG do pretty well here!

One of the things that makes this publication very approachable as a text book is the preface of each section which lists all the topics in that chapter with a list of buzz words that you may be searching for.

The first section is a short introduction to sound theory and sets the tone of practicality for the rest of the book. Sones and phons are mentioned for instance but are not gone into in any depth, whereas dBs which everybody wants to know about are explained pretty well. There is a well informed section on high sound levels and deafness and the debatable connection where music is concerned. Walne makes the point that outside discotheque, where a volume/distortion mix seems popular, a sound system with greater clarity tends to be used at a lower level. (The CEL noise limiter illustrated is no longer manufactured, by the way).

Section Two is devoted to acoustics, a topic which is finally being taken seriously by the people that actually buy the sound systems we design. The chapter serves, if nothing else, to give an inkling of the complexity of the subject and the tremendous effect different room shapes and surface



finishes can have on the final sound. Although the use of convex reflectors is described no mention is made of the most recent acoustic technique of perfect random diffusion.

Not being a classical music buff the orchestral section was all new to me and I shall now certainly be able to tell the difference between a Wagnerian and a Mozartian orchestra pit! There is some good advice at the end of the chapter on the possibly acoustically disastrous consequences of structural alterations to any venue.

Section three is a straightforward guide through the equipment chain from microphone to loudspeaker, through mixers, equalisers, amplifiers etc. All elements are well covered especially the speaker section which gives good descriptions of the different types of speaker systems and their usage, together with formulae for working out the power required for a certain output. I do have a problem, however, with a couple of statements in this section: 'line source designs do not follow the 6dB rule' and 'point source designs should be mounted at equal distances from all seats so that the fall-off is the same for all'. In my opinion both are incorrect and are confused over the same principal. By the laws of physics *all* sound sources in anechoic conditions, apart from a theoretical infinite line source, will decrease in sound pressure level by 6dB with each doubling of distance. What line sources and, indeed, constant directivity horn systems do *not* do is fall in volume off-axis at a constant rate. Point source speakers *do* fall-off in volume at a constant angular rate and this can be used with the 6dB rule to enable speakers to be placed nearer some people than others, the angular fall-off and distance fall-off being balanced to give a near constant SPL at all seat positions.

Section four is entitled System Design and may be considered the meat of the sandwich in that it is where Graham shows his experience, bellyaches about the relative lack of funds for sound systems, and gives away a few practical secrets of the trade. Particularly useful is the description of the use of articu-

lation loss calculations in an actual installation to arrive at the correct number and type of speakers required. Speaker systems for situations other than theatre are covered in this section: touring, swimming pools, churches, outdoors, etc. One of the photographs in the touring section brought back memories — it is that famous one with a very young be-flared Stephen Court standing in front of the original Court Roxy Music system, stacked 20 feet high.

The final section in this chapter 'Budgets, Tenders and Specifications' is a gem and is an excellent guide through the tendering jungle, with a fully justified gripe at how the system is often unfair. Graham suggests a system of two tenders from competing companies: one for price and one for system performance. Which one is opened first depends on the priority of the client. The section goes on to recommend what should be required for a tender and it really should be required.

The last chapter 'Communications and Effects Systems' describes the quite complex communications requirements that any theatre needs to run smoothly. Again Graham Walne makes the point that budget cuts in this area are false economy. There are sections on cuelights, intercoms, radio systems, paging systems and telephones, and their areas of usefulness. It struck me that this chapter would be of use for the design of any sort of entertainment venue, not just theatre. The end of the section illustrates the use of different media for creating sound effects and the obligatory look at digital alternatives and 'the future'.

The back of the book contains a very useful Appendix including such things as a glossary of terms, technical data and formulae and a list of books for further reference.

'Sound for the Theatre' may be thought of as a non-academic text book. It's easy, readable style and a rejection of any complexities not to do with the job in hand makes it approachable and understandable by anybody of reasonable intelligence. The inclusion and explanation of mathematical formulae, when relevant, makes the book of real use in real situations. For the student coming to the theatre for the first time it offers in one tome a complete picture of sound practice in the theatre and many situations outside of it. It will be of great interest to anybody working in the entertainment industry and I recommend it highly.

Vincent Rice



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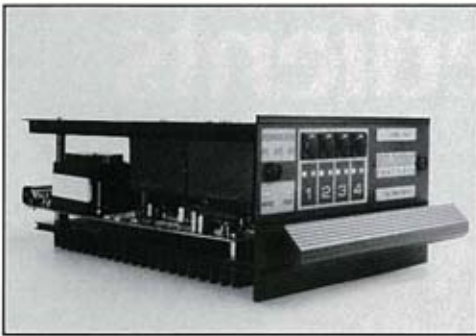
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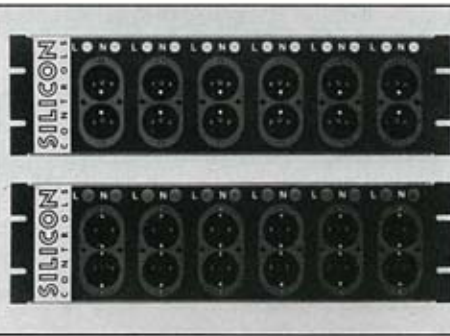
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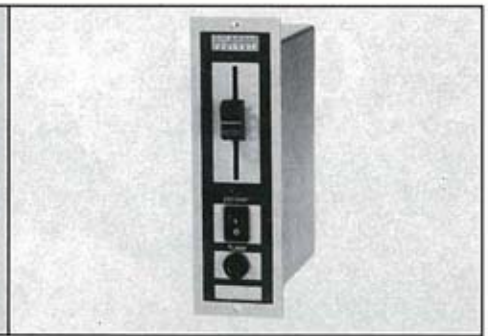
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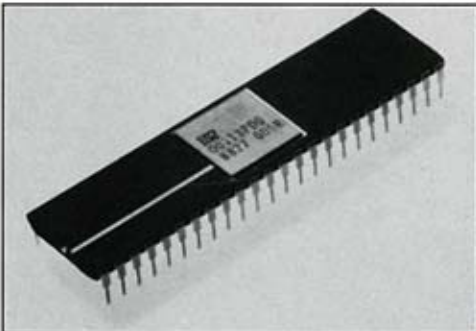
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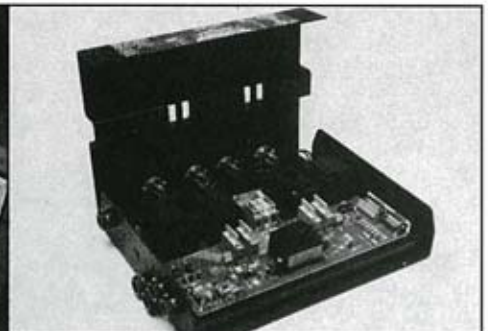
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SPEKE EASY

(OR WHAT WENT ROUND, NOW COMES DOWN)

Tony Gottelier at Fallows Too

It seems like only a few weeks ago that I found myself in Liverpool to check out the performance of the recently launched Color Pro projectors, newly installed in a large converted factory, now a disco called Fallows after its enterprising owner.

Yet a positive torrent of water has passed under the proverbial bridge since then. Barely was the ink dry on the previous piece, than John Fallows sold this Aintree site to acquisitive Plc, European Leisure for an undisclosed, yet no doubt vast, sum. (With the current news that Metropool in Holland, about whom I also wrote last year, has been swallowed up by First Leisure, I'm beginning to wonder if I should be on a finder's commission to supplement my meagre scribbler's stipend!).

Then, flushed with the success of the previous venture, John approached Michael Ward, Euro Leisure's chairman, with a new proposition. He had found another similar

site and, he explained, that although it was also in Liverpool, it was actually 15 miles away from the original location in a high-spend neighbourhood called Speke. He offered to supervise the entire construction and deliver the package to European as a turnkey. Ward readily agreed.

Fallows Too (get it?), tucked away behind a car showroom, is a vast monolith of a place with 26,000 square feet of public area, mostly at ground level. As before, the bars and public areas terrace downwards and surround the vast dance floor, turning it into an amphitheatre. The difference is that this time the performance area is raised somewhat higher than the lowest level surrounding it, and I am not sure that this is an improvement over the original model. Time will tell.

As before, Fallows turned to Hi-Tech Electrical for the lighting installation and to associated company Level Acoustics for the

sound. In turn, Hi-Tech went to their semi-detached 'in-house' lighting designer, Graham Barron for a lighting concept.

The final installed scheme draws on Graham's original design, but to a reduced lamping specification due to budgetary constraints.

A continuous double run of ladder beams traces the perimeter of the dance area at different levels two metres apart supporting a large number of Par 36 in banks of eight, 32 Raylights and eight grouped Clay Paky Martes. Two rectangular panels, each carrying a grid of Lynx 100SX 100W Halogen spots and Synchro Pins, a dynamic controllable 100SX also from Lynx, fold down from the horizontal to 45 degrees at either end of this area.

A void has been created by breaking the ceiling soffit along a line following the pitch of the roof, the ridge of which ran through the centre of the length of the dance area.



The cluster of Golden Scans replaces the central speaker array at the previous venue.

Photos: Neville Kuypers.



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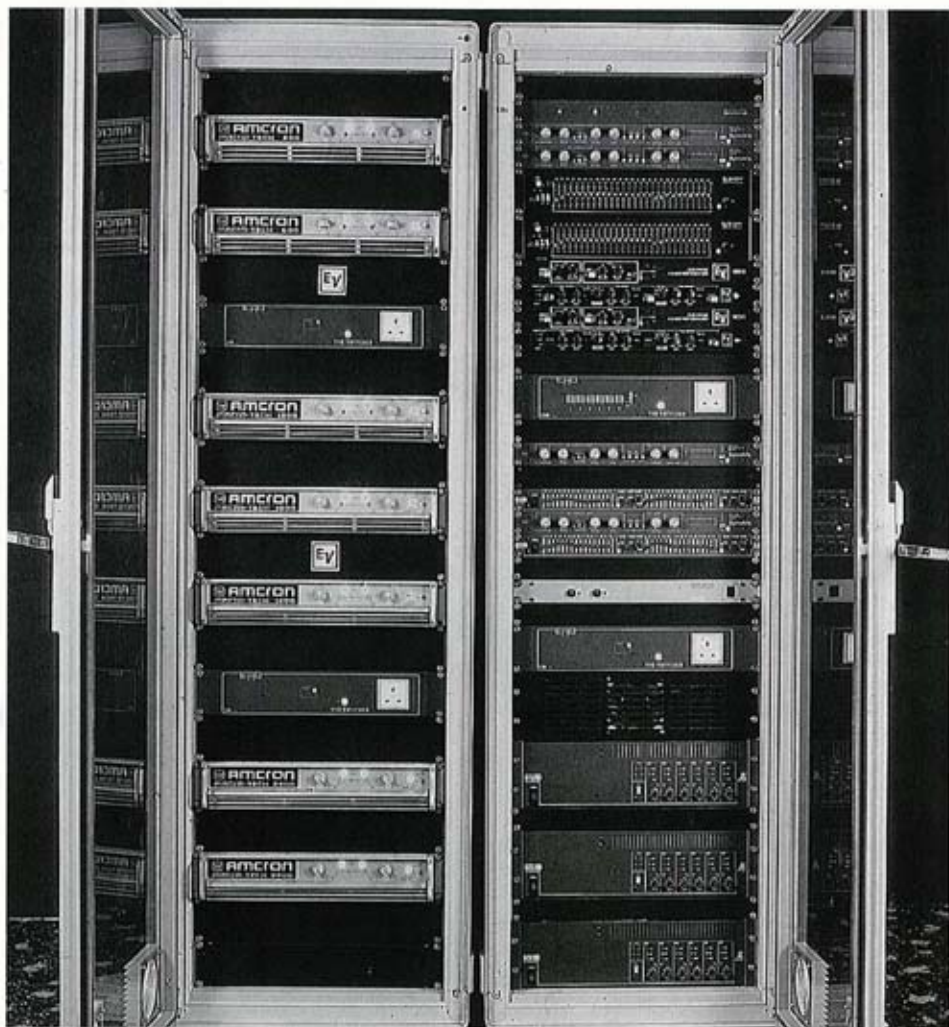
PROFESSIONAL SOUND HIRE / SALES / SERVICE / COMMUNICATIONS

Into this void at either end two scissor elevators have been inserted carrying square frames supporting strobes, more 100SX and Synchro Pins.

Two sliding panels, dressed with neon triangles in inverted pyramids, move sideways in the centre of the floor to reveal 12 Golden Scan articulate projectors which are bunched together in a tight circle on a hoist. An unusual configuration and for all the world like a high tech chandelier.

Like all chandeliers this can travel down towards the floor, and not just for cleaning and maintenance! When you consider that the centre of the dance floor can also be raised, Hippodrome style, by about 300mm to reveal banks of spots below, and that the headroom is only 4m, I began to think that an interlock was called for. All mechanicals are by locally-based Dagar Maintenance.

There was also a number of mesh-clad fixed angle panels, which are faced with clear blue and ruby red neon rods. These were designed to have moving lights behind the mesh, in what is Graham's signatory touch. Unfortunately, these went out with the fore mentioned constraints and this does leave the scheme a bit thin. With absolutely everything moving linearly in quite a tight head space, I suspect that the proposed Tumblers will be sadly missed. The move towards bold banks of colour and dramatic sweeps and changes of position, hard to achieve with limited height, which I wholly endorse provided such changes can be made apparent, should not preclude the use of a few toys as well. It also raises the question as to whether, when it came to making cuts, it might have been preferable



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to retain the original core lamping specification and sacrifice some movement instead.

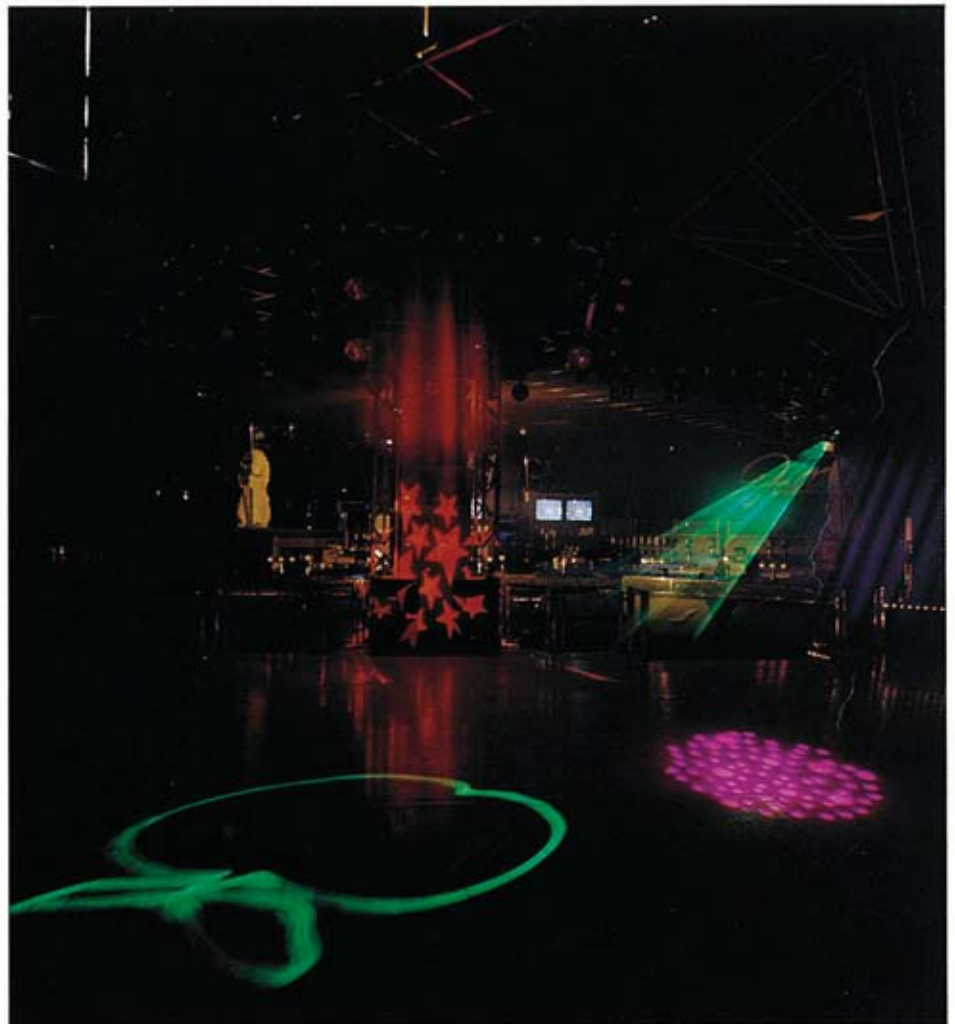
I suppose the biggest toy of all is the Argon laser package, provided by Royston-based Laser Grafix. Here they have used their optical bench technique, with actuators and other effects, for straight line dynamics of considerable force. But the most interesting aspect of this laser installation is the use of two fibre optic feeds to two separate scanner sets. These are placed in the orbs held by two lion statues, Fallows hallmark decor feature, on either side of the dance floor, enabling the duplication of all the scanned effects from two totally different angles to the main source.

All the lighting and the mechanicals are controlled by Oska, Pulsar's interactive, multichannel lighting control based around a touch sensitive TV screen. Andy Graves from Pulsar was on hand for several days beforehand to provide advice and programming. Opening night was operated by Dodds and Lindsell, well-known for providing the hands-on aspects of Oska's appearances at trade shows.

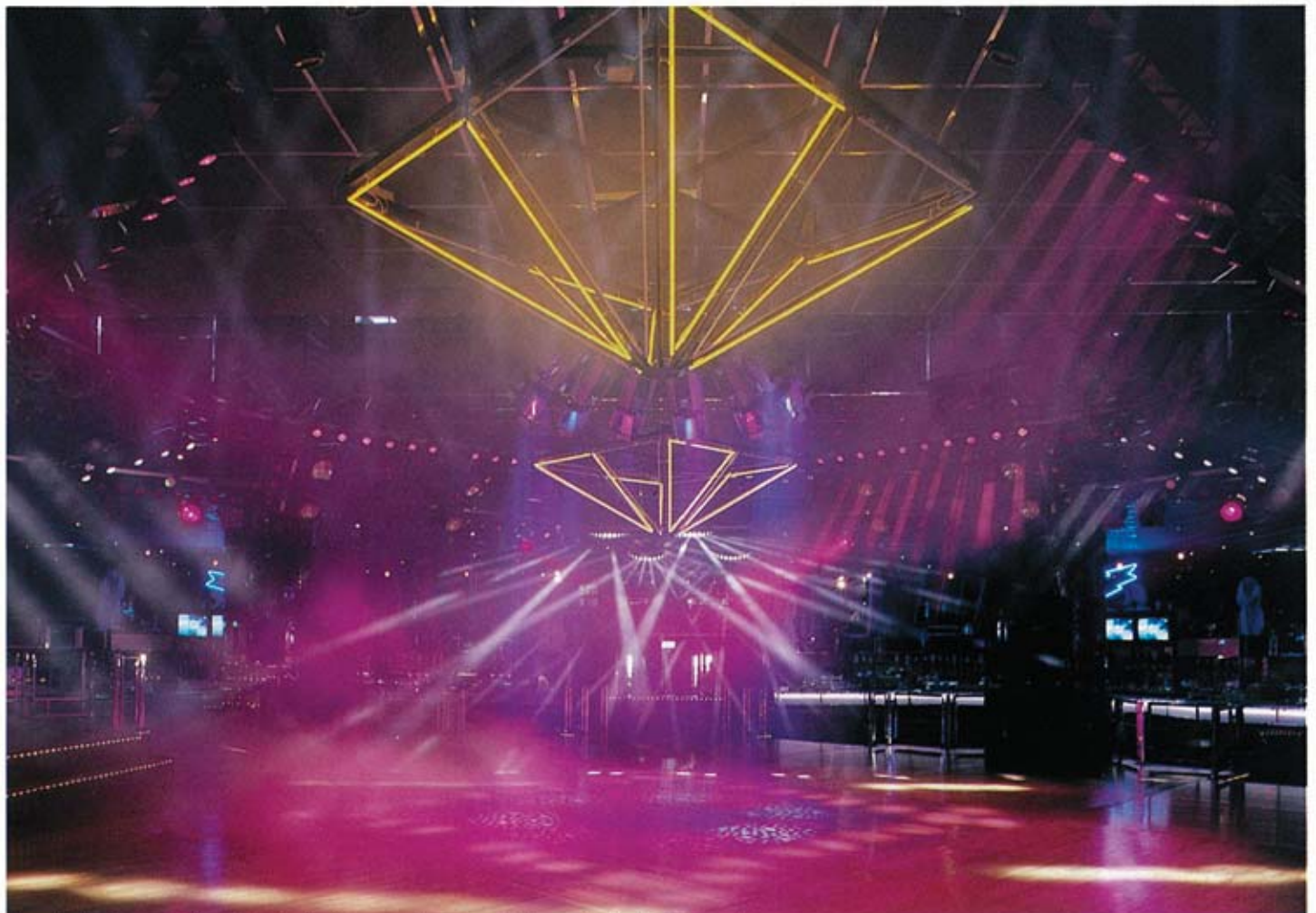
Level's sound system, based around Amcron amps, ElectroVoice speakers, crossovers and equalisers, and controlled by a Formula Sound mixer, made all the right noises and sported one of the smartest double rack installations I have seen.

Despite all this technical effort, the question still remains, will the place itself do the business and does this type of industrial discotheque really have a future?

Will the good people of Speke go easy on Fallows Too?



Out of the lion's mouth (well almost) come forth apples, courtesy of Laser Grafix.



The whole vista at Fallows Too, including neon feature and Martes in the background.

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PLASA News

A Good Year for PLASA



Above: Tony Kingsley, vice-Chairman of PLASA and Chairman of the sub-committee on sound, presents his report to the AGM, whilst Kevin Hopcroft (below) Chairman of the Association adds a note of humour to the proceedings.



The 1990 PLASA Annual General Meeting was held on 10th July at a new venue – The Blakemore Thistle Hotel in Little Wymondley, Hertfordshire. 50 attendees turned out for a very positive meeting which included reports, not only from the officers of the Association, but also from each of the nine sub-committees established this year.

The accounts for the year ended 31st December, 1989 were presented and these will be forwarded to all members together with the minutes. Members also learnt of the many new facilities and services recently developed at PLASA head office and their views were sought on a number of issues, including the possible introduction of an Associate class of member.

French Connection

Members will soon be receiving their first export fact sheet (which covers France) together with a detailed list of over 100 contacts within this country.

Questionnaires aimed to assess member's current export position and future priorities are to be circulated in order that PLASA can accurately respond to members wishes, and establish a comprehensive database.

Hotline

The PLASA Standards Office is now even more accessible to members with the introduction of a fax line. The latest fact sheet covering EMC, smoke machines and the National Outdoor Events Association is already on its way to members, and George Thompson is currently forging closer links with the British Standards Institute for the future benefit of PLASA members.

Double Jointed Ventures

For the first time, PLASA has succeeded in gaining DTI support for SIB/MAGIS, Rimini 1991 and details of the joint venture proposal are expected within the week, once prices have been received from Italy. The deadline for **Lighting Dimensions International**, Orlando (November 17-19, 1990) has been extended until August 20th due to negotiations with the DTI. Members interested in either of the above shows or in attending **Photokina**, Cologne (2-9 October, 1990) should contact Chris Sogno on (0323) 410335.

British Music Fair



Olympia 2, London, recently played host to the British Music Fair. PLASA members in attendance included Harman UK, Ramsa Panasonic, Yamaha-Kemble, Celestion, Light Engineering, MSL Pro Sound & Light, and W B Lighting.

PLASA is the foremost trade association in the lighting and sound industry worldwide. As such it does a great deal of work both with, and on behalf of, its members. Find out how PLASA could benefit your company by contacting Chris Sogno at

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THE THEATRE OF THE GUILLOTINE

Ruth Rossington's interest in the macabre found her dispatched to the London Dungeon

Many people will be familiar with the dark and eerie vaults of the London Dungeon, one of the City's biggest tourist attractions, and the gruesome exhibits therein. Now owners Kunick Plc have recently spent £250,000 to add a new theatrical 'experience' to the list of atrocities.

Opened in early July, the 'Guillotine' and the 'Terror' are designed to be a strong attraction leading the visitor through a series of chambers to recreate the troubled times of the French Revolution.

Situated in a long narrow area of around 4,000 square feet, the site is divided into three chambers. Having been directed through the imposing entrance, the visitor is held in the first area for approximately two minutes. The distant sound of crowds shouting and jeering can be heard. Here the mood is set for the rest of the attraction. The decor is fairly non-specific, but reflects the grandeur of the previous Louis XVI excesses, with faded drapes, torn and burnt flags, and vandalised interior details. The painted canvases of d'Eglantine, Danton and Saint-Just hang from the walls, and on the left, within an alcove sits Robespierre, high up behind a flag-draped table, and ready to pass judgement on those in the chamber.

On first entering, the light level is low with the banners and portraits picked out by soft focused pin spots. Low-maintenance Par 38s were chosen to give ease of operation for the non-technical staff at the Dungeon.

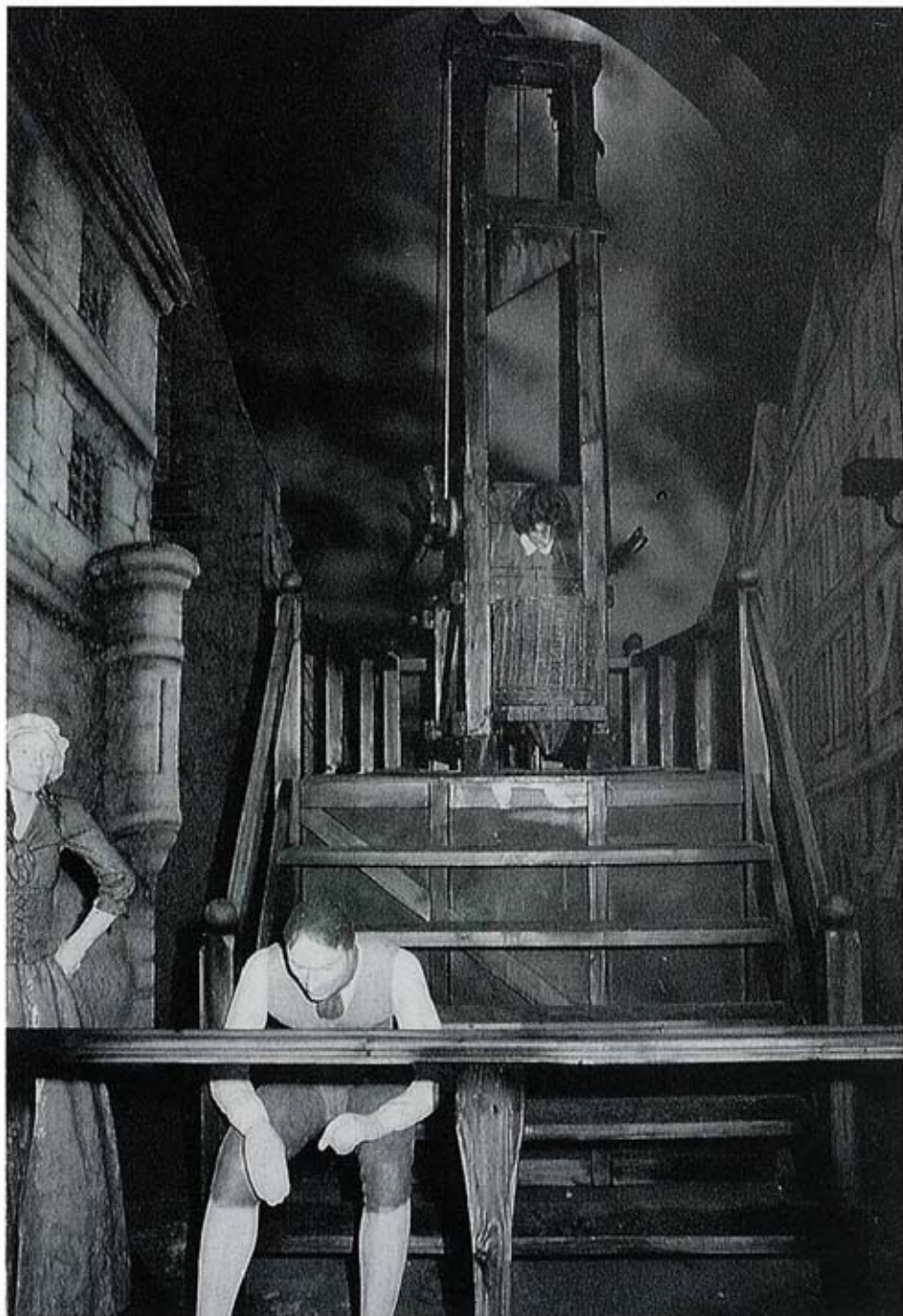
A voice-over introduces the subject of the French Revolution, and very briefly sets the scene for what is to follow. During the narration the banners become brighter as light intensity increases, and the three-dimensional representation of Robespierre is suddenly illuminated to condemn the prisoners to pain of death. The visual and audio concept of the experience was realised by creative design company Sparks who have worked on many similar projects in their 30 year history.

The ambient effects in the chamber, as in the others also, are operated from a computer-based system, actuated by a single control button situated at the entrance to each. The shows were initially programmed and sync'd to the sound tracks using a computer. Once perfected, the programme information was transferred to a silicon chip, or more accurately an Eprom (Erasable/Programmable Read Only Memory), a form of non-volatile memory. Start-up is as simple as flicking a switch, and all timings are preset to ensure that visitors make smooth and unhurried transitions through the chambers.

Sound in the chamber is provided by digital sound store. An ESTA 24 tapeless audio card frame, from Electrosonic, is fitted with three ES1354 message cards for the audio playing at 12kHz bandwidth. The chamber also has an auxiliary board, together with a simple relay control system. A localised second sound store provides Robespierre's voice.

The sound channels in the chamber are all mono, so a Roland digital delay unit was included to add depth to the sound effects. It delays sound to one speaker whilst sending it direct to another, thus creating a fuller sound. A constant crowd noise runs throughout the chambers and is incorporated into the general background effects. Rane mixers have been specially customised to allow this to happen. An SM26 splitter mixer supplies atmospheric sound at different levels.

With the close of the presentation, the large doors of the first chamber are illuminated and pushed open to reveal the cold, stark interior of a revolutionary prison. A smoke machine controlled by the previous scene, has already released a



"As the head falls into the basket, those at the front feel a spray of 'blood' on their faces."

The Theatre of the Guillotine: latest atrocities at the London Dungeon.



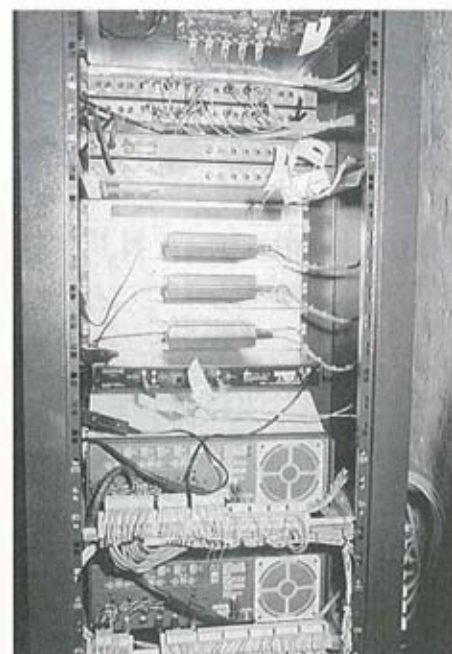
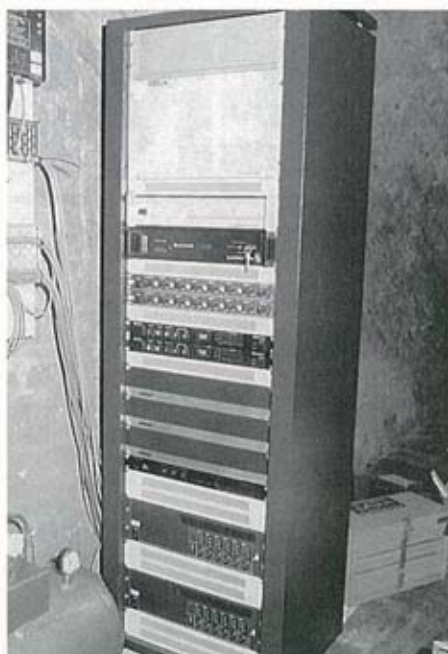
timed burst of smoke to create the atmosphere before the visitors enter. Concealed Bose and JBL speakers convey the distant sounds of crowds outside, which grow increasingly louder, and the occasional roar as the guillotine falls once more.

To the right are two deep-set barred windows situated high in the wall through which stream shafts of cold blue moonlight created by hidden pin spots, focusing detailed silhouettes onto the opposite wall. On the left are two deep grilled windows looking onto imaged buildings outside, set against a fiery dawn sky. Again, the effects are created by concealed pin spot lights positioned behind the construction of the cell and filtered to create effect.

The sound is stored in a similar manner to the lighting effects, which Graham Owen, technical director of Sparks, feels save on costly maintenance and wear problems associated with conventional tape decks. Three separate, but integrated sound systems, incorporating eight 'digital sound stores' are employed for the three chambers. Three Electrosonic single channel dimmers, and a 16 channel relay control, interfaced for dimmer control, are part of the sound line-up. The sound in each section is carefully controlled by audio mixing units specially modified for the purpose by Music Lab, who supplied the sound processing and amplification systems. Precision-made loudspeaker cabinets, 14 in all, are strategically positioned to recreate this turbulent period of French history.

At the far end of the second chamber, above a large pair of prison doors, images of the Revolution cross fade, accurately sync'd to a narration by Madame Guillotine. Three Simda projectors are housed in the roof of the chamber and project a series of slides depicting a concise history of the French Revolution and how the guillotine itself came into being. (The initial research and synopsis for the script was prepared by Spark's historical researcher Peter Gaunt).

As the audio visual presentation comes to an end, the large prison doors are illuminated and slowly open to reveal the dramatic finale to the experience. In front of a tempestuous dawn sky, (again realised through positioned effect lighting) against a stretched, painted scenic backcloth, the visitor sees the silhouette of the guillotine. Initially at an oblique angle, it slowly creaks round before halting face on to the audience. Throughout the whole, the noises



The front (left) and rear of the effects rack featuring Electrosonic, Roland, Bose and Rane components.

of the crowd grow louder still.

As the silhouetted guillotine slowly turns on the scaffold, the light level changes and the setting for the execution is gradually revealed the Place de la Revolution, a typical Parisien square of the time. Monochromatic, ghostly figures are already in place, and as the light level increases so does the sound of the expectant crowds. A ghostly tumbrel is heard rattling first from behind, then seemingly to the front over the cobbles. The sound effects of the chamber are relayed on digital stereo, and rather than the conventional placing of the speakers to the left and right, Bose 402s have been sited at the back with 101s at the front, and JBL speakers mounted at the base of the guillotine itself. Whilst the guillotine revolves, the blade slowly rises, and a spine chilling ratchet is audible as it makes its painful progress to its full height.

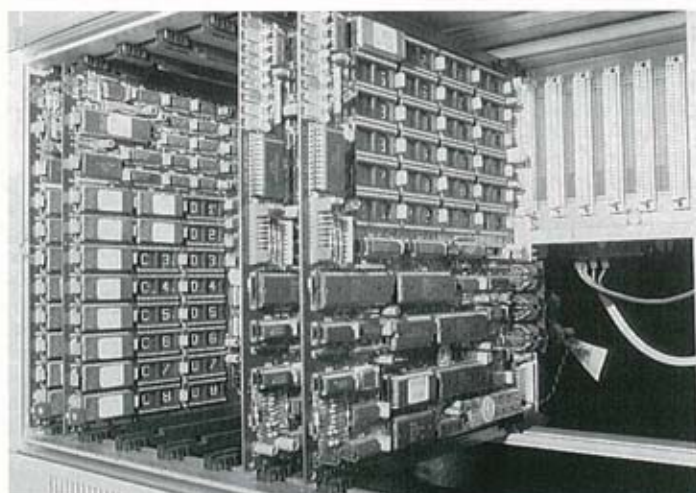
The digital solid state sound system produces the effect of the human heartbeat. Throughout the setting of the blade, lights appear in random sequence in window effects around the chamber and from a created alleyway to one side. Having reached the upper position, a spotlight falls on the blade, and the hysteria of the crowd is momentarily suppressed in anticipation. A drum roll is heard, and after a few seconds pause (which sets the old nerves twitching),

the blade falls with a terrifying certainty thudding to a halt as it hits the block. As the head falls into the basket those at the front feel a spray of 'blood' on their faces.

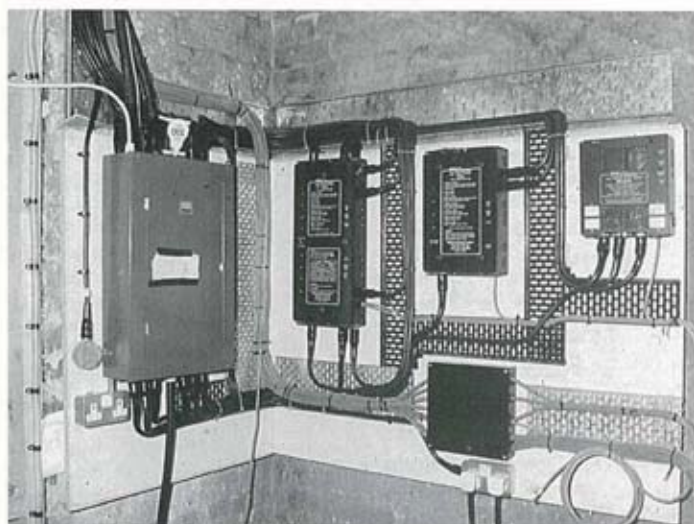
This third chamber involves the most complicated effects equipment. An Electrosonic show control card drives a 32 channel analogue controller, which controls all the Mode dimmers and switchpacks, and the air supply to the pneumatic devices operating the guillotine. With the dimming of the front lights, the guillotine's startling image fades, and a sequential flow of spot-lighting illuminates a series of victim's heads on pikes, ending with a figure in the rear of the room who informs that the executions are over for the day and that there will be more bloodshed tomorrow.

The equipment components had to be carefully selected to withstand the moist and damp atmosphere that prevails at the site. The electronic, audio and control equipment is housed in a suitably prepared dry 'Control Room', and a de-humidifier maintains a constant temperature in the room.

Kunick Plc feel that the Theatre of the Guillotine will strengthen their ties with France. A similar exhibition to the Dungeon, Les Martyrs de Paris, depicting the darker side of French and European history, opened in the French capital recently.



Close-up of an Electrosonic's Esta 24, a 'long message' device for material of two to eight minutes duration.



Mode switchpacks and dimmers in the Control room.

EQUIPMENT *News*

More Watts from NJD



Specialist audio manufacturers NJD Electronics have recently introduced the M500 250W + 250W power amplifier for the disco and nightclub installation markets. The new product represents the latest mosfet design technology. Each amplifier incorporates comprehensive DC loudspeaker protection and a single speed cooling fan ensures lower operating temperatures.

The amplifiers are fitted into a robustly constructed metal case with integral 19" rack mounting brackets. The electronic circuit produces an ultra low noise transparent sound quality, throughout a wide band of audio frequencies, without distortion. Maximum clarity, bass performance and music reproduction is further enhanced with low noise inputs and a complementary triple output stage.

The controls are simplified for club operation and consist of left and right rotary gains, adjustable by incremental steps, on/off power switch and LED's indicate output per channel in watts clipping and temperature overload. A combined mono/stereo switch enables the amplifier to be used either as a two zone unit, allowing individual control, or to supply 500W output in a bridged mono mode.

Input and output connectors are made through XLR connectors, jack inputs and binding posts. For further details contact NJD in Sandiacre on (0602) 394122.

Stack 170 Microphone

The Stack 170 is a true diversity wireless microphone system offering up to five separate frequencies. Designed and built in Italy by Entel, the system has two antenna that will monitor, react to, and compensate for any loss of signal that would normally result in drop-out. Ideal for live, broadcast and video applications, the Stack 170 is offered in three different formats — hand-held, instrument and lavalier (lapel) type transmitters. The hand-held transmitter incorporates a dynamic type capsule. For further information contact Entel srl in Calderara di Reno, telephone (51) 729101.

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Galaxy of Stars

UL Universal Lasers will be launching two new laser controllers at this year's PLASA Light and Sound Show (9-12 September), which they claim represent the latest design technology for sophisticated laser control.

The new 'Mirage' computer-based laser controller will be on display demonstrating a wide range of laser effects throughout the exhibition. Each controller contains a 20 megabyte Winchester hard disk, 640K operating memory and 3.5" floppy storage disk, with a control console incorporating both an ATG's keyboard and full A4 digitising tablet. The digitiser will enable lighting jocks to electronically draw and paint a full range of laser patterns and store these design programmes onto floppy disk. An integral four track tape player allows the light jock to operate the lasers with individual sound to light programmes, enabling the lasers to pulsate in conjunction with the music beat.

A new version of the Galaxy low cost 150mW system will also be launched at the show. The new unit has full remote control facilities and offers a range of colours - cyan, blue and green.

A laser show will be demonstrated every 30 minutes on each day of the exhibition on the first floor on stand F176. For further information contact the company in Grantham on (0476) 73006.

Transformer Range



Transformer manufacturers Low Voltage Technology have recently launched a new range of 12v toroidal transformers for powering the rapidly-growing low voltage lighting sector.

Made from grain-orientated EN52 steel laminate and high-quality copper, the new range is available in sizes from 20 to 750VA. The transformers feature individual-fused outputs from separate secondary windings in all sizes over 50VA — thus virtually eliminating traditional regulation problems of output voltage varying with load. LVT have incorporated separate individual windings and fuses so that with multiple outputs each lamp is unaffected by the fluctuation of load if one or more lamps fail.

Placed within spun aluminium housings, they have an enhanced heat-dissipating finish, which LVT claim, significantly reduces the temperature problems often associated with this type of transformer.

LVT also have an economy range, identical in quality, but with flying leads. Both ranges offer internal auto-resetting of the thermal cutouts, and are fitted with independent mounting brackets. For further information contact LVT in Godalming on (04868) 27375.

Scatterspot 50



Leicester-based Abstract have added the Scatterspot 50 to their range of lighting effects. The new product features a 50W flash-rated focused spotlight effect pushing out approximately 30 sharp scattered rays of light with a 35° beam spread. It is coloured by filters and designed to be used in quantities on inductive lighting controllers.

Manufactured in Britain, it complies with British safety standards with isolation of the transformer created via a rated fuse in an implement release-type holder. The lamp is accessed under the unit on a drop plate which incorporates the lamp focus plate. For further information contact Abstract Design to Light in Leicester on (0533) 825520.

Maestro From PEL

Installers of music systems will welcome a new colour leaflet from sound specialists Planned Equipment Ltd. Describing the recently extended Maestro range of music services, it contains all the information necessary to select the most appropriate hardware and software for both sophisticated and simple systems. Attractively designed, the leaflet is also a useful sales aid in negotiations with the end-user.

Of particular interest amongst the hardware is the Fortune range of tape-players with either two or four decks, and a compact disc player which enables six standard discs to be played in sequence, in a pre-programmed format, or randomly. Speakers, mixer-amplifiers and microphone requirements are also detailed. For further information contact Planned Equipment Ltd in Northolt on 081-841 6251.

Smart Lights

Bob Gautier, a senior research associate at the University College of Wales, Aberystwyth, has reached the semi-finals of the Design Council's Toshiba Year of Invention competition with a new electrical wiring system.

Using components already on the market, his design measures loop resistance. By placing resistors and a microprocessing gadget under programmable control, the system reduces cable bulk and switch complexity, whilst the use of lightweight twin-core cable negates the use of standard thick mains cables. Known as 'Smart Lights' Gautier hopes that, whilst the finer details are still on paper, the system could eventually become a low voltage and extremely safe way of wiring any building.

The 45 semi-finalists were chosen from over 4,000 entries. Regional finalists will be announced this month, with the national finals in December.

PLASA launch for KUDO Cans

A joint venture between Kupo Co of Taiwan and Doughty Engineering of Ringwood has produced the new brand name of KUDO (KUpoDOughty). The first product to be launched in the UK under the Kudo brand name will be a range of par 64 cans at this year's PLASA Light and Sound Show (9-12 September).

The new Kudo cans, designed by Doughty and manufactured by Kupo, are aimed at the top of the can market. With the use of colour scrollers on the increase, an important feature of the new Kudo cans is the segmented anti-slip yoke washers to lock the can solid in its hanging basket without the nose drooping.

Doughty have also incorporated all the features that initial market research found their customers required, such as four colour frame clips (to stand the cans on the floor when not in use!) an earth strap between both halves of the cans, and for extra strength the nose cone has been spun from a heavier gauge aluminium with extra ribs and end roll.

Attention has also been paid to the packaging. Whilst not of great interest to the end user, dealers will be glad to know that the KUDO cans come individually boxed or in convenient six packs! For further information contact Doughty in Ringwood on (0425) 478961.

NSI Melange



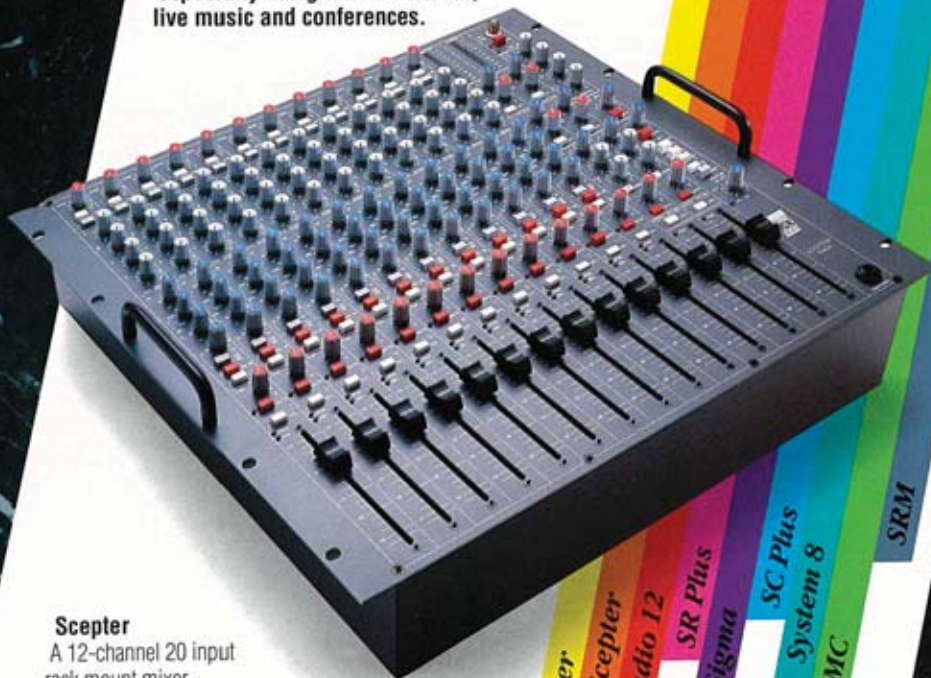
American company NSI Corporation have recently introduced the Melange memory lighting controller, which features 128 individual control channels with proportional soft-patch capability for up to 512 dimmers. 200 cues, retained in non-volatile memory, are available in standard configuration with an expansion option to double capacity. Other features include two independent auto cross-faders with individual go buttons and 'softpot' technology allowing touch sensitive control for fast data input. Up-fade, delay, down-fade and wait time are programmable from .1 second to over 99 minutes.

The Melange has 22 user definable macros, recursive cue linking for multiple simultaneous crossfades and a help program. Standard output ports include DMX512, NSI Micro-Plex, RS232 and MIDI. Options include memory expansion and removable card storage. For further information contact NSI Corporation in Wilsonville Oregon, telephone (503) 698 7976.

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ALLEN
&
HEATH

Klark-Teknik at AES



Klark-Teknik will be displaying various new products at this year's AES Exhibition in Los Angeles. One such product will be the DN735 solid state recorder which has been specifically designed to simplify editing when audio is required to cross fade from scene to scene. Also on show will be the recently-launched Series 500 dynamics including a quad compressor/limiter, a dual compressor/limiter/expander, an advanced dual gate and a quad auto gate — each in only 1U of rack space. Alongside these will appear the Series 700 digital delay lines, the DN780 digital reverberation system, Series 300 graphic equalisers, Series 400 parametric equalisers, a DN60 real time spectrum analyser, and the Jade One MKII active monitoring system. As distributors for Milab Microphones, Klark-Teknik will be displaying the full range of condenser and dynamic microphones.

The company will also be launching the new Midas XL3 live performance console which features 18 discrete mixes with individual pre-post and on/off switches, eight VCA groups, two output VCA groups and mix to master with level and pan. And last, but not least, Klark-Teknik will exhibit the latest Midas XL Two auditorium console, and the new optional rack-mounting outboard Midas Matrix. For further details contact Klark-Teknik in Kidderminster, telephone (0562) 741515.

Holding Court

Windsor-based Court Acoustics have released a touring version of their System 1000 3/4 way rig. The product is a development of the Black Box System and has been installed for live and recorded music in many UK and overseas venues, and in most of London's major clubs including The Camden Palace, Stringfellow's Hippodrome, Xenon and Le Palais, Hammersmith.



The 1200W bass bin is also the heart of the new System 2000 which has a high bin comprising two 15" 1200W drivers in a front loading horn with four midrange and hf drivers in a dispersive array, giving System 2000 a total power handling of 2600W. Court Acoustics are also launching a new range of power amplifiers from 800 to 1200W to go with their graphic equalisers and crossovers.

The company have just been appointed to

design and install a 9000W 4 way sound system in Vienna, working with Alan Parsons on the new musical 'Freudiana'. With increasing work overseas, Stephen Court is going to Australia at the end of July to finalise the setting up of Court Acoustics (Australia) Ltd with Court's Australian distributor, John Busst.

For further details on Systems 1000/2000 contact Court Acoustics in Windsor on (0628) 38555.

Metro QL8

The Metro Audio QL8 Cuelight System is a professional, rack-mounting eight channel system for use in theatres, conference centres, concert halls and any other venue where reliable visual cueing is required.

Each channel incorporates a red for 'stand by', amber for 'acknowledgement' and green for 'go' status indication lamp, which run in series with their outstation counterpart. This enables identification from the master station of any outstation bulb failure. 16, 24 or 32 way systems are obtainable by linking master stations together. All designated 'go' stations can be triggered simultaneously by a single master switch.

For more details contact Farrahs in Kingston on 081-549 1787.

Galatrek Power

Galatrek International has unveiled a new 'Fourth Generation' range of Ferrups and Micro Ferrups uninterruptible power supplies (UPS). The products feature unique 'Artificial Intelligence' functions, offering increased efficiency and prolonged product life.

The new UPS range provides continuous, on-line power, whatever the conditions of the incoming power, and the units provide tangible user benefits in terms of reduced hardware repair and maintenance. The Ferrups UPS also has the ability to carry out routine diagnostics, including predictions of life cycles for major components. Amongst the 'Artificial Intelligence' features of the range is adaptive line-loss detection, which automatically makes the transfer to battery power when necessary. For further information contact Galatrek on freephone 0800 269 394.

No Soldering Required

Future Film Developments recently introduced the SoundCorp PF Series patchfields. Designed for quick installation time, the

PF Series is built to comply to the industry standard.

Connections are routed from the transition panels to the patchfields via a special shielded ribbon cable. Any normalling configuration can be set, or changed quickly and easily before or after installation. Routine maintenance and/or reconfiguration of the PF Series is quick and simple using the link card and cable kit at the transition panel, which allows removal of the patchfield without disturbing 'on air' signals. For further information please contact FFD in Aylesbury on (0844) 238444.

Transformerless gives More



California-based Audix recently announced a significant breakthrough in dynamic microphone technology with the introduction of the first transformerless dynamic hypercardioid — the OM3xb. Unlike all other dynamics that require a small step-up transformer to enhance the mic's output, Audix claim to have developed a new capsule technology that produces excellent gain without any of the unwanted artifacts caused by transformers and other components.

To further ensure signal purity, the company have provided an electronically cut windscreen and gold plated connectors. The transformerless technology provides an unprecedented signal to noise ratio, 144dB SPL handling, uniform pick-up pattern for less feedback and a natural sounding microphone through its 38Hz to 21.5kHz range.

The OM3xb features a zinc alloy casing with a robust, non-reflective powder coat finish, a heavy duty tempered steel grille mesh, and comes with clip, pouch and the Audix Lifetime Road Hazard Warranty. For more information contact Audix in Pleasanton, telephone (415) 463-1112.

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ANNOUNCING



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4 OCTOBER 1990

Although 1990 is only the second year for the British Dance Music Charity Awards Luncheon, this event is already established as a unique opportunity for dance music artists and their record companies, DJs and club promoters, and dance music equipment manufacturers to get together, get talking and get into supporting **Dance Aid**.

THE AWARDS

The Dance Aid Trust Committee have selected nine award categories to represent the diverse aspects of achievement within dance music and related industries, and applaud the high standards British dance music consistently maintains.

- 1 TOP DANCE LABEL
- 2 TOP DANCE MUSIC SINGLE
- 3 TOP DANCE MUSIC ALBUM
- 4 TOP RADIO DJ
- 5 TOP CLUB DJ
- 6 TOP CLUB OF THE YEAR
- 7 TOP EQUIPMENT MANUFACTURER
- 8 BEST NEWCOMER TO BRITISH DANCE MUSIC
- 9 TOP SONGWRITER

Nominations are requested for the **TOP CLUB** and **TOP EQUIPMENT MANUFACTURER AWARDS**. Please call 071-437 3665 for relevant nomination forms.

THE LUNCHEON

This year's luncheon will be held in the Napoleon Suite at the Café Royal. Pre-luncheon cocktails will be available from 12.00pm, and a three course luncheon will be served at 12.45pm. Presentation of the awards and the charity auction will take place after the luncheon, and a cash bar will be open until late in the afternoon, to encourage guests to extend the occasion on a more informal level.

For details of the luncheon, table reservations, award sponsorship, prize donations for auction and advertising in the awards brochure, please contact Avril Peyton, EMS Associates Limited on
071-437 3665



NOTE ...the 4th October
in your diary now—
an industry event
not to be missed



Soundtracs PC Console

Due to overwhelming demand, claim Soundtracs, for a cost-effective 24 track console to package with the numerous tape machines currently available, the company have recently introduced a PC 32 Series console.

The PC 32 is an extension of the PC Midi Series range of consoles, comprising the PC Midi 24 and the PC Midi 16. The facilities on the PC Midi, which include MIDI control of mute automation, create dynamic and sonically transparent sounds which are suited to high quality track laying.

Fitted with 32 input/output channels, the PC 32 provides 72 line inputs on mix down with MIDI control of muting on inputs, monitors, auxiliaries and effects returns. 24 LED bargraph meters are provided to monitor 24 tape returns. For further information contact Soundtracs plc in Surbiton, telephone 081-399 3392.

Multi Products from Multiform



Multiform Lighting have developed two new additions to their range of professional stage lighting control systems. The Aquarius is an 18 channel, two preset manual control desk with standard 0-10V d.c. outputs and is designed mainly for theatrical presentations.

The A and B presets are provided with separate masters and 0-5 min timer controls. Both masters are fitted with green LEDs and the direction of the B master can be reversed if required. Separately mastered flash buttons, DBO and a grand master complete the controls. All channel outputs are monitored by red LEDs and include series diodes, allowing the Aquarius to be connected, in parallel with a rock desk or disco controller, to the same dimmer channel inputs for use in multi-purpose venues. In addition to a standard 25 way D connector the desk can be fitted with XLR7, locking DIN, BICC or Socapex connectors. The Aquarius is available in console and 19" rack mounting formats and can be linked in master slave arrangement using a single DIN cable.



The RAKPAC 605 is a 19" x 2U single phase dimmer pack capable of controlling six 5A of resistive or inductive lighting loads. Designed for touring stage lighting, where 10A dimmers are not needed, it is available with either hard wired or IEC socket outputs. A locking 8 pin DIN input connector is provided and the unit can be fitted with an XLR7 connector if required.

Both products will be demonstrated for the first time in the UK at the PLASA Light & Sound Show in September. For further details contact Multiform in Uckfield on (0825) 3348.



The PC Midi 32 mixing console from Soundtracs.

AMEK on Show

Amek Systems and Controls Ltd will be showing examples from their product range of new and established products at this year's AES. At the Los Angeles show, taking place from the 22-25 September, will be Amek's Mozart recording console in two formats: All-Input, where input modules are identical and function as mic, line, DI, buss or tape inputs as required; and In-Line, where inputs use an in-line monitoring system in dual path mode.

Also on display will be the Medici equaliser which features separate control paths, each containing a 4 band parametric equaliser with high and low pass filters. Alongside these products will be the Classic and BCII broadcast console systems, and the Amek G2520. For details contact Amek on 061-834 6747.

House Lights

The residents of a new housing development in Vining Street, Brixton are now plugging-in to the benefits of one of the most modern and flexible lighting systems on the market, thanks to electrical specialists MK Electric.

Plug-in lighting is as simple as it sounds. Both the ceiling and wall fittings consist of a cleverly designed plug and socket set which makes the installation of a light fitting quicker and safer than traditional connections. Many of the parts, such as the lighting flex, are already factory wired to the plug before being inserted in the socket.

The scheme allows occupants greater freedom to mix and match their lighting more frequently. The contract to supply 250 MK plug-in lighting units for the first phase of development was awarded to high street retailers BHS. MK Electric recently entered into partnership with them in order to create and promote a greater awareness of the plug-in lighting system among trade customers.

Contact MK Electric on 081-803 3355.

TMS Range

Turbosound have recently introduced a new product into the highly successful TMS Range. The TMS-5 (featured in last month's APRS review) is consistent with other products in the TMS line-up and is a full range, 3-way enclosure. It comprises a specially developed 12" low-frequency driver loaded with a patented TurboBass device; a 10" mid-frequency driver, loaded with a patented TurboMid device; and a 1" high-frequency driver loaded with a custom flare.

Turbosound developed the TMS-5 as a direct response to the specific requirements of the discotheque and nightclub industries, where there has been a demand for small and unobtrusive flown enclosures which produce high level, high quality sound with precise dispersion control. It features a user-reconfigurable mid/hi section which allows operation in either vertical or horizontal formats.

For further details contact Turbosound in Partridge Green on (0403) 711447.

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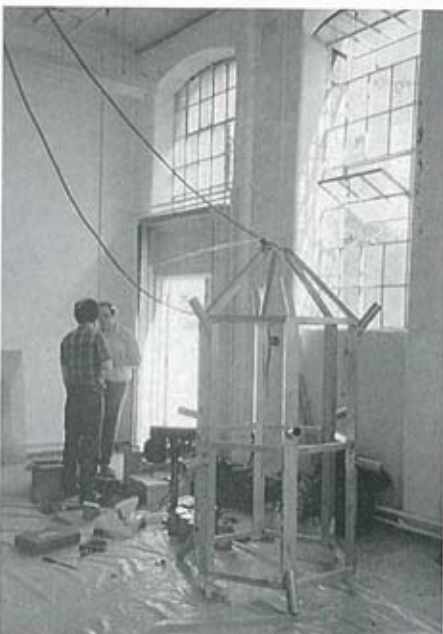


Sanding one of the sphere segments.

(continued from page 28)

for the generation of an even glow of light from internal illumination. Additionally, it had excellent moulding and bonding properties, but the Fire Brigade, despite rigorous pleadings, disallowed its use.

Polycarbonate was an obvious replacement candidate, but sheet sizes to the specification required could not be secured in time. The mould for the formation of the various segments having already been made, both time and cost dictated that it must be used. Eventually, a suitable material was sourced from Germany – but it had different moulding and bonding properties to the perspex and, on top of these concerns, it was clear. Eventually, the options ran out, fingers were crossed, and the sphere was successfully moulded. The diffusion effect required was achieved by a combination of compressed air sand-blasting and manual orbital sanding. The former caused no end of consternation,



Central metal drum on which were mounted all the electrical components, controllers and fluorescent lights.

since the sheer size of the segments and the dry weather conditions prevailing at the time meant that astonishing amounts of static electricity were built up during the process – enough to give the stalwart operator a shock he will remember for many years to come.

The maintenance considerations dictated much of the build design for the structure especially since light bulbs, by their very nature, can be prone to unpredictable reliability.

The inner framework was therefore designed as a metal hexagonal structure which would be large enough to accommodate a construction or maintenance engineer in reasonable comfort and allow him to access all the illumination features in and on the sphere and, where appropriate, their controls.

This hexagonal structure forms the basis for the whole construction. Round it are lamped 60 red and 60 blue linear light



One of the fibre optic signs; each message contains some 1,500 individual fibre optics.



Mounting the neon logos for initial testing – note legs protruding!

tubes. On it are mounted countless electrical junction boxes and sockets. Out of it emanate the central internal metal spokes which burst through the sphere as polycarbonate tubes carrying strobe lights. From it descend the three long metal downward spokes which terminate in the three carrying plates to support both the suspension cables up into the ceiling void and the three fibre optic signs hanging beneath. At the top of it lies the mounting plate to which is fixed the winch cable, which allows the structure to be lowered to the ground for both build and maintenance, and then raised into position at the ceiling.

Down came the winch cable; up went the hexagonal drum, on went the sphere segments; in went the spokes and flanges; around went the outer tubes and nodes; then the whole structure was winched up to allow the insertion of the lower metal spokes and base triangle. Touch-and-go at 3am was converted into rapturous relief when, at 5am the whole framework was complete and could begin its stately ascent to the ceiling.

One day – an empty space. The next – a massive 20' structure hanging over people's heads. The icosahedron had arrived.

For the next seven nights, teams of specialist contractors arrived on site at 11pm and worked through until 6 the next morning to turn the framework of the structure into the light sculpture that exists today.

The National Power light sculpture demonstrates the potential for using spaces that are currently considered 'too difficult' to accommodate advertising. This will have advertisers looking for unusual spaces and seeking creative solutions. They will be able to point to Heathrow and show the benefit of having an artistic solution. It is obvious that more people are taking notice of the fantastic light sculpture than of the standard flat signs within the terminal.

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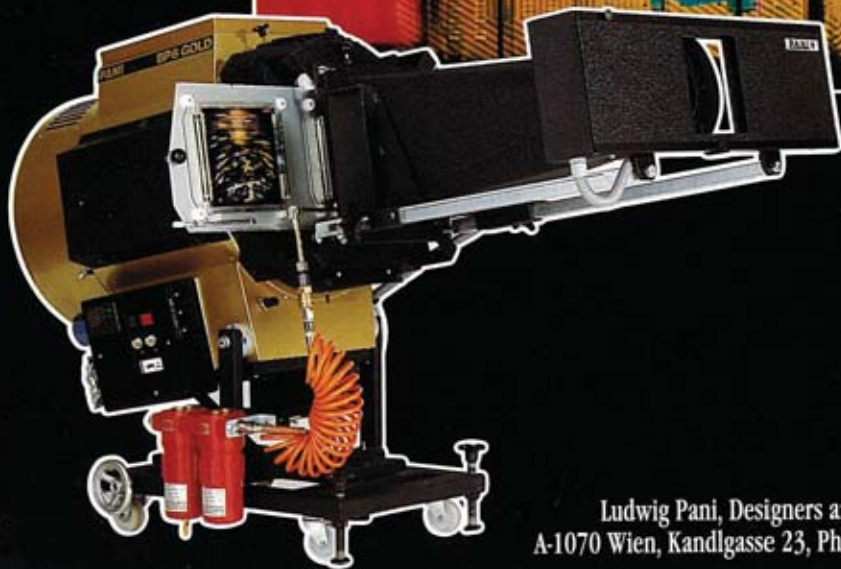
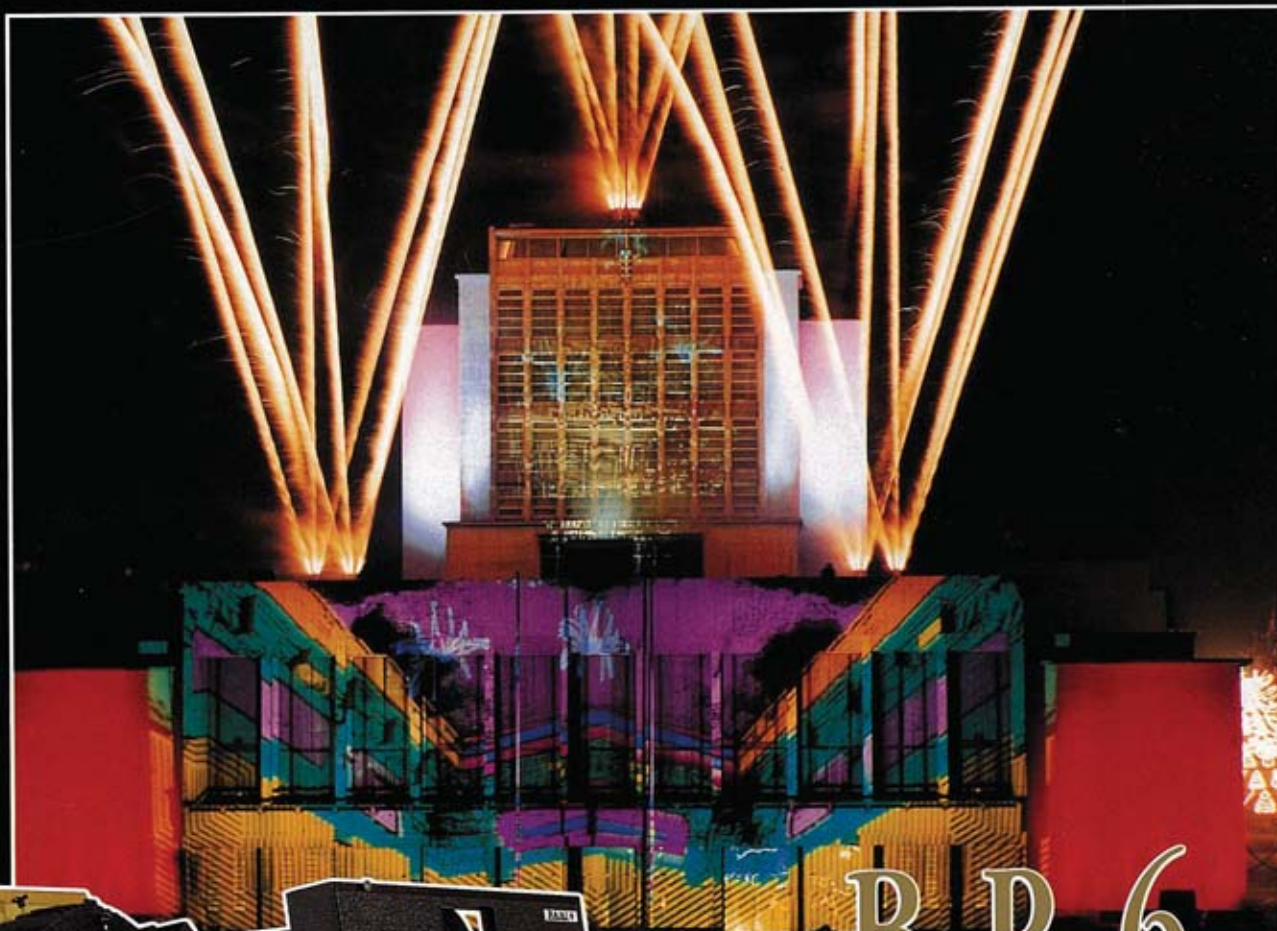
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ON TOUR

Catriona Forcer

It's been a particularly busy period from the beginning of June when I joined 100,000 people for a couple of days at a rather wet and muddy Glastonbury Festival. Tony Andrews of Turbosound related to me the history and thinking behind the Festival, an event he strongly believes in as you will see. Other interviews were squeezed out of lighting designers Shaun Fuller and Derek McVay. All in all, it was 72 hours of good music, veggieburgers, strange and illegal substances, hippies and a good atmosphere.

Bastille Day in Paris was celebrated with a Jean-Michel Jarre extravaganza set to the scale of Paris itself. The audience was well over 2 million and the show cost over 4 million (pounds?!). Jean-Luc Michaud of Alien Products kindly provided me with a synopsis of the show as well as some excellent photography.

Madonna took Wembley by storm, selling out all three dates at the Stadium. She delivered a controversial show full of words and actions I didn't understand, but there was nothing debatable about the lighting. It was a spectacular show of immense scale designed by Peter Morse whom I last spoke to three years ago when he was with Lionel Richie.

Waiting for Cousteau Jean-Michel Jarre

Following his earlier concerts of 'La Concorde' in Paris, China, Houston, Lyon and Docklands, Jean-Michel Jarre has returned to the stage for a mega-show produced to the scale of Paris itself. After Oxygene, Equinoxe and Chants Magnetiques, Jarre comes back into the limelight with a new album 'En attendant Cousteau' (Waiting for Cousteau).

To launch this LP, forecast to sell in excess of 12 million copies, Jarre has taken the step to introduce a new concept of multi-technical concert which the medias will echo worldwide. In Paris an audience of over 2,000,000 were treated to an amazing array of lighting and fireworks stretching more than six kilometres from the Defense to the Arc de Triomphe. The background was the futuristic buildings of the business quarters of the Defense with the avant-garde architecture of the big arch, and Jarre wanted to humanise this area by the music, the fire, the lighting and synthetic pictures.

The stage consisted of a gigantic pyramid custom built and manufactured by Stacco, the french trussing specialist. Each side of the pyramid was covered by a collapsible scrim of gauze used as a screen for the four lasers and the battery of Vari*Lite's rigged in the structure and masterly handled by Thierry Malaterre. The stage set itself was a maze of 'science fiction' control panels with VDU's, machinery, smoke machines and moving risers on several levels for the band of 12 musicians with Jean-Michel Jarre and a choir of 120 singers.

Jarre had called on his previous experi-



Above and below: Jean-Michel Jarre lights up Paris.

Photography: Skylight



Madonna in concert at Wembley Stadium.

ence to gather a unique technical team. The finest in television, lighting, sound, lasers, giant projections, scenography — true creators engineering the 'impossible'. From England video guru Mike Mansfield, who had been previously involved in directing 'Destination Docklands', was in charge of the whole video shoot of the event as well as mixing from 23 cameras. These included five hand-held on stage, several operated from the top of skyscrapers, one louma and even one located four kilometres away on top of the Arc de Triomphe (fitted with 44:1 lenses). The live video images mixed from the 23 cameras scattered among the public, on the stage, on top of the buildings, were projected onto 12 massive screens by Diamond Vision, Star Vision and Talaria. The final audiovisual product was on par with the event itself, for the use of wide angles and essentially daylight sources in the lighting rig displayed all the beauty of the geometry of the searchlight beams in the sky, of the graphisms, the lasers and the images. Mike has already started editing with Jarre for both a feature film of the event for the big screen and a 52mm video provisionally to be broadcast on TV later this year.

Three skyscrapers were totally covered with giant projection screens, specially manufactured from a nylon-based, flame-proofed textile for the support of a multiheaded laser writing projections system of impressive quality. On each of these massive screens, pictures were also projected from 12 Pani Gold projectors, all equipped with 80cm lenses. Cleverly used in rhythm with the music, and making the

most of the slide changers in vertical and horizontal motion, such a new type of support to this enormous stage was giving a perpetual movement not dissimilar to the music of Jean-Michel Jarre in fact.

In the avenues, dozens of 2.5k HMI scene projectors played on the fascia of the buildings with servo-rotation effects (butterflies, spirals, globes, visages, countdowns etc). Four laser tubes of 20 watt with writing facilities were giving graphic animation to the facades over 100 metres across. The pyrotechnics were perfectly synchronised with the music and the whole area was visually dressed up by a multitude of searchlights.

Jacques Rouveyrolis, French LD extraordinaire, had located 10 old carbon searchlights from World War II over an area of 10 square kilometres. On the surrounding buildings there were a dozen 4-head SkyTrackers which had been previously rigged by helicopters despite strong winds and attendant risks.

At the rear of the stage and on three buildings front of house 22 servo-searchlights were installed. STX Sky-Art 4000 watt Xenon were conceived and developed especially with this scale of event in mind by Sky Art of Paris. The STX combines, in fact, a Xenon source 4000W with elliptical nickel rhodium mirror electroformed to a motorised servo controlled yoke, enabling beam control like 'never before'. As well as new software, an ergonomic console permits the accurate positioning of STX with all the functions — tilt, pan, focus, and radial shutter. The whole is memorised and stored either on hard or floppy disk. The two consoles were each in charge of their own

area: one for the 12STX installed on top of the buildings, the other for the rear of the stage where 10 STX achieved three curtains of light, playing between buildings. A 14 strong team was required for four days for the installation of the STX equipment.

The concert, estimated to have cost 45.000.000 FFrs (approximately £4.7 million), was an aural and visual extravaganza never achieved on a stage before, and a free concert offered to all.

Madonna Wembley Stadium LD: Peter Morse

After finishing the 1987 Lionel Richie tour, Peter Morse went on to design the Madonna 'Who's That Girl' tour. He was replacing another lighting designer and he only had five days of rehearsals left to revamp the show. He admitted that it wasn't easy but then he must have done a good job to be asked back to light the current 'Blonde Ambition' tour.

During the past three years Peter has also been busy with what he calls his 'grass roots' acts: The Pointer Sisters, Dolly Parton and Kenny Rogers. He has also been designing a fair amount of industrial shows in addition to architectural lighting. However, he decided that he didn't want to tour again and explained why.

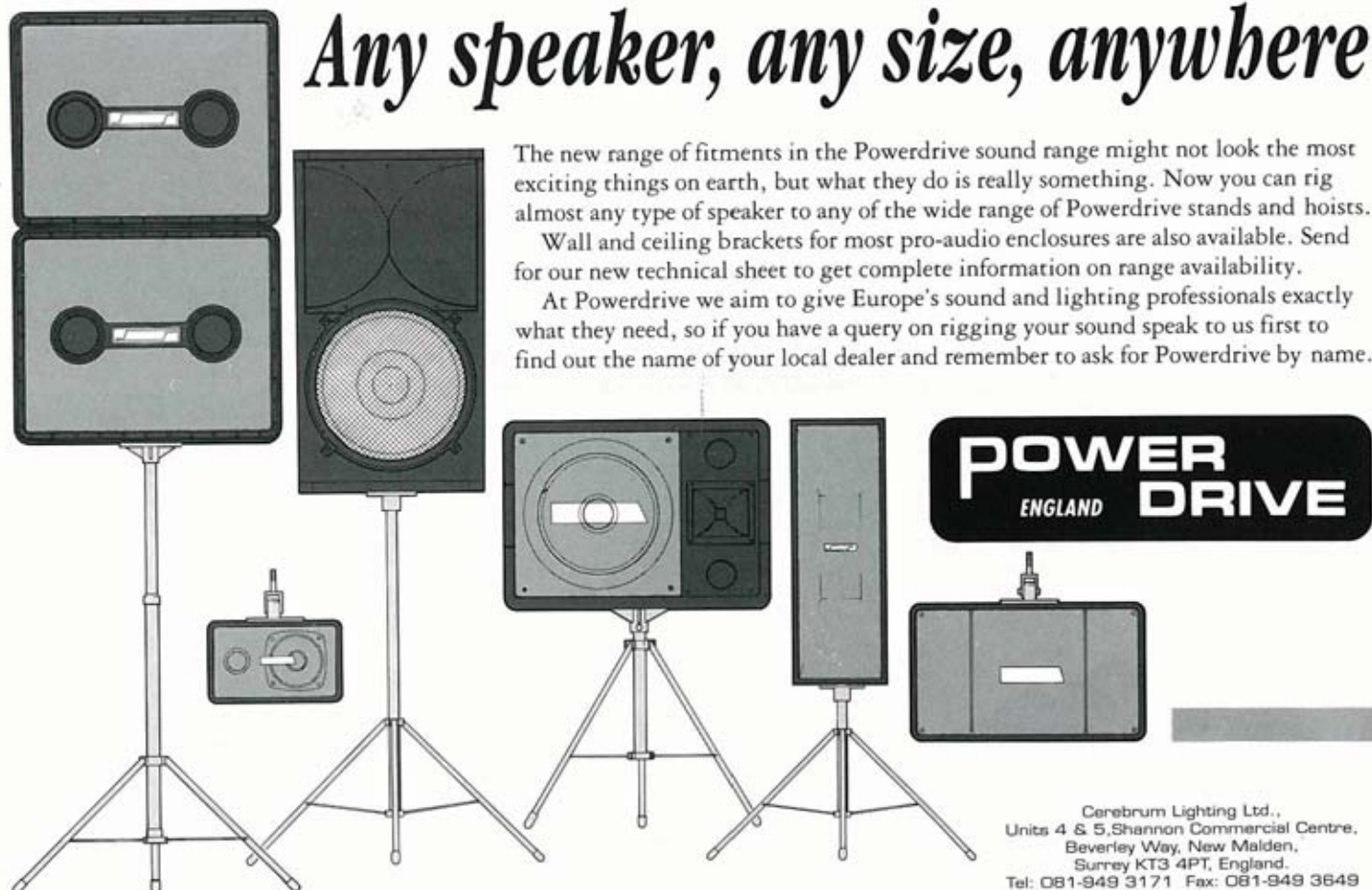
"There was a rumour going around that I had heart problems which cast doubts as to whether or not I was available to go on the road. Before the Lionel Richie tour I had an artificial valve put in and a month later I hit

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the road for 10 months, so obviously I was doing OK. It wasn't as if I wasn't asked to tour; I just decided not to do any on the road for a while. I'm still not that keen on it." Peter was particularly pleased to be asked to design this Madonna show, as this time round he was involved from the beginning, therefore had more control. Discussions on the tour started in November 1989, band and dance rehearsals in February 1990, and the technical rehearsals on March 1st. The first show was on April 5th in Japan followed by a further six weeks there. Then on to the USA for eight weeks and finally to Europe for about eight weeks. Madonna doesn't like to tour so she'll only do three or four months at a time.

"From the very first meeting we had input from Madonna, who described what she wanted, and from set designer John McGraw," continued Peter Morse. "As the models and drawings took shape, I sat in on meetings and a lot of discussion took place. Finally, at about the fourth meeting, Madonna's manager said: 'Well, what do you think the lighting's going to be like?' I replied 'big!' This was because the set is huge and I didn't need as much punch as I needed distribution. I needed to spread out the system to cover everything as the set is all hydraulic and multi-tiered. Because of the different looks some lamps would be blocked half the time whilst others wouldn't."

"I did the initial design; the accountants did the re-design. Coming out on the road at least thirty, if not fifty, per cent of the design is out here programming and running it. That's why part of me likes to be out here running the show. The other part of me just can't stand touring! I think what is happening now is the growth of a speciality — the lighting director."

"The rig is basically what I call two rings. They are actually like closed-in horseshoes with their open end facing upstage with a straight bar across the back. As the design progressed Madonna decided that she wanted Austrian blinds curving in and out of certain lights so we had to break the truss and come up with new designs. However, basically if you looked at the overlay, it would be two horseshoes."

"The floor lights originally numbered about 40 or 50 but they eventually got cut back to about 20 due to the set taking up so much room. They slowly, but very surely got eased out. Ninety per cent of the overhead is all Pan Command, all automated. The followspots and truss are all cue spots which are hand directed but everything is run from the computer: colour, on, off."

"All the colour is automated. Basically I've got 170 PC Beams, 95 PC Spots, 12 truss mounted followspots, 120 Parcans/ACL's — all with colour changers, and 18 Telescans. Involved with all that are moving truss pieces like the centre piece which holds about 50 fixtures and becomes a chandelier. We have four other separate pods with lights on that come down at head level to create different looks. Some lights travel up and down on lifts with her."

"It has all been running very smoothly considering we have four control boards, four board operators plus four operators backstage for things like truss movement and lamp movement. We decided the day we loaded in for rehearsals that we weren't

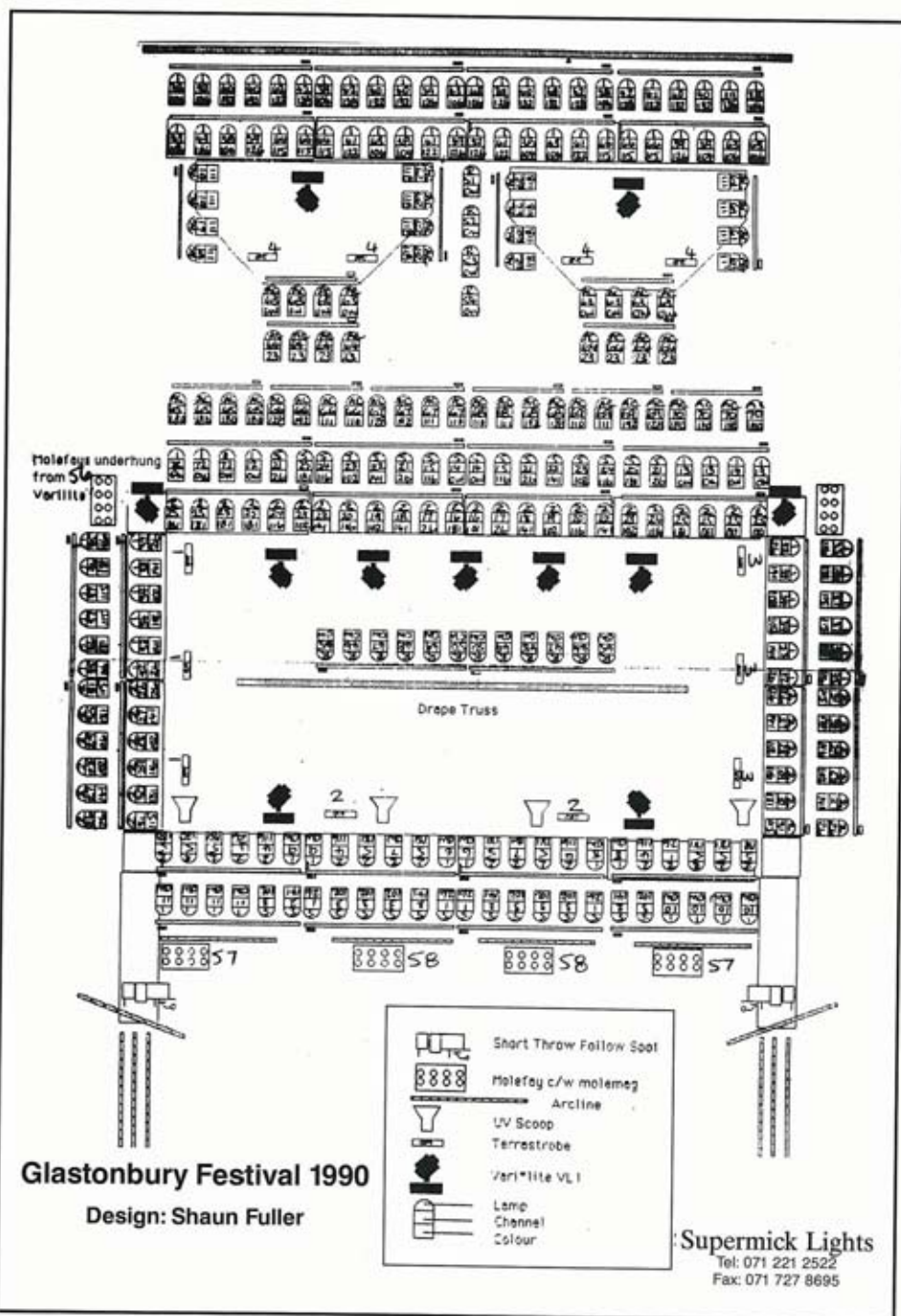
going to dilly dally — we had five weeks to get with it. By the fourth day we had started programming whereas most people are prone to play around for a week or two. It's a good thing that we got down to it when we did or we'd never have been able to get it together. We needed all the five weeks to get the basic programming done and we're still making changes even with so few shows left to go."

"I wish they could marry Celco and Avo because both have their attributes and both have their drawbacks. I'm using a Celco board on this tour as I'm more comfortable with it because I've done more shows on it, but I could just as easily use an Avo. Right now I'm more inclined towards the Celco. The advantage of the Avo is if it locks up it still has a back-up matrix. Celco has continuators (output limits) on each channel so that you can manually override the input level — Avo doesn't. The modifier on the Celco is almost instantaneous — Avo's isn't. Avo has incredible control over the chasers — Celco doesn't. Back and forth!"

"When I first did the design for this show I was told that there would be no video and

only outdoor shows in Japan. It's a very theatrical show with lots of subtlety and detail and we lose a lot outdoors. Since we went on the road they've decided to play more outdoor shows and unless we have a still night with the sun down we don't get the whole show. The spectacle of the show really does not hit here until midway through because the sun doesn't set until then. We've also got live image magnification which is a problem because I've never lit for it before."

"In addition it has been decided to video the show in Nice and they are bringing in my good friend Allen Branton. I was offered the opportunity to do the video but I declined because I have enough to do just supporting the show. I felt that I was not removed enough from it to see the subtleties that the camera might miss. I wanted a fresh eye in here. Out of fairness to the artist I backed down and I don't need all the glory; well I hope it'll be glory! We'll be bringing in quite a bit of extra equipment including 70 Vari*Lites, hundreds of Parcans, countless fixtures for the audience and 30 or 40 2K Xenon search-



light heads. We just have to play with the level on stage and I'll spend a few nights reprogramming a few things just to get them camera-ready.

"For a long time now Allen Branton and I have been talking about affiliating our talents. Reality wise I don't know if it makes sense right now; at one time it did make a lot of sense. We may yet do it. I did try a one-off with Jeff Ravitz — Bruce Springsteen's LD. Recently he and I were both bidding against each other on a huge Nissan project using about 8000 lamps. So one night I called him up to ask him if he really thought that he could do it all himself. He replied that he wasn't sure that he could, so instead of competing we decided to do it together and it was great. The problem was that we got to load-in day and the earthquake hit San Francisco so we never got to working together! We're going to try again this fall.

"I've really got into lighting architecture and I've done a few restaurants and a couple of hotel lobbies. I want to do more of this and more video and this is where the idea of several of us linking up is good. But we never seem to have time even to have a meeting! Even here, where Allen and I are together, we are too busy. After this tour I fly home and two days later I load Dolly



More Madonna: lighting design by Peter Morse.

Parton (not literally) into Caesars Palace in Lake Tahoe for a weekend show. Then I have some convention shows, the Pointer

Sisters on tour a few weeks, and a couple of big tours which I'm negotiating right now."

Glastonbury Festival 1990

June 1990 saw the 20th anniversary of the Glastonbury Festival, now the biggest 'green field' showcase for the performing arts in Europe. The site is set in a valley 5 miles from Glastonbury Tor, an area steeped in mysticism and riddled with ancient lay lines. The NME/CND/Greenpeace-sponsored festival went off with no more than the usual hitches associated with such mega events: drug related arrests, crush-related injuries, and lots of mud. The number attending was officially put at 75,000 but seasoned observers claimed that was an extremely conservative estimate.

It was after the 1980 festival that a decision was made to construct a permanent stage. The architects were a team of practical-minded people involved in rock and roll sound and staging and they had a grand vision. Being versed in esoteric physics they resolved to construct a correctly aligned model of the pyramid at Cheops, but with a canopy sheltering 60ft of open stage at the front and ramps to a loading bay at the rear.

The height was just over 30ft, which they reckoned was the minimum needed for a full rig of lights. As ever, funds were tight, and to avoid infringing planning laws, the pyramid had to double as a practical agricultural building. By the following summer, the team managed to source several lorry loads of surplus GOP telephone poles and ex-NATO galvanised cladding at bargain prices. With less than six weeks to go, the pyramid was bolted together by a team of 30 or so volunteers, lead by Tony Andrews, Roger (chainsaw) Heighton and Phil Randell. Construction finished on the night before the commencement of the 1981 festival!

Armed with this information and a lighting plot supplied by the festival's LD Shaun Fuller of Supermick, I set off from the

metropolis to my first ever outdoor festival, having decided to leave behind my loons, joss-sticks and love beads in order to keep preconceived ideas at a minimum. I soon discovered that it was not a good idea to arrive at a campsite at 11.30pm with only one small torch and a tent with a mind of its own. Imagine my surprise in the morning to find myself camped in the midst of a thistle patch between an overcrowded cow pen and the open cess pit serving the whole of the festival site. And I had probably not even pitched on the correct lay line!

Obtaining a backstage pass (courtesy of John McCue of UpFront) was my first concern, due mainly to the appalling toilet facilities available to the ordinary punters. Work came second!

Saturday's line-up consisted of James, De La Soul, Del Amitri, Sinead O'Conner and

The Cure. Sinead did an excellent set with amazing clarity and purity to her voice, and congratulations were in order to Turbo-sound. The audience consisted of many different youth tribes: punks, bikers, gothics and lots of hippies. And this year the presence of a large number of ravers added a new dimension to the event, having been attracted by the appearance of bands like Adamski, Jesus Jones and the Happy Mondays on Friday night.

Rave parties, still going strong at 6am and usually very near my tent, were a result of this. Flickering strobes and continuous dance music had to be endured. If the excessive sex, drugs and rock and roll didn't wreck havoc with the punters then the weather certainly did! Fortunately I had invested in a pair of wellies before the festival, and I could stomp smugly through the sea of mud. And yes, I was seen wearing a very unhip kagoul.



Lighting action at Glastonbury.

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Sunday's line-up included World Party, Hothouse Flowers, Deacon Blue, Aswad and Ry Cooder, and — guess what — it was still raining. I managed to trap Tony Andrews of Turbosound into an interview about Glastonbury.

"The first festival goes back to 1970 and the stage then was also a pyramid but it was a scaffolding thing covered in wire mesh with no weather proofing. It was a joke, but still a powerful symbol. I took seven weeks out of Turbosound to be involved in the actual construction of today's pyramid and to mastermind the way it went together. I've never known a team of people who have worked so effectively together.

"Just above the lighting rig level there's a platform which wasn't originally done that well as it was a bit like a saucer. After we had fixed the main diagonals in, the actual outline of the pyramid, there was about an inch of water trapped on this platform. It stayed because the sheeting panels had been put on so tight. The obvious thing to do was to drill holes in the floor to let it out, so we drilled three one-inch holes. The strange thing was that the water in two of the holes drained out anti-clockwise like it should in the northern hemisphere, but the third drained clockwise. We tried to force it to go the 'right' way, but we couldn't! Later on we discovered that we had drilled that hole almost directly on the central axis of the pyramid. I think that it was the clearest manifestation that I've ever witnessed of the metaphysical affecting the physical.

"It's all built of telegraph poles and fir trees whilst the roofing is ex-Ministry of Defence cladding which is heavy corrugated iron. When it was first put on it was brilliant, zinc silver — like a jewel in the valley. Now it has obviously weathered down.

"The pyramid is a very powerful thing to me and the aforementioned event says so. It's those areas, in fact, that we've got to get into as hard and as fast as we can to get the other 95 per cent of our brains working. People come on stage and say 'don't pay the poll tax', which is fine. But the real answer to the problem actually exists within all of us: there's a power we have. It's why people go to concerts; they think that they are going to see a band but it's actually the feeling that the focus of the band generates amongst the people and each other.

"Often they don't even realise that the reason they're feeling good is because they're with 100,000 other people feeling good and it self-generates. If we can carry along that track we might find a few more answers to what we are all about because we don't know really. Does anybody care? Well, I think we ought to. The planet is practically out of the window, and we had better get something together.

"I think that the festival will continue for a long time because it has moved from being a free concert to quite a commercialised event. Ticket prices are now high, but there are now so many people to pay off. The Police bill alone is probably around £150,000 to £200,000.

"This year nearly(!) became a very bad wet one like in 1986 when it was a mud bath. Although the people here have tremendous spirit, three days of getting pissed on can really grind you down.

"Another place that I'm coming from is that the music which appears on stage is



Tony Andrews: "There have been wonderful moments, but the moment we want has not occurred yet. We're building up to it."

not about the commercial bands. I don't like the big name draws, as they turn the vibes into something else. It's about people and that's why I'm into house music as that's about people celebrating their own energy. It wants rhythmic music here; it's not a hill-billy situation and the ideas that people have about the people here are just completely off the wall. It's not the woolly hat brigade: it's very intense people who have got certain things together and put them in here and hoped that we get a nice cake one day. There have been wonderful moments, but the moment we want has not occurred yet. We're building up to it.

"I'm not getting paid for this; it's irrelevant to me. I believe in it and I love the people. It's got nothing to do with anybody except me and the universe. I'm here to make sure the sound is as good as it can be. The sound engineer for The Cure was over the moon with it — he couldn't believe it and he said it was like being in a studio. If you're really into sound it's staggering. Light is all very well, but it's only one octave whereas sound is about eight. Going across eight octaves is a great deal different from (say) red to violet. Although if you think about it violet starts to get back to red, doesn't it. There's obviously a spiral going on there. I know there's nothing on this planet to touch the system out there!

"I'm hoping that the spiritual aspects are going to become more and more forward again. For me, CND was a massive bring-down, quite honestly, because until then there was no label to the festival. It was just



Catriona Forcer: stomping smugly through a sea of mud.

a pyramid which is a recognised symbol of perhaps something we've forgotten about. There should be no labels and no politics: all politics are bollocks.

"The feeling amongst the people on the site is really excellent. You never feel threatened by their sheer amount. Everyone is sensing something which isn't defined, similar to acid house. There's no direct focalisation of what the feeling is heading towards. All the aggression and ego manic power trip is pathetic to what the real juices are. This is love, and it's nothing to do with the world view of love as in advertising. It's something that's pure and goes out from everybody to everybody. It's our saving if only we can accept and develop that. Within it we'll find all the answers and we won't have any problems about politics because we'll all know.

"Because of house music kids are now into communal alpha rhythms. When you dance for that length of time, that seriously, all your thought evaporates. Loads of our gear goes to those do's as I love them. The authorities try to put them down because they are scared about the uprising of consciousness. They're all controlled from somewhere else; some of them may know that and some may not but as Bob Dylan said: 'You're gonna have to serve someone'. This ain't no joke; we've got ten years left and it's going to get sorted. What is getting paid for being here when the future of your species is at stake. That's how strong it feels. It's a bit of a burden sometimes. The more people start thinking positively, the easier it will happen."

Well, that was Tony Andrews in full Glastonbury flow. The man given the job of lighting design for the festival and the daunting task of having to please the numerous visiting designers. The rig consisted of 86 Par 64/1s, 14 Par 64/2s, 36 Par 64/5s, 56 ACLs, 16 Raylights, 12 Vari*Lite 1s, 6 Molefays, 12 Terrastroses, 4 UV scoops and 2 short throw follow spots.

Shaun kept the colour quite basic as to use strange colours would be unfair to the visiting LDs. Control was an Avolites QM90 which, due to a leaky roof, was drowned by a heavy downpour on the first night. This happened two minutes before the Happy Mondays were due on stage and their LD had to use the back-up desk on stage. Shaun has worked for Supermick for several years doing everything from dimmers to rigging. He admits that he does not particularly like being a designer, preferring to be in the background. Also, Shaun doesn't like loud music which is strange considering the business he is in!

I asked Derek McVay, Deacon Blue's lighting designer to comment on the lighting.

"It's a festival rig and you've got to use what's there. There's no point in giving Supermick a hard time. There's no time to re-design or re-focus. The Cure, being the headline act, added some lights of their own. It's certainly not the best organised of festivals, and personally I don't agree with the hippy attitudes."

But had Derek experienced any of the mysticism or pyramidal forces attributed to Glastonbury?

"Well I did stand under the middle of the pyramid and say: 'Make me a better designer'. But I don't know if it's worked!"

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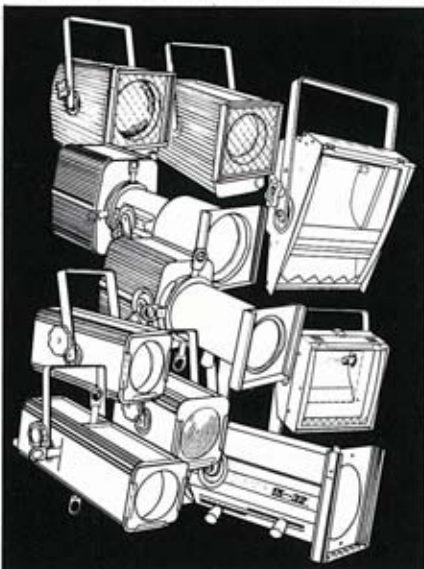
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VIEWPOINT

David Bearman says

* * * * the Light Show, Let's Dance



David Bearman was attracted to the performing arts at an early age. He has been unsuccessful so far at finding a 'proper' job in insurance, and this has resulted in him working for Beam Electronics and Turbosound! Latterly, he formed Quartz Systems Ltd with James Foster. The company specialises in the design, supply and installation of sound, lighting and video systems to the leisure industry.

As I criss-cross the nation looking at discotheques both new and existing, two thoughts have recently crossed my mind. Well, perhaps more than two actually, but only two need to be referred to in this article.

Firstly, why is the average discotheque sound system still not endowed with the quality that is now available from our audio manufacturers? Secondly, what happens when, or if, the sound system in a venue should have a terminal attack of 'not working'?

Many people amongst the pro audio community have long bemoaned the fact that 'the lighting system gets all the budget'. While that statement is not completely true, it must be said that lighting systems do tend to account for a disproportionately large amount of club construction costs.

It does seem rather illogical that our customer's customer, the vastly underrated British punter, can often achieve a better sound quality from a Hi-Fi costing a few hundred pounds than he or she can be subjected to on the dance-floors around the country. Even in your car, the quality available from some of the systems on the market these days is pretty good.

With the advent of digital sound equipment becoming freely available in the domestic market, the expectations of the ordinary man in the street are rising rapidly — especially in the younger age group who make up the

bulk of the discotheque industry's customers.

Imagine the scene: a packed nightclub, the manager rubbing his hands watching folded coin crossing the bar counters. Then, horror of horrors, the lighting controller finally succumbs to the amount of beer it has been forced to consume. Result: pitch black. Then the house lights come on, and after a few moments of confusion the Great British punter continues to enjoy himself. More importantly to the management however, money continues to cross the bar.

What happens if we reverse the scenario and the sound system dies a hot and ugly death at the hands of the DJ. In the silence that follows, can our hero the punter continue to groove, pouring a high gross margin beverage down a throat that hopefully bears a resemblance to the Sahara? The answer has got to be no. And that is the crux of the problem. The discotheque cannot operate without music, and to achieve that we need a sound system.

This episode should give all of us some indication of the importance of allocating the

correct amount of resources when we split budgets between the technical spend on nightclub projects. I'm not for a moment suggesting that lighting, video, or laser installations are unimportant, because the audio and visual elements of our complete nightclub should work together as a whole, hopefully, creating the atmosphere with the staff that pulls in the customer again and again.

Luckily, some of our more enlightened operators seem to understand the fact that their customers come to dance to music, not to the lightshow. These companies will, I believe, reap the benefits in a diversifying leisure market.

It is up to all involved in the installation of sound systems in nightclubs to inform our customers of the importance of doing the job right. After all, if you help them to bring in the customers there can be no complaints.

The importance of quality sound needs to be much more widely understood amongst the operators of discotheques. If that can be achieved then the industry as a whole stands to benefit.

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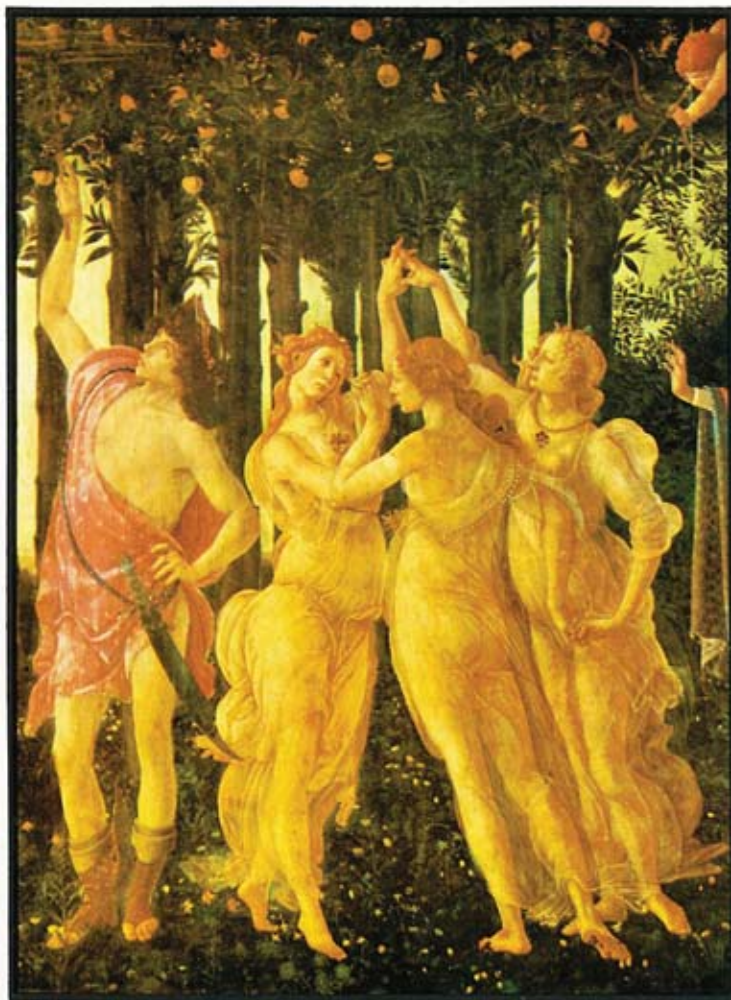
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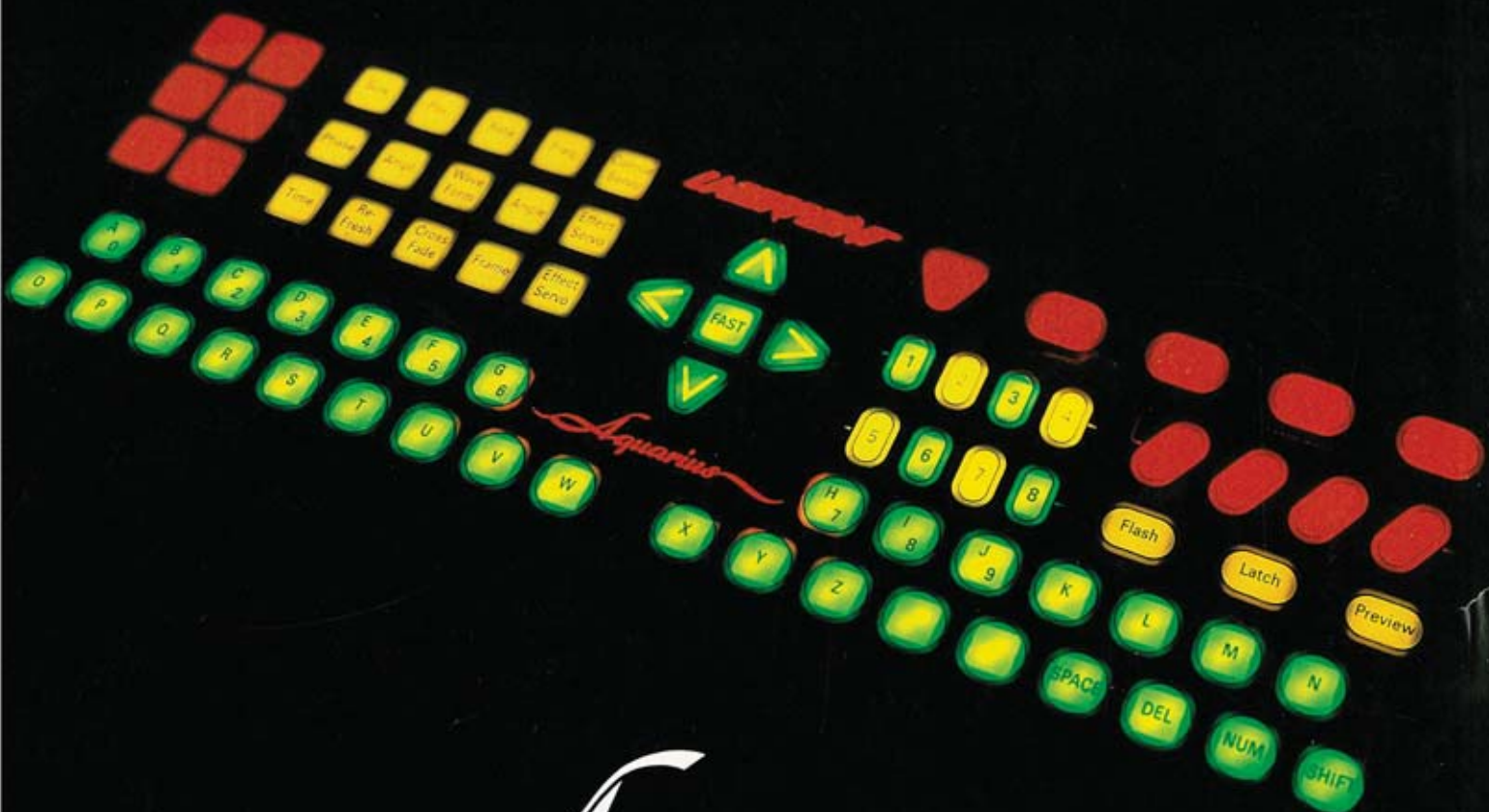
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