

# LIGHTING+SOUND

*International*



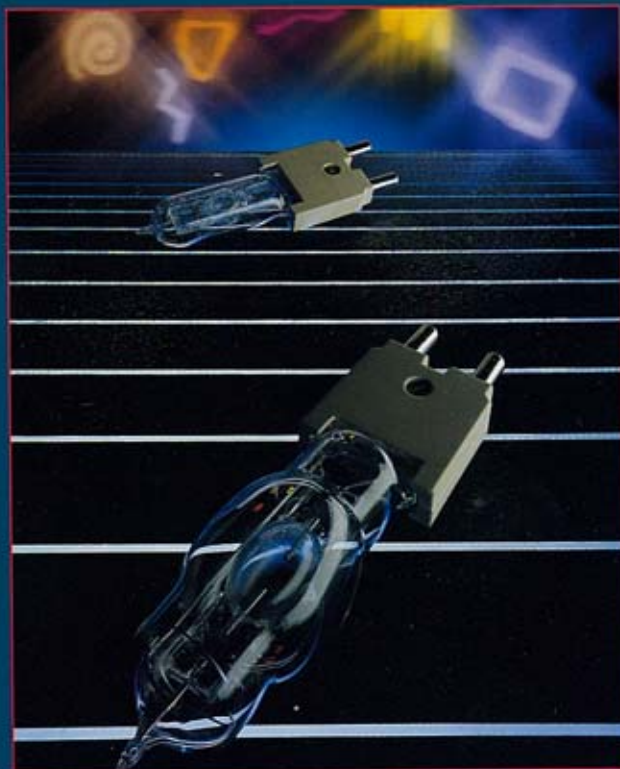
MAGIC BALLOON: BILLED AS BERLIN'S MOST INNOVATIVE NIGHTCLUB

- Sea Legs: Tony Gottelier and On-Board Entertainment
- Wybron: Scrollers from the Rockies
- Berlin's Magic Balloon: leading in multi-media
- New York: the Altman Heritage
- Julian Beech: Dressed for the Part
- Light Curtains: Technology under Control
- London: Clapham's Grand re-opens

**JANUARY 1992**



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# LIGHTING+ SOUND *International*

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The views expressed in Lighting and Sound International are not necessarily those of the editor or the Professional Lighting and Sound Association

# LIGHTING+ SOUND *International*

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Advertisement Manager: Alison Hunt

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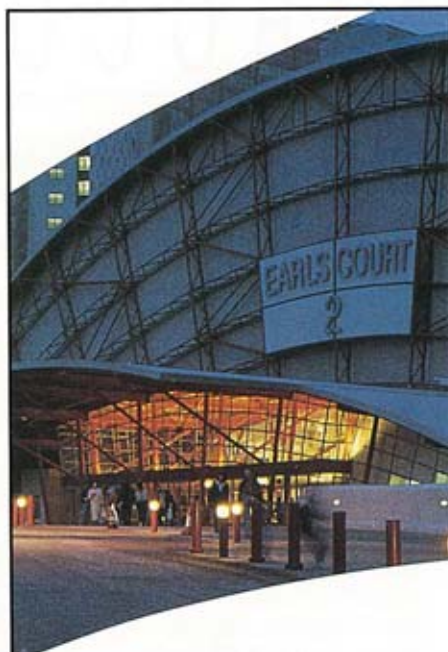
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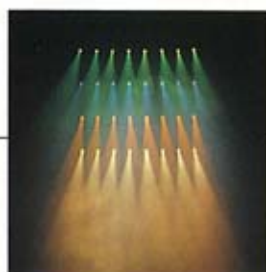
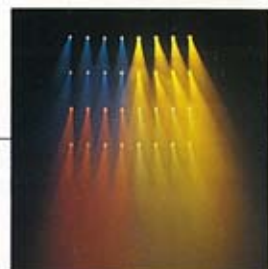
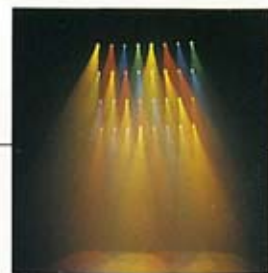
8 different built-in gobos can be selected and the super-fast color changer can instantly change between the 4 dichroic colors, plus white and black-out. You can mix two adjacent colors and there is also a strobe effect and adjustable focus.

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THE INTELLIGENT LIGHT OF THE 90'S



## Rapid Take-Up of Space at Earls Court 2 for PLASA's 1992 Light & Sound Show

Latest information from PLASA Light & Sound Show organisers Philbeach Events Ltd reveals that over 3,500 square metres of stand space has already been booked in the first round of applications. Overall bookings show an increase in the amount of space taken by exhibitors over their 1991 stand size and also indicates that the show will increase in size considerably compared with the 1991 event.

First allocations will be discussed with exhibitors in the near future and this will be done on a one-to-one basis and to a formula agreed by the Executive Committee of the Association.

Companies still considering whether to exhibit have been advised by the organisers to register their interest at an early date so that maximum consideration can be given to their specific requirements. Call James Brooks-Ward on 071-370 8215.

## Standards Officer Issues Warning

In the January issue of PLASA's Membership News standards officer George Thompson has issued a stern warning to member companies to take note of the requirements of BS 5750 (ISO 9000 internationally) - the Quality Systems Standard.

"Did you know that ISO 9000 was the best selling international standard last year," he asks members. "What do you think all those other countries outside the UK had in mind when they bought it? Could they possibly be thinking of selling their products and services against yours in Britain and Europe by claiming a higher standard of quality?" he asks. He urges members to read the issues of Standards News and make sure they take the detail on board.

## Who He?



Daryl Vaughan of Theatre Projects checks out the credentials of a stray Father Christmas. Any ideas? All the best (and nearest) suggestions will be printed in our February issue.

## First International Members



PLASA's treasurer Matthew Griffiths of TSL (centre) pictured with Nicolas de Courten (left) of Power Light Switzerland and Keny Whitright of Wybron Inc of Colorado. The two companies were the first to hand-in their completed application forms for international membership of PLASA

## Merde Alors

Among the many PLASA members who will be hoping to forget the existence of last year, as one of the worst years for business in living memory, Zero 88's chief executive, and former PLASA chairman, Peter Brooks has more reason than most to forget the end of 1991.

Arriving at his office shortly before Christmas in smart bespoke pinstripe, the dapper ex-chairman of the Association was unaware that Santa had arrived on the office roof in the shape of Zero's stalwart storeman.

Despatched on high by Freddy Lloyd to track down a mysterious leak, the enterprising lad took it on himself to clear an accumulation of rotting leaves which were blocking the gutters. Picking his moment, with the timing of a true music hall talent, he shovelled the lot on top of the poor unsuspecting arrival, who was left coughing and spluttering on the doorstep, up to his ears in the immerdement. Forced to retreat homewards for warm shower and change of clothes, my source tells me that it was several hours before the, normally, light-hearted victim could see the funny side.



## New Face at PLASA

Anna Pillow (26) joined the PLASA team in Eastbourne on January 6th and the main area of her duties will see her handling special project work for the Association, with Sheila Bartholomew taking over the routine membership work. Anna will attend the first executive committee of the Association on January 20th and assist on the PLASA stand at SIB in Rimini in March. She is a graduate of the Brighton Business School and in her spare time a keen rock climber and clay shooter.



## Christmas Award

L+SI's special award for seasonal lighting goes to Imagination who decorated their Store Street London HQ in fantastic fashion as shown on the front of their greetings card. The scheme was designed by Imagination boss Gary Withers.

## Action News



...and the Racks, control desk, dmx, all the cabling and communication systems!

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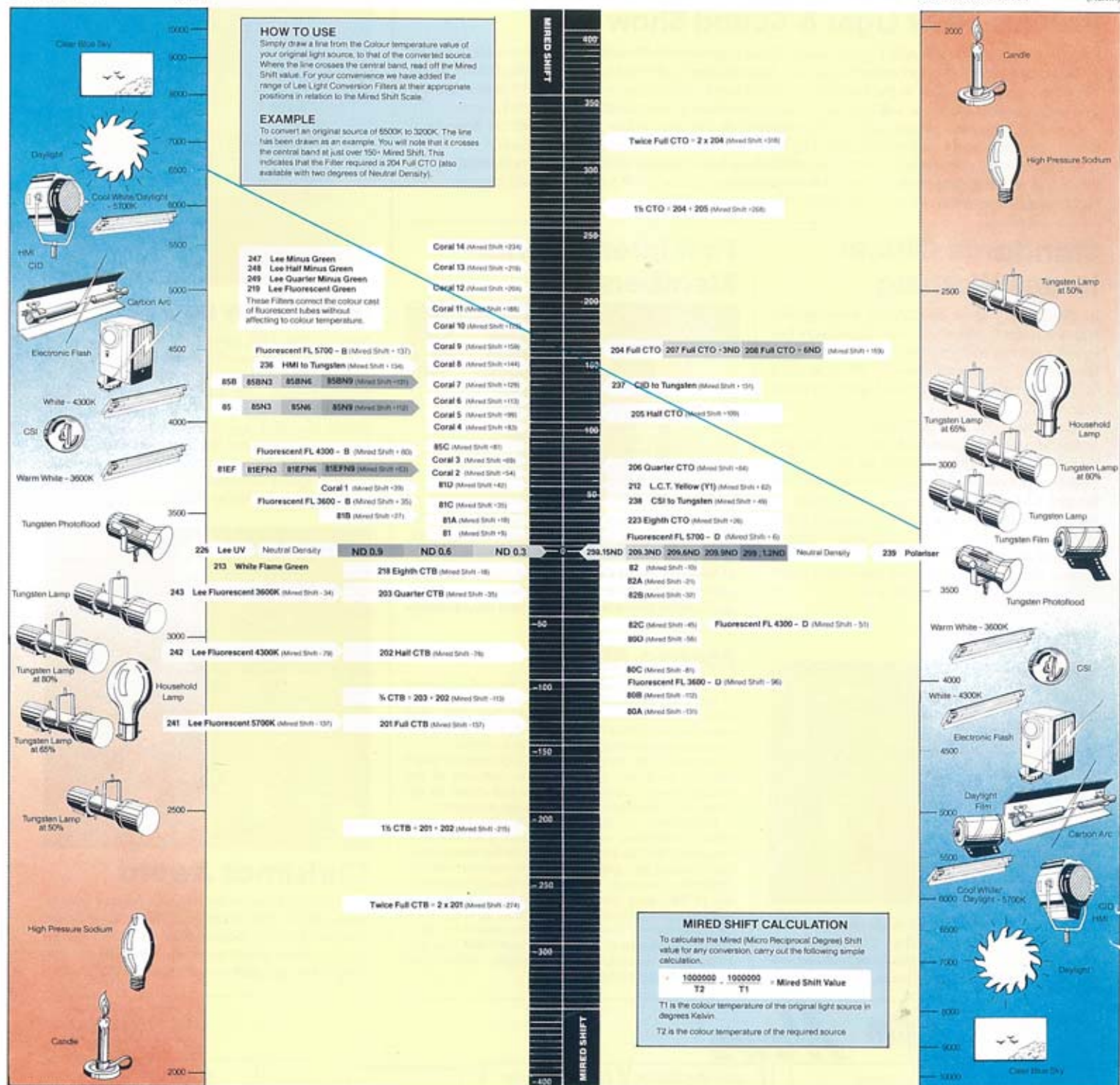
# Light Source Conversion Calculator

Original Source (Kelvin)

(Kelvin)

Converted Source (Kelvin)

(Kelvin)



**The Art of Light**



# The Art of Light

## revealed

Lee Filters Limited does much more than manufacture high quality light control media for the film, television, theatre and stills photographic markets. The company offers - whenever it can - to make an additional input to benefit the industries it serves.

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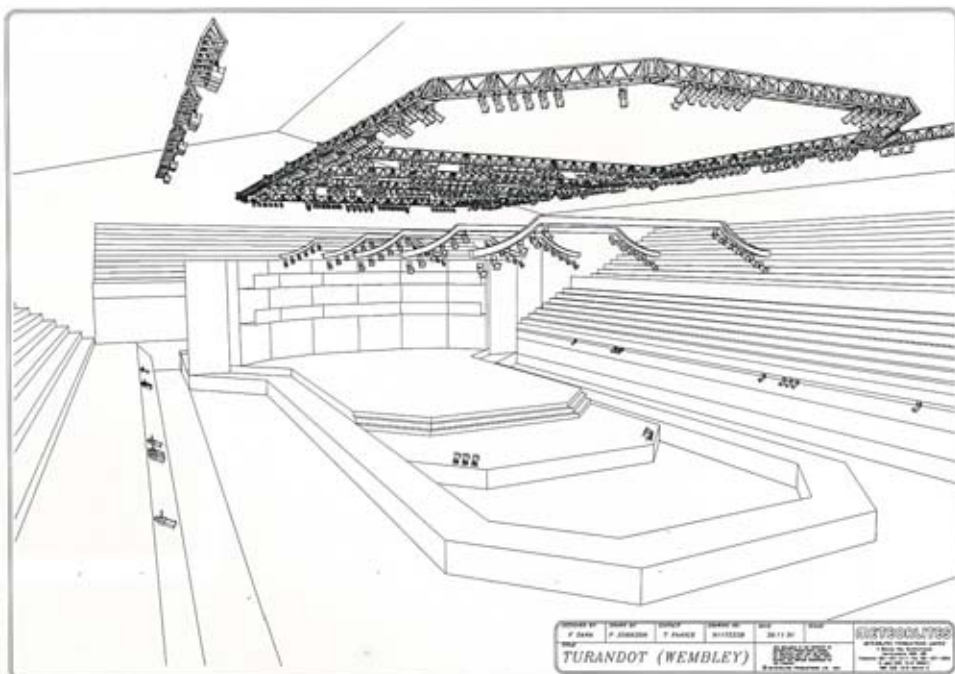
The first poster in the series - shown on the opposite page - has been designed to provide a simple and instantaneous reference for the calculation of filter requirements when converting from one light source to another.

Each type of conversion filter is listed in its appropriate place on the scale together with neutral density, UV and polarising filters.

To get your free poster (size 33" x 23½") simply clip the coupon, and send it to:

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## The Royal Opera at Wembley Arena

Following in the footsteps of Carmen, Tosca and Aida, Puccini's Turandot has reached the stage of Wembley Arena. Designed by Sally Jacobs and directed by Andrei Serban, the £2.5 million special staging runs for only 10 performances from late December to early January. As well as lush arias, such as the recent hit 'Nessun Dorma' the score contains exotic oriental themes and a colourful array of percussion to evoke the savage and erotic world of Imperial China. This is the first time that the Royal Opera House has ventured into arena opera in this country, and as a result, the production, already seen at the Royal Opera House, has had to be enlarged and additions made to accommodate the sheer scale of Wembley Arena.

Meteorlites provided one of the largest lighting rigs ever installed in Wembley Arena for the production. Using a state of the art CAD system, David Godin of the Royal Opera House was provided with scale drawings, 3D drawings, cabling lists and gel lists. A production office was set up at Meteorlites premises to enable the client to oversee the preparation of the equipment, patch the dimmers, and programme the desk. The Royal Opera House used their own Gemini desk to control both the Avo dimmers and the Arena's Strand dimmers. Special frames were fabricated to hang Lekos in the auditorium, and cracked oil and Rosco 1500 smoke machines provided the special effects.

Richard Lienard and Sutton-based Sound Hire supplied, designed and engineered the sound system for the production. Micron radio mics, Meyer speakers, Ramsa mixing desks, and a mix of Crest and Meyer amps comprised the bulk of the inventory.

## Mea Culpa - Artick

LDI '91 in Reno was such a press that your intrepid reporters managed to miss a new range of 'intelligent' dimmers from Italian electronics company Artick known as 'Digilight', for which we apologize.

The Digilight is a portable, 2u high, 12 x 10A channel dimmer pack, which will accept DMX512 or analog (0-10v+), and can be connected to any power source from 70 to 250v single phase, 50 or 60Hz AC, or three phase Y and Delta. Intelligence is provided by a high res. 24MHz, 10 bit 'single chip' processor while the on-board memory stores the latest programmed functions. 'Dimmer' and 'Switching' functions are programmable to each channel, with four selectable curves for dimming, plus variable pre-heat. In addition, very clear read-outs of the conditions on each channel are provided.

Artick are already the manufacturers of the AD



series of professional plug-in dimmers which allow user configuration for 1 x 10kW channel, or 2 x 5kW, or 4 x 2.5kW and have bi-polar protection. Tony Cottelier comments: "These new dimmers have many of the features UK designers will be looking for in a portable package. Isn't it time that more British manufacturers were looking at their dimmers, many of which were designed during the 70s and early 80s, before we once again get left behind our Italian cousins."

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## Den Hartog's Eye View in Oman

Laserpoint's Jean-Michel den Hartog took the photograph above when standing on the top edge of the 160-foot high floodlight tower (pictured right) in Oman. He'd climbed up to fix a laser-reflecting mirror and decided to record the moment for posterity (see feature 'Our Men in Oman', L+SI December)



## TGI Back on Track

Audio equipment manufacturers TGI, makers of Tannoy loudspeakers and owners of the Goodmans and Audix brands, returned to trading in the black in the first half of their current financial year - making a pre-tax profit of £671,000 as against a loss of £50,000 last time. Turnover was down by £9.5m.

The return to profitability was considerably assisted by the sale and leaseback of their Havant premises which netted £451,000 and the disposal of the loss making factoring business. The Audix business, which was the source of considerable problems last time, is reportedly coming back into profitability according to chairman Norman Crocker, who also said that the specialist audio side had satisfactory forward orders.

## Showlight 93

Showlight 93 is the latest in the series of four-yearly international conferences on lighting in the performing arts covering Television, Film, Theatre and Concert lighting. It is scheduled to take place in Bradford, West Yorkshire based around the twin venues of the National Museum of Photography, Film and Television and the adjacent Alhambra Studio Theatre.

The exhibition will include an area at the Alhambra where lighting equipment and services will be demonstrated and companies and delegates can meet. The conference is aimed at lighting designers and associated professionals working or supplying the performing arts and provides a forum for discussing both new and established techniques. For more information contact Barbara Leach, Yorkshire Television Ltd, telephone (0532) 438283.

## Safety within Entertainment

The Health and Safety Executive's (HSE) Entertainment Services National Interest Group (NIG) has established a Joint Advisory Committee with representatives from Broadcasting, Film, Television and Theatre, to discuss standards of health and safety within the industry. Members of the new committee, which aims to combine the industry's professional expertise and knowledge with HSE's experience, will be drawn from employers and unions in related disciplines.

The new committee, which met for the first time last month, will discuss among other things the drawing up of new guidance to cover existing situations and future developments in the industry. This will include new guidelines relating to substances and their use; electricity, scenery and pyrotechnics.

## Brill A' Base

With the client demanding something different from his new nightclub, Maurice Brill Lighting Design set about giving The Base in East Grinstead a 'theatrical' lighting feel. The Base forms part of the Atrium leisure complex, whose facilities will also include two floors of bowling, two cinemas, restaurants, bars and an exhibition area.

Brill's appointment covered the lighting design for all the public spaces, including the external lighting. "In particular, the nightclub presented special challenges in lighting," Maurice Brill told L+SI. The Base will be covered more extensively, with pictures, in the next issue of L+SI.

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# Lies, Damned Lies and Statistics

- 11 -

## READERSHIP OF TRADE MAGAZINES

Around half read 'Lighting and Sound International', although the proportion doing so varies substantially according to the type of company background the respondent is from. This is illustrated in the table below - for example, the publication is read far more widely among those with a theatre background (85%) than those working in the club and disco sector (38%). The obverse is true, not surprisingly, for 'Disco Club and Leisure International' which is read by 35% overall, but is not widely read among those who work on stage and film productions. One in four, overall reads 'Disco Mirror and Licensed design' while the remaining three publications specified are read by around one in ten respondents. A glance through the 'others' list suggests that many are aimed at the DJ and mobile sound system market.

	Base	Lighting and Sound International %	Disco Club and Leisure International %	Disco Mirror and Licensed Design %
All	(573)	51	35	25
Mobile/live/touring	(182)	34	40	23
Wholesale/retail	(105)	60	51	35
Installer	(27)	61	52	47
Club/disco	(101)	38	50	40
Theatre	(73)	85	15	7
TV/Film	(19)	79	16	16
Rental	(61)	67	38	23
Manufacture	(55)	53	29	20
Leisure	(65)	46	48	31
Local Authority	(11)	55	27	18

Source: MORI

When L+SI editors read the results of the MORI poll conducted among visitors during the Light and Sound Show '91, they thought that they had come out top as the favourite professional read of most of the people polled. Not so it seems - at least, that is, according to Disc-O International.

Imagine our amazement on reading their December issue to find that they had, in fact, won the contest hands down. (Though they were gracious enough to acknowledge L+SI's existence, they managed to get the title wrong, hence our little play on their title.) In our own report on the results, published in the November issue, we felt that we had taken a fair and balanced view. Having

said that L+SI was read regularly by 51% of those polled, as against 35% for the next closest, and topping the readership in almost every sector, what we said was:

"Disco Club and Leisure International beat us by just 2% in the leisure area and in the club and disco section we got near to Disco Mirror (38% to their 40%) with DI winning that section with 50%. We'd like to have given some more accurate detail on some other sectors, but the poll people lumped mobile disco's, live and touring into one section and there was no way we could split up the results from the computerized returns.

DI won the group with 40%, with L+SI on 34%

and Disco Mirror on 25%. But we don't think DI would argue with us if we suggested that they would have easily won the 'mobile' group, while we would have taken the honours in 'live' and 'touring'.

So why the need for this shabby and misleading reporting? While we would be the first to acknowledge, and we would expect, that DI would come top in their specialist sector, could it be that they are embarrassed at our success in the other professional markets? We would prefer to let our audience judge for themselves, rather than loading the dice, by reprinting the whole survey without further comment (see above).

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## Readership of Trade Magazines

Q Which of these trade magazines do you read regularly, by regularly I mean 3 out of every 4 issues?

	%
Lighting and Sound International	51
Disco Club and Leisure International	35
Disco Mirror and Licensed Design	25
Sound Communications Systems	11
Prosound News Europe	10
Leisure Week	9
None	18
Other	11

(Other trade publications mentioned include: DJ Magazine, Lighting Dimensions, TV Week, Mix Mag, DJ World, EDR Magazine, Stage, Sightline, Design Engineering Magazine, Optics Design, Sound on Sound, Studio 10 Sound, Home Studio Recording, Jocks, Music Week, Theatre Craft, DJ International, Blues & Soul, Night Club News, The Keyboard, Music Business).

Base: All (573)

Source: MORI

## Quadri for President

On the 1st January 1992, Pasquale Quadri, founder of Clay Paky (pictured below), became President and general director of Clay Paky srl, while Giulio Savoldi, formerly co-owner, left the company to pursue different interests. "All other directors, officials and employees continue in their present positions, leaving unchanged the creative, technical and operational know-how of the company, and allowing Clay Paky to benefit fully from the re-organisation," said a company statement.



"A new strategic and operational plan for 1992 has been drawn up. Resources and a new dynamism will be invested to allow Clay Paky to meet market requirements with new products and an aggressive marketing approach. These steps have been necessary to give Clay Paky the right organisation and strength to keep its technological and commercial leadership in the industry."

## Midi Music Show

The third MIDI Music Show, organised by Westminster Exhibitions, will take place at the Novotel, Hammersmith, London on 24-26 April this year. The show will focus on the use of MIDI in all aspects of music and sound, and products on display will include the very latest in MIDI technology fresh from NAMM and Frankfurt.

A major feature will be the seminar programme, which is free of charge to all visitors and will cover all aspects of MIDI usage. Friday will be High End Digital Day, aimed primarily at the professional user. Saturday and Sunday will include a broad spectrum of subjects such as sequencing on Atari and Apple Mac and MIDI in multi-media. There will also be a strong focus on education including a 'MIDI in Education' forum organised in close cooperation with Dave Ward of the Gateway School of Recording. For further information, contact Westminster Exhibitions in Kingston, telephone 081-549 3444.

## New Structures

UK-based Litestruktures recently commissioned a new powder coating plant at their premises in Wakefield. This has enabled them to supply their Astralite, Bilite, Quatralite and Minilite trussing systems powder-coated silver as standard at no extra cost, and to reduce the cost of any other colours by half.

## Pani for Barbican

After two years of searching for a quiet and powerful long range followspot, Roger Fox, the Barbican Centre's technical manager discovered the Pani HMV 2500 Zoom HMI followspot, which with the specifically developed low noise option fitted, is ideal for the sensitive acoustic environment of the London-based Barbican Concert Hall.

He was so impressed with the Pani unit he promptly ordered two, which he says performed admirably during the recent Elaine Paige concert at the venue.

## Going Dutch

In late December, Dutch company Focus Showequipment and Jansen & Jansen relocated to new premises which will offer them an additional 5,500 square metres, six loading areas, scenery storage, production halls, a rehearsal studio, warehouses and brand new offices and conference rooms.

The company is one of Holland's biggest suppliers of sound and lighting systems to the theatre and rock and roll fields. They can be reached at Isolatorweg 36, 1014 AS Amsterdam-Sloterdijk. Telephone (0) 206 821 821.

L+SI'S FAX NUMBER IS (0323) 646905



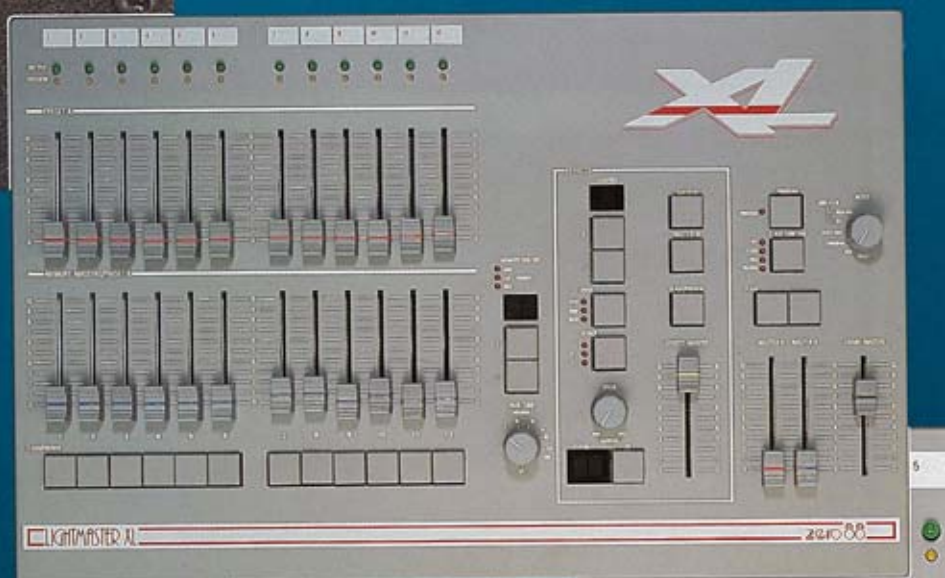
# NEW NAMES

*Available now*

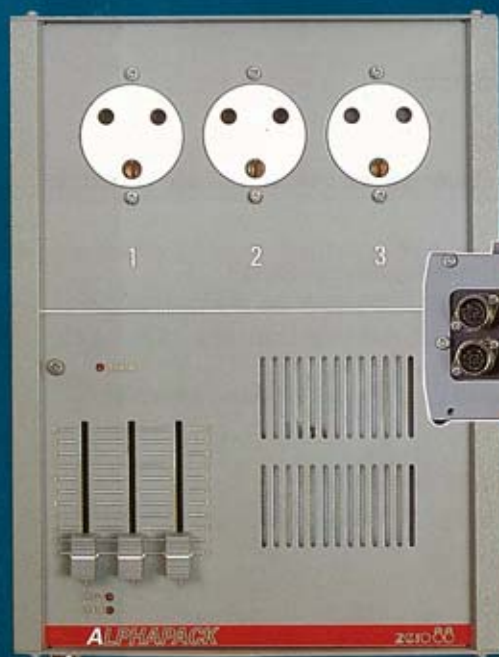


Focus 650 range includes 3 Profiles, a Fresnel, a Pebble Convex and two Assymetric Floods.

New products with new names. Names to remember, from the comprehensive Focus 650 range of luminaire; and the multipurpose, safety conscious Alphapack; to the Lightmaster XL, with it's powerful specification. New names for '92



Lightmaster XL, a 12 channel 2 preset lighting console with over 350 available level cues, analog and DMX output and MIDI interface plus a full range of programmable effects including sound to light.



Alphapack, with a wide variety of output sockets, individual channel faders and remote control input, and features a unique 'overload' safety device.



*from*  
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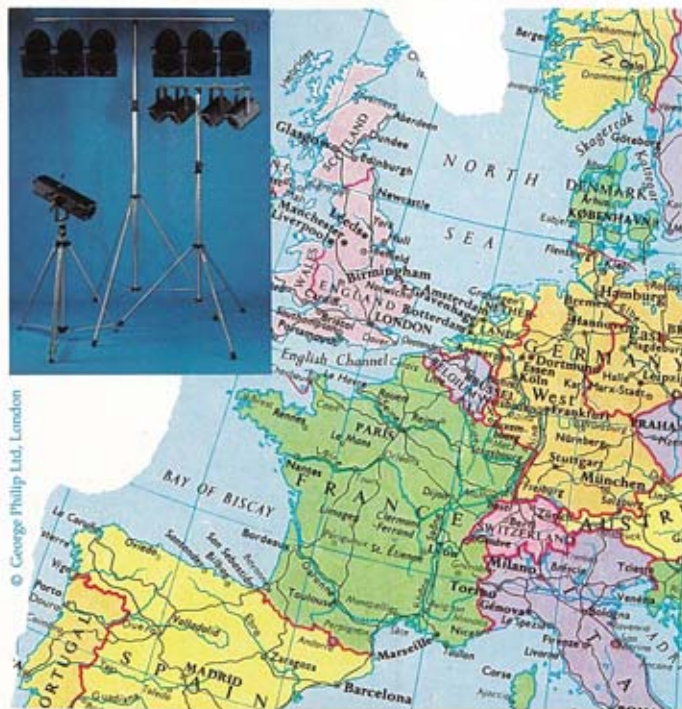
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## Where Are They Now?

Last year's LDI was remarkable for the number of erstwhile 'lost' faces which reappeared during the Show, writes Tony Gottelier.

The first surprise was the appearance after a long absence, at least in my compass, of **Paul Gregory** who throughout the 70s was president of Litelab in New York, one of the most successful suppliers and installers of lighting control equipment in the world at the time. Many other industry names were synonymous with Paul's at the time including **Howie Reiner**, who with Paul was responsible for the light dance floor in Saturday Night Fever which was the beginning, and most probably the end, of it all in the US.

At the time Howie was national sales manager at Litelab and on vacating that post, it was immediately taken over by the irrepressible Vinnie Finnegan, now half owner of Elektralite. Litelab product appeared in many of the most famous, and infamous, Manhattan nighteries including Studio 54, Xenon, Bonds, New York-New York, The Ice Palace and Stringfellows.

Since turning away from Litelab, Paul has established Focus Lighting, a design and supply consultancy for architectural and entertainment projects and he provides marketing consultation to lighting manufacturers. Current projects include the NASA Space Shuttle Museum, Florida; The Biltmore Estates Winery, North Carolina; The Marbel Technics showroom, New York; The Amadeus Club, Puerto Rico.



Paul Gregory.



Philip Vaughan.

**Philip Vaughan**, was one of the kinetic artists, along with Roger Dainton, responsible for the interactive neon tower on top of the Hayward Gallery on the South Bank. Built back in 1972, and subsequently a landmark for anyone arriving by train into Charing Cross, or by road access across Waterloo Bridge. Another member of the same team was one Peter Wynne Willson.

Phil, whose educational qualifications read like the UCCA guide to higher education - Queens Cambridge, Chelsea Art School, Newcastle Poly, City of London Poly and the Royal College of Art - has been resident in LA since 1980, having sailed across the Atlantic with his wife in a 42 feet fibreglass sloop of his own construction. Since then Vaughan has specialized in the design of exhibits and projects in the theme park and modern 'experience' museum fields. Among his credits are the 'through body ride' in the Wonders of Life pavilion at Epcot, The Indiana Jones Stunt Theatre and other 'rides' at the MGM studio tour in Florida and work on Tokyo Disneyland. Currently, Phil is hard at work for a number of projects at the Korean World Expo 1993.

Lastly, but not leastly, I returned to the Peppermill one evening to find a message to call an out-of-state number to 'hear a voice from my past'. This is normally an invitation to throw away the message slip for fear of severe embarrassment. However on this occasion, casting caution to the wind, I called the number to hear the recorded, dulcet tones of one **Mike Wan**, erstwhile of the Warehouse in Leeds.

In its day, the Warehouse along with the Embassy Club and Camden Palace in London, had been one of the most significant discotheques in the UK and had even been featured in Harpers and Queen, quite an accolade for a Yorkshire-based venue.

Mike was an extremely sensitive operator, with his finger on the pulse of the time and one of the nicest people you could hope to meet. Having sold the Warehouse in disgust with the stress caused by local authority hassle and the 'apathy of the folk in Leeds' Mike returned to his native America where, with partners, he is again operating clubs in the Houston area.

## i-Laser Abroad

i-Laser Sound & Vision of London have just completed a turnkey sound and vision installation into 'Night Owls' in Dublin. The system consists of a three colour, multiple scanner Image Synth laser system covering the main dance floor as well as a smaller secondary dance floor. Numerous down range effects complete a spectacular laser show.

In France, the company have also installed a laser and lighting system into one of the largest clubs in Bordeaux, Le Chat Bleu. Despite the limited budget of £50,000, i-Laser have installed a three colour Image Synth laser system capable of spatial effects and high resolution graphics onto a stage screen, complemented by a range of effects positioned around the club. i-Laser have also designed and will install the lighting rig within this budget.

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## Oska: Rumours Of My Demise Have Been Grossly Exaggerated

Axon Digital Design, the manufacturers of the Oska interactive, touch-sensitive control system, are very concerned at apparent attempts to 'kill-off' the product.

"Since we cancelled our distribution arrangement with Pulsar, due to fundamental disagreements over their policy in the marketing of Oska, we have noticed that most people we talk to are very surprised to learn that the product is still available," says, Rowland Hughes, Axon's director.

"We are keen to point out that Oska is alive and well, and living in Dorset!" It is possible that the rumours were started as the result of the announcement of Axon's new OEM product ShowCad, which will be officially launched in the Spring, suggested Hughes. However, the company do not plan to replace the one with the other. "Let the customers choose," says Hughes. "This is not an Oska Too saga."

In fact, the removal of an additional layer of discount has enabled the manufacturers to reduce the price of, what was arguably the world's first 'virtual' lighting control surface, to below £10,000. "This is where we always thought it should have been pitched," says Hughes.

Sporting a brand new touch-screen, now on



Oska (left) fully operational in Jac van Ham's Tilburg showroom in Holland, and also to be seen in Dutch discotheques, Carrera, The New Barn and The Marathon.

a Sony Trinitron colour monitor, the 512 channel control system has been installed in two new clubs in Holland in recent weeks courtesy of Jac Van Ham and, the manufacturers claim, will be spec'd into several new installations in the UK in the New Year.

Axon can be reached on (0929) 427232.

## People

G E Thorn Lamps Limited has appointed **Tim Povall** as marketing manager. He was previously brand manager within the company and will now be responsible for overseeing all marketing activity within G E Thorn's UK consumer division.

In a move likely to give the British distributor a strong sales line-up, HHB Communications has been joined by two sales specialists. **Chas Rowden** leaves his post at the helm of the London sales office of AMS Industries to become HHB's field sales manager, while **Tony Musgrove** joins from Music Lab to take up a new position in the company's pro-audio sales department.

**Dave Harries**, director of London's Air Studios, is to become Chairman of APRS, the Association of Professional Recording Studios. Harries, who heads the Association's membership committee and also sits on the exhibition committee, has been a member of the APRS board since 1975.

**Andrew Stone**, former sales director of the Eurolight Group Ltd has recently joined the Lighting Technology Group Ltd to head up a new installations division. This will provide service and expertise geared to the technical requirements of the leisure industry and will be run as a completely separate unit within the Lighting Technology Group trading under the name Turnkey Projects. The division will offer design, planning, project management, installation, training and service back-up for all areas of the lighting and sound industry.



Tony Musgrove and Chas Rowden.



Tim Povall.

Andrew Stone.



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## Sound

BBC Tomorrow's World will feature the JBN Sound Ceiling system during a programme to be screened this month. Filming will take place at the Croydon headquarters of **Voltlight Soundspin International (VSI)**, who distribute the JBN Sound Ceiling in the UK. The company has built a nightclub-styled set within their showrooms including rigging and intelligent lighting.

**Paxt Ltd** of Reindeer Lodge, Harton, were visited in December by the former tenants of their office, namely five reindeer from the herd in Scotland who were on a promotional tour. No doubt discerning reindeer, Rudolph and Co probably wanted to see Paxt's range of professional audio equipment, and in particular the line-up of Celestion products which Paxt export.



US President George Bush (pictured above) visited **Peavey Electronics** in December for the purpose of meeting with Hartley and Melia Peavey and addressing the employees of the sound equipment manufacturer. Nearly 2,000 Peavey employees and 200 members of national and local press gathered for the President's address which commended Peavey for its foreign competitiveness, and its range of exports to 103 countries. After his speech he was presented with a specialized Peavey Ecoustic guitar which is an acoustic guitar that can also be played electrically.

**Nexo Far East** is continuing its rapid expansion in the discotheque installation market. Following the success of 'Fire' which was awarded the title of Number One Nightspot for 1990, the club has become the Nexo showcase in Singapore, with its comprehensive speaker installation featuring several of the different

Nexo ranges. More recently Nexo has secured a number of contracts including Xanadu at the Shangri-La Hotel, Singapore; the Pasir Ris Resort Disco, Singapore; the Hilton Korea disco at Kyung Ju Hilton in Seoul, Korea; B&B Disco at the Bintang Bali Hotel in Indonesia, and Peppers Disco at the Kuching Hilton Hotel in East Malaysia.

UK sound reinforcement installation and equipment specialists **Marquee Audio** will be showing a range of new and established audio products from major pro-audio manufacturers at Sound 92. Featured in the line-up will be the new Europa and Spirit Monitor live sound desks from Soundcraft, the new programmable EQ system from BSS - the FCS-926 Varicurve Dual 6-band equalizer/analyzer, and Accord 212W stage monitor wedges, as well as a range of JBL speakers, EMO Systems main sequencers, Yamaha signal processing, DDA sound desks and C-Audio power amps. Sound 92 will be held at the Heathrow Penta Hotel from the 4-5th February.

**Tannoy-Audix** is currently reaching the end of several major contracts including a £6.3million broadcast contract to totally refit the fire damaged Radio Indonesia National Station, a number of projects in the Middle East and the controversial International Convention Centre in Birmingham. The ICCB project has been the subject of a great deal of industry speculation, and in a press statement received by this office, managing director Tim Roberts outlines the problems that have plagued the installation, and details the monies still owing for work completed. The statement goes on to say, that as a result of this and a combination of other factors, the company has made 40 people redundant. In addition, the company name is to be reverted to Audix, dropping the Tannoy part of Tannoy-Audix. Tim Roberts also outlined a new management structure and the implementation of a new sales programme and improved customer services policy.

Dave Ward of Gateway recently conducted a comprehensive training programme for the staff at **Soundtracs** automated production plant in Glenrothes, Scotland. From general familiarisation with recording techniques for the PCB, console assembly and stores staff, to an in-depth course on recording/synchronisation and sound reinforcement for the PCB test technicians



and console test engineers, the course was designed by Dave Ward (pictured above with staff) to not only motivate staff but relate production techniques to the end user. On the financial front, Soundtracs whose HQ is in Surbiton, Surrey, announced that it has maintained profits of £546,000 a whisker above last year, but the tax bill is down and earnings per share are up from 3.58p to 3.8p. Chairman Tod Wells told L+S: "Our second half clearly vindicated the decision to develop a range of new products for 1991. Our balance sheet is still highly liquid with negative gearing and we look forward to 1992 with confidence," he added. The company spent £1million on its new Glenrothes facility.

The first legal recording studio in Poland has chosen a **Soundcraft** console. Soundcraft dealer HHB Communications has sold a Sapphyre desk to The Hard Company in Warsaw. The studio is now set up and being used extensively by independent Polish bands.

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# LMP Lichttechnik

Freddy Lloyd reports

I think it must have been 11 years ago when I first met Uli Petzold, managing director of LMP Lichttechnik who was wandering somewhat forlornly around the Bloomsbury Hotel at one of the early BADEM shows. I remember well visiting his first office and warehouse - three adjoining garages which he had rented cheaply from the bank who had repossessed them from a previous bankrupt customer.



LMP Lichttechnik's impressive facility.

In December I was privileged to be invited to the official opening of his new premises in Ibbenbüren together with several of the industry's luminaries including the ubiquitous Mick McManus (Le Maitre), Adrian Brooks (Lite Structures) and Nigel Morris (JEM) to name but a few.

Uli has come a very long way in the intervening years, and the opening marks the culmination of the 11 years of work. The purpose-built offices, with five salesmen plus ancillary staff, the showrooms and warehouse total 3,600 square metres, on two floors, and cost no less than DM 3.5million, and must be the envy of all who see them.

The opening party started at 11 in the morning and ran through until past midnight for those who had the stamina to last the course, with non-stop champagne, beer and food, plus a truly excellent local band.

I was probably in my usual state of sobriety, and therefore cannot remember who said it to me, but someone said 'you know Uli has possibly got the biggest operation of its kind in the world.' They're probably right!



Clockwise from above left: LMP's lobby reception, sales office, showroom and demonstration room.



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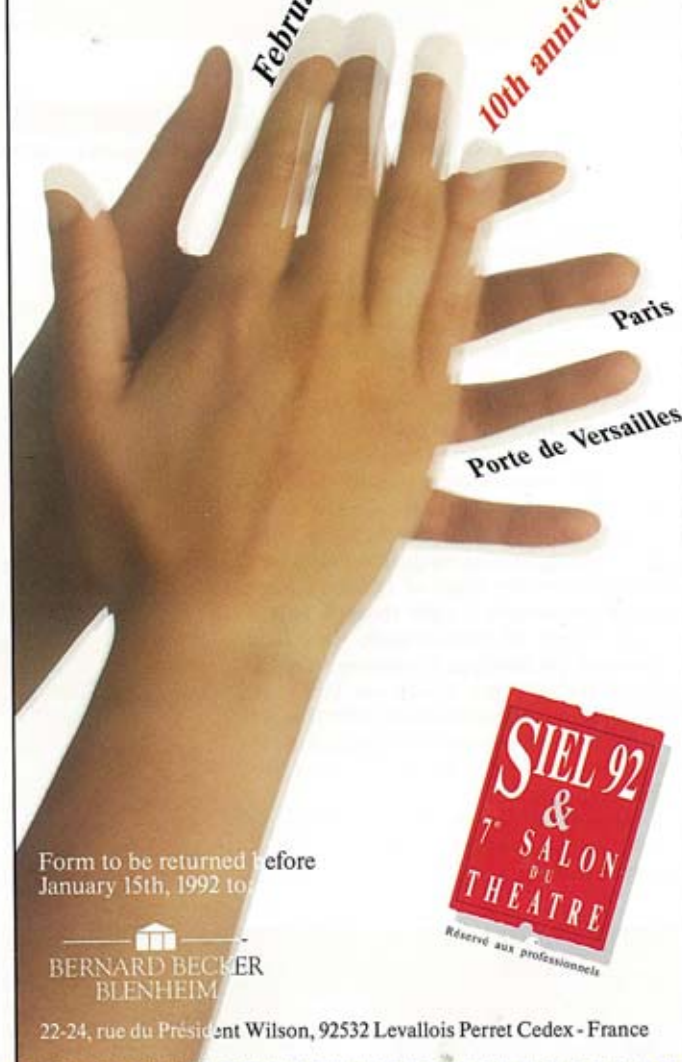
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# SCROLLING COLOUR FROM THE ROCKY MOUNTAINS

John Offord visits Wybron Inc at Colorado Springs



Wybron HQ in Colorado Springs with a Rocky Mountain backdrop and Pike's Peak (14,109 ft).

Keny Whitright, president of Wybron, will have his name put down in the entertainment technology history books of the future as the person who introduced the scrolling gel colour changer to our industry. A man of deliberate gait and ready smile, determined intention but easy manner, he would, however, be the last person to emphasise the point.

Keny would also be the first to admit that there's never anything much in theatre that's really, really new. Putting a colour medium in front of a light source is almost as old as the use of light itself, and what the Chinese hadn't done centuries ago those marvellous and dangerous-living Victorian technical impresarios certainly did on the stages of London's huge theatrical emporiums - right through to the ultimate effect of catastrophic fires that extinguished the buildings themselves. A quick research through my books on Victorian theatrical activity makes me shiver at the thought of so much flammable material being hoisted in front of ranges of open gas jets or circulated around oil-lit cylinders.

But back to our age. In 1980 Keny Whitright brought out a product, eventually called ColorMax, that put semaphore colour changers



ColorMax: a world first.

almost clean out of any future reckoning, at the same time ushering in a niche product that has burgeoned over the past few years into a standard piece in the lighting equipment repertoire.

Keny's background was in sound with

Showco of Dallas where he spent eight formative years in the business. He left to do a mix of industry odd jobs and ended up working in a club. "It was a Las Vegas style lounge act place, and they'd hired me to do the lights," he explained. "But the only reason they had hired me to do the lights was because they knew I'd fix the sound system. To this day I still know very little about lights!"

Every night during the four hour run of the show he set to thinking about how things could be better organised on the technical side. "At Showco we'd worked on a number of ideas for colour changers and so I knew about a bunch of things that didn't work. I came up with the idea that everything seemed to revolve around a gel frame, so I figured that this was the problem part of the equation. What was clearly needed was something to support the gel and to make it move. My first idea was a continuous band of gel around the lantern but it obviously wasn't feasible and it eventually came down to a scrolling colour changer as a front-end attachment.

"I was surprised when I went to do a patent search that back in the twenties there had been a similar device that had been tried on



Keny Whitright with prototypes at LDI Orlando in 1990: ColorMax (left) and Coloram.



November 1991: Keny and Coloram (left) with Bob Gordón holding the original inner workings of the first-ever ColorMax.



fluorescent street lighting units. However, that was the germ of the idea and the opportunity to do it came when I formed a company with partner Mike Brown to manufacture outdoor stages and during the winters I had time to develop the unit."

The first six units were sold to Obie Lighting of California who used them for a show and then put them into their production stock. Soon after, Keny and Mike each went their own way. "Mike didn't want to go into this kind of business whereas I thought it might be kind of exciting," continued Keny. "I kept the name Wybron (from Whitright and Brown) and then I showed the units to Joe Tawil of The Great American Market. Joe came up with the name ColorMax and GAM started to market them. In those days Great American Market was a sort of 'boutique' lighting shop where you could buy unusual and unique equipment - certainly at that time the colour changer was also an unusual piece of equipment."

ColorMax developed over the next six years across three models and various improvements and around 1,800 units were sold over the period. "Joe Tawil then wanted to see a breakthrough in price because of competition," said Keny, "and I went back to work and came up with a much simpler idea which became ColorWiz. About four thousand of these were manufactured over the next three or four years. What really opened my eyes was that by cutting the price in half we did more than double the business. It was a valuable lesson."

The business had by now moved to Colorado Springs from Dallas (1988) and the link with Great American Market was concluded. For a year or so Keny used a manufacturer's representative network to sell his products. "Sales were OK, but not great," he admitted.

Bob Gordon, now vice-president of sales, soon came onto the scene and dramatic developments started to take shape. Formerly of Great American Market and prior to that having spent many years in on-the-road production, Bob had stacks of experience and knowledge to back up his formidable energy, and he took off selling the latest Wybron product, the now-famous Scroller, which had its debut in 1988. The sales target for the first year was achieved within just seven months and things haven't looked back since. The company is housed in a modern double unit space that is



Price breakthrough: Keny Whitright with the ColorWiz.



Showing the Scroller range at LDI 91, Reno, Nevada.

tucked dramatically into the foothills of the Rocky Mountains. An ideal setting for high-tech activity.

So, before going on to look at Wybron's current and future products and prospects, how has the basic scroller developed over the years? "ColorMax started out as a micro-processor controlled colour changer with a stepper motor engine," explained Keny. "It had the advantage of being programmable for frame size and so on. Unfortunately it operated on what's called 'open loop' - there was no feed-back to tell you if the gel was in the right place - and the early versions got 'lost' rather easily. We then introduced an optical sensor with tags on each frame. The original design was an indexing unit so it would go from one frame to the next. The speed was variable, but it would always 'frame-up'."

"The breakthrough in price with ColorWiz

came from throwing the microprocessor away and making it a very simple analogue servo, which didn't require any tags and it didn't have to be initialised when you powered it up. There was a lot of advantage to that. ColorWiz proved to be a successful product largely because it was simple, with no bells and whistles. Also, because it was an analogue system the motion was continuous and you could put the frames wherever you liked. So you could split them, have three-quarters of a frame, and so on. Also, the speed control was related to the speed of change from the lighting control board. If you used a timed crossfade you could set the speed yourself. It gave a lot more flexibility to the lighting designer.

"Scroller was an improvement over ColorWiz in that DMX input was included and certain mechanical features such as the front-end door became standard. It also generated a lot more

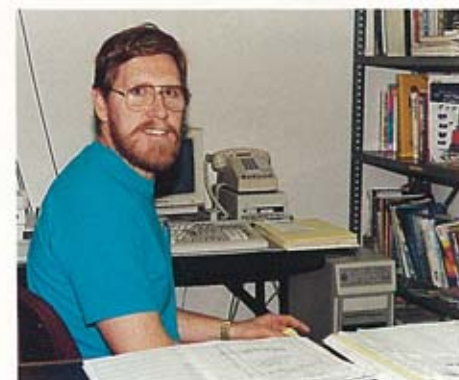
## Wybron Profiles



Scott Penner: assembly manager.



Kenneth Fasen: electronics engineer.



Rich Metcalfe: operations manager.



Doug Christensen: drafting and design.





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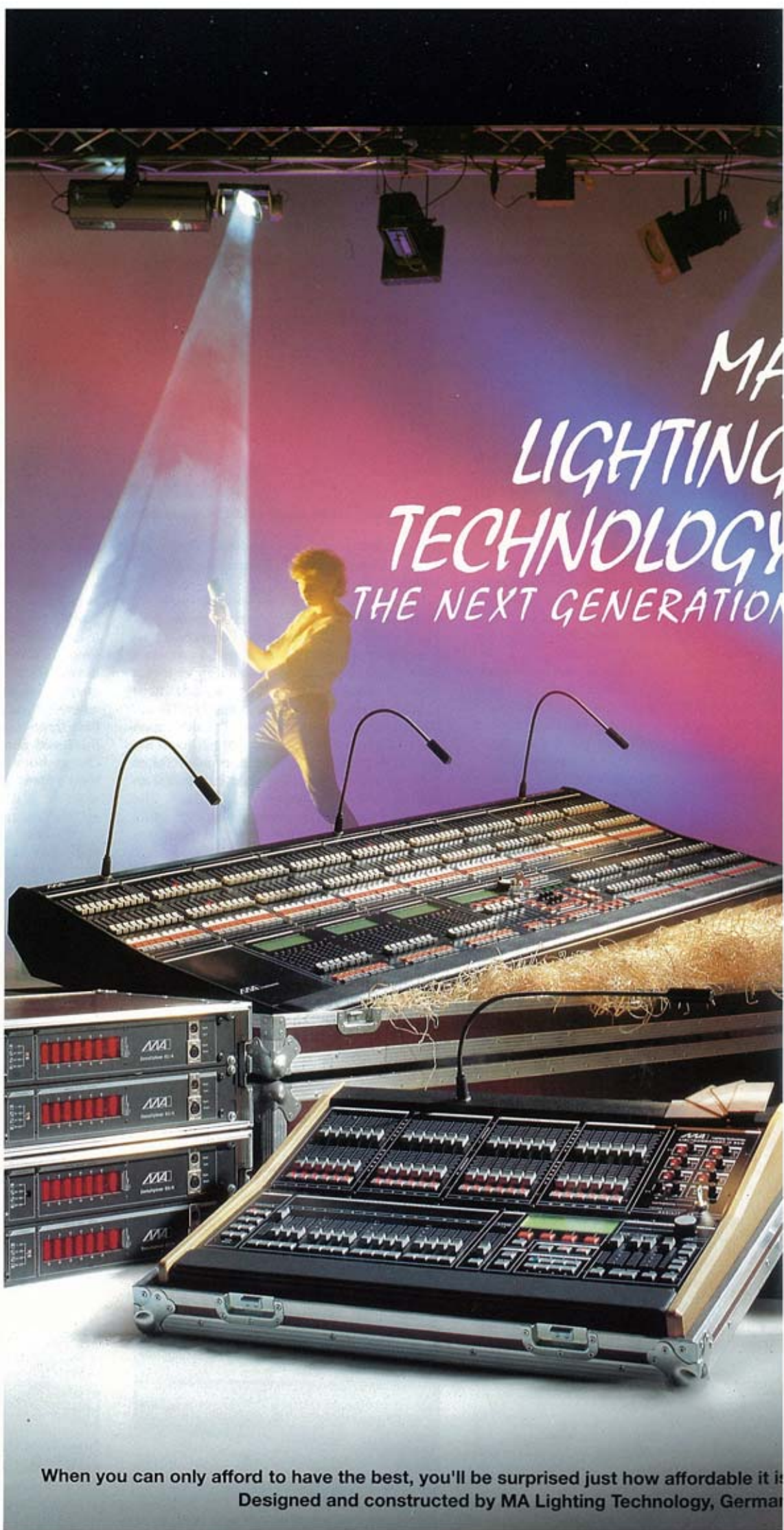
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**The Scroller 7" universal colour changer: 11 colours end to end and accommodating any analogue (0-10V DC) or digital DMX512 input control signal.**

models. Coloram, amazingly, goes back almost to the beginning in that we're using a microprocessor and a motor control chip and instead of a servo motor a DC motor, once again with no gears. This gives a complete lack of noise, apart from the movement of the gel itself.

"It's interesting that people have been growing up with scrolling changers just as we have. First of all they wanted them to work, and then to be faster. Now they're complaining about the noise and we're attacking that problem. I feel the Coloram unit is a good answer. It's still early days to talk about how many models there will be but I feel there'll be quite a few. There are some difficulties to overcome in scaling up this technology to larger models." Scroller and Coloram are set to boost Wybron's business massively over the next few years. "Scroller is the lower cost unit with a wider market base whereas Coloram is set up to be marketed to the professionals who command high performance and low noise all at the same time," continued Keny.

All Wybron products go through the sort of standard test procedures any self-respecting modern manufacturing facility employs. All sub-assemblies are tested before they go into a finished unit and these are then tested for performance and 'burned in' for 24 hours before a re-test, cleaning, packing and serial numbering. "The last thing we want is any infant mortality in the electronics area," commented Keny.

With thousands of changers now in the field, Keny Whitright and Bob Gordon are working hard to keep in close contact with the customer



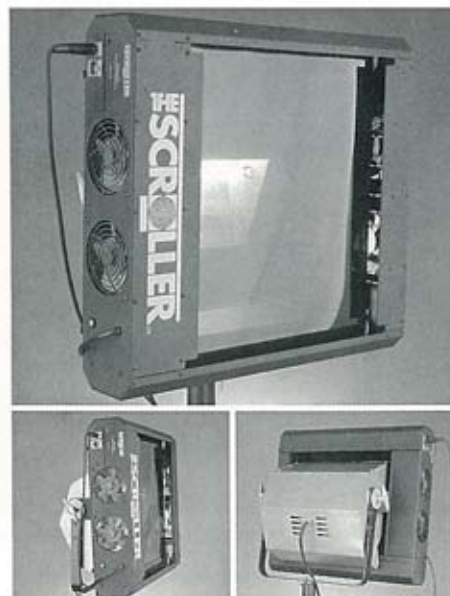
**The Coloram: quiet and fast, it has a variable gel string potential of 2-32 colours of differing lengths.**

and user. It's obviously useful for future sales, but there's another reason, and it's just as important. "There are some failures that occur that we can't explain but have to be looked at in terms of system problems rather than just a localised product fault," explained Keny.

"We're subject to the whims of lots of peoples' controllers and cabling and one of the topics I talked about with Steve Terry of Production Arts at the recent LDI show in Reno was that we seem to have a lot of people out in the world who are treating DMX as audio and many of our customers are susceptible to getting things wrong. It's no longer a simple matter of running one wire from your board to your dimmer rack. Hopefully there will soon be some sort of application note from USITT on the subject. If that fails then I'm going to have to write it, or get the experts to write it for me and publish it ourselves. We probably sell more DMX receivers/transmitters than anyone else in the world, just because of the nature of our individual products.

"However, right now I'm happy with the results our customers are having, but we have a commitment to making things better all the time, and if anyone calls us and asks 'why does it do this' we can treat the enquiry as a genuine learning and assistance task."

I asked Keny how this closer contact with the customer and user affected relationships with Wybron's network of dealers. "Our dealers are obviously important to us, and they are also our customers," continued Keny. "You must remember in this industry that a lot of products go direct to rental and production houses who



**The Scroller 'Far Cyc' variant: a wide body colour changer with 18" x 15" aperture.**

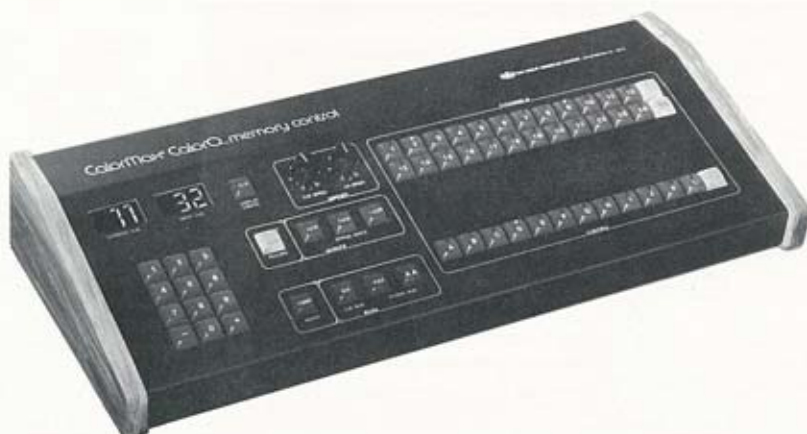
are in effect the end user. It's something strange about the lighting business in that few products are ever sold at list price. You must remember in this industry that a lot of products go direct to rental and production houses who are, in effect, the end user. We cannot physically talk to everyone so we will continue to depend on our dealer network for sales and service to their customers. Right now, outside the States, our only distribution outlets are in Canada and Asia. In Europe we can do business on a dealer basis but I think that in due course we'll have a warehouse there and have Wybron products in stock to deliver off the shelf and overnight."

Sales growth at Wybron has been enormous over the past year, with the 1991 figures topping those of 1990 by over 80 percent, and the 1992 sales figures due to double those for 1991 at the very least. Bob Gordon takes up the story: "It's scary to think you can sustain this growth rate for a long period of time, and it might in fact be unhealthy if we aren't careful with controls. However, like it or not, we've already increased our sales for 1992 over 1991 with solid orders we already hold! And all this doesn't take into account the growth we're looking for in some other market areas.

"One of our targets is to widen the application of the products and look at horizontal growth, finding other areas to sell the products into," continued Bob Gordon. "We feel that there is a broader application for colour changers - into the architectural field, interior design, shopping malls, etc. - and so far most of our enquiries into these areas make us feel confident that this is the case. In Japan, for instance, we're already involved with a product specifically designed for Karaoke bars - a small, inexpensive unit, except the sales could be 8,000 to 10,000 pieces a year. Our customer undertakes 2,000 installations every year in the field and the opportunities in this and other areas, beside the strictly theatrical, are excellent.

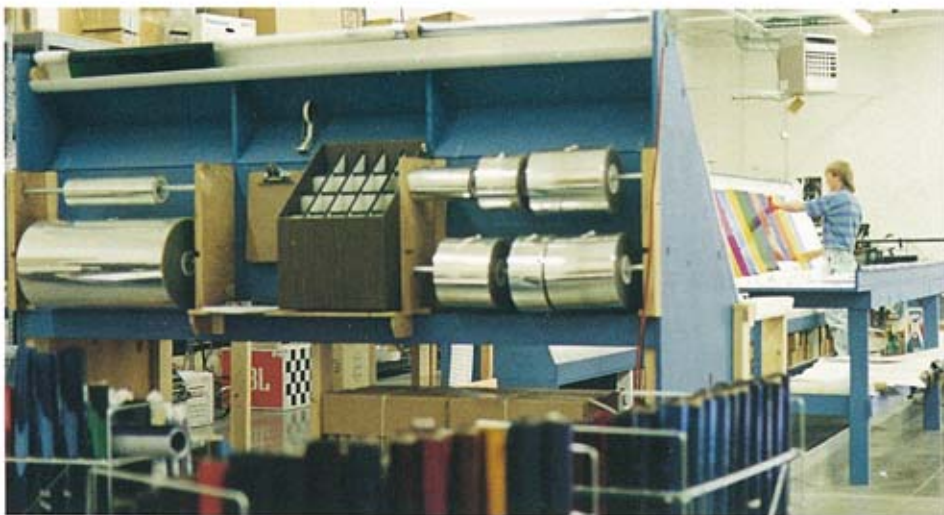
"We know in the theatrical area alone there is a growth pattern because the colour changer is starting to become a common tool. Once upon a time they were strictly the domain of the well-to-do rock and roll companies. That's not the case any more. Now it's within the domain of smaller theatres, high schools, and so on. All areas look like growth areas and the fact that we've doubled our business during one of the most severe recessions of our time indicates that the sky could be the limit."

Wybron have also seen a growing interest



**Into history: ColorMax ColorQ memory control board.**





Sneak preview: the ColorExpress gelstring assembly area.



Chae Knotts: Wybron's office manager.

from the world of film and television. Bob Gordon again: "With the Coloram's high-end application, remote-controlled television studios, for instance, are now paying increased attention to the use of scrolling colour changers. But we mustn't forget the less expensive products. We like to think we can bracket up the right product for the right market."

"The bottom line is being flexible enough. Let's face it, in this business we're all small manufacturers, and small companies tend to be able to make decisions and take action much quicker than larger ones. We therefore feel we can be very flexible and meet a broad range of needs."

With all this activity, Keny Whitright has had to take a few caps off his own head and regularly strengthen his senior team at Colorado Springs. Rich Metcalfe is operations manager and he has

the ever-expanding task of ensuring all the bits and pieces are in the right place at the right time for increased manufacture to happen on schedule. Doug Christensen looks after drafting and design and newly-appointed Kenneth Fasen is electronics engineer with Harry George as electronics technician. Out in the manufacturing area, Scott Penner is assembly manager and Dave Mayne assembly team leader. Chae Knotts is office manager.

And there's no stopping there. Another little business is growing within the walls of Wybron: ColorExpress, which is managed by Brandon James. Offering a gel-string manufacturing service, overnight if required, a special assembly unit has been custom-designed to cope with rapid output of colour strings for any type of scrolling colour changer. "We stock all the colours of the spectrum from the leading gel

manufacturers and we can furnish them for any style of colour changer, in any sequence and any length," said Keny Whitright. "It was originally only offered as a service to our own users and it helps us to stay in contact with them, but as it turned out business has expanded and we now build strings for all the different machines on the market."

Keny Whitright told me that when he first started he considered that if he could sell 10,000 colour changers then that would be about as many as the world could hold. "Eighteen months ago I did an informal census and I reckon that there were about 20,000 in use. Since then we alone have built another 4,000 or so, and based on what I know is coming up in Asia, I can't tell you how many there are going to be. However, I certainly feel an awful lot of them are going to come from Wybron!"

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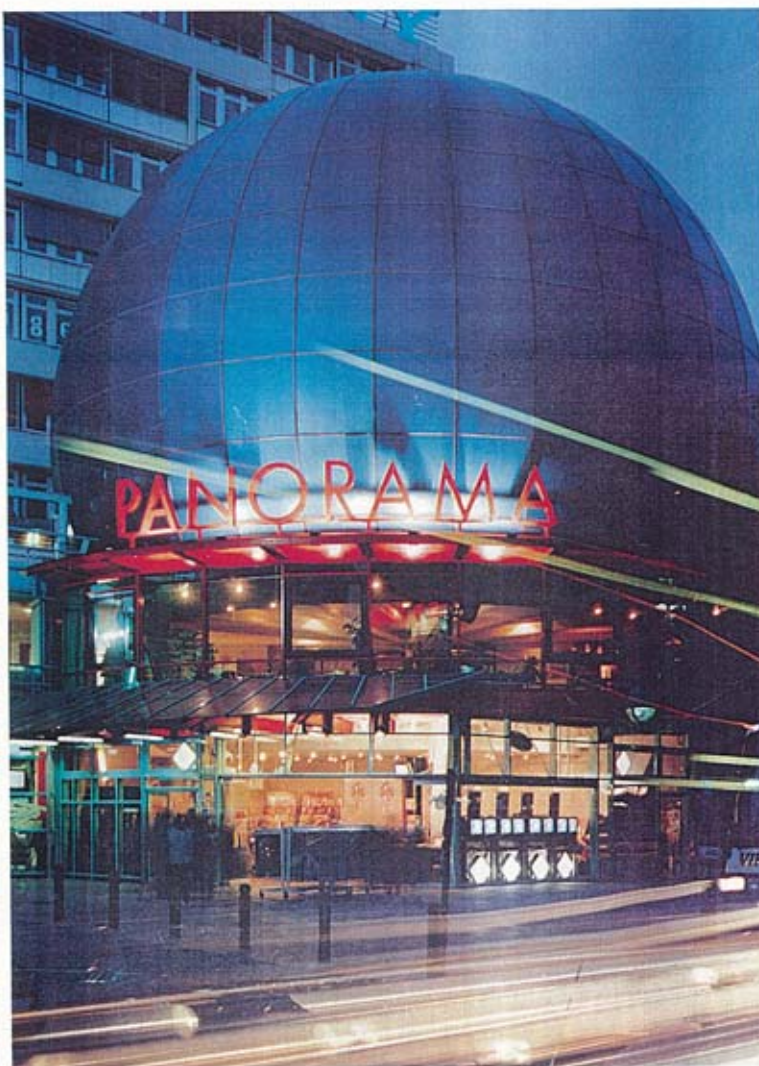
# BERLIN'S MAGIC BALLOON

Ruth Rossington talks to the designers involved in Berlin's newest and most innovative nightclub

If you take a trip to downtown Berlin these days, you'll find that things aren't what they once were. Aside from the political and economic changes that are catalogued daily by the media, other events are taking place. Berlin as a city has always been famed for its life, vibrance, and ability to push the boundaries (ironic when you consider past regimes and the stifling effect of the Berlin Wall) but perhaps most of all its desire to experiment, to take that next step which has always led it to be a city of contrasting and conflicting faces. Berlin's alive, and when you're there you know it. So it's no surprise to find, nestled within the shadow of the famous Gedächtnis Kirche, Berlin's newest and most innovative multi-media nightclub - The Magic Balloon.

To give you some idea of how it got its name, the 'Balloon' is a complete geodesic ball designed originally to house a 360-seat cinema, but as tastes have changed, so the cinema-going youth of yesteryear has been replaced by the affluent youth of today - whose expectations and demands are so much greater - and so the whole interior has been completely redesigned to create three distinctive layers of modern-day technology within the structure.

The first floor has had a complete re-fit to accommodate a cafe and restaurant, whilst the second floor is now where the bar and lounge are to be found. But it's the third floor that is destined to be the talking point of this club - and for good reason. Situated within the apex of the dome, beats the heart of the



The Magic Balloon.

whole operation - a multi-media melting pot that's alive with visual activity.

It's clear from the outset that the design philosophy that shaped the lighting for the Magic Balloon went beyond the traditional concept of a lighting rig and into a different realm of artistic creativity. That's not to say that the nightclub itself has been sacrificed at

the shrine of media technology - far from it. Certainly people will do the same things here as they would at any other disco but the overall experience will be much more theatre-oriented, and for once, the Sharons and Daves of this world might just notice.

The whole concept is the brainchild of Eric Veenstra and his company Art Lab Studios, who specialise in light and scenic design. Eric admits that his education, as well as his professional experience has always led him back to theatre, music, dance and opera. "As a designer and director in the arts, my work has always been as three-dimensional as possible. I work hard at maintaining this in every type of project."

Art Lab's brief was as open-ended as possible. "Magic is the first club I have worked on where I have been given such freedom to execute 'Gesamtkunstwerk'," explained Eric Veenstra (and if that's double deutsch to you, then join the club). From his first meetings with other project members, architects, technicians etc, he had a very clear idea of how the lighting scheme should look and the overall effect it should have. As a source of inspiration for his primary visual images he turned to the work of Stephen Spielberg, and in particular his blockbuster film 'Close Encounters of The Third Kind'. Standing in the

middle of the room, it's clear that this was no quantum leap of the imagination - it's obvious that the idea was almost force-fed by the sheer scale of the venue itself.

From a practical standpoint, a certain amount of three-dimensional creativity was needed in the technical execution together with a certain amount of creative know-how.



Air Craft Landing lights in action.



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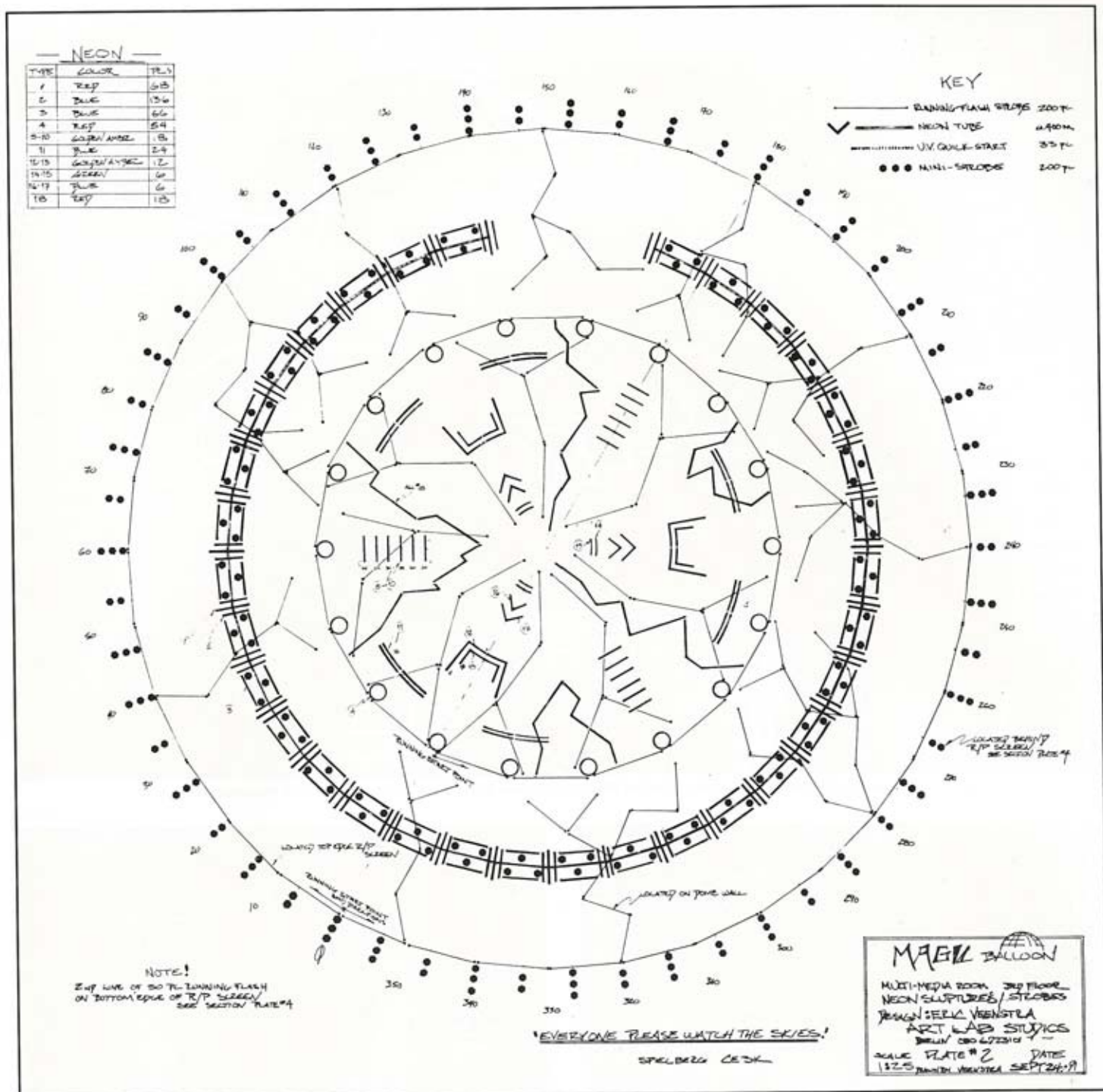
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Art Lab Studios' schematic for the multi-media room showing neon sculptures and strobes.

The photographs accompanying this article speak for themselves and show the concept clearly.

To create the sort of impact required in a venue of such substantial proportions Veenstra and Co have had to go for some weighty logistics. The rig itself dominates the centre of the room running in concentric circles. On it there are no less than 27 Clay Paky Goldenscan 2/1200s, partially equipped with customized Rosco-gobos providing the main lighting effects. Leading the support cast are over 100 gobo projectors with custom gobos and micro filters, with second-rank effects coming from the Stardancers, Starfans, Starlights, and Starbeams, all with computer-controlled high speed colour changers from Lokys AV Berlin who undertook the complete installation of lighting and sound equipment.

The gut-punching effects are provided by running flash strobes, 500 metres of sculptured neon tubing working 6 colours on

201 separate channels, tubelight murals giving four colours with 1+4 channel on 130 separate channels (these alone measure 710 metres and use 3.5 kilometres of cable), and ultra-violet 400W fluters and quick-start effects.

Control is courtesy of two PC-racks with Major-software Goldenscan 2 and SMPTE/EBU timecode-options for the Goldenscans; a staggering nine 108 channel Pulsar Masterpieces, with one master and eight slaves; an Atari computer with Cubase software and Steinberg Time-lock for linkage between SMPTE output and MIDI inputs of the Masterpiece, and four Star-System free programmable control units for colours and chases with CUE-interface for remoting from the Masterpieces. To complement the whole there are 14 60 channel Demux units from MA Lighting Technology.

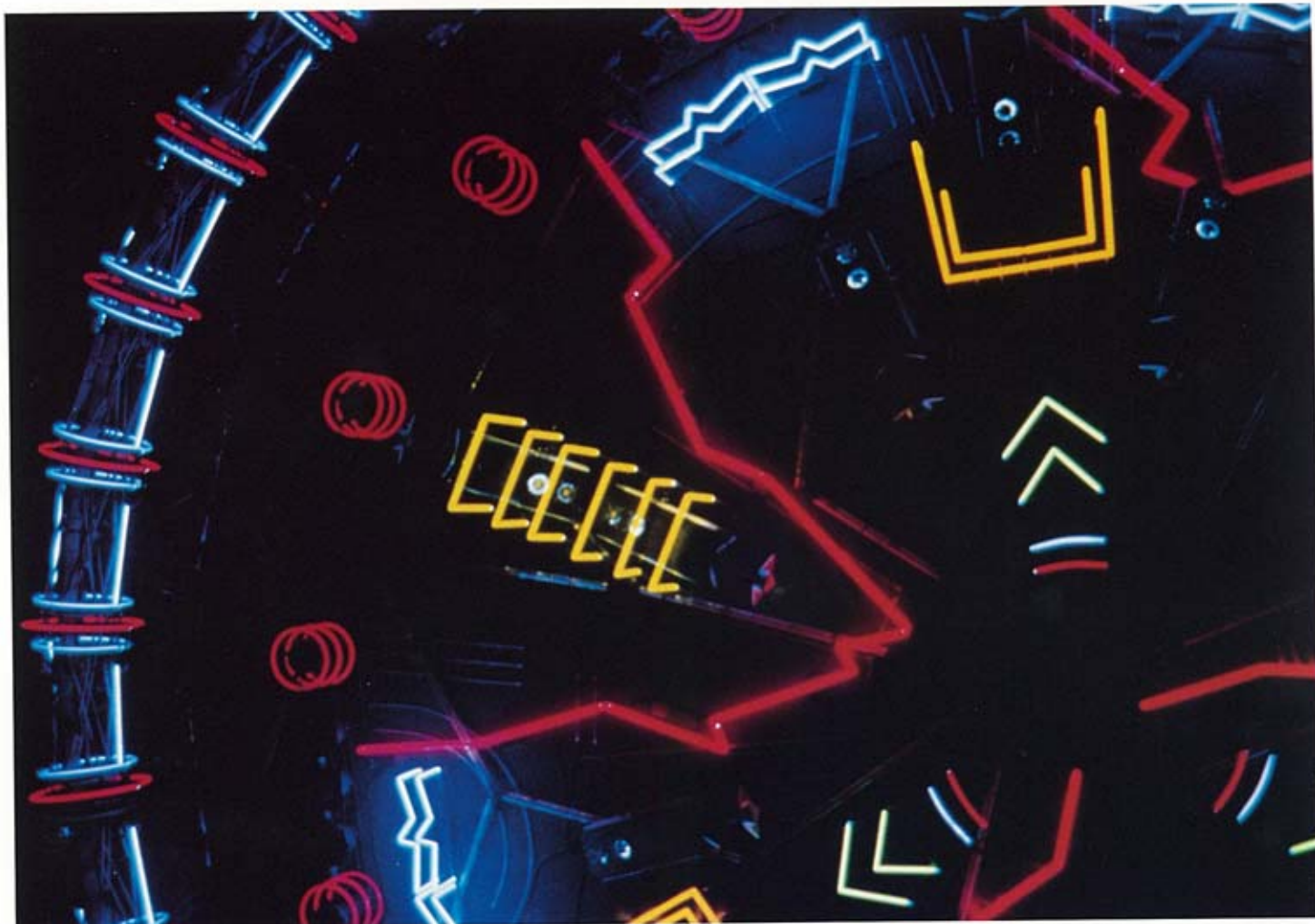
The laser system consists of three projectors: the main projector for fully coloured graphics - equipped with a crystal

RGB colour-changer - is located above the middle of the dance floor suspended from the ceiling.

The laser graphics can be shown on the cylindrical projection screen on two opposite sites at the same time. Because this projector is mounted on a stepper motor driven round-table, the graphics can be moved on the screen, which creates a quite stunning effect. The precision facilitated by the round-table makes it possible to bounce the laser beam onto 64 mirrors placed around the dancefloor and gratings mounted on the top of the screen sending beams scything through the air.

One of the two side projectors is located over the bar, the other over the lighting control desks. Each of these is capable of producing a variety of laser stunners such as mirrorball, grating effects and wide angle lissajous scanners for planes, tunnels and tube patterns. The effects are selected by newly-developed high precision optical

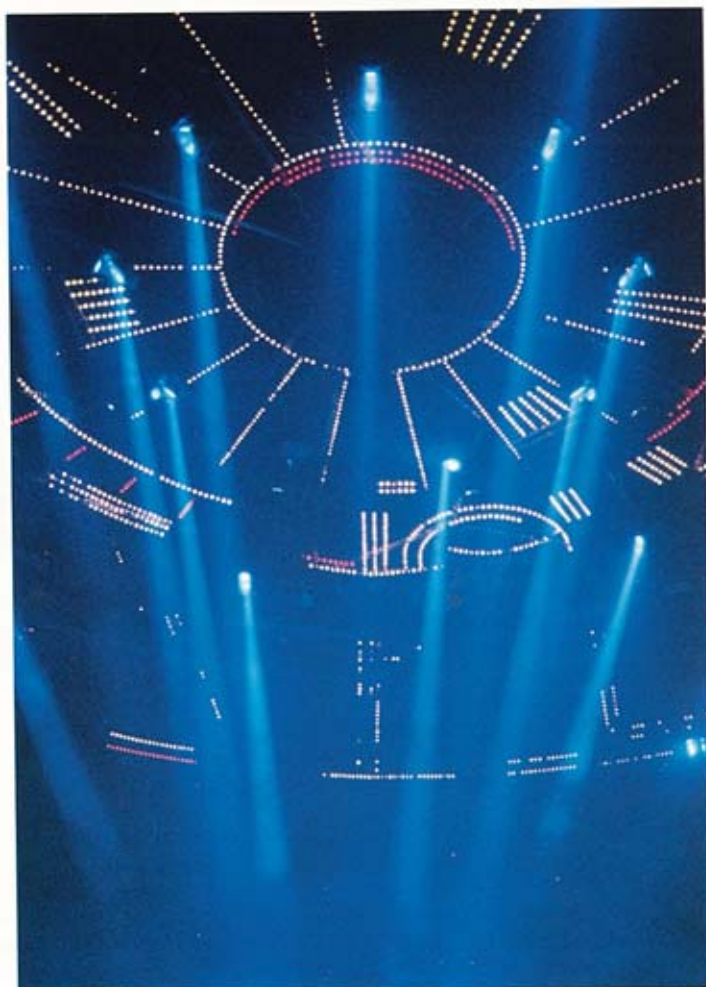




A section of the neon ceiling. Seen on the left is part of the 13 metre diameter 'Saturn Ring'. Each neon piece is on a separate circuit.



Golden Scan 2s and laser mounted below the projection screen.



Tube light mural on ceiling shown with Golden Scans. The 'Close Encounters' influence is very clearly seen.





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relays in conjunction with a fast eight-colour changer.

All the projectors are fed via fibre-optics from a Coherent Purelight 3.5 krypton white-light laser.

The laser system is controlled by the new Lasergraph DSP, developed by LaserAnimation of Berlin. The High End controller handles fully coloured 3-dimensional graphics with perspective view in real time. The heart of the controller, based on the industrial VME Bus, is a high speed digital signal processor.

The 'Trimagic' feature of the controller is

capable of displaying stereoscopic (3-D) pictures without any additional programming in the anaglyphic (red/green) or the fully coloured Polaroid technique. The concept of the laser system, together with all its engineering, was carried out by LaserAnimation in conjunction with another Berlin-based company, Laserconnection. A third company from the city, Lichtwerk, programmed the entire laser show.

There you have, in small measure, some idea of how the concept has come together. However, having overseen the installation and design, Eric Veenstra wanted to ensure

that the technology was put to its full application and not relegated to a secondary role. He therefore set about persuading the owner of The Magic Balloon, Panayote Pontikas, to stage special light show presentations.

"I felt that some parts of every evening



**Designer and art director Eric Veenstra of Art Lab.**

should be completely choreographed. We agreed with the client on the creation of two new music pieces, to be composed by my friend Bob Lenox, one being a seven minute dance piece and the other a 20 minute dramatic presentation." With over 850 channels of lighting, including 99 intelligent units, multiple laser heads, and 270 square metres of projection screen, it needed a clear structure otherwise the whole thing would become too complex to be effective. Which led Eric Veenstra back to a multi-media piece he's been putting together for several years - the History of the Universe. This is just the beginning of the Magic.

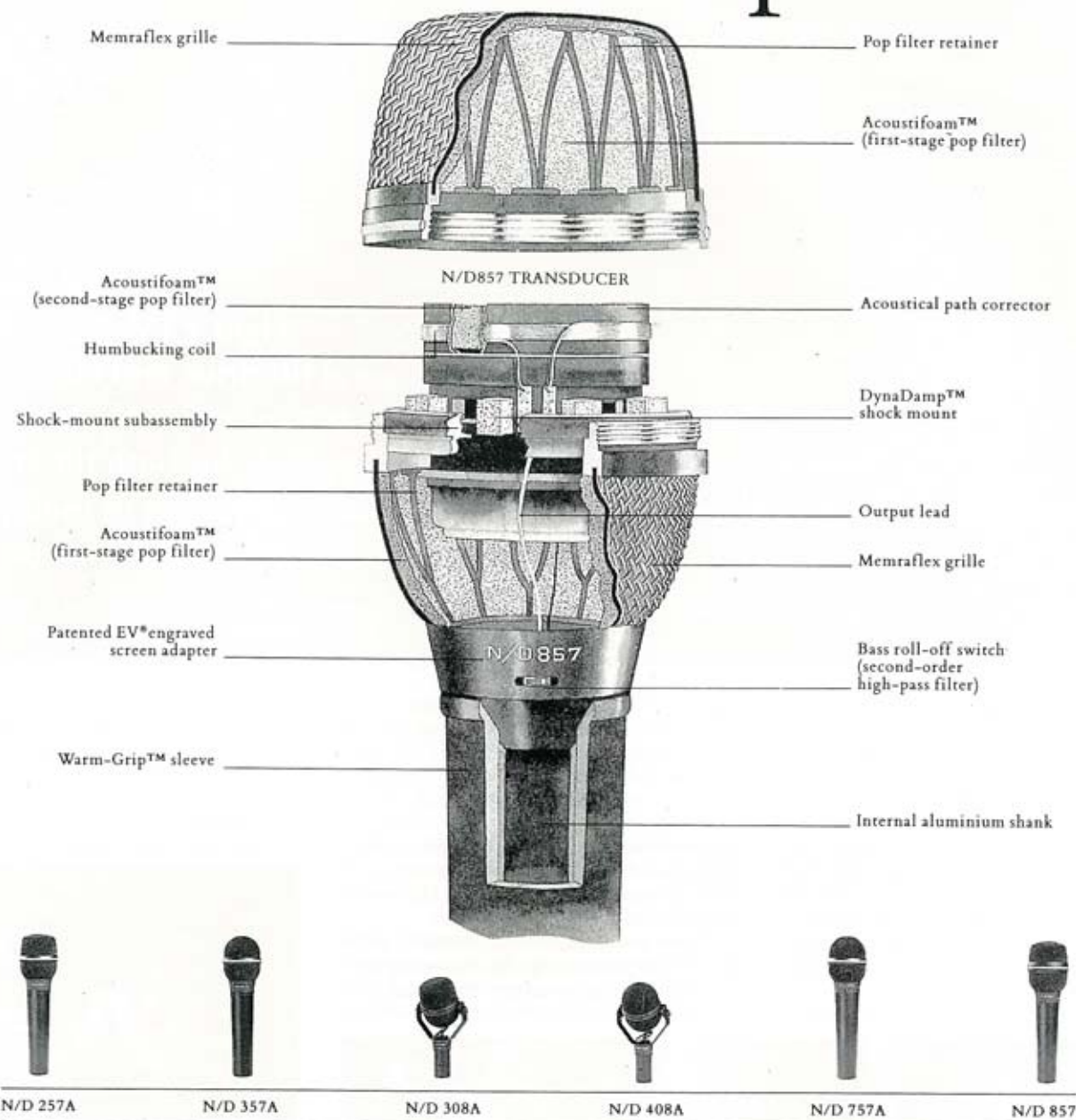
The photographs accompanying this article, together with the front cover, were taken by Candace Condusta.



ACLs mounted on the ceiling inside red neon sculptures. Each of the 54 red rings is on a separate control circuit, providing many different chase possibilities.



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# PERFORMANCE TECHNOLOGY GOES TO SEA

Tony Gottelier Considers the Sophisticated Technology that keeps Entertainment Afloat



Majestic Launch. 'Monarch of the Seas' slips her moorings for her first voyage across the Atlantic via Southampton.

Cruise holidays have long been considered a sedate and genteel pastime in the UK, fostered by memories of Empire and the great trans-Atlantic vessels of the past. Not so in the US, where ruling the waves when it comes to cruise liners these days, means considerably more than simply carrying a few itinerant minstrels on-board. In the case of Royal Caribbean's 'Monarch of the Seas', it means many tons of sophisticated entertainment technology in fact. L&S's stowaway mole, Tony Gottelier, himself involved in part of the project, reports.

As high as the statue of Liberty (14 decks and 51m), twice as much steel as the Eiffel Tower (14,000 tons or 195,000 sq. metres), 1290 and 65 km of electrical cable and piping respectively and 6.5 kilometres of corridors. The 74,000 ton Monarch of the Seas can

carry 2,354 passengers and is claimed to be the largest cruise liner currently afloat.

These statistics give a graphic indication of what a considerable enterprise the construction and furnishing of such a great vessel really is. Just imagine the tons of food, booze, laundry and waste to be stored or processed! And when it comes to entertaining the facts are equally impressive.

For the market in the US for cruising in the Caribbean and elsewhere is estimated at 4.1m passengers annually and these are definitely not the afternoon tea brigade. The cruises, which generally operate on a short turnaround, covering as many tropical islands in as many days, are today expected to provide the kind of facilities otherwise only found in a Las Vegas hotel. This means not only a casino, as garish as possible, and the

usual shops, bars, cafes, lounges and restaurants but also floor shows and dancing - all aimed at a much younger, or certainly less staid, audience than has come to be synonymous with cruise holidaying from the UK.

Here we still seem to foster the image of stiff Edwardians in evening dress and ostrich feathers, smoking cigarettes through long holders and strolling the deck of the Mauritania, or some other great vessel, on the grand tour down the Nile or across the Atlantic. Well, I am here to tell you that those days have gone and a US based cruise these days is much more exciting stuff.

Built in St. Nazaire by Chantiers de L'Atlantique, whose parent company also manufactures the TGV, Royal Caribbean's 'Monarch of the Seas' and twin ship



Performer's view. The two tiers of the main show lounge.



Excuse the boxes of props, rehearsal in progress. The stage with videowall in place.



'Majesty', currently under construction at the same yard, are truly floating shrines to hedonism. Two show lounges are provided, the largest of which can seat 1050 on two tiers, and with over 100 tables! It provides 'full' stage facilities, including resources for industrial presentations, and the largest video wall afloat which, incidentally, also happens to be trackable. There is also a cinema, a gymnasium, a night club, a discotheque and an interactive entertainment area for younger passengers.

The two show lounges can be looked at together, if only because of the commonality of the performance equipment. (For the record, the smaller lounge seats 450 and has a live performance stage with rather more restricted services.)

To find out how the concept for these areas was put together I talked to Knut Skeisvoll, one of only four in the small department at RCCL which provides supervision of all the technical aspects of equipment used on their vessels.

"Initially we set up a project team including Njal Eide, our architect for these areas, and RCCL's own entertainments people. Then we contacted consultants Jack Rouse Associates based in Cincinnati who came up with an arrangement for the stage, built a model and proposed an equipment list for budgetary purposes," he told me. "Subsequently, this specification was finalized, after further studies, with HMS of Ermont near Paris who became the specialist contractors for the lighting and sound equipment, though not for the video wall."

American specialists Kings Productions designed and produced the production staging, sets and props and designed and programmed the lighting 'looks' for the various shows. King subcontracted the two motorized tabs, of which the proscenium one is an 'Austrian', to Sapsis Rigging of Landsdowne, Penn., who are known in this context for their work on the famous animated video walls at the Palladium in Manhattan. So it was inevitable that they

were also asked to supply and install the mechanics for the Electrosonic video wall, designed and supplied by Miami-based Multivision, of which more later.

For Strand Lighting, who via HMS supplied the control system for both lounges and most of the luminaires, mainly Punchlites and Lekos, it was an opportunity to test out the viability of their new integrated global structure, to be explained more fully in a later issue of L&SI. This was particularly relevant since the ship was built and fitted out in France, the interior architect was based in Norway and the vessel would be operated from Miami. And it seems to have worked well with their offices in LA, London, Scotland and Paris-Courbevoie co-operating together to meet the special requirements of the job. (Other suppliers please note: your international distribution arrangements can often have a negative effect in such circumstances.)

The system decided on was a complex combination of two Light Palette 90s, a Premier PC-based architectural lighting controller and eight EC90 dimmer racks, integrated to allow maximum flexibility of control across the two rooms. This was achievable because the EC90 digital dimmer allows two different multiplex signals simultaneously to the same rack and the output of the performance desk can be connected to Premier so that it knows when the console is off, or to allow tandem operation on a highest-takes-precedence basis.

Thus the auditorium lighting can be controlled solely by Premier during the day, and the Light Palettes take over all the lighting at night. Otherwise, it is theoretically possible to control all auditorium and stage lighting from a combination of either system, or both, with Premier's outstations providing back-up for the Light Palettes.

Additional demultiplexing provides board control of both the High End ColorPros and Martin Roboscans. The total number of dimmer channels in the Sound of Music main

show lounge is 512 and, according to HMS' boss Michel Charles, this may even be expanded by the addition of a further dimmer processing card in the future. Followspots are two Lycian HMI575 'Midgets', smoke is from JEM ZR20s and all control equipment had to be tailored to the 3 phase delta, 220V 60Hz power supply used on-board.

The Premier, which may not be as well known to readers as Light Palette, is capable



**Bob Berkowitz, general president of Miami-based Multivision.**

of controlling 512 channels of dimming across 32 different areas, each of which can be programmed to 128 different lighting states selected by astronomical clock. One nice feature of the system is the ability in software to 'write' or change assigned labels of any of the outstations' functions in the language of your choice. This looks like a serious competitor to Electrosonic's Scenaset system which, interestingly, controls all the other architectural lighting throughout the vessel from 15 Digidim racks.

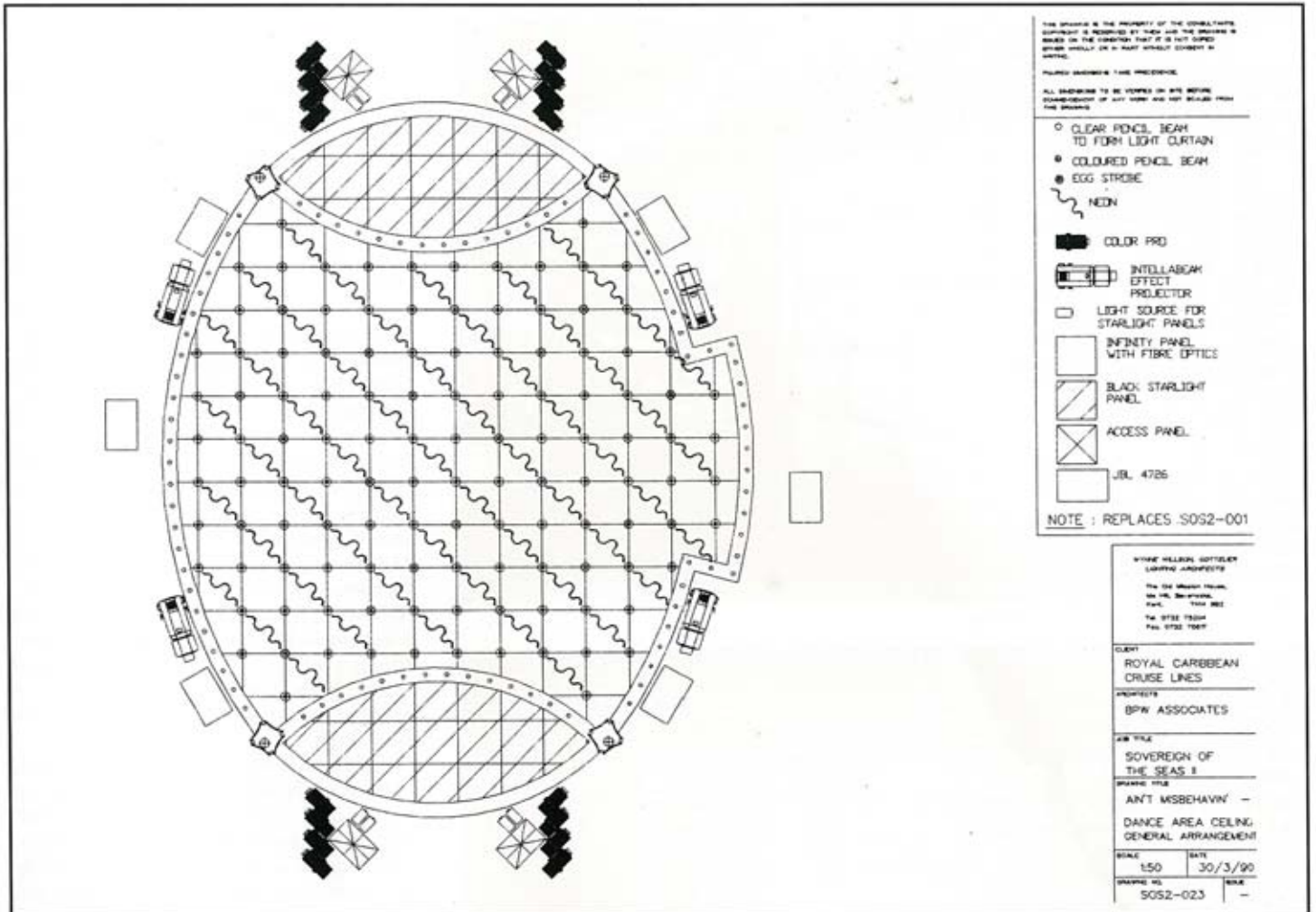
The video wall, designed by Multivision under the genial hand of its President Bob Berkowitz, is also an Electrosonic product. Using their Picbloc technology and four source capability, Berkowitz conceived a split wall of two 5 X 5 displays consisting of fifty 27" RGB monitors, which can be run together for 5 X 10 configuration, singly as a conventional wall, or divided into two parts to provide a 'scenery' dimension. Programmable sources are two 3/4" SP decks and two Laservision video disc players. Multivision also produced and programmed the video software which runs on the wall as well as a TV 'trivia' game which was custom-produced to entertain the passengers.

When it came to the mechanics, Bob deferred to the acknowledged experts in the field, Sapsis Rigging, who from their experience at the Paladium were well qualified to tackle the job. Bill Sapsis and his colleagues put together a system consisting of four motorized, 2-ton beam trolleys, with DC motors to enable variable

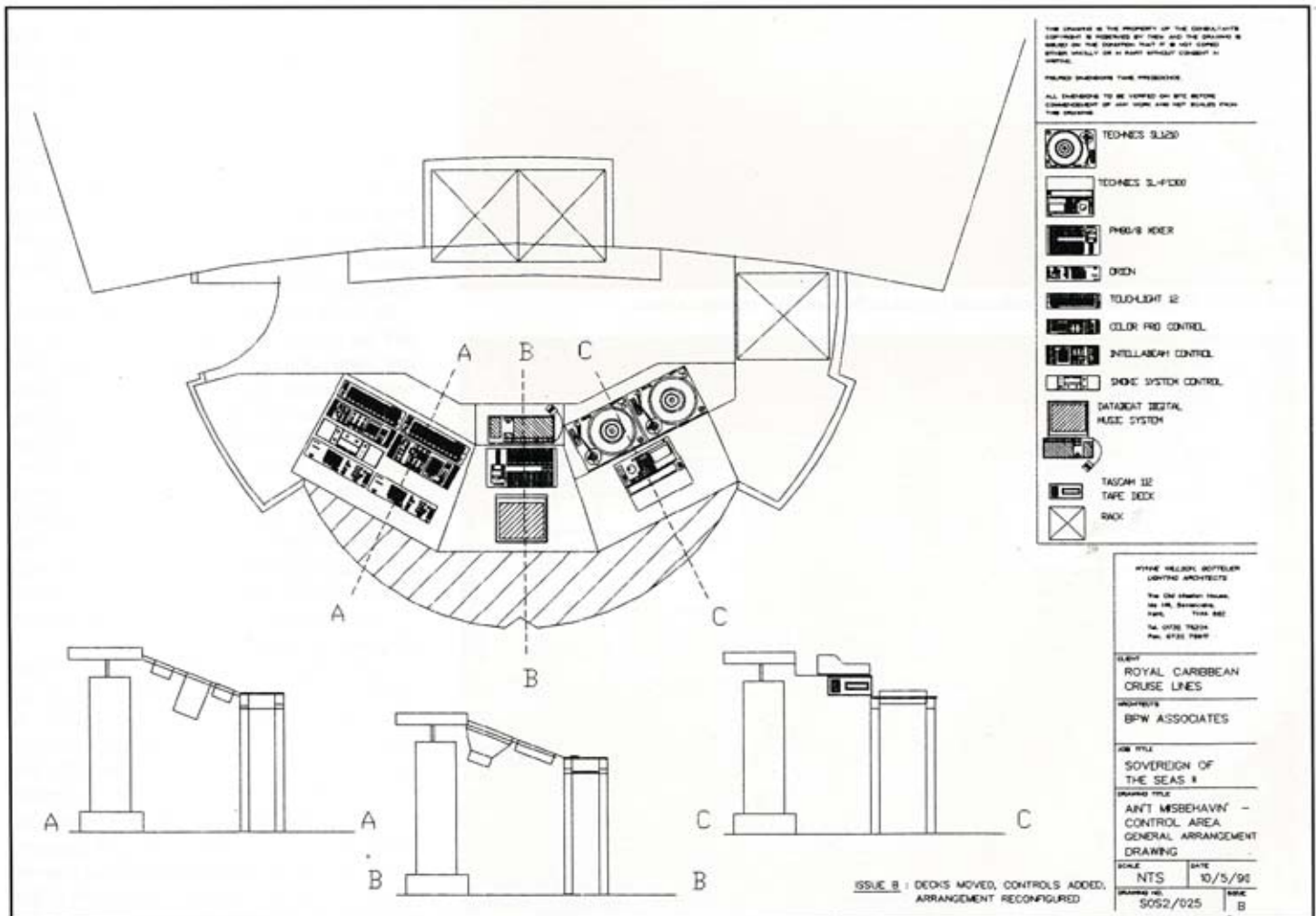


**Show lounge controls. Light Palette 90 and Yamaha PM 1800s side-by-side in the control point which has moved to the back of the auditorium.**





Wynne Willson Gottelier's light plot for the 'Ain't Misbehavin' discotheque ceiling. Support nodes double as downlights for a 'no visible support' effect.

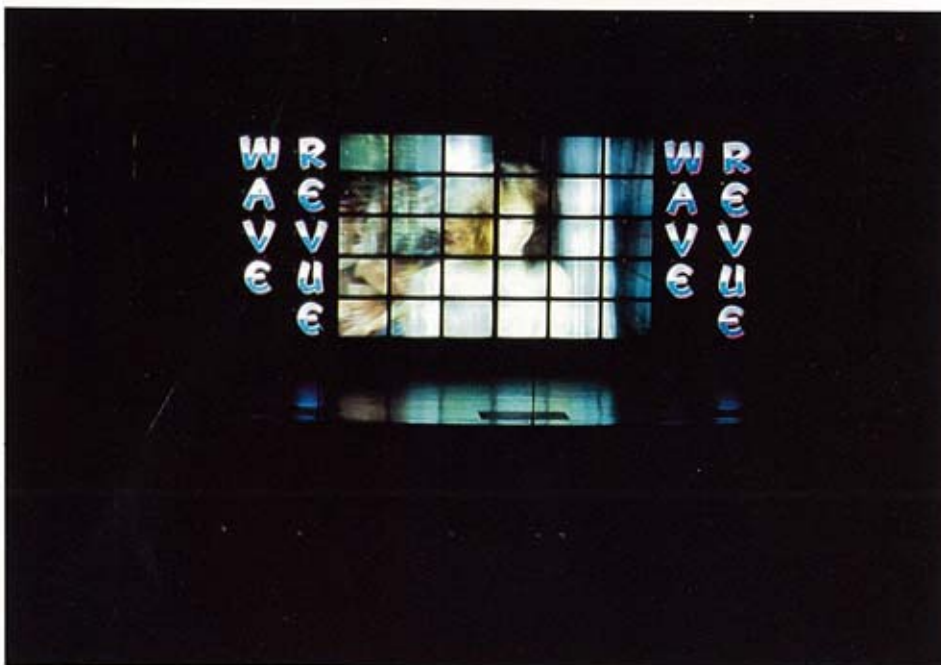


WWG CAD drawing for the discotheque control console on-board 'Monarch of the Seas'.

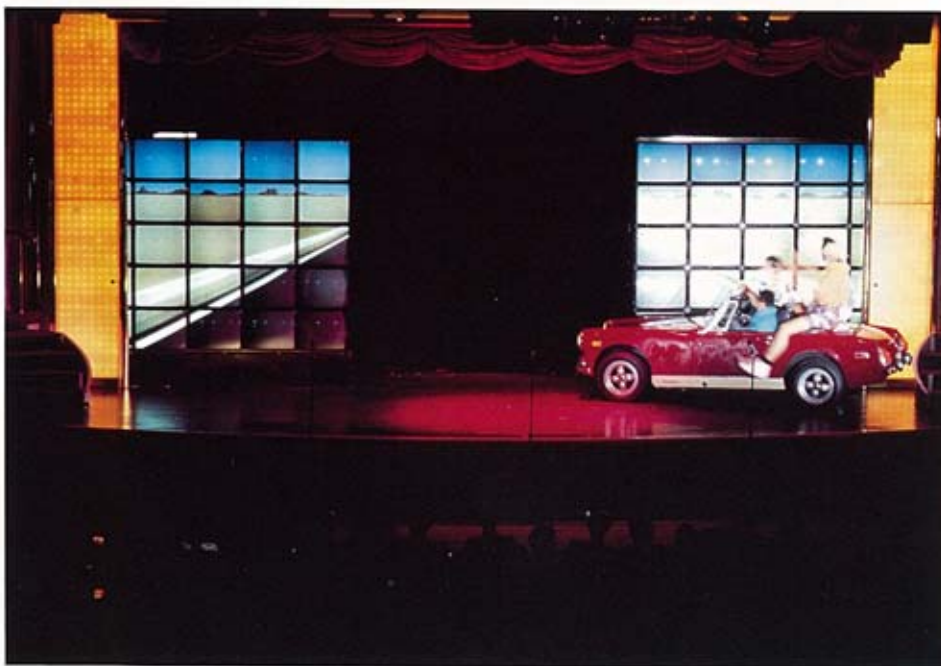




The mechanics of the videowall revealed.



Multivision's 'Picbloc' controlled videowall in one of the possible configurations.



The trackable videowall as scenery. There were problems with the list of the ship.

speed, from which the two aluminium cabinets each carrying 25 monitors are suspended. Movement control is provided by Goddard Design Inc's AWU motion controllers with ten internal position limits and collision avoidance module. There were problems, however, caused by such an awkward load and since no allowance had been made for the varying pitch of the ship, though Bill Sapsis is confident that this will be overcome.

Inevitably, there is commonality too with the audio systems in the two show lounges. Wireless mics are Samson CH258 or Vega T-38, while Shure SM57, 58s and AKG 451 are hand-held or stand-mounted, head microphones are AKG CK1 and two Sennheiser MKH816 shot guns are also used. Performance speakers are Apogee AE-12, 5's and 2's, driven through their processors by Crown Macrotechs using Klark-Tecnik 30 band, third octave eq. with DBX compressor-limiter and noise reduction. FOH audio processing control in both rooms is by Yamaha PM 1800 desks in two different configurations to suit the technical requirements of each room. The house PA is provided by dozens of Bose 102s recessed in the ceilings.

Nothing to criticize about all of that in fact, considering the difficulties of limited space on such a project the results are exceptional. The only slight black spot on the horizon, which I think all would acknowledge, being the interrupted sight lines which inevitably occur even in a double height space, still under 5m, wherever columns are deemed a necessary part of the interior design.

Mind you it had not all been sweetness and light, if you'll excuse the pun. There must have been a moment of exquisite panic when a visiting senior executive, touring the ship prior to its launch, insisted that the FOH control station, then located behind the stalls in the main show lounge, be moved to the back of the auditorium with a view to creating more seats to put bums on. The fact that the whole thing was already plumbed in, was a complete irrelevance.

So to the discotheque, and I hope readers will excuse me writing briefly about one of my own practice's productions, but this report would be somewhat incomplete without mention of it. This 350 capacity room, with interior design by Bidnell, Phillips Associates with whom Wynne Willson, Gottelier worked closely throughout, was a single height structure, meaning something barely over two metres to play with. Yet, the brief was to provide a sophisticated look, with plenty of 'balls' should the occasion demand it. Ain't Misbehavin' was to be a discotheque disguised in nightclub clothing.

Essentially, our solution was to use fibre optics extensively, both end and edge lit, using the versatile ColorPro as the source. In order to present this in an elegant package, partner Peter Willson came up with the concept of providing a virtually seamless infinity ceiling. This would be achieved by replacing the expected steel grid support, with discreet posts at the interfacing corners of each 60cm square panel. The beauty of this idea was that each of these hollow nodes could double as a downlight and house an



MR16 lamp, thus giving the impression of a mirrored ceiling with no visible means of support whatsoever.

Following a small experiment on a previous project to prove the concept, it was decided to go ahead with the 400 square foot ellipse-shaped feature, using fibre optics and neon in the infinity and peripheral Intellabeams and assorted SFX for added punch. Side emitting fibre was routed into the dance floor in undulating lines to reflect the wave pattern of the turquoise neon in the ceiling above. Partyline Lighting supplied the kit which was fitted by the, by that time, ubiquitous HMS. WWG carried out the programming during the Atlantic crossing specifying Zero 88 Orions and Betapacks for the purpose and a JEM 'Detector' system provided the essential smoke.

Dance area sound was delivered via six JBL 4726 and two JBL 4785 from Crown Macrotech amps controlled by JBL crossovers, limiters and equalizers, processed by a Formula Sound PM80/8 mixer, probably the last one we will use in view of the new model. Support at the periphery was provided by several Control Ones. Sources were a Databeat PC-based CD system with DJ interface, a Technics SL-P1200 CD player, Tascam 112R cassette and two SL1210 decks.

It was certainly an exciting moment to see

'Ain't Misbehavin' throbbing under the feet of a 'thousand' travel specialists, during its one night stopover on a promotional visit to Southampton. Although maybe it may have had more than a little to do with the open bar, even the Scandinavians were staggered at how much alcohol the British can drink, when its free!

The other area, in which we were also involved, was a small space designated for younger passengers, but lacking in specific purpose until late on in the project. A pre-condition was that this room should require minimal operational involvement and eventually an interactive concept was proposed to the client and accepted.

The idea was to provide a room where young people could congregate, play music of their own selection and make their own choice of visual stimulation between various video sources and lighting effects. A big problem was that the age range of the audience could vary from 8 to 18 plus, so it had to be assumed that an older group might be involved also. Also the final system had to operate automatically when not under interactive control.

Finally, it was decided to base the operation around the Databeat DJ system, once again. Giving the young passengers restricted access to a play list, the parameters of which could be designated in advance for

each session by the Youth Councilors on-board, and with a Sony RVP-6000 high-resolution, 60" back-projection screen as the main focal point. The latter was a requirement for this area anyway, in order to be able to provide communal access to sport, via the ships antenna system. Databeat would continue to operate in the background, from its library of some 2500 tracks housed in two synchronized Sony multiplayers, to the designated criterion, when no specific selections had been made.

Clearly the ideal way to provide access to choose the music would be through a touch sensitive screen on Databeat's monitor, however their screen information is not graphics-based and in any event the cost of such a one-off development would be prohibitive. Subsequently a solution was found with the Micro-Touch Un-Mouse, a small interactive panel which emulates the behaviour of a conventional 'mouse' by moving the cursor as traced by your finger.

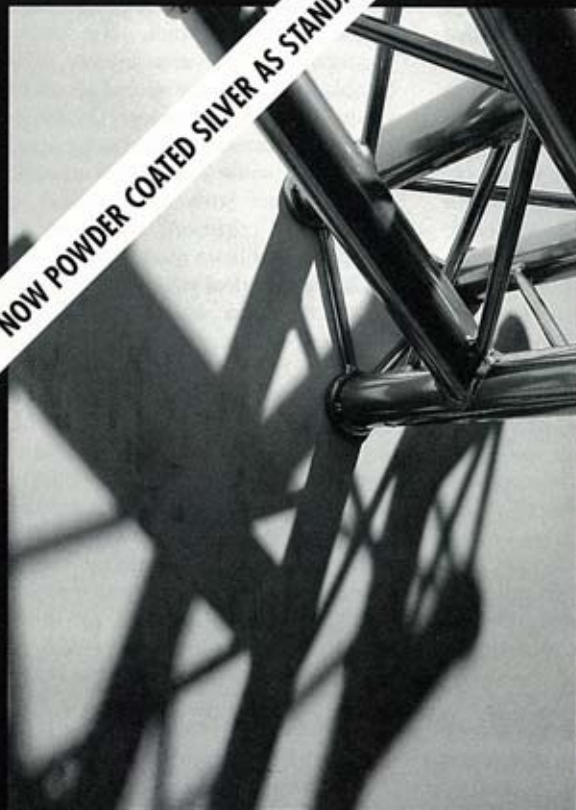
Video choices can be made from antenna, VCR, V-Cam, Nintendo or Innovative Insight's 'Technasound' video graphic system. This latter provides the background imagery when in stand-by mode and it also yielded the possibility of making 'intelligent' choices for the interactive lighting system, so that this too could run automatically when required.



Some of the lights behave in the discotheque. The effect of the 'seamless' concept can be clearly seen.



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The lighting control system too was a complex combination of equipment in order to achieve the desired result, remembering that at the time of design no low-cost, multiplex controllers were available. Zero 88 Orions and Touchlite 12s were interfaced with the Technasound music interpreter, via a Pulsar signal patch.

Most of this equipment was concealed from public access, apart from one Touchlite which gave latest-takes-precedence entree to several pre-programmed lighting sequences, including some WWG uniquely designed 'articulate' lights nicknamed caterpillars because of their undulating, organic form of movement. Some of these devices could also be controlled manually by passengers from joysticks provided.

Other lights in the scheme included PAR16s, Coemar Spartans, neon, rotating MR16 battens custom-made by James Thomas and a revival of the old UV-to-Red fluorescent trick, put together for us by Lighting Technology. Smoke, which also had to be automatic, was the JEM Detector system using 'Stage Haze' fluid to try to maintain a constant background medium for the lights.

As the sound would be running continuously also, it was necessary to provide automatic volume control which was programmable to the time of day and sensitive to the ambient noise generated according to the size of the crowd in the room at any moment. So a Quatro AP100 AVC was selected, and interfaced to the ship's alarm also for muting in case of emergency, with a Citronic SM350 mixer also in the line should operator override be required. Audio Logic equalisers and limiters were assembled together in Xixin racks with Crown Macrotech amps, otherwise as before, JBL components were used for sound transmission.

The jury is out on just how popular this concept will prove with its target audience but we have everything crossed and are very hopeful of its appeal.

I hope this has given a flavour of how complex working on a modern cruise liner can be and the high levels of entertainment technology currently employed by far sighted operators like Royal Caribbean and its charismatic CEO Richard Fain. One thing's for sure, now 'Monarch of the Seas' is plying between Pacific atolls, cruisin' ain't never goin'a be the same again.

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- Tuesday 31st March - Masterpiece 108 - Introduction
- Tuesday 28th April - Masterpiece 108 - Advanced
- Tuesday 26th May - Masterpiece 108 - Introduction
- Tuesday 30th June - Masterpiece 108 - The Hands on Controller
- Tuesday 28th July - Masterpiece 108 - Introduction
- Tuesday 25th August - Masterpiece 108 - The Automated Controller
- Tuesday 29th September - Masterpiece 108 - Introduction
- Tuesday 27th October - Masterpiece 108 - Advanced
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# PLASA NEWS

## SIB Rimini

At the last minute PLASA succeeded in reaching the target figure of 10 member companies and a group will therefore be attending the coming SIB event in Rimini, Italy, in March. The main group exhibit area will include a PLASA information stand to support the companies attending and an interpreter will be provided by the DTI for the duration of the event.

## Pro Sound & Light

PLASA member companies and other companies interested in exhibiting at the Pro Audio & Light Asia 92 event to be held in Singapore from 8-10 July this year should contact the SCIF office immediately if they want to take advantage of the special rates and travel subvention offered within the SCIF/DTI scheme.

Completed application forms must be received back before the end of this month, so there is no time for delay. Ring Ken Walker at the Sound & Communications Industries Federation now on (0628) 667633 for details and an application form. Management fee for SCIF and PLASA members is at the reduced rate of circa £300.

## New Members

**Light & Sound Design Ltd**  
of Birmingham 021-766 6400  
Contact: Simon Austin

**Vestax Europe Ltd**  
of Haslemere (0428) 653117  
Contact: Rob Peck

**Voltaglight Soundspin International**  
of Croydon 081-689 2299  
Contact: Phil Dinnis

**Leisuretec**  
of Luton (0582) 23300  
Contact: Mike Hendon

## Show Brochure Published

Philbeach Events Ltd, organisers of the PLASA Light & Sound Show, now have copies of the 1992 Show brochure, giving full information on the event together with detail from the MORI exit survey at the 1991 show.

If you're considering exhibiting, ring Philbeach on 071-370 8215 now to request your copy.



1992 PLASA Show Catalogue: all the information you need to know about the foremost exhibition for the lighting and sound industry.

## EXHIBITION DIARY

### Sound 92

February 4-5, 1992 - **London** - Sound and Communication Industries Federation, 4B High Street, Burnham, Slough, Berkshire SL1 7JH. Telephone (0628) 667633

### Siel 92

February 16-19, 1992 - **Paris** - Bernard Becker Blenheim, 22-24 rue du President-Wilson, 92300 Levallois-Perret, Cedex, Paris, France. Telephone (1) 47.56.50.63

### USITT Conference & Stage Expo 92

March 4-7, 1992 - **Seattle** - USITT, Suite 5a, 10 West 19th Street, New York NY 10011-4206, USA. Telephone (212) 924 9088

### Frankfurt Musik Messe

March 11-15, 1992 - **Frankfurt, Germany** - Collins & Endres, Morley House, 314/322 Regent St, London W1R 5AB. Telephone 071-323 6570

### SIB/MAGIS

March 22-25, 1992 - **Rimini, Italy** - PLASA, 7 Highlight House, St Leonards Road, Eastbourne, BN21 3UH and Knights Management Services, 1 Knights Garden, Hailsham, East Sussex BN27 3JR. Telephone (0323) 442747

### Expo Musica 92

April 22-26, 1992 - **Madrid** - IFEMA, Recinto Ferial, Casa de Campo, Avda. de Portugal, s/n., 28011 Madrid, Spain. Telephone (91) 470 10 14

### Pro Light & Sound Expo 92

May 14-16 1992 - **Sydney** - PO Box 913, Adelaide, South Australia 5001. Telephone (08) 296 4189

### Showtec 92

June 2-4, 1992 - **Berlin** - Overseas Trade Show Agencies Ltd, 11 Manchester Square, London W1M 5AB. Telephone 071-486 1951

### APRS 92

June 3-5, 1992 - **London** - APRS Ltd, 2 Windsor Square, Silver Street, Reading, RG1 2TH. Telephone (0724) 756218

### World Lighting Fair Tokyo 92

June 24-26, 1992 - **Tokyo** - Zenshyokyo, Kombaba Neo-Palace-501, 3-1-1 Ikejiri Setagaya-Ku, Tokyo 154, Japan. Telephone 03-3706-2001

### Pro Sound & Light Asia 92

July 8-10, 1992 - **Singapore** - Business & Industrial Trade Fairs Ltd, 28/F Harbour Centre, 25 Harbour Rd, Wanchai, Hong Kong. Tel (852) 575 6333.

### PLASA Light & Sound Show 92

September 6-9, 1992 - **Earls Court 2, London** - Philbeach Events Ltd, Earls Court Exhibition Centre, Warwick Road, London SW5 9TA

### Photokina

September 16-22, 1992 - **Cologne** - KölnMesse, Messe-und Ausstellungs-Ges.m.b.H.Köln,Messeplatz 1, Postfach 21 07 60, D-5000 Köln 21

### Lighting Dimensions International 92

November 20-22, 1992 - **Dallas** - LDI92, 135 Fifth Avenue, New York, New York 10010 USA. Telephone 212-353-1951.

## Glantre Engineering are seeking an Audio Engineer and a Workshop Technician

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# CLAPHAM JUNCTION CULTURE

## Catriona Forcer visits a newly-opened London venue

Not only had Vince Powers of The Mean Fiddler Organisation gained a respected reputation as the man who restored Reading Festival and Fleadh Festival but also as the main instigator behind the re-emergence of quality live venues in London. Already the owner of The Mean Fiddler, Subterranea and The Powerhaus, he has recently opened the new flagship of his organisation, The Grand in Clapham.

The Grand is an Edwardian variety theatre situated by Clapham Junction which hasn't been in use for over 12 years. The Mean Fiddler Organisation have bought it back to life using it for what it was originally intended - live music. Being a listed building, many of the original features have been kept or refurbished. The original architect was the rather eccentric Edward Woodrow who produced an eclectic building incorporating Japanese, Chinese and Spanish influences. Retaining the character of the place, the current architects Madigen and Donald, who were responsible for designing The Powerhaus and Subterranea, have entwined the old with the new. The result is a curious mixture of styles which, surprisingly, succeeds.

The renovation of The Grand was held up due to problems with some of the local residents who objected to a live venue opening in their neighbourhood. A music, dancing and liquor licence was finally granted after the opposition were placated by things such as sonic surveys. Due to the fact that people had to be laid off when it looked as if there wasn't going to be a licence, only the downstairs of the theatre is currently open. In July it is planned to open the two balconies raising the audience capacity from 650 to 1,600.

"Bands that you would normally see at The Astoria or The Town and Country Club will now be taking in this venue as a London date," explained David Phillips, the club's promoter. Acts already booked include Edwyn Collins, That Petrol Emotion, Fatima Mansions, The Godfathers and Soho.

Bryan Leitch of Art of Darkness was responsible for the lighting installation at The Grand, having already worked with Vince Powers at his other venues. A couple of years ago he rebuilt the system at The Mean Fiddler as well as designing rigs at Subterranea and The Powerhaus. Bryan has also worked extensively at the festivals as well as touring with bands such as The Manic Street Preachers and The Cranberries. Many people have not heard of him or his company as he admits that he loathes



The Grand, Clapham - dark for 12 years.

self-publicity (hence no photo of him) preferring his work load to grow with his reputation. "I've never advertised," stated Bryan. "I get the work because I enjoy it so much."

The budget for the light and sound installations was fairly generous as good equipment was needed for such a quality venue. It was also necessary to have a comprehensive range because the load in is very small. David Phillips was confident that there would not be the need to bring in much gear, other than backline.

"I've kept the rig fairly standard, although versatile," explained Bryan Leitch. "It's not too fancy and there are facilities to mount effects such as Golden Scans on it. There is also the room out front to bring your own lighting board, if that's required. Loading here is next to impossible. Even when we've been working here delivering, it's been a nightmare. I must have had about 16 tickets even though the wardens knew we were unloading. However, there's a big car park down the road for the punters."

"I've got 18 colour faders, mainly on Lekos, as it gives a lot of flexibility and I use them as an effect. A lot of people say colour faders are expensive but they aren't if you think what they can do, not just the colour changing but also the nature of the way they change. For the same

reasons I've got Wybron 8-lights. I know they are bulky but they provide a reasonable amount of washes: good, solid washes without buckets of lights up there. I prefer to invest my money in good quality equipment rather than enormous amounts of Cans. We're aiming at getting moving lights in here fairly soon but, again, not lots of them. It'll probably be Golden Scans or Intellabeams as I don't think anything else is realistic. I don't intend to use them as disco moving lights, I prefer to use them in blackout and bring them up in different scenes. I'm also using quite a lot of Par 36 ACLs as well as Par 64 ACLs to give a nice contrast. Alongside these are two Pani followspots. Control is a Jands Event 96 way and a Pan Command 'Colour Cue' both linked to a colour monitor. Bryan Leitch is a great fan of Jands boards, already owning five, and he insists that nobody who has ever used them has disliked one.

"The Event is really user-friendly," enthused Bryan. "We've got it on screen which has much more information than just on the board. There are an enormous amount of Jands being used throughout Europe. A lot of people insist on an Avo or Celco board only because that's what they are used to, or they feel that they should use them. The facilities on a Jands are really advanced and, above all, it's logical. Some people say that they are unreliable but none of



Edwyn Collins rehearsing, with rigging and focusing still to be completed



A view from the stage.





Pete Kellet of Encore (nearest camera) with Dave Freeth of The Mean Fiddler Organisation at the Midas desk.

mine have ever gone down.\*

The Mean Fiddler Organisation approached Encore PA early in the planning of The Grand stating their specific requirements for a large sound system that was reliable and simple needing low maintenance. It was necessary for the system to be good enough for any calibre of artiste. An excellent in-house system was needed because of the local residents and, also, it was thought unwise to move heavy equipment around a Grade 1 listed building thus minimising the risk of damage to the ornate interior. Pete Kellett, of Encore, worked closely with Vince Powers and Dave Freeth, the house engineer, in fulfilling these requirements.

Encore were pleased to take up the challenge of producing a powerful yet neat and tidy system, something that is next to impossible on the road. "When we originally budgeted for this job we decided to spend the money on the important things like the mixing desk, a good speaker system and amplification rather than on effects and gadgets," explained Pete Kellett. "We've supplied very high quality equipment which was really expensive. For example, the front of house mixing desk is a Midas XL3 400ch which is quite complicated for a house installation but justified because of the sound quality. There are enough channels to generally cater for two bands. It really does produce the best live sound and it is British built. I was a little anxious that it might be over complicated but now, after a few concerts, my fears are diminishing. There is a sophisticated five way system which already has house equalisation set

up for the room which is a good starting point for the engineers. We've made the effects rack quite simple by not supplying too many effects but adequate and good ones which are quality units.\*

The monitor system is quite powerful, in fact, there are more amps on the monitor than the PA and it provides a very good stage sound. There were a lot of sound tests to check the sound proofing which is so good that even with the sound on full blast it is barely audible outside. The monitors are all bi-amped except for the side fills which are tri-amped.

On stage there are no amplifiers; they are housed in the orchestra pit, so there is no speaker cabling. Encore also had a special plinth constructed for the monitor desk with a stage box built into it to make the cabling neater. The result is an extraordinarily clear stage compared to most gig situations.

A specific PA for the venue was built by Encore who initially had problems deciding where to place it. There wasn't much space between the proscenium arch and to stack the PA on stage would ruin the aesthetics of the room. It was also necessary to leave the attractive pillars at the side showing, rather than cover them with black boxes. There are no PA wings as the arch goes straight into the auditorium. Either side was a 7ft space, with height restrictions due to the ornate architecture, into which a large PA had to fit. Somehow Encore managed to install a neat, tidy 15kW PA system into that small space!

They supplied two megaphones which are built into the speaker system in case of a fire alarm. The PA can be switched off by remote from the box office in case of fire. Also, Encore built a specific portable disco console which, although at the moment is by the mixing desk, can be put on stage.

When the remaining two balconies open at The Grand later this year Encore will then install a flying system.

#### PA SYSTEM, THE GRAND

##### FOH & control equipment

- 1 x Midas XL3 40 ch
- 2 x Midas XL3 3 power series

##### Control rack containing

- 2 x KT DN 27 A graphic
- 1 x BSS MCS 200
- 2 x DBX 160X COM/LIM
- 1 x KT DN 60

##### Multi-core & stage box

- 1 x stage box
- 1 x multicore
- 1 x returns 12 channel

##### Rack containing FOH effects

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- 1 x Roland SDE 3000 delay
- F2 speaker system (ground stack)
- 4 x BSX sub-bass
- 8 x Martin Audio bass
- 2 x F2 special packs

##### Monitor system

- 1 x Soundcraft 8000 4Q/16
- 2 x PSU

##### Monitor rack containing

- 6 x KT DN 360 graphics
- Monitor speakers and wedges
- 10 x Martin LE 600 Bi amp wedges
- 2 x Martin Audio FR3 bass (side fills)
- 2 x M300 mid range (side fills)
- 2 x Martin Audio HF 2M (side fills)
- 1 x Martin Audio FA3 bass (drum fill)
- 2 x Martin Audio HF 2M (drum fill)
- 8 x MX4 crossovers
- 1 x cassette player

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- 10 x D1 boxes
- 8 x Shure SM 57
- 6 x Shure SM 58
- 6 x AKG 451 + CK1
- 6 x Sennheiser MD 421
- 2 x EU RE 20
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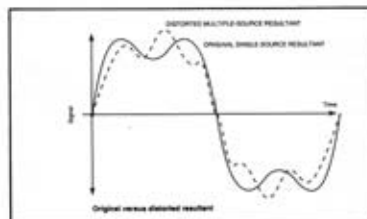
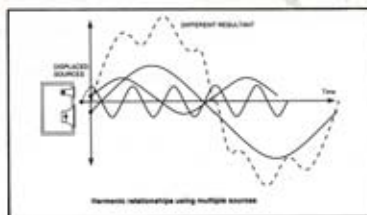
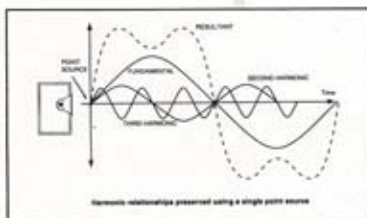


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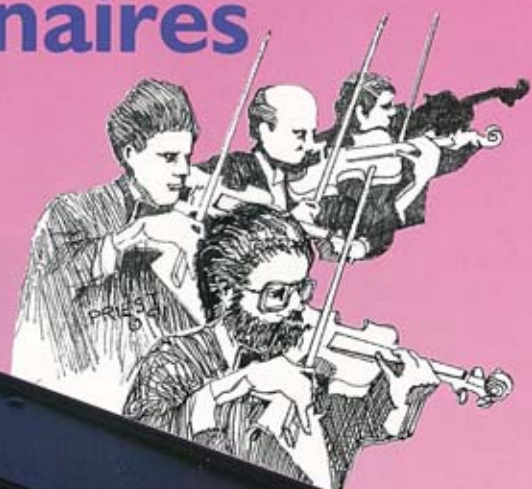
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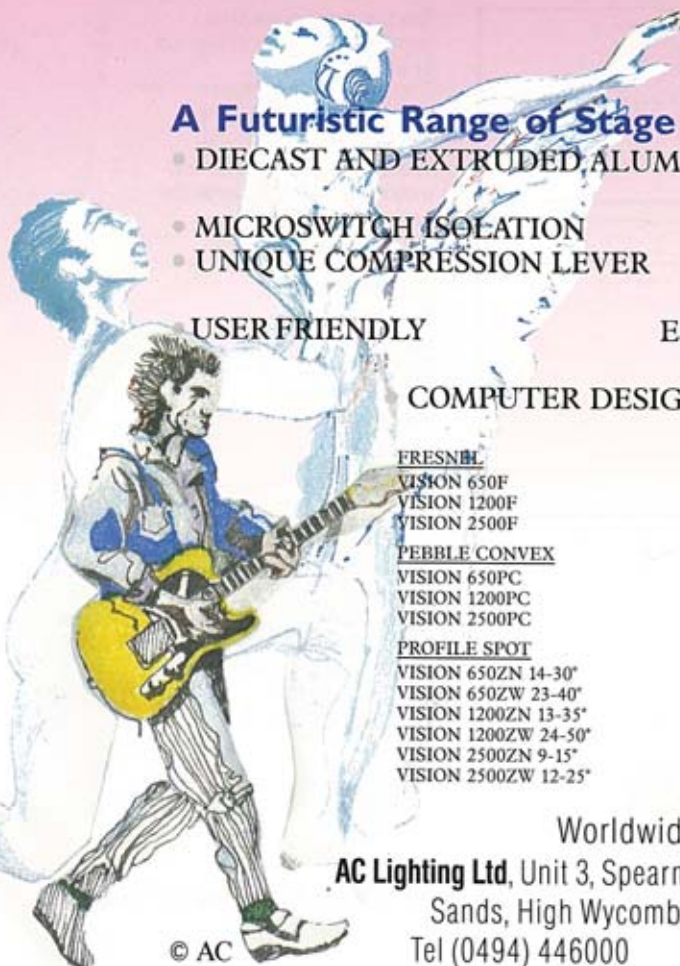
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# DRESSED FOR THE PART

Julian Beech discusses the myths and methodologies of radio microphones in the amplified world of the theatre

Sophisticated sound reinforcement has now become almost common-place in the theatre. We have reached the point where a number of productions would be impossible to stage without electronic assistance and many shows are written specifically with elaborate sound reinforcement in mind. However, the application of audio technology to theatrical productions can be looked upon as either a technical curse or a creative endeavour, depending on one's perspective.

Theatre sound is, and deserves to be seen as, an important creative art. It only becomes a curse when its application is either misunderstood or mishandled. One clue as to the appropriate application of theatrical sound reinforcement lies in the phrase itself. Reinforcement means exactly what it says - using technology to reinforce the sound, rather than reconstructing or recreating it.

The primary objective of any system is to maintain intelligibility throughout the auditorium, reinforcing the artistes' voices only to the desired level. Ideally, the audience should hear every word clearly, without being really aware that any reinforcement was present, and the performers' natural voices should still be perceived as coming directly from the stage. The question of "how loud should it be?" depends on the context in which a system is being used.

In a musical, for instance, the single loudest unamplified component is often the sound of the drum kit. There is obviously a practical limit as to how quietly a drummer can be expected to play and this limit defines a minimum level for the whole sound system. Maximum control over the individual performers is required, in order to balance speech or song above the sound of the kit, other acoustically audible instruments and sound effects.

The ideal solution, of course, would be a separate microphone for each performer, with no other conflicting sources in the vicinity. This ideal is relatively simple to achieve in a recording studio but is considerably more difficult on a stage or in an orchestra pit.

Close-micing techniques provide a solution, and their development in live sound has moved hand-in-hand with the progress of the radio microphone.

The miniaturisation of the radiomic has been one of the single most critical influences on sound system development. It has enabled sound designers to position a microphone as close as possible to an artiste's mouth, and at a constant distance, in order to stand the best chance of creating a valid balance under difficult conditions. It also provides the potential for a curse to gain a foothold within theatre sound.

Spurred on by the increased availability of dedicated radio frequencies, radiomics have found their way into a range of productions, including musicals, opera and drama. Their successful application depends on subtle and sympathetic handling, combined with an understanding of the limitations involved. The 'curse potential' arises from a number of myths which accompany the radiomic phenomenon.

A particular artiste may be badly cast in a role, and suffer from a basic inability to project their voice. The projection problem could be further compounded by their

ineptitude as a trained performer. Myth Number One says that this scenario can be solved by the sound designer. Unfortunately, no microphone technique can improve a performer's diction, or their ability to act convincingly and effect an audience's emotions.

This particular myth also gives rise to the erroneous belief that the sound system, or its operator, can compensate for a performer's hangover, bad cold or occasional lack of enthusiasm. No amount of system design expertise or operator skill can provide an artiste with synthetic tonality, dynamics and quality of performance. The true state of a performer's being, warts and all, will only be made all the more obvious.

Myth Number Two involves a show's venue. Just as a performer needs to be matched to a specific role, a production has to be staged in an acoustically suitable venue. Should a compact and intimate show be staged in a theatre with a too open and lively acoustic, the venue will contribute nothing to enhance the atmosphere of the show and the sound designer is likely to be called upon to compensate.

Using a sound system to counteract a lively



Over-the-Ear radiomic showing clip and cable taped in position.



Hairline radiomic with mic exposed.



Hairline radiomic - the audience view.



acoustic is notoriously difficult but radiomics can help to some extent. They can be placed close to the source, raising its relative level above the ambient sound. The end result can be a system running too loud, in an attempt to ride over and mask the inappropriate acoustics, whilst the real solution should have entailed a change of venue or an undoubtedly impractical re-tune of its natural acoustics. This second myth results from an inaccurate expectation of what is feasible, and points to the 'unrealistic expectation' syndrome which lies behind the myths in general.

Although the radiomic has provided greater freedom for the arranger and orchestrator, allowing a wider orchestral dynamic range during vocal passages, the cross-over point between creativity and cacophony has become tighter and more critical.

A specific orchestral arrangement may be too thick and heavy for a particular vocalist, resulting in difficulties for the audience, who struggle to hear the lyrics. Whilst absolute volume levels can be theoretically catered for, arrangers still need to be aware of how orchestration can affect the voices. They should not presume that because the performers are wired for sound, a strident brass section can provide a suitable contrast for a delicate vocal score. The orchestration myth is a subtle one, but has very real implications for an audience.

Set and costume designers also have to be aware of the sound department's requirements. Radiomics have provided performers with almost complete mobility, and therefore less dependence is needed on

microphones hidden in the set or placed on the floor. However, the acoustic effects of set design can still have a significant impact. Materials and shapes which inhibit the naturally reflective acoustic of a stage set should obviously be avoided, otherwise the design freedom myth can produce distinctly unnatural aural effects.

A similar situation exists in the costume and wig departments, who have to make regular allowances for accommodating microphones and transmitter packs. Combining masks, complex headwear or wigs and miniature radiomics requires careful handling and attention to detail, together with an awareness of the related mechanical and acoustic problems.

Ten years ago radio microphones were larger and, if used at all, were generally fixed to a lapel. The technology has undergone continual development, with the current equipment offering very high degrees of technical quality, performance and reliability. They are also now much smaller, allowing discrete and almost invisible placement behind the ear or just on the hairline. If too many of the microphone myths coincide, the combining problems can result in the microphone creeping closer and closer to the performer's mouth, giving rise to the 'carbuncle effect'. All subtlety is therefore lost, and audiences may just as well see small portable microphone stands hanging around the artistes' necks.

All the above myths and misconceptions stem from a lack of education and clear awareness regarding the issues involved. Should these myths move too closely towards becoming facts, the amplified world would



Julian Beech is one of Autograph Sound Recording's principal sound designers and a director of the company. He specialises in large-scale traditional musicals, modern sing-throughs and sound effects drama. He was previously head of sound at the National Theatre and sound manager with the Royal Shakespeare Company in Stratford. Julian has played a significant role in the development of theatrical applications for radiomics and lectures widely on the subject to international organisations including the AES.

dominate the theatre. This would have gradual but long-term negative effects on audiences and knock-on commercial implications for live theatre.

The radiomic phenomenon can offer the theatrical world considerable creative freedom, but it deserves careful handling on the part of the sound designer and an informed attitude from the other creative departments. Sound reinforcement in the theatre need not be a curse and with appropriate attention the quality and enjoyment it can offer will continue to be exploited for the audience's benefit.



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# ON THE MOVE

L+S invited Philip Nye, chief engineer with DHA Lighting, to comment on moving equipment in general and DHA's Digital Light Curtain in particular

When a lighting rig is a simple desk, dimmer and lantern combination, a high level of control over the equipment is assumed and is restricted only by the quality and suitability of the particular components. However, with a rapidly increasing amount of more complex equipment on offer lighting designers frequently find themselves having to wrestle with equipment which is at best awkward and at worst virtually impossible to control.

During the design of DHA's Digital Light Curtain, controllability was a very high priority - previous light curtains, whilst proving the power of the device as a lighting tool, had had the crudest of control systems. The new Digital Light Curtain was designed from the bottom up with a view to curing these defects. However, as other new features were introduced a number of new issues were raised and addressed which are of a more general application than simply making light battens move.

The Digital Light Curtain is self-contained with its own tilt drive and colour scroller built-in as an integral part of the unit - previous designs had been bolted together in lines with a single drive motor while scrollers were a separate add-on. It had 320 degrees of tilt movement driven by a microstepping stepper motor; even without microstepping an internal resolution of 0.04 degrees is possible - other light curtain rotators are servo driven with lots of backlash, poor resolution and repeatability. The colour scroller will comfortably hold anything up to 20 colours while previous scrollers for light curtains have been restricted to exactly 11.

These features will raise several questions: How do we adequately control a device of this accuracy? If units are separately driven how do we ensure that when they are hung in a line they will all move together? What if one unit must be hung in reverse because scenery is in the way? How can an operator rapidly select colour 14 on a 17 colour scroll (a nightmare on a conventional desk)? If several units are making different moves at the same time how do we ensure that they all begin and end together?

These are a few of the questions which we met head-on, and they are not unique to the Digital Light Curtain. The traditional solution is to try and make everything 'look' like a dimmer with a range from 0 to 100% and rely on the desk operator to sort things out. But even though desk manufacturers - particularly Celco with the Navigator - are waking up to some of these difficulties, the basic approach becomes increasingly untenable with new products.

The Digital Light Curtain control system is completely new and is designed to be low-cost, extensible and to address many of these difficulties. The first point established is that the operator or designer should be free to think in terms of real units and not to continually convert percentages and numbers. The Digital Light Curtain is given its tilt angles in degrees (to one decimal place) and they can be positive or negative. Colours are specified by their position on the scroll so that colour seven is the same whether there are only seven or 20 colours on this scroll. To allow the designer to select split colour for special effects the scroll position can also be given to one decimal place so colour 8.5 will be half way between colours eight and nine. All moves for both tilt and colour are timed in seconds (to one decimal place) so no matter how long or short the move is, the time taken can be precisely controlled.



The DHA Light Curtain as seen at the PLASA Light and Sound Show.

One implication of this way of specifying moves is that if two adjacent units receive the same command at the same time they will move in perfect unison - there is no worry about whether they have identical ranges set - however, to allow greater control of rows of light curtains each unit has a movable zero point (the position it goes to when 0 degrees is specified). As all other positions relate to the zero point this allows units in line to be finely aligned with each other to produce a continuous sheet of light many metres wide. Since the zero position can be anywhere within the 320 degree tilt range of the unit it is also possible to set zero at whatever point is convenient to the designer: straight down, the front of the deck, the bottom of the cyc, or whatever.

If a unit has to be swapped with a spare the new light curtain only needs to have its zero point adjusted and it's ready to run. Another refinement here is that the direction of movement can also be reversed so that positive tilt angles can be set to be up-stage or down-stage without re-hanging the fitting. If one unit in a line must be hung reversed, because of scenery constraints, for example, it can still be made to move in unison with all its fellows by telling it that it is a reversed unit.

To prevent light curtains blinding the audience inadvertently or lighting things they shouldn't, the user can set high and low limits of tilt beyond which they cannot be made to move.

The colour scroller works by sensing tape markers at each colour. It keeps a table of the positions of each colour which is updated as it scrolls back and forward so that it knows how

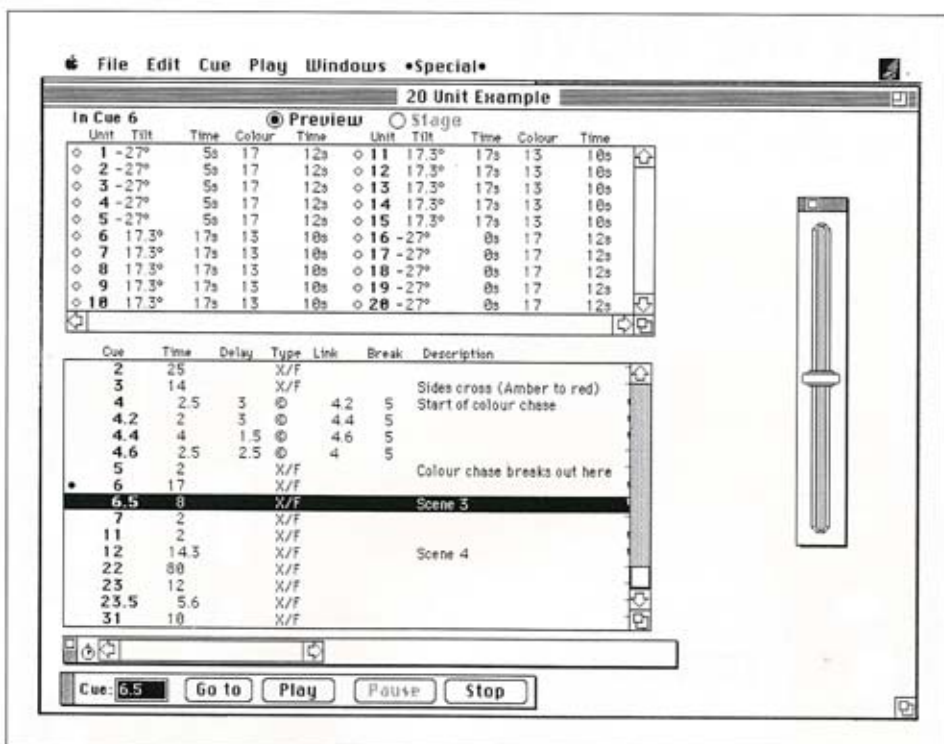
many colours it has and where they are. Because it knows where to expect the marker tape it can ramp down its speed and stop precisely at the marker at the cue time given. If a gel panel has been cut too wide the device will not be fooled but will adjust its speed accordingly. Once the unit has been calibrated (it scrolls from end to end counting colours and noting their positions) it is even possible to remove a sensor tape - the scroller simply goes to the point where that tape used to be! As with tilt the scroller can be reversed so that colour 20 becomes colour one and vice versa, so it is even possible for a unit hung backwards in a chain to appear to scroll in the same direction as its neighbours. Unfortunately, it's also necessary to make a reversed scroll for this!

Tilt and colour moves are independent; a colour move can be started during a tilt move or vice versa, and both are individually timed in seconds from 0.0 up to 3600.0 (one hour). Obviously, a real move cannot be made in zero seconds but this translates as 'as fast as the hardware will allow'. If a new move is transmitted to a unit before it has completed the last, the latest takes precedence and the unit will change smoothly from one move to the next, finishing at the right position at precisely the right time.

At the slow end of the range movement is uncannily smooth, particularly in the scroller which can be made to creep imperceptibly from one colour to the next over several minutes - great for sunsets!

All these control features are built into each light curtain and are not a function of the



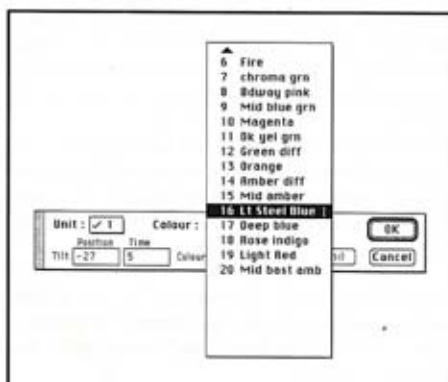


A screen shot of Light Moves.

controller. Important configuration features such as zero point, direction reversal, and tilt limits are retained even when the device is powered off so they need only be set once. The control system is fully bi-directional; it is possible for the controller to interrogate each device in a rig not only for such things as its current position but for the number of colours on its scroll, its current velocity, the time remaining for a move, and what kind of device it is (in this case 'Digital Light Curtain' etc).

All this may suggest a very high cost but in fact saves on the cost of both producing the Digital Light Curtain and running a rig in a number of ways. On the production side the unit itself simply has two control connections, Logic In and Logic Out. It has no switches, knobs or other adjustments, not even address switches. The control network operates at modest speeds (in electronic terms) using standard protocols so there is no need for expensive specialist hardware in the electronics and the microprocessor, which does all the work inside, does not have to spend most of its time decoding the control input. All this means much simpler, smaller and cheaper electronics. In use the Digital Light Curtain can be simply hung on the bar (it comes with hook clamps fitted) connected up and flown out. All adjustments such as zero positioning etc. are done remotely from the controller. The logic cables are daisy-chained from the controller through all the units from one to the next using robust, low cost, crimp-on connectors.

The controller option - 'Light Moves' -



Editing a cue . . .

currently supplied free with the units runs on a Macintosh computer (even an \$800 Mac Classic). Light Moves extends the principles established above with additional functionality and the full benefit of the Macintosh's intuitive user interface, while still maintaining a format of cues familiar to any board operator or lighting designer.

Cues can be set up with separate times for each unit and for tilt and colour moves. Tilt positions and colours can either be typed in - in degrees and colour numbers - or they can be moved directly using a mouse or track-ball. The colour name (or any other useful text) is displayed beside the colour position in a pop-up selection menu making it possible to scroll to 'Dark Bastard Amber' by simply choosing it by name with the mouse. Cue editing this way can be performed on individual units or whole groups of units at once with equal ease.

Groups of units can be selected for editing by single keyboard short-cuts giving very rapid

access to groups of Light Curtains which are required to work in unison, while still allowing individual control when required. As with virtually all Macintosh programs, cutting and pasting can be used to transfer values between cues, between different cue sheets, or even into or from other programs.

Units may be freely patched or re-patched to different numbers by 'point and shoot' menu choices - if a unit must be replaced the new one is simply patched in. All the configuration features mentioned above, such as zero point, direction reversal and high and low limits can be altered at will. Cues (numbered from 0.1 to 999.9) may be linked with timed follow-on for sequences and chase effects. Cues can overlap, and certain units can be moved manually whilst others are timed during a single cue. The list goes on. . . Despite the dedicated controller Digital Light Curtains don't have to work in strict isolation from the rest of the show. It is possible to slave the Macintosh to a variety of other lighting desks. At the simplest level this can be a simple 'play next cue' input, but with certain desks more sophisticated communication is possible. The Strand Palette 90 can be set to send a remote trigger which includes a cue number, so that even if cues are played out of sequence Light Moves can keep up. The cue numbers don't even have to be the same on both desks. (The main desk in Miss Saigon on Broadway triggers the Digital Light Curtains this way.) With a Celco 88 series desk (Major, Gold etc) it is possible, within Light Moves, to attach a particular Digital Light Curtain move to any cue fader on any page on the main desk. As that cue begins to come up the corresponding move is automatically triggered.

To conclude: by going beyond the limitations of 0-10volt or DMX control schemes we have been able to make a moving light which will 'whirl around' with the best of them but is capable of extremely subtle fine or slow movements which are vital for theatre applications. At the same time control of these movements is not a chaos of multiple channels, speed to time conversions and looking up percentage values in scribbled tables, but a simple matter of degrees, colours and seconds. From this starting point we hope to extend the approach to other devices and controllers, freeing the lighting designer to design the lighting instead of wrestling with the technology.

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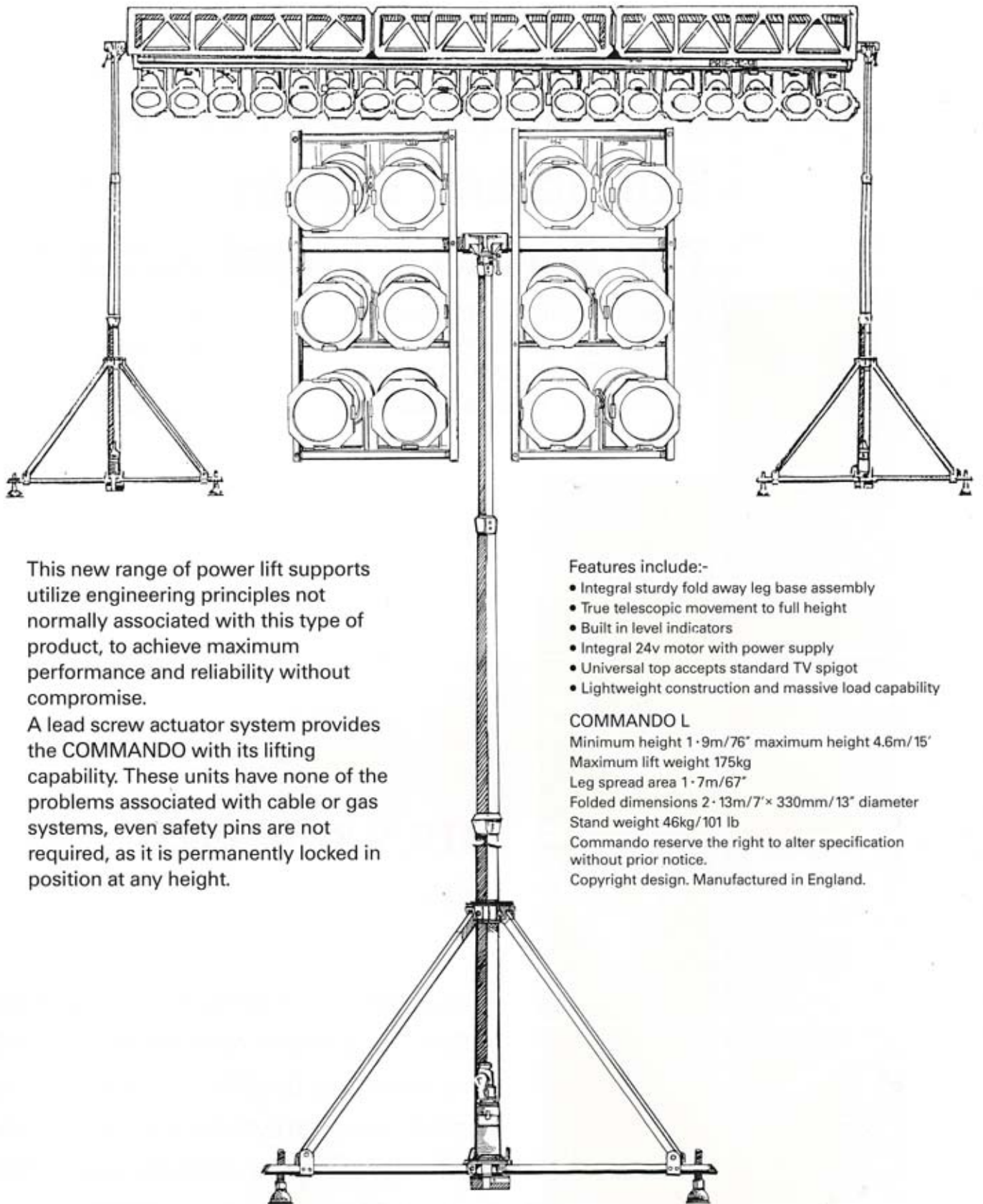
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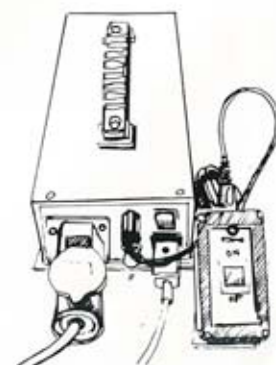


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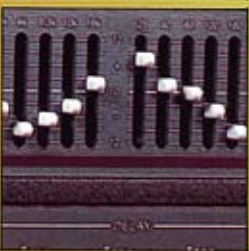
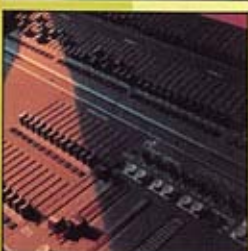
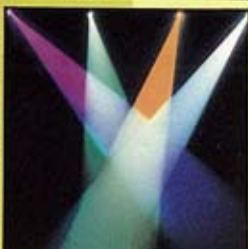
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# THE ALTMAN INHERITANCE

During LDI 91 Tony Gottelier took the opportunity to talk to industry old-timers, and first time exhibitors, Altman Stage Lighting to try and find out what is giving this dynastic company a new and dynamic lease of life.

On the back of every Altman equipment brochure you will find a photograph of the three generations which make this a family business. Surrounding founder Charles, who started the company over 40 years ago, are son Robert and grandson Randal under the banner 'What's in Name?'

Obviously, if your name is Altman, quite a lot! Or, as they themselves put it, 'Everything'. For the Altman name has been synonymous with theatrical luminaire manufacture in the United States for a very long time - fresnels, followspots and, perhaps most of all, ellipsoidals. Yet they have never exhibited at a trade show in all that time, other than through their dealers, nor have they forced the pace in development technologies.

Up to now, that is. For all that is about to change.

For Altman Stage, whose products are distributed in the UK by A C Lighting, decided to exhibit at LDI in their own right for the first time in November and chose the occasion to launch what, for them, must be considered some radically new products.

What is it that has caused this volte-face from one of the oldest names in the business? I talked to second generation representative of the family Robert Altman and R&D colleague Roger Pujol, as they packed up their stand and headed for home base in Yonkers New York after a gruelling week in inaccessible, over-the-top Reno.

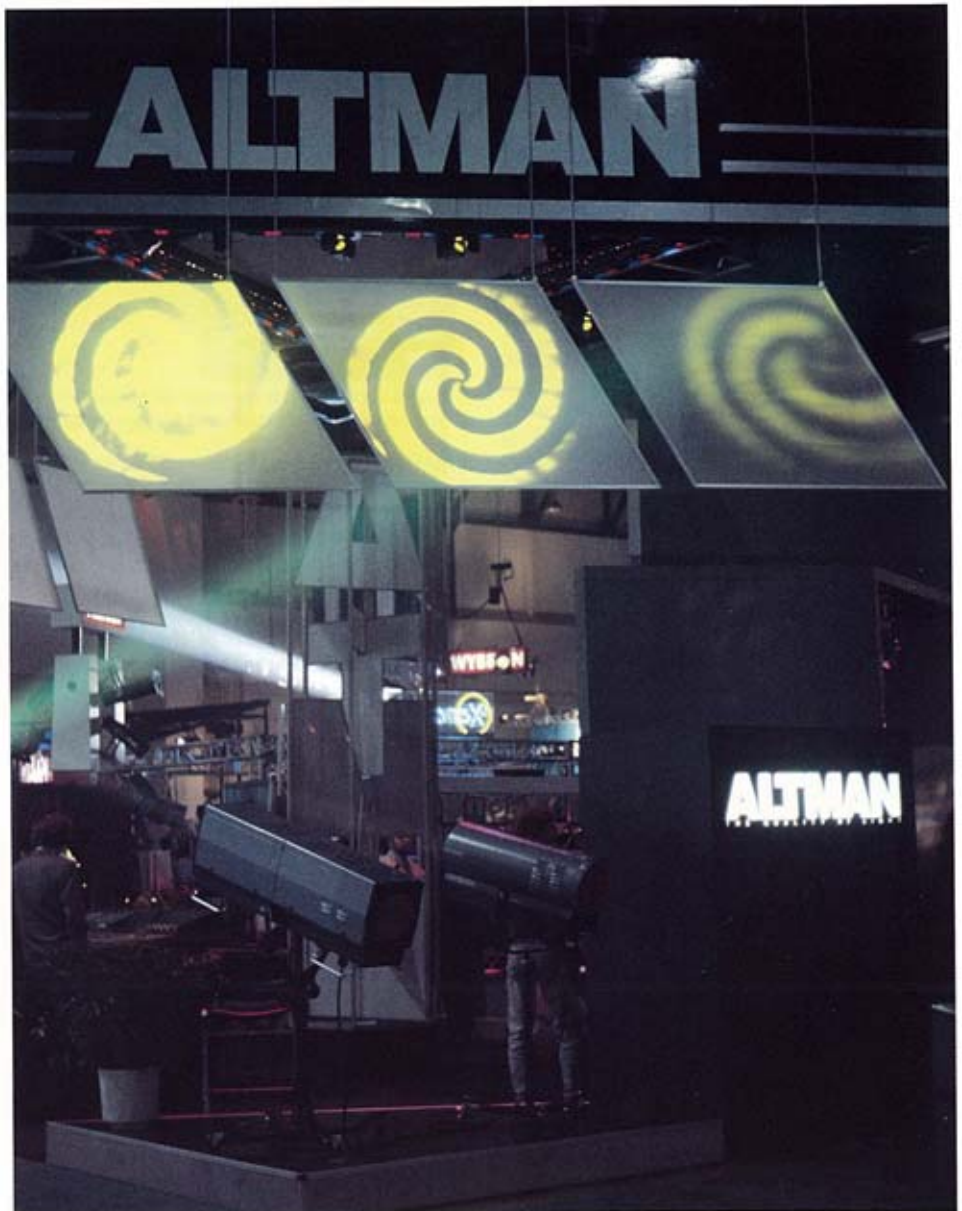
I started by asking what the Altman product philosophy is now?

"We've been in the business a long time and when we decided to start doing trade shows we said 'well, what do we bring, what do we show?' We decided new products, new technology, things we'll be doing in the future, rather than what we've done in the past. After all, we have a very solid past and we really don't need to prove the past, just to show that we're also up-and-coming in the future.

"As far as products in general are concerned we're leaning towards a high quality, high-end type of product. I think people are more conscious of quality now and, you know, if you've got a good product, you don't need a big sales pitch, because you're dealing with professionals who know what they're looking at. There's no song and dance about it, there's no b...s... about it. Years ago we had to come up with something that was good for a long period of time, new developments were slow because new lamps were slow coming, but now that lighting has become an instrumental factor in entertainment we manufacturers are having a field day, especially with the new light sources. In particular, Metal-Halide is really a way forward for the future.

"We have a strong dealer base in the United States and throughout Europe and our dealers were looking for something to compete with in the television and film market. So we have introduced a line of high-end, good quality fresnels, quartz units and HMI units, which are studio or location fixtures. We'll continue to build on that for the next year or two until we have an entire line.

"There's definitely a cross-over between theatre, television and video people and these are relatively new industries which did not exist in the past. If your dealers are involved in these types of services and markets you want to fill as



Altman: first trade show and launch of the Altstar.

much of the need as possible.

"These days it's a globalized market, the world is closer together and everybody's diversifying. And it's not just in this industry, you look at other companies like Philip Morris, going into different things, or like Seagrams alcohol making seltzer. Diversification is the name of the game and as you get more talent and grow and function as a team, such things are inevitable."

I suggested that the Altstar, also launched at LDI 91 (see LDI review, L+SI December 91), seemed to be a big departure from all of that. Isn't this a special effect light?

"That's not an understatement, that's for sure. Altstar's something that's been on-going for about four or five years now. We designed it for the high-end concert market after talking to many designers about what was lacking in the other companies operating in this area. The ability to manufacture the product, do the show, service the product, that's what the Altstar project is aimed at.

"But it ain't going nowhere till it's perfect. If somebody wanted to give us an order for it today, we'd have to refuse it because we don't

want a buyer with service problems. So at the beginning, for a while, it will remain on a rental situation so that we can maintain and control the quality of the system. Initially, we will be putting it out with our own operators or through some parts of our dealer network, though it's probably not a large portion. The moving light is definitely not for everybody, especially not a high-end moving light, but we want our dealers who are using moving lights, or who are on the threshold of using them, to be involved with the project. The larger dealers, that are more production and service-oriented, will certainly be able to take part in the scheme and so we will have outlets spread all across the country and throughout Europe. We don't plan on opening up new offices or anything like that."

So, what about control?

"Control is the most important part of moving light, so that's why we went for our own system and our own control desk. You see a lot of moving lights, with mirror systems, where control has been neglected, especially from the point of view of live action and concerts. We developed our own bi-directional data protocol



for the same reason. We looked at DMX, SMX and everything, but we couldn't find any other method that would serve the needs of the unit as we perceived it. (Altman claim .007 deg. resolution for pan and .03 deg. for tilt with a choice of 500+ colours and gobo changes possible in 0.1 secs.). Plus there are also 'specials' involved with a moving light, that other generic light boards wouldn't have on their control surface because they're not designed for the task."

Bearing in mind the choice of a dedicated protocol, I asked how 'closed' the Altstar control system is.

"Other boards can talk to our system, it has a feature to enable it to act as a slave to any zero-to-ten or DMX console, like a Celco or an AVO. You can link certain channels in the other boards, to trigger cues on this console. So you can combine cues, so that in a split second you are able to have several things happen at the same time. You may have an Altstar operator there, you may not, but it's instantaneous either way, as soon as the board gets its cue so will the Altstar control desk. Other than external cueing, we stayed away from the conventional lighting aspect in our moving light console, at least for now. I know Vari\*Lite tried it, but there are a lot of people reluctant to run their whole system off one console and they have an operator there anyway, so it really wasn't that much of a dilemma.

"This desk is designed to do everything we needed to do to get the moving lights to perform their functions properly. As we get a little more down the road, in a year or two, we'll be looking at other consoles, smaller more compact ones. We can envisage having several desks eventually. We also plan on several other software developments: remote focusing, easy updating for daily touring needs . . ."

But why specifically had they gone for an articulate moving light?

"We're not zeroing-in on moving lights, it was a natural evolution. We looked at it for many years but we sat back until we saw that it wasn't just a passing fad. Also, we had to take a look at it because moving light is becoming a part of everything, it's filtering down into theatre, into television and into rock and roll, so it's something that we had to consider just from a business point of view.

"Besides there are other hidden benefits and



Robert Altman (left) receives 'Best Booth' award from Paula Harris at LDI in Reno. Also in picture is Fritz Neidhardt of Neidhardt Design in Redwood City, California.

spin-offs also, which come just from being involved in a high technology project of this kind. In control, in electronics, in software . . .

"It's like the trickle valve theory, just by having the capability to do a moving light, we have the ability in-house to do other things. We've got a group of people who think and function together, and the sum of the parts is much greater than the whole. Added together we now have a very comfortable, talented group and everyone genuinely enjoys what they're doing.

"Besides, I have been talking to people throughout the show and someone asked me if Charlie Altman was going to be here. When I said yes, they said to me that if the Altmans can do for the moving light business, what they had done under Charlie for the theatrical lighting business and for stage lighting - making everything portable, easily obtainable, where everybody can have it - if Altman can do the same thing for the moving light, we'll be right along the same track, we'll be in good shape.

"You've got to compare Charlie to Henry Ford. Charlie Altman helped the theatrical industry by making lighting affordable, so instead of only being able to buy 50 luminaires, people could afford 100. That helped everybody in the

industry, even the cable companies, the unions, the electricians and the gaffers - everybody. Sure we got competition, but we helped the whole industry in general."

This attitude of live and let live, or laissez-faire is endemic to the Altman philosophy. This is not a confrontational dynastic family, in the mould of their soap counterparts, this is a gentlemanly lineage whose influence has been entirely benevolent in their chosen industry. A suitable family motto might well be 'All for light and light for all'.

Robert Altman's closing remarks sum up this family's commitment admirably. As I listened to these words on my tape recorder, while transcribing this interview, I had the strangest feeling that if I had been talking to Charles rather than his son, he would have expressed exactly the same sentiments to convey his feelings about the industry in which he and his company have made such a contribution.

"I'd like to say that I'm proud that we're part of the industry, it's a wonderful industry and there are a lot of wonderful people involved. It's just like being part of a family. It's something that you do because you love it, it really is a labour of love."

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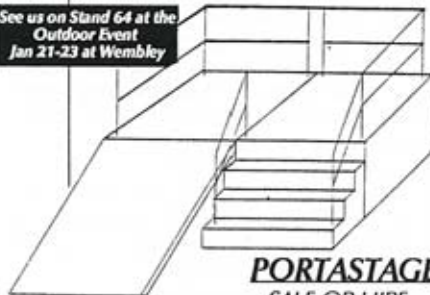
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# ON TOUR

Catriona Forcer

Archaos, the French circus company with a large reputation, have returned to London with a new touring show 'Metal Clown'. Bringing a whole new meaning to the word circus, Archaos looks like Mad Max meets Gerry Cottle minus the animals - well the four-legged variety anyway. The venue is a large domed tent appropriately placed on the bleak and barren wastelands of Battersea Wharf in London. Although the company is French, the sound engineer and lighting designer are both English and, despite many hurdles, they produce a lively and varied performance. The show was quite different, but thoroughly enjoyable and I would like to thank Iain MacDonald for recommending it to me.

The Wonderstuff are fast becoming one of the most popular bands in the charts, although they've been touring for several years. Carl Burnett's career as a lighting designer has grown with the band and at their recent Brixton Academy gig he produced one of the most colourful and exciting shows I've seen for a long while.

## Archaos - 'Metal Clown'

Battersea Wharf

LD: Sarah Sankey

Sound: Paul Chousmer

Since its creation in 1986, the French company Archaos has introduced new concepts and in the process revolutionised the circus world. Physical feats, poetic images and comedy are united in an inventive and original way which often provokes popular scandal and scorn. Archaos' roots are in the love, violence, loneliness and cruelty of city life. Cars, motorbikes and bicycles are an integral part, as are sports such as acrobatics, gymnastics and the martial arts.

A favourite of the media, Archaos claim that

the company's previous visits to the UK have generated a total of two acres of news coverage. Their reputation for outrageous deeds - some would say publicity stunts - is quite formidable and no insurance company will offer a personal accident policy for any member of Archaos - from box office staff to tent riggers to flying trapeze artistes. There was the story of the Danish environment scientist who advised Archaos of the highly carcinogenic properties of badly-tuned diesel engine emissions, who was shut in an empty barrel of diesel fuel and buried under the company's sewage soakaway for a night. Then there was the time Archaos programmed a computer virus into automatic cash dispensers in Australia which flashed up the company logo throughout transactions, credited money to the Archaos account and issued fake tickets for performances.

On the night of my visit the lighting designer, Sarah Sankey, was in trouble for projecting the logo of Archaos onto the towers of Battersea Power Station despite previous warnings of an injunction from the irate owner. Like it or not, you have to admire their courage.

The show 'Metal Clown' is an ingeniously woven tale about the history of Brazil, from its slavery to its current problems of street children. Amongst the performers are Bahia Axe Bahia: a group of 17 dancers, drummers, acrobats and capoeiristas from one of the most violent towns in Brazil. The conquistadors are represented by The Metal Clowns, a group of 15 actors employed in each town Archaos visits. The 'white' performers have musical backing from the London rock band Thunder Dogs.

Sarah Sankey, together with sound engineer, Paul Chousmer, take an active part in the performance as well as coping with the numerous technical problems which arise from such 'organised mayhem'. Paul's star turn is a piano solo during one of the juggling acts, but the short straw must surely have fallen to Sarah who is thrown into the audience by a

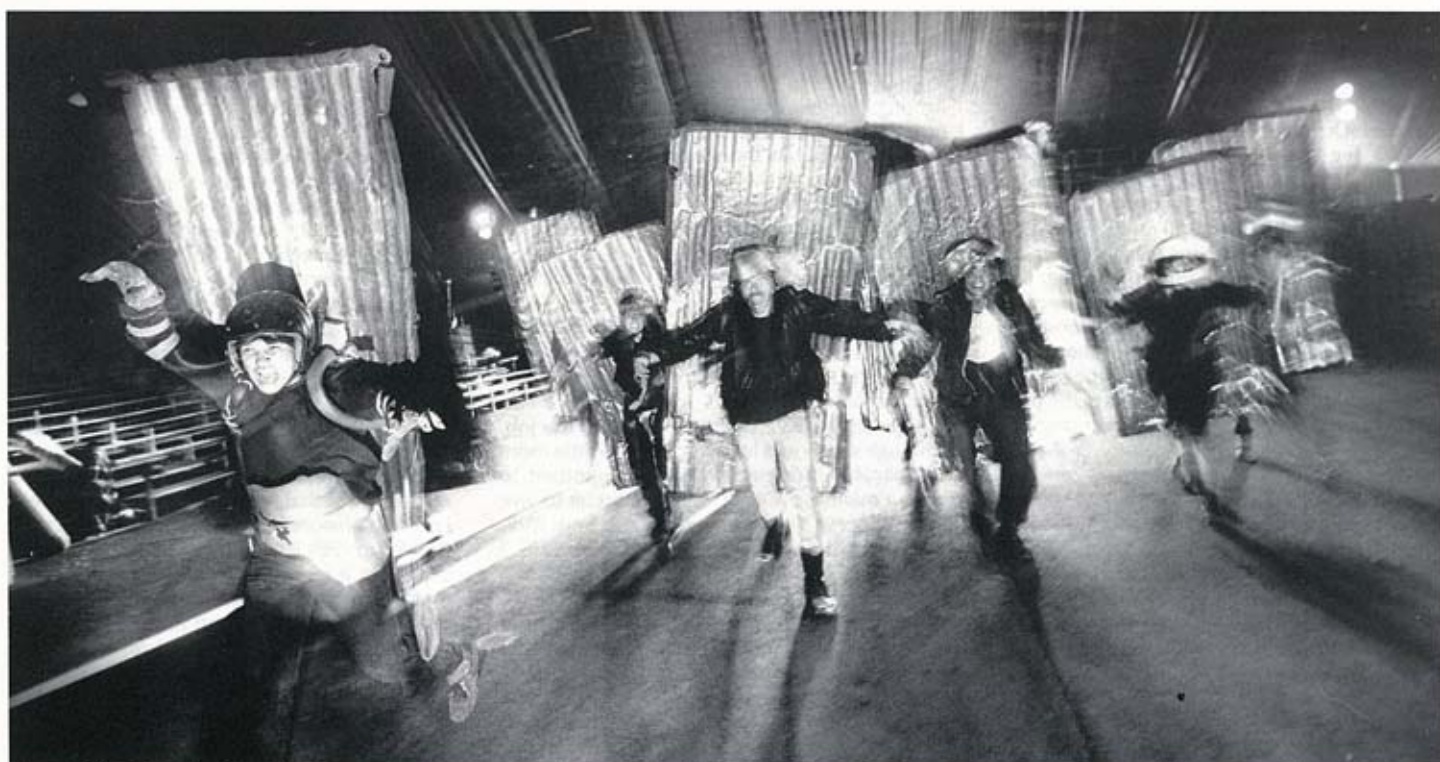
scantily-dressed man who proceeds to rip her clothes off leaving her running down the aisle in just her tights and high heels. I can't say I know many lighting designers, male or female, who would agree to that! Still, Sarah has many talents. As well as being an accomplished trapeze artiste, she also makes an appearance on stilts clothed only with a blindfold. A curious image.

The sound system for The Metal Clown tour was designed by Ivan Roussel who is based in Paris, with Paul Chousmer acting as engineer on the tour. Paul's relationship with the band Thunder Dogs goes back many years and naturally led to his present position. He has also worked as a freelance engineer, is an accomplished musician (his last band being Fields of Nephilim) and he was once the technical services officer at the University of London Union.

The sound desk is a rather battered Soundtracs 24 channel and Paul describes it as just about adequate. "I'm using every single input and every single output including all the matrix channels," he explained. "We don't have a monitor desk for the sound so I'm using four of the six auxiliaries for monitor outputs. The acoustics in here give a permanent 3.5 second reverb on everything so there's not much use for delays."

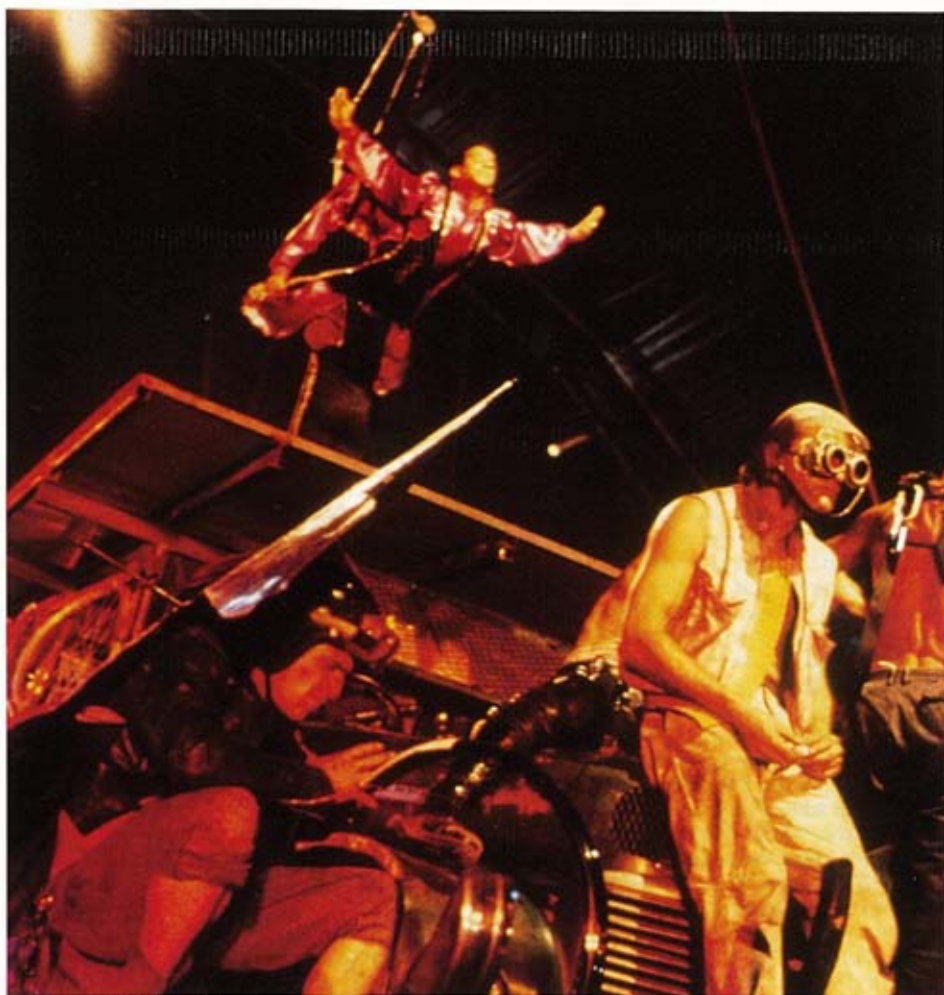
In October the tour went to Ireland where there were several setbacks for the already financially struggling company. Severe gales wrecked the covering to their recently acquired £250,000 tent, although fortunately the framework survived. Replacing the covering has meant there is little if no money for replacing or adding sound and lighting equipment.

"Everything we did in Ireland was a disaster," complained Paul. "The sound truck took a roundabout too fast and it turned over. Unfortunately, the truck had a two ton generator sitting right in the middle of it with sound equipment squashed in around it. Amazingly, everything survived, although the flight cases are



The weird and wonderful Archaos in action.





Archaos and 'Metal Clown'.

a bit battered. In fact, the desk came off a little better for it as some of the connections were shaken up! It wasn't a new desk at the beginning of the tour and I'm surprised it's lasted this well."

The only hired sound equipment consists of Turbosound TMS 3 main speakers as well as the amps to drive them. They come from the Parisien company Faust. "There is a problem with direction as the throw of the speakers is not really wide enough," said Paul. "Ideally, I'd like to double the number of speakers and get them a bit higher. Getting them up there is a frightening experience as I have to stand on top of a fork lift and bolt them on."

There is a mobile truck which acts as a standard rock and roll stage for the band Thunder Dogs. On it there are seven Martin LE400 wedges for each band member controlled by the four auxiliaries which go to the graphics at the control and there are amps in the truck to drive them. A clip-on radio Beyer MC5 mic is used for the saxophone player as he's very much involved in the show. Cabling is a nightmare with people running all over the place with fire, chainsaws, and Paul has to constantly remind the artistes not to drive over the cables. Hanging cable is out of the question because of the trapeze artistes. Also on the sides of the truck are Apogee speakers which Paul is running one way as he hasn't got the necessary crossovers and amps.

"The bane of my life are the Brazilian drummers because the Brazilian idea of musicality is completely different to the Western European idea," Paul told me. "When the band jam together they have very different ideas of tuning. The problems manifest themselves in the fact that, to me, the Brazilians are always out of tune. They start in keys all over the place, the rhythms are very off beat and we have real problems making it match. I can't get through to them how to behave with microphones. I had problems trying to monitor them and I'm using

a matrix channel for that. I haven't got a spare wedge for them so at the moment they're using a strange old French PA set-up."

Sarah Sankey has the problem of lighting the huge expanse the tent creates with a limited amount of lamps and little money. She has worked as a rigger in the past, mainly in dance and theatre environments. Before joining Archaos she had never lit circus and there was a great deal to learn. "You face situations with two acrobats performing handstands on each other's feet and if they have too many shadows they become confused. A juggler can't have light in his eyes. Each persuasion in the circus world has its own needs so you cannot impose your own lighting. Sometimes I find that difficult because quite often we have set pieces that require atmosphere but at the same time all the lights need to be up so the performers can see what they're doing. When I light aerial acts I always light them from underneath so that the ground is not lit as that makes them seem higher. If you light them directly underneath they get blinded so it has to be done from a distance."

When Sarah first started working for Archaos three years ago, she arrived to find that the previous LD had taken the lighting board and half the lamps with him. She acquired a two preset manual RVE board which does the job, although she would love something a little more complicated. For circus it's very important to have a manual override for every circuit to give instant access. The dimmers are also from RVE.

"When I bought the equipment from RVE I got a great deal because I also translated a few catalogues for them," explained Sarah. "I have 48 ways of 3k racks which, at the moment, have eight circuits not working because the company can't afford to have them revised. They've been through wind, rain and tomato juice! At one point the clowns used to throw tomato juice towards the lighting desk and it was pretty damn horrible. When we bought the new tent I wanted

to buy a Celco but there was no chance so I decided on a Sirius which was cheaper. Unfortunately, we haven't even been able to afford that yet.

"I bought 40 2k Strand profiles from the RSC last year but eight of them were wrecked during the gale in Dublin. Although we've got four followspots only two are in use as we can't afford to pay for four followspot operators. I have 48 Pars - 12 in each corner which cross light onto the stage as much as possible. The tent structure is difficult from the point of view of angles as there isn't a grid. I have ACLs in the middle with an awful lot on low voltage because one of my dreams is to do a show where the performers do the lights while I go to the bar. I like things that can move and be independent of cable. I have a 5k which is wheeled on stage half way through the show but most of our lanterns are old wrecks which is a pity. One day I'd like to work with some new wrecks! The tent is huge and that's sometimes wonderful, but at other times you want to make it as small as a matchbox. We have a beautiful steel structure which I would love to light in itself."

A few days before the tour was due to start, Sarah found out that there was no money for cables. Eventually she found a scrap yard with lots of old telecom cable from which she made all the multicores which are still working perfectly. She is obviously a lighting designer who can find her way round just about any problem. With no funding for special effects, she's designed such unique novelties as the supermarket trolley that has blazing car headlights on it and is wheeled around the stage by one of the performers. Drains are also laid at every venue through which there are lights shining, the cables having already been laid.

"We try to do what we can but it can be frustrating to know what you want to see but lack the resources to achieve it. I'm continually confident that that day will come. In Australia I could hire what I wanted, including a Celco Gold, and I came up with effects that impressed the manager who then wanted to know why these weren't always possible!

"We had a juggler once who had fluorescent balls, as they say. It was obvious when I saw the run through that his balls were made for having back light on them. But to hire the necessary equipment would have cost £500.00 per week which we couldn't afford. So, one day, while he was practising, I got the followspot and eventually came across Lee 120 which was perfect to use."

One idea Sarah has built into the show is the use of traffic lights and these she acquired by turning up at her local French council with a bottle of pastis and simply asking for some. Now, every time someone crashes into traffic lights in the town, they are brought to her.

"Unfortunately, we haven't got the cables and the circuits to feed them," explained Sarah. "I've bought an electronics kit with a microphone in it which will make the lights dance to the sound. One cable to the traffic lights and each traffic light on a separate circuit on the kit and they go wild whenever someone drives a motorbike in. You try to find ways round the fact that electricity needs cable, like pieces of string soaked in water and hope they don't touch each other."

"The biggest problem for me, as chief electrician, is that if I don't do my job properly I can kill someone. Once we used to have a truck that lit up with lights on each step - extremely crude but it looked good. The minute that the motorbike stuntman went up the stairs he shook out the bulb holders, which were the brass form because they were the cheapest, and that would touch the metal of the truck resulting in complete blackout. That happened once when one of the acrobats was in mid-air. She was fine although very shaken but I felt like committing suicide. We now have 4k of safety lighting."



## The Wonderstuff Brixton Academy LD: Carl Burnett

Until 1990 Carl Burnett was running a lighting company with dreams of becoming a full-time freelance lighting designer. Finally, he took the plunge by closing the company, selling off the assets and going solo. Fortunately, he hasn't stopped since.

Carl has worked with The Wonderstuff since 1988 when their first tour was with a 24k rig. The second tour had over 100 lamps whilst the recently-completed tour was originally designed for last June's Bescott Stadium gig in front of 18,500 people. The tour continued through the rest of the year to Europe, USA, Australia and Japan with every concert being sold out. The rig was revised for the final UK dates which culminated in four full houses at Brixton Academy.

"One thing that we've lost at this gig is our mobile system which the manager insisted we had at the Bescott gig," said Carl. "It consisted of four wheels, one on each corner of the truss, and a steel rope covered in plastic tensioned up. From this different graphics could be hung and moved around the stage. We approached several people to design it but they kept saying that it couldn't be done as it had to go round corners. Eventually we talked Arrow Rigging into it.

"On the second part of the tour I've added more trussing because of certain problems we had with the tracking. Somebody got the dimensions wrong and the tracking system ended up being inside the lighting system which meant that the track was running between par lamps and knocking them. For this tour I redesigned that so we could have the tracking system going behind the backdrop allowing the graphics to be changed there. This was done by hanging a window cleaner's cradle off the back truss."

One band member had seen a moving truss at a Pop Will Eat Itself show and he asked Carl to do the same. The original system had no moving truss, just a 45 degree angle at the back which Carl then adapted to a moving truss. On this truss there are panels with TV screens in them containing pictures of Elvis with colour changers behind them. The current album is called 'Never Loved Elvis' and the artwork from the cover is used for the backdrop. This is a New York skyline which has several windows painted in ultra violet so that when the backdrop is hit with certain lights the buildings appear to light up.

To make it seem even bigger and have the



A New York skyline for The Wonderstuff.

appearance of 3D, Carl decided to make a feature of the Chrysler buildings also featured on the album cover. The backdrop is 25 feet high which just comes below the bottom of the truss whilst the Chrysler buildings are 30 feet high and are placed 12 feet in front of the backdrop just in front of the moving truss. Focusing different colours on these buildings at the same time as lighting the backdrop tends to make them really stand out.

"Originally I was using a Celco Gold as control," explained Carl. "With that I used two Celco Panorama 60s, one for the colour changers and another for the Golden Scans. I wasn't happy using all those desks and I was going to use a Navigator for this part of the tour. Then we decided to use Summa lights and then an Avo QM Diamond.

"We lost the 12 Lekos we had because I was going to use more Golden Scans before deciding on the Summas. Unfortunately, five days before the start of the tour, we found we couldn't use the Summas and now we've got 14 Vari\*Lite VL1s. I wanted VL2s but they weren't available, so although I'm not totally happy with the VL1s, they are doing more or less what I want. It's a pretty furious and exciting looking show and there are a lot of lamps and effects involved. There are subtle bits which tend to stand out because there aren't many of them. I don't find the VL1s a particularly subtle lamp as they are difficult to slow down."

Carl is using the Vari\*Lites a lot more than he

did the Golden Scans but mostly just to light up the set.

There are only about four times during the show when you really see them moving about and then they are fairly manic. Carl tries to keep the effects as effects rather than use them in every number, consequently the Terrastrosbes and Strobeflowers are only used once whilst the colour changers are used about half a dozen times.

The Wonderstuff are due to go to the USA at the end of January and Carl will be going with them although they are only support to Siouxsie and the Banshees. He admits that being a support lighting designer is not quite as stimulating but he is still looking forward to the tour.



Wonderstuff's lighting designer Carl Burnett (pictured right) with Vari\*Lite operator Ian Cameron.



The Wonderstuff on stage at the Brixton Academy, supported by the lighting designs of Carl Burnett.





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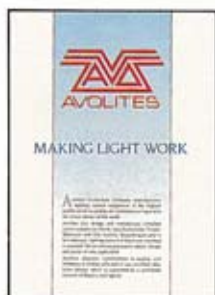
To obtain the latest catalogues and product literature from any of the companies advertising on these pages simply post or fax the slip below, indicating your choice(s) by circling the relevant numbers.



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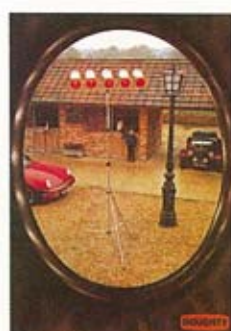
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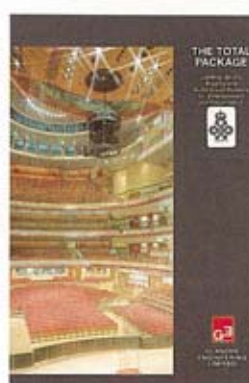
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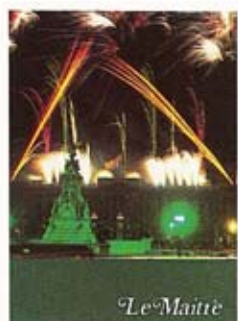


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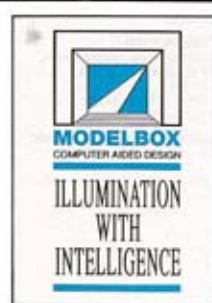
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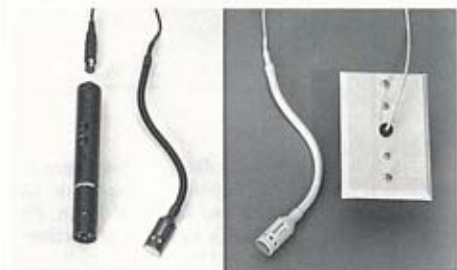
Jan92



# EQUIPMENT *News*

## Shure introduce MicroFlex

MicroFlex is a series of professional condenser microphones designed for fixed sound system installations by Shure and distributed by London-based HW International. The SM102 Hanging Condenser Microphone (pictured below) is a miniature condenser mic with a frequency response of 50 to 18,000Hz and is designed to be hung from overhead. A Unidirectional Cardioid, it utilises a half inch diameter condenser cartridge based on the one used in the SM85 which is permanently mounted to a slim gooseneck for both vertical and horizontal adjustment, and is available in four different versions. The SM99 is a miniature supercardioid gooseneck-mount microphone (electret bias) which features phantom power operation only, with the pre-amplifier built-in to the gooseneck of the microphone.



The new model the SM99SE has a side exit cable and separate pre-amplifier which can be mounted remotely from the microphone. A new recessed shock-mount, the A99SM is also available.

The SM90A and SM91A surface mount condensers also form part of the MicroFlex series and are upgrades of the original SM90 and 91 models, but feature the new ILP-1 compact, all steel in-line tube design pre-amplifier provided as standard.

HW International have launched the HW58 MS, an upgraded version of their HW58 handheld radio mic transmitters.

For further information contact HW International in London, telephone 071-607 2717.

## Rane Equaliser

The latest addition to the Rane family of graphic equalisers is the ME 60 stereo equaliser. This is a two channel one third octave design, housed in a two rack space unit. According to the company, the ME 60 is not just two M30s in one package, two adjustable band limiting filters add to each channel's versatility.

The active filter sections feature the ME30's innovative constant Q-design. The ME 60's front panel controls and indicators include an overall rotary gain control for each channel as well as overload indicators. Passive push buttons bypass switches feature LED indicators to avoid ambiguity from their operation. For further details contact Shuttlesound, telephone 081-646 7114.

## JEM Special

To mark their success in the export field and achieving the Queen's Award for export, JEM have announced the launch of a special commemorative version of the JEM Fogger.

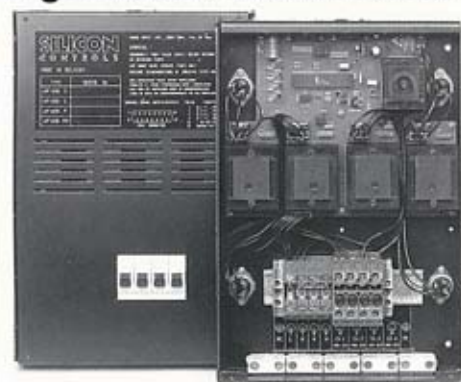
The 500 limited edition machines will be totally unique in their appearance featuring a highly polished mirror finish, solid stainless steel case. Each machine will carry the Queen's Award motif, and will be individually numbered. Furthermore, a copy of the award certificate will be enclosed with each machine and the company are also offering a 10 year parts and labour guarantee.

For further details contact JEM in Spilsby, telephone (0790) 54051.

## LSC Updates

Australia-based LSC Electronics have announced that the Softlink is now available with multiple DMX512 inputs. In addition, more than one DMX512 output has been provided to accommodate larger systems. Alongside these developments, the company has also updated the Precept + control desk to provide up to 99 second fade times. The Scene masters now incorporate page freeze so that swapping from page to page will not require programming another scene or master for the swap. For further details on these products and others from LSC contact the company on (03) 836 9111.

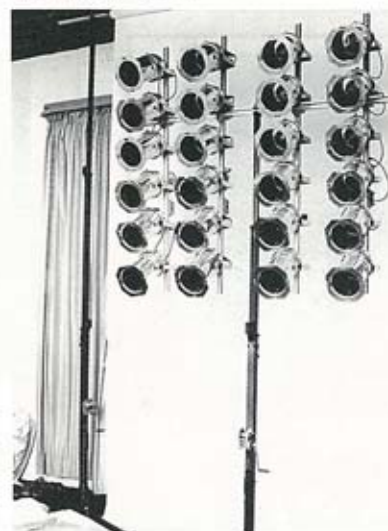
## Light Beams Power Packs



Belgium-based Light Beams have introduced a new range of four-channel power packs - the WP406. Each channel is rated at 2200W, and a 100 per cent duty cycle both resistive and inductive loads, including neon, cold cathode, high frequency fluorescent etc. The packs also feature: auto test, internal selection for dimming or zero switching, and 0/10v control signal with parallel output and green mimic LEDs. For further product information contact Light Beams in Deinze, telephone (091) 868255.

## Gap Bridged

With the TUV-approved Truss-Lift TL 150 from Lightpower of Paderborn a large gap between small light tripods, wind-up hoists and big theatre lifting systems will be finally bridged, say the company. The ruggedly constructed lift with a maximum lifting capacity of 150kg is of finished matt black square-headed tubular steel. With its self-braking handwinch the Truss-Lift TL 150 lifts crossbars of a maximum 12 metre width span up to a maximum height of five metres.



For reasons of safety the TUV-approved capacity of the TL 150 is 100kg. However, the approval covers even the most extreme conditions, such as strong crosswinds during open-air events.

Lightpower are also offering a range of accessories for the TL 150 such as head adapters for Slick Lite Beam and Trilite/Astralite with Scaffolding clamps 48 or two inches, Aliscaff clamps as well as head adapter for rectangular bars, and last, but not least, head adapters for round or pre-wired bars of 48 to 50mm. For further details contact Lightpower in Paderborn, telephone 05251/4184.

## Out Board Upgrade

UK audio control specialist Out Board Electronics Ltd has added an RS232 port to its SS1 Theatre sound automation system. The addition will be fitted to all new units and allows further integration of the SS1 into computer-based systems. Units will still be fitted with MIDI ports as well.

The first SS1 fitted with RS232 has gone to distributor Studiotec in Finland, where it will be incorporated into the company's PC-controlled theatre sound system. The system is now also offered for hire. For more product information, contact the company on 081-883 3194.

## Optex Chipbox

The 'Chipbox' is a new British-made monitor shade which incorporates a special filter to eradicate sunlight reflections from the screen. The shade is available from Optex, who have been appointed international distributors to the film and television industry by its inventor John Chipperfield.


Made of vacuum-formed GRP, units are initially being produced for the widely-used Sony 9" monitors 9020 and 9021 (American equivalent 8020/8021) and the Steadicam EFP monitor. Other monitor shades will be available in due course.

Further details are available from Optex in New Barnet, telephone 081-441 2199.

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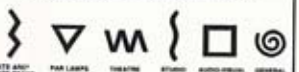
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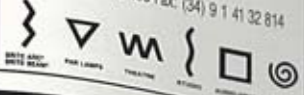
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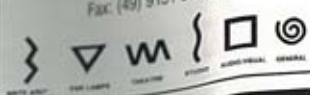
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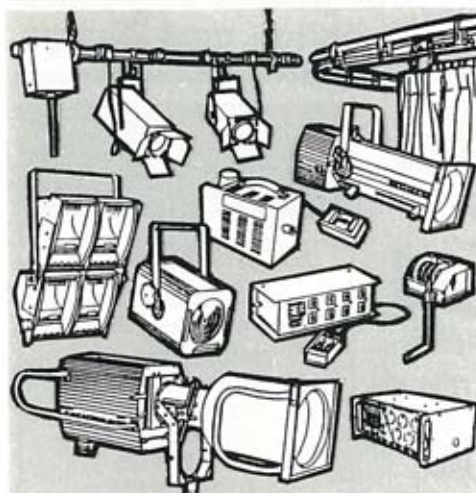
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# VIEWPOINT

## Ian Napier on A Force for the Future

'A Prophet is not without honour, except in his own country'

The Bible

Sometimes, when I have lain awake at night frantically counting serried ranks of moving hoists, the thought occurs to me that prophets, theatre consultants and stage machinery don't have too much going for them. They can expect to be either ignored, ridiculed or blamed according to circumstances over which they often have no control. And one thing we are good at in this country, apart from designing and building stage machinery, is refusing to acknowledge that we still are a nation of designers and engineers, although jobbing builders, taxi drivers and financial consultants do seem to be in the ascendancy these days.

Ten years at the sharp end of theatre engineering at the National Theatre, before it had Royal unilaterally bestowed on it, may have coloured my views but hopefully not prejudiced them. The National Theatre at its inception was provided with some of the most advanced stage machinery and computerized lighting control equipment in the world, only to be ignored, ridiculed or disparaged by people who, with hindsight know better. After all, since the opening of the RNT the marriage of state-of-the-art technology and theatre has gone on to lead to some enormous West End successes in the last few years.

Fortunately, the years have seen a change in attitude towards NT equipment, such as the Olivier Powered Flying System and the Drum Revolve, by both production and senior management and dedicated and skilled engineering and operating staff have made a vital contribution towards the fact that this equipment is now viewed as an integral part of the stage environment. This fact is emphasized by the thrillingly inspirational use of the Drum Revolve in the Olivier's smash hit *Wind in the Willows*, whose box office profits have probably paid for the Revolve twice over.

It would be wrong to gloss over the fact that there were initial problems with both the Flying System and the Drum Revolve and if there are lessons to be learnt, there are three that stand out. The first is that sensitive electronic equipment should only be installed in a clean environment and when all building work has ceased. Self-evident perhaps, but apparently not to building contractors under pressure. Secondly, the lowest price for the job does not necessarily produce the best result; especially where complex mechanical equipment and advanced electronic control equipment is concerned. A point emphasized by the fact that

the company which designed and built the Olivier Flying System and Drum Revolve electronics left the theatre business shortly afterwards. Proper management of stage machinery projects is as important as the technologies employed. The third and final point concerns the handover of a large control system, such as a power flying system with its combination of electronic and mechanical units, to a customer. Sufficient time must be allowed for the customer's engineering staff to become familiar with the engineering aspects of the system and to ensure that all inherited defects have been eliminated before it is put into service.

There were times during the last decade when being an engineer at the RNT, and this applied to both the stage machinery and building service areas, seemed to be the equivalent of a non-person working in a theatrical 'black-hole'. Sometimes comments would appear in the arts columns of the press about the unavailability or apparent failure of a piece of equipment and factually incorrect comments as to the reasons would be allowed to pass unchallenged by senior management. And so another nail would be hammered into the coffin of the stage engineering industry. The introductory guide to the RNT, available in its bookshop and handed out to the RNT guided tours, makes no mention of the unique and pioneering role played by both the stage and lighting computerized equipment and the consultants who had the vision and the belief to specify that equipment. The lightboards specified by Theatre Projects and installed by Strand in both the Olivier and Lyttelton Theatres set the standards for future memory control systems and were the forerunners of the highly successful Galaxy and Gemini boards. The powered flying system specified by Theatre Project's Richard Brett, is still, 20 years after its initial conception, setting standards that the latest systems are being judged by today. It is interesting to note that some of the latest power flying systems have operating features that can be traced directly back to the Olivier's flying system.

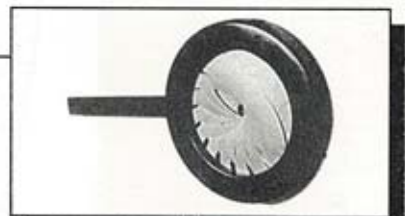
One feature that later systems do not have is the Olivier system's analogue/power switching matrix which allows a fixed number of drives to power up to five times the number of hoists. As well as producing significant cost savings in expensive drives it provides built-in redundancy in the event of a drive failure.

Even today with the stage machinery of the National Theatre showing its age and being scheduled for replacement or refurbishment

there is still a steady stream of visitors, mainly foreign, who display a keen interest in both the operating and engineering aspects of the equipment. I believe that the Royal National Theatre has a unique opportunity to be a showpiece, not only to display all that is excellent in British Theatre today but to demonstrate that we can design and produce stage machinery that can be envied by, and sold to, the rest of the world. Therefore I think that is crucially important that theatre management continues with its policy of enhancing its stage machinery and publicises it by providing more information in the form of both documentation and engineering guided tours. And, of course, that they continue to encourage and support the operating and engineering staff who keep the whole show on the road.

Ian Napier started his theatrical career at the Royal National Theatre where he was system engineering manager for ten years. He was responsible for the maintenance and development of a range of equipment including computer controlled stage machinery, lightboards and hydraulic elevators.

He left in 1989 and went to Nigeria with Voluntary Service Overseas for 14 months where he taught electronics to student teachers. He returned in 1990 and set up his own company, Paradigm Technical Services, to provide consultancy, design and contracting services to the theatre and television engineering industry.



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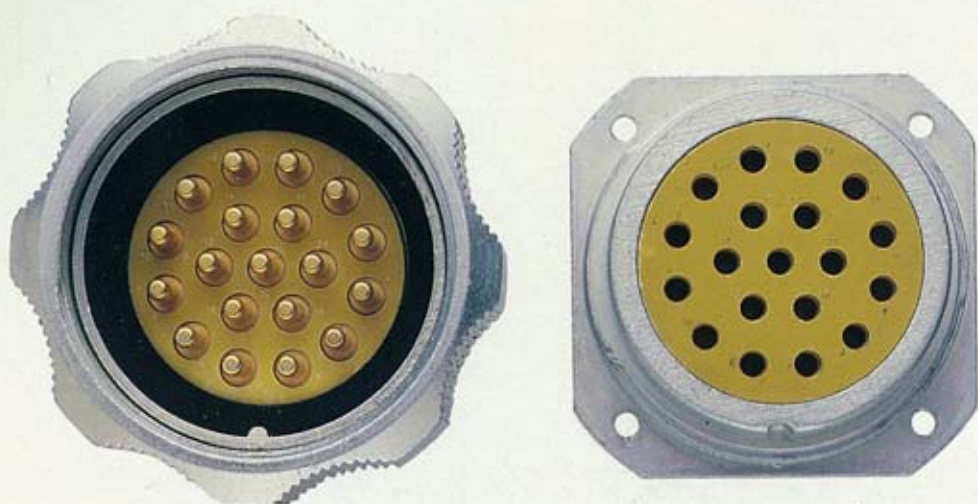
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