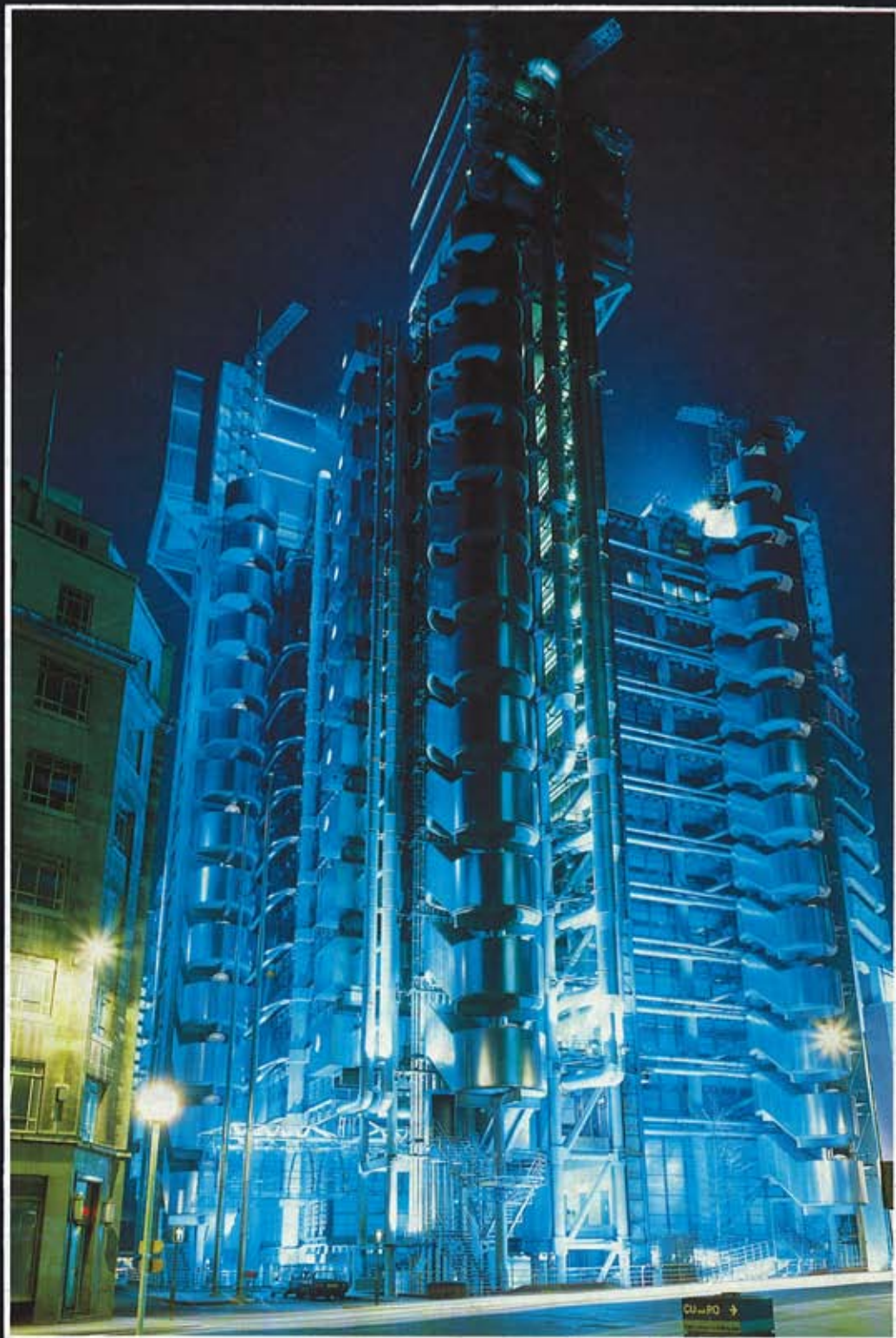


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Lighting Up Lloyds of London - see special colour feature in this issue.

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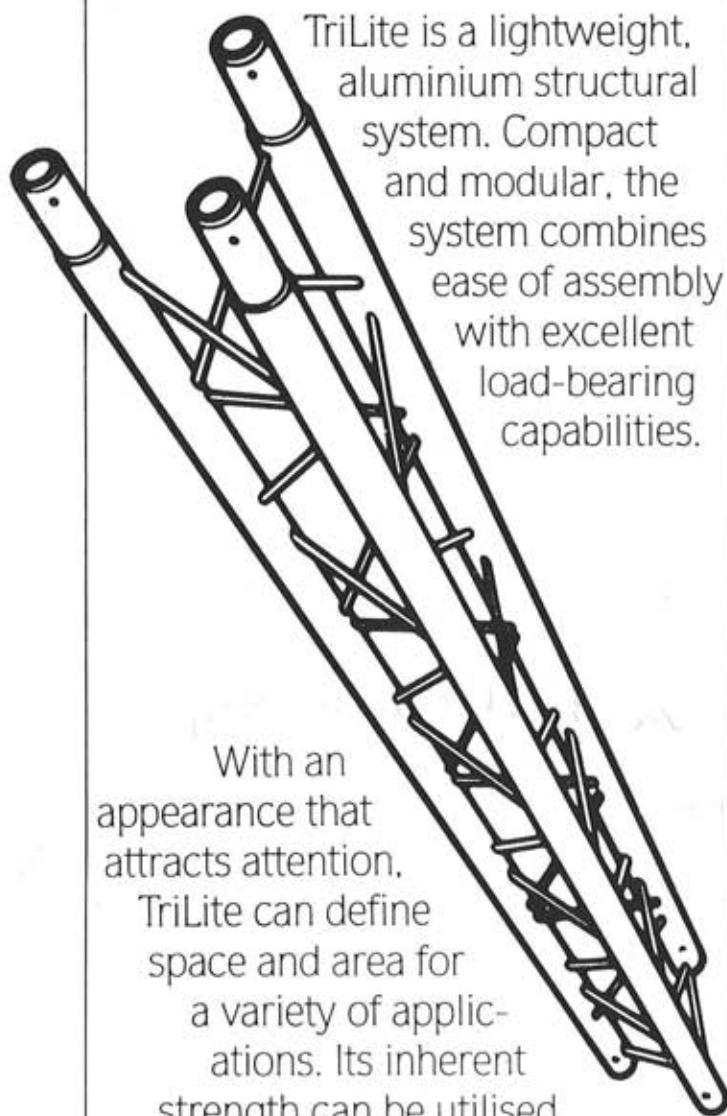
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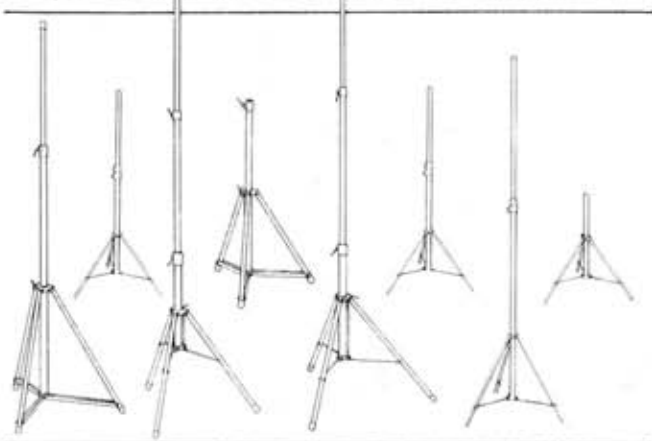
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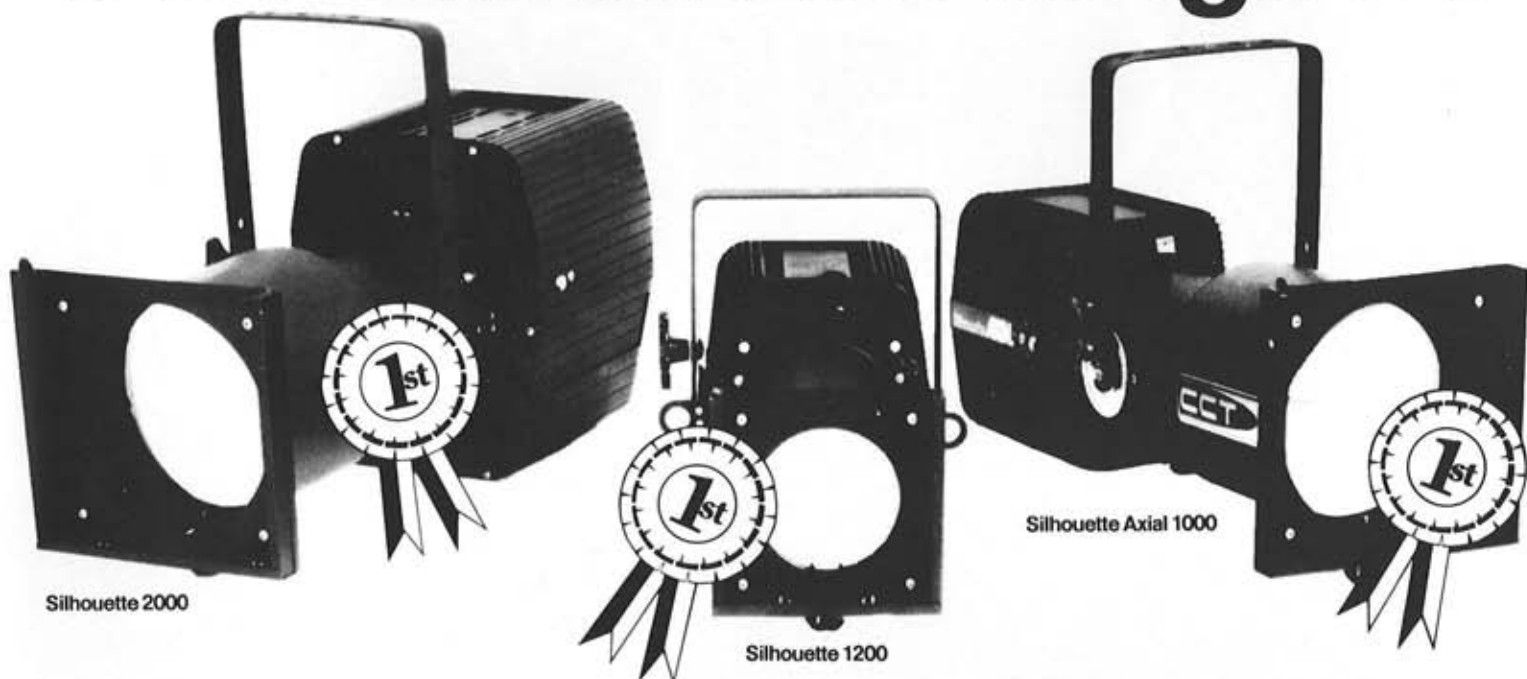
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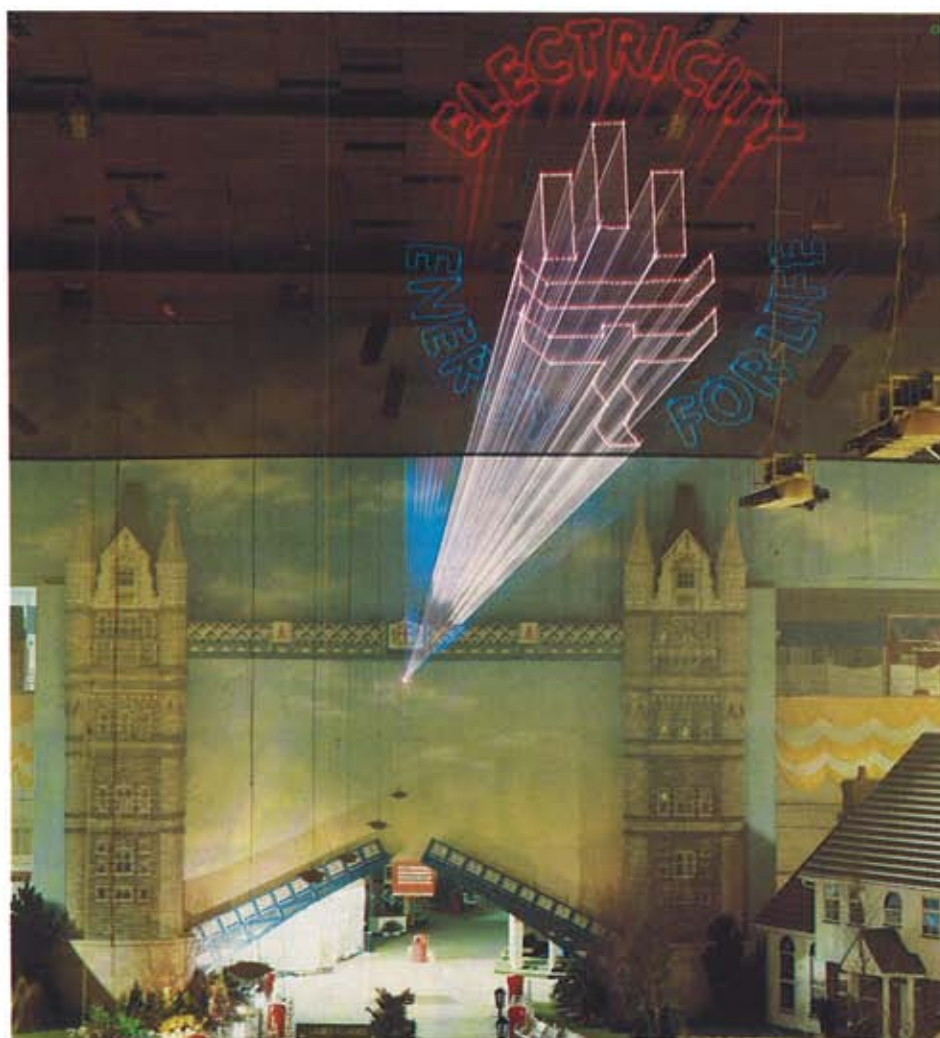


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LIGHTING+SOUND *International*

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CCT/Lee Colortran Merger a Non-Event

The long-running guessing game that's been going the rounds of the industry for more than six months has now been concluded. It has been officially announced that after long exploratory discussions on the possible acquisition of CCT by Lee Colortran Limited talks have now been suspended. The joint statement received in L+SI's office from CCT state this was due to 'material improvements in the trading position of CCT'.

Icelectrics to Link with Le Maitre

Following discussions since the new year, Icelectrics Limited have announced that they are to join Le Maitre Holdings plc.

Rob Peck of Ice told L+SI that they will still operate from their base in Hampshire and that the present management structure will remain the same. "Joining forces with one of the major groups within the entertainment industry will enable a significant move forward," he said.

"With the 1988 product range including many new products, Ice will now be poised to take full advantage of the market with the backing of Le Maitre. Improved production methods and organisation will take the company on to a new era," he said.

US Theatrical Dealers

Theatrical dealers in the United States have formed an Association, and the first president is Glenn Becker of the Grand Stage Company.

Membership requirements include various restrictions, with the most notable being that a member company must not derive more than 55% of its gross revenues from manufacturing. Other requirements include minimum value of stock held, minimum hours and location of showroom, and number of sales staff.

The Theatrical Dealers Association is based at 2030 El Cajon Boulevard, San Diego, California 92104.

Tele-Stage Acquired

Tele-Stage Associates Limited, currently in receivership, has been purchased by Theatres International Limited, the group owned by Qahtan Hardy that also owns Delta Engineering and Hoffend and Sons. General manager is Michael Bacon, who joined Tele-Stage in October 1987.

The company will trade as Tele-Stage Associates (UK) Limited, and Michael Bacon told L+SI that they are in the process of setting up an audio visual division. "We will be actively looking for contracts right across the field of theatre and television," he said.

Lighting Dimensions to Promote Entertainment Technology Show in US

Lighting Dimensions magazine, published out of New York, have confirmed to L+SI that they are currently firming up on potential sites and dates for a major convention on entertainment technology to be held either later this year or early in 1989. They were expecting to make a decision and full announcement before the end of April.

The most likely dates are in February, and possible venue cities being looked at include New York. The show will be targeted at the club, concert, stage, film, television and arena markets. Jacqueline Tien of Lighting Dimensions told L+SI.

Serious about Sirius?

As part of the launch of their Sirius lighting desk, Zero 88 will be organising a free draw at the coming ABTT Trade Show at Riverside Studios in London. "There will be no strings attached," said Zero's Freddy Lloyd. "All you will have to do is participate in a 'hands-on' demonstration, fill in your details on a special card and then hand it to one of our stand personnel."

Three Sirius desks will be there for the winning - one for each day of the Show.

Fair Trading?

With at least two major UK companies about to launch new Australian manufactured lighting control boards on the home market, manufacturers in the UK may well start asking questions about the removal of tariffs (currently 25%) for British exported products going in the opposite direction - or, of course the placing of an equal tariff on incoming goods from Australia to the EEC.

Theatre Renaissance in Spain

A special report from Francis Reid

Which European country has the fastest current growth rate in theatre? It could be Spain. Everywhere there is talk and evidence of refurbishing the old and building the new.

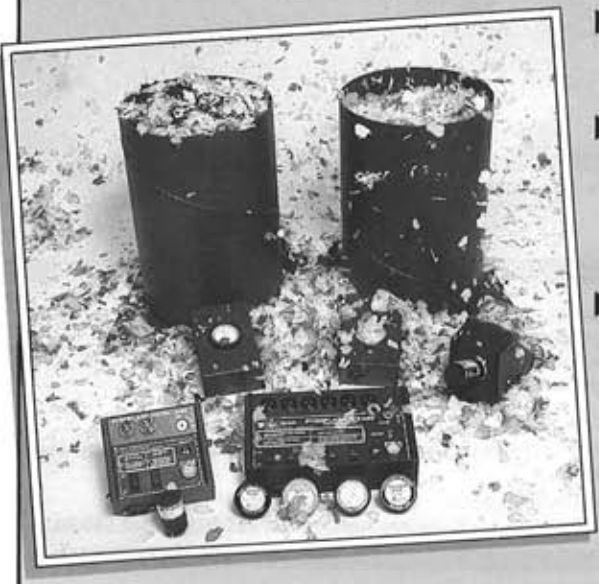
Take Seville as an example. The beautiful **Lope de Vega Theatre** has just reopened after a restoration costing 485 million pesetas (about £2.4 million). And on the splendid riverside site, formerly an Arsenal, part of whose fascia will be retained, three tall cranes preside over the hole in the ground from which will arise the new **Palacio de Cultura**. This is to be a big one with 1850 seats facing a stage with a potential maximum opening of 18 metres and intended for opera, dance and popular music of all kinds. The complex will include a small flexible theatre for drama and recitals.

Itálica, a few kilometres from Seville, is the site of a current annual summer festival where an international selection of drama, dance and music theatre companies are invited to play in the Roman Amphitheatre. Various staging configurations have been used for these performances and further restoration currently in progress will allow even more staging flexibility in future. However, the most exciting potential for open air theatre lies in the nearby Roman Theatre. So far this has been only partly restored, but the authorities have acquired the adjacent houses so that the site can be further excavated. The remaining fragments are sufficient to make this into a major theatre, but with the addition of those likely to be discovered, it could become one of the most important of all remaining Roman stages. Its location will make for a marvellous night at the opera, and a measure of the seriousness of the project is the planning to deal with noise from the adjacent motorway. Traffic diversions are already normal for the festival performances, but future proposals include diverting the road itself.

Expo 92 is the target upon which all Seville planning is focussed, and this major exposition will include an international season of performances of all kinds. Indeed, theatrical growth in general and Expo 92 in particular provide the reason why I am able to report on the situation in Seville. Who will staff the theatre explosion? The Andalusians are concerned about technical training and are doing something about it. Hector Morales has been directing a month's in-service course at the Instituto del Teatro with contributions from Derrick Zieba (sound), Tony Bond (stage technology and production management) and me (lighting).

Britain's manufacturers are prominent in the market-place. The **Pulsar** preset board in the Instituto del Teatro has just been joined by a **Strand M24** together with a full orchestra of lights from their symphonic range. Madrid's Teatro Compania Nacional Clasic arrived in Seville on tour with enough Silhouettes to indicate that CCT has established a formidable presence. **Rosco Espana** seem to be active everywhere. And presumably other PLASA members are getting, or seeking, a slice of the action.

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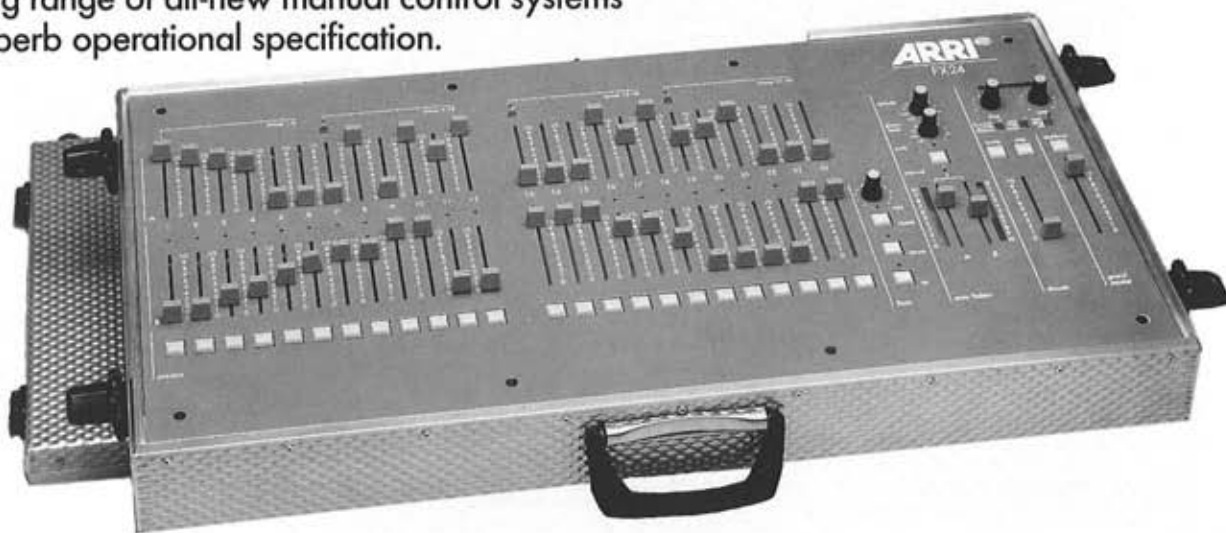
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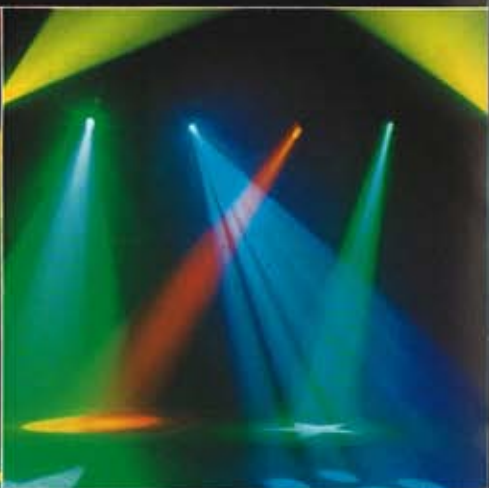
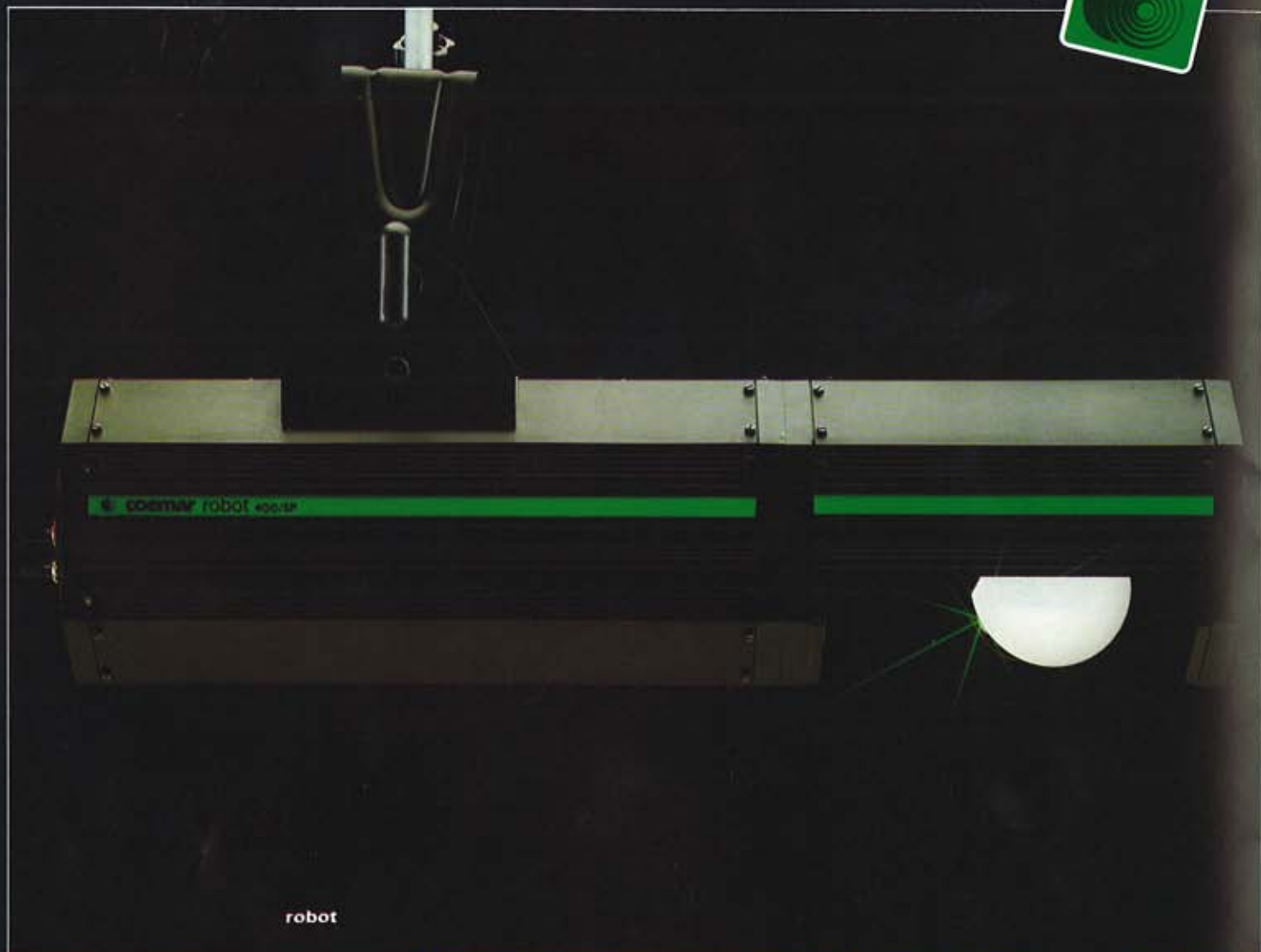
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Prototype Equipment Stolen

Anyone visiting Allen & Heath's stand at the recent Musik Messe in Frankfurt would have found it difficult to believe that all their exhibition equipment, lorry included, had been stolen just three days prior to the start of the show.

The theft occurred on the previous Saturday, just after Allen & Heath had finished packing their truck. The company were exhibiting at the AES Convention in Paris and were planning to use the same equipment on their stand at Frankfurt.

Tim Chapman of Expotus - export agents for Allen & Heath as well as BSS Audio, Klark Teknik, OHM Industries, Turbosound and others estimated that around £50,000-worth of stock was lost, together with prototypes of the new Allen & Heath SRC Series consoles, which were to be launched at Frankfurt.

Allen & Heath were notified of the loss on Sunday morning, and a hasty departure for Frankfurt ensued. Many frantic telephone calls later they had managed to beg, borrow or... most of the equipment lost.

All stand graphics were re-made in 24 hours and flown out on Tuesday evening prior to the Show, and a specially constructed Reflex fader automation system prototype was brought out from Audio Kinetics on the second day of the Show.

It was estimated that many thousands of pounds worth of orders were lost as a direct result of not having the new SRC Series consoles on stand, but at least the company were able to put on a representative demonstration of the rest of their product range.

Expotus would like to say a special 'thank you' to P.A. Sound of Frankfurt who were of invaluable assistance with provision of cables, connectors and a further rack of Klark Teknik equipment, not to mention the use of their workshops for an entire day. And they also asked L+S to thank the man who drove non-stop from Allen & Heath's Cornwall factory to Frankfurt to get the replacement equipment there on time.

Light & Sound Show 88

Organiser David Street told L+S that much of the newly allocated additional space on level 2 at Olympia has now been taken. Recent bookings for this area include Lee Colortran, Shuttlesound, Audilec, High End Systems Inc., and Laserpoint.

The ground floor is now completely sold out, and a few stands remain available on the first floor. A total of just over 30 stands are left for booking, mainly on the second floor, and David Street advises companies considering booking space to approach him in the near future to avoid disappointment.

It has been confirmed that John Butcher MP, Parliamentary Under Secretary of State for Industry and Consumer Affairs will open the 1988 Light and Sound Show.

People

Celestion International has announced the appointment of **Martin Brady** as export sales manager, responsible for both HiFi and professional audio products, initially concentrating on Europe. He was formerly with Casio Electronics Co. Ltd. as national sales manager of their music instrument division.

Harrison Information Technology has appointed **David Kempson** as technical director. He will take total overall responsibility for all technical research and design matters at HIT including the company's established range of amplifiers, graphics and crossovers.

Steve Gunn has recently joined Paul Farrah Sound to expand the company's sales team, and will work alongside Kevin Swain, Chris Gilbert and Trish Ashton. Employed in the professional audio industry for the past 16 years, he was most recently UK sales manager for Soundcraft Electronics. (Paul Farrah Sound are the world's largest stocking dealer of Soundcraft products).



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The purchasing group is specialised in major theatre installation involving lighting, audio visual and T.V. broadcast systems and, as such the business now has the facility of calling on additional expertise to provide a complete package of stage equipment, lighting and related audio visual systems.

We are confident in the ability of the business to build on its past reputation and continue to provide a good service to its clients across the world.

If you require any further information or have a specific project that you wish to discuss, please contact:

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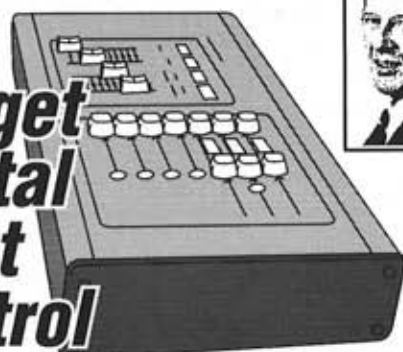
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Norman Lamont MP (right) at the controls in Kingston Polytechnic's new recording studio. With him (left to right) are David Ward, managing director of Gateway, Dr. Ed Ho, head of music at the Polytechnic, and Dr. Robert Smith, director of the Polytechnic.

New £1m Music Complex for Kingston Polytechnic

The new purpose-built music centre at Kingston Poly is the result of an innovative joint venture between the Polytechnic and the Gateway School of Recording and Music Technology. Gateway, formerly based in Battersea, now resides on Kingston's Coombehurst site. Here, as well as having its own independent curriculum, some of Gateway's courses in Music Technology have been made an integral part of the Polytechnic's own BA and BEd degree courses.

Gateway has been responsible for equipping the studio with an impressive array of state-of-the-art recording equipment, making it one of only a handful of orchestral recording studios in London.

The equipment includes a new Soundcraft Saturn 24-track and TS12 mixing console and wiring to facilitate outside broadcasts, and there are plans to install the latest in sound/picture synchronisation equipment. The rehearsal hall, which is also available for performances, and seats up to 180 people, has been specifically designed to the highest acoustic standards, and also includes a concert lighting rig.

The centre was formally opened on March 4 by the Rt. Hon. Norman Lamont, MP for Kingston and Financial Secretary to the Treasury.



First System 1000

Mick Anderson of Entec Limited (left) receives the first Court System 1000 from Stephen Court at their new premises at Shepperton Studios, Middlesex. The 4-way 1000 system uses JBL components and was recently used on the Rick Wakeman and Cliff Richard concerts.

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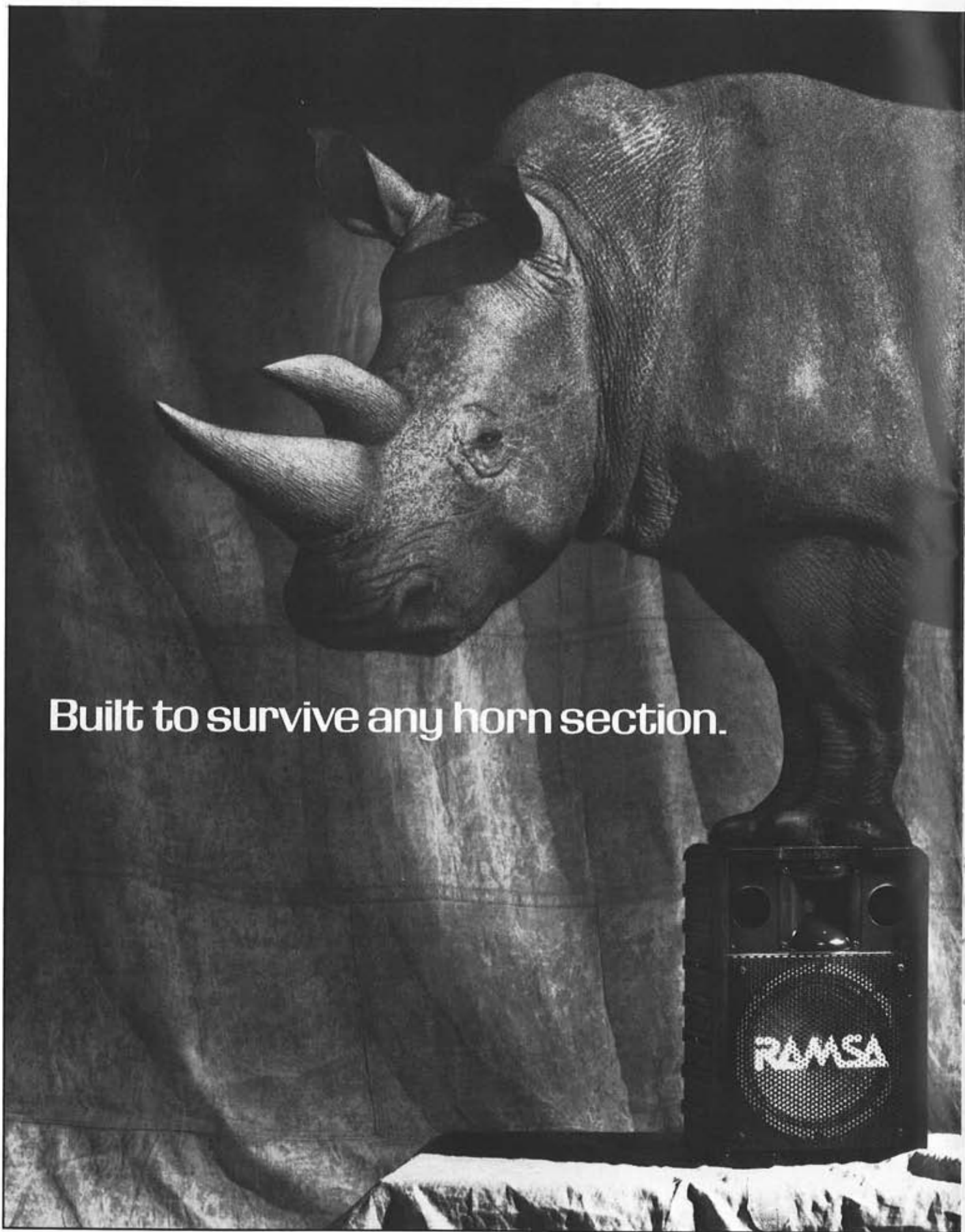
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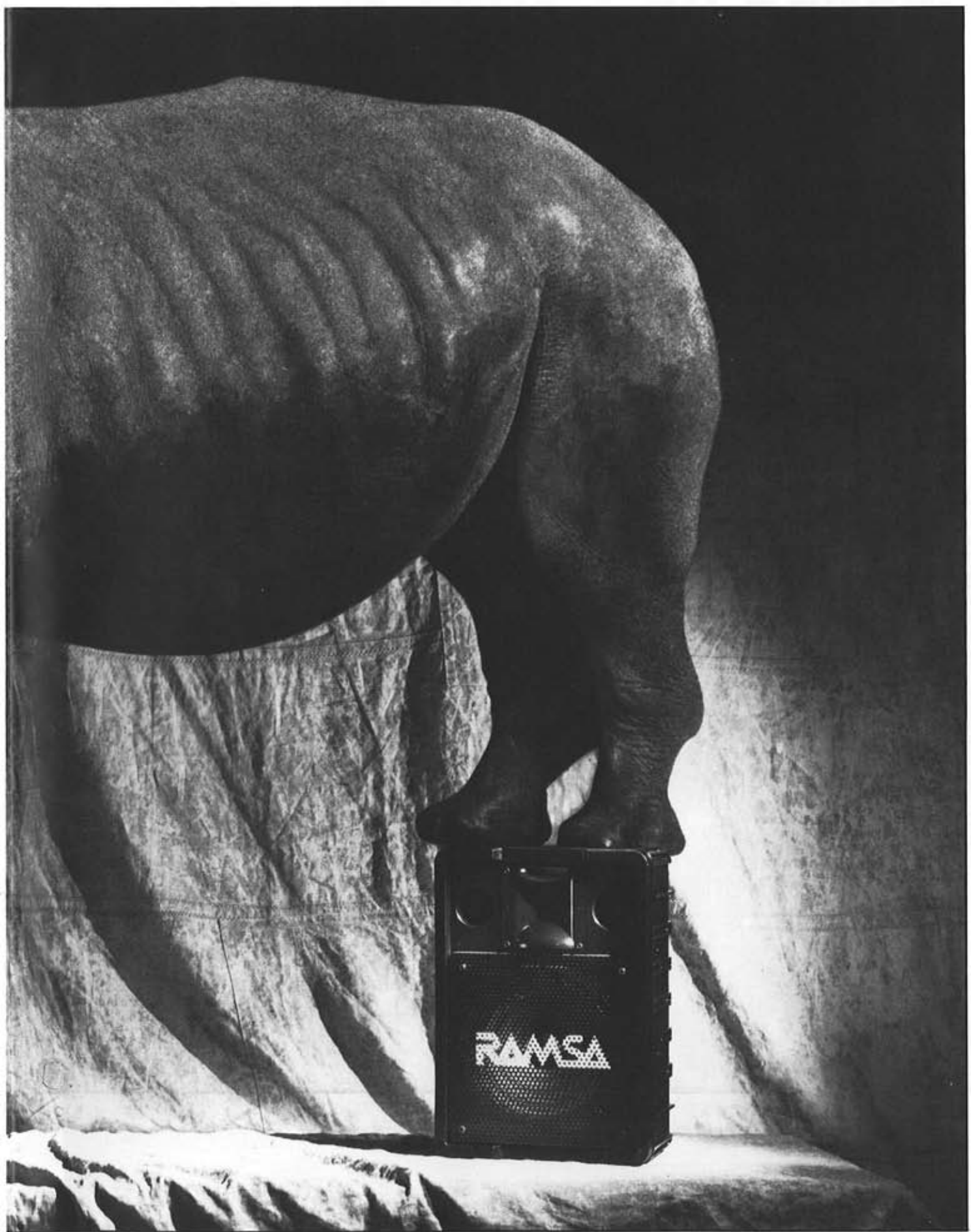
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Lighting Up Lloyds of London

Julian Williams talked to Andrew Bridge about the illumination project that has changed the City of London's night-time skyline.

Late at night on November 5th last year, and unbeknown to the odd remaining city gent wandering home with business heavily on his mind, a small band of radio-linked lighting men were stealthily doing manoeuvres around every sight in town. They were lining up viewpoints from miles around while instructing a 'soaking wet gaffer' who quietly moved lights around the rooftops in an attempt to find the best positions for the unveiling of a unique construction.

Set within the City's Square Mile, a striking new building had just 'flown in' and blended

itself with its original archway entrance amongst the surrounding ancient buildings. The world famous insurance underwriters, Lloyds of London, had taken a bold step to project themselves beyond the confines of the City and into the consciousness of the general public. No longer archaic, they welcome the public to observe brokers and underwriters at work inside.

The lighting men were 'hi-tech' designers Andrew Bridge, Simon Bruxner-Randall and production manager Richard Foulkes. Lloyds of London had asked specialist design company Imagination Limited, to provide a

centre-piece for their tercentenary celebrations. They wanted something that was going to make a mark in the city to celebrate the anniversary of the first insurance document issued by them 300 years ago. The 18th of February 1988 was the day to celebrate this event, and Imagination suggested that they should floodlight the unique new building, designed by the architect Richard Rogers.

With creative interior and exterior illumination, inaugurated by Her Majesty Queen Elizabeth The Queen Mother at a special ceremony, Lloyds now draws special atten-





The main body of the Lloyd's building has been washed in blue light with white beams for lift shafts. The 200ft central glass atrium was separately treated, lit from both inside and out in a golden rosy amber and pink.

tion to its standing and prominence. The lighting scheme offers new perspectives of the building and highlights many features that are less noticeable by day in a spectacular transformation.

The first task with the lighting design was to overcome the problem of the immense amount of potential viewing points: London doesn't suit itself to only one view point from afar, or from only one direction. Said Andrew Bridge: "We came up with a scheme early on because the building is so magnificent in its own style, which is quite fantastic. You'll either hate it or you'll love it. You have to go up to it to appreciate the majestic size of it, to see the quality and finish of it, and to get the real perspective of how good it can look.

"At night it just disappears in the dark amongst the other buildings. Focusing nights in the middle of winter had to be scheduled for a very late setting time to keep the project as quiet as possible and a surprise for the 'opening night'. Being a building of very controversial design and in a predominant place, it has drawn much criticism, though the lighting designers' task has been to enhance it in the best way possible," he explained.

"This wasn't an easy task," said Andrew Bridge. "The City of London is so cramped and congested it became obvious very early on that this building was going to be viewed from three aspects. First was the close one, up to 100 feet away from the building, appreciating that it is there, as the streets around it are so small. Suddenly, 'whap' - there's the building! Therefore it had to be lit for close-up scrutiny at street level viewing. Its second viewing aspect, farther away, such as Waterloo Bridge, Tower Bridge and various office blocks, was totally different,

these being no longer viewing points. The third aspect is from the air, looking down from the main flight path into Heathrow. What you would do close up you would never see miles away."

The proposal presented was that the main body of the building should be bathed in a combination of cold blue and steel lights, while the central vault should emit an eye-catching warm glow, with smaller lights around the building highlighting its dimensions and conveying an impression of intense activity.

"The building breaks down into two areas. One is the 200 ft-high glass atrium barrel vault, which is only really seen from a long distance, and the other aspect is the hi-tech modern pipes and functional services which surround the building, being part of Richard Rogers' design philosophy that the interior should be free and clean of such clutter. The outside is where he puts his drainage and lift shafts, flue pipes, water pipes, gas and water mains pipes, electric ducts, vent extractors, and so on. All these being in stainless steel with its brushed finish and mottle glass can naturally take light extremely well," explained Andrew Bridge.

To achieve the best end result they built a room-sized model of the building to do lighting tests on. Faced with this task, the problem was exactly what to light in order to avoid light spilling on to adjacent buildings. The lighting therefore had to be from within its own environment.

Operating in similar style to a fast fit-up for an industrial presentation, the difference here was that the installation had to be permanent and to survive perhaps for another one hundred years. The initial task was to come up with a lighting design within only

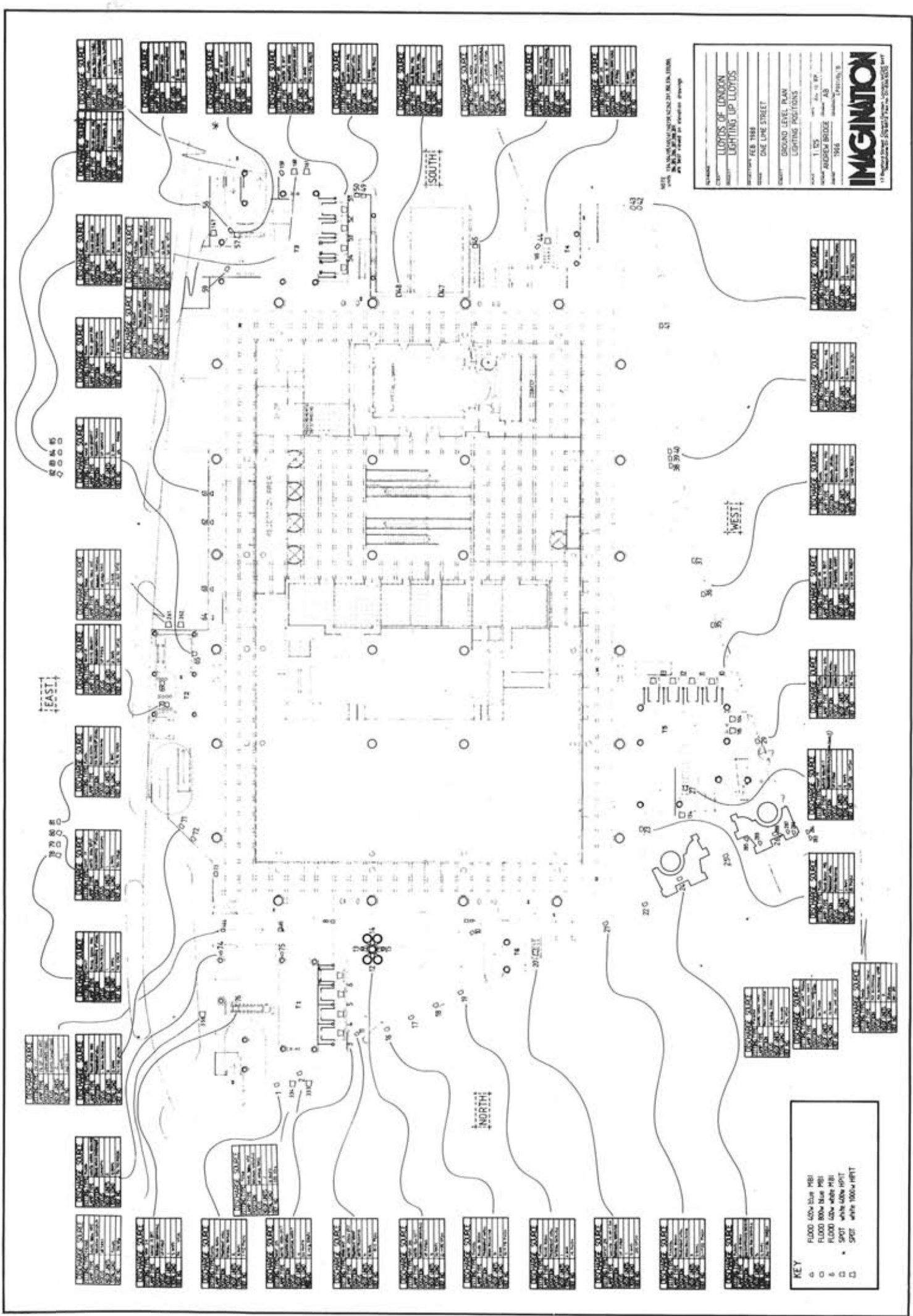
one week and Andrew had to walk around the building at night in the pouring rain taking his notes on pieces of wet paper. "On each facing you get lost in a maze of pipes," he commented.

His brief outline was to wash the outside of the building in a blue light and to pick out the outline of the pipework, services, and lift shafts with white beams. The 200ft. glass Atrium was separately treated, lighting both inside and out "in a golden rosy amber and pink, against the cold white steel of the building." This was his theatrical approach, creating "a little cathedral inside, glowing from within," which daily holds 6000 insurance underwriters. At the corners, the service towers, being the highest parts of the building, were picked out with adapted navigation beacons.

The fixtures had to be integral to the building and couldn't appear as bits added on. The required fittings came quite easily, but it was the lamp sources which required additional research and Bev Bingham of Lighting Technology was then brought in and had the task of adapting the units to take more appropriate light sources for this type of use. Because of the blue colour-wash required, and being a permanent installation, discharge lighting had to be used.

They were looking at an average lamp life of around 10000 hours, and, for safety, low amperage equipment - and economy. With the running cost factors in the schedule and the colour rendering required, they had to go for natural gases to produce the colour, as tungsten and traditional stage colour media obviously couldn't be used.

This is the first time Andrew Bridge had worked on a permanent architectural lighting installation, and having used so



many variations of lighting equipment in the entertainment industry, where so much equipment is available, his team was very quickly able to tell, due to the very small amount of equipment that is available for permanent use, which light units would be more suitable.

The flat and smooth image of floodlighting was not the case in point here, due to the building projecting various images and shapes, demanding a more creative approach to the design. For aesthetic purposes, a hi-tech rugged-looking lighting unit was required, and obtained from Philips lighting. He then decided that he wanted two types of colours - white and blue. "A Mercury White light output already existed," said Andrew, "so it was relatively easy to incorporate a very white crisp light discharge light source. Bev Bingham came up with a rarely-used blue GEC Osram light source to provide the deep blue wash that was needed. Luckily they were able to transfer a shipment on its way to the far east with the only eight lamps that existed at the time, and pinched them for this job, incorporating them into the Philips equipment."

"The next problem was to overcome the characteristics of the eye getting used to a natural blue colour. This blue wash has been mixed with some white light to compensate for the eye getting used to the colour and gradually returning to a natural white-rendering appearance," he explained.

The combination of lamp sources are the MBI/U Mercury Halide blue colour and the HPIT white. For the warm colours a sodium source was used, but they did not want the effect that a low pressure source, such as that used in street lighting, produces, avoiding the 'anaemic yellow' effect. They decided to use the SON DLE, and the deeper orange SON/T was the closest they could get to a tungsten rendering.

As Andrew Bridge knew artistically what he was trying to create, he claims he was able to move very quickly in comparison to the traditionally slow building industry. In order to get beamlights going up and down silver pipes, and remembering a similar light used to produce a bright beamlight from some past historic theatrical production, and which just happened to have been a searchlight, meant that they were led to Francis Searchlights, who make such things for the shipping and marine industry with a tungsten light source.

To obtain maximum brightness and a good lamp life they combined these two areas of equipment and built the MBI and HTI discharge units inside the Francis Searchlights, producing a controlled 'slot' effect by having to incorporate a much bigger envelope size lamp into the units than they were made for.

Lighting Technology then sent the adapted unit up to the Francis factory in Sunderland who produced them in a stainless steel housing - to be in keeping with the building - with modifications to the focusing assembly.

Out of a total lantern rig of 480 light units, which includes 53 searchlights, only three positions from his original plan had to be changed, and each of the positions required consultation with the building engineers for the appropriate fixings and positioning. Andy's enthusiastic 'pow show bizz' approach undoubtedly encouraged the contractors and builders on site to join in with the artistic fun of the moment! It obviously made a change from their normal duties on an unfinished building site.

I asked if it would be possible to find a

comparable project, and if a precedent could be set here for other buildings to be similarly lit. "Unlikely," said Andrew Bridge. Lloyds had spent "a lot" of money on the project. The annual operating costs come to a five figure sum, even though it is all switched off at midnight! The total electrical consumption is around the average requirement of twelve three storey houses.

The structure of the Lloyds building needed enhancing with a careful artistic approach to the lighting rather than an ordinary scientific one as often seen with so many flat, straight-on, floodlit buildings. And Andrew Bridge is somewhat disillusioned by the existing lighting of some buildings in London. He feels that some other buildings along the river are not particularly enhanced by having things such as green lighting thrown on them. "All the teams involved with the Lloyds project were pushing in areas that already existed, and all came together to combine their resources in thinking out a project in a totally different light," he said. He simply wanted to energise the building with some "exciting lighting!"

Andrew Bridge has crossed barriers with the dynamism of theatrical presentation lighting into the world of architectural lighting. But he simply wouldn't have it when I suggested that he had theatricalised the visual effect of this building. He unpretentiously claimed that this was a project for which Imagination, Lighting Technology, Francis, and Lloyds themselves collectively combined their areas of technology to produce a total state-of-the-art concept in a very unusual location.

Whether you are coming into town over London Bridge, Waterloo Bridge or Tower

Bridge, by boat from either direction along the river, or by air from the east, Lloyds of London cannot be missed.

Even Air Traffic Control were consulted for this project!

Credits

Project manager: Corporation of Lloyds Estate Dept
Project consultant: Imagination Limited, London
Electrical designer: T. Dunwoody & Partners, Harrow
Main contractor: Planned Maintenance Engineering Limited, London
Main supplier: Lighting Technology Limited, London
Component suppliers:
Francis Searchlights Limited, Bolton
GEC, Wembley
Landsdale Electrics Limited, Scotland
CGL Engineering, Essex
Peppers of Woking Limited, Surrey

Equipment Schedule

85 x HNF 001 (MBI Blue 800W)
51 x HNF 003 (MBI Blue 400W)
32 x HNF 003 (HPIT White 400W)
30 x HNF 206 (SON/T 1000W)
8 x Internal Flood (GEC SF400)
76 x FR 380 (HPIT 400W)
2 x FR 380 (MBI Blue 400W)
6 x FR 280 White (HPIT White 250W)
53 x FR 560 (HPIT White 1000W)
7 x Tungsten Flood
32 x Atrium Bulkhead
32 x Navigation Bulkhead
68 x Bulkhead

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Lantern Type	Lamp	Ballast	Igniter	Capacitors
HNF 001 Philips (blue) 400W (E40 Cap) x 2	GEC Mercury Halide. MBI/U	Philips H4000 x 2	P00002 x 2 (Philips)	Incl H4000
HNF003 Philips (blue) 400W (E40 Cap)	GEC Mercury Halide. MBI/U	Philips H4000	P00002 x 2 (Philips)	Incl H4000
HNF003 (WH) Philips	Philips HPIT 400W (E40 Cap)	Philips H4000	O00002 x 2	Incl H4000
FR 280 Francis Searchlight (Fc 2 Cap)	HQI-TS 250W/D	Tri Donic		
FR 380 (Blue) Francis Searchlight (E40 Cap)	GEC Mercury Halide. MBI/U (blue) 400W	Philips H4000	P00002	Incl H4000
FR 380 (White) Francis Searchlight	Philips HPIT 400W (E40 Cap)	Philips H4000	P00002	Incl H4000
FR 560 Francis	Philips HPIT 1000W (E40 Cap)	Philips BAL1000 L66	Philips S152	2 x L4025 (Philips)
HNF206 Philips (roof)	GEC SON/T 1000W (E40 Cap)	GEC GBIKWLV (complete)		
GEC SF 400W GEC (Internal)	GEC SON DLE 400W (E40 Cap)	GT 400 (complete)		
Tungsten Flood Tasley MX 1000W	240V 1000W K4 (R7s Cap)			
Bulkhead (Atrium) Coughtrie	CPS 80W	80W HPL/N (E27 Cap)	Integral	
Bulkhead Stairs Philips W4321		80W HPL/N (E27 Cap)	Integral	
Blue Beacon	Lens - Faros Marine Unit - Lighting Tech	CE MVR 250/u/40	Parry SHV 250	KPC184/18UF

Lighting Technology Insures that Lloyds are Lit

When Lloyd's wanted a very special floodlighting effect for their new London building, they appointed two companies with a combination of design and technical experience:

Imagination and Lighting Technology

Given two weeks to design the scheme, the easy part was left to Andrew Bridge. In the eight weeks prior to 'switch-on', we converted Andy's colour-call into discharge technology and supplied 350 luminaires onto site.

The Lighting Technology Group wish to congratulate Lloyd's on their Tercentenary and thank them for providing such a remarkable addition to London's night skyline.



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Telex 894452 Light G

Action Lighting Ltd 01-993 1684

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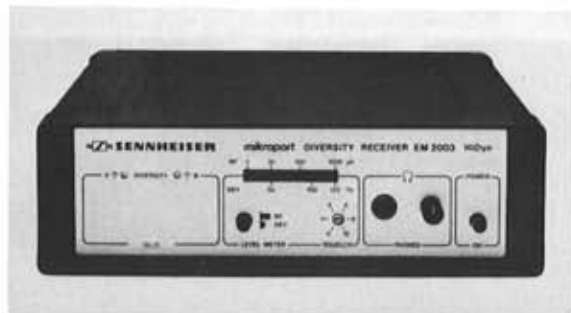
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SHOW PAGE *with PLASA News*

PLASA Strengthens BOTB Links

PLASA's general secretary Tony Andrew has spent a large percentage of his time since joining the Association in establishing strong links with the British Overseas Trade Board.

A mission to Canada and the United States in June had recently been approved, and provisional approval has been given for a PLASA group scheme for Discotec/Hogatec at Dusseldorf in November, he told members of PLASA's committee at their April meeting.

Tony Andrew also reported that the organisers of SIB/Magis at Rimini were looking seriously at moving the dates of the 1989 Show back to May. "They are currently examining the 1988 Show figures," he said, "and the dates for 1989 are expected to be finalised before the end of April." If the Show does move back to May there is the possibility of BOTB support - a big bonus that would see a large British turn-out at Rimini next year.

AGM Date Announced

PLASA's Annual General Meeting will be held at Novotel on Thursday June 16 and plans are being made for an after-luncheon guest speaker.

Exhibition Seminar

30 members have already booked for the Exhibition Training Seminar on May 5 at Warwick. If you are intending to go and have not yet booked, please contact the PLASA office immediately on (0323) 410335.

New Members

The following companies were admitted to membership at the recent Committee meeting:

Eurolight Limited
Astralloy International
Volt Loudspeakers

PLASA OFFICE:
7 Highlight House, St. Leonards Road,
Eastbourne, Sussex BN21 3UH
Telephone (0323) 410335
Fax: (0323) 646905

Exhibition Diary

ABTT Trade Show

April 14-16, 1988.
Riverside, Hammersmith, London.
Enquiries: ABTT, 4 Great Pulteney Street, London W1R 3DF.
Telephone: 01-434 3901.

Expo Musica, Madrid

April 20-24, 1988.
Madrid, Spain.
Organised by IFEMA (Institution Ferial de Madrid), Avda de Portugal, s/n Casa de Campo, 28011 Madrid 1101.
Telephone: Madrid 470 10 14.

Audio Visual 88

April 25-28, 1988.
Wembley Conference Centre, London.
Enquiries: EMAP/MacLaren Exhibitions Limited, P.O.Box 138, Token House, 79-81 High Street, Croydon CR9 3SS.
Telephone: 01-688 7788.

Showtech 88

May 18-20, 1988.
Trade Fair Centre, Berlin.
Enquiries: German Chamber of Commerce, 12-13 Suffolk Street, London SW1.
Telephone: 01-930 7251.

International Disco Technology Fair

June 7-9, 1988
Bally's Grand Hotel, Las Vegas.
Enquiries: Night Club & Bar Magazine, 305 West Jackson Avenue, Oxford, MS 38677.
Telephone: (601) 236 5510.

PLASA Light & Sound Show '88

September 11-14, 1988.
Olympia 2, London.
Exhibition Organiser: David Street,
Telephone: 01-994 6477.
General Enquiries: PLASA general secretary, Tony Andrew, 7 Highlight House, St. Leonards Road, Eastbourne, East Sussex BN21 3UH.
Telephone: (0323) 410335.

Photokina

October 5-11, 1988.
Cologne, West Germany.
UK Representative: Tony Pittman, 12/13 Suffolk Street, London SW1Y 4HG.
Telephone: 01-930 7251.

Discotec/Hogatec

November 7-11, 1988.
Dusseldorf Messe, West Germany.
Enquiries: Miss Renata Born or Mr Peter Brodie, Dusseldorf Trade Fair, Charles House, 108-110 Finchley Road, London NW3.
Telephone: 01-794 0166.

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CELCO.

G O L D

The Series 2 Range of lighting control systems are designed and manufactured by Celco Ltd. For further information please contact our distributors. **Worldwide Distribution** Cerebrum Lighting Ltd, 168 Chiltern Drive, Surbiton, Surrey KT5 8LS tel (01) 390-0051/4841 tlx 892337 Celco G **US Distribution** Celco Inc, 30 B Banfi Plaza North, Farmingdale, New York 11735 tel (516) 249-3662 dialcom IMC 1286.

Celco's Success Series

John Offord visited Celco Limited's South East London base and talked to the team of four who produced the 'Gold': Tim Bridle, Matt Deakin, Keith Dale, and Andy Reed.

Celco's march from Gamma to Gold has been one of the major success stories of the last decade in the international entertainment lighting control industry.

And the success came with a rush. The company had been formed in 1978, but it was only two years ago that Celco really knew they'd hit the centre of the target. The warm-up had started in late 1985 when a Series 2 90 was installed at First Leisure's Birmingham Dome (featured in L+SI's first issue in November of that year), and it continued through to the Frankfurt Music Fair in February 1986.

"Within a few months of that Fair turnover began to increase by a very significant amount, and from that point we've never looked back," said marketing director **Keith Dale**. Happily they've been on the same high ever since.

Four equal shareholders are the four directors of Celco Limited, and each has an equally important and interlocking role to play in the running of the operation. Tim Bridle is managing director, Keith Dale is marketing director, Matt Deakin is technical director, and Andy Reed is engineering director.

The formation of EFS Celco Limited (later changed to just Celco Limited) happened as a result of the merger of two companies - Celestial Lighting Company (owned by Keith, Tim and Andy, and where the Celco name comes from) and EFS Limited (owned by Matt Deakin and his team). Celestial was a rental and design outfit in the rock and roll field, whilst EFS manufactured lighting controllers. With the two companies sharing the same premises and trading with each other it was a natural follow-on to join the two operations together into one comprehensive unit.

"Right from the beginning we decided to expand the range of controllers that had previously been built by EFS," Keith Dale explained, "but because EFS were very much a 'me too' company, producing clones of what was then mainly Alderham equipment, Matt Deakin came up with the idea of a micro-processor-assisted control board, with a micro-processor replacing the pin matrix that was previously used.

"We thought this was quite a revolutionary process and we eventually manufactured a product called Gamma. We still believe it was the first micro-processor-assisted board in the world to be produced in numbers.

"We sold about 100 different Gammas around the world and it put us on the map - but we didn't reach the top of rock and roll. It was mid-stream, and looking back it was mainly because we missed out some important points. Whilst technically it was very innovative, it didn't have the attention to detail that we put into products today. Also, the colour was very strange, and I think that put quite a few people off! It had the nick-name of being a Chad Valley product.

"Eventually we came to a point where we had to replace the Gamma, and iron out the technical problems. At the same time we had to re-appraise the philosophy of the company, and its views on servicing, marketing, and so on.



Celco's four directors with their new 'Baby', launched at the Frankfurt Music Fair in March (left to right): Keith Dale, Tim Bridle, Andy Reed, and Matt Deakin. Over 80 per cent of Celco's output is exported, with Germany, Japan and the USA the principal markets.

"Great emphasis was placed on the 'quality' feel to a product in addition to its technical merits, and we also decided a much higher profile was needed in the market place and this is where Cerebrum Lighting played a very important role.

"When the Series 2 was launched in February 1984 people soon saw we had put right the shortcomings of Gamma, and it was good for us because we were now into our second generation of micro-processor-assisted boards. We felt we could now go from a position of strength because we had

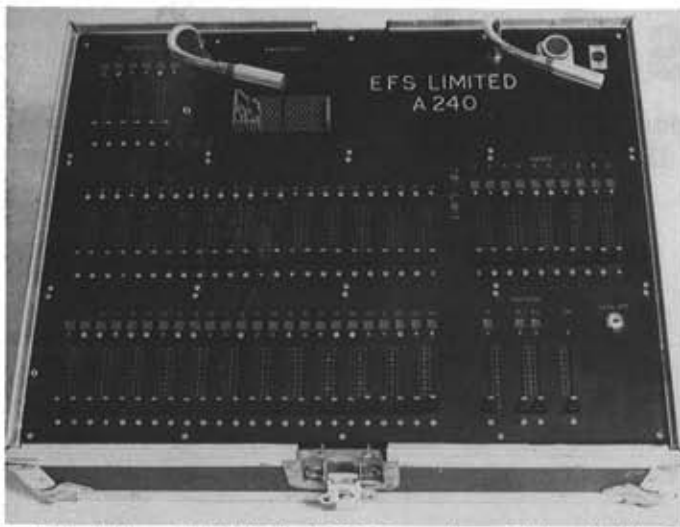
ironed out the problem areas.

"Initially we sold more of Series 2 than Gamma, but it was no big deal. I was working out of Cerebrum Lighting at this time, working closely with them, and to be on hand for demonstrations. And this situation continued until the end of 1985 when I moved back to base at Celco. I then said we needed to take a greater grip on our own destiny, particularly in terms of marketing.

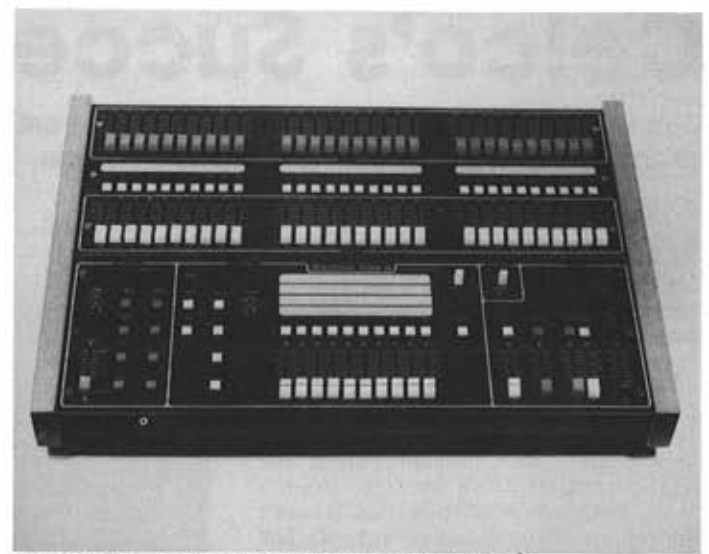
"It was a very big step, but it has paid off. We've just come back from the 1988 Frankfurt Music Fair where we launched our



Colour close-up of the Celco 'Baby' - up to forty programmable memories and numerous special features.



Early beginnings - EFS Limited's A240 10-way pin matrix board with 24 channels and 6 independents.



Gamma 300D - the first 'hands-on' memory lighting board.

new 'Baby' and new add-ons to the existing range. It has been company policy that when we produce a new item it must be retro-fittable to old equipment, and we've found this has done us a lot of good in many ways.

"It's a small world, and people get very annoyed if they've just invested many thousands of pounds and a week later you bring out a new board that's not compatible. It's highly unlikely they'll ever buy from you again. This policy has certainly paid off. We introduced Soft Options in 1986, and now over 40% of Series 2 boards have it as an add-on, keeping up to date in the process."

I asked technical director **Matt Deakin** the reasons for the spectacular success of the Series 2 range of memory lighting control boards, and how they'd come about.

"Gamma was the first multi-master hands-on memory board of its type anywhere - as far as we are concerned - and we learned a lot from it. It had some shortcomings, but we learned from the experience. We put a lot more into Series 2, but based on the same philosophy," he explained.

"I've always tried to come up with something that's very easy to use, and probably our secret is 'ease of use coupled with lots of facilities'," he said. "We try to design the product so that you can get in at the basic level very very easily indeed, and yet you can still explore its 'hidden depths'. As a user comes up with various requirements, he will find that he can cope with them, and we

also try to make his steps deeper into the system the most logical.

"We endeavour to sit back and look at it and say: 'if I was going to do something, for example the assignable chase, an addition where you could take a sequence and put it on a cue master, the most obvious answer is to put the chase up and store it as if it were a memory' - and that's exactly how we made it. This is the approach we always try and use.

"We spend an awful lot of time thrashing out every problem," interjected Keith Dale. "Every idea Matt and I suggest we go through in operational detail, which results in simple but neat and practical improvements to the boards."

"We check through all compatibility problems on new developments to make sure we can retro-fit," continued Matt. "If it's a serious problem we just don't do it, and if it's a minor one we can document it so people are aware of what they need to do." (Every Celco board is documented, just like a Rolls Royce.)

"Another major point is that we have worked very hard to get the boards reliable. There are two sides to reliability: the mechanical assembly to make the unit strong and reliable as a unit, and, because it is largely software driven, in making sure the software has a minimum number of bugs in it.

"We try to make the way products work internally very robust. For instance, if for some reason the computer was to crash, it has an automatic recovery system so that the user would never even know it had happened.

"Both Keith and I have worked in lighting design and we've listened to all kinds of designers - they must all be listened to. Right now we are moving into poly-carbonate panel extrusions, mouldings, and plastics. New materials are available from other

industries and we are moving away from shaped metal and wood. We are moving into new frontiers with product development."

With Keith Dale sitting in, and enthusiastic as ever, he joined Matt Deakin in giving me a short and sharp flurry of high spots. (All four Celco directors have just turned 30, age-wise, and I doubt if they'll mellow for a long time yet.)

- "We worked very hard getting the product totally reliable" (Matt)
- "Then getting a very definite image for Celco" (Keith)
- "And Cerebrum Lighting for pushing it continually and doing a very good job on the export side" (Keith)
- "The David Bowie Tour with two Golds" (Matt)
- "Finlandia Hall in Helsinki - a pinnacle of the installations" (Keith)
- "Many boards into TV work" (Matt)

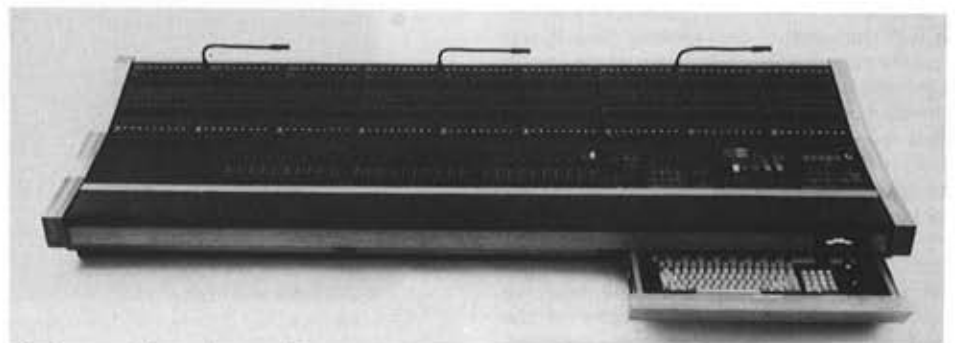
Celco's marketing is very designer/operator targeted. "If we can sell the concept to lighting designers and TV console operators the sale will come from a hire company," explained Keith Dale. "We've always found that if we can get to the people who are actually going to use the board and then give them a thorough demonstration we can almost always win them over," continued Matt Deakin. "We see the boards as suitable for almost everything except professional repertory theatre, and we don't present it as a professional theatre board."

Andy Reed is Celco's engineering director, and has the job of putting all the bright ideas into an attractive-looking box, and making sure it works and is reliable.

"Apart from being designed to do the job it was intended for, we also design so that servicing is as easy as possible. We've always had the philosophy that the customer ought



Keith Dale and Matt Deakin launch the new Celco 'Baby' at the 1988 Frankfurt Music Fair.



The famous Celco Series 2 'Gold'.



The Q-Card system. For latest boards and those up-graded with SoftOptions, the digital storage interface can record the memory content on to a Q-Card for subsequent archiving and playback in the same or different board.

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"In my view there is a right way to do everything. There are often a number of ways to solve a particular problem, but there is one right and best way - and that's the way I always try to use. Also we try to use the right materials; not materials that are in vogue, but those that are right for the job. At the end of the day we end up - in my view - with a Rolls Royce product, as near perfect as possible."

Space is at a premium at Celco, and whilst the directors continue the long search for suitable freehold premises, they have to send out a large degree of manufacture on contract, whereas they had previously produced most products at base.

"We make lighting desks for a living, not sheet metal work," said Andy, "and the sheer volume of work has now meant we've had to go out on sub-contract. We have retained the top end input and off-loaded the menial tasks from the bottom. We could make a conscious decision to bring all the work back in-house but we don't want to be stuck with techniques that may change within a short time having invested heavily in machinery and so on.

"We expect our sub-contractor to test circuit boards fully, and then we 100 per cent test them again when they arrive here. If they are OK they go into the finished product, and then we test the completed product and all its functions. Then we soak test the boards and test again for a second time before packing and delivering."

Managing director **Tim Bridle** looks at the business from an administrative and financial viewpoint. "Our success has come from a gelling of the groundwork we've done over the previous years," he told me. "We've successfully developed a product to succeed



Digital storage add-on for the older Series 2 boards using the new Q-Card facility.

our previous range, and it has now been accepted into the market. From having a good company with a good product we've gone on from there, with excellent support from our distributors coupled with improved marketing."

Celco's recent expansion in the market place has been self-evident, but the figures Tim Bridle divulged showed just how far the company has grown over the past few years. The financial year 1986/87 showed a 50% jump over the previous year, and the year that has just ended will show a neat 100% increase above the 1986/87 figures. And he confidently expects a 70-80% increase for 1988/89.

"In the next two or three years we will treble in size," continued Tim, who carries the pleasant but heavy burden connected with the financing and associated detail of such a huge continuous increase in turnover.

Celco's latest product is another success story in its own right. They launched their new 'Baby' at the recent Frankfurt Music Fair, and the first 50 were sold before advertising had started. "Now we've sold the second 50," said Tim, "and we've had to move all the production dates forward. I've already scheduled 250 between now and October." (The Celco 'Baby' will be featured in our May issue within the crop of Spring-time show reports.)

Celco have had three approaches over the past year from companies interested in tak-

ing them over or amalgamating resources, but the highly independent nature of their set-up and the personalities involved will more than likely see them attempting to get right to the top on their own strengths.

"There will certainly be a greater alignment between certain manufacturers in the industry," said Tim Bridle. (A polite way of saying buy-outs or take-overs.) "Because of technological links there will naturally be greater liaison between the control manufacturers and the instrument manufacturers - because of intelligent instruments - and there will be a greater involvement between the two sectors.

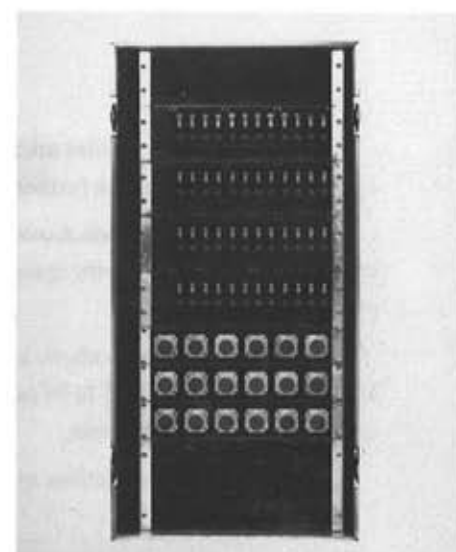
"It's an obvious development, and the same will apply to optics. Eventually there will be a number of major conglomerates.

"The stakes are high," felt Keith Dale, and switching the emphasis he said (with a glint in his eye) that Celco would be more likely to buy someone rather than be bought out itself. "Maintaining our integrity and identity is the most important thing," he continued. "The industry is full of characters, and if you start taking that away from people you just become another cog in the machine. Eventually it would become an industry run by accountants.

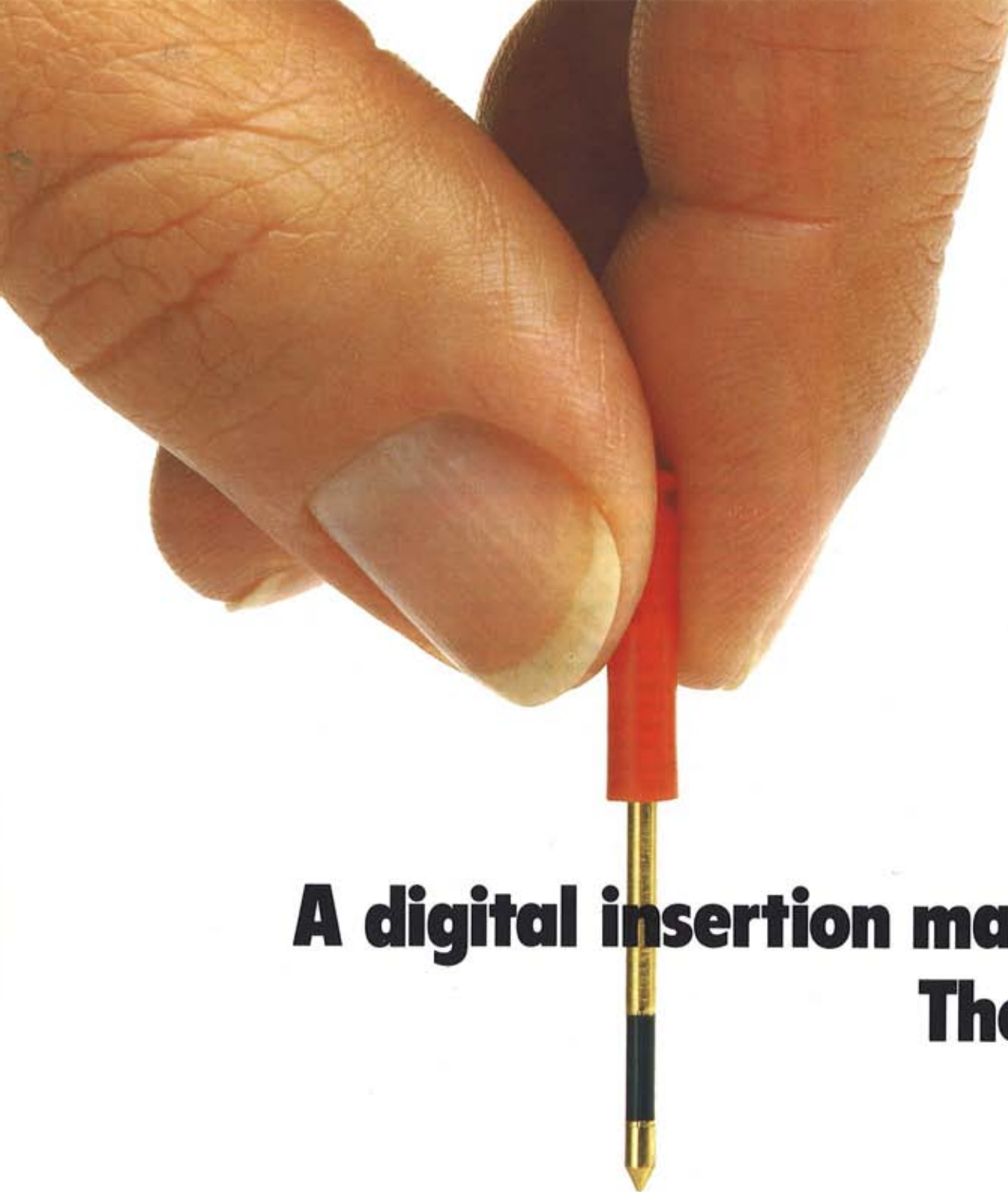
"All of us are very, very ambitious and we want to keep on pushing. We have no intention of slowing down. We've got our sights right at the top, and we intend to become the biggest console manufacturer."



Part of the final assembly, soak testing and quality assurance area at Celco.



The US0048C Series 2 dimmer. Manufacture of dimmers accounts for between 15 and 20 per cent of Celco's annual turnover.



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Q-PATCH FROM  **AVOLITES**

Miking Up Live

Ralph Dunlop of Brüel and Kjaer discusses the resurgence of interest in microphones and microphone techniques, and introduces the new B + K Series 4011 cardioid condenser mic.

Recent years have seen the advent of a bewildering range of new technologies in the recording industry - samplers, MIDI and console automation systems, synthesiser programming - which, once mastered by an engineer, have in some cases rendered microphones, if not obsolete, at least optional.

Ironically, this development has also prompted a resurgence of interest in microphone techniques, which has gone hand-in-hand with a desire amongst engineers to return to a more natural 'live' sound, rather than the mechanical, processed sound afforded by new technology.

Whatever the application, 'Choosing the Right Mic' has become the subject of great, and often unresolved, debate - unresolved not only because of the number and range of microphones currently available, but also because of the wide variety of mic techniques now being used by engineers. Take into account all the other considerations - personal preference, specific applications, even fashion - and generalisations about microphones and their applications cease to be useful.

Nevertheless, if a useful division between microphone types does exist, it lies between condenser and dynamic mics. The superior quality of condenser microphones - Neumann U87s, AKG C414s, Beyer MD740s et al - is naturally more suited to recording and broadcasting purposes, whereas the physically robust, directional pick-up pattern characteristics of the dynamic mic - in particular the ubiquitous Shure SM57s and SM58s are ideal where live work is concerned: the traditional image of the rock star thrusting the mic down his throat or whirling it around like a sling simply could not have existed had it not been for dynamic mics.

At the same time, the advent of digital technology, the compact disc, and low-priced quality hi-fi systems, has raised our expectations about quality sound, which now extend to what we hear at live venues. In this area, these expectations have been met partly by improved PA systems and mixing desks, but also through the development of quality condenser microphones which exhibit the same robustness as dynamic mics. AKG, for example, have designed the C535 and C1000S condenser mics to just this specification. The C535, which uses a Phantom Power Supply, is mainly a vocal mic and was put through its paces by Alison Moyet during the last few months in a series of live dates. The C1000, also primarily a vocal mic, is a more recent introduction and has yet to be used extensively; however, it does have the advantage of being powered by a 9v internal battery.

Similarly, Brüel & Kjaer has designed a new cardioid condenser microphone, the Series Type 4011, which has already been used in a number of live applications, and most recently to capture Carl Perkins' vocals during his European tour. Like the AKG condenser, the 4011 is physically robust - B & K demonstrate this fact in seminars and training courses by smashing the mic repeatedly against hard surfaces and then testing it to

prove its performance has not been impaired. Indeed, B & K are proud of the durability of the microphones in the Series 4000 range, which are designed to cater for the rough handling that can be expected in live work.

Another recent development has been the move amongst engineers to use omnidirectional microphones in the live sound arena, in particular to replace the dull 'thud' of drums coloured by inferior cardioids with a much richer, clearer sound. The theory here is that the high dynamic range of omni allows the engineer to venture nearer than ever before to the source of the sound without being punished with clipped signals. The dynamic range capability (for example, up to 168dB peak SPL for the B & K Series Type 4004 mic) also has the advantage of minimising leakage problems through close miking, since mic positioning for omni is not restricted by the proximity effect suffered by directional mics (see Fig 1 illustrating how possible leakage problems can be controlled through mic placement). Inevitably, some leakage will occur regardless of whether an omni or a cardioid is used, for example the hi-hat into the snare drum mic, or vice versa; however, cardioids will be clean and undistorted, due to their smooth off-axis phase and frequency responses, giving the genuine hi-hat sound rather than a corruption of it.

The experience of Chrys Lindop, a respected engineer who worked on the recent tours by The Pretenders and Stevie Wonder, bears testament to this theory. For Lindop has been using omni-directional mics in live applications for some time now. As he explained: "I had flown to the USA to take over on The Pretenders tour and another sound engineer, who was mixing the opening act, Iggy Pop, gave the Brüel & Kjaer mics a very high recommendation for the drum kit. I was a bit sceptical at first - all I could think of was the B & K measurement mic. But once we'd set the mics up and tried them they were brilliant, giving a very accurate, rich sound."

Naturally, the standard drum kit mics - for example, Shure SM57s on snares, E-V RE20s or AKG D12s on bass drums, Sennheiser 421s or Beyer 88s on tom toms, and AKG 451s overhead - are still much more popular

and produce excellent sound, but the omni do give engineers extra options. And their use often provokes further experimentation: for example, once Lindop had tried the omni on drums, he decided to try them out elsewhere: "I also used the omni on Stevie Wonder's grand piano during his European tour. On one occasion, when Stevie was playing at the Waldbühne (an open-air amphitheatre more famous for Hitler's speeches than for rock concerts), I had 1 4007 (high intensity) and 2 4006s inside the piano, with the lid closed. I used the 4006s to give a full sound and the 4007 took care of the high harmonies."

Such a spirit of experimentation does indicate a new attitude towards miking up for live sound. Moreover, the use of quality condensers in this area does indicate a merging between the two worlds of recorded and live music. After all, if engineers and producers are making live-sounding records using condenser mics, it seems logical to use the mics again when it comes to translating those records into live performance.

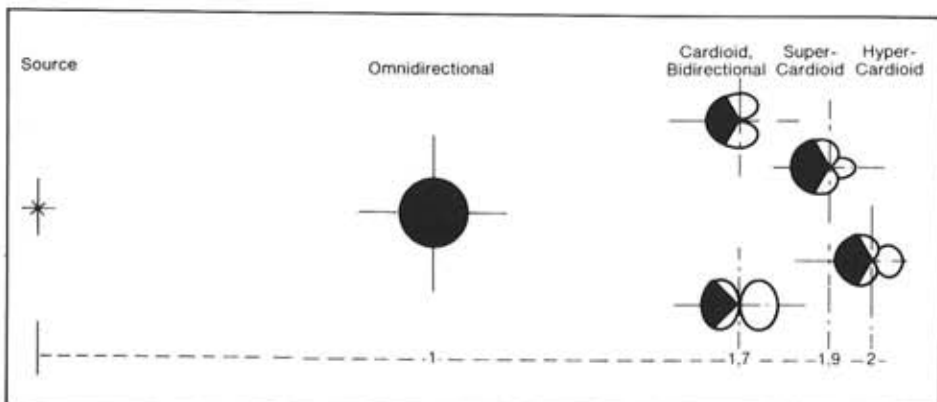
The matter is further complicated when a rock concert is recorded. Amidst the Shures and AKGs used for the live sound, the recording engineer may place Neumann 87s or AKGs on particular instruments to improve their recorded sound, or perhaps use condenser mics to capture audience participation. Inevitably this makes the whole system more complex, and once again, the robust condenser mic comes into its own when it can be used for both applications.

Theatres

Over the past decade, the sound systems in



The B+K Series 4011 cardioid condenser mic.



Relative positioning of omnidirectional and cardioid microphones that result in the same amount of leakage. Generally, an omni placed at two-thirds of the source/mic distance of a cardioid will exhibit the same leakage as the cardioid.

major theatrical and musical productions have become increasingly sophisticated, and the sound performance currently achieved in top West End shows is of a very high quality.

Perhaps the most notable development in this area has been the increasing use of Lavalier microphones, tiny omni-directional radio mics concealed within the artists' costumes. Lavalier mics are used almost exclusively by solo performers and leading characters in top shows, with gun mics positioned over the orchestra or chorus. Indeed, they are now used so extensively in London theatres that a move to switch frequencies into the UHF band is currently under review.

Despite the obvious advantages that these mics afford - size, mobility etc, their performance is not entirely satisfactory. Perhaps the most significant factor here is their cost. As Kevin Swain of Paul Farrah Sound explained: "Radio mics cost about £2000 each to buy and even though we hire them for the duration of a show, it's still an expensive exercise. When you consider that each production of 'Starlight Express' utilises 21 radio mics, costs soon start mounting up. Another problem that I've encountered is that the capsules of the mics sometimes get clogged up with make-up or perspiration, something which inevitably affects the sound quality."

This aside, as far as theatre work is concerned, radio mics such as those made by Micron are still of impressive quality. But the advent of cheaper radio microphones, as well as the rationalisation of frequency bands is certainly something which will be welcomed by sound production.

Corporate Presentations

Geoff Hutchins, who runs his own successful sound and lighting services company and has worked on a variety of top live projects including Walt Disney's 'American Celebration'

tour of Europe, has been involved recently in handling the sound for a series of conferences.

Geoff acknowledges that conferences are becoming increasingly sophisticated in terms of A/V effects, and as customary expectations increase, the production of clear sound on speeches is of prime importance, especially given the dubious acoustic properties of many conference halls. As Geoff said: "If the client wants radio mics I'll usually use Microns, or Nady's for the more heavy duty material. I've found that when I'm working in conference centres where there are a number of presentation halls, a lot of checking has to be done to prevent frequency interference; and when I've worked in Europe, the frequencies are slightly different there, so I have to be a bit careful.

"For most conferences, however, I'll nearly always use the AKG C451, since it is very reliable and gives excellent reproduction. Another mic to look out for in this department, according to Kevin Swain from Paul Farrah Sound, is the relatively new Sennheiser MKH40 cardioid model, also a reliable performer.

The Future

For a live sound engineer, choice of mic is dictated by experience: if a microphone is reliable and gives good quality sound, then it's best to stick with it, rather than use an unfamiliar mic. Besides this, an engineer often doesn't have the time to experiment with new mics, given all the other demands of setting up for a live concert.

Mic choice is also largely determined by the musicians involved - the Shure SM58 is considered by many singers to be the definitive 'rock 'n' roll' microphone, without which the live performer is somehow 'incomplete'. Similarly fashion plays its role - on one occasion in the USA, for example, a

singer was so convinced that the Neumann 87 was the best vocal mic that he refused to try anything else. For one particular song however, the B & K omni sounded better, and the engineer had to resort to concealing the smaller mic inside the empty shell of the Neumann!

There are some engineers, however, who constantly change their microphones and mic techniques in the search for a better sound. Chrys Lindop, for example, tries various mics on the drum kit every time he sets up in a new hall, especially when the band is touring through a number of countries where temperature and humidity change from day to day. It is because of this kind of experimentation, that we're beginning to see new mics - especially condensers - emerging into the live arena.



Ralph Dunlop

This article is based on a presentation given by Ralph Dunlop, UK/European sales manager for Brüel & Kjaer, at Sound Eighty Eight at the Penta Hotel, Heathrow, in February.

Brüel & Kjaer's headquarters is based in Naerum, Denmark, at a factory which employs 2,300 people. B & K also have 22 wholly owned sales companies throughout the world, including the UK office in Harrow.

Until recently, the company was known mainly for its measurement expertise in electronic measurement in the fields of acoustics and vibration. However, with the advent of their Series 4000 mics, B & K has earned a reputation for producing the highest quality mics for the pro audio industry. The mics are virtually hand-made, with only 10 automated operations in the 180 involved in producing each individual mic.

Designed originally to handle the demands of digital recording, the mics are now being used throughout the audio market - in recording studios, by broadcast companies, and in post-production houses. Their applications for live work, however, were the starting point for this article.

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Royal Scottish Academy of Music and Drama

The Royal Scottish Academy of Music and Drama has acquired a new purpose built home in Glasgow, the city which declares itself to be **miles better**. Now just what they mean by this slogan has never been clear to me: but then I was born in Edinburgh. However I am prepared to agree that the RSAMD is now housed in a building which is miles better than the accommodation which is normally provided for those wishing to learn the arts and crafts of performance.

Although the building has been in use for about six months, it has been subject to such a unique embargo on press reporting that I began to suspect that they must be trying to hide something. But no. After five minutes of truly investigative journalism on site, I am convinced that the embargo was just the result of natural concern that the Queen Mother would read all about it in L+SI before making a declaration of well, truly and officially open.

It is curious how the spirit of school pervades any educational building, irrespective of its construction materials. Despite the gentle warmth of soft raw bricks and the stout elegance of ash doors, I felt very clearly aware that I was walking the corridors of an Institution. And that is symptomatic of my response to the building as a piece of architecture. It is an excellent machine for training musicians, actors and technicians. It scores high on logic. I am sure its users will provide it with a soul. But this could be hard work when there is so little pleasurable visual stimulation to be gained from either the theatre or the concert hall.

But before exploring that particular area of concern, let us note that both the schedule of accommodation and the technological furnishing seem to be exemplary. This includes an ample quota of the spaces that are essential, indeed unique, to an academy of music: small rehearsal rooms whose sound isolation ensures that the ears of individuals are sealed from the intonation struggles of their fellows. The workshop, wardrobe, and storage areas for costume and props provide enviable service areas. But it is the performance spaces that are the core of a school for performers and there are five of these.

Concert Hall

The Concert Hall stage has approximately 440 seats raking towards a stage formed from a clear floor area rather than a raised platform. A section of the floor may be dropped to form an orchestra pit, giving some potential for opera. The ceiling has moveable panels which the brochure says 'will be used to vary and refine the acoustic properties as required'. This ceiling certainly has more flexibility than I would normally expect to find in a hall of such size and form, so I assume that the range of adjustments is required to allow students to play Mahler in a Haydn hall. An efficient space for playing and listening.

Theatre

The Theatre, too, is an efficient space. The proscenium, with an opening variable be-

tween 9.1m and 12.3m, frames a stage with a depth of 11m. The fly tower has 30 counterweight sets (25 single and 5 double purchase). A forestage elevator (9.5m x 2.3m) offers an optional apron or sinks below floor level, joining with a further understage area (10.5m x 4m) to provide an extensive orchestra pit.

The auditorium is in opera house format with shallow circles (only two seating rows deep) offering an excellent contact with the stage from a compact house whose audience (just over 400) are positioned in a way which will help them to achieve a corporate identity with ease. This is, of course, at the expense of impure sightlines from

some of the side seats but this is a price which we have recently rediscovered to be worth paying. But why that divisive central gangway?

Studio Theatre

Identified on the plans as **Laboratory Theatre**, this is a box of at least notional flexibility. However the time and energy required to shift the seating around (even with only about 100 seats) is unlikely to encourage regular form changes. Especially as its end stage form is rather good and the lighting bridges relate well to it.

TV Studio

This has an acoustic which is surprisingly live



The Theatre at the new Royal Scottish Academy of Music and Drama.



A view of the Theatre from the rear of the stage.

for television: could this be because the specification required it to double as an examination hall? The technical equipment of the 21m x 11m space is good, with a spacious control gallery and a grid of tracks for pantograph-suspended lights.

Recital Hall

It started life as an Opera Rehearsal room but offers a very sympathetic housing for chamber scales work. This is the space that lifts my spirits: the area about which I can enthuse subjectively as well as objectively.

Technical Facilities

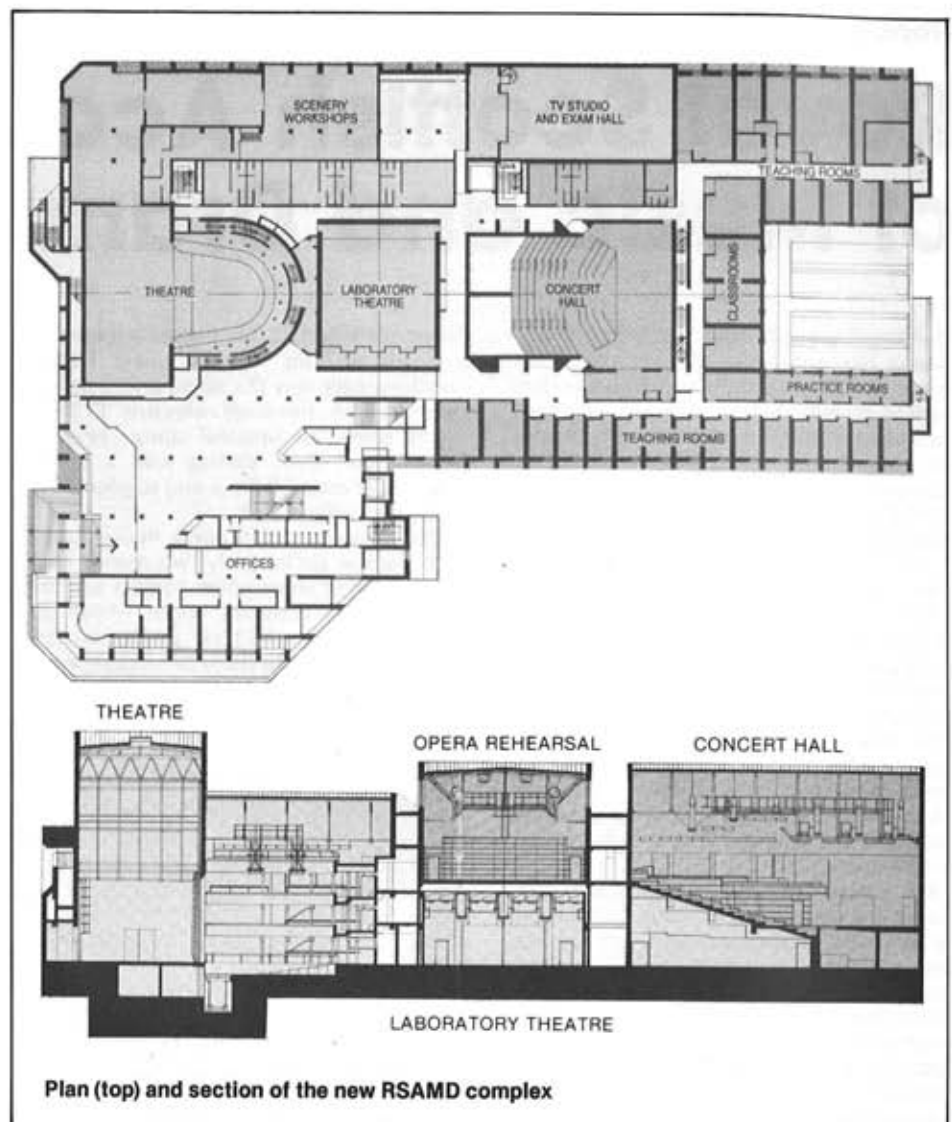
The School's technical facilities are splendid, and apt for both teaching and for performance support. In addition to the theatre workshops which include a good paint frame, there are workshops for instrument repair and particularly comprehensive facilities for electronic music.

Lighting

Each performance space has an appropriate lighting control from the Strand European range. So not only are the stages well equipped, but students will have an opportunity of becoming familiar with several types of control. (And this includes manual pre-setting which can be placed in the studio, where there is shelving and a supply for dimmer packs so that shows can be prepared under the right conditions prior to going on tour.) The Theatre has a **Galaxy** (100 x 2kW & 2 x 5kW dimmers), while the TV Studio has a **Gemini** (48 x 2kW & 12 x 5kW). There is an **M24** in the Studio Theatre (48 x 2kW & 5kW) and a second **M24** is shared between the Concert Hall (72 x 2kW & 4 x 5kW) and the Recital Room (48 x 2kW). There are comprehensive lighting rigs, combining the School's original equipment from the old theatre with a batch of new in which **CCT Silhouettes** are prominent in the Theatre's FOH positions.

Audio and Video

All performance areas are similarly equipped with Soundcraft 200B Mixers, the main theatre having digital delay and graphic equalising. All areas have video and audio tie lines to TV Sound Control, and the Concert Hall has tie lines to the electronic music rooms. There are comprehensive Stage Management desks with cue lights, ring intercom, effects circuits, etc in all spaces except the TV studio. Dressing Rooms have show relay and paging from all five spaces,



Plan (top) and section of the new RSAMD complex

selectable in each room by a key switch. And there is front-of-house paging from all four SM desks and from the telephonist. Each area has a CCTV show relay camera which is distributed throughout the building together with off-air TV.

A Personal View

So it is an efficient building, well equipped. Of that there is no doubt. But, as I indicated earlier, there are aspects of its architecture which have me reaching for my worry beads. Especially the auditorium of the main

theatre. Its form and function are a model that I would happily recommend. Indeed the form is close to my ideal. But I just have to record my personal amazement at the unsympathetic decorative style. There is a style of theatrical bad taste which can be appropriate and exciting. But this is not it. To be brutally frank, the decorative treatment looks like a committee job with separate members responsible for the various bits. The proscenium, whose timber is painted in a style with visual resonances of formica, is



The RSAMD workshop.



The Concert Hall.



The TV Studio with Strand Gemini lighting control.



The Studio Theatre, RSAMD.

not only ugly, but provides an overstressed frame. The flat painted circle fascias have their blandness emphasised by inserted lights which can only be described as ghostly.

Such an auditorium needs a chandelier. There was one but it has gone: a simple circle not only has an uneasy spatial relationship with a horseshow, but is difficult to integrate with spotlighting positions. How about making it a project for the sculptors at Glasgow School of Art? There is a thread of hope: the lighting of the pillars is excellent. And, it has to be emphasised, the excellence of form and function provides a sound basis for future decorators.

Glasgow has acquired a splendid new addition to that exciting arts and entertainment

precinct formed by the Theatre Royal, Pavilion Theatre and STV. As a building it is a triumph of logic. However if that logic had been enlightened by some of the imaginative but illogical decisions that are at the heart of any definition of art, then Glasgow might have acquired an RSAMD that was miles better.

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Sound for the Disco Mixers

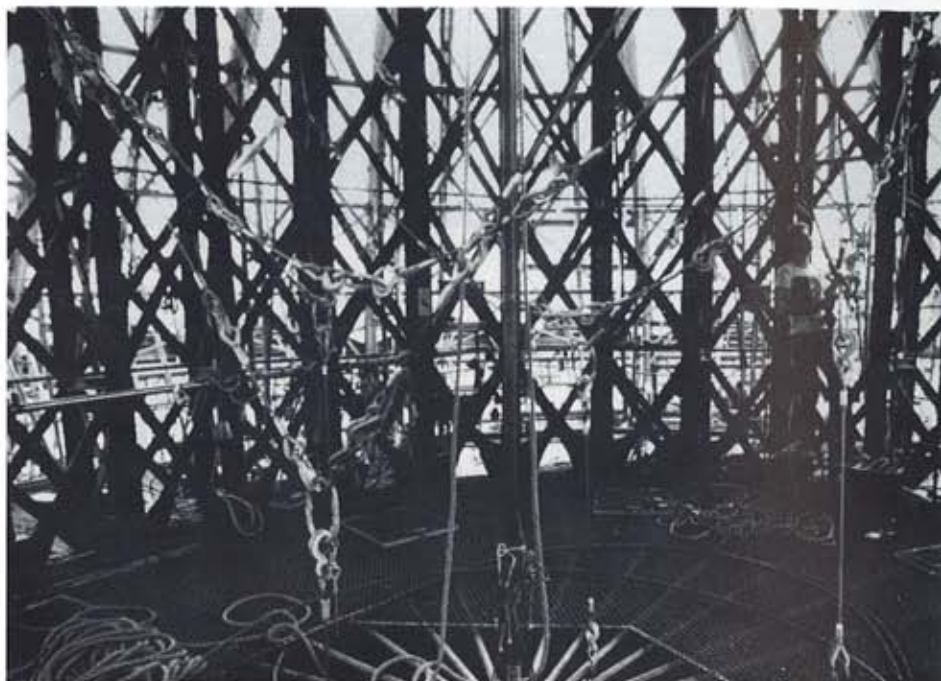
Richard Frankson of Turbosound explains how London's Royal Albert Hall was turned into what was probably the biggest discotheque in the world on the occasion of the recent Technics World DJ Mixing Championship Finals.

Constructed in the middle of the last century, the Royal Albert Hall was primarily intended for pageants, lectures, exhibitions in addition to music, and as was typical of many buildings constructed in this era, far greater emphasis was given to aesthetics rather than the acoustics.

The result of this unfortunate formula was a spectacular monument for London, but an acoustic problem so severe that at some points the reflected sounds from the concave ceiling surfaces were **3dB higher** than the direct sound. Over the last 30 years various attempts have been implemented to quell these problems; the most successful being the now infamous 'flying saucers' which are suspended from the roof and serve to scatter the direct sound path to the roof, thus redirecting and dispersing the reflected sound to areas away from the seating galleries.

However, the Royal Albert Hall does not lend itself graciously to having high-powered sound reinforcement systems installed - especially when the source material is discotheque dance music, which has been skilfully re-created by the keen ears and nifty fingerwork of the World Disco Mix finalists.

Turbosound were consulted, and in con-



To suspend the Turbosound cluster, Up-Front placed the rigging wires in the roof of the Royal Albert Hall - 150 feet above the auditorium floor.



The 1988 Technics World DJ Mixing Championships in action, Royal Albert Hall, London.

junction with their London dealers, Electro-music, considered how best to tackle the problem. "The 7000-seater venue had to have effective full-frequency and coherent sound coverage and should be capable of accurately re-creating a discotheque-type sound atmosphere," said Richard Frankson, "and the only solution to meet the specification was to install the now familiar Turbosound cluster.

"A full 360° central cluster was specified comprising 42 Turbosound TSE-111 mid/high enclosures and 12 Turbosound TSE-118 bass enclosures. The cluster forms a virtual point-source which is the only way of countering the problems in such an acoustically hostile environment. Two TSW-124 sub-bass enclosures were positioned on the floor as well as some TMS-4 full range enclosures and TMW-212 floor monitors for stage foldback," he explained.

"We knew exactly what we had to achieve, and realised what was expected of us," said Turbosound's David Bearman. "We calculated that the cluster should be sited

40ft above the dance floor, exactly in the centre. This ensured that the trajectory of the reflected sound paths were of equal length, and that the first reflected sound path did not get to the roof."

"The theory of cluster placement could not be put into practice if it were not for companies such as Up-Front, who placed all the rigging wires 150ft up in the Albert Hall roof from which to suspend the Turbosound cluster and the lighting trusses," continued Richard Frankson. "Once the wires were in place, the 54-cabinet cluster was placed, positioned, wired and tested in under two hours: a significant feature of the Turbosound approach to flying systems."

Following the sound and lighting checks, safety checks and all the other formalities that have to be meticulously attended to at a venue of this magnitude, the doors were opened to the waiting audience. It was the culmination of two days hard graft, with David Bearman's finger firmly on the pulse as technical co-ordinator. He was responsible primarily for the Turbosound cluster, but

was also co-ordinating the battery of lasers, lighting, video walls, crew tea and coffee, and all the other ingredients necessary to transform the Royal Albert Hall into a discotheque venue.

"The result was stunning," said Richard Frankson. "The lighting and special effects were spectacular, and in my view the sound system was beyond comparison."

Richard Frankson is marketing manager and David Bearman sales manager for Turbosound Limited.

Acknowledgements

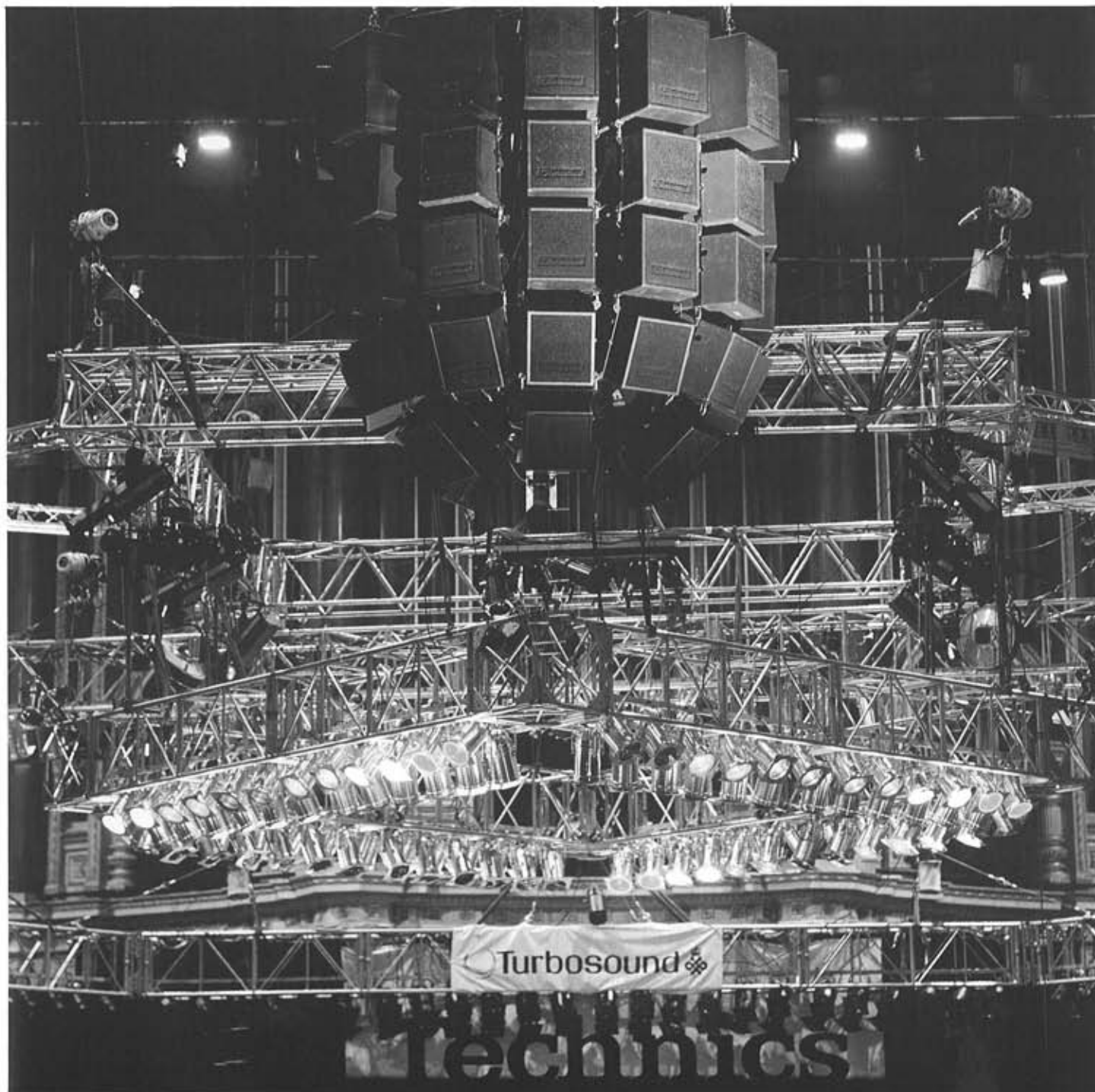
Electromusic - suppliers of the Turbosound equipment

Up-Front - suppliers of rigging equipment and services

Lighting

Lighting design was by George Cound of Light Angles with equipment supplied by Light and Sound Design of Birmingham.

Videowall was by Cameron. Video screens were from Amark who also supplied and controlled the cameras used for filming the event.



A close up of the lighting rig and Turbosound cluster.

Photos: Nik Milner

Safety with Lasers in Display Applications

by E. A. Cox

The first in a series of special features initiated by PLASA's Training and Standards Committee

PLASA
SAFETY + STANDARDS

1

1. General

Intense brightly coloured light beams produced by some lasers, when coupled with the other rather special optical characteristics of lasers can produce spectacular visual effects, particularly favoured by pop groups and others for artistic displays in discotheques, clubs, at pop festivals, and, for large scale advertising in a variety of public places.

The desired effects are usually produced by moving the intrabeam optical components using vibrators or small electrical motors to create web patterns or swirls. Other effects produced include cones, and tunnels of light, traversing criss-crossing beams, multiple bright light spots etc., together with various scanning effects to produce 'laser writing'. Frequently these effects employ micro processors.

Such applications of high power laser beams, which may be stationary or moving, and perhaps reflected from mirror balls and the like, and used in conjunction with prisms, interference filters and diffraction gratings in public places present a significant hazard and therefore require some degree of control.

2. Biological Effects of Exposure

Exposure to the main laser beam or its reflections may cause damage to the eyes or skin depending on the power or energy of the radiation, its wavelength, the duration of the exposure and the tissue site which is irradiated.

There are two organs potentially at risk from exposure to the radiation from lasers - the first, and most important, being the eye and the second being the skin.

The eye is designed to receive visible radiation and transmit it through the various structures within the eye bringing it to a focus on the retina at the back of the eye.

Only those lasers which emit radiation in the visible or near infra red regions pose a potential threat to the retina. The eye risk is very much greater from a laser than from a conventional incandescent light source by virtue of the irradiance (beam power density) of the beam, its near parallel configuration and, to some extent, the monochromaticity of the radiation.

The optical gain of the eye in the case of a visible laser is about 200,000. Hence an apparently modest irradiance at the cornea results in a very high power or energy density at the focus on the retina. This will raise the temperature of the cells at the irradiated retinal site causing their destruction. The exact nature and the mechanism of damage to the retina is related to the exposure duration.

All damage to the retina is serious because it will not heal, and if the central vision area is affected there will be a severe visual detriment.

The biological effects of exposure to the skin are much less complex than those for the eye. There are no focusing elements, although the depth of penetration of a laser beam into the skin will vary with the wavelength of the radiation. The most normal reaction is one of surface burning which

may occur following acute exposure to laser beam powers in excess of 0.5 watts. Unlike the eye, skin burns may be treated and will heal, albeit slowly in the case of deep burns.

3. Viewing Conditions

Depending on the power of energy of the laser, a hazard may be presented by either direct intrabeam viewing or by viewing reflections of the beam.

A reflection may come from a mirror like surface (specular reflection) which does little to reduce the intrabeam irradiance as the beam is simply redirected. On the other hand the reflection may come from a rough surface (diffuse reflection) in which case the reflected beam will be divergent and therefore generally safer.

4. Legal Provisions

The Health and Safety at Work etc Act 1974 by virtue of Sections 2, 3, 6, and 7 places various duties on employers, designers, installers, manufacturers, and persons at work respectively. These duties are aimed at securing, as far as is reasonably practicable, the health and safety of both persons at work and others who may be affected by the work activity, i.e. the general public attending a display.

There is currently no specific legislation relating directly to the safe use of lasers and so all control measures have to stem from the general provisions of the Health and Safety at Work Act. Clearly some more guidance is required to assist the industry and users to adopt a unified approach to safety, such guidance may be found in British Standard 4803:83 and more specifically in HSE's Guidance Note (see later).

5. British Standard 4803:83

British Standard 4803:83, which is published in three parts, replaces completely the previous standard (BS 4803:72). It is closely in line with the International Electrotechnical Commission standard (825:1894) and is intended to provide information and recommendations to assist manufacturers, suppliers, and users of lasers to comply with their legal responsibilities imposed by the Health & Safety at Work Act 1974. Although British Standards do not have the force of law, they may be cited as a national recommendation which has been subject to widespread consultation.

Part 1 of the Standard contains general definitions and background information on biological effects of laser radiation.

Part 2 of the Standard provides detailed information to manufacturers of laser products and systems.

As the beam power or energy and wavelength range will vary widely between different types of laser it is clear that lasers cannot be regarded as a single group to which common standards can, or should be applied. As a means of addressing this variation in the degree of risk the standard contains a scheme whereby manufacturers are required to classify laser products into one of five classes depending on the level of laser radiation to which access is possible and hence the potential hazard that such exposure may incur.

Classification of laser products is not based directly on maximum permissible exposure levels (MPEs), which have been established from the biological effects data, but on derived accessible emission levels (AELs). In this part of the standard a series of tables are given based on wavelengths and emission duration which establish the boundary conditions for each class of laser product. The measured or calculated AELs are compared to these tables by the manufacturer who must then assign the laser product to a particular class.

The definition of the various laser classes may be summarised as follows:

Class 1 Laser Products

These are safe under all viewing conditions so that the MPE's given in part 3 of the standard cannot be exceeded under any viewing situation because either the output beam from the laser is of a very low power or, the laser system is totally enclosed such that no laser radiation in excess of the AEL for class 1 leaves the enclosure.

Class 2 Laser Products

These are low power devices emitting radiation only in the visible region. The maximum output power of this class is limited to 1 milliwatt (collected via a 7mm diameter aperture i.e. the maximum possible pupil diameter). Safety with such lasers is normally afforded by the eye's aversion response, including the blink reflex, which limits the exposure to the eye to less than 0.25 seconds. Deliberately looking into the beam for periods in excess of 0.25 seconds is hazardous.

Class 3A Laser Products

These are again restricted to the visible region only and rely on the eye's aversion response for protection in accidental viewing situations. The output power of this class is restricted to 5 mW (collected via an 80 mm diameter aperture) and a maximum irradiance of 25 Wm⁻². This restricts the amount of radiation which could pass through a 7 mm diameter aperture to 1 mW and so it will be seen that in fact class 3A is a special case of class 2.

Class 3B Laser Products

These may emit in any part of the electromagnetic spectrum and are hazardous when viewed intrabeam. They may be viewed safely under specified viewing conditions. Lasers in this class are restricted to a maximum output power of 0.5 W for continuous wave lasers and up to 10⁵ J m⁻² for very short pulsed lasers.

Class 4 Laser Products

These are high power devices whose AELs exceed those of class 3B. They may emit in any part of the electromagnetic spectrum. Intrabeam exposure of the eye or skin to the beam and specular reflections are hazardous. Diffuse reflections may also be hazardous. The stationary beam may pose a fire risk. Use of lasers in this class require extreme caution. As will be seen later the majority of lasers employed for display applications fall into class 4 and in fact are the same as those used for eye surgery.

Once the manufacturer has classified the laser product the standard then goes on to

specify a range of engineering control features to be built into the product and outlines the information to be supplied to the user.

Part 3 of the standard is written for the end user of the laser product. It gives details of the MPEs and recommends a range of engineering and administrative controls for the user of the laser product to follow to ensure its safe use. None of the examples, however, cover display laser applications. A number of worked laser calculations are given in this section.

Although the standard is written in three parts it is essential that all three parts are read together.

6. Types of Lasers used for Display Purposes

While general advice on the general principles of laser safety and the hazard classification of laser products is given in the British Standard 4803:1983 more detailed guidance covering this particular range of laser activities is given in the Health and Safety Executive's Guidance Note PM 19 - 'Use of Lasers for Display Purposes'.

The following types and classes of lasers have been found in common use:

- Argon ion lasers - class 3B (typically air cooled 100 - 200 mW) or class 4 (typically water cooled 1 - 10 W). These are used where high power green or blue light is required. They are widely used and produce scanning or fan beams and 'laser writing'.
- Krypton ion lasers - class 4 (typically 4 W). These are normally used to produce high power red light.
- Dye lasers - class 3B (typically 5 - 50 mW). These may be tuned to a range of wavelengths and so provide a useful addition to the above lasers offering other colours.
- Helium neon lasers - class 2, 3A and 3B (typically 1 - 5 mW). These produce a red beam and are sometimes used with simple scanning optics to generate varying geometric patterns on a screen or wall.

7. General Recommendations for Safe Operation

A. Preplanning

It is vital that a detailed evaluation is undertaken to assess the foreseeable hazards prior to any public display. Appendix 3 to HSE's PM 19 lists the information which should be supplied by the laser operator to the person in control of the work activity prior to the performance. This information includes:

- sketches, calculations, and radiometric measurements data.
- written information regarding the security arrangements.
- conditions under which the laser will be shut down.

The prime requirement of the preplanning is to ensure that the laser system will be suitable and that the various optical beam paths will be restricted to safe locations from which the general public can be excluded.

With outdoor displays, consideration will need to be given both to persons who are likely to view the beam through optical aids, and any special hazards that might arise to air traffic movements.

B. Installation

The laser equipment, including associated optical components such as mirrors, should be securely and rigidly mounted to prevent any beams departing from their designated course. Mechanical masks should be installed where possible to prevent scanning

beams going out of the designated area.

At the end of the beam path the beam should be terminated by an adequate beam stop.

In displays where very long beam paths are involved, detection systems have been installed at the designated target/beam stop to provide an interlock so that the beam is cut off if it does not arrive at its destination.

All mountings of the laser and optical components including mirrors etc must be rigid and secure.

Where high power beams are used in locations where they will be close to locations likely to be occupied by members of the general public effective barriers should be erected to prevent such access. Lateral and vertical separation distances are specified in the Guidance Note for various circumstances. These are:

- In the case of a laser system not operated under direct control of an authorised trained operator - the radiation levels must not exceed the AEL for class 3A at any point less than 6 m above any surface on which the audience are allowed to stand during the display.
- In the case of a display operated at all times under the direct control of an authorised and trained operator, who maintains constant surveillance of the laser effect and is available to immediately terminate the emission from the laser in the event of equipment malfunction or audience unruliness, the MPE should not be exceeded at any point less than 3 m above any surface on which the audience are permitted to stand during the display.
- Unless effective means are provided to prevent access to laser beams there should be a minimum lateral separation distance of 2.5 m between any person in the audience and any radiation level in excess of the AEL for class 1 laser products.

Any area where levels of laser radiation exceed the MPE should be clearly identified and appropriate notices posted restricting entry to authorised personnel provided with appropriate protective eyewear.

Steps must be taken to prevent unauthorised use of the laser by fitting key switches to class 3A, 3B and 4 laser products.

Emergency STOP buttons should be fitted, and readily accessible, which immediately



E.A. Cox was for 16 years in the post of HM Principal Specialist Inspector in the Health and Safety Executive as an adviser on national standards on radiation safety. He now operates as a radiation consultant. He is a member of the British Standards Committee, and has been closely involved in developments in laser safety in the UK, Europe and the USA. He drafted PM 19.

terminate the laser beam(s) in the event of equipment malfunction, audience unruliness or other unsafe situation.

Prior to use all safety devices and interlocks should be checked.

Setting up, alignment of the beam paths, placing of optical devices etc., should be undertaken by trained personnel. Other persons not directly involved in the work should be excluded from the area. During such operations the laser should be operated, where possible, at its minimum power output consistent with the task. Where power adjustment is not possible, due to the design of the laser, other means of reducing the power of the output beam should be employed such as polarising filters, aperture plates, neutral density filters, beam splitters etc.

Equipment brought into a club or theatre premises should be installed in such a way that it does not obstruct normal fire exit routes.

8. Conclusion

The Health and Safety at Work Act 1974 imposes duties on manufacturers, installers and users of equipment to ensure the safety of persons at work and those affected by the work activity. The British Standard (4803:83) assists in quantifying the risks and identifying the standards of protection required for various types of laser. HSE's Guidance Note PM 19 addresses the specific use of lasers in display applications and outlines safe working practices for such applications. So far the safety record has been quite good in that there have been no serious incidents resulting in the permanent loss of sight. However, many display laser installations have fallen far short of the recommendations set out in PM 19.

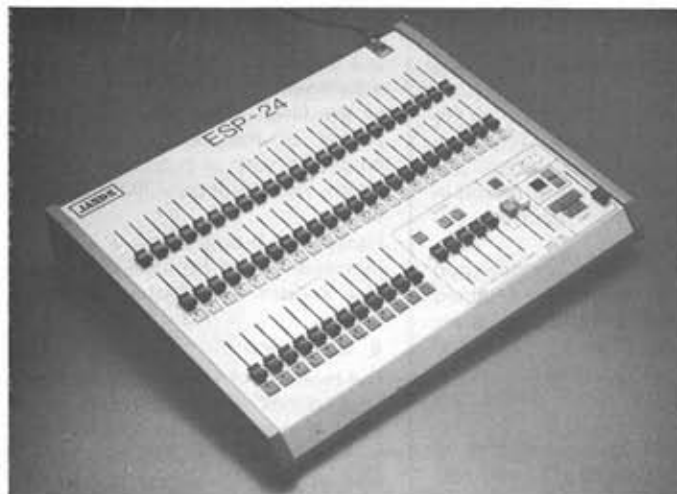
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- American National Standards Institute. ANSI Z-136, **Standard for the Safe Use of Lasers**. ANSI, 1430 Broadway, New York City, NY 10018, USA.
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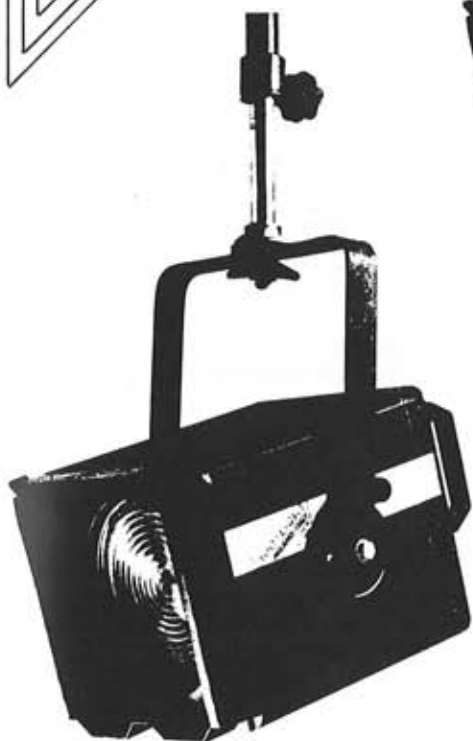
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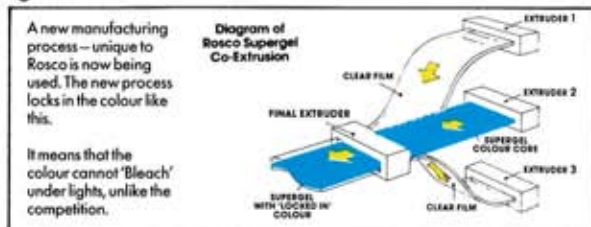
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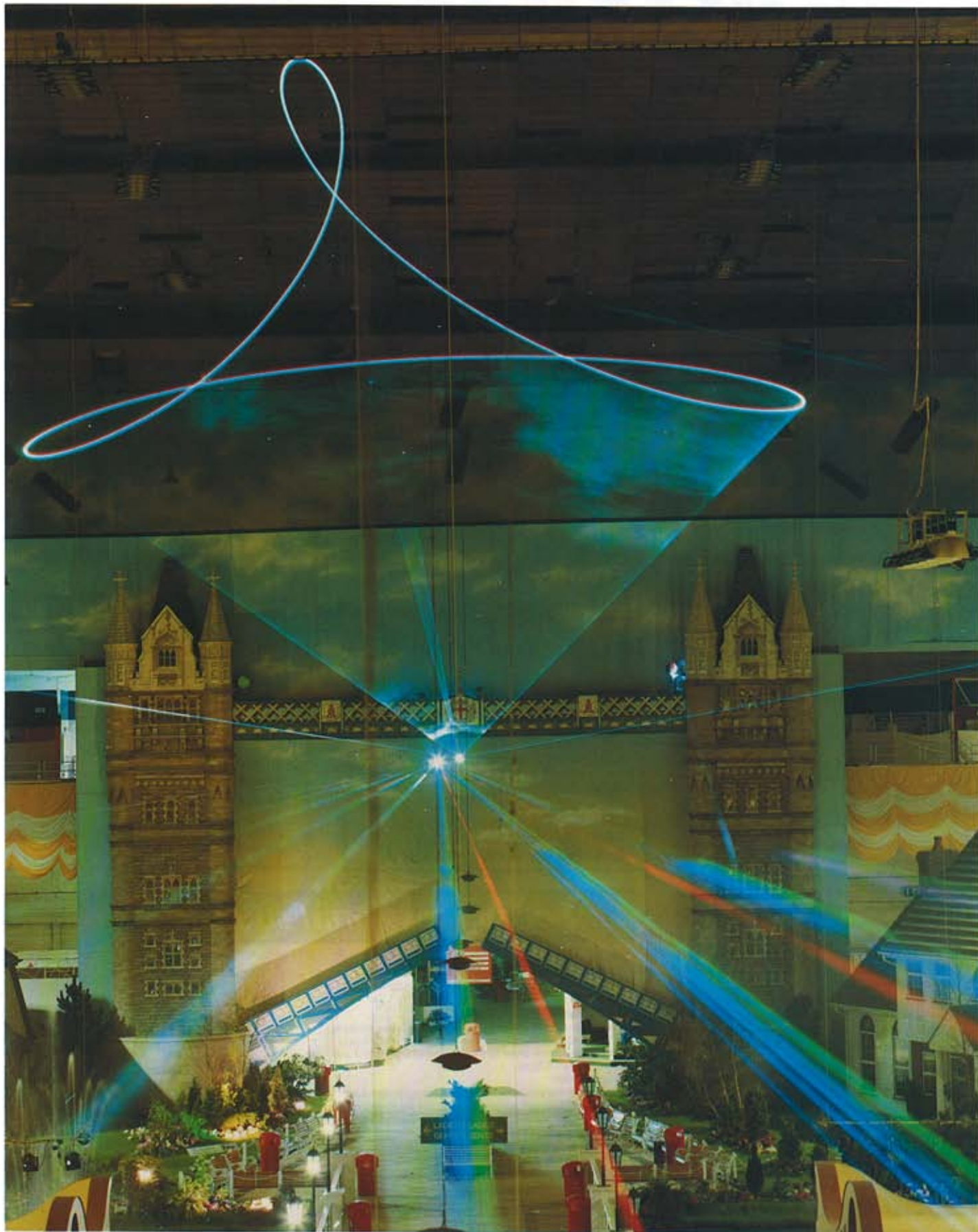
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Lasers for Ideal Homes



Commissioned by the Electricity Council, Laser Creations Limited of London have installed two large water-cooled lasers at the Ideal Home Exhibition currently running at Earls Court - an Argon (blue/green) and Krypton (red).

Running simultaneously, both lasers produce multi-coloured beam structures, tunnels and patterns of light. Custom-designed graphic images, advertising the Electricity Council, are also being projected

on to an 80ft x 30ft gauze screen suspended from the roof of the Earls Court centre.

The laser show has been specially designed to enhance the overall futuristic theme of the 1988 exhibition, and during the five weeks of the event it is estimated that over 1 million visitors will have passed through.

EQUIPMENT *News*

New Gyrolight

Laser Systems have announced the Series II HTI Gyrolight system, which supersedes the original Halogen Gyrolights. The new system offers a more versatile unit for both discotheque and theatre, and the first on-line units have been delivered to the U.S.A., Hong Kong, and Thailand and have met with much enthusiasm, say Laser Systems.

Additional features include: a new HTI Lamp System with an output of 36,000 Lum, improved dichroic colour system, faster speed of colour change, faster speed of gobo change, and increased rotational speed in X and Y axis, a new positional monitoring system, many new controller facilities, including 128 x 32 lamp scenes, and a copy head/scene facility for ease of programming.

For full details contact Laser Systems Limited, Unit 11, Llanerham Park, Cwmbran, Gwent NP44 3AX telephone (0633) 838280.

Motorised Fader

Out Board Electronics has dispensed with pulleys, drive belts, slip ring contacts, springs, strings, and clutches to 're-invent' the fader with the newly patented MF100-S Motorised Fader, say Sellmark Electronics.



Designed to retrofit almost all existing audio and lighting faders, the MF100-S motor is especially suited to mixdown automation applications since its inertia is so low that in manual operation the motor's presence is undetectable. The MF100-S achieves transparent mechanical performance in the absence of motor current drive and requires a bidirectional DC current drive and a three wire servo track connection for position feedback to the control system.

During automated mixdown procedures, the MF100-S Motorised Fader will allow the operator to accurately update presets and simultaneously position as it faithfully tracks the level of attenuation.

The MF100-S is to be marketed by Sellmark Electronics and Sellmark's own SV100115 100mm fader is the first to incorporate Out Board's advanced motorised concept.

For further information contact Sellmark Electronics, Rockwood House, Barn Hill, Stanley, Co. Durham DH9 8AN telephone (0207) 282880.

Rotovision Screen

March 7 saw the launch at S.I.S. in Northampton of the Rotovision Screen, a new concept in moving message screens which is linked to colour transparencies. It provides an information source to promote goods and services in clubs, restaurants, banks, department stores, hotels, exhibitions, museums - in fact anywhere that there are general public in situ.

The unit is built in Britain and designed to be

'user friendly' so that with a brief study of the manual the unit can be easily programmed to put across messages whilst illuminating relevant transparencies, say S.I.S. The controller has an in-built facility for duplicating text on a separate memory chip which can then be sent to other sites and used in other Rotovisions if required.

For full details contact S.I.S. Limited at 15-33 Gray Street, Northampton NN1 3QQ telephone (0604) 250025.

Q-MAX 1200 Power Amp

McKenzie Acoustics has introduced the Q-MAX 1200 power amplifier, which benefits from cast aluminium heatsinks and fan cooling. Rated at a massive 625 watts per channel, the power amp's input circuit has been designed to eliminate hum loops without disconnecting the main safety ground, while a relay controlled delay banishes power surges and speaker thump during switch-on.



Produced in a standard three unit 19 inch rack, the Q-MAX 1200 power amplifier is offered in a matt black design incorporating LED bargraph protection on the front panel.

For full details contact McKenzie Acoustics, Albion Drive, Thurnscoe, South Yorks S63 0BA telephone (0709) 898606.

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New Amp Gives Maximum Flexibility

Bouyer's new 100 watt mixer amp, the AS101, is now available from Planned Equipment Limited.

It gives five interchangeable inputs and four separate 100 volt line outputs each with individual volume controls. Maximum power of the four outputs can be restored for emergency messages however, regardless of the positions of the four volume controls.



Designed for attenuation in four zones, doing away with remote volume controls, power supplies and switch pairs, the AS101 offers considerable savings on conventional systems. It can also be used for fine adjustment of individual or groups of speakers which can be particularly useful in reverberant rooms, say Planned Equipment.

The flexibility of the AS101 makes it ideal for premises requiring numerous inputs and separate zoning such as hotels, schools and industrial or commercial premises.

For full details contact Planned Equipment Limited, Belvue House, Belvue Road, Northolt, Middlesex UB5 5HP.

Equipment News

Details of New Equipment for inclusion in this section should be sent to:

The Editor, L+S
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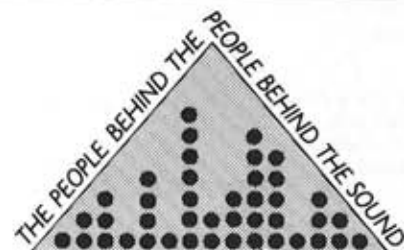
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ON TOUR

Keith Dale

This month I sent Catriona into deepest France to spend a few days on tour with Jane Spiers and Depeche Mode. Is touring really about sex, drugs and rock 'n' roll? Well, she didn't say, but she did tell me that she learnt a lot about lighting and rigging. Seriously though, both Catriona and I would like to thank Jane and the Depeche Mode team for their kind help and, from what I hear, they certainly went to a great deal of effort to show her 'life on the road'.

I also set Catriona another mission this month - to interview Phil Wiffen, the lighting designer for 'The Mission'. Phil doubles as a make-up artist (not for bands, although some could certainly do with it!) when he is not touring.

And finally, L+SI's editor, John Offord, has taken a tentative step into the world of rock. The oldest swinger in town donned his leathers and denim and was seen head-bashing his way through the AC/DC concert at Wembley last month! Apparently he was so keen to get to Wembley he was given a ticket for speeding en route.

Depeche Mode 'Music for the Masses' Jane Spiers

It was decided that the time had come when I must experience the wonderful world of touring, and when I met Jane Spiers at the Depeche Mode Wembley shows last January I mentioned the idea to her. Jane kindly offered to take me under her wing for a few days in France, and the panic was on! Never having been on tour before, I was full of trepidation although my main worries were basic ones. Where will I sleep? How many clean pairs of underwear should I take? Where do you wash or don't you? Would I be regarded as an intruder on the coach?

As it turned out I need not have worried - everyone was very helpful and friendly. The crew were marvellous, and the catering was great. And I'd like to take this opportunity to thank Tony (the bus driver) for letting me stay on his bus (and if he's found a pair of tights somewhere near the back of the bus they are mine).

I soon found out that there was no fooling about, and Jane had my work well planned out. I got a very informative lecture on Vari-Lites from Wally Lees as soon as I arrived which lasted two hours. After each show I gave a hand with taking down the lights and trussing. During the Show at Besancon I became stage-hand during the performance, and I didn't trip over a smoke machine once! Believe it or not I was also on the 7.30 a.m. bus to that gig to help set up the stage. Jane was determined that I would light the support band for at least one number on the last night in Strasbourg. I did - and my apologies go to them.

I must say that I thoroughly enjoyed my time on tour although it was very hard work. How do people work on tour for months on end without collapsing from physical exhaustion? But having said that I would certainly like the opportunity to do it all again.

The band Depeche Mode rocketed to stardom in 1981 with the singles 'New Life' and 'Just Can't Get Enough' - and over the past seven years they have had twenty UK hit singles, a collection of seven equally successful albums and a string of over one thousand live shows behind them. They are one of the foremost exponents of modern, machine-age pop, and they have grown to be even more successful abroad than here in the UK. Depeche Mode have massive record sales in



On tour with Depeche Mode (left to right): Walter Lees, Adam Duckett, Jane Spiers, Richard Anderson, Philip Broad, Simon Ambrose, and Billie Lawford.

Europe and have no trouble selling out concerts. They have built a reputation for giving a good, theatrical show, and in the USA they sell out bigger gigs than most main bands e.g. Madison Square Gardens. In the Eastern Block countries like Hungary, the kids refer to themselves as either a Mode or not, and on this tour there was a 72,000 demand on 12,000 tickets in Budapest.

There seems to be no explanation as to why Depeche Mode are so much more successful abroad than in their own backyard. Compared to the wild, ecstatic fans in France, the audience at the Wembley show seemed quite cold, which was a shame as Dave Gahan, the lead singer, gave his everything and worked incredibly hard to please them. Unfortunately for Jane, Depeche Mode have never released a single in Australia or New Zealand and consequently they have never played there. So when Jane goes home and tells her family what she has been doing, they say 'Depeche who?'

This world tour to showcase the songs from Depeche's latest album 'Music For The Masses' started last October in Europe and then went to the USA. After Christmas there was a British tour followed by more dates in Europe including some gigs in the Eastern Block countries of East Germany, Hungary, and Czechoslovakia. In March the tour went to Japan and then the USA again, finishing in the middle of June.

Jane Spiers has had a very successful career as a lighting designer, mainly for Depeche Mode, but also for Gary Numan, and the Style Council. She has worked on several Depeche Mode tours over the years and has gained a reputation as a highly creative and innovative designer specialising in stunning, moving, stage sets. Last year she started a second-hand stage set company because most people scrap their sets after a tour even though sets can cost anything from £30,000 to £100,000. She has had to give it up because of this tour but a friend is carrying the business on.

Jane wanted her designs for the 'Music For The Masses' tour to be very theatrical, and her design evolved around her original idea that the stage set should be totally modular and changeable - hence the front risers, back panels and backdrops. Her main idea for the lighting was to do it simply, so she came up with the novel solution of using floodlights on the front and back truss. On the front truss they replace about sixty lamps and, of

course, they save a lot of truck space. Most of the par lamps have ColorWiz's on them as do the mole fays.

For the first time in her career, Jane has included many Vari-Lites in her show. Originally she wanted to be able to operate the Vari-Lites herself instead of having an operator so she had all the par lamps, colour changers - in fact everything - operated through the Vari-Lite desk. But during rehearsals it was discovered that one cue was taking about four hours to programme which was obviously no good for Jane.

"I think now that I could run the show as it is completed, and then feed it back into the Vari-Lite desk but not the other way round. You can't grab things quick enough from a Vari-Lite desk. Also, with a par lamp show you have certain boundaries and so you can bring your show to a state of perfection which is the most you can humanly do with those lamps. With Vari-Lites there are no boundaries as you can keep on changing the colours and movements. Consequently you're never satisfied with what you have already done. It's hard to know how far you can take it because you are frightened that if you carry on playing with it you will ruin the original concept," she said.

Jane particularly likes the fact that Vari-Lites have gobos and, apart from the standard nine available designs, she had several of her own designs made up. These included some parallel beams, church windows and the extremely effective 'jumping man' which is used for the number 'Shake The Disease'. The artwork for the single had a similar figure jumping in the air, and Jane stylised it for the Vari-Lites.

"I've always like that single," she explained. "It's got a lot of movement and liveliness which complements the leaping man. Originally I wanted to get a cartoon effect because I've got two different men which I actually wanted to move across the screen, but unfortunately the pillars are in the way and also the Vari-Lite positioning on that is very tricky," she explained.

The way the audience leaves the show is very important to Jane as she feels they should leave smiling and not with an 'empty' feeling. So at the end of the last encore she drops the Depeche Mode flags like full stops, and the audience knows the show has definitely finished. The opening is also spectacular. As the house lights dim and the followspots light up the Depeche Mode logo on



Action from Depeche Mode during the number 'Shake The Disease', stylised by VariLite gobos.

front of the stage, the tension mounts as the long intro to the latest single is played. When the band finally appear it is teasingly behind a fine gauze curtain which is eventually pulled away to a tremendous scream of approval. The band are very aware of how many screams they get, and if they think that they are not getting enough they call on Jane to come up with some new effects!

When I joined the tour everything was running smoothly and they all seemed happy with their work, but apparently it was not so pleasant at the beginning of the tour and Jane explained why: "Spain and Italy were terrible. Everything was very hard and things seemed to take forever although I don't know why. A lot of the trips weren't arriving until 2.00 p.m. which obviously didn't please the crew. Then our production manager had a brain haemorrhage, which he has fortunately recovered from, and the set man broke his fingers on stage and had to be sent home. Eventually everything

sorted itself out and the four French stage crew we have with us through France are marvellous."

Not all of the equipment will be going to the Eastern Block countries. Most of the Vari-Lites are going, which will be better than the last time Jane went there with Depeche Mode as she only had par lamps and she counted herself lucky if half of them worked during the show. She also found herself with no multi-cord and had to operate the board from down by the dimmer rack. Of the stage set, only the flags and backdrop are making the trip.

Lack of equipment doesn't worry Jane Spiers. She believes in Peter Barnes' philosophy of enjoying what you've got, and making the best of it - it's either that or die of frustration. On the last Depeche Mode tour for their album 'Black Celebration' when they visited Hungary, some of the crew did a show instead of a support band. The audience went wild! Some people say that

anything you put on the stage there goes down a storm, and so this year there's talk of the whole crew putting on a production of Oliver!

Jane asked me to make a special mention of her spot operators/truck drivers - who she says are superb. "If they have trouble with, for example, colour frames or they miss a cue they get very depressed. I've always used moving stage sets because I think there is nothing worse than being on a tour where half the people sit in the bar for the show. On this tour everyone has got a job to do during the show," she said. The men concerned are Tony Grieve, John Marr, Alistair Brackenbridge, Robert Holder, John Thompson, James Withers and Duggie Hamnett.

Jane also praised Brilliant Constructions who built her stage set to 'aeroplane standards' with beautiful and precise finishing. Special thanks are also due to Hangman for supplying the flags and backdrop.

And, of course, there is her faithful lighting crew who helped to make my trip very enjoyable and highly enlightening.

Tour Team:

Name: **Adam Duckett**

Alias: Odom Bedknob

Position: Dimmer Man

Experience: Last Depeche Mode and Style Council tour with Jane. Also worked with Al Jareau, David Sandborne, The Kinks, Elkie Brooks, and Chucka Kahn. Holds the record for sleeping the most - 36 hours out of 48 in Paris - and was awarded the coveted Golden Duvet award. Likes smoke machines.

Name: **Philip Broad**

Alias: Ploppy Pants

Position: Rigger

Experience: Worked for Jane for about four years on Depeche Mode, Style Council, and Gary Numan. Works for Upfront Rigging Company and very much enjoys his work mainly because no one comes up a rig to harass you. Got stuck up the rig in Toulouse and had to absal down.

Name: **Simon Ambrose**

Alias: Undisclosed

Position: Rigger

Experience: Works freelance but mainly with Upfront. First time with Jane. Worked most of last year for U2 doing the staging. Specialises in anything that leaves the ground and has worked on a wide variety of things. Not



Four more scenes from the Depeche Mode 'Music for the Masses' Tour.

Photos: Lewis Lee

going on the rest of the tour as his wife is having a baby. Last February, in Kiel, he slipped in the shower and lost part of his foot. Consequently, he spent the next two and a half months in hospital. Would like to know if anyone has found his foot?

Name: **Billie Lawford**

Alias: Loud Hailer

Position: Stage, Set

Experience: Has worked with Jane for many years and has done all areas - lighting design, rigging, production. Has worked with OMD, The Clash, Simple Minds, Cliff Richard and many others.

Name: **Walter Lees**

Alias: Sub-Aqua Gummi-Bear

Position: Vari-Lites

Experience: Has been with Vari-Lites for three years and this is his first time working with Jane. Worked on the Bowie tour last year and has also worked with Duran Duran and Falco. Is a freelance operator and is not contracted.

Name: **Richard Anderson**

Alias: T.S.Elliott (TS short for token septic)

Position: Lighting Technician

Experience: Worked for Showlites for three years, one year with Burbank Television. Now lives in Dallas working freelance. First tour Samuelsons and first time to Europe. Wants to be a lighting designer - preferably for Heavy Metal bands.

Depeche Mode European Tour 1988

LIGHTING EQUIPMENT SCHEDULE (supplied by Samuelson Concert Productions)

For provision of lighting rig:

56 x Par 64 Cans
5 x 400 Watt U.V.
4 x Molemags inc. one spare
8 x Eightlighters
1 x 32-way Controller
4 x TTR Groundrows
34 x ColorWiz
1 x Celco Series 2 60
1 x 72-way 4-Rack
1 x Desk Remote
1 x Mains System

28 x Stage Multicorës
4 x Wind Machines
6 x Smoke Processors
14 x Ways of Intercom
2 x Xenons
31 x 8ft Folding Truss
2 x 4ft Folding Truss
2 x 2ft Folding Truss
4 x 90° corners
2 x 8ft Slick
2 x 6ft Slick
2 x Underhung Spot Seats
2 x Overhung Spot Seats
3 x Pani Spots
11 x 1-Ton Lodestars
10 x Points of Rigging
1 x Ladder
plus all necessary Gel
The Rig also includes:
21 x Active VL-2 VariLites plus 2 spares and all necessary control and cabling
15 x Active VL-3 VariLites plus 3 spares and all necessary control and cabling

Phil Wiffen

'The Mission'

Phil Wiffen is not only the lighting designer for the band 'The Mission', he also has a career working with prosthetics (make-up to you and me!), and he has worked on programmes such as the BBC's 'Casualty'. The day I met him he was wearing his lighting designer hat and talked to me about his career.

"I started working in rock 'n' roll five years ago with Sisters of Mercy (The Mission are a splinter group of this band). They used to record their singles in my home town of Bridlington, Yorkshire and their PA company was also based there. They needed a lighting designer - and there I was!

"When I left school I went to drama school because I originally wanted to be a make-up artist, which I still am, and when 'The Mission' aren't touring I work as one. I've worked for other bands such as Aztec Camera, Orange Juice and Pete Shelley, but before I got into rock 'n' roll I worked in the theatre and opera.

"I've worked for the National Opera which can be exciting if the opera is dramatic and there's plenty of blood and gore! I did a tour with a mime company for six months around England which was quite exciting although from a lighting point of view it was pretty dreary. I would like to do some ballet at some point in my career," said Phil.



"The design for 'The Mission' show is left totally to me - although the band do show an interest, which is very helpful. They keep in touch through the progression of the design from initial concept through to artwork and set pieces. Because their

music is very atmospheric you could go over the top.

"The sets are very important to me, particularly as I come from the theatre, because that is what you end up lighting. I like to start with the set



Five action shots from 'The Mission' - lighting design Phil Wiffen.

Photos: Tony Mottram

even if it only consists of a couple of backdrops. I never like to see towers, lights or genies, and I tend to make sure that they are well covered up. This is because I like to maintain a mystery about the lighting and where it comes from. I'm not one for thousands of lights - probably because I wouldn't know what to do with them, and I've never had that sort of budget!

"This tour has a larger budget and more scope so I'm using more expensive things like colour changers. I quite like the limitations of a smaller budget and if I didn't have any I would put them on myself by making it more complicated. For example, I might break down each number so that I've got twelve lighting rigs which may consist of six lamps for each number. These lights may not be used again, and so then I like to think that each

number is different.

"The Mission are very moody and I think that they are a group as U2 are a group. They are a very exciting band to watch and they prefer to play more dates at smaller venues with no seats - which doesn't help me because that usually means smaller stages. It's also more expensive as the equipment and the crew are out for longer, but it does create more atmosphere.

"This tour will probably run for the rest of the year. We've just done ten days in the USA and now we're doing a month tour of the UK followed by Europe through April, USA in May, South America in June, festivals throughout the summer, UK and Europe again in the Autumn, and probably back to the USA before the end of the year.

"Someday I would like to do a large production

like Prince, but then I dare say everyone would. U2 have an interesting light show but I don't know if I could take it any further than what they are doing with it already. The show is exciting enough without having anything dramatic like aircraft lights. I like to keep a show simple, even though I do use a lot of effects - but not for effects' sake. I don't like effects that say 'that was a lighting effect' - they should be there as an enhancement.

"I enjoy touring, particularly with The Mission, who have a crew called 'The Mission Slob Crew'. They are a totally unbelievable bunch of people to tour with! Clichéd as it sounds, it is like having a second family. In fact, I spend more time with them than with my own family, I find living on a tour bus quite exciting, although if you're not careful it can lead to serious liver damage!"

AC/DC World Tour Wembley Stadium

The elaborate set for AC/DC's World Tour was described in L+S's December 1987 issue when I visited Meteorlites Productions' operation at Stevenage at the end of last year. I was impressed then by the amount of work that goes on behind the scenes to get a show of this stature on the road, and having seen a concert suitably impressed again by the precision and professionalism of it all.

Needless to say Ronan Willson's lighting design was as electric as the human action on stage, and the whole presentation was obviously what the audience had come to expect. Even though I have to admit this type of music isn't my number one thing, the power of the event easily rode me along on its energy-charged path.

The tour is currently continuing through Belgium, Germany, Finland, Norway, Sweden, France and Switzerland before returning to the UK for another date at Wembley in mid-April before it departs to far distant lands.

The action on stage is to some degree caught by the photographs on the facing page, and the behind-the-scenes activity can quickly be imagined by a glance at the equipment/flight case lists as shown below, supplied courtesy of Meteorlites Productions.

John Offord



FOH sound engineer Mike Scarfe checks settings prior to the performance.

Sound Equipment (supplied by MHA Audio Ltd. of Maidstone, Kent.)

Hill 70kW M4 Sound System
Mixers: FOH - Hill Concept Series 48-16-2
Mixers: Monitor - Hill M3 S Series 32-10
Monitor System: Hill Tri-Amp wedges and Hill M6 full range cabinets
Side Fills: Hill custom built
Amps: All PA amps Hill DX 3000's
monitor amps Hill TX 1000's



Ronan Willson ready for action at the lighting control board.

Lighting Designer: Ronan Willson
FOH Sound Engineer: Mike Scarfe
Monitor Engineer: Bobby Owens

7'6" Pre-Rig Truss Sections	34	CASE CONTAINING:		36 Way 8 out Patch Box	1	CASE'S CONTAINING:	
7'6" Pre Focus Truss Sections	14	Avolites 72 Way Dimmer Racks	3			Avolites 8 Way Motor Control	4
Pre-Rig Hinge Junction Plates	54	Avolites 36 Way Dimmer Rack	1	CASE CONTAINING:		Units	
2'6" Aly Scaff Tubes c/w Pip Pins	54	CASE'S CONTAINING:		10m Ceeform TRS Extension	12	30m Motor Mains Extension	3
Pre-Rig Side on Frames	8	Celco 90 Way Gold Control		5m Ceeform TRS Extension	12	20m Motor Mains Extension	1
10' A-Type Truss Sections	2	Desk	1	CASE CONTAINING:		10m Motor Mains Extension	1
CASE CONTAINING:		Celco M.C.I. Interface Control	1	Clearcom Twin Channel Master	1	Motor Mains 'Y' Split	1
7'6" Aly Scaff Tube c/w Half Clamps	12	Unit	1	Clearcom RS100a Beltpacks	15	CASE CONTAINING:	
4'6" Aly Scaff Tube c/w Half Clamps	12	CASE CONTAINING:		Beyer DT109 Headsets	15	30m Motor Distribution Cable	6
5'4" Aly Scaff Tube c/w Half Clamps	6	Celco 60 Way Control Desk	1	100' XLR Intercom Cable	20	20m Motor Distribution Cable	6
20" Aly Scaff Tubes	2	CASE'S CONTAINING:		50' XLR Intercom Cable	10	10m Motor Distribution Cable	12
8' Tele Stage Truss Sections	26	Avolites 100m Triple Remotes	2	25' XLR Intercom Cable	5	5m Motor Distribution Cable	12
7'6" Meat Rack Dollie Containing		20m 3 Phase 70mm2 Mains Cable	2	10' XLR Intercom Cable	4	Socapex Ceeform Motor Fanout	8
7'6" x 6 Lamp Par 64 Bars	4	10m 3 Phase 70mm2 Mains Cable	2	XLR Male - 2 Female 'Y' Split	2	Socapex Ceeform Motor FanIn	8
Par 64 Four cell Units	12	3m 3 Phase 70mm2 Mains Cable	4	XLR Female - 2 Male 'Y' Split	2	Motor Distribution 'Y' Splits	2
5' Meat Rack Dollies Containing		20m 3 Phase 25mm2 Mains Cable	2	Male - Male Sex Changer	2	CASE CONTAINING:	
5' x 4 Lamp Par 64 Bars	36	2m Single Phase 150a - 400a		Super Trouper Colour Frames	26	Hammers	4
CASE CONTAINING:		Adaptor	1	CASE'S CONTAINING:		Adjustable Spanners	6
'H' Shape Outriggers	8	37 Pin Triple Socapex Control	1	Cloud Nine Smoke Machines	3	Large Screwdrivers	8
'V' Shape Outriggers	12	Links	2	c/w Airline Hoses	3	Terminal Screwdrivers	8
CASE CONTAINING:		Single Socapex Control Links	7	CASE CONTAINING:		Pliers	2
Single Par 64 Cans	2	3 Phase to 16a Fanouts	1	Compressor	1	Wire Cutters	3
Single Par 64 Floor Shortnose Cans	4	CASE'S CONTAINING:		CASE'S CONTAINING:		Flat Files	4
4 Lamp Par 36 Units	24	110v - 15 KVA Transformers	3	28' x 23' Black Drapes	2	Stanley Knives	3
CASE CONTAINING:		3 Phase 'Y' Split Adaptors	3	20' x 3' Black Border	4	Test Meters	3
Orbitor Followspots	4	CASE CONTAINING:		40' x 28' Black Drape	1	Socket Wrenches c/w Sockets	6
CASE'S CONTAINING:		Stage Power Distribution Rack	1	CASE'S CONTAINING:		Soldering Iron c/w Solder	1
Top Mount Followspot Chairs	4	3 Phase x 35mm2 Set Mains		Verlind 1 Ton Motors	32	Crow Bar	1
CASE'S CONTAINING:		Tails	1	28' Rope Ladders	2	Set Metric Spanners	1
Ultra Violet Lamps	12	CASES CONTAINING:		30' Steel Wire Rope	30	Torch	1
CASE'S CONTAINING:		H.T.I. Lycean Followspots	4	20' Steel Wire Rope	30	Electric Drill	1
Giant Strobe Lamps	12	CASES CONTAINING:		10' Steel Wire Rope	60	Set Drill Bits	1
Rainbow Strobe Control Unit	1	50m Socapex Cable	20	5' Steel Wire Rope	65	Mallets	3
Strobe Multicore Cables	2	40m Socapex Cable	54	2'6" Steel Wire Rope	12	Round Files	4
Strobe Distribution Boxes	2	30m Socapex Cable	21	1' Steel Wire Rope	12	Set Metric Sockets	1
Strobe Control Cables	12	20m Socapex Cable	1	Master Links	10	Tape Measures	2
Strobe 'Y' Lead Adaptors	4	10m Socapex Cable	9	CASE'S CONTAINING:		Medium Size Screwdrivers	4
4 Way Ceeform Block	1	Socapex - Ceeform Fanouts	6	6m Spanset Roundslings	31	Set Philips Screwdrivers	1
		CASE' CONTAINING:		4m Spanset Roundslings	35	Matrix Tool	1
		4:1 Patch Boxes	10	2m Spanset Roundslings	28	CASE CONTAINING:	
		6:2 Patch Boxes	1	CASE CONTAINING:		4 Lamp Par 64 Bar	1
				2 Ton Shackles	50	Single Par 64 Cans	2
				3 Ton Shackles	150	20m Socapex Cable	1
						Socapex-Ceeform Fanout	1
						3m Ceeform TRS Extension	2
						Thomas 8 lite units	4
						CASE CONTAINING:	
						Smoke Machines	2

Meteorlites Productions' lighting equipment list for the current AC/DC World Tour.



AC/DC at Wembley Stadium, lighting design Ronan Willson.

Photos: John Offord

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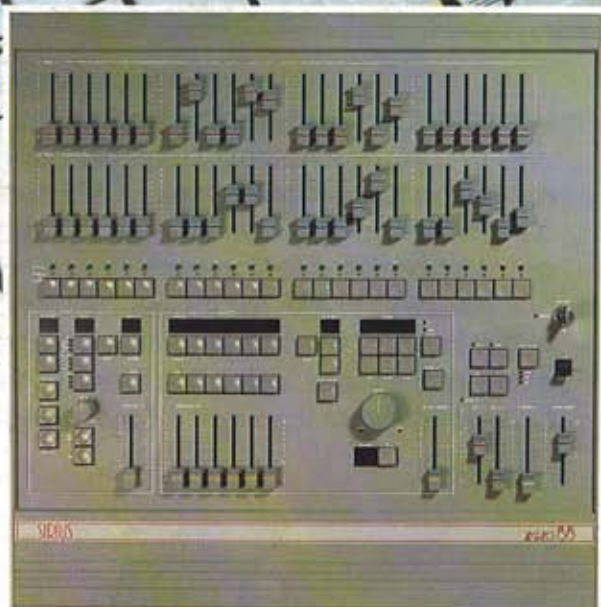
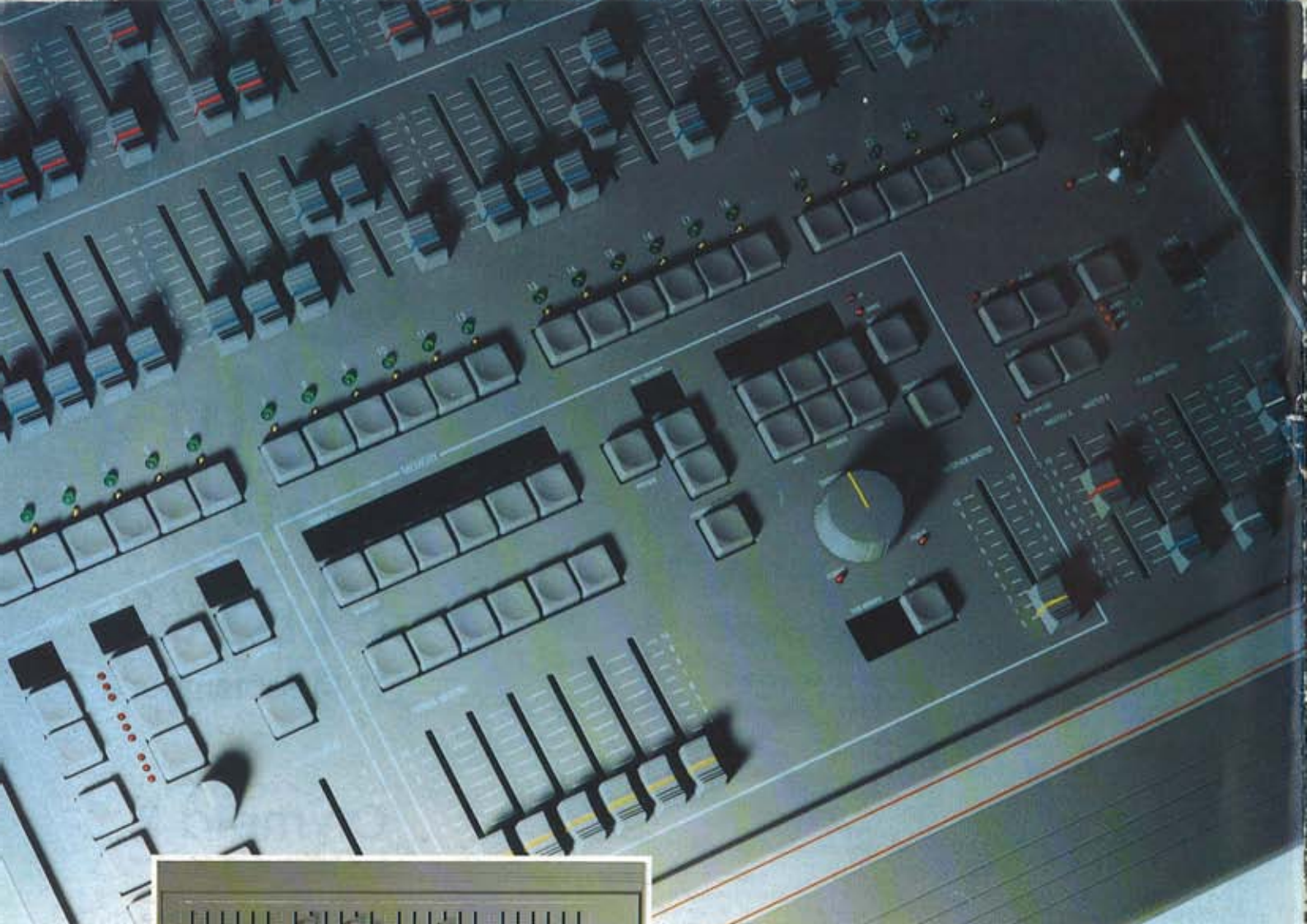
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