

LIGHTING+SOUND *International*



VOLKSWAGEN ROCKFESTIVAL: ARF & YES LIGHT THE BRANDENBURG GATE

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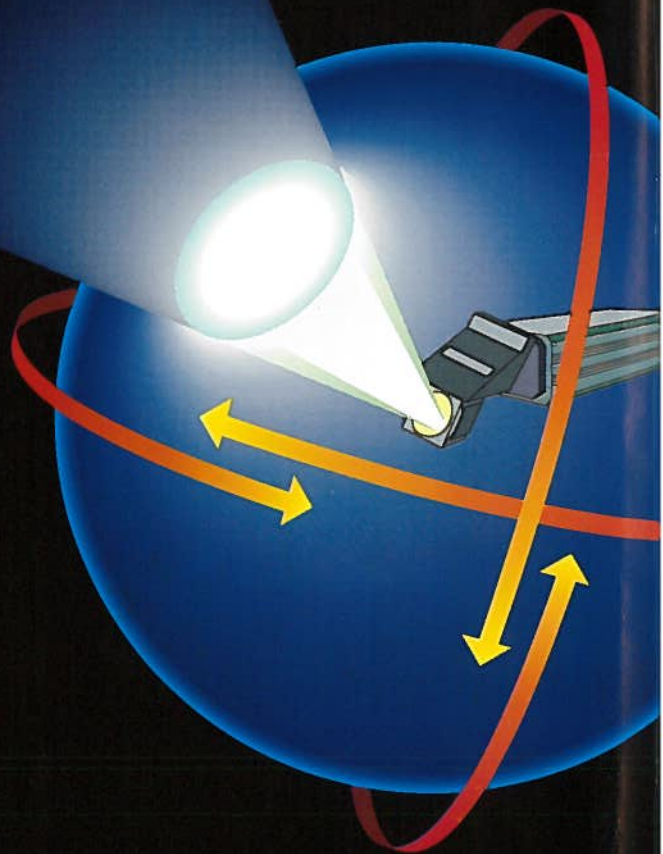
- Richard Knight and new lights on Broadway
- Behind the scenes of the first International Volkswagen Rockfestival
- On Tour sizes up Take That and Chris de Burgh
- L+SI Special Feature on the Wizards of Oz
- Stars in their eyes: a profile of PW Enterprises
- High Society: Tony Gottelier at High End Systems
- The final analysis: L+SI's amplifier survey reaches its climax

NOVEMBER 1994

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LIGHTING+ SOUND *International*

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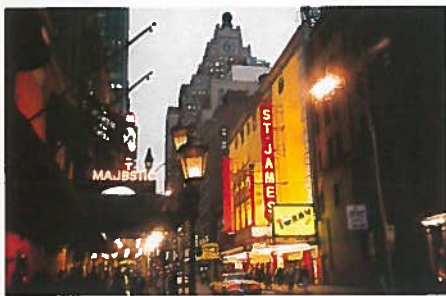
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Assistant Editor: Ruth Rossington
Associate Editor: Tony Gottelier
Editorial: Lee Baldock
Advertisement Manager: Barry Howse
Production: Sheila Bartholomew
Advertising assistant: Jane Cockburn

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Editorial Advisors: Tony Akers, Peter Brooks, Wyatt Enever, Mike Gerrish, Matthew Griffiths, Kevin Hopcroft, Tony Kingsley, John Lethbridge, Ian de le Vingne, Iain Price-Smith, Neil Rice, Jackie Staines

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LIGHTING+SOUND International News

L+SI: Top of the Tables Again

Lighting+Sound International came out top again in the magazine readership section of the PLASA Light & Sound Show exit survey - just as it has in all past surveys.

42% of visitors read this magazine regularly, with DJ magazine in second place with 31% and Disco Mirror and Licensed Design third with 29%. Disco Club and Leisure International followed with 23%. L+SI came top in no less than six out of the nine category areas covering TV/Film, theatre, concert/touring, lighting, AV and buying influence. In the remaining three categories we were second in the sound sector, and third in discotheque/club and mobiles.

In the all-important cumulative non-duplicating analysis of readership, we topped with 42%, with DJ magazine following on 24%, Disco Mirror on 9%, ProSound News on 3%, The Stage on 3%, Audio Visual Magazine on 2% and both Disco International and Live! on 1%.

Champagne Budget Overflows

Staff at Pulsar are set to become the industry's Champagne Charlies if the company's business goes on increasing at the present rate. Viewed in retrospect, directors Ken Sewell and Paul Mardon's tradition of treating all the staff (over 100) to champagne on every occasion their highest sales level step is overtaken, could prove to be a costly move.

When I spoke to Ken Sewell recently, just as we went to press, Pulsar had recorded their best ever month in September this year, but had already beaten that again in October. Ken was jubilant about the sales, but glum on the likely cost of the Krug, worried that the event might well become a habit. Perhaps he should be looking to negotiate a deal with Lord Archer, who knows the brand well, and lives just down the road.

Ken gave credit to the 1994 Light & Sound Show for much of the success. "PLASA worked well for us," he said. "It's certainly done the business."

Capitol Tour . . .



Theatre consultant Dennis Irving (left) with Derek Gilbert and Henry Lewis (left) with Engineering, take a 'seat' in Sydney's 2000-seat Capitol Theatre, currently being rebuilt for an early 1995 opening. The L+SI visit took place during the Entech 94 show in the City last month (see pages 40-49).

. . . and Harbour Trip



DHA's Philip Nye, Strand Lighting's Phil O'Donnell and Andy Collier, and Jem's Mike Wood (PLASA Chairman) have a night out on Sydney Harbour as part of the Entech events programme.

Looking Ahead . . .

Your 1995 Year Planner is enclosed with this issue. As you'll see we've highlighted just the main international shows, but also included the dates and venues for some of the national exhibitions. If you'd like another copy, please fax your request on 0323 646905. First fax, first served. (Subject to availability)

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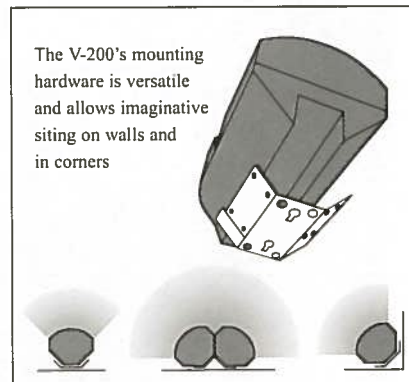
No ordinary loudspeaker can match the stunning Canon V-200 foreground loudspeaker. Its radical shape is no designer's whim. The elegant contours of its acoustic mirror give a more even spread of sound across a wider area.

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V-100



V-200

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LOUDSPEAKERS

New Look Alistage

Aliscaff Ltd, of Tottenham, London, known internationally for their prefabricated aluminium towers, have found that over the last two years they are becoming equally well known for their portable modular stage systems, so much so that they have now adopted the trading name of Alistage, which they feel is more consistent with their new image in the entertainment industry.

The company currently offers 30 different styles of staging with heights ranging from 200mm to 2.6m. A wide selection of shapes and sizes have been added to stock, including triangular, corner and wedge-shaped decks, which along with their square and rectangular decks, allow configurations not previously possible with standard equipment.

The SP at PM Audio



The SP2 mid/high unit.

The SP Series of loudspeakers, from Paul Martyn Audio Services, is the result of a rather bold step taken by the company when they were unable to source the equipment they wanted.

Finding hired systems inconvenient and rather costly, with sound quality often the victim of size and weight considerations, PM Audio decided to build their own. Consequently, the SP1 was born, with output from two custom 200mm long travel bass mid units and a bullet tweeter for top end, with a frequency range of 48Hz-18kHz \pm 3dB. The SP2 mid/high, the natural progression from PM's involvement with more demanding gigs, soon followed.

The SP range, with the SP Sub and SP2 Sub, now includes four cabinets in total, and who knows what PM might turn their hand to next.

Animator Saint



The recent tenth anniversary celebrations for the Scientology Church at Saint Hill just outside East Grinstead was an occasion marked by four days of events. It was attended by some 8,000 people and relayed by satellite to all Churches of Scientology worldwide.

Lighting designer Ted Mizrahi from Cinema Services of Las Vegas was flown over specially for the event, along with production crew, to transform the Great Hall at Saint Hill Manor. The rig consisted of eight each of the Vari*Lite VL5, Cyberlight and Trackspot luminaires, all run from a Compulite Animator 48. The house rig of conventionals was run separately from the house analogue desk.

Visions '94

Visions '94 is a new show aimed at the mobile disco and band market. A range of companies will be showing their wares, with one of the main features being lightshows mounted by Martin Professional and Abstract. The show will also witness demonstrations of Laser Entertainment Systems' 3.5W 8-colour laser and both the Pioneer and Denon CD systems.

Visions '94 takes place on the 13th November at the State Hall in Heathfield, East Sussex. The show runs from 12pm-5pm and admission is £2.00. Further details from organisers Vision Sound and Light on (0435) 867067.

Not What it Seems

The Spin Doctors current tour is attracting a bit more attention than perhaps it might. As the start of the tour approached, all the negotiations between band and supply companies seemed resolved.

The constant to'ing and fro'ing of bid and counter bid seemed at an end and certainly Yan Stile at Cane Green had, with only six days to go before load out, commenced preparation of the PA and secured all necessary sub-hires. However, with money already spent, crew booked and equipment ready, Yan was informed that the contract was now to go elsewhere!

Fortunately, his sense of humour remains undiminished. In the past month he has been seen on several occasions with Gary Marks (well known from his days at Tasco) who, like Yan, has similar limb problems. Such was the frequency of their mutual sightings that Yan is now circulating the rumour that they are about to form a company: "I thought we'd call it 'Arm and a Leg'."

Meanwhile, whilst sports stars in the US (baseball and more recently ice hockey) go on strike, the transfer of American sport into mainstream English culture goes on unabated. In the north of England ice hockey has taken a firm hold with the Stealers able to sell out the Sheffield Arena on a regular basis. In the South London Towers team, whilst Harvey Goldsmith is promoting the Leopards out at the Docklands Arena (with Supermick responsible for the lights), Planet Hollywood, the famous eaterie, is apparently involved with backing the Leopards also. A true multi-media conglomerate presumably packaged as rock meets jock at the dock, or should that be punk and chunk go for a slam dunk?

Steve Moles

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STLD Technology Weekend

BOB ANDERSON

The Society of Television Lighting Directors has always been noted for organising great events for its members. Nowadays, like everybody else, ambitions have to be more limited, but the STLD still finds generous firms such as Kodak, Samuelsons, Philips, the BBC and the commercial television companies, prepared to host evening meetings offering a mixture of education, refreshment and entertainment. Professional education is, in fact, the feature of most of these events.

There is however, a limit to what can be accomplished in a few hours, or a short evening. Consequently, the idea of organising a residential course to look at modern video camera technology, plus hands-on demonstrations of the products of 18 of the world's most prestigious lighting companies, must be warmly applauded.

Wood Norton, the venue for the week-end, has now become the BBC Centre for Broadcast Skills Training and much money has been spent modernising the site. Once installed, the 50 or so delegates settled down to two lectures on video compression and state-of-the-art video editing.

Saturday morning began after breakfast with three lectures. First, Adam Bennette of Arri presented the latest on DMX, and then Raph Janssens of ADB explained the benefits to be obtained from digital dimmers. Finally, Nick Villiesida offered delegates a demonstration of the latest Sony camera developments. All three presentations illustrated the extraordinary precision and stability that digital techniques can now provide to create and capture high quality visual images. After coffee, a fun packed hit and run session allowed 14 exhibitors about three minutes each to introduce their company and the products to be seen later in their hands-on demonstration areas.

Over the Saturday afternoon and Sunday morning, small groups of delegates were able to spend half an hour receiving undivided personal

attention from each of the companies participating. The products on display were many and varied and all supported by friendly technosales persons, many themselves members or associate members of the STLD.

Mentioning only the main products shown, Arri showed digital dimming and grip equipment; Derek Lightbody, now with Optex, demonstrated his impressive new softlight, Aurasoft, and Zero 88 had their award-winning ID portable digital dimmer packs.

Several companies showed automated moving lights. Lightfactor featured Cyberlights and Clay Paky and Pulsar had the popular Golden Scan 3, alongside Wybron's add-on Autopilot control system that tracked a performer wearing a transponder to a standard equalled by only the best human operator. Next door, the LSD Icon moved the whole lamphead and in the next room again, Vari-Lite, also using their familiar moving lamphead system, showed their complete range including the latest VL6. Most of these demonstrations used fog and mist provided by Rosco, M&M or JEM, all claiming improved standards of low toxicity. M&M also showed colour scrollers from Rainbow and CCT used a corner to show their latest wide angle Silhouette.

Only slightly more conventional, Michael Samuelson showed the latest Videssence fluorescent softlights, their safety-approved power distribution system and ran an outdoor demonstration of metal halide location lighting. Strand were, of course, well represented with digital dimmers, their latest consoles, a new condenser optic spotlight and fluorescent softlights. Nearby, ADB showed their competing Eurorack digital dimmers and control systems.

The STLD members got real value from the week-end, whilst the manufacturers showed their wares in highly favourable circumstances to an influential and technically sophisticated audience.

Sixties Revisited

Being the 25th anniversary of Woodstock means that it is also a quarter of a century since the end of the sixties, and the guys at High End Systems will be celebrating the period in their own inimitable way during LDI '94 in Reno this month.

On Saturday November 19th at the Reno-Sparks Convention Centre, some of the originals of the liquid light show era will dust down their bottles of coloured fluids and polish up their clock glasses, but one thing they won't be getting down from the attic shelf is the overhead projector or the Rank Aldis Tutor One. The anticipated British contingent of Cerebrum, Optikinetics and Peter Wynne Willson, who recently got some up-to-date practice with his effects for the Pink Floyd Tour, will be sweating over the heat of something rather more substantial in the light output department.

Visitations from the sixties will include Jefferson Starship, Dr. Timothy Leary and Woodstock MC Wavy Gravy. Tickets are available from High End Systems. For the full story see our profile starting on page 53.

Home from Home



PLASA chairman Mike Wood (left) plays host to Steve Rawlins of Martin Professional (centre) and Andy Graves of Pulsar during the recent Entech exhibition in Sydney.

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CP&P Move

During the summer of 1994, CP&P France moved from their old offices based in Normandy, near Caen, to a brand new building situated a few kilometres south of Paris, in Villejuif. The official opening of the new premises will be held on the 10th November, with training seminars and presentations for invited end users on the 8th and 9th. Professional lighting designers and major 'Points Experts' dealers will attend the official day on the 10th, followed by a grand opening party in the evening.

With Orly airport just 10 minutes away and a metro station just five minutes away, careful planning has gone into the choice of location, which means that the offices are easily accessible to all potential customers. The company plan to hold regular seminars, and presentations will cover the Clay Paky and Pulsar product ranges, with specialist seminars including Masterpiece training, service and presentation.

The new address is: CP&P Sarl, Batiment 4, 5/9 Rue Marcel Paul, 94800 Villejuif, France.

HW Draw Winner



Dennis Harburn of HW International (right), presents a Gold Shure 55SH microphone to Kevin Halpin (centre) and Eamon O'Niell of Ultimate Image Ltd at the recent ISLEX 94 in Dublin. The award was for the winner of the HW prize draw held during the PLASA Show in September.

A HUNDRED YEARS AGO THIS MONTH

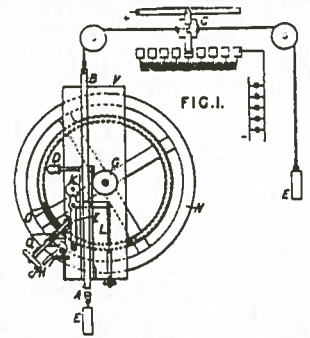
BRITISH THEATRICAL PATENTS 1801-1900

Intro' to Patent Abridgement 21140 of 1894 (Siemens & Halske)

Electric Light found its way into the theatre at least as early as 1848, but this was in the form of the electric carbon-arc. When, many years later, the incandescent electric lamp arrived on the scene, it came as a device which at first puzzled and later delighted stage managers and designers. The lamps could be distributed practically anywhere about the stage and yet all remain under the control of one operator. And, of course, the light levels could be so easily raised or lowered. So in 1881, the Savoy Theatre in London became the first in the world to be lit throughout by the incandescent electric lamp. It was equipped too with purpose-built dimmers, designed by Messrs Siemens. But in the fullness of time, these became inadequate for their purpose and this new patent of 1894 is an early updating of the original, the first electric stage dimmer in any theatre.

21,140. Siemens Bros. & Co., [Siemens & Halske]. Nov. 3.

Lighting, systems of; switches.—Relates to apparatus for controlling electric lighting, such as on the stage of a theatre. Fig. 1 shows a side view. A number of parallel bars A B slide within a casing V, and each is fitted with a handle D. Each bar is connected by a cord with one of a set of movable contacts C sliding over resistances. The bars are counterbalanced at E, E. In order that several bars may be moved simultaneously, they are adapted to be gripped, being covered with a strip of caoutchouc, between rollers K and a rotary cylinder G. Springs L tend to cause the bars to be gripped. Cams H, fitted with suitable handles, are arranged to work against the ends of the bars I, and so release the bars when desired. The cylinder G is rotated by the wheel N, and to give a slow movement a pinion Q may be pushed forward to engage with a rack O.



On The Road Again . . .

L+SI will be at the LDI Show in Reno, Nevada, this month.

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The Intermedia Adventure



The pride of Wroclaw - the Hala Ludowa exhibition hall.



Jerzy Holozubiec of Lighting Technology Trading flanked by Isabelle Rolet of Mobil-Tech (left) and Nathalie Vermont of RVE.



Stanislaw Maczywski of Teatrum (left) with Marta Stowikowska and Tadeusz Grudkowski of Discotech.

Although the Berlin and Moscow shows both say they reach the Eastern Europeans that other shows cannot reach, Intermedia in Poland is the only annual trade fair in the area of any scale. The event is now six years old and emulating the Frankfurt Music Fair in as much as it now boasts strong representation from both lighting and sound companies.

Wroclaw, the town where Intermedia takes place every year, is beginning to acquire some of the trappings of modern day living in the West, and if you can't cope with the local fare, McDonalds and a Pizza Hut are easy to find. There are at least six pubs in the vicinity of the old Market Square and one even sells Guinness!

The exhibition halls themselves are a marvel of pre-war architecture, with the vast unsupported dome providing an easel for projections and a home for the lighting and sound part of the exhibition. The wide corridors circumnavigating this huge area house the extensive musical instrument and sheet music sectors, as well as the technical workshops which run throughout the show.

Intermedia is the annual music fair for Eastern Europe, and has more than just a healthy representation from the discotheque and theatre industries. Some of the big names that participate include Ohm, who had an impressive presence,

Steinigke Showtechnic, Optikinetics, Soundcraft, Coemar, Teatro, Mobil Tech, RVE, Martin Professional, Rosco, Programmi Sistemi Luce, Celestion, WDR, Soundtracs, Sennheiser, Shure, RCF . . . and the list goes on. Distributors ESP and AC Lighting were supporting two of the larger dealers at the Show. The majority of the products on display have, of course, been launched and covered here editorially before, but it has to be said that the enthusiasm and pride of Coemar's Ukrainian distributor Zinteco launching his NATs into Eastern Europe was quite staggering and Polish disco lighting manufacturer, Actronix Disco-Service, was also causing quite a stir with the visitors.

With 106 stands and over 360 companies represented, and a neat round estimate of 10,000 Polish trade visitors with 1,000 more from other Central and Eastern European countries, plus 20,000 non-trade visitors (primarily from ex-USSR countries) the general consensus was that Intermedia was a very worthwhile show. Participants particularly noted the high calibre of the visitors. Finally, to answer the crunch question, reports are that people really did have millions of zloties to spend, and that they were spending them.

Anna Pillow



Stanislav Kushpitolovsky of Zinteco (right) introduced the Coemar NAT to Eastern Europe.



Mariusz Swiekatowski of Interdisc Lighting (right) with Hermann Froom of Laguna.



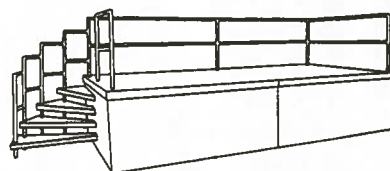
Mike Lowe of Teatro (left) with David Stressing of ESP and Jerzy Holozubiec of LTT.

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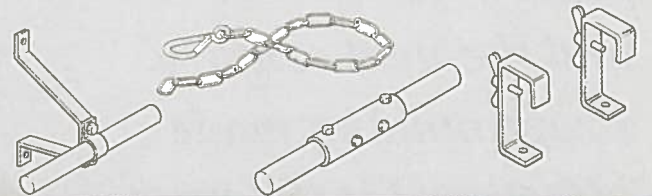
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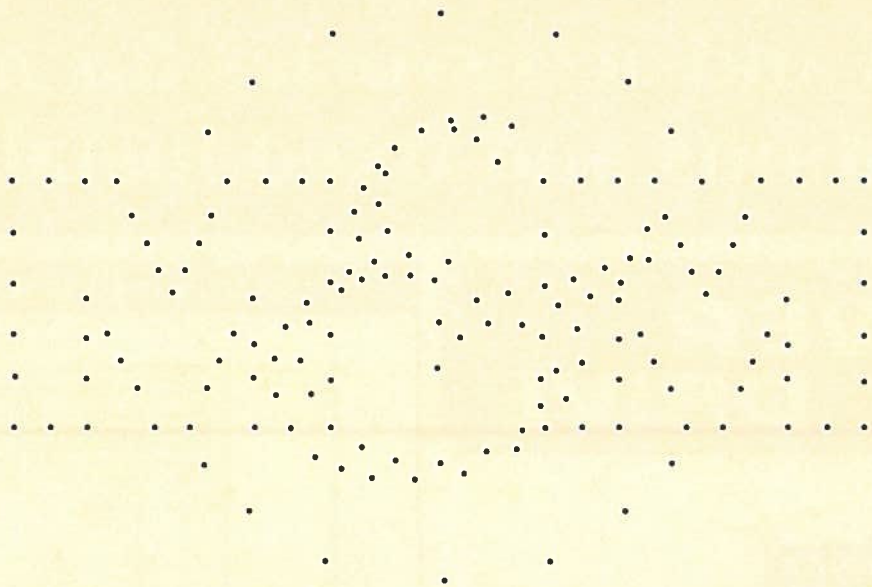
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City of Westminster College



Harvey Goldsmith opens the Performance Lighting Studio.



Christopher Raeburn cuts the tape to open the Music Studio (left), and Harvey Goldsmith (right) surveys the lighting studio.

The City of Westminster College recently opened new Music Technology and Performance Lighting Studios at their Paddington Green site in London.

In his opening presentation, Paul Bellamy, principal of the college, welcomed Harvey Goldsmith, the international impresario and Christopher Raeburn, recently retired senior record producer and director of opera productions at Decca. The new lighting studio was formally opened by Harvey Goldsmith, while Christopher Raeburn did the honours for the music studio by cutting the audio tape stretched across the threshold.

The college, which has eight sites in the area, is one of the foremost educational establishments for theatre technology in the country, and currently franchises its courses to other colleges in England and Europe.

The Visual and Performing Arts faculty at Westminster has been training potential sound engineers since 1981, and has, through close contact with the ABTT, established strong links with the industry. All students on full-time sound and lighting courses spend one day a week, throughout their course, working on industrial placements. These include most of the West End theatres and many of London's major sound recording studios. This work-experience helps students to build a high level of awareness of the professional working atmosphere, as well as enabling them to develop a large range of useful contacts which could lead to employment. These placements include work at the ENO, the National Theatre, the Theatre Royal, Drury Lane, the Savoy Theatre, Britannia Row, Air Studios, the National Sound Archive and EMI Studios.

The new lighting studio, fitted with an overhead lighting rig, will give students a chance to work on and study the installation, maintenance and operation of performance lighting. Computers for the design and control of the lighting are available to familiarise students with the techniques they will encounter in professional venues.

Training at the college is always geared towards a professional level. The courses teach awareness of analogue recording, digital techniques, sound systems, audio electronics and acoustics, as well as a sixth sense, which Christopher Raeburn describes as 'knowing when something sounds right'. The aim is to teach all of the basic skills to a very high standard, so that an excellent general understanding of the processes involved, and an overall grasp of how the 'tools' at the technician's disposal can be best put to use, is achieved. With the lecturers on the courses having extensive personal experience of the industry, low standards are not appreciated. Sound engineering student Graham Burton, having worked in the industry for two years himself, before deciding to take up a course at the college, appreciates the very high standards demanded of the students, and told L+S: "On this course, if you get below a 'C', you're classed as 'sacked'."

Jerome Mohamed, a student on the two-year Broadcast and Audio BTEC course, explained: "The course works because it drives you towards industry standards. What's drummed into me, is that to be a successful broadcast or sound engineer, you have to be a perfectionist." Now in his second year, Jerome has already had an extensive range of work experience within the industry, and is hopeful that the contacts he has made will lead to employment in the future.



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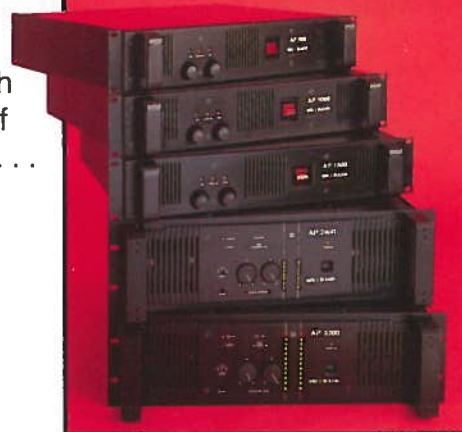
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People News

Presentation Services have announced that **Malcolm Mellows** has left the company, which he helped to establish two years ago. Since his departure Malcolm has been devoting his time to show and lighting design, and has been confirmed as LD for the current Suede tour.



Adrian Hicks.

Richard Wear, formerly manager of the Professional Products at Fostex UK Ltd, has joined Celestion as marketing manager in their Professional Products division. Wear has considerable experience in the field of professional digital recording products, as well as studio systems and installations, having also worked at Harman UK. He is an engineering graduate and also an accomplished musician.

Adrian Hicks, who joined M&M at the end of 1992 as product manager, has been made a director of the company. His talents have played a great part in helping M&M to expand its range of products and his technical knowledge and expertise has been invaluable. The expanding range and the availability of space in M&M's offices has allowed the company to set up its own in-house service centre. **Roger Hennigan** has been appointed service manager and will be responsible for providing a 24 hour maintenance and repair service. A qualified electrician with electronics training, Hennigan will be working both on the bench at Cameron House and on site to guarantee a rapid turnaround. Also new on the M&M team is **Nigel Sadler**, who has joined the sales team from the BRIT School, where he has been technical stage manager for three years. In addition to general sales, Sadler has special responsibility for establishing a dealer network for the range of Smoke Factory fog machines.

Definitive Lasers of Dubai have appointed **Mark Stitfall** as head of their lighting division. He was originally trained as a heavy current engineer and mechanical fitter in South Africa. Since 1983 when he arrived in the UK, he has applied his expertise in the fields of theatre and ballet, and on such events as Moscow Invites and The Wall. Working with such well known production companies as Park Avenue, Imagination and HPICM, and with lighting designers such as Durham Marengi and Andrew Bridge, Stitfall has many years' experience in lighting design and mechanics, having been involved in the development of electrified rigging and moving truss systems.



Richard Wear.

well respected consumer brand names. She then joined Autograph Sales to support the UK and European sales and distribution network, and since leaving, her experience in marketing and distribution has continued with international companies outside the audio industry.

Futurist Light & Sound have announced the appointment of a new rental/production manager and an engineering services manager. **Jonathan Walters** has joined Futurist to head the company's activities in the professional theatre rental market in the UK and brings to the company a wealth of technical and commercial experience. Previously he worked on many leading West End and UK tours, and most recently was at the Charter Theatre in Preston. **Paul Davies** joins Futurist to build up a new technical services operation able to fully support professional lighting and sound equipment. Davies, who has both a BSc and HND in electronic engineering, has significant experience in the theatre business and will enable Futurist to fully support professional theatres in the north of England from their newly equipped workshops, say the company.

Following their appointment as the exclusive UK distributor for Fostex professional digital and multitrack recording products, SCV London have appointed **Tony Besgrove** and **Mark Perrins** as sales manager and product manager respectively. Both have a long association with the Fostex range of products, having held positions at Fostex UK Ltd before the changeover to SCV London. SCV have also appointed **Lucie O'Connell** as marketing assistant. Lucie will be responsible for the day to day PR of the company on both a national and international basis, and will be liaising with the company's distributors to service and co-ordinate their marketing requirements.

Re an Products have announced that **Peter Wilson** has been appointed to head its new professional products division. Previously European sales manager for Switchcraft, the Chicago-based audio connector manufacturer, Wilson has over 16 years' international sales experience to draw upon.

Sally Granger has been appointed by d&b Audiotechnik to join their UK offices in Nailsworth. Granger's previous experience includes a long span in the public relations division of J Walter Thompson, responsible for promoting several

ABTT North

The ABTT North trade show took place recently at the Royal Northern College of Music in Manchester. Over 30 companies plied their wares to a somewhat disappointing visitor turn-out which fell just short of 600.

Without doubt, the small, regional shows have an important part to play in the scheme of things, but unfortunately ABTT North didn't draw the numbers and most exhibitors felt that scheduling the show for three days was over-optimistic in light of the low visitor count. Inevitably, regional shows cannot compete with the scale of business opportunities offered by the international exhibitions but one has to question the viability of running such shows when the bottom line for the majority of those attending, i.e. to do business, is an option undermined by lack of opportunities.

Having said that, there are certain advantages to be had by attending. The smaller shows can steal the march on the larger ones by offering a forum for more detailed debate, and a chance to catch up with colleagues and friends in a more leisurely environment. They also tend to place greater emphasis on the seminar programme which, in this instance, featured, amongst others, Francis Reid and John Earl.

The regions are crying out for more accessible events. ABTT North has grown, a reflection of its potential, and it will be interesting to see whether future events creep out of the shadows of shows such as PLASA and create an identity all their own to serve the regions in the way they deserve.

Ruth Rossington

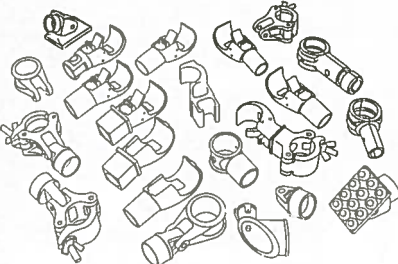
AC in Full Sail

Following the PLASA Show, AC Lighting have reported their best two months ever. The increase in sales has been across the board, but most interest has focused on the Wholehog and Jands Hog, orders for which are running into next year.

Meanwhile, the first Wholehog to set sail for the Caribbean was recently delivered to Puerto Rico-based Switch Lighting. The console was put to use controlling Coemar's NAT and Samurai luminaires and a Strand dimming system, for a massive 40-year celebration Sulsa festival. With the tropical weather proving rather trying, the stadium system was eventually assembled allowing only two hours for programming. Despite this, and the fact that this was the first alliance of the Hog and the NAT, the 20,000 crowd were not disappointed and the show went off without a hitch.

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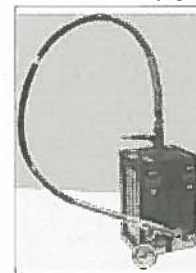
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More for Oliver!

Tannoy's SuperDual loudspeakers are to be used on the major new production of Oliver! which is opening at the London Palladium in December.

Mike Walker, the sound designer for Oliver!, chose the SuperDual after hearing them in action at the Barbican Theatre and using Tannoy Dual Concentrics in Singapore. He specified four each of the CPA 10S, CPA 12.1B and the CPA 12.3B loudspeakers. In addition, the show will use six Tannoy 15" drive units.

The new version of the popular show is being produced by Cameron Mackintosh, directed by Sam Mendez and will star Jonathan Pryce as Fagin. (Watch out for a major L+SI feature).

On Campus



Soundtracs' ongoing involvement in pro-audio industry education was demonstrated once again in September when one of the newly launched Megas II Stage sound reinforcement consoles was used for the University of Surrey's Campus AV Live Sound PA course.

The intensive three day pre-degree course, held in the University's Performing Arts Centre, was led by Victor Rush of The PA Company. Eager candidates learnt the 'tricks of the trade' and were given a rare opportunity to set up a live 'gig' with a band, audience, and all the attendant pressures involved with a real event. This followed the 'rehearsal' session at the University when live music was provided by 'Hed', a talented Surrey band. They gave candidates a mix of strong vocals, powerful guitar and keyboards to handle.

Autopia Trunk Deal

Autopia Terakat (Kit Kases) - manufacturers of high quality professional flightcases, recently received an order worth £25,000 from Theatre Projects for 80 cable trunks, which was delivered within three weeks of receipt of order. AT recently achieved BS5750 accreditation.

Grease's New Laser

Despite its highly successful first year, there were still some elements of the show that the team behind the West End musical Grease were not entirely happy with. In particular, the laser effect during the 'Greased Lightning' song was not felt to be wowing the audience in the way that it should. Fortunately, the show's success meant that time and money were available to investigate alternatives.

This search led to a series of discussions with the original supplier, and then, finally, to the original laser being replaced by a new 7W water cooled argon system from Laser Grafix. The initial requirement was for the new laser to create a similar effect to the original - a spinning image of the Grease Lightning car. Brett Salmon from Laser Grafix achieved this, feeding the laser to an 8-degree scanner that flies in to centre stage during the sequence. Using their Prisma software running on an Archimedes computer, he also improved the effect by giving it a more 3D appearance. This, and the laser's extra brightness, gives the effect a greater dominance over the audience/blinding Digital Light Curtains than used to be the case.

At the same time, an extra laser effect was added to the show. An extra fibre-optic laser feed was run to just downstage of the proscenium. A diverter mirror then bounces the beam out to a whole series of mirrors scattered around the FOH booms. This creates a series of laser fingers shining out over the audience, momentarily distracting them as the 'improved' car is revealed on stage. The new installation did, however, call for some new health and safety procedures; the mirrors are carefully locked off to ensure that the beams miss the audience, but they do scan the lighting control gallery high at the rear of the auditorium, where the lighting operator now has to wear dark orange safety goggles during the sequence.

Grease's success has also meant that work has had to be carried out to permanently install the show's lighting, as far as possible. This work has been handled by Simon Needle, the show's original production electrician, and his company Electrolite. Their work has tidied up the dimmer room with cable runs in trunking and purpose-built load lamps, and hardwired the dry ice and smoke machines, all to the complete satisfaction of local safety inspectors. This work, and a host of other changes and improvements made by the resident crew over the show's first year, have ensured that the show has not only remained ready to face its audience, but has actually improved to give those audiences a better show.

Robert Halliday

Sweden's Operatic Gala



Goteborgsoperan, Sweden's brand new opera house, was opened in mid October by the King of Sweden, commemorating the region's first major new venue of its kind to be built this century. Amongst the extremely well-equipped facilities are a 48-input Cadac J-Type console, fitted with motorised faders and comprehensive automation facilities.

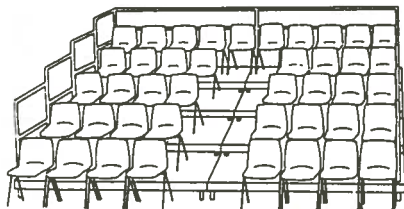
The sound system installation was handled by a local company, Tal & Ton AB. The console, sited at the rear of the auditorium within the control room, was the first worldwide to be fitted with Cadac's motorised fader system. Another innovation at Goteborgsoperan is the console's specially designed hydraulic table, allowing operators to adjust the desk's height quickly and easily. The J-Type will be used on a wide range of different productions ranging from ballet and classical opera, to large orchestral concerts, experimental theatre and popular music events.

A substantial Meyer Sound loudspeaker system has also been installed, again by Tal & Ton AB, Meyer's local distributor. The system comprises the compact MSL-2A unit at its core, handling high levels with clarity and without distortion.

The Meyer sound system is configured with an upper and lower left-centre-right arrangement, ensuring even coverage throughout the 1500-seat auditorium. In total, 14 MSL-2A units are used, with six MPS-355 speakers as front fills. Low frequency handling is catered for by a mobile rig of 650-R2 subwoofers. Additional MSL-2As and 650-R2s are provided for special effects replay, and can be located either on the stage or within the auditorium, as required. The whole system is augmented by a pair of UPL-2 speakers, with its conical horn design providing a full 60 degree coverage to support demanding applications. Meyer's SIM System II acoustic analyser also features at Goteborgsoperan, for final optimisation of the configuration.

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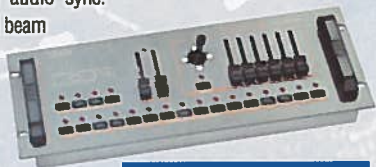
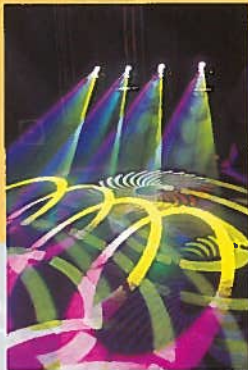
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PSL Appoint Team Lucas



PIC Systems Ltd, manufacturers of the Vp and Ve range of professional power amplifiers, have appointed Team Lucas Productions as their official distributor for Sweden. TLP immediately placed an equipment order valued at £40,000. The official hand-shake took place at the recent PLASA Light & Sound Show in London, and shown above on the PSL stand are the company's Roger Skuse (left), head of sales and marketing and John Smith (centre), head of manufacturing, with Lucas Soderberg, managing director of Team Lucas Productions.

Star Hire in South America

Star Hire have announced that, following visits by Star Hire's partners to Buenos Aires, a decision has been taken to establish a permanent branch office there, to be known as Star Hire Argentina.

One of Star Hire's portable StarStages was shipped from Tilbury in September and will be available in South America from 1st November 1994. The company are also shipping 40 tons of scaffolding.

Daniel Panebianco, already well known as a stage builder and production manager in Argentina, has been appointed manager. Long standing employee Graham Thomas will also be based in Buenos Aires to operate the StarStage.

In a further development Star Hire Argentina is to form a joint venture with three local companies to provide a complete package of production services. To be known as El Techo srl ('The Roof'), they will supply a range of stage, lighting and sound equipment.

The first major contract for El Techo srl is a complete package of services for a three month run of outdoor shows for Walt Disney in Buenos Aires. The stage, designed by Star Hire UK, will provide over 8,000 square feet of covered floor, with the main production area being 66 feet x 58 feet.

All design work and safety initiatives comply with British Standards, and the Pop Code. AutoCAD equipped computers in England and Argentina are modem linked to provide ElTecho srl with access to all of Star Hire's design and analysis resources in the UK.

Cyberlights on Babylon 5

In the USA, producers of Fox Network's Babylon 5 are utilising six High End Systems' Cyberlight automated luminaires for various special effects sequences on the weekly television series. Filming of the current season of Babylon 5 continues through to February 1995. The Cyberlight fixtures were provided by Chris Wickman Productions, who also supplied technical support to the show's production staff.

Going Live '95

Soundcraft has announced new dates for the next Going Live course, covering the skills of live sound engineering. It will be held once again at the University of Manchester over the weekend of March 31st - April 2nd, 1995.

Going Live will offer valuable insights and instruction for those with all levels of knowledge of sound reinforcement - different parts of the course will cater for beginners, those who already have a basic knowledge, and those who know how to set up and operate a console and PA system. The course will be structured as a two-day event over Saturday and Sunday, with an optional pre-course session for beginners on the Friday. This will provide a basic introduction to signal path, console layout and system components for first-time students.

As before, the instructors will be top professionals from the world of live sound - previous courses have featured engineers whose touring credits include the Eurythmics, David Byrne, Mike Oldfield, Prince, David Bowie, Jeff Beck and Shakespear's Sister - with a brief to cover everything from set up and sound check through to equipment operation and live performance. Saturday night provides an opportunity for students to be both audience and engineer, as they set up and mix a band live on stage.

Going Live provides a unique training opportunity, combining academic tuition with practical hands-on sessions. Using the latest equipment, students get the chance to learn the art of positioning microphones and foldback/FOH speakers, use of EQ and dynamics, and all other aspects of live sound mixing. For information, contact Katrina Davies on (01707) 665000.

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Philips Catalogue

Philips Lighting have announced the publication of the second edition of their Architectural Lighting Catalogue, which gives both architects and interior designers an extensive overview of the European range of the company's products, and guides the reader in the selection of the appropriate units.

The hard-bound, 320-page catalogue gives a quick-reference presentation of Philips' complete range of architectural luminaires and lighting systems.

It contains chapters on projectors, power tracks, downlights, lighting structures and systems, as well as outdoor luminaires. A new chapter has been added on post-top luminaires for outdoor lighting. Each chapter starts with general information and is followed by descriptions and technical specifications of the luminaires.

Wembley West

Wembley Loudspeakers of Shepherd's Bush, London, have announced the appointment of their new Canadian distributor, Novatec. Negotiations were initiated at the SIB show in Rimini and concluded at the recent PLASA Show at Earl's Court with a sample order of £10,000 worth of products.

Based in Ontario, Novatec is one of Canada's leading distributors for high-end products in the discotheque and leisure contracting market. The sample order is being shipped out in time for the LDI show in Reno where the product will make up an important part of the Novatec stand. The announcement comes just months after the news that Wembley have been expanding their potential in the Far East with the appointment of Vestax in Japan as a distributor, building on the base already established by Wembley distributors in Hong Kong, Singapore and Korea.

Baby Face



Framed by L+SI's camera at the recent Entech show in Sydney are Murray Rogers and Shirley Jensen, formerly with Howard Eaton Lighting, and now with Bytecrafft. The eye of L+SI's editor was drawn to their latest arrival - not the copy of the October issue of L+SI clutched by Murray - but Rogers junior getting an early grounding in the technical aspects of the industry.

HW Roadshow

HW International have recently launched a mobile roadshow which offers 'on site' demonstrations from three of their top pro-sound range - GAE speakers, QSC amplifiers and Shure Audio products. The mobile unit includes GAE monitors, mid/high cabinets and sub bass cabinets. The GAE speaker range is designed for multi-applications such as small venues, theatre, stadia, theme parks and of course rock and roll with the Arena Array.

The demonstration is designed to travel to any suitable location in the UK and is available to anyone who books an appointment via HW's technical product manager Peter Barnard, or one of HW's local representatives.

ELCA Arrives in UK

Owl Video Systems has announced its appointment as sole UK distributor for the Italian-manufactured ELCA range of video production and distribution products. The full range comprises character generators, colour logo generators, video and audio matrices (including multi-level), video switchers, stereo, video and audio distributors and video clock generators. These systems provide full functions and professional quality bandwidths for applications in the audio visual, presentation, video production and broadcast markets.

There are three character generators in the ELCA range, with variations in storage capability and real-time operation. The main features of the generators are simple commands with a wide choice of graphic and text manipulation options. The basic model is the ELCA CG19Y, which can store 16 pages of text in four lower case and two capital fonts. Characters and backgrounds can be individually coloured, while effects include roll, wipe, crawl and automatic centring. The CG128Y stores 84 pages with 13 colour palettes, each of 16 colours. There are nine fonts in various sizes, plus 16 one-colour backgrounds and 32 types of soft background in 48 colour levels. Additional features include borders and shadings, character flashing, and subtitling with a capacity of 1,340 lines. An autoscan feature allows pages to be scanned in sequence either backwards or forwards.

The top-range CG180 offers real-time operation, with a floppy disk drive that allows 80 pages to be stored on each diskette. The seven resident fonts can be augmented by loading others, with 16 fonts available on line at one time. There are 13 colour palettes with 16 shades for each, plus 96 soft backgrounds. Subtitling, editing functions and menu display complete the extensive list of features. None of the ELCA character generators requires an external genlock.

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New for Old

To celebrate the arrival of the SM12, their newest dedicated monitor console, Soundcraft are offering to exchange a new SM12 for the oldest/most travelled/most interesting working Series 500 monitor console they can find. The popular Series 500 monitor console, was first produced by Soundcraft in the early eighties and over 400 consoles have since been supplied to hire companies, venues and bands all over the world.

Somewhere out there is a Series 500 with a story to tell - and to the owner of that console Soundcraft will supply a 32 or 40 channel SM12 (depending on whether the winner's 500 is a 24, 32 or 40 channel version). The consoles will be exchanged at the Awards Dinner during the Live! show in London in January next year. If the winner is outside the UK and cannot make it to the awards, Soundcraft will arrange to exchange the consoles at the distributor's premises.

The winning Series 500 monitor will be added to Soundcraft's growing 'Hall of Fame' which will become a showcase for classic consoles and will provide a permanent record of the history of audio mixing. Owners of Series 500 monitor consoles should contact their Soundcraft distributor with a brief life history of the desk. The closing date for entries is Friday 2nd December 1994 and the winner will be notified via the distributor.

Yamaha Launch

Yamaha held its biggest ever product launch on 25th October, introducing 15 new Hi-Tech and Pro-Audio products, from new keyboards and next generation synthesizers to effects processors, mixers, AV installation speakers and amplifiers.



Among the new products presented to Yamaha authorised main dealers at the Metropole Hotel in Birmingham, were the W7 and W5 professional workstation keyboards, VL7 Virtual Acoustic synthesizer, MU5 and MU80 portable tone generators, the MX200 stereo mixer, the MT50 entry level 4 track recorder and the D5000 professional digital delay unit.

Canada ILE Change

Canada's only lighting show, the International Lighting Exposition, has transferred to an Autumn date in response to exhibitors' requests and the needs of the visitor. Now the exhibition, which brings together manufacturers and suppliers of lighting equipment and services, will take place at the Metro Toronto Convention Centre from September 27-29, 1995.

Companies such as Philips Lighting and Osram Sylvania have already booked their space and others are following daily. Over 150 booths, about 50% of available booth space, has already been reserved.

In conjunction with the ILE, the Illuminating Engineering Society of North America (IESNA) - Toronto Section, will once again be hosting its annual Canadian Regional Conference. This will consist of several hands-on practical sessions of importance to lighting professionals.

RS Open House

RS Sound & Light based in Howard Street, Glasgow, will be holding an Open Day on Thursday 24th November, to demonstrate the brand new Wharfedale Force range, along with the Kam and Gemini range of mixers. There will also be a lighting display from Genius and Lampo, and the first preview of the new Le Maitre low-lying fog machine which creates a dry-ice effect. Appearing at the event will be guest DJ's Stevie Kerr (Radio Clyde), Joe Deacon (Metro) and Trevor Reilly (Hanger 13).

Wharfedale's Force range of loudspeakers have been used in recent installations at The Jumping Jelly Bean in Bedford, Zone in Loughborough, H20 in Bishop Stortford and the Eastside Club in Colchester.

LETTERS

Dear Editor,

PLASA Light & Sound Show 94

This is a letter I never imagined writing, but unfortunately I feel I have to, and hope that it will do some good in one way or another. If not, then maybe it will make certain people think about the way they market their lighting products.

As a visitor to PLASA 94, I went to see companies give demonstrations of their products with a view to looking at what was new on the market so I could assess and then recommend them to my customers.

Most of the exhibitors did just this (congratulations to Martin Professional, NJD, Clay Paky and Pulsar to name a few) but if a company needs to use eroticism and sexual temptation to sell their lighting products, then, in my opinion, they must be getting towards a stage where they are desperate for business, and are prepared to stoop to the lowest levels imaginable to help them sell products. Is one company in particular in this desperate situation? I doubt it. Not after the success of their original mobile disco lighting products which were sold using the method which most dealers use, namely advertising their products in the press until people buy them, then letting word of mouth take over. That worked.

Do certain exhibitors get some kind of cheap thrill from seeing near-naked girls (and boys) flaunt their flesh on stage, and gyrate various unmentionable body parts to raunchy music? Probably. Did everybody visiting this particular stand actually see the lighting effects? Doubtful.

This kind of thing may be acceptable in some sleazy Soho back street bars, but at the world's leading sound and light exhibition? Come on please. We want to see lights, not tights. There is a time and a place for people to go and see acts such as the one I refer to, and PLASA 94 was certainly neither the time nor the place. I hope that next year we will not see a repeat of this type of show. A marketing angle of this type is a poor approach to take and certainly sub-standard for any company wishing to launch new products. (Do you get a free whip with every new product, or is it a free new product with every whip?)

I hope that, in future, companies will refrain from using this kind of marketing technique, and revert back to actually demonstrating the lighting itself, as the methods used were not only inappropriate, but also unjustified and totally unnecessary.

After all, aren't lighting demonstrations what you go to PLASA for?

*A disgusted and disappointed Elect Club Visitor.
(Name and Address not supplied)*

Autograph Cruising

The Cunard liner QEII recently enjoyed a loud Liverpool interlude during its Silver Anniversary Cruise, thanks to Autograph Sound Recording. A powerful sound system, specially installed by Autograph on the liner's helicopter deck, relayed a selection of Merseyside music to an estimated 250,000 spectators along the banks of the Mersey.

Awkward sound installations are second nature to Autograph, with their extensive experience of touring and installed theatre systems. Supplying a large percentage of Liverpoolians with music played out from the decks of the QEII fell neatly into this category. Liverpool is the original home of the Cunard line and for this historical visit, the QEII was bedecked for the occasion with eight Meyer Sound MSL3 loudspeakers and four Meyer 650R2 sub-bass units.

Autograph's Nick Lidster and Bobby Aitken designed and installed the system, which was craned aboard the QEII in Southampton. Six MSL3s and the 650R2s were arranged to fire at Liverpool city itself, whilst two MSL3s projected the music on the far side of the ship towards The Wirral. The system drew over 60 amps from the ship's generators, via a 75 metre cable, with up to 80 amps being consumed at the peaks. A 2.5 second echo could be clearly heard from the ship, demonstrating the power and reach of the system.

The music programme lasted 16 minutes and was repeated twice during the liner's journey from Liverpool down to New Brighton near the mouth of the Mersey.

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Showtime in Beirut

The war-torn streets of Beirut, until recently filled with the clamour of bombs and snipers, underwent something of a transformation in September when they became the venue for an historic event - the first major concert in the Lebanon since the ending of hostilities, and the first appearance in her home country for over 17 years of Lebanese star Feyrouz. A key role in putting the whole event together was played by Peterborough-based B&H Sound Services, who provided the PA system.

The remains of bombed-out buildings had to be bulldozed and the area tarmaced before the staging could go ahead. The 50m x 40m stage was constructed from wood, and the rig was built to represent the seven sails of a galleon, with the sea providing a dramatic natural backdrop. Provision was also made for an audience of 45,000 - all seated.

Simon Ward of B&H decided that equipment hired locally would have to be combined with equipment from B&H's own stock. The main L/R FOH stacks each contained eight EV MTL2s and eight EV MTH2s which were driven with Amcron amplifiers, while four Meyer 355 cabinets were used for frontfill. The nine planned delayed positions were each to comprise four Meyer UPA1s and two Meyer USWs together with Meyer M1 and B2 processors and amplification from Crest 4801s. Soundcraft equipment was used for both FOH and monitor mixing, with a 40 channel Vienna II FOH and a 40 channel Delta on stage. A variety of Apogee equipment was used for monitoring including eight AE5, one AE10, eight 460s, eight 420s and two 320s, together with Apogee processors and amps.

The long site (over 280m) meant that the delay systems were to contribute greatly to the overall sound set-up, and their positioning was critical. Simon Ward left specific details of the size, shape and positioning of the towers before he set



The bombed-out city of Beirut witnesses the preparations for the concert.

off for Beirut. The number of delays also meant that an efficient and well-designed mains distribution system was vital. With all power being supplied from locally sourced generators, Ward decided to sub-contract the design and supervision of the power distribution system to Pearce Hire.

Time was short, so it was imperative that the equipment be moved as quickly as possible. The Lebanese Embassy and the Arab Chamber of Commerce co-ordinated a straight passage for the microphones, amps and speakers, bypassing red tape to ensure that everything arrived in record time. Nevertheless, the schedule was tight.

Ward told L+SI: "It was only on arrival that we realised what we were up against. The country has been isolated for so long that we had to start from scratch on a lot of things, particularly with items such as scaffolding and cable laying. We spent a lot of time explaining exactly what we wanted, and some of the equipment we were working with was pretty basic. When it came to digging trenches for the cables, we had 12 men with pick-axes, working 24 hours a day for three days, to dig four cable channels.

The concert was a great success, despite the difficulties involved, and the organisers are already discussing the next event.

Cadac Seminar

Clive Green & Co, manufacturers of the Cadac theatre and live mixing consoles, teamed up with the Association of Professional Recording Services (APRS) on 12th October to stage a 'behind the scenes' theatre sound seminar. The session was held at the London Palladium, where the new Cameron Mackintosh production of *Oliver!* is currently setting up.

APRS members attending were given an insight into the principal differences between console design for recording and live applications, as well as the growing importance of automation for theatre sound - explained by Tony Waldron and Philip Jones of Cadac. Mike Walker, co-sound designer on *Oliver!* followed with a run down on the embryonic sound design for the show, covering the team's progression through the set-up period to the production's opening in December.

The formal presentations then gave way to a detailed technical tour, including a close look at the 92-input Cadac J-Type console - the largest J-Type system yet used for a musical. The console, which comprises three main frames, occupies a sizeable stalls area, and features Cadac's unique motorised fader system to handle the eight channels of sound effects being used on the show.

Following the morning session at the London Palladium, the APRS group transferred to Her Majesty's Theatre for a performance of *Phantom of the Opera*, with sound design by Martin Levan. This show has been playing to capacity audiences since its opening in 1986, using the same Cadac A-Type console throughout. After the show, the group was treated to a backstage tour - this time hosted by sound operator Jane Bloomfield and one of her assistant sound operators, Martyn Hunt.

The theatre sound session was part of the programme of events which the APRS periodically arranges for its members.

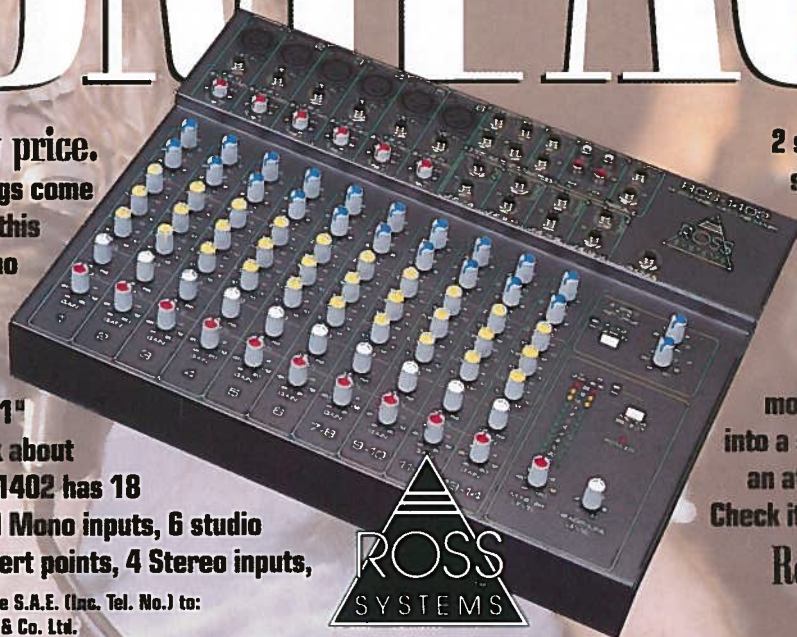
L+SI will cover Oliver! in a future issue.

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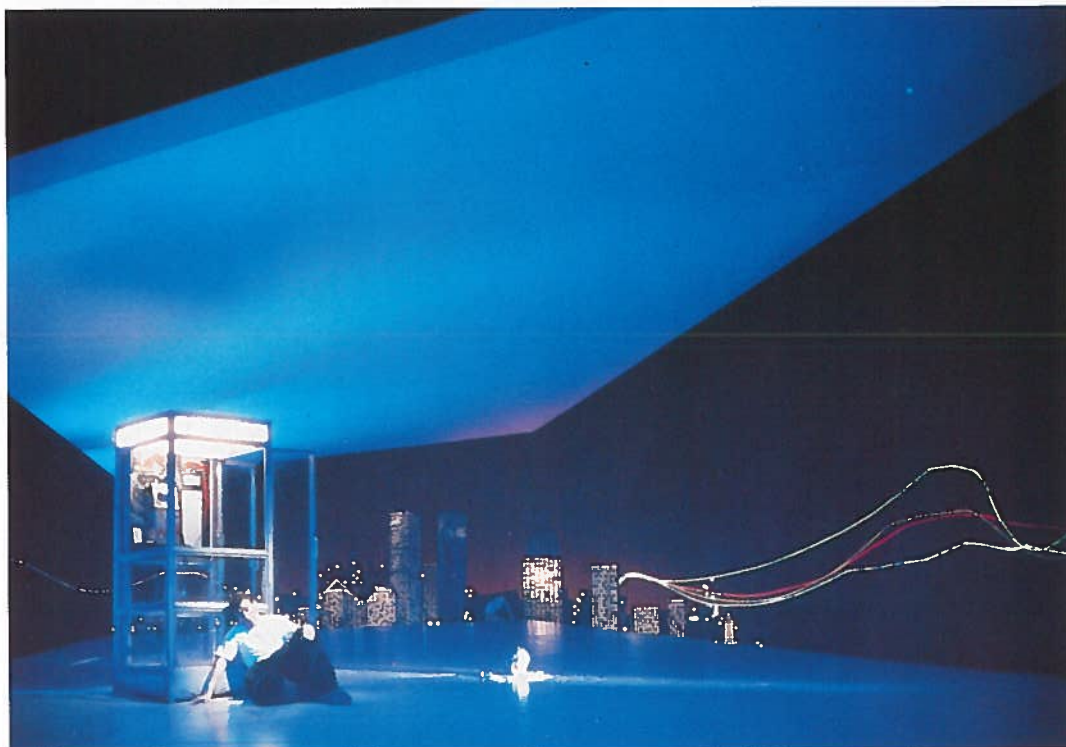
John Offord at Glyndebourne Opera House

The name of Sir Harrison Birtwistle, composer, conjures up thoughts of the unusual and esoteric, to put it mildly. Associate it with an opera called *The Second Mrs Kong*, and your initial questioning and suspicion deepens. Learn that it's to be produced at Glyndebourne and then wander off on a tour of the UK and has stacks of video involved heightens the anticipation even more. It is Glyndebourne's most recently commissioned work and will be revived as part of the 1995 Festival. For librettist Russell Hoban it is his first excursion into the field of music, and his collaboration with Birtwistle knows no bounds.

The *Second Mrs Kong* features characters from elsewhere in their work, and they are brought together in a most unusual love story, set against a background of reality and imagination, popular culture and ancient mythology, long-time preoccupations of both the composer and writer. There is the idea from the classic movie of 1933; Pearl, the girl from Vermeer's painting 'The Girl with a Pearl Earring'; Anubis, the jackal-headed boatman who brings the souls of the dead from the world of the living; Orpheus and Euridice; Inanna, a former beauty queen, her husband Mr Dollarama and her guru Swami Zumzum. Get the idea?

Designed and directed by Tom Cairns, the production relies on a mixture of adaptable (and mostly movable) scenic pieces, some unusual lighting elements and numerous video and film effects. The set was built by Flint Scenery and involves, amongst other things, a huge ceiling piece 15m x 10m almost a third of a metre thick, a glass fibre mountain and an aluminium aircraft-style honeycomb flooring. Howard Eaton Lighting were called in to handle some of the nasty little lighting problems that have a habit of coming up on such productions.

The lighting, by Wolfgang Göbbel, is mainly floor and side based, due largely to the design of the set, with only eight units employed from above. Four lighting towers, based on a pre-rigged principle to enable them to be toured, are positioned on each side and fitted with Cantatas, Pars, Lekos and Fresnels, some with scrollers. Front lighting provides a deep



New York City: note movable 'ceiling' structure and fibre optic car light trails. *Kong* (Philip Langridge) is by the telephone box and, yes, it is a head in the floor - that of Orpheus.



Kong and Orpheus lost at sea.

blue (through gauze) for the stage floor.

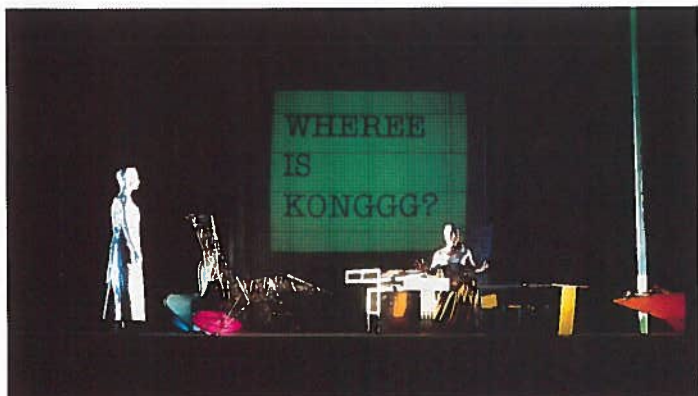
The unexpected takes place all the time. For Vermeer's studio there is an underlit floor incorporating Pars with scrollers, Howie battens and Birdie units. In the penthouse scene a glowing green pillar appears as if in thin air. It was made from a clear plastic drainpipe filled with diffusion material. A floor-mounted unit, complete with a Par 36 ACL with green filter, is the base for later location of the said pillar and when it is pushed into the floor the light

shining upwards through it is reflected down again for maximum effect via a top mounted mirror. Yet another moving pillar, this time in perspex, incorporates a Minim in its base.

Car trails in the New York skyline are provided from a Xenon lightsource and with polymer fibres stripped of their usual covering. The city-scape itself is composed of two three-dimensional elements with a mixed bag of lighting tricks behind. There are scenes where boats travel across the stage, and these are lit with rope-lights and by Lekos in the side towers and Cantata 1832s used as followspots. There is much more trickery, to the extent of UV paint and so on - it's all a real pantomime of a production.

Control (a total of around 160 cues is involved) is by Glyndebourne's own Galaxy Nova (usually used during the Festival season in the stalls position) and this console will go out on tour with the production.

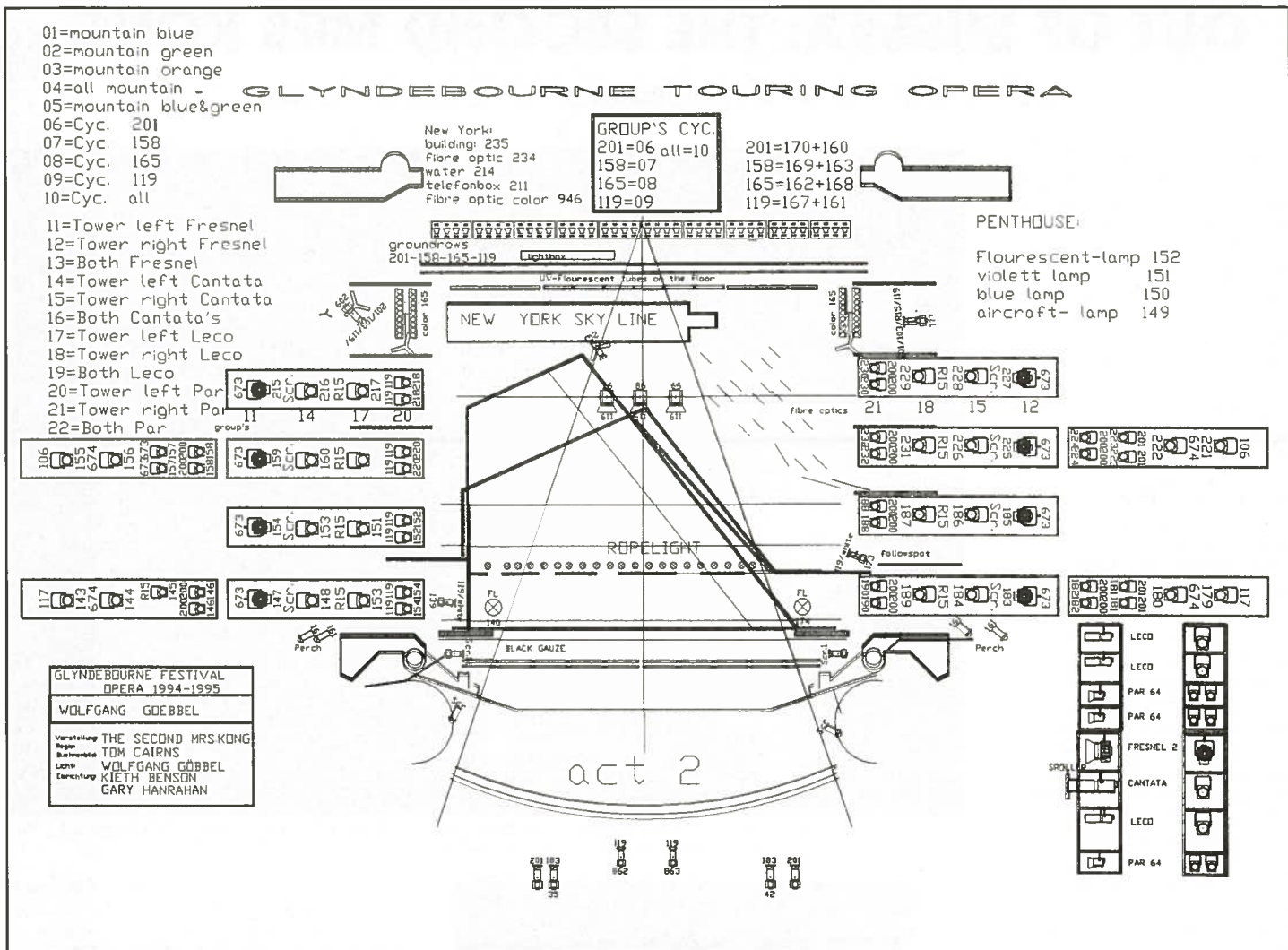
As mentioned earlier, video work - from John Maybury - plays an integral part in the production, and the main unit used is the new Barco 8000 which is located on the centre balcony, next door to the lighting control room. There are two GE15 LCD projectors on stage,



The Penthouse flat, Mammon House.



An island in the World of Shadows.



The lighting plan for the second act of *The Second Mrs Kong*.

one with zoom and the other with a wide angle lens, and their location is moved during the show. Within the 'mountain' scenery is a four-gun Cine Quattro which provides the computer graphic images onto the screen used during the first act. It also feeds five small video screens located on the mountain.

Glyndebourne's lighting manager Keith Benson, who will be supervising on tour as you read this piece, told me that involvement with this production had been a learning process for everyone behind the scenes, particularly as it was a world premiere: "It's been a long, long process with work on the lighting running on for at least five hours every night, and we were still lighting right up to curtain-up on the very first night," he said. "It was a very tight schedule, and it is a very complicated and technical production - but it works well."

Control of the video projection is from a CAV laser disc player and programming was by Dave Herd of Visual Techniques. The operator just needs to press one button and the system is automatically advanced to the next cue. The person in control of bringing in the complicated sequences of computer graphic images at the correct time has to consider himself as 'one of the orchestra', and able to interpret the score and follow the conductor.

"The brief from Glyndebourne was that they needed to present still and motion video images on cue to the beat of the music," explained Dave Herd. "As this would vary to some degree each night, the system had to be simple and straightforward to use. What I had to do in order to achieve this was to take the black art out of the medium of video and present it in a way that could be easily understood, as you would control the lighting. We arrived at a system



Wolfgang Göbbel. Ian Dearden. John Maybury.

which could be operated easily by a number of different technicians and which would produce the still images without problems of roll. It is very rare to see video used in this way, especially for opera, and it works very successfully in this context."

Sound cues also have to be very accurately timed. Part of the Electro-Voice installed house system is employed, with a Soundcraft 200B mixer located in the stalls. Various stage mics are involved plus a pair of AKG 451's off-stage for effects use. Four radio mics are used for the main characters.

The unusual atmosphere of the production is typified by the use of special effects on the voice of Mirror (Deborah York). Whilst she is singing live and radio-miced, with fold-back to stage, a recorded version stored on an Akai S1100 is cued in from a MIDI keyboard. What the audiences hear is a 'double' mix of the live sound and the sample.

Obscure operas by a 'modern' composer are usually a portent for disaster in the audience popularity stakes, most often having to be supported heavily by arts councils and sponsors. This one got that support, of course, but it also seems to have won over its audiences too. Many of them may well have gone in the first instance to have the privilege of sitting in Glyndebourne's grand new opera house, just to say 'I've been there'. However, the audience

I was part of enjoyed *The Second Mrs Kong*. I also have the feeling that when they relate the visit to their friends they will highlight the show above the venue. And that's the way it should be. But will they be highlighting the music or the magic of the production itself? This is no 'easy' piece by any stretch of the imagination.

I had another thought. In spite of the technical cleverness of the video work, until the time arrives when this medium can give much clearer and brighter images, its range is, in my view, very limited on such a broad canvas. I'm personally convinced standard projection work (and less video) could have handled this particular production better, even after allowing for some loss of movement and continuity.

And to paint the picture clearly, we mustn't lose sight of the fact that the more traditional scenic techniques used in this opera, such as the tunnel cloth early in Act 2, along with the gold of the 'sphinx' (Madame Lena), allied with skilled lighting, provided the real magic and ephemeral feel essential to *The Second Mrs Kong*.

THE SECOND MRS KONG

Opened at Glyndebourne Opera House, Sussex 24 October 1994

Music: Harrison Birtwistle

Libretto: Russell Hoban

Director/designer: Tom Cairns

Co-director/choreographer: Aletta Collins

Lighting designer: Wolfgang Göbbel

Sound designer: Ian Dearden

Video artist: John Maybury

The opera tours to Oxford, Norwich, Plymouth, Woking and Manchester and will be revived as part of the 1995 Glyndebourne Festival.

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KNIGHT ON BROADWAY

Richard Knight changing the colour on the Great White Way

After almost 20 years in the industry, Richard Knight finds himself working on Broadway for the first time, and alongside lighting designer Andrew Bridge on Sunset Boulevard.

Broadway is busy! There are musicals everywhere, and *Sunset Boulevard* will add to their number when it opens here on the 17th of this month. It didn't take me long to realise that I had arrived at an interesting point in Broadway's lighting history. Here in the home-town of the modern musical, half of the productions have Vari*Lites on their rigs. Major progress, and obviously a source of great pleasure to Vari-Lite New York, who recently celebrated their first year of operation. On the personal front, getting here has been a long and interesting journey for me, and I make no pretence about the fact that I am very pleased to finally finding myself working on the Great White Way!

Automated lighting, despite the best efforts of those who have a vested interest in making it appear otherwise, is a multifunctional discipline which does not fit easily into any particular slot. Its versatility is its great attraction - it moves and changes - and therefore, the wise would perhaps do best to avoid defining it. The only important thing is to keep moving 'forward'. The issues surrounding automated lighting in theatre are many: would a show be better served with it than without it?; is the lighting designer comfortable with the idea of a loss of direct control in return for the gain of immense versatility?; can the lights be successfully integrated into the show running system - allowing for the unions, suppliers and the ever-present financial constraints? To the credit of all involved, the answer to all of these questions for a number of musicals on Broadway right now is yes!

The line up is impressive. Current musicals include *Cats*, *Les Miserables*, *Phantom of the Opera*, *Miss Saigon**, *Blood Brothers* and *Carousel**, all sourced from the UK. In addition, there is *Guys and Dolls*, *Grease**, *Crazy For You*, *Damn Yankees*, *Tommy**, *Beauty and the Beast** and *Passion* from the USA and *The Kiss of the Spider Woman** and *Showboat** from Canada (I've starred thus* those productions using Vari*Lites).

The working system on Broadway is extremely regulated, which makes it good for executing pre-planned work schedules - everyone knows where they are and where they are trying to get to. The flaw in this almost military methodology however, is that it is not conducive to the creative process. Creativity can only be guided and does not respond well to being constrained by pre-planning, and this has led to very few shows emerging directly from Broadway itself (in fact, I can't find any at the present time). The cost of creating a show from scratch is prohibitive for most producers, primarily because of ballooning labour costs when the scheduling goes awry. (I can assure you personally that it can and does!) The most cost-effective solution is to make a show elsewhere and then transfer it and inevitably this means that Broadway shows are at least second attempts at

getting it right, usually resulting in better productions. Often the extra bits and bobs provide the razzamattaz and extravagance that makes Broadway the greatest concentration of the very best in commercial theatre in the world.

The use of Vari*Lites (or indeed any moving lights) has had to fit in with the precedents existing with conventional lighting that have been defined by the unions over many years. Unions are far more powerful in the USA than in the UK, and this fact has led to very differing working practices from those in the West End. As one would expect, some things work out better, others worse. My favourite is that when it's time to stop for a meal break, then it is absolutely and definitely time to stop! Sushi a go go! When it's time to start again exactly an hour later, it is absolutely and definitely time to start.

All shows on Broadway are union shows and it is the union that defines the numbers of 'pink' contracts. These allow people to work on the show who are not members of the local union, in other words, the freelancers that management hire in direct. If the show is using Vari*Lites, a further precious 'pinkie' can be needed for the operator. Strangely, the sound operator can also be included in the lighting department and may need a pink contract. To add to the list, there is also the designers union of United Scenic Artists, aptly known as USA, and there is also one for projection. Confused? Hey, it works, and pretty well too!

Whilst there have been other automated lighting suppliers involved in theatre shows, at the present time the only company with automated lights on Broadway is Vari-Lite Inc, which is currently dominating this market, as its UK counterpart does in the West End. The internationalism of their operation combined with the lack of motivated competition has certainly helped them achieve this, though it is fair to say that in the early days Vari-Lite had little knowledge or interest in the theatre market. After all, everyone within the operation had come from a rock and roll background. However, things are now improving, but it can still be difficult to get those inside the company to turn their attention more fully to the bigger picture. Any real competition is, in my opinion, likely to come from other moving yoke companies. It is in the nature of a moving yoke unit that it is much more suited to theatre than a moving mirror. The actual movement is more human and friendly, being slightly arced, rather than straight, and it is invariably smoother. A mirror tends to glint and takes the eye up and away from the action on stage. Moving yoke units also look more traditional and theatre can be embarrassingly traditional at times. Most importantly, the precious space-on-a-bar requirement is less for a yoke unit than a mirror one, and in my view, moving mirrors are unlikely to be the work horses that moving yokes have become.

Vari-Lite New York has, fittingly enough, a high rise office in Manhattan



with the full operation, including warehouse, on the fifteenth floor! Tom Janus and his team have recently been running an open door policy, with demos for the new VL6s and the new Mac-oriented software for the front end. Now that the software is finally changing to include information storage on Mac, it means that it should soon be possible to address the special control issues that theatre has by getting someone (like Richard Bleasdale) to write a programme for thespian types. Blind and pre-programming creeps closer, as should information access.

Lighting designers, including those working on Broadway, want to use this new technology (and see it improved and adapted for their own special needs) and they are now doing so. As has been the case in other areas, designers are working with a person of their own choosing on the automated lighting aspects. It is right and proper that this is so, as the role of this person is to make a contribution to the overall design. It is often impossible to know what the degree of that creative contribution will eventually be, but if the best result possible is to be achieved, then the relationship between the designer and their 'automater' is a crucial collaboration and must be the choice of the LD and the show's management and producers. It is, and should remain, user - chooser.

What shows need are trained automated lighting operators and technicians who are able to keep the show looking as good as it did during yesterday's show. The union IATSE seem to accept this, and it is what, in practice, is happening on Broadway. Union people are being sent to the Vari-Lite school in Dallas for operation and maintenance training. This is being done on a show by show basis and is starting to create a stock of Vari*Lite-familiar people within the union. And this, without the union issue, is what, in effect, has taken place with automated lights in the West End of London.

The UK theatre scene does not have a strong union influence to contend with, and this may have been partly responsible for automated lighting arriving in British theatre a little earlier. However, the upside to the American IATSE union is that its ensured rates of pay are high enough to attract and keep talented people. The union system may not be ideal, but, on balance, I believe it is preferable to the ad hoc arrangements of the West End.

The cost issue of automated lighting is, to my mind, a matter which has been self-inflicted by the lighting industry. It has been the case for years, particularly in the UK, that the conventional lighting hire prices for theatre rigs have been far too low. It has been baffling to watch this process of cutting off the profit to spite the competitor, and producers have, not surprisingly, taken advantage of this stupidity. The problem with the introduction of automated lighting to theatre is that the budgets that producers have been used to have been unrealistically low, making the cost of introducing automated lighting appear high. But it can add up for the producer, and someone, somewhere, has previously been a touch economical with the financial truth.

The original image of automated lights was inevitably going to cause them to be first used by theatre shows that needed some rather more jazzy special effects -

musicals! The lights have become far more versatile, with gobos and washes adding to the capabilities of the lighting rig.

A further consideration is space. The aspirations of theatrical presentations continue to increase, and long may it remain so, but the physical size of theatres remain the same, though North American theatres are consistently bigger than British ones. There is a continual attempt to get a quart into a pint pot, particularly with the scenic requirements of some shows where some spectacularly clever craftiness is employed by set designers. This has resulted in lighting being subjected to a major space squeeze, and the limited space available to lighting necessarily employs automated lights to maximise these precious positions. This space squeeze tends to be primarily in the grid with bars for hanging at a premium. The other direction being taken, partially out of desperation, is to hang lights off scenery!

It doesn't stop with just the space squeeze. There is also the time squeeze! Because scenery gets bigger, the installation time gets longer as does the time needed to set up the scenery to focus on it. It used to be the case that a fit up would finish, the master carpenter would come out and ask the lighting department what scenic set up they would like, which would then be set up, work lights would be switched out and then stage lights would be focused. This used to be called a focus session. Dream on! This just does not happen any more. This abuse of the lighting departments time slot is now so embedded in the system on major musicals that it is in fact the new reality. This can be dealt with much more easily if the overheads do not need to be focused manually. Other lighting positions such as booms and FOH can be reached without stopping stage proceedings during the technical which has now become partly the focus session, as well as the lighting session.

The very first sight of Vari*Lites in the theatre was Andy Bridge's use of VL1s on the seminal piece *Time* (see L+S, April '86) which had the best looking first 20 minutes I have ever seen in a musical. The first use of Vari*Lites on Broadway was for Will Rodgers' *Follies* lit by Jules Fisher which got him a best lighting Tony in '91, making it the first lighting Tony to have a Vari*Lite content.

The street chant here by fake watch sellers is 'C'mon check it out', so I decided to do just that and start as near the beginning as is currently possible. *Miss Saigon* was originally created at Drury Lane in the West End in '89, with the lighting designed by David Hersey. It was the first in the West End and the second on Broadway to use the Series 200 system and its transfer seems to have assisted the Vari*Lite breakthrough. Nick Moran was David Hersey's Vari*Lite pilot in the West End, and on Broadway that role was played by Alan Henderson. The rig consists of 10 VL2Bs and 10 VL4s in New York and 14 VL2Bs with 12 VL4s in the Toronto production.

Some of the VL2s are on an extremely nifty tracking arrangement around the pros. I watched this show from the back of the stalls and couldn't see all the moves, but the automated lighting certainly added to the versatility of the production and created some interesting effects. The lighting and its mood fitted the piece



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beautifully. It's a lovely production to look at, which is just as well as it has a pretty predictable plot.

Kiss of the Spiderwoman was made in Toronto and has also appeared in the West End. Its popularity continues unabated in the US with touts still asking \$100 for \$70 tickets. I did manage to get in to the Mezzanine (circle to you) and got the high view. The production bagged an impressive seven Tonys in all, with lighting designer Howell Binkley getting a Tony nomination. The lighting design is built completely around the Vari*Lite's and their use is risky to say the least - specials, specials and more specials. I dread to think what happens when a bulb blows five minutes before curtain up - be friendly with the two followspot operators would be my advice to the Vari*Lite man. The infinitely variable 'special' approach is taken a step further here with a lot of actor follow moves. Performers have to be well trained in their movement start and end points and, particularly, movement speed.

This fake followspot style is interesting but can be risky if an actor misses a cue. If you need followspots, why not use followspots! The look as a whole is thin and skeletal with a half starved feel to it, with the fattening that conventional lighting (or more 4s) could supply, being kept to a minimum. *The Kiss* Broadway rig consists of 12 VL2Bs and six VL4s, and there is a national tour out with the same rig. The lighting style presented here is very innovative for theatre and it's not hard to see why it has turned heads (Howell got the best lighting Olivier for the West End production). The Vari*Lite and projection combination has certainly caught on and, ignoring for the moment budget implications, is set to stay.

The Who's *Tommy* arrived last year from La Jolla Playhouse in San Diego, just in time to clean up in the Tony awards. This production is of an extraordinarily high calibre and I thoroughly enjoyed it: an elemental, clutter-free set with ace pinball machines and some outstanding slide projection. It received five Tony awards including best direction and with Chris Parry receiving the best lighting Tony for '93 making it the third in a row with a Vari*Lite content. There is no category for best projection (which is also the case with the Olivier awards) but anyone seeing the show can be in no doubt as to the considerable contribution this makes to the visual appeal of the show.

As with all shows featuring projection, the life of the lighting designer is made that much harder. The Vari*Lite's are often used as specials (incredibly, the actors actually find them!) and as one would imagine on this style of show, for effects. A show with this much style, could absorb more dynamic within the Vari*Liteing without falling (or perhaps leaping, Townsend-style) over the edge into a full-blown rock concert. It would still fit within the usual dictat in theatre of supporting, and not distracting from, the piece, as it is dynamic enough to handle this treatment. I understand from Victor Fabel, the show's programmer, that the touring version has added more in that area. *Tommy's* Broadway rig consists of 13 VL2Bs and four VL4s with the national tour having 14 2Bs, three VL4s and an additional four VL5s.

Another show on Broadway that uses Vari*Lite's is *Grease* - a different production from that currently running at the Dominion. This is using 18 2Bs and 14 VL5s, and there is a national tour which has cut numbers down to 10 VL2Cs and five VL5s. *Carousel*, meanwhile, is running at the Lincoln Center, a venue which seems to have the relationship with Broadway that the National has with the West End. This show is using 18 VL5s without a Vari*Lite front end. *Joseph and his Amazing Technicolour Dreamcoat* was here earlier this year and closed to make room for the incoming *Sunset Boulevard*. It was the third clone of the Palladium version, the first clone version is surprisingly still on tour in Canada, whilst the fourth is currently touring the UK. The great thing about *Joseph* is that it gets a young audience and trains them in theatre going. *Beauty and the Beast* has arrived on Broadway this year to continue this vital work (though I pity the parents at these prices).

Beauty is big in the Vari*Lite department, with around 31 VL2Cs, 24 VL4s and four VL5s, almost as heavyweight as *Sunset!* Natasha Katz is the LD, with Alan Henderson on Vari*Lite duty. It is good to see Disney joining in the fun on Broadway and long may they remain. The production has been extremely successful, breaking box office records (until *Sunset's* box office opened), and consequently I have been unable to get in to see it. There is a message in there and one I am sure Disney will be wise to.

One of the shows which started the whole musical genre in the first place was the classic *Showboat* and I was fortunate enough to see the preview. It is monumental in scale and the lighting is by that Grand Master of lighting designers Richard Pilbrow, and he paints the piece with a lovely eye for detail. Fine Art! (see L+SI, April '94). The Vari*Lite content is quietly supportive with gobo, colour wash and specials and was made in both Toronto and on Broadway by Doug Gentile. Rig-wise, it consists of seven VL2Cs, nine VL2Bs and 21 VL5s.

It is difficult to imagine how projects like this could be countenanced without automated lighting, given the limited space left over, but no doubt the Grand Master has faced many such in his time. Chatting to Richard at dinner we agreed that automated lighting was here to stay in musicals and was a good thing, but that the control side was in urgent need of attention. However, I believe, Vari*Lite's recent software changes to incorporate Mac will greatly assist in getting this moving in the right direction.

To break my 'musical' addiction I went to *An Inspector Calls* by J. B. Priestley. Time and the Conways never looked like this when we did it at the Yvonne Arnaud Theatre 18 years ago when I was fourth electrician out of four! (I told you this journey to Broadway had taken a while!) This is the production made by Stephen Daldry at the National and later the West End. He clearly loves theatre and hates convention and it shows in this remarkable and unconventional piece. It has what must be the best rain ever seen on stage. Rick Fisher got a very well deserved Best Lighting '94 Tony - and not a Vari*Lite in sight! It looks as expensive as most musicals and also has a large silent crowd and one mother of a bright and expensive looking light off stage right!, a collapsing set and for good luck, some pyro whizz bangs. Brilliant!

Sunset Boulevard is a heavyweight with some serious scenery! Norma Desmond's house weighs in at around 17 tons and takes up an awful lot of grid space. The rest of the flown scenery takes virtually all the remaining space. There is room for just three lighting bars and one of these becomes unusable when the house is out. Andy Bridge's 'solution was to employ Vari*Lite's on these bars. The underside of the house is also used as a lighting position with 15 Vari*Lite's tucked in with the conventionals beneath two other pieces of flown scenery over the stage. Conventional backlight through the house windows is on pipe six which is also wiped out when the house goes out! All the way up stage there are some wonderful real film units.

The result is the largest and most expensive Vari*Lite rig yet seen in a theatre. It consists of nine VL2Cs, 10 VL2Bs, 18 4s and 30 VL5s - making 67 on this production. This is the fourth time this show has been produced and the rig has changed slightly each time. The first production in the Adelphi had bars one and two so tightly packed with Vari*Lite's that if they all reset at the same time they collided with each other resulting in a battle on the bar for supremacy. The first version got a radical overhaul for the Los Angeles production which altered the colour tones of the show making its look much more monochrome and stark. The Adelphi production was then redesigned to look like the LA version and slimmed accordingly.

Broadway seems to be very pleased we are here, and we have an unprecedented advance at the box office. There is a big buzz of anticipation which I hope we can fulfil. Wish us luck for the opening!

Richard Knight was assisted in the preparation of this article by Tom Janus, Theresa Lovelace, Vivien, Keith and Doreen.

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FREEDOM GATEWAY

Lee Baldock talks to the design team behind the first Volkswagen Rockfestival in Berlin

The First International Volkswagen Rockfestival took place early last month at the Brandenburg Gate in Berlin. The show featured Elton John, Paul Young and the Gypsy Kings among its performers, and was watched by an audience of around 130,000.

The aim of the organisers was to create a large-scale rock event in front of the Gate to commemorate the unification of East and West Germany and design company Arf & Yes of Ghent, Belgium were approached with the basic requirements of the organisers, and asked to come up with a suitable solution to the brief. With their previous design experience ranging from product design and corporate identity to stage/set and lighting design, the team from Arf & Yes have built up a reputation for creative flair and ability across a broad spectrum of presentation areas. Particularly well-grounded in television lighting for music programmes in Europe, Arf & Yes were featured in L+S in March 1992 after their involvement in the '10 Om Te Zien' Special at the Sportpaleis in Antwerp that year.

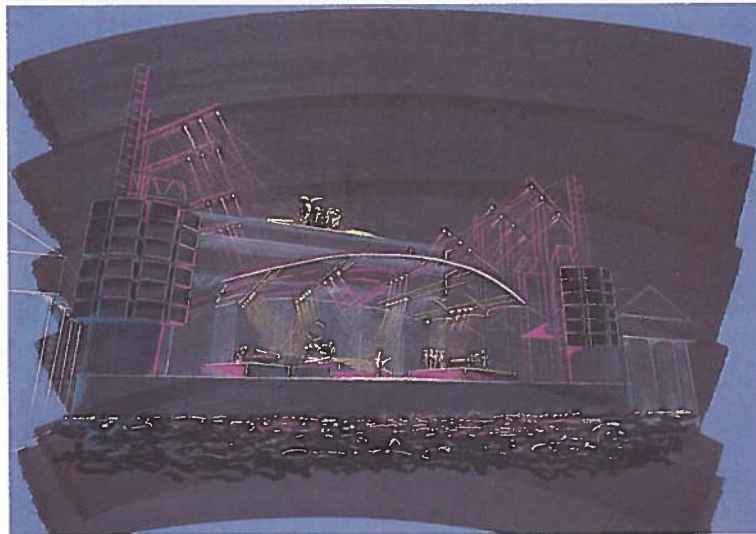
On the 2nd of September, they were told that a rock festival was to take place in front of the Brandenburg Gate, and that a special stage and lighting concept was needed for the occasion which would be spectacular, but which would not detract from the structure of the gate itself as the central feature of the festival. The Brandenburg Gate, as a symbol of freedom, would serve as a perfect backdrop to the show, which would be held on the anniversary of the unification.

Arf & Yes are accustomed to producing innovative stage and lighting concepts, but in this case it was the proposed date of the show that placed an unusual amount of pressure on their team - the anniversary was October 2nd, just one month to the day after the initial contact from the organisers.

Ignace D'Haese was to be the stage and lighting designer on this occasion. He explained: "The 2nd of September was a Friday, so we worked through the weekend, and by the Monday we had the first draft of our design ready."

This seems like a tremendous amount of work to complete over a single weekend, but Ignace takes it all in his stride, admitting: "I made more detailed lighting plans through that week, and the full design was ready for presentation to the client by Monday of the following week." At this meeting the go-ahead was given, and Arf & Yes set to work with the StageCo team to construct the stage.

StageCo, heavily involved in both the Pink Floyd and Rolling Stones tours, were in fact the link between the Volkswagen organisers and the Arf & Yes design team. It was Hedwig De Meyer of StageCo who had first been approached by the organisers, and who recognised the need for a designer to be



involved in the project, as it was evident that a normal stage structure would be inadequate in this case. Arf & Yes were a natural choice, being experienced, professional and based on the continent.

Despite the short time-scale, the team did not experience any major problems in the design and construction of the stage. Giovanni De Schampheleire, managing director of Arf & Yes, attributes the speed with which the project was successfully completed to the way the company operates. Firstly, the proposed solution to a brief is always presented to the client in a firm and positive form, as can be seen from the drawing above. Giovanni explained: "We try to avoid presenting 'loose ideas'. In cases where time is very limited, we would rather go for one entirely finished concept, with the possibility of making small modifications."

Secondly, the company always try to undertake as much of the project as they can themselves, including set design, engineering, lighting design and coordination, in order to lessen the number of separate units involved,

thereby keeping the operation as smooth as possible. As Giovanni explained, the less outside coordination involved, the quicker the job. All the design work is carried out on AutoCAD, and the files are made available for all participating contractors to work from, thus maintaining a high degree of cohesion.

Thirdly, the association with StageCo, who supplied and built the stage, was an important part of the process, as the two companies have worked closely together before and understand each other's methods very well - Hedwig De Meyer and Ignace D'Haese were old colleagues from their time at EML. Since time was so limited, Arf & Yes proposed a concept that was

composed almost entirely of StageCo elements. As a consequence this was done smoothly and extremely quickly.

Hedwig explained how this was achieved: "It helps a lot if the designer knows our equipment - what we have, what he can use, and how. With Ignace it is the same as in our work with Mark Fisher - they understand not only how they want the finished production to look, but how it can be put together. It also helps if they use AutoCAD!"

StageCo specialise in short-term response, having their own pre-fabrication yard in which structures can be prepared and tested. The whole project seemed perfectly oiled from start to finish. Was there any point at which they thought there wouldn't be enough time? "Always!" says Hedwig. "It doesn't matter if they give you one week or two months to work with, you always reach that point at some time."

As the main idea of the show was to use the Gate itself as the backdrop to the event, Arf & Yes decided to construct a completely transparent roof to the stage structure. This

covering, which StageCo had only five days to build, was made from a clear synthetic material attached to a frame of aluminium tubing, and suspended on steel cables from eight towers, four on each side of the stage. How quickly was the idea for the roof seized upon? "Immediately," says Ignace.

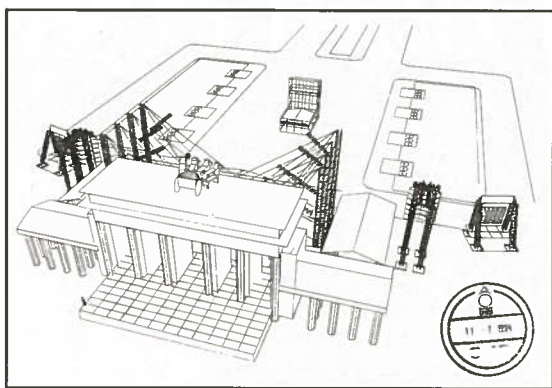
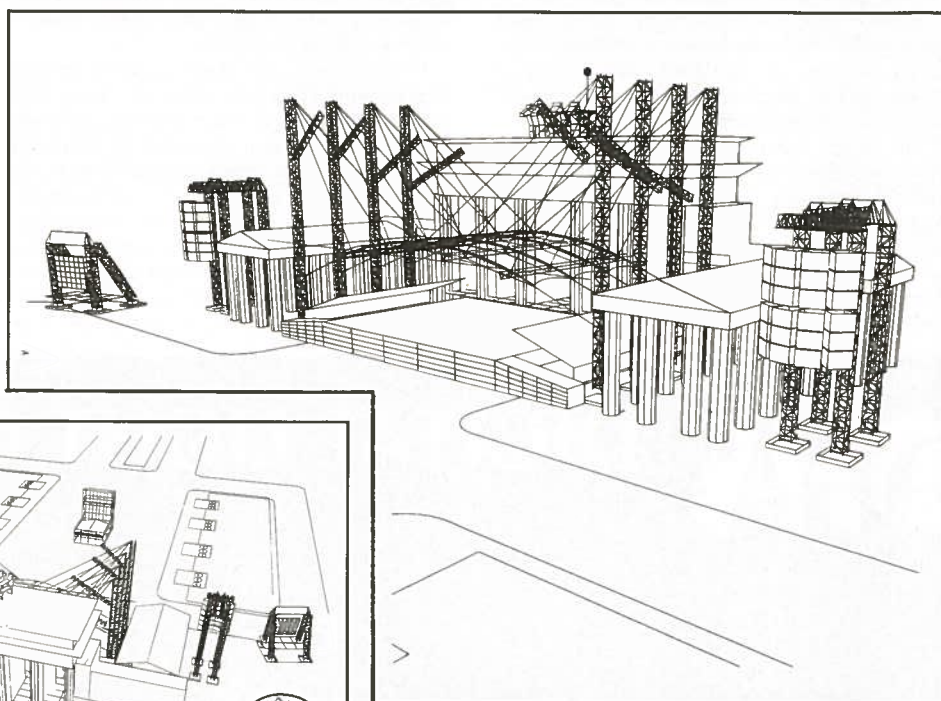
With the arched transparent roof in position, the full spectacle of the hugely symbolic Brandenburg Gate was maintained. A truss was mounted on each tower, facing inwards over the stage, and attached by a custom-made hinge. These trusses could be raised and lowered by means of eight motor-controlled winch cables supplied by Unusual Rigging. With the trusses lowered to the horizontal position, the set was effectively closed off. When the trusses were raised, the set was 'opened'. The structure was 40m wide, with the 23m high towers holding the transparent roof above the 10.5m high stage. Covered areas to stage right and left were built to house the technical facilities.

StageCo had 24 truck-fulls of equipment at the site, with two cranes and eight fork-lifts, and between 35 and 40 people working for one week to complete the construction. This followed a test-build at their Belgian base the week before. In addition, further demands were made of the StageCo crew as the preparations progressed. It was decided that two large platforms were needed either side of the site to protect the surrounding gardens and trees from the massive number of spectators expected. StageCo added this task to their list of jobs in hand.

Ignace D'Haese rigged the lighting for the show on three different levels. The first level, positioned underneath the transparent roof and aimed at the performers, consisted mainly of Vari*Lite VL5s and VL2s (over 180 Vari*Lite units were used in total - Ignace had originally wanted over 230, but was forced to lower the numbers because of problems with availability) and 28 1.2kW HMI Cyberlights. Eight Digital Light Curtains from DHA were also used, positioned upright at stage level to light the performers. Ignace was quick to praise the light curtains, having used them before, outside as well as under cover, and having always found them reliable and highly effective.

The second level was above the roof, and was used to light the Brandenburg Gate itself and the surrounding buildings, as well as the stage and performers through the transparent material. This level of lighting consisted mainly of 2.5 kW HMI Cameleon Mk IV Telescans, 16 of which were supplied, and Vari*Lite VL4s.

The third and highest level was solely for use on the Gate and surroundings, with four 4000W-STX Skytracker spotlights from Skylight, France (suspended from cranes positioned behind the Gate) and two 6000W HMI Cameleon Teleprojectors with image scrollers, projecting images jointly designed by Arf & Yes and Cameleon onto the stage and the Gate, along with an array of Arena Visions, Parcans and Molefays, plus 80 Par 64s with scrollers. Two 20W lasers and four Colourays were supplied by Frequence Events of Belgium. The use of smoke machines from JEM and Concept on the top of the Gate had a particularly remarkable effect - the four stone horses that have been pulling the same chariot





since 1789 seemed to come galloping out of swirling mists of varying colours. The combined effect of the different lighting levels was, as the photography demonstrates, quite stunning.

Volkswagen, also sponsoring the European leg of the Pink Floyd tour, were naturally keen to include in the Berlin event as many of the companies involved in that highly successful tour as possible - hence the presence of StageCo, the large numbers of Vari*Lites, the Cameleon Teleprojectors, and the PA system, which was supplied and installed by Britannia Row.

The latter have extensive experience in handling PA systems in such large scale venues, having previously supplied the PA for Roger Waters' The Wall concert in Berlin in 1990, and shows at the Eiffel Tower and Red Square, as well as Pink Floyd's Division Bell tour. Bryan Grant of Britannia Row explained that although the system had to be supplied and

installed at such short notice, it was the sheer scale of Arf & Yes' construction, combined with the architecture involved, that made the task of the eight man sound crew an unusual one. The size of the stage, and the two great neo-classical temple-like structures that project from the sides of the Gate, meant that the PA wings had to be positioned 140m apart, a distance which amazed all concerned, and almost made it seem as if there was no PA.

The PA wings were made up of 64 stacks of Turbosound Flashlight speakers. Two delay stacks were built, to cope with the enormous number of spectators expected to attend the show, as Volkswagen's sponsorship of the event meant that ticket prices could be kept to a minimum. As it turned out, the event drew a crowd of 130,000. Each delay stack consisted of 12 stacks of Flashlight speakers. Front of house were two 48 channel Yamaha PM4000s, with two 48 channel Midas XL3s on stage.

Amplification was carried out by BSS EPC 780 and EPC 760. A further two XL3s provided the monitoring, along with a 32 channel BSS graphic EQ. The Britannia Row crew were kept on their toes by a 15-20 minute changeover time between performances.

Ignace D'Haese added: "There was no problem with anything. When we told Brit Row that the PA wings were to be so far apart, they quickly found a way to deal with it, by putting additional infills beneath the stage. The advantage was that the PA equipment was relatively small - we didn't have to have these enormous blocks of speakers to deal with."

The end result was, as you can see from the illustrations accompanying this article, quite remarkable. Hedwig De Meyer seemed suitably impressed, adding a final comment: "I was amazed. . . making it work on a drawing is one thing, but making it work in reality is quite another."

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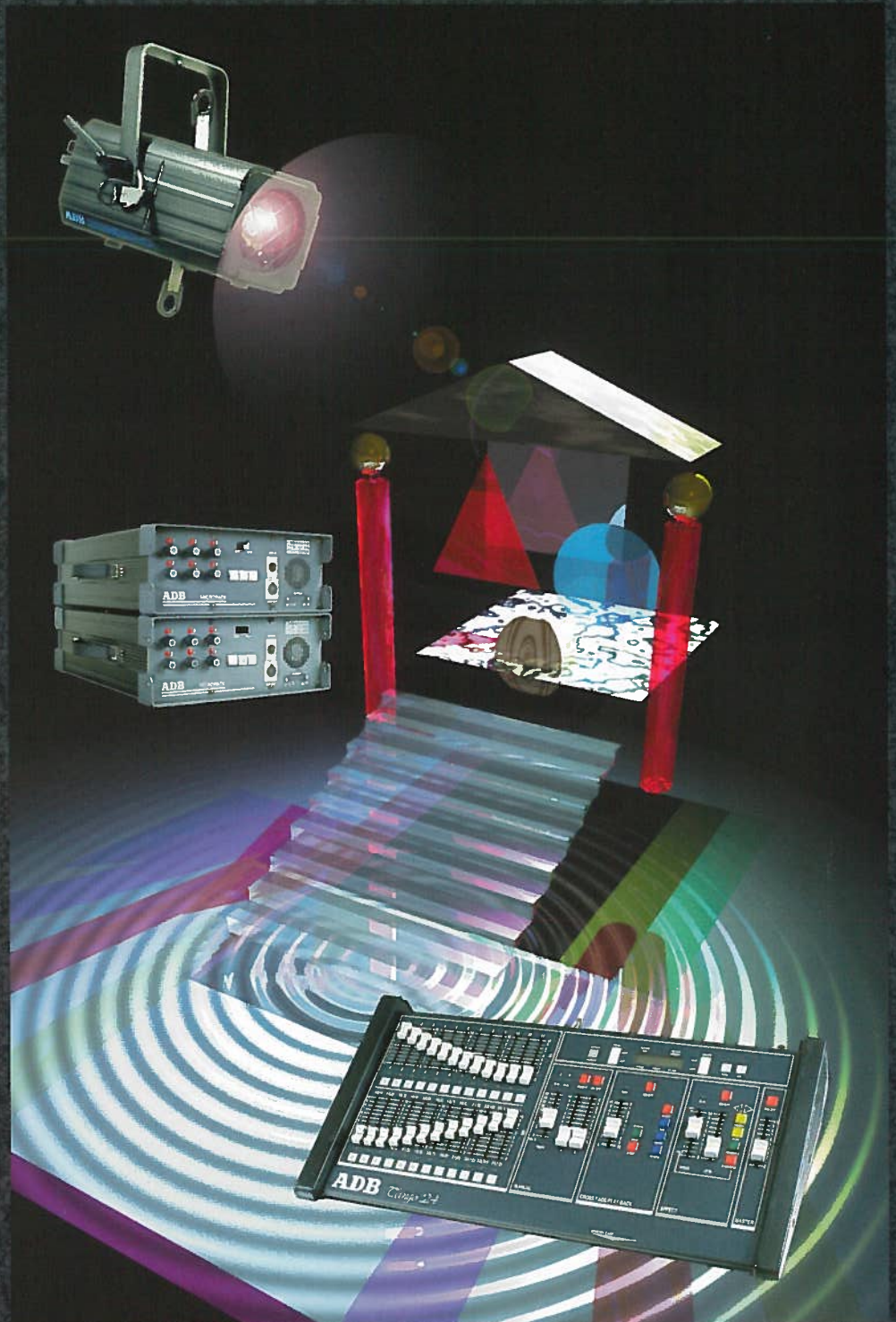
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ON TOUR

by STEVE MOLES

AND PRODUCTION NEWS

Take That Sheffield Arena LD: Simon Tutchener SD: Dave Pringle

At 10.30pm Sheffield Arena was surrounded by anxious fathers, while inside 12,000 adolescent girls were doing their best to make sure that Robbie, Mark, Jason, Howard and Gary never forgot them. As individuals, the girls' screams of adoration were hopeless; as a group they need have no worries, for Take That are as committed to their audience as the fathers who waited outside are tied to their daughters. Despite the gutter press affinity for bare bottoms, the show is more sensational for its scale and well crafted presentation; the boys manage to pull off that most difficult of balancing acts, a wholesome show for its target audience without recourse to the sickly sweet patronising kitsch of many of their forebears.

Kim Gavin is the show's director, and coming from a theatre background his input to a pop show is most notable in the variety of the dance routines. However, lighting designer Simon Tutchener is keen to point out his major contribution to the overall look. "It was Kim, in conversation with myself, who first suggested the boys performed in the midst of the arena for part of the show. Moving them out into the house through the audience presented a huge security risk, and with the prospect of seat kills to provide a performing area once there, the concept seemed ill-advised. The only solution was to fly a stage, and even then it had to be over the mix position. Getting the boys out there from the main stage had to be via a flown walkway above the heads of the crowd."

Persuading hall managers and the local health and safety departments that placing lighting gear and scenic elements above the audience's head was a sound proposition fell to production manager Mark Gosling. Although lighting trusses in the auditorium have become common place and Bon Jovi put a catwalk out over the heads of the audience a couple of years ago, this was the first time anyone had contemplated a performance platform suspended 20 feet high in the middle of the auditorium.

The Manchester G-Mex and the Cardiff CIA ruled the equipment too heavy to fly at their venues, so Mark had to arrange for a StarGrid from Star Hire to be rigged behind the stage, carrying seven tonnes across a 60 feet span. The circular platform, some 20 feet in diameter, is lowered in mid-way through the show for a medley of Beatles numbers. A combination of Unusual Rigging's hoist control system and John 'Happy' Bray's load sensing devices for monitoring the movement dynamics eventually reassured the authorities. At a seemingly high price in both financial and effort terms, for what is only a short segment of the show, this small spectacle reaps enormous rewards as Take That make eye contact with thousands of their screaming admirers.

LIGHTING

Simon's lighting rig (supplied by Concert Productions and Vari-Lite) is enormous. The main stage has over 600 Par 64s, almost 100 Par 36s, 50 VL5s, 24 VL2Cs and on tour for the first time in Europe, 24 of the new VL6s, all suspended from a cluster of nine geometric truss shapes. To the rear a wall built of truss supports a host of scenic elements, as well as five Pani spots. Everything moves during the show - the wall, the trusses and



The boys from Take That point out Simon Tutchener's handiwork. photo: Philip Ollerenshaw/Idols

many sections of the stage - the only thing to remain stationary for the duration were the two video screens positioned to either side of the stage. A huge mother grid is rigged above the whole area to provide consistent suspension points, as crew boss Mike Humenuik pointed out: "we are using 141 motors. If you include the 40 feet diameter lighting truss above the circular stage in the house and the PA, we are hanging in total around 44 tons of equipment."

Simon has another 300 plus Pars of various types on the circular rig as well as legions of fuzz lights and yards of Arcline, in addition to six Super Troupers out in the hall. Control is equally vast with two 90-way and one 30-way Celco Series IIs all linked for the over 200 lighting channels running to eight 72 channel Avo racks. Curiously all the racks are linked to the desks by analogue snakes, a bit of a rarity in this day and age. Use of the rig is heavy without being heavy handed. The

"The battle against the screaming is incredible . . . I literally can't hear to mix on occasions."

looks are big, even for the short intimate interlude when the boys perform a couple of ballads clustered about two keyboards centre stage. Despite the scale they exert a dominating presence on stage: athletic dance routines, knowing winks to the cameras and constant changes to the set and costume, all contrive to keep the attention focused firmly upon them.

SOUND

Dave Pringle took over sound control following Tim Warhurst's appalling and fatal fall during rehearsals. (At the time of this performance Tim was still alive. It was noteworthy that not only the entire production crew but also the band and management maintained a sincere and genuine interest in Tim's condition). Dave was already a member of the PA crew (personnel and equipment all supplied by Capital Sound) and is an experienced engineer, having mixed for Status Quo and Deacon Blue, and so was well qualified to take over. The demands upon the PA are dominated by two major influences, the screaming of the audience and the constant changes to the performing area and position.

"The battle against the screaming is incredible -

it often exceeds 110dB. I literally can't hear to mix on occasions," he told me.

The Martin F2 system is substantial as you might expect - 48 cabinets per side and a further delay cluster of eight half way down the house. Dave uses DBX 160 compressors on all the vocals' mics to help control the sound and avoid any muddying from the ambient screaming, and mixes from a PM4000. All vocals are wireless and all the band, not only the boys but musicians as well, use radio fed In Ear monitoring from Hand Held Audio. For monitor man Ian Newton this is no doubt a blessing when dealing with such a volatile and movable environment; the control of stage sound is total. Its administration must prove a bit of a headache though, with 29 separate mixes to provide from 60 inputs, but presumably the two Midas XL3s and Soundcraft 8000 make this bearable. The choice of the In Ear system is obvious for the stars of the show but to carry the expense further and equip all the musicians similarly is typical of the overall budgetary approach to the show: spend the money where it matters - on the presentation.

Despite Simon Tutchener's assertion that "this is entirely a visual show" and Dave Pringle's protestations that "at times, the adolescent screaming overwhelms the PA," the sound was rather good, thanks to a controlled, well arrayed system and a lot of care and attention put into the management of it. I declined ear plugs for the show, as I know Dave has to in his job. I can only assume that at the more acute moments when the screaming peaks, he must be mixing by the seat of his pants, relying on instruments, feel and experience. Well done!

This article would not be complete without mention of the set and video. Built, as ever, by Brilliant Stages, the ascending drum and percussion risers that also tracked across stage, drawbridge rigged stairs, rising dance platforms, and aerial walkways all contributed to the overall slickness of the presentation. The new Barco 8000 projectors supplied by PSL were a noticeable improvement over the older 5000 model; despite the screens being in close proximity to Simon's enormous rig, there was never the slightest threat that the all important close-ups would be washed out. The final trompe-l'oeil of the slit, walk-through projection screen (so beloved of Alice Cooper in the early seventies), where projected image is synchronised to the actual on stage performers, allowing projection to transform to reality, was wonderful and reduced the girls surrounding me to near apoplexy.

Chris de Burgh
Sheffield Arena
LD: Andy Doig
SD: Jeff Hooper

A stage set, simple in concept, powerful in realisation, is a strong tool for any production. For a performer like Chris de Burgh, a man whose songs are firmly rooted in romance, but whose small frame and reedy speaking voice make for a less than commanding stage presence, such a platform more than compensates for any lack of stature. Of course the emotional content of his lyrics, simplistic sentiments, well worn truths, right and wrong, good and evil, are all the stuff of many a musical genre, but there's no doubting he's good at it - 8,000 people at Sheffield paid witness to that. But it takes more than cosy familiar songs to draw people out for the evening. Chris de Burgh's music has probably played more times in the background to candle-lit, anniversary dinners than ever it has on stage, so why do they come out to see him? It's in the mix and balance; like any good cake, only the best of ingredients will do. Chris de Burgh has found the Dundee Cake of performance, slightly rich, certainly fruity and with that all-important light touch of whisky.

SOUND

The talents of Jeff Hooper on sound and Andy Doig on lights have been part of the Chris de Burgh package for over 10 years now. The EAW PA from Concert Sound is a certain fixture on this tour, but what might surprise you is the amount of it - 24 KF850s flown per side, with a further four each side on the floor accompanying the four sub basses. The flown cluster also contains four KF1000 long throws per side. The quantity however, is not unwarranted. Chris's songs tread a fine line, most are firmly in the easy listening vein, a mix of folk, country and ballad, but every once in a while something really ballsy jumps out and whacks you. In fact it's almost heavy metal, but in the AOR mould so beloved of American bands like Boston. In songs like that anything less than a seat shaking, gut churning power would be a disaster.

Jeff has a certain touch on the faders - even with 50 inputs to the two Midas Pro 40s the stage sound is tight and well controlled. The songs swoop from soaring guitars to plaintive melodies with ease. He is using a Focusrite dual EQ for the first time on this tour. The EQ is a popular item in the studio and he is very pleased with its performance on the road: "I'm using it on Chris's vocals, both line and radio mic, and it's excellent. We've been lent it for the tour, but you can be sure we will be buying one." There's the usual array of other effects, an H3000 for the backing vocals and the old DBX160 for the saxophone. Jeff is assisted front of house by Dave Dickson. On stage Paul Boothroyd mixes monitors from a Midas XL3 plus stretch, whilst the wedges are of course Concert Sound's own



The 'cube' stage set, by Brilliant Stages, complete with false perspective and cut-outs for the band.

design, perhaps physically a little large (actually they look huge even in this stage set where they are well hidden), but they are obviously sweet enough. After all, Eric Clapton doesn't insist on dragging them around the world with him because he likes the Welsh.

LIGHTING

Maybe Jeff and Andy Doig have been working together too long; in a rare moment Jeff let slip: "I thought the show looked absolutely amazing tonight." Andy was equally flattering: "I must admit I'm well into Jeff Hooper's bottom end." He was of course referring to one of the heavier numbers of the night. Jeff's remark was well made; Andy has always had a reputation for dabbling with the amazing. A complete technocrat, Andy Doig is, I believe, the only lighting designer in the industry with the intellectual prowess and understanding to build his own moving light.

This can be somewhat intimidating for the supply company, in this instance Meteorlites and Vari-Lite, as Andy can, and frequently does, ask for that which has not yet been done! Fortunately, he has usually worked out the solution himself in advance, so all that's required is the application. In fact, on this occasion, the lighting per se is not so earth shattering - 66 VL5s and 30 VL6s with 44 Dataflash strobes mounted in Parcans and just eight Par 64s, which are really only for the opening act.

What is exceptional is the projection and this is where Brilliant's stage set, alluded to in the beginning, is so important. The stage is, for want of a better description, the inside of a 50 foot cube all lined in white. A false perspective is put upon it so the roof, sides and floor all slope towards a receding infinity. (The band are each neatly positioned within a circular cut-out in the floor, the slope being a little too vertiginous to comfortably stand upon for two hours). Video projection, provided by PSL, is from four of the new Barco 8000s, but it's the image source that's unique. Andy wanted the projected image linked to the music but, and it's a big but, he wanted to release the band from the obligation of playing to a time-coded backing track. He wanted them to remain spontaneous. Laser disc was not an elegant solution, the two second delay in accessing any



given point in the video was hardly fast enough to respond to a musical inconsistency. With the help of Richard Bleasdale, Andy has transposed 17 minutes of video image to computer hard drive (two giga bytes of it, run through an Apple Mac Quadra 840) and consequently can access and cue in 1/125th of a second. Although he, ever the obsessive when it comes to perfection, says he can still detect a delay, for all intents and purposes the video is run live in real time just like the rest of the light show. What's nice here is the victory of humanity over technology (sorry if that sounds pompous).

The advent of time codes et al brought about cue perfect shows (great for well-structured performances, especially industrials) and naturally enough this technology transferred into the live environment for use with the more ambitious presentations. Shows with such tight cues are very slick but in danger of becoming soulless - the essence of live performance is its fallibility. There's nothing an audience likes more than to see or hear an artiste slip up and then make a great recovery; and there's the difference between coming out or staying at home with your spouse and a nice bottle of claret with the hi-fi playing in the background.

With a two hour performance, video was obviously only part of the show and Andy is pushing the VL6s 'til they break (as Rebecca Hughes from Vari-Lite can vouch for). But like any new light it's only when it's out on the road that any mechanical bugs show themselves. One thing is certain, at 50 feet they are very bright, competing well with the four Gladiators out in the house, and maybe it's just me, but they seemed really fast. Another Doig creation, and a beautiful effect, was his dichroic mirror ball. Built from quality control rejects, the 'ball' is really a geodesic of what appear to be Telescan filters. Hollow, and with a VL6 beneath and behind it, the reflected images were magical.

Chris de Burgh is well worth going out to see and hear - there are no end of embellishments that make the show special. However, I will level one criticism at the show if I may. Singing 'Ship to Shore' with lyrics like 'I can't hear you any more' was a little insensitive on the day the MS Estonia sank killing 900 people, especially as he was 'in tune' enough to report on the Manchester Utd v. Galatasaray game throughout the show.

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Coemar De Sisti Australia's Peter Kemp (left) with Coemar Italy's Fausto Orsatti.



Emmanuel Ziino (left), managing director of Show Technology, with Clay Paky's Pio Nahum.



'Stake' Farley (left) and managing director K. M. Malik showed selected items from the Studiomaster range on their PLASA group stand.



PLASA chairman Mike Wood of Jem Smoke Machine Co Ltd (left) with Show Technology's Rod Salmon and Jands' Paul Mulholland.



Strand on Bytcraft: showing off the new 430, first seen at PLASA, were Phil O'Donnell and Andy Collier (left and right) with Bytcraft's Stephen Found (centre, right) and lighting designer Nigel Levings.



Lightmoves Technologies' managing director Jonathan Ciddor (left) with Neil Rice of Optikinetics.



Flying Pig's Nils Thorjussen (centre) had a constant stream of enquiries on the new Jands Hog moving light consoles, first seen a few weeks earlier on the AC Lighting stand at PLASA.



'Old' Faces meet. Catriona Forcer, for a long period L+SI's stalwart 'On Tour' columnist and now resident in Australia, pictured with Don Hindle of CCT Lighting.

ENTECH 94 AND MORE

or All About Doing the Biz in Oz - John Offord reports

Dateline 6-8 October, Hall 2, Sydney Exhibition Centre, Australia. Julius and Caroline Grafton, owners of Connections magazine, lately established as the journal for our industry in the sub-continent, took the decision of their lives and launched the first truly successful trade event to match their earlier successful endeavours with the printed word.

There will be ever increasing interest in the Australian market in the run-up period to the year 2000 Olympiad, and I would guess most exhibitors' eyes were trained on Entech with this factor high on their list of priorities. I doubt they would have been disappointed. The promotion and organisation was excellent (owning your own magazine helps), the show looked good and was well balanced, and although one would have liked to have seen some more bodies walking the aisles to add an extra ring of confidence, those who did attend were deemed to be 'quality' - both from the comments I heard and my own direct experience on the PLASA stand.

The vast majority of big industry 'names' were in evidence on one or more of their distributors' stands; indeed, I'd have to do a computer cross-check to find any serious companies missing. Major 'own name' international stands were obviously those attributable to the Australian manufacturers known in world markets.

There were some lovely anomalies, such as the appearance of Clay Paky on the same stand as Martin Professional. Emmanuel Ziino and Rod Salmon of Show Technology were the politicians doing the balancing act, and evidently the business to keep both camps happy. To witness the light shows, you watched the Clay Paky effort from one end, and the Martin from the other, 30 minutes later - or earlier - as the case may be. Smoke for CP was from Jem, which conveniently kept someone else happy, whilst Martin puffed it out on their own machines. Also represented by Show Technology on stand were Geni, Pulsar and MA Lighting.

There were other twists to the theme. **Bytecraft**, the people who take care of Strand Lighting in the country, showed the new 430 control system fresh from PLASA, amongst other kit, but emphasised their own-



The impressive glass-fronted facade of Sydney Exhibition Centre.

manufactured dimmers. Other companies represented by Bytecraft include Pani, Skytracker, DHA, AVAB, and Light & Sound Design's Icon moving light system. Some may consider that little bundle of names a slightly unusual 'mix' - but then why shouldn't a particular company's 'genes' be of a different combination? It certainly makes for some differing personalities.

The biggest presence, taken on the basis of floor area, was that of **Coemar DeSisti Australia**, and their NAT-based lighting effects were on the grand scale too, controlled by ShowCAD software linked to SMPTE and a Compulite Animator. Showing off the latest



Entech promoters Caroline and Julius Grafton.

Stardraw and Microlux.

Back to **DeSisti**, on view were the ultra-new Monet 1k and 2k units just launched at Photokina in Cologne, economy fresnels, 2k and 5k Micros with new lamp technology and the Goya discharge broadlight for either 2.5 or 4k lamps. However, the big, big new Rembrandt Piccolo 18k discharge daylight fresnel unit hadn't yet arrived in the country, but Peter was busy telling people about it nonetheless, so I thought I'd pass on the info to you, too. (More details in our Equipment News in a later issue).

Established back in 1970, **Jands Electronics** has become one of the country's largest importers and manufacturers of audio and lighting equipment (see separate story) and their exhibit areas reflected their standing on the scene, not forgetting, of course, that sister operation Jands Production Services runs the country's biggest rental and production operation. In addition to their own well-known lighting control consoles, dimmers and amplifiers, plus, of course, the new Jands Hog desk, product emphasis was on their big import names of JBL, Soundcraft, Shure, Rane, Urei and Clearcom. Lycian followspots were also noted.

LSC Electronics' now-in-full-production Axiom control desk (see separate story) was playing the central role on a Lite Structures-built stand where in your less bright moments you could be excused for feeling you were still at PLASA in London. Good news for the company arrived, literally, on stand. Mid-show they had confirmation that Axiom had won the Design Mark issued by the Australian Standards office. General manager Alan Graham told me that this award is given in recognition of design excellence and marketing and export potential of a product. To win it, your company gets a severe vetting, ranging through from inspection of manufacturing processes and quality control to the management and organisation of the company itself. To the best of his knowledge, managing director Gary Pritchard reckons it's the first such award given to a product in the industry. It was certainly a red letter day for LSC and they hung up the special blue banner to prove it. Also on stand was the range of Smoke Factory products from Germany, for which LSC are Australian distributors.

Over the water from New Zealand, **Selecon** spread themselves out on a big stand that gave plenty of room for inspection and operation of their ever-growing range of lanterns, including the new Acclaim series, just seen at PLASA. Managing director Jeremy Collins had a full team of people out too, including principals



A bird's-eye view across part of Entech 94.



Martin Audio's Martin Kelly (left) on his PLASA group stand.



Amber Technology had the Soundtracs Topaz front of house.



The centre hall stand of Penn Fabrication.



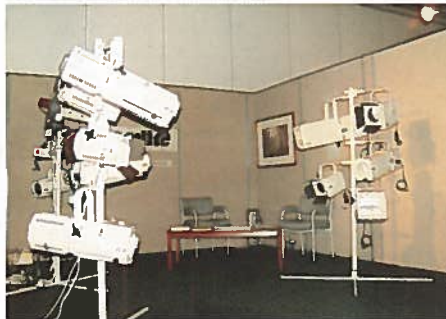
Abstract and Numark were featured by ULA.



Theatrelight showed their CueMaster control desks.



Mediavision had the latest control from Colortran.



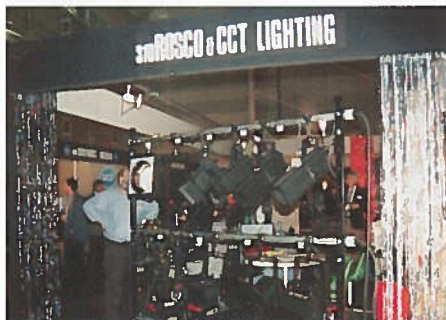
The all-white range from Prolite.



Clive Bradbury (left) in export talk for Celestion.



Selecon stand line-up (left to right): Adrian Hicks (M&M), Tim Kennard (Herkes), Andrew Nichols (Selecon), Norma Hancock (Three Arts Services), Wayne Kellett (Herkes), Simon Garrett (Selecon) and Jeremy Collins (Selecon).



The joint Rosco and CCT presentation.



GUVT and their tables of Citronic mixers.



High End Systems' John Adams (right) and Anthony Goh.



Showcraft's Lee Conlon (facing camera) with the GAM Tool range.



Service engineer Andrew Parker pictured at the Icon control desk on the Bytecraft stand. The company now boasts 33 units and two control systems.



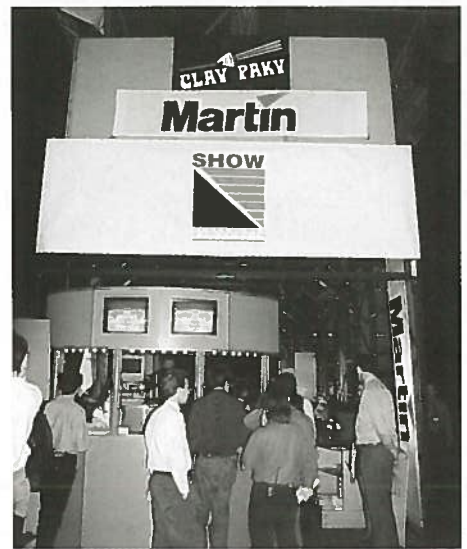
Pulsar's Andy Graves (centre) in control on the Show Technology stand.



The LSC team of Alan Graham, Gary Pritchard, Christine Krohn and Andy Meldrum show Axiom and the Australian Design Mark.



This new stage manager's desk, pictured on the stand of the PA People, is going to the Capitol Theatre.



Show Technology played host to the lighting talents of both Clay Paky and Martin Professional.

from their 16 Australian dealers. Backing them up, that here-there-and-everywhere man Adrian Hicks from M&M Lighting was showing his favourite Rainbow colour changers. Completing the line-up were specimen units from the Strong followspot range.

GUVT spells Greater Union Village Technology and, in Australia, High End Systems. So we had John Adams, the major US outfit's international representative, arrive from PLASA, via other international places, with those lovely abstract shapes from London to play the Cyberlights on. With John was Anthony Goh, recently appointed as general manager of South East Asia Operations for High End. Goh will be based in Singapore, where an office has just been set up to service their fast-growing customer base in the Asian market.

Back to **GUVT** itself, the outfit is a major player in the country, with various divisions covering cinema, AV and video conferencing in addition to the usual audio, theatre and special effects work. On stand they had tables and shelves full of Citronic Ephos mixing desks and signal processing equipment, and alongside, the ranges of Anytronics and Light Processor products.

There was more than one place to find other major industry names, and **Lightmoves Technologies** has long-standing links with many. Celco, Zero 88, Le Maitre, Optikinetics, Cloud, Teatro, Kupo and Theatrelight products were duly train spotted. The company also has



Two scenes from the well-attended Awards Dinner.



a significant hire division and their projects division is currently involved with the rebuilding and refurbishing of Sydney's 2000-or so seat Capitol Theatre, due to open its doors in a few months time and from July become the home of Sunset Boulevard for a couple of years.

Taking the other half of the same block, and running the hospitality floor above, Glantre Engineering have big things going for them in Australia, including a turnkey contract for the said Capitol Theatre, which you'll hear more about in this magazine in the near future. Like everywhere else they exhibit, they also had Richmond Sound Design's Stage Manager system, complete with ever-present guru, Charlie Richmond, who is also a partner in Glantre's US company. An Australian office has now been set-up in Melbourne - under the command of Henry Lewis - obviously with potential pre-Olympic business in mind. And it was a pleasure to meet up again with theatre consultant Dennis Irving, another man who's enjoying himself over at the Capitol.

Rosco was evident on several stands, but they had their own base too, as **Rosco Australia Pty**,

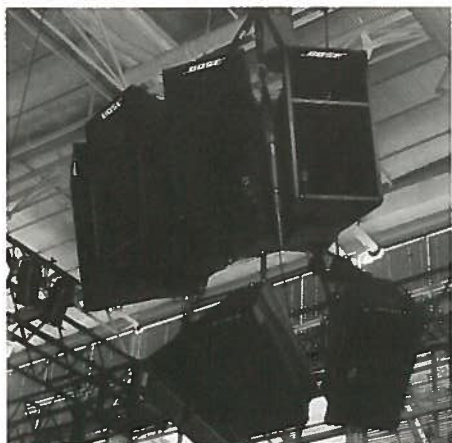
under the guidance of Ian Baseby, managing director. The stand also showed the range of CCT Lighting luminaires, with Don Hindle out from the UK to handle that section.

Lee Conlon of **Showcraft Australia** is the man who makes the GAM Tool range of products (in Australia) which are marketed worldwide by Joe Tawil's Great American Market, and Entech provided the official

home launch of the products, to great interest. It includes a family of hand-held lighting control and test tools, including Test DMX, Command (DMX control and cable test), Opto-Iso (optical isolator and splitter for DMX), and Switch DMX (for auto switching between two DMX sources). Also on stand were several versions of the Australian-manufactured Colourset scrollers.

For **DHA Lighting's** chief engineer Philip Nye, the trip to Australia meant keeping a watching brief over his small PLASA group exhibit with moving effects and fibre optics and the Digital Light Curtains on the stand of **Bytecraft**. The stand of **Mediavision Australia** starred the Colortran Medallion lighting console alongside other desks, dimmers, luminaires and cyclorama lampheads. Also represented here were Lee Filters, Ianiro and Kobold Light, plus Zero 88 lighting control equipment with Lightmaster XLS and 1200, dimmers and luminaires.

Theatrelight Ltd of New Zealand had their own stand in addition to the representation already mentioned, and the company had a



Out of reach - Bose Panaray LT loudspeakers high above The PA People stand.



HirePoint's Tim Grafton demonstrated their latest software upgrade.



Doorway to the past with the line-up of memorabilia from UK-based Bygone Times.



The Jands Collection.

wide range of lighting control products on view including their Cuemaster control desks, the Cuemaster Plus able to control both moving lights and standard luminaires. They've been exporting for five years now and have achieved sales throughout Asia and Australia, with ever more equipment now reaching Europe and North America. Two stands down the aisle, **ProLite Manufacturing** showed an interesting range of luminaires, but with no information supplied for the catalogue, and with the stand either busy or with no-one there at all, I couldn't get the low-down. You'll have to consult the picture with this article or give us a call to get their contact information in Toowoomba, Queensland.

Another company with ever-strengthening ties outside the country is **Dynalite**, an operation that has moved over the years from theatre lighting control products into the field of architectural dimming and energy management. In the centre of the hall, **Penn Fabrication Australia** showed the Penn System 2000 lighting truss and roof support system, in full working order, with motor winches and Penn Parcans. The company's various bits and pieces of flight-case and speaker hardware were also on view.

ULA, or Universal Lighting and Audio, provided an excellent demonstration of lighting effects from Abstract, Griven, Infinity Lighting and Orion Lighting (UK). Alongside, Numark Industries' DJ audio equipment was given the usual slick presentation back-up from export sales director Nick McGeachin.

To complete the scene on the (mainly) lighting front there were several zappy supply and installation company stands showing effects lighting, videowalls and lasers for the home market, proving that the industry is alive and well down through the essential supply chains.

Big new boxes from Bose, hanging high above the stand and well out of reach and therefore close inspection, were causing a stir on the big front of house stand of **The PA People**. They weren't 'listed'. Upon question, they were Panaray LT (long throw) units and there were three of them: 27 degree, 40 degree



Adrian Brooks of Lite Structures (left) swaps notes with John Adams of High End Systems.

and sub units. It was considered a 'sneak preview' - first in the world? - and I was told to get the information direct from Bose upon my return to the UK. We eagerly await the official European launch, but specs should follow in our Equipment News next issue. Meanwhile, if you really are anxious to know more, take a trip to Tottenham Hotspur FC in London where a system using the LTs is already in commission.

Back to The PA People. On a neatly arranged stand, divided by sector, they showed Peavey, Soundcraft, Crown, Amcron, Denon, Jands, JBL, etc, etc. The company itself operates with five divisions covering sales, systems contracting, hire, concert production and technical services. An example of their work was shown: a stage manager's desk due for installation as part of the re-build of the previously mentioned Capitol Theatre.

Other sound stands simply added to the international names. **Amber Technology** had Soundtracs' new Topaz project studio console in pride of place, with equipment from Beyerdynamic, Neumann, Neutrik, Otari, Quad, TC Electronics and Canare backing up. **Syntec** showed Ampex, Bryston, dbx, Dolby, Eventide, Fostex, Orban, Sennheiser, Solid State Logic, Studer and Tannoy amongst other specialist gear. **Syncrotech Systems** represented AMS-Neve, Audio Kinetics, Calrec, DDA, KRK, Soundfield and Sonic Solutions.

Confused? There's more. **Tascam** had their own stand, as did **Yamaha Music Australia**, where the new Pro Mix 01 again attracted much interest. **Production Audio Services** showed Community speakers, Crest Audio amps and Ashley signal processing equipment. **AR Audio Engineering**, in addition to many products already listed, are the distributors in Australia for Martin Audio (who also had a separate information stand within the PLASA Group, under the direction of Martin Kelly), ATC, SCV, Nakamichi, Ivie Technologies and QSC. ATT Audio Controls cover Amek, Langley, BSS, Apex and Turbosound. Mark IV Audio Australia look after Electro-Voice, Altec Lansing, Klark Teknik, Dynacord, University Sound and Gauss. **AWA**, the largest



Lightmoves Technologies - an active link for many well-known industry names.

Australian-owned electronics company, take care of AKG, TOA Saori and Denon.

That's by no means all, and if this little lot proves anything, it shows you just how well covered the options were for the visitor, and how deep into the market sound has travelled. There were numerous small and highly specialised audio service companies, and again, you'd be extremely hard pushed to find any international names missing on the product front.

From Australia's own internationally-aligned manufacturers, **ARX Systems** of Melbourne, who have sales offices in the UK through TCI in Cambridge and in the States through ARX USA in California, released an updated version of their PowerMax 1 full range loudspeaker system. **Australian Monitor**, who now export to over 40 countries featured contractor/installation amplifiers, studio speakers and amps, sound reinforcement systems and the QMX double 18" bass subwoofer.

As if to put some final pieces into the jigsaw of Australian distribution, representatives of two companies with the PLASA group, Celestion and Studiomaster, journeyed back to the UK reasonably happy with the result of their efforts, and no doubt studying whom they will now appoint as distributors for the region.

So there, by and large, you have it. But please be aware of the fact that although I've included a host of names and most of the major stands have had a mention, numerous exhibitors do not appear within this report. Neither have I detailed the Awards evening, the full programme of workshops, or the trips to the Capitol Theatre and the Sydney Opera House.

The picture I've endeavoured to paint is one for 'outside Australia' consumption. It should mean that if you are a manufacturer looking to develop this market, the next Entech, in April 1996, will be written in your diary in permanent ink. And Sydney is such a gorgeous city, after all.

To our readers in Australia, this will be the month Connections magazine will give you the real home truths. To Julius and Caroline Grafton, well done! I have a strong feeling that this show will run and run.

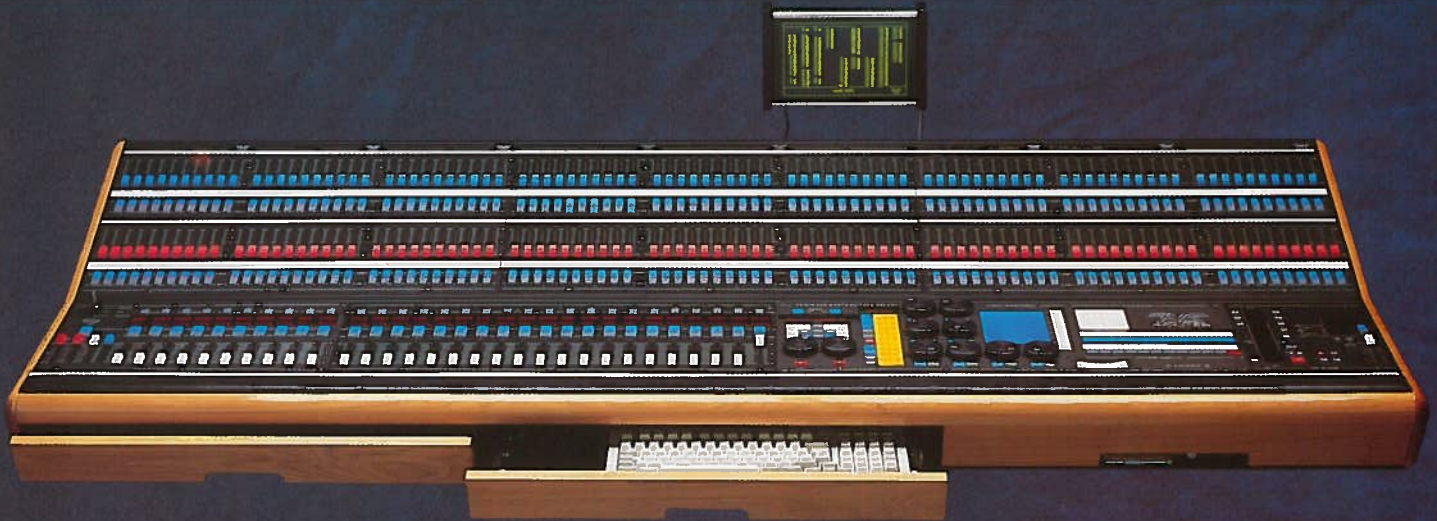


Derek Gilbert (Glantre Engineering UK), John Mackay (Theatre Advisory Service), Richard Stuart (Queensland Performing Arts Trust), Kerry Saxby (Melbourne Theatre Company), Rory Dempster (lighting designer), Damien Fuller (Theatre Royal, Hobart) and Henry Lewis (Glantre Engineering Pty).



Bob Prosser (Premier Lighting), Ian Coolesley (Melbourne Theatre Company), Bill Jennings (WA Jennings & Associates), Andrew Moon (Victoria Arts Centre) and Jamieson Lewis (Melbourne Theatre Company).

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THE AUSTRALIA OF JANDS

A discussion with Paul Mulholland

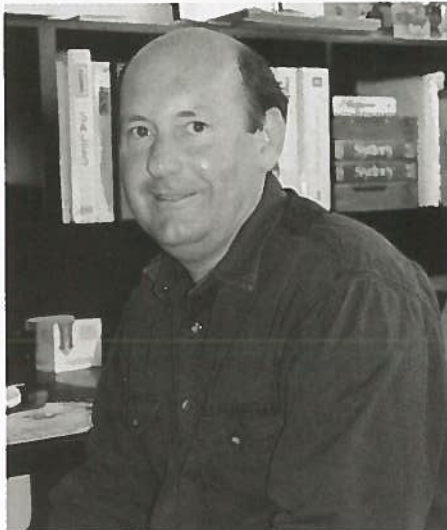
Jands Electronics is based close to the end of the runway at Sydney's international airport, and they joke that there are skid marks on the roof to prove it. With the recent Japan-bound Ansett Jumbo emergency landing, complete with broken nose-wheel, they probably aren't using that one any more.

The Jands operation was started way back in 1970 by Paul Mulholland and Eric Robinson, and these days employs around 75 in the Electronics company and 50 or so a few kilometres away at Production Services. Paul runs the first, Eric the latter. "We've remained partners ever since," said Paul. "After the first six months we agreed to have two sides to the organisation - one rental, one manufacturing - and we look after a division each, with an unwritten law that if we fought or argued one of us would give way. So, if push comes to shove, on this side of the operation Eric will back off and let me have my way, and vice versa. That's how it's always operated, and that's how our partnership has stayed intact."

In effect, the companies have developed alongside each other and benefited from each other. "The rental operation used to use a lot of our manufactured product," continued Paul, "and was the organisation that foresaw new trends and new equipment requirements. This enabled us as a manufacturer to respond, but it also enabled us as an importer to go out and source the right sort of product. It allows us to test and evaluate product, and it's grown from there."

Back in the early eighties Jands built over 30 different audio and lighting products but determined that as the industry was starting to mature the successful companies would be those who had specialised, and that business would tend to polarise around these particular operations. They made the important decision to rationalise.

"We looked at what we were doing, and where we thought we had a competitive edge or were smarter where the market was weaker in terms of competition. We came to the conclusion that in the lighting area, and specifically in control consoles, there was something of a void, and therefore an opportunity. So, from building 30-odd products we are down now to two: a lighting console and a power amplifier. And instead of selling 30 products to one country, we now sell two to 30 countries. In doing this in this way, we have stayed within our traditional business area by



Paul Mulholland.

sourcing imported product."

Interestingly, particularly for those of us looking in from overseas, by far the biggest part of Jands' business is the import of equipment. "In the pro audio and lighting area we are a fairly large player; we've got a strong dealer base of around 50 companies throughout the country who are supportive and loyal, and I like to feel we offer a good service.

"Equally, one of our strengths as an importer is our manufacturing expertise, because it provides a strong base of technical knowledge in-house. There is a 'core' of understanding - we are not just a boxes in, boxes out company."

The figures speak for themselves. Manufacturing represents around 20 per cent of total turnover, with half going into the home market and half for export. Higher maths shows that this means 10 per cent of Jands Electronics' own-manufactured goods are sold overseas. If anything, these figures prove how strong a hold Jands have in the home market, and with agencies such as Soundcraft, JBL and Shure, one understands the reasons why.

"We are starting to concentrate heavily on the contractor market," continued Paul Mulholland. "Between now and the year 2000 there is going to be a lot of building going on and a lot of re-equipping ready for the Olympics: not just stadiums, but hotels, night clubs and theatres. So much of our business is confidence driven. You have, say, a theatre in

Cairns, 2000 miles from Sydney, which has nothing whatever to do with the Olympics, starting to talk about new projects and saying 'we'd better get it organised before the Olympics'.

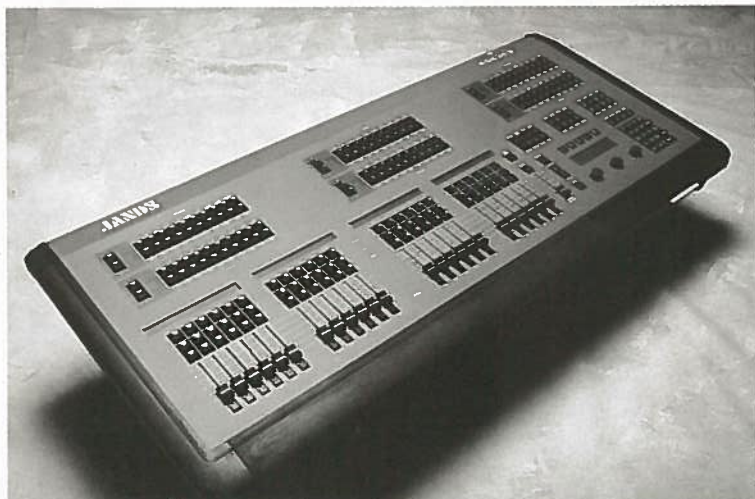
"Figures show that when the Olympics focus on a country, for the four years prior to the event you will get an increase in tourism - simply because people are talking about the destination! And the truth happens to be that tourism is probably the fastest growing industry in the world. It is the joy of our industry that we cater so much for this area.

"And our industry has even more going for it. If you look at Jands Production Services these days, only 50 per cent of their work is now for traditional rock and roll or concert touring. For instance, we have a contract with Toyota to do a total stand package for the Motor Show. We are up in Port Douglas at the moment for three weeks working on the launch of the BMW 7 series. Last month we were in Melbourne launching the Toyota Corolla. We do fashion parades for David Jones, conventions, and so on. All these people are looking to our industry to provide the creativity - they are not going for the hardware as such, but that obviously follows on."

Jands' major export initiative came alongside their intention to build a new console, and with it the decision to take a completely different approach to its design and development, as well as re-define their manufacturing standards. "We figured we had to design to a world standard, as opposed to the attitude often expressed here which is one of 'she'll be good enough, mate'.

"So we arrived with a console, the original ESP, which was quick and easy to build but made to a quality standard. We took it under our arm to an agent in the US, where things didn't work out, and to David Leggett at AC Lighting in England. If it wasn't for David, we wouldn't be in the export business today. It was one of those fortunate occurrences where things came together at the right time. AC were looking for the right product, got behind it and produced immediate sales for us. David became the backbone of our business and for the first three years he represented a very large percentage of our overall export business. It justified us carrying on."

Along the way, the next desk, the Instinct, was a failure, but learning from it, Jands put all their experience into 'Event', which has lived up to all their expectations. "The way I look at things, rock and roll consoles had become computerised, and the computer was used to do the things that we used to do manually. No-one had really thought about what was truly possible with a computer. We took that



First fruits of a new partnership, the Jands-Hog 6000.



Michael Tanner (left), lighting sales manager of Jands Electronics, pictured with Jands Production Services lighting manager Stuart Fenton in the latter's extensive Sydney facility.

approach, and I think Event was innovative in that it did things in different ways. It became quite popular as a result.

"The real success of Event came about largely by accident. It lent itself to the control of moving lights, and that was good fortune rather than good planning. We obviously capitalised on that by bringing out subsequent versions of software to strengthen this area.

"In addition, Event was a good, honest value-for-money console and it established our reputation as a supplier of value for money products. We're certainly not the cheapest around, but I feel that when you buy something from Jands you get value for money, and this is where we've positioned ourselves - in the middle of the pack price-wise, but trying to offer more than the competition in terms of performance. And this is also the direction we hope to take in the future, through our association with Flying Pig Systems."

From the experience with Event, Jands decided that a dedicated moving light console was required, and spent time and money on research into the idea, including a look at what the competition was offering. "We came to the conclusion that the product we wanted had basically been developed by Flying Pig Systems, and the way a console should work was the way they were heading.

"I therefore faced a problem. Getting the software written would involve 12 months or so of solid work and it would be totally unknown whether something successful would pop out at the other end. So, with AC Lighting's connection with Flying Pig, coupled with our obvious belief that they had come to grips with what was required, it occurred to me that I should at least take the time to talk to them. Which is what happened. One thing led to another, and after about three months of discussion it was agreed that we develop a console jointly, with Jands doing the hardware and Flying Pig the software. In December 1993 we agreed a product brief and then went off to take care of our own parts of the project.

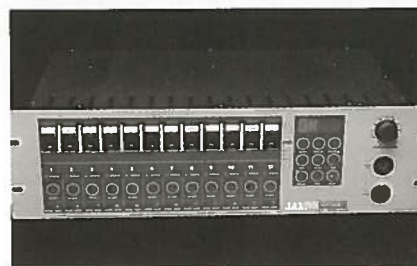
"I think it's an ideal partnership. It's a little disappointing that we weren't on schedule, but we were probably too ambitious in the first place with such a difficult concept. Most people only want to use about 10 per cent of what a console can do, but one person's 10 per cent is very often different to the next person's! And they all want their own particular 10 per cent. At the end of the day you've got to appeal to the greater majority but in a way that allows most individuals to zero in on what they specifically want.

"I'm very optimistic about the arrangement. I've been in partnerships all my life and they can be very good business structures. They allow people to put their own expertise in, and as long as you can manage the partnership, it will always be stronger than the individual.

"Business is getting harder and harder and you've got to get better and better at what you do. You need to work out what you're good at, and stick to it. As a company that's what we are trying to do. We told ourselves in the early nineties that if we weren't going to be at least number one or two in a business area then we wouldn't be in it at all. I don't think our industry's big enough to let third- or fourth-ranked operators survive into the next century. It's too hard, and we are seeing it in



Event - "an honest value-for-money console".



Jands HP12 dimmer.

everything we do, with polarisation around the stronger players. You need to shape up, get good at something, and then stick with it. One of the interesting things about our industry is that we are also dealing with creative people who are capable of moving very fast.

"My other theory is that to be successful as a supplier you need two things going for you: good product and service. Part of the service element is being able to answer instant questions, and as communication gets better, people are not only demanding, but assuming they will get immediate answers. There is more and more tendency to use the telephone, and people are already starting to work with and around the different time zones across the world.

"For Jands, it will be harder to handle Europe out of Australia, and Europe will find it hard to handle Asia. Australia, however, will be naturally competitive in Asia because clients can pick up the telephone and talk to us immediately.

"On the same basis, if you look at the United States, they will probably enjoy more success in South America than the Europeans or Asians because of the same or similar time zone situation. It's all in the mind. If people can talk to you, they will deal with you."

BYTECRAFT

(and the Sydney Opera House)

Well-known on the international scene, Bytecraft's name in its home country is linked in some way with most, if not all, of Australia's major theatres and arts centres, and particularly with the two big 'national' venues - the Victorian Arts Centre in Melbourne and the Sydney Opera House.

The latter is currently undergoing a major programme of refurbishment over a long period; in fact, like the famous Sydney Harbour Bridge or 'coathanger' nearby, it is one of those buildings that will always be needing 'treatment' of one sort or another. (You have to bear in mind it has four main auditoria, almost 1,000 rooms, about 4.5 hectares of usable floor space, 6,225 square metres of glass, 645 kilometres of electrical cable and 26 air conditioning plant rooms - to name but a few superlatives.)

Being just a quarter of an hour away from the Darling Harbour quay, itself alongside the Sydney Exhibition Centre housing Entech, it was both an easy and visually exciting trip to take one of the regular boats that ply between there and Circular Quay (via 'the' Bridge, of course) to go and check out this City icon and world wonder. Murray Rogers, late of Bytecraft's UK distributors Howard Eaton Lighting, and now one of the company's

technical men in Sydney, provided me with the background information to their own continuing involvement with the venue.

It was in 1985 that Bytecraft won the service contract for maintenance and upgrade of the Opera House's four Galaxy lighting control systems, and the partnership was further enhanced when it was decided to replace the ageing magnetic amplifier dimmers in 1987 and the contract to supply and install 1362 5kW dimmers was awarded to the company. The number of dimmers was significant because the requirement from the Opera House was to quadruple their dimmer capacity but not to exceed the existing space used to house them.

The relationship deepened further when the Opera House's lighting master Peter Marshall decided to install a dimmer data distributing system, or DDDS, in 1989. This featured dual DMX inputs, one for the Galaxy main desk in each of the four control rooms, and one for the Galaxy back-up in each theatre. As part of the installation, the crates which had always resided in the dimmer rooms were moved to the control room beside the desk, ensuring significant savings and ease of installation (the dimmers being analogue).

Bytecraft designed Atriplex Ultra to handle

the demultiplexing and provide facilities such as full softpatch, allowing the surplus dimmers to be assigned to the existing 384 control channels from the Galaxy. Further on-board facilities included with Atriplex Ultra were assignable curves (up to eight per dimmer, including one user-designed curve) and full fault reporting and status monitoring to the control rooms.

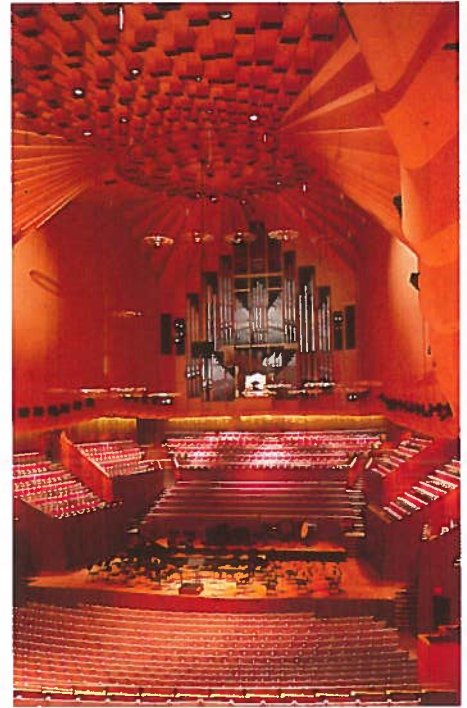
Homing in closer on the company itself, Bytecraft is based in Mordialloc, Melbourne, and commenced operations in 1984, followed by Bytecraft Research Pty Ltd, Bytecraft Theatrical Pty Ltd and then Bytecraft Systems Pty Ltd. The group currently employs around 60 people and has interstate offices in Sydney and Brisbane. Its directors are Stephen Found and Ted Fregon.

Since it began to export in late 1987, the operation's presence on the international market has grown steadily, and sales outside Australia now account for 40 per cent of the group's total sales. Their business plan expects to see this rise to 60 per cent over the next five years.

Bytecraft's expertise is largely theatre and arts based, and its establishment was founded on providing a service to the major theatres in the country for their lighting and stage machinery equipment requirements. It now claims to be the biggest domestic supplier of lighting and stage machinery control systems in Australia, and its wide-ranging technological expertise serves markets in theatre, television, general entertainment, and the leisure and architectural fields. Bytecraft is also Strand



Above, the familiar sails of the Sydney Opera House and right, the concert hall.



Lighting's distributors in the country.

Their involvement with the Victorian Arts Centre in Melbourne saw the commissioning in 1991 of their 'State' stage automation system within the Centre's State Theatre. Controlling 111 hydraulically powered bars between a speed range of 0 to 2 metres/second, with an accuracy and repeatability of within 1mm, the system can be operated centrally or from virtually any remote location within the house, including the production desk.

The said State system is now in operation in various theatres and arts centres around the

world, and on numerous touring productions. Its younger brother, Joey, is for smaller theatres and concert halls. For TV studio use Skippy is a synchronised group movement controller and Chains is, as you might expect, a chain motor controller for theatre and concert use.

Moving deeper into the Bytecraft product range, they produce the Ultra and Professional series of dimmers, the well-known Bytesize dimmer packs, the Sage control protocol converter, Ultraplex multiplexers, Felix and Phantom for remote rigging control and power supply and the Dimmaster fault detection and

soft patch unit. For the exhibition and presentation world come Columbus and Dimmaster 483 video timecode event synchronisation controllers and for architectural use the Arc control system, Solution 28 dimmers and DAmP for data distribution.

Outside Australia, installations using Bytecraft equipment range from the Hong Kong Cultural Centre to London West End productions, via Tokyo and the Opera Nouvel at Lyon in France. No less than 13 countries now receive their products and services.

LSC: SETTING STANDARDS

The company and its products

Melbourne-based LSC Electronics printed a flyer that claimed many firsts in the control of lighting: first with modular lighting control (Focal 1), with microprocessor lighting control (Precept 12/24), with microprocessor dimmers (Tour series), with digital output control desks (Precept 36), digital input dimmers (Wallpak), with multiplexers and demultiplexers (Linklight), with proportional soft-patching (Softlink) and with small system multiplexers (miniMux). That's for Australia.

Just to open the debate, and possibly draw in a few letters, some of them may even be world firsts. It doesn't matter that much, but it does at least indicate that the people at LSC are a pretty bright bunch.

Managing director Gary Pritchard took me through the story of their very early involvement with the DMX512 control protocol standard, which is indicative of their approach to product development. "We were working on Precept 36 and during the period attended the USITT convention and exhibition at Oakland California in the Spring of 1986. At the convention there was a meeting of interested people who discussed the development of digital protocol and who were endeavouring to standardise what we now know at DMX512.

"The sort of things being proposed were along similar lines to the type of work we were doing, so we opted to go in their direction and immediately utilised the proposed standard. Shortly afterwards in, in mid-1986, we came out with both a console and demultiplexer. As



Alan Graham and Gary Pritchard outside the company's new HQ in Melbourne.

a result of the timing, we think we are probably the first company in the world to have brought out a DMX product."

LSC had been set up in 1979 when it built a basic 2-preset control console, but it was the introduction of the Precept 12 - a 12 channel memory-based console - that established their name on the national scene. International interest in their products followed and the

company commenced exporting for real in 1987. Development into much larger desks was the natural next step and their LCD-based modular 'Focal' desk was launched in late 1989, followed by the Precept Plus.

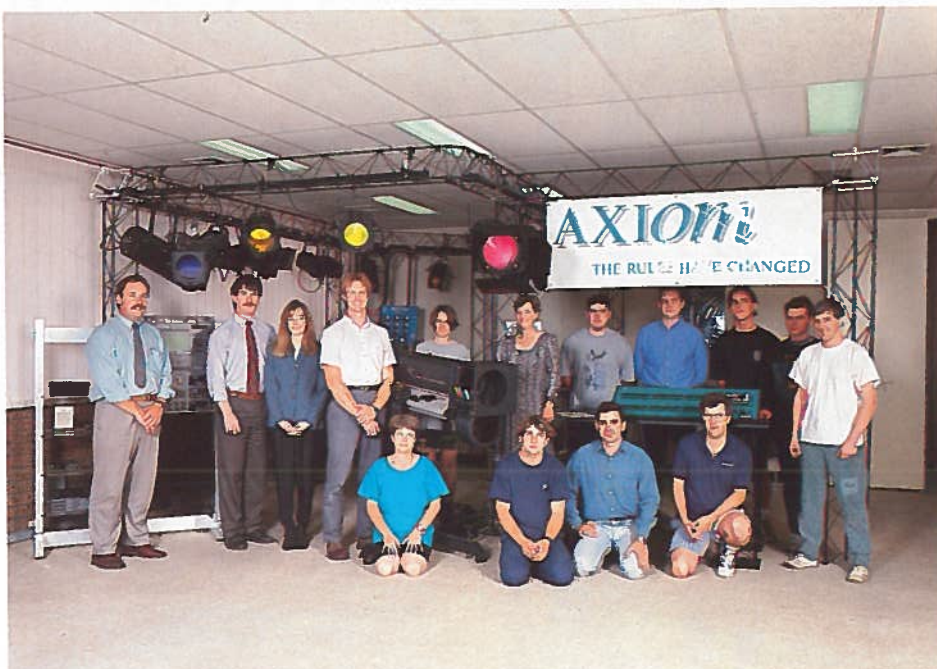
Axiom, the latest desk from LSC, was first seen, in prototype form, at the PLASA Light & Show in 1993, having been commenced as a project in April of that year. Easily identifiable in its turquoise livery, it went into full production in March this year and its first 'dress' appearance was on the LMP stand at the 94 Frankfurt Music Fair.

"We were looking for a different type of aesthetic approach to the product," continued Gary Pritchard. "We felt that all our previous products had become somewhat 'industrial' in their design and appearance and we wanted to get away from that."

An external design company came up with four possible solutions and mock-ups were made and the assembly and electronic considerations taken into account. Having chosen their preferred design, the team of Gary, Patrick Base (design engineer), Andy Meldrum (software development) and Trevor Sykes got on with the design of the guts of the product, with general manager Alan Graham keeping a watchful eye over operations.

They returned to Melbourne following the PLASA and LDI exhibitions in the autumn of last year with the final collection of on-stand response and comment and set about putting it into production. "The response since we presented the desk to the market has been nothing short of fantastic," said Gary. "We've sold more of the Axiom in the last six months than Precepts in the last three years!"

The construction of the Axiom is interesting.



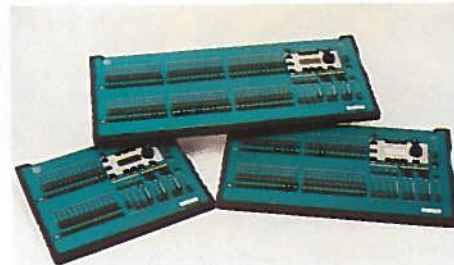
The LSC team pictured in the demonstration area with a range of the products manufactured and distributed by the company.

Thin in profile like the Precept, it is essentially a steel box with a back-screened acrylic sheet (the turquoise bit) squeezed together with a 'rubber' surround sandwich inbetween. The back-screening means you can't rub words off, and its matt finish gets rid of the 'finger-print' problem. The rubber - in fact an EVA foam - that provides the surround also gives added bump protection.

The production of products at LSC's new premises is planned on a 'just in time' basis,

with around half of production on any batch being made for specific orders, with the other half being built, but not completely finished, for stock. With so many worldwide variables required, a shorter finishing process can be employed to adapt the product to suit its place in the relevant market.

Latest launches from the company include a 36 channel dimmer and hot patching system that will suit most touring rig configurations. It features 36 channels of the proven Tour Series



The Axiom family in its trendy turquoise livery.



Trevor Sykes (left) and Andy Meldrum in their development area.

dimmers, digital instrumentation and a versatile hot patch system housed in a compact road case format. Also new is LinkLight II, the second generation of the Linklight multiplexer which now has several new features added.

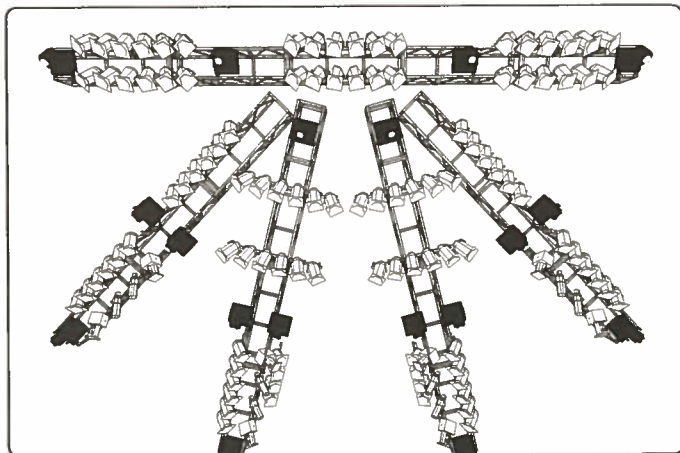
MORE AUSTRALIA

A full feature on Sydney's Capitol Theatre by theatre consultant Dennis Irving will appear in a forthcoming issue of Lighting and Sound International.

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EQUIPMENT *News*

EAW MultiMedia

EAW have announced the first two products in their new MultiMedia Series.

The MM12 is a package of two UB 12s and an SB48-12 subwoofer. An internal crossover allows the entire system to be powered by a single stereo amplifier, with left and right high pass filtered outputs to the pair of UB12s. The SB48D2 is a drivers-only subwoofer without passive network for bi-amped applications using an external active crossover unit.

EAW will soon introduce a version of the SB48-D2, packaged with the new MX100 crossover unit for a total bi-amped solution. The MM80 is designed for portable A/V use with the JF80 on an Ultimate support stand. The MM80 includes the SB150ixR-80 and a JF80. As with the MM12, the subwoofer contains an internal crossover network, allowing the entire system to be driven by one amplifier channel as a single compact high performance full range package. Later in the year, the MX100 will allow users to power one subwoofer and two mid/high systems. The SB150ix-80 input panel has a separate input that by-passes the internal network for use with external electronic crossovers.

For details call Lighting Technology Projects in London, telephone 081-065 6800.

Full Steam for Chevin

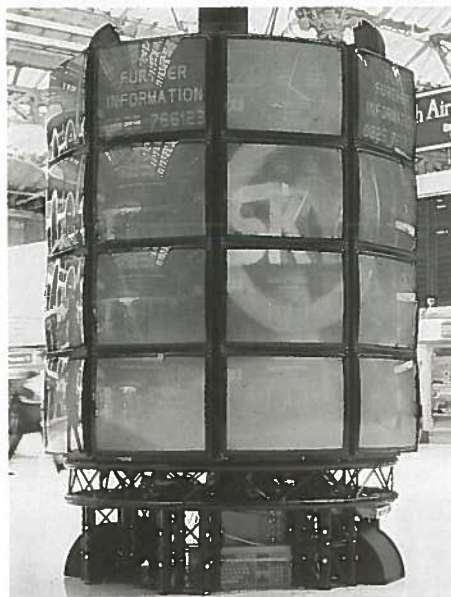
Following their worldwide launch at the '94 Frankfurt Music Fair, the newest additions to Chevin's A Series of compact, light-weight professional power amplifiers are now in full production.



The A500 features 350W per channel stereo in a 1U x 9" deep chassis weighing just 4kg. Designed as a compact, high-quality solution for small-scale live and installed sound applications, the A500 shares the same audio circuitry and power supply technology as A Series 2U models. The A2500 monoblock (single channel) is rated 2500W into 2 ohms and 1500W into 4 ohms, and is enclosed in the standard Chevin 2U x 15" chassis, weighing just 12kg. The A2500 monoblock was designed specifically to drive the new generation of compact high-power loudspeaker systems.

For more details contact Chevin Research Ltd in Otley, telephone (0943) 466060.

Video Revolutions



Owl Video Systems has introduced a new videowall monitor consisting of a unit with a wedge-shaped casing that can be configured into circles, ovals and waves, making it easier to create videowall designs that make full use of available space.

Designated the SMV 280W, this 28" monitor is suitable for use in a wide range of audio visual, broadcast, retail, architectural and leisure applications. Its compact size makes it suitable for fitting into, and around awkward corners. With the SMV 280W it is possible to build a videowall up to 12 units high with all-round visibility. The sharply-tapered wedge monitor allows a circle to be built with as few as nine monitors. The units can also be combined with Owl's standard 28" wall monitor, the SMV 280N, to create a wide range of designs.

Technical features of the SMV 280W include a Black Matrix screen, power and signal loop-through circuitry for fast set up, and colour temperature switching for studio and broadcast use. Each monitor has audio circuitry and amplification for an external speaker with industry-standard video connections.

For further details contact Owl Video Systems in Uckfield, telephone (0825) 766123.

Intelligent Graphics

Tecnation Digital World have developed a major software upgrade that further enhances Sonovista's wide variety of real-time visual effects. Featuring a 500% speed increase on some features, multi-user operation and a new easy to use on-screen menu-based Vision Control user interface, the 1.5 upgrade also introduces multi-media capabilities such as the ability to display full colour near-photorealistic Photoimage pictures, an enhanced Cyberwriter video typewriter, MIDI control and an intelligent image importing system that makes it easy to install custom scanned logos and patterns from a variety of sources.

For further information contact Tecnation in California, telephone +1 (415) 327 4332.

Take Note

Le Mark have introduced a range of flight case labels to meet the requirements of the new manual handling regulations. The three labels, produced in either heavy duty (PAL) foam backed format or conventional vinyl can be supplied with or without your company name and have bold black letters on a bright yellow background.

For details contact Le Mark in Huntingdon, telephone (0480) 494540.

Yamaha Advances

Yamaha has introduced the YDG2030 digital graphic EQ and the YDP2006 digital parametric EQ. They have also advanced their digital EQ technology with the introduction of the QS1 software and IFU485 interface unit, allowing enhanced computer control over the full range of Yamaha digital EQs, including the already established DEQ5, DEQ5E and D2040.

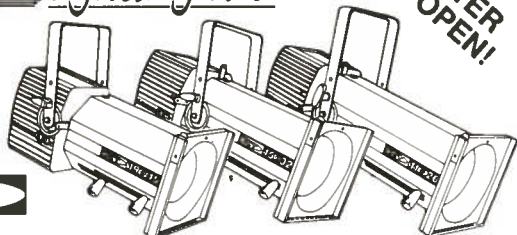
As stand alone units, both the YDG2030 and YDP2006 offer 40 panel memory locations for EQ settings and can be remotely controlled via MIDI. QS1 software allows a large network of up to 31 EQs to be readily configured and controlled, using a single computer, via Yamaha's proprietary Y-485 serial control bus. The IFU485 interface allows the host Mac or PC to 'talk' Y-485, via RS-232C or RS-422 protocol.

For further information on the full range contact Yamaha-Kemble in Milton Keynes, telephone (0908) 369269.

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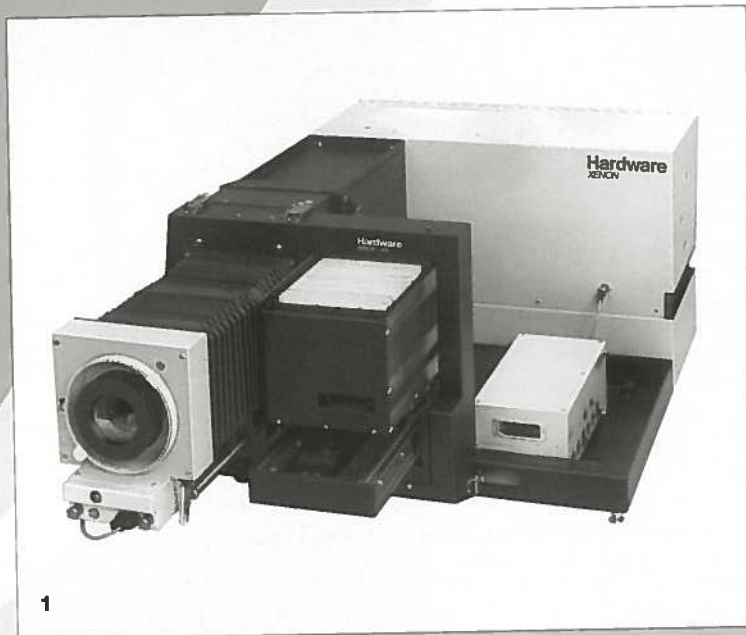
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1



2



3



4

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The top of the range for giant image projection.

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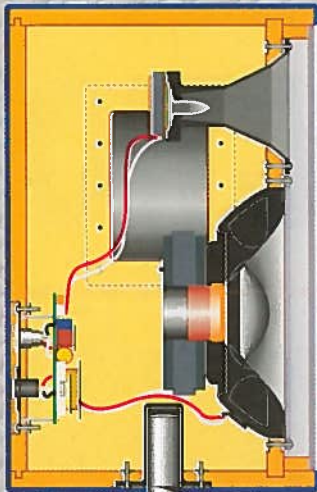
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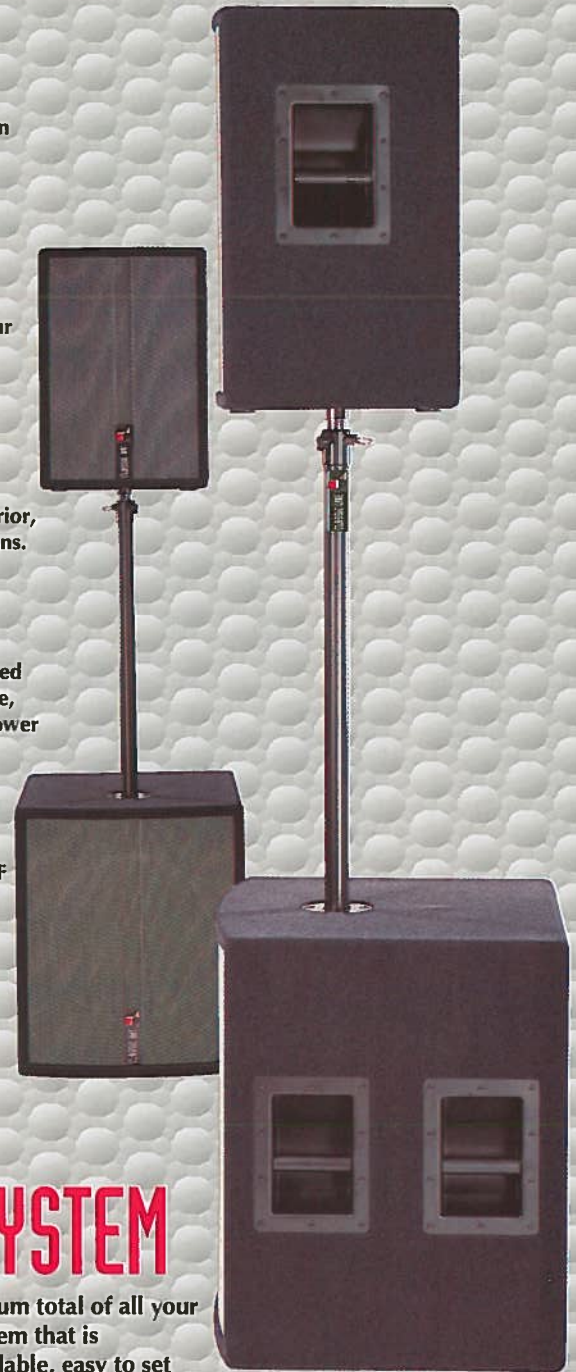
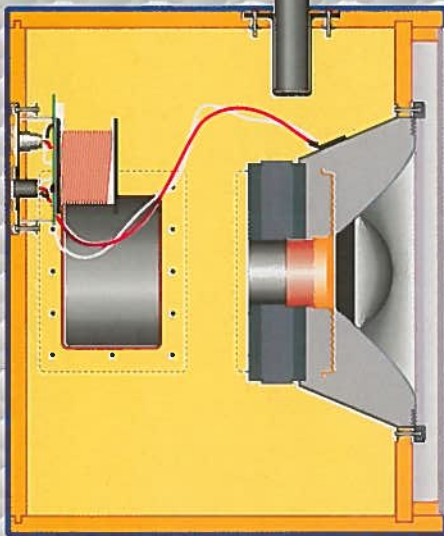
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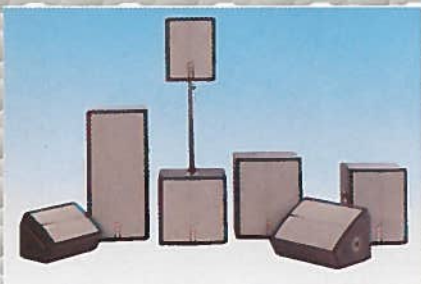
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HIGH SOCIETY

A visit to the Austin headquarters of High End Systems and Lightwave Research is an uplifting experience for Tony Gottelier

The billboard in Times Square, Manhattan for Converse baseball boots shows a clean pair of soles leaping off the top of the poster accompanied by the slogan, 'only one thing takes you higher . . . but it's illegal!' The connection with Austin, Texas, which is probably as far away from this legendary poster site as London, may seem tenuous, but touring the High End facility at West Braker Lane with wired-up development genius Richard Belliveau, is something of a 'trip' in itself - it comes at you in a great rush and afterwards you definitely suffer from withdrawal.

And as if to confirm that the feeling is mutual, Belliveau's expression of the moment (to describe how humbled he feels with regard to the numerous manifestations of his truly remarkable achievements), as he steers you round on a breathtaking techno white-water ride on the Light Wave, is - "it's all totally out of control!" He means that it has all grown far beyond his original dream - not that he doesn't know what's going on. As he struts around proudly showing off his latest toys with childlike enthusiasm, the pocket 'voice memo' is never far away as he bristles with instruction, comments and ideas. "All of this will be on the network to those concerned by this afternoon," he staunchly forecasts.

There have been considerable changes since I was last in town, two of the most significant being a massive re-investment in more and bigger dichroic plant, which enabled Lightwave to quintuple filter production capacity over the previous year. And to produce huge dichroics, up to 750mm in diameter, and then cut them to any size on their state-of-the-art, high pressure, water-jet cutter. This precision machine tool is so powerful that LR have found it necessary to place a 6mm aluminium plate under the glass to soften the impact of the cut. We watched it dispose of the ali sheet and the glass like a knife through butter. It has to be said that his faith in the value



Intellabeams, Dataflash and Color Pros used to surreal effect to create the Ice Palace at St. Paul, Minnesota.

of the dichroic has been instrumental in Belliveau adding something both to the art and to the science of lighting. First, to build your own vacuum coating plant from scratch, as he did, has to be something, but the fact that he was responsible, almost single-handed, for the emergence of all those luscious colours that we now swoon to, is something else. Belliveau is emphatic: "We had to have our own plant to do it. There was just no other way to ensure the necessary quality."

Before Belliveau, we seemed to be stuck with the same old colours which could be had by mail order from the Edmunds Scientific catalogue since the early seventies. Now, we have colours that you can dine out on - like Ben and Jerrys flavours, so rich you can eat them. Lightwave have made a religion of their colour range, especially the deep indigo which made Peter Wynne Willson and I gasp in unison the first time we saw it. What was realised was that a bold, accurate and unusual colour range would give their projectors that extra edge and this is well demonstrated by the Cyberlight. Yet Belliveau had almost missed the boat at the beginning. He wasn't struck by the bug when he had one in his hand at the PLASA Show in 1987, but when he saw ACR's Pars and Cyc

lights alive with dichroic filters at the Frankfurt Music Fair, "it blew my mind, I knew I had to have this technology."

Belliveau tends to get his own way on such matters, and dragged his two partners Lowell Fowler and Bob Schacherl along with him, no doubt, kicking and screaming all the way to the bank. "It was not as though we were not securely financially in debt," quips Richard, "but you gotta do, what you gotta do." For the man who came back from SIB Rimini in 1989 having parted company with his major supplier Clay Paky, and developed the highly successful I-beam inside the next six months, nothing would be too daunting. He could have walked on Lake Austin at the time.

The other major change since my previous visit, was the huge growth of the company's R&D department. Now, with over 35 people across a spectrum of specialisations, it must be one of the biggest in the business. The names rattled by like a high speed train. One of the few which stuck was Michael Dubinovsky, a Russian emigré optical engineer with barely passable English, who had managed to make it to the US together with his own optics design program, who kept saying earnestly: "I sink I will haf somesing viry intresting to show you later Reechard." The others which registered were Rebecca Kittrel, who is in charge of the arty side of the production of photo-litho gobos, which have served to set the Cyberlight aside, and the team of Larry Cotten, Mark Stultz and Jeff Maddox who are responsible for the development of Status Cue, of which more later. After a brief stint in marketing, Peter Cutchy has found his way there also, and I learn, since my return, that Woody Smith, who was with Orion, the US Coemar importer, has signed up in a co-ordinating role.

Belliveau is a man with a mission, in fact, a man with a missionary zeal bordering on the fanatical burning in his eyes: "Just the fact that this facility exists blows my mind. The sheer level of complexity, half of which I don't even understand! We've got a lot of dedicated people working for us, and loyal people all over the world. I pinch myself every morning, it's



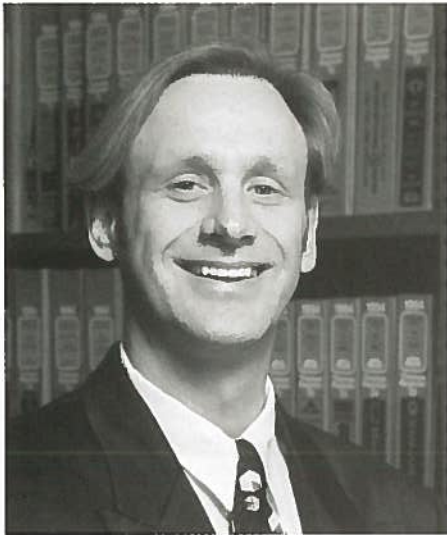
A forest of Color Pros providing the atmosphere at Club EFEX.



I-beams at play on the Robert Plant tour.



Intellabeams, Color Pros and Dataflash in combination for MTV's Turn it Up!



Richard Belloweau, passionate about the technology.

just unbelievable. It gets away from me, yes, basically I micro-manage things here. It's out of control!" Not bad for an ex-DJ from the old country, huh?

In the past few months items which have passed from this department into the reality which is production are the Cyberlight, already delivered in the hundreds to the rental houses in the USA, and with several successful tours already under its belt, and the previously mentioned Status Cue, which delivered less than expected when it was released earlier this year with beta software, but which now seems to have got over its troubles and is in good shape. Tim Grivas, High End's control guru, explained that what is special about it is that it is really very intuitive to programme: "All you need to know is what you want and where you want it, you don't even have to press 'store' to save. Macros are the last thing on the list because they are so cumbersome to build on any board. It's very fast to operate, because the software is dedicated to our products, it's all out front, it's all there." Like all 'soft' products, Status Cue will continue to grow and develop and at LDI, the first version outputting a single line of DMX will be released, with a full version scheduled for the New Year.

Other new products at LDI '94 will be the Dataflash AF 1000, a high intensity weather-resistant strobe for 'architectural' purposes, by which I guess they mean for outdoor stadia, a particularly American phenomena, but a huge market nevertheless. Designed to scare off high flying aircraft and aliens alike, the AF 1000 packs a 14,000 joule tube and can generate single flash power of 230 joules and a maximum flash rate of 120 flashes per second, which must be beyond perception of vision, and enough to set Health and Safety officers in a spin like incandescent Catherine Wheels. It is DMX-controlled, and this, together with the other new item, a DMX remote control for the F-100 smoke machine, seem to indicate that the company, who more than any other were dedicated to dedicated



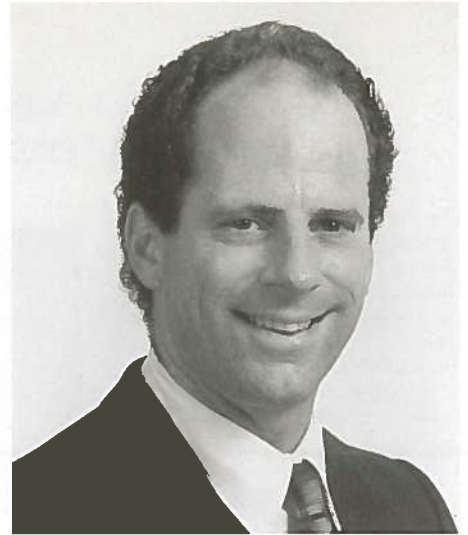
Lowell Fowler, into the art of lighting.

control, have finally seen the light (or is it a Dataflash?), which can only be good news in an industry crying out for compatibility.

So what about the other two arms of the trinity which is High End Systems? In contrast to Belloweau, Lowell Fowler, who founded the business as Blackstone Productions, off the back of his eponymous light show started in College in 1969, gives the impression that he's just having the greatest time. Or he would be, if people would just let them get on with it. Right now, Lowell is preoccupied with two serious issues which have invaded his space from outside, and taking his leisure with his own agenda for LDI '94 when he can.

The two issues which preoccupy him are patents and smoke. HES now has its own in-house legal counsel in the shape of one J. R. Bell, who is doing all the research necessary to fight off the predators. So far JR has been very successful, but as Fowler points out: "There is no other issue more stifling to business and in the US it has reached crisis proportions. We are forced to protect ourselves in any way we can, which goes against the grain in a business which has always been quite open up to now." The other is the matter of theatrical smoke which is under threat from the regulators in the USA. As manufacturers of smoke machines this is obviously of concern to High End, and, as manufacturers of beam-dependent lighting products, it is crucial.

Lowell has always been closer to the domestic market, while Bob Schacherl takes on marketing and international sales: "I see myself sometimes as a kind of band-aid and other times as the lubricant which, hopefully, keeps things running smoothly," Fowler explained. One of his pet projects of the moment is to create a tribute to the portable light shows of the sixties which 'started it all' during LDI in Reno. Titled 'The 25th Anniversary Celebration of the end of the Sixties', he has invited various legends of the light show era, now successful in the business, such as Neil Rice of Optikinetics and John



Bob Schacherl, the glue that binds them together.

Lethbridge of Cerebrum Lighting, to re-enact their liquid light shows with modern technology in a vast hall at the Reno Sparks Convention Centre on Saturday November 19th. Peter Wynne Willson will also re-create his spectacular, and spectacularly successful, liquid show as used on the recent Pink Floyd tour with xenon projectors. Whether Lowell plans to dig his Blackstone show out of the closet and dust it down is another matter, but he was certainly there and doin' it in 1969.

"We've got Jefferson Starship, with the original band members from Airplane, playing on stage with other bands," enthuses Fowler. "And 'tune-in, turn-on, and drop-out' Dr. Timothy Leary will be on hand to promote his book Chaos and Cyberculture, while he will also take to the stage for his own multi-media presentation. The MC will be Wavy Gravy of Woodstock fame. As they said then, and some still do now, be there or be square. Sounds like a psychedelic occasion not to miss.

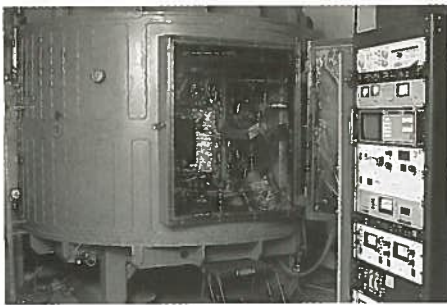
Would you believe, after all that, he completely forgot to tell me that, coincidentally, this meant that High End Systems is 25 years old this year. Well kind of, if you link it through to Blackstone. Actually, it's the anniversary of Lowell's 25 years in the business.

And so, to Mr. Cool. Bob Schacherl, now president and marketing muse of High End, joined Lowell Fowler in 1977 and, I am sure, has been the steadying influence ever since with a firm hand on the corporate rudder. He, along with sales executive John MacDowell, is the face of High End Systems which we know best in Europe. He attends every show and consequently has a good feel for the way the market is going.

A wine buff, Schacherl would enjoy nothing better than describing the pleasure he and his wife got from a visit to the Italian vineyards with the owner of the famous Café del Artiste following this year's Rimini Show. Doubtless, he will be off to Napa following LDI. But Bob is the serious one, and if Richard is passionate



Behind the scenes at LR/HES with the Cyberlight (left), Intellabeam (centre) and Status Cue in production.



Big Bertha, the new dichroic vacuum coating chamber quintuples production.

about the technology and Lowell is into the art, then Bob is the glue that binds them together and makes the whole thing work without too many mishaps along the way.

You can see his steady hand behind this year's refinancing and corporate restructuring which has brought the venture capitalists into the boardroom. "We are a business which has doubled in size every four years, now employing over 240 people in a 150,000 square foot facility. By any measure, that's a serious business and you cannot go on growing helter skelter. There has to be some control, and you might say that we have reached a critical mass where we can now afford to pause for breath and make some money for a change."

So now they have a lot more interested parties looking over their corporate shoulders, scrutinising their every move, and they find that having a board of directors representing those outside influences turns out to be a big advantage. "The Board help us to make the right decisions, so it's not just our own judgement as in the past. Now there are checks and balances, where in the past those things did not exist. We were making decisions which we felt were in the best interest of the company, but which maybe led us to grow too fast. They have calmed us down a little bit, and given us the opportunity to overcome the tremendous management problems which come with un-controlled growth."

One of the issues which has turned the business round, at least from the image point of view, is the crossover into the performance market which Schacherl had been instrumental in engineering. "Over the past three or four years our primary focus has been calling on touring and production companies, television stations and theatres around the world, to



Photo-litho gobos, art in the making.

introduce ourselves and ask for a chance to have their business," explained Schacherl. "Quite honestly, at the beginning we got caught up in the hype, the glamour of seeing our products on television shoots and in music videos. It was that star appeal that really attracted us. But, being seen as a discotheque company made show people feel excluded and led them to believe that our products couldn't possibly be appropriate to them."

This, of course, was seen as a challenge. I can't think of anything more likely to stimulate Richard Belliveau and the other two, than somebody telling them what they can't do. Like a red rag to a bull! So the struggle has been to listen and respond to the concerns of a catholic universe of users in different disciplines, and shape the products to transcend these concerns and to local market requirements. A trick which David Copperfield would be proud of.

"We had the experience of the Intellabeam, which moved across with relatively minor changes," Schacherl recalled. "But it needed a little help from an initial lucky coincidence, which had LD Chas Herrington selecting them for the Dire Straits tour, following their successful installation in a Bali nightclub he had been asked to design. That really set us on the road in the performance market." What they found was, that stardust aside, getting their products used by headline bands and on hit musicals, had a trickle-down effect in other markets. "If it's good enough for them, it will be good enough for us." In other words, almost by accident, it turned out to be downright good marketing.

In the meantime, the HES trio decided to build a small scanner to cover their tracks in the club market and for low-budget work, and appropriately called it Trackspot. It has been



The 'clean' prep room in the dichroic plant.

highly successful, selling 800 pieces per month since lift off. The next step was to develop what HES consider to be the infinity scanner, the one with all 'the bells and whistles'. "It had to incorporate all the items that people had communicated to us from the experience of Intellabeam. We just took all their input and rolled it into one ultimate lighting tool and that is Cyberlight," explained Schacherl. Yet the success of Cyberlight hasn't dented the sales of I-beams which still run at 400 pieces each month.

High End have certainly felt the heat of competition from the Martin Roboscan 1220 and the Clay Paky Golden Scan 3, and market conditions in the last couple of years have been less than ideal, especially outside the USA where the dollar value see-saw creates havoc with their prices and their margins. Nevertheless, at the end of the day they can rely absolutely on their home market when it comes to product loyalty. In America, people understandably prefer to buy American, unless a product has a particular snob appeal. In an attempt to make this loyalty unshakeable, HES have worked very hard on back-up service and 24 hour contact numbers by cellphone and bleeper. "The competition keeps on nipping away at us. Some people might view that negatively, but actually I think it helps us build a better business and better products. It keeps us on our toes. The opposition might not want to hear this, but in my opinion, competition does us good."

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STARS IN HIS EYES

John Offord profiles PW Enterprises and managing director George Wetherill

Twinkling starcloths and fibre optic effects have been scattered so liberally into entertainment productions that they have now become one of the essential elements of 'showbiz'. Whether they are used in a TV game show or for a seaside summer spectacular, or even a car launch, they set the scene for the event. You are expecting the bright and glitzy, and if those little stars weren't there, we'd be trying to work out what was missing. But you don't have to blanket the walls or ceilings - their more subtle use can also add drama and atmosphere to elements of a larger whole, and they can also be used as specific effects in themselves.

Making the use of the starcloth more flexible fell to the lot of one George Wetherill, now managing director of PLASA member PW Enterprises, who devised a modular system to cope with the mixed range of sizes and requirements needed. Nowadays, as our main picture shows, the top end of television entertainment, in this case the latest edition of BBC TV's *The Generation Game*, makes full use of the latest techniques. How it all came about though makes a story as punctuated with as many different highlights as the cloths themselves.

George had ambitions to go to sea, as an officer in the Merchant Navy, but a hole in the heart, later repaired with great success, stopped him in his tracks. He went to work in a soft furnishing store in Scarborough, by then his home town, where, and as it turned out luckily, he learnt to make drapes. Soon becoming bored with shop work, he left to attend a course in radio telegraphy at Hull College of Technology, picking up a mix of jobs during the holidays. At Butlin's in Filey he was a Red Coat, he worked at the Fylingdales early warning radar complex high up on the Moors, and he was an assistant in the box office at the Futurist Theatre. And that, as they say, is how he got into show business.

George was busy in the box office when the *Black & White Minstrel Show* was wowing the audiences with its very first summer season at the theatre. Having got to know company manager Laurie Bloom well, George was invited to become sound engineer for the Minstrels, and he ended up touring the UK with them before ending up at London's Victoria Palace Theatre. Along the way he met his wife June, currently one of the family trio running PW, who had joined the production as a singer.



The set, featuring PW Enterprises' starcloths, for the current series of BBC TV's *The Generation Game*, designed by Richard Morris.



George Wetherill works out the logistics of the next production.

He stayed with the show for ten years, in due course becoming company manager, before moving to the Apollo Victoria.

"The touring experience was invaluable," explained George. "The show used to be in a different place every week, leaving on Saturday

night and opening for two nightly shows every Monday. The work was relentless, but the show was a sensation."

As an aside, if you were one of those people who wanted to know the answer to the question everyone asked at the time about the sound for the *Black & White Minstrels* - was it for real, or taped - then George is the man who has the answers, because he 'did it'. I'm certainly not going to give the game away, but his contact number is listed in the PLASA Yearbook of members. However, don't blame me if you get a sales pitch on starcloths.

The owner of the *Black & White Minstrel Show*, Robert Luff, had many other shows to deal with and George worked with him 'behind the scenes' for 27 years. It was he who suggested that they should start their own lighting hire company, and Robert Luff Theatrical Hire was the result. George's total involvement with the technical side of production kept his mind in tune with every possible technique, and this was soon to pay dividends.

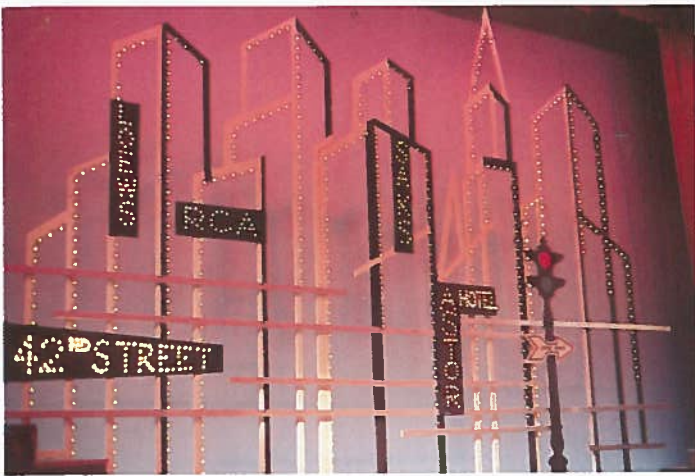
Being of an inventive nature helped too. He'd been working on the starcloth idea when designers started to show interest, little knowing that they would soon sweep the



The LWT set for Richard Digance (Michael Hurl TV), designed by Bill McPherson.



A Bobby Davro summer show spectacular.



Typical use of pealamps in a frame from a show at the New Victoria Theatre in the late sixties.



PW Enterprises' stand at the 1992 PLASA Light & Sound Show.

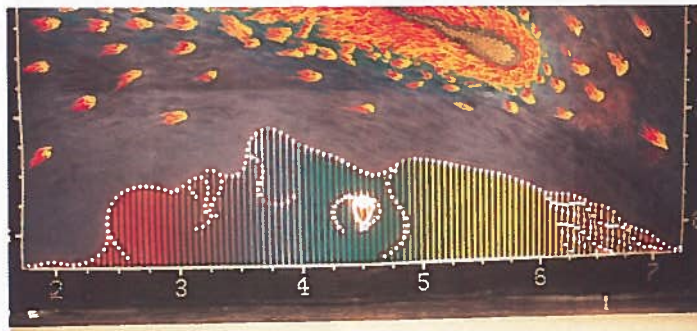
country. At the same time he left the Luff organisation and went to join Unit 1, working on trade shows and conferences.

Concurrently, his son Perry, who at the age of 16 had joined the 25th Anniversary Tour of the Minstrels as sound engineer - a case of history repeating itself - and had moved on to work in the same capacity for The Krankies, Lenny Henry and Danny La Rue, decided to set up a company with June to supply lighting and sound equipment for various shows. They called it PW Enterprises.

Perry took up the story: "I went on a 12-week tour and came home to find my small premises had been taken over by starcloths! The family had moved in, and my sound system had to go in the house."

In due course larger premises were found, George officially joined the family fun, and a new limited company was formed to incorporate all their interests. "We operate as one company," continued Perry. "June looks after the office and accounts, George takes care of the drapes, and I take care of lighting and sound. We obviously share tasks, and our team is flexible to suit the demands, with dedicated freelancers employed as needed."

But back to the starcloths, the point of this story. Five years into its operation, a hire stock of around 450 is now available, and George has treadled his Singer to make most of them,



Lower part of a 7 metre wide hanging cloth (1981) for designer Adrian Ord.

no doubt with that experience at Scarborough at the back of his mind, and with his sun hat on his head and the Test Match commentary in the background. Business has been so good that there have been occasions when the store has been practically empty. And there weren't too many specimens on the shelves when I visited - maybe between ten and 15 per cent of the total stock.

Being modular, and made in a series of standard sizes, cloths can also be adapted, and George has been known to work some of them into unusual shapes, making stock-taking a sometimes difficult process. (Can you imagine the inter-family breakfast-time moaning!?)

George won't mind me describing him as 'one of the old school' when it comes to quality. "We always use super quality wool serge - it's the only thing we use. Colours are also

available, to order, for instance on such shows as the Generation Game (where all the cloths were dyed purple), and if people want names on the cloths, or 'fireworks' displays, then we can incorporate them. If the customer can draw it, then we can make it up."

Most of the orders that go out from PW, in fact around 80 per cent, are for modular cloths, as these can satisfy the majority of requests, even with small adaptations. However, specials call on the remaining capacity, and if colour lighting units or fibre optics are required then they can be made to order.

Also in stock are starflats, and again, there is a standard range of sizes to call from. Units without pealamps are also available, and they can all be used in conjunction with starcloths. "It's really a case of 'anything you want'," said George.

For 'movement' in the lights, then control can be arranged in-house. "We can programme as desired," explained Perry, "and this is based on a Strand MX running with Act 6 dimmers. However, we can jump up to anyone's desk."

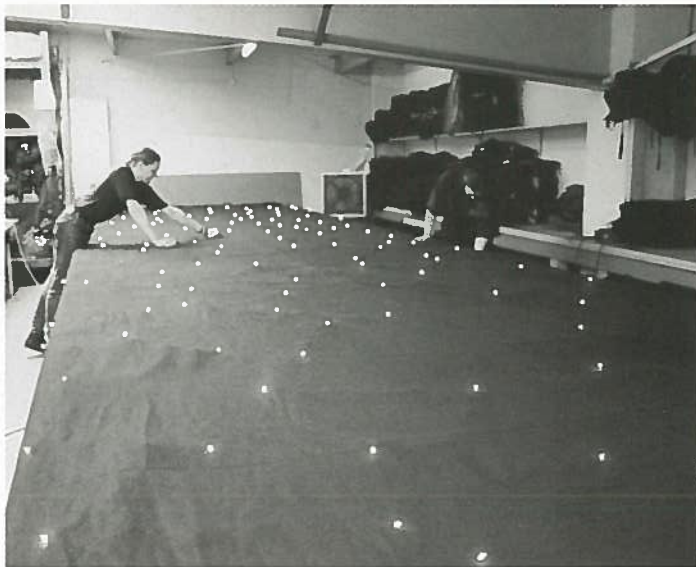
"Being a hire company, we don't always know what jobs our starcloths are being used on," said George. "But there's hardly a show nowadays that hasn't got one on it in some form or another, and I like to think a lot of them are ours!"



Hard work on the Singer brings back memories of soft furnishings and Scarborough.



The Wetherills (centre), namely Perry, George and June, with Michelle Meacock and Marcus Farr, pictured outside their Merton (south London) base.



Checking out a starcloth before it goes back into store.

There is a huge television market, and PW have taken care of literally hundreds of programmes covering all channels. On the presentation front, PW supplied the cloths for the occasion when British Airways changed their livery and a Jumbo jet parked in a hangar was entirely surrounded by starcloths, so that when visitors looked out, they could see an atmospheric 'sky'. "We've also starclothed complete hangars too," he said. Then there's the West End, with shows such as Hot Shoe Shuffle, Forbidden Planet and Bounty.



Part of the warehouse facility.



Perry Wetherill takes care of PW's lighting and sound operations: "For sound we are based on the Bose range and are also dealers for Nexo speakers, Lab Gruppen and Chevin amplifiers and Shure, AKG and Beyer microphones. On the lighting side we have stocks of Thomas, Tomcat, Strand and CCT equipment, and a range of control desks."



June Wetherill.

As a child, George Wetherill used to look up at the sky on a fine night on the moors behind Scarborough and think of the amazing effect the stars made on their black background. Many years later when he was approached by Phil Grief of Caribiner/Unit 1 about the possibility of making a huge starcloth for the launch of the Acclaim car at the NEC in Birmingham he thought back to his childhood. It was at that point he created the modular starcloth in his mind, and put the idea into practice by pulling together his long experience with both drapes and lighting.

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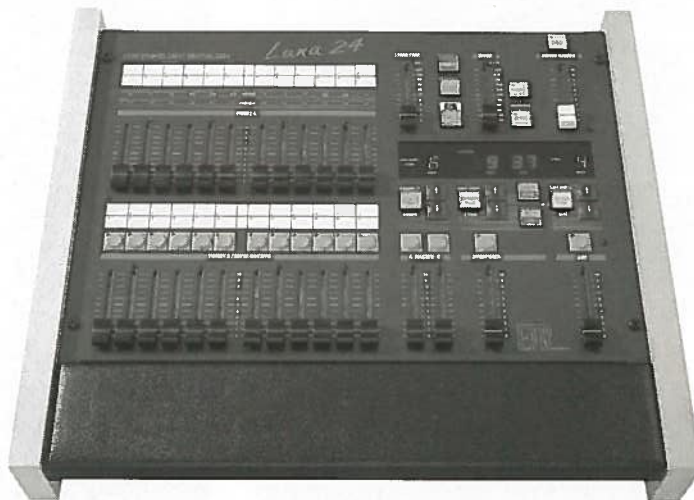
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POWER, PERFORMANCE AND EMC

The home straight of Ken Dibble and Allen Mornington-West's Amplifier Marathon

In the September issue we set out the evaluation procedures to be adopted, explained the basics of EMC testing and its implications, and reviewed the Crown Macrotech 3600 VZ, MHA Chameleon 1400S and the amazing midget, the Peavey DPC-1000. In the October issue we published three further reviews including the C-Audio XR-5001, Carver PM-1400 and Chevin Research A750. Now we are able to publish the final two amplifier reviews, the much awaited Lab Gruppen LAB-2000C and the Crest 9001 beastie. And to round off, we shall provide a summary of the results and a further update on the EMC aspects of the project. So stand by for some thrilling bedtime reading!

LAB GRUPPEN LAB-2000C

SER. NO. 940-347

GENERAL DESCRIPTION

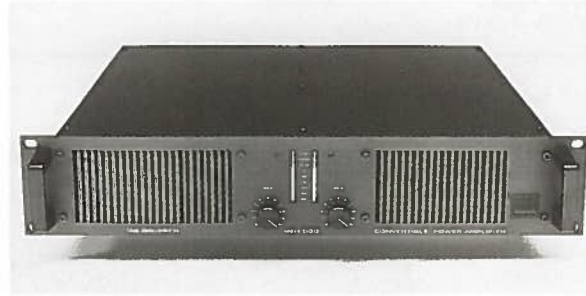
This amplifier somehow just exudes quality. It feels right, it looks right, and by golly it is right, as we shall see. It comfortably packs a genuine 2 x 1000W amplifier into a 2U rack housing just 350mm deep, weighs just 10kg, and can be configured to deliver any desired power level into almost any load impedance from 1.5 to 16 ohms into the bargain! Let's take a closer look.

The front panel is simplicity itself, with just two calibrated and detented volume controls and two led ladders which incorporate both signal level metering and condition monitoring, closely grouped at the centre. The lower six leds are yellow, with the lowest as the 'on' indicator, the next five the signal level metering in 5dB increments, followed by red clip, over temperature and RF indicators. To either side are the air intake grilles, then the handles, with the AC mains power switch alongside the left handle.

The rear panel, however, is somewhat busier. A centre section carries all the input connections and mode presets, whilst the output connectors and the associated load impedance presets are located on either side - the intervening spaces being taken up with further ventilation slots. The input connections are balanced on XLR/3s wired pin 2 hot to the IEC-268 standard which are duplicated on 6.3mm TRS jacks. Between these are three mode switches; one selects between 38dB and 29dB gain (0dBu or +9dBu), one links the two channels together for dual mono operation and the third phase reverses the input to channel B only. By setting the last two together, the amplifier is converted into bridge mono.

The output connectors are Neutrik NL4MP Speakons, one per channel, each with two fully recessed, latching push switches alongside. These are used in combinations to select the load impedance matching characteristics and can be set for the same or for different load/power combinations on each channel. Maximum continuous power delivery is obtained by connecting a load which is matched to the selected setting, whilst load impedances which are greater than the set value will reduce the power available, and impedances below the selected value are stated to provide enhanced peak power delivery. The available settings are 1.5, 2, 4 and 8 ohms and the amplifier will drive any load impedance between 1 and 16 ohms. The rated continuous output power is 2kW in total, which can be

delivered in any combination between the two channels provided the sum does not exceed the rated figure, or into a single bridged load. The maximum single channel power/load combination is 1800W/4R using the 8 ohm setting, whilst the lowest is 160W/16 ohms using the 1.5 ohm setting. Under closest matched conditions the amplifier will deliver around 1100W per channel, both channels driven, into 2, 4 or 8 ohm loads, reducing to 500W into 1 ohm or 16 ohms loads. To take an extreme illustration of the benefits of this approach, the 2000C will deliver the same power into an 8 ohm load as the Crest 9001, yet it is half the size, one fifth the weight and



draws only half the AC supply line current! It has to be the most sensible and flexible load matching arrangements ever seen on a professional power amplifier and will enable the LAB-2000C to be used in almost any application environment.

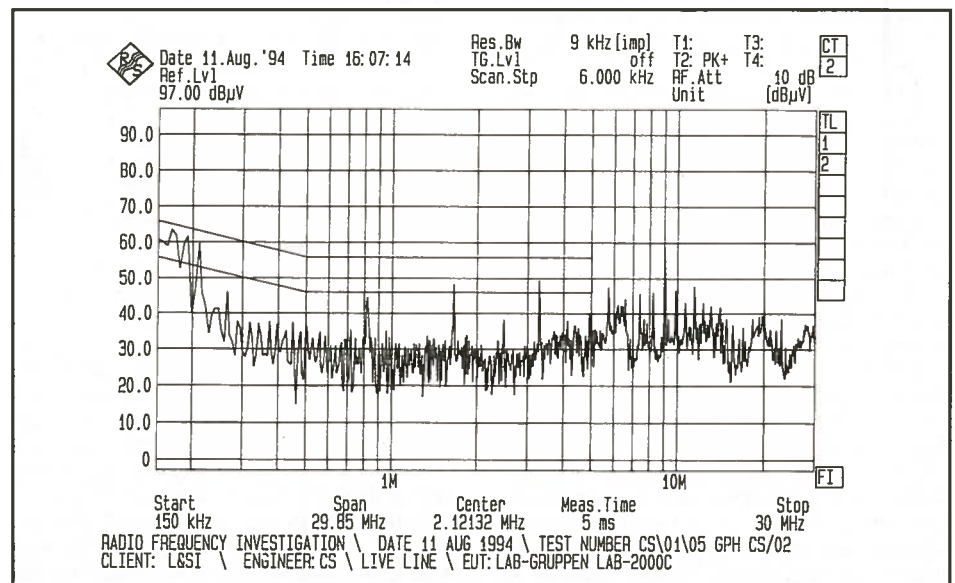
The build quality too is excellent. The chassis comprises separate folded 16SWG aluminium side and rear panels, and a standard 10 gauge 19" rack front panel, bolted together using hexagon socket engineering bolts, with 18 gauge top and bottom covers, all in a high grade black anodised finish. The chassis is braced by four interior ribs which divide the interior into five compartments, three across the front, a narrow full width centre strip and a full width rear compartment. The power transformer is sensibly placed in the centre front compartment immediately behind the front panel for best weight distribution, with the power supply oscillator, rectification and smoothing sub-assembly to one side and the

pulse width processor, DC voltage and output power 'sets', switch-mode supply stabiliser and power MOS switching array on the other.

The central strip compartment carries two axial cooling fans, the low voltage regulator and associated electrolytics. The rear compartment has two substantial bi-phase DC to AC converters inside polished copper shielded enclosures and the high current linear active filters. All connectors, the differential input pre-amplifiers and all input and output switching is carried on a narrow pcb attached directly to the rear panel. The quality of the components, the mechanical and electronic engineering and the overall build quality is absolutely superb and quite up to the rigours of road use. We have seen a number of good engineering specimens during the course of this project, but the LAB-2000C has to take pole position.

CIRCUIT TOPOLOGY

The LAB-2000C employs a high frequency switch-mode power supply and much of the weight reduction occurs as a result of replacing the traditional heavy AC mains transformer with a very much smaller and lighter ferrite cored high frequency device, in much the same way as the Chevin A750 reviewed last month. In essence, the raw AC mains is rectified and smoothed by tank capacitors to provide a 310V DC supply. This is then pulsed through the primary winding of the ferrite transformer by an oscillator circuit running at 27kHz, the transformer itself being used as a charge store device in a similar way to the Carver design. The 'on time' is regulated by a pulse width processor fed by a tertiary winding on the transformer so that full output power continues to be available at any AC supply voltage between 180V and 260V. The transformer secondary voltage is then bi-phase rectified by a pair of reverse biased fast recovery epitaxial diodes and smoothed to provide the ± 136 V rails, with a voltage divider and regulator circuit to provide ± 16 V and +38V to drive the input and control electronics. The arrangement is stated to overcome the poor



Lab Gruppen LAB-2000C EMC Conductive Emission result.

LAB GRUPPEN LAB-2000C - SPECIFICATIONS AND TEST BENCH RESULTS

PARAMETER	SPECIFICATION	TEST BENCH RESULT
Power Bandwidth:	10Hz - 20kHz	20Hz - 20kHz, -2.5, +0dB 10W - full power
Rated Power - continuous:	2 x 1200W/2Ω @ 1kHz 2 x 1100W/4Ω @ 1kHz 2 x 1000W/8Ω @ 1kHz	1300W/2Ω one channel 1300W/2Ω both channels 1332W/4Ω one channel 1260W/4Ω both channels 1010W/8Ω one channel 968W/8Ω both channels
Headroom Power:	2400/4Ω bridged 2200/8Ω bridged 2 x 1600W/2Ω 20ms 2 x 1570W/4Ω 20ms 2 x 1050W/8Ω 20ms 3300W/4Ω bridged 3200W/8Ω bridged	Not tested Not tested Not tested 882W/4Ω 100ms Not tested Not tested Not tested
THD:	Typically 0.08%	
Slew Rate:	20V/usec	
Signal Path Delay:	19usec	
Damping Factor:	Not stated	
Hum and Noise:	Not stated	-63dBu
Signal-to-Noise Ratio:	<105dB(A)	102dB unweighted
Input sensitivity:	0dBu or +9dBu	Confirmed
Power requirements:	180/260V @ 3kVA	

TEST BENCH RESULTS

The first thing we noticed was the incredibly low inrush current of just 4A peak upon switch-on. The 2000C clearly has one of the most effective soft-starts in the business.

For the purpose of our power output tests the load switches were set for matched loads with the same setting on both channels. The manufacturer's rated power output figures are given in several different formats and for all load impedances. We have taken the EIA 1kHz rating with matched load selector settings as being the closest to our own test procedure and to economise in time and space, have limited our results to 2, 4 and 8 ohm impedances. So these are the figures which appear in the table, and with which we have compared our results. We found negligible differences between the one channel driven and both channels driven conditions, and no difference whatsoever at 2 ohms. It can be seen that our 8 ohm result is marginally under the 1kW rating (-0.14dB) with both channels driven but that at 4 ohms we measured 182W above rated (+0.7dB) and 100W above at 2 ohms (+0.3dB).

The power bandwidth tests were carried out under 4 ohm matched load conditions, and it's interesting to note the HF roll-off characteristics at all power levels - which would probably account for the 'squeezed' HF performance noted during auditioning. This is apparently due to the action of a high frequency limiter circuit which - as we discovered later - can be disabled by means of a DIL switch on the linear active filter board. It seems that these amplifiers are shipped with the limiter engaged as it provides improved protection for amplifier and compression drivers alike, and virtually no degradation in quality in a rock

and roll environment, but is normally only disabled for studio monitoring applications. But, as no one told us anything about the limiter or its disabling provision until we were about to go to press some weeks after testing, and the facility is not mentioned in the brochure, we are unable to comment on the performance in the full power bandwidth mode.

However, HF limited or not, about 10 seconds after the half power sweep the 2000C had had enough and shut down. We left it to cool for 10 minutes and restarted it, but before we could complete the full power plot it shut down again, as can be seen from the curve. This was a surprising development because up to that time it had been sitting there with no sign of stress and running very cool. So we have to conclude that whilst the amplifier is capable of effortlessly meeting its power ratings, for some reason it is not happy under sustained high power, high frequency, sinewave testing and self protects under these conditions.

Another point of interest arose from the 100ms burst test. Into a 4 ohm load, but in the 8 ohm matching position, the 2000C has a 20ms IHF rating of 1570W, which is 1.5dB above the 4 ohm rated power. However, under 4 ohm matched conditions it would only deliver 882W absolute maximum before the clipping eliminator engaged, which is almost 1dB below the rated continuous power!

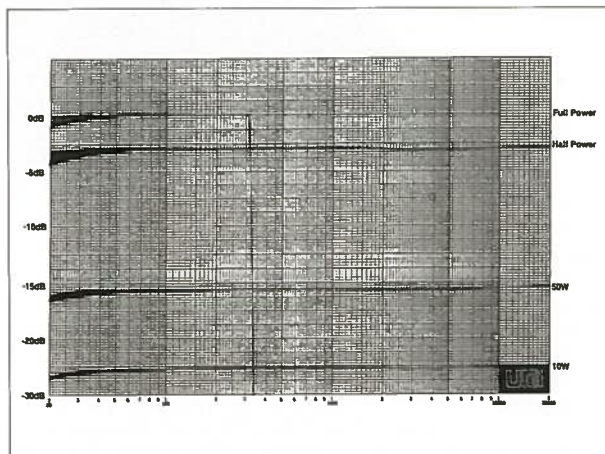
The hum and noise level was measured at typically -62dB unweighted, which gives a signal-to-noise ratio of 101dB referenced to full output into 4 ohms. The discrepancy between the measured and specified figures is due to the

bass performance often associated with switchmode designs due to an unacceptably high power supply impedance, and is a refined version of that which has been used in the SS-1300 since 1987 and therefore has an established track record for reliability.

The audio input is fed to a conventional differential input stage followed by a limiter and 20kHz low pass filter, which together are intended to slew-rate limit the signal fed to the power amplifier stage in order to avoid intermodulation problems - presumably because of the close spectral proximity of the 27kHz supply switching frequency. After a conventional IC phase splitter stage the signal is fed to an almost conventional Class AB pre-driver and output chain, except that the collectors of the high and low side output device composites are fed from those copper screened bi-phase DC to AC converters we hear so much about in the sales literature. In essence, these regulate the voltage conditions in the output stage according to the drive level requirements as determined by the base voltages on the output device composites and the settings of the load matching selectors, but do so via a comparator circuit and pulse width modulator circuit running at 830kHz.

The objective here is clearly not dissimilar to the thinking behind the class G or H designs in which the output stages 'slide' or are 'commutated' between two or three fixed voltage rails as a means of minimising heat dissipation yet providing adequate voltage swing to accommodate peak signal excursions. The difference lies in the sheer simplicity and logic of the arrangement in that there is no sliding or commutating requirement, the voltage is infinitely variable between 11V quiescent and the full $\pm 136V$ power supply rails and the arrangement naturally accommodates the load regulation and protection provisions. Extensive RFI filtering provision is apparent at every stage in the process - presumably due to the high switching frequencies used, especially in the bi-phase DC to AC converter stages.

Amongst the many benefits claimed for the 2000C topology is a very high conversion efficiency due to minimal thermal dissipation and a particularly effective heat dissipation system - a claim that was certainly confirmed during both auditioning and the test bench evaluation. The design is stated to provide twice the audio power output for a given AC supply current draw, which equates to something of the order of 70% efficiency.



Lab Gruppen Power Bandwidth Plot.

The amplifier incorporates a seven-stage protection provision. Firstly, it is completely short circuit protected by a current limiting circuit which keeps the load current to within the safe operating area of the output devices. There is also a DC current limiting circuit plus DC line fuses, thermal protection, AC protection which shuts the amplifier down in the event that the AC supply should move outside the stated working range, VHF protection and a permanent clipping eliminator circuit.

AUDITIONING

The LAB-2000C is extremely quiet, has excellent and precise control and superb LF definition, totally free of colouration. The reverberant cymbals ring-on which hides behind the bass and piano restarts during the percussive slams on Tricycle were clearly resolved, demonstrating good HF resolution and accuracy. Although the piano sound on this track was solid and the jazz guitar retained its natural warmth, when it came to the drum break the mid seemed on the splashy side, and the HF squeezed and a trifle edgy.

This impression also manifested itself on 'So Far Away', where again, the bass guitar intro was superbly resolved with all its harmonics preserved. Tina Turner's vocals had exceptional clarity, with good articulation and texture, but with a tendency to shout with noticeable sibilance. We noted that in accordance with the manufacturer's claims regarding thermal efficiency, virtually no heat was generated by this amplifier during auditioning.

F (MHz)	qpk level	avg level	qpk limit	avg limit	qpk margin	avg margin	pass/fail
0.1618 MHz	65.9dBuV	59.7dBuV	65.4dBuV	55.4dBuV	-0.5dB	-4.3dB	fail
0.2136 MHz	56.1dBuV	51.4dBuV	63.1dBuV	53.1dBuV	7.0dB	1.7dB	pass
3.2760 MHz	49.6dBuV	49.5dBuV	56.0dBuV	46.0dBuV	6.4dB	-3.5dB	fail

Table 1. Specific Spectral Frequency Amplitudes from Lab Gruppen LAB-2000C.

use of A-weighting in the manufacturer's data. Anything above 100dB unweighted should be considered an excellent result.

EMC PERFORMANCE

The LAB-2000C is clearly in a different league with respect to its EMC performance over the 150kHz - 30MHz region at least. Here was an amplifier which looked to be sufficiently close to being below the limit lines to warrant investigating three of the spectral lines in more detail. This was accomplished using the post-processing facility provided on the Rohde & Schwarz RF analyser, as shown in the table above.

The workings of this amplifier are complex and it is outside the scope of this article to offer suggestions as to how it could be brought within the limit. As with the Carver PM-1400, it shows that there is no reason why a high power audio amp should not achieve EMC compliance and that there is no need to seek excuses for retailing non-compliant equipment after 1995.

CREST AUDIO 9001

SER. NO 2300A58

GENERAL DESCRIPTION

This amplifier measures 3U high x 0.5m deep, weighs 56kg, is rated at 2 x 3kW into 2 ohms in stereo or 7kW into 4 ohms bridged mono and draws 33A from the mains at full power! It really is a brute of a thing. Also available is the 1001 which is rated at 2 x 5kW into 1 ohm and a 4-channel version, the 10004, which is rated at 4 x 2800W, both in a 4U rack and weighing some 66kg. We know of no rack assembly that could possibly be expected to house more than one amplifier of these size/weight proportions without substantial structural reinforcement, and in any event, it would require a crane or fork-lift truck to move it. This begs the question as to whether there is in fact any benefit in conforming to a standard 19" rack format at this size level. Because of the ungainly proportions and weight distribution it is an almost impossible lift for a single person without real risk of injury, which makes these amplifiers extremely difficult to handle.

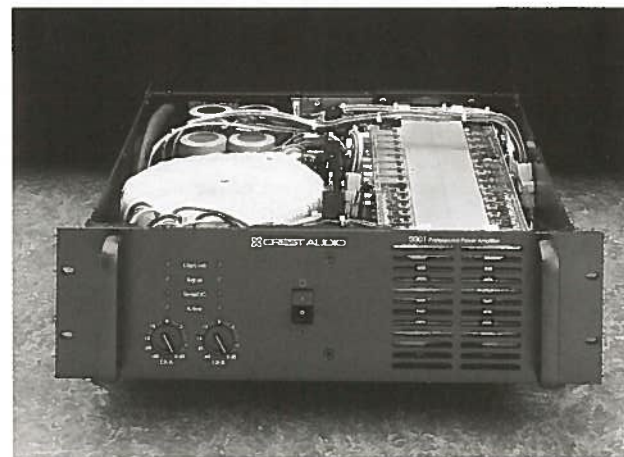
Anyone remember the old Midas 1kW block amplifiers of the early seventies? These were almost as heavy but were built in a far more manageable welded steel housing, about 320mm square on the end elevation by about 500mm wide, with two substantial bar handles recessed into cut-aways in the top/side corners. From a purely ergonomic aspect it would surely make more sense to consider an alternative engineering approach when amplifiers reach this order of size/weight proportion. The IEC-297 standard rack system was never designed for, and is entirely unsuited to, accommodating this order of pure bulk.

That apart, the Crest 9001 is superbly constructed. The chassis is made up of 12 gauge steel sections with a front-to-back central divider. The left side compartment houses the power supplies which comprise a massive 3U high by 210mm diameter 10kVA toroidal mains transformer and a pcb which accommodates six very large electrolytics, three bridge rectifiers, internal fuses, and regulation components. The right side compartment houses the amplifier circuitry clustered around a full depth 'tunnel' heatsink,

with a 125mm diameter 4200ltr/min. variable speed DC axial fan blowing through from the rear panel and exhausting through a grid of perforations in the front panel.

The front panel controls are extremely simple, comprising two detented volume controls which are fitted with rather small, partly recessed, fiddly knobs and a mains power switch which, in fact, is an MCB overcurrent protection device. In addition, led status indicators are provided for 'Channel Active', 'Temperature/DC Fault', 'Signal' and 'Clip' on each channel.

The rear panel provides two XLR/3 type balanced input connectors wired pin 3 hot - i.e. contrary to the IEC standard - with no link-through facility and no jack alternatives. Each channel is also provided with an octal valve-base type accessory socket and we confess to some surprise that these antiquated bakelite valve bases are still being used despite the mechanical and EMC drawbacks. These provide an insert point to their respective channels, make the DC power supply voltages available and incorporate an interface for NexSys - which is Crest's alternative protocol to the MediaLink remote control and condition monitoring facility which was more fully described in the Carver PM-1400 review. As shipped, these sockets are fitted with exposed metal links to facilitate normal operation, whilst by rearranging the links the input polarity



can be changed to make pin 2 hot, signal processing devices can be inserted into the signal chain or Crest's own range or processing modules can be plugged in. These include input isolation transformers, two 24dB/oct. active crossover module options (with or without built-in limiter), a dual channel limiter module, a precision attenuator and a CD horn compensation filter. A three position mode switch is provided to select between stereo, dual mono or bridged mono modes.

The output connections comprise four heavy duty hard wire terminals underneath an insulated terminal box instead of the usual 4mm binding posts or Speakons. This is necessary because up to 200V can appear across the loudspeaker terminals and to enable the large cross-section cables necessary to carry these output powers - 40A in the case of the rated 7kW 4 ohm or 3.2kW 2 ohm load - to be satisfactorily terminated. Another reminder of the sheer power capability of this amplifier - as if any were needed - comes in the form of the mains cable. This is a massive 25mm diameter industrial 'cab-tyre' rubber cable which is rated at 65A necessary for operation at 120V. At 240V operation this amplifier is on the limits of the rating of a 32A CEE/17 (Ceeform) industrial connector and the mains cable can only just be shoe-horned into a Ceeform 32A plug!

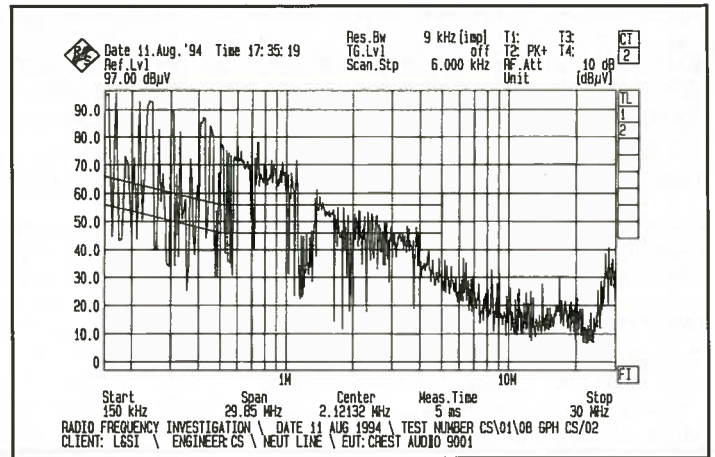
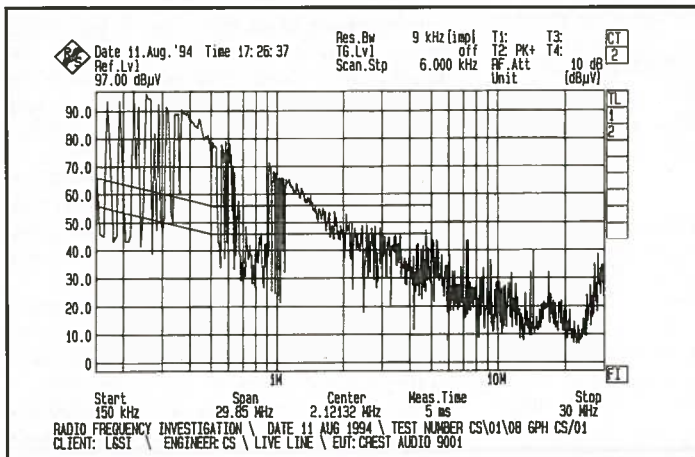
CIRCUIT TOPOLOGY

As will have been realised, the 9001 employs a conventional belt and braces power supply which produces three DC rails, one at $\pm 16V$ regulated for the input and control electronics, and two high current supplies at $\pm 65V$ and $\pm 165V$ for the driver and 'TriClass' output stages.

It is this 'TriClass' output stage which qualifies the 9001 for inclusion in the project. In essence, it is a further development of the sliding rail topology first seen in the pro-audio market in the Carver PM 1.5. In the case of the Crest 9001 the amplifier operates in Class A under small signal conditions, converts to Class AB under moderate signal conditions and slides to Class H for large signal transient conditions. Class A is the purist audiophile mode which produces minimal distortion and the most natural sound quality. It is not normally used

CREST AUDIO 9001 - SPECIFICATIONS AND TEST BENCH RESULTS

PARAMETER	SPECIFICATION	TEST BENCH RESULT
Power Bandwidth:	20Hz - 20kHz -3, +0dB	20Hz - 20kHz, -0, +2dB 10W - full power
Rated Power - continuous:	2 x 3300W/2 Ω @ 1kHz 2 x 2200W/4 Ω @ 1kHz 2 x 1200W/8 Ω @ 1kHz	3280W/2 Ω one channel 2700W/2 Ω both channels 2030W/4 Ω one channel 1790W/4 Ω both channels 1128W/8 Ω one channel 1060W/8 Ω both channels
Headroom Power:	7400/4 Ω bridged 4400/8 Ω bridged None claimed	Not tested Not tested 400W/4 Ω
THD:	<0.02%	
Slew Rate:	35V/usec	
Rise Time:	3usec	
Damping Factor:	200:1	
Hum and Noise:	Not stated	-64dBu
Signal-to-Noise Ratio:	>100dB	105dB
Input sensitivity:	+9dBu	Confirmed
Power requirements:	120/240V @ 8kVA (65A @ 120V, 33A @ 240V)	



Crest 9001 EMC conductive emission test showing both the live (left) and neutral (right) plots.

in professional applications because it is grossly inefficient in terms of heat dissipation and numbers of output devices required for a given power output rating.

Crest say that the cooling system fitted to the 9001 is quite capable of dissipating the heat over the output range over which the Class A stage operates. Class AB is the normal mode for a high power professional amplifier, which is then augmented by a bank of high voltage devices to accommodate high peak signal demands. Provided seamless commutation between the three stages can be achieved, this would seem an entirely logical topology for music programme.

Like most amplifiers these days, the 9001 incorporates elaborate fault condition and load protection provision. Firstly, there is a clip limiting circuit which allows transient peaks through but actively reduces amplifier gain to prevent sustained clipped signals being fed to the loudspeakers.

A special feature is the IGM impedance sensing circuit. IGM stands for Instantaneous Gain Modulation, which adjusts amplifier gain to a safe level whenever the load characteristics overstress the output stage. When the IGM circuit is driven to its extreme, the gain of the amplifier is reduced to zero, thus effectively providing the short circuit protection - although long term short circuits will eventually also activate the thermal trip and disconnect the load. Both the clip limiting and IGM protection provisions are stated to be sonically transparent in operation.

DC protection is provided by isolating the loudspeaker lines whenever any trace of DC appears at the output terminals and subsonic protection is provided by means of a 12dB/oct. high pass filter with a turnover frequency of 8Hz. Again, the loudspeaker load will be disconnected in the presence of abnormally high levels of subsonic energy.

Finally, there is an 'Auto Ramp' provision which is activated on power-up and whenever the protection systems have been triggered. Its function is to progressively ramp up the audio drive level to avoid a sudden burst of power in the event that the amplifier is turned on under signal drive conditions or following activation of the protection systems.

The manual provides useful additional data on how to maximise loudspeaker protection by utilising the amp's built-in protection in conjunction with external filters, limiters and fuses, and provides excellent common sense guidance.

AUDITIONING

The 9001 produced exceptionally firm and full LF with good control, as might be expected in an amplifier designed for loads down to 2 ohms and with this amount of headroom. The midrange - especially the vocals - seemed a trifle withdrawn and the HF 'tingly', but nevertheless test powerfully impressive overall. On the specific test tracks used, the bass guitar intro to 'So Far Away' was very impressive indeed, but the piano on Tricycle was jangly, the percussion snitty and the drum solo cluttered. Tina Turner's vocals we found somewhat rasping - she seemed to shout and hurt your ears - but the guitar and sax sounds on 'Private Dancer' were excellent - very well defined and articulate. As might be expected, the percussive intro to Floyd's 'Happiest Days' showed staggeringly good attack but again, the percussion was noticeably splashy. Clearly this amplifier would be an ideal choice for driving large LF and sub-bass systems, but whilst it provided lots of slam, it was considered uncomfortably strident on full range.

TEST BENCH RESULTS

Because of its high AC supply current requirements it was necessary to by-pass the RCD and MCB protection and the RFI filtering on KD's test bench, and hard-wire it into the 45A raw mains with only the main dis board MCB (down in the cellar) in circuit for protection. Also, this amplifier is at the maximum safe working limit of the 'Pokeometer' 5kW fan cooled dummy load, so the tests were conducted with extreme caution.

To consider the power rating tests first, the manufacturers give two sets of data, a 20Hz - 20kHz broad band rating measured at 0.1% THD and an EIA rating at 1kHz at onset of clipping. Although our tests are based on the

EIA approach our results are in broad agreement with the 20Hz - 20kHz broad band figures and marginally below the EIA ratings at 8 ohms and 4 ohms, falling short of both with a 2 ohm load connected. In essence, we measured around 1130W single channel or 2 x 1060W both channels into 8 ohms, 2020W single channel or 2 x 1790W both channels into 4 and 3300W single channel or 2 x 2700W both channels into 2 ohms.

However, after approximately 10 seconds of continuous sine wave operation at full power into either 4 or 2 ohms, the overcurrent MCB repeatedly tripped, even though the amplifier appeared to be running quite cool and with no apparent signs of stress. Given that our dummy load comprises close tolerance non-inductive resistors and therefore, unlike loudspeakers, does not drop below the rated value, this has to be due either to the protection circuits being activated prematurely, or to a genuine inability to maintain the rated power on a continuous basis. Given the large disparity between the one channel and both channel figures - especially at 2 ohms - we suspect power supply problems, which is surprising considering the vast physical size of the PSU components.

It can be seen from the power bandwidth plot that the amplitude response is virtually ruler flat from 20Hz to 20kHz, but note that the circuit breaker tripped before we could complete a full power plot. We left the amplifier to cool and tried again, but the result was the same.

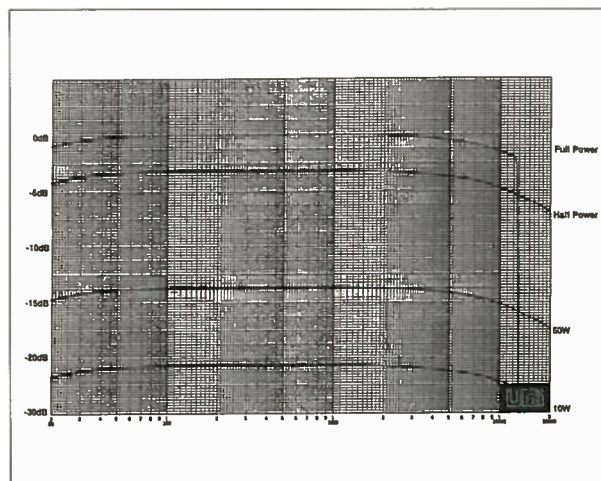
The most startling result came from our 100ms power burst test, where the maximum voltage swing we could elicit was 112V peak-to-peak before the clipping eliminator circuit clamped the swing. This converts to just 400W at 4 ohms! We repeated the test with the burst envelope reduced to 50ms, with almost identical results. Clearly the 9001 for some reason does not like pulsed signal conditions.

Hum and noise was measured at -64dBu unweighted, which gives an excellent signal-to-noise ratio of 105dB referred to full output into 4 ohms.

It's clearly an impressive beast and extremely powerful, even it does apparently struggle to maintain full power into low load impedances under continuous sinewave signal conditions and took exception to our power burst test!

EMC PERFORMANCE

The live and neutral plots from the 9001 are the only results to be significantly dissimilar and so we have shown both. We suspect that much of the activity below about 1MHz is due to the randomness of the pink noise test signal used and arises because of the fluctuating current through the transformer as the signal troughs and peaks pass through the power stages. Clearly, the current demand on the $\pm 65V$



Crest Audio 9001 Power Bandwidth Plot.

supplies will reflect mean signal values whilst that of the $\pm 165V$ rails will reflect peak activity. We suspect that this compound periodicity in current demand will account for the considerable emissions activity in the 150kHz - 1MHz frequency range. Quite how this could be resolved must be for others to determine, and it is always better to address the problems at source rather than apply remedial solutions like filtering as an afterthought if this can possibly be avoided. In any event, the provision of RFI filtering to a 10kVA power supply would not only be expensive, it would require a significant increase in what is already an enormously large and heavy amplifier to accommodate the filters.

IN SUMMARY

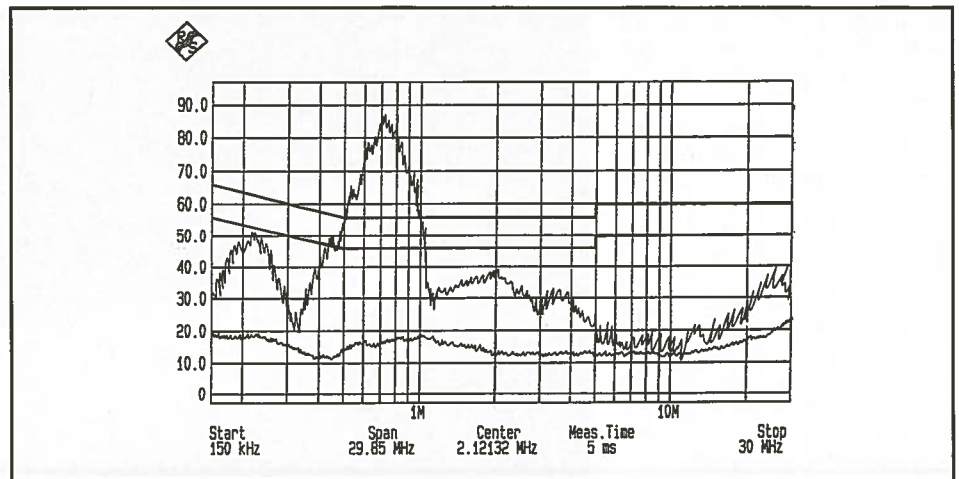
It has to be said that this has been a fascinating project with some interesting and unexpected results and we would like to thank the eight brave manufacturers who were prepared to subject their products to this level of objective scrutiny, in the knowledge that we would be delving into the still largely unexplored territory of EMC in an audio context.

With rated output powers ranging from 2 x 450W to 2 x 3.3kW, and with so many different circuit topologies, direct comparison of results is clearly inappropriate. The greater majority of the amplifiers tested were found to comply with their power output ratings, and those that failed did so by the smallest of margins - typically 0.1 to 0.5dB in relative terms - which of course is insignificant. We were however surprised to find that two of the 'heavyweight' contenders, the Crown Macrotech 3600VZ and the Crest 9001, along with the Lab Gruppen LAB-2000C, were not capable of maintaining full rated power into low load impedances under continuous sine wave conditions for any appreciable period of time without activation of the protection circuitry, whilst conversely, Carver - who are known for their transient rated designs - sallied forth with no such problems.

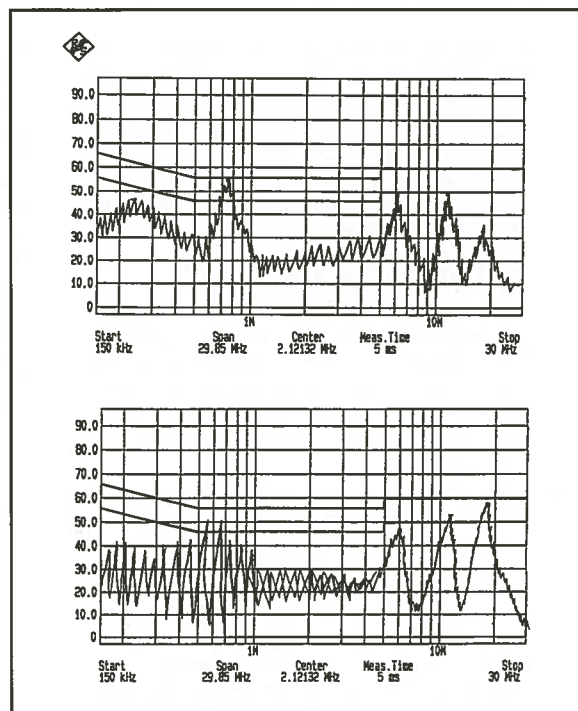
Another surprise came from the excellent test bench and auditioning results achieved by the little Peavey DPC-1000, which packed a genuine 2 x 500W design in the space of a 1U DSP device and which is so light that you can literally pick it up with your little finger! However, nothing stands still, and it is rumoured that Yamaha are poised for the imminent launch of a 1U packaged 2kW/4 ohm amplifier. It will be interesting to see how this performs and what topology is used!

Most of the review samples acquitted themselves very well under auditioning, but with the general trend that the larger amplifiers - i.e. the C-Audio, Crown and Crest - were found a trifle brittle at mid and high frequencies. However, all three performed superbly at low frequencies, and since most amplifiers of this size are likely to be used primarily to drive large LF and sub bass systems, the relatively esoteric differences are not likely to be a problem. Most of the auditioning was actually carried out by KD who considers the Hill Chameleon 1400S to be the clear favourite in terms of wide band sonic quality, with the Carver PM-1400 and Peavey DPC-1000 as close seconds, and the C-Audio as the best of the 'big boys'.

The EMC results also caused some surprises, with the only two products to come within borderline compliance with the draft PAVI standard, the Lab Gruppen LAB-2000C and the Carver PM-1400, as well as the third runner,



Hand-sketched emissions characteristics of C-Audio XR-5001 under no signal conditions as measured at the PLASA EMC demonstration. The lower trace shows the off-load noise of the measurement set-up.



Hand-sketched emissions characteristic of two power supplies for video doorphone system having a 6MHz video carrier frequency. Upper = conventional psu, lower = switchmode psu.

the Peavey DPC-1000, all having switch-mode topologies. It was because we were being offered switch-mode products for the review that we became involved with emissions testing at all in the firm belief that these would be the prime offenders, whereas, in fact, it has proved to be the traditional power supplies which exhibit the biggest problems.

KD has concluded that if he were replacing his existing in-house high power amplifiers on the basis of this review, he would choose the LAB-2000C on account of its power/size and power/weight ratio, its build quality, its superb audio and EMC performance and because its load matching feature would be so appropriate to the many applications to which his amplifiers are put in the course of his audio and acoustic consulting, reviewing and musician activities. AMW, who has met Kenneth Andersen, the senior engineer and owner of Lab Gruppen and knows the efforts which have been made to achieve the sonic and EMC performance, would also be happy to use a 2000C to power his band's FOH system. We recognise, however, that amplifier selection is a matter of horses for courses and no two users will apply the same criteria. But for what it may be worth, you have our considered views on the matter.

FURTHER EMC GUIDANCE

Courtesy of Rohde & Schwarz UK, the ISCE and C-Audio Ltd, we were able to run a demonstration of EMC testing at the PLASA Show in September, with the XR-5001 as the test specimen. Although this was not under the same controlled conditions obtained at the RFI test site, we did carry out an off-load RF background noise test and found that although this was higher than in the RFI screened room (see Part 1 in the September issue) it was nevertheless not out of order, being typically around 15-20dBuV. Also, the 1/8th power pink noise plot for this amplifier measured at the show bore striking resemblance to that measured at RFI, so it seemed that we were measuring more or less the same things despite the absence of a controlled RF environment. Unfortunately, we did not have a plotter on the stand and so can only report the findings from notes and observation.

The common factor amongst the review amplifiers with conventional power supplies is the emission activity between 150kHz and 1MHz, usually with a rising amplitude characteristic towards the lower end of the frequency scale, and which we have loosely attributed to the fluctuations in the pink noise test signal

appearing as current modulation in the mains transformer primary windings. To verify this we tested the XR-5001 under no signal conditions and found a very different EMC result which is shown at Fig.1 as a hand drawn trace on the Rohde & Schwarz grid for illustration purposes. Note that the haphazard activity below 1MHz has been replaced by a peak centred on approximately 750kHz. We consider that this lends credence to our postulations regarding the effects of signal characteristics on EMC performance, although we could have been more certain if we also had a sine wave generator to hand to see if this produced the expected odd-order harmonics of the fundamental test frequency.

During the exhibition we invited exhibitors to bring other products to the stand for testing. As part of this exercise we found that several other pro amplifiers, along with a small 50W mains/battery public address amplifier, all with conventional power supplies, behaved in exactly the same way - i.e. much activity between 150kHz and 1MHz under pink noise signal conditions and a residual peak at around 750kHz under no signal conditions.

We were then asked to test two power supply units from a video doorphone system which used a 6MHz video carrier frequency. One of

the supplies used a conventional toroidal transformer and regulator, the other a high current version using switch-mode topology. It can be seen from the hand sketched results shown in Fig.2 that the conventional transformer/regulator psu produced a similar emissions peak at 750kHz as the XR-5001 and other amplifiers off-load, plus a series of notable peaks at 6, 12 and 18MHz which we suspect to be due to the 6MHz video carrier frequency used. The switch-mode supply however, appeared to more or less conform to the limit lines, although this too clearly reflected the video carrier harmonics.

The only exception we found to this trend was the Chevin A-750 review amplifier, which is the only switch mode product to be tested which is well outside the draft PAVI limits and thus appears to break the rule. So, we have concluded that it will be those products which employ traditional power supplies, not the switch-mode topologies, which will find the greatest difficulty in complying with the EMC emission standards when these come into force on 1st January 1996.

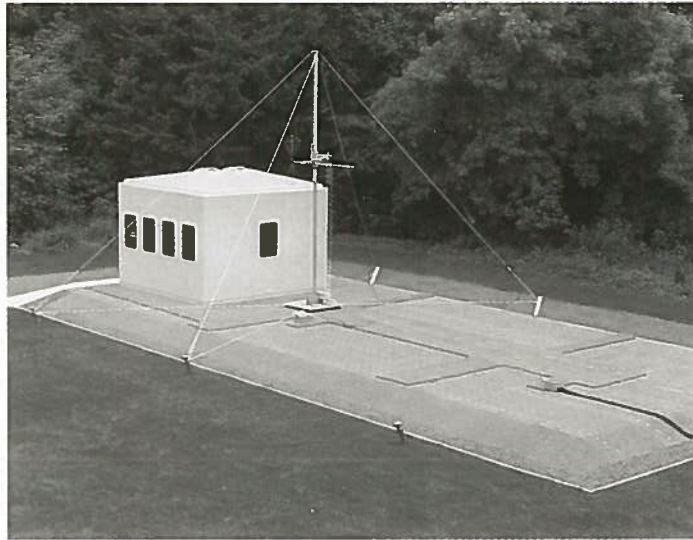
UPDATE TO PAVI EMC STANDARD

The world of standards is never fixed and this is ever true where a draft of a new standard is being worked on by its international committee. Since the time when the EMC testing for this review was carried out a few changes have been made to the draft standard (prEN55 103-1-2). The most significant is that it is now intended that the conducted emissions test will cover the frequency range from 150kHz to 80MHz whilst the radiated emissions are to be assessed from 80MHz to 1GHz. Thus the frequency ranges used in the emission standard align with those of the immunity standard.

Some manufacturers may already have carried out tests to show FCC compliance in the USA market area, or possibly with the German VDE0871 standard. The FCC standard for conducted emission covers the frequency range from 450kHz to 28MHz and the limit lines are very similar to those used in the PAVI standard. The tests for VDE0871 start at 9kHz which might pose problems for certain apparatus in the future but only if the purchasing contract specifically requires conformance to that standard. Happily, the PAVI limits, which are themselves based on CISPR 16 limits, will be sufficient to show compliance and thus to claim the right to barrierless trade across EU states. Of course, a purchaser can always stipulate a more stringent standard, but this will form part of a specific tender or purchase contract and the bid can be priced to accommodate any such requirements.

At the time of writing, the only EMC standards in being are the generic standards. These in turn call up further standards. If you are using the generic standards you should check the additional standards referred to in the informative annex, as some of these have since become adopted as active EMC standards. This means that you'll need to show you can also meet the requirements for mains harmonic distortion currently set out in EN60 555-2, for example.

When having tests carried out, the members of the BSI working panel would be grateful to know whether any problems are experienced



The Open Area Test Site (OATS) at RFI's Dunlop site.

in meeting the proposed PAVI standard. With the benefit of this type of feedback timely adjustments to the standard can be made prior to publication. Anyone with any comments to offer are requested to write to John Hoile, general secretary to committee EEL/-32, British Standards Institute, 358 Chiswick High Road, Hammersmith, London W8 4ZZ.

VISITING AN EMC TEST HOUSE

Anyone who has made a visit to an EMC testing facility before will be in a position to appreciate the benefits of planning beforehand. The starting point is to select a suitable test house bearing in mind the kind of work to be carried out. Your local EMC club may be able to offer advice on this.

For basic exploratory work it is unlikely that the services of a full NAMAS accredited test house will be required. Such a facility would be used either when certifying a product using the Technical Construction File (TCF) method, or when carrying out the final set of EMC compliance checks. We called on RFI because of their initial association with the audio industry, both through hi-fi and the professional sector. RFI's Stephen Kirk presented one of the first papers at the AES conference 'Will You be Legal?'. RFI have two establishments, one near Basingstoke and the other near Dunlop in Ayrshire - which was where they offered us our measurement day.

Having identified a possible facility, visit the site in order to talk over the kind of tests you want carried out and the kind of report you want at the end of the day. A proper test site will be able to show that the test equipment is within its calibration date, and many will be operating within an ISO 9000 or BS5750 quality standard. The fee rates will depend on whether the site offers a less encompassing pedigree for a considerably reduced price or whether you are asking an accredited NAMAS test house to provide a full written report. Expect to pay from around £200 per day for a more basic facility, through to £800 plus up to £300 for a written report at a NAMAS test house.

We would invariably recommend that you accompany the equipment under test, especially in the early stages of product design and when carrying out immunity testing. We did, and we both learned a great deal from the experience. This makes clear sense when using the test facilities as a means of investigating how and why the trial equipment is misbehaving. It is in any event essential if you have to use the subjective evaluation approach when carrying out immunity testing. Most test

houses provide a knowledgeable equipment operator who should be able to contribute towards solving an EMC problem. If you want them to act as consultants beyond the test period booked they will usually charge extra for such assistance.

Past experience has shown that you should arrive at the testing site almost as if you were expecting to be stranded on a desert island! Audio, video and lighting equipment has hitherto been a rare sight on such sites, and they certainly do not have the dozens of odd cables and dedicated connectors which are taken for granted in the usual AV workshop. Also you will need to go armed with your own support equipment such as signal generators, oscilloscopes, metering, etc. along with any special apparatus likely to be

necessary to exercise the equipment you wish to check out. If the apparatus under test is temperamental or is still in its developmental infancy, don't forget to take any necessary spare components.

With the possible exception of the 4kV electrostatic discharge immunity test, EMC testing is not normally destructive. In this regard it differs from the requirements for safety testing where damage can be deliberately caused.

Radiated emission testing is best carried out using an open area test site (OATS) because this gives the most repeatable results. The photo shows the OATS at RFI's Dunlop site. A considerable amount of space is needed in order that the receiving aerial is at least a wavelength away from the equipment under test, and also so that the assessment can be carried out with all combinations of aerial polarity and equipment orientation. The same site cannot be used to assess the equipment enclosure immunity to an RF field.

For this purpose an anechoic RF room is required. The tests carried out for this review were performed in a shielded room so that we could be sure that we were measuring the effect of the equipment under test and not the effect of some wayward transmission or interference - which is why we felt the need to qualify the comments made arising from the ad-hoc tests carried out during the PLASA Show at Earls Court 2.

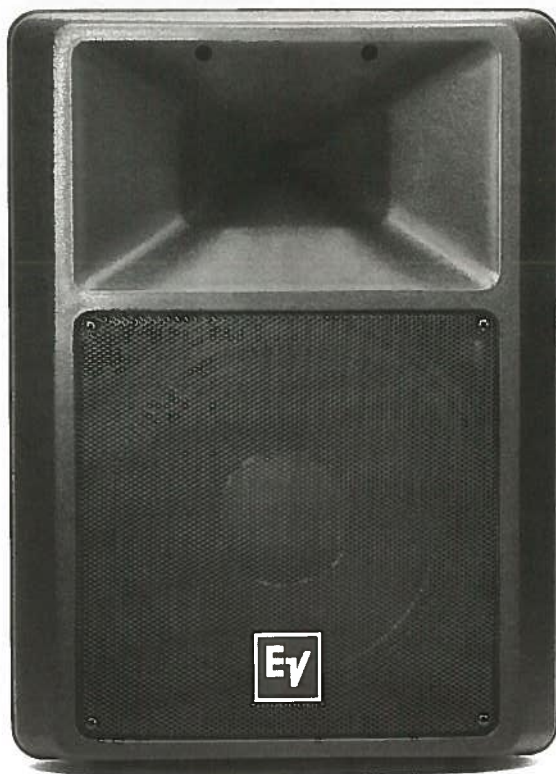
CONCLUSION

So you've taken the medicine, swallowed the results and perhaps learnt much about audio amplifiers you didn't know before. Certainly the next generation of amplifiers will not repeat the mistakes which might have been made this time around - and it is already becoming cheaper to achieve EMC compliance. Once you start it's surprising how quickly you get a feel for EMC matters and become familiar with the procedures involved at both design and test & measurement stages.

It's difficult to advise when a given design should be checked out fully and formally or when, having carried out simple checks, you should consider self certification. Either way, the legal responsibility for the declaration of conformity rests with the person who has been delegated the task of signing the declaration - after all, management of risk is one of the tasks of a manager!

*AES UK conference 'Will You Be Legal?' May 1992, chaired by AMW. Copies of the proceedings may be obtained from AES British Section, PO Box 645, Slough SL1 8BJ.

The EV Sx200.



Sorry, guys.

We've done it again.

The Sx200 Full-Range System

For ten years no-one has been able to produce a small speaker to rival the EV S200, and frankly, we're not surprised. It's taken us that long to research new materials and technology to make a stronger, stiffer, truer and *louder* cabinet. And to develop a new horn for added cut, coverage and intelligibility, even in noisy, reverberant rooms.



The Sb120 Bass Module

Having built the Sx200, we went on to design an entire system. For the bottom end we've redefined speaker geometry to make the DL12sb — a 12" woofer that's thinks it's a fifteen. The result is a new bass bin that gives 40Hz low bass, weighs only 32.2lbs, and fits easily in the back of a saloon car to boot.

The Xp200 Electronic System Controller

Now you'll want to make sure that all these extra frequencies are matched and manageable. Our Xp200 Controller not only keeps the output clean, no matter how you configure your system, but even provides adjustable enhancement of the low frequencies.



We could take six pages to tell you all about the new EV System 200. In fact, we have. Phone Shuttlesound for your free leaflet.



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ASLEEP IN THE STALLS

As the musicals and nostalgia-compilations roll into the West End in ever-increasing waves (is it true they're preparing *Five Guys Named Buddy*?), there are those who have begun to worry a bit about the straight play. Musicals can, if they succeed, make fortunes, and for this if no other reason there will always be hopeful souls out there willing to risk several million pounds (usually of other people's money) to find the next *Cats* or *Les Miserables*. New straight plays, on the other hand, have seldom been money-spinners, and now that even Alan Ayckbourn and Michael Frayn are no longer guaranteed box office smashes, an anxiety has set in: can we ever again expect to see a West End schedule that is not overbalanced by feel-good musicals and feel-snobby classic revivals?

Does it matter, you may ask? Yes, a great deal, because unless it can restock itself steadily with such works, the West End risks following Broadway as a glitzy desert, where theatregoers in search of something more than trains on roller-skates or recreations of sixties rock concerts are rare birds. Theatres that can't accommodate big musicals will close, and jobs - in what is already, God knows, a precarious enough trade - will disappear.

It's not that new work isn't being done - there's tons of it on the Fringe and even a smattering in the regional houses. Today's challenge is to make that work succeed in the hit-conscious world of the West End.

These last months have seen some brave attempts to take up that challenge, like *900 Oneonta*, David Beaird's filthily funny look at a disintegrating Deep South family. *Oneonta* started in the 100-seat Lyric Studio with the advantage of a think-big set from Tim Shortall which fits well on any stage. It may have been over-ambitious to put it into the 1,000-seater Old Vic, but it did well enough there to earn its slot in the more accessible 400-seat Ambassadors. And its original good notices have been repeated along its journey, strengthened by good word-of-mouth from audiences who have got over their initial shock at the play's colourful language and appreciated its roller-coaster of a plot. A show which ejaculated all over its audience in the Lyric simply retreats a little to become an end-stage production; audiences probably feel a little safer at a respectable distance from *Oneonta*'s exuberant action.

Beautiful Thing, Jonathan Harvey's 'urban fairy-tale' of a gay teenage love affair, has had equally friendly reviews in its two year journey from the pocket-sized Bush and the small-scale Donmar to the Duke of York's, but its chances of success there seem more precarious. Where *Oneonta* can expand easily to fill a bigger theatre, *Beautiful Thing* depends on intimacy. The inventive Robin Don has cleverly redesigned his L-shaped housing estate setting for the Duke of York's end stage, but the play's impact has been fatally lessened: it no longer wraps around to embrace its audience, and becomes - literally and figuratively - two-dimensional.

This makes me wonder what's going to become of *My Night With Reg*, Kevin Elyot's gentle study of a set of intertwined gay relationships, when it hits the Criterion. In the Theatre Upstairs, Bill Dudley gave it a traverse setting, the action taking place between two banks of audience seating.

"Can we ever again expect to see a West End schedule that is not overbalanced by feel-good musicals and feel-snobby classic revivals?"



Kendra Ulliyart's design for *Once on this Island*.



David Beaird's Deep South saga - *900 Oneonta*.

Moving it to a traditional proscenium stage shouldn't be too difficult, but it may strain the play's original intimate, muted atmosphere.

Not that a play's setting is always critical. Over the years Alan Ayckbourn shows have adapted very happily from Scarborough's Stephen Joseph Theatre in-the-round to West End pros stages, a transition that has done no harm either to Tim Firth's *Neville's Island*, which sits very prettily in the Apollo. In fact, it's probably stronger there, because while Lez Brotherston's set hasn't lost the original water-bound isolation in which

Firth's black comedy of executive disintegration takes place, you're no longer looking through its thickets to a sea of audience faces on the other side. It gives more opportunities for tight-focused area lighting, too, which Mark Henderson, as might be expected, takes well.

For *Once On This Island* (see August, L+SI), another regional import (it was staged

at the intimidating Birmingham Rep), Imagination Entertainment has taken the bold step of converting an entire London theatre to support the setting of this flimsy, if amiable musical. Kendra Ulliyart's decor doesn't just spill over into what was previously the uninteresting auditorium of the Royalty. It starts as soon as you enter the foyer, and you are led through a bustling (and keenly commercial) Caribbean market before you enter the theatre proper. Imagination are trying to justify a 90-minute show by turning it into a longer evening's experience, with an optional buffet and dancing to follow. In New York, *Island* came over as an endearing Off-Broadway piece uncomfortably marooned in a huge Broadway house. In London it gains as much from its total-experience trappings as it does from an exuberant cast who can sing like nobody's business. But its failings are summed up for me by the big storm which gets the narration under way: in a house festooned with foliage, not a single leaf moves.

By coincidence the busy Ms Ulliyart is responsible for another merry spatial adaptation, The RSC's *Venetian Twins*, which has been tarted up considerably in its move from Stratford's Swan to the less welcoming Barbican mainstage. As always, her costumes are a delight, and there is plenty of happy invention in her piazza set, where punters mingle with players in the on-stage trattoria. Once again, however, the change in playing space changes the nature of the production. It's not hard to throw buckets of joie de vivre across a thrust stage to the galleries of the Swan, but 'spontaneous' ad-libs, chases through the house, and frequently corpsing actors have a different impact in the cavernous Barbican - laughs drain away. Here Michael Bogdanov's company gives the impression of trying far too hard, and any delicacy of playing is lost: the pantomime season has arrived a mite early.

Venetian Twins will probably be a popular hit, for all that - you can never underestimate public taste; but rather more is riding on the other shows. If they succeed, producers will feel more confident in looking to the Regions again for new 'products', and they can also start to explore the considerable riches of the Fringe for new writing that appeals to a wider, maybe younger audience. If they don't, the writing is on an alarming number of West End theatre walls.

Ian Herbert

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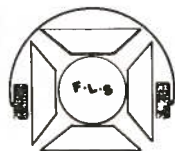
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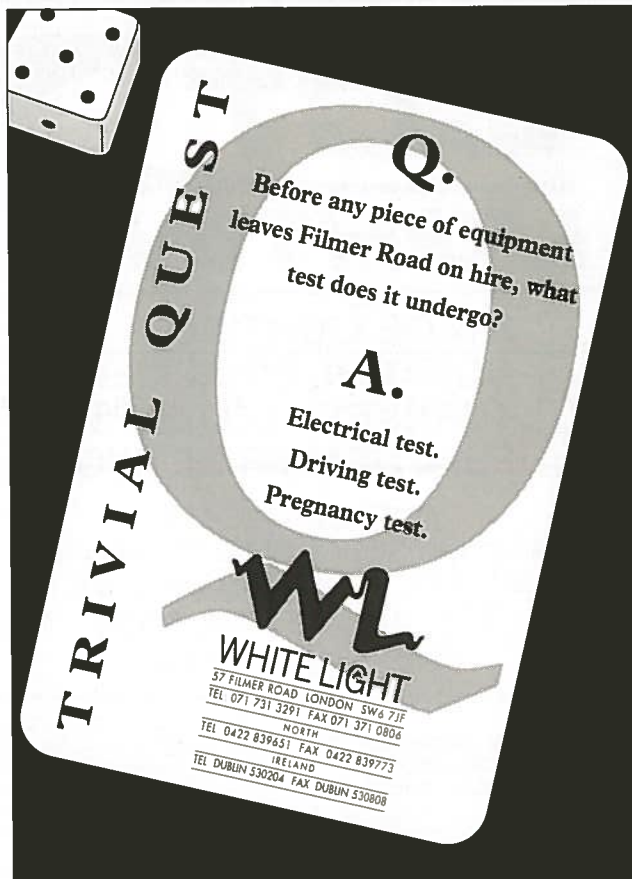
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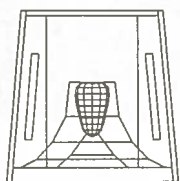
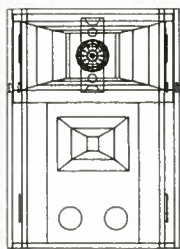
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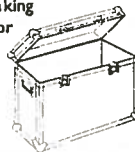
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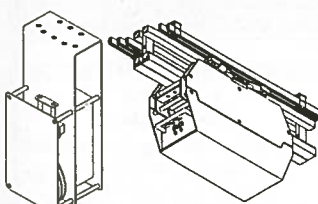
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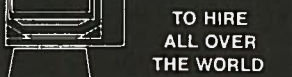


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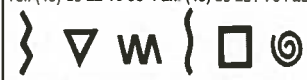
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VIEWPOINT

Chris Watts on The Qualification of Lighting Design

"What, you don't have a masters degree in lighting design? How can you think of being a lighting designer?"

Is this a statement that will become more commonplace in the coming years in the English theatre scene? I hope not. I have spent a few years working for two of America's biggest universities which are leaders in American theatre. I have even taught students that will graduate with a 'Bachelors' in lighting design. But how can they have learnt all that one needs to know about lighting from the classes. I don't think they can.

I saw a lot of students that had no real interest in the subject, but had been picked by the professors and pushed in the direction of lighting. This can only be harmful and gives the impression that the only thing these students have to do is light one production to graduate. In some cases they did not or would not understand what lighting could do for a piece and really did not have the time to explore all the possibilities. The appreciation of lighting is obviously more than drawing a plan and setting cues to what the director wants; you have to have a feel of the piece and give it the energy that it deserves.

Surely we should be able to give our students the knowledge, by example and teachings, to enable them to start to see the beauty in everyday life and the way the light moves through the day. I am not saying that we should disregard the teachings of our colleges and universities, but I do think that we should not go down the same road the American universities have taken. They seem to regard the lighting courses as a minor subject, and thus do not give it much importance.

Fortunately, in the UK we are gaining more and more lighting courses each year. But do they give the students the correct ideas to enable them to understand what lighting is about? Surely one must start with what is light, how is it made and how it travels. Only then should one move on to the colour, angle intensity, how one can change light by use of other pieces of equipment and the 'style' or 'look' aimed for. Designers should have a clear picture in their minds of what each section of the production will look like. They will, over time, build up an all-round memory of looks that can be used at different times for different feels. I found that in America the students often adopted the style of the teacher mainly because the teacher failed to allow the student to explore his or her own style. This was not the intention, but a result of the student presenting the project work that they thought the teachers would want to see and over time expect to see.

In the UK we create time for our students, often giving them the chance to work on realistic projects in real theatres with real equipment. But it is not only the practical projects that are worked



Chris Watts has been involved with professional theatrical events for the past 15 years. During this time he has worked with most of the major companies in England, as well as for the Plymouth Theatre Royal as technical and electrical supervisor. In 1987 he taught theatre lighting for Northwestern University in Evanston and Chicago. In 1988 he moved to Cornell University in Ithaca, New York, and again taught theatre lighting. He returned to England and took up a position with Theatre Projects Consultants in 1990 and turned self-employed in 1991. He has worked on projects around the world, including Glyndebourne Opera House, the Savoy Theatre, Walt Disney Concert Hall in Los Angeles and the Theatre Museum, London. At present he is Secretary of the Association of Lighting Designers.

on; the theory gives good mind and eye skills and lets the students test themselves. By requiring them to take work experience assignments, in the 'real world', they begin to understand that their world

inside the course is much closer to the real thing than they perhaps were ready to believe. The deadlines and budget restrictions are quite realistic and grumpy old production managers will cut their time in half because they messed up. The students have a chance now to make mistakes and to learn from them.

Are we in England in a position to accept graduating students as good assets? Well, I hope so. For a long time the feeling around the country was one of "well, if you had to go to college to learn about theatre then you can't be any good". Well, times are changing. Look around you and smell the roses, as the sayings goes. Students in this country are now the lighting designers of tomorrow. Not all of them will make it, some will lose interest, some will move into technology and some will become technicians. But all will remember who treated them well and who treated them badly. I am always stunned that some students get the cold shoulder from the industry. They should all be treated equally. This, by the way, is the politically correct part of this 'viewpoint'!

Now if this sounds as though I am totally on the side of the new student, you are wrong. I would hate to think that within a few years all our training in lighting design would be totally course-based. There is something good about having a mix of course-based and theatre-based newcomers. But it would be nice to see graduating designers not having to struggle against the tide of bad feeling often thrown against them. It's bad enough trying to get work without having other's pre-conceived prejudices levelled at you. I can honestly say that the students that graduate from such courses are well trained and have a good understanding of what British theatre is about.

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