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Turbosound's recently installed TSE system at the Guildhall Portsmouth
(see second feature on cluster sound systems in this issue)

PLASA

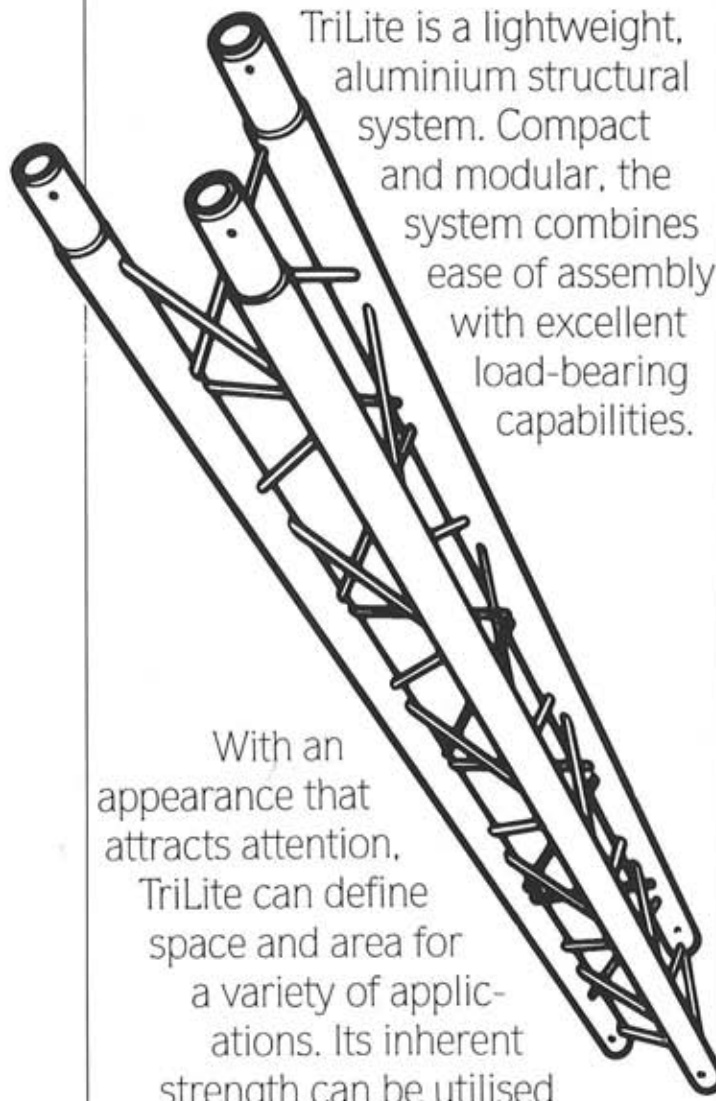
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March 1987
Volume 2 No.3

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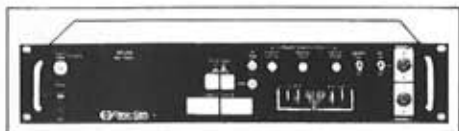
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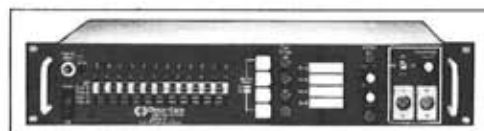
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Perhaps the final word should be left to Nick Jackson – President "Light and Sound Design" Inc. Los Angeles. *"We have used Avolites exclusively for the last seven years with total satisfaction. They are the best!"*

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LIGHTING+SOUND *International*

MARCH 1987

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Sound and Light at the Messe . . .

News from the Frankfurt Music Fair begins on page 10 in this issue.



Zero 88 Lighting's Freddie Lloyd tries out a two-handed selling act.



Pulsar's Ken Sewell opens the door on the new 'Portapack 3' flight-cased dimming system.

LIGHTING+SOUND
International

PLASA

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PLASA Olympia Bound in 1988

The Professional Lighting and Sound Association will be holding their 1988 Light and Sound Show at Olympia 2 in 1988, subject to a few small details that still have to be agreed, and the provisional dates of September 11-14 are expected to be confirmed in the near future.

The new venue, only a short distance from the present home at Novotel, will provide well over double the amount of floor space and provide room for even greater expansion in future years. It should also prove to be a more practical and positive base for Britain's top lighting and sound show.

PLASA chairman Peter Brooks told L+S: "The move to Olympia 2 will enable us to provide sufficient space to reflect the needs of the increasingly professional and fast-expanding lighting and sound industry."

It will consolidate the Show's position as one of the leading international trade shows for the industry.

Squire's complete £200,000 Showroom Project

Squire Light and Sound have completed their showroom refurbishment programme. Over the past 12 months £200,000 has been spent on improving decor, layout, product displays, and most important of all - comprehensive lighting displays - all wired up on touch panels for demonstration.

Each showroom also incorporates some lighting on an 'elevator' system - now demanded by many venues. The new London showroom features a 6' x 2' control desk sporting a mind-boggling array of touch panels and master controls. Literally any effect on the ceiling rig can be demonstrated in seconds, and the whole display can be brought to life with music, including the elevating part of the rig.

The displays include all the leading products from Squire's sole agency ranges - Lampo and Sapro. Also on display are products from all the major UK manufacturers and sound systems from Bose. "Although fashions change from year to year, we always find it vital to get exactly the right atmosphere, not only to represent the needs of the venue owner, but also to make our showrooms a pleasant place to do business in. We can say with utter confidence that each of our showrooms in London, Birmingham, Manchester and Glasgow have the most comprehensively displayed sound and lighting systems in the business," Roger Squire told L+S.

Donmar Nationwide Repair Service

Covent Garden based Donmar Limited have developed a new system for dealing with the servicing of demountable equipment throughout the UK. As an official service agent for many leading brands of stage lighting control desks, dimmers and special effects, and centrally placed in London, the company can arrange collection and delivery of equipment for repair anywhere in the UK within 24-hours, often at a cost comparable to parcel post or other methods taking three or four days.

All the client has to do is to phone Donmar who will then make all the arrangements for the collection and return of the faulty item. In most instances the client will not have a suitable size robust travelling case, and a key feature of the new service system is that within 24-hours Donmar can deliver an appropriate size of service case complete with internal protective packing. In many instances, while the carrier waits, the faulty item can simply be placed in the case which is pre-addressed and pre-paid for return to Donmar.

"Service of the equipment is rapidly carried out by Donmar staff, who have in most instances been trained at the manufacturers' premises," managing director Ian Albery told L+S. "Donmar carries spare parts for most lighting control desks, dimmers, and special effects equipment in recent or current production, and rapid repair is a strong feature of the system."

The service is available for the following manufacturers' recent or current models of manual and memory lighting control, dimmer and special effects equipment: Arri (Image and Imagine), CCT (Command), Electrosonic, Environ, Green Ginger (Microset, dimmer packs and modules), Le Maitre (MiniMist, OpitMist and Pyroflash) and Strand (M24, Gemini, Tempus, Act 6, Act 2, dimmer packs and modules).

Special arrangements have to be made were equipment not purchased from Donmar is to be serviced under the manufacturers' warranty.



Squire's newly refurbished London showroom, complete with mirrored walls, comprehensive ceiling rig, and E.V. sound system for demonstration.

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"Donmar's service customers have already found this new system has taken most of the aggravation out of dealing with any faulty equipment, and in certain instances we can also make available temporary replacement equipment if this is necessary to ensure the show goes on," said Ian Albery.

Lee Academy Award

Lee Electric (Lighting) Limited of London is to receive a coveted 'technical achievement' award from the US-based Academy of Motion Picture Arts and Sciences. The company, part of the British-owned Lee International plc group, is to receive the award for its design and development of an electronic flicker-free discharge lamp control system. The Lee breakthrough uses electronics to



Lee Colortran's 12kW luminaire with electronic ballast.

provide current in a true 'square wave' format which eliminates strobing or flickering, enabling the film camera to operate at any camera speed or shutter angle required.

Lee International founders John and Benny Lee will jointly receive the award at a presentation at the Beverley Hills Hilton Hotel on March 22.

Double Dutch

In the December issue of L+SI we included an article on 'The Escape', the exciting new venue in Amsterdam. We were wrong in our statement that the installation was carried out by Flashlight of Utrecht. Flashlight did install the Celco board and neon, but the complete design, supply and installation of all the rest of the project and the overall concept was in the hands of Profound of Veldhoven, and the lighting plan reproduced on page 9 was also their design. In fact, Cor van Avezaath, managing director of Profound, told L+SI that the venue is considered to be the 'flagship' of their design work to date, and a new concept in discotheques.

So when you think 'Escape' - think Profound!

On the Grand Scale

North London-based Theatre Projects have been making the news as far as major events are concerned. Their largest installation to date was for the 'Phantom of the Opera' at Her Majesty's Theatre where nearly £250,000-worth of sound equipment took Derrick Zieba and his team of engineers two months to install. The project involved 108 separate loudspeakers, two 8-track tape machines, 17 radio mics, and a 54-channel computer controlled mixer. Sound design was by Martin Levan.

Another big one was for ICM, the international conference division of Saatchi and Saatchi, who presented the spectacular show over the Thames to launch the flotation of British Airways shares. Lighting equipment and crew were from Theatre Projects and Samuelson Vari-Lites. Other major projects have included the supply of various equipment for a national video production of the Bolshoi Ballet in Moscow to equipment for this year's annual Faraday Lecture, currently on its UK tour. Right up to date, they've just looked after



Fane's highly popular 'Loudspeaker Enclosure Design and Construction' handbook - 50,000 copies have been sold over the past three years - has had a price increase. Increased printing, packing and postal costs have necessitated rise in price to £3.50. Fane Acoustics are based at 286 Bradford Road, Batley, West Yorkshire WF17 5PW.

sound, lighting and video for the launch party of Robert Maxwell's London Daily News.

In an effort to get to know tomorrow's clients early, TP recently hosted a two-day course on lighting with Robert Ormbo organised by the British Theatre Association, and are currently negotiating to sponsor the lighting for a forthcoming student opera production from the Royal College of Music.

Hong Kong based . . .

Electrosonic have opened an office in Hong Kong to be headed by Brian Smith and Ian Fueggle.

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Sound and Light at the Messe

At look at new offerings from British exhibitors at the 1987 Frankfurt Music Fair

The first two days of this year's Frankfurt Music Fair were restricted to trade visitors only - a change from previous years that saw overall attendance drop from the record 59,000 of 1986 to somewhere in the region of 50,000. The restriction of 'general public' to the last of the five fair days was the prime reason for the fall in numbers, but from the trade and organisation point of view everyone seemed happy.

So much so that the same arrangements will apply in 1988, and the quieter and calmer atmosphere was generally thought to be conducive to business discussion and the filling of order books.

From British exhibitors' viewpoint the Music Fair is an ideal opportunity to meet up with many of their overseas dealers and distributors who themselves go to Frankfurt for a mixed variety of reasons.

One in every three visitors to the Messe halls was from outside West Germany, and they were representing over 70 countries. A marked increase was reported in the visitors numbers from Scandinavia, Spain, Portugal, Greece, Yugoslavia, Japan, Israel and Australia.

Citronic used the Frankfurt Music Fair as the showcase for the launch of their new PPX1200 power amplifier. This model extends the current range which consists of the PPX450, PPX900 and the PPX300. It is planned to complete the range later in 1987 with the introduction of a fifth unit - the PPX150.



Citronic's new PPX1200 power amplifier.

The new 1200 extends the scope for matching units at different powers in two, three and four-way sound systems, and technical development of the unit has also led to product enhancements across the full range.

A new degree of sophistication is offered by using an active-sensing circuit. This has provided an enhanced DC protection facility which activates the crowbar device immediately violation of output DC level occurs. Furthermore, the sensing cir-

cuit has been altered to compensate for each of the amplifier power ratings, thereby matching the protection with the power of the loudspeaker system.

Further developments enable the PPX amplifiers to be manufactured with an improved DC offset at the output. The maximum DC offset on manufactured amplifiers is now only 6mV.

C-Audio's DM8 professional disco mixer was launched at the Fair, and features include 100mm faders, 8 channels, split cue LED output display, independent cue meter, built-in limiter, automatic voice ducking, 4 separate EQ sections, powerful headphone amplifier, individual control on second set of outputs, 5 stereo switchable R.I.A.A. deck inputs, a separate power supply, and a 10 watt mono amplifier for monitor speaker. Also in the C-Audio line-up was their SR range of professional power amps.

An impressive stand under the EdgeTech banner included a display of products from its subsidiaries, BSS and Turbosound.



The new V-2 high frequency device.

BSS showed off their full product range, and on view for the first time were the MSR-604 microphone signal distribution system and the DPR-502 dual channel noise gate.

Providing a high-quality solution to the problem of supplying multiple feeds from a single microphone source, the MSR-604 eliminates signal



The LS2403 24" driver.

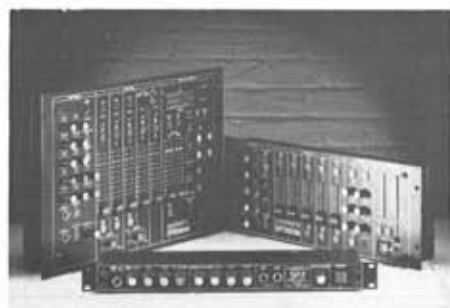
degradation, and improves overall performance, with provision of active current driving stages for long multicore runs.

The DPR-502 dual channel noise gate incorporates a number of new concepts, specially created to unlock the absolute potential of the noise gate in an even wider variety of applications. Auto-threshold and auto-attack modes allow the engineer to select initial parameters and presets, and then let the DPR-502 compensate for any variations in input signal rise time or changes in background signal information.

Centre-piece of the Turbosound display (apart from the clusters featured elsewhere in this issue) was the TFM-2 floor monitor, featuring the newly-developed TurboConcentric loading principle. This radical monitor features two 15" loudspeakers combined with a 2" HF driver, in an unusually compact enclosure measuring just 16" wide x 32" deep.

Other new additions to the range included the revolutionary V-2 high frequency device, designed to couple two 1" compression drivers and initially available mounted on the T-3 horn in the company's best-selling TMS-3 enclosure; and the LS-2403 24" loudspeaker, available mounted in the TSW-124 enclosure, featuring an unprecedented 6" voice coil, a frequency response extending to below 15hz, and power handling of 600 watts RMS.

HIT (Harrison Information Technology) were displaying their new DSA series of digital amplifiers, covering a power rating spectrum of 100 watts to 600 watts per channel. Their GP series of graphic equalisers have now taken on board extra control and performance innovations,



The SP series of professional stereo mixers from Harrison Information Technology.

and the SP series of stereo mixers, from 4 channels to 10 channels, includes the SP2, a product ideal for disco use. With four different inputs the SP2 is a mini-mixer with integral power supply and equalisation - features which make it extremely flexible in use.

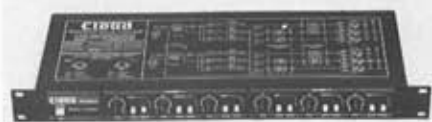


Technical director Steve Hale with C-Audio's new DM8 pro disco mixer.



Turbosound's managing director Alan Wick (centre) gets back to basics.

No less than five new products for 1987 were introduced at Frankfurt by that small company with the big reputation, **Cloud Electronics** of Sheffield.



Cloud's AX2300 active crossover.

Their AX2300 active crossover provides numerous functions and facilities required in professionally engineered sound systems - state of the art performance, proven reliability and rugged construction, say Cloud. It features superb low-noise circuitry with state variable 4 pole Butterworth filters used throughout. Two plug-in filter cards are used, one for the lower frequency and one for higher frequency, and frequencies can be specified from a preferred list from 100Hz to 6Hz. Only one filter card is required for 2-way use. Input and output circuitry is electronically balanced using XLR connectors and can easily be used in the unbalanced mode. Each frequency band has a gain control together with phase reverse and mute switches with LED indicators.



GR1500 graphic equaliser.

The GR 1500 graphic equaliser is designed for use in professionally engineered sound systems. This stereo 15-band equaliser features exceptionally quiet circuitry, and the 45mm faders have a range of plus/minus 12dB. A gain control with a similar range is also provided on each channel. A failsafe feature is the automatic selection of the by-pass mode in the unlikely event of a power failure. An active switch-on delay also selects the by-pass mode for two seconds, enabling power supply to establish and eliminating any switch-on thumps.



CV250 power amplifier.

The CV250 stereo power amplifier features Mosfet reliability and performance, together with comprehensive protection and a high performance limiter in a convection-cooled 2u 19" case. The limiter built into each channel utilises dedicated VCA with true logarithmic full wave side chain circuitry. It can only be switched in and out by an internal switch but status is indicated by

a small LED, visible through the rear panel. The CV250 features full protection, and the output connections are both XLR and binding posts. The input is electronically balanced with an XLR connector but it can easily be used in the unbalanced mode.



CV500 power amplifier.

The CV500 and CV800 stereo power amplifiers have output powers of 250 watts per channel and 400 watts per channel respectively. They each have comprehensive protection and a high performance limiter in a fan-cooled 3u 19" case. As with the CV250 they utilise a dedicated voltage controlled amplifier, and have full protection. A three-position mode switch on the back panel selects either stereo operation, mono link or bridge mode. Output connections are as for the CV250.

The **Martin Audio RS802**, designed primarily for restricted space applications, is an installation cabinet consisting of the mid and HF sections from the RS/VRS800 system. It can be used from 200Hz upwards, contains a passive crossover and may be operated with any of the Martin bass bins. Driver configuration is one Martin MI220 on a Martin midrange horn, plus one JBL2425 on a Martin HF horn. Power handling is 200w continuous, 400w programme into 80ohms minimum. The RS802 can be floor or wall mounted and its trapeze shape allows for cluster formations.

A new unit on the stand was the 2-way stereo or 3/4 mono crossover, designed to complement and enhance any Martin speaker system. The performance of each system is optimised through the use of dedicated product plug-in boards, further designs of which will be able to accommodate any future Martin system introductions. A general purpose adjustable board will also be available for users of other makes of systems who wish to take advantage of Martin Audio's advanced crossover design.

Opus Amplification are hoping to bridge the gap between hi-fi and disco markets with their totally new Elite 200 - a mightily powerful unit that will withstand 200w, looks good, and comes in a range of colours. Also on demo were their VL250 and VL300 range of speakers.

Soundtracs's new FME series made its first appearance at the Music Fair, and this fully modular console looks set to make a big impact. Due to the number of configurations and permutations available, it is suitable for many applications including sound reinforcement, 4/8 track recording, video post production, audio visual presentation, and also clubs, theatres and local radio. It has two mainframe sizes, 22 and 30 module, with a selection of module types: mono input, mono input with remote switching, stereo input including



Todd Wells (left) of Soundtracs pictured with Jan Johsson, the company's new Swedish dealer, alongside an MC Series console.

RIAA and line, with remote start; monitor input with eight monitor sends; group output with upper and lower monitor sections; monitor output; and master module.

The total range of Soundtracs audio mixing consoles is one of the most comprehensive available, and although the majority are aimed at the broadcast and recording sector, the regular up-dates on their MC Series of consoles needs to be kept in view for the larger end of the performance market.

On the stand of **Musicraft Limited** the new Soundtex MX2000 professional power amplifier is designed for use in large audio systems, discotheques or for group P.A. Each of the two 1000 watt sections can be withdrawn from the front without removing the amplifier from the rack, leaving the heavy power supply components behind in the main chassis, making connections and servicing easy.



The Soundtex MX2000 power amplifier.

Also launched were the SPX150 and 200 speakers, two new mixers - the MZ6/2 and 10/2, the SX2000 and 1000 consoles, and four new slave amps in the MX series.



Martin Audio's Bob Kelly (second left) and Chris Stirling (right) discuss their new MX4 crossover unit.



Andy Kay of Opus Amplification shows off the secrets of the new Elite 200.



HH's new 1201 and 1501 Super Series loudspeakers.

Amongst **HH Acoustics**'s high quality product range was their new 1201 and 1501 Super Series loudspeakers. They are designed for use in musical instrument amplification systems, sound re-inforcement systems and many general applications. The greatly improved performance is a direct result of changes in construction say HH.

These changes include larger and thicker magnet assemblies for higher flux density, which combined with the improved 3" high temperature voice coils give the dynamic driving force needed for super efficiency. The loudspeakers also now feature a vented pole piece, rubber magnet covers and push button spring release connectors.

Each coil is wound on a heat resistant former, laminated from high temperature polyamide film, which provides tremendous thermal durability. Specially designed cones with critically specified mass and stiffness are used to ensure smooth frequency response and fast transient attack.

Tannoy exhibited their new Wildcats live performance range of loudspeakers for the first time. Having identified a need for the product to be modified to suit two specific applications - permanent installations and mobile use - the Wildcats range is now available in two versions.

The contractors' version, for permanent installations, have cabinets made from high density particle board with appropriate internal bracing. They



Tannoy's new SR840 power amplifier.

will not have corner protection or handles but will instead be fitted with M10 insert fixing points and a range of hanging straps will be available. They will also use the new internal damping material introduced on the SGM monitors and the cross-overs feature higher power handling components.

Also on show at Frankfurt were the new Super Gold monitors, for broadcasting and recording work. These dual concentric monitors are an updated and improved version of Tannoy's successful SRM monitors. The SR840 studio/power amplifier completed the company's line-up.

Introduced by **Studiomaster** was their Series 5, an up-date of their popular mixer range which has been associated with top names in the music business. The circuit design of the Series 5 has been improved using technology developed for the Series II, III and IV to give it outstanding specifications in its class, say Studiomaster.

Extra features include five auxiliary busses instead of the former three, 100mm faders instead of 90, the two auxiliary returns can be routed to the cue/foldback system as well as on to groups and mix busses, the three-band EQ on the L/R channels can be switched to either the aux returns or the L/R outputs - rather than L/R only, and new panel colour, artwork design and Studiomaster knobs to match other mixer ranges.

The Series 5 is scheduled for production in late March and delivery expected to be in April this year.

Fane Acoustics Limited listed an enormous two dozen or so new products for 1987 which they introduced on to the market via the Music Fair. Many of these were on demonstration in custom-

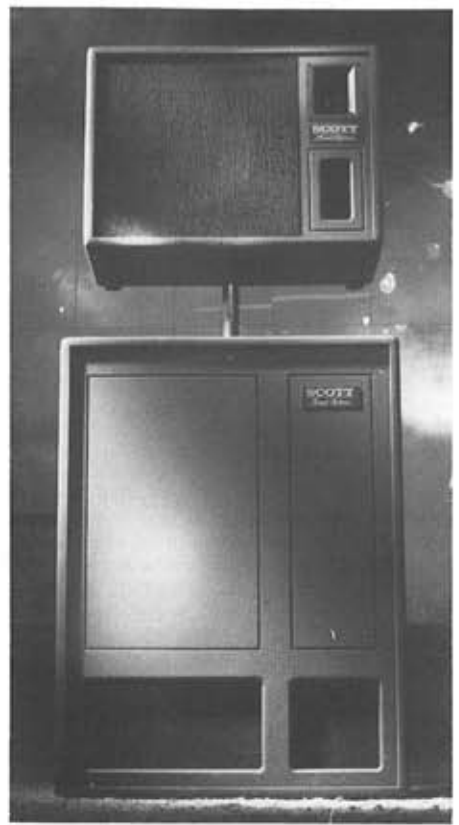


The new Studio CX18 from Fane - an 18" full-range professional co-axial speaker.

designed speaker systems. New units included additions to their co-axial speaker range, three crossover units, and three new low cost bullet tweeters.

The Rock 30 mixing desk was front-of-house on the stand of **MJL Systems Limited**, together with the up-dated and more powerful Latterpack D - a six channel power pack specially designed for portable systems but versatile for other uses. Developments in the pipeline include the PRO30 mixing desk (a more powerful version of the Rock 30), with extra mixing facilities and extra masters and with optional add-on for memory facility - 100 scenes x 30 channels.

The Gemini system was shown by **Scott Sound Systems** of Barnsley and included the new G15 bass enclosure, available in either 300 or 500 watt versions. The G12 is a 175 watt system with a 2-way 18dB crossover. Both cabinets are ideal for mobile use. A major up-grading and re-launch of



The Gemini G12 and G15.

the Gemini range is evidently in the pipeline for the 1987 PLASA Show in London in September.

On the stand of **OHM** a new 8-channel mixer was displayed for the first time, along with upgrades of the company's new MR228 compact PA speakers - the flagship of their range.

A number of new speakers and cabinets were on display on the **Electro-Voice** stand (Shuttle-sound in the UK). Included were the TL3512, which has nightclub applications, and an installation version of the 5200 stage system, the FR200. **Carlsbro** offered three new Mosfet amplifiers - the CP1000, CP600 and the CP250, and **Colin Barrett** were featuring a new series of Custom Sound Mosfet power amps.

Multiform Lighting's remote switch panel LSP430 and Light Fingers TSB431 have already been featured in our Equipment News pages. Also new on display were their Multipac 4X1MkII remote dimmer packs and Switchpac remote switch packs - 4 x 1kW black box slave packs to drive tungsten and inductive loads. These new packs are very compact and provide numerous features that make them compatible with most control systems.

Designed for either 0-10v or 0-6v control, they have high impedance inputs allowing several units to be driven in parallel, and are provided with an enable or disable input whose function is selected by an internal jumper link. They incorporate a full-on override input for matrix control systems, and



Audilec's Phil Price set to do an interview job on the Audio Technica stand with Kazuo Matsushita (centre) and Tetsuaki Katada.

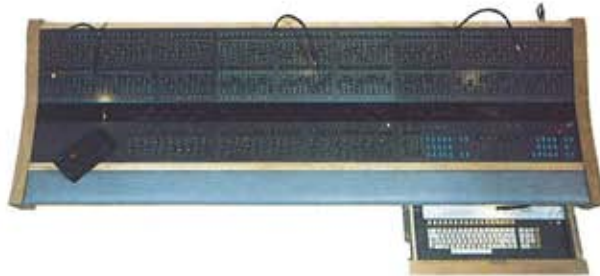


Soundcraft consoles were a big attraction on the AKG stand.

CELCO.

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Multiform's Iain Price-Smith (left) demos the Rakpac 610 dimmer pack.

an external DC output of either 12v DC stabilised or 18v DC unstabilised.

All I.C.'s and opto-couplers are socketed and the triacs are fitted in screw terminals for ease of servicing. On the front of the unit are situated the channel mimic indicators and load fuses which can be replaced without removing the lid.

Also new from Multiform is the Rakpac 610 dimmer pack (model LDP610) - a new range of compact 6-channel dimmer packs for 19" rack mounting and suitable for use with any control desk operating with standard 0-10v control signals. Each dimmer channel is provided with quick acting 10A fuse, fuse OK indicator, channel level indicator, and full-on override switch. Lamp pre-heat is available on all channels and can be adjusted by a master control on the front of the pack.

Input control is via rugged 7-pin XLR sockets which also provide an external 15V supply to power the control desk. Two sockets are provided, one on the front and one at the rear, allowing connection from either side or linking of packs for parallel operation. Available in 3 output options, the Rakpac can be supplied with either internal terminal blocks for hard wiring at the rear, or with 15A-UK or 16A Schuko sockets on the front panel. The unit is designed to allow modification from one option to another by the purchase of a simple conversion kit.

Rakpac can be used on single or 3-phase supplies. When wired for 3-phase operation the unit will continue to operate on 4 channels in the event of a loss of any one phase. The dimmers are hard firing to allow operation with resistive or inductive loads and use the latest opto-couplers and semi-conductor devices for efficient reliable operation. For ease of servicing, all opto-couplers and integrated circuits are fitted in sockets and the triacs in screw terminals.

Pulsar's new 'Portapack 3' flight-cased dimmer system has been built specifically with cost-conscious hire companies in mind. It provides 36 channels at 10 amps per channel, each channel

with fuse-blown neon indicators and full override switch for testing. Each individual module is fan cooled. At the back Socapex outlets and mains patching system allows patching of any lamp to any dimmer channel. There is also a signal patching system with Socapex signal inlet and 2 BICC sockets and Camlok mains connection.

Zero 88 Lighting were showing their control range on the stand of Neuphone. It included their new Superchaser 24, a programmable 24 channel effects unit, first hinted at at PLASA in 1986, and soon to be given a major launch under a different title. Watch this space.

Sharing a stand were Mushroom Lighting and Eminence. The latter showed off their range of lighting stands, while Mushroom's Paul Butler demonstrated his latest lighting effects including the Aero eight-lamp light curtain, and a new Transit Box. This specially-designed case has space for 8 Par 56 lanterns and filter plates, in the centre for controller and cables, and a top tray for 2 lighting stands, 2 T bars, extender bars and G clamps.

Cerebrum and Celco were together again as always. Celco's Series 2 control boards included the 90 channel 'Gold', tied in to an impressive Keith Dale-built perspex map of the world with a programmed sequence of shining lights where over 300 Series 2 sales/installations have been made across the globe. Needless to say, it was a fully-lit effect.

Shown for the first time was the new 'Connexion' system. By using the system it is possible to patch up to 450 desk channels to a maximum of 960 dimmer channels. Over the next few years digital multiplex control systems of this type are set to revolutionise the professional lighting industry.

Also on stand was the Posi-Spot moving light system and a selection of Powerdrive stands. The attractive and highly 'readable' Powerdrive catalogue, produced in a five-lanuage format was available for the first time.



Paul Butler explains the ins and outs of Mushroom's new transit box.



Matt Deakin (right) details the advantages of the Connexion system from Celco.

Apart from the obvious attractions of their gorgeous QM500 and Rolacue lighting control consoles, a highlight on the Avolites stand was their new Motor Commander - a microprocessor-based motor or chain hoist controller designed to facilitate complex movements of suspended trussing.

By the use of sensors fitted to individual hoists the system can be used to plan and execute the co-ordinated movements of up to 30 motors. It will be a powerful tool for any progressive stage designer wishing to add an extra dimension of movement to his set, providing for the control of up to 30 chain hoist motors, and is expandable in units of 30. Storage is up to 99 discrete movement cues, and there is additional storage for up to 99 'loop cues' which allows a cue to be repeated with delays between repetitions. Set-up and control is via a VDU terminal, and it is a fully menu-prompted system. There are numerous operational features and the flight case includes a useful accessories draw.



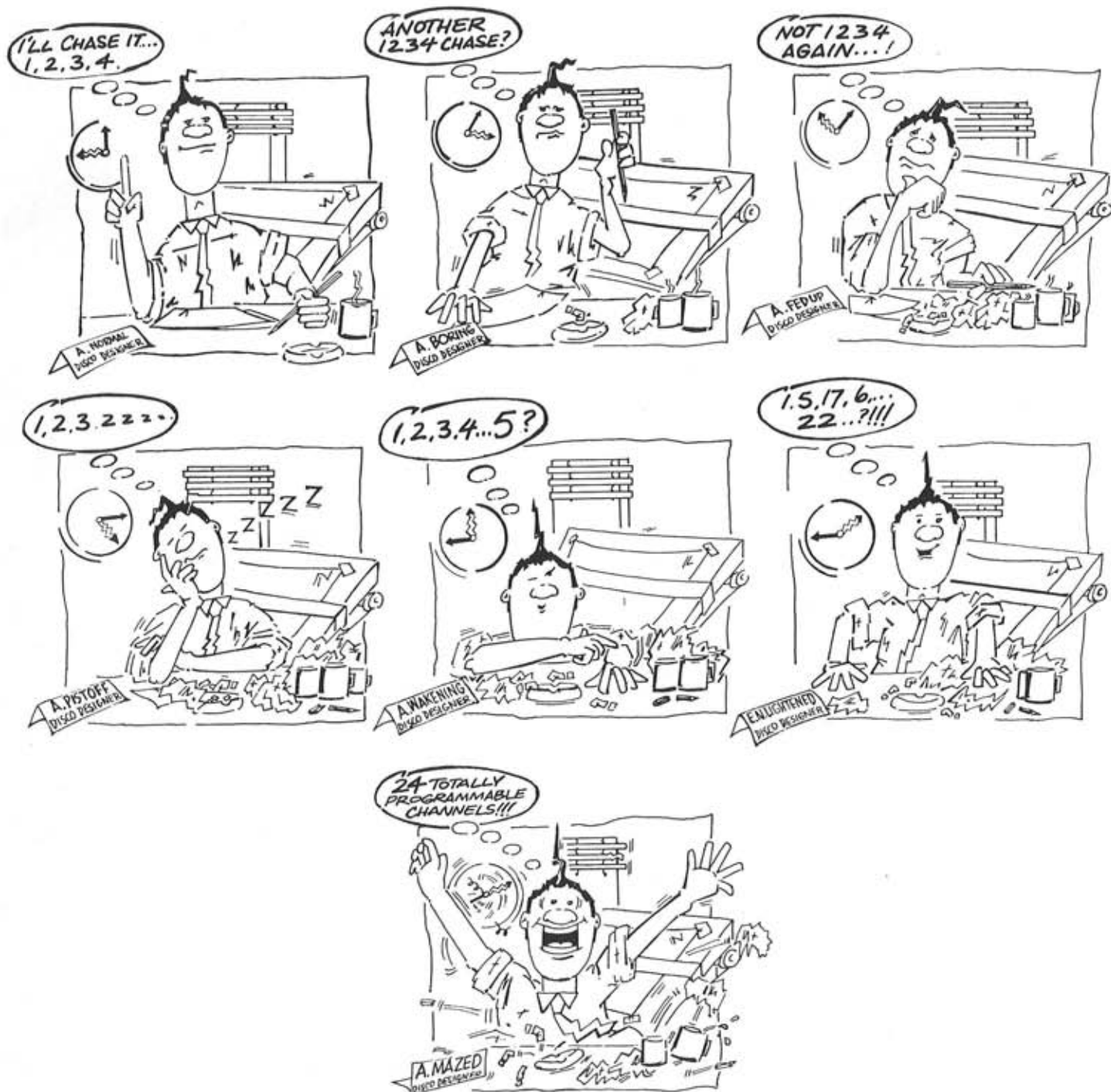
Avolites' Monique Frobose and Michael Till with the new Motor Commander.



Citronics' Mike Gerrish gets set to answer the next question.



Andrew Colley of Cloud Electronics (right) with the company's Norwegian agent Sivilingenior Husey of Fatelo, Lorenskog



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Palm Grove at First Leisure's Pink Coconut in Derby. The refit was conceived and supervised by an in-house design team.



Home Grown in Derby

Roger St. Pierre talks to club manager Anthony Walker at the Pink Coconut in Derby, where First Leisure have just completed a major refit in the Palm Grove part of the complex using an 'in-house' design team.

First Leisure have just spent a whopping £100,000 on an ambitious refurbishment of the Palm Grove which is just one part of their Pink Coconut complex at Colyear Street in Derby.

This project represents something of a milestone for the company, which now operates discotheques at more than a hundred sites around the country, since, rather than calling in outside design consultants, the whole job was conceived and supervised by an in-house team from Sean Doyle's technical services department, led by Martin Tasker. "We didn't use Mike Gibson, Group Northern or anyone else for this one - we did it ourselves," said club manager Anthony Walker proudly.

"Whether it saved money or not I don't know, but it did mean that we got the finished result we really wanted rather than what some outside designer thought we should have.

"We are the operators and we know what we want and what we need because we deal directly with the end user - the public - on a daily basis. We had a lot of ideas input from our crowd and it influenced what we did. After all, each community has its own likes and dislikes and what works perfectly at one club would not necessarily work at another club in another town."

The philosophy behind the refit was simple: "We've always done good business here, so our aim was not so much to increase admission levels but to consolidate what we have already got.

"We do capacity business every Friday and Saturday, 1000-plus on Thursdays and around 500 on our Wednesday over-25's nights, with plenty of private lets on Mondays and Tuesdays," said Anthony Walker.

Part of First Leisure's 'A Division' of venues, the Derby site is three clubs in one - with a single admission price. Previously part of the old EMI network, the place was refurbished back in 1978 as Romeo and Juliet's and was one of the club's which launched the First Leisure name on to the club scene.

A major re-vamp in 1983 saw the introduction of the 'three-in-one' concept. The Pink Coconut, with a capacity of 900, is the main room - a 'Marks and Spencer discotheque' as Walker calls it, aimed directly at the mainstream audience. The Peppermint Lounge, with a 150 capacity is a comfortable relaxation suite with softer, quieter sound and light, while, in contrast Palm Grove is described as a "thoroughly 1987 up-front discotheque".

Palm Grove's overall feel is something like that of Birmingham's renowned venue The Dome - but without the Dome bit! "With the refit, we've moved away from the soft, pastel colours and ostrich feathers approach and gone back to hard disco, with lots of light and movement," explained Anthony Walker. "We've used lots of mirrors, lit with tivoi, to heighten the atmosphere.

"Since we have a lot of private lets, which are good earners for us, we've made provision for a stage and have put in proper stage lighting above it. We've had to build in a lot

of flexibility. For instance, we've got a country and western night coming up as a private let and that's followed by a fashion show - which requires a totally different kind of lighting. These days, you've got to be able to offer lots of flexibility in your lighting scheme.

"The Palm Grove has 30 Par 36 cans serving the stage area alone and they become part of the dance-floor scheme by night. By using mirror-clad walls inlaid with tivoi we've been able to bring the whole room alive.

"The dance floor has been extended, and we have totally refurbished the two very large bars but we have made no provision for a formal restaurant as we find that our punters would rather buy a meal in a basket and take it over to wherever their friends are sitting. People don't go to clubs to eat in groups any more.

"The club is full of downlighters - we haven't used any real uplighting at all - and we have carpet with UV lines in it which add colour, warmth and atmosphere to the place."

One of Palm Grove's most successful features is a corner area containing a mass of motorised mirrorballs flanked by mirror screens and lit by Par 36's: "Mirrorballs are the oldest effect of the lot - going back to the old dance-hall days - but they are still the best, they still work."

In all their clubs, First Leisure only have a handful of lasers in total. "We go for atmosphere rather than sheer spectacle," said Walker. "We tend to put as much money into fixtures and fittings - surround lighting and sound and so on - as we do into effects lighting."

At Palm Grove, the effects include Galaxy balls, a Tri-copter, the ever-dependable Par 36's, scanners and the like. "We haven't gone for one massive central effect as we are not convinced that they work well enough in practice. Those massive hydraulic rigs which go up and down are just too unreliable. I think people have gone too hi-tec with them - they look great when they are working but they are always going wrong and cost a fortune in maintenance. They just can't last the hours of use we demand - four or five hours a night, six nights a week.

"At Palm Grove we've got a central rig but it is static and is filled with individual effects rather than one big complex one. We use smoke machines and strobes and have a neon feature behind mirrors which is very effective."

It is on the sound side of things that Palm Grove has really stolen the lead on its competitors. "We went for the new Turbosound speaker system, which really is the state-of-the-art in sound. There's only a couple of clubs in the whole of Europe which have it in full-blown form like us. Our managing director Mike Paine came down and asked how much we intended spending on it. When we told him, he said we must be joking and couldn't spend that kind of money, but he went away and heard the system in operation and said 'you've got it!'

"We feel we can justifiably claim to have the best sound system in the country. I suppose we've gone OTT really, but it should take us right into the 90's. Top quality sound is a vital element these days. After all, people can go into a hi-fi shop and buy an off-the-shelf sound system for £350 and enjoy superb sound at home, so if you want them to pay to come into a disco you've got to give them the very best."

First Leisure's investment in Palm Grove has been huge, but, feels Anthony, well justified. "In the past, club operators have tended to neglect their secondary rooms but First Leisure wisely sees that they have huge earning potential. It's nice that the company is spending its money in this way."

Paul Smith of JSG of Bradford supplied and installed Palm Grove's superb sound system while the lighting supply and installation was provided by Steve Wilcox, contracts manager of Effects Lighting of Leicester, both of them working closely with First Leisure's Martin Tasker, who masterminded the whole scheme, with input from the club's own on-the-spot staff, headed by Anthony Walker.

"We've got a club within a club that we can be proud of," he said as he welcomed the first of another busy night's punters.

Sound Equipment:

Technics SL1200 turntables with Stanton cartridges
Cloud DM600 mixer
Formula Sound S19G graphic equaliser
BSS FDS360 crossover
3 x C-Audio SR606 amplifiers
2 x C-Audio SR404 amplifiers
3 x Turbosound TMS3
2 x Turbosound TSE-218

Lighting Equipment:

Meroform lighting rig fitted with 32 Par 36 pinspots, 16 Par 64 floods; 32 x 70-watt Nisel high-power pinspots; two McCormack Pershing 2 halogen tumbling dice effects; two contra-rotating SIS helicopters; two Pulsar Jumbo strobes; LSD Twister; Lighting Development Tri-copter; selection of 360 degree and 90 degree scanners. Control system based on Mode 5, with two Mode Unit 8 programmable touch sensors. Mode unit 4m controller for Tivoi lighting to mirrored walls. 17 mirrorballs, plus mirror screens.

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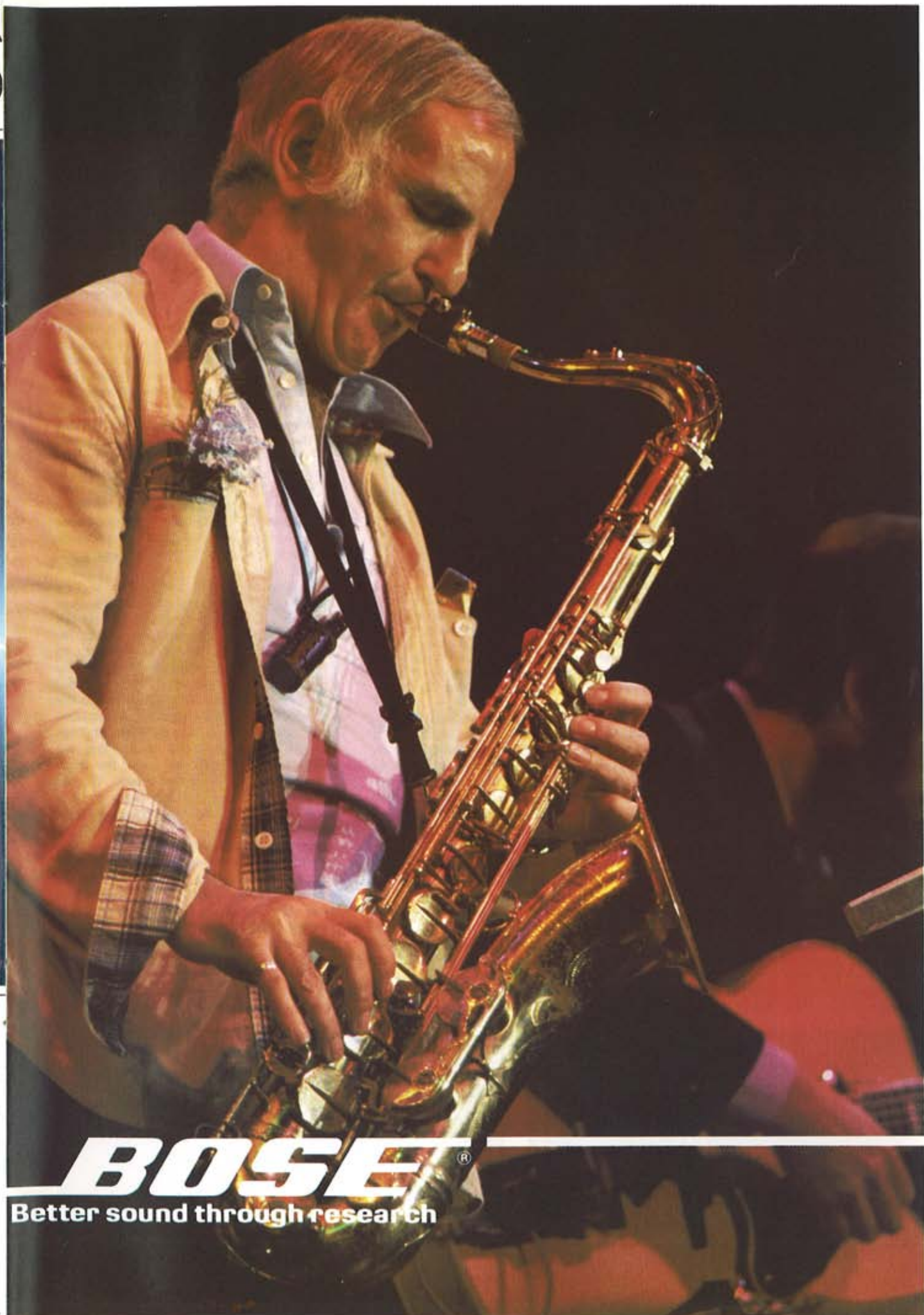
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Bose Banks on Dealers

John Offord visited Bose UK headquarters at Sittingbourne in Kent and talked to general manager Alan Kilford about the company's products and its operating policy.

"Until the last few years, Bose was very much a domestic-orientated product corporation. It was founded in the hi-fi industry with the 901 and it was only with the advent of the 802 - or the 800 as it was then - that we got into the professional market seriously. And even then it was via certain subsidiaries. At that time the Americans, as I understand it, saw the professional market being based around the MI industry, whereas we in the UK saw it based upon the installation and hire side," explained Alan Kilford.

"We have a very good reputation within the corporation of being five years in advance of everybody else, including the Americans, on the professional side. And Britain has certainly led the way as far as installations are concerned. In terms of numbers, and the sheer size of America and its MI market, US turnover is very substantial indeed. But in terms of installation and installation expertise and the sort of contracts we were getting, I would say that the UK has led the Corporation, and has done so for a number of years."

Alan Kilford puts the reasons for their success down to their dealers. "It is all down to good dealers, and the fact that the product was right for the market. We believe in 'small', with small drivers, trying to keep the cabinet size down to as small a size as possible. It means in the case of the 802 that the industry can see it as a 'building block', and one pair will do a job. If you have a larger audience or a wider auditorium then you put two or three pairs on top and just connect them up.

"The reputation we've built up is very kind, and it's very very useful to us, because we get an enormous amount of help from the States in particular. We are only ahead of everybody else because of the type of dealer that we have in the UK, and we are totally committed to a dealer network. We have to have the right installation company for our product, and we are totally committed to working very closely with our dealers, to the point that we almost have an 'open house' atmosphere."

I asked how this development had come about. Had it come from the dealers, or did it come from Bose? Or was it something that just happened because of the type of dealers



Alan Kilford joined Bose over three years ago as southern sales manager on the pro side after a career that spanned many aspects of the audio industry. He was appointed general manager in May 1986 when Walter Mirauer left the company. "I thoroughly enjoyed my time with Walter," he said. "A lot of the success of Bose in the UK has to be put down to him and his team at the time."

Bose had? "In the UK certain dealers recognised the quality of the product and the research that had gone behind it, saw the opportunity, and it spread from there. As our reputation grew, so more and more enquiries came in from the trade. But it's really only after the last three years that we've reached the stage we have," said Alan Kilford.

"In the UK we've always been predominantly in the pro market. Our hi-fi side has always suffered for two reasons. Firstly we are competing against a good home-based industry, and quite rightly, the industry supports its own. Secondly, we have the reputation of being slightly more expensive than most, and that applies to pro as well as hi-fi. Thirdly, in the UK, where there is such a healthy loudspeaker industry, and again I'm

talking predominantly hi-fi, our principals of direct reflecting sound are not altogether accepted. Over the last two years we have made great steps. We have an expanding domestic market, and we have just completed two major deals to supply Bose hi-fi into national outlets.

"And as far as Bose is concerned, the hi-fi is slightly different from the pro. In the pro field we are not saying 'this is direct reflected sound'; we are saying there is wide dispersion sound. Going back to the early days, Dr. Bose wanted to buy a pair of loudspeakers, and was horrified that he couldn't buy speakers based on technical information. Being the man he is, and having the facilities of the Massachusetts Institute of Technology and the co-operation and support of certain of his colleagues and students, he investigated acoustics and psycho-acoustics in his spare time. This was back in the mid-fifties when unless you had something like a ten, twelve or eighteen inch driver in your cabinet you really hadn't got a speaker at all. Even eight inch drivers were frowned upon in those days.

"Dr. Bose also studied the violin, and he realised that when you go into an auditorium and listen to a concert, the sound system employs reflections from the walls. He believed that that had to be the way to achieve concert hall realism in the home. So our hi-fi speakers are very much directed with drivers facing forward as well as to the rear so that we can bounce the sound from the back walls, onto the side walls, and out into the room. In terms of listening we always light-heartedly say we're the most 'hospitable' speaker for this reason. We say you can sit anywhere in the room and still listen in stereo - still hear two channels by using reflected sound.

"To some degree we've had a reputation over the years of being brainwashed by Dr. Bose. It isn't altogether true, and it's a bit unfair. At whatever stage you join Bose, if you know nothing about reflected sound, the principle makes so much sense that you believe in it. In the case of the pro it's slightly tapered to give wide dispersion. Obviously it's far more detailed than this, and Dr. Bose would probably rap my knuckles most severely for simplifying things too much."



Tony Cowell in the Bose service department at Sittingbourne.



John Hancock keeps Bose stock in order.

What is it about Bose product that make them 'different'? "We have over 100 people in the research department at Framingham in the States. We devote a lot of finance into the department, and we have our own engineering and production - and they are experts. For many years we've been convinced about computer testing of products. We've also been convinced that it isn't sufficient to produce a driver that when you put it to a scope you can get 'x' amount of measurements. We take it a step further. We freeze them, and we put them into water. We drop them, we throw dust and sand at them. We come out with a product and we can say to our buyers that the driver is guaranteed for five years.

"It's an attention to detail all the way through the development of the product.

Background to Bose

Although the company was founded in 1964, the story of the Bose Corporation began in 1956, when Dr. Amar Bose was an assistant professor of electrical engineering at the Massachusetts Institute of Technology. Shopping for a pair of speakers for use at home, he assumed that his knowledge of physics and electronics would allow him to select good-sounding speakers by comparing the technical specifications provided by each manufacturer.

But all the loudspeakers he auditioned at the time were a disappointment. In particular, his intimate knowledge of the sound of the violin (having studied the instrument for seven years) made him acutely aware of the limitations of these loudspeakers in reproducing the sound of string instruments. He was thus prompted to study the relationship between reproduced sound as perceived by the people and sound as measured by electronic instruments.

Dr. Bose and his students at M.I.T. performed in-depth studies in the area of Psychoacoustics. They discovered that existing measurements for loudspeakers did not correlate with human perception and that new measurement techniques had to be developed.

From those small beginnings the Bose Corporation now houses one of the most advanced acoustical engineering shops in the world. The company's scientific staff includes specialists in many fields and technical innovation is on-going, and regularly incorporated into existing products as well as into the development of new ones.

Most of the original engineering team members are still with the company. While some remain in research, others have assumed management roles in marketing, manufacturing and administration. And in addition to his position as chairman of Bose Corporation, Dr. Bose retains his faculty appointment as Professor of Electrical Engineering and Computer Science at M.I.T. He teaches acoustics and supervises graduate and undergraduate thesis students.

The Corporation's headquarters in Framingham, Massachusetts, reflects the company's attitude to design excellence. The modern facility, located on top of The Mountain, provides a vista of lakes and forests. The building is specially designed so that all employees can enjoy the spectacular view. The sophisticated and functional plant is clean and spacious, relaxed and comfortable and houses research, development and production facilities.

Bose also has production facilities in Hokinton, Massachusetts; Hillsdale, Michigan; Sainte-Marie, Canada; and Carrickmacross, Ireland. And in addition to the UK subsidiaries in Australia, Belgium, Canada, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Spain and Switzerland.



Bose pro line-up. Left to right: the 101, 402, 802, and 302.

And when we've completed all that, and launched a product, we go back and work on it again to see if we can improve it, with new trends and new ideas. Also, we are constantly looking at ways of solving some of the acoustic problems that people experience around the world," said Alan Kilford.

Bose rely very much on feedback through their dealer network. "There are mechanics within the company structure to report back. Because the Corporation is a 'listening Corporation', we do listen to the industry. We are not in an ivory tower, with the 'law according to Bose' philosophy."

Bose are very strong in the club and brewery markets in the UK, and also in the hire field. They are also seeing major improvements in the audio visual market. "Local authorities are an interesting market. When I was asked to give a presentation to the Americans last July it touched upon a nerve that's been bugging me for most of 1986. Around a year ago I was very conscious of the fact that when we had a building like Terminal Four at Heathrow for instance, we never got Bose equipment in. At the time a new project was built it was never a first-time Bose installation, other than in clubs. We were always called in for refurbishments, and that's where we were successful.

"In my opinion we were not successful on getting hold of 'first-time' installation work, and this started to bother me. We felt that we ought to look at interior designers and the like. We had to take time out to find out how they work, the language they used, and how they responded to the media - whether it was advertising, direct mail, or whatever. We spent some months thinking about it, and decided that when we had the computer package we could use as a credibility tool, we could talk to them and introduce our company to them. And just as important, introduce our dealer network to them.

"It was important that we took our dealers to these people. We decided that we would first of all exhibit at the Northern Interior Design show at G-Mex in Manchester in late 1986, and it was a tremendous success.

"The results have been better than we'd anticipated, and the position we are now in on developing this market is solely due to the efforts of Barbara Churchill - in addition to her normal work as northern professional sales manager."

Going back to basics, why is the 802 so popular? "The reason the 802 is so established is the research, design and reliability of the product. It could also be summed up by

saying that there are better speakers than the 802 per particular job. But the 802 will do many different jobs extremely well, and it will, because of its wide dispersion, solve a lot of the problems that other speakers won't.

"But that doesn't mean that there are bad installations around with other speakers. What it does mean is that if there are problems, I think we stand a better chance than anybody of solving them. And if they have a bad sound, the chances are that Bose will sound good to very good, whereas others will sound awful. When you get a good source signal we will sound magnificent. So it's the element of flexibility, plus reliability, plus research, and engineering. And, of course, it's small! You can pick up a pair, one in each hand, and walk away with them."

The Bose range of products, from the top, are the 802 and the 302 systems for discos and the stage - high energy work. Coming down from there, the 402 is a column speaker with four drivers. "It's an extremely good speaker," explained Alan Kilford, "and to a certain extent it's suffered because it's in the shadow of the 802 and from being the next model down. Fortunately over the last year or two it's found its niche for PA and acoustic work on stage. For foldback on stage and installations where you can't put an 802 box, you can put a small column in and still have quality sound as opposed to a normal line column speaker sound. It's an alternative to the 802 in the installation market depending upon how big the room is.

"Down from there we have a situation where some of our hi-fi products solve pro problems too - notably the 301. The 301 is



Philip Carpenter, financial controller.

an extremely good speaker, very good quality, easy to drive and install, and there are coloured 'boutique' versions available. They literally go anywhere. We've put them into clubs where we have an 802/302 on the dance floor area and the 301 goes in as in-fill on the balconies, bars, and so on. They also go into pubs, restaurants, and shops - including HMV in Oxford Street. The smaller 205 speaker is also used on installation work, mainly for wine bars etc., as is the 102 ceiling speaker."

What new products would be coming from the Bose stable in 1987?

"Around April time we will be introducing a product called the Acoustic Cannon - at least we're calling it that at the moment. This product has evolved because of our growing involvement with cinema sound. And again, when the Corporation in the States were looking at cinema sound, we in the UK were looking at it too. It was only by chance when we made a telephone call to the States to ask a technical question that we happened to get through to Brian McCarty - an award-winning sound man who has worked with Spielberg - and he asked why we were asking these particular questions.

"It's because of his involvement that we've produced this product. There is a need to develop certain things in cinema, particularly good, accurate sub-sonic bass. And this acoustic cannon will go down far below a 302 system."

I asked why this had happened in the UK. "We are always looking for new avenues to explore, and we've always assessed different courses. With cinema sound we were introduced to a company in Greater Manchester who are important in this field. In establishing a very good relationship with a certain key person in the organisation it was mutually felt that Bose had something to offer.

"At that time we were talking about the 302/802 system, but during various discussion and research, it led us to make the telephone call to the States that made us aware of the new product under research. Since then we've put a 302/802 system in mono into a cinema in Greater Manchester as an experiment - and the reaction we've had from many different areas was that it was a very big success.

"The acoustic cannon is essentially a 'tube' - around six feet long - and uses the acoustic wave principle the Corporation has developed over the last seven years or so, and it will obviously have an electronic controller."

There will be two versions, one for cinema, and one for the discotheque industry. "The bass response of the unit is extraordinary, and there is no way that you can describe it as anything other than that. In March we will have some prototypes built specifically for the UK and Japanese markets. This will be the first major new product, apart from upgrades, since the ceiling speaker which was launched at the PLASA show in 1985.

"In addition, we have a very important hi-fi product, which we think will have professional applications, but we need to produce dedicated professional versions of it first. This will also be released in April. In September we have a very, very exciting product coming out. I will talk to you later about that! It's a biggie, for sure, and dedicated to the pro field. I've got all the information from the States and they asked for a UK opinion. It will cause a lot of interest, and raise a few eyebrows. It will certainly be a major launch."

If it's going to be big for Bose, it will be big for the industry. I asked for some clues, but Alan Kilford wouldn't give anything away. "Some knowledgeable Bose dealers will not be totally surprised, and I think some Bose dealers will be totally amazed! But one thing it will do is generate a lot of talking points."

Once again the talk went back to the dealer link that Alan Kilford returned to at numerous points during our conversation, and which is reiterated frequently in the company's literature.

"We have tried to be very professional in the way that we address problems, and in the way we handle our business. We try where possible to offer that sort of help to our dealers should they need it. Our PR representatives have an open-ended brief to talk to any dealer on any subject.

"And we take things a step further. We don't consider Bose UK to be a supplier only. We like to offer a complete service. It's our dealer's decision as to whether they support Bose and only Bose, and some do. I'm grateful that we have that sort of support, but it bothers me, because I think they are doing themselves a disservice by not offering their customers a choice. As we've already discussed, Bose cannot solve all the industry's problems. And therefore there will be many times when some of our key dealers are faced with putting in an alternative system to Bose because the alternative is the right system.

"I would like all my Bose dealers to have an

alternative loudspeaker, at least one, running with Bose, to cater for that eventuality. If they don't, they are selling themselves short, and they may be putting in something they don't totally believe in. They may be putting in a Bose system thinking 'maybe if I've got brand 'X' that would be better for this particular job - but I haven't, so I'll put Bose in'. I thank them for it, I really do, but at the end of the day their reputation and our reputation is on the line. I've had this conversation with two or three dealers in the last few months to persuade them to look at things this way.

"We are as an industry becoming more professional, and it's good to see it. A lot of dealers are solving problems rather than taking short cuts to get round a problem, and that has to be professional. The trend is there. The industry has certainly seen the need to become more professional, and address their problems in a professional way."

Bose People

Alan Kilford is general manager

Barbara Churchill is northern sales manager (professional)

John Dodson is southern sales manager (professional)

Philip Carpenter is financial controller

Tony Cowell is service manager

John Hancock is warehouse manager

Angela O'Sullivan is secretary to Alan Kilford (there is an identical sales structure for the Hi-Fi Industry)

The (Quiet) Revolution

Graham Waile attends the launch of the Bose sound system design software

We have long become accustomed to glancing nervously across the Atlantic in anticipation of accelerating or retarding the influences of our empathetic ally.

One influence I wish we had accelerated earlier is the American appreciation that sound systems cannot be installed without an understanding of acoustics. Twenty years ago only a handful of people in this country were able to make the link between the two; the rest either carelessly disregarding the physics in favour of commerce or, Canute like, resisting the invasion of sound systems into erstwhile purely acoustic environments.

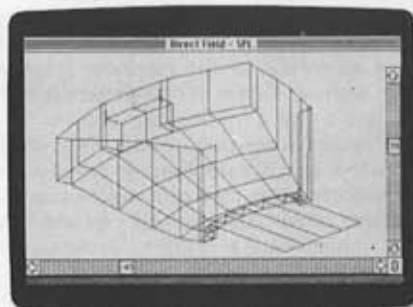
Today the UK has a fairly healthy, viciously competitive industry peopled by experienced international engineers. A more realistic attitude to budgeting from the clients, without which nothing is possible, has been matched by the suppliers' improved respect for their science. Into this climate Bose have introduced a new tool for the sound system designer.

The Bose Modeler Design Program is used in conjunction with an Apple Macintosh and enables a wide variety of acoustic calculations to be made and then presented in either numerical or

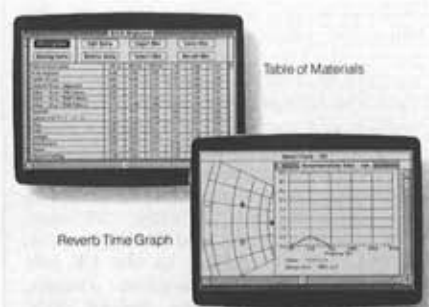
graphical format. It is true that CAD programs are not new and also that computers have been in use for years to remove the drudgery from many acoustic calculations. However, the Bose system is probably one of the first to make this software widely available and builds upon their established worldwide reputation. The obligatory Macintosh obviously has other uses too.

The system's main feature is its ability to project into the computer's model of a room the acoustical data for a given loudspeaker. The data then available comprises sound pressure levels, reflection paths and reverberation times and can be updated almost instantly as the loudspeaker is 'moved' or augmented. Of course this objective data is meaningless to most clients and consequently potentially misleading and Bose are wisely restricting the system to those it considers best able to use it. Hence the impressive display lends credibility to the system designer and should help him to better explain to architects the importance of correct loudspeaker positioning and the influence of shape and texture on sound waves. If it does nothing else but break the idiotic concept

continued on page 40



Oblique view of Room



Reverb Time Graph

Some VDU formats of the Bose Modeler Design Program.

Spotlight on Silhouettes

CCT Theatre Lighting are now in their 21st year of operation. John Offord went to their Mitcham base and talked to managing director Don Hindle and production director Phil Rose about the company's achievements and operating philosophy.

"I may be sticking my neck out, but internationally CCT are almost certainly the second most well-known lighting equipment manufacturer, with Strand obviously first," said Phil Rose.

It has taken the company 21 years to reach that position and grow from a three-man hire company to a 60-personnel operation with major computer controlled manufacturing facilities.

Luminaires are CCT's business, and its foundations as a major business were built on the now famous Silhouette spotlight. But CCT

didn't feel it was viable. Colin wanted it to continue, not least because a lot of the money the company owed was owed to clients of his advertising agency.

"I took a look at it and thought that it could be turned round, and the first eighteen months was spent doing sensible things like getting the pricing right - I don't think they'd had a price review in three years. They had even got to a situation where they were paying more to sub-hire equipment than they were actually getting for it. We had assets of about £3000 and liabilities of about £6000, but we

turned it round within eighteen months and at that stage I went to the shareholders and suggested that if they wanted me to stay that now was the time to start looking at manufacturing.

"We recruited a team of three people as a design team in late 1969 - Bob Deichen, Mike Downie and Terry Bailey - and went quite intentionally after the specifications which had been issued by the BBC for colour television studios. They had three requirements: a profile spotlight, an optical projector, and a follow spot. The very first



Don Hindle - CCT's managing director.

didn't begin life that way, as Don Hindle explained.

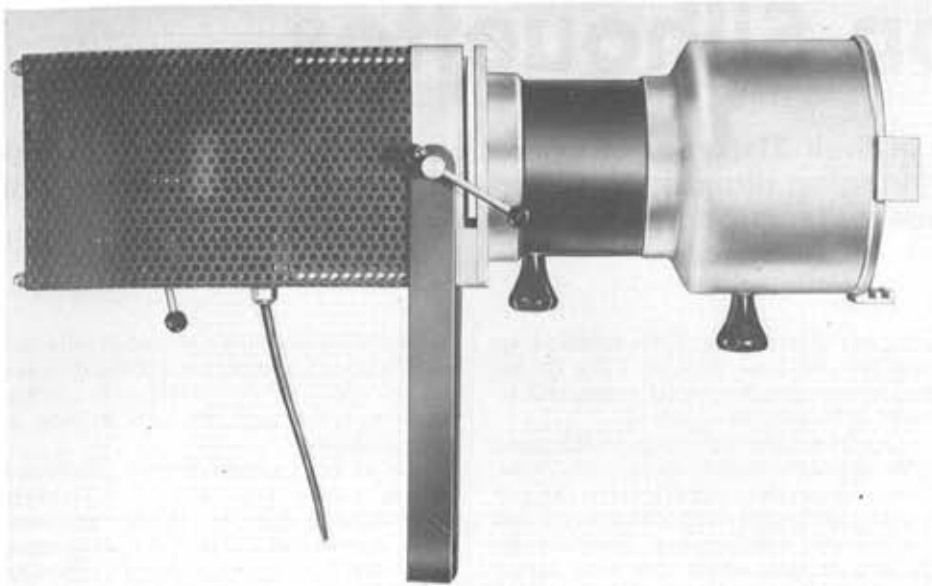
"In 1964 three people got their heads together and decided to form a hire company. They had seen an opportunity to make some money because the new Fairfield Halls complex had been built in Croydon and if anything it was rather under-equipped. Colin Phillips, Colin Turner and Terry Fitzgerald formed a company called CCT - which actually became CCT Theatre Lighting Limited in September 1965.

"Colin Phillips ran an advertising agency and was also very active in amateur theatricals and lighting for amateurs; Colin Turner was interested in theatre lighting but was a GPO engineer and also interested in boats, and after a while he went off in that direction and was one of the crew of Edward Heath's yacht at one point before taking over a ship chandling business in Hampshire; Terry Fitzgerald is and was a character - an actor manager - and the third of the triumvirate.

"I don't quite know how, but when I came to CCT in 1968 one of the most difficult things was to sort out which was CCT equipment and which belonged to Fairfield Halls! The arguments were long and furious. The reason I was asked by Colin Phillips to look at the company was because at the time Terry Fitzgerald wanted to close it down, and Keith Kennedy who was running things



CCT Silhouettes lighting 'Barnum'.



The first Mk.1 Silhouette.

thing that CCT produced was a 400 watt CSI optical projector which the BBC said wasn't powerful enough. So we produced a 1000 watt CSI projector called the Halostar which they still said wasn't powerful enough. Finally we went on to the profile spot.

"That optical design was the basis of the existing Silhouette range, although since that time it's obviously gone through a tremendous amount of change. Effectively it was first sold in the latter part of 1970 to television companies only, in its old 'blue box' format. It then developed on to the black format which was launched in 1972.

"This had come about by a visit from Jean de Baker of ADB Brussels who looked at our optics and said that what we were producing was a lot better than that which his research and development people were making, and would we make it in an extrusion that would match the rest of their range?

"This eventually led to a two-way agreement whereby we were responsible for developing and manufacturing profile spots, follow spots and optical projectors for ADB, while they provided us with fresnels, floods, and control systems. It all led to the first full installation that CCT undertook which was the Redgrave Theatre at Farnham in Surrey in 1972. And this was the very first full package where all the luminaires were CCT or ADB.

"This co-operation ran until 1978, a total of six years, by which time ADB had established a factory in France and decided they wanted to make their own equipment, and we had a 'semi-amicable' parting of the ways."

I asked Phil Rose, who joined the company in 1979, how he'd viewed CCT as a Rank Strand man looking in from the 'outside'.

"I first became aware of CCT when I came back from the States in 1974. I went down to see the equipment they'd put into Farnham, because there were comments coming through the trade about the company. I was quite impressed, particularly with the CCT equipment; but not quite so much with the ADB. One then became increasingly aware of CCT because of the attraction of the Silhouette range more than anything else.

"They'd identified a gap in the market and were successfully filling it. The approach they were making to the development of the profile spotlight was one that I'd been trying to persuade Century and subsequently Strand to go for, which was the interchangeable lamp house and lens tubes which was a very sensible way to go - and



Phil Rose - production director.

also some use of zoom lenses.

"I was therefore quite taken by what CCT had done because it reflected a lot of my own thinking at the time.

"One also became more aware of the impact they were making because of their cleverness in concentrating effort on a very narrow product range which had a lot of appeal and where the competition was quite restricted. In the process they developed a reputation. The profession was saying that at last here was a small company that seemed to be able to respond very quickly, that seemed to know what they were doing, and who were taking the trouble to talk to people about what they wanted and why they wanted it, and were going back and doing something about it.

"Subsequently I got closer and closer to CCT because they were beginning to compete seriously. One became much more conscious of them in a market-place sense rather than just in a technological sense, or a product design sense. Increasingly we were beginning to be asked 'why can't you do what CCT are doing?'

"This became very apparent on the Barbican project when many of the lights at that time were being specified around CCT product, and Rank Strand were very anxious to make sure CCT didn't get the order."

By 1977/78 turnover had topped the half-million - nearly all attributable to Silhouette or Silhouette derivatives. Looking to broaden their base, CCT started to make determined

efforts to expand into further product ranges.

"In 1977 we had decided that we wanted to produce a small 500 watt unit and we had identified a 500 watt long life lamp manufactured by Thorn - the M40 - as the size we wanted to use," explained Don Hindle. "We actually built a prototype and tested it with the M40 lamp, but Thorn did not want to produce a theatre version of it. Eventually we managed to convince them that we were very serious about it and we delayed the launch of the Minuette fresnel, the first in the Minuette series, until 1978 while Thorn developed the bulb. This became the T18 bulb and led to a whole range of offshoots of the original bulb we pushed for - the T range.

"This was the first real break-away from the Silhouette, and the demand to do it was generated by the break-up of our agreement with ADB. They had offered us the project of assembly of ADB products in the UK, and upon evaluating it we found we would have to reduce our operation by about 50 per cent. So it gave us the necessity of broadening the base as far as product was concerned, because we had no fresnels, no floods, etc. And this is where the new product ranges enter the scene. It simply grew from there.

"In addition, the semaphore colour changer was launched about the same time. It was originally conceived for a refit of the 'Talk of the Town', and developed by Bob Deichen prior to manufacture all within the period between the end of November and the following mid-January when the venue reopened. It was a very important product which we also make for Rank, and we still make colour changers for the Rank Organisation today. It's a good thing when two companies can get together and benefit from one product made by one operation.

"The Rockette was the first project John Schwiller developed after he joined us in R and D, and he then went on to produce the Starlette range of fresnels."

The general broadening of product has been regularly spiced up with the introduction of 'specials'. Phil Rose explained how some of them came about.

"We have certainly introduced new products that one could look at as being 'relatively original'. The colour wheel system was a significant breakthrough in that it was an attempt to bring together emerging technology in electronics, with multiplex control. One of the real problems with colour change in any kind of theatre has always



The original CCT Halostar with polaroid spinner - used for moving effects.

been the number of conductors that you have to wire around, and this has been one of the main factors that has inhibited the use of colour change. One breakthrough was an attempt to come up with an inexpensive colour change based on multiplex control with intelligent wheels, and I think our MX system was a major step forward in that direction.

"The most significant things we've introduced in more recent years has been the extension of the Minuette range. And there was a certain amount of logic in the way we did it. We wanted to have a balanced range of product that incorporated all the different types of optics that one has in theatre lighting, but put them into a scale that would suit both an educational environment or small theatre."

To aid manufacture of their growing brigade of luminaires, and having adopted various computer systems on the management side at an early stage, CCT now began to explore how the latest technology could help with production.

"Because you can't have continuous manufacturing in our industry - the demand isn't big enough - one has to have batch manufacturing," explained Phil Rose. And if you do that, you've got to have a fair amount of sophistication in the planning, even though you are only making relatively small quantities and in a simple format. So we looked very carefully at emerging technologies, and there was no doubt that the two things that took our eye were CAD (computer aided design), so that we could get away from the drawing board to a large extent, and CAM (computer aided manufacture). We took the decision about eight years ago to go in this direction. 1981 saw the installation of our turret press, and 1983 saw our computer-controlled press take its place in the factory."

Moving from the position of a small and intuitive company working on energy and optimism and a few good ideas, to a position where you are an established part of the industry worldwide brings up a different set of problems. I asked Don Hindle how they now approach the business in general and the introduction of new products.

"Basically our business combines two major aspects. One is manufacturing the thing, and the other is selling it. Historically, CCT has never had any problems selling its products. The way we have seen to go forward is to strengthen the distribution aspect first, and being an established company to put a heavy emphasis on making sure that if you put something on the market it's going to work all the time every time and for everybody. And we have to think in terms of all over the world. Part of the philosophy behind the products is that we use high technology to produce low technology products. Anybody can service a CCT lantern with a Phillips screwdriver and a wrench.

"As a major company we cannot afford to 'take a risk' and say 'we'll try it out'. Recently the industry has seen a lot of nice ideas - often ideas we've looked at here - but ideas where effectively we've had to say 'not yet'. And sometimes it's very galling to see someone else try it, even though it may not actually work. It is often very frustrating to be hit over the head with ideas that have been kicked around within this company many times. I think we are very restrained. We have had people copying, people who have knocked our products heavily, and people who have used our product to measure their's against, and told fibs in the process. We have never gone back hammering at



Silhouette side extrusions ready for assembly.

these people. We have said: 'if it works it's a great idea'.

"It's astounding when you really take a look at the number of companies who have taken a swipe at us. Look at LITO - it was effectively a poor man's CCT. There have been companies who have described one of our products in the following way: 'new one kilowatt axial lantern with moving reflector - price to be announced'. That's when they've got round to copying it!

"On more positive issues, I think the lines between theatrical lighting and display and architectural lighting are becoming very blurred, and I think we are looking more and more in this direction. A lot of Minuettes are being used in these areas, hence the 'Lightline' range of architectural versions. They work extremely well. They give people control in shop window or architectural situations, and we are currently working with the Lighting Design Partnership on lighting ef-

fects for the new Whitgift Centre in Croydon where CCT luminaires will be projecting effects for the 'entertainment' of passers-by.

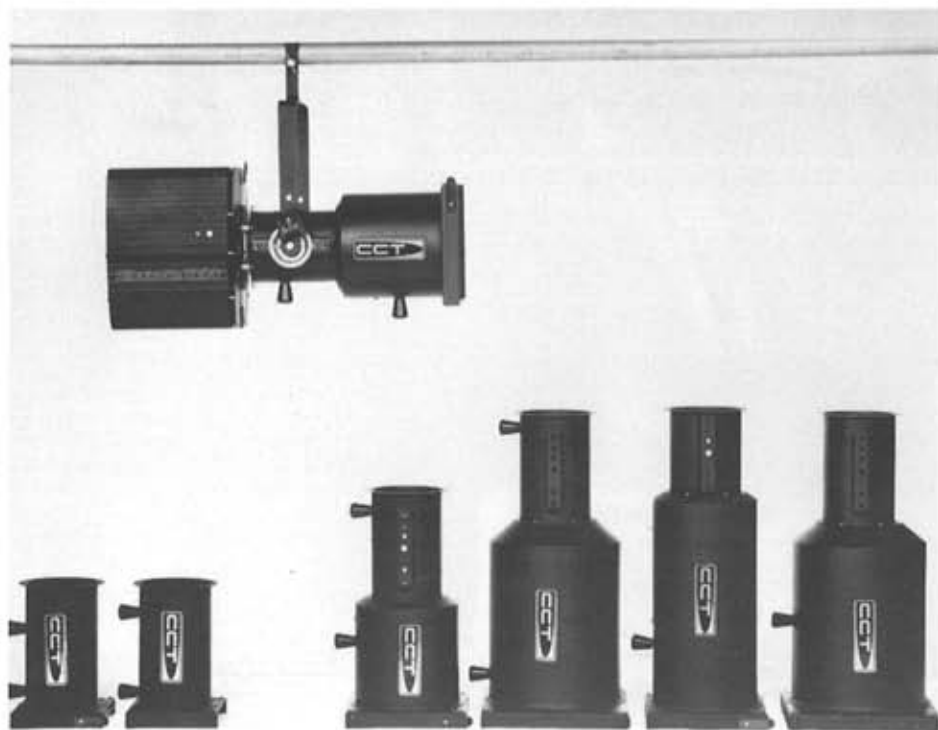
"So there is a broadening of the market, as well as new products. When you are a small company growing fast it's very easy to be inventive. You can take more risks. When you look back on it you can say, 'well we were right, and sometimes we were lucky!' A good example of that was the pebble convex lens, which we were the first to show at an ABTT Trade Show, and which everybody else picked up. We all ended up with the same problems! The original idea was the right one, and we should have stayed with it rather than go on to produce a special lens."

About 60 per cent of CCT manufactures go for export, and with the recent deal with Kliegl Brothers in the United States a full network of sales outlets covers the globe.

"We have made a conscious decision on



CCT equipment in a conference situation.



The new Silhouette 2000 - the latest 2000 watt lamphouse together with range of interchangeable zoom and non-zoom lens tubes.

how to approach the 'long distance' market," said Phil Rose, "and have deliberately encouraged the overseas assembly of our own products. We've not been narrow in our thinking, and we recognise that shipping relatively low cost and bulky product long distances around the world only adds unnecessary cost to the end-user. So we had to look very carefully at how best to encourage the sale of our products in places such as

Australia or North America. This is all part and parcel of our distribution chain, and has been our philosophy for a long time."

"We have had sales in America through direct representation for the last four or five years," explained Don Hindle. "This has always been for fully made product, and we have been reasonably successful, but within two years of the time we first entered the market in the States all other lighting manufacturers had variable beam angle spotlights, which took some of our uniqueness away.

"But all the time we were looking for an improved distribution system. Phil Rose then identified Kliegl Brothers as a possible partner when it became apparent that they were reorganising and moving to new premises in Long Island.

"They were approached in September last year to see if there was any interest, or any grounds on which we might work together. A deal was agreed on 2nd December, and the details of assembly are being worked out at the moment. It looks as if most of the lamp houses will come from the UK, and that lens tubes will probably be manufactured in the United States.

"Kliegl is the oldest company in the business in the United States. It is a dynasty, and they were market leaders in product design and innovation for many years, and slugged it out with Century Lighting before that company became part of the Rank Organisation.

"They had some very bad experiences with early memory systems, and also had possibly become somewhat introspective. In the past two or three years they've realised they've been overtaken. But the thing they have got is the name, the premises, and facilities. They also know the market, and they are very much a part of it.

"In Australia we were selling around 3000 fresnels a year, shipping thousands of fully made products. It became quite obvious that it was much more sense to make the components locally. So Jands CCT found a sub-contractor with a turret press very similar to our own, the programmes to make the components were sent out, and they make them



Ancient and modern - CCT spotlights at work in Greece.

to our design, manufacturing under licence. "More recently we've been exporting specifically-designed product for the Japanese market. They've evaluated the products - and they do evaluate things very carefully - and they are coming back for more."

Annual turnover of the company now exceeds £2m, well over 75 per cent of which is manufactured in CCT's own factory. But there are figures and figures, and the company also has to be able to respond quickly according to pressures of demand.

"We are pretty close to being a nuisance to Strand on their level of luminaire sales," said Phil Rose. "And when you look at our sales figures, an awful lot of that is 'kit' - it in no way represents the final sales figure. If you convert the kit and licence monies into on-the-street prices, we're probably talking much nearer a £4m end price," said Don Hindle.

"The other important thing is the ability to respond very quickly. Nobody ever seems to think about buying lights six months before the show is due to go on. They will suddenly decide three weeks beforehand and we are expected to be able to respond. We have to be able to change our production lines very rapidly to suit requirements. And all in all we have around 60 basic luminaire products with as many as 200 variants for different markets.

And what of the future for the industry in general?

"There is going to be a lot more impact of technology in theatre lighting. In many ways it's a shame, but theatre embraces new technology very happily verbally, but never has the money to back it up," said Don Hindle.

"Theatre has to be a parasite, riding piggy-back on other industries. It can't afford the original research and development," said Phil Rose.

CCT have built up a very solid reputation worldwide, and of their broad range of luminaires, many are industry standards. Right in front of our eyes, but without much noise, they have added and improved and pushed up sales. Now, everywhere you look, there are CCT lanterns.

Not bad when you've only just come of age.

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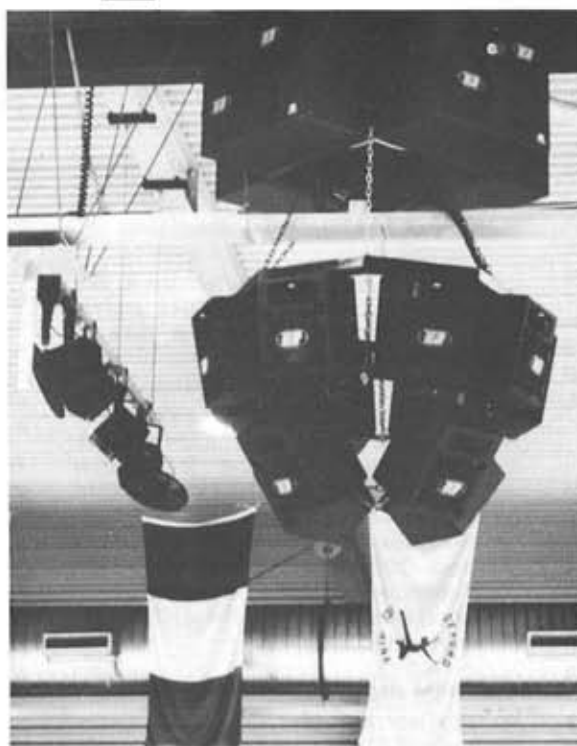
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The sound of *the world...*

Dynacord

Room acoustics are one of the major problems facing sound system designers and this problem can exist even in the smallest venue. Dynacord have successfully designed sound systems in venues as diverse as theatres, concert halls and ice rinks, as well as discotheques, all over the world, finding novel solutions to acoustic problems that were thought to be unsurmountable. This expertise is available to U.K. sound specifiers and installers, as well as direct to operators, through Dynacord's U.K. club equipment distributors Avitec.

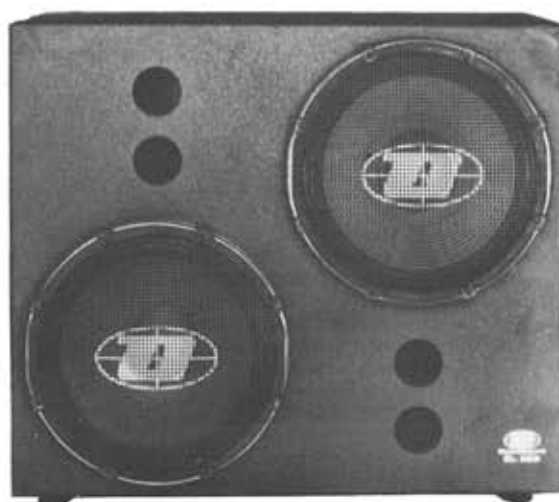
Full information on Dynacord's club equipment range of loudspeakers, mixers, power amplifiers and audio processing equipment is in Avitec's new 1986-7 catalogue, available on request. Avitec's sound design service available by arrangement.



Oxford Ice Rink got it right – Avitec measured the venue's reverberation times for sound installer/supplier P.S.D. Electronics and these and other data were fed into Dynacord's computer – in this instance, the rink's acoustics were forgiving enough to give remarkable results from a relatively inexpensive centre speaker cluster, recently installed, as pictured left. In fact, the Dynacord CL808/CL108 combination has been equally successful in many night clubs and discotheques all over Europe, and represents a cost effective solution for many applications, but may not be right for every venue.

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Making a sound impression in entertainment!

Two more for a Cluster

Ben Duncan continues his look at horn-loaded cluster systems

COVER
STORY



Recapping on last month's episode, the old problem of getting a coherent sound in a large and reverberant space can be resolved by (in effect) concentrating all the speakers into one: if there's only one sound source, there can be none of the time delays which habitually wreck intelligibility in systems with multiple, distributed sound sources. In practice, an individual speaker capable of efficiently converting a few kilowatts output of sound, let alone one which smoothly covers 180° (or even 360°!) of solid space is pure moonshine. Instead this hypothetical 'Super Speaker' is constructed by combining the outputs of a **cluster** of close seated drivers. Put together, these are capable of handling the full power and bandwidth. The other vital ingredient is horn loading, which alone can provide the controlled dispersion (like a spotlight), needed to get a host of individual drivers to focus together as coherent whole, across most of the audio bandwidth.

Turbosound at The Guildhall, Portsmouth

Built in 1890, Portsmouth's Guildhall derives from a period when architecture was grandiloquent, if nothing else - the portico alone rises to 70 feet! Inside, the main hall seats 2000, including a 720-seater balcony; while the floor space, at 95' x 82', is roughly square. There's also a sprung dance floor in front of the stage, or room for an extra 876 seats, as required.

For the first 80 years, the Guildhall's stage principally accommodated orchestral and choral musicians, speakers and banquets. As with the majority of multi-purpose venues, the acoustics are something of a compromise. During rebuilding in the 50's (after sustaining damage in World War Two), unfulfilled attempts were made to quell reverberation with 16' x 8' Genovese velvet banners, hung on the walls, and by incorporating acoustic tiles in a succession of shallow coves across the ceiling. At the same time, the rebuilt Guildhall boasted an elementary PA, suitable for speeches and

toastmasters. The picture changed radically with the onset of the 80's, seeing increasing use for rock concerts and for conferences, the latter making strong demands on the house PA for clarity and even distribution.

Subsequently, a new sound system was tendered for - one which would work either in support of a rock act's rented PA system; or of its own accord, for vocal performers and theatre productions. The specification included:

- An overall dispersion of 180°h x 90°v
- A mean SPL capability of 110dB, with 3dB of **headroom** (i.e. short term SPL capability).
- No more than ±6dB difference in SPL from the front seats, to the back, and no more than ±1½dB between seats in adjacent rows.

Tenders were invited from various consultants with the opportunity to demo the system 'in situ', though with The Guildhall fully booked up, the time for system demonstration and installation was curtailed to just one day for each. DRV Sound Consultants provided comprehensive system drawings based on Turbosound's TSE 'Installation Series' system, and were awarded the contract after giving the authorities a convincing live demo.

A different angle of approach

In common with the 'Big 3' American speaker companies, viz. EV, Altec and JBL, Turbosound are O.I.M.'s: original innovators and manufacturers of horn loaded PA speakers. For unlike the majority of UK manufacturers, every Turbosound product is 101% **original**. What's more, Turbosound's design approach has a distinctive, radical flavour when seen alongside the rigorous, classical approach adopted by the pioneering American speaker companies. To begin with, designers Tony Andrews and John Newsham uncompromisingly eschew the use of compression drivers in the midrange

out of long experience. Instead, Turbosound's directors spent ten years developing a high-performance horn-loading technique based on a more economic and better-sounding 10" cone driver, and a series of compact, efficient and uncoloured bass horns, all utilising their patented 'Turbo loading' principle. In 1981, Turbosound introduced their TMS Series, which brought the bass, mid and HF drivers and horns into one compact box, and provided all the neat 'extras' (like ring-type flying points), to speed forth installation. Aside from the TMS-3, flying was limited to horizontal arrays, but nevertheless, central cluster arrays were possible, viz Turbosound's installation at **The Grand Ole Opry**, Nashville. Here the enclosures are suspended from cartwheel frames with wire rigging, clamped to the desired length. Though widely used in the industry, this flying technique is time consuming in set up.

The TSE System

The more recent TSE Series contains the same components, only repackaged with an emphasis on today's fixed installation requirements. To quote John Newsham, "We wanted to simplify the whole business of permanent installations". Speed and simplicity of erection is the obvious keynote. Another is versatility, thus the 1 x 18" bass cabinet is separate from the mid/high 'pack', and the two can be brought together on a stalk, or flown in a variety of array patterns, both horizontal and **vertical**.

At Portsmouth, the two enclosures are mounted into special flying frames (fig. 1a), then through-bolted into captive lock nuts. In turn, the flying frames are suspended by simple 'quick links' from 90° cartwheel assemblies, which come in sectional



David Bearman (left) and John Newsham working on the Portsmouth Turbosound installation.

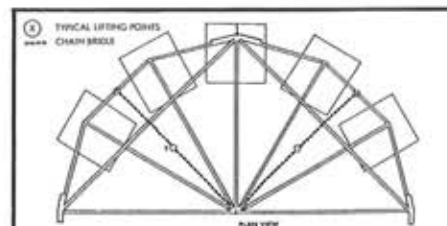


Fig. 1a Plan view of the Turbosound cartwheel assembly.

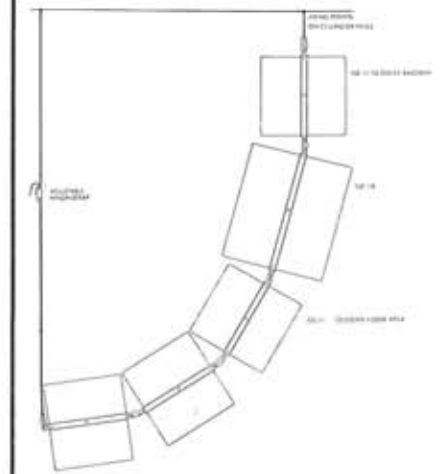


Fig. 1b A sectional view showing array configuration.

quadrants (fig. 1b), and can be expanded in 30° sections into covering 300°, or even 360°. Multiple vertical rows of enclosures each comprising up to 10 TSE-111, 8 TSE-118 (or a mixture, as required) can then be hung from adjustable clamps on the cartwheel. Finally, the vertical rows are drawn back into position with nylon webbing straps mounted between the cartwheel and the base of the lowest flying frame, the 'Quick Links' acting as ball joints to create a smoothly curving array.

Meanwhile, the rigging lugs on the TSE-111 flying frame form a perfect square, meaning that any of the enclosures can be rotated through 90° for greater horizontal directivity. At the same time, vertical dispersion is increased, thus SPL (Sound Pressure Level) and dispersion characteristics can be adjusted without resorting to different components.

In essence, says designer Tony Andrews, "It's a 'one size fits for all' system. John Newsham then sums up the sonic advantages: "Unlike constant directivity systems, where short, medium and long-throw horns inevitably sound different from one another (because the longer and relatively constricted throat of long throw horns spells higher distortion), with the TSE enclosures, the installer is working with just one, known dispersion pattern to create the array. The TSE-111, like all our enclosures, provides controlled directivity in the midband right down to 250Hz. In the upper HF, it narrows slightly; that's of vital importance when constructing arrays, producing minimal phase cancellation and cabinet to cabinet interference."

Installation

The Guildhall only required 5 TSE-118 bass enclosures to achieve the specified SPL below 100Hz, complemented with 12 TSE-111 mid/high cabinets. All ancillary equipment was pre-wired and on the day of installation, the only major work undertaken was the provision of a 15' box girder to span the existing lateral girders. Once welded into place, two 5" holes were made in the ceiling to lower through the lifting and safety chains and the signal cables.

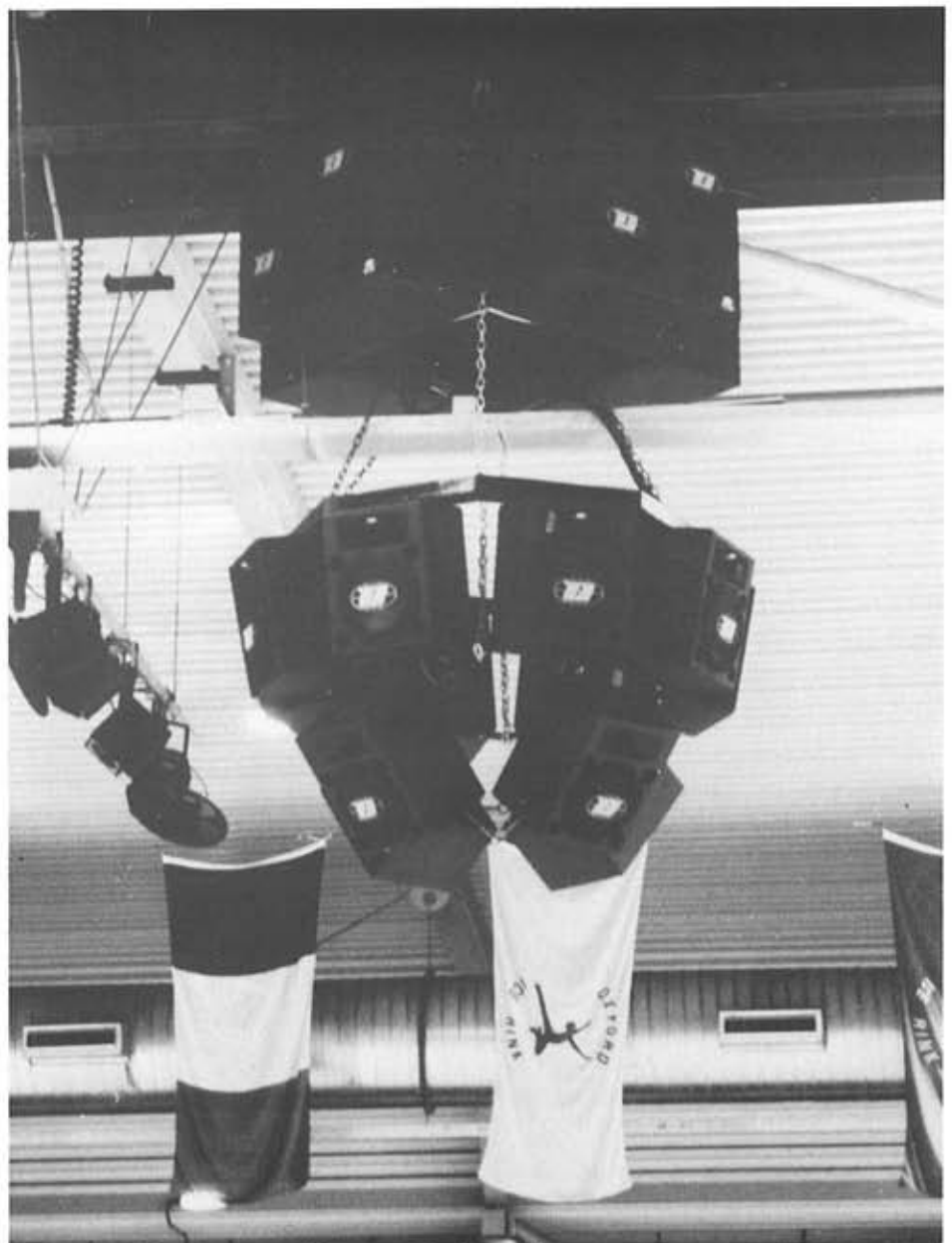
With the aid of two motors, the cartwheel was raised enough to suspend, wire and strap the enclosures. In all, basic assembly took less than an hour, and by the end of the day, analysis and fine tuning of the EQ had been undertaken, with just ± 3 dB of EQ being required to achieve the specified response throughout the hall.

The completed system is bi-amped with seven C-Audio 606 amplifiers, totalling 8.4kW, in conjunction with a BSS FDS-360 crossover, which helps perfect mid/bass integration through its 24dB/Octave 'Linkwitz Riley' alignment, while the HF/Mid crossover is passive, at 3.7kHz and integral to each TSE-111 cabinet.

Avitec at the Oxford Ice Rink

Avitec's Tony Kingsley is well known enough for us to leap straight in. The rink is 24 x 46m, the ceiling is 8.6m above us, and the clientele are interested in only one thing - Ice Disco. Avitec's first task was to measure the acoustics' vital statistics. Some, like the further point from the proposed cluster location, can be checked with a tape measure. Others - like the reverb times at different frequencies need rather more elaborate instrumentation.

In this instance, Avitec are using IVIE's IE30A analyser and matching IE17A microprocessor. Having set up a temporary sound system to excite the room in a known



A close-up of the Avitec-created cluster at Oxford Ice Rink.

fashion, the IE30 revealed a situation common to many similar, well-designed venues, be they ice rinks or large halls: a groggy bass end, up to 250Hz, but fine above this frequency. The data was then processed by a

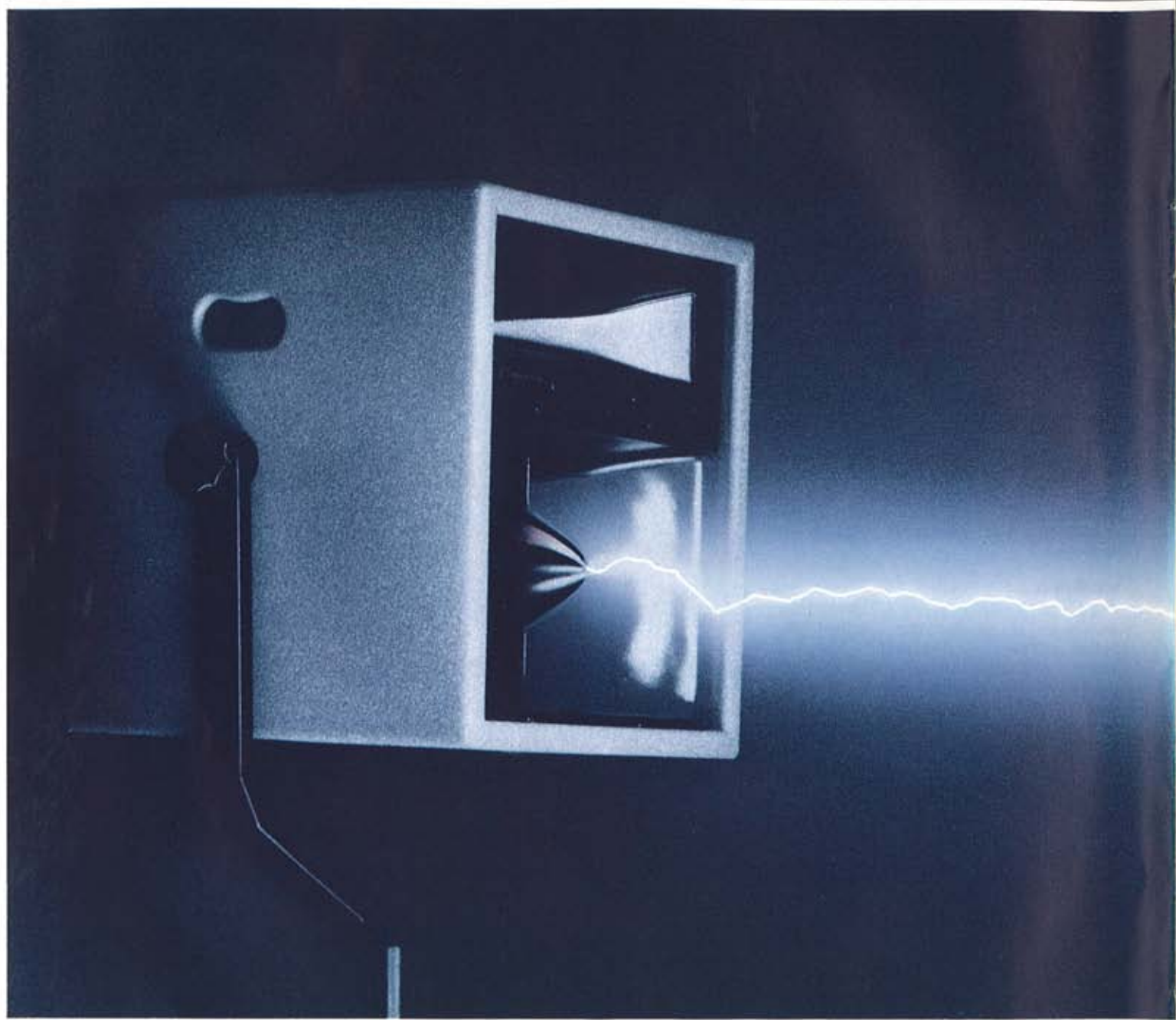
programme written by Dynacord's Winnie Hintze. Looking down the printout (fig. 2), it begins by enumerating the room's volume, then the reverb times at 5 x 1 octave spacings (each octave is a doubling of frequency,



A general view of Oxford Ice Rink.

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beginning at 250Hz in this instance). Next, the 'Q' factor is a numerical expression of the speaker's directivity, entered according to the proposed speaker system. Again, 'SPL at 1m (1 metre's distance from the cluster)' is read off the proposed cluster system's or speaker's data sheet.

Having entered the key parameters, the Dynacord programme proceeds to print out the SPL at the further point (103dB), and a host of other facts, leading to the **articulation constant**, here abbreviated to **alcons**. A percentage figure, alcons is a measure of how badly the acoustics mangle the intelligibility of a human voice. Generally, a figure below 15% is considered 'good' to 'acceptable', depending on circumstances. Avitec's own standard is x13%. But here, the computer is raising its eyebrows at an alcons of 30% at each of the five octave frequencies. It then goes on to suggest four remedies to get alcons below 15%. We need to (i) increase the speakers' 'Q' factor to 2.0, or (ii) reduce the distance to the furthest seat to 26.8 metres, or (iii) reduce the venue's

reverb time to 2.8 seconds. This latter one implies that some extra acoustic deadening wouldn't go amiss, so the computer's next suggestion (iv) is to achieve this by cramming a minimum of 9515 sweaty bodies on to the ice!

Finally, there's a table showing how alcons changes with distance: at 8 metres it's 1.3% (= excellent intelligibility), but beyond 16m, it deteriorates badly. Needless to say, this Dynacord programme is interactive: we can quickly 'cut and try' by punching in one or more different parameters, and soon get a feel for the way that the speakers and the room interact.

The system

Avitec didn't use C.D. horns. Since the cluster would be 8 metres above the floor, Tony reasoned that the sheer distance would ameliorate the worst hot-spots. By using conventional direct radiators and 'bullet' horns, the hardware budget would then go further. And, since the Dynacord speakers specified had defined 'Q' figures, not to mention their own cluster design programme,

good results were anticipated! Looking at the photograph of the cluster accompanying this article, the lower part comprises a ring of four Dynacord CL108's, pointing downwards. CL108 is a simple but well-tuned full range cabinet with the classic combination: a 12" driver, a tweeter horn, and some vents to buck up the bass response. It may look like a dozen other cabinets, but Dynacord's designer, Krauss, is well-known for using interactive computer design techniques until he gets best results. In this particular cabinet he chose a crème-de-la-crème Japanese tweeter horn, made by Foster. Overall, the cab's dispersion is a nominal 60° x 40°, Q=2 and output is 100dB for 1 watt of amp power, at 1 metre. There's also passive protection incorporated, so the tweeter isn't zapped in the event of uncontrolled howlround, and as a safety belt, just in case the system's limiters should ever fail to prevent clipped signals reaching the cabinets.

In the second, central tier, there's a ring of eight CL108's, covering the far ends of the venue and the intermediate distance. After a moment's reflection(!), it's evident that four of the CL108's inclined towards the short side of the ice will be too loud, if driven at the same level as the remaining four, which are covering the full 38 metre span. In a C.D. horn system, we'd solve this by using a medium throw horn, thus widening out the dispersion to compensate for the excess SPL. Avitec's answer is different, yet effective: the speakers are driven from the amplifier channels in pairs, so the drive level to the short sides is simply reduced by 64dB by turning down the amplifier gain controls.

Up top, the cluster is completed with a ring of four CL808's, Dynacord's most ballsy bass cab, comprising two 15" drive units in a vented enclosure. While the LF response is already -3dB down at 80Hz, rolloff is gentle - it's been tuned for best excursion capability below this frequency. Then the cones don't 'flap' or fart if the DJ applies lots of sub-low boost. In Thiele terminology, this is called the 'step down mode'.

Installation was by PSV Electronics of Newquay. Working to a tight budget of just £10,000 for the PA electronics (i.e. excluding console end) and associated acoustic measurements and system design, the 16 speakers cost £5,400. The amplifiers were Avitec's own Beta 800's, built by C-Audio. With integral limiters, the budget for 3 Beta 800's (£2,590) is doubly impressive considering the cost of 'outboard' rack mounting units. Of course, the limiters are intended to provide almost foolproof protection against speaker failure. In the Pro-model of the Beta 800 meanwhile, Tony assures us that the limiters are inaudible when hard in operation. In any event, the Oxford Ice Rink's management were amazed and gratified that the new system - superficially so similar to the dreadful (and nameless!) thing they took out - could sound so much much better and so much clearer. And that's what it's ultimately all about.

Conclusion

All the four cluster systems we've looked into have individual strengths and weaknesses. Some are best suited to and/or most economic in larger or smaller venues, and inevitably, each approach has its own 'sound'. But overridingly, they have one thing in common: the soundfield is far clearer and more coherent than it ever was before. As for assessing whose system best suits your **own** requirements, the best advice is to make an appointment to view each of the venues described.

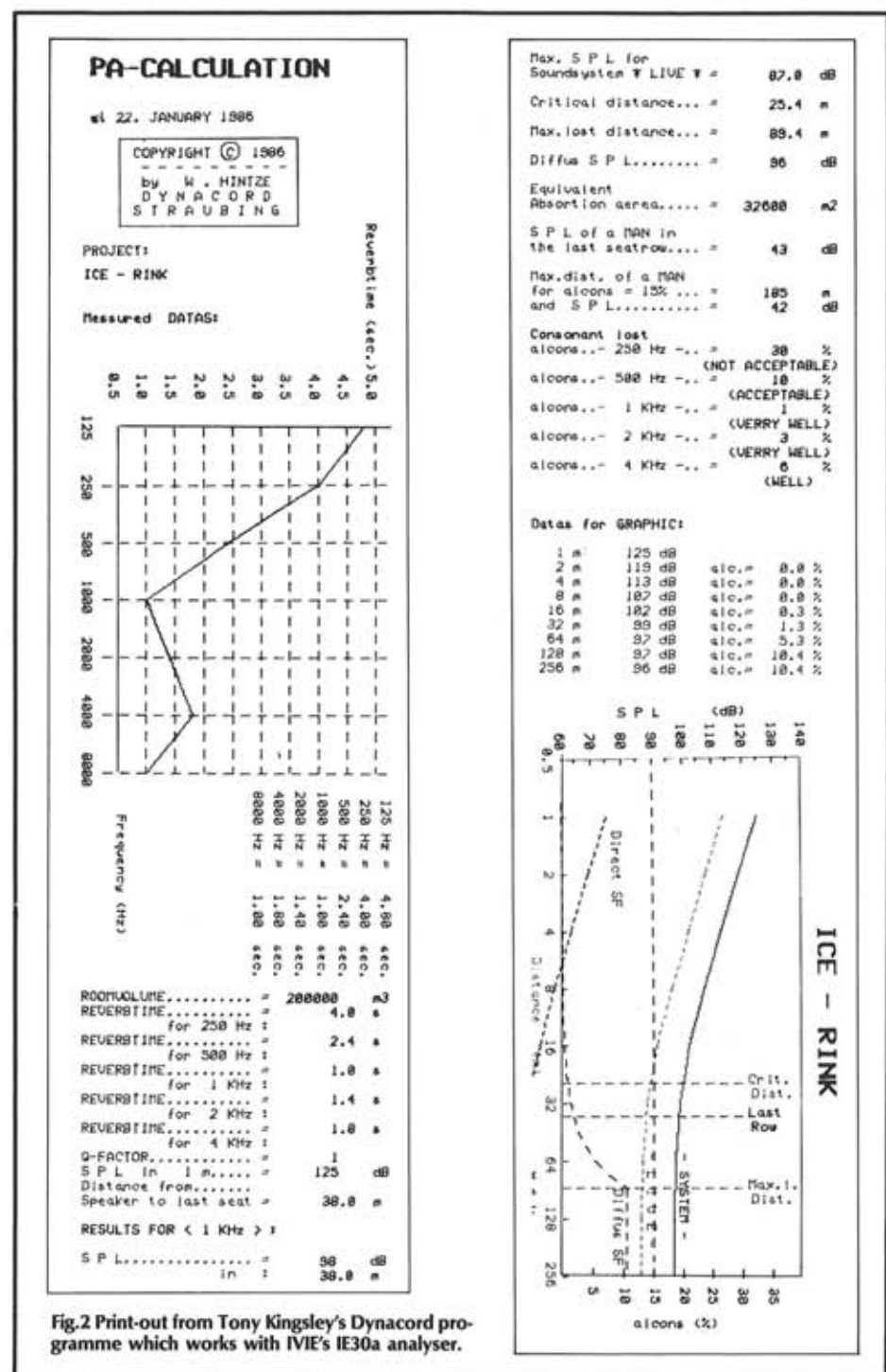


Fig.2 Print-out from Tony Kingsley's Dynacord programme which works with IVIE's IE30a analyser.

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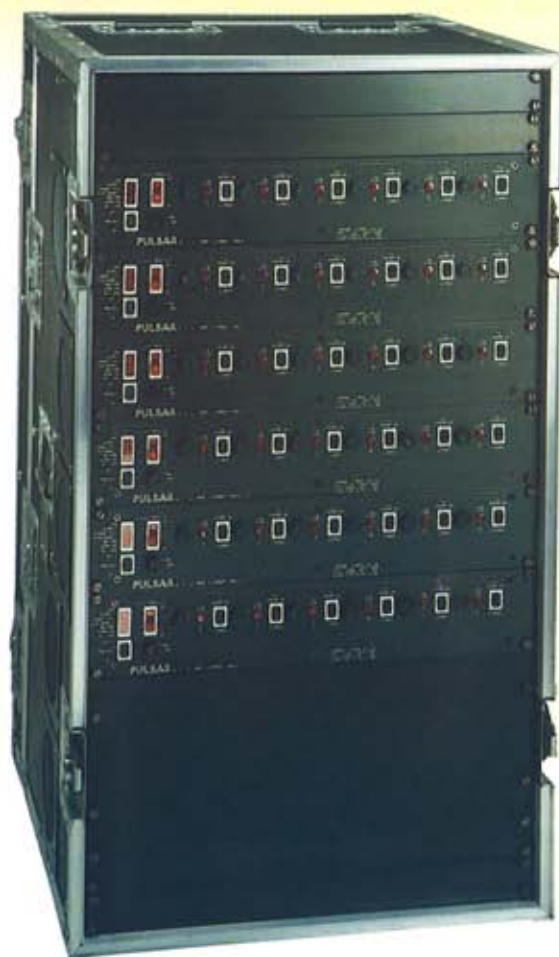
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A Siemens in the Garden

Francis Reid

Memory lighting control has come of age. Twenty-one years ago Thorn launched their Q-File and those of us who were at the launch immediately recognised that, while various experiments during the previous couple of years had demonstrated potential, here was a system that was fully developed to go on a live show.

In these early years we were prepared to accept the risk of possible system amnesia in return for the excitement of the new instant plotting, infinite presetting and simultaneous cues - although it should be said in fairness to the Thorn boards that they enjoyed a better reputation for reliability than many of their contemporaries.

Subsequent developments have tended to stress increasingly sophisticated operational facilities, and our enthusiasm for this has often overtaken our concern for engineering reliability. Lighting controls are a buyer's market and so the industry has probably not been under sufficient pressure to apply the kind of engineering philosophy that keeps aircraft flying by duplication and triplication of, for example, hydraulic systems.

This phase is over, however. Reliability has quite recently (even suddenly) become the number one factor in system choice. There is certainly every reason for reliability to override capital cost. Rehearsal failures, apart from the obvious consequences to the quality of subsequent performances, can be very expensive in terms of overtime payments. Performance failures, although rarely resulting in cancellation and refunds, can reduce the audience level of enjoyment (consciously or subconsciously) to the extent that a subsequent draught can be felt at the box office. Reliability is particularly critical in an opera house where the lighting is in continuous use for a performance and rehearsal cycle which is so tightly scheduled that there is absolutely no slack. A lost five minutes is gone for ever.

At the Royal Opera House in London, no one is more conscious of this than technical director Tom Macarthur who, looking at future schedules and past maintenance budgets, decided to search for a new system where the engineering was not only the tops but adopted that same belt and braces approach which keeps aircraft from crashing.

To initial surprise from many, including I have to admit myself, his market analysis led him to choose Siemens. Certainly Siemens have always been in the top echelon for engineering quality. However, many of us have had past doubts about the operational philosophy of their systems. Indeed both Glyndebourne (i.e. me) and Covent Garden in 1963 looked very seriously at Siemens controls, admiring the engineering but opting for Strand because they (and ADB) seemed to be the only manufacturers then willing to build desks to a particular theatre's specific requirements.

In the developmental era of memory systems, Siemens lost a considerable proportion of their own home market share, allowing MMS, Lightboard and Galaxy to become a familiar sight in German opera houses. It must, therefore, have taken our Royal Opera House considerable courage to announce that British lighting technology which led the international market in volume and price

was not the right stuff for them.

The decision was taken primarily on reliability grounds, but there was a second factor which also indicates a growing trend in an area of customer preference which is being matched by manufacturer response.

Until recently, lighting control development has been geared to mainstream theatre with its runs of a single current production with plotted lighting. Facilities for repertoire changeovers, for 'effects' sequences and for instant lighting design during performances have tended to be treated as something to be grafted on as an ancillary rather than as an integral part of the system design. Now we have desks dedicated to coping with the special needs of the popular music industry and one-night-stands of all kinds.

Opera and ballet have their special needs too. For example, the speed of the twice-daily changeovers and the tight technical time available for revivals requires a rig with fixed elements. Certain lights get permanently assigned to certain channels, and geographic mimics make a lot of sense - particularly when combined with a display system that enables groups to be quickly and clearly formed and labelled. Also, while

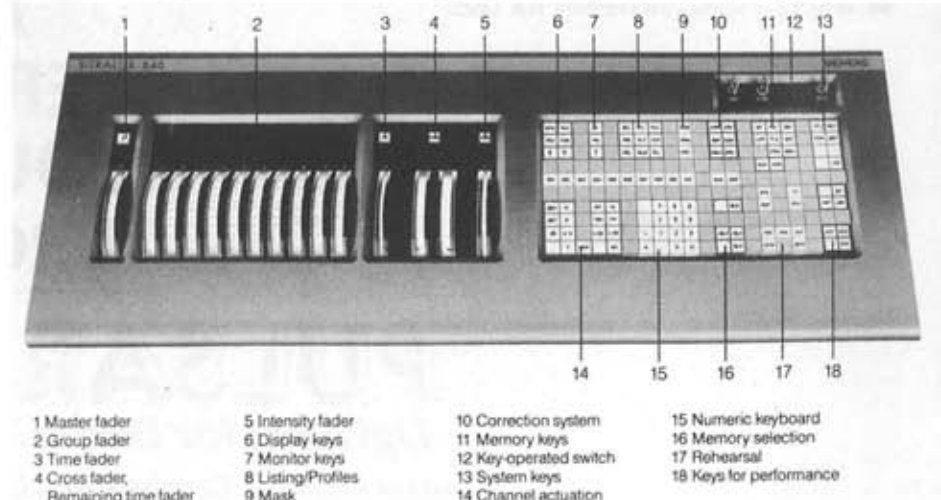
every form of lighting change is involved from time to time, the priority is for impeccably balanced sequences unfolding smoothly and often very slowly. This requires the capability for each individual channel to be given its own start time within the overall cue. But, above all, system specialisation means that a desk should have its display and its functional ergonomics laid out to reflect the priorities of the particular performance form that it is to be used for.

Much is made in every manufacturer's literature of the scope that their machines offer to the lighting designer. In my view (and experience) this is a misplaced emphasis. It is to the operator that a lighting control must appeal. Good operators can squeeze virtually anything that a lighting designer asks out of the most unpromising machine. But why should they have to?

Anyone doubting whether the Royal Opera House has made a good buy should talk to the operators. They are relaxed, confident, cheerful, enthusiastic and full of pride in their equipment. Or talk to Tom Macarthur for the rather uncommon spectacle of a technical director who is confident that neither his schedule nor his budget will be thrown by a system crash.



The Siemens computer controlled Sitralux B40 lighting control system at the Royal Opera House.



Layout of the Sitralux B40.

ON TOUR

Paul Devine has been working in the lighting industry for many years, and currently as both lighting designer and technician. Catriona Forcer met up with him at Wembley recently during the 'Frankie Goes to Hollywood' concert and discussed with him the many aspects of lighting design.

Not to be left out, I managed to see both the show and Paul during the Frankie's recent concert at Frankfurt - even though the tickets did cost me a meal! The lighting and set design was dramatic and used with good pacing - something all too often cast aside. Feeling the enthusiasm of the capacity audience left me in no doubt that it was a show to remember.

Keith Dale

Frankie Goes to Hollywood Frankfurt Festhalle

Catriona Forcer talks to
lighting designer

Paul Devine

How did you begin your career in lighting design?

The company I was working for needed someone to look after a Mott the Hoople tour - that was in 1976, I think. Before then, I had only designed for a support band, but Graeme Fleming, my boss at the time, decided to throw me in at the deep end. I guess you could say that my first design (for Mott) was the equivalent of an 84 lamp rig - a bit different from what I'm using nowadays!

Which other bands have you toured with?

A few of the many I've worked with include Procol Harum, April Wine, Status Quo, W.A.S.P., Lindisfarne and, of course, Frankie Goes to Hollywood. I've also worked on the odd Ski Show at Earls Court and a Ford Motor Show.

I toured Canada and the U.S.A. with Pro Skate. They were all professional skaters such as Robin Cousins, John Curry, Peggy Fleming, Dorothy Hamill and others. It was a different kind of tour working only with spotlights, but I really enjoyed it.

I've worked with many other people on tour as well. In 1974 I was on the Pink Floyd's 'Dark Side' tour of Europe and in 1975 I worked on their 'Wish You Were Here' U.S. tour. I did the 'Animals' tour in Europe and the U.S. in 1977 and 'The Wall' at Earls Court.

I've also worked with Roxy Music during the 'Love is the Drug' era, Queen, 'A Night at the Opera', Clapton, 'Slow Hand', Bob Marley, Robert Palmer, Yes, Flying Pickets, Joe Jackson, AC-DC, Saxon - and probably others I can't remember at the moment.

Are there other lighting designers who particularly impress you?

Yes: James Dann on Queen's 'A Night at the Opera' for spot calling, and Ronan Willson on AC-DC's 'Monsters of Rock' for spot calling, colour and movement in the scenes. Also Jeff Ravitz on Styx's 'Grand Illusion Tour' for being both theatrical and very tasteful and finally whoever did ZZ Top's 'Eliminator Tour' - that was brilliant, even though he had Vari-Lites!



Holly Johnson looks on as Paul Devine gets down to plotting.

Do you have a personal trademark in your designs?

I'm not aware of any. I tend to use two sets of dark rich colours for washes and lighter colours for beam patterns and specials. I like using gobos and I tend to use some moving parts but generally not over the top all the time.

I've been told by my wife Sue, and Clare Nash (The Frankie's guitarist's wife) that they can tell when I'm thinking of something new to do, either during the show or at rehearsals, because apparently I stop tapping my foot and cock my head to one side! Since I've been told about it I've noticed that it's true!

What are your particular dislikes in lighting design?

The only thing I don't really like to see in a show is weak colours - I like rich colours. The way most people use Vari-Lites I find annoying. It seems that because they are on a tour the designer must use all the colours and use the movement constantly.

Is there any band you would like to light?

I would very much like to design for Simply Red. The music is good, and I could use lots of rich colours to create moods and make use of specials, gobos and ellipsoidals. I'm not sure about moving trusses, though. Somehow I don't think that it would fit in!

What are your future ambitions?

Ambitions? Do you mean other than being rich enough to pick and choose who I work with and when?

Seriously, I would like to light an ice-capade type of show. Also, I'd like to try a video - not the live band type, but the real thing. However, I'd have to learn about colour temperatures and the like before I attempt anything like that.

Tell me about the current 'Frankie' tour.

The Frankie tour goes to England, Ireland, Italy, France, Holland, Germany, Belgium and Switzerland. We are playing mainly larger venues and it has sold really well. It started on 1st January with a load-in at the Brixton Academy for rehearsals and the last date is on the 2nd March in Rotterdam.

Please tell us about the design.

The Frankie's system is reasonably large with 750 or so lamps - I tend not to count them! It uses a lot of lamps that are only used once during the show. I'm using quite a lot of CCT Projects with gobos and cyc lights with four basic colours which I mix. It was quite strange at the beginning of the tour as it was the first time I have used a Celco Series 2 Gold instead of the Avo desk, but I'm used to the differences now. The stage set is a fluorescent green framework with a large red clenched fist (17' wide x 13' high) with a drum riser cantilevered out of the centre. The show was designed by three people - myself, Neville Lee of Star Patrol, and Ronan Willson of Meteorlites.

Neville Lee of Star Patrol designed the stage set after discussion with The Frankies. The set was manufactured by Tomcat. Both companies are based at: Unit 24, Pershore Trading Estate, Pershore, Worcs. WR10 2DU telephone (0386) 556686.

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Frankie Goes To Hollywood - two scenes from their current tour. Lighting design by Paul Devine/Ronan Willson, stage design by Neville Lee/Chris Cronin.
Photos: Ian Bosley



Equipment on Tour

Ford Sierra Launch

Client: Imagination
Lighting designer: Andrew Bridge
Lighting equipment: Theatre Projects
Tel: 01-609 2121
Trussing provided by Unusual Rigging Company
Lamps: 100 Par 64, 56 Chrome Par 36,
40 CCT Silhouettes, 150 CCT Minulette fresnels
Desk: 2 Celco Series 2 Sixty
Dimmers: 2 Avolites 72 channel dimmer racks



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Telex 945470 Riggng G

British Airways Share Launch

Client: ICM
Lighting designer: Durham Marengi
Location: various spots on the River Thames in
London
Lamps: 300 Par 64, 54 floods
Followspots: 3 ColorArcs, 2 Supertroopers
Desk: 2 Zero 88 Eclipse, 2 20 channel Green
Ginger
Dimming: 180 channels, Avolites and Green
Ginger
Effects: Lasers by Laser Creations, Concordel by
British Airways, 4 Searchlights courtesy of the
Army!
Sundry (?) items: 2 kilometres Letriflex cable,
200m 300A/3ph. cable, 300m 63A/3ph. cable,
400m 32A cable.

DAF Trucks, Brussels

Client: Congress en Theater Projektion,
Amsterdam
Lighting designer: Simon Tapping
Lighting equipment supplied by: Theatre
Projects Ltd.
Tel: 01-690 2121
Trussing: Supplied by URC
Lamps: 16 Vari-Lites, 300 Par 64, 30 Profiles,
40 1k fresnels, 4 Patt.252, 10 Par 36 Battens
Desk: 1 Celco Series 2 Sixty, 1 Celco Series 2 Thirty
Dimming: 2 Avolites 72 channel dimming systems
Effects: 50m Arcline, 2 smoke processors

Style Council

Lighting designer: Jane Spiers

Lighting equipment supplied by D Lights Design
Tel: (0223) 844500
Trussing: Triple Box Truss - Telestage
Lamps: 400 Par 64, 12 Leko, 4 Pallas 4 Groundrow,
various Par 46 and ACL's
Followspots: 2 Neithammer (truss mounted),
2 Lycian SuperArc (out front)
Desk: 1 Celco Series 2 Gold
Dimmers: 2 72 channel Avolites dimming system



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01-549 1787

We refer to our recent letter sent to various people in the industry enclosing a report concerning the use of Mono Ethylene Glycol in smoke machines, and more particularly the alleged use of this highly toxic chemical by JEM Smoke Machine Co. Limited of Louth, Lincolnshire in conjunction with machines manufactured by them.

We now accept that Caleb Brett Laboratories Limited who prepared the report are unable to confirm that their analysis was correct. We have also been informed by JEM Smoke Machine Co. Limited that they had their fluid analysed by a highly qualified Toxicologist of national reputation some months ago and he has declared it to be totally safe.

We therefore unreservedly withdraw any allegation of impropriety and irresponsibility against JEM Smoke Machine Co. Limited, we accept that any such allegation is totally unfounded and we apologise to JEM Smoke Machine Co. Limited for any damage and inconvenience caused.

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SHOW PAGE *with PLASA News*

PLASA Light and Sound Show 1987

Plans given to committee members of PLASA at their February meeting showed that practically all space has been sold for the September show at London's Novotel - a sign that the proposed move in 1988 to Olympia 2 is now absolutely necessary if the show is going to maintain its standing as one of the big three events on the international exhibition calendar.

Prospective exhibitors will soon have to start joining the usual queue for any possible cancellations unless they ring organiser David Street and take up the few sites left on the plan. A feature of the 1987 Show will be the appearance of the Italian Trade Federation (APIAD) who have booked one of the larger suites for various member equipment manufacturers.

Blackpool Event Off

The 'Club Sound, Light and Design 87' exhibition - billed by the organisers North West Exhibitions as the first 'total concept' exhibition, has been postponed. Originally planned for March 8-10 in Blackpool's Winter Gardens complex, the organisers told L+SI that it will now be held in the autumn and that they are still looking at possible dates.

Reason given for the postponement, both from North West Exhibitions, and confirmed by the office of 'Disco and Club Trade International', who were assisting with the event, was lack of time for effective promotion.

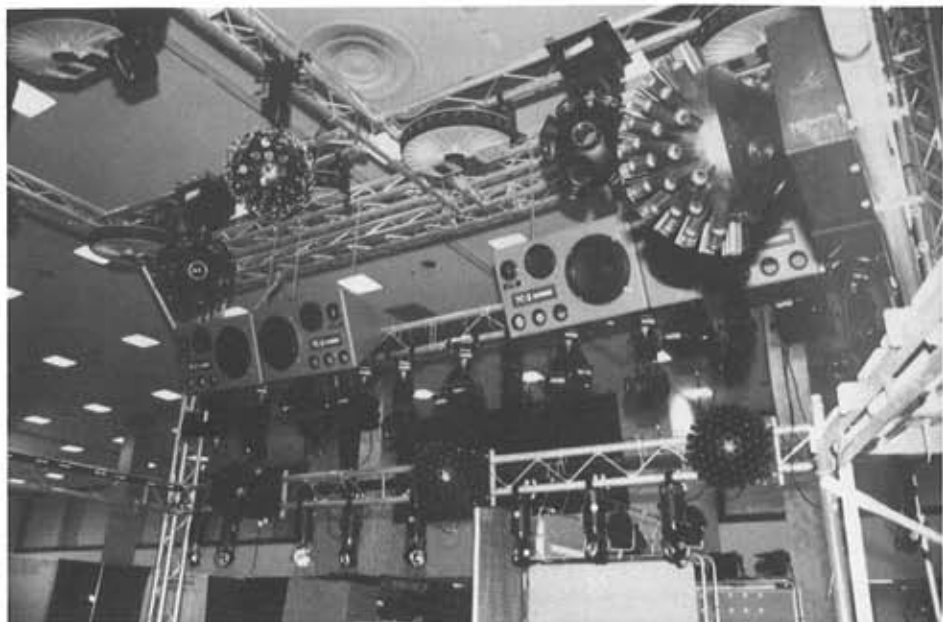
Manchester in October

ABTT North will be holding their second Trade Show in Manchester in October. The first was held in 1985. Precise dates are still awaited, but the event will be held in the Corn Exchange, the venue used in the successful first show.

Harrogate in November

Brintex Limited have announced that they will be organising the first 'Entertainment and the Arts' exhibition and conference at Harrogate Conference and Exhibition Centre from November 16-18 in conjunction with the Association of Entertainment and Arts Management.

It is planned to follow a similar format to the Entertainment 81, 82 and 83 conventions held in the same venue in those years. Contact details are provided in the 'Exhibition Diary' on this page.



Pulsar in Control

Pictured above during preparation is the High End Systems stand at the recent Nightclub and Bar Expo at Las Vegas in January. High End are based at Austin in Texas and all lighting for their stand was run from six Pulsar touch panels, a Pulsar 4-way modulator and a Pulsar Rainbow Strobe Controller. Derek Saunders told L+SI they did "a huge amount of business" at the Show - mainly touch panels and other control equipment. One typical order received was for 40 touch panels, 34 dimmer packs of various kinds, 20 modulators, and "other bits and pieces".

Exhibition Diary

ABTT Trade Show

March 5-7, 1987.

Riverside Studios, London.

ABTT, 4 Great Pulteney Street, London W1R 3DF.

Telephone: 01-434 3901.

SIEL 87

March 28 or 29 - April 3, 1987.

Porte de Versailles, Paris, France.

Organisation: Bernard Becker Promotion,

161 Boulevard Lefebvre, 75025 Paris.

Telephone: (14) 533 74 50.

Pub, Club and Leisure Show

April 7-9, 1987.

Olympia 2, London.

Angex Ltd., Europa House, St. Matthew Street,

London SW1P 2JT.

Telephone: 01-222 9341.

Nightclub & Bar EXPO

April 13-15, 1987.

Georgia International Convention Center,

Holiday Inn Crown Plaza Hotel, Atlanta, USA.

Nightclub and Bar Magazine,

305 W. Jackson Avenue, Oxford, Mississippi 38655.

Telephone: (601) 236 5510.

USITT Conference/Exhibition

April 22-25, 1987.

Hyatt Regency, Minneapolis.

Show Manager: Richard James, 486 Fullerton

Court, San Jose, CA 95111.

Telephone: (408) 225 6736.

National Office: 330 West 42 Street, Suite 1702,

New York NY 10036.

Telephone: (212) 563 5551.

Expo Musica, Madrid

April 22-26, 1987.

Madrid, Spain.

Organised by IFEMA (Institucion Ferial de Madrid), Avda

de Portugal, s/n Casa de Campo, 28011 Madrid 11011.

Telephone: Madrid 470 10 14.

AUDIO VISUAL 87

April 27-30, 1987.

Wembley Conference Centre, London.

EMAP/MacLaren Exhibitions Ltd.

PO Box 138, Token House, 79-81 High Street,

Croydon CR9 3SS.

Telephone: 01-688 7788.

SIB Rimini

May 4-8, 1987.

Rimini, Italy.

Ente Autonomo Fiera Di Rimini,

PO Box 300, 47037 Rimini, Italy.

Telephone: 0541/773553.

UK enquiries: Disco & Club Trade International.

Telephone: 01-278 3591.

Lighting World 5

May 11-13, 1987.

New York.

National Expositions Company Inc.

49 West 38 Street, Suite 12a, New York NY 10018.

Telephone: (212) 391 9111.

Sound Comm 87

May 19-21, 1987.

The Business Design Centre, Islington, London.

Organisers: Batiste Publications Ltd.

Pembroke House, Campsbourne Road, Hornsey, N8 7PE.

Telephone: 01-340 3291.

(Assn. of Sound and Communications Engineers).

NAMM Exposition

June 27-30, 1987.

McCormick Place, Chicago, USA.

Larry R. Linkin, 500 N. Michigan Avenue,

Chicago IL 60611, USA.

PLASA Light and Sound Show

September 6-9, 1987.

Novotel, Hammersmith, London.

Exhibition Bookings: David Street,

Telephone: 01-994 6477.

General Enquiries: PLASA general secretary,

Roger Saunders, 1 West Ruislip Station,

Ruislip, Middlesex.

Telephone: (08956) 30718.

Entertainment and the Arts '87

Exhibition & Conference

November 16-18, 1987.

Harrogate Conference Centre, Yorkshire.

Organised by Brintex Limited.

178-202 Great Portland Street,

London W1N 6NH.

Telephone: 01-637 2400.

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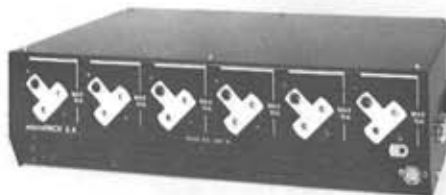
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01-549 1787

EQUIPMENT *News*

New MicroPACK from Green Ginger

A new patented design using opto-isolators has enabled the new MicroPack 2.4 series dimmer from Green Ginger to have decreased weight and cost while offering enhanced reliability.



Green Ginger's new MicroPack 2.4 series dimmer.

With six channels packaged into a unit of similar size to previous four channel packs, the unit offers an impressively high power-to-weight ratio. Five variants covering all power ranges and connection types are available, including one with dual CEE-22 sockets (per channel). All variants feature user-selectable 3 phase or single phase operation. The unit is fitted with a fold-away handle for easy portability, and can also be rack mounted for permanent installations.

For further information contact Concord Controls Limited, Unit 3, Dawson Road, Mount Farm, Milton Keynes MK1 1LH telephone (0908) 644366.

New Interface Unit from Anytronics

Anytronics have introduced an interface unit to allow lighting controllers with 0 to -10v or 0 to -15v output to be used with the PP410 DAP. This now makes their PP410 DAP one of the most versatile dimming packs on the market today, say the company.

For further information contact Anytronics Limited, Unit 6, Hillside Industrial Estate, London Road, Horndean, Hants. PO8 0BL telephone (0705) 599410.

Court Up-Grades

Court Acoustics have remodelled their range of graphic equalisers to incorporate the following improvements: electronic balanced input circuitry, transformer option on input and output,

auto by-pass relay on power-down, overload indicator, and an improved power supply regulation.

Models available are the GE30 (1/2 octave mono), GE60 (1/2 octave stereo), GE1515 (1/2 octave stereo) and the GE1515X (GE1515 with built-in 2 or 3 way crossover). All Models feature choke/capacitor technology in Court's 'Unilooop' circuitry.

For full details contact Court Acoustic Sales Limited, 29 Beethoven Street, London W10 4LG telephone 01-960 8178.

Voice of the Theatre

Altec Lansing have recently launched their A12-8A louspeaker system as part of their 'Voice of the Theatre' range of professional sound products. It is a two-way, factory-assembled louspeaker system producing high level acoustic output (long term average at one metre, 123.5dB-SPL re 20 upa, measured by the AES standard method), in a small package, making it ideal for high level reproduction in cinemas, theatre and auditoria, say the company.

Ease of installation and service was a key consideration in the design of the unit resulting in the front mounting of the woofer and placement of one of the three bass reflex parts on the back panel immediately behind the back cap of the compression driver, enabling quick replacement



Altec Lansing's new A12-8A loudspeaker system.

of diaphragms. The A12-8A projects sound in a controlled wide-angle pattern for maximum uniformity of sound quality at all listening positions. It provides smooth response and excellent linearity throughout the audio band.

Altec Lansing's professional sound products are available in the UK through Audix Limited at Station Road, Wenden, Saffron Walden, Essex CB11 4LG telephone (0799) 40888.

Low Bay Luminaires

The new Tamlite shallow profile luminaires from Tamworth Electrical Engineering, produced to complement their recently introduced high-bay fittings, are specifically designed to allow for high intensity light sources to be installed in situations of restricted head room or where lower mounting heights are necessary.



Tamlite low bay luminaire with 'plug-in' control gear module.

Particular features are the removable back plate and the 'plug-in' control gear module, which is common to both fittings, enabling fast and easy installation and providing greater maintenance flexibility. The module is easily removed via a wide opening louvred entry door without the use of hand tools.

For full information contact Tamworth Electrical Engineering Co., Harcourt, Halesfield 15, Telford, Shropshire telephone (0952) 586818.

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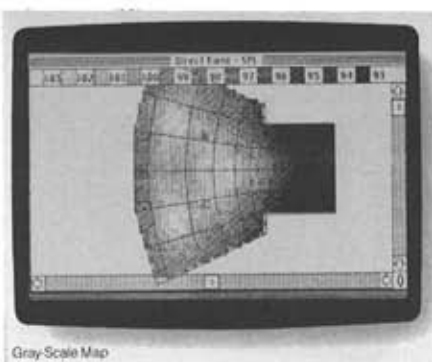
that acoustics are only found in concert halls then it will be worth its weight in gold.

I have to say that I was disappointed by the press launch (with the now obligatory smoke and laser show) and I don't think the music, 'Sledgehammer', was particularly appropriate for a product that sells refinement! Sound quality was unimpressive and for a system that aims to help place loudspeakers, a lecturer to my right and the sound to my left wasn't an encouraging start. Much of the presentation centred around the need to even out the level of background music in restaurants, but I have a dreadful fear that this means that I won't find that quiet table any more. Many verbal claims seriously fought in my mind to devalue the esteem with which I initially received the product when I read the press pack.

No, the system will not help most people understand the data better than that in technical reviews of the Hi-Fi magazines. Similarly it cannot tell the user if he will like the loudspeaker - only his ears can help him to do that, and since his ears and tastes differ from yours, the final loudspeaker choice will always be a subjective one. And incidentally gentlemen, cinema attendances are not falling, they are rising. OK, I feel better now. But come along Bose, you can do better than this!

Sadly for the moment the software falls short of those dreams we have all had for years. It won't predict gain before feedback or tell you what settings to feed into the graphic equaliser to achieve a defined response from the speaker. But there is a link here with what speakers the system currently uses, more of which anon. Oddly it won't calculate volume, a rather fundamental aspect of acoustic calculations. However, any software based product is clearly able to move with developments, so let us be patient.

I can't quote a cost because there are several scales, but I will say that for anyone undertaking acoustic calculations regularly, particularly of reverberation time (and even without involving loudspeaker placement) then the system will pay for itself in time saved. There is, however, an ob-



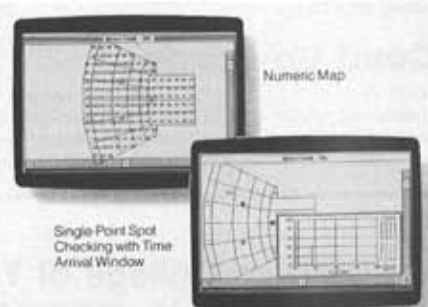
Gray-Scale Map

vious time factor to be costed in surveying the relevant room or entering that data in the system and it will take longer for a theatre than for a restaurant. Hence system users will have to judge just how much data they give away to prospective clients as an appetiser.

The loudspeaker data stored at the moment comprises the Bose range (and a few Electrovoice horns) and it is perhaps unreasonable to expect that Bose will actively encourage the system users to enter many other manufacturer's specifications, hence the lack of interest in room equalisation. To some extent this is a chicken-and-egg situation since only a few other manufacturers produce the

kind of data Bose need and perhaps this system might persuade others to do so.

I think the success of the Bose loudspeakers has caused many manufacturers to think more seriously about their products, system design and marketing. The Modeler pushes all this a stage further, and since Bose are committed to research it is certainly an important step in the right direction.



Numeric Map

Single Point Spot
Checking with Time
Arrival Window

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