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Published by the Professional Lighting and Sound Association

December 1987 Volume 2 No.12

I

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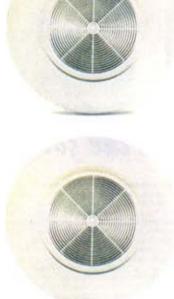
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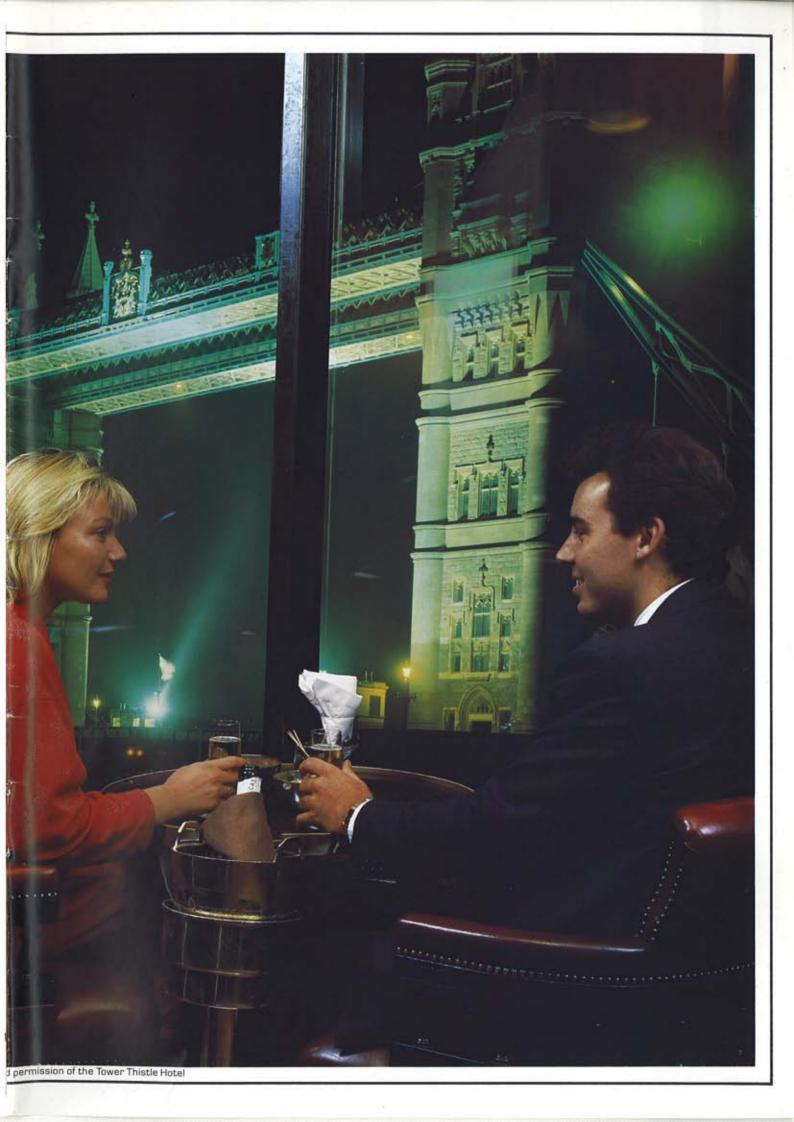


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#### **DECEMBER 1987**

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The Coliseum, Halifax (see page 29).

# LIGHTING SOUND

published by the Professional Lighting and Sound Association

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# LIGHTING SOUND News

#### **New Industry Training Initiative**

A meeting held in Oldham in late October has set in motion events which may lead to the establishment of a national industrial training body for theatre technicians. Concerned for the maintenance of technical standards, technicians in the arts and entertainments industries feel there is a paucity of adequate training, initial and continuing, and these concerns were expressed by many representatives attending.

The conference, timed to coincide with the ABTT North Trade Show, but emphasised as not being part of that event, was the culmination of discussion and lobbying by the organisers, Graham Walne, a freelance lighting designer and consultant, and Alan Stevenson, a senior lecturer in the Department of Performing Arts at Oldham College.

Delegates unanimously passed a resolution ex-pressing grave concern for the maintenance of

technical standards, the status of the technician, and the failure of previous training initiatives, and they are demanding urgent national debate prior to the bringing together of around two dozen organisations concerned with the arts and entertainment industries.

The initiative is an attempt to bring together in partnership employers, organisations, unions, professional associations and educational institutions both inside and outside the state sector.

"We want to facilitate the provision of the type of training demanded by technicians and employers alike and perhaps, more importantly, a body that can seek out and obtain the plurality of funding now utilised so effectively by other industries," said Graham Walne.

For a copy of the full resolution and details of the initiative and forthcoming meetings contact Alan Stevenson on 061-624 5214 extension 2010.

#### **Rosco's Free Trip** to USITT at Disneyland

Roscolab Limited are offering a free trip to USITT at Disneyland Hotel, Los Angeles next March.

All you have to do is win the Rosco Supergel Competition and the three-day trip to the United States Institute of Theatre Technology Conference and Exhibition in Disneyland from March 23-26 is yours. Ten runners-up will receive top of the range polaroid cameras.

A competition entry form is included in this issue, but if you require further forms for colleagues, respond to the Rosco advertisement on page 33 for details.

Roscolab's Mike Hall told L+SI that judges will include both senior and well-established lighting designers and also a couple of younger 'out of town ones' to balance the panel!

Get thinking Supergel, and dream of Disneyland.

#### Lighting Technology/Valiant Merger

The Lighting Technology Group, comprising Lighting Technology, Action Lighting, American Lamps and Lighting and VID Engineering, has joined forces with Valiant Electrical Wholesale to create a powerful new combine.

The group acts primarily as consultant and distributor of specialised lamps and lighting to the television, theatre, film, leisure and hi-tech industries, and supplies lamps to over 90% of West End theatres. Equipment manufactured exclusively includes the electronic flickering flame effect used in Phantom of the Opera', the custom-made

lighting strings for the sets of 'High Society', 'Follies' and '42nd Street', and the Raylight, used extensively by touring rock bands.

The merger will give Lighting Technology in-creased access to the large TV studio and film market where Valiant has been well established as the major supplier since the early seventies.

Senior personnel with the group include five ex-Valiant employees, headed by chief executives David Morgan and Bev Bigham, supported by co-directors Bob Peach, Jack Exell and Brian Smee.

#### Federation to Run Sound Eighty-Eight

The newly-styled Sound and Communications Industries Federation, formerly the ASCE, has decided to resume responsibility for the organisation of exhibitions and similar events.

The Federation's Secretariat will organise 'Sound Eighty-Eight' to be held at the Heathrow Penta Hotel at London Heathrow Airport on 23rd and 24th February 1988. Both the Federation and its new journal will be officially launched at the event. Details (06286) 67633.

#### 9ntroducing THE QUICK-FIT SILHOUETTE LAMPHOLDER FOR THE NEW T 29 1200w LAMP

CCT have designed a simple low cost way of keeping your Silhouettes right up to date. We have introduced a plug-in replacement lamptray for Silhouettes Mk 2 and Mk 3 - designed especially for the new T29 1200w lamp. Which goes to show once again - that if you want to stay up to date with lighting technology, you can depend on CCT.

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Silhouette Update Lamp Tray £26.50 STARLETTE Pebble Convex or Fresnel luminaires may also be updated.

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Also available soon. The

theatre lighting

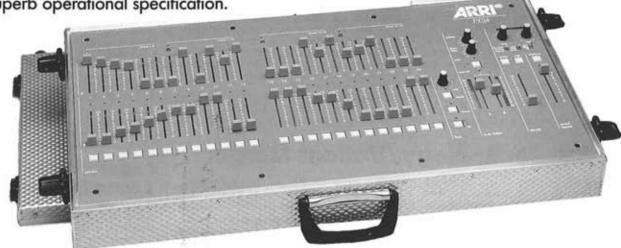
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## LIGHTING

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- Tough, compact, stackable.





Part of the new Manchester showroom. Customers visiting the trade counter and shop at Lee Colortran International's new showroom can purchase consumables such as replacement lamps and products in the Lee Filters range.

#### Lee Colortran in Manchester

**New Showroom Opens for North West** Sales and Marketing Move in from London

Lee Colortran International, the manufacturer of professional lighting equipment for film, TV and theatre, has opened a new trade showroom at Eccles, Manchester to serve the North West. It features displays of the company's wide range of lighting and lighting control equipment, and visitors can also purchase consumables such as lamps and filter material from the trade

The company has opened the showroom at the Lyntown Trading Estate site as part of its commitment to local service in the North West. On the same site is the company's warehousing and despatch operations, and products manufactured at Kearsley and Thetford are shipped into Eccles before being

sent to customers throughout the UK and the rest of the world.

A further development will see Lee Colortran move its sales and marketing functions from London to its operations centre at Eccles on January 1st. The move is designed to improve service levels to customers by "shortening the organisation's lines of communications."

Lee Colortran's - and Lee Filters' - national and international product distribution is already carried out from the modern warehouse at Eccles, and the company promises availability of Lee Filters' product anywhere in the world within 24 hours. From January 1 all sales enquiries, quotations, administration and marketing support will be based at the Eccles complex.

The product shop at Lee International's London headquarters at Ladbroke Hall, Barlby Road, W10 will continue to cater for the important volume of business in the South East. In addition, sales development manager Gordon Smith will be based in London to maintain local sales support to the company's London customers.

#### Major Arena for Docklands

To be known as the London Arena, a major entertainment development in Docklands will be officially announced during the course of the next few weeks. The venue will seat between 2000 and 12,500.

General manager will be Tim Walsh, formerly deputy general manager of

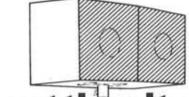
Alexandra Palace.



#### Strand Lighting's January Move

All departments of Strand Lighting will be located at their new base at Isleworth, Middlesex from January 4. Pictured above, the new premises is located in Grant Way (off Syon Way). Telephone numbers will remain the

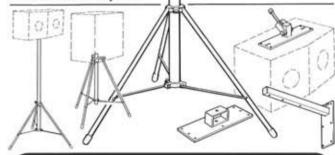
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Lee Sharp, manager of the London branch of Squire Light and Sound, with some of the Rane products the company will be stocking, including the MP24

#### Rane Products from Squires

Squire Light and Sound centres now have access to the full range of Rane equipment, which includes graphic and parametric equalisers, active crossovers and multi-channel amplifiers as well as mixers. "The MP24 mixer and ME15 micrographic equaliser are the most accessible units for the mobile DJ, the road-show and the small to medium club owner. However, the whole range is very useful to us, and several units are already being built into some of our quotes," said Squires' London manager, Lee Sharp.

The Rane unit which most impressed Squires was the MP24 Disco/ Production Mixer, already installed in established clubs like Legends and Heaven. The unit has four stereo mixing busses, any of which can be assigned to the independent crossfade control. Separate equalisation is provided for the mixer and the two microphone inputs, while studio grade faders and in-ternal FET switching give the MP24 noiseless operation.

#### Tapetheque Presentation System

John Leefe, co-founder of Bacchus International Discotheque Services, which was successfully sold to the Juliana's Group in 1981, has left Juliana's where he was technical director to form Tapetheque Limited with them as a joint

The company is developing a computer-controlled recorded music presentation system - which will also control lighting where applicable - for use in applications as diverse as discotheques, pubs, broadcasting, airliners and hotels. The system defines each piece of music in its library by criteria such as style, speed, key and year of release, and can prompt the operator with intelligent suggestions for songs to follow the one currently playing.

It will also cue and start the tracks automatically. The critera governing the choice of music can be selected by the operator so that specific styles, eras or whatever are chosen for target marketing or special sessions. An automatic version will also be available in which the computer will choose, cue and start each track using whatever material is available in the transports

The prototype has been developed using a BBC computer and cassette decks, but IBM PC compatibles and multi-play CD players are now being investigated. Lighting control is executed by a digital programme encoded on the tapes which is then interpreted on site in such a way that overcomes the problems of varying types and sizes of lighting installations.

For more information contact John Leefe on (0635) 201206.

#### Promotions at Strand Lighting

Russell Dunsire has been appointed sales and marketing director of Strand Lighting. He joined Strand 14 years ago, and his career with the company has included running the Kirkcaldy factory sales office and responsibility for sales management of both UK and overseas territories. Prior to his latest promotion he was general sales manager.

Russell's team includes Ivan Myles, who now becomes UK sales manager after several years as UK theatre lighting sales manager, and Graeme Pusey who has been promoted to export sales manager. Also promoted is Nick Perry who is now sales administration manager.



Russell Dunsire.

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For further information on the JBL Control Series, write to: Harman UK, Mill Street, Slough, Berks SL2 5DD. Telephone: 0753 76911.

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#### **Furse Theatre Products** Division to be Sold

Following the recent acquisition of W. J. Furse and Co. Ltd. by the Thomas Robinson Group plc, it has been announced that the Theatre Products Division is to be sold, as it does not form part of the overall strategy for the group's advancement in their established fields of industrial and electrical

Furse involvement with theatre equipment can be traced back to the early days of cinema when the son of the founder designed the first panic bolt

Today, Furse Theatre Division is a successful manufacturer and installer of an extensive range of lighting, dimming and engineering equipment supplied to clients both at home and overseas. The secret of their success has proved to be the ability to provide a complete scheme, from planning through to commissioning. This is particularly true in the educational field, where they are acknowledged as one of the leaders.

#### **CCT Buy Back Shares**

CCT Theatre Lighting has reached agreement in principle to buy back the 15% holding in the company held by the British Technological Group (BTC), managing director Don Hindle told L+SI.

#### On the Move

JEM Smoke Machine Co. Ltd. has a new location in Lincolnshire. Their new address as from November 30th is Vale Road Industrial Estate, Boston Road, Spilsby, Lincolnshire PE23 5HE telephone (0790) 54050. The number for JEM Pyrotechnic and Special Effects is (0790) 54052.

Cable Technology, UK distributors for Klotz professional audio cable, will be based at Unit 9, Enterprise Court, Park Farm, Wellingborough, Northants from January 1st 1988 onwards.

Services offered include heavy duty speaker and

microphone cable, custom multicore systems, connectors and other accessories.

#### Samuelsons for Telecom

Samuelson Communications was recently contracted by H & P Associates Ltd. to assist in the realisation of a design concept displaying the global communications network to which British Telecom plc is committed, for Telecom 87 in Geneva. The stand was framed with three giant inverted triangular panels of welded aluminium,



interlinked to form an enclosed, yet 'open' exhibition space with an all-white theme.

Each surface displayed a facet of worldwide communication, illuminated from within by a matrix of over 300 multi-coloured lamps on complex, microprocessor-controlled circuitry specially designed and unique to each panel.

Samuelsons also supplied the Videowall. The 18-monitor system presented a wide panoramic picture complete with stereo sound, and was run from two synchronised video sources to ensure high resolution.



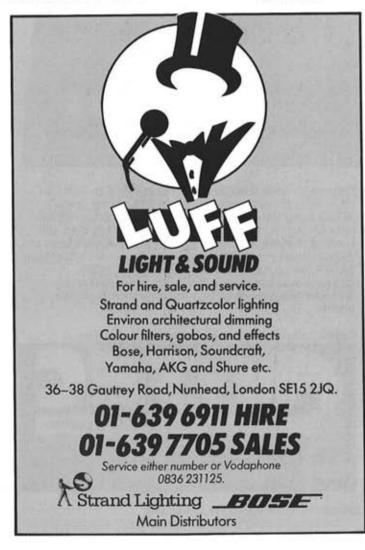
The latest addition to the Paul Farrah Sound team is Trish Ashton who has joined the company as sales co-ordinator. She was previously with Hayden Laboratories since 1976.

#### Letters

I am writing to correct some inaccuracies in Richard Harris's 'Circumnavigating for Stage Lighting' article in L+SI's July issue. I feel Mr. Harris attempts to give the reader the impression that all Australian theatres use nothing but Strand equipment!

Whilst making allowances for age and failing eyesight, I cannot abide statements in reference to the Victorian Arts Centre such as "all stage lighting is by Strand"! In point of fact, the Victorian Arts Centre Playhouse features as original equipment over 300 CCT Silhouettes, locally built by CCT in Australia. Likewise the Sydney Opera House.

Mike Tanner National Sales Manager, Lighting Jands CCT New South Wales, Australia





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# Clubmixing?

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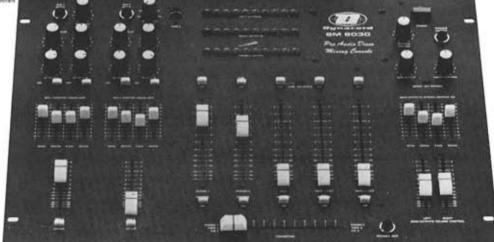


#### Soundout

#### Clubmaster . . . Professional Mixer.

This well established club mixer gives ease of operation and is a particular favourite with club DJs — a truly superb product with specification and reliability to match. Studio quality allows inclusion in top specification systems, but at a realistic price. The Clubmaster has six input channels, with full three band equalisation on both microphone and music override. Low voltage deck start

switches with LED indicators together with on/off switches for the two microphone channels are provided. The comprehensive push button monitoring system gives a visual meter display on the accurately calibrated LED meters, as well as the normal headphone output, and left and right decks can be monitored simultaneously for beat mixing.



#### Dynacovd

#### SM8030 ...

**Professional Mixer.** Dynacord's 8 channel professional club mixer was the culmination of two years of research and development and combines Dynacord's own extensive experience with in-depth analysis into user operation.

The wealth of useful features includes smoothly operated 100mm ALPS faders, transition control, remote start switches, built in active 2 way stereo crossover, adjustable mono outputs for background systems and light controllers, and a sophisticated four band music output graphic equaliser with unusual frequency points especially designed for club system use. Dynacord's in-depth analysis into operator requirements is exemplified by the two microphone channels, which have features never combined before on a club mixer – four band graphic equaliser, two special effect send-return channels, pan controls, on-air switch and adjustable automatic music ducking. An adjustable low cut filter eradicates bass feedback and is another example of the thought behind this mixer – the electronic and audio specifications, naturally, are superb.

Both mixers are distributed exclusively in the UK by Avitec an form part of their comprehensive sound equipment "menu". Avitec's menu of sound equipment is already first class with each unit selected for its particular forte in a given application. This combines with the knowledge and expertise of Avitec's sales and technical team, to make a powerfully sound reason to look closely at the Avitec sound menu before purchasing a system.

Catalogue available on request or visit our comprehensively equipped showroom (Mon-Fri) — by appointment if possible please.

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# The Northern Lights Graham Walne

- \* Lee Colortran Magic Sheet
- \* Specialist Lamps Move House
- \* Avolites and Opera North \_
- \* Starframes for Pancans
- \* Eltec Scenestealer
- \* Triple E's linear options
- \* Playlight's 'News'
- \* MAC Sound for Pantomimes
- \* Ark Light restorations

When I was growing up in Lancashire, people used to say: "What Manchester does today, London does tomorrow". The ABTT North Trade Show, held at the Grange Arts Centre in Oldham, gave me an opportunity to see if this was still true.

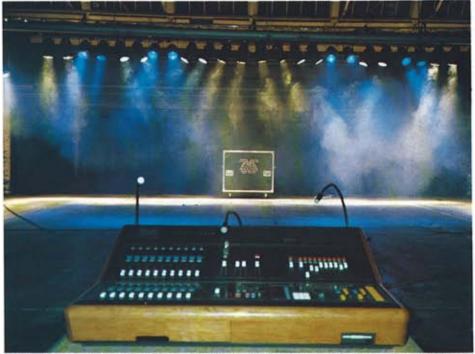
I used to measure the success of trade shows by the difficulty of getting to the bar, but after Oldham I will have to reassess this yardstick. Although that wasn't a problem, the standholders were content with the quality of their enquiries, and after all the chat, the business of a trade show is still business.

The Grange Arts Centre is intimate and comfortable, and provided a relaxing atmosphere in which one could meet, chat and investigate. There were several stimulating seminars, especially the debate between Peter Cheeseman, creator of the Victoria Theatre in Stoke, and Phil Clifford, surely one of our leading exponents of sound for theatres in the round. At another such event Francis Reid contrasted the regenerative possibilities of the regions with the frequent apathy in London. Certainly the Oldham air gave life to a new training initiative, born out of my own seminar, and reported elsewhere this issue.

The Trade Show gave Northerners their first opportunity of checking out **Strand's** new range of controls and the Cantata 1200w range and then to contrast that with the new 1200w Silhouette from **CCT** across the way. This unit was reported on in the previous issue of L+SI, but the Trade



Strand's Terry Abbs with Lightboard M. Leicester's Phoenix Arts Centre ordered a 36 channel manual package on the first day of ABTT Trade Show North.



The new Avolites QM500T at Salts Mill, Saltaire, Shipley during the production launch of Opera North's West Side Story.

Show gave me the chance to ask about the availability of 1200 watt lamps rather than 1200 watt spotlights, and I have to tell you that I'm not getting many straight answers.

If your budget is tight then it does make good sense to ensure that your existing equipment is well maintained. Often this is hard to do in-house, and it is interesting to watch the progress of companies that offer an outside maintenance service. Ark Light offer an extensive service of restoring spotlights: typical prices (for the kind of restoration which they say could extend the useful life of equipment by five years) are £33 for a 264 and £23 for a 123. They are a new company to me, and I think they are one of only three outfits in the UK undertaking this kind of work. Ark Light are also interested in obtaining old lanterns - so if you have some contact Joanne Taylor on 053758 336.

Researching some dates for the latter part of this article I was surprised to come across the origins of the linear induction motor which first saw the light of day in 1830. Consequently, its introduction into the theatre some years ago by **Triple E** might be considered welcome, but rather over-

How many ideas are there out there? Triple E's



Bill Jones of CCT shows off the new 'compact' Silhouette.

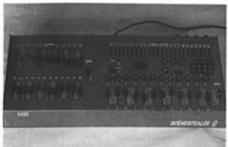
new version of their track on display in Oldham uses an overhead powered tractor which picks up its power from adjacent busbars. Since the conductors also offer a data line it is possible to record and reproduce various stopping positions. Although essentially a curtain track, the device offers many possibilities, laterally thinking!



A Furse-ADB line-up with (left to right) Richard Atkins and Lynne McCall of Furse, Dirk Van Nieuwenhuysen and Raph Janssens of ADB and Nigel Kenton of Furse.



The Lee Colortran Magic Sheet in demonstration. Chris Cook (right), dimming and controls product manager, shows off its capabilities.



Eltec's 'Scenestealer II'.



A close-up of Lee Colortran's 'Magic Sheet'.

The small memory market is hotting up, and smaller theatre and amateur companies can no longer ignore the ever decreasing prices. Many such clients are frightened by the idea of memory, and systems which can also offer a degree of manual control are likely to overcome some of these fears. Typical of these is the **Strand** 'Action' with 24 faders working to a memory. Another system on display in Oldham and well worth considering is the 'Scenestealer II' from **Eltec**. On this system, 24 conventional channel faders talk to the memory system which has a capacity of 99 states. These can be replayed via 12 masters. I liked this system because it seemed clear in its operation, essential to first-time buyers, and they will like the price of only £750.

Nearby, Lee Colortran were demonstrating their new adjunct to their range of Prestige memory lighting controls. I have to be honest and say that I was never favourably disposed towards the old Berkey Colortrack systems because whenever I went to a theatre that possessed one, the show always took longer to plot. However, the new organisation have certainly produced a device

that will change all that.

I am talking about 'Magic Sheet'. This is a graphics tablet which can interface with the Prestige desk. The lighting designer places a small version of his plan on the tablet and by touching the pen on the corners establishes the coordinates of the plan. Then he touches each spotlight symbol in turn and with the aid of a built-

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in key-pad, tells the system the number of the dimmer channel into which that spotlight is plugged. After that, any touch of that symbol with the pen calls up that spotlight and a nearby scale offers intensity control.

It is possible to arrange that when touched the front of the system switches the spotlight on and the back switches it off. Spotlights touched in turn are grouped for common levels.

I especially like the feature which offer further group memories, since the designer can write on the paper the designation of any group memory he wishes, say 'cyc' or 'blue wash', and as long as he enters the co-ordinates of that designation into the system, all he has to do to recall that memory is simply to touch that point on the paper!

Trade shows have their limits when testing equipment, and so Lee put me in touch with a user of Magic Sheet - Malcolm Granville, chief electrician of the Rambert Dance Company. He was very enthusiastic about the time the unit has saved his company in plotting, especially in touring where the circuit numbers might not be the same each week, but the geographical layout offered by the plan will be. Malcolm also pointed out that even with the best operator, a conventional desk still requires three button pushes to create a level, whereas Magic Sheet replaces these with one pen push.

Lighting designers have long sought an improvement in the interface between their ideas and their execution. I certainly recall Richard Pilbrow talking of geographic controls and Joe Davis asking for fewer buttons between him and his lighting. Lee Colortran have stolen a march on their competitors who, after all, have rather more installations into which such systems could be connected. Watch this spacel

After the Trade Show I visited exhibitors Specialist Lamp Distributors at their new base close to Manchester's extensive motorway network and to the old docks - an area now being given a new lease of life with a hotel, cinema com-

plex and shopping area.

Specialist Lamp's new northern base is compact with a display area, trade counter, offices and warehouse which holds over £250,000's worth of stock at any given time. They have also established a sales office in London. Founder Ron Merchant told me: "I felt that the location didn't matter, but some people still feel that an 01 number is important and we do have to get through that psychological barrier.

"But the world has shrunk so much that Manchester is just a 'phone call up the road. I don't sell lamps: I sell a service. As we've grown we've had to concentrate on what we're good at, and that is giving people a red-hot, next-day service throughout the country - and remember that we generally don't charge for delivery."

Ron Merchant formed the company in 1979 out of a subsidiary of Thorn, and today it enjoys a





All action at Specialist Lamp's new base at Salford.



NEWS ALITIMM 1987

Hallé Orchestra Launches Playlight's G-Mex Lighting Truss

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gross turnover of £2m, 50% of which comes through the audio-visual and educational market, 15% display, and 15-20% theatre - "not as much as I would like" - and the balance being disco, television, and micrographic.

"We are not electrical wholesalers," he said. "If it's not lighting, we don't carry it. But in addition to lamps we do carry plugs, fuses, lampholders and colour, the Chris James range - it's the same as Lee but very competitively priced and we sell a lot, especially to television. But our lamp range is especially high tech. We don't sell GLS lamps - we concentrate on audio-visual, television, outside broadcast, micrographic, disco - General Electric and Silvania. I chose the name Specialist Lamps because I didn't want people confused about what we do," he explained.

Most successful businesses are built not only on the foundation of such a clear philosophy but on actively imparting that philosophy to all who work within. Specialist Lamps is no exception. "We chose not to go into lighting design at first but to concentrate on the service aspects because you have to get the business in before you can afford to give people time to look at other things. We have a very young team here, and now I want them to come up with ideas.

"We are all learning all the time, and we learned a lot from the Oldham Trade Show. It isn't just about selling. I believe that if people enjoy what they do then they'll do it well and the secret here is that everyone is paid on profits. So all told we might never be the biggest, but we will certainly be one of the most expansionary companies." Founder Ron Merchant deserves his success, hav-



Ron Merchant: "A red-hot, next-day service."

ing proven (yet again) that the touchstone of profit is through service.

Another company associated with reliability is Avolites, whose name is a by-word on the concert touring circuit for well-built equipment. They have recently delivered a new memory lighting desk to Opera North and I caught up with it on tour at Manchester Palace.

On my way to the Theatre I studied the press release, and as a writer of my own I am accustomed to a certain amount of hyperbole. However I am not sure that Avolites do themselves justice with the phrases 'the ultimate lighting desk' and 'in the past theatres seem to have been content with restricted technology' - phrases that bring on my incipient schizophrenia, excited and suspicious at the same time. I do agree that the rock-and-roll world is rather better than the theatre at the introduction of technology from other industries. After all it is some time since the theatre borrowed the limelight from the surveyors and the fresnel lens from the lighthouse.

Although the QM500T desk does not appear to have any technology in it that cannot be found on another desk it should not be dismissed as merely another memory desk. Firstly, it heralds a return to the modular concept popularised by that doyen of memory boards, the MMS. This ensures that maintenance and updates are easier than with other desks where controls are built into one fascia. Secondly, it also heralds a welcome return to the era of timber and leather trim. The renowned Avolites solidity is evident, apparently a similar desk was still operational recently after being thrown off the upper circle by 'fans'! Thirdly, the QM500T follows the recent trend away from what Mr Bentham once called the 'cash register' approach to switchboard design, and the layout is spacious.

Many of the existing facilities have been carried over from the rock-and-roll origins of Avolites, such as the flashing and chasing functions, and these are being retained since Opera North plan to hire out the desk when they are not using it themselves. By contrast many facilities which theatre operators take for granted, such as the 'at'



The 'Telex' diversity radio mic system aroused interest on the stand of CIE.



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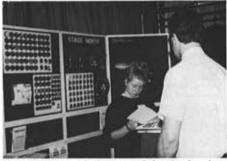
Strand dealer duo - Ray Scott of Sound Electronics (Newcastle) and Sean Browne of Futurist (Dewsbury).



Northern Light with their popular stage manager desk



Le Mark's Stuart and Linda Gibbons get theatre taped.



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Fax 061-873 8089 push are missing. However, Opera North are having constant meetings with the designers to rationalise these alterations. They specifically opted for early delivery so that they could work with the desk and improve it rather than be told what facilities would be provided. Indeed, the factory maintains an identical desk and updates are discussed by both operator and technician over the telephone

The QM500T has essentially the same facilities as many other memory desks in that it offers menu-updates, disc storage, blind plotting, 20



Joanne Taylor sells Ark Light's lantern restoration scheme



Melvyn Smirk of Northern Stage Snowden of Eltec Drama Lighting. Services with Phil



Philip Edwards (right) draws a crowd.



Triple E's latest - picking up power from the track, and giving huge flexibility of application.

#### MAC - the Sound from Manchester

Manchester-based MAC have a national reputation when it comes to sound supply and design for trad-itional theatrical and musical produc-

For the coming pantomime season For the coming pantomime season they are supplying equipment for all the Paul Elliott-produced pantomimes in England and Canada, and a complete system for a five-week tour of major theatres in Canada. MAC equipment will be operating in the UK at the Palace Manchester, Alexandra Birmingham, Theatre Royal Brighton, Wimbledon Theatre, Richmond Theatre and at the Grand Opera House in Religious 1



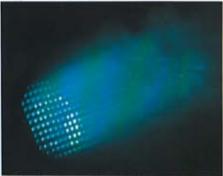


A new method of presenting those same old par lanterns to enhance any lighting display, and using them in a cost-effective manner, has been developed in the UK by a new name on the lighting scene, **Starcan Lighting**, who have appointed Mushroom Lighting Services of Northampton as their distributors for the entire

Launched at the Entertainment and Arts conven-



Mushroom Lighting's logo (left) and a standard Starframe.

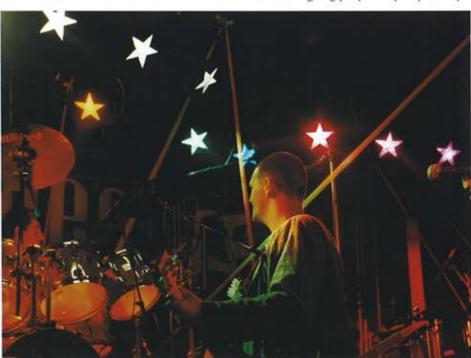


The 'Dot Grid' in lighting action.

tion at Harrogate in mid-November, 'Starframes' fit on to most of the Par 64 lanterns currently being used throughout the world, and can be used in a multitude of situations, from rock concerts to AV. The idea of lighting designer Mike Cooper, Star-frames are produced in a wide range of designs,

with a custom artwork service available to

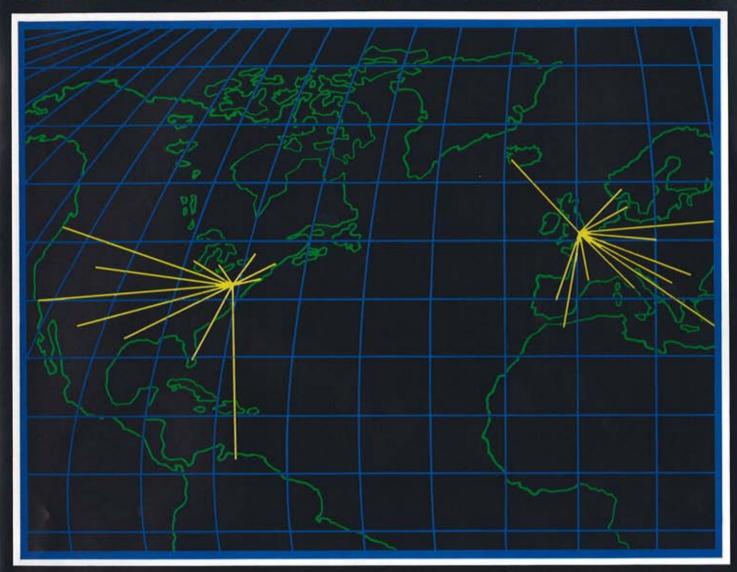
reproduce logos and graphics to clients' specifications. Shapes currently available are Soft Star, Sharp Star, Hearts, Diamond, Club, Spade, Circles and Squares, Half Moon, Dot Grid, etc. Other designs are in the course of preparation, and a ful-ly detailed fact sheet will shortly be available from Mushroom Lighting (telephone: (0604) 494866).



In performance with Starframes - the 'Cardiacs' pictured in London's Marquee Club.

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The QM500T from Avolites.

way sub-mastering 60 minute timed faders, unlimited cue inserts and level pin-matrix backup, and since some aspects of these facilities are altering I do not propose to go into detail about them here; the Opera North desk is by way of a prototype.

What it does have is one of the clearest displays of its contents of any board. This takes the form of alpha-numeric displays above each cue fader and master, and this in turn has relieved the screen of displaying everything but the level of channels used. Operator Dave Whittlestone explained: "With the legend facility I am not as dependent on the plot. This is an extra precaution where memory numbers are not cue numbers because you see what state you are in and where you are going in relationship to the show itself. You can call it anything you like; it's not just a number, and if I'm off sick someone else can easily follow what's happening." The QM500T appears to me to be one of the few memory boards designed with touring in mind and clearly the Opera North staff are content with Avolites' solid reputation born out of so much experience on the road.

born out of so much experience on the road.

However, Opera North's reappraisal of its lighting policy extends well beyond the switchboard. Chief electrician lan Somerville explained that they had looked at their entire installation and had adopted many of the techniques of ontheroad shows.

The entire rig, with a larger contingent of Pars than perhaps any other opera company, is arranged in 6 PAR-lamp sections and pre-rigged on to 7'6" bars, each fitted with clamps for gas barrel or scaffolding. The bars with their lamps are toured on 'meat-racks' which are bought straight on to the stage, making it easier to get the bars into the air. Each short bar is served by its own multicore which is taped into a loom with the others for the overall lighting bar, and then passed straight to the toured dimmers in the wings. This is very similar to the technique that John Wyckham used many years ago for the first tour of 'Oliver', but theatre appears to have forgotten it.

theatre appears to have forgotten it.

By using these rock-and-roll techniques lan reckons they can hang and plug 300 instruments in just over a half hour. The technique brings many benefits since it opens up much of the day for focussing, retouching the set and sorting out problems. Ian said that his system has to be flexible enough to cope with the differing styles of lighting now that many theatre lighting designers are coming into opera. Lighting designers have welcomed the system since it has given them more equipment to play with than with the previous one. The entire system is now available for hire from Opera North.

So, in the space of a few days I met a good exhibition, a vigorous company, and two interesting switchboards . . . clearly there is life beyond the Watford Gap!

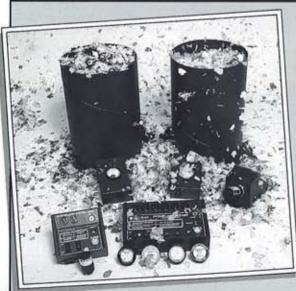


Low fog from Rosco - John Riddell demonstrates the 1500

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# Meterolites' Macroscopics

#### John Offord visits Meteorlites Productions' Stevenage base and talks to Ronan Willson.

Ronan Willson - the man behind Meteorlites Productions - has an intrinsic love of equipment. "I still go on the road and have a hands-on attitude," he said. In truth, that is something of an understatement. What he really loves to do, and his real forté, is to create and bring into full working action those massive, intriguingly designed and highly dramatic sets and lighting rigs that are part and parcel of major rock and heavy metal tours.

And when he gets down to describing a set, he fully enjoys explaining how all its various and complicated elements work, and where they fit into the scheme of things as far as the show itself is concerned.

The story of Meteorlites, alias Ronan Willson, is another of those fairly regular scenarios in the lighting and sound business - of growth from the garage workshop to a major operation. But along the way, every tale has its highly individual characteristics, and the Meteorlites route from its disco beginning to six-figure world-touring production sets and other allied business is as interesting and exciting as any.

Ronan Willson started "dabbling" in the business when he arranged disco gigs at his college. "Quite simply, whilst having plans for art school and picking up extra A levels, I needed money and did some work for the local student unions. We became a support act for many of their events, and I found I could actually earn my living fairly easily," he

From providing a couple of mics, the activity expanded to the provision of a complete package of equipment and actually running events. A few months down the line and his stock of equipment was also earning income from hire.

Concurrently he was also working parttime for a company in the electronics field - who rather appropriately manufactured noise measurement equipment! "I remember how I used to count how many weeks I had to work to earn enough to buy my first sound-to-light unit from Pulsar," he said.

#### AC/DC Stage Set

The original set was first used for AC/DC's US Summer Tour in 1986, but it has been substantially modified and re-designed for the group's forthcoming World Tour.

It comprises a series of connected walkways and ramps of various heights standing on 13 perspex pillars. Built into the set are four elevators and a number of highly dramatic special effects - but you'll have to see a show to find out what they are! A dressing room area is built in, as is all the back-line equipment, which is therefore all invisible to the audience.

The set requires a stage of 64' x 44' excluding the downstage thrust and crowd barrier which adds a further 10 feet to the front. All sections clip together for rapid assembly, and when dismantled pack into 13 'meatracks' and six flight cases requiring 70 feet of truck space - about 1% artics.

On the road there will be a three-man crew to assemble the set and operate the special effects.



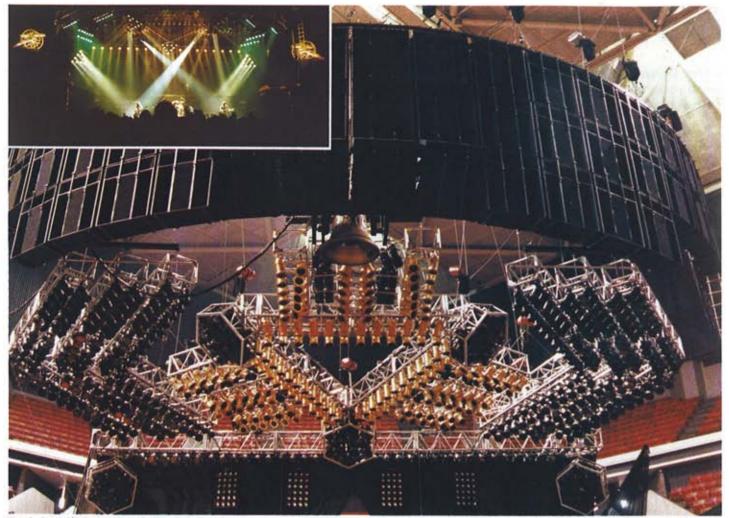
Judas Priest' at the Hammersmith Odeon in 1980.



Ronan Willson (left) with Tony Panico and a model of the set for AC/DC (see story, left).



The elaborate and pioneering rig for Iron Maiden during construction in a rented warehouse in 1983. The rig had its own ground support gantry, just visible in this picture.



The rig for AC/DC's 1983 North American Tour in 1983 pictured at the Omni in Atlanta. The 1000-lamp structure included five hexagonal 'pattern pods', each containing 12 Par 64's and 24 Par 36's, which could be illuminated in various formats. Inset picture shows the concert in action.



'Monsters of Rock' in action at Castle Donnington in 1984 with an 1800-lamp rig that required over one megawatt of power. Pictured below is the eight-foot long model of the set.



Having decided lighting rather than sound would be the area he would concentrate on, a decision also influenced by the capital costs involved, Meteorlites set out into the pro field. Via several lock-up garages, ten years ago at the age of 23 Ronan Willson rented a shop unit, and the business took on a "presentability". They've moved twice since then, and in mid-1988 the company will move into its recently purchased freehold premises - a 15,500 square foot complex in the heart of Stevenage's high-tech industrial area.

The background to the strength of the operation has come from two main areas: a major stock-holding of rigging and lighting equipment, and a very close and inspired relationship with design and presentation. Cleverly progressing the two together has seen the establishment of Meteorlites as a major force in the industry. Equipment held is valued at well over £1m, and major projects undertaken involve design, production and logistic knowledge of the highest order.

"When I was 25 I found I was becoming exposed to a wider front," Ronan explained. "Heavy metal lighting was just beginning, and from small club work I moved on to gigs in America, and at this time I became lighting designer for Judas Priest. I think I was the first person to take out a moving system - and an all-silver system."

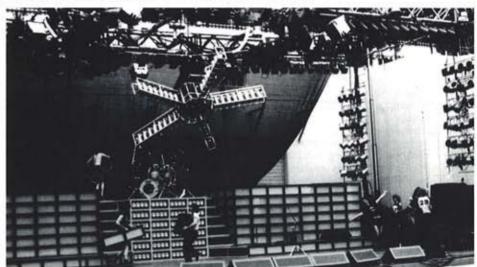
The major development of the Company happened in the later seventies, with an ebb and flow of business across the heavy metal, rock and concert spectrum. "Judas Priest wanted me to go full-time on the road, but I wanted to develop the Company. Iron Maiden were the first group to have my input on this new basis, in 1981.



The Montreux Rock Festival, 1987. Meteorlites have supplied the lighting equipment for this event for the past four years.

"We were still a small company, just four people, with crew and specialist help hired in as necessary. We set up a welding shop to build sets. They were experimental times, and we had an awful lot of small clients - what we called three-tonner tours. In those days a 300-lamp system was a big rig, and now everybody wants them!"

The growth of the operation over the last five years has been phenomenal, and international. Ten permanent staff look after Meteorlites Productions' operation in the UK, whilst a sister operation in the United States, based at Hagerstown near Washington DC, has a duplicate hire stock of lighting control and equipment so that international tours can be organised from either base. Meteorlites Productions 'Limited' and 'Inc' look after all rental and production business, while a new company, Modernworld Lighting, was set up just 12 months ago to take advantage of the experience accumulated, and to look after direct sales of



Building the set for the 1981 US Tour of Judas Priest in the San Diego Amphi-Theater. The drum rise featured 96 aircraft landing lights which could be pattern sequenced, and the moving 'star' effect pulsed to the music beat.



Iron Maiden in rehearsal at Brixton Academy in 1983. (see also picture page 24) Frankie Goes to Hollywood at the Hammersmith Odeon in 1986.





Part of Meteorlites' extensive storage area - soon to be expanded when the company moves into its new 15,500 square foot industrial and office complex.

materials and systems across the complete lighting spectrum. It is based with Meteorlites in Stevenage.

Ronan Willson's and his team's design skills are probably best known from the work produced for AC/DC since 1983. The sets are landmarks of engineering skill and theatrical surprise. Every set out of the Meteorlites' stable is constructed in modular format to fit trucks and containers, and capable of being repeatably set up and moved on to major venues world-wide - no matter how intricate the construction. And they are all fully built and set up at the time of first manufacture to ensure everything fits exactly when it comes to the actual concerts.

"We are one of only four or five companies who have the necessary expertise on both sides of the Atlantic, and we've tried to cut out a high quality brand of equipment and service. It means we don't get all jobs, but I feel it puts us into a particular class, and we have a consistent pattern of clients who repeat business," said Ronan Willson.

Gradually the branding of the operation as a heavy metal outfit is being eliminated as they have moved towards middle-of-the-road clients, and an increasing involvement with television has emphasised the trend.

"Our TV involvement began in 1983 when we introduced rock and roll formats to the BBC. We supplied frames, racks and trusses, complete with lamps. Now there's quite furious competition. Some we win - some we don't."

Equipment has also been supplied for shows such as the 'Late, Late Breakfast Show', The Old Grey Whistle Test' and 'Wogan'. "We've also played a large part in bridging the outside broadcast gap between TV and rock lighting, and we've got a bit of a taste for that! Our involvement with Seaside Special from Jersey this summer was a good example of how we've developed into this area of the business," said Ronan Willson.

Meteorlites' latest television project has been 'Meltdown' for Thames TV, where they've taken a fully fledged moving rock system and put it into a studio situation. "Our approach means TV companies can save on rentals with rigs, but we've also had to ensure we haven't trodden on other people's toes, and that we have met all the necessary safety requirements. We are also members of the Society of Television Lighting Designers."

The Company's range of regular work involves everything from major industrial theatre and product launches and across the whole field of concert presentation to television lighting for events like the annual Montreux Rock Festival where they have supplied lighting equipment regularly for the last four years.

Meteorlites is a compact totally family owned and fully independent company in a



Preparing part of the set for AC/DC's coming tour of Europe and Australia.

field where the majority of the competition is in the form of publicly quoted organisations. "It means we are very flexible," explained Ronan Willson, "and we are not tied to particular products. We will provide whatever it takes for a production - the best for the job."

Obviously the hire stock centres on their massive range of rigging and hoists, and they have been instrumental in the design of products - particularly many items now manufactured by James Thomas Engineering. "As a company we were able to road test the prototypes," said Ronan Willson.

Taking it to the final degree of involvement, Ronan Willson has his own miniature 'meccano set' of Thomas Trussing to play with when the next major tour hits the drawing board. It's indicative of the personal involvement that is put into the Company's projects.

As with all successful and expanding businesses, the major problem is often one of time. "At least one day a week I spend looking after the US operation, and an awful lot of my time is now pure business. The big problem is organising how my time is used.

"I now consider going on the road as a bit of a holiday. I can concentrate on just the job in hand and forget business for a while."

Which is probably why he's excited about looking after AC/DC in Australia next year as part of its coming world tour, while back at Stevenage the Company will start to fill up that 15,500 square feet of space . . .

Key staff at Meteorlites in the UK include **Tony Panico**, operations manager, who oversees all daily operations, and **Tony Slee** who looks after client contact and co-ordination of production. Sales manager is **John Jackson**. Vice-president of the US operation is **Dizzy Gosnell**.

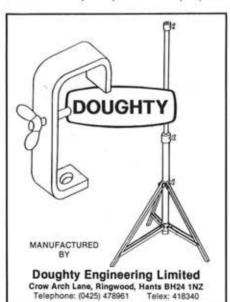
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#### London's Cafe Satellite

Just opened in Argyll Street, right next door to the London Palladium in the heart of the West End, is Cafe Satellite. The brainchild of two young entrepreneurs, lan Howard and John Northcote, the venue is more than just a restaurant - it is part of an exciting new £5 million project that will see a series of Satellite stores opening around central London in the next few months.

The concept behind 'Satellite' is one of global communications bringing together leisure activities from around the world, incorporating fashion, music, films, sports and world events. From the studio at the Cafe, in-house programming will be broadcast at the shops, and will include satellite television, the latest international fashion, music and film videos and TV clips from around the world.

Ian Howard and John Northcote's previous venture was the innovative Music Market chain which was the largest privately owned record and cassette retail chain in the UK with over 22 shops. The chain was bought by WH Smiths at the end of 1985 and incorporated into their specialist music division, 'Our Price Music'. After six months of working independently Ian and John met up again and began putting together the new concept behind Satellite.

"We both felt that there were enormous opportunities to be explored in the leisure and entertainment industries," explained managing director lan Howard. "By incorexplained porating these opportunities into the restaurant and retail business, we believe Satellite will provide a remarkable and refreshing new attitude," he said.

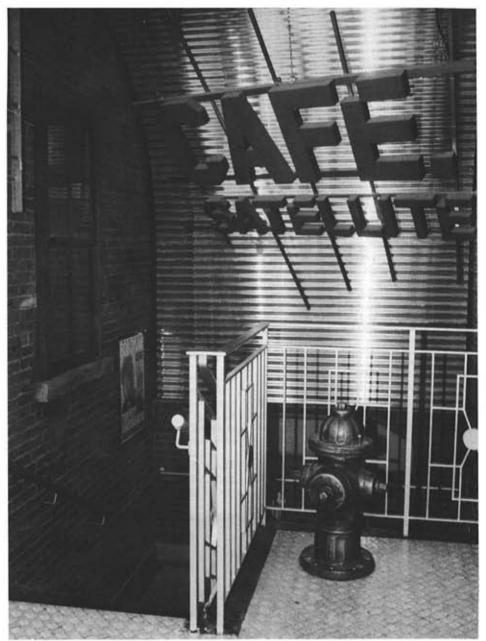
Nearly £2 million has been spent on the Argyll Street site. Fitch and Company, the leading design house, was commissioned to develop the concept and design the interior to encapsulate elements of modern culture world-wide - be it music, art or film, fashion or food, and the exciting and unique at-mosphere created extends through the venue's main eating areas, bars, shop, studio and conference facilities.

The visual language of Cafe Satellite's setting - it's entrance, bars, restaurant and even its graphics - make imaginative use of tough materials: stone, timber and steel. The lighting too has been specifically designed by Fitch and uses stage lighting to give the venue a constantly changing sense of theatre.

An innovative graphic language symbolises the Satellite's theme. An entire Satellite alphabet has been created, and English, Russian and Japanese versions have been developed. This international alphabet has been used decoratively to provide information throughout the Cafe - on signs, menus and place mats, and on Satellite merchandise such as clothes, bags and other fashion products.

TV, film, and stage scenery experts Kimpton Walker Limited, whose earlier work has included the construction of stage sets for West End hit musicals such as 'Time' and 'Starlight Express' were commissioned by the designers to build an imaginative entrance to

At street level, visitors are met with the large suspended Cafe Satellite sign. Using the Fitch-designed alphabet Kimpton Walker have cast the sign's 30" high letters in fibreglass to appear as glazed terracotta concrete blocks mounted on a raw steel grid.



Cafe Satellite's entrance - next door to the London Palladium.



A view of the main restaurant from the studio/control room corner.

Each letter is backlit with neon, the halo of which is reflected in the cove of the aluminium shuttering from which the whole sign hangs in perspective.

Entering under the sign, visitors pass a hunched football player, hand painted by Kimpton Walker's Art Department, in streetart style directly on to the brick surface obscured behind a temporary guard of chain link fencing framed with scaffold. A 'Diner' sign at the final foot of the stairs illuminated in blue neon, points patrons to reception.

Once you've descended to the Cafe Satellite's depths, audio visual engineer Roman Hust takes over to enhance the atmospherics. Amongst numerous small screens are five Panasonic PT102N video projectors creating much larger images, so from wherever you are sitting you can see at least one big screen and several small ones, and your neck muscles can relax. The sound system is excellent, and kept to a level where conversation is easy.

Equipment in the control room, located at one end of the main restaurant area, in-

cludes the following:

Panasonic AC6500 Hi-Fi VHS Edit Suite Panasonic VP5030 low-band U-Matic Marantz CD, amps and cassette decks Chyron word processor for screen messages JVC Vision Mixer

6 x Panasonic TC800 monitors 2 X JVC Hi-Fi VHS play-back machines

Triple standard VHS monitor for monitoring overseas tapes prior to translation

Five Turner B302 VU power amps for control of Bose speakers: 6 x 802's in the main restaurant, and 6 pairs of 301's to cover the bar areas. Sound mixing is courtesy a Sound-craft 200B. Both sound and vision can be independently controlled for three different locations - the restaurant, and two main bar areas. Two satellite dishes are located on the



One of Cafe Satellite's attractive bar areas.

roof - one moving, and one static.

The complete in-house studio, sound system and audio visual set-up, costing a total of £250,000, was designed, built and installed by Richard Studerus of Park Video International Limited.

The overall scheme for the project was by David Fraser and Angela Simpson of Fitch and Company, and Richard Woolf designed the lighting. It was manufactured and installed by Indica of Bath. Controlled from the inhouse studio, a Mode Electronics SD2500 2½k slider dimmer can set independent lighting levels in ten different parts of the complex.

Take a look at Cafe Satellite next time your in town - it's open every day. And from Monday to Friday you can go for breakfast from 8.30 a.m. and watch Music Box or CNN News direct from the States.



Part of the main restaurant - open all day from 8.30 a.m. to midnight Monday to Friday, and from noon to midnight on Saturday and Sunday.

## Halifax's Coliseum



A very cost-effective £400,000 has seen the old but structurally sound Coliseum Cinema at Halifax start a new life as a classy disco-nightclub.

Capacity is 800-plus and the project is of particular note in that much of the finance required was raised under the Business Expansion Scheme, and a considerable amount of time and patience was needed by directors Chris Deith, Neil McGuire and Peter Marks to put together the complete package in a tidy business-like format.

Group Northern took care of the interior design while Avitec provided and installed both the lighting and sound systems.

The centrally hung lighting rig consists of four 'fins' or arms radiating from a central area of

lighting and effects. Major effects come into play when the arms are raised or lowered in sequence to form a 'shuttlecock' shape.

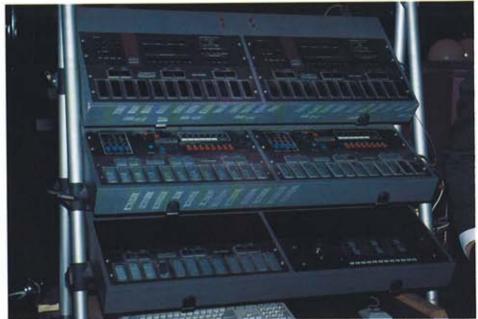
For the sound system Avitec used Cerwin-Vega speakers, for which they are exclusive UK distributors. Handling the mid and treble frequencies are a single pair of high output DSM-200 Dual Spruce Moose cabinets flown either side of the dance area. Each with 300W power handling and providing long-throw, they give a 90° coverage pattern to overcome the problems of a venue which is by nature high-ceilinged, and has hard, reflective wall surfaces.

Bass and sub-bass are floor mounted either side of the DJ's console, and directed towards the dance floor. They comprise two pairs of Cerwin-Vega 436JE 'Junior Earthquake' folded-horn bass cabinets, reinforced by two Cerwin-Vega SW-18 sub-bass enclosures.

The whole system is driven by C-Audio SR-808 power amps on the bass end, and Avitec's own Beta amplifiers for the other frequencies.

In addition to the main system, Avitec also installed a total of eight hi-fi speakers. Some are wall-mounted at the back of what were once the rear stalls to lift the mids and highs where they would otherwise tend to drop off. The remaining Missions pipe the music at background sound levels into such areas as the foyer, restaurant, and





The impressive display of Avitec Beta and C-Audio amplification (left) together with Audioscope spectrum analyser. Lighting contol at the Coliseum (right), in an unusual keyboard-style layout, is based on Light Processor Commanders and 434 Touch Panels incorporating a unique matrix patch panel unit for full flexibility.

## **Acousticians in Performance**

Conference organiser Dr. Roy Lawrence FIOA of the Institute of Acoustics gives an outline report on 'Reproduced Sound 3' held at Windermere in November.

'Reproduced Sound 3' was the third in a series of annual November conferences held at the Hydro Hotel at Bowness-on-Windermere from 5th to 8th November 1987. It was organised by the Institute of Acoustics which is the professional body in the UK for acoustics, in collaboration with the Association of Sound and Communication Engineers, the Association of Professional Recording Studies, the Audio Engineering Society, the Association of British Theatre Technicians, and the Electroacoustic Music Association.

The Institute of Acoustics tries to establish and maintain contact with individuals and organisations throughout the UK whose activities may involve acoustics - although not at such a level as might justify formal par-ticipation in the Institute. One way in which this has been achieved has been through the annual November conferences. Although this has involved long travelling distances for many participants, the idea of getting away to such appealing surroundings proved sufficient again this year to attract over a hundred delegates and thirty wives, for whom a special programme of visits to local places of interest was arranged. The hotel provided an exceptionally congenial atmosphere within which delegates from a wide variety of backgrounds and disciplines could exchange experiences and ideas and learn about latest developments in subjects that are allied to

The conference commenced at 7.00 p.m. on the Thursday, with thirty delegates arriving by train from London and the others travelling by car in time for Guy Fawkes night celebrations provided on a fine November evening by the Hotel - a real light and sound introduction to what proved to be a very vibrant event.

A packed programme of technical sessions, workshops and meetings necessitated an 8.30 a.m. start on the Friday morning. The interest of the delegates was such that, having broken the ice through informal contacts in the late night bars following dinner on the first evening, almost all managed to make

the early start! Technical sessions, consisting mainly of twenty-minute verbal contributions, supported by eight-page written papers in the conference handbook handed to delegates at Registration, formed the main framework of the conference pro-

On the first full day the technical programme continued until 7.40 p.m., with minimum breaks for refreshments and lunch. On Saturday delegates were given the afternoon to relax and most took the opportunity to enjoy a boat trip on Lake Windermere. The programme on Sunday was just as intensive, with the technical sessions finishing just in time for delegates to board the coach for the return train to London at 4.00 p.m.

It is difficult to select particular highlights from a programme for which the very high level of attendance at the sessions tells its

The Stereophony Forum on Friday afternoon was programmed for three hours' duration and the issues explored were of such that this time simply flew by. It commenced with a historical panorama of stereo sound presented by Antony Askew, who is a serious music producer with the BBC Transcription Service. His polished and well researched presentation was delightfully supported by examples of stereophony which was both entertaining and also a salutary lesson to those who imagined that stereophonic recording and transmission was a recent development. Malcolm Johnson, assistant head of sound at BBC-TV, then described current thinking about stereo sound at the BBC. This covered the present test transmissions and highlighted the very special psycho-acoustic problems that are certain to exercise the minds of programme producers as stereophonic television sound becomes a reality. It was a subject that proved to be of considerable interest to the 15 representatives from the Granada, TV South. Central, Thames, Yorkshire and Scottish ITV companies who were there.

This was followed by a stimulating paper from Michael Gerzon on aspects of the stereo recording of amplified music, and Eric Lundbeck from Swedish television presented an invited lecture in which he set down the thinking behind the Swedish approach. The formal part of the Forum was completed by John Emmett of Thames TV who spoke of developments at ITV.

Dick Mills from the BBC Radiophonic Workshop enchanted the audience with a description of their activities, and this consisted of videos of typical days in the life of the Workshop, followed by a discussion of their procedures including extensive computer-based composing and editing

John Watkinson of Ampex (Great Britain) Limited gave a 70-minute invited lecture on the fundamental principles of digital sound which included a careful exposition of error correction and detection technology. He made a complex subject comprehensible to the large audience.

On Sunday morning the Association of British Theatre Technicians organised a discussion on the complex variables of performance acoustics. It was chaired by Bruce Elliott of Elliott Brothers. The discussion was led with contributions from Peter Clifford, head of sound at the Royal Exchange Theatre, Manchester and John Leonard, head of sound at the Royal Shakespeare Company. The main focus of the discussion centred on problems that arise from working with producers and actors in problematical acoustic environments, and on the proper use of voice support systems in the theatre.

The main body of the programme was divided into technical sessions each of twenty minutes duration covering such diverse topics as Entertainment Noise Control, Sound System Design, Instrumentation, Loudspeaker Developments, Digital Techniques and Studio Acoustics.

Ken Dibble of The Sound Studios and Mike Burgin of Shuttlesound described noise control procedures at the purpose-built Hollywood Night Club at Romford, the effectiveness of which illustrated the value of close collaboration amongst all concerned at the planning stages, together with excep-

# LIGHTING SOUND

wishes all its readers a Happy Christmas and Prosperous 1987



An 'electric scene' in the 1883-84 pantomime at the Theatre Royal, Manchester.

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tional attention to detail. Ben Duncan, of B & J Sound demonstrated a dynamic loudness compensation device based on a design derived from the ear's complex response to sounds of varying frequency and intensity. This had the interesting effect of raising the sensation of loudness beyond that to be expected from the measured sound pressure level. More loudness for fewer discotheque A-weighted decibels is a notion carrying clear implications for a subtle form of entertainment noise control.

Peter Mapp described the intricacies of a large computer-controlled sound system for the Hong Kong Jockey Club which involved the installation of hardware of mind-boggling proportions. The system involves 3000 loudspeakers of fifteen different types, 125 power amplifiers with a total output of 70kW and sixty ½ octave graphic equalisers. The computer control and zoning facilities raised the possibility of interfacing with the alarm system.

Dr John Atherton from the Bolton Institute of Higher Education impressed the audience with a demonstration and description of a tracking notch filter specifically designed to remove power line interference from audio signals. Auto-correlation techniques are used to cause the very steep filter to find and follow the power line frequency. Francis Rumsey of the University of Surrey, Dr Malcolm Hawksford from the University of Essex and Dr Mark Sandler of Kings College, London then presented a series of papers covering theoretical and practical aspects of developments in digital techniques.

On Sunday morning Bob Walker, Bill Taylor and Tony Woolf, all of the BBC, and Alan Fry of Salex presented a session on studio acoustics chaired by Neil Spring of Bickerdike, Allen and Partners. Currently used objective measures of the acoustic

behaviour of small rooms and studios were reviewed and evaluated in an interesting paper by the first of these authors. The second paper, also from the BBC Research Department, examined the behaviour of practical functional absorbers and Tony Woolf described the conversion of an existing hall into a drama recording centre for the BBC's South and West Region at Bristol. The centre has facilities for creating the illusion that the action of a play takes place in a variety of acoustic environments such as a court room, a telephone box, a kitchen and so forth.

The formal proceedings were completed with a presentation from Jim Griffiths of London Scientific Services which analysed noise annoyance data from recent pop concerts held at Wembley Stadium in the light of the GLC Code of Practice and suggested revisions to the latter. Dudley Wallis of Cirrus Research discussed the possible use of micro-computers in the control of disco noise levels as an alternative to the largely discredited attempts in the 1970's to do the same thing.

The conference was supported by a manufacturer's exhibition. The companies exhibiting were Bruel and Kjaer (UK), Cirrus Research, Shuttlesound, Accusound, Bridge

Microphones, Scientific Atlantic, Hakuto International, LMS-difa, Klark Teknik, and Vibrometer.

Additional demonstration sessions were arranged in the Teak Room by various contributors for whom the twenty-minute allocation was insufficient to permit complete appreciation of the issues involved. David Meares of the BBC Research Department provided a VHS-Hi-fi reproduction system with monitor loudspeakers for this purpose.

The special atmosphere generated by this type of conference, held over a long weekend with excellent accommodation, food and wine at moderate cost, offered a very effective way of exchanging ideas and experience and highlighting issues of concern. Delegates left for their transport home looking forward to next year's event which is scheduled for 3rd-6th November at the same yenue.

A number of the more prominent of this year's contributors have already offered their help with organising the various activities. Anyone else wishing to take part in next year's event, or who feels they have issues worth exploring, should contact Cathy Mackenzie, Secretary, Institute of Acoustics, 25 Chambers Street, Edinburgh EH1 1HU.

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# ON TOUR Keith Dale



Peter Gabriel pictured in Birmingham during his recent tour.

Photos: Nik Milner

# Peter Gabriel Palacio de Sportes,

Palacio de Sportes, Madrid

Catriona Forcer talks to lighting designer

#### **Jonathan Smeeton**

I met Jonathan Smeeton at the penultimate show of the Peter Gabriel Tour which had taken in nearly 100 shows over a year-long period. The show was both stunning and creatively interesting, and Jonathan used a minimum amount of equipment as opposed to the mega-productions used by Peter Gabriel's old band, Genesis.

Peter Gabriel is an artist who many lighting designers would like to work with, because he understands the medium and how to work with it. He worked closely with Jonathan designing the show, and much of what he does on stage is following pre-arranged cues that are very well choreographed. Lyrically, Peter's songs offer plenty of interesting drama for which Jonathan could create atmospheric, imaginary situations. In the opening number 'San Jacinto', Peter uses a hand-

held mirror to capture the light beam from a Vari-Lite, and to bounce it into the audience. This was something he did in the closing number of his previous tour, and he specifically wanted to use the effect again.

Several of the Vari-Lites are situated on what look like four camera booms which are moved about the stage by human operators sitting at their base. Jonathan's original idea was to use vertical cranes with horizontal jibs but Peter suggested using something from the film industry. Together they came up with the parallelogramshaped booms which were custom-built by Eddie Barber. Throughout the show Peter Gabriel works with the booms to the point where they seem to take on a life of their own and look quite menacinal.

The show was highly theatrical and extremely well received by the audience, but Jonathan considered the best shows of the tour were the ones at Earls Court earlier this summer where they used a couple of large video screens at the sides of the stage. One of them was switched 'back to front' - which he particularly liked.

Jonathan Smeeton, known as 'Liquid Len' to "old farts" (his words, not mine!), started his career as a lighting designer back in 1967 when light shows were all the rage. He spent a year in Sweden demonstrating shows to the fine art community in Swedish art galleries. When he returned to London he became the lighting designer for 'Traffic'

and since then he has worked with bands like 'Free', 'Hawkwind', 'Motorhead', 'Wham', and 'The Thompson Twins'. Earlier this year he designed the lights for Paul Simon, who, along with Peter Gabriel, is one of his favourite artists.

He admits to not seeing many shows because he is too critical, and he doesn't enjoy them. One show he did see, and admits to thoroughly enjoying, was Kate Bush at the London Palladium in 1979. The show was designed by Dave Jackson, who had a theatrical background, and Jonathan believed that this showed through in his designs. "I would like to work with Kate Bush because she is not just a stand-up performer - she actually creates a role," said Jonathan. "Peter also creates a character which makes a lot of difference to the lighting because the concert can become dramatic and theatrical. The lighting is not there just for the sake of lighting; instead there is the skill of moving through a scene with someone to project certain gestures or tangents. That is much more interesting than the standard rock 'n' roll bump and grind, and picking out the odd solos.

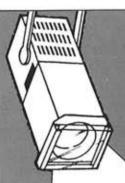
"I did the design for 'Journey' last year, which was huge and very active with lots of moving trusses and screens. But in fact it was very simple. I believe that you can get more out of a lot less equipment if you have someone like Peter who's determined to work with you."

Jonathan has had quite a lot of experience working with film and video. He looked after the celebrated 'Wham in China' - which was an eye opener for him, particularly as the Chinese had absolutely no idea of what he was trying to do! There were many willing hands, but even more unwilling ones and, not surprisingly, he had a real problem with communication. He also worked with Allen Branton and Peter Morse on 'The Pointer Sisters' 'show in Paris, which he said was interesting to do because there were several people contributing ideas. His view is that music stands up for itself, but images usually don't.

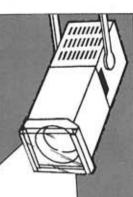
"One of the most interesting and entertaining videos I've ever seen, and which can hold it's own for much longer than a pop video, is of an aquarium. There's no sound - just fish swimming around for two hours," he said.

Having worked non-stop for the last five years, Jonathan Smeeton's plans for the future are to stay at home for eighteen months and do nothing! If he manages to do it I'm sure his talents will be greatly missed in the business.









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# The Small-Scale Set-Up

Denis McGeary takes in the Royal Shakespeare Company's regional tour at Barrow-in-Furness



The venue: Barrow-in-Furness Sixth Form College.



A scene from 'Comedy of Errors' in the same venue a few hours later.

Me and my big mouth. Certainly John, I'll write you an article on the visit of the RSC regional tour to Barrow. Copy to you by the 20th November, sure. Photographs, right, let's get on to the local press — they're doing a get-in story anyway. Yes, they can do some prints for us. Colour? During the performance? Alright, I'll see what I can do. Suppliers, well, let's see. Give me a ring. When will I write it? Well, after fielding latecomers and sorting out FOH problems and making a nuisance of myself I'll write it while they're here...

It's fine saying yes you'll do something; actually getting around to it is something different. After the first few paragraphs the inspiration fails and another good idea bites the dust - well the waste paper bin to be accurate - and after ten tries (plus two conversions) I am really accurate when it comes to getting inside the waste paper bin.

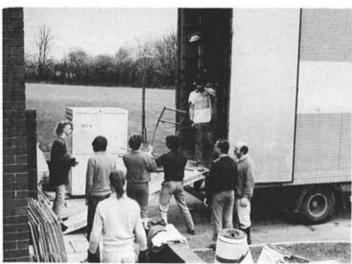
So, why am I here, and what is all this flannel about? It all started by meeting L+SI's editor John Offord at the ABTT North Show in Oldham. As John had bought the drinks I really had to chat about everything that had happened since we last met at Entertainment 86 in Bournemouth. After all John Offord is way down south in Eastbourne and I just happen to run Renaissance, Cumbria's Area Arts Association, from a little office in Ulverston. Many of the events I promote are small-scale and in peculiar places needing nothing more than the trusty ACT 6, a 13 amp socket, three or four Preludes plus Minim 23's, stands and cable and everything fitted into the back of the Montego Estate. As long as the fuses don't blow everything works fine.

Every so often we go a bit silly and book something a little bigger. Normally we go into one of the larger public halls in Barrow-in-Furness, Ulverston or wherever, but in 1979 we booked the Royal Shakespeare Company's small-scale tour and we got hooked on it. Since 1979 they have kept on coming back. The audiences got bigger and bigger and booked earlier and earlier - which meant

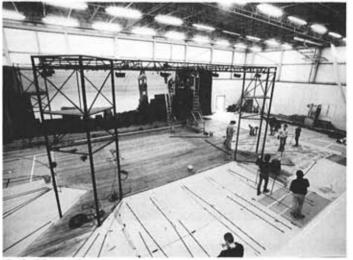
I could earn more and more interest on the ticket money in the bank! And I could go on - but I won't. Instead I'll attempt to put on to paper a week in the life of a small (but perfectly formed) Cumbria promoter.

It's 7.45 a.m. on a grey November Monday morning in Barrow-in-Furness. Despite that, it doesn't look as though it will rain - thank goodness. The car park of the Sixth Form College is full. Three large trailers are backed up to the Sports Hall, the rest of the car park is filled with cars, vans and caravans. A few more cars arrive and the sleepy local crew move into the Sports Hall and lay out large paper making felts (thanks to Bowater Scott). 8.00 a.m. brings more signs of life. Caravans open and a get-in team assembles: fourteen locals, some experienced, others unsuspecting students from the College, plus fourteen from the Royal Shakespeare Company and two drivers. RSC carpenters John Bluck and John Vickers mark out the floor of the Sports Hall and the get-in begins.

First off are the lanterns and Proax speakers



First stage on the get-in - the author is in picture extreme right.



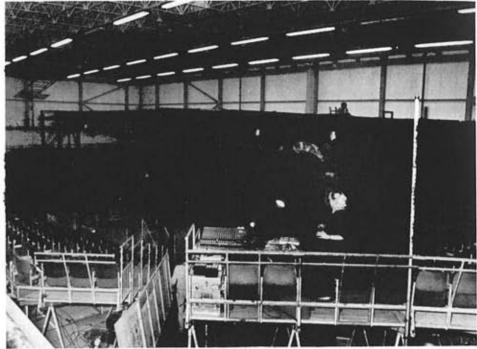
The build-up under way.



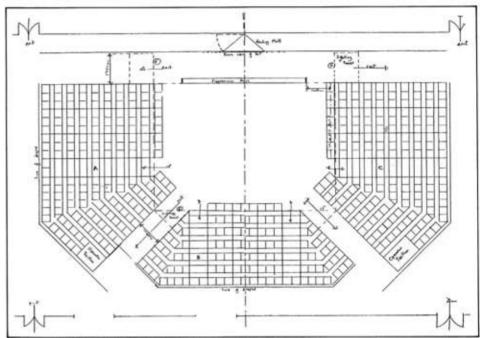
The 'Image' set up and ready to go.

followed by the metalwork for the lighting towers and trussing to form the grid. The two main proscenium arch towers are the first to be built, and these are then joined by an aluminium cross member. The triangular front-of-house towers, which mark the limit of the stage area, are erected next - and joined by a similar cross member. The FOH and pros towers are then connected with wired bars and there we have the basic grid. Now the work speeds up. The stage floor is jigsawed in. If it goes on the truck in order, it comes off it in order (allowing for the odd gentle wind-up between the truck drivers and stage crew). After the floor we get LX racks, wardrobe, washing machines, skips mobile wardrobes won't go through the doors so they queue up outside. Eventually, the two trailers are empty and it's only 10.00 a.m. Time for a break? No.

Trailer three now moves into a new position right outside the door. This is what we've all been waiting for - the seating units. Those in the know try to slink away. Braces in order round the perimeter of the stage, front seating members in position, mid, back, triangular supports - three sizes, small, family and economy all go in - into position. The framework is quickly built - nice place to rest holding a chunk of metalwork while somebody bolts it up. We have a break at 11.00 a.m. and after the initial burst of



The opposite operator position was used for sound control.



Seating layout for the RSC tour at Barrow, showing operator positions

energy some of us are getting tired. Now the last bit. Once the framework of the seating unit is complete we can start on the seating itself. Already there are casualties among the seats and these are laid to one side, similarly the single and double seats are laid off and we start with joy and enthusiasm on the unwieldy triple units. This bit is just sheer slog



Final preparations before the first performance.



A view of the rig from side stage.

but by 3.30 p.m (and after a lunch break) the three seating units are complete.

The sports hall now looks like a theatre space. It will seat 439 in relative comfort and nobody is more than 10 rows from the front. In Barrow the central block has been reduced in size to fit the space, but in larger venues the total seating can be up to 500. The final piece of construction is to erect the back cloth and acoustic curtain. All four sides are now surrounded. On stage it looks and feels like a theatre. The acoustic curtain, a fairly recent addition, helps to concentrate attention on the stage, and cuts down extraneous noise from the 'backstage' areas around the auditorium. (Backstage includes quick-change areas, some lighting, storage and 2 stage manager's desks. Sound and light are controlled from positions at the rear of blocks C and A respectively.) Final focussing of lanterns continues until 6 p.m.

At 7.00 p.m. the house is clear and the audience which has been building up since 6.30 p.m. is let in. There's a great bustle of activity, but by 7.30 p.m. the house is in and we're ready to go. Hamlet starts and runs until 11.00 p.m. Everything has gone smoothly - well almost - and the odd late-comer has been soothed (major road works on the main road) and let in. Oh yes, I think we temporarily mislaid one or two actors, but they turned up in the end.

The schedule for the week ran as follows:

Monday: 8.00 a.m. Get-in, 3.30 p.m. Press Call, 7.30 p.m. Hamlet performance, finish at 11.00 p.m.

Tuesday: 1.30 p.m. Matinee, Hamlet then changeover for 7.30 p.m. Comedy of Errors, finish at 10.00 p.m.

Wednesday: Day off. 7.30 p.m. Comedy of Errors, finish at 10.00 p.m.

Thursday: 10.30 a.m. Technical Workshops (schools), 1.30 p.m. Matinee, Comedy of Errors then changeover for 7.30 p.m. Hamlet, finish at 11.00 p.m.

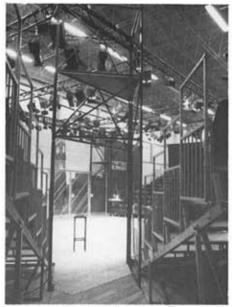
Friday: 11.00 a.m. Workshop - 'Presenting Shakespeare', 2.00 p.m. Workshop - 'Aspects of Hamlet', 7.30 p.m. Hamlet, finish 11 p.m.

Saturday: 3.30 p.m. changeover for 7.30 p.m. Comedy of Errors, finish at 10.00 p.m. Getout starts, and carries on until 1.05 a.m. and a welcoming pint of beer. 2.30 a.m. bed and a sleep-in for local crew.

Sunday: sometime in the motning trucks and crew head for Stranraer and the ferry to Belfast ready for an 8.00 a.m. get-in on Monday morning.

By the way - the rain came in the week and strong winds. And it also rained during the get-out. Was it worth it? Yes! And when can we do it again?





The converted sports hall as the audience saw it for the first time.

Every performance was sold out by mid-September and all the money was put to work in our deposit accounts to earn. Financially, even with the tickets at £6.50 (less generous concessions) we broke even.

It brought in sponsorship, with the large names acting as bait. And audiences in far flung Barrow-in-Furness were able to see the country's best (their words, not ours) theatre company without having to travel for up to 3 hours to Manchester or Newcastle.

In March it's Opera 80 with II Seraglio and Carmen, and next November we're looking into the possibility of London Festival Ballet. But in the meantime what is happening? On the Wednesday after there's Covent Garden Community Theatre's 'Revenge of the Schreiber Kitchen Units', and after that a stage fight workshop tour of schools, The Jiving Lindy Hoppers, Opera 80 schools tour, then a monster rig for a schools show in Barrow - which means a trip to Lancelyn Lighting at Oxford for the hire equipment. Then there's Cumbria Dance Project and out comes the ACT 6 and our basic rig. After that it's Christmas, thank goodness!

Who says nothing ever happens up here? I'm knackered - and in January it all starts

again. Now, have I got a P.A. for tonight, and can I pick up the photos from the local newspaper office before the 3.30 p.m. getin? Ah! Lack a day, lack a day.

Tour manager and administrator: Ludo Keston Production manager: Gerry Jeatt

Trucking by Chris Cooke and John Stephens for CH Lucking (Washington) Lighting hired from LHS Limited

Lighting rig and trussing designed by RSC in association with Tomcat Engineering , Evesham Designed by Chris Parry

Operators: Derek Brain and Richard Power

Board: Arri Image

Racks: 12 x Act 6 in 3 travel cases plus 3 x 5kW dimmers

#### Lanterns

30 x 1k Patt. 223, 10 x 500W Coda, 12 x Parcans, 4 x 2k CCT fresnel, 8 x Silhouette 30, 11 x 500W Patt. 23, 2 x Strand 16/30 Preludes, 8 x ADB 1K fresnels, 1 x Patt. 264, assorted pageants etc., practical stage effects, 7 x Sun floods (house lights) and 1 x concept Comet 3 smoke machine and fan

Sound designed by: John A Leonard Operated by: Carole Cox

#### Sound

1 x Soundcraft 200B Series, 1 x SBX90 effects, 1 x Proverb Reverb, 2 x Sonifex cartridge, 16 x Proax speakers, 4 x Lit-tle Reds, 1 x radio mic and receiver, assorted mics and stands for live musicians and effects, 4 x Mosfet V500 amplifiers

Auditorium seating by: Arena Promotional Facilities Limited

#### **Touring Equipment includes:**

2 x washing machines, 2 x tumble dryers, 1 x wig oven. Musical instruments

'amaha DX7, 2 bass guitars, 2 violins, 1 cello, 1 double bass, tenor sax, percussion.

Carpenters: John Bluck and John Vickers.



Props for 'Hamlet' await their turn on stage.





# EQUIPMENT/lews

#### Control Five - the Big Brother from JBL

November saw the launch of a new addition to the JBL Control Series loudspeaker range. The 'Control Five' is the new 'big brother' to the wellestablished Control One system that has been highly successful in many market areas.

JBL's original intention was to produce a range of 'utility' loudspeaker systems that would cover the installation and audio monitoring fields, and the Control One was designed as a rugged and almost indestructable system that could deliver high quality high level sound. A key feature was its excellent flexibility with mounting hardware that could fix it to microphone stands, walls and ceilings or even clamped to any convenient surface.

The 'Control Five' - which is immediately available - measures a very compact 15" x 10" x 9", and is capable of handling 175W with a frequency response that goes flat from 75Hz to 20kHz with usable output down to 50Hz. With this power handling, coupled with excellent efficiency, each Control Five can generate over 114dB SPL (1m).

The drive units have been specifically developed for this project. The HF is a 1" pure Titanium driver which has added protection built into the dividing network to minimise damage caused by overdriving and errant amplification. The 165mm bass driver has been designed for low distortion performance even at very high levels. Both drivers are magnetically shielded so that the Control Five can be mounted directly next to a video monitor in video production, exhibition and A/V applications.

JBL say it has been designed with ease and flexibility of installation as a primary feature. The cabinet is moulded in a dense polypropylene



The Control 5 from JBL.

which combines high structural strength and stability into a unique shape. The sides are raked to enable a wide range of mounting positions, including close up to wall corners.

Like the Control One, there is a wide range of mounting hardware, including 19" rack brackets, that simply clamp to the speaker, making for very speedy installation. The wall and stand brackets, which also have security bolts, can be angled in any direction for best coverage. The Control Five's dispersion characteristics are extremely well controlled, in both the horizontal and vertical planes, reducing the possibilities of dead spots or excessive feedback, say JBL.

"Control Five is a superb loudspeaker system that performs well for moderate sound reinforcement and foreground music applications, audio and video studio use, exhibition and higher quality background and information systems. It is an elegant piece of industrial design that can be relied upon to deliver the goods," said JBL.

Priced at only E279, full details and technical specification are available from Harman (Audio) UK Limited, Mill Street, Slough, Berks SL2 5DD telephone (0753) 76911. response and wide dispersion at high frequencies when incorporated within compact playback systems such as keyboard monitors and smaller PA systems.

Features of the HT100 and HT150 include a composite Kapton-Titanium diaphragm and edge-wound aluminium/glassfibre voice coil. A crossover must be used in conjunction with the HT100 and HT150 homs. Fane recommend their own HPX4 crossover for this purpose.

For further information contact Fane Acoustics Limited, 286 Bradford Road, Batley, West Yorkshire WF17 5PW telephone (0924) 476431.

#### **Studio 1 Playmate**

The 'Playmate' background music system has recently been introduced into the Studio 1 Electronics' product range. It is available in single or twin endless play cassette facility with Dolby B.C. noise reduction. Mixer facilities include microphone with bass and treble controls; aux input; tone controls and tape volume, bass and treble tone facilities. Speaker zoning over 4 speakers is switchable from the mixer.



Studio 1's new 'Playmate'.

Amplification is 30 watt into 8 ohm, and 100 volt line on the standard unit with the 'Super' version offering a 150 watt Mosfet power amplifier.

offering a 150 watt Mosfet power amplifier. The Playmate is designed for the small hotel, restaurant, sandwich bar and pub requiring a high quality background music system. It is compact, and will fit in any bar or reception area. The speaker zoning allows the operator to select where music is required e.g. bar, lounge, reception or restaurant. The microphone allows the announcements throughout the venue. High quality JVC cassette systems are used on all models. Where the unit is required to produce foreground music a 150 watt amplifier unit is available.

Full details are available from Studio 1 Electronics, The Gatehouse, Foley Trading Estate, Foley Street, Hereford telephone (0432) 277067.

Correction Capacitors

Hale Instruments Limited of Altrincham, Cheshire

have been appointed sole UK distributors for the sale of a new range of power factor correction



The Colossus 24 bass driver.

#### **New From Fane**

The new Colossus 24 is not merely an extra large, deep bass driver, but also a genuine sub woofer capable of generating a new depth of sound totally absent from most sound systems say Fane. The unit operates comfortably from the depths of 80Hz down to a staggeringly low 20Hz.

Designed for stage, studio, concert hall, theatre and disco use, the Fane Colossus 24 inch loudspeaker can be used in horn-loaded, reflex tuned or infinite baffle systems. It benefits from a rigid cellular foam cone which terminates in a double roll suspension to beat speaker fatigue and blow outs.

Also new from Fane Acoustics are two constant directivity horns with integral driver, namely the HT100 and HT150, 30 and 40 watts respectively. Each unit is designed to operate between 3kHz and 20kHz to provide an exceptionally smooth



Fane's new HT150 constant directivity horn with integral driver.

## capacitors by Ducati of Bologna, Italy. In single, modular three-phase and units the range of capacitors are many

In single, modular three-phase and multi-phase units the range of capacitors are manufactured in a purpose-built factory which incorporates continuous process and strict quality control techniques to ensure every capacitor is of the same uniformity.

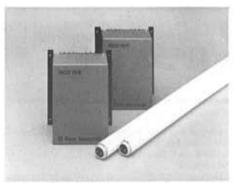
Three types are available: the 416.08 series for single phase LV power factor correction, and the SL10/SL100 three phase units. Customers can buy single or multi units so that different KVAR ratings can be achieved. This offers the user the opportunity to purchase single capacitor elements which enables him to construct any particular electrical solution for his application.

Full technical specifications and pricing can be obtained from Hale Instruments Limited, Manor House, 2 Manor Road, Altrincham WA15 9QX telephone 061-941 4540.



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Home Automation's new Studio Series fluorescent dimmers for 1500 and 2500 watts.

#### **Fluorescent Dimmers**

Home Automation Limited have engineered and manufactured two commercial dimmer packs specifically for the control of fluorescent luminaires.

The models come within the company's new 'Studio Series' range, and are available to control upto 1500 watts or 2500 watts of light. No further modifications are necessary except for the replacement of the normal fluorescent ballast with electronic dimmable types.

Each dimmer consists of a compact red metal box which houses the control equipment, with a combined switch and linear slider dimmer controller for situation at the most convenient location. Using such a dimmer plate also allows for pre-set level setting prior to switch-on.

An illustrated brochure is available from Home

An illustrated brochure is available from Home Automation Limited, Pindar Road, Hoddesdon, Herts EN11 0ET telephone (0992) 460355.

#### **New Connector**

The Cannon Mass 176 pin multiway connector will hook up the largest multicore cables to the very largest stage boxes, 24 channel consoles to

24 track tape machines, and up to fifty or sixty microphones to just one source.

The 3 piece unit is waterproof, virtually indestructible and foolproof - in as much as it's impossible to misconnect the connector. In the unlikely event of damage to the pin contact area, it can be separated and replaced without incurring the full cost of a whole new connector. Pins are gold plated on to nickel silver on steel for perfect contact.

For further information contact Rhino Distribution, Springhead Enterprise Park, Springhead Road, Northfleet, Kent DA11 8BN telephone (0474) 323202.

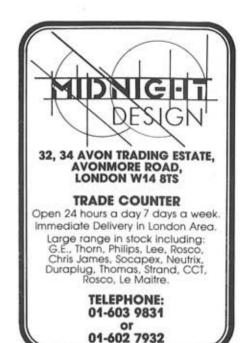
#### Optical Disk Technology For Audio

Optical disk recording technology has surfaced in a new application, with Ferrograph now marketing a machine which uses the medium to record digital audio for security-copying and archiving purposes. The Ferrograph Series 9000 uses 5½" optical disks and, operating on the WORM principle (Write Once, Read Many), can record up to 512 minutes of speech (or 90 minutes of stereo music) which remains totally secure.

Once recorded, the material represents a permanent archive medium - its tamper-proof



Ferrograph's Series 9000 Optical Disc Recorder.



character makes it suitable for security-sensitive applications since the material may subsequently be manipulated for editing purposes, yet the original recording remains on the disk and cannot

be erased or interfered with.

The Series 9000 is currently priced at under £9,500, and is available from the Ferrograph manufacturing base in Newcastle and from Scenic Sounds in London. Optical disks are currently priced around £100 each, but costs are expected to fall to around half that figure by the end of the year.

For further information contact Ferrograph at 20/21 Royal Industrial Estate, Jarrow, Tyne and Wear telephone 091-489 3092.

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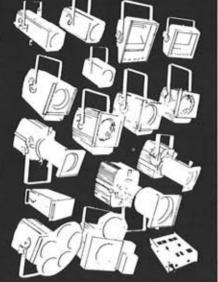
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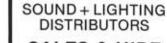
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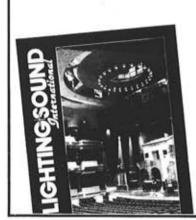
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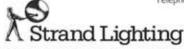
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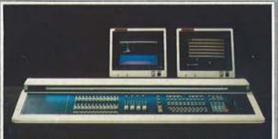
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