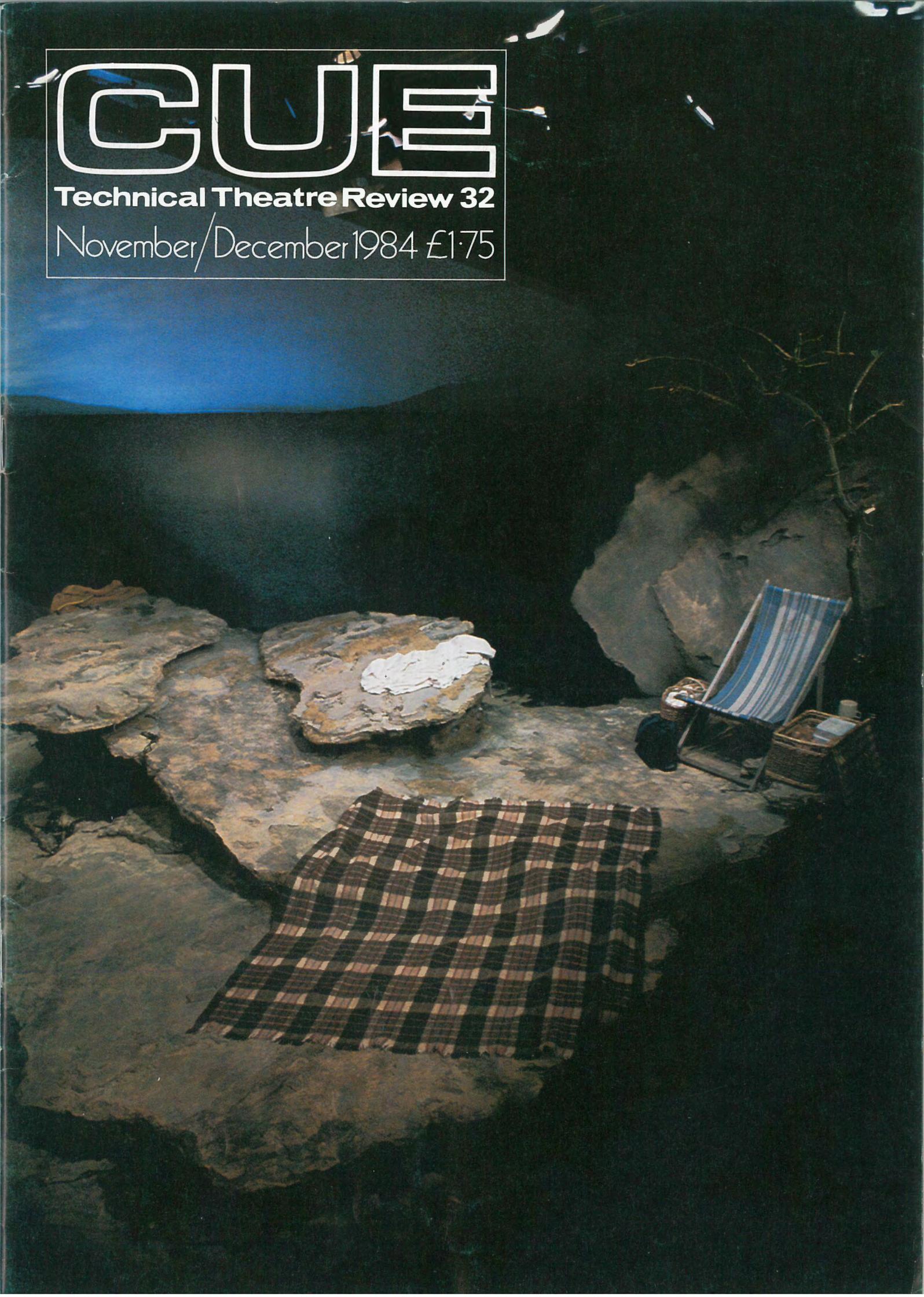


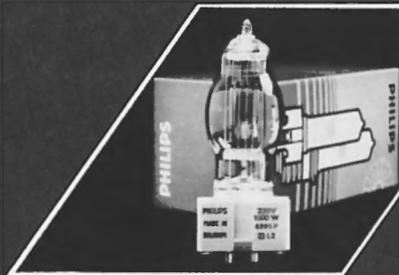
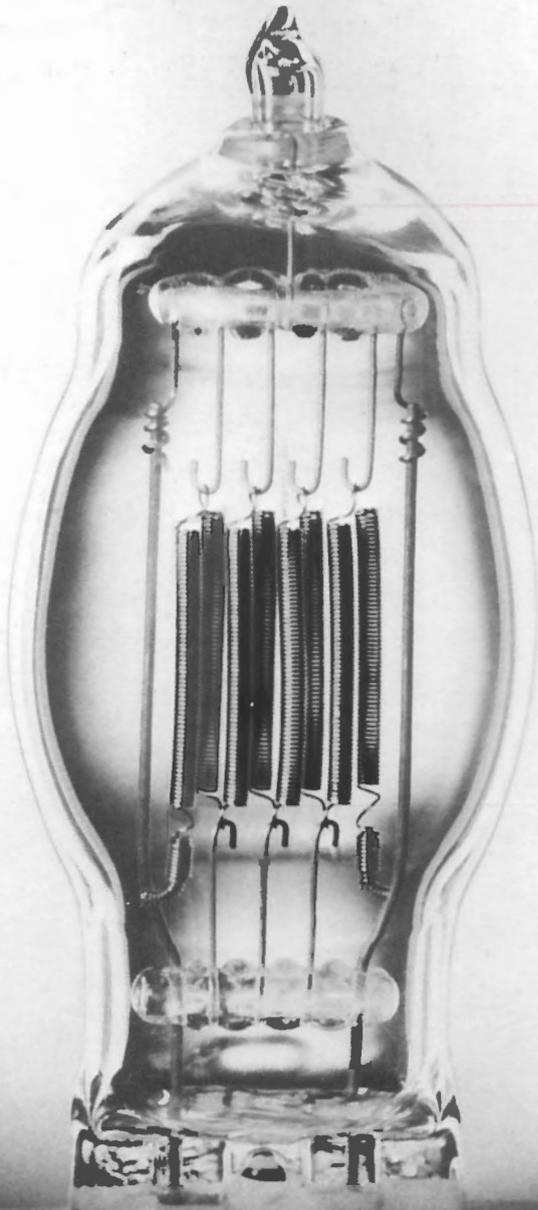
CUE

Technical Theatre Review 32

November/December 1984 £1.75



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Our cover picture is Robin Don's design for *When I was a girl I used to scream and shout* – a first play by Sharman Macdonald. Directed by Simon Stokes at the Bush Theatre – London's most cherished venue for Fringe Premiers.

On page 4 Robin Don describes the pleasure of working with a great little team at the Bush. Photo by Donald Cooper.

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ART, LIFE and LEISURE

The relationship of art to life is of increasing importance as society moves into a shorter working week and a shorter working life, so that the question of what people will do with their greatly increased leisure time becomes one of the most urgent sociological, psychological and spiritual problems of our day.

Although the leisure problem may be generally acknowledged, does consensus extend to a full realisation of the potential contribution towards a solution that could, indeed must, be played by a fuller understanding and exploitation of the interaction between art and life?

Should not the proposition – succinctly stated here by James Roose-Evans (discussing Grotowski in 'Experimental Theatre', reviewed on our Book page) – be a matter for urgent debate?

For, if we accept his solution – which surely carries a considerable ring of logic as well as deeper humanitarian truth – a reallocation of arts resources will be inevitable, starting with Arts Council policy for Housing the Arts being subjected to a radical rethink amounting to reversal.

The majority of people possess, no matter how unused, real creative and imaginative faculties, so that the question is less one of educating people to appreciate the fine arts than of providing facilities and environments in which they can be and are actively encouraged to use their creative faculties.

DESIGN at the BUSH

ROBIN DON

Approximately 90 people can be seated in this friendly, well run and tidy theatre above the pub on Shepherds Bush Green.

The room measures 34ft x 24ft and the grid is at 12ft. One could say the seating lacks a bit on the side of comfort but on the other hand one does get to know ones fellow spectators quite intimately.

It is impossible to admit latecomers as they would need to cross the acting area to get to the steeply raked seating units. Once everyone is seated the doors are closed and there remains an acting area of perhaps 15ft x 21ft. —: it really depends on how long the legs of the spectators in the front row are.

Throughout its 12 year history the Bush has gained a splendid reputation for its selection of new authors. The management have the facility to encourage and produce new work by playwrights whose writing might be unknown or too risky for a strictly commercial venture. The willingness is there to take a chance. The pressure for commercial success is off; everyone of course wants the productions to be successful, but that is not the ultimate goal. The management recognizes that where no risks are taken, the project is likely to lack excitement, challenge and innovation. These values then, take precedence over commercial success.

For the designer the impact of this philosophy, allowing experimentation and risk taking is enormous. When the pressure to produce a financial success is removed, the designer can experiment with different techniques and concepts. Without this freedom a designer is liable to fall back on the creative processes he knows have proved successful previously. This can deter his growth and diminish the vitality of the work he produces.

The confines of the space and a budget figure of £950, (this includes sets, costumes, lighting and props) give me a greater challenge than many of the productions I have designed in International Opera Houses during the last two years. I gladly accepted the invitation as it has been all of two years since I last designed for this theatre and the rewards at the Bush are such that make it well worth coming back for. One can once more lift a paint brush without fear of union difficulties and there is time to quietly experiment with fresh ideas and materials.

Perhaps even time to have another go with a spray gun. (if one dares)

When it comes to building the set it is a case of everyone getting down to it, management et al. There aren't many theatres which can boast a payment structure which allows the actors, the staff and the management to accept an identical weekly wage packet; this is what helps to

make the BUSH tick.

Three weeks before opening night, stage manager Jacqui spends from nine to six on the telephone miraculously getting all the props we require. All of them are either donated or on loan. She has opened up an exquisitely detailed file on every item that arrives in and that has to be returned from the theatre at the end of the four week run. Every person or company that has helped with the production in any way, is clearly documented for inclusion in the "Special

thanks to", section of the programme.

The timber we do have to purchase, but the eager stage manager chaps, Mark and Jinne, have a keen edge on their saw blades. With their intuitive adaptation of the working drawings, the rostra quickly take shape. Fortunately the weather is not too unpleasant and some of the bulkier items are more easily constructed in the car park below. Jenny and Nicky, although extremely busy in the office, manage to find time to check through the costume stock and



Celia Imrie and Eleanor David in the story of a weekend by the sea. The sea is painted sheeting, the sky is Back Projection material. The mountains are an added layer of B P material. The colour photograph is by Donald Cooper. Monochrome picture below by Nobby Clark.



we hopefully find some items to fit the scenes. A rather stylish bathing costume arrives from Nicky's sister and we manage to squeeze one of our leading ladies in to it. This vision cannot stifle the roar of laughter from the rest of the company, so we know it's off to Marks and Spencers to try again. Our leading man also shows some apprehension of appearing in a swimming costume. His legs certainly haven't seen much of the recent sun but he is comforted when we all agree that the shape is right for the part.

During the production weekend, Sebastian from the office, having found a babysitter, is able to concentrate on some of the finer details. His dear lady-friend Sue is rattling up a frock or two that we haven't managed to find. Simon, the director, also manages to give a hand with a complicated step unit but we know he daren't work too late as he has to be fresh for rehearsals at 10am.

It becomes apparent that one of the rostrums is turning out a bit on the high side. We decide to chop it and lower it by 5 inches. — This might set us back, so a quick phone call is made to previous employees, Bart, Susan and Ash. They willingly arrive and their vital help gets us back on schedule.

Although understandably a little apprehensive, since this is her first play, Sharman Macdonald has been of enormous help with every aspect of the production. She is the promising young authoress of this sensitive

study of stormy adolescence and unquiet maturity. The title is 'WHEN I WAS A GIRL, I USED TO SCREAM AND SHOUT.' The setting requires a rocky sea-shore on the east coast of Scotland. Rock pools and jellyfish are a necessity. I can remember, so well, those beaches from childhood. They have a particular smell; the bracing ozone, combined with the distinctive flavours of the flotsam and jetsam — shells, driftwood, starfish and of course the occasional dead cormorant covered with oil. When the tide is out, there is an abundance of that marvellous clinging seaweed which pops when you tread on it and entangles the occasional item of debris from Russian trawlers.

The jellyfish proved to be one of the trickiest props to make. — I think we all had a go with many and various materials. Some of the efforts bordering on the obscene before achieving an effective item which becomes believable at a distance of 3-4 feet. Every effort is put into 'Getting the detail right', in a theatre of this scale. The proximity of the audience allows every item to be scrutinized; even the date on a magazine has to co-incide with the plot!

Of course the rock pool leaked. It even started seeping into the pub below. A tiny hole in the polythene lining was discovered but the addition of another layer, reinforced with a laminate of fibre-glass made it strong enough to cope with all the business required.

The rocks in the model had been con-

structed from heavily textured cork tiles. Mark, from stage management happened across a ragged bit of chipboard in the store which had an interesting fragmented edge. A further attack on the board with a chain saw obtained a very believable rock-like texture with a hard enough surface which gave a sound like stone when walked upon.

I made the mistake of applying a ragged portion of scenic gauze here and there for added grip and texture. Being small enough areas I thought one would get away with it, but on one of the preview nights, — a Mr James R. Crabtree approached me. Although he agreed that the gauze gave a sensible texture, he confirmed that such a known material, (even in such a tiny area) had dispelled his belief in the finished surface. Although Mr. Joe Public might not have spotted this, we have to change it, just in case. (Mr. James R. Crabtree turned out to be the producing director from the Playhouse Theatre, Crossville, Tennessee. Apologies J.R., from us all!)

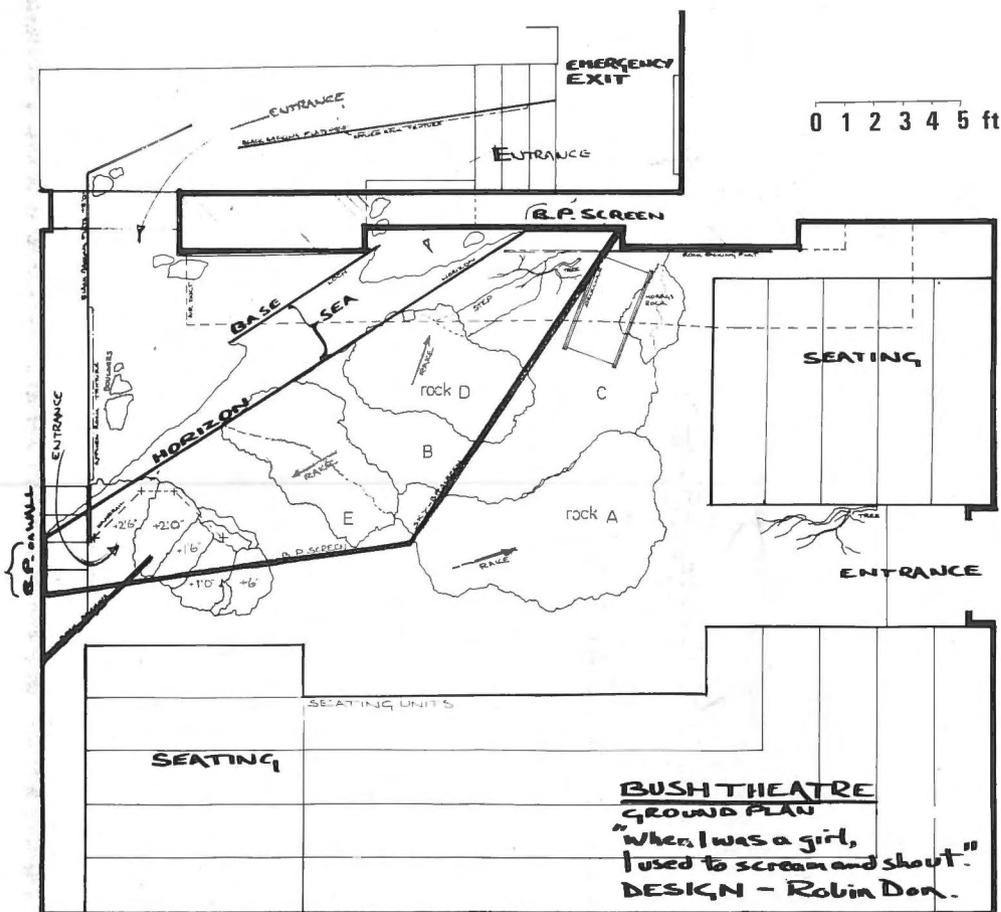
The weather and the sky on these northern coasts play an enormous part in the mood of the environment. I was determined to try to include a surface which would give a hint of this quality. A back projection screen seemed a possible answer, but instead of it being stretched on the normal type of frame, we needed to find a way of making it grow out of the wall, enabling us to obtain a soft transition between rock, sea and sky. A 23ft batten was wedged in a horizontal position from wall to wall diagonally across the theatre. This gave us the horizon line and formed the base of the screen. In order to gain enough space for the lamps behind it was necessary to continue the surface of the B.P. screen out over the acting area at an angle of 45 degrees right up to the grid. Thinking this might prove a bit bright from general bounce in the night time scenes we started to cover the entire surface area with a taut black scenic gauze. It soon became apparent that this was not going to work. At this steep angle, the gauze (from the audience sightline) became almost opaque where it touched the horizon. I should have remembered this from the opera. It is exactly the same problem, only at a different angle, that one has when a front gauze is used in a proscenium theatre; namely that it is almost impossible to see through it from the boxes at the sides.

Eventually all the problems are eliminated and everything is completed leaving this trusty team very little to do for two whole days before preview night. It leaves a rather uneasy feeling all round as one is usually accustomed to anxieties and panic right through to opening night.

The first night went very well and the critical response to the whole production was very warm. It is cheering when one plays to full houses.

As well as the hard physical work that takes place on these premises, the facility for advance organization and acutely detailed planning makes it a pleasure to be involved with.

My next stop is Sydney Opera House, — fingers crossed!



The Pursuit of Intelligibility

P W BARNETT and V W DOBBS

The authors' concern here is not the signal processing equipment as this is generally well defined by the client's brief. The problem lies with the loudspeakers: A system can enjoy the highest level of excellence in respect of the signal processing chain and it can solicit and usurp the assistance of frequency shaping and equalisation units, but if the loudspeakers are inadequate then so will be the end result.

The indictment of inadequate is not necessarily, as would be dictated by popular opinion, directed towards size or frequency range. True, if we put our minds to it effects could be made to sound like the real thing; a clap of thunder or gun fire could like Joshua (with a little licence) bring the house down. Sounds of this magnitude would be a trifle distracting and totally unnecessary. The set and lighting create the atmosphere and in any case the thunder or gun fire can always be distant.

Nor are we necessarily advocating the direction of more funds into the sound budget, only that greater consideration and importance should be assigned to the design of the sound system.

This article looks at the criteria and methods that we use when designing such systems. Our approach is by no means traditional in the sense that most theatres are equipped in this way, but it is absolutely

quantify this facet of communication and indeed many of the concepts and ideas are still in use eighty years later.

The celebrated acoustician Vern O. Knudsen took the Bell laboratories ideas and applied them within the context of auditorium acoustics. Articulation tests were the order of the day; a practised orator calls out 1000 unrelated words, carefully selected to test a wide range of speech sounds, listeners then write down what they think they have heard and with the aid of a few statistics the percentage articulation of the auditorium was estimated.

If the consensus was 900 words correctly heard then the percentage articulation was rated at 90%. To place articulation in perspective 75% is regarded as just acceptable; 100% perfect articulation cannot be realised in practise since some consonant sounds may be misheard even under ideal conditions and, therefore, for practical purposes the figure of 96% is regarded as perfect.

Knudsen proposed the following equation to explain the dependence of intelligibility on the prevailing acoustic climate:—

$$\text{Percentage Articulation} = 96 \varphi_1 \varphi_r \varphi_a \varphi_s \dots \quad (i)$$

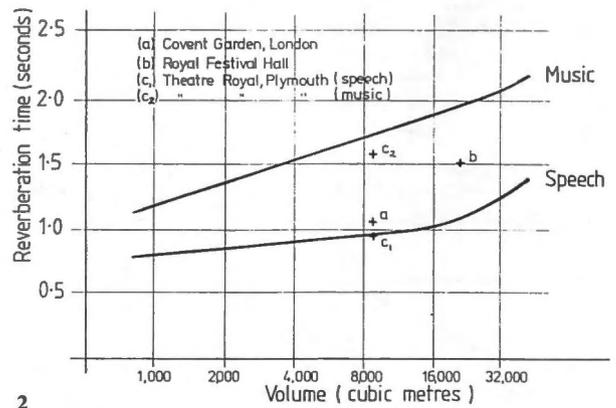
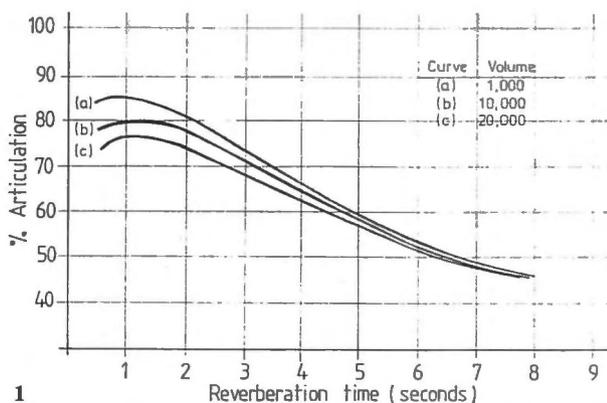
where the reduction factors for inadequate loudness, reverberation time, ambient noise

data gives surprisingly consistent and technically acceptable results. Fig. 1 shows the effect of reverberation and shape on percentage articulation. It can be seen that there is an optimum reverberation time for a given volume. From this and additional information a graph of ideal reverberation times for differing volumes and differing uses may be produced; this is shown in fig. 2.

All of the foregoing relates to unaided speech and clearly with the almost ubiquitous need for sound reinforcement systems further attempts were necessary to quantify intelligibility, given revised conditions and parameters.

The best known and probably the most reliable is the concept of %ALcons, which is a measure of the percentage of consonants lost (in fact a reciprocal percentage articulation). This method was devised and proposed by Messrs. V. M. A. Peutz and W. Klein whose findings were published in the Audio Engineering Journal, December, 1971. It is based on the fact that it is the consonant sounds in our speech that determines intelligibility.

The Peutz and Klein work has over the years been extended and modified in the light of technological advances and the formula given below is the generally accepted format:—



conventional with due regard to the science of acoustics.

In addition to the main theatre sound we have also included reference to reverberation enhancement methods since this is gradually assuming greater importance and indeed gaining greater acceptance with the proliferation of multipurpose spaces.

During the last ten years there has been revitalised interest in the concept of speech intelligibility, almost certainly as a result of increasing public awareness which seems to correlate with the spread and advances in technology. It is interesting to note, however, that work started in earnest on this subject in the early part of the 20th century with the advent of the telephone. Researchers at the Bell telephone laboratories were perhaps the first to attempt to

level and shape of the room are given by φ_1 , φ_r , φ_a and φ_s respectively.

Under ideal conditions the product of the reduction factors is unity, giving the percentage articulation as a 'perfect' 96%.

Unfortunately the reduction factors are not readily accessible. They cannot, for example, be looked up in published 'log' type tables. They do, however, give assistance to our understanding of the parameters that affect intelligibility and from equation (i) we can infer that if the speech level is inadequate or if the reverberation time is too long or if the ambient noise is too high, then there will be as expected a reduction in the intelligibility. A trifle esoteric is the dependence of shape on intelligibility and perhaps it is a tribute to the tenacity of purpose of early researchers that the collected

$$\%ALcons = \frac{200D^2RT^2(N+1)}{VQM} \dots (ii)$$

- where: D = Distance to the listener in question
 RT = Reverberation time of the space in seconds
 N = Number of loudspeaker groups identical to the prime group
 V = Volume of the space in cubic metres
 Q = Directivity of the loudspeaker
 M = A modifier, generally chosen as unity relates to audience absorption

Peutz states that if the %ALcons is below

10% then the intelligibility is very good; between 10% and 15% the intelligibility is only good if the message is simple and/or the talker is accomplished; 15% is generally considered the practical working limit.

It would not, therefore, seem unreasonable to return to the original Knudsen formula (i) and introduce modifications in the light of the Peutz and Klein research. It follows therefore, that:—

$$\text{Percentage Articulation} = 96 \varphi_l \varphi_r \varphi_a \varphi_s \varphi_n \Psi_q \Psi_m \dots \text{(iii)}$$

where the additional terms φ_n , Ψ_q and Ψ_m are the reduction factors for increased number of sources and improvement factors for directivity and audience absorption respectively.

%ALcons is without a doubt the most

We think it fair to point out that the above expression is at this point insoluble since there is presently a dearth of data relating to the effects and parameters that determine the reduction factors. At best our endeavour is to be aware that they exist and to attempt to design the sound reinforcement systems with due regard to their importance.

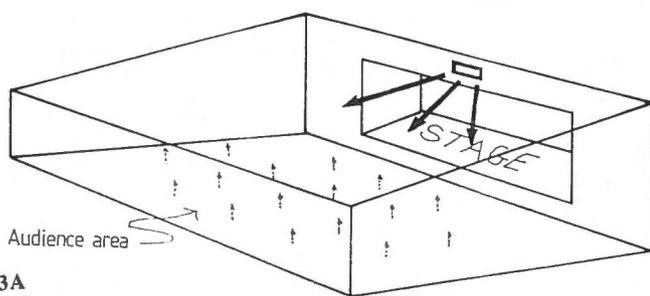
Directivity, Reflections and Audience Modifier

Ψ_q , φ_i and Ψ_m are inter-related in that the requirement is to maximise the direct component of energy and to minimise that portion which makes a contribution to the reverberant field or impinges on non-audience surfaces. Clearly, therefore, it is important to capitalise on the effect of Ψ_m . In order to do this the directional properties

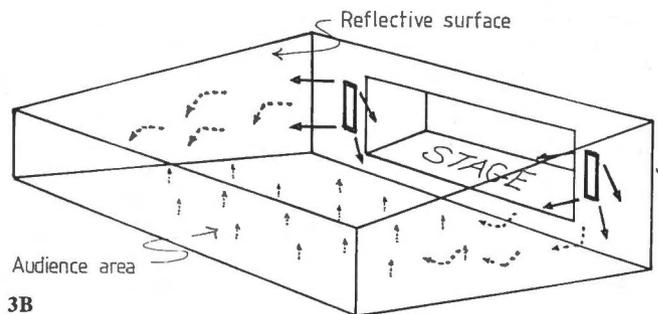
of the audience but walls and ceilings as well, often producing unpleasant and unwanted reflections (in some extreme cases echoes) that serve to provide a confused and muddled sound. We need, therefore, to direct the sound on to the audience area without 'passing GO' and without picking up unpleasant reflections en passant.

Until the 1970's in terms of directional loudspeakers, the best available were column units. True they are 'sort of' directional but their directional properties are dependent upon frequency and further any semblance of directionality they possess is drastically degraded and altered when they are mounted on to or are close to a surface.

The problem of coercing sound to behave in a similar manner to light may be appreci-



3A



3B

reliable aid available when designing sound systems destined for large reverberant spaces, in fact where the ratio of reverberation time and volume are the major influencing factors. Its significance when considering theatres or small auditoria is questionable and in fact in some cases it is possible to postulate good intelligibility whereas in practise it is poor.

We need, therefore, to look more closely at our model used to predict intelligibility. We would suggest that equation (iii) be further extended as follows:—

$$\text{Percentage Articulation} = 96 \varphi_l \varphi_r \varphi_a \varphi_s \varphi_n \varphi_t \varphi_i \Psi_q \Psi_m \dots \text{(iv)}$$

where the additional reduction factors φ_t and φ_i refer to the degradation in intelligibility caused by arrival times from secondary sources and reflections from surrounding surfaces.

To summarise, therefore, we should first state that we are not suggesting that the well established criteria are inappropriate, rather that due to the expected low reverberation time they assume less importance, which in turn promotes and exposes effects which at first sight may be considered as academic or trivial.

Given that the above premise is valid, that the volume and reverberation time of the space is fixed, that the loudness of the system will be adequate and that the background noise level will be acceptable, then we can simplify equation (iv) as follows:—

$$\text{Percentage Articulation} = K \varphi_i \varphi_n \varphi_t \Psi_q \Psi_m$$

where all of the fixed (or assumed) reduction factors are lumped together to form K.

of the loudspeaker have to be as far as it is practically possible optimised to the space.

Fig. 3a and 3b demonstrate this. In fig. 3a the loudspeaker is exactly matched to the audience in fig. 3b there is a considerable mismatch which can give rise to undesirable reflections from acoustically 'hard' surfaces. We need, therefore, to exercise the maximum control possible over the loudspeakers directional properties.

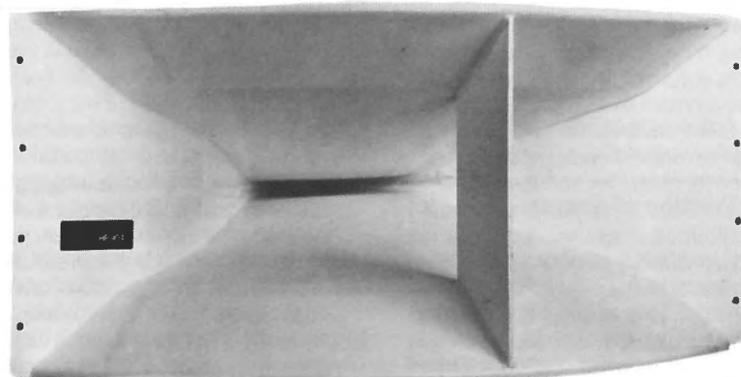
It would not be unreasonable to suggest that in many theatres the task of the sound engineer is akin to a lighting designer attempting to light a set using two 100 watt tungsten bulbs with white plastic reflectors, fed from a microprocessor controlled state of the art lighting system. Light would go everywhere; create hotspots and shadows in spite of the technology back up the wires.

The same is true of sound. In most installations it is ubiquitous, covering not only the

audience but walls and ceilings as well, often producing unpleasant and unwanted reflections (in some extreme cases echoes) that serve to provide a confused and muddled sound. We need, therefore, to direct the sound on to the audience area without 'passing GO' and without picking up unpleasant reflections en passant.

This can be explained by considering the difference in wavelengths; the difference is analogous to walking in a high wind with a crew cut or with hair a quarter of a mile long and expecting to arrive without a hair out of place.

Although not perfect by any means, loudspeakers exist that are able to provide a good degree of control and directivity roughly constant over a reasonable frequency range. The audio industry especially in the United States and lately in the United Kingdom, has been employing these devices to good effect in extremely hostile acoustic environments, yet they are rarely seen in the theatre which acoustically is much more friendly.



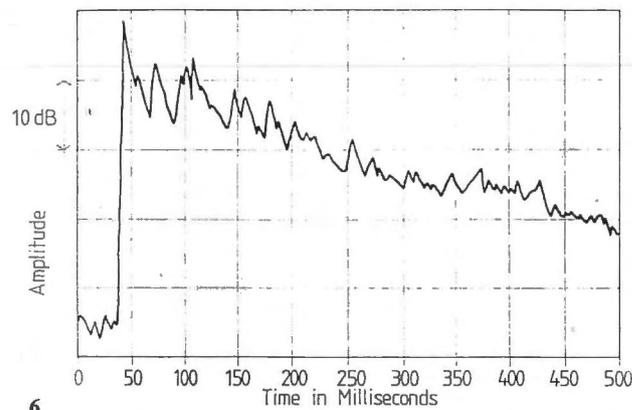
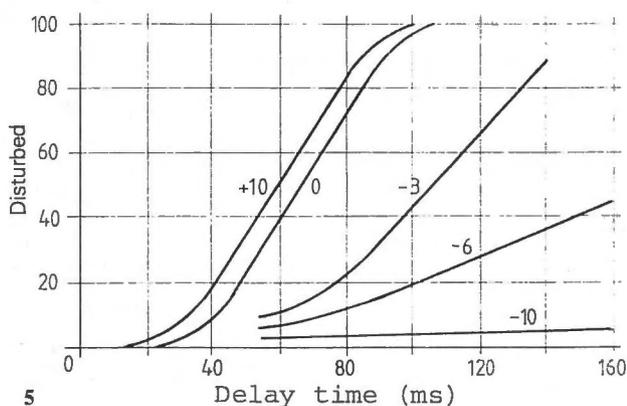
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ELECTRO-VOICE — HR9040 High-frequency Horn

We are of course referring to constant directivity horn units which are available from a limited number of manufacturers. Fig. 4 shows a typical unit. There is a common misconception that this type of horn unit sounds similar to those encountered on the top of police cars and at church fetes and also that the sound of a constant directivity horn is inferior to a column loudspeaker. On both counts this is absolute rubbish. With the correct equalisation and the correct low frequency partner they will out-perform column units in almost every

one unit to cover the stalls and a further unit to cover the balcony. As far as possible these units should be placed very close together and angled to achieve the desired coverage. The placement of the loudspeakers is also extremely important. Traditionally loudspeakers are placed each side of the proscenium arch. Apart from our reservations regarding the type of unit employed, this approach can give rise to overlap which in itself is not a good thing and also due to the pedestrian speed of sound the difference in arrival time at an

does the disturbance. The 50% level of disturbance (for equally loud reflections) occurs at 68ms for a speech speed of 5.3 syllables per second. When this experiment was conducted outdoors the critical delay time reduced to 44ms. As the speech speed increases the critical delay time reduces further; at 7.4 syllables per second the critical delay is 40ms. Later experiments suggested that the critical delay (for 50% disturbance) was in fact much less (25ms). If, therefore, we are attempting to achieve rather better than 50% disturbance then we



respect. It is, however, the term 'constant' which really separates these units from column loudspeakers. A column loudspeaker's directional properties are almost without exception frequency dependent, whereas within the bounds of practicality a constant directivity horn's directional characteristics are, albeit over a limited frequency range, roughly frequency independent.

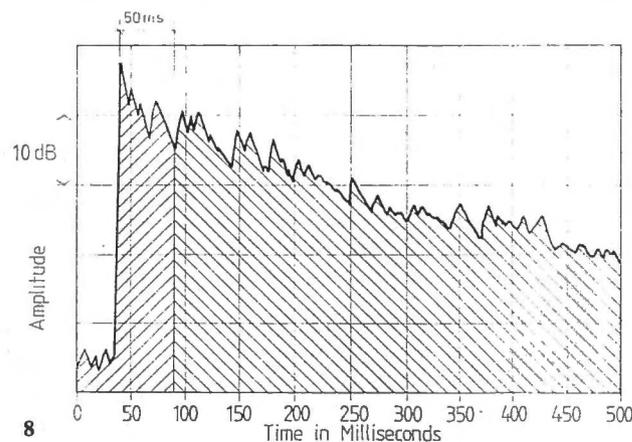
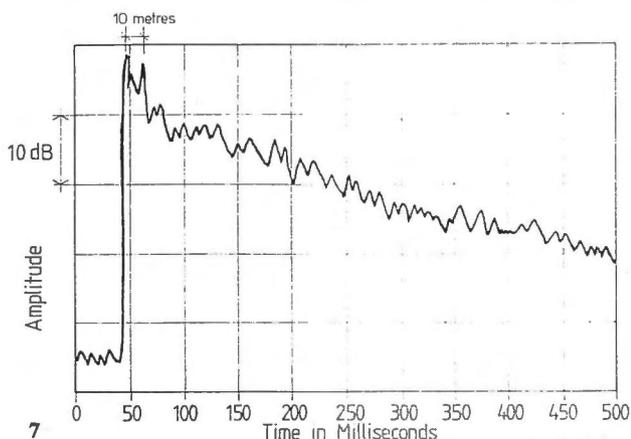
Constant directivity horns have another attribute in that the back radiation is much less than for column units, thereby reducing

audience position can serve further to degrade the sound quality.

The term ϕ_t is affected by the various arrival times from different sources. A traditional two column system with the loudspeaker units separated by the proscenium opening must, therefore, give cause for concern. A listener sitting on the centre line of the theatre would receive signals from both sources at the same time. However, as the listening position moves away from this centre line then the signals from the furthest source will arrive late.

can infer that the critical delay should in fact be shorter still. Since sound travels at approximately 1 foot per ms then if the path difference between individual sources and the listening position exceeds 25 ft. then some disturbance is likely.

There have been several further attempts at quantifying the effects of secondary arrival time on intelligibility. One such attempt was by Thiele in 1953 who postulated that from the impulse response of the auditorium it was possible to estimate intelligibility. An impulse response (or



unpleasant reflections when they are sited close to a reflecting surface.

Position of Source

In large geometrically complicated theatre it is often necessary to use more than a single loudspeaker unit. This of course affects ϕ_n . However, providing that the loudspeakers are placed close together then the detrimental effect of increasing the number of sources is minimised. For example, it is often necessary and indeed desirable to use

True the secondary signal will be reduced in intensity but due to the uncertain directional characteristics of these units, presumably modified by the building structure, this reduction may be insufficient not to cause problems. There is some doubt with regard to the critical delay time/secondary amplitude that can cause disturbance or as it is termed the limit of perceptibility. The best known and earliest work was carried out by Haas; fig. 5 illustrates some of his results.

Immediately we can see that as the delay interval and the secondary level decrease so

echogram) provides a temporal amplitude response of the auditorium. Such a response taken by the authors in a London theatre is shown in fig. 6. From this response it is possible to isolate discrete reflections and from a knowledge of the time interval and velocity of sound the path of the reflected ray can be suggested. The equipment necessary to measure the impulse response is both complicated and expensive. Briefly the system works as follows.

A short duration pulse (less than 20ms in duration) is output from the system. From

the measuring microphone in the auditorium the signal is digitised and fed into a micro-computer for subsequent analysis and display. If the impulse duration is kept very short it is possible to resolve very short distance. For example, fig. 7 shows the impulse response of two loudspeakers separated by only 10 metres.

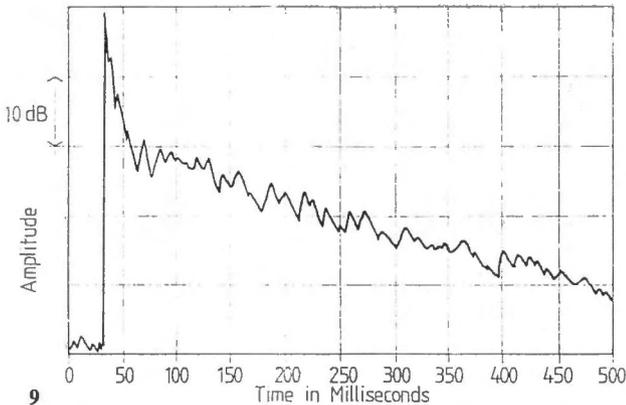
Thiele suggested that intelligibility could be related to the ratios of early and total energy. This ratio he called definition (Deutlichkeit) and was given by the following equation:—

$$D = \frac{\int_0^{50 \text{ ms}} [g(t)]^2 dt}{\int_0^{\infty} [g(t)]^2 dt} \times 100\%$$

where: D = definition
g(t) = impulse response of the room

Note: Our measurements use an RMS converter which effectively squares the impulse response

The equation given by Thiele is approximated by comparing the areas (squared) under the echograms as shown in fig. 8. As we stated earlier there is considerable doubt with regard to the critical time window and although Thiele suggested 50ms, in common with current thoughts, we feel that 25ms is more appropriate.



To demonstrate the effect of single and multipulse sources, figs. 9 and 10 show typical echograms for a single directional source and for two less directional sources respectively. It is clear that the ratio of direct (up to 25ms) to total energy is much greater in fig. 9 than in fig. 10 and, therefore, we can infer that the single directional source will provide improved intelligibility.

Finally with regard to φ_t there is the question of arrival time of the reinforced signal with respect to the direct unaided component. It is the first arriving signal that determines the listener's perception of the direction of the source. Therefore, it is important to ensure that the reinforced signal does not arrive prior to the direct and to this end it is sometimes important to make use of signal delay lines. This is particularly true of under-balcony systems which are generally used if the under-balcony portion of the auditorium does not have line of sight of the main loudspeakers.

Reverberation enhancement systems

From the foregoing it is evident that good speech intelligibility is afforded if the reverberation time of the space is short. With a multipurpose space this presents a dilemma since the required reverberation time for symphonic music is much longer than for speech. Should the space, therefore, be designed for speech or music or maybe even a compromise between the two? The table gives typical reverberation times required for a variety of different performances.

Type of presentation	Reverberation time at 500 Hz (seconds)
Cinema	1.0
Pop Music	1.0
Speech	1.0–1.2
Drama	1.0–1.4
Comic Opera	1.2–1.4
Baroque Opera	1.2–1.4
Grand Opera	1.4–1.6
Symphonic (Baroque period)	1.2–1.5
Symphonic (Classical period)	1.5–1.8
Symphonic (Romantic period)	1.8–2.5

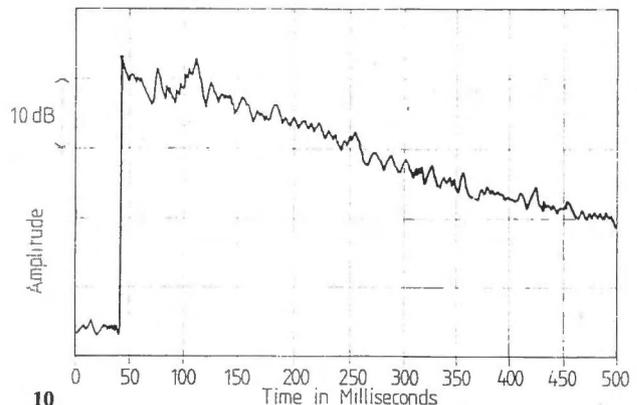
Attempts at artificially increasing the reverberation time of performing arts

the inevitable compromise that would result.

Taken at face value it may seem a simple matter using a microphone, reverberation means, amplifier and loudspeaker to produce the desired effect; in fact the converse is true if the added reverberation is to be subjectively acceptable and most importantly without undue coloration. The acceptability of the quality of the reverberation is not a function of the excellence or intrinsic nature of the reverberation unit; a considerable number of first class machines are currently used in studios and the recording industry, but they have the advantage that there is no feedback problem with which to contend. It is the interaction and transfer function between the microphone and loudspeakers that causes most of the problems.

It would of course be possible (although it is by no means easy) to effect a change in reverberation time by architectural means. There are, however, many problems and constraints associated with this endeavour and such explanations are beyond the scope of this article. The main drawback being their limited effect, they are also expensive and slow to operate.

At present there are two systems commercially available; Assisted Resonance (AR) for which Acoustical Investigation and Research Organisation Ltd. (AIRO) are responsible and the Multichannel



spaces is apparently not new. The Greeks and Romans are reported to have used earthenware pots (eheria) of many different sizes and hence tonal properties to provide a degree of resonance in amphitheatres. The same type of approach has been observed from studies of Byzantine architecture where metal vases (golaniki) were set into the walls and domes of temples. Stretched strings in the roof spaces of churches have also been reported.

The last fifty years have seen numerous attempts using electro-systems to increase reverberation time. I think that it would be fair to say that most did not meet the expectation of either the recipient or even the designer, but that is not to say that all were outright failures. Any limitations were probably as a result of inadequate technology. In any case such attempts are a tribute to and demonstration of a definite need; consultants and performers would clearly rather not suffer the inadequacies of

Reverberation system (MCR) which is manufactured and installed by Philips.

Assisted Resonance

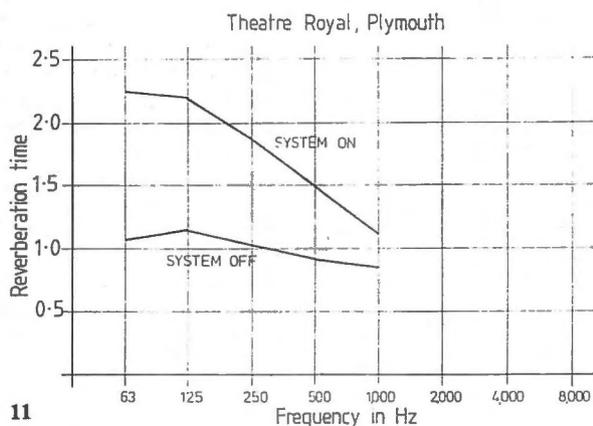
Assisted Resonance was developed by Professor P. H. Parkin and 1965 saw the start of a four year research and development programme to install a system in the Royal Festival Hall to correct the short-fall in low frequency reverberation.

An Assisted Resonance system consists of a large number of microphone/amplifier loudspeaker channels; each channel being as far as practically possible frequency independent of the others. AIRO suggest that this frequency independence is achieved by the use of high Q acoustic filters, together with the selectivity afforded by the careful siting of these units. The system employed in the Royal Festival Hall uses 168 of these channels and achieves a reverberation magnification of some 30% at

250 Hz. The latest systems bear little resemblance (except in principle) to the Royal Festival Hall system. AIRO reduced the number of channels used and increased the frequency range over which the system was to operate. A recent typical system employs 90 channels and covers the frequency range 63 to 1300Hz.

Obviously the technology employed has altered. AIRO now use 50 watt MOSFET power amplifiers instead of the 5 watt valve amplifiers of the original RFH system and instead of fixed attenuators they use a microcomputer to change the gain.

The latest system to be installed in this country was at the Theatre Royal, Plymouth. Fig. 11 shows the increase in reverberation time.



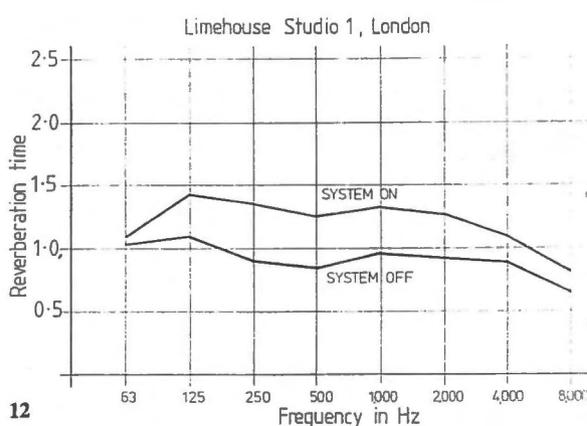
budgets are suffering cuts.

From an objective standpoint there can be no doubt that these systems increase the reverberation time, as seen by the measured results. From a subjective point of view opinion is divided and in fact we would agree that there is a definite inconsistency between objective measurements and subjective effect. By subjective effect we are referring to real live orchestral music, not gunshots or tone bursts. It is only fair to point out, however, that we have not heard a MCR system for a real performance.

There is also the question of stability and coloration. These systems operate quite close to feedback and, therefore, day to day variations in the acoustic climate of the auditorium may affect the gain and hence

Conclusions

Generally speaking not enough thought has been given to bespoke designing sound systems in the past. All too often systems have been specified on the basis that a similar installation 'worked well' in another space. We would take issue with this philosophy on the basis that 'worked well' does rather suppress the initiative to design a system that will 'work better' and in any case by what yardstick do we measure 'well'? Further unless one can have a clear understanding of why a system performed to expectation in a given space there cannot be an acceptable measure of confidence in applying the same design in a different location.



Multi-Channel Reverberation System

This system is based on work carried out by Professor N. V. Franssen published in 1968. As its name suggests and in common with Assisted Resonance, this system consists of a large number of channels (between 50 and 100); the exact number being dependent on the space and the reverberation magnification required. The channels are, however, unlike Assisted Resonance, not frequency selective and are, therefore, not frequency independent.

The principle behind this system is simple and compact. Basically since in the diffuse field the sound energy density and the reverberation time are directly related then if the diffuse sound is amplified the reverberation time will suffer a corresponding increase.

To date, five MCR systems have been installed; the most recent is in Limehouse Studio 1, London where it is intended to provide an acoustic climate suitable for orchestral presentations in an otherwise acoustically dead space. The Limehouse MCR system uses 79 channels (20 watt per channel) and covers the frequency range 63 to 8KHz. The maximum reverberation achieved is shown in fig. 12. Seven steps of reverberation are available between the natural and operational maximum.

There is still considerable controversy with regard to the worth of these systems, especially when related to cost (Assisted Resonance approx. £100,000, Multi-Channel Reverberation approx. £180,000), which may invoke a certain amount of criticism when the sound and lighting

the degree of coloration of these systems.

Again opinion is divided. What constitutes acceptable coloration? Certainly an Assisted Resonance operating at 100% reverberation magnification produces a level of coloration which some listeners may find objectionable especially in the upper octaves.

Once again we should qualify the statement by saying that MCR would seem to be less colored than Assisted Resonance but in fairness it does not offer (perhaps for this very reason) the same degree of magnification.

There can be no doubt, however, that both Philips and AIRO have contributed a great deal to our understanding of this subject and to the improvements and flexibility of the acoustics in multipurpose space and I am sure that such systems will continue to gain favour. Indeed due to the increasing demand for such systems a research and development programme assisted by the Department of Trade and Industry will shortly result in a new system on the market.

The new system which we have heard in its crude, experimental form, shows considerable promise especially in respect of its subjective effect. Due to the operational principle of the new system, stability and coloration would not seem to be such an acute problem as with systems that rely on a feedback principle. We also understand that it will cost considerably less (in the region of £50,000) and further it will integrate with the normal sound system thereby reducing redundancy.

Our design philosophy is based on six basics:—

- 1) As far as is practically possible do not distribute loud-speakers throughout the auditorium. A single multi-element source is to be preferred.
- 2) Position the source if possible above or on the top of the proscenium arch. This ensures that those patrons in the front rows do not get 'blasted' whilst those at the back cannot hear. It also assists the premise that the reinforcement system should be acoustically as unobtrusive as possible since the ear's discrimination is not as acute in the vertical plane.
- 3) Consider very carefully the directional properties of the source and use it to best advantage. Keep the radiated sound off reflecting surface; this includes balcony fronts (i.e. use a different unit for the stalls and balcony areas). Also keep in mind that local surfaces will affect the directional properties of the source.
- 4) If possible conduct an acoustical survey of the auditorium prior to system design. Impulse responses are to be preferred.
- 5) During the commissioning of the system repeat impulse measurements through the system and adjust the angles if necessary. Set the equalisation of the system initially based on measurements (record the setting), then make such adjustments by ear to suit individual taste. Also use impulse measurements to set the delay time if they are included in the system.
- 6) Finally take great pains to explain to the client any operational procedures and system use constraints.

Projecting Back Over Fifty Years

FRED BENTHAM

We have spoken at some length about impulse measurements. Once again these are not new, but the advent and versatility of digital electronics and computing has vastly improved the techniques and simplified the analysis. With this method it is possible to detect and identify reflections occurring from quite small surfaces and indeed with a high degree of precision.

Periodicity within the sound decay process of the room (an extreme case is a flutter echo) also probably serves to degrade intelligibility and it may also affect our subjective assessment of reverberation time. From the impulse (temporal/amplitude) response it is often possible to see vague traces of periodicity. With the aid of a transform technique (Fourier) it is possible to convert the temporal/amplitude response to a frequency/amplitude response. Within this context frequency is not necessarily the pitch of the sound but rather the frequency at which events take place during the decay process. Following this transform it is possible to deduce the major modes of excitation of the room; comparisons of the relative amplitude reveal either the major cause of repeated reflections or the major surfaces which determine the reverberation time. These "room-prints" are stored on floppy diskettes and may be used for subsequent analysis if required.

With regard to reverberation enhancement systems, there is little doubt that the need exists, but the price must be a major factor in restricting their proliferation. True, if that cost is set against an architectural means then electro-acoustics does offer a viable and attractive proposition. However, there is generally a much more worthy cause on which to spend the budget. There is also the question of the subjective effect since it is difficult to comprehend spending these sums of money if there is any doubt that a proportion of the audience cannot tell if the system is on or not. Note our concern is not based on the objective measurements although once again it is difficult to understand how there could be any uncertainty if the reverberation time has been doubled.

In our opinion the way is open for a system which costs less and in addition leaves no doubt as to its effect. It would also seem unreasonable to specify two systems, one for reinforcement and the other to provide reverberation, since they both use common building blocks (amplifiers etc.) and they are unlikely to be used simultaneously.

For the future the prospect seems good. We are not alone in our thoughts and ideals; others have used to good advantage these same basic principles. Several West End theatres are equipped with this type of equipment.

The authors would like to thank the following organisations and individuals for their assistance in preparing this article:—
Shuttlesound, AIRO, Philips, John Oliver and Graeme Atkins of Spectrum Audio Ltd.

The article on scene projection on the following page appeared in the *Illustrated London News* of Oct. 3, 1931. It is doubly contemporary for it was cut out at that time and put in my Technical box file. The other boxes were (and still are!) Theatres & Cinemas Descriptive, and Architecture General or, as one might say, Other. There was nothing going on in these Isles which could claim to be scene projection though optical effects like clouds, snow, flame and, of course, the *Treasure Island* wave effect were very much around. The problem with scene projection was where to put the projector backstage and how to reconcile actor illumination with the 'magic lantern' need for darkness. In any case there were good painters of backcloths around.

It is interesting that the author of the article, Herr Von Zallinger, gives economy as the prime reason for the use of projected scenery then. No one could claim this of the way it has been used in the professional theatre here in the last couple of decades. It is just another way of doing scene changes and the set and screen technique it has been used in conjunction with have been elaborate. What enabled the Germans to claim the attribute of economy was due to the different geography of their stages. The giant opera houses and theatres we can still associate with Germany were in existence then. The vast stages, high grids and all-embracing cycloramas only needed the addition of a good scene projector. Put two or three on the existing lighting bridge and tower structure just behind the pros. and project clear right over the acting area and there you were.

In contrast we had no space: even our much vaunted large stage in Drury Lane was the wrong shape. Great depth but masses of masking needed downstage and it was an absolute rule that everything had to mask completely. Lines of borders or a ceiling overhead and not a light source allowed to betray its presence. It was probably Sean Kenney's set for *Oliver* at the New (now Albery) in 1960 which made exposure fashionable. It is curious that the naked technical stage — seeing the works — should coincide with the mini-skirted sixties.

Some of those between-wars German stages had great plaster cycloramas but the commonest method was the Hasait cloth which rolled up on the O.P. side and was motor-driven to encompass the whole area of the stage. Our only enduring installation of this kind is that of 1934 at Covent Garden which post war has figured very splendidly in the Zeffirelli *Cav* over the years as it surfaced in the repertoire. Given the necessary stage geography to make things easy they also had the projector — the GKP system. The great name in Germany in those days was Schwabe, or Reiche & Vogel as the firm was later to become, but this scene projector was Viennese in origin. The

initials are those of the names Geyling, Kann and Planer but it is the last, Paul Planer, who seems to have been the driving force. To give the requisite light an arc (100-amp) was used but tungsten lamps (60-volt 50-amp) did become available later on it would seem.

Even in a German opera house there could be angular distortion but both the design of the projector and the practice of photographing the design for the slides at the same angle overcame this. The slides were approx. 7 × 5-ins. and often hand-painted or at least coloured-in. GKP went on to develop the system for other applications such as display work and exterior projection using the wall of a building as a giant screen. In July 1935 an attempt was made by GKP to interest Strand Electric in taking on the agency for U.K. If we had, then this would have anticipated the relationship of Pani Vienna to Rank Strand by some thirty-five years; but we didn't. And it is typical that when at last we did take up scene projectors seriously in the mid-fifties, we designed and made our own — the 4-kW Patt.152 and later the Patt.752. It was, so to speak, a point of honour to develop and make our own equipment. The state of affairs today where one never can be certain where an engineering product bearing a very familiar name was really made, wholly or in part, certainly did not apply.

Late in 1936 further very detailed specifications and literature with translations and photographs were sent to Strand. These I still have: among them was one which may serve to illustrate the other worldliness or tactlessness of enthusiastic inventors — or some of them. It was included as an example of the outside projection on the end wall of a building: it was of Adolf Hitler. Here it is the very one, reproduced alongside. Fancy sending us that in the Autumn of 1936!



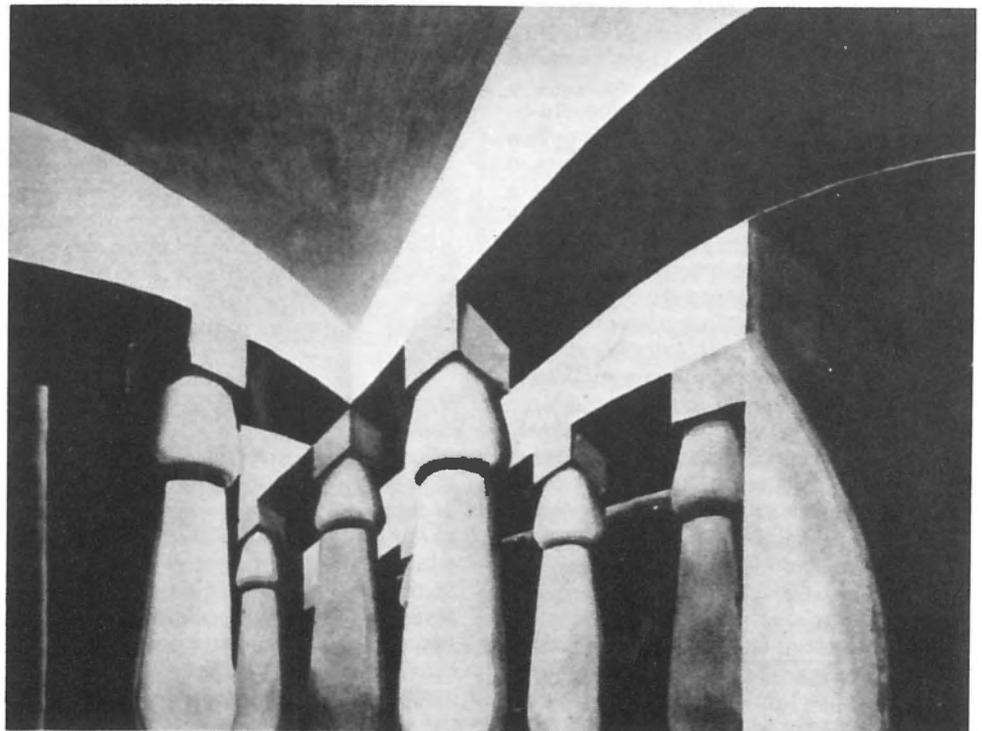
This is the original photograph received at Strand Electric in 1936 — note the arrow inked in by the German company to show the position of their projector on the balcony.

SCENERY FOR A COMPLETE OPERA



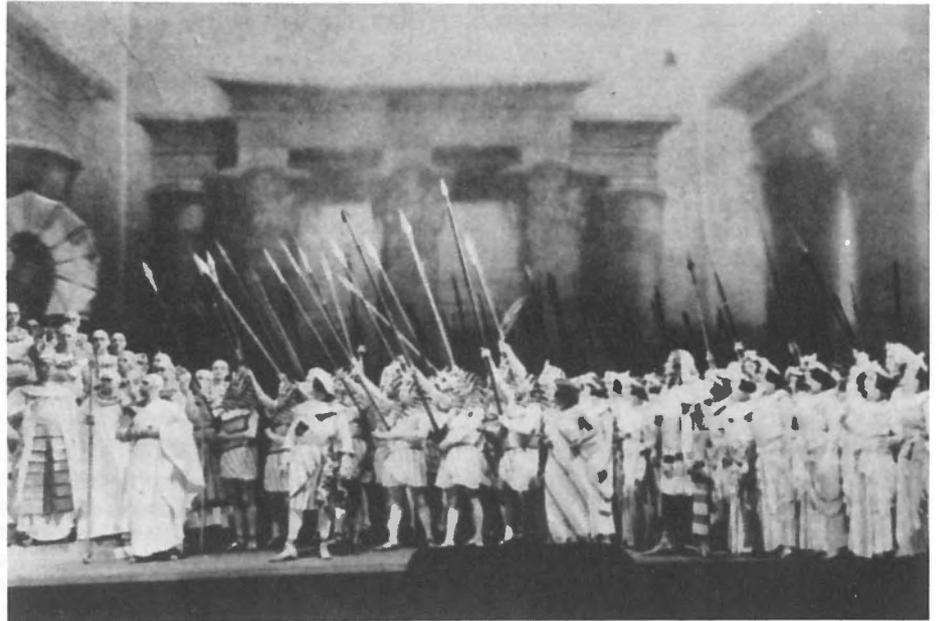
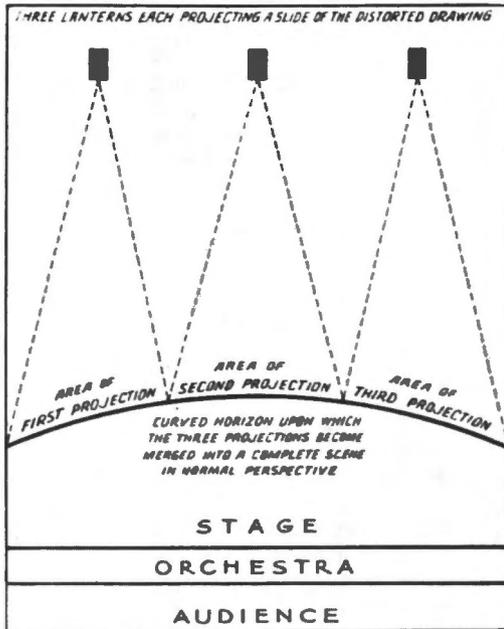
1. The "setting" for the temple scene in "Aida" in normal perspective, although projected on to a "curved horizon" by lantern-slides bearing distorted pictures of the scene. (see fig. 3 below).

The severe economic crisis in Germany has brought into the forefront the finances of the operatic theatre. Against the ever dwindling receipts there are, on the expenditure side, disproportionately high outlays — for first-class solo singers, chorus, dancers, the orchestra (the members of which, in most German towns, rank as officials), and, last but not least, for scenery. Ways and means of escape from this position of difficulty have been sought, and the Cologne Opera House can claim to have found a new and decidedly economical method of providing stage settings. Picture projections are the latest means of presentation; but not, as hitherto, used to supplement ordinary scenery. The chief manager and able artistic director of the Cologne Opera House, Hans Strohbach, has, in his new staging of "Aida," adopted picture projection to eliminate expensive fixed scenery. When the spectator at the opera witnesses the immense expanse of the stage picture which has been projected on to the "curved horizon" stretching across the bare stage, he has hardly any conception of the innumerable problems which Strohbach has had to solve. He works with projections of



3. The distorted drawing for the temple scene in "Aida" as used on the lantern-slides for the projection of the "setting" in normal perspective — as shown in fig. 1 above.

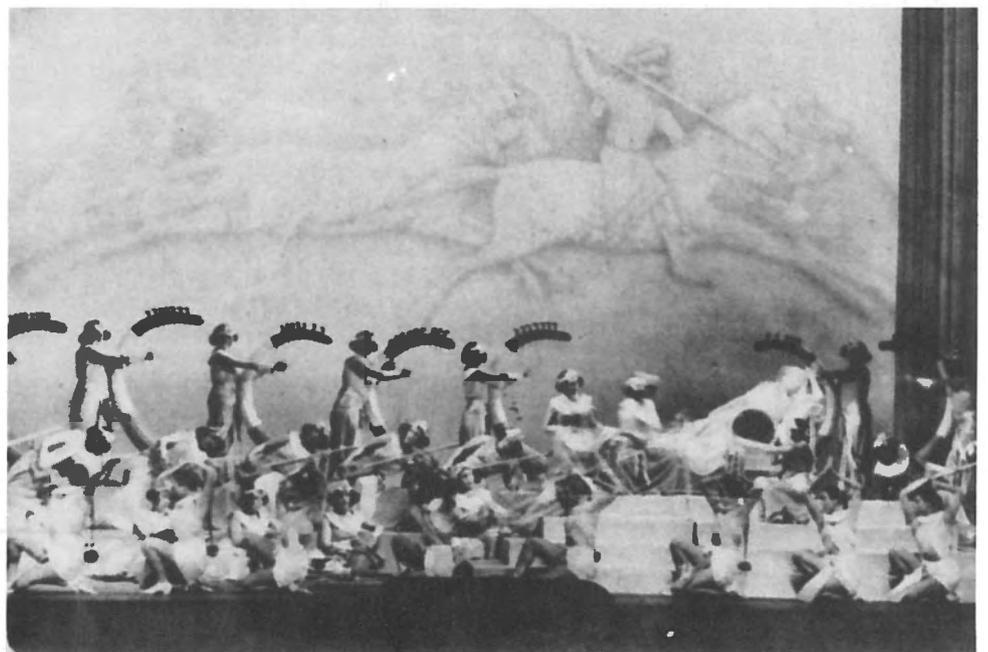
A CONTAINED IN A SMALL BOX!



2. How the three lanterns project distorted pictures of the scene on to the "curved horizon".

4. Another scene in "Aida" created by projecting lantern-slide pictures on to a "curved horizon," upon which the "setting" is viewed in normal perspective. 5. (below) An "Aida" scene created by projecting a lantern-slide picture on to a flat screen, a "curved horizon" not being necessary in this instance.

two kinds. The first is rarely used and presents no difficulties: on a white screen, a picture is projected from behind the stage; but owing to the flat projection, this picture only imperfectly conveys the illusion of an expanse of space, and consequently can only be employed in special instances. The second method makes use of a "curved horizon" at the back of the stage as the surface of projection, and this permits the use of the whole stage space. Behind the stage, three projecting-lanterns are placed side by side in such a manner that the area of the image produced by each lantern is 20 by 30 metres; the entire irradiated surface of the "curved horizon" therefore being 1800 square metres. Adjustment of the three pictures projected by the three lanterns presents great difficulties, and, besides this, a new problem is created by the surface of the elliptically-curved screen, on which a normal image would appear in distorted form. Strohbach overcomes this difficulty by using lantern-slides bearing a distorted drawing of the scenery, which is seen in proper perspective when projected on to the "curved horizon" behind the performers. This distorted drawing (prepared with the aid of small models) is photographed and the finished lantern-slides are then coloured. The cost of making slides is negligible, and, as the whole of the scenery of an opera can be placed in a small box, scenery stores and laborious transport are done away with. The practical application



of this new technique will be welcome, particularly, in operas calling for elaborate staging; for the projection method cannot only provide immense "settings," but enables change of scene to take place in a few seconds. In addition, of course, the stage, being innocent of heavy scenery, can be utilised to its fullest extent. So successful was the first trial of the idea that Reuter was able to report: "In the temple scene massive

stone pillars were seen supporting tons of masonry, and it was not realised that the scene was nothing more than a picture cleverly projected from a 'bridge' above the stage. The delicate task of transferring the scenes to the 'slides' was carried out by Fraulein Fritz. Perfection was necessary, for a microscopic defect in a slide would have been a glaring error on the stage." — Meinhard von Zallinger.

REIDing SHELF

It would have been rather nice if the Victoria and Albert Theatre Museum had been able to mount a Glyndebourne exhibition in celebration of the golden half-century that has transformed our national standards of operatic ensemble. (Even nicer if Glyndebourne had announced the foundation of an opera museum and research centre in their gardens.) Such an exhibition could have been expected to generate a catalogue that would have been rather more cherishable than the volume of essays that John Higgins has assembled under the title **GLYNDEBOURNE: A CELEBRATION**. The contributors are all jolly distinguished chaps — and individualists. So, while their contributions are all interesting in a free-standing way, this is certainly not a book that amounts to anything more than the sum of its chapters. However two of the key aspects of Glyndebourne are dealt with particularly well: Peter Hall is perceptively articulate about Mozart, and Asa Briggs considers the social history of an institution that chose the elitist path to quality. Of the Opera House's technology and architecture there is little reference, even in passing, yet this was a major area of John Christie's interest and influence. Roy Strong provides a neat summary of the development of design, reminding us of Glyndebourne's deft timing in adapting particular styles precisely at the moment when they were becoming acceptable to the conservative taste of an opera audience. He is a little hard on the early contribution of Hamish Wilson whose designs surely cannot be considered outside the context of Ebert's lighting. Indeed there is no mention of Carl Ebert's strong influence over all his designers — all Ebert productions have virtually identical ground plans and similar elevations. The singers in Hamish Wilson's sets would have felt perfectly at home in Oliver Messel's 'Figaro' or Rolf Gerard's 'Cosi' (or indeed in the current set that Mauro Pagano designed for Michael Hampe's Salzburg 'Cosi'!).

And I am so sympathetic to John Pritchard's *Charter for Opera Conductors* that I must reprint it in full:

1. No, absolutely no, stage action or mime or symbolism during the overture.
2. No scrim or gauze aimed at giving diffused lighting on the stage — it *does* affect the acoustics, and singers detest it.
3. No enlargement of the stage apron by erection of supporting structures in the orchestra pit; no steps into the orchestra utilised by the stage performers; no mounting of lighting equipment in the pit; nothing to fall into the orchestra pit!
4. A more positive acceptance of the validity of the great concerted ensemble as an intrinsic (and mainly static) ingredient of opera; perhaps, even, an encouragement to accept the set-pieces at face value, in need of no accompanying distracting stage

movement either by swaying, rocking or marching (I have yet to see an audience whose attention is not riveted by the great operatic concertato).

5. More realisation of the fact that it is VOCAL excellence which in the last resort draws people into opera performances: therefore the available budget must be stretched in the direction of providing fine voices, wherever they can be found, rather than in the building of expensive sets and needlessly rich costumes. One producer not long ago in Brussels asked for 2,600 'props' and when refused went on to Geneva to demand 3,400 in Traviata, including fake ash in the ash-trays!
6. The provision in rehearsal plans of regular musical ensemble rehearsals, *interrupting* the sequence of staging rehearsals so that the musical levels are maintained. Stage directors must be barred from these rehearsals.

'The way I work is wasteful of effort and it can be very irritating, because if I don't find a solution, I just go on nagging at it, and people have to stand around and wait. No matter how well you prepare, things don't begin to take shape until you have people on the stage'.

Peter Hall's evolutionary approach to direction is easier to accommodate in a playhouse than in an opera house. Glyndebourne can provide the rehearsal conditions for a Hall approach and his work has flourished there. Bayreuth shares many ideals with Glyndebourne — indeed the Wagner Festspielhaus was a major source of inspiration to John Christie in founding his own festival. But even the most generous of extended rehearsal periods becomes overstretched under Bayreuth's traditional insistence that the entire cycle of a new Ring production should be mounted in one season. This is only possible if the technical planning has been so intense that all rehearsal time can be devoted entirely to developing the details of interpretation, both individual and ensemble. Even so, Bayreuth Rings do not generally mature — and are not expected to mature — until their second year.

The interaction of Peter Hall and Bayreuth is charted in words (by Stephen Fay) and pictures (by Roger Wood) in **THE RING — ANATOMY OF AN OPERA**. It is one of the most fascinating books of the year. And also one of the saddest: the tragedy of a failed collaboration between a brilliantly talented director and a brilliantly talented theatre.

It is a classic tale of failure to communicate. An inevitable 'them' and 'us' polarisation between German theatre and English production teams (perceptively summarised by designer Bill Dudley as *They think we're amateurs and we think they're amateurs, and the trouble is we're both wrong*) was compounded by language difficulties, par-

ticularly since Peter Hall's intention to learn German was frustrated by the pressures of his personal schedule. In this respect, it seems an unfortunate Freudian slip that Technical Director Walter Huneke's name is printed Honeke throughout the book!

It is a book to join Jim Hiley's "Theatre at Work" (Galileo at the NT) and John Higgins's "The Making of an Opera" (Don Giovanni at Glyndebourne) on the essential library shelf for those trying to understand and improve the curious ritual of stage production. Amid creation do we really need such destruction?

Stephen Fay strives to maintain his objective impartiality with considerable success, although, in response to some of the evidence he lays before us, I find my own sympathy straying rather more towards Huneke, to Lighting Designer Manfred Voss and to their crews (but rarely to Wolfgang Wagner) than towards the Hall camp. Fay, like Higgins, is an outsider while Hiley is an actor and director. Would it not be interesting if a future 'fly-on-the-wall' book was to be written by someone with an understanding of the production process gained by having been both 'us' and 'them' in many backstage roles? With the customary modesty of the theatrical profession, I hereby offer myself to any publisher who agrees.

There have been many many books on Gilbert, Sullivan and Carte but the latest, Robin Wilson and Frederic Lloyd's **GILBERT & SULLIVAN: THE D'OYLY CARTE YEARS** must surely be the key visual reference for this phenomenally successful sector of our music theatre tradition. Over 450 pictures from the D'Oyly Carte Company Archive illustrate their continuous productivity from 1875 to 1982, throughout which the essence of the staging style remained faithful to Gilbert's original. No true G & S fan will wish to be without this book. The rest of us will enjoy it with an objective fascination.

My travels have shown me that New Zealand has one of the world's most vigorously developing theatres. The staggering statistic for that country, which occupies an area of global space roughly comparable with the British Isles, is that their total population is less than our unemployed. Yet the last fifteen years or so have seen the development of a network of producing playhouses which offer not just an invigorating programme of classical drama and plays for today, but a healthy proportion of indigenous new writing. Rough calculations on my pocket keyboard indicate that either a higher proportion of their population with reasonable access to theatres actually go, or the regulars go more often.

Growth has been so rapid that Peter Harcourt's recording of New Zealand's theatre history in **A DRAMATIC APPEARANCE**, published in 1978, has been somewhat overtaken. However for anyone seeking an overview, it should still be read in conjunction with this year's **NEW ZEALAND DRAMA** in which John Thomson approaches the subject through the perspective of the Nation's dramatist's struggle with the interacting problems of developing an idiom and getting work performed. These books, both eminently readable and positively illustrated, should be on the shelf of any library which seeks to offer an opportunity to study world theatre.

James Roose-Evans is articulately aware of the importance of historical perspective in the on-going development of theatre —

Truly experimental work, that has an organic, and not merely a spasmodic growth, can only be arrived at in the light of what has already been achieved by other workers in the field. In order to move forward one must first be able to look back. A knowledge of what has been achieved at different times in different parts of the world strengthens a sense of tradition, of one's creative and cultural roots. Truly creative minds, such as Grotowski or Brecht, acknowledge their debt to the past. Such men build on what they find. We cannot escape our debt to the past even when it is necessary to break with it. A sense of history creates a sense of humour, a sense of humility; we are less inclined to

appropriate to ourselves the credit for certain techniques or discoveries.

and in a quote from Barbara Hepworth he acknowledges the limitations of intellectual analysis as an approach to art —

I know by the way people walk round my garden, and touch the statues, whether or not they have responded to them. The experience must come first. Analysis comes later. The difficulty is that the professional critic too often by-passes the experience and ends up by projecting his own expectations onto a work of art. He does not respond to what is there.

The Roose-Evans approach to charting the history of **EXPERIMENTAL THEATRE** is therefore to extract the essence of what was there. Theatrical experimenters are rarely concise in describing their work, but he digs out for his readers the quotes that encapsulate the philosophy behind the experiments as well as the methods and the consequences.

James Roose-Evans can write a 12-page chapter entitled 'Reinhardt, Piscator and Brecht' that not only summarises their approach but indicates their influence on Dean, Ronconi and Stein without the reader feeling rushed or trivialised. He has, in his own words, 'avoided disfiguring the text with footnotes' but has provided a comprehensive chapter-by-chapter bibliography. Essential and readable are dangerous words for a reviewer's vocabulary but I am tempted to use them for this book which so clearly summarises the past to stimulate the future.

I feel that I know a lot more about **RESTORATION THEATRE PRODUCTION** since reading Jocelyn Powell's creative analysis of the slender evidence available to any student of the performance style that developed when theatres reopened after the darkness of 1642 to 1660. Powell is not merely a good theatre detective, he is the first historian (and several have failed) to make the Dorset Gardens Theatre come alive for me. The combination of his literary style and Hogwood's recording of Matthew Locke's music for Dryden and Davenant's improved version of *The Tempest* on L'Oiseau Lyre DSLO 507 is highly recommended.

My modern dramatists shelf continues to expand as Macmillan add to their series of compact analytical volumes — now over two dozen and more on the way. Howard Brenton, David Hare, Trevor Griffiths and David Edgar fit neatly into a volume of **NEW BRITISH POLITICAL DRAMATISTS** while Elmer Rice, Kaufman & Hart, Maxwell Anderson, Clifford Odets, Thornton Wilder, Lillian Hellman and William Saroyan are the chapter heads of **AMERICAN DRAMATISTS 1918-1945** (Eugene O'Neill already has a volume to himself). **FREDERICO GARCIA LORCA** includes

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useful background on the Spanish theatre, an area of European drama that seems to be less well documented than most others, and Maurice Charney brings to **JOE ORTON** a more persuasive literary style than many of the authors in this series, making clear the extent of our loss in the tragic shortness of Orton's life.

And, finally, Phylliss Hartnoll has compiled a small book about **PLAYS AND PLAYERS** that would easily slip into any theatreperson's christmas stocking or hang lightly from their tree. It is an anthology of quotes about actors and the various problems that are liable to beset them including audiences, accidents, critics, children and the theatre cat. Mostly smiles but many truths.

GLYNDEBOURNE. A Celebration. George Christie, Sir Peter Hall, John Cox, Raymond Leppard, Sir John Pritchard, Sir Roy Strong, Desmond Shawe-Taylor, Isaiah Berlin, Asa Briggs, Bernard Haitink, John Julius Norwich, Gillian Widdicombe. Edited by John Higgins. Jonathan Cape. £12.50(UK).

THE RING. Anatomy of an Opera. Stephen Fay. Photographed by Roger Wood. Secker & Warburg. £18(UK).

GILBERT & SULLIVAN. The D'Oyly Carte Years. Robin Wilson & Frederic Lloyd. Weidenfeld and Nicholson. £12.95(UK).

A DRAMATIC APPEARANCE. New Zealand Theatre 1920-1970 Peter Harcourt. Methuen Publications New Zealand.

NEW ZEALAND DRAMA 1930-1980. An Illustrated History. John Thomson. Oxford University Press Auckland.

EXPERIMENTAL THEATRE from Stanislavsky to Peter Brook. James Roose-Evans. Routledge & Kegan Paul. £6.95(UK)(Paperback).

RESTORATION THEATRE PRODUCTION. Jocelyn Powell. Theatre Production Series. Routledge & Kegan Paul. £19.95(UK).

NEW BRITISH POLITICAL DRAMATISTS John Bull.

AMERICAN DRAMATISTS 1918-1945. Bernard F. Dukore.

FREDERICO GARCIA LORCA. Reed Anderson.

JOE ORTON. Maurice Charney. All in Macmillan Modern Dramatists. £13(UK). £4.95(paperback)(UK).

PLAYS AND PLAYERS. Compiled by Phyllis Hartnoll. Oxford University Press. £3.95(UK).

Letters to the Editor

21st Sept. 1984

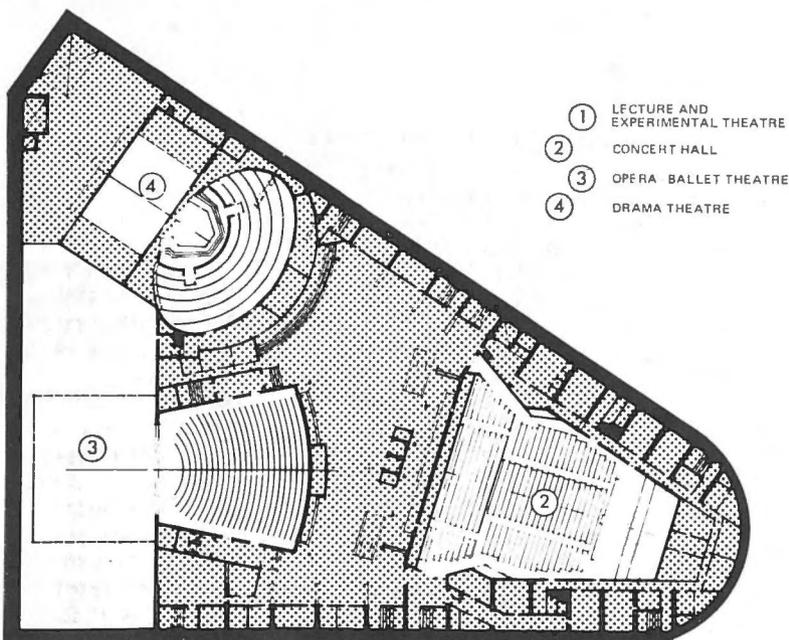
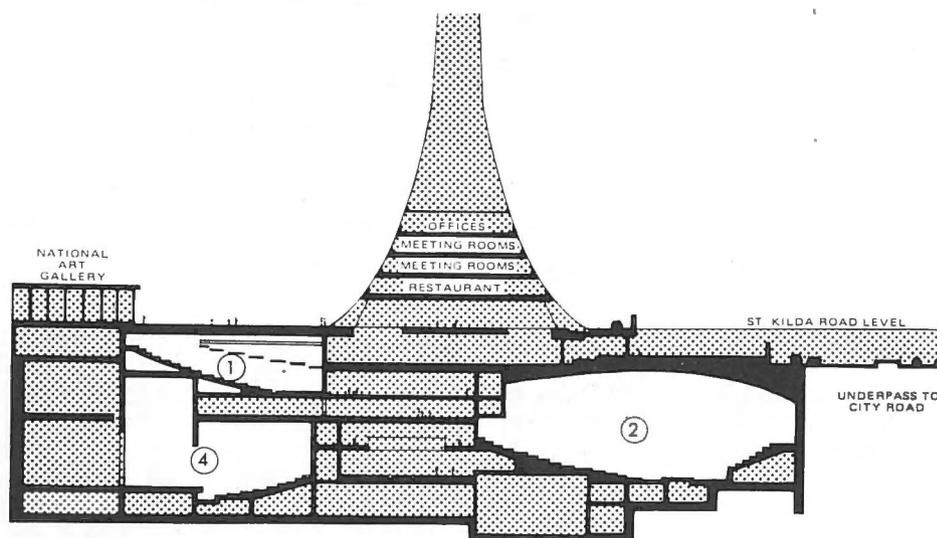
The Editor
CUE Magazine

Sir,
In a characteristically helpful letter (CUE 29) Dennis Irving seeks to correct "some misunderstandings" in my article on the Melbourne Arts Centre (CUE 27).

I am most grateful to him for having clarified the contractual position of Rank Australia vis-a-vis both Hall Stage and Telestage.

But since Mr Irving is concerned "for the sake of some future scholarly reader aiming for a degree in theatre archaeology" (his own awesome words) will he allow me to seek similar clarification on the central questions of why a hole in the ground was chosen for this mega-arts centre and why that hole was then found to be too small? (Mr Irving's second paragraph).

Although Mr Irving does not state precisely with what it is in my account he disagrees one can infer from his letter that he believes the decision to place the theatres



Sketch plan, and above section through Drama Theatre axis Victorian Arts Centre, Melbourne. Architects: Roy Grounds & Co. Pty. Ltd.

underground was solely the result of the architect seeking firm foundations. He rationalises the decision by stating "it seemed reasonable to dig the bad dirt out and sit the building directly on the solid rock beneath". I contend first that the decision to take this "reasonable" course was in part an architectural one concerned commendably with the massing problems of flytowers on the townscape, second that the site problems encountered in the early construction made it uneconomic to dig as deeply as originally intended and third that the increase in accommodation required by the client contributed to the fact that the original concept was unrealisable.

Mr Irving states that "the volume of the main theatre did not grow significantly" despite the evidence that the capacity of the main theatre with flytower was to be 1200 seats in 1960 (evidence: page 21 'The Victorian Arts Centre' published by the Victorian Arts Centre Trust, 1982) and 1,700 in 1970 (evidence: Mr Irving's own article in TABS Vol 28 No 2, page 43) in contrast to the "as built" figure of over 2,000. Further one can compare the section and plan reproduced in Mr Irving's article (page 45) which clearly shows that in 1970 the flytowers were to be completely below St Kilda Road level (ie below ground level) while the tower was to be wholly occupied by foyers, restaurants, meeting rooms and offices. In contrast a glance at the photographs of the tower in CUE 27 will show the opera house flytower and associated air handling plants rising through the ground to a height higher than the roof line of the above-ground National Gallery alongside.

Mr Irving continues: "the separate Concert Hall idea evolved as the limitations of dual use large auditoriums became apparent" possibly implying to his future scholarly reader that it was a functional reassessment that led to the Concert Hall being built on a separate site. However, the illustrations in plan in the TABS article show that in 1970 it was the intention that the by then distinct four auditoriums (concert hall, opera/ballet theatre, drama theatre and experimental/lecture theatre) were all to be contained within the original single hole and as the section of the same indicates, all below ground level.

Accordingly I stand by my contention that the two reasons why the original daring concept was compromised were firstly the difficulties encountered in digging the hole as deep as originally intended and secondly the increase in the volume of the auditoriums. Any other explanation would seem to be post rationalisation.

But, Mr Irving, I do admire the Melbourne Arts Centre even if like Topsy it just grew and grew and even if the bedizened decor does grate on this Pommy bastard!

Yours faithfully,
Iain Mackintosh
2 Sibella Rd
London SW4 6HX

To the Editor of "CUE"

In his interesting review of "Our World was the Stage" Francis Reid suggested that Paul Weston might be able to provide details of the cyclorama lighting for the Torpedo Attack Trainers designed for the Royal Navy and the Air Force. Fred Bentham would be better able to oblige as he actually devised and supervised the lighting effects, as stated on page 39 of the book. Included in the system was an entirely new Bentham control which made it simple for an operator to change the complete effects by selecting appropriate push buttons.

Fred has a reverential regard for archives and could certainly supply whatever details Francis might require, not now deterred by the fact that the work was officially declared to be SECRET at the time: which reminds me that when I tried to impress the assembled employees about the need for reticence, our inveterate staff joker, Bill Watkins, asked with excessive innocence "Would the workers be entitled to claim "Hush-money"? The amused applause made an answer superfluous!

Paul Weston was, in fact, much concerned with the Operational Crew Trainer (see page 44). Paul gave invaluable service in the design and installation of that trainer.

There were numerous workers whose expertise and devotion would have justified specific mention had the space available permitted. I can but hope that their virtue has been its own reward.

Percy Corry
4 Harefield Drive
Didsbury, Manchester
M20 8SY

To the Editor of CUE

Sir,

The writings of Francis Reid in CUE seem to have a knack of providing a cue for my typewriter. This time it is his review of Percy Corry's *Our World was the Stage* in your last issue. I doubt if any of the ten installation drawings for the wartime Torpedo Attack Teacher survive but I do have a copy of the 20-page first specification. That is how I can say that there were ten drawings! The origin of that specification is curious. After the first installation, at Crail, had come together experimentally and worked, one of our meetings at the M.A.P. (Ministry of Aircraft Production) was discussing the need for a spec. to cover the many repeat installations required, when I suddenly realised that I was the only one of the many around the very, very large table who knew how to write one. So it was back to my first job with Basil Davis at the G.E.C., so to speak, and I treated these T.A.T. buildings as if they were each a new super-cinema.

Sticking to the lighting of the all-embracing cycloramas, for present purposes, there were 22 Patt.55 circular 500-watt floods. Eleven had single 32 blue filters and eleven double pieces of 32. For

effects there were 14 1-kW Patt.51 projectors with six storm clouds, six fleecy and two sunset. Tinting had to be precise and that is where I devised the 'broken colour' method using triangles etc to overlay, rather than the usual stage tear-a-corner-off and see what happens! A further six Patt.51s had running water effects to make the sea rush by under the aircraft after the dive. The discs and slides in those days were mica. Spotting was done with seven Patt.27 250-watt 'float spots' our smallest regular spot in those pre-Patt.23 years.

Taking up the Francis query on cue sheets, the answer is there weren't any. The remote dimmer bank had *precise* presetting. The panel on the Instructor's table had nine push-buttons: — Dark night, Searchlight, Bright night, Moonlight, Sunset, Misty day, Overcast day, Fine day, & Target test. The lighting brought in by these also included the appropriate circuits in the epidiascope to light the target model. That epidiascope must not be confused with those in lecture theatres before or since; the French exclamation "Formidable!" is the only way to cover that one adequately.

The dimmer banks were Mansell clutch controlled resistances but how did we manage the precise preset back in wartime 1941-2? The answer was to fit a small box of cam-operated limit switches (all home-made so to speak) to the front of each dimmer. The dimmer would be up-a-little & down-a-little using the clutch as handle just like any manual board. At the command "plot it" the appropriate cam for that preset on dimmers in use would be adjusted to break contact and screwed up tight. Once this had been worked out on the first two prototypes the others could be set at the works. The limit switches broke relay sustainer circuits so there was no indecisive chatter and 'general fade' and 'target fade' (to zero) always used when going from one preset to another. There was also a push to change the night lighting to give the effect of dropping a flare while held. It blacked out temporarily the normal front, left, & right lighting of the ship model in the epidiascope and put on a backlight at full. On release the target as-you-were to its previous check levels.

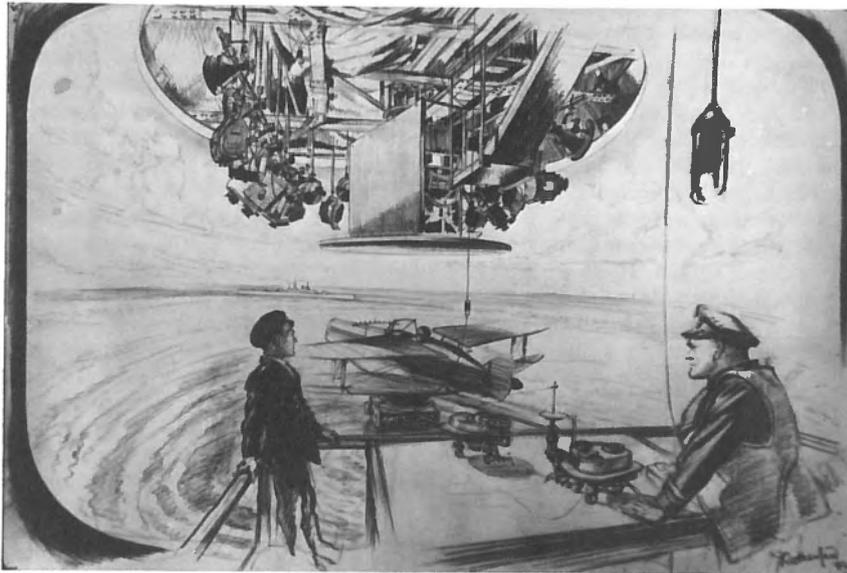


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Prototype Torpedo Attack Teacher (Flight Simulator) for Fleet Air Arm, Crail, Fyfehire in 1941. Contemporary sketch by Harry Rutherford.

The whole thing had to be as automatic as possible. The instructors were chosen for their torpedo skills not theatre experience. Thus the bringing into action a particular effect for an exercise dimmed out the 'house lights' and changed the lighting of the instructor's table from white to blue. (Early integration of batten pilots & working lights!) On cancelling, the reverse applied and so forth. Our stage effects made the Fleet Air Arm officers goggle; whereas they seemed to take the wonders of that epidiascope rather for granted. They expected a tiny deck view of the target first sighted nearly under the Link trainer aircraft they were 'flying' to rise up, change size, angle, & aspect on the great cyc all around them before they dropped their 'torpedo' and thanks to the art of stage lighting its track appeared.

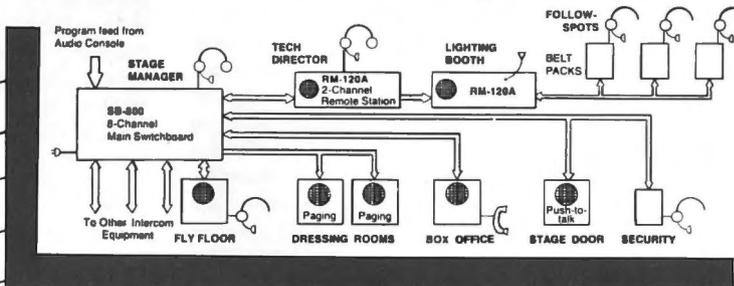
What that early flight simulator was built around was, in effect an analogue computer without a single electronic valve or circuit and there was, somehow or other, just the right team to pool ideas & invention. Who was our leader? The answer has to be Percy Corry who walked the tight rope between the Royal Navy and us civilian technicians; and appeared equally at home whichever side of that rope he might find himself on at any particular moment!

Fred Bentham

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AUSTRIA AND AUSTRALIA

... continuing FRANCIS REID's Theatric Tourist Trail

To visit *Grein am Donau's 1791 Stadttheater* in style take the Danube boat that daily plys between Linz and Vienna (or more slowly, against the current, from Vienna to Linz). Some day I hope to do just that but, hurrying between operatic assignments with Mozart in Salzburg and Vienna, I had to resort to the speedier route offered by a meandering railway that nevertheless offers spectacular glimpses of a river that seems to me to be more in sympathy with Richard Wagner than Johann Strauss.

Grein's Rathaus (Town Hall) was built in 1563 and the Stadttheater, billed as the oldest civic theatre in Austria, was provided by converting a first floor room, previously used as a corn exchange, in 1791. In the height of summer tourism it can be visited at 10.30 and 2.30; otherwise a notice invites the curious to "Ring Mimi Kelcher 366 (English Spoken)". Since 1964 there have been performances of an annual comedy on Fridays, Saturdays and Sundays in July and August.

This must be the ultimate in intimacy for a proscenium theatre. There are four rows of stalls between the stage and the front of the balcony, and a further three rows of benches under the balcony. Total capacity is about 160. The plain wooden seats are unique in that they may be locked in the tipped-up position — the citizens could ensure that nobody sat in their personal seats, just as subscribers in larger towns could lock their boxes.

The small stage is set rather high above the stalls sightline and its painted act drop, like the theatre's decoration generally, has something of a homespun quality — suggesting that, as one would expect in such a small and relatively isolated community, neither the original nor refurbishing brushes have been accustomed to the techniques of the theatrical scene painter. But the colouring is attractive in its blues, golds, and delicate bluish-grey. The curving balcony, supported by four pillars, straightens towards the proscenium where it forms into single boxes. The panelling on the balcony fascia is moulded (in 1791 might one have expected only paint?) and the centre panel features a boat amid Danube rocks. The ceilings, including that under the balcony, are decoratively painted. Lighting is by five paired-candle sconces.

Altogether a delightful insight into a type of small theatre of which many many across Europe have long since disappeared.

The theatre in the grounds of the palace at *Schönbrunn* is an altogether grander affair. It was built in 1767 as a court theatre for Maria Theresa and is the only Viennese theatre surviving from that period. The commanding centrepiece of the auditorium

is the royal box facing the stage to which it reaches out with two arms of shallow balcony that extend to the classically colonnaded and pedimented proscenium arch surmounted by a prominently sculpted royal coat of arms. Little balustrated boxes project high above the balcony doors, adding to the intimacy without threatening the elegance. Indeed, of all the baroque theatres, this is probably the one that provides the biggest proportion of good sightline seats while retaining the intimacy provided by a responding audience on the side walls.

In 1926, to expand audience capacity, the seating was carried through the proscenium arch to a new inner proscenium framing a shallow stage. Recently the auditorium has been magnificently restored to its original condition and a new stage house provided. Photographs in the corridor encircling the stalls show the process of refurbishing, documenting the physical state that old buildings inevitably reach through a process of natural decay behind facades and fascias.

The theatre now gleams and glows, a masterpiece of the painter's art. The juxtaposition between real and illusionist moulding is a delight.

Haydn and Mozart performed their own works in this theatre — this could only add to the ambience of the routine performance of Mozart's 'La Finta Giardiniera' that I attended as part of the Vienna Chamber Opera's annual summer season. I now have an ambition to assist, as audience, at a festival standard Figaro or Cosi with original instruments and a director who has not been recruited from the world of spoken drama.

Vienna's eminence in today's world theatre is founded on a rich heritage. The *Österreichisches Theatremuseum* preserves the ephemera of that heritage and holds changing exhibitions in its galleries in the Hanuschgasse, adjacent to centralised box office for the State lyric and dramatic theatres. Past exhibitions have included tributes to individual specialists such as designer Teo Otto and technologist Sepp Nordegg, as well as broad themes such as 'Operette in Wien', 'Tanz' and the Burgtheater.

This summer's exhibition was *Harlekin*, displaying about 250 items in nine themed rooms whose titles indicate the width of interpretation of the exhibition's theme: The Clown — Commedia dell arte — Travelling troupes — Hanswurst — Kasperl — Harlequin in citizen's clothing — Harlequin's rebirth in the twentieth century — The circus. The illustrations included paintings, prints, puppets, masks and video. As in all good exhibitions of this type, the

items complemented each other to provide a total impression that almost gives movement to the frozen moments captured in the individual pictures and objects.

Two sheets of 'Grotesque Kopfer' used 32 faces to illustrate everything that can be done with a face to make it funny — except what can often be funniest, that is keeping it straight. Only the timing element in the videos of Karl Valentin, Laurel and Hardy etc could show the hilarious possibilities of a straight-faced Harlequin.

The Austrian Theatre Museum does not have a selection of its collection on permanent display: policy is to mount a sequence of special thematic exhibitions like that on 'Harlekin'. However, nearby in the Hofburg, there are a series of *Gedenkräume für Persönlichkeiten des Theaters* or 'Memorial Rooms for Theatre Personalities'. These rooms may be visited at 11am on Tuesdays and Thursdays by making an appointment (preferably the previous day) at the Theatre Museum's reception desk. One is then led through back stairs and back passages in the Hofburg to a series of linked rooms whose secluded quietness, reliance on artificial light and an access dependent upon several keys, gives the visitor a feeling of trespassing on the past.

Each room is devoted to memories of a single personality and has chronology of the key events in their lives. The furniture of operetta composer Emmerich Kalman (described on a brass plate from Trieste as 'Illustre Maestro') is laid out as in a room, with an early television set and slippers set amidst his accumulation of furniture both antique and homely.

Personality actors tend to look the same in each role. Carl Michael Ziehrer is no exception and photographic sequences and montages show his personality coming through a diversity of extensive character make-ups. The abundance of sashes with which he was adorned and acclaimed indicate the strength of his popularity. Posed photos of another actor, Joseph Kainz, before and after the performance are exaggerated yet capture the spirit of an actor's (or indeed any artist's) ups and downs.

The room of H. Thimig has emotional resonances for a Mozartian like me because there are bits of the old Burgtheater — a piece of stage and the prompter's shelf. There is a fan picturing the old and new Burgtheaters and memories of his dressing room during his founding years at the new one, including a plate inscribed 'Garderobe Nummer 13 (1874–88) an Herr Thimig'.

But the highlights for theatre visualists must be the Casper Neher room and the Reinhardt one. The latter has Clemens

Holzmeister's model for the Salzburg Festival Faust in the Felsenreitschule and Ernst Stern's model for the 1905 Midsummer Night's Dream in Berlin's Deutsches Theater.

The Hofburg rooms present an embryonic history of a relatively short period. I have not yet discovered how long they have been there, but assume that they are being left undisturbed in their present condition until their contents can be absorbed into a permanent rationalised display covering the long distinguished and influential history of Austrian theatre. The Hofburg would be an ideal location for this.

Vienna is, no surprise, peppered with composer museums, usually located in houses associated with the musician whom they commemorate. For opera persons the most tingling one must surely be Mozart's apartment at Domgasse where he lived from 1784 to 1787. A short period perhaps, but for Mozart three years was long enough to complete a huge output including a dozen concerti, two dozen chamber works as well as the Marriage of Figaro. Although the City of Vienna acquired some of the rooms in the Mozart family apartment in 1941 — or '*Figaro Haus*' as it has become known — it was not until 1978 that all the rooms became available, making a full restoration possible.

The Mozartiana displayed in the Figaro Haus places a strong emphasis on the composer's association with Vienna and, to make the displays as comprehensive as possible, there are, in addition to original items, photographs and facsimiles of material preserved in other collections. From these it is possible to gain a substantial feeling for the environmental conditions of the original performances, particularly of the Magic Flute. Such gut recaptures of performances past are dependent on the emotive power generated by the historical associations of the building whose preservation provides the historic continuity. These elegant yet domestically friendly rooms are alive with such associations — including the visits paid to Mozart in this apartment by Haydn and Beethoven.

Although I have attended performances at the Staatsoper on several occasions since 1961 and been given full conducted tours of both *Staatsoper* and *Burgtheater* by their respective technological managements, I thought it would be fun to try the public tours. And it was.

The Opera House is a popular summer tourist attraction requiring a considerable degree of organisation with tours starting most hours, on the hour, in several groups and several languages (on my day German, French and English, with apologies for lack of Italian and Spanish). The various crocodiles set off in different directions but all paths lead through the foyers, on to the stage, and into the orchestra pit. Standing on any stage is always, in some degree, a heightened moment. Standing on this particular one can only be exciting, even if the present structure dates from the post-war reconstruction of 1955 — and even as I stood there, timbers were being replaced as

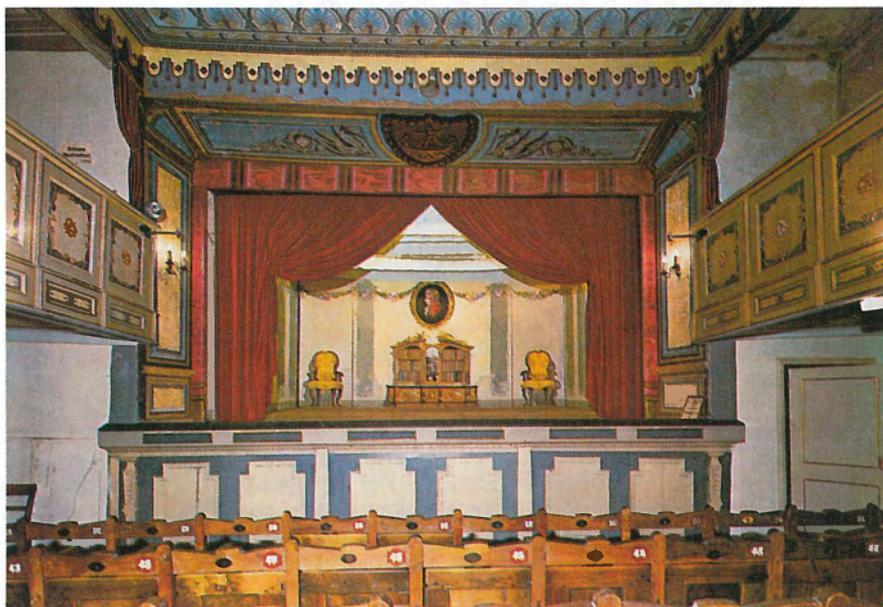
The Performing Arts Museum

In trust for the future

The Museum has been entrusted with the preservation of a number of other major collections, including:

- * **The J.C. Williamson Theatres Ltd Collection** — a multitude of scrapbooks, programmes, props, photographs and documentation of the wide ranging activities of "The Firm" over sixty-five years.
- * **The St Martin's Theatre Collection**, comprising comprehensive records of productions throughout the lively forty year history of this theatre, originally the Little.
- * **The National Theatre Collection**, including scrapbooks and programmes, plus an interesting collection of memorabilia relating to the National's founder, soprano Gertrude Johnson.
- * **The Donovan Joyce Collection** — recordings and scripts of the Donovan Joyce Studio's prodigious output of radio drama and serials.
- * **The John Lemmone Collection**, including sheet music and personal memorabilia, plus fascinating documentation of his tours with Dame Nellie Melba.
- * **The Les Levante Collection of Stage Illusions**, fine examples of the magician's craft, donated by the family of this famous Australian illusionist.
- * **The Grunenberg Pavlova Etchings** — believed to be the only complete collection of these evocative studies of the legendary ballerina.
- * **The Viola Tait Collection of Costume Design**, comprising hundreds of sketches for the original productions of many late nineteenth century and early twentieth century musical comedies and pantomimes. *The Chocolate Soldier*, *Chu Chin Chow* and *The Merry Widow* are a few of the productions represented.
- * **The Ashton's Circus Collection**, including costumes, props and other mementoes from Australia's oldest circus.
- * **The Dame Edna Everage Collection** of exclusive haute couture — plus a vast store of Barry Humphries memorabilia.

Other notable pieces in the Museum's collection include Sir Henry Irving's *Hamlet* cape; a rare plaster statuette of Roy Rene ("Mo"); Jenny Howard's *Dick Whittington* costume; a Victorian children's toy theatre in original condition; the stage lighting control board from the Bijou Theatre in Bourke Street; character masks designed and made by Mirka Mora for *Medea*; and dress circle chairs from the old Tivoli.



Stadttheater, Grein am Donau.

part of the annual summer stage and auditorium renovations that were busying a huge crew.

Burgtheater tours are a smaller affair and conducted in German only. Access was restricted because of extensive refurbishment of the flying system, although it was possible to visit both the stage and, more dramatically, the understage with its huge revolve which includes extensive elevators. And on this stage there is something that I have not seen anywhere else — lighting

booms which rise on little elevators in each bay. (I'll bet they are hardly ever in the right place!) The auditorium was swathed in polythene sheeting because the stage boxes were being totally reconstructed as lighting perches. The auditorium is another post-war reconstruction, but the majestic original foyer of Semper and Hasenauer can still be savoured.

Some day I intend to take a backstage tour of our own National Theatre. I am rehearsing my disguise.

The leaflets publicising the exhibition of *Her Majesty's — A 50th Birthday Tribute* at the *Performing Arts Museum in Melbourne's Victorian Arts Centre* announce:

"The finest theatre museum in the English speaking world . . ."

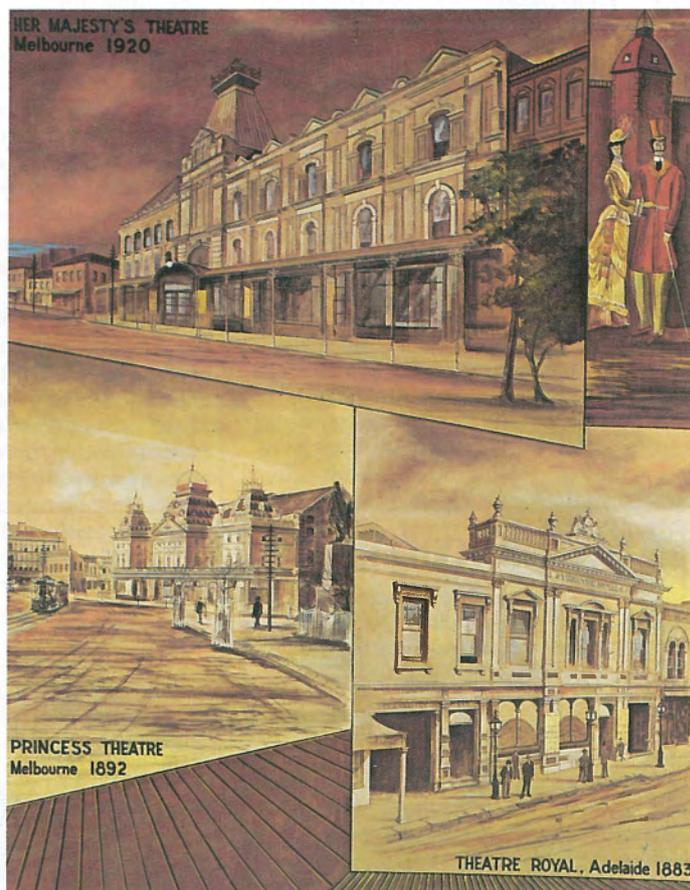
Cue Theatre Review, London, 1984

The quote comes from Iain Mackintosh who, in Cue 27, took some delight in getting down to Melbourne before me. However, I was less than a year behind him and I am now happy to endorse the Mackintosh view. That a major arts centre should include a theatre museum's exhibition space is naturally an attitude that I applaud. And when that space is so attractive and its exhibitions are presented with such flair, then my applause is accompanied with shouts of *bravo!* unrestrained.

Throughout the antipodes, each of Her (His) Majesty's Theatres of the former J.C. Williamson circuit are universally known as the 'Maj'. Melbourne's original Maj was destroyed by fire and the Maj whose silver jubilee was being celebrated by exhibition is the replacement theatre of 1934. Entry to the exhibition was by a stage door with historic notices on the wall and a vintage tape of stage manager Sue Natrass calling beginners against a background of audience chatter and orchestral tuning. Sound was particularly well used throughout the



Schlosstheater Schönbrunn.



Panels exhibited in the Melbourne MAJ during J.C. Williamson's Centenary Year (1974)

PRODUCT NEWS

exhibition and included a 'White Horse Inn' recording from an outside broadcast from the Maj in 1935. There were slides of the shows, star dressing rooms with ephemera, and a stage with props, costumes, old lanterns and dimmer levers from the Siemens lighting board that served from 1934 until 1980.

And, again to quote from the publicity leaflet "spectacular costumes, set designs and models, special audio and video presentations. Rare clip of Gloria Dawn in Gypsy. Tributes to some of the great headliners: Gladys Moncrieff, Jill Perryman, John Diedrich, Evie Hayes and others. Original plans and designs. Memorabilia from earlier theatres on the site." I was not able to catch one of the personal appearances of Maj personalities but I came away cherishing a copy of the booklet that J.C. Williamson produced to celebrate their century in 1974, containing external and internal photographs of all their theatres together with dimensions and details of their electric and sound installations.

Concurrently with the Maj, there was a display of theatrical photographs by Harry Jay from the beginning of his career in Berlin in 1927 until the closure of the Tivoli Theatre in Melbourne in 1966. This was a splendid record of actors and productions, national and international: the fact that such an excellent photographer was on hand to record the passing shows must be a very positive asset to any theatre archive.

From the listings of the material that has been deposited, it is obvious that Melbourne's Museum of the Performing Arts is developing a comprehensive collection. And the evidence of the exhibitions indicates that its curators know how to use the past to enlighten and entertain the audiences of the present and future.

Viking Lighting Control System

One of the most respected Companies designing and making Control Systems for Theatre and Television Lighting is AVAB. A Swedish Company with its head office in Goteborg, it has a subsidiary Company in San Francisco and in the UK is represented by CCT Theatre Lighting.

As is to be expected with product made in Sweden, AVAB control systems are superbly engineered and reflect some of the most advanced thinking in control techniques.



CCT recently showed in their Clapham premises for the first time in Britain AVAB's "Viking" system, probably the most advanced lighting control system anywhere. It has an excellent pedigree being an evolutionary development from AVAB's first computerbased control installed in the Royal Opera House in Stockholm in 1973.

"Viking" is a multi task system based on a series of micro processor modules which can be selected to present the most appropriate format for the application - Opera House, Repertoire Theatre, and Television Studio.

"Viking" can handle up to 1,000 control channels and dimmers which can be analogue or digital. In addition to all the functions one would expect to find on a major lighting control system "Viking" has the unique facility to perform disparate tasks simultaneously including remote control of colour and luminaire orientation.

Several peripherals are available as standard including a technicians wireless remote control invaluable during rigging, set-up and lighting rehearsals.

The visual status display options are comprehensive and in addition the system has a voice personality being able to talk to the operator when eyes are otherwise engaged.

"Viking" incorporates key test routines and can also be connected by telephone to an AVAB test computer back at headquarters.

Full technical details on "Viking" and other AVAB product including the popular 201 micro processor system are available from CCT.

Show Light '85 - International Symposium on Theater, Television and Film Lighting -

SHOW LIGHT '85, an international symposium on theatre, television and film lighting, has been scheduled for March 17th to 20th, 1985, at the Sheraton Centre in New York City.

The symposium is an annual event sponsored by the Theatre, Television and Film Lighting committee of the Illuminating Engineering Society of North America. It is supported by the Commission Internationale de L'Eclairage (International Commission on Illumination).

The last TTFL Symposium in Orlando, Florida (December 1983) drew registrants from all over the United States as well as sizable delegations from Europe and South and Central America. This year, in New York City, an equally international flavor is expected.

SHOW LIGHT '85 offers an opportunity for professionals in entertainment lighting to meet each other and exchange experiences through papers, round-table discussions and field trips to theater, film and TV production facilities. There is an exhibit area, so suppliers to the industry will also participate. This year's exhibition is expected to be particularly useful, since Show Light '85 overlaps with the annual convention of the United States Institute of Theatre Technology (USITT) that follows in the same location. Exhibitors will maintain booths for both events.

In addition, many entertainment lighting professionals will find it easier to attend both events during the same week in New York.

Charles Clark (General Electric Co.) and Nathan "Sonny" Sonnenfeld (Sonnenfeld Associates) have been named Chairman and Vice Chairman respectively of SHOW LIGHT '85. Kenneth Ackerman (British Broadcasting Corporation) is serving as International Coordinator.

People interested in registration information, including program details and costs, should contact Mr Jay Langan, SHOW LIGHT '85, c/o Theater Production Service, 133 West 19th Street, New York, NY 10011.

Joint development programme for Rank Strand and Strand Century

The Rank Organisation announces that its two subsidiaries specialising in the manufacture and marketing of stage, studio and location lighting - Rank Strand Limited and Strand Century, Inc. - are to be managed as a worldwide business to strengthen their combined sales, marketing and development activities.

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Already the largest stage lighting business in the world, their closer working relationship will enable the two companies to jointly develop products designed to meet lighting requirements throughout the world, and to compete more effectively in the market place.

Under the new arrangement the managing director of Rank Strand, Mr Michael Lowe, and the president of Strand Century, Mr Marvin Altman, will become members of each other's boards of directors and will be responsible to the president of Rank America, Inc., Mr Brian Edney.

Rank Strand is based at Brentford, West London, with a factory in Kirkcaldy, Scotland, and Strand Century's head office and factory is in Los Angeles, U.S.A., with additional sales offices in New Jersey and Toronto, Canada.

Show Strand Companies to retain previous management team

Four new companies have been formed to trade under the *Show Strand* banner. In June this year, Carraun Plc. acquired five businesses which were previously part of Rank Strand Ltd., a subsidiary of The Rank Organisation. These businesses have been formed into four separate subsidiary companies, *Show Strand Seating Ltd.*, *Show Strand Electrical Contracts Ltd.*, *Show Strand Audio-Visual Ltd.*, and *Show Strand Drapes Ltd.*

Previous Rank Managers appointed to the Boards of these companies include *Charlie Irvine* and *Eddie Souster* (Electrical Contracts), *Len Holme* and *Geoff Molyneux* (Seating), *Owen Clark* (Audio Visual) and *Brian Povey* (Drapes).

These newly appointed directors will manage these separate companies which will form a new *Show Strand* division within the Carraun Group.

For further information please contact *Marcia Davey* Group Marketing Executive, Carraun Plc. Chapman House, 10, Blackheath Village, London, SE3 9LE

New Compact Memory Lighting Control System! From Dynamic Technology

The Chameleon Memory Lighting Control System is the latest addition to the Datalite range of lighting control products. The Control Panel's compact dimensions, (19 inches wide x 10.5 inches high) also make it an ideal unit for portable applications. In terms of design, the Chameleon owes much to the Datalite Modular Lighting Control System; full use has been made of Datalite's existing well-proven design and sub-assemblies.

The Chameleon offers a control capacity of between 64 and 256 circuits with up to 999 memories. Operational features include individual Channel and Memory Control, 2-Group Playback (providing 2 operational stores), and a Colour Television Mimic Display. Options include an 8-Way Group-master, Trick Effects Unit, Pin Matrix and a

Datadisk System (providing floppy disk back-up, text playback, dimmer law shaping and soft patching facilities). Further information from Dynamic Technology Ltd, Zonal House, Alliance Road, Acton, London W3 0BA.

Colortran U.K. announce an HMI range

The Thetford, Norfolk based lighting and control Company Colortran U.K. now have available the first items in a massive range of sophisticated HMI lamps. The daylight colour temperature has made this source very popular with location lighting directors. Especially as a full range is available to choose from including 'Open Faced' and 'Fresnel' types giving very significant luminous flux and efficiency over the more conventional sources.

The first release by Colortran U.K. includes five models from 200 watts-4000 watts (200, 575, 1200, 2500 and 4000



watts) of the open face type which gives both spot and flood facility. HMI lights have requirements for stringent safety regulations all of which are adequately met with the Colortran UK units. Micro switches engineered into the flanges are held into position by the safety glass. Should a glass break, the micro switch pops out of its seating to break the circuit and instantly switch off the supply to the lamp. These and other features make this lamp safe in all applications.

The price of these units is competitive and the running cost far less if we consider the luminous flux output for the power consumed. This is easily seen on the larger units as included in the lamphead is an hours counter, which will record the number of running hours per lamp. In these days when replacement lamps are expensive, this is an important factor in the initial purchase decision.

More details from Colortran UK, PO Box No. 5, Burrell Way, Thetford, Norfolk IP24 3RB

Rank Strand's New Gemini Memory System

First impression of the Gemini system is a compact and uncluttered ergonomic control panel. Gemini's carefully-planned features include simple and logical operation using professional standard control keys, informative LED panel displays and colour



enhanced VDU displays, sophisticated channel access, twin dedicated keypads - one for channel controls, the other for memory, twin independent playbacks and decimal point memory assignment. Ten pages of eight groups of electronic back-up are provided.

Advanced user-programmable software makes possible the proportional patching of the 384 dimmers to Gemini's 180 control channels. Eight additive and inhibiting submasters are integrated into the system for manual control of channels or memories, and for blind recording. The multiplexed dimmer output means compatibility with standard equipment. A major technological breakthrough is the facility for the simple programming of diverse special effects, many never before possible, by means of a unique micro-processor-synthesised dynamic special effects system. A friendly, prompting colour VDU display guides the designer through the many options available.

Also included in the Gemini system are hard cased disc library storage, riggers controls, wire link or infra red designers controls, and hard copy printers for cue sheets.

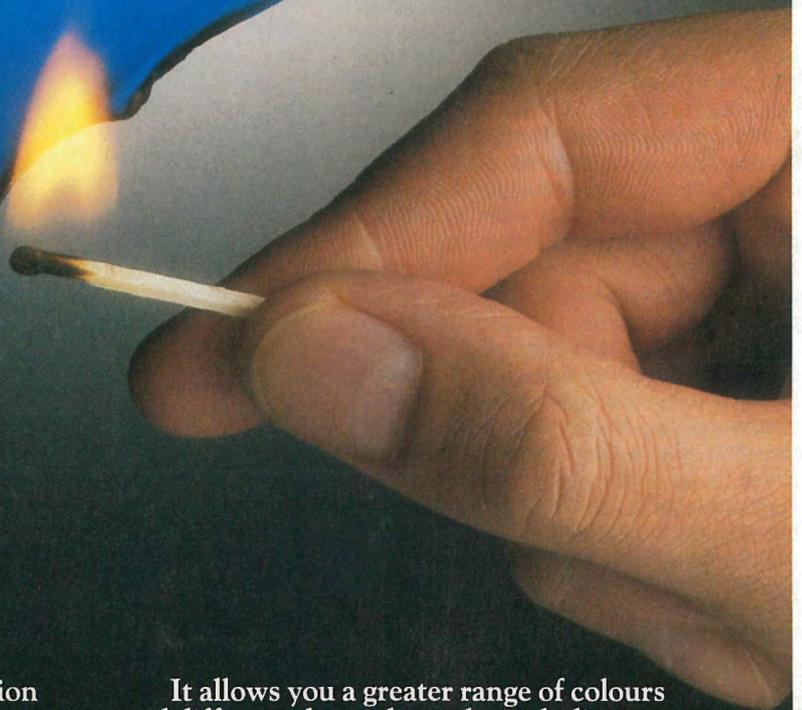
Rank Strand believe that in Gemini they have developed a flexible system for the future where the only limit on creative lighting programmes and special effects is the imagination of the designer!

Illustrated descriptive literature on request from W G Crisp, Rank Strand PO Box 51, Great West Rd., Brentford TW8 9HR

Theatre Projects' Equipment Rental Business to merge with Samuelson Group

As we go to press we learn that Samuelson Group plc are to acquire a majority holding in the lighting, sound and audio-visual hire business of Theatre Projects Services Ltd., in a transaction worth £1.6m. Samuelson will also acquire a minority stake in other parts of the Theatre Projects Group.

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