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MUSIC IN TELEVISION— THE SOUND ASPECT

IN CONSIDERING the televising of music, and in particular orchestral concerts, the first question that comes to mind is: "Is it a good idea to do it at all?"

It can be argued that, since music is an aural experience, the presence of a picture may represent an unnecessary distraction. There are, however, various justifications for television music. Perhaps the most obvious and important is that serious music on television reaches a great number of people who would not normally listen to it on Sound Broadcasting. Many people with the capacity to enjoy good music lack the necessary concentration, and the compulsive effect of the picture can be a great help.

Television can give a sense of occasion and a deeper understanding to people with little or no experience of concert-going. For the enthusiast, a well-presented programme can provide a sense of participation and the privilege of studying the technique of great virtuosi at much closer range than is possible in the concert hall.

As to those who claim to listen with their eyes shut in the concert hall, it is perhaps worth noting that they do not insist upon being led into the hall blindfold: they are, therefore, able to absorb the atmosphere and store up a mental picture which they can call upon later as directed by their binaural sensibility. Obviously much of the sensation created by music is abstract in nature, and it is even dangerous to attempt to portray "programme" music in realistic pictorial terms, because an image conjured up by the music can represent only one individual's subjective reaction, and may be totally at variance with the composer's intention or another viewer's reaction to it. There is, however, every justification for showing pictures of the musicians, if only to serve as a reminder that, although broadcasting is an electro-mechanical process, music-making is a human performance.

The ironical fact is that when it comes to the actual process of televising a concert, it is the sound rather than the picture that often appears to require justification. While no one would go so far as to suggest that it is possible to enjoy music without sound, there is a tendency to underestimate the importance of the sound element in television production, and when the complications of picture-making create conflict between the requirements of sound and vision, the scales tend to be loaded in favour of vision.

The reasons for this are not difficult to understand. The process of creating pictures is so much more complicated and, therefore, more interesting from the production point of view than with sound alone that it is easy for people pre-occupied with vision production to forget sound almost completely. Visual production technique also has the advantage of being more obvious. The picture is there for all to see and even the untrained eye has a very keen perception, but the effect of sound technique is largely subjective and, although it can greatly influence the listeners' enjoyment, it usually takes an expert to be able to analyse and appreciate the precise contribution it has made.

It has always been difficult for people who have not had actual experience with microphones to appreciate the niceties, or even the necessity, of microphone technique, and the presence of a picture complicates the issue still further. The layman is quite capable of assuming that, because he can see something apparently at close quarters, he will automatically hear it and he will certainly expect to do so, subconsciously investing in the camera the faculty of hearing, and quite oblivious of the vast difference in transmission characteristics of the two media. Although long-focus lenses can make it easy to take close-up pictures from a considerable distance, picking up the corresponding

sound can be quite a different matter and, in fact, many of the most difficult problems of television production are concerned with the sound element.

In the earlier days of television there was a tendency (which still persists to some degree) to evade the problem of achieving high quality sound by suggesting that the presence of the pictures makes it less critical, because it distracts the attention, or because it supplies most of the information. In fact, usually the reverse is true. As most televised material stems from a script or a score, the most common function of the picture is to illustrate what it is important to hear. It is not suggested that the sound is more important than the vision, or vice versa, even when televising music. In fact, the question of relative importance does not come into it. There can be no excuse for a lowering of standards in either medium or for a poor compromise between them. The televising of music can only be justified if both the sound and vision production are tackled with the utmost integrity and respect, each not only for its own medium, but also for the other, because there is a powerful subjective inter-action between them. The most obvious example of this effect is the matter of acoustic and visual perspective.

Listeners to sound broadcast drama are well aware of the ability of sound to create atmosphere and a sense of perspective and movement and to stimulate the imagination without the need of a picture. Obviously Television Sound will do likewise whether the viewer realizes it or not, and if the visual and aural stimuli are in perfect accord they will produce an effect of depth and conviction that will greatly enhance the production. If, however, the two media are made to contradict each other, the vision element will usually predominate (because people tend to believe what they see), but the viewers will be left with a sense of frustration and inadequacy that can greatly undermine their enjoyment.

The conventional approach to broadcasting or recording so-called "straight" music is to aim to reproduce the effect that might be heard from an ideal position in the concert hall, and this can often be achieved by the use of a single microphone if the orchestra has a good internal balance and the hall good acoustics. In fact the aural perspective of most broadcasts or recordings would be appropriate in television terms to a wide-angle long-shot of the whole orchestra. This, however, is somewhat indistinct on the small screen, and if it were held for a long period of time the viewer would not be able to maintain visual interest, because he could not focus his attention

clearly upon different sections or single instruments as suggested by the music, as he would do as a member of the audience in the hall. It is desirable, therefore, that the visual presentation should provide many variations of picture and angles of view, and this should be accomplished in a manner that gives sympathetic impact to the music. Most of the time, therefore, is taken up with close-up shots of sections of the orchestra or individual shots of the musicians. The question then arises as to what to do about the sound. To maintain the usual distant flat perspective would cause the close-up pictures to appear most incongruous, whereas any serious attempt to match sound with picture would result in a disturbance of the perspective relationships within the orchestra that could be most detrimental to the music.

Obviously the music must be the first consideration and any adjustments occasioned by the presence of the picture must not detract from it in any way. It is therefore essential that the pictures are motivated entirely by the music and that close-up shots are only taken when the instrument concerned is intended to be predominant.¹ This visual high-lighting of the important instruments throws particular emphasis on to the finer points of balance by illustrating those parts that the viewer should expect to hear, thus making the balance especially critical.

This point about vision imposing the need for greater care on sound is very important and requires careful definition, as it is the reverse of normal experience, where often the ability to see assists the faculty of hearing. The listener in the concert hall can often overcome a poor balance by looking at the orchestral instruments and thereby use his binaural sense to discriminate in favour of the required source.

If a solo, or important part, is submerged or indistinct, a close-up picture will not make it any clearer but will merely increase the viewer's frustration. So it emerges that a television presentation requires a sound balance that is immaculate and clear, for which it usually becomes necessary to depart from single-microphone technique and employ a degree of mixing. This must, however, be done with great subtlety in order that the instruments portrayed become clear without unduly altering in perspective, for this is the key to the situation. The concert-goer uses his eyes to select the important instrument and in so doing he hears it more clearly, but he does not leave his seat and move over to where it is, so that for him its sound perspective remains virtually unchanged.

The requirement as far as television is concerned, therefore, is that the sound in general should have



Orchestral layout for a sound broadcast, where visual considerations are not important, and aural balance can be easily achieved.

slightly more "presence" than is usual for sound broadcasting. This does not mean that the sound should be lacking in reverberation, but rather that the direct sound should precede the indirect in a manner that provides a clear attack for each note. This is a subtle distinction, but a very important one. In a hall with live acoustics this effect can be obtained by employing a mixture of microphones that are respectively too close and too distant for single-microphone technique.

ARTIFICIAL REVERBERATION

Most television music is, however, broadcast from television studios rather than concert halls, and here the question of acoustics raises a further complication. Television studios must have compromise acoustics because they may be used for anything from recitals to drama. The overhead costs of television studios are such that it is not usually possible to set aside a large one for music only and even then there would be conflicting acoustic requirements because only in the case of concerts and recitals would a really live acoustic be satisfactory. This is because of the problem of separation, which will be discussed later.

If a studio is to be used for the spoken word, and particularly for drama (where it may be necessary

to represent the effect of an open-air scene), the acoustics must be very dead by musical standards. In television it is seldom possible to get the microphone sufficiently near to the artist (because it must be kept out of shot), and this also calls for dead acoustics. In effecting the acoustic compromise it is necessary to err on the side of being too dead for music rather than too live for drama. This is because it is impossible to subtract the effect of reverberation where too much exists, but it is possible, within certain limitations, to add reverberation by artificial means. Normally all music that is broadcast from television studios involves the use of artificial reverberation in some form or other.

LIMITS OF ARTIFICIAL REVERBERATION

However, no source of artificial reverberation is a complete substitute for a natural acoustic and most systems introduce a considerable degree of coloration. For this reason several different sources are sometimes mixed together or used in series so that their respective colorations tend to become less distinctive. It is also common practice to use separate sources of reverberation of different time-lengths for singers and orchestras.

These stratagems, skilfully applied, can result in a



Much thought must go into designing orchestral layout and rostrum levels in television broadcasts so that clean lines and a good picture can be provided without impairing the musicians' ability to play in balance with each other.

tolerable broadcast, even under the most unsuitable acoustic conditions, but there still remains the problem of the effect on the performer, and really dead acoustics can have a very serious effect on performance. String players particularly are affected by lack of reverberation and often tend to force their own tone in an effort to hear themselves; this results in a harsh quality and poor ensemble and internal balance, some instruments tending to "stick out" above the others. Careful consideration must be given to this, especially in the design of sets, so that the orchestra, and particularly the string players, are surrounded by sound-reflecting settings. Sometimes artificial roofs are also used.

Although careful design of reflective settings can provide a few early reflections which do much for the comfort and encouragement of the performers, it is not usually possible to introduce sufficient reflective material into the studio to have much effect on the reverberation time.

AMBIOPHONY

Clearly, the ideal would be to have studios with variable acoustics that could be adjusted to meet the changing circumstances of production. Such methods as revolving reversible panels or louvres are not practicable in television studios because so much of the wall space is taken up with apparatus and most of it is usually covered with scenery anyway. Experiments have been proceeding over the past five years with a basically different approach to the problem of artificial reverberation called ambiophony. The aim is to develop

an electronic system which enlivens the acoustics of the studio itself (instead of being applied only to the sound signal emanating from the studio) so that the artists get the benefit as well as the viewers.²

The method is to employ a large number of loudspeakers, placed around the walls of the studio and fed with the orchestral sound through a multiple time-delay device. The loudspeakers are intended to re-radiate the orchestral sound in much the same way as the studio walls would do were they reflective instead of absorbent, so that the musicians are presented with a more suitable acoustic environment and can adjust their performance accordingly. They cannot do this if the reverberation is merely added afterwards.

The most obvious use for ambiophony is in the televising of symphony concerts, when its application is reasonably straightforward, but investigations are proceeding into the possibilities of its use for other types of music production.

It is obvious that, as soon as vocalists' microphones are employed, and especially if they are moving around on booms, there will be considerable complication due to pick-up of the loudspeaker output on the booms.

THE PROBLEM OF SEPARATION

There is also the problem of separation. This could be termed the major problem of television sound. It stems from the fact that, in order to keep the vocalist's microphone out of the picture, it is usually too far away from the vocalist, with the result that it picks up much too great a proportion of the

accompaniment. Even if this does not result in the vocalist being swamped by the accompaniment, it means that the balance of the orchestra is spoiled, as the microphone is usually far from being in the correct position for a good orchestral balance.

TELEVISED OPERA

This problem of separation is particularly acute in the televising of opera, where a large orchestra is usually employed and where the production often calls for wide-angle long-shots for spectacular effect.

Unless the opera is very small and intimate in character, the first essential, if good sound and freedom of visual presentation are to be obtained, is to employ a separate studio for the orchestra. This provides the double advantage of increasing studio space and reducing the problems of separation.

The singers hear the orchestra by means of directional loudspeakers mounted on the microphone booms and tracked about the studio to follow the action. In this way the amount of orchestral sound fed into the vision studio is minimized and localized, and this helps to enable the boom microphones to work at greater distances from the singers and also prevents the vision studio from becoming a vast "echo room" to the detriment of the orchestral sound.

THE CONDUCTOR'S CAMERA

To overcome the problem of the occasions, which are quite frequent in opera, when the singers require a lead from the conductor, a television camera is used in the orchestral studio to relay a picture of him on a closed circuit to monitor screens arranged around the action studio (usually over the top of the sets). A *répétiteur* is then employed to stand beside the cameras in the television studio and relay the conductor's beat while watching the screens.

By these means, perfect synchronism can be achieved between orchestra and artists, regardless of their movement, and the risk of serious time-lag, which is almost inevitable if the orchestra is at the other end of the same studio, is eliminated. At the same time, the use of remote orchestra technique results in considerable improvement in orchestral balance and, above all, greater freedom of presentation.

THE INCOMPATIBILITY OF TELEVISED OPERA

Having overcome the practical problems of opera production on television, there remains the problem of adaptation. Most operas, and particularly the larger classical ones, are written for a grand, and sometimes gargantuan, theatrical effect. It matters little if the libretto is indistinct (in fact, sometimes several

different languages have been used at the same time), or if the situation makes sense. The whole presentation is separated from reality by the proscenium arch and the footlights. Opera in the theatre is a spectacle of colour and a satisfying blend of vocal and orchestral tone. Television opera presentation, on the other hand, tends to take the form of a music drama; the proscenium is forgotten and the action shot in close-up with realistic settings.

Under these conditions, a conventional opera balance can be most incongruous, and an artist seen in close-up made to look ridiculous mouthing inaudible, or at least indistinct, words. Yet if the accompaniment is sufficiently suppressed to enable the words to be clearly heard, all musical perspective is lost and it ceases to be opera. Here, again, the television sound mixer is faced with a dilemma, caught between two diametrically opposed requirements. All that can be done is to adopt a technique of weaving the two sources together through every bar of the music so as to make the utmost of each; a process that demands considerable skill and sensitivity, particularly as it must be carried out without detriment to the artist's intended dynamics.

A QUESTION OF VOCAL DYNAMICS

Part of an artist's musical interpretation is bound up with the dynamics that he applies to the score. When broadcasting or recording under static conditions, the vocalist-microphone distance remains constant and it follows that the microphone output level will follow the artist's intentions. In television, however, it is necessary to move the microphone continuously and sometimes to switch between a succession of fixed microphones while the artist is singing, in order to accommodate his movement about the set or to clear camera shots of varying lengths. Under these conditions, the output from the microphones will be continually varying, and these variations may bear no relation to the artist's intended dynamics whatsoever. It is, therefore, necessary for the sound mixer to be thoroughly conversant with the work and the artist's interpretation in order to be able, not merely to "iron out" the variations, but to re-interpret his dynamics for him. This is a factor that concerns not only opera but all television music where movement is involved.

BALLET

The problems of television ballet from the sound point of view are somewhat similar to those of opera in as much as a large orchestra is usually employed and it is, therefore, not possible to accommodate it and the large sets needed for the action in the same

studio. It is, therefore, necessary to employ another studio for the orchestra, and advantage is usually taken of the more suitable acoustics of one of the sound broadcasting studios for the purpose.

It has been discovered that if the sound is limited entirely to that of the orchestra, the production has an unreal quality. To give conviction to the pictures, effects microphones are employed in a subtle manner to introduce noises from the dancers' feet and rustle of costumes, etc., particularly when in close-up.

LIGHT MUSIC

The sound technique associated with so-called "straight music", complicated as it is, is simple compared with that involved in the televising of modern light music, but this is beyond the scope of this article.

The home listener has become accustomed to accepting as normal a very high standard of sound quality and operation in sound broadcasts and recordings. He

cannot be expected to make allowance for problems that he probably does not understand, and often it is the artist's reputation that is at stake.

It would be a comparatively simple matter to achieve high-quality sound at all times by imposing serious restrictions upon the scope of visual presentation, but such a policy is considered unlikely to be in the general interests of the service.

Television sound is thus presented with the interesting challenge to produce professional results under the most unsuitable conditions. This challenge is being met by the use of all existing sound techniques and by a continuous search for new equipment and methods appropriate to the particular problems of television.

REFERENCES

- 1 L. SALTER: *Listening in Eye and Ear; Listener*, Vol. 66/1701, p. 715, 2nd Nov. 1961.
- 2 *The Broadcasting of Music in Television; BBC Engineering Division Monograph No. 40*, Feb. 1962.