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BBC RADIOPHONIC WORKSHOP"

by Desmond Briscoe

BBC Radiophonic Workshop

1973

THE BBC RADIOPHONIC WORKSHOP

The Radiophonic Workshop was opened in 1958 and was the first of its kind in Britain. It was set up after interesting possibilities had been demonstrated by certain experimental programmes that had been made in normal studios equipped with their own tape recording equipment; in fact, it was the introduction of the tape recorder generally in the BBC that allowed real experimentation aimed at broadening the radio dramatic canvas.

In radio drama attempts had been made to use existing recordings of musique concrète and electronic music as incidental music. These were not successful because this type of sound or music needs to be made very much for the particular programme and is not easily transferred from one use to another. 'All That Fall', by Samuel Beckett, commissioned by the BBC Third Programme in 1956 and first broadcast in 1957, was the first radio play in which a new sound convention was attempted rather than using music in its normal form. The play is largely a monologue, and a convention was needed which gave the movement of an old lady between her home and the railway station. This was done by starting with natural footsteps which were taken up by a sound rhythm and whenever this musical shorthand was heard the listener knew that the old lady was on the move. She is absorbed in her own thoughts and from time to time reality impinges on her in the shape of people she knows, who meet her on the way. Their approach is indicated by strange and unreal sounds which, as she becomes aware of them, materialise into the real sound of, say, a donkey cart or an old motor car. The experience gained in doing this programme led to the application of similar techniques to a very different radio play, 'The Disagreeable Oyster', by Giles Cooper. This was a comedy; a fantasy, set in a real world, in which real things suddenly become an unfamiliar nightmare. It demanded extreme stylisation - a radio equivalent of the cartoon film. A 'radiophonic poem' followed, and this was an attempt to take words and sounds as written and described by an author specially for the purpose, and to build up something that could not exist on the printed page - a pattern of words spoken by actors, words which were manipulated and sounds which illustrated the words. The result was, perhaps, that we finished up by saying everything three times; the words said it, the treatment of the words said it, and the sounds illustrating the words also said it. But nevertheless these experiments and others led to the setting up of the Radiophonic Workshop with the aim of developing techniques of producing electronically the special sounds and incidental music required for radio and television productions.

The sound and music made in the Radiophonic Workshop is produced by the electronic manipulation on tape of all sources of sound, including the natural sounds used by the original creators of musique concrète and the sounds which are derived from electronic generators, as used in pure electronic music. The sound of musical instruments is also used and is either recorded normally over the microphone or, in the case of instruments such as electronic organs or electric guitars, the recording is made electrically direct on to the tape machine. All these sounds can be subjected to various treatments; they can be filtered - which removes some of the frequencies; they can be altered by tape manipulation; other recording processes can be used, such as reducing and increasing the speed and continuously varying the speed in either direction. Speed change has the effect, of course, of not only changing the pitch of the sound but also the quality of the sound. Using tape it is very easy to reverse a sound, and also using the various systems of tape recording one can superimpose the sound on itself or repeat it after a timed delay. The tape can be edited and cut to shape and both the envelope of the sound and the rhythmic patterns can be altered. In addition all the normal techniques of radio mixing, adding of artificial reverberation of various types, etc. are used.

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It is essential that the person who is going to undertake the creative work fully understands what part it is going to play in the programme; there may also be film or drawings to see, and when this has been done and a general idea of what is required is available then the detailed work of composition can start. If the producer has strong ideas and can describe the sound quality he requires, then it is possible to produce this; in most cases though, the creative radiophonic worker is given considerable freedom to interpret, according to the script, the producer's wishes and any other relevant information. If the elements to be used are familiar, then the composition can be written immediately. Some of the staff write it on music manuscript paper, some work with figures of frequencies, formulae and durations, and some do it with diagrams; the method depends on the individual and on the type of commitment. The realisation in terms of sound then follows. If a new sound is to be used - perhaps suggested by some element in the graphic design - then this new sound must be explored before the composition can start.

If it is a single note produced, say, from the sound of a hand hitting the top of a bottle, then this note must be tuned on the variable speed tape machines through possibly three chromatic octaves, and it must be listened to critically since the tonal quality will obviously change with a change of pitch. Only after this exploration can the piece be written, bearing in mind the synchronisation with the graphic design on film. Each pre-recorded note will have to be cut and joined to the next, due account being taken of the length of the note and the shape, the form of attack and the rate of decay required. The beginning of a sound or note (usually called the 'attack') gives it its recognisable quality. With many musical instruments the first moments of a note are not in fact of the pitched sound at all, but of noise. We have therefore experimented by introducing a moment of noise at the beginning of a sound to give a particular sort of attack. When the various lines of the music have been realised, they are then played together in synchronisation and the mixture is recorded.

There are undoubtedly many subliminal effects on the audience when using radiophonic sound apart from the more obvious uses of rhythms which either reflect or oppose the natural rhythms of life, of the heart, the brain, etc. It is also possible for sounds to affect an audience physically, particularly when they are of an unfamiliar nature.

When the work is completed, the producer is invited to visit the Workshop again to hear the result. It is true to say that in most cases the producer, while not always necessarily hearing exactly what he expected to hear because of the interpretative element in the work, finds that the realisation is right for his production. The final result either goes to the sound or television studio on $\frac{1}{4}$ " tape to be played into the production, is transferred to film track and laid with the film for television or, of course, it can be played in from a tape machine during a post video tape recording/dubbing session. With the advent of the video tape recorder, it is now possible for the composer to have a 'viewing copy' of the studio production before work commences on the sound and music sequences. This facility can be of considerable help in assessing the mood of the production, apart from providing a readily available reference as to the content and timing. A Shibaden video tape recorder is provided at the Workshop for this purpose. If the production is a complex one, and if the producer feels it will help, the creator of the radiophonic work will go to the studio as adviser; he must also be prepared to make alterations, if necessary, to the work he has made. Attendance at the studio is, of course, of two-way benefit - since the creative work is done away from actual production studios it helps to keep the composer in touch with studio problems and practices.

The BBC Radiophonic Workshop provides equally a service for radio and television, for regional and local broadcasting and for the BBC External Services. The Workshop has so far undertaken work for every department of the BBC from Religious Broadcasting to Light Entertainment. It is interesting to

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note that during a year when almost 200 commitments are undertaken, the largest proportion are for educational programmes at all levels. These commitments can range from simple single special sounds for, perhaps, a schools' play, to long and complex works of an experimental nature, where the whole programme is made in its entirety at the Workshop. A great deal of the work is musical and a great deal of this is in the form of signature tunes for programmes. In fact many of its longest running pieces of work, signature tunes, have been made for the External Services, and in this type of work the precise control one has over sound means that a piece can be designed to penetrate the background interference of short-wave broadcasting. Science fiction of course also has its place but is a comparatively small section of the work.

The Radiophonic Workshop is situated at the BBC's music studio building in London's Maida Vale. The original Workshop was one large room with a small annex used as a studio. That one room was originally equipped with largely sub-standard semi-professional equipment, until the success of the experiment was proved. It was soon found, however, that sub-standard equipment was not suitable for this sort of work because so many of the recording processes are repetitive and the cumulative effects of limited response and distortion restrict the range and quality of the work. If a sound picked up by a microphone is to be used as a basic element, this sound has to be very carefully recorded because any extraneous noise (and certainly any surface noise from a record) will become part of the sound, and any manipulation that takes place will also incorporate this unwanted noise. It is often found that in order to get the essential sound - a ship's siren for instance - it is far better to synthesise this from electronic sounds than to use the real thing. The synthesised sound is without atmosphere, without extraneous noise and can be handled and changed much more easily.

The Radiophonic Workshop now includes a number of separate working areas where sounds can be manipulated and put together. In addition to the original small studio there is now a larger listening room in which the work can be played and discussed, and this room is also used as a studio for the local recording of basic sounds. The equipment is serviced and maintained in a technical workshop where the engineering staff of the unit also devise, develop and build those special pieces of apparatus that are required for the work; faders operated by light-sensitive cells which will fade pure tones smoothly without crackles or steps, various vibrato devices, special types of reverberation, metronomic switching units and electric guitars and an electric autoharp. Each of the 'composition' Workshops are equipped with high quality tape machines, and as far as possible each room has a number of machines of exactly the type and characteristics so that it is easy to copy from one machine to another without unwanted minute changes of speed and pitch; similarly, tracks can be run together with the necessary speed constancy for synchronisation purposes, or multi-tracking. Variable speed tape machines are also used and can be varied from about two inches per second to 40 inches per second; such machines are essential, particularly for producing the more musical type of work. A tape machine adding the refinement of speed change without pitch change (and vice versa) is also available. Each room is provided with a mixing desk to which each source of sound can be directed and then 'treated' by switching, filtering, adding reverberation, etc. Sources of sound in the form of electronic generators of various types are also provided, and these produce the pure sine tones, square wave tones rich in harmonics and 'white' noise which is a mixture of all frequencies, rather as white light is a mixture of all the colours of the rainbow. This white noise can be filtered down into narrow bands to produce new working elements.

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Approximately 50% of the total effort of the unit is for television and of this a larger part is concerned with film. To facilitate the creation, manipulation and compilation of sound material for such programme commitments, the sound creator's task is simplified by having access to a film viewing desk on which the pictorial content of the programme can be examined. In this way a more sympathetic rapport can be established between the sounds to be created and the visual contribution. A further aid has been the provision of a 16mm magnetic recorder and a track synchronising device to enable radiophonic sound sequences to be tailored to fit the provided picture track prior to the final dubbing session. This is important because the mixing of the various tracks is a part of the creative realisation and it is not easy or satisfactory to delegate this to a busy dubbing mixer.

Much of the primitiveness, and certainly most of the bulk, of the early sound-generating equipment has been eliminated by the introduction of voltage-controlled equipment - the so-called synthesiser. Even the smallest of these needs only the addition of a tape machine and monitoring system to become a self-contained 'studio', comprising, as it does, various waveform generators, envelope shapers, filters etc. One Workshop area houses a larger synthesiser which has its own memory/sequencing device and together with an associated 8-track recorder provides the facilities for the creation of the more ambitious electronic music and sound sequences. All the synthesisers used in the department are stereo capable and in this respect other areas are being progressively converted for stereo compatibility. This will bring further scope for the sound creator - literally broadening the audio horizon - and looking further into the future there is the possibility of 'quadrophony' or should it be 'quadradiophony'?

Some of the output of the Radiophonic Workshop is issued on commercially available BBC Records, and while it is difficult to describe the quality of the sounds and of the contribution made to programmes, it is equally difficult to describe in words the complex techniques which are applied. What started off as a simple attempt to create new atmospheric sounds has become, with time, a sophisticated creative process. In this new field of creative activity, the musician, the mathematician and the intuitive worker with sound all have a part to play. While technical assistance is always available in the Radiophonic Workshop, it is essential that the creative workers combine a strong technical instinct with their interpretative ability. The work tends to become more musical; in the case of radiophonic music the dehumanisation which started with the absence of a performer is beginning to disappear as techniques develop. In the field of electronic music some people feel that whatever humanity is not already inherent in a musical work cannot be revealed by interpretation. It is perhaps rather ironic that the composers who replaced performers with machines might be replaced themselves by computers. For our radiophonic application we do not consider the computer as anything more than a tool of the trade; in fact legislation should, perhaps, be introduced to impose heavy penalties on those who invite the electronic computer to usurp any of man's more pleasurable and satisfying functions.