

Radiophonic Workshop A Glimpse of Current Activities

Four a.m. and sounds of a robot tripping over emerge from a room at Maida Vale. But it's not really a robot, just a young man who is beginning to feel rather mad as he walks around with one foot in a bucket whilst rattling a waste paper bin! His determination to get the right sound has taken him many hours into the night and despite the array of electronic sound making equipment he finally resorts to anything else at hand. It doesn't really matter what time you call in on the Workshop — there's always someone hard at work.



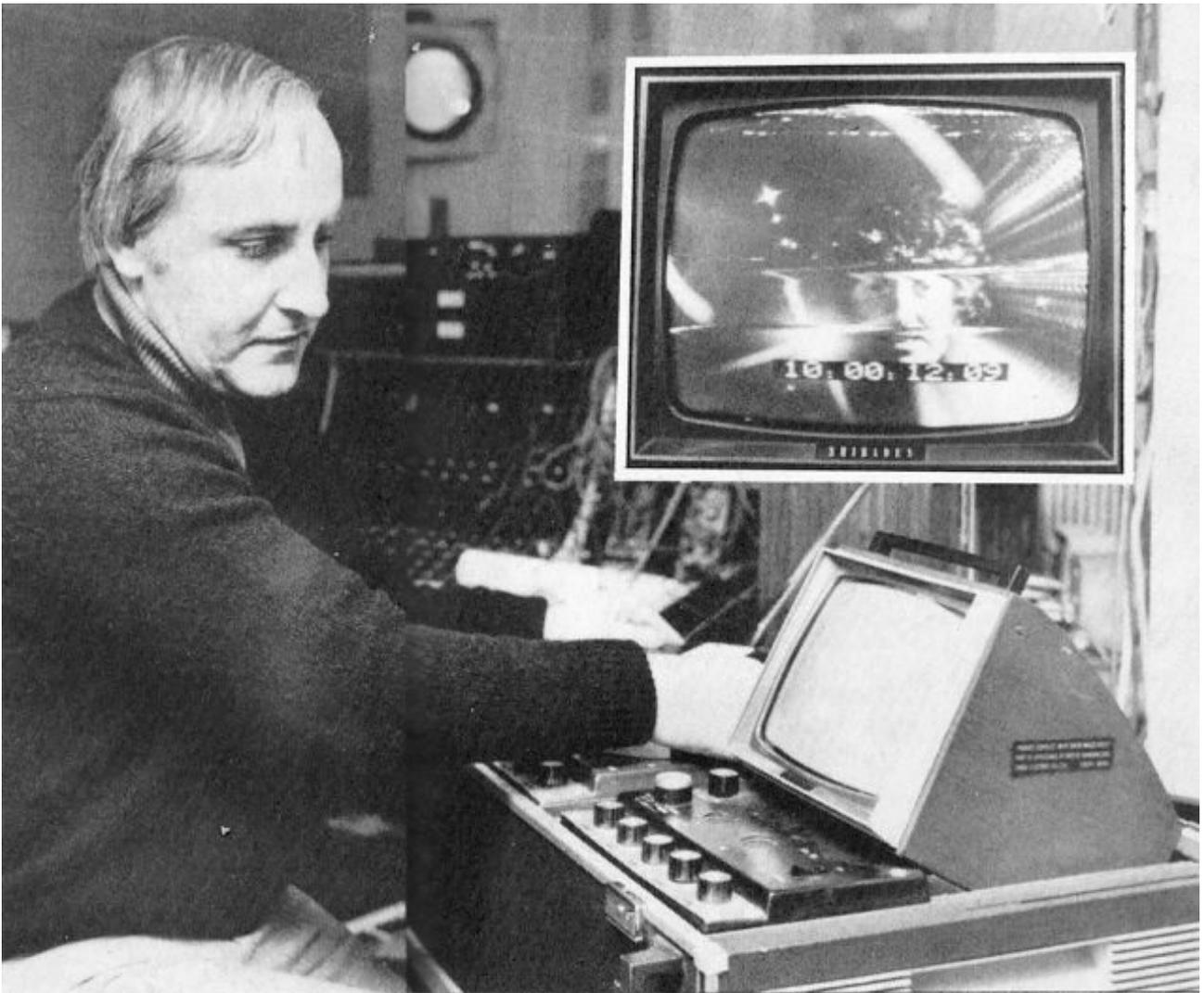
Elizabeth Parker in Studio H

Such is the life style of the composers at the BBC Radiophonic Workshop studios, who spend a great deal of time preparing incidental music, theme tunes and sound effects for over three hundred radio and television programmes each year. With schedules fully booked three months in advance, the team of six musicians under the enthusiastic directorship of Desmond Briscoe make a very important contribution to the programmes we watch and listen to.

I met Brian Hodgson at the studios one afternoon before Christmas. Brian is responsible for the general working of the studios, besides contributing a great deal himself to the success and future development of the workshop. After a quick cup of Beeb tea we took a look in Studio H.

'Lord of the Rings'

Seated next to a large mixing desk was Elizabeth Parker, now working on 'Lord of the Rings' and also responsible for the last set of sounds for 'Blake's 7' and many radio programmes. She will also be doing next year's 'Blake's 7' and probably 'The Day of the Triffids' as well. We concentrated on the 'Lord of the Rings' for our discussion. This was commissioned last June although Elizabeth had only just started working on it ready for first studio takes, with further recording sessions planned before the programme goes out in February in 26 episodes. It's a full time job for Elizabeth with lots of overtime thrown in as well, even though she is only concerned with the effects. Whereas the 'Hobbit' was made previously with the help of Radiophonic sounds, this time the approach is to more 'natural' sounds. In fact, natural sounds are used as the basic material. For example, 'Shadowfax' the horse is represented by an actual horse neigh which is slowed down and treated by an Eventide Harmoniser which returns it to its original pitch giving a slightly out-of-this-world feel to it.



Dick Mills. Inset shows Time Code on Video picture

To get a thunder effect, Elizabeth started off with tin foil, tearing it apart slowly to make a cracking sound. She likes this much better than using sound effects records or even a synthesiser, because it retains such a sharp edge which can be spliced and edited together using the live recording for multi-tracking at different speeds. Add to that two white noise tracks and various degrees of echo and you've got the final effect.

Here in a nutshell is the art of the Radiophonic Workshop — combining Music Concrete with pure electronic synthesis to make sonorous landscapes and effects for radio and television programmes. Brian refers to Music Concrete as a 'big bouncy baby — its been the starting point for so many sound effects!' and points out that electronic synthesis very often emasculates the final result. The programme producer Jane Morgan also prefers these more

naturalistic effects rather than electronics. Elizabeth's main task is to integrate the sounds with the accompanying string music for the series. It is also important that she establishes a good working relationship from the outset with the producer, who is obviously initially very busy with casting and rehearsals.

Each episode lasts half an hour and the effects, some specific, others only broadly outlined are indicated in the actor's scripts, e.g. a rippling and sucking tentacle noise of a nasty lake monster! Whilst the sound for the Ring required liaison with the producer, most of the time Elizabeth works independently. Very often the script simply indicates 'high vibrating' or 'low pulsing' when the author really has no definite idea what he wants. Gandolf's 'staff' was created by recording a striking match which was then slowed down on playback and sent through a phase box with other treatments added on top. Another sound was bubbling water, done by Elizabeth gurgling, wet towels slapping together and a river played back at low speed. Despite recent popularity of the vocoder, it was only used for one sequence (it's the Roland rack Vocoder that's used) for a sustained 'Aah' tone through it as a background to magic spells. You can't quite tell whether its human or electronic and like most of their effects it takes a lot of time and experiment to find the right combination of natural sound and electronic treatment.

Turning to the other equipment in the studio, Elizabeth prefers to use Roland's 100M modular synthesiser system, especially for 'Blakes 7', rather than start off on a keyboard. The Jupiter 4 was also sitting prominently in Studio H, although this and other instruments — synthesisers in particular — are in fact shared by all the team using the studios. If Elizabeth wants a particular sound from the Yamaha CS80, for example, then she books Studio B instead. Yamaha's CS40M is used to play to stored sounds in addition to the Jupiter 4.

Recording equipment in the studio includes a Revox A700, two Studer A80 machines and a Scully 8-track. The mixing desk is a Soundcraft 16 into 8 and Chartwell speakers are used for monitors. The other studios are very familiar with a Studer B62 in Studio G

and a Glensound 24 into 8 custom designed desk. Two other mixing desks are used, the Neve 8066 24 into 16 and a special desk from Technical Services which is 24 into 8.



Paddy Kingsland

Elizabeth emphasises that her aim in composing the sounds for 'Lord of the Rings' is to integrate them successfully with the acting and Stephen Oliver's music.

When all the sounds have been assembled on tape they are taken to another studio where they are inserted in the script so that the actors can react to them. Safety copies of the master recordings are kept and more obvious sound effects such as closing doors and footsteps are left to the Studio Managers. Picking up the technical know-how is something that Elizabeth is doing all the time — in the end it's the ideas that count.



The Wavemaker Polyphonic System.

'Dr. Who'

We then moved on, passing a training room and an interesting old mixer that had pan-pots actually fitted onto its faders, until we reached Studio G, where Dick Mills was putting together another 'Doctor Who' set of sound effects. He's responsible for all the programme's weird and wonderful sounds that emerge every week from our TVs, especially voice treatments that can't be done in studio. Peter Howell and Paddy Kingsland share the incidental music, alternating three programmes each usually, with Roger Limb popping in to fill in the occasional episode. Incidentally, later this year Peter Davidson (from 'All Creatures Great and Small') takes over Dr. Who's part. The 'Dr. Who' incidental music is now almost all electronic although sometimes it may not seem so. For example, 'Warriors Gate' used a time flip to a medieval banquet and the authentic early instruments were programmed on the Yamaha CS80. Roger Limb is currently doing the series 'Keeper of Traken'.

Collaboration between the music composer and Dick's sound effects is essential to avoid clashes of sound and music at any one time. Dick chooses his frequencies for sound effects carefully so that they don't appear as wrong notes in the music! Before video recorders and electronic synthesisers were standard equipment for 'Dr Who', the composer could often lose track of the story line by the time he had got together musicians using conventional instruments to play the music. Now, the video recorder picture has a 'timing code' inserted during recording to enable each sequence of music or sound effect to be synchronised within a hundredth of a second.



Peter Howell.

Dick prefers to use natural sounds as his starting point whenever possible — after all, he was one of the first composers at the Radiophonic Workshop — and then uses a Stereo Flanger, Phase Shifter, Double Reverb and Pitch to Voltage converter for treatment. For example, in 'Warriors Gate' a mirror was the gateway to time travel. In the script the aural sensation required was described to Dick as the audio equivalent of what you feel when you touch the front of a TV screen — static charge. To get the tingling effect he decided to use a large sheet of oven foil. Even grunting of pigs was recorded and treated for one programme! Dick finds that he gets better ambience using natural sounds. In the early days he recalls using BBC's large Studio 1 to get a long reverb time. He likes the Stereo Flanger for robot voices and talking weighing machines! The Phase Shifter gives him a constantly changing background ambience that makes sounds like spaceship hum much more interesting. He uses an Envelope Follower to deaden speech by cutting off a VCA sharply at the end of words. An old BBC PA stabilising device provides an unusual way to get phasing and since it could be voltage controlled, a high frequency input can ring-modulate a voice for bell sounds. He's even tried a long tape loop round a ribbon microphone that gives a very long fade because each

time it passes the mic a little more gets wiped! Dick remembers when effects like Flanging didn't come in small black boxes, but were made by pressing your thumb on the flange of a tape reel, thus altering the tape speed slightly.

All the 'Dr. Who' effects are recorded in full track mono and similarly the music produced is also mixed down to mono.

'Hitch-Hiker's Guide'

If you've been watching the new, TV version of 'The Hitch-Hiker's Guide to the Galaxy' then you should be interested in the work of Paddy Kingsland who I found in Studio E. Paddy has been composing the incidental music for this series (on BBC 2) since last June, when a pilot version of episode 1 was first approved and six episodes planned. Besides providing the incidental music, Paddy has to 'orchestrate' all the computer animation which appears as letters or graphics on the screen — they all have to have sounds that fit with the music. Other effects that are required are explosions, spaceships taking off, monster noises and, of course, alien voices that usually need special treatment. For the latter, an actor speaks the alien's lines and Paddy uses various treatments on the taped voice. The story had an interesting start for him, with a spaceship arriving and the earth being destroyed. Unlike the radio programme, where the timing of an event is not absolutely critical for perhaps an explosion, the TV version requires precise sounds for the pictures so that a 'spaceship close-up' which immediately cuts away to 'people panicking in the middle of London' proved to need a complex series of sounds, although the distinct sounds required were defined by the picture action. Paddy's sound tapes are made in short sections, e.g. a spaceship has its sound fitting the exact number of frames. On the dub which is done at BBC TV centre with the sound engineers, they play in the effects tape at the right time onto a multi-track machine that eventually records the whole sound score (including actors' parts and possibly a sync track to ensure the mix stays with the picture).



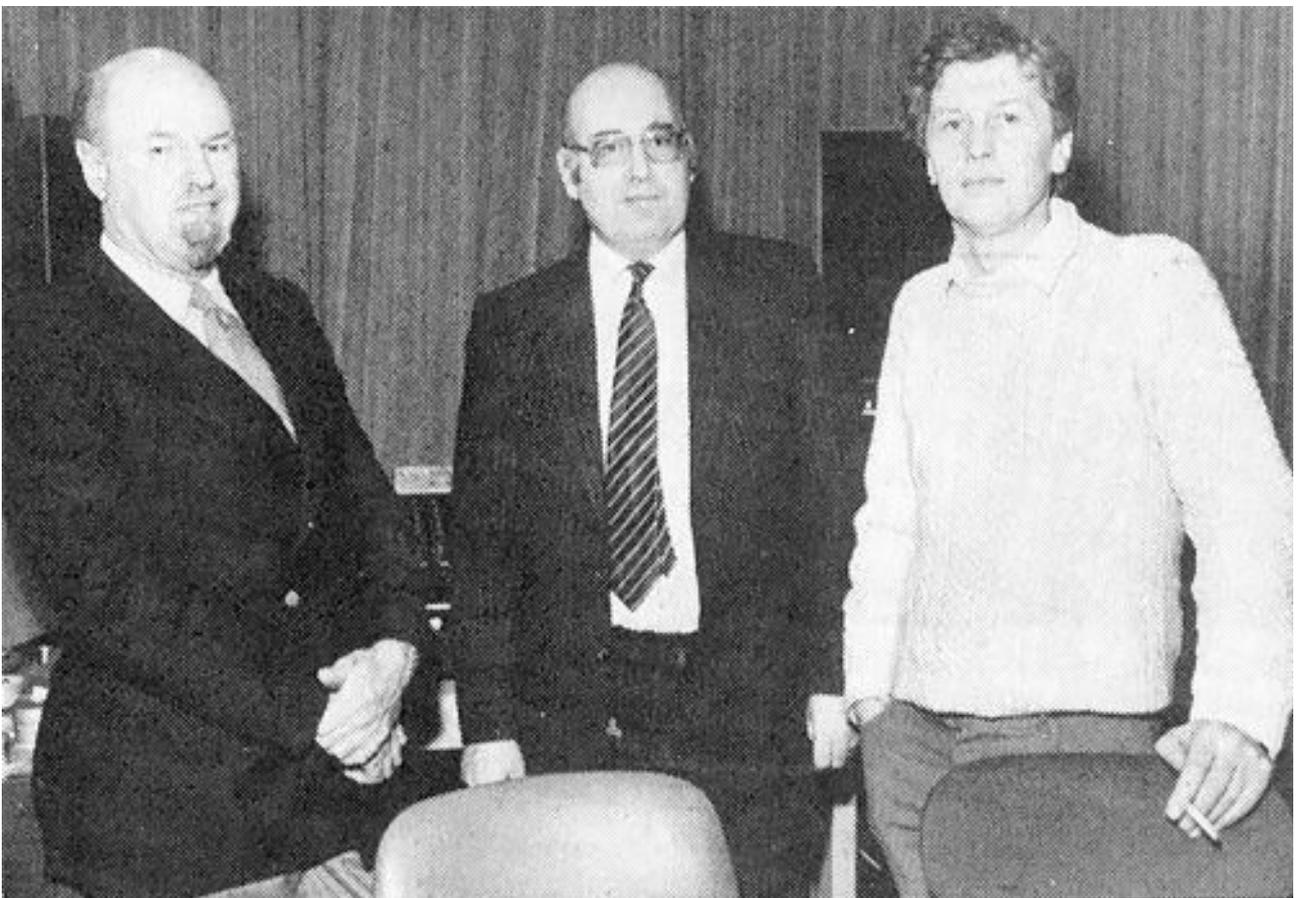
Film editing equipment

The Narrator in the story has two functions — as a storyteller and as the voice of a futuristic book that plays like a cassette tape recorder. You punch in a code and it comes out with some information and that's what the 'Hitch-Hiker's Guide to the Galaxy' is! Behind this narrator is music which must not swamp out the words — it must create the right mood for the scene. Nearly all of the music is electronic, although one exception is the commercials — there's a 'Pan Galactic Gargle Blaster' drink advert. This is treated like a real commercial using live music on keyboards, guitars and drums. Paddy's work load is so heavy that he often has to switch every few days to a different programme to keep up with scheduled series. In addition, each adventure of four episodes has a different director, so that several groups of episodes can be overlapped to save time. Some directors simply do the first and last episodes of an adventure.

Instruments in the studio included the Oberheim OB-X8 polyphonic synthesiser, often used for sustained sounds. The Roland Jupiter 4 was used a lot — the spaceship soaring away was

done with white noise and four-note chords near peak resonance just before oscillation of the filter. For the animation, computer blips and bleeps came from this also and occasionally during a 'wipe down', where a graphic style face is printed out, a single chord was played on the J4 with its special arpeggio effect added during a long decay. The Roland CR78 rhythm machine is used by Paddy all the time for guide tracks and occasionally for his own special rhythms. He also employs a Stereo Flanger, Voltage Controlled Stereo Panner and likes to use the old Yamaha SY-2 preset mono synthesiser.

The main areas of Paddy's work are sound effects, music background and voice treatments and for the latter he uses a clean voice recording treated by Harmoniser, Vocoder, Flanger, as well as echo plates (looped round the flanger so that echo is phased as well as the voice). When the vocoder is used on a voice, a 'dirty' noise input is used as the carrier e.g. for the alien voice, and a slow frequency modulated echo is added to make the 'depressed alien' voice.



Desmond Briscoe, Mike Beecher and Brian Hodgson

Other Areas

We paid a brief visit to another vital room within the complex that contains all the film and video facilities. In this room producers can check film against sound tracks, measuring time in frames at TV speed (25 per sec.) or cinema (24 per sec.). The film track is simply inserted with the sound track (see photo) and run through so that frames can be located and checked for synchronisation. Sync 'pips' are sometimes inserted on one track of a 16-track recorder as reference points for intended music cues. There is a useful device designed by their own technical lab that stores the total number of frames edited and searches for this amount at the start of a new editing session. Also kept in this room are copies of all the BBC's sound effects records and these are often used for specific items in a script e.g. a steam train, bird sounds, animal noises and natural sounds.

In rounding up my enjoyable visit we spent a few minutes with Peter Howell, who has devoted a lot of his time in the past to the 'Dr. Who' series. He likes the present 'all electronic' style of music which he composes mostly on the CS80. Listen for an autoharp in the programme too — it was recorded via piezo pick-ups under each string. (We plan to review Roland's electronic autoharp costing around £160.) One day's work on 'Dr. Who' for Peter produces only a few minutes of music, taking about 8 days per episode, although that is often cut to four or five days to meet deadlines. We talked about his frequent use of augmented 5ths to create a sense of anticipation - suspended minor 9ths are a favourite too. He uses plenty of chromatic harmony, often starting from the key of C then modulating to some remote key such as F# minor! The timing for his music writing has to be accurate to 6 frames a second and final juggling can be done at the dubbing stage. He revealed that kettle-drums in the 'Dr. Who' music are really made by using a single tuned tom-tom with bottom skin removed through a harmoniser. Whilst someone hit the drum, Peter was playing the harmoniser keyboard to get the different pitches!

Peter came to the Workshop convinced he was a pop musician but over the last five years has realised his music is much more classical in style. 'You don't have to dislike electronic sounds here but it helps! — it makes you try and round them into something more interesting!'

Looking to the future, the Radiophonic Workshop have had the 'Wavemaker' Polyphonic System designed for them by Ken Gale (he was responsible for a lot of the EMS Synthi 100 final development from David Cockerell's designs). It has a 10-note digital keyboard which is touch sensitive. With the keyboard is a digital control voltage recorder that stores your performance on one track of a 1/4" tape. You can also lay one track at a time, then play it back whilst accompanying it on the keyboard and it will re-record automatically. Thus previous tracks can be edited or added to without any noise degradation. Next to the recorder is the 16,384 events, 10 layer sequencer with micro-memory and the ability to actually loop within a specific sequence. The memory contents can be dumped in serial form onto tape for storage. Although the sequencer might be considered primarily for storing voltages to drive VCO's, the 10 output control voltages can also be used for filter control, sound envelopes or spatial control. The sequencer itself can receive up to 256 'instructions' which in turn can be loaded on tape for use again at any time. A new modular synthesiser system is also under development and should prove ideal for the workshop as it will always be expandable.

To the aspiring musician, the Workshop composers task is an enviable one, but motivation is not easy — getting down to composing, deciding on the right sound when working alone, and then finishing the programme on time. Despite the long hours and dedication to the sole task of getting music produced, Desmond Briscoe has formed a team that brings us a vast amount of electronic music through the medium of broadcasting.