


A M A T E U R

TAPE RECORDING

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- * **RADIOPHONICS AT THE B.B.C.**
 - * **RITUAL FIRE IN ZETLAND**
 - * **ECHO AND REVERBERATION**

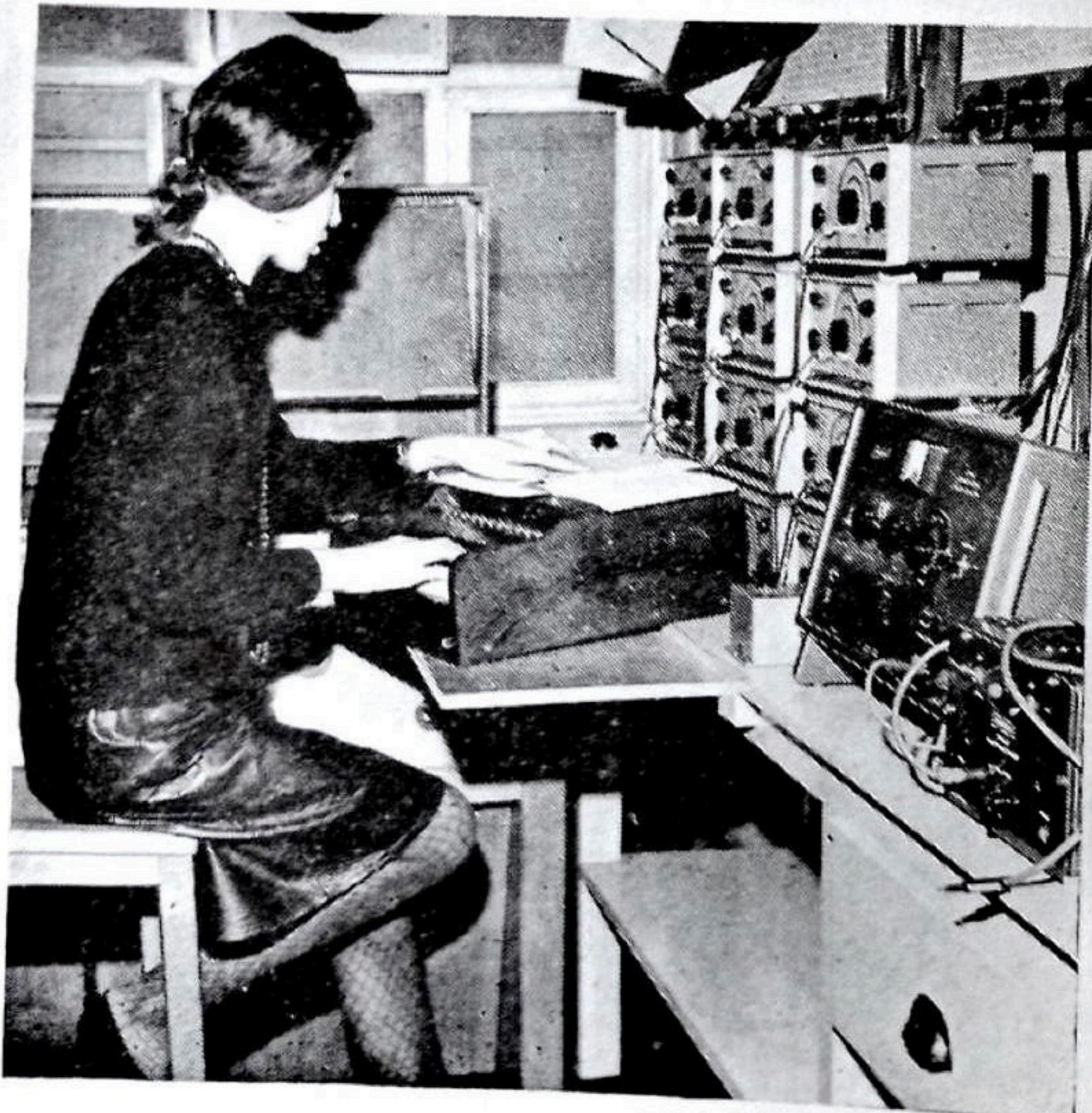
RADIOPHONICS

THE B.B.C. Radiophonics workshop first came into being in 1957 mainly as a result of certain experimental programmes, but with a definite service in view, namely the development and production of special effects, mainly electronic, for sound and television programmes. If you have watched television lately you may already be familiar with the title music of *Dr. Who* or if you are a Network 3 "Sound" enthusiast, you may have noticed the introduction of *Time Beat* as a signature tune. Both records were produced by the Radiophonics Workshop but more about these later.

The effects and music made in the workshop are produced mainly by electronic manipulation of all sources of sound including those from sine and squarewave tone generators, white noise, electronic musical instruments of various kinds as well as sounds picked up by a microphone.

All these sounds can be further treated or transformed by electrical filters, modulation and most of all by various recording processes with tape as the all-important media through which the different techniques are applied. For instance speed manipulation, feedback, reversal and tape loops which are familiar to all keen recording enthusiasts. In addition there are all the usual techniques of mixing, artificial reverberation, tape cutting, and finally the editing of the finished work.

Fig. 1. New sounds in the making. Twelve sine-tone generators and electronic Keyboard.



Composition

Composition is a deliberate interpretative process, which must be motivated by a creative intention. Random selection of contrived sounds, combined empirically into a montage does not usually produce an aesthetic result or a composition with artistic merit.

Many of the accepted techniques of Electronic Music and Musique Concrète are of course used in the workshop, but the aim generally is not to produce music to stand by itself as a separate work. Aside from definable compositions such as *Time Beat* or *Waltz in Orbit*, the major work of the studio is to provide special sound sequences to form an integral part of a programme, to accentuate meaning and intensity. (Ref. 1).

The Workshops

The Radiophonics suite is composed of two main workshops, a library, staff offices, an editing room, a small studio for live recording, a technical workshop and engineering office. It is part of the main B.B.C. Maida Vale studio centre and therefore conveniently adjacent to the five large music studios in which are a conventional pipe organ, electronic organs and a specially designed multi-colour tone electronic organ.

Workshop Equipment

The two workshops each have their own special equipment. Workshop No. 1 (Fig. 2) has sine/square-wave generators, that can be fed into keying units (a specially designed electronic keyboard device which provides controlled rise and decay characteristics) to an E.M.I. reverberation plate and an artificial reverberation machine of the magnetic drum type. Other specialised equipment includes two ring modulators, a limiter, a twelve channel mixing console and playing equipment. Tape recorders in this workshop are two 15 i.p.s. Motosacoche machines with console, two Philips (15 and 7½ i.p.s.) EL.3503 studio recorders, a variable speed Reflectograph and a Ferrograph.

Workshop No. 2 (Fig. 1) has twelve sine/square-wave generators and a keying unit for providing adjustable decay, a high stability decade sine-tone generator, and a sine-tone generator with frequency modulation. Reverberation equipment is similar to that in workshop No. 1 and there are also various kinds of electrical filters. Tape recorders are an E.M.I. BTR/2, three Philips 3 machines (see front cover) and last but not least an eight-track Leavers-Rich recorder specially designed for the B.B.C. This is shown in Fig. 3 and has a Velodyne controlled variable speed drive which permits any recording speed between 0 and 40 i.p.s. with a high degree of speed constancy.

AT THE B.B.C.

This recorder employs 1" wide tape each track occupying $\frac{1}{8}$ ". The eight record/replay heads are stacked vertically and there are eight recording and eight replay amplifiers. The outputs from the eight channels are fed into a twenty-channel mixing console which will also accept any of the sound sources in the workshop.

Other Special Equipment

A rather unique device developed by the B.B.C. designs department is the Gunfire effects generator which is essentially a white noise generator with an electronic 'gate' that allows pulses of the noise to be triggered off. Filter circuits are also provided to alter the characteristics of the sound. An additional pulsed oscillator also provides the 'ricochet' effect so popular in the Wild West films. The whole unit is quite portable and will produce many other sounds including squeaking doors, bells, steam engine and motor-cycle noises.

The keying units which can be seen in the photographs are also special developments and can be used for playing sequences of electronically generated sounds. A short section (one octave) of a piano keyboard is used in conjunction with electronic keying circuits that will accept the outputs from tone generators, etc., and which can simultaneously provide different degrees of attack and decay.

The Work of the Unit

Typical of the work of the radiophonics department are some of the specialised sounds such as those produced for *Quatermass* and fantasies like *Asylum Diary* or documentaries like *Giants of Steam*. The producer or the author will generally discuss the theme of the play and the content in which the sounds are to be produced by the workshop. This may call for a complete score or merely an unusual sound backing to suit a particular mood or scene. Signature tunes or incidental music may be called for as well as 'imitations' of everyday sounds.

Sometimes electronic sounds are added to conventional music, or as in *Time Beat*, music of traditional instruments produced against rhythm or other sounds produced electronically or from tape loops.

Finally for those interested in new forms of music and sounds such as those produced by the B.B.C. Radiophonics Workshop the list below contains details of various recent recordings, now readily available. In conclusion I should like to extend my thanks to the

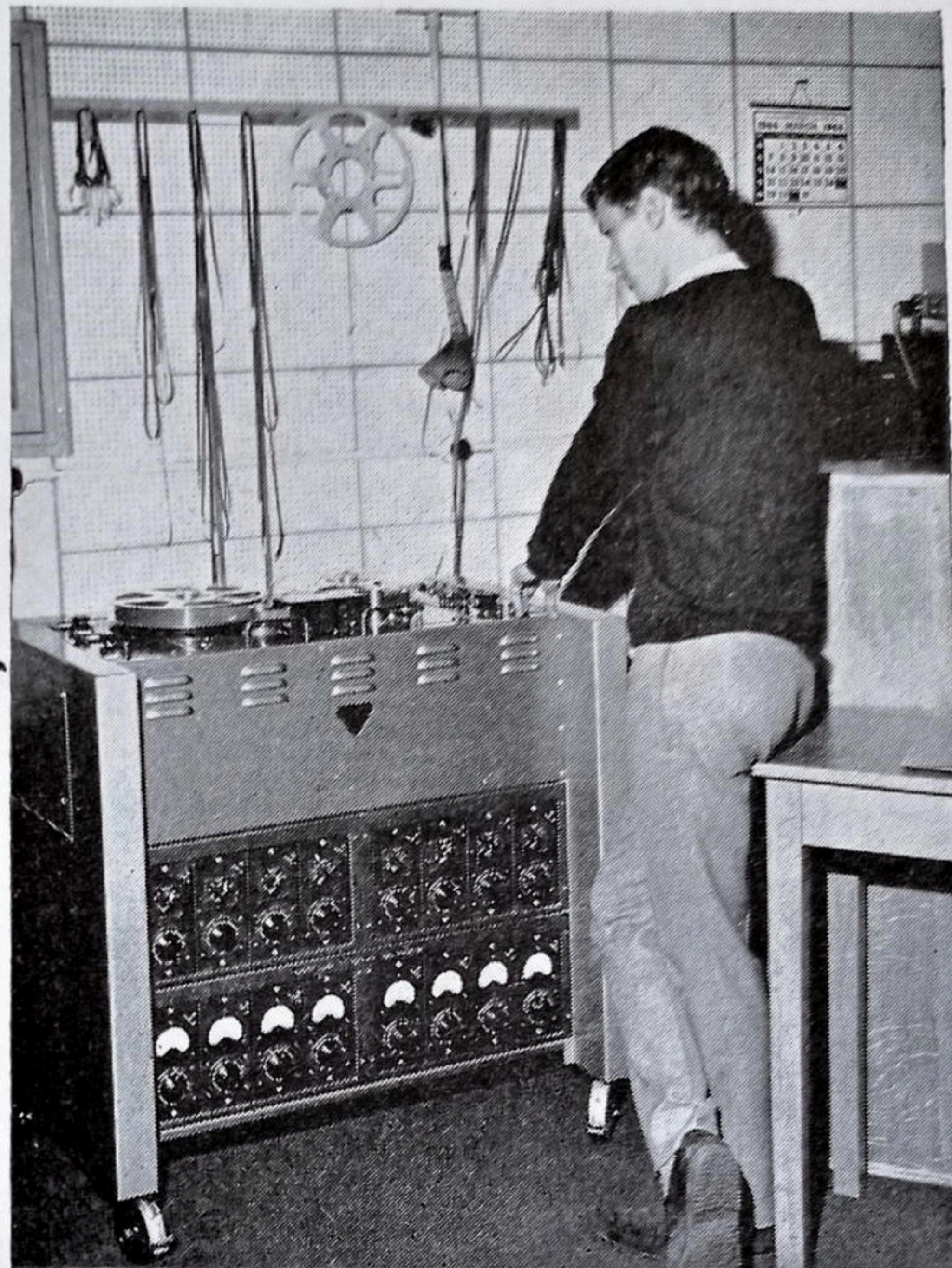


Fig. 2. A corner of workshop No. 1. An assistant sets up the tone generators for an experimental sound sequence.

Radiophonics Senior Studio Manager Desmond Briscoe and his staff for their kind co-operation and to the B.B.C. for photographs and other information on which this article is based.

Records by the B.B.C. Radiophonics Department

1. *Time Beat*. Parlophone 45R4901.
Waltz in Orbit, reverse side.
2. *Dr. Who* Decca F.11837 original sound track from B.B.C. TV series (reverse side not by Radiophonics).

[continued overleaf

Other Records

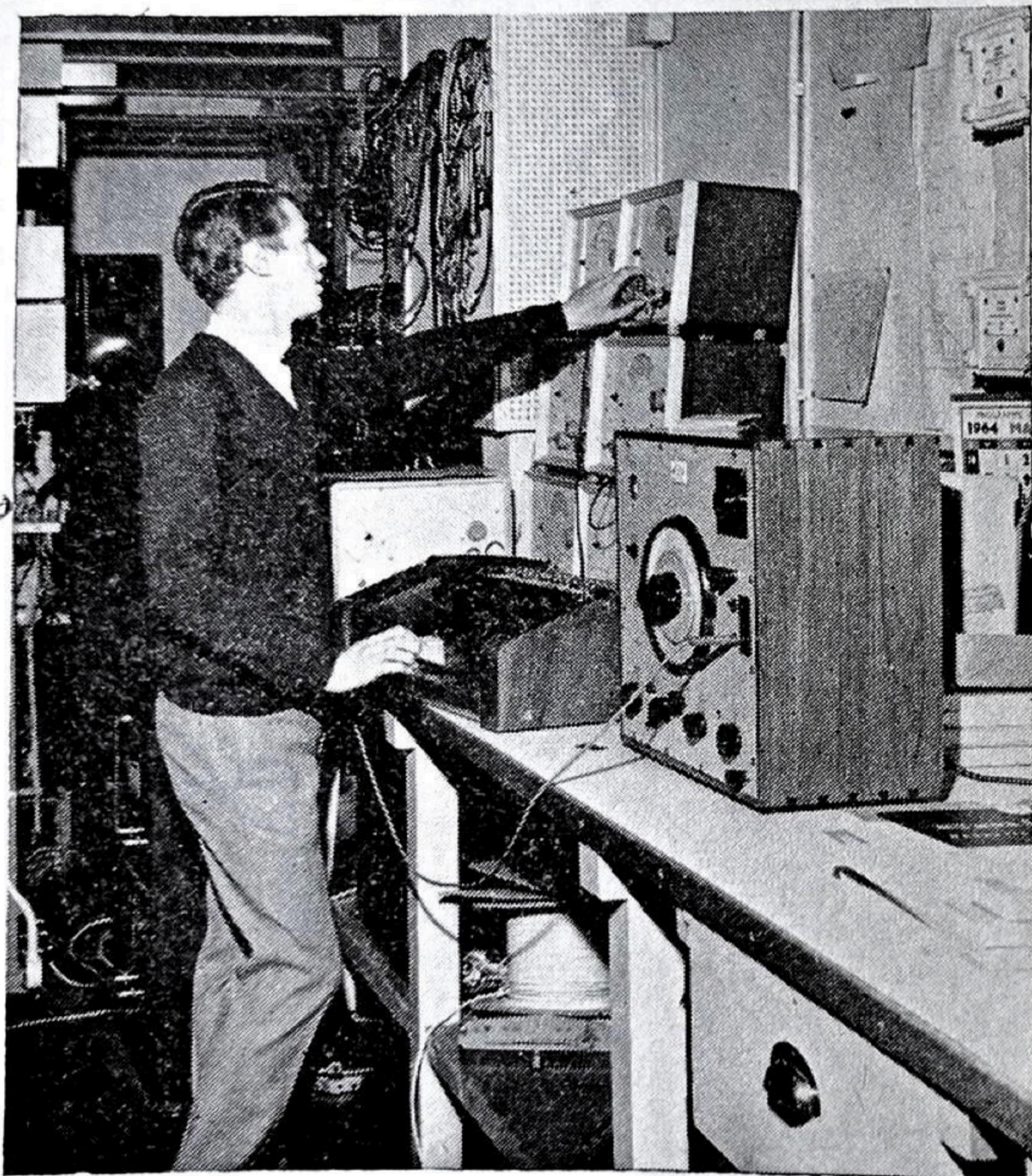
1. *Electronic Movements*. Philips 430-736 PE. Four recordings by Tom Dissavelt and Kid Batan — Syncopation, Whirling, Vibration, Drifting.
2. *Electronic Themes*. Castle EFX-2. Four recordings of electronic and Musique Concrète themes — Delta F, Study in Tinetones, Sound Object, Montage.

Postscript

The title music *Dr. Who* was composed by Ron Grainer and created in the Radiophonics workshop. Working from a score, the basic sound elements were individually recorded from various electronic sources — sine and square-wavetone generators, a white noise generator and a special beat frequency oscillator, known as the 'wobulator'. These raw elemental sounds were then intricately cut, shaped, filtered and manipulated in various ways until finally the separate tracks were ready for mixing and synchronization. The resulting catchy tune can be heard every week introducing *Dr. Who* on B.B.C. television.

Reference 1. B.B.C. Monograph 'Radiophonics at the B.B.C.'

The special 8-track Leavers-Rich recorder with a Velodyne drive system. Speed range 0-40 i.p.s. continuously variable.



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