

## **The BBC Radiophonic Workshop**

The BBC Radiophonic Workshop was for me the absolute epitome - the pinnacle - of electrical/electronic and aural wonderment during the 60's, '70's and 80's. It always amazed me (and made me somewhat non-plussed most of the time!) how these genius's came up with all these wonderful noises - and having an interest in almost everything electro-mechanical, spent a good deal of time trying to find out!

What I did find out was that the people employed in the BBC Radiophonic Workshop were - and still are - some of the foremost artists (and terribly undercredited!) in this genre of music and the methodology used to construct it. Sadly most of the early pioneers like Delia Derbyshire are now not with us anymore and since the disbanding of the workshop only a few (that are left) are either retired, or working still as composers.

The Workshop was an integral part of the BBC - and out television lives - for well over forty years and led the field many, many times in it's lifespan. It's a great pity that this has gone mostly unnoticed by the General Public (and even the BBC - the 50 year anniversary this year yielded a couple of quick pieces on TV and a few web pages), however you could say that this is a good thing - they've obviously done their job very well, otherwise they would have had a certain notoriety to their work - which there clearly isn't!

It's also a great pity (and very, very sad) that hardly anyone that worked at the Workshop has ever had any credit! Medals, OBE's, MBE's and the like are handed out willy-nilly to anyone nowadays who runs a race! Where would we have been without Delia's Derbyshire's realisation of the Doctor Who theme, Brian Hodgson's TARDIS sounds, Malcolm Clarke's wrangling with the Delaware and Dick Mills' many many sound effects?? Surely at least one of the people who worked at the Workshop deserves some sort of recognition.....Sir Richard Mills.....sounds good to me.....

Many many webpages since the demise of the Workshop have sung the praises of this incredible department of the BBC - this is just one of many and I hope it will be useful in providing an insight into the work of these pioneers of electronic music.

## Creation and Early days

The Workshop was set-up to satisfy the growing demand in the late 1950s for "radiophonic" sounds from a group of producers and studio managers at the BBC, including Desmond Briscoe and Daphne Oram. For some time there had been much interest in producing innovative music and sounds to go with the pioneering programming of the era, in particular the dramatic output of the BBC Third Programme.

One of the few benefits of wartime had been that some women had an opportunity to work in jobs previously denied to them; Daphne Oram was one. Daphne had started working for the BBC as a 'music balancer' during the war, turning down a place at the Royal College of Music to do so. After her promotion to studio manager in the '50s, she began pestering the production of electronic sound and musique concrète. Desmond Briscoe (1925-2006) was

also a studio manager, with similar interests, so in 1957 the pair teamed up to produce some innovative programmes for the BBC Drama Department. Using borrowed test oscillators and tape-splicing techniques, they produced sounds that had never been heard before on the BBC.

Often the sounds required for the atmosphere that programme makers wished to create were unavailable or non-existent through traditional sources and so some, such as the musically trained Oram, would look to new techniques to produce effects and music for their pieces. Much of this interest drew them to musique concrète and tape manipulation techniques, since using these methods could allow them to create soundscapes suitable for the growing range of unconventional programming. When the BBC noticed the rising popularity of this method they established a Radiophonic Effects Committee, setting up the Workshop in rooms 13 & 14 of the BBC's Maida Vale studios with a budget of £2,000. The Workshop regularly released technical journals of their findings - leading to some of their techniques being borrowed by sixties producers and engineers such as Eddie Kramer.

Their nagging finally paid off, and in April 1958 Desmond and Daphne founded the Radiophonic Workshop in the BBC's Maida Vale Studios (a former ice-skating rink). They were joined later in the year by 'technical assistant' Dick Mills. Brian Hodgson came along in 1962 and he eventually ended up running the place. Brian adds: "Workshop was then a very

popular word among theatre 'types', and it gave away the Drama Department origins. It was originally going to be called the Electrophonic Workshop, but it was discovered that 'electrophonic' referred to some sort of defect of the brain, so it had to be changed! A board was set up to see that the place was run properly. Unfortunately, one board member had a doctor friend, who advised that three months should be the maximum length of time that anyone could work there, as staying any longer could be injurious to their health; they'd go mad, or something. This problem recurred throughout the Workshop's history — just as a recruit was getting into the swing of things, they'd have to leave."

Daphne Oram was the first to fall foul of this rule. After three months in her new job, she was ordered back to work in a control room at Broadcasting House. But for some reason Desmond Briscoe was not required to leave: instead he was appointed as the Workshop's Senior Studio Manager. For the BBC's women, it seemed, the war was over. A lengthy and bitter row ensued, and eventually, Daphne left the BBC for good in 1959, moving to an oast-house that she'd bought in Kent and establishing her own Oramics Studios for Electronic Composition. She was replaced by Maddalena Fagandini.

In 1958, Desmond Briscoe was appointed the Senior Studio Manager with Dick Mills employed as a technical assistant. Much of the Radiophonic Workshop's early work was in effects for radio, in particular experimental drama and "radiophonic poems". Their significant early output included creating effects for the popular science-fiction serial Quatermass and the Pit and memorable comedy sounds for The Goon Show. In 1959, Daphne Oram left the workshop to set up her own studio, the Oramics Studios for Electronic Composition, where she eventually developed her "Oramics" technique of electronic sound creation. That year Maddalena Fagandini joined the workshop from the BBC's Italian Service.

From the early sixties the Workshop began creating television theme tunes and jingles, particularly for low budget schools programmes. The dramatic move from the experimental nature of the late 50s dramas to the cheery themes was noticeable enough for one radio presenter to have to remind listeners that the purpose of the Workshop was not pop music.

In fact, in 1962 one of Fagandini's interval signals "Time Beat" was reworked with assistance from George Martin (in his pre-Beatles days) and commercially released as a single using the pseudonym Ray Cathode.

During this early period the innovative electronic approaches to music in the Workshop began to attract some significant young talent including Delia Derbyshire, Brian Hodgson and John Baker, who was in fact a jazz pianist with an interest in reverse tape effects.

In these early days, one criticism the Workshop attracted was its policy of not allowing musicians from outside the BBC to use its equipment, which was some of the most advanced in the country at that time not only because of its nature, but also because of the unique combinations and workflows which the Workshop afforded its composers. In later years this would become less important as more electronic equipment became readily available to a wider audience.

## Techniques & Influences

The techniques initially used by the Radiophonic Workshop were closely related to those used in musique concrète; new sounds for programs were created by using recordings of everyday sounds such as voices, bells or gravel as raw material for "radiophonic" manipulations. In these manipulations, audio tape could be played back at different speeds (altering a sound's pitch), reversed, cut and joined, or processed using reverb or equalisation. The most famous of the Workshop's creations using 'radiophonic' techniques include the Doctor Who theme music, which Delia Derbyshire created using a plucked string, 12 oscillators and a lot of tape manipulation; and the sound of the TARDIS (the Doctor's time machine) materialising and dematerialising, which was created by Brian Hodgson running his keys along the rusty bass strings of a broken piano, with the recording slowed down to make an even lower sound.

Much of the equipment used by the Workshop in the earlier years of its operation in the late 1950s was semi-professional and was passed down from other departments, though two giant professional tape-recorders (which appeared to lose all sound above 10 kHz) made an early centrepiece. Reverberation was obtained using an echo chamber, a basement room with bare painted walls empty except for loudspeakers and microphones. Due to the considerable technical challenges faced by the Workshop and BBC traditions, staff initially worked in pairs with one person assigned to the technical aspects of the work and the other to the artistic direction.

The Radiophonic Workshop regularly released free journals of its experiments to the public, complete with instructions and wiring diagrams. Amongst those who studied the journals and learned from their techniques was sound engineer Roger Mayer, who supplied guitar pedals to Jeff Beck, Jimmy Page and Jimi Hendrix.

The Workshop's reputation grew over the next few years, and the ranks swelled with the addition of Brian Hodgson, Delia Derbyshire and jazz pianist John Baker. The equipment at their disposal was minimal, to say the least, as Brian recalls. "In the very beginning, Desmond had been given £2000 and the key to 'redundant plant' [the BBC's junk pile] and that was it! The place kept going for years on what we called 'fag-ends and lollipops'. 'Fag-ends' were the bits of unwanted rubbish that other departments had thrown away; 'lollipops' were the much rarer treats that were occasionally sent down to keep Desmond quiet. Like the vocoder, for instance: it was very nice, but we hadn't asked for one and didn't really need it. It was like the icing on a non-existent cake!"

The Workshop's equipment consisted merely of a lot of old tape recorders and a few pieces of test equipment that could make noises. The tape recorders could be used for echo, and reverb was also available — it came from an empty room downstairs with a microphone at one end and a speaker at the other. Maida Vale Studios is an unusual building, long and thin with one of its two floors below ground. The Radiophonic Workshop's rooms were at street level, spanning an extremely long corridor.

The room was occupied by a succession of dedicated engineers who had the tools and the know-how to fix all the broken rubbish that arrived; they also built special equipment to order. First was 'Dickie' Bird; then came Dave Young, and finally 'The Two Rays' (White and Riley). Dave Young started a tradition of visiting the nearby Portobello Market every week to buy bits and pieces for the Workshop, and this continued long after he'd left. In the '60s, a lot of ex-military kit from the war was still being sold off; Dave would return with items such as a genuine aircraft's joystick!

Much of the Workshop's output then was produced simply by using the techniques of musique concrète: natural sounds were recorded and manipulated on tape by editing, pitch-changing, and very often by reversing the tape. There was a standing joke that a Radiophonic composer could enthusiastically churn out original compositions for

several years. When the inspiration ran out, all their old tracks could be re-used (and improved?) by playing them backwards!

In the early '60s, synthesizers simply did not exist. Producer Joe Meek was using the monophonic, valve-operated Clavioline but the Radiophonic Workshop, oddly enough, never had one. What they did have, though, was all the test oscillators that they could beg, borrow or steal from other BBC departments. A method was devised for controlling 12 oscillators at a time, triggering them from a tiny home-built keyboard of recycled piano keys. Each oscillator could be independently tuned by means of a range switch and a chunky Bakelite frequency knob.

There was also the versatile 'wobbulator', a sine-wave oscillator that could be frequency modulated. It consisted of a very large metal box, with a few switches and one very large knob in the middle that could sweep the entire frequency range in one revolution. They were used in the BBC for 'calibrating reverb times in studios' apparently. And as far as the Workshop's electronic sound sources went, that was it!

Yet, curiously, it is the work produced in those early years that the Radiophonic Workshop's reputation still hangs on. The Doctor Who theme was first recorded in 1963, and still there are fans who insist that the original is the best of many versions made over the years. What's more, some of the sound effects made for the first series of Doctor Who are still being used! When the newly revamped Doctor Who appeared in 2005, hardcore fans recognised the original effects and wrote to Brian Hodgson: "How nice to hear the old original Dalek Control Room again, after all these years!"

Brian's 'Tardis' sound, dating from 1963, is also still used. "I spent a long time in planning the Tardis sound," says Brian. "I wanted a sound that seemed to be travelling in two directions at once; coming and going at the same time." The sound was actually made from the bare strings of a piano that had been dismantled. Brian scraped along some bass strings with his mum's front-door key, then set about processing the recordings, as he describes it, "with a lot of reverse feedback". Eventually, Brian played the finished results to Dick Mills and Desmond Briscoe; at their insistence he added a slowly rising note, played on the wobbulator.

Brian and Delia Derbyshire were, as he says, "best mates. We used to go on holiday together." In 1966, together with the founder of synth manufacturers EMS, Peter Zinovieff, they formed Unit Delta Plus, a band of

sorts, and began performing on London's psychedelic underground scene. As one Workshop member remembers it, "At the end of their day at the BBC they used to race off to the West End, changing into their kaftans in the taxi."

Unit Delta Plus split in 1967, but some of their gigs sound like crackers: how about the two-day 'Million Volt Light and Sound Rave' at the Roundhouse? In 1969 the pair teamed up with David Vorhaus as the White Noise, releasing the cult classic album *An Electric Storm*.

## Changes & Latter

As the sixties drew to a close many of the techniques used by the Workshop changed as more electronic music began to be produced by synthesisers. Many of the old members of the

Workshop were reluctant to use the new instruments, often because of the limitations and unreliable nature of many of the early synthesisers but also, for some, because of a dislike of the sounds they created. This led to many leaving the workshop making way for a new generation of musicians in the early 1970s including Malcolm Clarke, Paddy Kingsland, Roger Limb and Peter Howell. From the early days of a studio full of tape reels and electronic oscillators, the Workshop now found itself in possession of various synthesisers including the EMS VCS 3 and the EMS Synthi 100 nicknamed the "Delaware" by the members of the Workshop.

The three-month rule ensured a steady throughput of staff, but some managed to become permanent. David Cain arrived in 1967, Malcolm Clarke in 1969; Richard Yeoman-Clark, Paddy Kingsland, Roger Limb and Peter Howell all joined in the early '70s, just as Brian and Delia were leaving. The association with Peter Zinovieff had already led to the BBC buying three VCS3s, but in 1970 the Workshop took delivery of an EMS Synthi 100 modular system. It was the biggest voltage-controlled synthesizer in the world! Christened 'The Delaware', after the road outside the studios, it had 16 oscillators and even incorporated its own oscilloscope and frequency counter. As with the VCS3, there were no messy patch cords: instead were provided two 60x60-way 'pin patch boards'. There was a digital sequencer too, which could store up to 256 events. The massive control surface presented a sea of knobs to twiddle, but one of them, labelled 'Option 4' was actually a dummy. Not connected

to anything at all, it was occasionally tweaked to appease awkward producers who wanted to get 'just the right sound'.

Desmond Briscoe's retirement in 1977 saw Brian Hodgson returning as Workshop Organiser, after five years away. Brian finally managed to prise a reasonable annual budget out of the BBC and he set about systematically renovating the place, eventually providing a customised studio for each of the five composers. Apple Macintosh computers were introduced, and a lot of the new kit was identical to what could be found in any studio of the time; there were growing mutterings about the Workshop having somehow deviated from its original purpose to become a 'music-writing factory'. This was not really true: the Radiophonic Workshop had been founded because the equipment needed for electronic music production was not generally available. Mass-produced synthesizers did become affordable with time, but remember that when the first 8-bit digital sampler, the Fairlight CMI, appeared in the early '80s, it cost over £30,000: you could buy a house for that! The Workshop's composers were all producing work in their own styles, using equipment that may have been available to outside composers, but was prohibitively expensive for most.

By this point the output of the Workshop was vast with high demand for complete scores for programmes as well as the themes and sound effects for which it had made its name. By the end of the decade they were contributing to over 300 programmes a year from all departments of the BBC and had long since expanded from its early two room setup. Their contributions included material for programmes such as *The Body in Question*, *Blue Peter* and *Tomorrow's World* as well as sound effects for popular science fiction programmes *Blake's 7* and *The Hitchhiker's Guide to the Galaxy* (in both its radio and television forms) by Richard Yeoman-Clark and Paddy Kingsland respectively.

By the early 1990s, under the direction of John Birt, the BBC had made the decision to cut departments which couldn't make enough revenue to cover their costs. In 1991 the Workshop was given five years in which to break even but the cost of keeping the department, which required a number of engineers as well as composers, proved too much and so they failed. In 1995, despite being asked to continue, organiser Brian Hodgson left the Workshop closely followed by Dick Mills and Malcolm Clarke. By the end only one composer, Elizabeth Parker, remained and the Workshop closed in March 1998. Elizabeth Parker joined in 1978 and her trademark



sound came from the pricey and unreliable PPG 2.2. Richard Attree, who, in 1987, was the last composer to be taken on, made good use of the Yamaha TX816, which was effectively eight DX7s in a rack. Just one DX7 cost £1200 when it was new.

Ultimately, it was costs that killed off the Radiophonic Workshop. The controversial appointment of John Birt as the BBC's Director-General in 1992 was the writing on the Workshop wall — for Birt brought 'producer choice' to the BBC. The asylum would be run by lunatics no longer: the accountants were taking over.

With 'producer choice', staff producers at the BBC could now either use the BBC's carefully costed in-house facilities, or they could choose to go outside — all that mattered was the cost. And everything in the BBC was costed. So what happened? In London, staff producers and directors cleared off to Soho in droves, to work with their old mates who'd already taken redundancy and gone freelance. For about a year, many BBC buildings felt empty. Everyone was eventually recalled and producer choice was 'modified', but the damage was done — it resulted in a catastrophic lowering of morale within the BBC.

Brian Hodgson struggled for a long time to keep the Workshop alive, but it was a losing battle. Under the Birt regime, every BBC department was assessed for profitability, and if running costs were found to be greater than profits, extermination followed swiftly. The Radiophonic Workshop had been doing a fine job providing quality music for many programmes that didn't have big budgets — schools programmes, in particular. But now the Workshop was expected to compete on the 'open market' with freelance composers. Brian spent many months calculating the cost of finished music per minute and searching for ways to reduce it. I didn't even bother costing my music per minute: I didn't have to. If a director asked me for a quote, I could just say "Well, it depends How much have you got?"

Despite this approach being the most obviously competitive, it was not permitted under BBC rules, and so in 1998 the Radiophonic Workshop finally closed its doors.

John Birt was awarded a Life Peerage, by the way, and now sits in the House of Lords.

## The Legacy

Whilst the decision to close the Radiophonic Workshop was both regrettable and difficult the BBC recognised its contribution and heritage and as such Mark Ayres and Brian Hodgson were commissioned to catalogue the extensive library of recordings by the workshop prior to placing it into the archive, thus preserving a considerable part of the workshop's work for posterity.

Since the closure many of the Radiophonic Workshops albums have been re-released on CD and some of the incidental scores for episodes of Doctor Who have been made available for the first time.

In October 2003, Alchemists of Sound, an hour-long television documentary about the Radiophonic Workshop, was broadcast on BBC Four.

The Magnetic Fields titled the first track of their album Holiday after the BBC Radiophonic Workshop.

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