

The Computer & The Sound House BBC Radiophonic Workshop

by **Richard Elen**

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The BBC Radiophonic Workshop's network of Macintosh computers handles everything from music programming to looking after the tape library. Richard Elen talks to Brian Hodgson, the head of the Workshop, about their musical Macintoshes.



Hi-tech heaven? Peter Howell's well-equipped studio at the BBC Radiophonic Workshop.

For nearly thirty years - the 30th anniversary is next April - the BBC Radiophonic Workshop has been creating electro-acoustic music for BBC radio and TV, domestic and overseas services, local and national alike, from its group of studios at the converted skating rink that is BBC Maida Vale.

As with any creative recording facility, the Radiophonic Workshop is its people - a group of six composers under the helpful and supportive eye of Brian Hodgson, formerly a Workshop composer himself.

From early days in one room and a small complement of recording equipment that nobody wanted, the Workshop has grown from its humble beginnings to be one of the most up-to-date electronic music facilities in the world, not - being the BBC - by having masses of money to splash out on all the latest gear, but by careful choice and selection of only those pieces of equipment and facilities which are really what the composers require. That's Brian's job and he's very good at it.

So while things have moved on from painstaking recording, looping and editing of magnetic tape to Fairlights, Roland S-50s and, latterly, the Apple Macintosh computer, the Radiophonic Workshop is essentially doing the same task: keeping the entire BBC supplied with top-quality themes, signature tunes, and incidental music.

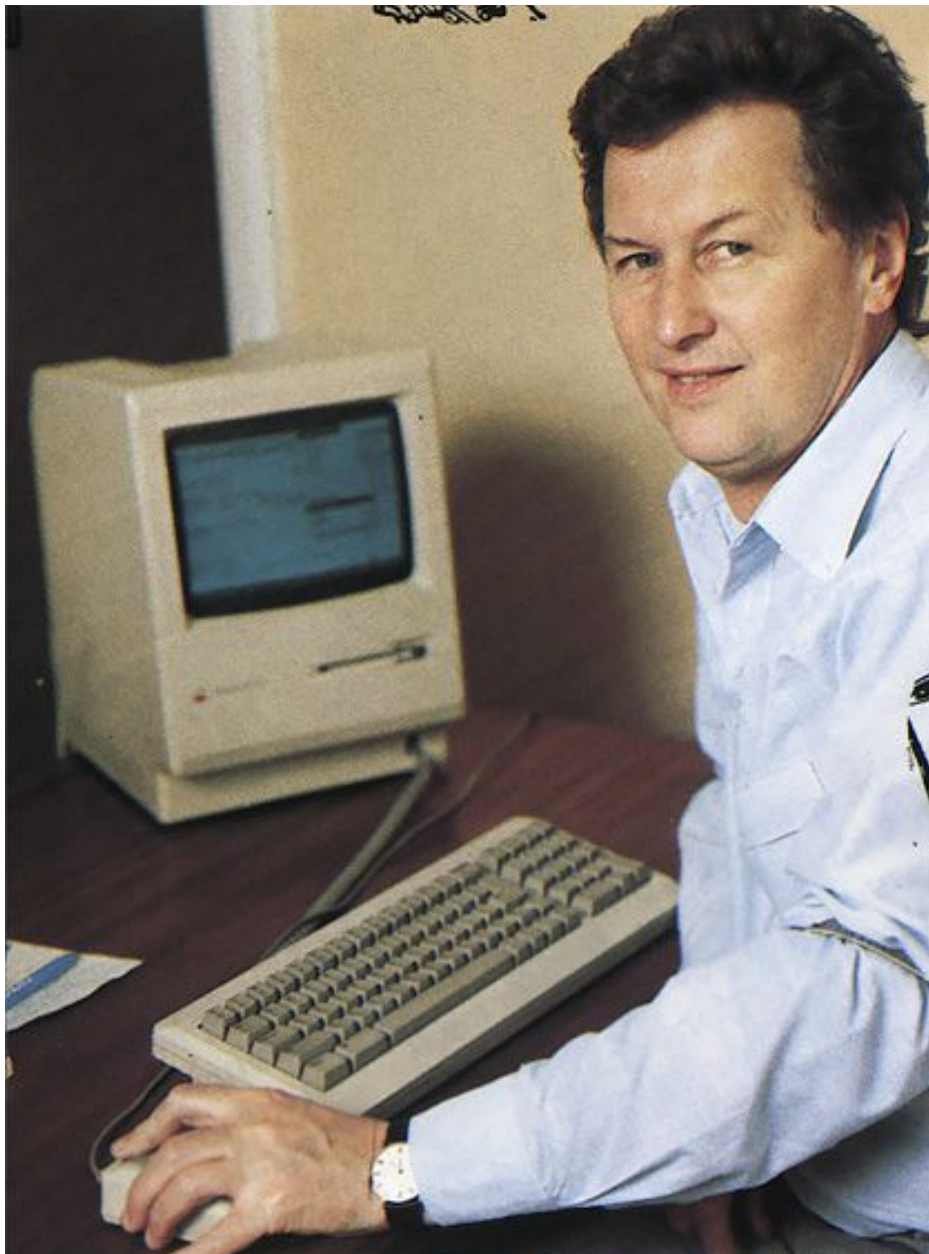
Neither is the Workshop's output entirely electronic: while we may think at once of Peter Howell's re-working of that original *Dr Who* theme, the Workshop's Elizabeth Parker last year wrote some remarkable string ensemble material for Max Whitby's two-part documentary on LSD. Yes, it was processed, flanged and distorted where it needed to be, but it was excellent writing, in the best Radiophonic tradition: for from the beginning, 'Radiophonic' and 'electronic' were never synonymous terms. It all began with banging on metal lampshades and blowing over the tops of milk bottles, varispeeding cash registers to play Christmas carols, in the days when the head of the Workshop sat in an office, one wall of which was graced with the amazing quote from Francis Bacon's *New Atlantis* that begins, "Wee have also sound houses...".

Today, due to rebuilding work that is proceeding apace, Brian's office is more like a corridor: in fact, it's the tape store, with sounds and music from BBC programmes stretching back nearly three decades lining the walls around him. And on the desk in front of him is an Apple Macintosh computer. There are a dozen of them in the Workshop: I asked Brian how it came about.

"We started to see in *Computer Music journal*, programs for the Macintosh, and they looked quite interesting," says Brian. "We were

especially interested in Southworth's *Total Music*, and also in Mark Of The Unicorn's *Performer*.

"That was a couple of years ago. I made contact with Apple UK to see if we could take a look at a Macintosh... they were singularly unhelpful. Then, last year, we managed to contact someone who had some of the programs and managed to borrow a Mac. We looked at *Total Music* and found that it was, at the time, rather slow for what we needed.



Head of the Workshop, Brian Hodgson

"So we were undecided about what we wanted and what machine to go for," Brian continues. "Then I sent Workshop organiser, Jon Gibbs, to the Computer Music Conference. I had a deep-down feeling that, at the end of the day, it would be the Macintosh that we'd go for. Jonathan was not convinced... but after he'd been to the Computer Music Conference, and realised that most of the software that worked well and was available *now* was for the Macintosh, he came back and said that he thought we should go for the Mac."

So the Workshop bought one, complete with Mark Of The Unicorn's *Professional Composer* and *Performer* software, and put it into Peter Howell's studio. Peter started working with it right away, "unlike the Yamaha QX-1," says Brian, "which you almost needed brain surgery to be able to operate!" Within days he was producing music on the system, including the series *Children Of The Green Knowe*.

That series went out at Christmas, 1986. "Almost immediately it became obvious," Brian recalls, "that it was such a stupendous machine that what we should do was to equip the entire Workshop with them: we could save such a tremendous amount of time and do so many extra things."

So they made the decision to purchase the Macintosh system and commissioned AF Computing of Ashford, Kent, to install a machine in each studio, one in the office, one in maintenance, and one - an operating 'spare' to begin with - on Brian's desk. Each Macintosh has a very useful hardware modification - in the form of a carbon-fibre fabric sheet stretched over the screen, which cuts out *all* reflected light in the studios.

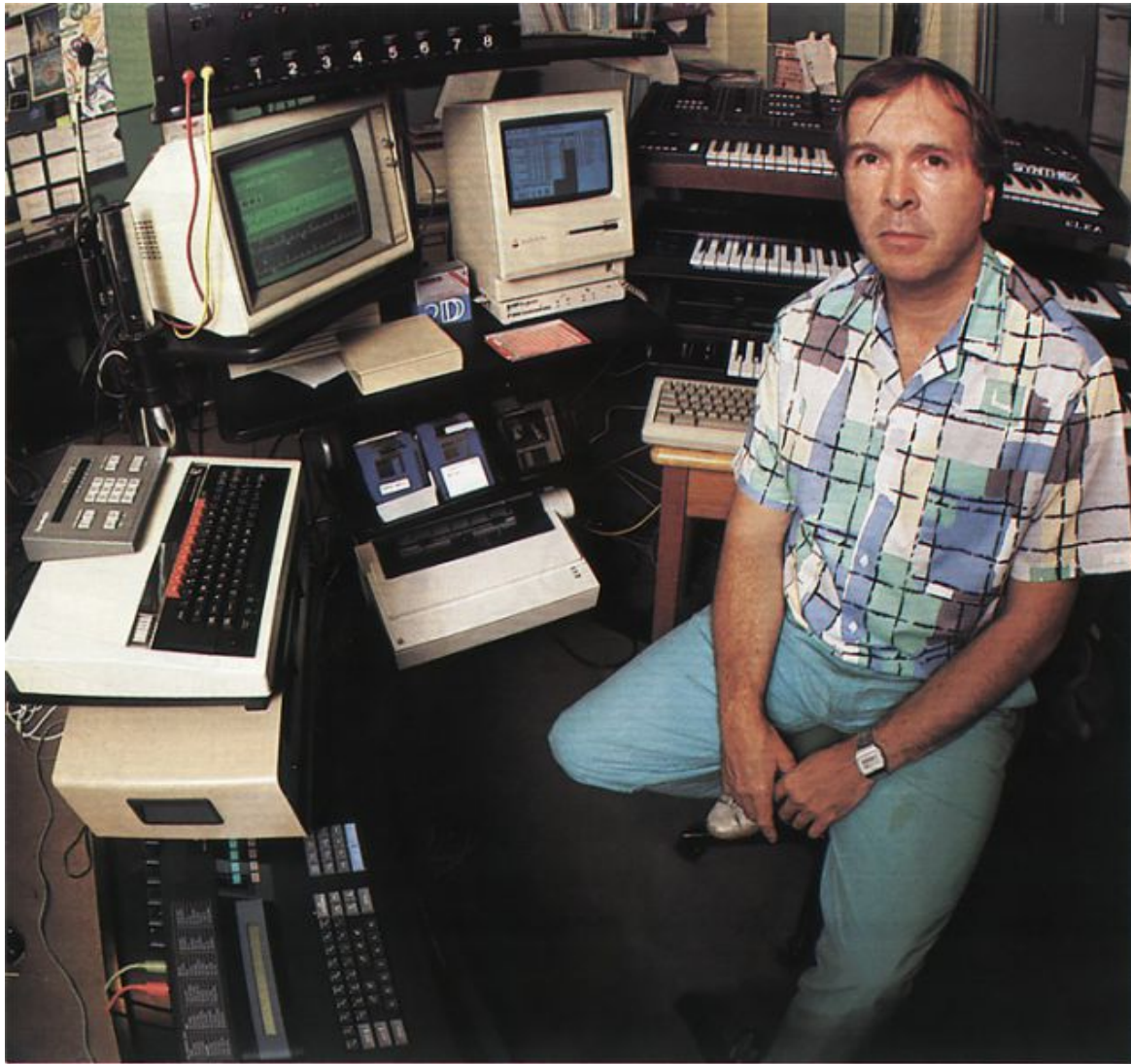
All the machines are linked together via the Apple Talk local-area network, an additional computer being responsible for running the *AppleShare* network server system, which requires a dedicated machine. "We used to use *MacServe*," says Brian, "but for some of our applications it was too slow." Each of the composers' systems includes a 2MB Mac Plus with a 20MB hard disk, and there is additional shared storage on the system for other applications - the

tape library, for example, the structure of which was designed by Brian himself, using a database program called *Omnis*.

But there are limitations to the use of the network for music, it turns out. While it is technically easy for the composers to exchange sounds and samples, for example, on the network, it is unfortunately the case that most music technology manufacturers expect users to be running individual systems, rather than linking a network of studios together as is the case in the Workshop. While this assumption is no doubt the case, it means that on the face of it few people have considered the behaviour of MIDI interfaces with a network. The fact is that both the MIDI interfaces that Brian has been experimenting with are giving trouble when the Mac is interfaced with the network. As a result, the Radiophonic Workshop composers tend to run their systems as self-contained set-ups most of the time, hooking up to the network only when they need to. This means that the composers still keep their sounds on disk, although they use *Sidekick* to index them.

"Our idea has been," says Brian, "to stick something in at a low level, see how it adapts to us - rather than the other way around - and that way we actually adapt and change the system until it approaches what we want it to be."

On the software front, Brian has purchased identical packages for each of the six studios. "They're using Mark Of The Unicorn's *Performer* and *Composer*, and Opcode's *DX/TX Editor/Librarian*," says Brian, "plus Digidesign's *Sound Designer* for the Emulator II." The Workshop is also evaluating Passport's *Master Tracks Pro*, I was informed.



Radiophonic Workshop composer Roger Limb in his studio.

Peter Howell, as the first to use the new systems in the Workshop, was an obvious person to speak to. He has been in Radiophonics for nearly a decade, producing all kinds of material - as a Radiophonic Workshop composer is wont to do - including a couple of commercial albums. When I visited the Workshop in the late Seventies, Peter was sitting in front of a little mixing console with a gigantic Yamaha CS80 polysynth. Now, it's a full-scale Soundcraft console, a full Studer multitrack installation, a Roland S-50 sampler, a TX816 rack (and other goodies), and the Mac.

"I'm running five programs at the same time with an application called *Switcher*," Peter says, "which allows you to put all of the programs in a kind of carousel and look at them one at a time. So I

can boot up in the morning and not have to go back to the original desktop to launch another application all day.

"I'm running *Performer*, the Opcode *Librarian*, *MacWrite* - for doing cue-lists as I go - and *Composer*. The desktop appears there as well, in case I need it," Peter goes on. "They're arranged in such a way that you can sit in the middle with *Performer* as the central program: to the right you've got the manuscript (*Composer*) and to the left you've got the librarian."

Peter was working on a programme at the time with the unlikely title of 'Ernie's Incredible Illucinations'. "What I do with the *Librarian*," he says, "is to write cue numbers in the library as well as sounds - you can have as many as you like." As far as sounds are concerned, Peter tends to store standard voice banks in the Yamaha TX816, for example, and when he wants to send a new sound from the library, he just stores it in the edit buffer rather than allocating it a place in the module memory.

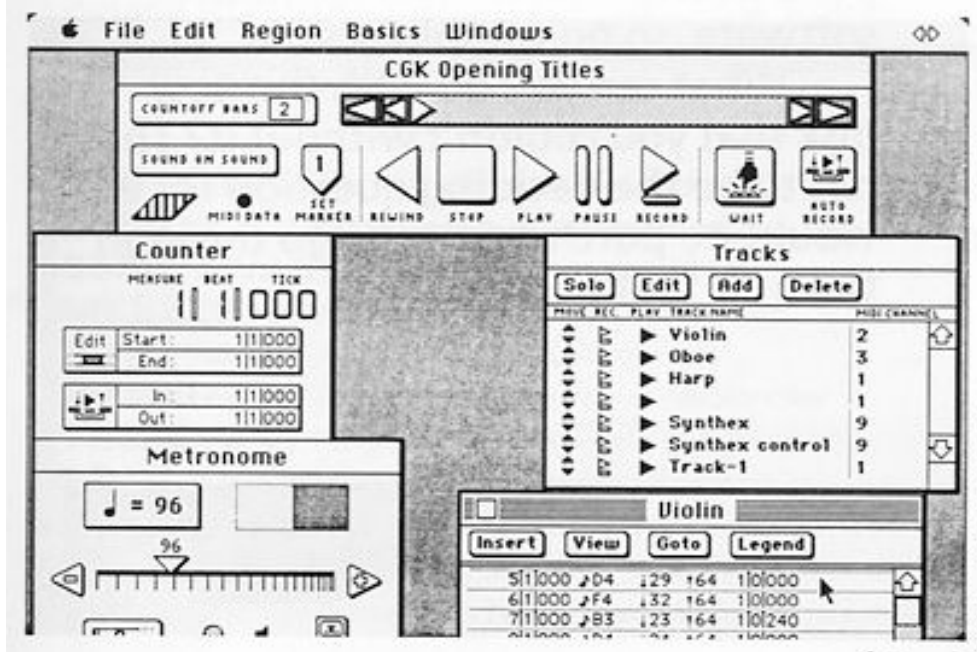
"The way the machine is linked up to the studio is that, at the front end, the Mac is connected to a SyncWriter," says Peter, "which is the BBC's own computer sync-to-picture system which runs on a BBC B micro. It sparks off MIDI clock at a certain time. At the other end is an Opcode MIDI interface.

"On the musical side, besides the TX rack and the S-50 sampler, we have an Elka Synthex - which has been made volume sensitive via a MIDI-to-CV link and a VCA. So the pedal on my master keyboard can be used to control the volume of the Synthex." In addition, Peter uses a Yamaha DX7 as a master keyboard.

"The way I work," he explains, "I start with the simple 'untitled' file in *Performer*. Some people in the Workshop, I know, have a special startup file that has all the tracks and MIDI channels sorted out; but for a small piece that can be rather confusing: I prefer to look just at tracks that are active.

"I am definitely in the business of splitting tracks as much as possible," Peter Howell continues, "so that control data can go on a separate track. The practical limit on the number of tracks in

Performer is how much data you can send down one MIDI cable: I suppose in theory you could have only four tracks with tons of pitch-bends and controls and have too much."



Some example Macintosh screen dumps from Composer and Performer files showing part of Peter Howell's music for 'Children Of The Green Knowe'.
 © Peter Howell/BBC Radiophonic Workshop, reproduced by permission.

Because of splitting the data for one instrument across a number of tracks, Peter finds little or no need for the 'Sound On Sound' facility, if you'll pardon the expression, in *Performer*. "Neither do I use the internal marker system, because SyncWriter is so much better," he adds. "But without it, the markers would be very useful.

"I use the 'Split Notes' function a lot. It means that you can perform a keyboard piece, jamming for two minutes for a cue, and then - if it went well - instead of re-performing it in different parts (because at that stage it's all on one track), you can highlight the entire piece and use 'Split Notes' to cut or copy all the notes within a certain pitch range to the Clipboard, so that you can paste them on to a different track to be played with another sound. In fact, I did an entire string quartet session like that, using *Composer* to write the parts: playing on the keyboard and deriving all four parts from it."

It's a technique that I'm well used to myself: working in *Total Music* with my composer colleague I'll often extract a bass part, say, by copying the piano piece on to another channel and filtering out all the notes above a certain pitch and below a certain velocity. The good thing about this, of course, is that you retain the original performance where re-playing it would result in something as dead as a dodo.

With *Performer* (version 1.0), Peter often came up against the problem of not being able to change time signature within a sequence: a common complaint about the majority of computer-based sequencers until the advent of programs like *Master Tracks Pro* and *MidiPaint* (and version 2.0 of *Performer*), which allow you to change the meter at each bar.

"What I do," says Peter, "is to play blindly across 4/4! In *Composer*, you *can* change the number of beats in a bar... but then you end up without a relationship between the bar numbers in the two programs."

One solution, I suggest to Peter, is to work in 1/4: in other words, bars and beats are equivalent.

"Richard Attree has done something like that," Peter comments, "on *Frankenstein*, using the Yamaha QX-1. He had a one-beat bar divided up in 25 subdivisions, one for each TV frame. So that he could tell exactly where it was related to the SMPTE timecode. Very useful if you're doing 'sounding' sort of music!"

And, of course, at the BBC Radiophonic Workshop, they're doing *all* kinds of music, in a virtually unique situation that has already provided many pointers to how the future National Studio for Electronic Music on London's South Bank might be set up, with self-contained MIDI and computer compositional studios networked together. And with the same need, in the present times, to make a little money go a very long way.

But unlike somewhere like IRCAM (in Paris), the BBC Radiophonic Workshop is not a research environment for the study of modern musical techniques: it is a working, commercial studio operation with a continuing, longterm project well under control - that of providing electro-acoustic music for the BBC. It's a job that Brian Hodgson *and* his team carry out with dedication and world-beating results.