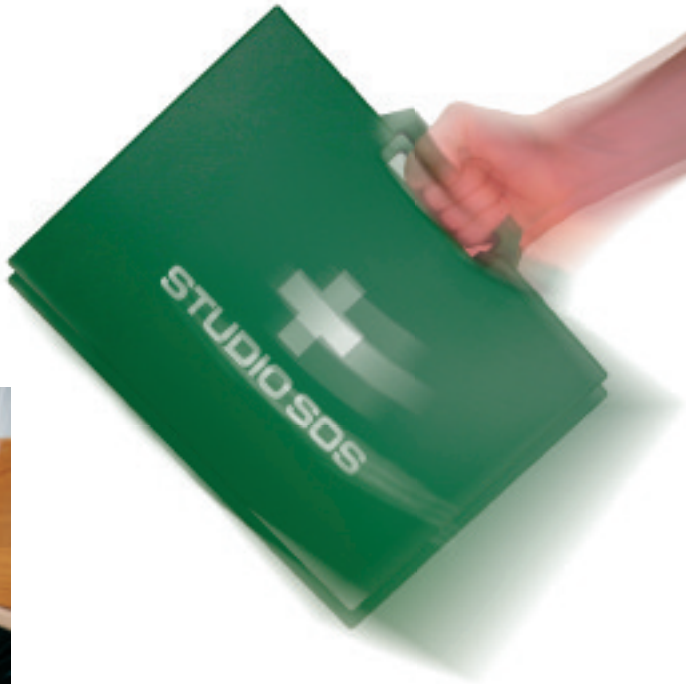
Studio SOS



David had accumulated more than enough gear, but it left him spending more time fighting gremlins than making music!

Having tackled his room acoustics, David Balen found himself plagued by a confusion of excess hardware. Our job was to get him back on track.

Paul White & Hugh Robjohns

Drummer and percussionist David Balen has a control room, a live room and a separate drum booth, and has already installed some effective, *SOS*-style, Rockwool-based acoustic treatment. However, despite having plenty of gear, at the time of our visit he'd not managed to get it all to work together properly. He was particularly concerned about a planned session with his band in a few weeks time: he explained that a typical session might need a dozen mics to capture the drums and various instrumentalists, as well as one headphone mix for the drum booth, and four more independent headphone mixes for the main room. He just wanted a setup that worked and made recording easy.

Spaghetti Cable Disaster

The main room was dominated by a huge bamboo frame covered with ethnic percussion, but there was also an upright piano, V-Drums, a Yamaha Motif keyboard and a small powered mixer with speakers, for use with the electronic instruments. The floor was a sea of cables and there was a broken XLR socket in the wall box. Next to the main studio was the long, narrow control room: at one end was a huge piece of studio furniture housing a Mackie D8B mixer and hard-disk recorder, plus a digital patchbay and an RME Octamic II eight-channel mic preamp; and at the other was an Apple Mac Pro system running Logic 9.1, a Mackie Control and a Novation keyboard. A MOTU 2408 system provided eight channels of line-level in and out, a monitor output and three ADAT ports, capable of providing up to 24 channels in and out. A Mackie Big knob was hooked up as a master volume control, for both headphones and a pair of Mackie HR824 monitors.

An impenetrable mass of cables and ADAT lightpipes hung out of the back of the desk, and the Mac Pro and D8B systems were loosely interconnected with miles of cabling — very little of which worked correctly, and most of which was difficult to access. The drum booth was on the other side of the control room, again with a tangle of wires connecting it to something in the vicinity of the D8B!

David's Behringer four-channel headphone amp in the main room was fed from a stereo source, so everyone had control over their own level but not the mix. Again, there was cable running everywhere, and exactly where the various signals went was anybody's guess! At least there was a wall box for mic lines and tie-lines to the main room, and holes in the walls (lined with plastic pipe) to the drum booth and main room for running additional cables.

Logical Next Steps

Fortunately, David was already familiar with the essentials of Logic 9 so, after discussions over coffee and chocolate Hob Nobs, he agreed that it could be time to make the leap to a more compact Logic-based system

and to retire the D8B, along with some other hardware. The Mackie recorder could then be used with a small mixer to form the basis of a simple mobile recording rig if required. The studio furniture could be retired, making the control room far more spacious, and creating the possibility of recording vocals in there too!

After taking stock of the available gear, it seemed sensible to use the RME Octamic II as an expander to the MOTU interface, because both were fitted with ADAT ports. That would give David eight line-level analogue channels, plus eight good-quality mic-level channels. This wouldn't be enough to handle the dozen mics necessary for his typical recording sessions, so for further expansion without spending too much, we suggested adding a Behringer ADA8000 eight-channel preamp which, again, offers ADAT interfacing. I use one of these little boxes in my own studio for the rare occasions I run out of channels and need some extra capacity, and it performs far better than you might expect given the price.

An idea was taking shape: we could feed the RME's eight mic inputs from the main room tie-lines, the ADA8000 from the drum-room tie-lines, and use the MOTU's line-level outs to carry the five headphone mixes. All eight line-level inputs would remain free, so David could plug in more external mic preamps or use them to record line-level sources.

Tactile control would come from the Mackie Control, though David also had a Frontier Designs Tranzport that would allow him to initiate recording and to operate the essential transport controls from the drum booth. A quick test proved that the Tranzport was installed and working correctly. The Mackie Control was more problematic, as it (and Logic in general) seemed to be in conflict with the Novation USB keyboard: every time a control was moved on the keyboard, a Logic fader would move and the screen would flash. Clearly, this was a problem to be resolved after we'd fixed up the essentials.

Getting Down To Business

We got to work moving unwanted gear to the garage. We also took out virtually all of the cabling, so we'd be able to start with a clean slate. While Hugh was pruning cables, I fixed the broken XLR connector in the wall box, using epoxy 'liquid metal' to rejoin the broken halves and to build up some reinforcement around the joint: it may not have looked pretty from inside the box but it worked! A new socket would have been better, but there was no local source and it would have meant drilling out and replacing rivets.

A small tabletop rack already housed the MOTU 2408, plus an Emagic AMT8 MIDI interface, but there was also space for the Octamic II and the Behringer ADA8000, which would keep the connecting cabling short.

Clocking On & Patching Up

The Octamic II has an impressive technical spec, and excellent jitter recovery, so we decided to set it up as a slave unit in the system, with the MOTU as master, sync'ed via word clock. That meant setting the RME box to word-clock external sync, using the rear-panel DIP switches. One ADAT 'lightpipe' optical cable was needed to feed the output from the Octamic to the MOTU bank 'B' input. The ADA8000 was also set up to run in slave mode, but because it has no provision for word-clock termination, it was ▶

connected in a daisy-chain of word clock from the MOTU, via the Behringer, using a BNC T-piece, and on to the Octamic, which would provide the required 75Ω termination via a rear-panel DIP switch.

Audio from the ADA8000 was hooked up via ADAT lightpipes connected to the MOTU bank 'C' ports. The ADA8000 also provides eight line-level outputs, but David didn't need these for the time being. Bank 'A' of the MOTU was left set to 'analogue', for use in the headphone system and to provide extra line inputs, while the dedicated monitor outs from the MOTU were sent to the Mackie Big Knob.

David's Mackie HR824 monitors were fed from the 'Speaker A' output of the Big Knob, and the level trim on the rear adjusted to give a sensible level, with the Big Knob set around halfway up and the level knob on the MOTU around three-quarters full. A pair of Tannoy Eclipse active speakers was fed from output 'B' on the Big Knob, and the levels were adjusted so that switching from one set of speakers to the other kept the listening level more or less constant. We had to angle the Mackies in, as David had them pointing almost straight back along the length of the room, but their height was fine. He was also persuaded to relocate a noticeboard that he'd fixed over his acoustic treatment at the right-hand mirror point.

MIDI Headaches

David had connected his Mackie Control to MIDI port one on his interface, using standard MIDI cables. This setup was causing screen flickering problems (even when the Novation keyboard was disconnected and its software uninstalled), so we moved it to another MIDI port on the interface and it worked perfectly. We also experienced similar problems when feeding the Yamaha keyboard's MIDI output to input one of the interface, so we suspected there was a hardware problem. As David never needed more than three MIDI inputs at once, we opted not to fix the issue properly: he could simply abandon port one and use any of the remaining seven.

We didn't have time to get to the bottom of the problems with the Novation keyboard, either, so as a quick fix we set it up as a simple MIDI keyboard, with its Automap button switched off, and connecting to the computer via a MIDI cable rather than USB. This gave us a MIDI input to play Logic's internal instruments with no conflicts. The Mackie Control meant David didn't really need to use the Novation as a remote control, so we left it set up this way for the time being.

Hugh re-routed the cable snake feeding the main studio wall box, which turned out to be 16-way: 12 female XLRs for mics and four male XLRs for returns. We didn't need returns, as the headphone feeds would be routed another way, so we connected channels 11 and 12 and the four returns as unbalanced line feeds to six of the MOTU's analogue line inputs, for use with the keyboards and V-Drums. Adaptor cables would be needed to access those four return channels, but David had plenty of jack-to-XLR cables he could use to connect up the studio end, and I wired up some shorter cables to feed the control-room ends into the MOTU inputs.

David also used a Dymo electronic labelling machine to create some signs on the wall box to identify the new line-level connections. The first eight mic feeds from the main studio were fed to the RME box, with channels nine and 10 fed to the first two channels of the ADA8000. Hugh created a loom of a further six mic cables, threaded them into the drum room, and connected them to the remaining six ADA8000 inputs. This was deemed enough, as David normally records his jazz kit with kick, snare and overhead mics only. We also pulled two pairs of long MIDI cables through the wall to transmit the MIDI data to and from the Yamaha Motif keyboard and Roland V-Drum kit in the main studio to the computer.

That left us with two spare line inputs on the MOTU, which we connected to a TL Audio Ivory C5021 compressor in the control room, that David could use as a DI unit when recording instruments in there. We checked the mic and line feeds and labelled the cable ends. All the connections were reflected in the input and output labelling of the Logic default song template we created, but we also listed the routing in a text file, for general reference.

The desk and outboard setup underwent a severe prune, leaving David with only a few rack units, and free of hardware headaches.

Headphone Feeds

Examination of the Behringer four-channel headphone unit David had set up in the main studio area showed that it had an unbalanced stereo auxiliary input on each of its four channels, as well as a main balanced stereo input — so we reckoned we could feed in four separate foldback mixes via the aux inputs. This theory proved correct, but as the aux input comes in on a TRS stereo jack we couldn't just use balanced cables from the MOTU: that would result in only one side of the headphones receiving a signal. We needed to wire a TRS cable to be unbalanced at the MOTU end, with both channels connected to the tip of the jack and the ring left unconnected, to split the mono headphone feed from the MOTU into two, feeding both headphones channels.

This worked fine, so we made four of those for the four channels of the Behringer, plus an additional one to feed a basic Samson headphone amp in the drum room. Fed from different send buses within Logic, this arrangement would allow four performers

in the studio to have individual headphone mixes, and they'd each be able to access the unit to adjust their own overall levels.

That left the problem of talkback to solve. The Big Knob doesn't have a dedicated talkback-mic output, but we found a workaround by setting the Headphone/Studio Out to follow the external 'phones input, which we left disconnected. This mix of 'nothing' is then routed to the studio-out jacks, but when the talkback is operated, the talkback signal interrupts the 'nothing' and feeds to the studio outs. We then cabled this stereo studio feed to the main stereo inputs of the Behringer headphone amp, and adjusted the front-panel balance controls on each headphone amp output to the mid-way position between 'aux' and 'main', so that both the talkback signal and monitor mixes would be audible to the four performers in the studio. This arrangement doesn't dip or kill the monitor mix when the talkback is used — which is normally the case on dedicated talkback setups — but David said he only used the talkback during pauses in the playback, so this wouldn't be a problem in practice. We relocated the headphone amp from its original position in the centre of the studio to the top of the piano, so that the cables could be run through an existing pipe in the control room wall to the MOTU line outputs, and Hugh made up another loom to keep all those cables neat and tidy.

David had acquired a number of long headphone extension cables to run from the relocated headphone amp to the required studio floor positions. Unfortunately, the drum-room headphone amp had no provision for a second input, so there was no way to feed talkback to this, other than via a channel in Logic. However, as the drum room glass door faced into the control room, David felt he could live with not having talkback in there until he could replace the headphone amp.

To tidy up the control-room cabling, Hugh ran it around the edge of the floor, but we couldn't avoid having a large bunch of cables running across the door opening. To make this safe, we found a piece of wood to use as a low step, supported by a batten along one edge and the wooden door sill on the other. There was room beneath it for cables to pass through safely, and a couple of screws into the threshold strip made sure it wasn't going to move about under foot.

Reader Reaction

David: "There's a new level of immediacy and engagement in my studio that enables me to sit down, tune in and forget loads of switching gear on and off, background noise or invasive and time-consuming procedures. Projects with my group Interplay, as well as my own CD can now move ahead: my own project has been languishing for years because technology hassles sapped my creative juices!

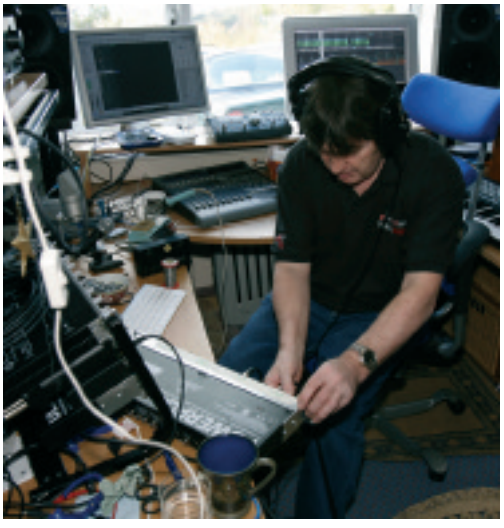
"Abandoning the familiar and the tactile is a leap of faith! My past experiences with software have caused much gnashing of teeth, but Paul really sorted out my working templates. Gratitude to Paul and Hugh for their diligence, expertise and humour. It was worth the investment of time, money and shares in the Hob Nob factory."

Default Song

David had two screens connected to his Mac, which always makes life easier, but the displays were the wrong resolution, resulting in too-large icons and out-of-round circles. A couple of minutes in the monitor preferences page got these looking correct, with smaller, sharper icons and circular circles!

The key to making the system simple to operate was to create a song template with the required audio tracks set up, their input sources selected and labelled as per their physical interface inputs, and five pre-fade sends per channel, arranged as headphone feeds routed to line outputs 3-8 of the MOTU interface. Further post-fade sends were configured to accommodate reverb and other send effects, with a Space Designer reverb set up and ready to go. David often records a MIDI piano (using Synthogy Ivory) at the same time as the audio tracks. We laboured the importance of checking that the MIDI track in Logic is selected before David hits record — otherwise no MIDI gets recorded into it, even if the track's red record light is showing.

We also explained the concept of track grouping, which is important when you're recording a band, as it ensures you don't accidentally nudge tracks out of sync. In the Groups box, you simply tick the Edit/Selection box and uncheck all the others. (If you need to make an edit to an individual track, Command-G toggles group mode on and off.) When we'd made the necessary adjustments, which included a screenset to place the Arrange page on one monitor and the Mixer page on the other, with a large SMPTE display below, we saved it as a 'New Song' user template.



To make recording sessions easier to manage, Paul White set up a system for individual headphone mixes, and talkback.

The Remains Of The Day

By the end of the day, we had accomplished everything we'd set out to, other than getting the Novation keyboard working properly. We started to download the latest software but David's internet connection was rather slow, and by the time we had to leave, it still said two hours and 44 minutes to go — so that was one for him to install!

The control room was now much tidier, with a compact Logic system set up to work both for band recordings and David's solo projects, and the floor was free of cabling spaghetti. The back of the control room had already been acoustically treated with broadband wall absorbers and a ceiling cloud, and the new-found floor space meant that it was now practical to use this space as a vocal booth, if required. Standing the vocalist with their back to the acoustically treated corner, possibly with a Reflexion Filter or similar device behind the mic, should produce clean and usable vocal tracks. Headphone monitoring would be easy to arrange from the MOTU's own headphone output via an extension cable. Of course, that left David to decide how to deal with all the redundant gear and studio furniture — but fortunately that wasn't on our to-do list! SOS