

technique

choosing a
recording setup

hard choices & soft options

CHOOSING A RECORDING SETUP

PART 5: In this final part of our series looking at the alternative systems available for recording and mixing, **Paul White** outlines his own system and the reasons for building it that way.



Over the past few months, I've been looking at the relative merits of different ways of recording and mixing music, but this month I'm concluding the series in a more anecdotal way by looking at a system I've recently put together for my own use and explaining my choices.

At the heart of any serious system is a mixer, so I'll start there. Although it's quite possible to mix entirely within a computer using a mouse as a controller, I wanted a hardware control surface, and needed the reliability of a dedicated device, as I occasionally work with other musicians who don't take kindly to sitting about while I reboot computers or mutter about driver conflicts. The current crop of digital mixers suitable for the project studio ranges from the compact Tascam TMD1000 and Yamaha 01V to the Mackie d8b digital 8-buss and

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Tascam's TMD8000 with the Yamaha 03D, 02R, Spirit 328, and the new Ramsa DA7 in between. I liked the idea of moving-fader automation, and didn't want to have to rely on an external sequencer to store and edit dynamic automation moves, so I decided to try out the Yamaha 03D on the basis of price and availability (the Spirit, Ramsa and Mackie were unavailable at the time). The 03D also features good

experience the benefits and pitfalls for myself. Despite this, I have made one decision which you may find unusual..."

internal effects as well as dynamics and four-band parametric EQ on just about every channel and orifice other than the mains socket!

Why go for a digital mixer rather than one of the many excellent analogue designs around? To be honest, I don't believe any of the current crop of digital mixers offers any sonic advantage over analogue technology, and in some cases the EQ is noticeably less satisfying, but what you do get is the potential for a

much quieter, simpler system (you have effects and dynamics processing built in), plus the ability to precisely recall a session complete with all the control and effects settings, not just faders and mutes, as is the case with most affordable analogue automation. One disadvantage is the control surface of a digital mixer, which is usually not as intuitive as the 'one knob per function' approach of an analogue mixer. However, I reckoned that if the world is going to go digital, I ought to go along with it to experience the benefits and pitfalls for myself. Despite this, I have made one decision which you may find unusual -- not a strange equipment choice, but the way I decided to connect everything together.

Layout

Setting up a studio isn't just a matter of choosing the right gear -- you also need to site everything where it is easy to use. My own setup has the mixer, patchbay, BRC and a few pieces of outboard gear at the front, with everything else in racks down one side of the room. The keyboard and computer station is actually facing the side of the room rather than the front, but when working on sequenced music, I don't find being side-on to the monitors a problem. You can always swivel through 90 degrees to check what it really sounds like once the parts have been recorded.

All the studio furniture is home-made, either from pine or from oak-veneered chipboard, and finished with antique wax -- there's no messy paint or varnishing and wax always gives a professional finish. As most studio furniture is made up of rectangles, you can get the material cut to size at your local DIY store if you don't feel confident about doing all of the job yourself. This just leaves you with the corners to glue and pin. The upright rack supports in my system are simply strips of wood (20 x 30mm approx) glued and pinned to the inside of the cabinets and set back around 15mm from the front.

The gear is fixed to the uprights using Posidrive wood screws, though it's best to drill pilot holes before fixing the screws. To prevent the gear getting damaged, a metal cup washer, then a plastic washer is placed over each screw. I've secured fairly heavy power amps and samplers using this method with no problems. One major benefit of using wood mounting strips, other than its low cost, is that if you separate each item of equipment by a millimetre or two, you eliminate the possibility of ground loops caused by rack cases touching each other.

The Analogue Connection

Although I have a Power Mac running Emagic's *Logic Audio*, which is quite capable of digital multitrack recording to hard disk, I actually use two Alesis ADATs as my main multitrack system. These are controlled by an Alesis BRC (Big Remote Controller), which also provides the MIDI Time Code (MTC) sync for the mixer and sequencer. Although hard disk recording has its seductive attractions, tape is cheap enough to archive without having to back up, it's intuitive to use, and you can punch in and out with ease. Perhaps more importantly, there's a better-than-even chance that your audio data will still exist when you come back to it the next day and that all the tracks will still be in perfect sync with each other!

So, what was the strange choice I made? Well, rather than use the ADATs' optical digital link to connect

Equipment Choices: Effects

The 03D mixer has good effects built in, so in theory you could get away

them to the mixer, I decided to use only the analogue inputs, connected via a patchbay, so that I would, in effect, have a whole set of analogue insert points between the tape machine outs and the mixer. With all the 03D pads switched in and the input gain trims turned fully down, the level match is about right. Having insert points was important to me, because although you get dynamic processors built into every channel on an 03D, there are times when I'll want to use my own analogue outboard when I mix. What's more, the 03D only has provision for fitting eight channels of ADAT optical I/O, so I couldn't have handled both ADATs digitally -- a total of 16 channels -- even if I'd wanted to. To be fair, most affordable digital mixers have no insert points on the tape returns (they're always between the mic amps and the input converters), so if you want to use your own outboard, you have to come back via an analogue input. I've also linked the stereo mixer output to the DAT mastering machine in the analogue domain, as this is the only place you can insert end-of-the-line processors when mixing, though I can use the digital link when no processing is required. You have to remember when inserting mastering processors in this way to monitor the DAT machine (Tape Return), not the mixer, otherwise you don't hear the effect of your processing.

without buying any outboard, but for classy reverb, the Lexicon PCM90 is a tough act to follow. Likewise, the Lexicon MPX1 is a really good-sounding true multi-effects unit. The Alesis Quadraverb is used only on the keyboard mix and I also have an easy-to-use Alesis Wedge processor that I can connect to the Mackie mixer for general reverb.

The other break with tradition is that I decided not to record through the 03D. It's not that you can't do it, but I prefer the idea of using discrete mic preamps or channel strips and patching them directly to the ADAT inputs, and as my current ADATs are about to be replaced with the 20-bit versions, I have no fear about losing quality at the analogue-to-digital stage. For any mic signals that need subgrouping, such as those from drum mics, I also have a small Mackie mixer connected to the patchbay, and as regular readers will know, a small, well-designed mixer invariably means a cleaner signal path than a large mixer. Working this way, the 03D is always monitoring the tape outs, so there's no routing to change, though I concede that you do have to do more patching when assigning outboard mic/line preamps to the tape inputs. Of course an 03D only has 16 mono analogue ins and one stereo analogue in, so the next point to consider is how I handle my MIDI modules and effects returns.

Equipment Choices: Computers & Software

I have numerous old Macs at home, but I doubt that if all their processor clock speeds were added together the result would be close to the speed of one of Apple's G3s, so that's the next thing on my shopping list. Why am I so fanatical about Macs? It's probably a matter of familiarity -- I've always used them, it's rare that anything too puzzling happens, and if it does, I can generally fix it. Also, music software is often released in a more advanced form for the Mac -- that's certainly the case with *Logic Audio*. Having come up from an Atari ST, I find the Mac interface more intuitive; I can't recall needing to open the manual very often. It's a bit like cars -- they all do more or less the same job, but some will work week in, week out with no more attention than keeping the fuel tank full, while others require you to take off the distributor cap, clean the points, unblock the carburettor jets and tighten the fan belt every few days. I like Macs because they only need petrol, but if you like to tinker and are happy to choose a PC, I'm not going to try to convince you otherwise.

The choice of *Logic Audio* is also largely a simple matter of personal history -- I used C-Lab's *Creator* way back. If you're just starting out, however, *Cubase VST* seems to do much the same job in a very similar way these days. Apart from a few minor operational niggles, I'm pleased with *Logic* -- it's extremely robust, and now that it can use VST-format plug-ins, it's even better.

I also have a pensionable Nubus Power Mac kitted out with a basic Pro Tools system, which is used mainly for running Digidesign *Sound Designer II* so that I can master albums. A Yamaha CD-R burner lets me make test albums or CD-R masters using *Masterlist CD*, another useful Digidesign program. However, as Digidesign say they no longer intend to support *Sound Designer II*, and as *SDII* plug-ins

only work on the Nubus version of Pro Tools, I think I'm going to have to look more closely at BIAS's *Peak* audio editing software...

MIDI Modules

My first solution was to use a Mackie 3204 keyboard mixer feeding into the remaining stereo analogue input. In fact, I used a 3204 plus a 3204 expander unit, so there's a total of 32 stereo analogue channels plus eight stereo effects returns. This is more than adequate to connect all my tone modules and also to leave my four main effect processors

"What I've described here is not the definitive small studio system, it's just something that works for me..."

permanently connected (via a normalised patchbay) to the 03D's sends, with their outputs directly connected to four of the Mackie 3204's returns. There are also enough spare inputs to handle the audio outs from my Mac systems, for example, the Audiowerk8 card, the Mac's own AV output and my Pro Tools 888 I/O interface. However, Yamaha have just announced a new expander card that fits both the 03D and 02R and provides eight balanced analogue inputs feeding mixer channels 17 to 24 on the 03D, so I'm hoping to fit one in the near future to enable my four main

effects units to be returned directly to the 03D rather than via the Mackie keyboard mixer.

The effects requirements for the Mackie 3204 side of the mixing setup are fairly modest, as most synth modules now come with effects built in, and within *Logic Audio* I can also add effects from *Cubase VST*-format software plug-ins. However, it's useful to have at least one hardware reverb and here I'm still using my old Alesis Quadraverb, not because it's the smoothest or quietest machine around (it definitely isn't!), but because it can create certain effects that, as yet, I've been quite unable to emulate on anything else. Figure 1 (previous page) shows how the mixers and effects are interconnected. There's no automation on the analogue mixing side of the system, but this doesn't really matter, as I can automate my MIDI and hard disk audio material at source, in the sequencer.

One vital part of the system that isn't shown (because I don't have it yet!) is one of the new Alesis PCI cards that will allow me to transfer data directly between the ADATs and the Mac for editing, via the optical Toslink. To me, this is one of the most powerful features of running ADAT tape alongside a computer -- you reap all the benefits of tape-based recording mentioned earlier, but when you do need non-linear hard disk-style editing facilities, you simply pipe the data across to your computer, do what editing you need to there, then pipe the data back again, while maintaining perfect sync. Once I get the optical interface card, I will probably need to add a digital patchbay that can handle ADAT optical connectors.

Equipment Choices: Synths & Sampler

I am about as bad a keyboard player as King Herod would be a Mothercare manager, so I use guitar or guitar synth where I can. Even so, the sequencer allows me to cheat quite effectively, so I end up inputting (I hesitate to say playing!) quite a lot from the MIDI keyboard (a modest Yamaha SY35) and I have a reasonable choice of modules for sonic variety. My fully expanded Akai S2000 has turned out to be an excellent budget sampler, and now that I have a fast CD-ROM drive for it, it loads sample CD-ROMs fairly quickly. My favourite sound-creating device, though, is my Wavestation SR. If you haven't heard a Wavestation, you should -- it's got a number of flaws and its polyphony is lamentable, but it sounds fantastic.

My most recent acquisition is a Roland JV2080, the idea being to buy some expansion cards for it and then sell off some of my less-used modules to simplify my overall setup. As it stands, it offers good GM

sounds plus a fine range of up-to-date S&S fodder, but add the voice expansion cards and it definitely becomes greater than the sum of its parts. Waveforms from each of the different cards fitted can be used in combination to produce new sounds, and the large, well-set-out screen means that even I can be bothered to edit things! The orchestral card is particularly impressive and there may even be a piano somewhere in the JV2080 card set that I like more than my old Yamaha EMT10 piano module, which will free up another hole in my rack. However, my Yamaha VL70m physical modelling module is staying -- the expression you can get when using a breath controller is absolutely worth the inconvenience of drool dripping on your Levis! One antique I'd be reluctant to part with is my Kawai K1m -- it's a bit gritty and it has no filters, but you can coax some great textural sounds out of it. The disadvantage is that the dynamic noise reduction system required to clean it up costs around twice what the module is now worth!

How Did It Work Out?

After doing a couple of commercial sessions, it seems the system is working pretty well. The shorter signal path clearly works -- I've never before produced such quiet, clean recordings recording through a multitrack mixer, though I must stress that absolutely everything is wired using balanced cables, which helps. The small amounts of unbalanced equipment in the system (mainly MIDI modules) are wired using specially made balanced-to-unbalanced cables as shown in Figure 2 (above), and every plug and socket (including mains plugs) was sprayed with DeOxit contact cleaner when the studio was wired up to minimise connection problems.

There's a little more patching to do when overdubbing, as you can't just use the mixer routing buttons to move the vocal mic up to the next tape track, but it isn't a problem providing you write notes showing which mic is connected to which preamp. The 03D has turned out to be a lot easier to use than I anticipated, largely because I'm not recording through it, and although it sounds somehow different to an analogue desk, it's very clean without being too clinical. I'm still getting used to the EQ, but I can always patch in outboard EQ for anything really critical. There's also no obvious quality loss from using the analogue inputs. As the desk is always in mixdown mode, I generally get a ballpark balance set up by the time recording is finished, which I save as a snapshot (Scene memory) to use as a starting point when doing the mix proper.

Equipment Choices: Front Ends

With the type of setup I have, I obviously need a few decent mic amps, and the Drawmer 1960 valve compressor just happens to have a couple built in, so it gets used for tracking as well as when mixing. In addition, I'm using a Symetrix dual mic preamp and a Focusrite Platinum voice channel, and of course there are two more mic amps tucked away on the back panel of the Mackie 3204 if I run out. I'd like to add at least one of the Joemeek boxes to my armoury as I really like the sound of their compressors, and the SSM chip-based mic amps are also good performers. A little Mackie 1202 or 1404 is ideal for recording drum submixes, and either is small enough and cheap enough to be considered as a piece of outboard gear.


Most of my analogue outboard is from Drawmer, though I do have an SPL Classic Vitalizer (to my ears, the Classic is the best-sounding of the Vitalizer range) and an SPL De-esser, which are both great pieces of gear. Other widgets worthy of mention include the Palmer Junction Box guitar speaker simulator/DI, the Mesa Boogie V2 valve guitar preamp pedal and the Ridge Farm Gas Cooker tube DI box, which is also nice for warming up a sound via insert points. I'm also trying out a Hootersound mic preamp/compressor as an input to the Mac (either via the AV inputs or my Pro Tools interface). Designed by Ted Fletcher of Joemeek fame, this budget box is very simple, but has a good mic amp and a smooth compressor.

Initially, I was worried that plugging the Mackie analogue rack mixer into the 03D's stereo input would add a significant amount of noise, but this doesn't seem to be the case. Unused 3204 channels are muted, which on this model routes them to the Alt output buss, and any hiss from the mixer itself is at a very low level. As usual, most of the noise comes from the synth modules themselves, but since I've got more selective about which modules to use, this is no longer as serious as it once was. I'm also surprised at how clean the Mac's analogue ins and outs can be. You need to keep the levels as high as possible, and it helps

to use a gate to keep silences really clean, but for adding the odd track of guitar or occasional rhythm loop to a mix, it's absolutely fine. Even though I have a Pro Tools system that is exceptionally clean, it can't be used for tracks that employ VST-format plug-ins or other native processing functions. The Mac's reasonably clean built-in audio I/O also saved me from having to buy a separate soundcard -- something prospective computer buyers should take into account when comparing the cost of new Macs and PCs (the latter always require separate I/O cards, although these may be bundled with a PC when you buy one).

For projects where the system sounds too 'digital', the output from the 03D can be fed through an external processor (such as my Ridge Farm Gas Cooker or SPL Vitalizer) to change its character. Because of the patching system, outboard equipment is easy to hook in, but most of the time, you can work quite satisfactorily using the 03D's own effects and dynamic processors. The compressors don't add much in the way of character, but they do provide a transparent means of gain levelling. I look forward to trying the new digital consoles from Spirit, Mackie Tascam and Ramsa -- I anticipate that these will all have very different characters, perhaps more so than analogue consoles.

Summary

What I've described here is not the definitive small studio system, it's just something that works for me, and I know that in time it will change again -- it always does. However, I hope that along with the rest of this series, this month's account will make you think about what you are doing in a slightly different way. Instead of settling for a 'one size fits all', traditionally 'correct' recording system, you'll be able to take into account your own needs and your own way of working, then come up with a system that suits you. With today's equipment, you can make professional-sounding recordings for surprisingly little money, and you no longer need a garage to hold all the gear. At one end of the scale you have the desktop computer system or perhaps an integrated hard disk multitracker, while at the other you have the traditional multitrack tape recorder and big mixing console. In between those two extremes are countless options just waiting to be explored. 

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Equipment Choices: Monitoring, Mastering & Mics

At the moment, I'm using a pair of active Klark Teknik Jade monitors that have given me excellent service for years, and although there are more refined-sounding speakers, these have always given me consistent mixes that don't need much in the way of additional work at the mastering stage. I also have a pair of passive ATC SCM20s in the next room, which are perfect for checking finished masters.

Stereo mastering is generally done using a Tascam DA20, though I also have a DA30 MkII so that I can clone tapes, and this is also linked to my Pro Tools system. I've found both these Tascam machines to be reliable and have a good sound. I'm also hanging on to my Tascam 32 open-reel stereo machine as it definitely has a different sound to DAT, and occasionally, clients come in with open-reel tapes from which they want to make DAT masters.

Like every other SOS reader, I'd like a Neumann U47 or 87 microphone, but I really can't justify the

cost. Most of the time I use a Rode NT1 or an Audio Technica 4033, both of which are superb performers for the price, yet they sound sufficiently different for it to be worth having both. I also have a Russian Oktava MK219, which despite its 'back street' looks, always surprises me with its big, clean sound, and going upmarket a bit, there's a Beyer MC740, which I feel is rather underrated.

Perhaps my favourite dynamic is still the Sennheiser 421, a design that's over a quarter of a century old, but it's still superb for everything from vocals to kick drum. Inevitably, I also have a couple of Shure SM58s, and despite their now considerable age, they still manage to sound warm and classy. I also use a couple of the cheaper Audio Technica back-electret mics, including the ATM 89R, which are actually extremely good all-round performers as well as being tough enough for the odd live recording session. But the *pièce de résistance* (or should that be *pièce de impedance*?) of my mic collection is a Soundfield SPS422 stereo microphone, which is unequalled for capturing the impression of actually being there. The pickup pattern and stereo width can be changed from a remote control box, so you can set up the mic, retreat to your control room and adjust it from there.

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