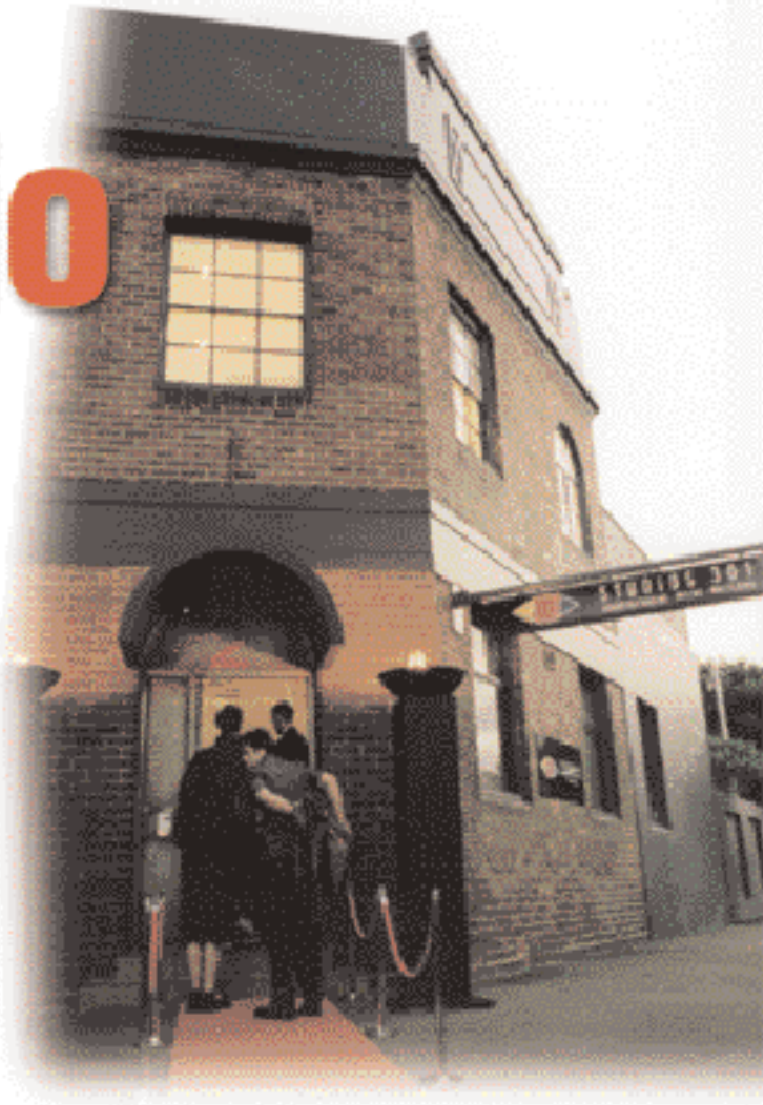
Studio 301



Two identical control rooms (one Neve, one SSL), a versatile rock studio, a huge orchestral room, and an $8,000,000 investment! Greg Simmons reports on the most ambitious studio complex ever built in the Southern Hemisphere – Tom Misner's new Studios 301.

Since its beginnings in 1926, Studios 301 has become an Australian institution for recording, mixing and mastering. While other long-established facilities in the region have fallen by the wayside, Studios 301 has demonstrated an uncanny sense of self-preservation that has seen it through three different names, three different addresses, and three different ownerships (not to mention the massive technological developments that have occurred during its 74 year history!). And yet, throughout all these changes, Studios 301 has remained a local reference for audio professionalism and technical expertise – rather like England's BBC. Now, after being acquired by Tom Misner (of SAE fame) and relocated to new premises in the inner Sydney suburb of Alexandria, Studios 301 and its team of home-grown professionals find themselves housed in the most ambitious studio complex ever built in Australia.

The studios

The new facilities consist of two major recording/mixing studios, three smaller studios and a multimedia suite, all interconnected via 48 channels of tie lines and 100BaseT ethernet, and all accessing a very well equipped central machine room. (Studios 301's famous mastering services remain in their existing location at 301 Castlereagh St, Sydney.)

Studio One is the jewel in the new 301 crown, and offers a combination of features never before available in one Australian facility. It's based on a Neve VR Legend 48/48 console with Flying Faders and Martinsound 7.1 surround matrix, a Yamaha 01V submixer with Apogee 24-bit converters, Genelec surround monitoring, and a huge collection of permanently installed outboard equipment (36 items at last count, including flagship products from Lexicon, AMS, EMT, TC Electronic, Pultec, Focusrite, Amek and Avalon). All this surround recording and production power looks into a beautifully lit orchestral room which seats over 70 musicians and has two isolation rooms. Studio One is, of course, ideally suited to film scoring and other large orchestral recordings, and includes appropriate video monitoring and synchronisation capabilities.

Studio Two also adjoins the orchestral room and is physically and acoustically identical to Studio One, but features a 64-channel SSL G+ console with Ultimation moving fader automation and 5.1 surround sound capability, a Yamaha 01V submixer with Apogee 24-bit converters, and Genelec surround monitoring. In addition to the orchestral room, Studio Two also looks out into a typical studio recording area with 100 square metres of floor space and three isolation rooms. Studio Two is obviously designed for recording and/or mixing commercial and popular music, and this is reflected in the permanently installed outboard equipment (over 38 items at last

count), which includes the same flagship products as Studio One but with an emphasis on commercial music production.

In addition to a good choice of recording options housed in the central machine room, each room also contains a ProTools Mix24 system with 888/24 converters running on a Power Macintosh G3/266 with 9GB hard disk, 2GB Jaz drive, 128MB RAM and a 15-inch plasma screen. Each room also contains an Akai DD8 8-track 24-bit/96k digital MO recorder for full 7.1 surround mixdown, a Tascam DA45HR DAT machine for stereo mixdown in 16- or 24-bit resolution, and a two track 1/2-inch analogue tape recorder (Studio One has a Studer A80, Studio Two has an Ampex ATR102). Finally, for those times when all you want is a quick cassette dub, each room contains a Marantz professional three head cassette deck.

Considering the power and versatility of the Neve and SSL consoles, you may be wondering why each room has a budget Yamaha 01V digital console. Obviously these can be used for submixing effects during mixdown, but they also serve another useful function. Misner explains: "During recording, the 01Vs become versatile headphone mixers so you don't have to use the main console's auxiliaries for that purpose, instead, you assign the important tracks for headphone monitoring to the 01V. A single 01V lets you create three separate stereo mixes – say, drums, guitars, and vocals – which are fed out to the recording space. Each musician has a little system with the three stereo mixes available to them, and they can make their own balance between them. That's how the headphone system runs for standard multitrack recording, and all the headphones for that application are AKG 141s. But if you're in orchestral mode, we have 80 pairs of Beyer DT102 single sided headphones which are run from the stereo bus.".

As mentioned earlier, these two control rooms are physically and acoustically identical, even down to the main Genelec monitoring. With both control rooms having access to both recording spaces and the central machine room, this provides an ideal combination of Neve and SSL capabilities and tonalities. For example, it's possible to track on the Neve in Studio One and mix on the SSL in Studio Two, without any of the translation difficulties usually encountered when moving a project between two different facilities. And by simply walking across a corridor you've stepped out of one room and into the other. Your precious tapes stay safely loaded on the same machine!

To avoid confusion and disorientation, each room has a different colour scheme – blue for Studio One, and red for Studio Two. This blue/red colour identification scheme also carries through to other parts of the facility, but more about that later...

Studios Three, Four and Five are all situated on the mezzanine level above Studios One and Two, and all have access to the recorders in the central machine room. Studio Three contains a 44 channel Amek Big console with SuperTrue automation, Genelec 1031A and Yamaha NS10 monitors, and a range of outboard including EMT reverb and Urei compressors. It features a ProTools Mix24 Plus system with three 888/24 converters and two 19 inch monitors, a Sony DAT machine and a Marantz cassette deck.

Studios Four and Five are both based on Mackie D8B 48/24 consoles and ProTools systems running Logic Audio software (each with two 19 inch monitors). Studio Four adjoins a 4.5m by 6.5m recording space and is equipped with a Yamaha 01V submixer, Genelec 1031A and KRK monitors, a good selection of keyboards/samplers and guitars, a sound library containing over 15,000 sounds, and a modest range of outboard mic preamps, compressors and limiters. Studio Five has little more than the D8B console and the ProTools rig, with the main outboard being an Amek 9098 mic preamp/EQ and Urei 1178 stereo compressor/limiter.

To top it all off, there's a multimedia suite with Macintosh and Silicon Graphics workstations, and software from Macromedia, Adobe and Quark. On the topic of multimedia, there's another quaint aspect of the facility that will appeal to some clients. Misner explains: "We're able to Netcast from here, so you can show a session live on the net, 24 hours per day. Of course, a client has to request it, and we give them the access codes. Also, because we have ISDN lines, you can do sessions with musicians from overseas. So a guitarist plays in New York over the ISDN lines, and he has the picture of the session there, too. It's not a perfect picture, but it's good enough to get a feel for the session."

Machine room

The central machine room houses an impressive collection of recording equipment including two Studer A820 and two A800 Mk III 24-track analogue recorders, one Mistubishi X880 32-track digital recorder, four Otari Radar II 24-bit 24-track recorders, two Alesis ADAT XTs, two Tascam DA38s, two Studer 1/4 inch two-track recorders, a Sony 2700 DAT machine, two HHB CD recorders, and a collection of Marantz dual cassette decks for real-time duplication. Complete 24-track and two-track Dolby SR noise reduction systems are installed and may be patched in where desired. For video work, a DoReMi digital hard disk system with 18GB of storage is also installed.

The orchestral room is capable of accommodating 70 musicians

This room truly is the signal flow 'hub' for the entire facility, as it allows virtually any combination of analogue and digital multitrack recording systems to be patched into any of the five studios, or into each other, using an EDAC-based multipin connector patchbay and custom made switching systems. A number of Otari UFC-24s take care of digital interface conversions between the numerous formats.

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All machines are kept in sync with Lynx TimeLine synchronisers. Having so many different recording formats may seem like a dream, but it does introduce other problems. For example, each machine has its own autolocator/remote control. Rather than having a huge array of autolocators waiting to be wheeled into the control room and patched in as required, Misner chose to install the MotionWorker system. This provides a single intelligent autolocator/remote control interface in each control room, which in turn communicates with the TimeLine synchronisers. Being user-programmable, it allows the facility to maintain a consistent autolocator/remote control interface regardless of the actual recording format in use. It also ensures all patching is done entirely in the machine room, leaving the control rooms free of the clutter of numerous multipin panels for numerous autolocators.

Finally, the machine room is also equipped to serve as a transfer and dubbing room. Backing up and transferring recordings between formats can be done entirely in the machine room, as can CD burning and cassette duplication.

Studio One features a Neve VR Legend 48/48 console with Flying Faders.

The Orchestral Room

For many local engineers and producers, one of the most interesting aspects of the new Studios 301 will certainly be the orchestral room. With a seating capacity of over 70 musicians, could this be the orchestral and film scoring studio that Sydney has been longing for?

Misner elaborates: "The orchestral room has 385 square metres of floor space. It's got an internal volume of around 2800 cubic metres, and the ceiling reaches 10m at its highest point. You can put an 80 piece orchestra without a big percussion section in there. But if there's a percussion section, that figure goes down to 70. Of course, you could put the percussion section in the rock studio and give the conductor visual contact to the whole lot. With that set-up you could probably record a 110 piece orchestra."

While the control rooms were jointly designed by Misner and Roger Darcy of London-based Recording Studio Architecture, the orchestral room was totally Misner's design. "My primary specification was for a two second reverberation time, including bottom end reverb, and that's the expensive bit," explains Misner. "To have bottom end, you need mass. Therefore all the rooms are concrete and they're all floating. For the orchestral room I also wanted two isolation rooms. One is designed for a percussion section, fairly bright, with stones on the corner and a totally diffused ceiling. It's got a 1.3 to 1.4 second reverberation time. The other room is a fairly dead vocal overdub room, 0.5 to 0.6 second reverberation time. It's got a fairly high ceiling, so it doesn't sound boxy."

Simply walking around the orchestral room makes you realise this is no ordinary studio design. The sound is quite different, more alive and vibrant than most studios. This is, of course, partly due to the room's healthy reverberation time, but there's something else, something very 'non-studio' and organic sounding about it. "You've noticed the special floor!", laughs Misner. "This floor is unusual in that it behaves like the floors of the great concert halls around the world. It's a proper orchestral floor. It's 110mm thick, floating, with a gap underneath. As you step on it you can hear yourself walking. In comparison, most studio floors are smack dead on concrete, which is good for typical rock studio work, but not good for orchestral work. It drains the natural energy of the instruments away too quickly."

Another interesting aspect of the orchestral room is the complete lack of distributed mic panels around the room – one very large panel about 1.5 metres tall is all that can be seen. This panel follows the colour scheme of the control rooms – a blue section contains 48 mic inputs for

the Neve control room, and a red section contains 56 mic inputs for the SSL room. Very clever, but with such a large room, what do you do if you want to place a microphone far away from the mic panel? Misner explains: "You can run individual mic leads if you want, but right next to the panel are big EDAC connectors, and each of those can be connected to a multicore that carries 24 mic lines on a stage box. So you hook up an EDAC and put the stage box wherever you need it."

Other features of the orchestral room include a built-in foldback system consisting of eight JBL Control One monitors distributed throughout the room (for communicating with musicians on sessions where headphones are not being used), and a $4800 movable conductor's podium with video monitoring and interfacing. "It's a serious bit of gear," says Misner, "custom designed by Martin Benge and Richard Lush, because I wouldn't have any idea what is required and would never have spent that amount of money on a podium!"

Control room design

As mentioned earlier, Studio One and Two feature identical control rooms which were jointly designed by Misner and Roger Darcy. "I worked out with Roger how big I wanted my rooms", says Misner. "One of the basic rules of good acoustics is that you need to increase your room modes – the more the better – and put them closer together, which means a big room. But a big room has other problems, such as excessive reverberation time, etc. So it's generally considered that the best control rooms have an internal volume between 8,000 to 11,000 cubic feet. We're sitting at around 9,000 cubic feet. Also, there has been a lot of design gone into the amount of absorption and diffusion in these rooms. If you walk into a room that's totally dead, like an anechoic chamber, you feel it in your ears straight away. That's wrong. In these control rooms there's no particular pressure on your ears, and that's what you're always aiming for in a good control room, a little bit dead but no sense of pressure on your ears. That can only be achieved by room size. That's why I always have to laugh when people say they have a recording studio and a great sounding room, but when you walk in it's a tiny room and you can feel it on your ears. That's not a good room..."

Construction

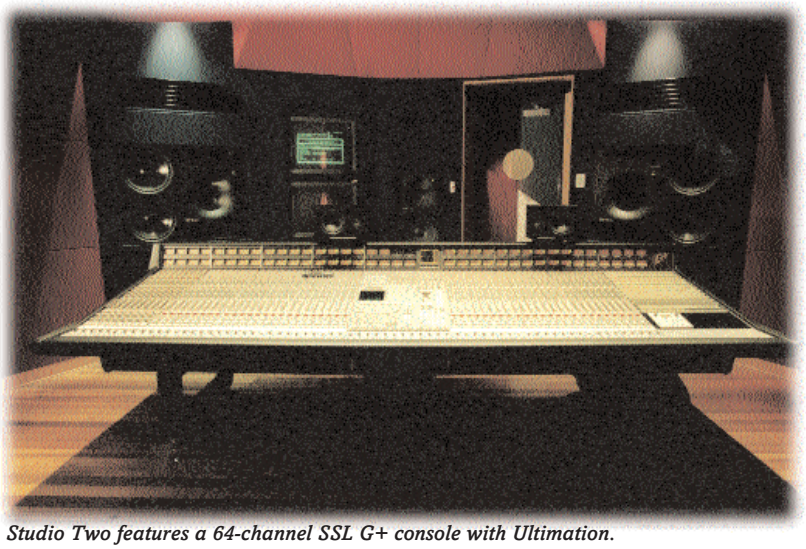
The new Studios 301 complex is actually built in two adjacent buildings. The administrative offices are housed in a former Commonwealth Bank that was built in 1901. In fact, the original vault is now the tape storage room. "Your recordings are certainly safe in there," says Misner, grinning as he pounds his fist on the vault door. "No one gets their tape out without paying!"

The studios themselves are housed in a warehouse that was originally the horse stables for the early Sydney trams. The stables were taken over by a cement factory, and were then bought by the Commonwealth Bank in 1936 for storage. As with any good studio, construction began with the floor.

"The original concrete slab in the warehouse was laid in 1926, coincidentally the same year that Studios 301 began life [as Columbia Gramophone Studios] in Homebush", notes Misner. "There is roughly 25cm to 35cm of concrete in that original floor. I've put down 10cm of blue metal and rubber on top of that, and then a 50cm layer of concrete, except in the central area, which used to be a loading dock. There's one metre of concrete in there, that's how I got it level. With the loading dock being filled there's no chance of resonance in the base because they're all at different levels. The special orchestral floor floats on top of that. The control room floors are a layer of 25cm thick concrete floating on Tico pads. So there are three layers of concrete altogether, and in the control rooms you have about 1.25 metres of concrete below you."

Isolation is always a big issue in multi-studio construction, particularly considering the three studios on the mezzanine level. To avoid sound transmission between the floors of these studios and the ceilings of Studios One and Two, the mezzanine floor is supported on huge steel beams which are mounted via Tico pads to the original concrete foundation slab, and isolated from the other concrete floor layers. In effect, the mezzanine floor is statically sitting below the other floors.

The wall construction is another area of interest. Rather than using the traditional



Studio Two features a 64-channel SSL G+ console with Ultimation.

plasterboard, brick or concrete block construction, Misner chose a system known as Rapid Wall, from Adelaide. These are 125mm thick Gyprock panels with hollow channels running through them, which have been mounted on Tico pads and filled with concrete for increased mass. Apart from the isolation offered by such construction, Rapid Wall has other advantages, too, according to Misner. "It's the only technique which can guarantee the inside shape of the control room to be within 10mm, and I needed that for my pressure cavity in each room. You could use concrete block construction, but that only gives you about 40mm accuracy because of the way it's layed."

Except for the orchestral room, all the ceilings are also made of Rapid Wall, supported on steel and pumped full of concrete. "Each room is virtually a concrete bunker sitting on rubber," says Misner. "And we've used over 1200 tubes of silicon to seal every little gap we can find. It's like a ship on water! As for total isolation, the two main control rooms are -NR10. The orchestral room is NR10, which is very good for a big space like that. You can't hear a thing."

Wiring and installation

Two years ago, Studios 301 made their in-house technical expertise available to the industry by establishing 'Signal2Noise'. Now part of the new Studios 301, Signal2Noise specialises in professional audio equipment repairs, service, studio design and installation, and custom hardware design. Steve Crane of Signal2Noise talks briefly about wiring the new facility:

"One of the great luxuries of this project was the fact that it's nice to be able to do something properly; and to do audio properly is very expensive. Wherever possible, we used the best equipment we could find to suit our purpose. We used Neutrik connectors. We used Canare for microphone cables and other situations where flexibility was required, and Klotz for fixed installation wiring.

"There are things we've made ourselves, because we couldn't find anything on the market that was right for our needs. We've made our own video crosspoint switcher for switching AES/EBU, word sync and video black. We're building a system to do 48 track transfers in the machine room, so when you're transferring from one format to another in analogue, you can cross patch, change levels, and monitor them as well. We've also built a 48 track oscillator, so you can align a tape recorder in the machine room without needing a console to supply the tones - it might sound funny, but it's actually a very practical thing!

"It's been a team effort, involving quite a few people over the last 12 months. Tom's main brief was 'do it properly, make it right'. His only real requirements were that he wanted 48 tie lines between all the studios, he wanted a central machine room, he wanted to be able to do video work, and he wanted to be able to anticipate future formats and be expanded if desired. All the detailed wiring and electrical installation stuff came from myself and the Signal2Noise team of Bruce McBean, Rick Taylor, Peter Higgs, Ian Spilsbury, Greg Cameron, Otto Ruiter, Freddie Quinzon and Bromwyn Davy. Collectively there would be over 150 years of experience between us. Our methodology has evolved over a number of years of working together, and it works very well. It's quite efficient."

In closing...

The new Studios 301 is definitely a 'no-compromise' facility, and Misner has obviously gone to great lengths to build it properly. We'll close this story with the question that has been on many lips ever since news of this new facility hit the rumour mill: Why build a facility like this here in Australia, Tom?

"Well, financially it's unviable – there's just no way that this studio can make money. It can keep going, it can keep people employed, but it can't make money. I built it because I wanted to. I started out in Australia, I have my staff in Australia, and now that I'm global with my businesses I always wanted to build a major studio here as a 'thank you', for want of a better word. It's designed to revitalise the Australian industry, to go against the trend which has been on the decline for the past 15 years or so.

"It's aimed to be in the top 10 facilities in the world. It's not aimed to be better or worse, because it becomes more arbitrary what is better or worse, but it's just in the top 10 rooms in the world. Australia's first world class facility – without any question – in terms of acoustics, surround sound, equipment, and so on. And hopefully it will help to raise our local standards.

"I work in various places overseas. I've spent a lot of time working in Nashville, and when I come back here and listen to local releases, they sound like demo mixes. Okay, people are buying them, but have you ever wondered why just about every local recording that is released overseas is mixed or re-mixed overseas? Is it because they want to spend more money re-mixing? No! It's because our local standard is just not good enough.

"The mixing standard here is not as high, that's all there is to it. It needs to be seriously increased. Without mentioning names, there are people running around here calling themselves 'engineers', but they are really only 'second engineers' when judged by the Nashville standard. But it's not like the people here are not capable of it – it's because there are no local facilities where people can improve their skills and raise their standards, so they have to go overseas. But now there's a truly world class facility here in Australia that is better than more than 90 percent of what's available overseas. So, engineers of Australia, here are the facilities... Do your thing!"

The purchase of 301

Interestingly, Tom Misner had intended to build a world class facility in Sydney long before he decided to purchase Studios 301. In fact, his new facility began life as 'Mirage', with Martin Benge as studio manager and Richard Lush as chief engineer. Mirage would've provided stiff competition for Studios 301, and may have eventually closed it down. Misner explains: "I had no doubt that once Mirage was up and going, Studios 301 would go broke. But it would've been sad to kill it off, and there were some very good people there who I wanted to work for me.

"So Martin Benge put the deal together, and I bought the whole lot: the company, the name, the equipment, I even bought the Strata Title. Then we called the 301 staff in here. They'd heard lots of rumours about Mirage and what we were building here, but they didn't know that I'd just bought them! So we showed them around the facilities, which were still under construction at the time, and then we had a meeting in the board room. I asked them what they thought of the studio. 'Well, it's nice', they said. Of course, they couldn't say 'Oh wow!' or anything else, because I was the enemy. I said 'What I'd really like to do is call this Studios 301, because 301 has got such a good name'. So they were all sitting there chuckling, thinking 'there's no chance of that'! Then I said, 'For that purpose, I have bought your studio'. Then there was silence... I have it on video. They all have a job as long as they do it my way!"