REINVENTING STUDIO 4 AT RAK

GENELEC'S IMMERSIVE MIXING SOLUTION

What would a modern, immersive studio look like if you had the opportunity to re-invent it from the ground up? The answer, at least as far as the recently revamped Studio 4 at RAK is concerned, is very different to most people's idea of what a professional studio looks like.

There's no big console at the heart of the room, to start with — although envisaged as a multi-use room, immersive mixing is a key component and exclusively a DAW-based activity in RAK 4. And then there are the speakers, lots of them, everywhere, for this is a 9.1.4 Dolby Atmos and Sony 360 room. For anyone who has not been paying much attention for the last decade — yes, Atmos really is ten-years old now — Dolby Atmos is a surround-sound format that has made its way from post-production for film and TV into the world of music production and consumer playback. Atmos expands on the common 5.1 surround format to include more surround resolution, able to position 'sound objects' anywhere within a three-dimensional sound field because it also incorporates a real height dimension. To explain the numbers: in a traditional 5.1 speaker system, you'd have a frontal stereo pair, with a dedicated centre speaker also at the front, plus a stereo pair of speakers at the rear. The 'point-one' then refers to the existence of an LFE (low-frequency effects) or sub-woofer channel (which may actually have more than one speaker attached to it, but will still be a mono source, hence 'one').

In a 9.1.4 Atmos room, however, you'd have Left, Centre and Right speakers at the front, Left and Right Wide speakers, Left and Right Surrounds, Left and Right Rear Surrounds (that's nine, if anyone is still counting), the 'point-one' low-frequency channel, plus Left and Right frontal overheads and Left and Right rear overheads. You can have even more speaker channels in an Atmos rig — cinemas often do — but practicality probably tops out at about this many for a music mixing facility!

Monitor systems and room design for acoustics are highly inter-dependent, perhaps even more than ever when you put a far greater number of speakers into a room than just the traditional stereo pair of 'main monitors'. But the opportunity to develop and optimise both aspects together generally only arises with a new-build facility, with large commercial studios understandably loath to endure the substantial period of down-time needed for a major revamp involving building work. Changes to successful rooms therefore tend to become incremental when sometimes a more radical approach would have significant benefits. Studio 4 at RAK, however, was a bit of an outlier in their facility. RAK Studios was set up in its present London location by publisher and record label owner Mickie Most in 1976, initially opening with two large tracking rooms, Studios, 1 and 2, before adding a third in 1985. Their fourth »

Maintaining the natural light in the room was one of RAK's major requirements despite the challenge of needing to improve the acoustic isolation from the street outside.

» room was designated as Mickie Most's personal studio, but never received professional design attention, although it did subsequently become a bookable room. "It didn't really have that much of a purpose," says Studio Manager Emma Townsend. "It was always the 'problem child' of all of the rooms. It was acoustically all over the place and went through several iterations of hand-me-downs of consoles. The best course of action, we decided, was to tear the whole thing down and start from an empty shell. In a project like this, you either do it properly, or you don't do it at all."

RAK had been considering converting Studio 4 into an immersive space for a number of years, but they also wanted a multi-functional room that could adapt to any project that came through the door. Emma Townsend again: "What we wanted was a great listening room, mixing room, writing room, and it very much made sense to put Atmos in there as well. We were definitely seeing a massive increase in Atmos mixing rooms, and a demand for it as well. Immersive felt very different to the old 5.1 thing because it felt like it was something that was going to be in everyone's headphones, so it did feel like it was going to be the next technological step for recording studios. If we were refurbing a studio, it seemed silly not to include the capability of immersive mixing. We didn't want it to be only an immersive mixing room, but we did want it to have that capability. And that's partly why we retained the windows — most Atmos rooms don't have

Studio Manager at RAK Emma Townsend.

"We were invited to come down and see the room. We understood there were some challenges with the space as it was and I don't think anyone had been happy with the sound of the room for a while. We had a listen and a look around and tried to identify what the challenges were. The room was orientated totally differently — there was a big SSL console, a vocal booth and a machine room in there. We knew that they wanted a world-class room, with a drive towards an Atmos room that also could be used as a programming, production and writing space, so it had to have a feeling of comfort and not feel oppressive. And we also had to have a solution for when Atmos was not in use: to be able to take the speakers away or at least minimise their impact visually on the room. Emma also told us that she wanted it to feel like part of RAK Studios, so internally the design had to work from that perspective, too."

Andy Bensley, Regional Business Development Manager at Genelec became aware of talk that RAK was looking at building a commercial immersive room and that a space had been earmarked for it. "It was all a bit hush-hush at that point, but I started speaking to Emma and Engineer Robbie Nelson about what potential system could work in their space — there were rough dimensions being thrown around. I knew that Robbie and the engineering team were going out and visiting just about every

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windows, because you don't want the reflection, but we made our builders work hard to build a room that sounds great and also retains lots of gorgeous natural light."

The acoustic design challenge

RAK invited acoustic architects Level Acoustic Design to initially consult on the acoustics and interior design work, while RAK's engineering team set about evaluating different monitor systems. Matt Ward, Technical Manager at Level Acoustic Design:

UNDERSTANDING DOLBY ATMOS

At its launch in 2012 Dolby described Atmos as "the most significant development in cinema audio since surround sound." Incorporating real overhead channels coming from above, Atmos allows the listener to be immersed in a hemisphere of sound in a suitably equipped playback environment. Of course, not everyone is going to want or be able to have a theatre-style installation in their living room, so more practical and affordable solutions are available that use a bit of audio trickery to create a similar, if the not quite the same, experience, so long as you have an Atmos-encoded source.

But you can experience Atmos via headphones, too, using binaural headphone rendering. The latter relies on the phenomenon of head-related transfer function, or HRTF, the short version of which is that your brain knows where a sound is coming from by the differences in the sound arriving at your two ears. A difference created by the fact that, no matter where the sound comes from, some part of the rest of your head will always be to some extent in the way! So, using headphones and ear buds, Dolby Atmos will even work on modern smartphones and tablets, which has helped fuel an ever-increasing interest in immersive mixes for music. Recent years have seen Atmos tracks become widely available on streaming services thanks to Dolby's partnership with Universal Music Group and adoption by major players such as Apple and Amazon.

But the production technology is not solely the province of expensive, high-end studios, however, as the DAW software programs used by artists and producers are increasingly supporting virtual immersive mixing via headphones. 'Sound objects' positioned in 3D in a virtual environment, will play back in an equivalent position when the mix is played using a fully immersive speaker system. That's one of the key components of the system and perhaps one that will ensure that it ultimately flourishes in the music market.

» variation of a larger Atmos space in London that they could — they did the rounds and had every demo on every system and every room permutation! So, although we were given a heads-up early on, we were still made to sweat a little bit!"

The RAK engineering team's diligent research included a visit to the immersive demo system at Genelec's London Experience Centre. Lead Engineer for the new Studio 4 at RAK, Robbie Nelson was already a fan of Genelec monitors: "I've used Genelec 1032s and 1031s as my main recording monitors for almost 20 years. They are my go-to and I don't like to record with anything else to be honest. The 1032s are amazing for me. With those, I know that when I take a recording away, I'll get back exactly what I've been listening to, but it's been interesting moving from the old-style design of the 1032s to the point-source design of the new 8361s. It feels a lot more even. That's one of the things we noticed when we went to Genelec's demo room [London Experience Centre]: you don't notice the crossover points at all. There's a sub drop in one of the tracks we were listening to and it was just so smooth and continuous all the way down to the bottom, which you just don't get with having a separate sub doing that low end. I'd heard these speakers before, so I knew that I liked them, but it was really helpful for me to bring the rest of the team in and just double check that what I was hearing was what everyone was hearing. The spread was a lot more with some of the other speakers that were suggested, but the Genelecs just felt more

The original Studio 4 had never received any proper acoustic design so the best course of action was to tear the whole thing down and start from an empty shell.

focussed and you had a much better stereo image. Everyone was just sort of 'wow, these are pretty special.'"

"The engineers from RAK were quite taken with some of the technology that's inherent in The Ones," recalls Andy Bensley. "Things like the very consistent and controlled dispersion characteristics and stereo imaging. What was clear from RAK is that they wanted a 'gold standard' room. They were aware of the requirements of the Dolby guidelines and Universal Music Group had been quite clear about what was expected within rooms that would set them apart to be a gold standard room, so that's what they were really shooting for. The question to us was: 'you've got a blank canvas here: in an ideal world what would you put in?' And our ethos just seemed to match theirs in terms of how they envisaged working in this format, and the studio's engineering team reached a unanimous decision to choose Genelec."

"This was the dream scenario for us," Andy continues "because the majority of Atmos rooms for music that we had done up until this point had been added on to existing stereo systems. The room already existed and the studio's outlook was 'we're not sure how long we are going to be mixing in this format, but we need to kind of make something work', so there was always a compromise involved, whether it be the room dimensions, ceiling height or existing equipment that had to be accommodated. Whereas with the RAK 4 space

we had free rein. It was one of those rare occasions where the system was going to be completely integrated into the room — building the room around the monitoring — and we hadn't seen that in a long, long time."

Andy was also really pleased to be working with Matt Ward and Level Acoustic Design's founder and principal acoustician Chris Walls again: "I knew that the acoustic design was going to be special, and it was all going to look fabulous. Everyone involved in this went all out to make it as good as it could be. I think that Level Acoustics and Studio Creations, who did the building work, are among the very best at what they do."

With a decision reached on what the speaker system should be, the project was then handed over to Level Acoustic Design to incorporate that in their plans.

There were two or three concepts considered: whether to have a monitor wall, or go with a free-standing approach because of the large W371s, and there were two or three subsequent iterations before finally settling on a configuration with a free-standing L-C-R array and then having the wide sides and rears incorporated into a flush-mount design.

The challenges in the acoustic design for Matt Ward weren't just internal: "We had to maintain the natural light into the room — that was one of RAK's major requirements — but the outside of the building is listed, so we couldn't change the window design and we had to keep the single-pane glass. We had to improve the acoustic isolation from the street, which when we initially measured the room was really not performing very well, and also devise a system that would allow us to gain access for cleaning and condensation problems, so the window units ended up being quite complex in their design. The windows are also in the worst possible place in the room both acoustically, and also from the perspective of the way we like to design mixing environments, in that they

Andy Bensley, Regional Business Development Manager at Genelec.

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ACOUSTIC
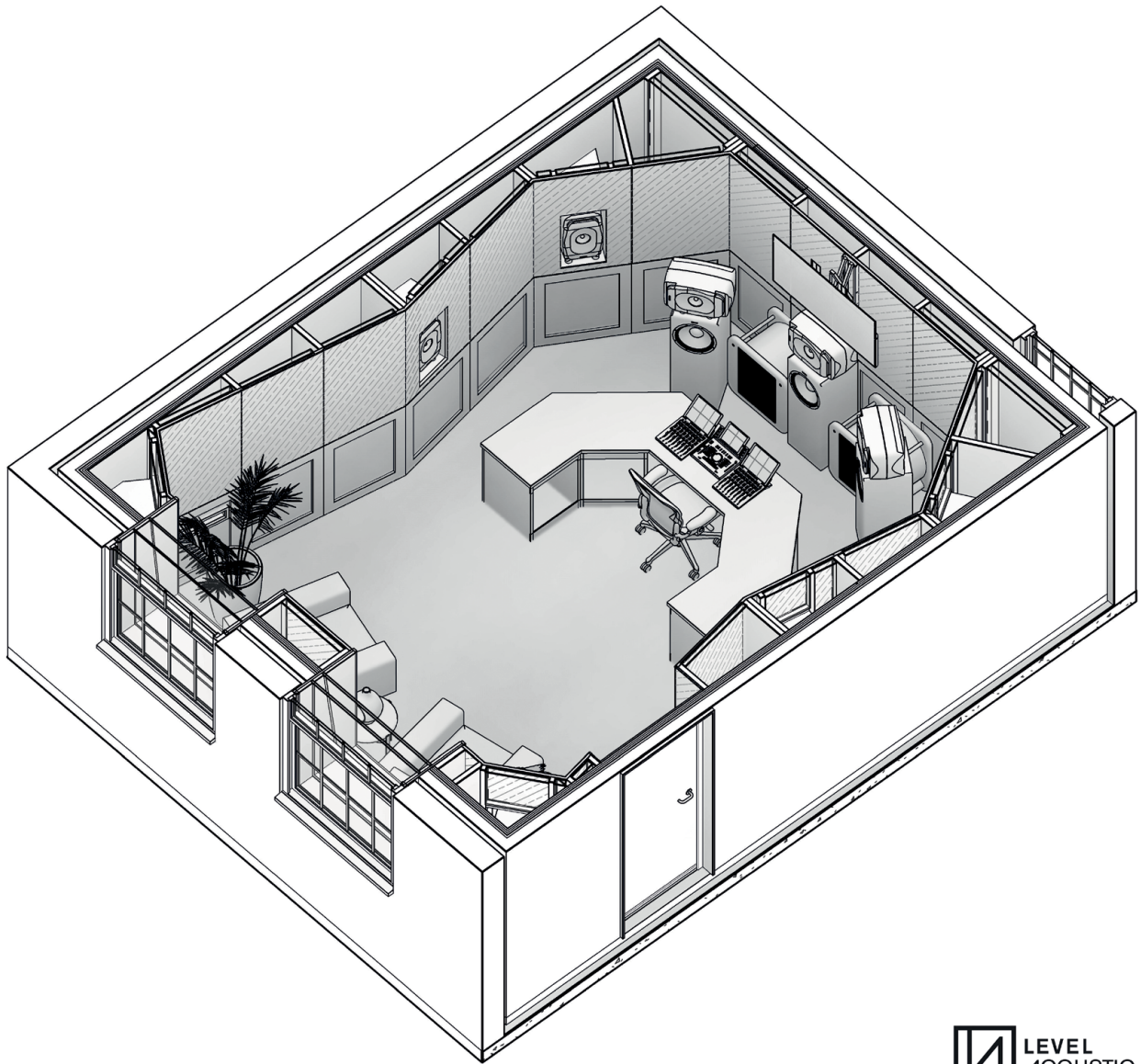
are on the rear wall. That sacrifices some of our trapping and control, so we had to find different ways to make the room work acoustically whilst accommodating these large flat, rigid surfaces on the rear wall.

"The original room also wasn't floated, so we completely took it back to a shell, took up the floor and floated a complete new structure to get the isolation we wanted, because we also needed to dramatically improve the separation from the accommodation above, which is where producers and artists sometimes stay when they are working at RAK, and there were some challenges in getting that to a reasonable level."

### Immersive design for the smaller room

Having looked at the dimensions, the team was confident the room could accommodate a 9.1.4 setup without having to compromise the locations of the speakers. Matt Ward identifies a general trend towards immersive mixing in smaller spaces: "The entry of Atmos into the home entertainment space has quite significantly changed the design of facilities for television mixing and then subsequently immersive technologies for music have changed how we design music studios. People have become much more aware of the compromises involved in mixing audio content for domestic delivery in theatre-sized rooms, because theatrical rooms have generally horn-loaded compression drivers which tend to emphasize the dialogue — there has been a lot of recent discussion in the media about TV programs where the dialogue has been muffled or incomprehensible — and we are finding there is more of a trend now to mix content for domestic delivery in smaller rooms that are closer to a living room-size space, using speaker systems that have less projection of dialogue. The challenge with smaller immersive spaces is that you've got a lot more speakers in the room and a lot more low-frequency energy, which creates issues of its own, but the average audio production space that we are engaged with is definitely getting smaller."

"We were fortunate, however, that we had enough space to shoot for that Dolby gold standard," says Andy Bensley. "To take their framework and say 'how closely can we match this?' And it's pretty much one-to-one. The initial drawings that were coming back from Level Acoustics were just really exciting, and then knowing that Justin Spier's build team at Studio Creations were involved, made it the perfect project. We'd all worked
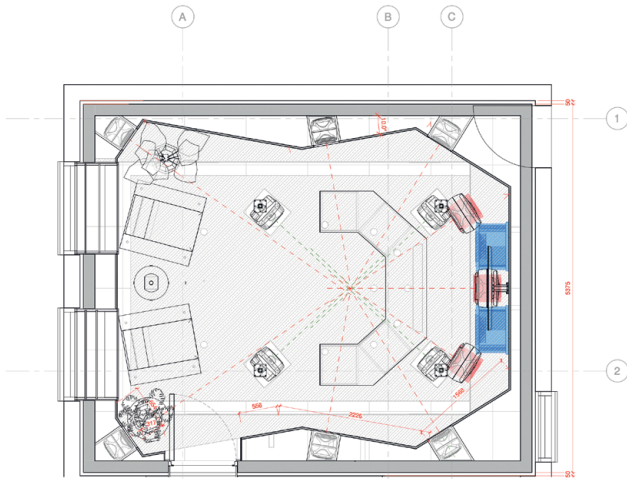
1 Studio 4 Speaker Setting Out Plan
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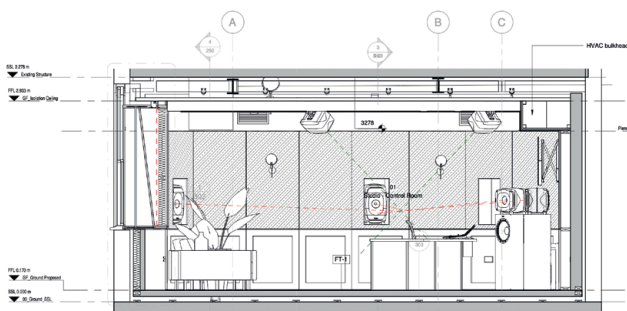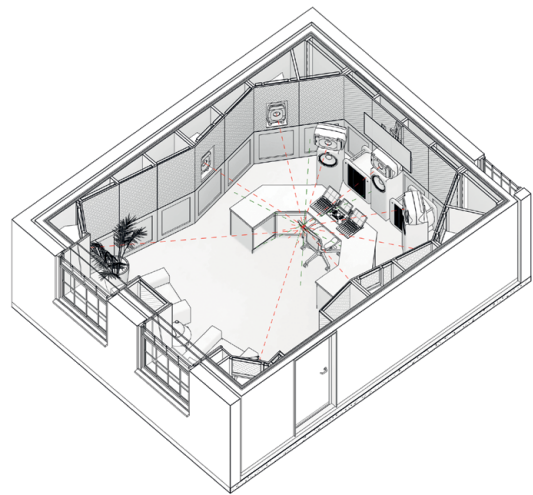
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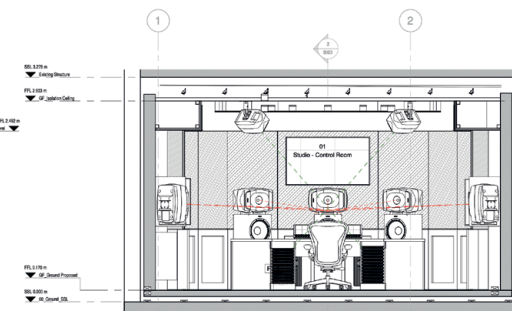
3 Studio 4 Lateral Section
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together before, so we knew that it had the foundations to be something really special.

"But the other side of this was being very aware of the history and ethos of RAK, and that it was going to be very different to Studios 1, 2 and 3 — they've still got Genelec 1032s in some of those other rooms, so this is quite a departure for them really! It was clear that they wanted something really modern and that there wasn't going to be a console in there: that was decided really early on. They wanted a room that would be great whether people were coming in just for writing or to mix in immersive formats, but they also wanted it to be able to stand on its own two feet as a stereo room as well, so if they had American engineers or artists coming over, the monitor system would be capable of being really exciting and engaging as well. Ensuring that would be the case was a big part of the process, hence having the big W371 woofer systems and the three-way 8361s in the front as well."

The full speaker line-up in RAK Studio 4 consists exclusively of 'The Ones' series: specifically nine 8361A three-way coaxial monitors in the horizontal plane formed by the front and surround positions, plus three W371A woofer systems that augment the low frequency performance of the frontal L-C-R array. Two pairs of 8351Bs provide the height

channels, with a pair of 7380A dedicated subwoofers handling the overall system's LFE-channel. All are SAM models (Smart Active Monitor) which means they feature automatic calibration to the environment, with system control and management available via GLM software (Genelec Loudspeaker Manager). This facilitates system volume control, multiple setups, level monitoring and loudness calibration. SAM systems using all SAM monitors and subwoofers can be scaled to any required playback channel count, and offer AES/EBU connectivity, plus full bass management when used with SAM subwoofers.

Matt Ward, Technical Manager at Level Acoustic Design.

GLM system calibration

Genelec's GLM networked control system allows all the speakers to be remotely controlled via standard CAT cabling, taking care of in-room frequency-response compensation and time alignment, with functions and settings stored in System Setup files or directly into each monitor. "The precision of Level Acoustics' design and Studio Creations' build provided the ideal foundation for the system to be calibrated," says Andy Bensley. "It gave us a fantastic starting point for GLM to refine the performance of the system, but the quality of the room and the »

Three W371A woofer systems augment the low-frequency performance of the 8361A three-way coaxial monitors in the frontal L-C-R array.

optimised speaker positioning is doing the vast majority of the 'heavy lifting', which means that GLM has to do far less."

"What we found in this room was that we had an abundance of everything," Matt Ward continues. "We had a very good LF response, flat down to a very low frequency, and we had a very flat high-end response post-GLM. What we wanted to do for the type of mixing in this room, and because of the desk surface surrounding the listening position, was just back off the high frequencies slightly to control them somewhat. We were also at great pains when we were running GLM to average all over the room, not just the listening position, and then calibrate the room afterwards, considering all those positions." With GLM doing the basic tuning, Richard Addis, Content Services Engineer at Dolby Laboratories, then made some final adjustments before signing it off as an Atmos room.

"We had everything in our favour here," says Andy Bensley. "An excellent speaker system going into an excellent room, and then

you've got GLM to be able to optimise that and pull that extra 5 or 10 percent out of it. But where GLM really shines in this system is with the time alignment, so when you are sitting in the sweet spot the sound is just so precise, and so clear as you pan through the arrays. But as you move off-axis and start to move around the room, the response remains super even."

Acoustic designer Matt Ward concurs: "If you sit in the sweet spot, you should be able to localise all sources and the mix around the space. If you sit out of the sweet spot you should still be immersed in the sound and the music, and that's not necessarily true in all rooms, partially because of the way the room behaves, but also because of the loudspeaker systems. What is noticeable with this system in this room is that there is a very smooth response throughout." That's obviously an

IMMERSIVE AUDIO: THE FUTURE IS HERE ALREADY

"Engineers and artists are already learning better ways of using immersive audio," says Genelec's Andy Bensley "so we are going to be seeing fewer examples of deconstructed stereo mixes where elements that are meant to work together are pulled apart and put under the microscope. Sometimes those things just don't stand up too well if the original sources aren't actually that great. It makes you realise how much the mix-bus processing was bringing to the track. When you stand the drum elements on their own, sometimes you think there's not actually a huge amount going on there. But from working with mix engineers who are really studying immersive and getting deep into it, I think things have really moved on over the last 18 months in terms of how sophisticated some of these mixes are. And we are now having artists who are revisiting their back catalogue who are saying 'I don't actually want to "respect the stereo". I want this to be a completely new version of the track: a re-imagining of it.' I think that's really exciting that people are starting to explore what can be done within that immersive space. It still has to be appropriate for the specific style of the music. It's difficult if it is a band where you are expecting that experience of everything being upfront, but if it's something a little more avant-garde, or electronica, you've got free rein to be a little more experimental with it and it feels less like a gimmick. What's going to be best for immersive moving forward is when music is conceived with this format in mind and there's no weight of expectation of what's gone before. People are not all having to invest in a large domestic playback system to hear this and experience it, and they'll make their own decisions as to whether they prefer stereo or immersive. About 98 percent of people who are listening to an immersive mix are doing so through headphones or earbuds."

Engineer Robbie Nelson agrees: "Immersive is going to pretty much live or die on headphones — most people can't even arrange two stereo speakers around their room — so the better the headphone experience gets the more people are going to get out of immersive audio. In the next few years technology is going to allow headphones to become more personal, so the experience for everyone will be able to be the same. At the minute it is a bit hit and miss as it's all based on an average head shape.

"The Apple announcement when they said they were doing spatial was a massive step change and the industry got into gear and said 'we should do this thing'. The way Amazon present spatial audio in their app is also really good, because you can switch between stereo and Atmos instantly and then you get a perspective of actually what the Atmos and spatial can do."

Andy Bensley identifies immersive recording as also having an important part to play in the future of the format: "RAK have got two exceptional acoustic spaces in Studios 1 and 2, and I know they've been experimenting with immersive mic arrays: looking at what techniques they can use to capture the space. What does a string section look like in Atmos? Capturing the room tone really makes you feel like you are in that space. Essentially the mic array is assigned one-to-one to its speaker location and you get a very faithful recording without having to do anything in post-production. You are just mimicking the speaker locations with the mic positions. It's a really powerful effect — some of the best immersive experiences I've had have been actual immersive recordings.

"Of course, as the format starts to mature, it's not inconceivable that the immersive mix will be the first mix and the stereo will be derived from that. It is the quality of the mixes that is the key thing. If you have the right people doing it, there's no reason why an immersive mix shouldn't be way more dynamic and interesting than a stereo mix, if it is done right. Some people are doing excellent work at the moment and with their mixes, if you listen to the stereo and then go to the immersive, it will have the impact that you would hope for, compared to some of the earlier mixes that were rushed out on some of the formats. It's still early on, but some people have been working in this format for a couple of years and are starting to understand the tools now and to really dig down into their mix process. The best mixes will always rise to the top and I think we are starting to hear some incredible work."

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important attribute for a multi-purpose room, as Lead Engineer for Studio 4 Robbie Nelson states: "It was very important for RAK that the room didn't just work as an Atmos and an immersive room. It needed to work as an amazing-sounding stereo mix room, and stereo writing room as well."

Family resemblance

Genelec speakers are renowned for retaining a uniformity of sound across all their models, but the system at RAK 4 takes consistency even further in being able to implement the same speaker type in the entire hemisphere. "Frontal L-C-R, wides, sides and rears are all exactly the same model," Andy Bensley explains "which helps to ensure that sounds remain tonally consistent as you position them around the space. You are not going from a three-way to a two-way, which I think really helps in terms of

selling the illusion of an immersive format. The speakers used for the height channels are also just one size down from the others, so they too retain a very similar tone as you start to move sound objects to high positions.

"The really exciting thing with this, though, was to be able to incorporate The Ones. Having that kind of consistent point-source design, that precision in terms of time-alignment between the drivers and consistent off-axis response, is geared up perfectly for this kind of application. They weren't necessarily designed with immersive in mind, but the coherence of all those drivers hitting you at the same time just adds to the immersive illusion. If you put a system like that in a good room, you get an exceptional experience. When you've got consistency throughout the space and the ability to control low frequencies in that space, you've also got more freedom to move around and you are less shackled to the one listening position. When you sit in the main sweet spot, you are very aware of what the system is telling you, but as you start to move out of that spot, it »

Acoustic and architectural design was carried out by Level Acoustic Design, whilst Studio Creations did the building work.

is still really immersive, it is just a little bit more diffused, and this is down to the consistency of the off-axis response of The Ones. When you start to pan in between speaker positions, you still get to appreciate how big objects are, and are they near or far? It's really creating stereo pairs between the L-C-R and the wides, the wides and sides, and then the sides and rears. That's what sets this system apart: the ability to accurately perceive objects in between speaker locations. It is not just like traditional 5.1 or 7.1 expanded, where you just kind of feel stuff leaning to one side. You can actually appreciate what's going on within all the phantom centres here."

Everyone involved is agreed that not having a big mixing console at the centre of the room is a huge advantage. From

SONY 360 REALITY AUDIO

Sony's 360 Reality Audio, like Dolby Atmos, is an 'object-based', immersive audio format in which audio content is transmitted along with metadata defining the position and loudness of the audio objects. Both formats are proprietary, requiring additional software for production: respectively, the 360 Reality Audio Creative Suite and Dolby Atmos Production Suite. For producers, the creative possibilities that exist are much the same in both formats, but differences emerge in the consumer experience, in that Atmos uses loudness normalisation (track-to-track playback volume levelling), whilst 360 Reality Audio does not. The HRTF (Head-Related Transfer Function) algorithm used to create spatial localisation in headphones is also different. The subjective differences, for binaural (headphone) listeners, are fairly consistently described in terms of Atmos being satisfyingly immersive, albeit spatially quite conservative, but tonally consistent, versus 360's greater localisation, at the expensive of some tonal consistency. Very few tracks are released in both formats, however, with Sony Music Entertainment unsurprisingly favouring 360 Reality Audio, whilst Universal Music Group strongly backs Dolby Atmos. Streaming services, too, tend to favour one or the other, making direct comparisons difficult.

Andy Bensley's point of view
"It's huge. I love it. Over the past few years, as we've had the next generation of control surfaces and consoles come through, you start to see the same lumps and bumps in the frequency response. You literally get to see what specific consoles do to the room. Having fewer screens and control surfaces in the way really makes a difference, and that was another exciting thing about this room, that everything was up for discussion. It wasn't like 'we've already got this console, so we've got to work round it', it was literally that the speaker system was the first consideration, and then we built everything else around that. Even the speaker heights were decided very early on in the process, so the furniture had to then respect that, so it wasn't the case that at the last minute we were going to have a huge rack coming in that was going to sit in between the listening position and the sides, for example.

"The sightlines mean you've got this kind of direct connection between you and the system when you are sitting in the sweet spot, and everything else that's in there has had to earn its place. It had to

RAK Studio 4 Lead Engineer Robbie Nelson.

» complement the system in terms of it being an immersive room and a mix room, but also in what it feels like if you want to bring four or five people in there to write. I think what's been achieved here, not just sonically and technically, but in terms of the aesthetic and the vibe of that room, is really special. It's a space that you want to spend time in that works for all these different disciplines, which is so important for a commercial facility. But it also had to complement the existing spaces at RAK — it had to feel like a RAK room, too."

Engineer Robbie Nelson agrees on the importance of that aspect of the redesign: "RAK is totally different I think from any other studio that I've been to. It's very family orientated. It doesn't feel like you are walking into an office building — some studios, the bigger studios, do — and that's a very hard thing to pin down and get right."

Of course, even the best speaker system in the world isn't much use without sources, and RAK 4 has a stellar array of equipment and software including Pro Tools via Avid MTRX and HDX 3, control surfaces, plug-ins and other mix hardware. With a monitor system of this degree of sophistication, however, the monitor controller becomes a key component. RAK could have opted to use Genelec's GLM software to control the whole system, but eventually decided to go with a Grace Design m908 immersive monitor controller hardware unit. Without having a console, this still gives them the ability to easily bring in other sources, and access things via the patchbay, and they were also very keen on running this system »
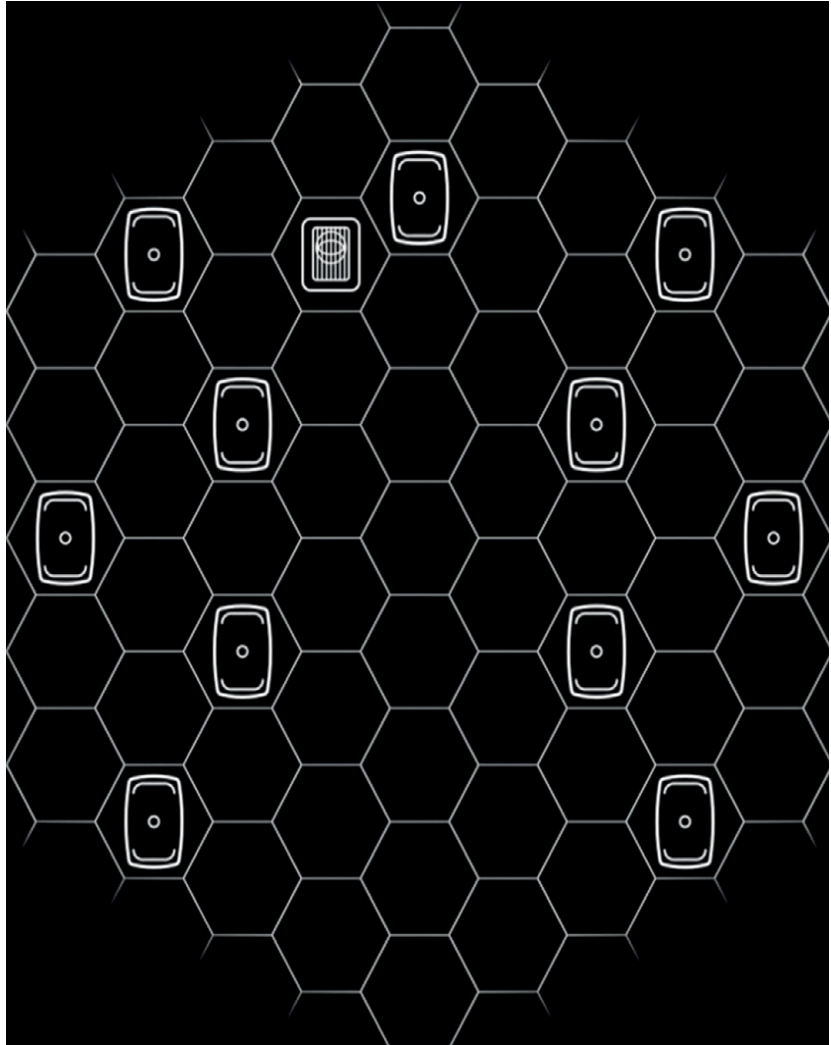
Genelec's GLM networked control system allows all the speakers to be remotely controlled via standard CAT cabling, taking care of in-room frequency-response compensation, playback level and time alignment for each individual speaker.

SPEAKER SPEC

8361A SAM™ Studio Monitor, using MDC™ (Minimum Diffraction Coaxial) Driver Technology. These are new flagship of The Ones range, and in the RAK 4 installation cover the L-C-R array, Wides, Sides and Rear Surrounds.
SPL: 118 dB
Frequency Response: 30 Hz - 43 kHz (-6 dB)
Dimensions: H 593 x W 357 x D 347 mm, with Iso-Pod™

8351B SAM™ Studio Monitor
The next size down in The Ones range is used for the ceiling-mounted height channels.
SPL: 113 dB
Frequency Response: 32 Hz - 43 kHz (-6 dB)
Dimensions: H 452 x W 287 x D 278 mm with Iso-Pod™

W371A SAM™ Woofer System
Combining the roles of low-frequency extension speaker and speaker stand, these can be seen supporting the 8361s of the L-C-R array.
SPL: 120 dB
Frequency Response: 23 Hz - 500 Hz (-6 dB)
Dimensions: H 1108 x W 400 x D 400 mm

7380A SAM™ Studio Subwoofer
A pair of these dedicated sub-woofers, deliver high SPL and extended LF response for the LFE channel.
SPL: 119 dB
Frequency Response: 16 Hz - 100 Hz (-6 dB)
Dimensions: H 685 x W 718 x D 492 mm

More 8361A speakers take care of the Wide, Surround and Rear Surround channels.

7380A SAM™ Studio Subwoofer

W371A SAM™ Woofer System

8361A SAM™ Studio Monitor
(see Speaker Spec boxout for details)

Two pairs of the slightly smaller 8351Bs provide the height channels.

via the AES digital protocol as well. Being able to have the functionality of a large-console monitor section at the heart of the room was especially important in a multi-use facility, so it had to be something fully featured with a lot of flexibility. [See RAK 4 Equipment boxout for full list] Another important inclusion for the RAK engineering team was the incorporation of both Dante and fibre networking. "There's patch points literally everywhere", says Robbie Nelson. "We wanted to be able to future proof as much as possible and make it easy for people to connect to the system. It also gives us the ability to later add Dante interfaces to the other studios and integrate everything with Studio 4, so in the future we'd be able to record a live session in Studio 1 and live mix the Atmos in Studio 4 via Dante."

"Not guessing anymore"

"Everyone's thrilled with it," says Andy Bensley, summing up the reaction. "We've heard from

RAK STUDIO 4 EQUIPMENT

Monitors
9.1.4 Atmos and Spatial mixing array;
Genelec 8361A x9 (+2 for Sony 360RA)
Genelec W371A x3
Genelec 7380A x2
Genelec 8351B x4 (ceiling)
Nearfields: ATC SCM25s/Focal SM6/
Genelec 1032As

Software And Interfacing
Pro Tools Ultimate (HDX3)
Logic Pro
AVID MTRX
Grace Designs m908
Dolby Atmos
Sony 360RA
UAD Octo x2
Full plug-in suite including Nugen up/
down mix, Liquid Sonics Lustrous
Plates and Cinematic Rooms, UAD
Ultimate, Plug-in Alliance Mega

Control
AVID Dock
AVID S1 x2

Mic Preamps
Avalon Vt737sp

API 500 series
Vintage Neve 8 channel console
UA 6176

Dynamics
API 500 Series
Chandler TG1
Empirical Labs Distressor x2
Eventide Omnipressor
STAM SSL Bus compressor
Tube Tech CL1B
UA 1176 x3
UA 6176
UA LA2A

EQ
API rack with 2x 550aEQs, 2x
550bEQs
GML 8200

Effects
AMS DMX 15-80S
Bricasti M7
Roland Dimension D
Eventide H3000
Eventide Eclipse
Lexicon 480
Lexicon PCM 70

people who have visited RAK 4 who have also had experience of other spaces, that this one is regarded as the gold standard, which was, of course, one of the goals. We feel that's validated our approach not just to the original electro-acoustic design, but also how we ensure our monitors perform in the real world — getting them back to that reference when you get them in a real room. We can talk about what we've tried to achieve in terms of design and how these systems measure in controlled conditions, but how does that work in the real world? How does that translate to the user's day-to-day work and what they experience? That's the really exciting thing. When somebody says 'this system is so coherent and so complete in every part of the frequency response that I'm not guessing anymore', that's exactly what we are hoping to achieve.

"RAK is incredibly busy. There's a huge number of projects that are moving through there. They are in a very fortunate position in terms of their heritage and their history, but it's the quality of their spaces, not just acoustically, but also the vibe and the feel of that place that's very special. There's a lot of bands going in there, working on albums for significant periods of time, and I understand that the new Studio 4 has got a high number of clients moving through

now. When it's not being used in an immersive context, the stereo system still stands up really well. With the 8361s and the W371 woofer systems, we've got a balance between something that's incredibly accurate but still really fun and inspiring to listen to. It's not sterile. You don't feel like you are listening to music through a microscope. The bass extension of that system is not only really impressive, but also incredibly complete. What you would usually see with a free-standing system is some sort of cancellation or discontinuity in the lower midrange, with the sense of impact being affected, either because of rear-wall cancellations or floor reflections. The beauty of this system is that once you measure the room it then goes through a process of optimising each of those drivers to ensure that every part of the frequency spectrum is being reproduced, resulting in an authoritative system with a lot of precision, excellent stereo imaging and a lot of power. So, in a writing context, you can play that system very loud, with a lot of detail there and a lot of excitement, but when you take rough mixes or compositions out of that room, everything will translate to other spaces. That's what's been really successful about that room: it's genuinely multi-use. It's not just a case of 'it's an amazing immersive space, but just okay for other applications': it had to be top-tier for each of its intended uses."

Studio 4 Lead Engineer Robbie Nelson is in no doubt as to both the success of the re-development, and the future of immersive formats for music. "Studio 4 is so much better now. It feels calm, it feels like walking into the nicest living room you could ever imagine that's got the best possible sound system in it, and you can work here for 12 hours a day and not really feel tired. »

RAK 'N' ROLL: THE LEGACY OF MICKIE MOST

RAK Studios was founded in its present Charlbert Street, London location by former music artist, producer, publisher and record label owner Mickie Most in 1976. Mickie's RAK Records was founded in 1969 and had a string of hits through the 1970s and early '80s, before being sold to EMI in 1986. Housed in a converted former Victorian schoolhouse, the studio complex offers four studios of differing sizes and functions. Studio Manager Emma Townsend explains: "Studio 1 tends to be used by big bands who want a certain sound, but we also do orchestral stuff in there as well. Studio 2 gets lots of indie bands and drum recording sessions, while Studio 3 is a middle-sized tracking room — they all serve a purpose as being great recording rooms. Studio 4 gives us the one thing that we were missing, — a really good listening, writing and mixing room. We've had Liam Gallagher, Green Day, and Michael Kiwanuka, who have all

been recording for album projects here, we've had lots of independent projects, and we've done an amount of orchestral recording for TV and film projects, too."

RAK Studios was used by RAK Records artists, such as Hot Chocolate, Kim Wilde, Cozy Powell, Smokie and Suzi Quatro, but has also hosted some of the biggest names in music, including David Bowie, Al Green, Michael Jackson and Pink Floyd, and more recently, Adele, Plan B, Arctic Monkeys and Shakira. Other notable recordings made at RAK over the years, include: Gallagher & Lyle *Showdown,* The Cure *Pornography*, The Jam *All Mod Cons*, Susie & The Banshees *Scream*, Simply Red *Picture Book*, The Smiths *Big Mouth Strikes Again*, Curiosity Killed the Cat *Keep Your Distance*, Ultravox *Vienna*, Radiohead *The Bends*, The Pogues *Fairytale of New York*, Take That *Beautiful World*, Sam Smith *In The Lonely Hour*.

» Genelecs, to me, are the choice of engineers. They are not as flashy maybe as some of the other options, but every engineer I know loves Genelecs, especially the new models. They translate really well. People starting mixes elsewhere are going to be able to come here and instantly know where they are with their mixes and be able to work really quickly.

"Working in immersive is still evolving, I think. It is going to take a while, like the jump from mono to stereo, people are going to take a while to really home in on what it is. But, for me immersive does give you that feeling like when you are listening to a mono recording and then you listen to a good stereo mix of it. It gives you that extra space and the feeling like you are in it, and an immersive is that times ten! Listening to an immersive track — a really good immersive track — just makes you feel much more part of it. What you previously thought was a good stereo mix, feels very flat all of a sudden after listening to an immersive mix. Six months ago, I'd have

said guitar-based music, especially rockier stuff, doesn't really work as well in Atmos, but today there are albums by Turnstile and The Black Keys in Atmos that are both amazing. They retain all the power and to my ears they're both better than the stereo version, even in binaural. We're all getting to grips with what it could be and how to mix in it, and when you do get the chance to deviate from the stereo mix it can be something special. But there will always be music that doesn't work, and sometimes the case for doing it as an immersive mix just isn't there. It should be an artistic decision rather than a process of doing it for the sake of it. In general, though, with immersive, you feel a bigger part of the music and perhaps understand more of what the artist was intending. It gives you the opportunity to just do

different things in a mix, not necessarily movement, but just pulling stuff into spaces that you didn't think were possible. It can be really creative.

"For Atmos in RAK 4, we've got it set up at the minute so the 7380s aren't actually doing too much of the work of the W371s. The subs themselves do just enough just to make you really feel the bottom end — they give that gut-wrenching movement that you want. The room is very smooth and natural sounding. It's just very comfortable and unlike pretty much any other studio I've worked in. Overall, the room has far exceeded everyone's expectation in how good it sounds. The response so far has been amazing. You turn the speakers on and play something and it blows everyone away."

Studio Manager Emma Townsend is also in no doubt as to the success of the project: "The function that we now have for Studio 4 is the missing piece of the puzzle in the RAK Studios repertoire. RAK has always invested in the equipment, and then also the team, the people that RAK invest in, encourages clients to come back time and again because it is such a nice environment in which to make a record. RAK is very much still a family business, and we are in a fortunate position in that we own this building outright. We also have a number of other music-based companies based here — a management company, PR and publishing — and they all feed into the building nicely. It's great to have a little hub of music-based companies around here.

"In our opinion we've built a studio that is going to last the next 40 years. That's what RAK does. Do it once. Do it properly. The feedback and the response to the room has been phenomenal. I was quite blown away by how positive the response has been, and we are filling up with bookings already, Atmos and otherwise. We definitely achieved everything we wanted." ///