Life in the round

Following his design and build, which has been covered in previous issues, JIM BETTERIDGE is now after a license for his Stationhouse post studios and explains his preparation and the process involved when dealing with the Dolby police.

ONLY A FEW YEARS AGO the worlds of television audio post and feature film audio post were set wide apart. Some upmarket television shows were mixed for Dolby Pro Logic offering some possibility of surround sound in the home but TV was mainly L/R stereo at best and was watched on modestly proportioned CRT sets. In contrast, the cinema was about big budgets, big screens and big sound coming from all around you; all something of a mystery to the average TV dubbing mixer.

Today with DVDs, games consoles and the threat of the HDTV broadcast revolution, plus 5.1 sound systems fairly flying out of the shops for under £50 a pop, every postproduction sound person undoubtedly sees their future in the round. And if you're purely interested in mixing music, DVD, television or radio sound there's nothing much to stop you. The technology is widely available to encode and decode the signal in Dolby, DTS or even SRS Circle Sound, as are DAWs, consoles and sound cards with multichannel outputs. If your sights are set on cinema, however, you can't be so cavalier. To mix for mainstream cinema you need the approval of the godfather of cinema surround, Ray Dolby; or at least one of Dolby Laboratories' representatives.

Dolby has achieved an amazing dominance in the cinema sound market. Having first applied the technology for the original LCRS matrix surround format in the 1970s it went on to establish a set of minimum technical criteria as a guide for cinemas wanting to show Dolby encoded films. Similarly, studio facilities wishing to mix in a Dolby format for theatrical release are required to achieve a set of minimum technical standards before Dolby will sign the official agreement that allows them to do so. The standard has been adopted internationally and is an extraordinary achievement. When cinema goers see the Dolby logo they can be fairly sure of technically good quality sound. I say fairly sure because although the requirements for a studio license are strictly maintained the guidelines for cinemas are only guidelines; there's no enforcement. Equally, when working on a Dolby mix you can move from one studio to another knowing that they'll be compatible. In a world teeming with incompatible formats that dog audio professionals most days of their lives you've got to feel a bit grateful.

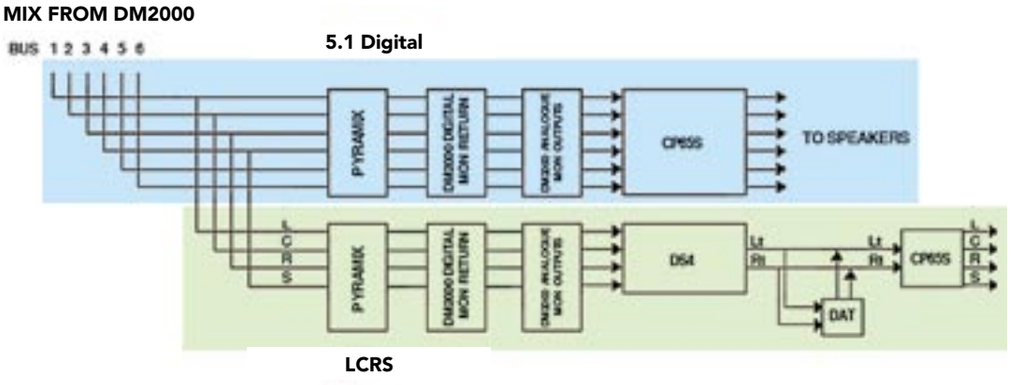
Of course, Dolby's isn't the only audio format in use in the cinema. Most major feature films these days additionally carry DTS (Digital Theatre Systems) and occasionally Sony's SDDS format, both of which are excellent and have a lot to be said for them. This does incur costs, however, and only the Dolby mix is considered a virtual must for a movie of even modest budget destined for cinematic release. It's also worth remembering that it's in Dolby certified rooms, aligned to Dolby-approved curves, that the vast majority of DTS and SDDS theatrical mixes are made and that there are no DTS or SDDS equivalents to the Dolby certification process. For simplicity, then, I will largely be limiting this discussion to Dolby technology and standards. I'll also leave aside Dolby Digital Surround EX which is identical to Dolby Digital with the addition of a centre surround channel.

If you're thinking of building or adapting a room for cinema work, Dolby is happy to send out an application pack including a 3,000-word document detailing the minimum requirements for feature film mixing. If these are too steep you might be able to attain the only slightly less rigorous requirements for a 'trailers and commercials' license. As the name suggests this licenses you to mix cinema trailers and commercials in SR or 5.1. Basically, you have to have a well presented, reasonably large (5m from back edge of your console to the screen for feature work), quiet, acoustically controlled room with a 5.1 sound system capable of certain SPLs and frequency responses. You also have to have a projected image although it no longer has to be actual celluloid. Another thing to consider is that you can't use bass management; i.e. you can't have a crossover that throws anything below a certain frequency in the five main channels into the LFE channel to provide the necessary bass extension. The LFE channel is not intended to be used as a sub bass for the whole system but only as a discrete low frequency effects channel. You also have to have a mixing console capable of mixing in 5.1 and interfacing with the Dolby equipment.

After reading the documents and talking it over with Dolby a payment of £1,200 starts the process rolling. If for any reason you fail to get certification Dolby will return £1,000 of the fee — could they be fairer? The fee normally includes an initial visit to discuss what you're going to need to do plus a final day's visit by a Dolby engineer to check and align your new system.

I quickly discovered that my control room was a metre or so too short for features and so I went for the trailers and commercials license. The room was designed and equipped by Roger Quested with surround in mind and so we were fairly confident it would measure-up acoustically and I'd employed an acoustically transparent screen to allow proper positioning of all three front speakers (*Resolution* V3.6, V3.7). Great care had been taken with the air con, the boxing-in of the projector and the banning of all noisy kit to the machine room so that the ambient noise was very low. The mixing console, a Yamaha DM2000, was also designed for 5.1 operation and I knew it would be fine. However, Dolby wisely requires a diagram of how things are going to interface before they'll give you the go ahead to purchase and take delivery of the necessary encoding/decoding kit.

Working in 5.1 with its five discrete channels is in many ways easier than the matrix soup of LCRS where the positioning of a sound is far less precise



or predictable. Hence, whereas with 5.1 there is no need to have an encode/decode system while you're mixing, with LCRS you need to monitor through the entire chain to hear what you're doing. To this end Dolby provides on loan, free of charge to every certified studio, a DS4 encoder; this also means that Dolby can take it back at any point should your standards drop too far.

Into the DS4 you feed the discrete LCRS analogue outputs of your desk and out of it comes the LtRt (Left Total, Right Total) equivalent. This is then encoded through a standard pair of Dolby SR (CAT280) noise reduction cards. It is this LtRt mix that is married to the final 35mm print to be brought back into LCRS through a Dolby decoder in the cinema. So in the studio you need to have a similar decoder through which you can monitor. For all new installations this will now tend to be the digital CP650S, although until quite recently second hand examples of the older analogue CP65S were still commonly being installed. The CP650S will cost somewhere between £6,500 and £8,500 depending on which options you choose.

I used a CP65S which, linked with a DS4, gave me an entirely analogue encoding, decoding and monitoring system. When installed in a cinema the CP65 tends to be in a rack next to the power amps and so the fact that its outputs are unbalanced isn't an issue. For a professional studio environment where everything is balanced and the power amps may be at some distance, an optional balancing board is fitted, resulting in the addition of the suffix 'S' for studio.

In addition to various stereo analogue ins and outs the DM2000 console has eight assignable analogue outputs called omni outs. One way to approach the interconnection with the console would have been to have separate paths for the record signals and the monitor signals. For this I could have used the omni outs for monitoring but would have needed to give up one of the DM2000's 16-way I-O card slots to provide more analogue outputs for the record path thereby losing I-O flexibility and potential monitor channels for my Pyramix and Akai DAWs. The other way, quite commonly implemented these days, is to use one set of analogue outputs to feed both the monitoring and the record path. To anyone used to having separate control over the record level going to the master recorder and the level for the monitors this will seem a bizarre suggestion. The thing is that when Dolby aligns your room it establishes a fixed relationship between the level 'on the master tape' and the acoustic level in the room. Thus, when you're mixing you have an absolute reference for how loud it will be in the cinema.

With complaints about excessive loudness in cinemas growing in recent years a set of guidelines has been presented by Dolby for maximum SPLs for features and a set of limits are actually enforced for commercials and trailers. Just as in television, the

latter have always been the biggest offenders in terms of high sustained levels. So as part of the installation for a commercials and trailers agreement is a Dolby loudness equivalent meter known as an Leq meter.

This takes the six analogue outputs from the desk and calculates and displays an average level over the duration of presentation as a Loudness Equivalent (Leq(m)) number. The idea is to allow occasional loud peaks and preserve exciting dynamics while avoiding the constantly high volume that seems to upset and fatigue audiences. The magic number that mustn't be exceeded for a 5.1 mix is 85dBLeq(m). So it's clear that the relationships between your meters, your monitors and the Leq(m) meter must be fixed.

With this in mind the DM2000 has 'Set SPL85' and 'Snap to SPL85' buttons to assist in the initial line-up and in returning to reference level when doing a Dolby mix. The desk will work in stereo, LCRS, 5.1 and 6.1 and allows you to assign output buses to each speaker position and also to assign an omni out to each of the buses; all this can be stored in memory. The console is generally very flexible in terms of assignable inputs and outputs but I decided anyway to bring up everything of any interest on an analogue patchbay, half-normalled for 5.1 and patchable for LCRS or stereo; time spent on a patchbay is rarely wasted.

The console has a range of other useful facilities: displays of graphics of signal paths and how the desk manages fold downs; detailed adjustment of delay, level and EQ on all outputs; and 5.1 reverbs. Bearing in mind the need to switch between stereo and surround operation there's a facility whereby the main stereo monitor outputs can be switched to become the Left and Right of the 5.1 system, using omni outs 1-4 for the remaining channels. Although probably quite workable, in practice I found it easier and more accurate to use omni outs 1-6 for 5.1 and simply repatch for stereo work. Likewise, I patch the PPMs across whichever outputs are in use and use line amps to align them, bearing in mind too that Dolby aligns its meters for -20fsd = PPM4, as opposed to the -18fsd television standard.

Although I did use the DM2000's level trims on a couple of outputs to very precisely match levels reaching the Dolby processors, the CP65S itself provides level and EQ for the monitoring chain. James Seddon from Dolby spent a day checking everything out with an array of microphones and some proprietary Dolby test equipment to achieve what is known as the Dolby X Curve — similar to the original Academy curve — on all the main channels. Happily, the installation as it stood was not far off ideal and took relatively little EQ.

One last word of caution. I'm no stranger to the soldering iron but the backs of the DS4 and CP65S are a daunting mass of barrier strip and confusing legends. Not only that but interfacing Dolby kit of differing vintages requires a certain degree of improvisation. You'll need help so budget a few hundred quid for either Dolby or a third-party specialist. Apart from Dolby I asked Norman Brown of Norbro Electronics to help straighten a few things out and also to do an inexpensive mod on the CP65S to allow its inbuilt stereo Dolby SR cards to be used for decoding, thereby requiring me to purchase only two channels for encoding.

The alignment produced a marked improvement in terms of consistency when panning a sound around the room and an overall more cinematic sound, also mixes taken from Stationhouse for completion in larger feature licensed rooms have transferred seamlessly. Perhaps more important though, the Saturday night DVD with a few beers and a few mates has never sounded better. ■

Contact

USEFUL SOURCES
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