

# AGM Digital TSS I; TSS I-D

With surround formats still in abeyance, mixing for a centre channel is becoming an imperative. **Rob James** searches for the missing link

**A**PERENNIAL CHALLENGE faced by film-dubbing mixers, and others concerned with multispeaker reproduction systems, is how to deal with stereo material. The stereo format attempts to create the illusion of sounds emerging from 'phantom' sound sources located between the 'real' left and right loudspeakers. Generally, this only works acceptably for listeners located in the central 'sweet spot' listening position. Off to either side these phantom images are pulled towards the nearest speaker, destroying the illusion.

In the cinema, and increasingly in 'home cinema' systems, three separate channels of sound are used to feed an array of left, centre and right loudspeakers intended to provide (among other things) a better experience for listeners outside the sweet spot.

When films are mixed using the analogue Dolby Surround matrix system, the encoding process can be relied on to bleed onto the centre speaker, not to mention the surround. However, the effect is not always predictable and often has a deleterious effect on the music balance. With digital multichannel surround systems there is no encoder matrix to help. Although Dolby do not condone the practice some mixers use the Dolby Surround encoder to produce a centre channel. Apart from this wheeze, the only option has been to use delays and filters to produce a hard centre.

AGM Digital's TSS process uses a Trifield-Gerzon, patented, frequency dependent, matrix-decoding method for feeding three loudspeakers. Michael Gerzon, a brilliant theoretician, did a considerable amount of research into how the ears and brain localise sounds. The theory is highly mathematical, based on orthogonal matrix theory, and a velocity-sound intensity theory of sound localisation. In Gerzon's words 'this leads to horrendously complex systems of nonlinear equations'. I do not pretend to understand the maths involved, but the bottom line is it appears to work. According to AGM, 'by careful optimisation, the stereo from the three speakers is balanced according to the various different methods used by the ears and brain to localise sounds at different frequencies.' Consequently, the German-based AGM operation has produced two 1U-high rackmount units using the theory to convert stereo source material for 3-speaker reproduction.

The TSS I and the TSS I-D Processors (equipped with a programmable centre-channel delay board) have balanced I-O on XLR connectors and a centre channel thru facility. The TSS I-D also has an RS 232 interface and is supplied with a PC software package. The delay is there to compensate for the position of the centre speaker. Settings can be stored and downloaded to a unit. Once programmed the computer can be dispensed with as the unit remembers the previous settings with the

power off. For convenience of installation there is a jumper on the processing board that makes the unit switchable via the RS232 interface using ASCII commands or the supplied software. Without the jumper, the unit goes into dumb mode, and the processing-delay is switched on or off by simply linking two of the RS232 pins. The unit then passes left, centre and right signals unprocessed, removing the requirement for external patching.

These AGM processors work, and they are ridiculously easy to use, what more is there to say about a box you simply plug in? Well, the programmability was added to offer ease of installation for live sound-reinforcement applications. The Windows software allows comparison between alternative settings using 8 memory locations, and an area where a sequence of two or more locations can be switched by simply toggling the space bar. In practice, subjective evaluation tends to produce slightly different optimum values for the centre-channel delay than mathematics would indicate. There is also a toggle between two



test modes. Left input routed to both left and right outputs, attenuated -3dB, compared to left input routed to the centre output with no attenuation. This allows the user to balance levels on live systems before allocating the centre-channel delay.

AGM claims to have adopted an analogue form over a DSP. There is no sonic penalty for having the unit purely analogue. It was decided to make it analogue and invest in making the boards small enough to enable some larger company to make a processor for domestic computer usage. It does rather a good job on a desktop PC. Apart from this, the unit boots faster than a digital equivalent and is inherently, with the right converters, 96kHz, 24-bit ready. And yes, the delay-board option is digital.

With multichannel sound-only delivery systems such as audio DVD looming large the TSS I will find other uses converting stereo material when remastering. It also has a number of sound reinforcement applications. In fact units are already installed in some 20 German fixed installations, mostly handling reproduction in conjunction with a video screen.

Ultimately, if you need to convert stereo material for 3-channel reproduction this unit may be the simplest possible way of approaching the problem. ■

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