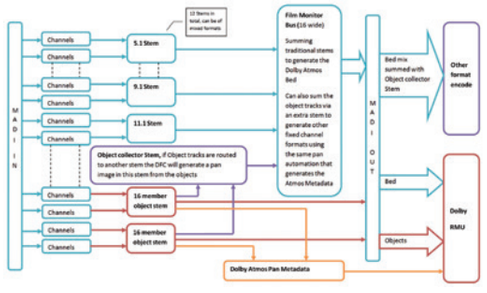
DFC goes 3D

Software Development Manager DAVID CRITCHLEY and Product Specialist JAMES TOWNEND explain how AMS Neve added an extra dimension to movie mixing

The AMS Neve DFC (Digital Film Console) has become something of a standard among the world's premier motion picture facilities (including Warner Bros, 20th Century Fox and Skywalker Sound to name a few). One of our key challenges has been adapting to the developing requirements of the studios: we wanted the DFC to be at the cutting edge of content creation in the emerging 3D surround formats that are now gaining traction for theatrical and home cinema release such as Dolby Atmos™, Auro3D™ and IMAX12™. DFC3D is designed specifically for multi-format film dubbing and post production. We wanted the DFC3D mix engine to mix natively in three Dimensional sound-space with its 16-wide stems and predubs. This is accomplished via the USP (Ultra-scale Processing) DSP Engine and several QuadMADI64 cards (4x 64-channel MADI) which reside in the signal processing rack unit.

DFC3D Stem Metering



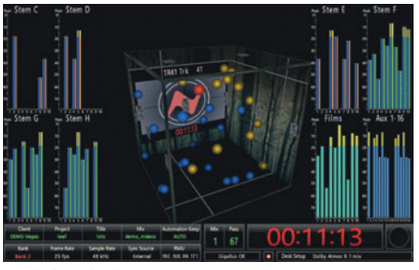
DFC3D bussing structure

The console is built from the ground up to mix large track-count feature films. Audio arrives into the console via channels, often grouped as predubs — allowing one fader and channel strip to control all the individual channels within the predub, which can then be spilled out onto the surface to manage individual elements. The channels are then routed to a combination of Stems (a selection of tracks grouped together in a particular surround format), direct to individual tracks, or to Aux sends. The console now has 192 busses for configuring stems and objects, which allows for an uncompromised workflow enabling studios to deliver multiple formats within the same timescales as a traditional 5.1 mix. With 12 stems available this means 12 16-wide stems can be individually managed, with different surround formats possible for each stem.

The console can also directly control the Dolby Atmos™ RMU (Rendering and Mastering Unit) from the DFC3D surface, generating the required panning metadata, and providing rather more comprehensive stem monitoring and solo operation than when working in-the-box with multiple systems. Dolby Atmos™ object stems and traditional stems can co-exist, and as signal routing is fully automated within DFC, objects can be combined and re-used regardless of their source — which allows for more creativity and spur-of-the-moment decision making. It also enables more efficient use of objects, which is important as Dolby now allow multiple bed stems that can bring available object counts down.

DFC3D now has new integrated DSP plugin processes including a Sub-harmonic Synthesizer, Multi-Band Compressor, and the return of the well known RMX-16 Reverb. Increased DSP capacity allows for using the new processes in existing mix setups without compromising DSP availability. The plugins were designed to provide as much control as possible using a minimum of physical controls. They are quick to setup and fully automatable, keeping the feel and pace of mixing on a console.

New high-resolution 3D-enabled metering was developed to provide the feedback required at a glance, with a unique spatial panner optimised for Dolby Atmos™ providing an efficient Atmos™ mixing experience and a quick transition from conventional mixing techniques. The "camera" angle can be infinitely controlled, and the 3d visualisation re-skinned. The metering options can be changed on the fly, and each operator can have a different meter setup so they can be tailored for the department they are working on. This also minimises distracting and/or unnecessary information from non-relevant meters and objects. Pop-up plugin displays can appear when their associated controls are touched, waveform displays are now cached so no prior play pass is needed when reloading a setup, and stem and object routing, status, MADI status and project settings can all be displayed on the master meters, allowing for quick diagnostics.



3D Spatial Panner

Channel Meter Display

The mix engine natively supports 16-wide stems and predubs, allowing true 3D panning without any compromises or workarounds. As the panning is generated depending on the destination stem format, remixes in other formats become very simple to create and all the previously-created automation can be immediately re-used in the new mix. There is enhanced online and offline automation editing, speeding up re-conforming and streamlining mix workflows. EDLs (Edit Decision Lists) can be imported directly from the picture department to conform mixes quickly which, given the many changes often required right up to the last minute in a modern movie, is vital! New Ethernet communications links were introduced which simplify installation and provide flexibility, allowing for the console surface to be easily reconfigured and allowing more diagnostics and status information. It also makes the system more resilient — e.g. in the event of power failure to the control surface the current automation data can still be saved minimising downtime.

Stem Status Display

The DFC3D console is available from 16 faders to 96 faders, configurable as 1, 2 or 3 partitions for multi-operator environments with scalable DSP and I/O to suit any application. In summary, we aimed to show with the DFC3D that it's possible for large-format consoles and DAW-centric controllers to coexist without losing the benefits of either system, and post-production businesses appreciate the 'format agnostic' model that basing a room around a console provides.

Academy and BAFTA award-winning post-production house, Goldcrest Films, already home to two DFC Gemini desks, have chosen a large-format DFC3D digital film console for a new Dolby Atmos mixing theatre in their Soho-based studios. The theatre is now fully operational and already working on a large film project using the DFC3D. The console is a dual-engine 1000-path USP engine, with a 72-fader dual-operator control surface with designed-in integration with the Avid S6 controller.