



A Quantum Leap

By: Dan Daley

DiGiCo's new Quantum 338 console goes to church

Houses of worship often ask much of their AV systems. In particular, audio consoles are regularly called upon to handle mixes for both front of house and monitors in a single desk, and the latter can often be fairly complex for churches that offer both contemporary and traditional types of services. Mt. Horeb United Methodist Church, in Lexington, South Carolina, had been managing all of that with its existing DiGiCo SD9 consoles. (The church's first SD9 was installed in November 2015 and the second in July 2016, one in each auditorium.) Seth Ely, production manager and lead audio engineer at Mt. Horeb for the last six years, was managing a single-desk environment well enough. He and audio colleague Cole Carter liked the DiGiCo software's GUI design and the console's layered workflow, which let them assign pretty much anything, anywhere. However, with often-complex music mixes in the 1,900-seat east sanctuary, which also hosts concerts and other events, the work surface was getting a bit crowded.

"We were doing monitors and front of house on the same console, and I was doing a lot of grouping for different instrument groups, and we just did not have the amount of I/O for what we were trying to do with the console and what we had

coming off the stage," Ely says, in a stream-of-consciousness-reply that mimics the workflow itself on a busy Sunday morning. "The console could get loaded up quickly. And then when we hit Christmastime or Easter, or doing other special events, we'd have even more inputs coming from stage. We quickly filled up the 96 inputs on the console."

A history With DiGiCo

Mt. Horeb—the name refers to the mountain from which, according to the Old Testament, Moses descended from with the Ten Commandments—is one of the more successful churches in the region, constructing a \$17-million main worship center that opened in 2015 on its 70-acre campus. At the time, the venue was generously outfitted with state-of-the-art audio-visual capabilities, including a pair of SD9 consoles as front-of-house mixers for the east and west worship spaces, used for contemporary and traditional types of services, respectively. But the growth of a more modern worship style, as well as larger contingents of musicians and more complex special events, meant that the SD9 in the more heavily used east auditorium was approaching its capacity limits. But, like manna from Heaven, the Quantum 338 console appeared at a propitious moment, installed and commissioned by the Atlanta office of Clark Integrated Services, along with two DiGiCo SD-Racks with 32-Bit Stadius mic pre-amps and one SD-MiNi Rack in the



Seth Ely, the church's production manager and chief audio engineer, at the Quantum 338.

church's video production room. It was the first Quantum 338 installation in a house of worship on the East Coast, and easily won over the church's audio staff, which had also been considering the SD10 and SD5-CS models.

"The challenge for this project was that the auditorium also hosts some very big touring concerts with some well-known Christian music performers, as well as the church's Christmas and Easter shows," explains Brian Morrison, head of business development for Clark Integrated Services. "In addition, their worship leader was considering adding some more musicians onstage for their Sunday services. The SD9 is a great console, but it was reaching its input limit, so the Quantum 338 was the perfect solution for them at this time."

The new 338, installed at the front-of-house position about 100' from the stage and elevated about 6' above the seats around it, brought considerably more digital real estate to the church, fulfilling Ely's main need: more inputs and outputs. The newly installed audio system brings the church 128 total inputs and 88 total outputs, along with sixteen 32-bit Stadius microphone input cards, nine Stadius line-output cards (comprising 72 outputs total), and a pair of AES output cards, adding 16 more outputs. The original SD9 used in the auditorium was slated to become the monitor-mix console, giving the church dedicated desks for

front-of-house and monitor duties for the first time. (However, that reassignment would have to wait, as we'll see in a moment.)

The Quantum 338 desk sits on an Optocore fiber loop, which makes access to the front-of-house and monitor consoles and the auditorium's d&b audiotechnik PA system simpler for visiting artists and engineers. "They can plug directly into the stage pockets and access the 32-bit pre's in the racks and the console on the network," Morrison says. "The Quantum gives the church the flexibility they need as they grow while also providing a workflow they were used to, and it hit a price point that they wanted to stay within. It was right on target in every way."

The new desk, however, was about to get a workout that would test that new real estate: The week after the console was installed in June, the church's regular monitor mixer had to leave town, rendering the audio crew short-staffed. For the new console's first several weeks in action, it would, like its predecessor, have to shoulder both front-of-house and monitor mixing.

"The 338 came along at the right time and it had the right combination of I/O and was a nice step forward in technology compared to some of the other digital concepts that we were considering at the time," says Ely. "We were confident that it could handle doing both front of house and monitors



This page and opposite, left to right: Rack options with the console include the SD-Nano Rack, SD-MiNi Rack, SD-Rack, and D2-Rack.

right away. We also felt that we would get a little bit more longevity because it is a newer console and features the latest and greatest that DiGiCo has to offer.”

Features

The “the latest and greatest” here includes DiGiCo’s recently introduced (and piquantly named) Mustard Processing channel strips (48 aboard the 338) and Spice Rack plug-in-style native FPGA processing options (an even dozen Spice Rack processing slots, including Chili 6), as well as features such as Nodal Processing and True Solo. Mustard Processing is a set of channel processing strips that work alongside standard Quantum channel processing. Each Mustard Processing strip provides a choice of two pre-amp modelers, a four-band EQ (including all-pass filters), four different boutique-style compressor models, and a gate/duck function. The Spice Rack, meanwhile, allows users to build a rack of up to eight insertable processors. The first-released of these—Chili 6, a six-band multi-band compressor—allows full control of all parameters, including DiGiCo’s release-shape control, and is useful for shaping vocals and instruments as well as focusing on problem frequencies.

“Mustard Processing is the clearest win for us as far as new features to the Quantum range,” says Ely. “That is the one that I find myself using the most,

especially the dynamic section of the Mustard channels, which is easily on par with any third-party processor that we’ve been using previously. It can be applied to any input or output channel strip. I find myself using it on channels like the bottom snare mic.

“But where we’re using it the most is on our spoken-word applications,” he continues. “On any handheld or headset microphones coming from the stage, I’ve been using the dynamic Purple Opto compressor. It has a natural-sounding gain reduction that you don’t really hear but, rather, you kind of feel. It does a good job of controlling the dynamic range of our speakers without feeling overcompressed. It’s hard to explain: You don’t hear it working, like you do with a lot of compressors, but you feel it working, which is what I want—a very clean, transparent compressor for spoken word.” That will be applied to the dozen channels of Shure ULXD wireless that Mt. Horeb deploys, with a mixture of capsules, depending on the application, including Shure Beta 58A, Neumann KK 105-S, and Earthworks WL40V. Headworn mics include a variety of transducers from Countryman and DPA.

In addition, Mustard has allowed Ely to reduce by half the amount of equalization he had been applying for speech, due to the combination of the 32-bit Stadius mic pre’s inherent clarity and the additional I/O available. “Just what we’re able to do in Mustard has

meant we need a lot less processing for it to feel natural in the way we want it to in the room,” he says.

Workflow

Ely says the single biggest impact of the Quantum 338 on workflow is its additional I/O. “Not only did we get the ability to do monitors at the front of house, but we also added I/O with this console, going from 48 to 64 outputs, and the same goes for the input side. We have buses to spare now, which is a great place to be,” he says. “Just the amount of mental [workload] that it has taken off me as an engineer and as someone who manages the audio system is fantastic. We’re getting the results we wanted sonically but using a lot less processing and effort to do so.”

Fittingly for a spiritual setting, Ely also finds it hard to describe the transparency that the 32-bit mic pre’s add to the overall sound of the room, as well as the music played, and words spoken within it. “There’s a new level of clarity across the entire mix,” he says. “You really do just have to hear it to really understand and really feel the difference in those 32-bit preamps.”

The added digital real estate makes itself apparent when building macros for fast access to complex submixes. “On the SD9, we had eight macros to work with; now, we can have up to 40 macros on the console,” he says. “I’ve been able to create macros that we



Just the Facts

- The Quantum 338 supports 128 input channels, 64 aux or subgroup buses, LR/LCR/LCRS/5.1 master buses, 24 control groups, two solo buses, and a 24 x 24 matrix—all with full channel processing. The work surface includes thirty-eight 100mm touch-sensitive faders organized in three blocks of 12 faders, plus a central section with two masters. A 17" high-res touch screen with two rows of rotary encoders is located above each fader bank for quick access to various channel parameters.

- All input channels feature gain control, phase reverse, gain tracking, digital trim (-40dB to +40dB), variable delay, DiGiTube tube emulation, high-pass and low-pass filters, four-band parametric/dynamic EQ, two dynamics sections (comp/multiband comp/de-esser and gate/ducker/external input comp), two insert points, and a direct output.

- The 64 aux/subgroup buses feature gain control, phase reverse, gain tracking, digital trim (-40dB to +40dB), DiGiTube tube emulation, high-pass and low-pass filters, eight-band EQ (configurable as eight-band parametric or four-band parametric plus four-band dynamic EQ), two dynamics sections, two insert points and a direct output.

- Thirty-six of DiGiCo's Mustard patchable processing strips have tube emulation, high-pass and low-pass filters, four-band EQ, and dual dynamics sections with emulations of classic compressors, while 64 Nodal Processors provide four-band parametric/dynamic EQ and two dynamics sections.

- Twenty-four internal stereo effects processors are capable of generating effects such as delay, chorus, pitch shift, and reverbs.

- Local I/O includes eight XLR mic/line inputs with DiGiCo 32-bit Stadius ADC, eight XLR line outputs with DiGiCo 32-bit Stadius DAC, four AES/EBU digital I/O (8x8), six MAD1 ports that can also be configured as three redundant MAD1 interfaces at 48kHz or three MAD1 interfaces at 96kHz; two DMI expansion slots, and a USB Type B audio interface for recording and playback of up to 48 channels.

- The Quantum 338 is compatible with a range of DiGiCo racks, including the SD-MiNi Rack, SD-Nano Rack, D2-Rack, and SD-Rack. DMI expansion card options include analog A/D, AES I/O, Aviom, Dante, MAD1 B or C, and Waves SoundGrid. Sample rates are 48 and 96kHz, and latency is less than 1ms from SD Rack input through the L-R bus to stage output, at 96kHz.

just didn't have the amount of work surface needed to create before, which has led to faster workflows because of more repeated actions that I no longer have to do, like channels or groups of channels that need to be

muted in rehearsal and unmuted for a Sunday morning. It's just all live on one or two buttons."

Different drums

DiGiCo's Nodal processors provide

four-band parametric/dynamic EQ and two dynamics sections. Twenty-four internal stereo FX processors are capable of generating effects such as delay, chorus, pitch shift, and reverbs. Ely says he's been using Nodal Processing



The 338 has a trio of 17", 1,000-nit, high-brightness multitouch screens, with the meter bridge and soft quick select buttons displayed on each screen,

in a limited, but important, manner thus far: on the drum kit. "I come from a studio background and I am always chasing a 'big drum room' feel from my reverbs," he explains. "So far, I'm using Nodal Processing to bypass my front-of-house dynamics processing in the node that [busses], via an aux send, each drum channel to my drum reverb. Nodal Processing allows me to bypass the EQ and compression that I use at the front of house to fit the direct channel into the mix, while allowing my drums to feel natural and unprocessed in my drum reverbs. I can then EQ and compress my drum reverb like I would a room mic. I find that I like the way that that sounds better than the heavily processed dry channel that I've had for the house before. It's giving me flexibility and new operational options that I did not have previously just using auxes. Also, if you are doing both front of house and monitors from the same console, as we have been the last few weeks, you're able to bypass that processing in the IEMs. [The church has 10 stereo Shure PSM1000 and two PSM 900 in-ear monitoring stations on stage.] That's another very clear win for Nodal Processing."

Speaking of that dual front-of-house and monitor workload, Ely adds, "The increase in outputs on this console has made it much easier to use one desk for both applications. It still allows me to have more processing for front of house,

for my subgroups, and still be able to do monitors in front of house without issue."

All of those subgroups have come in handy for the church's contemporary music. "Drums are a really good example of where lots of subgroups are very useful," he explains. "You may have multiple microphones on certain drums—for instance, two microphones on a kick, or a snare top and a snare bottom, or you may have two or three toms to work with. Being able to group those channels down to one fader and still be able to apply processing to that group as a whole is very valuable. So, for instance, I have a kick group, a snare group, a toms group, and a group for my high-hat overheads. And then I have a drum 'clean' group, which is all of my drums together. And then I have a parallel drum 'smash' group—applying parallel compression across the whole drum kit. And all within the console itself."

That grouping and assignment capability has an effect not just on the mix but on the mixer: Ely says he's been noticeably more relaxed at the board during services since the 338 arrived. "Having the extra flexibility to do what we wanted with groups and outputs has led to a greater ease while mixing for me, being able to actually buss things together and group things together the way that I want."

Ely also creates a broadcast mix directly from the front-of-

house mix, using post-fader aux sends, another way the 338 streamlines the FOH's mixer's workflow. "It takes maybe five or 10 minutes to check it and make sure everything is good in that mix on Sunday morning, and then I don't have to think much about it at all," he adds.

The little things

Finally, Ely likes the 338's aesthetic, not a minor detail when the desk is installed right in the center of the Sunday gathering. "DiGiCo has always had very good fit and finish on the consoles, including in the small details like the bumpers and even the armrest," he says. "That's all there on the 338 but they've also really stepped the hardware design up a notch. It just looks and feels nicer than any other console that I have seen. And the screen is nice and bright, so I imagine it's great outdoors. [The 338 has a trio of 17", 1,000-nit, high-brightness multitouch screens, with the meter bridge and soft quick select buttons displayed on each screen.] They even added a small, blue-tinted [computer] keyboard light under the front lip of the desk. It's a little touch but it's one of many that make working on the 338 so enjoyable." 