

# keyboard

## Yamaha AvantGrand N3 Stephen Fortner

**F**or as long as keyboards with power cords have existed, reproducing the sound and playing experience of the concert grand piano has been a Holy Grail. The Rhodes and Wurlitzer, now revered for their distinct sounds, were originally intended as acoustic piano facsimiles. Early electronic stage pianos made do with applying piano-like attack and decay to analog waveforms. Yamaha's CP60, CP70, and CP80 put pickups under real strings and hammers, doing for the piano what Les Paul did for the guitar. In 1983, the Kurzweil K250 ushered in multisampling and the nearly three decades of leapfrog we've seen since: more polyphony, more velocity layers, sympathetic resonance, sustain pedal samples, release samples . . . the list goes on.

Now, the AvantGrand attempts to leap not merely out in front, but *up* to a higher plane—such that if, say, software pianos keep pulling forward in terms of how big a hard drive they require, they still look like ants from where it sits. It does so by aiming holistically at utterly convincing your ears, eyes, fingers, and both sides of your brain that you're playing a real concert grand. Let's find out if it succeeds.

### The Digital Side

Yamaha calls the AvantGrand an "acoustic/digital hybrid," and the first sense in which that's true is that both the acoustic and digital piano divisions of the company had equal say and input.

The digital side is the tone generation. Yamaha conducted entirely new sampling sessions of their vaunted CFIIIS concert grand piano. Though they don't advertise how many velocity layers are in play (for trade secret reasons as well as a conscious decision not to market to spec-spotters), my ears guess it at well into the teens. More accurately, throughout the full playing range from *pppp* to *ffff*, I heard all of the dynamic drama and rich harmonic buildup I'm used to from the CFIIIS, but I couldn't hear any telltales whatsoever that the AvantGrand had switched from one sample set to another. Likewise, response at a given velocity from one key to another was remarkably even across the full 88 notes. Even through headphones, you can tell that this is the most meticulous and sophisticated sampling effort to date in any hardware digital piano.

The first of two grand piano presets is warm and perfectly balanced for classical and mellow jazz; the second is a bit brighter and more contemporary, but not nearly so much as to

evoke the tired "Yamaha makes a bright piano" rap. The first electric piano is a soulful Rhodes emulation, a bit on the clean side, with a nice chorus and lots of low-end bark if you dig in; the second EP is more DX7-like. These, and a harpsichord with authentic key-release noise, are all you get for non-piano sounds—you won't even find the normally obligatory General MIDI bank. It's clear that Yamaha wants as few technological distractions as possible from the message that this may as well be a real grand.

For the same reason, you won't find parameters for, say, release sample volume, sympathetic resonance, or other details you might tweak in the software world. These details are present, though, and beautifully rendered, erring on the side of subtlety. For example, if you play a staccato chord while holding down other keys (or the damper pedal), you'll hear the un-dampened "strings" resonate accordingly. Let's remember—you don't get knobs or menus for such things on a real concert grand, either.

### The Acoustic Side

The AvantGrand takes ownership of what happens to the sound *after* it comes out of the speakers in a way that no other virtual piano—hardware or software, stage or home—quite does. The basics of it are simple. Under the N3's lid are four woofer/tweeter pairs: three at left, center, and right towards the front, and one at center rear. These correspond to where Yamaha placed microphones when they were sampling the source CFIIIS piano, and what comes out of a particular speaker is what went into the respective mic. Bass frequencies are gently crossed over to four floor-

acing subwoofers on the underside of the unit; I found that this perfectly duplicates the way the bass blooms up at you from below when you play loudly in the lower range of a real grand.

It goes a little deeper than multi-channel sound. The output of each channel works in concert with the shape of the cabinet and lid, so that the various frequencies reflect, mingle in the air, and find their way to your ears along much the same trajectory they'd follow from the strings and soundboard of a real grand. Though the N2 model has fewer speakers, it follows the same principles, optimizing instead for the upright cabinet.

Done poorly, this could well result in a sound with audible "holes" in it. Yamaha, though, has done it so well that not only is the realism head and shoulders above what I've experienced sitting at other high-end "digital baby grands" with built-in speakers, but it has also absolutely spoiled me for playing piano through studio monitors. Those are fine for when I'm overdubbing or mixing piano in a multitrack project, but for solo performance and playing enjoyment, I suffered severe N3 withdrawal when the review loan period expired.

Also in the N3's acoustic arsenal is a "soundboard resonator"—a pair of transducers coupled to the hardwood underneath the music rack. Together with the TRS system under the keys (described in "Action," below), these go a long way towards reproducing the vibrations that, when playing a real grand, you feel more than hear.

### Action

The AvantGrand N3 and N2 keybeds are real grand piano actions, virtually part-for-part. So they feel exactly like the real thing in terms of weight gradation, escapement, and every tactile aspect. Under the hood, optical hammer sensors register note-ons and basic velocity information, but key sensors (also optical) know when you begin striking keys and where those keys are at any instant. The sound engine looks at all these factors to decide what tonal content you hear for any note. The result? That most ineffable virtue of a good pianist, *touch*—a rabbit-hole of physics and geometry far deeper than simply how hard you play—is as consequential on the AvantGrand as it is on the real thing. Simply put, this is the best finger-to-music connection we've yet enjoyed on a virtual piano.

The final percentile of the action's realism is TRS (Tactile Response System), a transducer underneath the keys that transmits vibrations to your fingers. You can hear it if you turn the main volume all the way down—it sounds like a muffled piano. I preferred its intensity right around medium.

### Controls and MIDI

Downplaying the tech factor yet again, Yamaha discretely packed a volume knob, three-digit LED, and ten brushed aluminum buttons into a classy little drawer that slides out from under the keyboard. This means many operations, such as playing demo songs, adjusting touch response (you get hard, medium, soft, and fixed velocity curves), and transposing, are done by holding something while pressing something else. For example, you hold the Function button, then press a key in the octave from *F#* below middle *C* to *F#* above, to transpose physical *C* to that key.

Yes, it has MIDI (five-pin jacks, not USB), so you can sequence it from a DAW if you're so inclined. You can also save single-track songs to, or play MIDI files from, a USB stick. GM and XG files will play back, but since the AvantGrands aren't multitimbral, you'll only hear what's on MIDI channel 1. Either AvantGrand also perfectly plays back DKV files for Disklavier player pianos, though there's no need for the keys to move like on a Disklavier, and again, you'll hear only the piano from a multitrack file.

### Conclusions

Yamaha has set a new benchmark for what's possible in a grand piano substitute, and by a dramatic margin. The elephant-in-the-room question is, "But is it worth the price?" One naysay is that you can find a more-than-decent baby grand for the same money or less. Having lived with an N3 for six weeks, and repeatedly compared the N3 at my local piano store to many sizes and makes of acoustic grands in the showroom, I found I needed to step into the six-foot (and at least \$30,000) league to hear something compelling enough to make me forget that the AvantGrand will never need tuning nor react to temperature and humidity, and can be turned down for quiet practice. Point being, the AvantGrand sounds and plays so authentically that even purists who've historically dismissed such standard digital piano selling points have ample reason to think again. With aplomb, Yamaha has pulled off not just a major technological leap, but a seeming contradiction: a virtual piano for people for whom nothing but a real piano will do.

