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New Features In The Yamaha AW1600

A popular DAW adds power and connectivity

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We looked at Yamaha's AW16G desktop recorder in our February 2003 issue. It was a machine that continued Yamaha's trend of developing smaller and more affordable subsets of the features in its flagship AW4416 (reviewed February 2001), offering a solid spread of capabilities for around $1000 on the street. The AW16G offered 16 simultaneous playback tracks and up to 8 simultaneous record tracks with 24-bit/44.1 kHz converters and 16-bit/44.1 kHz data storage on hard disk, a four-button Quick Loop Sampler for incorporating loops and other sampled data easily in songs, a CD burner, extensive internal effects, and more.

Yamaha's new AW1600 is an updated version of the AW16G, and at first glance—or even at second or third glance—it appears identical to its predecessor, with many if not all of the same specs and a front panel that's identical, button for button, with that of the AW16G. So what's with the name change? Is Yamaha out of ideas?

Hardly. Let's take a Reviewed & Revisited look under the hood of the AW1600 and see the hidden treats that await the curious user. There are a number of enhancements to the AW16G's original feature set that put the AW1600 in a class by itself.

On the front end

As noted in an erratum in this month's Talkback column, the AW16G did have eight mic-level inputs on board, but only two of them had XLR connectors—the others were balanced 1/4" TRS jacks. This isn't an ideal arrangement for recordists who want to hook up a bunch of mics without adapter cables, or who need more than two channels of phantom power. The AW1600 removes this limitation neatly with the inclusion of eight Neutrik Combo jacks. These clever connectors allow the user to plug in either a 1/4" TRS cable or an XLR, making all the inputs suitable for mics or for line-level sources per the user's needs. The AW1600 offers 48V phantom power for these inputs in two groups of four via rear-panel switches, so users can take advantage of the wealth of affordable condenser mics on today's market, and the AW1600 retains the separate Hi-Z 1/4" jack for Input 8, for direct guitar or bass input to the DAW.

Pitch Fix

At first, the front panel of the AW1600 looks quite different than that of the AW16G, but on closer inspection you realize that the buttons and faders are all exactly the same as the old ones, just of a different (and to this reviewer's hands, sturdier and more positive) design. There's only one function label that's different: in the Quick Navigate section, which calls up handy templates for recording and monitoring signal path settings, there's a small label marked Pitch Fix.

Pitch Fix is a new DSP feature on the AW1600 that allows for intonation correction of vocal tracks that have been recorded to hard disk, with a fair number of options ranging from the subtle to the sick. You can use it with nothing more than the AW1600 itself, but some functions are more easily accessible if you attach a small MIDI keyboard to the AW1600's MIDI In jack.

Pitch Fix works in real time as you listen, but can't be applied on the fly to a recorded part as it's sung; you have to record the vocal, put the AW1600 into Bounce Mode, select a destination V.Track (remember that the AW recorders allow multiple takes and edits via a set of 144 V.Tracks, eight for each playback Track and for the stereo Mixdown bus), and select the Pitch Fix window to set up the operation.

Working in Bounce Mode is a deliberate and practical choice: you start with a source track and create a new V.Track from the result of the pitch tweak rather than overwriting the original. This gives you plenty of chances to get the tweaks exactly right... and it will probably take a few passes before you're content, as there are a number of parameters that have to be finely adjusted to get the most musical results.

You can control how tightly the DSP forces the audio to a pitch, how quickly it acts on each note and how quickly the shift occurs, and whether or not the formants (the fixed frequency content of a voice that determine its character, such as male or female) are shifted. You can set which notes in a scale are legal destination pitches for the corrected vocal, either by clicking keys on the onscreen keyboard or holding down MIDI notes. You can also play a MIDI note line to create a harmonized version of the original vocal.

Mastering FX

The AW16G had a lot of effects processing power, with dynamics control and parametric eq on each channel plus assignable multieffects. The AW1600 adds a special set of settings for the stereo mixdown channel that it calls the Mastering Library. There are 14 presets with equalization and dynamics control optimized for everything from gentle boosting of levels to hard limiting and distortion.

Bits and bytes

The AW1600 has lots more room for data, with a 40 GB hard disk drive in place of the AW16G's 20 GB disk. This is especially important since the AW1600 allows data to be captured to disk in either 16-bit or 24-bit resolution, instead of truncating all data to 16 bits as the AW16G did. The internal processing and data paths of the AW1600 are all 32-bit, allowing maximum retained sound quality while working with 24-bit files.

Some of you may be asking at this point: "Why do you need 32 bits for your data paths and processing? The converters are 24-bit, the hard disks store 24-bit data. As it is, 24 bits is almost beyond the dynamic range of human comfort: if a full-on sound is loud enough to make your ears bleed, that 24th bit is so small as to be essentially inaudible. So what's the use of those extra 8 bits?" Well, I'm glad you asked. Having as many bits as possible for internal math is a lesson that was hard-learned in the early days of digital recording, after a whole lot of gritty, gnarly recordings were released at "CD quality 16-bit resolution." Here's the basic idea.

All digital data are strings of binary bits, which can be 0 or 1 in value, off or on. 0 and 1 are self-explanatory, but 2 is written as 10, 3 as 11, 4 as 100, 5 as 101, etc. Notice what's happening here, though, when you add these numbers together: 1 plus 1 is 2, or in binary, 1 + 1 = 10. You've added a bit of resolution; two 1-bit numbers add up to a 2-bit number. Similarly, 4 + 4 = 8 becomes 100 + 100 = 1000; two 3-bit numbers add up to a 4-bit number. And so on.

This adding-on of bits applies all the way up to adding 24-bit numbers together, which is what you're doing when you mix or add digital effects to stored audio data on your hard disk. So having more digits to do those mathematical functions means you retain more accuracy, right up until it's time to write the final result (the processed or mixed audio) back to hard disk or CD. The more bits, the less noise and crud, the better your music sounds.

USB and computer integration

This added resolution becomes especially handy when you consider the last major addition to the AW1600: a USB port on the rear panel for direct connection to a Windows or Mac OS X computer. The AW1600 shows up on the host computer's desktop as a shared disk, and its files are directly accessible to the host computer for data backup and read/ write operations. Lots of other DAWs do that, but the AW1600 adds a nifty wrinkle or two.

First, all of the audio data on the AW1600's hard disk is written in a file format that's directly understandable by computers: 32-bit WAV files. That means that programs that understand and can work with 32-bit WAVs, most prominently Steinberg's Cubase and WaveLab, can open and use its data directly, with no translation or import needed. Second, the USB connector follows the USB 2.0 spec, which means it's screaming-fast... fast enough to let a computer access data on the AW's hard disk as if it were in the computer itself, or on an external USB 2.0 or FireWire hard drive.

This is a uniquely empowering capability for the recordist who likes the depth and accuracy of computer-based editing but *doesn't* want to mess with a computer when laying down tracks. The AW1600 becomes a portable, powerful, easy-to-use recording medium with excellent preamps, lots of disk space, and built-in effects...and when you're done tracking, you just hook it up to your computer, open its hard disk in your DAW, and work with the audio right on your computer screen, saving it back to the AW or onto your computer's hard drive as needed. Way cool!

For this feature alone, the AW1600 represents a significant step forward in DAW design, but its other new tricks and added sound quality are of equal note. You'd do well to check it out.

Price: $1499

More from: Yamaha Corp. of America, 6600 Orangethorpe Ave., Buena Park, CA 90620. 714/522-9011, www.yamahaproaudio.com.

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