

REVIEWS



WHAT THE EM METERS MEAN

- 5 = Amazing; as good as it gets with current technology
- 4 = Clearly above average; very desirable
- 3 = Good, meets expectations
- 2 = Somewhat disappointing but usable
- 1 = Unacceptably flawed

KORG OASYS

Introducing the mother of all workstations.

By Geary Yelton

At last year's Winter NAMM show, after years of rumors and speculation, Korg unveiled the OASYS, its most ambitious synthesizer workstation ever. Touted as the culmination of Korg technology, it encompasses sample playback, physical modeling, DSP effects, multitrack audio and MIDI sequencing, KARMA control, and practically everything else you'd want in a self-contained music production studio. The OASYS can take you from sketching out ideas to tracking, mixing, mastering, and burning them to an audio CD completely within its confines.

The OASYS's feature list alone makes it king of the keyboard synths: a maximum 172-note polyphony, a huge variety of designer timbres, tons of

hands-on controls, plenty of expressive capabilities, and seemingly limitless programming potential. Its tilting 10.4-inch color touch screen LCD is gorgeous. With a 40 GB hard disk, a gigabyte of RAM, more than a gigabyte of onboard samples, and the ability to add more of all three, the OASYS furnishes more waveform data than any previous hardware synth.

OASYS is an acronym for Open Architecture Synthesis Studio, and its core concept is expandability. Like the OASYS PCI card that came before it (see the sidebar "Traces of OASYS"), its sound engine depends entirely on the software that it's running. Every time you power up the OASYS (which takes more than a minute), it loads its operating system, synthesis and effects algorithms, and sample banks from its hard disk. That means that you can potentially extend the OASYS's architecture by installing new software and soundware using its built-in CD drive. In other words, the OASYS can evolve into any synth that Korg's R&D team develops.

All Hands on Deck

The OASYS is available in two models, one with 76 semiweighted keys, and another with an 88-note graded hammer action.

FIG. 1: The OASYS integrates and advances numerous technologies from previous Korg workstations. From its tilting touch screen to its vector joystick and ribbon controller, it delivers a wealth of musically expressive capabilities.



With its charcoal gray exterior, silver aluminum trim, and large side-panel ventilation ports, the OASYS's striking appearance distinguishes it from other keyboards (see Fig. 1). Its front panel is a well-organized array of knobs, sliders, buttons, and joysticks. Most buttons illuminate when they're engaged. Just beneath the display are eight Velocity-sensitive pads for playing chords or individual notes (typically drum samples), and you can program them differently for each Program or Combination (Combi).

To the display's left, the OASYS's fully assignable control surface furnishes 9 sliders, 8 knobs, and 16 buttons can serve whatever mixing and modulation purposes you desire (see Fig. 2). The sliders and knobs each have 11 LEDs that make it easy to see their positions, even on a darkened stage. Five buttons determine the control surface's overall function, instantly switching it from a KARMA and a modulation panel to a mixer panel or to a Tone Adjust panel. Because the control surface can send MIDI Control Change (CC) messages, it can also control external MIDI devices and computer software.

To the far left is the vector joystick, illuminated by a glowing blue ring. Use it to pan between two stereo or mono oscillators in Program mode, to pan between four groups of Programs in Combination mode, or for almost any control function you can dream up.

The panel's right side has buttons to select Programs, Combis, and modes; to enter numeric data; and to trigger sampling. That's also where you'll find sequencer transport and tempo controls. Among a cluster of four Utility buttons is the Help button; pressing it summons text and graphics that explain the currently selected page or controller. Such functionality wouldn't be practical without the OASYS's large LCD, which makes reading help files just like reading them on a computer display.

I/O and Away

Except for a single ¼-inch headphone jack up front, all inputs and outputs are mounted on the back (see

FIG. 2: The Mixer & Modulation section is packed with assignable knobs, sliders, and buttons for controlling synth parameters, audio and MIDI tracks, and even external hardware and software.



Fig. 3). The OASYS has eight individual unbalanced ¼-inch outputs and two main unbalanced ¼-inch outputs. Two analog inputs are on balanced Neutrik combination XLR and ¼-inch jacks, each with a corresponding phantom-power switch, mic/line switch, and level knob. The other two analog inputs are unbalanced ¼-inch inputs. I was surprised that the OASYS has

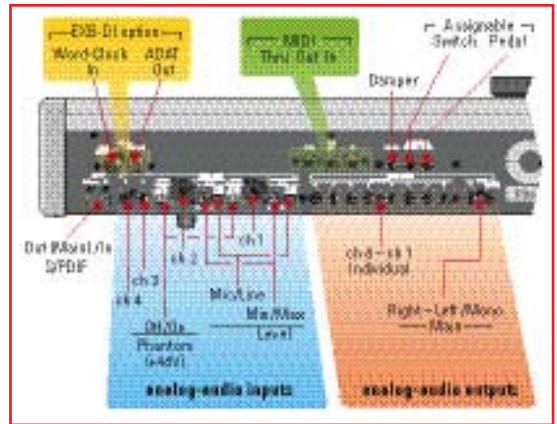


FIG. 3: Connections for analog and digital audio, MIDI, and USB 2.0 are located on the back panel. Two Neutrik XLR inputs supply switchable phantom power for condenser mics.

only two balanced inputs and no balanced outputs, especially considering its suitability for studio work.

Optical S/PDIF ports comprise the instrument's digital audio I/O (AES/EBU is not an option). The optional EXB-DI digital interface board (\$200), previously available for the Triton, adds 8-channel ADAT Lightpipe output and a BNC word-clock input. If you want to record four audio tracks into the OASYS at the same time, then you'll need to use at least two unbalanced analog inputs or the S/PDIF inputs.

Jacks for a damper pedal, an assignable pedal, and an assignable footswitch (all optional) are above the outputs alongside single MIDI In, Out, and Thru ports. Also on the back are four USB 2.0 ports for connecting external hard drives or other mass media. There's currently no support for connecting the OASYS to your computer using USB, but a flash drive is a convenient means of transferring data between them.

Organization, Man!

The OASYS is built around a 2.8 GHz Pentium 4 CPU and has a proprietary operating system based on Linux. Rather than adopting the entire Linux OS, though, Korg customized only what was needed. Unlike instruments that run a stripped-down OS originally designed for general personal computing, the OASYS OS is built from the ground up with musical applications in mind.

The OASYS ships with 1 GB of RAM. The most recent operating system (as of this writing, OS 1.10) supports a maximum of 2 GB, attained by adding a 1 GB PC2700 DDR333 or PC3200 DDR400 DIMM. The amount of RAM the OASYS has, of course, determines how much data it can load at startup. Sample data is divided into the 314 MB ROM sample bank, which comprises the standard sound set, and an EXs expansion sample library, which is loaded optionally. Korg's nomenclature is a bit confusing, though, because the wave data isn't stored in ROM. Instead,

it's loaded into RAM from the OASYS's built-in hard disk. How much RAM you use to load sounds determines how much is left over for user sampling.

Two EXs banks come standard with the OASYS. A 313 MB bank called EXs1 is an extension of the standard sound set, and a 503 MB bank called EXs2 is a beautiful multisampled Steinway concert grand piano with four Velocity layers and sampled damper resonance for each note (EXs1 contains a 130 MB version of the same piano). Because the standard 1 GB of RAM isn't enough to hold both EXs banks, you must choose which one will load when you restart the OASYS (EXs1 loads by default).

The OASYS organizes Programs and Combis into seven Internal banks and seven User banks, each with room for 128 Programs or Combis. Each Combi contains as many as 16 constituent Programs, one for each MIDI channel. Previous Korg workstations allowed only eight Programs in a Combi.

Making Synths

The OASYS's stock voice architecture, HD-1 (High Definition), is the latest incarnation of Korg's tried-and-true 16-bit, 48 kHz PCM sample-playback engine and a generation ahead of the Triton's HI (Hyper Integrated) synthesis. Its modulation capabilities are impressive, and its sound is clear and pristine.

HD-1 sounds can have two stereo or mono oscillators, each with an independent signal path. Each oscillator can layer two multisamples and generate as many as four multisamples for crossfades and Velocity splits. As you'd expect from an instrument with so much waveform data, the sample selection is enormous—everything from practically any instrument you can think of to almost 300 sound effects and well over 100 synth waveforms.

Each oscillator is routed to either one or two resonant multimode (lowpass, highpass, bandpass, or band-reject) filters, each with a dedicated envelope generator and a multitude of other modulation sources. Single filters can be 6-, 12-, or even 24 dB per octave, depending on the selected type. An onscreen image displays the filter's overall response curve. The OASYS's filters sound impressively analog, and the total absence of audible zippering when you sweep the cutoff frequency is like nothing I've ever heard on a digital synth (see **Web Clip 1**).

HD-1 has three flexible envelope generators. Each envelope has three to five levels, and four time values determine how long it takes to move to the next level. A Curve parameter governs whether a level changes in a straight segment or in a linear or an exponential curve. You can modulate an envelope's time parameters with as many as three modulation sources, and you can modulate level parameters with as many as two sources.

One key to understanding the OASYS is the concept of AMS. It stands for Alternate Modulation Source, but it's really any assignable modulation source. An AMS might be a physical control such as a joystick or a slider, a MIDI command from KARMA or from an external source, or a modulator such as an LFO or an envelope generator. Every possible modulation destination has at least one AMS input. In fact, many of them can receive control signals from AMS Mixers, which combine two or more sources and allow for shaping, quantization, and other forms of processing.

You Can Call Me AL

The OASYS's additional synthesis engines are called EXi Expansion Instruments. The OASYS originally shipped with two EXi algorithms—a virtual analog called AL-1 and a drawbar-organ emulation called CX-3—and Korg has just released a third, a plucked-string simulation called STR-1.

AL-1 effectively demonstrates just how far analog modeling has come. It offers all the warmth and character of a real analog synth with greater programmability and control. AL-1 has a maximum polyphony of 84 notes, and each voice has an 8-waveform audio oscillator, a 6-waveform audio oscillator, a 2-waveform suboscillator, live audio input, a ring modulator, and a noise generator with a fixed lowpass filter and saturation control. Five of those six sound sources are available simultaneously.

You have complete control over the start phase of each oscillator—something you won't get with a traditional analog synth. The most interesting waveform choices are Saw/Pulse and Square/Triangle, which can crossfade between two waveforms at a rate specified in the Wave Morph parameter. You can modulate the Wave Morph parameter in real time. You can also use the ring modulator to intentionally create and control aliasing, which is useful for certain electronic timbres; the OASYS is the first synth I've seen offering that capability.

In addition to all the filter types in HD-1, AL-1 features a thick and juicy resonant Multi Filter that can crossfade between any 2 of 21 filter types. You can assign a fixed value to the balance between the two types and modify it with a modulation source, the depth of which can be controlled by another mod source.

AL-1 Programs each have a dedicated step sequencer that serves as a modulation source. Use it to create

PRODUCT SUMMARY

KORG OASYS

keyboard workstation
OASYS 76 \$7,999
OASYS 88 \$8,499

PROS: Impressive sound. Excellent display. Well-designed user interface. Lots of hands-on control. Flexible synthesis engine. Computer-like multitrack recording.

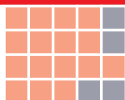
CONS: Expensive. No balanced outputs. Only two balanced inputs. No multichannel digital input. No USB connection to computer.

FEATURES

EASE OF USE

QUALITY OF SOUNDS

VALUE



MANUFACTURER

Korg
www.korg.com

melodic patterns, to automate changes in filter cutoff, or to bring any modulation destination to life. Assign each of the 32 steps a different duration to create complex rhythmic patterns. EXi Programs can host as many as three simultaneous step sequencers.

B-3 and Beyond

Korg introduced the CX-3 algorithm several years ago on an electronic drawbar organ of the same name. The OASYS's version goes so much further that it should have been given a new name. Accomplished Hammond players will love CX-3 (and roadies responsible for transporting real B-3s and Leslies will love it even more). Like Korg's CX-3 keyboard, the OASYS's CX-3 emulates every detail of a B-3 organ and a Leslie cabinet (see Fig. 4). The new CX-3 extends the original CX3 with capabilities such as percussion on the lower drawbars and the ability to save your own vibrato chorus presets.

You can split the keyboard into two upper and lower halves and assign different drawbar combinations to each. Choose a vintage or a clean tonewheel type and emulate key click, leakage, noise, and other aspects that enhance realism. Add percussion to the second or third harmonic and govern its level and decay time. In EX mode, you can add four extra drawbars to the traditional nine and assign percussion to a mix of five drawbar pitches.

CX-3 does an exceptional job of modeling a Leslie rotary-speaker cabinet. You can independently specify the slow and fast speeds of the horn and rotor and control how long they take to accelerate and decelerate. You can program the lengths of time it takes them to stop completely, and you can even set the phase at which they stop. You can also specify distances and stereo spread for a pair of simulated mics for the horn and another pair for the rotor.

Strings Attached

STR-1, the most recent addition to the OASYS's bundled EXi algorithms, is a physical model of a struck, scraped,

or plucked string. It synthesizes traditional string timbres such as guitars, basses, harps, electric pianos, and various ethnic instruments such as dulcimer and sitar, as well as unique pads and effects. User parameters control various characteristics of the virtual string such as damping, decay, dispersion, and harmonics.

A collection of 128 Programs accompanies STR-1, along with KARMA voicings that take advantage of its real-time expressive capabilities. They sound uniformly

excellent and do a good job of showing off Korg's string-modeling technology, but programming your own string sounds can be daunting. Although the Parameter Guide describes dozens of parameter choices, it doesn't clearly explain how to use many parameters to your advantage. The best way to learn, then, is to edit existing Programs and listen to what happens.

Taste a Sample

Like the Triton, the OASYS is a fully functional sampler. You can record mono or stereo samples to RAM or direct to disk through the analog or S/PDIF inputs. In addition, you can rip samples from audio CDs or import Akai, AIFF, or WAV files. The OASYS can digitally sample its own output, whether you're playing a Program, a Combi, or a Song, either live or sequenced, and with or without KARMA or effects processing. Once sampled, a sound can be used any way you use the OASYS's native samples to create multisamples, one-shots, or wave sequences. You can also time-slice, time-stretch, and perform other sample-editing procedures.

With the stock 1 GB of RAM installed, just over half is available for sampling if you don't load any expansion (EXs) samples. If you load EXs1, 202 MB is available, and if you load EXs2, you won't have any sampling memory unless you add more RAM.

Catch a Wave

One of the OASYS's most creatively stimulating features is wave sequencing, which plays a series of multisampled waveforms in succession to create evolving textures or rhythmic phrases (see Web Clip 2). The Wavestation introduced wave sequencing in 1990, and the Legacy Collection's soft synth Wavestation recently updated it. Like the Legacy Collection, the OASYS furnishes all the Wavestation's original waveforms.

Wave sequencing on the OASYS goes quite a bit further, allowing you to modulate each step's position and duration in real time. At long last, stereo waves and user samples are supported. Wave sequences can be as long as 64 steps, with user-programmable parameters for each step such as pitch, level, start offset, and crossfade time and shape. Wave sequences can loop forward or backward or alternate in direction. They can also control Program parameters such as filter cutoff or LFO rate, with two modulation settings for each step. The OASYS's internal memory banks contain 150 rewritable wave sequences, and the user banks generously provide locations for 224 of your own creations.

Improve Your KARMA

Just in case you've been asleep for the past five years, KARMA stands for Kay Algorithmic Realtime Music Architecture and was developed by inventor Stephen Kay. First introduced in Korg's Karma keyboard,

FIG. 4: CX-3 effectively duplicates every control parameter of a Hammond organ and a Leslie cabinet, from drawbar and split settings to independent horn and rotor speed.



KARMA uses software magic to generate MIDI data that triggers notes, chords, and musical gestures in response to your real-time input. For example, by playing keys and pads, pressing buttons, turning knobs, and pushing sliders, you can control phrase dynamics and rhythmic complexity or realistically simulate guitar strumming.

The sheer processing power of the OASYS allows KARMA to go considerably further than previous versions while simplifying operation. More than 2,000 Generated Effects (GEs) have been categorized into 13 Real-Time Control (RTC) Models. RTC Models standardize which controllers are available on the control surface. Learning 13 setups is much easier than

OASYS SPECIFICATIONS

Sound Engine	HD-1 sample playback, AL-1 modeled analog synth, CX-3 modeled drawbar organ, STR-1 modeled plucked string, user sampling
Maximum Polyphony	HD-1: (172) notes; AL-1: (84) notes; CX-3: (172) notes; STR-1: (32) notes; all have dynamic voice allocation
Audio Data Format	16-bit, 48 kHz mono/stereo
Analog Inputs	(2) balanced ¼" TRS/ XLR Neutrik with 48V phantom power, mic/line switches; (2) unbalanced ¼" TS
Analog Outputs	(2) unbalanced ¼" main, (8) unbalanced ¼" individual, (1) ¼" stereo headphone
Digital Audio I/O	optical S/PDIF, optional ADAT output/word-clock input
Data I/O	(4) USB 2.0, (1) MIDI In, (1) MIDI Out, (1) MIDI Thru
Control Inputs	(1) assignable switch, (1) assignable pedal, (1) damper pedal
Keyboard	Velocity; Channel Aftertouch; OASYS 76: 76-note semi-weighted synth action; OASYS 88: 88-note weighted hammer graded action
Pads	(8) programmable note/chord or Control Change, switchable Velocity
Real-Time Controllers	(1) pitch-bend/mod joystick, (1) ribbon, (1) vector joystick, (18) assignable buttons, (8) assignable knobs, (9) assignable sliders
Display	10.4" color LCD, adjustable angle
CPU	Pentium 4/2.8 GHz
RAM	1 GB, expandable to 2 GB
Included Waveform Libraries	314.6 MB preset PCM, 313.6 MB EXs1 expansion, 503 MB EXs2 (piano) expansion
Mass Storage	(1) 40 GB 2.5" hard disk, (1) CD-R/RW
Memory Locations	(1,920) Programs, (1,792) Combinations, (161) drum kits, (374) wave sequences
Effects	(185) effects types, (12) insert effects, (2) master effects, (2) Total Effects, 3-band EQ (1 in Program mode, 16 in Combi mode, 32 in Sequencer mode)
Sampling	stereo/mono user sampling; imports Akai S1000/S3000, AIFF, WAV
Audio/MIDI Sequencer	(16) audio tracks (4-track simultaneous recording), (16) MIDI tracks, (1) master track, (200) songs
KARMA	(2,048) Generated Effects, (13) Real-Time Control Models, (1) Module in Program mode, (4) Modules, (1) Master Layer in Combi and Sequencer modes
Additional Features	16-part multitimbral, General MIDI 2 support, vector synthesis, wave sequencing
Dimensions	OASYS 76: 49.84" (W) × 5.31" (H) × 19.06" (D); OASYS 88: 57.40" (W) × 5.31" (H) × 19.06" (D)
Weight	OASYS 76: 56.44 lbs.; OASYS 88: 70.99 lbs.

memorizing different control layouts for hundreds of individual GEs.

One KARMA Module containing a specific GE is available to each Program. On the original Karma, Combi shared front-panel controls; the OASYS lets you switch between four control-surface layers so that all the sliders and buttons are available to each KARMA Module. As well as the four KARMA Module Layers, a Combi or sequence has a Master Layer that controls aspects such as swing.

One OASYS-exclusive KARMA function is the ability to generate its own form of wave sequencing. Just as it can trigger different notes or modulation parameters,

KARMA automatically triggers individual waveforms and pitches in a wave sequence, one for each step in a KARMA pattern. KARMA-generated wave sequences can't cross-fade from one sample to another the way that standard wave sequences can, but you can build complex and random timbre patterns triggered by a single note or the press of a button.

Another new KARMA ability is Note Remapping, which lets you edit patterns in real time by substituting individual instruments. For example, by moving a slider, a pattern that plays a snare, kick, and hi-hat groove will play the same drum pattern on sidestick, tom, and ride cymbal (see **Web Clip 3**).

Effects Department

The OASYS supplies 185 effects algorithms running the gamut from mastering-quality dynamics and 3-band EQ to ToneWorks guitar-amp modeling and stompbox classics such as flanging and chorus. It also features the Korg O-Verb, which is one of my favorite stereo reverbs borrowed from the OASYS PCI. Other outstanding effects include the Korg O1/W synthesizer's stereo waveshaper and the Polysix's ensemble. Just about the only effect notably lacking is a convolution reverb. Considering the OASYS's native expansion capabilities, however, I would be surprised if such a reverb wasn't already well into development.

The OASYS can process Programs or even individual oscillators through as many as 12 stereo insert effects arranged in series, and you can route wet signals to either the master or individual outputs. Two stereo master effects are routed to the Send 1 and Send 2 bus, and they can be any effects type available as an insert effect. In addition, the OASYS routes the master L/R outputs directly through two Total Effects, which can also be any available effects type.

The OASYS can function as a 6-input, 10-output effects processor for external audio, whether you're processing live performances or audio recordings (see **Web Clip 4**). Additionally, the OASYS's two stereo FX Control Buses let you create side-chains to control the vocoder and dynamics processors in response to audio signals other than the signals being processed.

Hit Record

The OASYS offers 16-track audio and 16-track MIDI recording from a unified graphical user interface. You can use the front-panel mixer to control levels and panning

and to enable tracks while recording or mixing. I was surprised that you can record only four audio tracks at a time, especially considering that all six inputs (four analog and two digital) are simultaneously available for external effects processing.

You can apply any of the onboard effects to the audio tracks, and you can record dry while monitoring through effects (if desired). You can also transfer audio from computer-based DAWs by importing AIFF or WAV files into OASYS tracks. You can insert time signatures at the beginning of any measure and tempo changes anywhere in a song, and the MIDI sequencer lets you record tempo changes using a tempo-tap function. Punch-ins and punch-outs can be manual or automated. In addition, mixer automation is available, and like a computer-based DAW, the OASYS lets you make recording passes that record automation data only.

Personalized song templates prepare the OASYS for multitrack sequencing at the touch of a button by automatically assigning Programs, routing voices, and arming tracks. Song templates include a selection of rhythm patterns for assembling drum and percussion tracks. And for quickly capturing musical sketches, just press the Enter button and then press Record.

TRACES OF OASYS

In 1992, Korg first previewed a prototype of a DSP-based keyboard synth called the OASYS. It had a software-expandable architecture with PCM playback, physical modeling, additive and FM synthesis, and the first iteration of Korg's TouchView display. Other than two appearances at Winter NAMM, however—one in a private hotel suite and another on the floor a year later—it never saw the light of day outside of Korg, which used its technology as a springboard for other DSP instruments such as the WaveDrum, the Z-1, and the Trinity.

Creation of the original OASYS also led to 1999's introduction of the OASYS PCI, a DSP and audio expansion card that you could install in your computer (for a review, see the October 2000 issue of EM, available online at www.emusician.com). Though the OASYS PCI offered algorithmic synthesis and effects capabilities that were previously unattainable, its \$2,200 retail price (along with users' unrealistic expectations regarding its polyphony) prevented it from catching on.

Thanks to a well-designed user interface and detailed color graphics, the OASYS effectively duplicates the experience of recording with a computer rather than with a synthesizer. The OASYS supports 16-bit, 48 kHz recording, but because the bit rate is limited by the software and not by the A/D/A converters, 24-bit recording could someday be offered in an OS update. That's one update I would like

to see, because it would minimize bit-rate conversion when importing audio tracks and samples from a computer.

Dream Machine

Hardly anyone (outside of Korg) mentions the OASYS without bringing up its enormous price tag. Fortunately, you get what you pay for, and the OASYS delivers more than any synthesizer workstation I've ever seen—more usable features, better integration of those features, and more expandability than most of its competitors. All its wonderful attributes will only add to your frustration if

you can't afford to own one, though. Anyone who makes serious money by playing keyboards should at least consider buying an OASYS, and commercial recording studios that don't own one will be at a real disadvantage.

Korg has invested so many resources into the technology behind the OASYS that I expect it to be around for a while. The company's long history of growing its flagship instruments assures me that the OASYS's expandability is more than just marketing hype. In the next few months and years, Korg plans to offer more expansion samples, instruments, and effects. During the time that I was writing this review, Korg announced the STR-1 EXi and an OS update, both free of charge. Don't expect all future upgrades to be free, though, just as you expect to pay for your computer's new software.

I thoroughly enjoyed working with the OASYS. First and foremost, it's a blast to play. It sounds fantastic, and I had a great time exploring its abilities. It was as stable as any DSP-based synth I've ever used, and I didn't experience a single crash, unlike what I expect with a computer-based workstation. Switching Programs, effects, and modes was impressively speedy, and the large display (which always stayed remarkably cool to the touch) made it easy to see what was going on at all times.

The OASYS covers most of the territory you've grown accustomed to treading in a computer-based music-production rig. It adds impressive traits such as vector synthesis, a touch-screen interface, and realistic drawbar organ and analog synth modeling. If you're likely to take advantage of KARMA, it's sure to take your music to places it couldn't go otherwise. The built-in help is useful when you're learning your way around an instrument as deep as the OASYS.

Along with its sound quality, functionality, and flexibility, the OASYS's depth is the instrument's most impressive aspect. There are so many features that I've been able to touch on a just few. (For additional information about the OASYS, see **Web Clip 5**.) If you commit yourself to mastering the OASYS, you'll probably spend months (if not years) discovering things that you never imagined it could do.



EM associate editor Geary Yelton has been playing synths for more than 30 years and writing about them for almost as long.