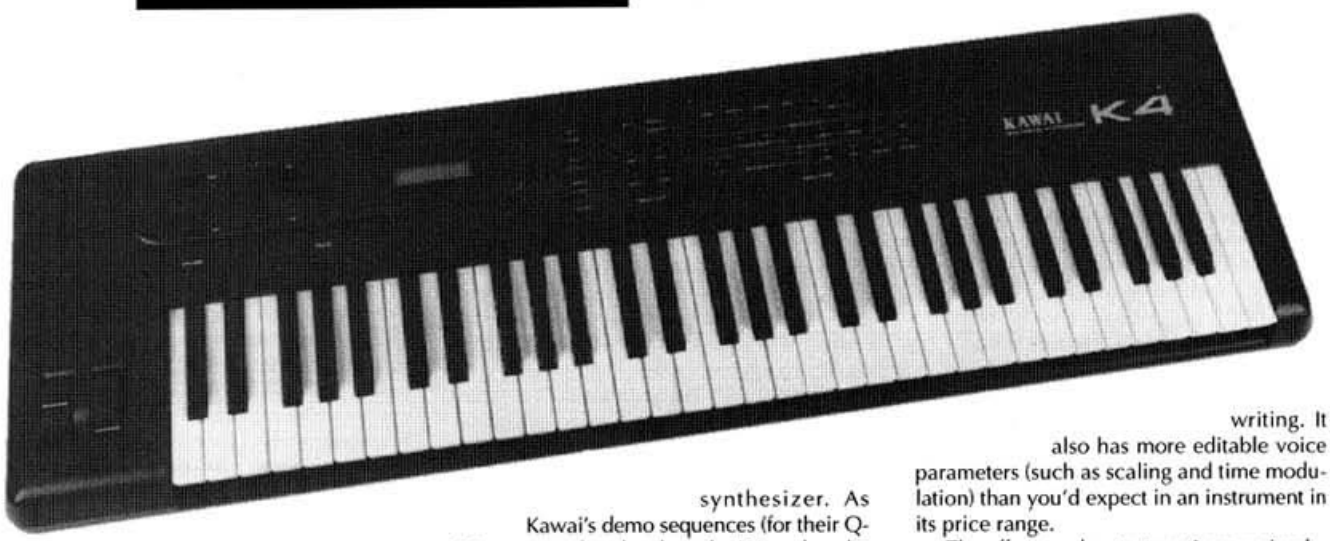
KEYBOARD REPORT



KAWAI K4

SYNTHESIZER

By Jim Aikin

THREE OR FOUR YEARS AGO, THE trend in the synthesizer market was to produce less and less expensive models. The more features you could cram into a box that had some semblance of musical sound and still sell it for under a thousand bucks, the more musicians you could attract. Today we're moving in the opposite direction. The descendants of low-end instruments like the Kawai K1 and Ensoniq ESQ-1 have mutated in grandiose directions. They've sprouted uptown features—and uptown price tags. For a review of the Ensoniq VFX-SD, an unabashed social climber, see page 136. Kawai's K4 has stayed a little closer to its working-class roots, but if you put it in a tux, somebody might mistake it for a Korg M1. It has lowpass filters (with resonance, if you please), programmable effects and output routings, and even release velocity.

No doubt about it, the K4 is a distinct improvement over the K1, as you'd expect from a price comparison ($1,445 compared to the K1II's $995). All the same, it's *not* an M1. The effects have fewer programmable parameters than most effects, the sampled waveforms are not spectacular (nor is there a slot for plugging in additional PCM cards), and the operating system responds to button-presses a bit sluggishly. But let's not quibble; it's still a very nice synthesizer. As Kawai's demo sequences (for their Q-80 sequencer) make clear, the K4 packs a *lot* of music power. Kawai has struck a careful balance between power and affordability, and in most areas we think they made the right design choices.

Overview. The K4 is another 16/8-voice synth, meaning that if you're playing a patch programmed in normal mode (two oscillators, one filter) it has 16 voices, while a patch that uses double or twin mode (four oscillators) has only eight voices. It has both single and multi playback modes; in the former, only a single patch is active across the entire keyboard, while in the latter, up to eight patches can be active simultaneously with splitting, layering, velocity splitting, and individual MIDI channel response. In addition, it has a drum section.

The operating system is a direct descendant of the K1: In edit mode, various buttons take you through series of parameters in rotating order, while a "previous" button lets you step backward through the current series. This isn't our favorite programming system, but it's easy enough to get used to. Our only real gripe is that the increment/decrement buttons are located on the opposite side of the front panel from the data slider. Of course, we were already familiar with the K1, which made the system easy to get into. The first-time synth programmer may be intimidated by the manual, which entirely fails to explain a couple of important points, and explains others in ways that make sense only *after* you understand them.

On the positive side, the K4 sports an edit recall button, which allows you to create a new patch and then flip through the ones in memory until you find one that you don't mind overwriting. It also has more editable voice parameters (such as scaling and time modulation) than you'd expect in an instrument in its price range.

The effects and output routings are implemented differently than in most instruments. Instead of having a programmable effect for each patch, you can program 32 effects independently of the 64 patches. Each patch is then given its own effect number, and uses whatever effect is stored under that number. If you later reprogram, say, effect 19, then all patches that use it will have different sounds. In the same way, there are eight output routings (including effects send levels) for the instrument as a whole, and each patch uses one of these eight. It's a workable system, and makes efficient use of memory, but it does force you to think about what you're doing—like, if I crank up the chorus depth on this patch, what other patches is it going to affect? You also have to remember, after an editing session, to save both the effect and the patch to memory.

Sounds. The K4's factory presets are mostly very impressive. A number of patches offer percussive or chime attacks with string or choral sustains—the type of thing that you could confuse for an M1 or Roland D-50 if you shut your eyes. Brass, solo synth, guitar, some solid basses, all of the usual bases are covered. There's quite a variety of percussion, and two percussion samples can be layered per key, each with its own tuning and decay, so you can mix and match your kit. The acoustic piano is marginal at best, and the electric piano, while perfectly usable, isn't going to fool anybody into thinking it's a DX7.

As in the K1, there are 254 waveforms in memory. Kawai got rid of a lot of the redundant single-cycle waves, though, and brought in a new batch that have sampled attack transients. There are many more looped samples than on

the K1, but most of these have only single-cycle loops. There are even some backwards drums. When you listen to them raw, the K4's waveforms are not a triumph of sampling technique. Some of them are good starting points for imitative patches, but others are better thought of as raw material for layered sounds. Since you can layer up to four waves per patch, it's very easy to come up with rad sounds, even if they aren't super-realistic.

We ran into some odd little sonic problems when we got into programming the K4. The filter envelope generators can be programmed for a very fast attack and decay, which is good, but with some settings they will cause occasional notes to pop or click quite badly. Also, we suggest that you not set the 1-2 balance parameter (in the effects send section) to a value of 0. There seems to be an operating system bug that causes a slow sawtooth LFO to appear in the chorus section when a patch with this value is stored in memory, even though it sounds fine when it's being edited.

Keyboard. The keyboard on the K4 appears to be perfectly standard, but appearances can be deceiving. We didn't much care for the soft, spongy feel, and we liked it less when we discovered that the black keys actually sound softer than the white keys on patches with a lot of velocity response. How much softer? That depends on how you play. In our tests, two members of the staff averaged 10 velocity points lower on the black keys, but two others averaged 25 lower. Just for fun, we looked at the velocity data from some other synths as well, and found quite a spread. On one, the black keys actually averaged 15 points *higher* in velocity than the white keys. The bottom line: Try out the K4's keyboard for yourself, using a patch, like electric piano, that's very responsive to velocity changes. If you like the response, don't worry about our test results.

The good news in the live performance department is that the K4 has a programmable list of eight linked programs. You can enter the link list and step through it by hitting the inc/dec buttons. The bad news is that the instrument's response to button presses is not instantaneous. If you want to move a parameter up by 10, for example, you can't simply tap the increment button ten times rapidly. Doing this will only move the value by 5 or 6. It's too bad there isn't an input buffer to count the number of button presses and continue updating the processor until the target value is reached.

There is such an input buffer on the keyboard, but you may wish it wasn't needed. If you program a layer with three voices or so per key, and then play some four- or five-note chords in a rapid-fire manner, you will quickly outrun the capacity of the K4 to start its notes. The response time in this situation is so sluggish that the input buffer can get backed up and continue to spit out notes for half a second or more after you stop pounding on the chords! We've never seen a synthesizer do this before.

Delving further into the rapidity with which the K4 handles input from its own keyboard and MIDI, we hooked up a sequencer and recorded some five-note chords in a regular eighth-note pattern. We then attempted to overdub two more notes in the same rhythm, using the K4's keyboard. The result: Horribly staggered rhythms that made it impossible for us to follow the sequenced performance accurately. When we examined the newly recorded track, we found that our two new notes, which had been struck at the same moment, more or less, on the keyboard, were never closer to one another than 68 milliseconds by the time they reached the sequencer (34 clocks at 240 ppq, 120 bpm). With nothing in the sequencer, we recorded some three-note chords playing a three-voice layer, and found a minimum of 24ms (12 clocks) between recorded note-ons. Admittedly, this was a torture test, but if you're planning to use the K4 as your primary sound source and your music relies on tightly phrased, expressive timing, you should give the matter some thought.

Patch Programming. The K4 offers four oscillators per voice while retaining 8-note polyphony (twice the number of oscillators found in the M1). You can choose among three configurations—normal, twin, or double mode. In normal mode, you have two oscillators and one filter at your disposal, and 16-note polyphony. In twin mode, you have four oscillators in two pairs, with each pair routed through its own lowpass filter. In double mode, all four oscillators pass through a single filter. A diagram in the manual shows this filter twice in series, so conceivably it becomes a four-pole rather than a two-pole filter, with a sharper rolloff slope. Listening tests confirm that there are fewer high harmonics in double mode than in twin mode when the waveform and all other settings remain the same.

Each filter has a four-stage (ADSR) envelope, and each oscillator has its own five-stage (DADSR) amplitude envelope. For some reason, the delay stage is programmed under a separate menu from the other segments, which led us to suppose that maybe sample start time was also being delayed. We discovered that while start time is delayed for non-looped samples, it isn't delayed for the looped ones, which means that when you delay one of these you'll lose the attack transients. Boo. When a non-looped wave's start is delayed, a small but noticeable click is introduced into the beginning of its playback, which is what you would expect to happen if it weren't being delayed quite enough, so that a bit of the initial attack were being shaved off. Since delayed attacks aren't used too often, this is not a major cause for concern, but we have heard better implementations on other instruments.

The modulation section is definitely one of the nicest parts of the instrument, and puts more expensive but less programmable instruments like the Roland U-20 to shame. Most modulation routings have ranges from –50 to +50, which is lots of resolution and allows you to perform some neat programming tricks. With a negative modulation amount from velocity to amplitude, for example, you can crossfade from one waveform to another based on velocity. Likewise, pressure crossfading and positional crossfading across the keyboard can be programmed.

When it comes to positional crossfading, you can choose among no less than eight different preset curves. This is a great resource, as it lets you bring out or suppress one oscillator (or a group of them) in a smooth manner at either end of the keyboard, or even in the middle. The only limitation here is that the curves for the first and third oscillators will be applied both to filter and amplitude. Depth is separately programmable for the two, but not the choice of curve. If you need filter tracking of the keyboard to make a sound work, this type of design could put you in a bind once in a while, but we're talking about very high-end programming here, not something that's going to be a problem every week. Most of the time you'll just choose curve 1, linear tracking, which is the only curve offered on most synths, and use it for everything.

Velocity response curves are also offered, and velocity response depth is sep-

PROS & CONS

Pros: Wide choice of waveforms, programmable effects, release velocity, resonant filters, multitimbral operation.

Cons: Sampled waveforms short with short loops. Slow note-on response to layered chords. Pops and clicks at starts of notes in some patches.

KAWAI K4

Description: Multitimbral digital synthesizer with PCM (sampled) waveforms.

Keyboard: Five octaves, *C* to *C*. Velocity, release velocity, channel pressure.

Memory: 64 single patches, 64 multi patches, 32 effects, 8 submixes. 256 waves (2Mb).

Voice Architecture: Four oscillators with individual DADSR amplitude envelopes, two resonant lowpass filters with ADSR envelopes, two LFOs, amplitude modulation, choice of keyboard scaling curves, envelope time modulation from velocity and keyboard position.

Features: Built-in effects and drum kit. Choice of velocity response curves. Positional and velocity crossfading and switching. Edit recall button. Drum parameter and sound parameter copy utilities. Programmable stereo pan position for single patches.

Interfacing: L and R/mono audio outs, headphone out, hold pedal in, power supply in (12-volt tip-negative DC). Memory card slot. MIDI in/out/thru.

Dimensions: 40" x 12" x 3-1/2". 16 lbs.

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