

BIG BRIAR'S

Minimoog[®] The Most Popular Analog Monosynth Voyager[®]

Reborn *by Mark Vail*

After several years of dreaming about owning a synthesizer, I finally made it happen in 1976. I knew I wanted a Moog, and considered the then-new Multimooog and Micromooog — both of which were within my price range. I drooled over the Polymoog, too, but that was way over my head. What I really wanted, though, was a Minimoog. Thank goodness I held out for it. I found a slightly used one in a reputable music store where some guy had returned it after deciding a set of drums would better suit his style. His loss, my huge gain.

That Minimoog is still a prized possession. Although I have newer synths that get more use these days, it's my favorite synthesizer of all time. Nothing else has proven as intuitive, immediately gratifying, musically inspiring, and sonically inviting as my Minimoog.

That's why, 20 years after the original went out of production, I'm totally jazzed that the man himself — Bob Moog — has a new version of the Minimoog ready for you and the Twenty-First Century. Introducing the **Minimoog Voyager!**

Let's take a look at the original Minimoog and the new Minimoog Voyager to see what has remained the same and what's changed.

USER INTERFACE

In some ways, the Voyager shares quite a few similarities with the original Minimoog. Both feature lots of lovely, high-quality wood in their cabinetry. Both have lots of knobs and switches for user interaction, and they're arranged and coordinated in sensible groups like separate modules on a modular synthesizer. On both instruments, traditional pitchbend and modulation wheels — which over the years have proven to be among the most expressive hand-operated controllers

— are located beyond the left end of the keyboard. At only 44 notes, the keyboard may seem truncated, but it's the perfect size for playing leads and bass lines, and it allows the instrument to be more portable than a synth with a 61-note or larger keyboard.

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Similarities in the user interface pretty much end there. Although both synths have the same sized keyboard, the original Minimoog's keys respond just like an organ: note on, note off, and that's it. In contrast, the Voyager's keyboard senses both velocity and pressure, which are critical for expressive performance. In addition, the Voyager sports a superbly crafted synth-action keyboard from the world's most prolific keyboard manufacturer, Fatar. And although the Voyager is a monophonic synthesizer, the keyboard transmits chords you play via MIDI, so you'll be able to layer the synth's exquisite voice with timbres from external MIDI instruments.

Have you ever been frustrated by a synthesizer because its front panel wasn't at a decent angle for you to work with its controls? That was



never a problem with the original Minimoog because of the way Bob, Jim Scott, Bill Hemsath, and Chad Hunt designed it. Its front panel can be locked in-place at various angles, from flat to nearly vertical — whatever pleases the synthesist. Very few synthesizers have copied this unique feature, but it's been duplicated on the Voyager. Yay! Not only that, but smack in the middle of the control panel you'll find a backlit dot-matrix display, which collaborates with adjacent buttons for programming functions and recall hundreds of patches from the internal memory.

Directly below the Voyager's programming interface is a three-dimensional Tactex[®] touchpad. Put your finger on the pad and move it around: Not only will the Voyager track your touch along the X (horizontal) and Y (vertical) axes, but it also senses how hard you press. Your interactions with the pad can be assigned to control specific aspects of the synthesizer's sound, serving as an innovative and powerful performance tool.

OSCILLATORS — THE SOUND STARTS HERE

One of the important performance synthesizer standards set by the Minimoog was the use of three oscillators. Anyone who has compared the sound of a two-oscillator synth with one that has three oscillators will immediately realize how

much thicker and stronger the three-oscillator synth can sound. The only limitation in the original Minimoog is the fact that the third oscillator also serves as the LFO. You have to choose between the killer three-oscillator sound without the benefit of a low-frequency oscillator for modulation or a slightly milder sound with a modulating LFO. We'll cover the Voyager's dedicated LFO below, but it's important to realize up front that this synth is a true three-oscillator barn-burner.

All three of the original Minimoog's VCOs can oscillate at frequencies over six overlapping ranges. The lowest setting, labeled "LO," covers frequencies in the LFO range. That is, you'll hear a series of clicks below the generally accepted bottom end of human hearing, which is 20Hz (or 20 cycles per second), which you might find useful for creating some sort of polyrhythmic pattern. Other frequency ranges are indicated in traditional organ-style foot markings: 32', 16', 8', 4', and 2'. The numbers refer to the length of pipe used to create the lowest note on an organ keyboard.

The six ranges for the Voyager's oscillators are an octave higher: 32', 16', 8', 4', 2', and 1'. Gone is the little-used LO setting, although oscillator 3 can be switched to the sub-octave/LFO range using the 3 FREQ switch. Note as well that an octave has been added to the range of each oscillator at the top end.

Similar on both synthesizers are the FREQUENCY knobs for oscillators 2 and 3, allowing you to tune their pitches up to a fifth above or below oscillator 1. The frequencies of all three oscillators are affected by the setting of the master FINE TUNING knob. Missing from the Voyager's control panel is the A-440Hz tuning switch that appears on the original Minimoog. As with many synthesizers in those days, the oscillators tend to drift — requiring frequent retuning to a reference pitch during performances. The Voyager's oscillators are much more stable than those in the original Minimoog, so they'll stay in tune.

Waveform selection for each oscillator is quite different on the two synths. Whereas the original Minimoog offers rotary switches for selecting specific waveforms such as triangular, sawtooth, and square, the Voyager's WAVE knobs turn smoothly, allowing you to fade from one waveshape to another. "The Micromoog was like that," Bob explains. "The Voyager works in a similar manner, but it incorporates a more extensive lineup of waveforms. The Micromoog offered sawtooth through rectangular. This starts with with triangular, then goes to sawtooth, and then to rectangular. On the original Minimoog,

there's a switch position that contains a mix of triangular and sawtooth. This one goes continuously from pure triangle to pure sawtooth, and from there on it's like the Micromoog. As you turn it more, the sawtooth begins to get clipped out and a rectangular wave comes in, then the rectangular wave spreads so that you can go from a narrow rectangular waveform into a square wave." Also, the Minimoog wasn't capable of performing pulse-width modulation, but it's easily performed on the Voyager.

That's not nearly the extent to which the Voyager goes with oscillator tricks that weren't available on the original Minimoog. Flip the 1-2 SYNC switch to the on position and oscillator 2 will be hard-synced to oscillator 1, opening up new timbral possibilities.

In addition there's a dedicated switch for frequency-modulating oscillator 1 from oscillator 3. "But wait," I hear you say. "You could frequency modulate oscillators 1 and 2 from oscillator 3 on the original Minimoog." True, and you could get some outlandish bell-like and distorted tones that way, too. But this is different. "This is linear frequency modulation," Bob tells me, "which is different than what it is on the original Minimoog. The pitch of oscillator 1 won't change, but the tone color will. It's the analog emulation of two-operator FM synthesis."

Then I find out oscillator 3 will function normally even while it's serving as a frequency modulator for oscillator 1. That's extremely excellent because you'll have an extra voice with which to play timbral games.

Another switch in the Voyager's Oscillators module works identically to a switch on the original Minimoog; they're just labeled differently. The Voyager's 3 KB CONT switch functions like the Minimoog's OSC 3 CONTROL: When either is turned to the off position, oscillator 3 will serve as a drone. Playing a note on the keyboard will trigger the oscillator, but the pitch will be determined by the oscillator's FREQUENCY knob, not the keyboard.

THE NAME OF THE GAME IS MODULATION

Compared to the earthy modulation capabilities of the original Minimoog, the Voyager takes you to Saturn. From the Voyager's front panel alone, you'll find multiple new possibilities. When you factor in the patchability afforded by jacks on the rear panel, there's a wealth of opportunities worthy of exploration.

Although the Voyager's dedicated LFO frees up oscillator 3 for sound production instead of modulation, it can still serve as a modulation source besides the FM routine we just discussed.

The LFO allows you to specify rates from 0.2 to 50Hz. The high end extends into the audible frequency range, which adds to the timbral flexibility of the instrument. In addition, the LFO can be synchronized to the keyboard, MIDI clock, or an external gate. Not only can the LFO produce triangular and square waveforms — both of which are available simultaneously for internal and external modulation applications — but it also produces two types of sample-and-hold functions: one stepped, the other smooth. Sample-and-hold is a beautiful thing, and it's so cool to have it built into the Voyager synth.

Let's talk about envelopes. You may be familiar with the most common type, the ADSR (attack, decay, sustain, release). Strictly speak-



ing, the original Minimoog comes up a segment short. It has sort of glorified ADS envelopes, along with a Decay switch that can be enabled to provide a pseudo-release segment. With Decay engaged, the envelopes will have a tail equal to the times set by the Decay knobs; otherwise, the envelopes will come to an abrupt ending upon key release. In Tom Rhea's excellent manual for the original Minimoog, the decay segments are defined as "initial" and "final." With the Voyager, you get a true release segment for both the filter and amplifier envelopes. As with the original Minimoog, there's a switch that allows the release segment to be active or inactive. Now, however, it's sensibly called the RELEASE switch.

Another of the Voyager's front-panel switches allows you to trigger the envelopes from an external device rather than the keyboard. "If you want to use the keyboard just to play the pitches, but you want something else making envelopes, you throw that switch to Ext/On and plug something into the ENVELOPE GATE input," Bob explains. "It could be an LFO, sample-and-hold, a footswitch, or whatever."

Further spicing up the Voyager's envelope implementation is a unique RATE input. "This is the only synthesizer with a Rate input," says Bob. "The Rate input varies the time constants

for all of the envelope segments. Once you've set the envelopes up, you can shorten or lengthen the duration of both envelopes with just one controller. With an expression pedal, you can slow down or speed up the envelopes, which is a very expressive feature. You can ride the pedal and alternate between long and short notes."

The Voyager's filter envelope includes a knob labeled AMOUNT TO FILTER, which corresponds to the original Minimoog's Amount Of Contour knob. Both work in conjunction with the filter cutoff to determine the cutoff frequency and the level of high-frequency content passed through the filter. There's one big difference between the two knobs, though: "The Voyager's AMOUNT TO FILTER knob goes negative as well as positive," Bob points out. "That means you can invert the filter envelope. The original Minimoog's Amount Of Contour was just an attenuator."

There are two main modulation busses in the Voyager. One is tied to the mod wheel, the other to a pedal/control input. Each buss is represented by a column of four knobs in the Modulation Busses module. The knobs are for selecting a modulation source, its destination, some kind of modulation shaping, and the overall amount of modulation. The modulating signal

travels through two VCAs between the source and destination, which determines the strength of the modulation. While the first VCA is controlled by the mod wheel, the second is controlled by whatever you've selected with the SHAPING knob. That might be key pressure, the filter envelope, or control voltages from an external source. You can disable modulation simply by turning the SHAPING knob to its off position.

MIXER

In many ways, the original Minimoog and Voyager mixers are very similar. Both provide on/off switches and level knobs for each oscillator, the noise source, and an external signal.

Noticeably absent from the new synth's Mixer module is a White/Pink rocker switch for the noise source. "We're providing a mixture of pink and white noise," Bob explains. "The bottom end is pink, and the top end is white. That turns out to be useful in most conditions where you want to use noise as part of the mix."

Whereas the original Minimoog has two audio outputs and one input, the Voyager provides EXT. IN, MIX OUT, and AUDIO IN jacks. (Both have 1/4" headphone jacks conveniently mounted on the front panel.) What's the difference between the Voyager's Ext. and Audio inputs? The Ext. In duplicates what the original Minimoog's audio input does: Insert a sound source and you can switch its input to the mixer on or off and vary its level from the front panel. On the Voyager, the output of the mixer and the input to the filter are separated. The Mix Out is normally connected internally to the input of the filter. Plugging a signal into the Audio In breaks the normalised mixer output to the filter input. Together, the Mix Out and Audio In function as an effects loop, perfect for inserting an external processor such as a fuzz box, ring modulator, or delay line.

FILTERS

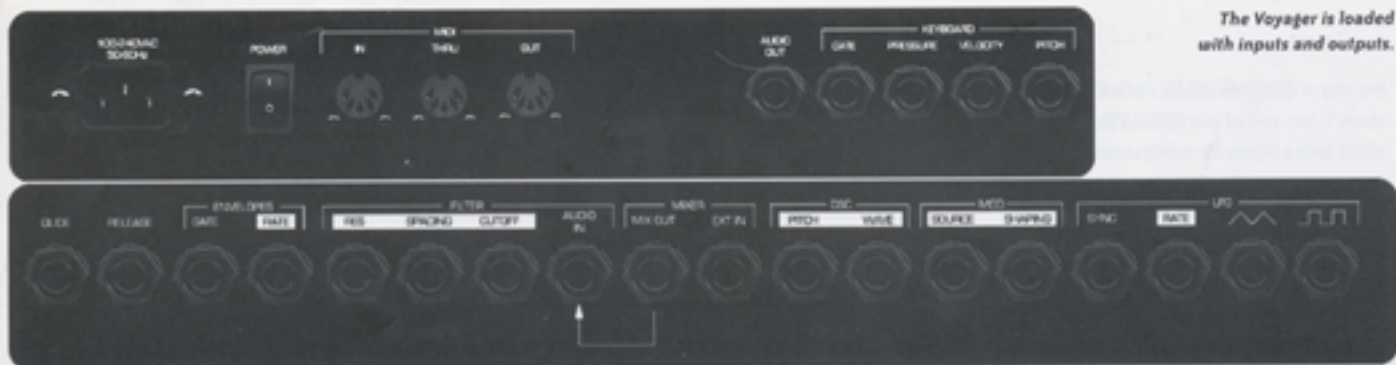
The Moog filter is famous. It's capable of producing an immediately identifiable sound, and it was the only module Bob Moog patented during the early days. It was also a main contributor to the original Minimoog's popularity, and it can be had all by itself in the Moogerfooger MF-101 Lowpass Filter.

Here's some exciting news: The Voyager actually gives you two lowpass Moog filters! Both can be cranked into high resonance. The Voyager's filters also offer 2- and 4-pole cutoff slopes. The unusual SPACING knob controls the frequency spacing between the filters' peaks in octaves. You can separate the peak of one filter up or down from the other by up to three octaves. And, whereas the original Minimoog provides two switches so that you can select one of four possible ways for its filter to track the keyboard — 100%, 66%, 33%, or not at all — the Voyager provides a knob for completely variable tracking by its filters.

What does the dual-filter configuration sound like? "It's a double resonance," Bob explains. "It comes halfway between a lowpass filter and a phaser. Some settings will come close to sounding like what you can get on other complex filters, and some will be brand new." It must be heard to be believed!



The Voyager is loaded with inputs and outputs.



I/O, I/O, IT'S IN & OUTS, YOU KNOW

You'll get a grasp of how flexible the Voyager is when you compare its rear-panel input and output complement with the original Minimoog's. The original Minimoog gives you an audio input, two audio outputs, control-voltage inputs to the oscillator pitch, filter cutoff, and VCA, and a trigger input. With the exception of the latter, all are 1/4" jacks. The trigger input takes an odd and rare two-prong connector called an S-trigger, which is available from Radio Shack.

In comparison, the Voyager is loaded with inputs and outputs. Besides the MIDI IN, OUT, and THRU connectors and the audio I/O previously revealed, it sports a generous supply of CV and trigger connections. Among the outputs are the LFO's triangular and square waveforms, and four for the keyboard alone — gate, pressure, velocity, and pitch.

Jacks labeled with black lettering on a white background are 'pedal/control' inputs that will accept CV inputs as well as expression pedals. There are nine of these inputs: envelope rate, filter resonance, spacing, and cutoff, oscillator pitch and waveform, modulation source and shaping, and LFO rate. Inputs are also provided for switches to control glide, envelope release and gate, and LFO sync.

Given the Voyager's generous complement of audio and CV inputs and outputs, its combination with one or more Big Briar CP-251 Control Processors and some Moogerfooger processors would comprise an awesome modular synthesizer system — that is, a Moog modular system, and it doesn't get any better than that!

One thing that always bothered me about my original Minimoog was that its power cord is permanently attached. Detachable cords make setup and teardown quicker and easier. (That stupid drummer also whacked off the ground plug!) Not only does the Voyager feature a standard IEC AC power input, but it has a universal power supply. "The Voyager's power supply is rated from 100 to 240 volts," Bob reveals. "That means it will work anywhere in the world."

MIDI IMPLEMENTATION

Did I mention the Voyager features a comprehensive MIDI implementation? Knob movements and switch manipulations result in the transmission of controller data, and the Voyager will respond in kind to the reception of this data. Ditto for the keyboard, wheels, and pad, which also send pertinent MIDI data. Internal patch memory can be downloaded and reloaded via bulk dumps.

Best of all, the Voyager's operating system can be updated. "The Voyager's software will be constantly evolving," Bob promises, "and owners of this instrument will be able to update their synthesizer via MIDI files they can download from the Big Briar website."

*...a brilliant new alternative
that goes much further than
the original in terms of
musical power and flexibility.*

Granted, lots of MIDI capabilities can be added to the original Minimoog by retrofitting it with the Moog LMC, Lintronic's MIDI Converter. The LMC supplements the stock original Minimoog with MIDI controllable pitch, pitch-bend, filter, volume, modulation amount, glide, and decay. It also adds an independent multi-waveform LFO with sample-and-hold, and allows velocity, aftertouch, and MIDI control of the original Minimoog's VCF and VCA. You can buy the LMC kit from Big Briar for \$295 and install it yourself, or pay them \$495 to install it for you. Still, the LMCed original Minimoog lacks much of the Voyager's MIDI functionality.

CONCLUSIONS

Not many more than 12,000 original Minimoogs were manufactured between 1970 and 1981. If you've ever had the chance to play one, you know how special and musical it is. Minimoog players such as Jan Hammer, Vince Clark, Dave

Stewart (of Egg, National Health, and Stewart & Gaskin), George Duke, Rick Wakeman, and Brian Eno certainly realized that.

In case you missed the boat and never owned a Minimoog, or you once had one but for some sad reason no longer do, there's new hope. Previously your only salvation was to find one on the used market, which could take a lot of leg work, probably would have cost an arm and a leg, and often would have led to a frustrating conclusion. Now there's a brilliant new alternative that goes much further than the original in terms of musical power and flexibility. When you consider the Voyager, the Signature Edition of which costs \$2,995, isn't much more expensive than an original Minimoog that's in excellent condition and has been retrofitted with MIDI, the Voyager is even more impressive.

The original Minimoog shares a prestigious status with only a few other electric keyboard instruments: a place in the Hall of Fame. It's there with the Hammond B-3 and Rhodes electric piano, to name two. Now room will have to be opened for another entrant: the Minimoog Voyager. Count on it!

BIO

Mark Vail is the author of *Vintage Synthesizers*, which is available from www.backbeatbooks.com and fine bookstores everywhere. The book includes Bob Moog's inside look at the development and production of the original Minimoog.

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