

DOMINIC MILANO

# KEYBOARD REPORT

## The Emu Emulator

**MANY A KEYBOARDIST** has stayed up nights dreaming about what it would be like to be a one-man orchestra. To be able to play a violin, a guitar, a flute, a 'cello, a kick drum, chimes, barking dogs, and a plethora of other non-keyboard sounds from a keyboard. That seems to be the idea that instruments like the Mellotron and the Chamberlin were addressing using tape recording technology under keyboard control. Those instruments came close, but their popularity has waned in the face of more current developments in synthesizer technology.

One of the more recent keyboard instruments that takes the basic idea of play-any-sound-from-a-keyboard a few steps further is the Emu Emulator. It uses a computer to sample and record sounds and it lets you play those sounds from its keyboard. Unlike its predecessors, it uses mini floppy disks (diskettes) instead of audio tape to store its sounds on. The idea of playing almost any sound you can find in the world is a powerful one, but even with the high-powered technology of a computer in place of mechanical devices it's still an idea that has its problems and limitations.

**The Diskettes And Software.** The computer in the Emulator needs software to function, and that's where the floppy diskettes come in. Stored on these are the programs that tell the computer in the Emulator what to do. Each machine is shipped with ten diskettes. Eight of these have factory pre-recorded sounds on them, and two are left blank for you to record sounds on. Each diskette can hold two sampled sounds, or eight sampled sounds if

it's a multi-sample diskette (we'll get to what that means later). The diskettes cost about \$10.00 each, and they're very vulnerable to destruction by things like scratches, strong magnetic fields from telephones and transformers, and so on. Each diskette also contains the operating software of the instrument. You have to treat your diskettes kindly or you'll have a machine that doesn't work because you don't have any more diskettes that can tell it how to work. The sounds you can store on the mini floppies (and in the instrument itself for that matter) are limited in length to two seconds. That may seem really short to you, but it turns out to be a relatively musically useful limitation that's not too hard to live with.

One more thing about the diskettes: Don't forget to pack them up and bring them with when you're taking the Emulator out on a gig, because it won't work without them. We musicians aren't used to thinking about diskettes yet. There is a small recessed area on the instrument for keeping the diskettes when you're using them, but it would have been nice to have seen some provision for storing the diskettes when you're moving the instrument, just so you won't forget them.

**Storage And Recall.** The slot where you load the diskettes into the machine is at the left side of the front panel. To the right of it are the front panel controls. The first set of controls is for loading the information that's on the diskettes into the computer. Four switches - Get Lower, Get Upper, Save, and Swap - let you load the lower end of the keyboard's sound, load the

upper end of the keyboard's sound, record a sound onto a diskette, and flip the sound that's assigned to the lower half of the keyboard to the upper half of the keyboard and vice versa. Loading sounds only takes a few seconds, the actual length of time depending on the sound being loaded. Putting a sound that's in the Emulator onto a disk takes about 20 seconds. The machine is playable during the loading and storing of a sound, i.e. if you're loading a sound into the lower half of the instrument, you can play the upper half and vice versa.

This section will remember up to three depressions of switches, so you can hit, for example, lower, upper, and swap, and go right into playing. It's not necessary to wait for a section of the keyboard to be loaded before pushing the button for the other section or the swap button. That's useful for live performance. Each of the pushbutton switches in the Storage section has an LED in it that will blink or light constantly depending on whether the instrument is functioning or encountering an error.

**The Keyboard.** The Emulator has a 4-octave keyboard, C to C. You can play up to eight notes polyphonically on the eight-voice Emulator, four voices on a four-voice Emulator. We looked at an eight-voice. Emu did offer a two-voice, but it wasn't very popular, so it was discontinued. The keyboard is always split into two halves, the split coming at the midway point, between B and C. One of the options you can buy, called the User's Multi-sample, enables you to split the keyboard at every tri-tone, giving you eight possible split points rather than two.

That's particularly useful for recording instrument sounds that don't lend themselves to sounding like the same instrument in different ranges. The piano is a good example of this.

One thing to remember is that just because there's an automatic split doesn't mean you have to record two different sounds all the time, or that the factory did either. What it means is that you have to sample two different octave ranges of whatever sound you want to put in order to get that sound across the entire four octaves of the keyboard. Say you want to sample an organ or a synthesizer. You'd need to sample first at a higher octave range, then at a lower one (you can only sample for the bottom half of the keyboard, moving the programmed sound to the upper half of the keyboard with the swap switch). For sounds that are impossible to change octaves on - say a bottle breaking or a car revving its engine up then you're stuck with a two-octave range. Of course, you can record the same sound at both ends of the keyboard, but the octaves will repeat themselves.

**Dynamic Allocation.** Back up on the front panel of the instrument, next to the Storage section, is a switch labeled Dynamic Allocation. What this switch does is control how many voices are assigned to each half of the keyboard. When the LED in the Dynamic Allocation switch is unlit, the instrument is in Fixed Allocation mode, which means that the lower half of the keyboard will get voices one-five, and the upper the remaining six-eight on an eight-voice machine; channels one-three for the lower and channel four for the upper on a four-voice. When the Dynamic Allocation LED is on, the instrument is in the Dynamic Allocation mode. What that means is that all of the channels are available in any combination across the two halves of the keyboard. These two

modes are most useful when you're using the mono and stereo outputs on the back panel. Fixed Allocation is useful for stereo outputs when you want the lower part of the keyboard coming out of one speaker and the upper part coming out of another. Dynamic Allocation is useful for when you're in the mono output. Channels are always assigned in a last-key-depressed mode. If more than the available channels are being played the keyboard will steal the note that has been depressed the longest for each new note that's added.

**Left-Hand Controllers.** There are pitch-bend and modulation wheels supplied on the instrument to impart a pitch-bend of up to a whole step on any sound you've sampled (pitch-bent piano is weird), and the modulation is simply vibrato. The limitations of these two devices become obvious after playing with them once. The vibrato is provided by a simple LFO, and is therefore mechanical sounding, but still provides some interesting effects (vibratoe'd slamming doors?). It is enabled by a set of controls on the front panel. The range of the pitch-bending wheel is somewhat small as it relates to the amount of physical movement you've got to make in order to get to the maximum of a whole step. This will take some getting used to, especially if you're accustomed to playing pitch wheels with much larger ranges on synthesizers. It would be nice to see the range expanded so you don't have to make a big motion in order to get a small pitch-bend.

**Vibrato Enable Section.** In this section are two switches and a single pot for enabling the vibrato and controlling its speed. The switches are for enabling the lower and upper sections independently, and the pot is for adjusting the speed of the vibrato. The depth of the vibrato is controlled by either the modulation wheel or a footpedal.

**Sustain/Filter Section.** Next to the vibrato controls is a section whose function won't be that obvious to you. In fact, the controls serve double and triple duty. There are three switches and two slider pots in the section. The first two switches at the left are for setting the sustain loops for the sounds on the two halves of the keyboard. You can't set both sustain values simultaneously, which may be something of a limitation when you're setting a loop in a sound that is available across the entire keyboard. The third switch is for allocating the two slide pots to serve as truncate and filter controls. If that switch's LED isn't on, then the sliders serve as controls for setting the loop point and length. Just what is a loop? When a sound is first entered into the Emulator, it can have a duration of no more than two seconds. Holding down a key won't have any effect on its length at all. In order to give a note some sustain, you can use the Sustain sliders to locate a segment of the sound that you want to repeat over and over for as long as you hold a note down. It takes some practice to find a point in the sound that has what's called a zero crossing, and in some sounds it's almost impossible. The reason it's important to find a zero crossing point is that if you don't, you'll get a regular ticking in the sound, which may or may not annoy you. That's one of the limitations of the instrument, but with some practice you'll be able to avoid having crossing points that drive you nuts.

With the Truncate/Filter switch on, the two slider pots act as a truncate slider and a filter slider. The truncate slider is used for times when you sample a short sound, say 1/2 second. The Emulator will always record for two full seconds no matter what, so in order to cut off the back second and a half or the unwanted portion of any sound, you'd use the Truncate slider. The filter slider is a control for a low-pass filter. It's used

to filter out unwanted quantization distortion, which occurs in the high-frequency range of a lot of sounds - the noise is present simply because of the digital nature of the Emulator. When the slider is at the far left, there's no filtering. When it's at the far right, the higher harmonics are filtered away. The positions of these two sliders are stored on disk when you save a sound. The other thing the top slider (start point/truncate) does is adjusts the speed of play back for the sequencer.

**Master Tune Controls.** To the right of the Sustain/Filter controls are two pots used for tuning the two halves of the keyboard. The main purpose of these two controls is to tune two instruments to each other when they've been recorded at slightly different pitches. However, you can use them to create chorusing effects by recording the same sound on both halves of the keyboard, detuning them slightly, and playing unison lines or using the doubling mode, which we'll talk about in a bit.

**Inputting Sounds.** The last section on the front panel is for controlling sound sampling. There is a gain switch that lets you determine the input level. Choices are between 0dB, 20dB, and 40dB gain. 40dB is used for mike-level inputs, while 20dB and 0dB are used for line and instrument level inputs. As you may have guessed, you can input sounds with either a microphone with an XLR input or run them straight from an instrument using a 1/4" jack supplied on the back of the Emulator. Just above the gain switch is an attenuation control. This is used in combination with an overload light to set the recording level of the instrument. A switch labeled sample is used to start the recording process and the level setting procedures. It also sets an automatic threshold, which is useful in recording in a noisy environment. Some notes about recording: Some sounds are easy to sample while others aren't so simple. There are so many different possibilities for

recording that it's hard to think of everything that one might encounter. Sounds with big dynamic ranges might give you some difficulties. Some sounds will have more noise present in them than others, depending on how well you record them. Recording into the Emulator isn't much different from recording onto tape, except that you'll get quantizing noise in some sounds where you might have gotten no problem at all on tape.

**The Sequencer.** The sequencer is located next to the pitch and modulation wheels and has eight switches associated with it. Two of these, labeled A and B, are for special functions which we'll get to shortly. Each switch in the sequencer section has an LED in it, just like all the other switches on the instrument. In the row of switches closest to the player you have B, Store, Recall, and Stop. In the row just above these, you have A, Get Seq., Seq. 1, and Seq. 2. Store is the switch you use to put the sequencer into record mode. Recall is for replaying sequences, and Stop obviously stops the sequencer. The Store and Stop switches interact such that hitting the Stop switch by itself causes the sequencer to stop after it has played the entire phrase that's been stored in its memory. Hitting Stop while holding down Store causes the sequencer to stop immediately. On later instruments (or those with updated software), these functions can be performed by a foot-switch, a convenience for live performance. The Get Seq. switch is used to store sequences on floppy disk for permanent storage. Whatever is in Seq. 1 and Seq. 2 at the time you hit Get Seq. and the Save switch will be saved on a floppy, provided of course that you've got a non-write-protected floppy disk in the disk drive. The next two switches are for storing and recalling sequence numbers 1 and 2, respectively.

The total memory space for these two sequences is about 900 notes, combined. There is an extra sequence space in the Emulator in case you inadvertently record over a sequence that you didn't want to erase. To access this sequence, you hit the recall button twice.

You can also do some less than obvious stuff with the sequencer. You can add on notes to the beginning of a particular sequence, you can add notes to the end of a sequence, and you can cut a sequence short. The procedures for doing this are explained in the owner's manual and are a bit too involved to go into here. As we said, the speed of playback is adjustable on the sequencer. Unfortunately, there isn't any provision for syncing the sequencer's clock to another sequencer or a drum machine. However, we're told that Emu is planning to bring out a SMPTE interface which will let you sync the sequencer to tape recorders with SMPTE time coding. By the way, this sequencer is polyphonic.

**The Special Functions of The Sequencer Switches.** To get to these functions you press one of the two prefix buttons, A or B, which we mentioned before. Each sequencer switch has a number just above it. These serve to indicate their triple duty functions. The A prefix mode works like this: A1 sets the lower sound to normal mode the sound just like you would expect it to be. A2 sets the lower sound to solo mode - the sound is playable only monophonically, single trigger. A3 sets the lower sound to the non-transposition mode, which means that you'll hear the originally recorded pitch on every key you depress, rather than hearing it sped up and slowed down to create a chromatic scale. A4 puts the lower sound into natural release mode, which means that you'll hear each sound all the way through to its end no matter whether you're holding the key down or have let it up. This mode is just like having the release

footswitch held all the time. A5 cancels the A prefix. A6 means that the release foot-switch will only affect the lower sound. A7 means that the release pedal will affect only the upper sound, and A8 means that it will affect both the lower and the upper sounds. B1 is for using a software replicate function, which is used to copy more current software onto older disks. B2 - 8 cancel the B prefix.

**The Back Panel.** On the back panel are a detachable power cable, the on/off switch, a fuse, pedal inputs for a vibrato pedal which overrides the vibrato wheel rather than adding to it (the vibrato pedal input will also accept an external voltage source), a release footswitch, an 'access' pedal (which is used for doubling the upper sound with the lower sound and turning the sequencer on and off after a sequence of buttons are pressed on the sequencer), XLR and 1/4" inputs for sound sampling, and both XLR and 1/4" stereo and mono outputs. Having stereo outputs is especially useful if you want to control the relative volume of the sounds on the upper and lower halves of the keyboard, since there is no way to change the balance using the front panel controls.

**Conclusions.** The Emulator does a lot. It can be both simple and complex depending on what you want to use it for. The factory supplies some very beautiful sounds, and they supply some very silly sounds, which are fun anyway. Sampling your own sounds may take some time to get right, and the results may be frustrating at first, but it's a machine you've got to

experiment with if you want to learn all the things it can do.

It's constructed both handsomely and solidly, but the top is pointed, so don't expect to be able to stack anything on top of it. It's a heavy beast, though, and you'll want to get a flight case for it if you have any plans to travel with it, but due to its weight, it's going to be cumbersome once you've added the weight of a flight case. We also wonder about the roadability of a floppy disk drive, but the instrument is just too young for us to have heard anything about reliability problems. As with any high-tech instrument, you'll want to handle it with kid gloves.

There are limitations to its sound, but you will probably be able to live with those. Finding the zero crossing point when putting in sustain loops is a trick to master, to be sure. But overall, the Emulator is an interesting machine that can sound good, great, silly, or bad, depending on what sounds it's being asked to reproduce.

As far as we can tell, its price is its biggest limitation: \$6,395.00 for a four-voice and \$7,995.00 for an eight-voice. Diskettes are \$10.00 each, available at Emu dealers. The User's Multi sample, which was too complex to go into detail on here, is \$100.00. The program for enabling users to copy the most current software onto their own diskettes is \$350.00.

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