THE E-MU DRUMULATOR
By Jim Aikin

PRICES ARE STILL COMING DOWN in a few areas, especially those involving digital technology, and musicians are among the beneficiaries. The first programmable drum machine that had real drum sounds (the LM-1 from Linn Electronics) cost almost $5,000. The Linndrum followed a year or so later from Linn and then the DMX from Oberheim, both of which checked in under $3,000. And now E-mu Systems is offering the Drumulator, list priced at a mouth-watering $995.00. (For Keyboard Reports on the Linndrum, see *Keyboard,* Nov. '82, on the DMX, Apr. '83.) We can expect that in the next few months more units will be appearing in this price range - already Oberheim has announced a budget-priced version of the DMX, called the DX. If you're recording your own keyboard music and don't have access to (a) a drummer or (b) a soundproof room and eight or ten high-quality mikes, one of these gadgets can be worth its weight in gold. To be fair, we should point out that the folks at E-mu did have to cut a few corners to get the price so low. But they also managed to include a couple of features like programmable tempo and programmable accent levels that no other drum machine currently has, making the Drumulator a highly competitive item.

Overview For those of you who haven't run into one of these little marvels yet, a brief review might be in order. Percussion units of this type contain digitally recorded sounds of actual drum strokes. The user can combine these in whatever rhythmic pattern is desired. Patterns may be of any length, but are typically one, two, or four bars long. The machine will store a number of patterns in its memory. It will also allow you to chain patterns together in any order to form whole songs. Since very few of us can play pushbuttons with any high degree of rhythmic accuracy, a drum machine also contains an auto correct function that adjusts the user's input so that it is played back in perfect time. The auto correct can be set to various minimum time values — on the Drumulator, to eighths, eighth-note triplets, sixteenths, sixteenth-note triplets, thirty-seconds, thirty-second-note triplets, or no correction.

The Drumulator will store 36 separate rhythm patterns (which E-mu calls "segments"). These can be strung together in any combination into eight different songs, with each song consisting of up to 99 segments. This is a somewhat smaller memory capacity than is offered by the competition (49 patterns and 49 song chains for the Linn, 99 patterns and 50 songs for the DMX), but it's certainly

more than sufficient for most recording projects, especially since — as on the other machines — you can save the entire contents of the memory on digital cassette tape. The possible length of the songs is increased by the fact that you can store repeats that will loop through a series of segments up to eight times.

Drum Sounds The Drumulator contains twelve sounds: bass drum, snare drum, "rim" (a stick hitting the rim of the snare drum), three Tom toms (high, middle, and low in pitch), claves (rosewood sticks), cowbell, handclaps, hi-hat open, hi-hat closed, and ride cymbal. There is no provision for tuning these to various pitches, unlike the situation on the Linndrum, which offers manual tuning pots for some sounds, and on the DMX, which has voltage-controlled tuning. However, both of the other units have fixed accent levels - a snare drum sound at three different volumes, for example. The Drumulator has a considerably more flexible system of programmable accents, whose levels can be set separately for each drum. The way the loudness and accent controls work is a little tricky, so pay close attention. Each drum can be set to any volume on an arbitrarily numbered scale from 0 to 15, with 0 being no sound. The accent can also have any value from 0 to 15, and this value is added to whatever basic level the drum is set to. Let's say you set the snare drum to a loudness level of 10 and an accent level of 3. The accent volume will then be 13. If you later turn the basic loudness of the snare down to 7, the accent volume will move down to 10. However, the total level for the two together can't be more than 15. So if you turn a drum up to 15, all the accents will disappear. All the level, accent, and metronome functions are controlled from a single front-panel slider — a cost-cutting move that seems very sensible and easy to work with.

Another simplification is the fact that all twelve sounds are played from only four 'drum play' buttons, which can be assigned to trigger any drum. This might seem inconvenient if you've never worked with a drum machine, but usually you're not loading more than one or two sounds into a pattern at any given time, so having a maximum of four available is really no constraint at all. In fact, it's probably a plus, since you can assign the drum sounds to the buttons in whatever order is easiest for your fingers to play.

In general, the quality of the sounds is excellent. The closed hi-hat isn't quite as crisp as some people might prefer, but it does override and cut off the open hi-hat, as it should. The tom-toms, in our opinion, are superior to those offered on other digital-recording drum machines, in that they don't

have an annoyingly large fall in pitch. There is some sharing of channels, because of which the claves and cowbell, while they can both be used in the same segment, can't sound at exactly the same time; the same is true of the high and middle toms and the snare and rim sounds.

Operations As with most of the current generation of digital musical instruments, the front panel of the Drumulator is simplified by having switches perform double and triple duty. For example, the same set of six buttons that are used to assign the twelve drum sounds to the four play buttons is also used to tell the machine which segment you want called up, which auto-correct setting you want, and a couple of other things. There is certainly some potential for confusion here, but the owner's manual (written by Craig Anderton) is very clear and logically laid out, which helps a great deal. Most people should be able to learn to operate the machine flawlessly in an hour or two. At the upper left corner of the front panel are a pair of two-digit LED readouts that clarify what's going on. These display information on which segment is currently running, whether it's being recorded or playing back, what the volume, accent, and metronome settings are, and about two dozen other things.

The Drumulator has all the necessary utility functions. You can set its metronome to click in whatever rhythmic value you prefer, and turn the metronome volume up or down with its own front-panel knob. You can set a time signature for each segment, including signatures whose denominators are triplets, allowing you to do bars of peculiar lengths without changing the playback speed of a song. You can erase individual drum strokes from a pattern you're recording, or alternatively erase an entire drum from the pattern. Or you can erase everything in a segment. You can even erase the entire contents of the memory if you want to. You can append a segment to it self, doubling its length. You can copy a segment from one numbered slot of memory to another, which is useful if you've already recorded, say, a basic snare-and-bass pattern and you want to put three or four different cymbal patterns over it at different points in the song. Also, you can check to see how much memory space you've got left.

You can create eight different "songs," which are numerical lists of segments in the order they are to be played back. A song also contains some other information. Each song can have its own

programmable mix of volume and accent levels. If a long song contains lots of repetitions of patterns, you can save yourself time by programming repeats. A song can also contain - and this is something no other drum machine will do currently - programmed tempo and tempo changes. The Drumulator allows you to store eight tempo changes as percentages (110% of the previous tempo, for example), which are then entered at the appropriate spot in the segment list. This isn't a capability that a lot of musicians are likely to make frequent use of, given the bias toward a steady groove in most current rock music, but it is nice to know that you can change tempo if you want to. If you change the length of your song as you're composing it, you can insert or delete individual segments from a song list.

A Drumulator song doesn't have to end unconditionally. It can be set to repeat forever - or, more interestingly, it can be programmed to go directly from one song to another song with no break. Why not just write one long song instead of two short ones, you ask? For a very good reason. The songs, remember, can have different volume level mixes. By using up three or five of the Drumulator's eight songs, you can create one piece of music that has variations in dynamics and accents. For certain kinds of music, this feature will be a real plus. No more fiddling with the mixer while the tape is running - just load the mix into the computer.

Swing As on other drum machines, you can program the Drumulator to play swing rhythms, in which the first eighth-note of every quarter lasts somewhat longer than the second, in a ratio of 50% (straight time), 54%, 58%, 63%, 67%, or 71%. However, swing on the Drumulator is a *playback* function rather than a record function. This is a significant limitation. On both the Linn and the DMX, different drums can be set to different amounts of swing, giving the feel of a percussion section with two or three different players. On the Drumulator, either all the drums swing, or none of them. Also, you can only have eighth-note swing. Sixteenth-note swing isn't available. Disappointing, but since nine-tenths of today's rock tunes are in straight time anyway, this was probably a sensible place to cut corners.

Cassette Interface. The Drumulator has the usual facilities for storing its memory on cassette tape, which is useful if you're building up a library of tunes, and also handy for preventing accidental lunching of the data stored in the machine. Loading takes only about fifteen seconds, but if you're thinking about a Drumulator for live use, don't forget that you also have to find the right fifteen-second segment on the cassette, load the machine's memory, and possibly rewind and load again if the transfer doesn't work right the first time. If you've got two Drumulator's and a roadie, however, you could definitely play an entire set with no breaks by having the roadie load one of the machines while you're playing along with the other one.

The Back Panel The jacks on the back panel include both signal outputs and some functions we haven't discussed yet. There are two inputs for footswitches — a run/stop footswitch that duplicates the function of the front panel run/stop button, and a repeat footswitch. The repeat switch has two functions: If a song is playing, it gets you out of a repeat loop at the end of an indeterminate-length solo. If you're in song mode but the Drumulator is stopped, it advances you to the next numbered song. Next there are four gate inputs that correspond to the four drum play buttons on the front panel, allowing you to play the Drumulator from a percussion pad or other suitable voltage source. These inputs are all 1/4" phone jacks.

A pair of RCA phono jacks do triple duty, acting as in and out for the cassette interface, in and out for an external clock, and in and out for an RS-232 computer interface. Using the external clock feature, you can sync the Drumulator to a sync track on tape, or to many of the commoner sequencers. There is also an output jack labeled "met/trig." This gives you your metronome signal when you're in record mode, in case you want to listen to it on a separate channel. In song play mode, you can program this jack to put out narrow 5-volt trigger pulses at any subdivision of the tempo, from eighth notes through thirty-second-note triplets. This is highly useful for driving things like arpeggiators in sync with the Drumulator. An added bonus is the fact that you can program the triggers to start, stop, or change rate at any point in a song.

The rest of the jacks are signal outputs. Theme is one mono mix output, and eight individual channel outputs that you can run through outboard effects devices or a mixer. Unlike the other drum machines, these separate outputs are affected by front panel volume changes, but given the programmable dynamics; this was obviously the right design choice.

Conclusions If you have a suspicious nature, you might expect that a drum machine this affordable would be a bit on the cheesy side. But you'd be wrong. The Drumulator is a full-function programmable percussion system that sounds great and is easy to use. It doesn't have humongous amounts of memory, true, but for most applications it should have plenty. The only real weakness of the design seems to be the fact that you can't give different drums different amounts of swing. But this is more than offset by the positive features - programmable dynamics, accents, and tempo changes, syncability, external triggering of sounds, and the program-mable trigger output. There is, to be honest, just a bit of background hiss in the mono output, but nothing you couldn't live with. All in all, we were very impressed by the Drumulator, and we imagine a lot of other musicians will be too.

Article Written By: Jim Aikin
Many Thanks to Keyboard Magazine for Permission to Republish