

E-mu SP-12 Sampling Drum Machine

THESE DAYS, POPULAR music has become so dominated by rhythm that the drum machine is an integral part of most equipment setups. Unfortunately for the manufacturers of these devices, their longevity is threatened on the left flank by affordable (or nearly affordable) general-purpose sampling keyboards. With the latter, you can create your own great drum sound (or sample one from a record) rather than being tied to the factory snare, toms, and so on. The tradeoff is that the sequencers in most sampling keyboards lack the kind of build-a-song user-friendliness we've come to expect of drum machines.

With their new SP-12, E-mu has a device that gives you the best of both worlds. On the one hand, it's a standard drum machine, with the usual segment and song modes, repeat loops, and so on, plus several innovative features, such as single-step data entry for segments and programmable ritardandos and accelerandos for songs, that would put it in a competitive position even if it didn't have user sampling. And at the same time, it's a no-frills, easy-to-operate sampler, whose 12-bit resolution and 27.5k sampling rate give it a crystal-clean sound.

Sounds. The SP-12 sounds are played back from a row of eight buttons, with one of four sounds available from each button depending on what bank you have selected with the bank select button at the left end of the row. The machine holds 32 different sounds at a time, 24 of them factory presets and 8 user-programmable. Well, actually, that isn't quite the whole story. A copy function lets you reassign sounds to any location you like (which is handy for performance), and by reassigning your own sampled sounds to factory-sound buttons, you can free up the user slots to record still more of your own sounds. The limitation here is that all the sounds you sample have to fit inside the maximum available recording time (1.2 seconds for the standard unit, 5 seconds for the "turbo" version). A little arithmetic will tell you that if you want 32 of your own sounds, each can be a maximum of 150ms long, which may not seem like much. But we're told that the total sampling time for the factory samples is only about 5 seconds too. Most percussive sounds are short, and there's plenty of room for eight or ten of them to live in the machine at a time. If for any reason you need more, it's easy enough to lay down the first batch while syncing the SP-12 to tape, store the samples on disk or data cassette, and do some new sampling to sync with the existing tracks.

Now that we've explained that less is more, let's back up for a minute; more is also less. Those 24 factory samples are not actually 24 factory samples. There are only 11 of them - bass drum, snare drum, electric snare, sidestick snare (also known as "rim"), cowbell, tom-tom, electric tom, hi-hat, claps, ride cymbal, and crash cymbal. To allow expanded performance possibilities, several of them are assigned to two play buttons. The toms have four buttons each. Thus if you want to record toms tuned to different pitch levels, or bass drums with different accent levels, you can do it without having to do a lot of messy stopping and starting. You can even mix three or four versions of the snare drum on the same beat if you like.

E-mu SP-12

Description: Drum machine with user sampling of sounds.

Memory: 5,000 events and 1.2 seconds (standard format) or 15,000 events and 5 seconds (turbo).

Interfacing: MIDI in, out, thru. SMPTE and pulse sync in and out. Audio in, monoaural mix out, eight audio channel outs. Data disk and cassette jacks.

Features: 11 factory sounds, up to 32 user-sampled sounds. Tuning, decay, and volume programmable for all sounds. Velocity-sensitive play buttons. Single-step and running mode data entry.

Dimensions: 19½" x 16" x 6".

List Price: \$2,745.00.

(Turbo option is an additional \$795.00.)

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It's certainly not the case, by the way, that E-mu is trying to pull the wool over anybody's eyes about how many factory sounds there are. The unit is quite comparable in this respect to most of the other drum machines on the market, and has the added convenience of extra play buttons. We liked the factory sounds a lot— with, as usual, the exception of the handclaps, which don't sound any better than they do on any other drum machine.

The SP-12 offers two different ways to change the sound of the sounds: by tuning, and by adjusting the decay rate. Tuning for everything but cymbals is variable in half steps over a range of a minor tenth. The cymbals also have fifteen different tuning settings, but these mostly seem to be far lower in pitch than the original sounds, and some have unusual overtones. They're very usable for crashing sounds, but don't expect to play "Mary Had A Little Lamb" on your cymbals. The decay rate settings do about what you'd expect: They roll off the end of the sound, making it more clipped or more sustained. This is the control that you use to turn one hi-hat sample into open and closed

hi-hats. It's also excellent for making other sounds, from ride cymbal to snare drum, tighter or more open.

One of the limitations of the SP-12 is that the choice of tuning or decay is an either/or choice for each percussion sound. That is, at any given time you can have a tuned snare or a decay-clipped snare, and if you've got the snare sample assigned to two buttons you can have one of each, but you can't have a single snare sound that is both clipped and tuned to some other pitch than the one it was recorded at. (Not directly, anyhow. The default decay setting is user-programmable, but whatever setting you choose here will be the same for all drum sounds on which you select the tuning option.) The tune/decay setting is recorded with each drum hit as part of a drum segment, but whether you will get a tuning variation or a decay variation when you enter that segment into a song will depend on which programmable mix (see below) is active in that portion of the song at that time. Change to a different mix, and the low-pitched drum will suddenly change to a quick-decay drum.

Programmable volume levels for each drum sound are always active, being independent of the tune/decay setting. What's more, the drum play buttons are velocity-sensitive, allowing you to do expressive accents from a single button while recording in real-time. We were less than thrilled with the quality of the touch response, however. Many medium-velocity hits seem to produce very quiet sounds, while a harder hit may produce an unexpectedly strong accent. There is no provision for adjusting the intensity of the touch response. We'd recommend toggling this feature off (regrettably, it is on by default when the machine is turned on) and assigning various dynamic levels to various buttons as needed. A feature called "multi mode" gives you a quick short cut for doing exactly this. You can assign all eight drum play buttons to a single sound and get a full spectrum of either tuning/decay or dynamics, which is very handy for doing crescendo drum rolls, cowbell melodies, and things. Not to mention sampling a pitched instrument.

Incidentally, a swap command is available in segment mode, allowing you to replace all the hits from one drum globally with hits from a different drum. You'll find this of great advantage if you've written a song with one snare drum sound, for example, and later sample a better snare. It only takes a few keystrokes to drop the new snare into the machine with exactly the same dynamic accents that the old one had.

User Sampling. With 12-bit linear encoding at a fixed 27.5kHz sampling rate, the SP-12 offers high-quality sound playback. We'd recommend paying the extra \$795 for the turbo-charged unit with expanded memory, as doing your own sampling is bound to be half the fun with this machine. The basic unit has 1.2 seconds of user sound storage, while the turbo option has 5 seconds, split into two 2.5-second blocks. The blocks are separate, so you can't do a single 5-second sample. If you've recorded two 2-second samples, you won't be allowed to do a 1-second sample with the remaining time, you'll have to do two separate .5-second samples. But this is an easy enough limitation to live with.

Utility functions let you set the input level (0db, +20dB, or +40dB) and the threshold at which recording will begin. A handy VU mode turns the SP-12's 32-digit LCD window into a meter for checking input levels. Remaining sound memory is displayed, and if you don't need all of it, you can shorten the recording time in .1-second increments. Naturally, you get to tell the machine which of the eight user sample locations you want to record into. It defaults to the lowest unoccupied slot, and if you ask it to re-record over an existing sound, it will ask for verification before doing the erase.

Once you have recorded a sound, you can truncate from either the beginning or the end. You can also set a loop point, which will cause a straight loop from the loop point to the end point. Looping on a percussion device? Yup. The repeating loop will die away at the rate determined by the decay control for that sound. This can be very useful for things like imitation echo on a snare drum. Both coarse and fine controls are given for setting the loop point. However, the fine control jumps through increments of 25 samples, so even a lot of hunting may or may not be enough to find a loop that is free of popping.

We were hoping to have a little fun sticking loops and weird truncations into the factory sounds. There is no way to do this, however - not even by copying them into the user-sample locations. The machine will cheerfully let you play the factory sound from the user button location, but when you try to set a loop, it reports that that user location is empty. Well, you can't have everything.

We sampled some chimes from a CD into the SP-12, and were unable to tell the difference between the two when playing them back. Of course, our monitor system is not the worlds finest, but the signal degradation, if any, is very, very slight.

Song Mode. Building songs with the SP-12 is pretty standard, especially for those who are familiar with the E-mu

Drumulator. Segments with any meter can be strung together in any order, with repeats if desired. Inserting and deleting of segments is supported. Songs can end unconditionally, can repeat indefinitely, or can be segued into another song. One new feature is a subsong send, which will cause playback to insert another entire song into the current song, play through the subsong, and then return to the point in the main song from which it departed. Even more interesting is a tempo change feature, which allows you to insert an *accelerando* or *ritardando* at any point in the song, specifying both how many beats per minute will be gained or lost on the master tempo clock and how many quarter-notes the machine will take to do the shift, from zero (instant tempo change) to 99 beats. This feature may make the SP-12 very attractive to anybody who is programming classical music into their sequencers.

The SP-12's memory contains eight programmable mixes. These include data on volume level, tune/decay selection, and output channel selection (see below) on all 32 drum sounds. By inserting "new mix" commands at various points in a song listing, you can get a given drum to have tuning shifts in one segment and decay shifts in another segment, create programmable stereo placements, and so on.

The Back Panel. The rear panel of the SP-12 has both interfacing jacks and audio outputs. The audio output section is a little more complex than you might suspect. It contains a monaural mix output and a row of eight jacks for separate channel outs. The various sounds are assigned to these jacks with a set of default assignments, which are painted on the panel. However, you can reassign any sound to any channel you like as one of the aspects of a programmable mix. There might be several different reasons for doing this. First, it gives you more flexibility in a stereo mix down situation. Second, a given channel can only be sounding one drum at a time. So, for example, if you want to have three ride cymbal hits overlaying one another very close together, you have to assign the sound to three separate outputs to avoid having the second hit cut the first one off.

A more important reason is that the eight channels are not alike. While channels 7 and 8 are unfiltered, the other six have low-pass filters on them with various settings. Channels 6, 5, 4, and 3 have fixed-frequency filters set to successively lower cutoff frequencies. The filters on channels 1 and 2 are actually dynamic, sweeping down to cut off the highs in the last part of the sound. Channels 7 and 8 are thus optimized for cymbals, while 1 and 2 would be ideal for bass drum and tom-toms. But you can assign the drums to whatever channels you like. The snare drum sounds great on all channels. The filter settings are not accessible to the user at all; rather, they are hard-wired in a fixed configuration. Note that the mono output is after these filters, so you can hear the changes even when listening to the mono

signal. Of course, if you happen to prefer the sound of one particular output filter setting for all your drums, you're going to find the drums cutting one another off if your percussion pattern gets at all complicated. But as a quick, simple way to add character to the sound of the unit, this scheme has a lot to recommend it. Other jacks include metronome out, cassette/sync/SMPTE in and out, three footswitch ins (run/stop, step/end repeat, and tap/auto repeat), MIDI in, out, and thru, and a five-pin connector suitable for plugging in a Commodore 1541 disk drive. And of course there is an audio input for sampling. The sampling input does not feed through to the mix out, so you'll have to find some other way to listen to what you're sampling

Miscellaneous Features. A tap/repeat front panel button (echoed by the rear panel jack) has two functions. If you hold it down while holding down a drum play button, the drum sound will repeat at the auto-correct rate—handy if you like those super-mechanical rolls. The tap function allows you to input a tempo manually if you'd like, by tapping the button repeatedly at the tempo you want. The machine measures the time between this tap and the last one and computes the corresponding beat-per-minute rate. The readout changes instantly to reflect the tempo you have just input. In our test, we found it difficult to get a steady reading with this method. No matter how rigidly we tried to tap, the metronome value fluctuated over a range of 6 or 8 BPM. Since there are three other ways to enter tempo values—with arrow keys, with a slider, and numerically—it's a bit difficult to see what value the tap feature has. You might want to use it to sync the SP-12 to a live drummer, by driving the input jack from an envelope follower attached to the drummer's bass drum. Of course, this only works if the bass drum is playing a steady quarter-note on every beat of the song. And if the drummer is listening to the drum machine while playing, it turns out to be tricky to slow down or speed up in any controlled way, because your tap must be inaccurate relative to the current beat in order to affect the next beat. Still, it's an interesting feature, one that clever musicians may find creative uses for. We were disappointed to note that E-mu is still clinging to the global swing setting concept, which was one of the chief drawbacks of the Drumulator. Swing works on all drums on playback, rather than being a record function, as on the LinnDrum and other units. The swing factor is separately stored for each segment, but it is strictly a quarter-note swing, in which the second eighth-note of each beat is pushed back; eighth-note swing is not available.

And if you enter an unbroken string of 32nd-notes, you'll discover that the swing factor doesn't stretch the first half of the beat out, nor compress the last quarter of the beat. All it does is delay that second eighth-note.

Interfacing. The SP-12's MIDI implementation does all the basic things. You can sync to an incoming MIDI clock if desired, and a MIDI clock output is generated when the machine is syncing to something else. MIDI note-ons will trigger the various drums, and the ability to reassign the drum sounds to different play buttons insures compatibility with drum sequences you have already recorded on another device. MIDI note velocity information will affect the loudness of the drum sounds. And you can record segments, if you have any reason to, by playing an external MIDI keyboard. All 16 channels are sent and received, as well as omni mode. One potentially useful MIDI feature that is missing is a song select command.

The machine will stripe tape with a SMPTE clock in 24, 25, 30, or drop-frame format, and sync to the same codes. A song-start time can be entered, and if the tape starts past the beginning of the song, the SP-12 will fast-forward silently until it catches up with the tape, at which time it

will begin playing. The fast-forwarding may take a number of seconds, depending on how far the tape has rolled into the song. Pulse clock in and out are also supported, with the usual divisors for the incoming signal.

Two options are available for data storage: cassette and disk. A standard Commodore 1541 disk drive can be connected directly to the SP-12+no computer is required. (And yes, the SP-12 itself will happily format blank disks.) Sampled sounds can be loaded either in blocks of 32 or one at a time, although there appears to be no provision for loading a sound that was stored in location 3 into location 5, for example. Likewise, you can load either all the songs and segments or a single specified segment. Expect the loading and storing to take a bit of time, as the 1541, while faster than a data cassette, is not noted for its celerity. A utility command lets you look at a catalog of what is stored on a disk or cassette, but as you can't name your sounds and segments, the information in the catalog is bound to be extremely sketchy. Do remember to label your disks and cassettes.

Conclusions. As a new kind of hybrid device, the SP-12 is an impressive accomplishment. It offers a wide range of useful functions and is easy to operate, once you learn a couple of basic concepts. The multi mode feature, in which a single drum sound is spread across all eight play buttons with variations in loudness, tuning, or decay, makes the

recording of accent patterns a breeze, while the programmable mixes and tempo changes help a lot when it comes to building interesting songs.

We were a bit disappointed to discover that there are actually only 11 factory sounds rather than the 24 implied by the front panel layout. The user sampling, however, more than makes up the difference, allowing you to build truly awesome percussion tracks. The unit we had for review was loaded with some gated ambient drum hits that had the whole office dancing in the halls. We're told that a library of additional sounds on disk is being developed by E-mu; they also mentioned that the Digidesign Sound Designer software that currently talks to the E-mu Emulator II is being updated to allow transfer of sounds back and forth from the SP-12 to the E-II. Our only real gripe with the SP-12 itself is with the inadequacy in design of the swing factor. It has been several years since the Drumulator came out, so E-mu has certainly had time to rectify this problem.

Combining the segment/song architecture and single-note-erasing-on-the-fly of a standard drum machine with the sonic resources of a sampler makes for a very attractive product. If your music depends on power percussion, the SP-12 may be exactly what you need.

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