

# TRANSONIQ HACKER

*The Independent Ensoniq Mirage User's Newsletter*

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You know those little legends you sometimes find inside the front cover of paperback books: "This edition was lovingly set in all new type on our \$100,000 typesetter and printed with brand-shiny-new metal plates on acid-free paper, etc., etc., blah, blah." Well, this is kinda like that. This was lovingly put together with photocopies - right off our original paste-up sheets! Being a user's newsletter we can afford to be a little more informal. You'll find a variety of tpestyles that we've used as our newsletter has evolved and grown, and maybe some rather odd layouts as we puzzled everything together. (Have to have the right number of pages, you know.) You'll also find over a year and a half's worth of effort on the part of our writers and contributors to help you get the most out of your Mirage. Enjoy!

Reprints in this series that you may find useful:

- No.1 - Ensoniq Mirage Operations
- No.2 - Ensoniq Mirage Sample Reviews
- No.3 - Ensoniq Mirage Software Reviews
- No.4 - Ensoniq Mirage Questions & Answers
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## A FIRST LOOK AT THE MIRAGE

by Clark Salisbury

A notion that has long tantalized musicians, composers, and instrument designers is that somehow an instrument could be built that would put the power of an orchestra, with its vast range of tonal colors, under the direct control of a single musician. We've all seen the advertising headlines. "Have an orchestra at your fingertips" has almost become a cliché. And how many times have you run out to see the new "Rolaha DJ-C3PO" which, according to the ad, "has 400,000 user programmable presets, motion-sensing keyboard, joystick, game paddles, resynthesis of digitally interlocking parameter access, and doubles as a microwave oven" only to find that the best sounds it seems capable of producing all seem vaguely related to the bagpipe family.

Contrary to popular belief, however, the manufacturers do not sink all of their capital into advertising hype. The research into instruments with greater capabilities and new sources for the production of sounds continues. The latest, and I think most important recent technology, to emerge, is that of digital sampling. As is usually the case, though, the first instruments have been a bit on the, shall we say, expensive side, and this has put them out of reach of most of us ordinary musicians and electronic music enthusiasts. With the introduction of the Mirage, though, all that has changed. RC090317

The Mirage, of course, is the first digital sampling instrument to come available in a price range more suited to a musician's budget than that of a corporation. It is the logical offspring of a family of sampling instruments that boasts such illustrious names as Synclaviar, Fairlight, and E-mu. As a matter of fact, it's design philosophy is surprisingly similar to that of E-mu System's \$8000 dream machine, the Emulator II. Given the relatively short history of digital sampling, the Ensoniq folks must have done their homework to produce a product this comprehensive, with so many sensible functions.

In this article, I want to take a basic look at the Mirage as a whole, and probably the easiest way to do that is to look at its functions individually. So let's start with the biggie - sampling.

## SAMPLING

Sounds can be sampled into the Mirage via a 1/4" jack located on the rear panel. Input can be either mic or line level, selectable from the main keypad. The frequency at which the Mirage samples, called the sample rate, can be varied from approximately 33 kHz to approximately 8 kHz. At the maximum sample rate, the sample time will be about two seconds at either half of the keyboard (about four seconds total). Sampling time can be extended to as much as eight seconds per keyboard half at the lowest sample rate, but there's a tradeoff. Lower sample rate means lower frequency response. And since frequency response can be no more than half the sample rate (unless you are fond of aliasing noise) this means that at eight seconds you will get a frequency response of only about 3.5 kHz or so. So you may find that you'll want to keep your samples as short as possible, and loop them to get sustain.

Looping is a digital technique common in sampling, and it's very much like tape-looping. The idea is to take a portion of your sampled sound, and play it over and over without any space between replays, so that the sound can be sustained indefinitely. This is probably the most difficult operation to perform satisfactorily with any sampling machine, and the Mirage is no exception. Practice, intuition and clean living will all prove a great help here.

There are five functions that deal with looping in the Mirage. The first is the loop on/off switch, and it simply tells the Mirage to start a loop within the current sample. This function is also used to truncate (erase) the end of a sample. Truncating is usually done after the loop, to erase the unused portion of the sample and free up memory for other samples.

The next function sets the loop start point. In normal circumstances, you want your loop to start somewhere in the middle of the sound. If the loop is too near the beginning, you may get some or all of the sound's attack repeating over and over as the loop is replayed. Of course, you may want this effect in some instances. But generally, a good loop should be undetectable, and your sound should sustain smoothly.

The next two functions deal with the loop end point. This sets the point at which the Mirage stops playing the current sample and instantly returns to the loop start point to begin replaying the loop. The Mirage includes coarse and fine loop end adjustments.

The last function is a command called "wavesample rotate," and it is somewhat esoteric. Suffice it to say that wavesample rotate is used to move data from one end of your sample over to the other end, and its main purpose is to help in finding appropriate loop points.

Since pitch changes of a sample are affected by playback speed, (i.e. faster playback yields higher pitch and slower playback yields lower pitch) it may not be feasible to distribute a single sample over the entire keyboard. Anyone who has played back a tape recording of a singer at twice normal speed has found that not only is the singing higher, (by one octave actually), but that it now sounds like Alvin and the Chipmunks. This effect, (sometimes called munchkinization), is not noticeable with all sounds. Many keyboard sounds do not suffer too much from pitch-shifting. But sounds which have greatly varying resonant characteristics throughout their range, such as voice and saxophone, can suffer greatly from pitch-shifts of even a few notes.

There is a solution, however. It's called multi-sampling. It allows the user to take a number of different samples and distribute them across the keyboard. Using multi-sampling, you could sample your voice singing at a number of different pitches, assigning each sample to an appropriate area of the keyboard. In this way, no single sample will have to be shifted in pitch very far; you only need to shift it a few notes either way before you're into an area of the keyboard that is occupied by another sample. Then by looping each sample you can get realistic, sustaining vocals at any area of the keyboard. Provisions are made in the Mirage to take as many as eight samples per keyboard half, 16 total. You can then adjust each sample's tuning, volume, and filtering in order to balance the sound across the keyboard. RC080317

Of course you don't have to use the same type of sound for each sample when multi-sampling. You can use each sample to capture a different sound, making the Mirage a multi-timbral instrument. For example, you could sample a bass drum onto the lowest key of the Mirage, a high-hat on the next key, a snare drum on the next key, a tom-tom on the next octave of keys, (remember, one tom-tom sample will be pitch-shifted to yield the sound of 12 chromatically tuned toms) an octave or so of bass guitar, and finally three or so octaves of piano. These sounds may be hard to play all at once, of course. But by overdubbing parts on the built-in sequencer, you can quickly become your own one-man or one-woman band. And finally, there's a way to use the multi-sampling for layering effects. By sampling two different sounds, one on the even-numbered wavesamples and one on the odd, then pairing the even and odd samples together, you can get two distinct sounds under each key.

## ANALOG FUNCTIONS

Now that you have your samples in the Mirage, you may wish to do some processing to beef them up a bit. This is where the analog functions come into play, and these functions are quite straight-forward in terms of more "traditional" synthesizers. Since there is a great deal of printed material already available dealing with analog systems, I think we'll just touch on the analog functions within the Mirage.

Included in the analog section are eight (one for each voice) 24 db-per-octave filters with variable resonance (or "Q"). The filters can be adjusted for percentage of keyboard tracking, and each has its own five-part (attack, peak, decay, sustain, release) envelope generator. There are eight more envelope generators (again, one per voice) dedicated to dynamic control. Any or all segments of the envelope generators can be controlled by keyboard velocity, including release time, which is controlled by how quickly you release the keys. The digital oscillators can be paired and detuned to create digital chorusing effects. Eight LFOs are included. These can be routed to control pitch, for vibrato effects, and/or filtering.

## SEQUENCER

The sequencer in the Mirage is also quite straight-forward. It is a real-time sequencer, meaning it plays back exactly what is put into it, with timing variations and all. Its capacity is somewhat small. One Ensoniq brochure lists its capacity at 333 notes, but a representative of the company tells me it's 333 events. Since pressing and releasing a key are each counted as separate events, this would mean that the sequencer capacity is closer to 165 notes. Ensoniq does plan to expand this memory, however.

The sequencer allows you to lay down a basic track and overdub as many times as you want to as long as you don't exceed the eight-note polyphonic capability of the Mirage. Individual overdubs cannot be erased, but if you save each sequence to disk between overdubs, you can always recall the previous version of a sequence if you blow it while over dubbing. The sequencer supports all real-time controllers including pitch bend and mod wheels, sustain pedal and key velocity. It can be synced to drum machines or other clocked devices through its sync input on the back pane, or it can be synced through MIDI. Interestingly, the Mirage will still transmit MIDI clock data when it is synced through its clock input. This means you may be able to use it to synchronize some MIDI and non-MIDI devices.

## BACK PANEL

The back panel of the Mirage includes audio out, audio in (for sampling input), footswitch input (either for sustain pedal or sequencer start/stop footswitch

- selectable from the keypad), sync input, computer port (RS-232, baud rate selectable from the keypad), MIDI in, and MIDI out/thru (also selectable from the keypad).

## EXPANSION

Ensoniq Corp. has some interesting enhancements in the works for the Mirage. As mentioned before, there will be an expander for the sequencer which will add some 1024 events to its capacity. There will also be a new disk, called MASOS. MASOS stands for Mirage Advanced Sampling Operating System, and it will be a must for the serious sampling enthusiast. Among other things, it is supposed to make sampling easier and quicker by reducing the number of keystrokes needed to perform some operations. It will also allow you to play samples backwards, examine the value of individual samples, and achieve sample rates up to 50 kHz (!) when used in conjunction with a new input filter to be made available soon.

The next enhancement, projected for May or so, utilizes the MASOS and an Apple IIe, allowing the Apple to access wave samples and parameter functions to create a high-powered visual editing system for the Mirage. Pretty heady stuff, here!

To sum up, then, the Mirage represents a breakthrough in keyboard instruments; its features and functions are surprising indeed in this price range. Sampling, of course, can get somewhat technical and time-consuming, but the rewards can be great for those willing to make the commitment.

I welcome any sort of correspondence, questions, comments, or good jokes - address, mail to me, care of this publication. Until next time - RC090317

Clark Salisbury

Clark Salisbury is Product Specialist with Portland Music Co. in Oregon, and is also a partner in "The Midi Connection," a Portland-based consulting firm. He has been actively involved in the composition, performing, and recording of electronic music for over five years, and is currently involved in producing and marketing his own pop-oriented compositions on cassette tapes.