



TRANSONIQ HACKER

The Independent News Magazine for Ensoniq Users

LFO's: Useable, or What?

by Clark Salisbury and Erick Hailstone

The following is a somewhat modified (to run on both the ESQ'1 and the SQ-80) excerpt from the book "Programming the Ensoniq SQ-80", due out from Alexander Publishing, (14536 Roscoe Blvd, Suites 105/110, Panorama City, CA 91402) this spring.

LFO's. Every synthesizer has 'em. So what are they good for? And what does LFO stand for? And how do I use them? And where does electricity go once it leaves the toaster?

Well, first things first. LFO stands for Low Frequency Oscillator, and yes, it is an oscillator not unlike the audio oscillators found in the ESQ/SQ80, but there are a couple of significant differences. First, the LFO's have a much more limited selection of waveforms available, specifically, a triangle wave (a close relative of the sine wave), a square wave, a sawtooth (or ramp) wave, and a noise wave. Second, an LFO oscillates (cycles) at a much lower frequency than the audio oscillators. Its frequency range is below the normal audio range; in other words, LFO's will complete one cycle in a long enough period of time that we wouldn't be able to hear their output as a pitched sound. This isn't a problem, though, as LFO's are used as controllers, just as envelopes are used as controllers. But where envelopes are one-shot controllers, LFO's are cyclic controllers, swinging from positive to negative and back again, repetitively.

LFO's have four primary uses: to control pitch (creating vibrato and trill effects), to control amplitude (creating tremolo and cross-fade effects), to control timbre (for repetitive wah-wah, or "growl" effects, as well as quasi-phase shifting effects) and to produce automated stereo panning effects.

Let's set up one of the most common uses of an LFO, a vibrato effect. To follow along with this example, you'll first need to enter the "VIOLIN" patch included in this article into your ESQ/SQ80's memory. For the waves, we're using the "STRING" wave and the "BOWING" wave for the SQ-80; for the ESQ'1, use the "SAW" wave for all three oscillators - all techniques described in this article will still apply. Next, since we just want to work with OSC], let's turn the other two off by selecting DCA 2 and DCA 3, and setting "OUTPUT=" to "OFF" for each of them.

Now we should be hearing the output of OSC 1 all by itself. Select OSC 1, and set MOD 1 to LFO 1, and MOD amount to "+32". This will connect LFO 1 to OSC 1. Now all we need to do is make it do something - hopefully something interesting. So head over to the LFO 1 page. In the upper-left hand corner you will find "FREQ". This controls LFO rate - set it to "18". Next to "FREQ" is the "RESET" switch. When this is set to "ON" the LFO will return to the beginning of its cycle whenever a new key is played; when it's "OFF", the LFO continues through its cycle from whatever point it is currently at regardless of whether or not any keys have been played - for now, leave this set to "ON". Next is the "HUMAN" function. When off, the LFO will cycle with mechanical precision. When set to "ON", slight variations are introduced to the LFO's speed, giving it a less mechanical, more "human" sound. Leave this set to "OFF" for now. And in the upper-right hand corner is the "WAV=" function. This allows you to select which of the four waves you want the LFO to produce. For now, let's use the "TRI" (triangle) wave.

Along the bottom of the display are four more parameters. Reading from left to right, the first is "L1", the next is "DELAY", and then "L2". What we have here, in actuality, is a basic envelope. If you substitute the label "T1" for the label "DELAY", you'll see that

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Ensoniq Performance Tour '88

Latest Dates

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Clark Salisbury & Erick Hailstone
7280 S.W. 104th, Beaverton, Oregon 97005

SOUNDSET I from SYNTAUR

Reviewed by Rick Hall

FOR: ESQ-1, SQ-80.
PRODUCT: Soundset 1
PRICE: Set of 40 sounds (Mirage disk or cassette) for \$17.95.
FROM: Syntaur Productions, 11116 Aqua Vista, #2, North Hollywood, CA 91602.

A multitude of features at a very reasonable price is what has made the ESQ-1 the synthesizer of the common man. Many of those features, however, are the programming options that really define the immense capability of this instrument -- a capability which, alas, often goes unused by the average musician. This condition is due either to a lack of interest in using the instrument as a tool for sound invention, or, more probably in my estimation, a lack of education in how the programming functions actually work.

Well, nothing wrong with that... I myself do not usually spend the time to work up new sounds, being too busy making music instead. But I have made sure that I know how to create a sound when I need to, which is a frequent occurrence when one is involved with studio and commercial production work. Programming your own sounds may seem complicated, but on the ESQ-1 it's really a pretty simple affair in most cases. One of the most useful ways to learn how sounds are constructed is to look closely at some existing patches, with all the parameters available to see at once and maybe a little explanation thrown in as well...

Enter programmer Sam Mims of Syntaur Productions, a chap who has kept the needs of the common man in mind while coming up with a nice little potpourri of voices he calls his SOUNDSET I for the ESQ-1, ESQ-M, and SQ-80. The package consists of 40 sounds, primarily emulative (meaning that they try to emulate actual instruments such as strings, horns, etc.) and effects (telephones, sirens, crickets...). It is available in a number of formats for \$17.95. I used the cassette tape version and it loaded right up with no trouble. Included on the cassette was an audio version of the demonstration sequences, which were also included on the cassette as sequence data (if you want to play the demo sequences, you will need an expander cartridge).

What is really nifty about this collection, though, is the documentation supplied with the sounds. There is a soundsheet for each sound, and a short explanatory note detailing how the patch works. Consider the following entry on BSCCLNT: "A solo bass clarinet is simulated by using square and pulse waves, with oscillator 2 synched to oscillator 1. ENV1 is applied to these oscillators to "scoop" the notes slightly. Breath noise is provided by OSC3. The mod wheel adds vibrato to the sound, and BSCCLNT is panned just left of center (unmoving)."

In every instance, the information concerning these voices is useful and presented in the concise, readable manner shown in the above example. The data sheets are displayed next to the text and the parameters are set up in block diagrams which correspond to the ESQ's pages.

The voices themselves, 40 in all, are on the whole well-crafted. As always, there are some stand-outs... I liked the electric piano called DX PNO (described as "...the always-in-demand imitation of a DX7 imitating a Fender Rhodes piano...") and,

believe it or not, BANJO, which contains a very detailed account of how the patch was derived along with the pointed advisory "...This is quite a realistic patch, but the real trick is learning to pick like a bluegrass man.". Try making your keyboard play like a banjo and you'll see what he means.

Some of the simulated instruments I have heard done better, but I have not yet run across such useful documentation in any set of voices for the ESQ. In programming, just a little bit of informative explanation goes a long way towards increasing one's understanding of what you're hearing. These sounds are definitely worth the bucks, and with a little study this package can help you get a leg into the real excitement of the Ensoniq instruments.

See you in the Hackerpatch!

Bio: Rick Hall is a well-known -- some say notorious -- denizen of the Philadelphia music scene who keeps himself busy writing, performing, producing and recording with numerous ensembles of every conceivable nature, including his own R&B group DANIELS/HALL. He frequently sluffs off his serious obligations in order to go fly hot air balloons and indulge a passion for fiddle-making. He is in love with a large white dog named Lady. ■

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Tips On Using The EPS

by Clark Salisbury

For those few, hardy souls out there who have actually purchased (or will do so soon) Ensoniq's new EPS, I have good news and bad news. The good news is, the EPS is one helluva machine. The bad news is, good luck using it.

First of all, remember the Mirage? Remember the big print, words-of-less-than-two-syllables "Musician's Manual" that came with the machine? Granted, the "Musician's Manual" was user-friendly. And user-useless. If you really wanted to know anything at all about how to really do anything with the Mirage, you had to purchase the "MASOS" manual (which, in itself never made it onto anyone's "easy reading" list. But then, it was never intended to be a "Musician's Manual").

I will grant that the rather thin volume provided with the EPS is a good notch or two above the first Mirage manual. And you can now get the "Real EPS Manual" for free, just by sending in your warranty card. No big deal. And I'd venture a guess that, with all the difficulty Ensoniq seems to have had getting the EPS's rolling off the conveyor belts, we can forgive them if, maybe, they kinda left the manual for last. At least I can forgive them.

Because the EPS is one helluva machine. It sounds GREAT. I've sampled everything from compact disks to drum machines to voices and basses and synthesizers and other samplers. And it really sounds superb. I hope I'm making myself clear here. The sound of the EPS is as good as any sampler I've used, and I work in a music store. And it loops things, too. Actually, it loops anything. Weird, chorused multi-layered sounds that would give any other sampling fanatic the cold sweats it loops without blinking (how do they do that?). And the sequencer is without a doubt the finest sequencer I've ever seen built into a keyboard. And nicer than most stand-alone units. You see, the EPS is one helluva machine. It does everything they said it would, and then a whole bunch of other stuff. It's just that, well, it might just be a teensy little while before you can get a manual that will tell you how to do all that other stuff.

Like, I was doing some multi-sampling with the EPS. Naturally, I wanted a nice sounding drum kit, since the one provided by Ensoniq didn't impress me that much. As a matter of fact, the whole "library" they sent with the EPS didn't impress me that much. One piano (and a bit on the harsh side at that). A string section - nice samples, but funny attack. Some Latin Percussion (who am I, Ricky Ricardo?) and a bunch of synthesizer sounds, for Hernando's sake. Classic, highly sought-after sounds like "Theme", "Pingz", and "Ice Spinner". What in the world is an "Ice Spinner" anyway? Never mind - after hearing the sample I don't think I care to know.

But you see, it doesn't matter! Because the EPS is one helluva machine. It samples anything. And so I was doing these multi-samples off a drum machine. Bass drum, snare drum, cymbal - and naturally I was assigning them to the keyboard. And it was great. You'd simply hit the "Keyboard Range" button and play the low note and the high note for the sample you were working with, and presto! There it was, right where you wanted it. Except that every now and then, I'd assign a sample, and all the other samples on the keyboard would disappear! Bummer. Then I found out that you have to pay attention to whether you're working with a "wavesample" or with a "layer" when editing on the EPS. Because not only can

you have as many as 127 samples across the keyboard, you can go up to eight layers deep for any range on the keyboard. And that's just for one instrument. And there are eight of those. Instruments, that is. And this is a very good thing. Except that if you inadvertently set the range for a layer to something like, say, one note (as I was doing, thinking that I was assigning a shaker sound to the F# key) you won't hear any of your other samples. So, (to quote the manual) don't do that.

As a matter of fact, there's probably a lot of little things like this that aren't really explained in the EPS "Musician's Manual". Of course, if you're a musician, you probably don't care about stuff like this anyway. You'll be having too much fun jammin' with the "Ice Spinner" sound. But for the rest of us, there may be a few little things not covered in the manual that will make life a LIVING BREATHING INFERNO OF WRONG TURNS, DEAD ENDS, AND MISPLACED SAMPLES. So in the spirit of cutting-edge do-it-yourself-ism that the Hacker has for so long embodied, I'll be giving you a few tips occasionally on how to get the most out of your new EPS. At least this will provide a bit of light diversion while you and I wait for the "Real EPS Manual" to arrive.

So herewith are this month's tips:

Tip #1: Send in your warranty card! It's the only way to get the "Real Manual".

Tip #2: If you can't find your warranty card, send in a facsimile that includes your name, address, and where and when you purchased your EPS. After all, Ensoniq doesn't really want the warranty cards back. They've already got lots of them. What they really want is to know who and where you are. Marketing and all that. If you're feeling particularly benevolent, send them your own demographic study on yourself along with your facsimile warranty card. Include your age, sex, income, taste in movies, where you can be reached in case of an emergency, and what you had for breakfast. They'll appreciate it.

Tip #3: Don't edit a wavesample if you mean to edit a layer, and vice versa. If you're not sure you know what I mean, don't edit.

Tip #4: Send the factory sounds that come with the EPS back to Ensoniq with a note saying "Ha ha! That's a good one. Now could you please send me the Real Disks?"

Tip #5: Buy stock in Sony, Maxell, BASF, or Fuji. Once everyone owns an EPS (and I'm quite convinced that everyone will own an EPS, eventually) there will be so much sampling going on that it wouldn't hurt to have a little money invested with a disk manufacturer or two.

After all, it's a helluva machine.

Bio: Clark Salisbury is a partner in the MIDI Connection, a Portland-based consulting firm. He has been actively involved in the composition, performance, and recording of electronic music for over 7 years and is now producing his own pop-oriented compositions. His favorite color is chrome. ■

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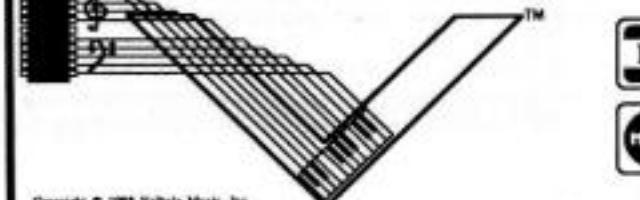
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Flexible Extras From STD Productions and Gotcha Covered

Reviewed by Dave Caruso

FOR: All instruments using cartridge or disk drive.
PRODUCT: Highpockets.
PRICE: \$18.95.
FROM: STD Productions, Route 13, Box 3, Morgantown, WV 26505.

Of all the products I own for storing, carrying, or displaying disks or cartridges, I have nothing like Highpockets. I think its designer, keyboardist Mark Kimble, knew that his product idea was different, and perhaps better.

I agree with much of the design of Highpockets because it's practical and original. The most important feature for me is its ability to display 13 disks or ROMs in a vertical, 100% cotton pouch system while hanging directly on my synth stand. I see that as the biggest attraction to buying this product over another one. And, as Don Pardo would say, "But wait--there's more!"

It's machine washable (minus your disks), and attaches quickly and easily to almost anything. It has elastic straps sewn to the top, bottom, and middle of its thirty and three-quarter inch length. It folds up, with 35 disks inside, to a neat package that can be easily put in a briefcase, purse, shoulder bag, etc.

So much for that literature. Here's why I like Highpockets.

On an Ultimate Support Stand, my favorite choice of placement for Highpockets is over the 'A' frame, on the left side of the stand, close to the Mirage disk drive. This causes the long, flexible product to hang on the same angle as the post it hangs on, which I like. Now this beats the newer Mirage display "lip" or stacking shelf. Put the Mirage on a bit of an angle and start playing with velocity and your disks will start flying to the floor. Highpockets won't dump your disks. And although the older model Mirage lip won't dump disks as easily as the newer one, it doesn't hold as many disks as Highpockets.

When I leave the stage, I take my disks with me, whether it's between the soundcheck and the show or between two sets. Highpockets means I don't have to grab each disk individually and put them into a separate case (which I don't really have a place for onstage anyway), before I can walk off. That makes me the last guy offstage every night. With Highpockets, I can fold, lift, and go.

Highpockets is black, and therefore it doesn't call too much attention to itself onstage.

This is the only disk case I have that works equally well if I'm using 3.5-inch disks, quick disks, RAMs, ROMs, or several of each.

So, I recommend this product, with a few design exceptions. And since it is such a good product, let's take these exceptions and turn them into suggestions for a hypothetical "Highpockets II."

1. An optional spine to keep it flat. This could clip itself to the existing Highpockets, and store easily in a synth case, underneath the synth. Without this spine there is the tendency for Highpockets to slink to one side. Using plastic would keep static down and keep it lightweight.

2. Add Velcro to Highpockets, perhaps for the above application, but especially for folding it up. When you get to

the last fold, it would already be fastened closed.

3. I personally would've made the pockets deeper. I don't need to see much of the disk, and I would feel safer if I couldn't. I must admit that this is being picky, because a bit more than half the disk is inside the pocket, and with repeated bumping I couldn't spill a disk. Still, deeper pockets would look better for me and my multi-colored disks and labels. So while it isn't a very important consideration, neither is fitting over sixty disks in this product at once. I tested this (it was mentioned in the literature), and I will never need that many disks on my stand at once--not even for an audition. What I'm trying to say is that I'd have "deepockets" before "widepockets."

4. An optional carrying strap, or at least built-in metal rings for this purpose (a camera strap would do). For portability and convenience, why not go all the way?

Overall, if Highpockets sounds like it fills a need for you, definitely get one. It's inexpensive, it comes with complete instructions for care and use, and it's "fully guaranteed for refund or replacement."

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Dust covers do more for you than keep dust off your equipment. They're water resistant (spills can be deadly to your equipment), and they look a heck of a lot better than those sheets you pile over your racks at the club.

I called Gotcha Covered Dust Covers Company at the above (toll free!) number and spoke to Gary Winder, vice president and general manager of the Band Instrument Division. He told me about the above sale prices, which were what he actually sold me on the product. I already knew I wanted dust covers, but I wasn't interested in paying thirty-four to thirty-seven dollars apiece for them. But now that I have them, I wouldn't do without them.

Gotcha Covered (hereafter referred to as "G.C."), makes covers for over one hundred different instruments, and they do custom orders. Now all of your drum machines, mixers, etc., can benefit from this kind of protection at a reasonable cost. Geez, I just had a terrible thought about a disaster outdoor show we had where the rain would sprinkle just a little, then go away, then sprinkle, then go away--with never enough rain for anyone to cancel the show. During a performance like that, any slave unit I wasn't playing but needed onstage could've been covered aesthetically during the performance.

Which brings me to another point. All of G.C.'s covers can be used without unplugging any headphone, MIDI, audio signal, pedal, or other kind of cords from the unit. They're made that way on purpose, with outlines sewn around these areas.

G.C. cases are made of a flexible vinyl-type fabric that allows you to fold it and put it right into your keyboard case with your keyboard so you can take it anywhere without needing an extra hand.

Another nightmare recalls the outdoor gig where the wind kept whipping the drop-cloth covers off the equipment before showtime. G.C. covers fit snugly around each instrument, because they're made especially for that instrument.

Their original ESQ-1 and Mirage covers have a window built into them where the display is, so you can cover the keyboard while in use without forgetting whether it's on or off. Newer G.C. covers don't have this feature, but if you like the idea you can custom order one. I especially like this idea because if I'm using an instrument as a slave, I don't need to touch it, but I do need to watch the display while I'm giving it MIDI commands.

The new G.C. covers are all the same color--black, with an orange stripe. Older covers were color-coded according to instrument make, and some of those are still available. Four-color catalogs allow you to see before you buy.

A few other nice features:

1. G.C. covers are completely American made.
2. G.C. takes MasterCard and Visa.
3. G.C. won't process your order until they ship it, so you won't be charged immediately for a purchase that's back-ordered for six weeks. There's a great company policy.
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Playing Between The Keys

Inside the "Q" Chip

by Dick Lord

Some of you may be old enough to remember the last time an article appeared under this title. After a somewhat premature sabbatical, we are back together again. For those of you too young (or forgetful!) to remember, this is the place where we look "under the hood" of Ensoniq's machines to find out what makes them tick, even if that means going slightly beyond the scope of the "Musician's Manual." If you're brave enough to venture into the uncharted waters of reverse-engineering, we will attempt to explore those realms that apparently are considered too secret and sacred for mortal consumption.

The topic of this month's article is Ensoniq's special piece of custom silicon, officially known as the 5503 Digital Oscillator Chip (DOC), but also known as the "Q" in Ensoniq. The same DOC (or "Q" chip) is the heart of all of Ensoniq's products except the EPS (which has a new DOC-II.) This one 40-pin custom IC is what makes an Ensoniq keyboard unique. It's one of the few parts in a Mirage or ESQ that you can't buy at Radio Shack.

Although the details of its inner workings do not appear in the "pamphlet" that comes with your DSK, the intrepid explorer may note that Ensoniq was kind enough to supply this chip to owners of the Apple II-GS. This is fortunate, because II-GS programmers obviously want to know how to do more than make a beep with their machines. Chapter 6 of the SYBEX book, INSIDE THE APPLE IIGS by Gary Bond, gives a fairly complete description of the 227 registers that make the DOC perform. For those who wish to go beyond the scope of this article, I recommend getting your hands on this book.

Before we plunge into the details, let's examine the concepts behind digital oscillators. Figure 1 shows the basic idea. A digitized waveform is stored in some form of waveform memory. An address generator supplies the location of each sample. The sample data is read from the waveform memory and sent to a digital-to-analog converter to produce the analog output. The address generator may be nothing more than a counter which simply steps through the memory. To change pitch in such a simple system, you would simply change the clock rate. Unfortunately, this scheme does not work as well when multiple oscillators are sharing the same wave memory and randomly competing for access. It also is not clear how one generates all the different clock rates.

Conceptual Digital Osc.

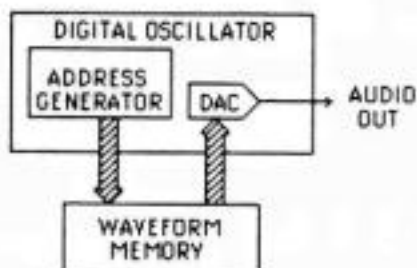
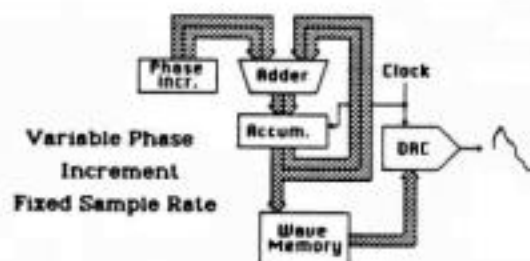


Figure 1

Figure 2 shows a different approach to producing the waveform. Here the address generator doesn't necessarily step consecutively through the wave memory. Instead, the address is formed by repeatedly adding an increment to the previous address. The address can be visualized as the phase angle of the sample. The phase angle is stored in an accumulator and may have more resolution than is presented on the address bus. The fractional part of the phase angle is kept to give finer control. Playback sample rate is constant in this design and pitch is controlled by the value of the increment.

Digital Oscillator Fundamentals Fixed Rate - Variable Phase Angle



| Fractional phase increment | | |
|----------------------------|------|-----------------|
| 0000 | 0000 | |
| 0000 | 0111 | Repeats 3 times |
| 0000 | 1110 | |
| 0001 | 0101 | |
| 0001 | 1100 | Repeats 2 times |
| 0010 | 0011 | |
| 0010 | 1010 | Repeats 2 times |
| 0011 | 0001 | |

Resolution is a constant frequency value.
If sample rate is 32,768 Hz. and Pitch reg. is 16-bit.
resolution = 32768/65536 = 0.5 Hz.

Figure 2

The phase increment oscillator concept assumes that the waveform will not be seriously damaged if a sample is occasionally repeated or skipped. If there are enough samples in the wave, the data probably will not change too rapidly between adjacent samples and this irregularity won't be noticed. This assumption is not always valid in waves where there are sharp transitions. That is why some Mirage samples sound OK on one note and whine on an adjacent note. (The new DOC chip in the EPS cures this problem by fetching two adjacent samples and interpolating between them to derive the data.)

Though phase incremental oscillators suffer from this sampling imperfection, they are very easy to build. Figure 3 shows how the concept is extended for multiple oscillators. The phase angle accumulator and increment register (i.e. pitch register) of Fig. 2 are replaced by memory blocks with a location for every oscillator. As each oscillator gets its slice of time, its phase increment register is added to its accumulator. The address is presented to the waveform memory and the sample is converted and sent to the appropriate output. We might want different oscillators to have different waveforms, so each oscillator also has a page latch (or a base pointer) that selects what part of wave memory the sample will come from.

Playback sample rate for each of N oscillators is simply the clock rate divided by N.

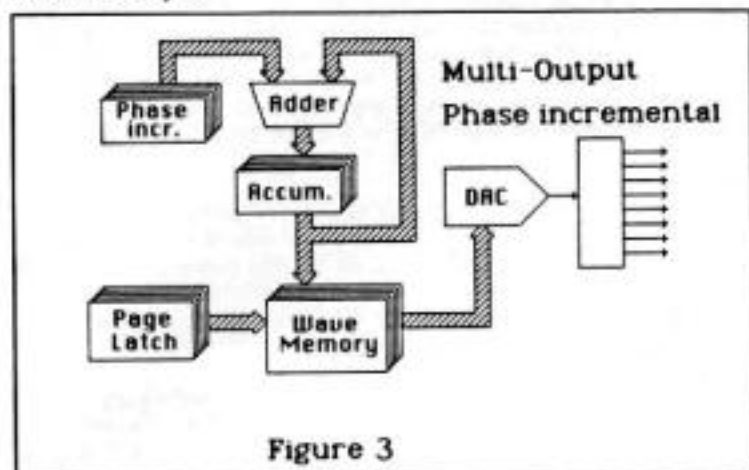


Figure 3

It is not too far a leap from the ideas in Fig. 3 to the block diagram of Fig. 4. This is my concept of what I believe is inside the DOC. Since it is considerably harder to reverse engineer silicon, I can't guarantee that this is a perfect model. The DOC has 32 oscillators worth of registers, though not all of them are always used. In the ESQ-1 only 24 are activated.

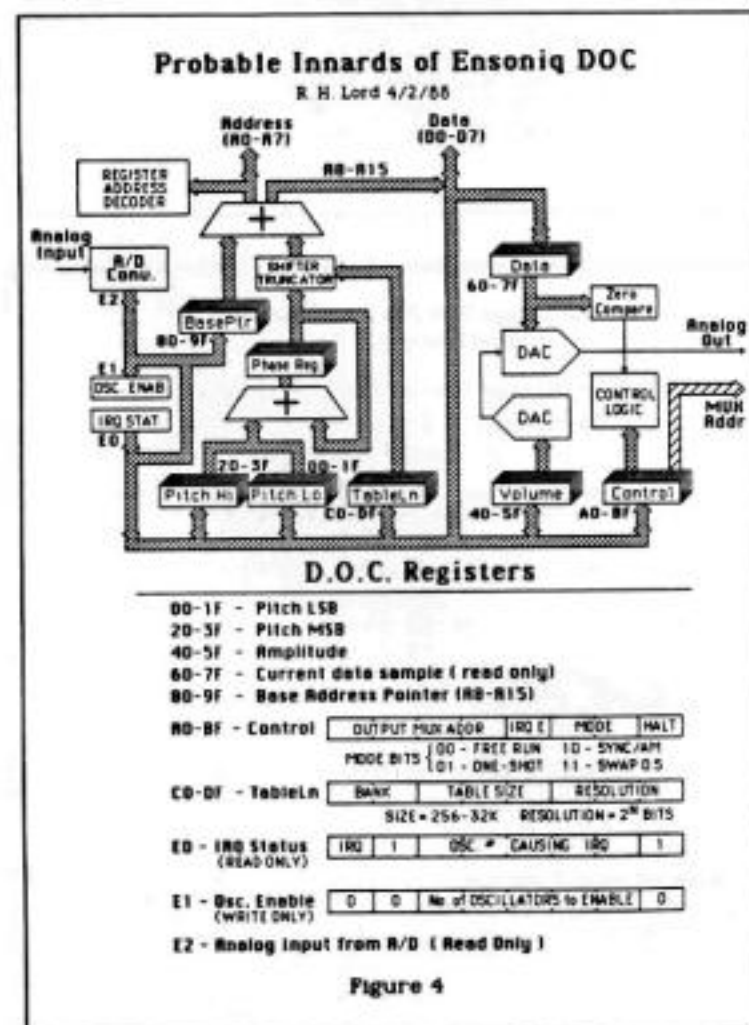


Figure 4

Our old familiar adder and phase angle register appear again at the lower left. The phase increment register is now 16 bits in length and split into pitch low-byte and pitch high-byte registers. There are 32 registers in each group, one for each oscillator. The pitch low-byte registers appear at chip addresses 00 through 1F. For the hacker these are decoded into address

space at EC00-EC1F in the Mirage and 6000-601F in the ESQ-1. Registers are accessed by chip selecting the DOC and placing the register address on A0-A7. The data then is read or written on the data bus. The high byte of the pitch appears at 20-3F. The phase angle data then enters a block that I call the shifter/truncator, which is controlled by the table length registers (C0-DF) to determine table length and resolution. The output of this block is then added to a base pointer (80-9F) to allow waveform selection.

The final 15 bit address is combined with the two MSB's (bank select bits) of the table length registers to form 16 bits of address output and an upper/lower bank select. The 8 LSB's of the address are sent out on dedicated address lines A0-A7. The MSB's appear on the data bus (D0-D7) during the first part of a DOC memory cycle and are latched externally.

Data fetched from the waveform memory returns on the data bus and is loaded into data registers (60-7F) for the output DAC. This is a multiplying DAC and its output level is determined by a reference voltage that is controlled by an amplitude DAC driven from the volume registers at 40-5F. The output can then be steered to the appropriate analog filter by an external multiplexer controlled by the MUX address stored in the 4 MSB's of the control registers (A0-BF.) Though the Mirage and ESQ assign each MUX output to fixed groups of oscillators, this is done in software and is not cast in concrete by the hardware design.

Figure 5 shows my speculation of how table length and resolution are controlled. My guess is that the internal phase angle accumulator is 22 bits long (PA0-PA21). A barrel shifter, controlled by the resolution bits of the table register, supplies 16 bits to a truncator where the cycle length is determined by cutting off MSB's. The oscillator table length can then be set to any binary value from 256 to 32,768 samples (1 to 128 pages).

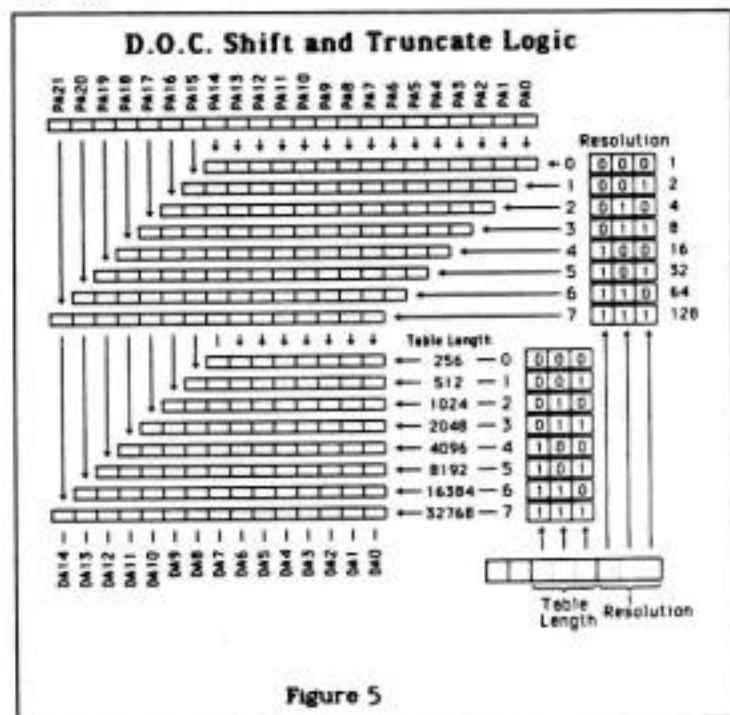


Figure 5

Two interesting problems arise from this design. First, the table length is limited to 32K bytes. A 64K sample requires two oscillators for playback. The first plays the first 32K. When it finishes, a second oscillator (with an offset base pointer) plays the remainder. The second problem is more complex. Not all samples are going to have lengths that correspond to nice binary multiples. How does the DOC know when it has reached the end of a 400 byte sample?

Without another 64 registers available to store a 16-bit end address for each oscillator, Ensoniq was stuck having to find another alternative. Their solution was to limit the analog data to 255 levels of output and to reserve data word 00 as a stop flag. (When you sample, all 00 samples get replaced with 01's.) For our 400 byte sample, the table length is set to 512. When a 00 is detected in the 401st byte, the oscillator cycle is terminated. With some combinations of resolution and pitch increment it is possible that the 401st sample might be skipped. This is why samples must have at least eight consecutive 00's to terminate reliably.

What happens when an oscillator terminates its cycle? This is determined by the mode bits in control registers A0-BF. In the free-run mode, the oscillator just starts again and repeats the cycle. In the one-shot mode it halts and must be re-started by software. In the swap mode, it is paired with the adjacent oscillator. When the first oscillator finishes, the second oscillator begins. It then starts the first oscillator again.

The final sync/a.m. mode looks at pairs slightly differently. Half the oscillators do sync mode and the other half can be amplitude modulated. In sync mode, both oscillators free-run, but the synchronized oscillator gets re-started whenever its pair completes its cycle. In A.M. mode, the output of one oscillator is used as the reference input for the second oscillator in place of the amplitude DAC input. The output of the second oscillator is multiplied by the output of the first.

The micro-computer that sets up the registers for the DOC needs to know when an oscillator completes its cycle. The interrupt enable bit in each register's control bit can be set. When the oscillator reaches the end of its cycle, an interrupt is generated. The computer then looks in status register E0. If

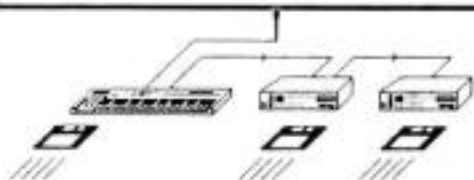
the MSB is set, the interrupt was from the DOC chip. The number of the oscillator causing the interrupt appears in the LSB's. Note that this is shifted one bit to the left. This allows the oscillator number to be used as an offset into a 16-bit vector table so that the interrupt can be vectored. Reading the interrupt register clears the interrupt. If the oscillator is operating in one-shot mode, it also is halted and the halt bit is set in its control register. It is re-started by writing a 0 to the halt bit.

Finally, register E1 is used to set the total number of oscillators that are usable. The playback sample rate is determined by how many oscillators are activated by this register. Register E2 supplies the data from the analog input pin. This A/D is used both for sampling and for digitizing the input from the pitch bend and mod wheel controllers.

This is certainly a whirlwind tour of the apparent operation of the DOC. There may be a few subtle points that I haven't yet uncovered, so hackers are on their own from here but this complex part is certainly the most interesting device in the Mirage, ESQ or SQ-80.

Bio: Dick Lord has no musical chops, whatsoever. His interest in keyboards is mainly surgical. The voice behind the Upward Concepts phone, he occasionally has been known to work as a consultant in the design of pulmonary test systems (just to pay the bills.) He is married to Persis Ensor, a very talented Medieval/Renaissance musician who finds it fairly difficult to relate to instruments that have power cords and MIDI cables, even when they play in meantone. ■

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Mirage Drum Machine Sequencer

By Nathan Miles

After I bought my Mirage and the factory sample diskettes I had in my possession some great drum sounds and no reasonable way to turn them into a credible rhythm track. Adding an external MIDI sequence recorder would give me the functions I needed but would cost a few hundred dollars more than I had available (available funds stood at \$2.34 last time I checked). Fortunately, I discovered that with a little software hacking the Mirage itself was able to produce the kind of sequencing I needed.

In this article I'll cover the operation of the sequencing software I designed and the instructions for loading it into your Mirage with either LEAPING LIZARD'S Mirage Monitor or UPWARD CONCEPTS' Monitor Disk. (For a copy of the 6809 assembly language source for the sequencing software and a description of how it functions internally, send an IBM-formatted disk and \$3 for p/h to Nathan Miles, 1905 S. 30th., Terre Haute, IN 47803.)

ENTERING THE SOFTWARE

This section tells how to add the drum machine sequencing software to an OS 3.2 diskette. The following listing can be entered with the ':addr' command using the LEAPING LIZARD'S monitor or with the 'M' command if you are using the UPWARD CONCEPTS' monitor.

Addr/Memory Contents

```
94A7 B6 80 8B 81 32 10 2F 02
      50 B6 80 8B 80 32 4A 48
      5F C3 1C 00 1F 01 B6 80
      AE 81 12 10 27 02 AB 16
      02 85

9700 8E B8 0B 10 8E B8 0B A6
      84 84 80 27 21 A6 84 81
      80 26 09 8D 2C 10 BF B8
      06 39 12 12 81 81 26 04

9720 30 02 20 E3 81 E0 26 0A
      A6 3F 8B 08 A7 3F 30 03
      20 D5 8D 0D 6F 3F 20 CF
      EC 84 ED A4 30 02 31 22

9740 39 EC 84 ED A4 A6 02 A7
      22 30 03 31 23 39 10 BE
      B8 06 10 8C B9 FF 23 05
      CC B6 9E 20 11 10 8E B8

9760 00 EC A0 ED 80 10 8C BA
      00 26 F6 39 12 12 DD B3
      39 A6 01 81 39 27 05 CC
      2A B6 20 F2 7F B8 0A 10

9780 BE B8 06 31 3D 30 0B 10
      8C BF 00 23 05 CC B6 9E
      20 DC A6 84 81 80 27 0C
      81 81 26 04 8D 9A 20 E7

97A0 8D 9F 20 E3 8D 9B 10 BF
      B8 06 39 12 12
```

After entering (and double checking) the code it must be saved to a disk. Don't use your most precious sample disk or only copy of the WHIZ-BANG II operating system disk. A newly formatted disk would be a good safe choice. The LEAPING LIZARDS monitor will save the entered code via the '^S', Save Operating System command. To save the code with the UPWARD CONCEPTS' monitor use the following commands:

```
x 9400 95ff 1000 "Relocate code to buffer"
w 00 05 y "Write buffer"
x 9600 99ff 1000 "Relocate rest of code"
w 01 00 y "Write buffer"
```

RHYTHM PATTERNS

One technique drum machines use to enter rhythm patterns is "step time" entry. In step time entry you punch in all the notes you wish to play on the current beat and then hit another button to advance a small step (usually a 16th note) forward. We can use the top key of the Mirage keyboard, that is the C which is usually 3 octaves above middle C, to emulate the step-forward-in-time button of a drum machine.

For example if we wished to create a rhythm pattern with bass drum hits on beats 1 and 3, and snare drum hits on beats 2 and 4, we could enter the following:

```
<SEQ Rec> <SEQ Rec> "Enter record mode"
BD / / / / "Enter bass drum, advance 4 1/16 notes"
SD / / / / "Enter snare hit, advance 4 1/16 notes"
BD / / / /
SD / / / /
```

```
<Cancel> "Cancel sequence recording"
```

Where: BD = Key which plays bass drum in current sample
SD = Key which plays snare drum in current sample
/ = Top key, C, on keyboard

If we'd like an additional bass drum hit on "2 and" and closed high-hat (CH) hits on every 1/8 note we'd enter:

```
BD CH / / CH / / SD CH / / BD CH / /
BD CH / / CH / / SD CH / / CH / /
```

It doesn't matter what timing we use to enter this sequence because the next step is to use the rhythm pattern command built into this software to adjust the timing. To change what we entered to the proper timing use the following command button pushes:

```
<Param> 5 0 <SAMPLE Upper>
```

This command sequence will cause the drum machine sequence software to execute and transform the timing of what we entered into perfectly executed beats. In the process the top key notes we entered are removed. This command only takes a few thousandth's of a second to execute so don't be fooled into thinking nothing happened when you pressed the <SAMPLE Upper> key. Press the <SEQ Play> button and you should hear the entered rhythm pattern played in real time.

After a sequence is built, it may be saved for later use either through the standard Mirage sequence save commands or the commands described in the next section.

BUILDING SONGS

It would be possible to use the rhythm pattern section to enter an entire song but it would be a very tedious and error prone process. That's why most drum machines have another level of capabilities which allow predefined rhythm patterns to be joined into songs.

This sequencing software allows you to define up to 39 patterns and join them together into a song. The patterns are numbered 51 through 89. Each pattern may be up to 150 notes long.

To save a pattern for later use, enter it as described in the previous section and play it to verify that it sounds right. Enter the following command button pushes to move the sequence to the desired save location:

<Param> x x <SAMPLE Lower>

Where 'x x' is any parameter from 51 through 89.

If the pattern is longer than 150 notes, the display will read 'SE' (Sequence Error) and the pattern will not be saved.

The patterns are actually stored in the area of Mirage memory normally used to store wavesamples for the lower keyboard half. This has its good points and its bad points. The good news is that you can make a permanent copy of the patterns you create by using the standard Mirage Parameter 11 command to save the lower sample area to an unused sample slot (1-3) on your disk.

The bad news is that the saved patterns will probably overwrite a portion of your lower keyboard sample. This is not a major problem since the patterns are only stored in lower waveform memory temporarily while you are building the completed sequence. After you have completed building the sequence, simply reload your lower wavesamples using <LOAD Lower>.

You may incrementally build up a collection of rhythm patterns by loading your previously saved patterns using the <LOAD Lower> button, adding your new pattern, and then saving it again using the standard Parameter 11, Save Lower, command. Don't forget to reload your lower drum sample after saving the pattern area.

To create a song out of predefined patterns, first clear the sequence area by pushing:

<SEQ Rec> <SEQ Rec> <Cancel>

Now you may append patterns one-at-a-time to your sequence by entering:

<Param> x x <SAMPLE Upper>

Where 'x x' is any number from 51 through 89.

If you wish to append the same pattern multiple time to your song, you only have to enter the number the first time. Thereafter, pushing the <SAMPLE Upper> button will cause the same rhythm pattern to be appended again.

If you have not yet created rhythm pattern 'x x', the display will read 'nS' (no Sequence) until you press cancel. If appending the sequence would cause the Mirage sequence area to overflow, the display will read 'SE' (Sequence Error) until you press cancel.

After you have built the song, it may be saved using the standard sequence save commands.

USING THE SOFTWARE

I've had a lot of fun with this software using the 102 sound disk which comes standard with the Mirage and has a sample with a bass drum, snare drum, and closed high-hat in the lowest three keys of the keyboard. I enter a basic rhythm pattern using the sequencing software and then jam against the rhythm track as the Mirage sequencer plays it.

In some cases you might want to use this sequencing software to create just a basic rhythm pattern on the bass and snare drums and then use the Mirage sequence overdub commands to go back and add the high-hats, cymbals, and tom-toms.

Bio: Nathan Miles is a programmer/would-be-musician whose keyboard career is in decline having peaked out when many years of intensive practice yielded a reasonably recognizable rendition of "Chopsticks". About him it can truly be said, "Of all the people in the world, he's one of them." ■

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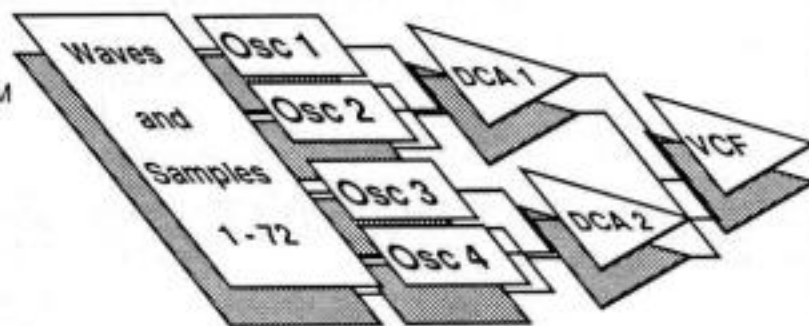
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Hackerpatch

HACKERPATCH is intended to be a place where patch vendors can show their wares and musicians can share their goodies and impress their friends. Patches designated "ESQ-1" will also work on the SQ-80. The reverse is not true. Once something's published here, it's free for all. Please don't submit patches that you know to be minor tweaks on copyrighted commercial patches unless you have permission from the copyright owner. All submitted patches are subject to consideration for mutilation in Erick Hailstone's "Hacking Part" and comments by Sam Mims - our resident patch analyst. If you send in a patch, *PLEASE* include your phone number.

The Hacking Part...

PROGRAM: UPRITE (by Brian Williams)

This sound works fine as an upright bass. OSC1 and 2 are tied together using amplitude modulation to create the main body of the sound. OSC3 creates the thunk attack. Many different bass sounds can be created from this one patch by altering OSC3 to simulate different types of attacks or to change the primary sounds.

For example:

1) Change the following OSC3 parameters : OCT=-1, FINE=4, WAVE=SQR2. Change the following DCA3 parameters: LEVEL=63, MOD1=ENV3, DEPTH=63. The sound that results is more synthetic with the fine tuning giving a chorusing effect.

2) Starting with Brian's patch, change the following OSC3 parameters: FINE=0, WAVE=BELL. Select DCA1 and 2 and change MOD2 to OFF. We now have a digital bass sound. Try tuning OSC3 in different ways using OCT, SEMI, and/or FINE.

3) Starting with Brian's patch, change the following OSC3 parameters: OCT=-3, FINE=0, WAVE=KICK. Select DCA1 and 2 and set the LEVEL parameter to 0. Select the MODES page and turn the AM (amplitude modulation) OFF. Select ENV2 and change T2 to 0. If you want to hear more attack, turn MOD1 ON, OSCs 1 and 2 down.

SQ-80 Modifications

Let's start with the obvious. Take advantage of the SQ-80's aftertouch. Set LFO1's MOD=PRESS. Now you can control vibrato with pressure. Select OSC1 and change MOD2=PRESS. When you apply pressure you now get a slight detuning effect.

Start with Brian's patch. Follow the directions in #3 above for the ESQ-1. Now, select OSC3. Try selecting the drum waveforms. Try the following - THUMP, PLUNK, PLUCK, PLINK, SLAP, PICK1, and PICK2. If you want to hear more of the attack waveform, turn MOD1 down on OSC1 and 2. The way things are set at the moment, ENV2 is controlling DCA3, the attack waveform. Select DCA3 and turn MOD1 and MOD2 off. Use the LEVEL control to set the amount of attack waveform you wish to hear.

That's it for now. As always, if there are specific sounds or instruments you would like to hear about, drop me a line.

Erick Hailstone.
The MIDI Connection

The Patching Part...

PROGRAM: UPRITE

by Brian R Williams

This is an acoustic bass type of patch that I use when the Mirage is busy doing other things. It is meant to be used as a split program with piano or vibes, etc. since the upper range is not particularly useful.

[Sam Mims: This is an interesting patch. It has the flavor of an upright acoustic bass, with the strength of an electric piano. I prefer not to detune OSC 3 so much; I set FINE to 10. Don't ignore the top range, though - it could be useful as a tuned percussion effect.]

PROGRAM: TYMPANI

by Tim Edwards

Don't be fooled by the SQ-80s TYMPANI sound - drum waveforms don't always make the best drums. This sound has a limited range in the bottom two octaves of the keyboard, but it sounds good there. I use my Control Voltage pedal to do drum rolls. If you don't have a pedal, just change the four occurrences of PEDAL to WHEEL. Do a roll by starting a trill with the pedal (wheel) all the way forward, then slowly roll back to zero.

[Sam Mims - This is the best of many attempts I've heard at imitating a tympani. I prefer using NOISE 2 on OSC1 for a more pitched sound with less "bang" - but this is strictly a matter of taste. Also, try editing out the "Also Sprach Zarathustra" (2001) effect by leaving the SPLIT/LAYER, LAYER, and SPLIT turned OFF.]

PROGRAM: NIGHT

by Greg Lief

This is an odd texture with the mod wheel enhancing the stereo pan effect. I suggest trying all five formants for OSC 3, depending upon the effect you want to achieve.

[Sam Mims - This is a nice sound in that catch-all "new age" category. I like FORMT 1 best on OSC 3, but nearly every waveform works well, giving many interesting effects. I prefer speeding up LFO 3 to 21 or so, for more of a "shimmer" in the panning.]

PROGRAM: Y-BASS

by Pat Finnigan, The Big Picture Co.

Here's a bass patch that's a cross between two popular DX-7 sounds. OSC 2 is used in the same way as a coarse fixed frequency control in FM programming, adding the "spank" to the sound. The KEYBOARD parameter on the FILTER page will emphasize and sustain this overtone at higher settings. Never boil those Rotosounds again...

[Sam Mims - A good way to control the slap of the sound is with the LEVEL of DCA 2. The sound only works on the bottom 1-1/2 octaves, but it's a nice bass patch. To make a resonant synth bass, try playing with FREQ and RES (Q) on the FILTER page; settings of 17 and 19 respectively work well. For a neat African-sounding percussion/bass, simply switch MOD 1 to ENV 2 on the FILTER page.]

ESQ-1 PROG: UPRITE

BY: BRIAN WILLIAMS

| | OCT | SEMI | FINE | WAVE | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-----|------|------|------|-------|-------|-------|-------|
| OSC 1 | -1 | 0 | 0 | SQR2 | OFF | - | OFF | 0 |
| OSC 2 | 0 | 0 | 0 | OCT5 | LFO1 | 1 | OFF | 0 |
| OSC 3 | 0 | 0 | 21 | SINE | OFF | - | OFF | 0 |

| | LEVEL | OUTPUT | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-------|--------|-------|-------|-------|-------|
| DCA 1 | 63 | ON | ENV3 | 63 | ENV2 | 63 |
| DCA 2 | 55 | ON | ENV3 | 63 | ENV2 | 63 |
| DCA 3 | 0 | ON | ENV2 | 63 | ENV2 | 63 |

| | FREQ | Q | KEYBD | MOD#1 | DEPTH | MOD#2 | DEPTH |
|--------|------|---|-------|-------|-------|-------|-------|
| FILTER | 0 | 1 | 20 | ENV3 | 63 | KBD | -19 |

| | FINAL VOL | PAN | PAN MOD | DEPTH |
|-------|-----------|-----|---------|-------|
| DCA 4 | 63 | 8 | OFF | 63 |

| | FREQ | RESET | HUMAN | WAV | L1 | DELAY | L2 | MOD |
|-------|------|-------|-------|-----|----|-------|----|-------|
| LFO 1 | 22 | OFF | OFF | TRI | 0 | 0 | 0 | WHEEL |
| LFO 2 | - | - | - | - | - | - | - | - |
| LFO 3 | - | - | - | - | - | - | - | - |

| | L1 | L2 | L3 | LV | T1V | T1 | T2 | T3 | T4 | TK |
|-------|----|----|----|----|-----|----|----|----|----|----|
| ENV 1 | - | - | - | - | - | - | - | - | - | - |
| ENV 2 | 60 | 23 | 2 | 0 | 21 | 3 | 21 | 20 | 12 | 37 |
| ENV 3 | 63 | 46 | 45 | 29 | 0 | 0 | 31 | 35 | 20 | 51 |
| ENV 4 | 63 | 28 | 28 | 6 | 63 | 1 | 45 | 54 | 16 | 63 |

| | SYNC | AM | MONO | GLIDE | VC | ENV | OSC | CYC |
|-------|------|----|------|-------|----|-----|-----|-----|
| MODES | OFF | ON | OFF | 0 | ON | ON | ON | OFF |

| | SPLIT/LAYER | S/L PRG | LAYER | LAYER PRG | SPLIT | SPLIT PRG | SPLIT KEY |
|--|-------------|---------|-------|-----------|-------|-----------|-----------|
| | ON | | OFF | - | UPPER | PIANO1 | 60 |

ESQ-1 PROG: TYMPNI

BY: TIM EDWARDS

| | OCT | SEMI | FINE | WAVE | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-----|------|------|--------|-------|-------|-------|-------|
| OSC 1 | -3 | 0 | 0 | NOISE1 | ENV2 | 32 | OFF | - |
| OSC 2 | -3 | 0 | 3 | NOISE2 | LFO1 | 63 | OFF | - |
| OSC 3 | -2 | 8 | 0 | OCT+5 | OFF | - | OFF | - |

| | LEVEL | OUTPUT | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-------|--------|-------|-------|-------|-------|
| DCA 1 | 63 | ON | LFO3 | 28 | PEDAL | -13 |
| DCA 2 | 63 | ON | LFO3 | 28 | PEDAL | -13 |
| DCA 3 | 63 | ON | LFO3 | 28 | PEDAL | -13 |

| | FREQ | Q | KEYBD | MOD#1 | DEPTH | MOD#2 | DEPTH |
|--------|------|---|-------|-------|-------|-------|-------|
| FILTER | 23 | 0 | 0 | PEDAL | -23 | ENV1 | 63 |

| | FINAL VOL | PAN | PAN MOD | DEPTH |
|-------|-----------|-----|---------|-------|
| DCA 4 | 63 | 8 | OFF | 0 |

| | FREQ | RESET | HUMAN | WAV | L1 | DELAY | L2 | MOD |
|-------|------|-------|-------|-----|----|-------|----|-----|
| LFO 1 | 63 | OFF | OFF | NOI | 63 | 0 | 63 | OFF |
| LFO 2 | - | - | - | - | - | - | - | - |
| LFO 3 | 40 | ON | ON | SQR | 0 | 4 | 63 | OFF |

| | L1 | L2 | L3 | LV | T1V | T1 | T2 | T3 | T4 | TK |
|-------|-----|-----|-----|----|-----|----|----|----|----|----|
| ENV 1 | 60 | 23 | 35 | 20 | 0 | 0 | 32 | 47 | 36 | 0 |
| ENV 2 | -63 | -63 | -63 | 0 | 0 | 0 | 63 | 63 | 63 | 0 |
| ENV 3 | - | - | - | - | - | - | - | - | - | - |
| ENV 4 | 63 | 35 | 35 | 14 | 0 | 0 | 30 | 39 | 32 | 0 |

| | SYNC | AM | MONO | GLIDE | VC | ENV | OSC | CYC |
|-------|------|-----|------|-------|----|-----|-----|-----|
| MODES | OFF | OFF | OFF | 0 | ON | OFF | ON | OFF |

| | SPLIT/LAYER | S/L PRG | LAYER | LAYER PRG | SPLIT | SPLIT PRG | SPLIT KEY |
|--|-------------|---------|-------|-----------|-------|-----------|-----------|
| | ON | PNOSTR | ON | OB BRS | UPPER | 3 TRIMS | 60 |

ESQ-1 PROG: NIGHT

BY: GREG LIEF

| | OCT | SEMI | FINE | WAVE | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-----|------|------|--------|-------|-------|-------|-------|
| OSC 1 | 1 | 0 | 2 | BELL | LFO1 | 5 | OFF | - |
| OSC 2 | -1 | 0 | 1 | OCT+5 | OFF | - | OFF | - |
| OSC 3 | -1 | 0 | 0 | FORWT3 | LFO1 | 5 | OFF | - |

| | LEVEL | OUTPUT | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-------|--------|-------|-------|-------|-------|
| DCA 1 | 48 | ON | OFF | - | OFF | - |
| DCA 2 | 50 | ON | OFF | - | OFF | - |
| DCA 3 | 56 | ON | OFF | - | OFF | - |

| | FREQ | Q | KEYBD | MOD#1 | DEPTH | MOD#2 | DEPTH |
|--------|------|---|-------|-------|-------|-------|-------|
| FILTER | 100 | 0 | 0 | OFF | - | OFF | - |

| | FINAL VOL | PAN | PAN MOD | DEPTH |
|-------|-----------|-----|---------|-------|
| DCA 4 | 63 | 8 | LFO3 | 39 |

| | FREQ | RESET | HUMAN | WAV | L1 | DELAY | L2 | MOD |
|-------|------|-------|-------|-----|----|-------|----|-------|
| LFO 1 | 16 | ON | ON | TRI | 5 | 0 | 21 | LFO1 |
| LFO 2 | - | - | - | - | - | - | - | - |
| LFO 3 | 12 | ON | ON | SQR | 19 | 4 | 50 | WHEEL |

| | L1 | L2 | L3 | LV | T1V | T1 | T2 | T3 | T4 | TK |
|-------|----|----|----|----|-----|----|----|----|----|----|
| ENV 1 | - | - | - | - | - | - | - | - | - | - |
| ENV 2 | - | - | - | - | - | - | - | - | - | - |
| ENV 3 | - | - | - | - | - | - | - | - | - | - |
| ENV 4 | 63 | 63 | 40 | 7 | 63 | 33 | 23 | 32 | 40 | 0 |

| | SYNC | AM | MONO | GLIDE | VC | ENV | OSC | CYC |
|-------|------|-----|------|-------|----|-----|-----|-----|
| MODES | OFF | OFF | OFF | 0 | ON | OFF | OFF | OFF |

| | SPLIT/LAYER | S/L PRG | LAYER | LAYER PRG | SPLIT | SPLIT PRG | SPLIT KEY |
|--|-------------|---------|-------|-----------|-------|-----------|-----------|
| | OFF | - | OFF | - | OFF | - | - |

ESQ-1 PROG: Y-BASS

BY: PAT FINNIGAN - THE BIG PICTURE COMPANY

| | OCT | SEMI | FINE | WAVE | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-----|------|------|--------|-------|-------|-------|-------|
| OSC 1 | -1 | 0 | 0 | BASS | OFF | - | LFO1 | 10 |
| OSC 2 | -1 | 0 | 1 | NOISE3 | OFF | - | LFO1 | 10 |
| OSC 3 | -1 | 0 | 0 | E PMO2 | OFF | - | LFO1 | 10 |

| | LEVEL | OUTPUT | MOD#1 | DEPTH | MOD#2 | DEPTH |
|-------|-------|--------|-------|-------|-------|-------|
| DCA 1 | 53 | ON | OFF | - | OFF | - |
| DCA 2 | 63 | ON | OFF | - | OFF | - |
| DCA 3 | 63 | ON | ENV2 | 63 | ENV2 | 63 |

| | FREQ | Q | KEYBD | MOD#1 | DEPTH | MOD#2 | DEPTH |
|--------|------|---|-------|-------|-------|-------|-------|
| FILTER | 30 | 0 | 4 | ENV3 | 59 | OFF | - |

| | FINAL VOL | PAN | PAN MOD | DEPTH |
|-------|-----------|-----|---------|-------|
| DCA 4 | 63 | 8 | ENV2 | 63 |

| | FREQ | RESET | HUMAN | WAV | L1 | DELAY | L2 | MOD |
|-------|------|-------|-------|-----|----|-------|----|-------|
| LFO 1 | 24 | OFF | OFF | TRI | 0 | 0 | 20 | WHEEL |
| LFO 2 | - | - | - | - | - | - | - | - |
| LFO 3 | - | - | - | - | - | - | - | - |

| | L1 | L2 | L3 | LV | T1V | T1 | T2 | T3 | T4 | TK |
|-------|----|----|----|----|-----|----|----|----|----|----|
| ENV 1 | - | - | - | - | - | - | - | - | - | - |
| ENV 2 | 63 | 0 | 0 | 57 | 0 | 0 | 7 | 0 | 20 | 8 |
| ENV 3 | 63 | 18 | 0 | 63 | 0 | 0 | 28 | 26 | 22 | 0 |
| ENV 4 | 63 | 59 | 55 | 10 | 0 | 0 | 20 | 63 | 0 | 0 |

| | SYNC | AM | MONO | GLIDE | VC | ENV | OSC | CYC |
|-------|------|-----|------|-------|----|-----|-----|-----|
| MODES | OFF | OFF | OFF | 0 | ON | ON | ON | OFF |

| | SPLIT/LAYER | S/L PRG | LAYER | LAYER PRG | SPLIT | SPLIT PRG | SPLIT KEY |
|--|-------------|---------|-------|-----------|-------|-----------|-----------|
| | OFF | - | OFF | - | OFF | - | - |

Classifieds

USER GROUPS

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PATCH UPGRADES

VOICE CRYSTAL UPGRADE #8-A3-3.1 MODEL: VC3

PATCH: OBXHPN
LOCATION: BANK A3
OSC 2: WAVE=REED
OSC 3: FINE=04
FILR: RES=03
DCA 4: MOD=ENV4 * 60
NOTE: Adds a bit of brightness to the horns as well as reducing the chorus effect. This patch was used as the basis for a voice created for Keith Emerson which will appear on Voice Crystal 4!

SEQUENCES

ROLAND MC500 sequences wanted. Your list gets you mine. 914-963-1768. G-4 Productions/M.U.G., 622 Odell Ave., Yonkers, NY 10710.

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The Interface

Letters for The Interface may be sent to any of the following addresses:

U.S. Mail - The Interface, Transoniq Hacker, 1402 SW Upland Dr., Portland, OR 97221

Electronic mail - GENIE Network: TRANSONIQ, CompuServe: 73260,3353, or PAN: TRANSONIQ.

This is probably one of the most open forums in the music industry. Letter writers are asked to please keep the vitriol to a minimum. Readers are reminded to take everything with a grain of salt.

Dear Hackers,

I'd like to pass on some important info which I recently discovered (frankly, much to my chagrin) and want to relate to all you fellow ESQ-1 owners.

First off, perhaps I should preface by saying that I think one could say I know the ESQ-1 fairly well sonically (I am the programmer of the Q-Spectrum sounds), and was surprised to hear from various sources that the SQ-80, which while described by Ensoniq as being completely compatible with the ESQ-1, might in fact sound slightly different especially with certain sounds. Ensoniq has said that they changed certain circuitry in the SQ-80 to improve the D/A conversion and the filtering section. Seemed good to me, at least on paper.

But goaded by reports from different people as to differences sound-wise between the two units, I decided to check out exactly what the story was and so went and took two identical Q-Spectrum cartridges, put one into an ESQ-1 and the other into an SQ-80, and set about to methodically A/B each patch one-at-a-time on middle-C. Many of the patches sounded the way they were supposed to, but yet certain patches didn't sound quite right to my ears. Not "bad" mind you, simply different somehow. On some patches ("MYLAR" from Q-Spectrum Vol. 1 for example) a completely different balance of harmonics was present(!) altering a subtle timbre relationship I had programmed into a patch which did not sound bad, but was not the one I created or intended. Going on to the next patch, FMPIANO1, I noticed a similar occurrence -- in fact I kept coming across the same thing again and again as I tried certain patches. I checked to see if any parameters were changing "accidentally", but that was not the case. I was perplexed.

Second part of story: A few days later, I updated my ESQ-1's 3 operating system from version 2.3 to the most recent 3.4 software which incorporates many SQ-80 sequencer and other improvements such as being able to add or delete bars anywhere in the measure (nice, huh?), for the ESQ-1. Now here is where this really gets interesting (if that's the right word). I start playing the MYLAR patch and lo and behold -- it sounds just like it did on the SQ-80! I go through the other patches I wrote down as sounding different, and THEY sound like they did on the SQ-80! I also own an ESQ-M module, and so repeat the same A/B experiment with the two cartridges to double-check my ears. Result: the patches sound "right" on the

ESQ-M and "not quite right" on the ESQ-1. By now I'm feeling like a character in a Twilight Zone rerun.

I want to talk to someone at Ensoniq -- so I called John Greenland, an Ensoniq sound designer I met a few months back doing some research at the Ensoniq factory. I explain all the same details I've just related, and he says that it is possible some of the voice architecture was accidentally altered in updating the operating system, and that he will check it out with the engineers and get back to me. At this writing I haven't heard anything further from Ensoniq -- I don't know if they were aware of this problem before now, and as I wanted to get this letter in as soon as I could. I don't have any answers yet as to what the problem or the cure is (I will follow up with another letter here when I get the info).

Third part of story: What is bugging me about all this is why only SOME patches seem to manifest this difference. Trying to troubleshoot this as much as I can, I again go through all the patches, write down the ones that sound different from the way they were supposed to and a couple of hours later, finally hit upon a common denominator and thus solve (part of) the puzzle, jumping up out of my chair crying "Eureka". All of the "problem" patches I notice use the waveform E PNO2! I check my findings: I turn off all oscillators but OSC1, open the filter all the way on the ESQ-1, and set the same exactly on the ESQ-M --- listening to the two I find the harmonics ARE different. Somehow I think (don't ask me how, I'm just a lowly programmer with golden ears) the waveform E PNO2 got changed between the old OS and the new OS. The same is probably true in the SQ-80, thus (partly at least) accounting for the sonic discrepancies. This just happens to be one of my very favorite waveforms -- a subtle, altered Electric Piano waveform with just the first nine harmonics left in -- and I used it to good degree here and there in the Q-Spectrum sounds. Hey, maybe Ensoniq will confer on me the "Order Of The Q-Chip" for doing their homework and de-bugging a major bug! Maybe they'll send me an EPS for my birthday! Naaaaahhhhhhh... It's all in a day's work for Patch/Works Man, shweetheart.

So for the time being, I think if you are considering the OS 3.4 update you might want to wait. As nice as the OS 3.4 improvements are, considering the fact it will alter the way your ESQ-1 SOUNDS -- even if it's only patches which use the E PNO2 waveform -- I would wait till OS 3.5, or whatever, that will correct it. (I hope).

Sincerely,
Jed Weaver
Patch/Works Music Software
NY, NY

[Ensoniq's response - As a result of your relentless investigating you found a bug. Your trained ear picked up something most users would not have heard. ESQ-1 version 3.5 and SQ-80 version 1.8 corrects the errant waveform you found. Since we never received any reports from other end users, it is apparent to us that no else noticed it or found it different enough to report. Regardless, it is for this type of situation that we maintain a policy of continually upgrading our products and making those upgrades available to end users. Our EPROM upgrade policy includes EPROM's at no charge - end users are only responsible for the installation fee.]

[TH - Thanks for finding this sort of thing and letting the rest of us (and Ensoniq!) know about it.]

Dear TH:

As an employee of an authorized Repair Station for Ensoniq Corp., I can't help but be disturbed by Jay Meyers' letter in Issue #33. First off, let me state that I agree very much with Mr. Meyers' desires for service manuals for Ensoniq products, and I think he raises some very valid points (I bet he didn't expect that). But I must take exception to the tone of the letter and what he apparently sees as a plot by a major corporation out to fleece the very same customers they're trying to keep.

First of all, at least here in West Virginia, we are not lining our pockets with profits from unfortunate Ensoniq owners. In the two years we've been an Authorized Repair Center, we see an average of two to three Ensoniq products a week, of which one or two really have problems related to hardware. In all that time, only one person was charged anything for a repair. It was an out of warranty Mirage that was physically abused (broken keys and main board), and then we only charged the customer our cost on the board.

We have never charged any Ensoniq customer for reinitializing an ESQ-1 or charged a customer for diagnosing a problem. Further, I can't remember when a customer had to do without an instrument for a gig, or leave it for more than 24 hours when he doesn't have to play. What I'm trying to say here is that although I agree with Mr. Meyers' desires for more information, his real problem

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seems to be with the dealer, not Ensoniq Corporation. Maybe back here in the sticks things are different than in the big city of Chicago, but around here, customer service still means something.

You see, we are also an authorized service center for Korg, Yamaha and Peavey, and I have to give credit to Ensoniq. They have never balked at anything we needed to do to satisfy a customer, including recently replacing the power supply, main board and display board for a customer one week after his warranty was up -- and a display board for a customer one month out of warranty -- because the customer merely called to complain before the warranty had expired. Try that with Peavey!

I'm sorry to ramble on like this, and I don't agree with Ensoniq's policy on technical information, but it's obvious to me they didn't decide this with dollar signs in their eyes. With new products coming out now, they can't risk alienating a built-in market like that (even Mr. Meyers bought an ESQ-1 knowing what he knows). I think Ensoniq's reasons aren't very strong, but after buying 5 rack mount units and a Mirage with a keyboard, you certainly wouldn't have to rent a keyboard for your impending studio date if you'd bought your Ensoniqs from us. And I'm sure there has to be a better dealer near you someplace.

When you work in the service business like I do (17 years), you learn to appreciate a company that cares and will work with you. Ensoniq has proven themselves to be such a company. So my advice to anyone buying anything that their careers depend on, is to buy a product from a company that cares, and buy them from a dealer that cares. I work for such a dealer, and Ensoniq is such a company, so I know that they do exist.

Kim Monday, Technician
CompuServe, [71445,674]
O.B. Fawley Music Co.
Morgantown, WV

[TH - That's what we figured.]

[Ensoniq's comments - Thanks!]

Dear TH:

Are you tired of hearing praise yet? Hope not...I think the Transoniq Hacker is a great publication, one of the few I've seen that can be called genuinely useful.

I'm writing to mention something that may be of interest to other ESQ-1 owners: I recently mail-ordered a book sold by Valhala, one of your advertisers, called the "ESQ-1 Bible." It can be frustrating to buy products through the mail because you can't be certain of what you will get. This book is one of those disappointments. The edition I

received appeared to have been published before being edited or read by anyone; I found it unreadable due to the poor grammar, misspellings, and lack of clear structure or meaning. But, most disappointingly, it had no significance as a programmer's reference. I found nothing in it to even supplement the Ensoniq manual, and many pages were devoted to describing things such as the waveforms already depicted in the ESQ-1 manual. There are 40 patches on program sheets, and that's essentially what you get for your \$27.95 (\$24.95 + \$3.00 postage).

To Valhala's credit, when I returned the book they sent me a check for \$24.95 -- without comment -- so I am only out 5 bucks or so for postage.

I assume many other readers also purchase Mirage/ESQ products through the mail. I know your product reviewers simply cannot keep up with the huge number of items being sold, but we sure can. Since it can be extremely valuable to read firsthand reports, would it be possible to devote some space in the Hacker specifically for reader comments? I believe that if you just ask, many people will write about both bad and good experiences.

By the way, I read something in the January edition about the possibility of you "going slick." Put me down as against it, on purely utilitarian grounds; it's much easier to read the Hacker than any of the glossies -- honest!

Craig Haggart
Sunnyvale, CA

[TH - Thanks for the feedback. We'd rather not put aside a dedicated space for reader's comments on various products - they're always very welcome in The Interface. We hope the slick hasn't disappointed you too much. The photos should come out a lot better and the print should actually be a little darker than before. Probably shouldn't try to read it by the swimming pool though...]

Dear Sirs:

As a recent purchaser of an ESQ-M, I am a little concerned about its buggy response to generic system exclusive messages, such as from my Yamaha DX7II's disk drive, and from some computer librarian programs for the ESQ-1.

My questions are: 1) Is there a way to get the ESQ-M to send its patch banks over MIDI to external devices successfully, and, 2) if not, is Ensoniq planning to fix this as they did with the ESQ-1, via a ROM upgrade?

Thank you for your attention on this matter.

Yours truly,
David Anderman
Solana Beach, CA

[Ensoniq's response - There really isn't any such thing as "generic system-exclusive messages." There are however, "generic system-exclusive recorders" such as the DX-7II (not to mention the SQ-80 and the EPS).

These devices simply record whatever sys-ex message they receive and save them to disk. Later you can send the same message back to the device which originally sent it (or to some other compatible device). In this way you can store patches, sequencer memory drum patterns, etc.

The ESQ-M will send its internal programs out MIDI either one at a time or as an entire bank (see pp. 86-87 in the ESQ-M Musician's Manual for instructions.)

When you save data to a sys-ex recorder, imagine that you are sending the data from one ESQ to another. The sys-ex recorder simply "intercepts" and holds the data for a period of time before sending it along to the receiving unit (which is the same unit that sent the data to begin with.)

Dear Hackers:

I couldn't resist the temptation to respond to Clark's response to Pete Profilet about mix-mode and the WX-7 in the March letters column. Hopefully, both Pete and Clark will see Walter Daniel's fine review of the Upward Concepts SM-1 Super-MIDI Disk and find out how to really use the WX-7 and Mirage via the Super-MIDI disk's MIDI volume control. Of course the EPS will have volume control built in, but Mirage owners can add the capability for a very modest fee with this disk.

A major feature of the SM-1 OS is the ability to save volume control device numbers with sound samples. A separate controller can be specified for each of the four patches on an upper or lower sound sample. When you load your sax sample, the breath controller automatically loads in with it. Load in your B-3 sample and the foot pedal controller gets loaded.

To clarify Mr. Daniel's question about the SM-1's "Midi Controllers to Local" parameter, normally MIDI pitch-bend, mod-wheel, sustain, volume and sostenuto inputs only affect MIDI notes. Notes played on the local keyboard are not affected. Since the Mirage has no volume pedal input, this controller must come in via MIDI. When "controllers to local" is on, the MIDI controllers all act upon local keyboard notes as well as MIDI notes.

For those of you contemplating re-wiring your Mirages with a transpose pot as suggested by Charles Fischer's letter in the same issue, all UPWARD CONCEPTS operating systems allow you to easily transpose by semitones

without voiding your warranty or zapping your Mirage's guts.

Thanks for the chance to respond.
Dick Lord
Upward Concepts
Durham, NH

[TH - Thanks for the real scoop. We also have an article (in hand, and soon to be published) that further explores the WX-7-Mirage connection.]

Dear Hacker:

Concerning Charles Fischer's article "Build a Footswitch Adapter" in Issue #31: I have been using a Korg DS-1 pedal as a sustain pedal with my ESQ-1. I guess that not too many people are aware that Korg also uses "normally open" footswitches in their products, as well as Ensoniq.

Not meaning to disparage Mr. Fischer's article in any way, or to discourage anyone interested in doing an electronic modification of this kind, I just wanted to pass the information on to readers. The Korg pedal is not cheap (its list price is in the \$50-60 range), but it works just fine with the ESQ-1, and is very solid--in fact, a little bit larger and heavier than the sustain pedal that came with my DX7.

Congratulations on a great, friendly, helpful newsletter, and keep up the good work!

Sincerely,
Peter Supersano
Zephyr Cove, NV

Dear Hacker,

I am looking for a waveform-sample librarian program for the Mac and my Mirage. The librarian would hopefully have the ability to not only receive/dump the waveform data but also the parameter data, just as the Mirage drive uploads samples. If fellow hackers know a solution, please give me a call or write the Hacker for all to share.

Mark
915-591-9176

[TH - Both Blank Software's Sound Lab and Digidesign's Sound Designer provide screens of the parameter data which you could then dump to the printer. We've heard of some utilities out there to print parameter data, but offhand can't think of any for the Mac. Readers?]

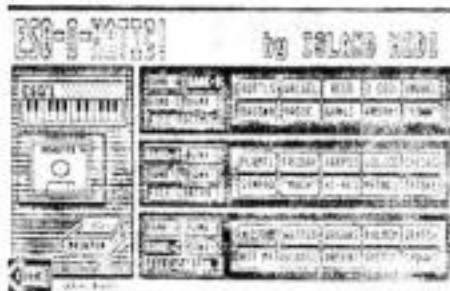
Dear Hacker,

First, let me say that I am not a habitual letter-writer who sends all these questions to you just to see my name in print. I just think of things to ask as I continue to work with my Mirage.

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Anyway....

Is there any sort of modification that can reduce the clock noise from the Mirage? It's really annoying when you record directly through a board. My unit is out of warranty, so is this something I could do? If so, how? If not, who and how much?

Thanks for your time,
C.W. Vrtacek
New Milford, CT

[Ensoniq's response - If your unit is below serial number 14732, you may want the noise/bandwidth enhancement. For more information, please contact ENSONIQ Customer Service at (215) 647-3930.]

Transoniq Hacker

I would like to see tips on sampling and the legality of using sampled sounds. For example, can you sample a sound from ROM and sell the sound? I really don't understand what is considered copyrightable and what isn't. I think this would make a very interesting article.

Sincerely,
Thomas M. Osborn
Cicero, IL

[Larry Church replies: Patch programmers are entitled to protection for their programs under copyright law, but the sounds these programs produce are not copyrightable. If the terms of a patch sale stipulate that these sounds not be used commercially, then the case changes. Such a stipulation seems unlikely as not many people will buy patches if they can't use them at the gig or on a recording project. The law doesn't seem to recognize a difference between these uses and the sampling and re-sale of a sound.

At some point the law does allow for greater protection. The sampled material might exceed a certain complexity and represent perhaps a melody or otherwise protected method of organizing or presenting sounds. In a recent conversation with Portland entertainment law attorney Bart Day, I learned that there is a large gray area here. The law is not particularly precise about what is or isn't protected. In addition, it is likely that identical cases will be judged differently by different courts.

Common sense and good judgement should prevail. If you feel like you are ripping someone off, then don't make a business of it.]

Dear Hackers,

I am trying to develop a really GOOD harpsichord patch. Any suggestions?

Yours,
Walter Poat
North Chatham, NY

[TH - Issue #27 (September, '87) has some tips by Erick Hailstone (page 16) about diddling harpsichord patches. Hope that helps.]

Dear Hacker,

Thanks for your fine magazine (and for printing my letters).

I have a suggestion for the brains who work on ESQ-1 upgrades. How about allowing the sustain pedal to be assigned to particular voices as a controller? A practical application would be to build up a 4-6 note chord on one side of a split with the sustain pedal, then play a mono melody on the other side of the split, which would ignore the sustain pedal and allow the chord to continue. I realize this is possible with the ESQ plus a (synthesizer of your choice), but it would also be possible with just the ESQ.

I applaud Ensoniq on its seemingly continuous ESQ upgrades (even though it's released the SQ-80). Do Yamaha and Roland provide such extensive support? And look at the Ibanez MIDI guitar. The price fell 50%, then the instrument disappeared. Does anyone know of third party or other upgrades for this which I bought to use with the ESQ?

What's going on with Blank Software's Sound File for the C-64? Did they ever upgrade past V1.0 (which is full of problems)?

Keep up the good work.
Wayne Dooley
Winchester, VA

[Ensoniq's response - The sustain function is a global function on the ESQ-1. While it is possible to incorporate it into a patch as a patch parameter, we have no current plans for this modification.]

[TH - Unfortunately, our contact at Blank Software says that the C-64 Sound File software has been discontinued. So far at least, the PROM-based O.S. for the ESQ hasn't attracted the third party vendor-hackers. But maybe one of them will hear your plea.]

Dear Hackers,

Thanks for publishing a magazine that is most helpful to Ensoniq owners.

I would like to offer the a couple of suggestions:

1. Rather than offering software version update information in bits and pieces how about a short review of new operating systems as they are released. This would be most helpful in deciding when to update my ESQ-1.

2. Do you have any reviews of "Sound-process" planned?

3. I am still looking for a good "Pedal Steel" patch for the ESQ-1. Can anyone help?

Yours truly,
Darrell Fedak
Sask., Canada

[TH - This is probably old news by now, but TH Issue #33 (March, '88) reviewed Triton's Soundprocess and we ran Jack Ginnever's nifty Steel Guitar and Techniques article in Issue #34. The OS upgrades usually follow more of a "slow evolution/bug fix" type of path and it usually doesn't seem to make sense to devote a review to it. More dramatic changes (such as 3.4) get announced in Random Notes. If a review were to happen, it would probably be at least two months later before it would see print.]

Dear TH,

Regarding Robert Planner's letter in the March issue about some patches distorting around the lower end of the keyboard: Try lowering the input levels at the DCA pages. If amplitude settings of 63 or above are used with more than 1 DCO, distortion is likely. It seems that some waveforms distort more than others, and on some patches a little intentional distortion adds a little "spice" to the sound.

My advice to Robert or anyone wishing to clean up a few nasty patches is to call up all three DCA pages and verify that all 3 DCOs are on. Note the level settings of the initial LEVEL (soft button #1) and any modulators used. Add up the total on each page, and each one will probably be 63 or higher. To lower the distortion, make sure that the total sum is no higher than 56 or 57 (if only 2 DCOs are used), or 52 to 53 (if all 3 oscillators are on). It seems a lot of programmers suffer the malady of cranking the mix page up whether or not it actually helps the patch in question, and a little editing can clean up many otherwise usable sounds.

Best wishes,
Charles R Fischer
Mescal Music
Hercules, CA

[TH - Thanks, Charles. (You sure there isn't a way to do this in hardware?..)]

Dear Hacker,

I need your help. I am an ESQ-1 owner dissatisfied with the ESQ-1 electric piano sounds heard so far. They have an organ quality I don't particularly care for and the DX-7 Rhodes patches you've published aren't quite what I am looking for either. I am interested in learning how to obtain on my ESQ a classic

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Sincerely,
Douglas C Medeiros
Somerset, MA

[TH - Patchers?]

Dear Hacker,

I enjoy your magazine very much and I have a question. I own an ESQ-1 (version 2.0) that I am preparing to interface with a Yamaha PF10. My question is will the ESQ read the sustain MIDI code? The kit sends info on controller #64. How can I get around this?

Thank you,
David B. McDonald
Concord, NC

[Ensoniq's response - The ESQ-1 certainly responds to sustain pedal (MIDI controller 64) information received from external devices. When you play the ESQ from a PF10, the ESQ should react to the PF10's sustain pedal just as you would expect it to.]

Dear Sirs:

In the January issue I inquired about the availability of scoring software to copy directly from the ESQ's sequencer. You suggested I contact Quiet Lion. I had just read their ad about Mu-Script. Now, I have that software and can tell you that it is super, and it is very easy to transfer sequences from the ESQ and then print scores and it only costs \$100.

Respectfully,
Keith Hammond, MD
Cape May, NJ

Dear TH,

I would like to support C. Alleyne's letter (March issue) regarding Valhala's Voice 320 cartridge. The quality of the sounds was very disappointing. I returned the cartridge for another thinking perhaps the cartridge was at fault - such was not the case. The person I spoke with at Valhala brushed off my complaint saying that they had had about five people that did not like the product. To me, even one is too many. He showed a lot of class as a business person by becoming annoyed, saying there was nothing he could do. Beware, fellow Hackers. Test drive a Valhala product first.

Joe Pace
Amherst, NY

Dear Transoniq Hacker,

A couple of questions if I may:

1. I've heard rumors of a stereo option, and, although Ensoniq hasn't authorized a product yet, they published a circuit

diagram in *Electronic Musician* magazine. I wonder why they can't supply an authorized hardware version for owners of older Mirages.

2. Does the authorized noise-for-bandwidth enhancement add much improvement and is it still available?

3. I've seen ads for products allowing you to change OS's in the Mirage. Is there any way to add the MIDI Sample Dump Standard to the sampler in order to access a wide variety of samples from other samplers directly? Has anyone attempted this?

4. I am looking for a sample of a waterglass being played by rubbing fingers around the rim, similar to Edison's glass harp - any suggestions? I really love that sound.

5. And last - I heard that Ensoniq is working on D-50 sounds for the Mirage. Is this true?

Stewart Cherman
Morton Grove, IL

[Ensoniq's response - 1. Because the modification requires cuts and jumpers to the mainboard and requires additional circuitry, we cannot offer it as an upgrade due to the complexity involved.

We have heard that the mod is being offered in kit form. The article by ENSONIQ was offered as a more reliable alternative to a previous article in EM.

2. See C.W. Vrtacek's letter in this issue.

3. We don't know of any. However, many of the visual editing systems for the MIRAGE (ALCHEMY, for example) can access samples from other systems and transfer them to the MIRAGE. You will still need to perform editing on the sounds because the analog/control sections (ENV, FILTERS, VCA, etc.) of most samplers are different and impart different qualities to a sound.

4. This sound is available on Sound Disk C-2.

5. At ENSONIQ, we try to create sounds which are original, though the source material may come from many sources. Sampling a synthesizer doesn't require as much effort as recreating an acoustic instrument and is therefore not a priority in our sound development activities.]

[TH - Regarding the stereo mod, you should contact Musitech at 615-894-9771.]

Dear Hacker:

I think you missed the point of Pete Profilet's letter in the March issue. Pete seems to be looking for MIDI volume control which is not supported by Ensoniq's OS 3.2. There are a couple of third party OS disks which DO support

MIDI volume (both send or receive) which most wind controller players will find useful.

Thanks,
Christian Super
Los Angeles, CA

[TH - Damn! If there's anything we hate doing, it's missing an opportunity to toot an advertiser's horn. Both Upward Concepts' and Leaping Lizards' products support MIDI volume control. (Upward - Send & Receive, Lizard - Send.)]

Dear Sir,

You really deserve all the compliments you receive for your efforts in producing such an informative monthly production. Please keep doing the articles on the ESQ-1 which detail procedures to follow to get the maximum mileage from its capabilities. It would be nice to see an article on in-depth sequencing with a detailed example to follow using layered sounds - again, with a view to maximizing the full capabilities. Also, anything on tying in the ESQ with other Ensoniq rack mount products using the ESQ as a master keyboard.

Yours sincerely,
David King
Surrey, England

[TH - Always open for submissions.]

Dear TH

I am looking for information on the nitty gritty details of the Mirage disk format. I am working on some direct synthesis software and would like to be able to read and write Mirage format disks directly. There must be some hacker out there that would be willing to share this information with me.

Thanks,
Tom Doyle
5222 Big Bow Road
Madison, WI 53711

[TH - Actually, just such an article is on the way.]

HELP Hacker or Ensoniq!

My name is Mr. Wavesample and, as a lot of people may know, I sell all kinds of keyboard samples. Now some of my customers are happy with the standard one upper and one lower sound bank (1, 2, 3) setup. Others need more sounds per bank (up to a possible seven) which cover the entire keyboard. I can make these seven sounds available via the eight upper and lower programs by hitting 0/PROG LOWER 1-3 to get the three lower sounds on 61 notes and

Hitting 0/PROG LOWER 4 to get to the upper 1-4 programs on 60 notes. They will be all full keyboard sounds.

My question concerns the above procedure and the EPS... How can you use the Mirage and DSK disks on the EPS to obtain the same configuration? What punches should I use, what parameter values need to be changed, etc.?

Mr. Wavesample
Keyport, NJ

[Ensoniq's response - The architecture of the EPS is quite different from the MIRAGE. Although any one of the four MIRAGE programs can be converted to play on the EPS, the remaining programs are ignored. Also, certain MIRAGE functions (filter resonance, for example) are not available on the EPS.]

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