Transoniq Hacker

The Independent Ensoniq Mirage User's Newsletter

FILTERS MADE FUN

By Clark Salisbury

Before we jump into this month's column, I think it would not be totally inappropriate for me to reminisce a tad - what with it being a new year and all.

The Mirage is now nearly a year old. The first Mirage that we got in at our store came complete with sound disk number one, period. No sustain pedals, no sequencer expander, nothing. Just a disk with piano, slap bass, flutes, a couple of drums, and some silly guitar sounds. In a little less than a year, though, the situation has changed a bit. Now there's MASOS, Input Sampling Filters, VES's (at least three - and growing), dozens of sound disks - and it looks like it's only the beginning for digital sampling. Lest we forget where we've been, does anyone remember the original Emulator? A cool $10,000 for a sampler with a four octave, non-touch-sensitive keyboard which would hold a maximum of two samples at any given time. It had no envelope generators, no dynamic filtering, almost no waveform manipulation, and of course no MIDI. Why, you couldn't even re-tune the samples by more than a few cents either way. And, still, it somehow managed to amaze us. Today there is talk of developing a part of the MIDI specification to allow for the dumping of sampled waveform data in a standard way so that you could take your Mirage samples and dump them into a Sequential Prophet 2000, or any other sampling device. This is particularly exciting news. Once the programmers and techno-weenies get hold of this, watch out! I don't think I exaggerate when I say that we are witnessing a revolution in the way sounds and music are being created and performed.

Anyway, this month I'd like to talk a bit more about filters and envelope generators and such, those friendly processors that help make sampling such good fun.

In Issue #4 of the Hacker, I briefly touched on the function of the Mirage filters, but, as many of you may have realized, there's quite a bit more to it than I could squeeze into that particular article. To briefly recap, the filters in the Mirage are 24 dB-per-octave resonant low-pass filters. What a mouthful. What this actually means is that the Mirage filters will attenuate (turn down) frequencies above their cutoff point at, say, the frequencies at 20 kHz (one octave higher) will be some 24db quieter. This, of course, is useful for eliminating unwanted noise and aliasing present in the original sample.

Also, the filters are known as resonant filters because the frequencies at the filter cutoff point can actually be amplified. This can be used to emphasize upper harmonics present in the waveform, and is often perceived as quackiness, or the all too familiar "wah-wah" sound that has come to be identified particularly with analog synthesizers.

There are other uses for the filters as well. The sound of many acoustic instruments has a tendency to become darker over time as the upper harmonics decay. Percussive instruments, such as guitar, piano, and marimba are good examples of this. A looped sound, however, remains at the same level of brightness indefinitely, and even if a more or less natural decay in volume is obtained through the use of envelope generators and voltage-controlled or digitally-controlled amplifiers, things can sound somewhat unnatural if the overall brightness of a sound remains constant. This is one place where dynamic filtering can be of great usefulness. By progressively filtering the sound across time, a gradual (or not so gradual) change in the sound from bright to dark can be affected. And it works both ways. The filter can be used to make a sound get brighter over time. Or you can use rather unnatural envelope generator settings to get bizarre, cyclic-sounding changes in brightness, as with upper and lower program number 4 from the strings/cellos sample. So how do I control all these nutty kinds of changes, you ask? Easy. Just check out Uncle Clark's step-by-step guide to "Filter Wizardry," coming right up.

Let's think of the filter as a "brightness attenuator." It can be used to filter out higher frequency components in the waveform, while letting the lower frequencies pass through - hence the name "low-pass" filter. Note, however, that the filter cannot add upper harmonics or brightness to a waveform that does not already contain them; it can only work to attenuate what's already there. In theory, then, it is probably best to pre-emphasize the upper frequencies in any sounds you may wish to sample. Not to worry if your sample turns out a bit on the bright side - it can always be filtered down to normal brightness later on. And this type of filtering can have the extra benefit of filtering out unwanted noise and hiss from the wavesample. The point in the frequency spectrum at which the filter begins attenuating is called the cutoff point, and it can be controlled in a number of ways in the Mirage.

The most obvious filter cutoff point controller is the Manual Filter Cutoff control, Parameter 36. Increasing and decreasing the value of this control has the effect of raising and lowering the filter

cutoff point in semitone increments, and will be perceived as brightening and darkening the sound. (I know I said that the filter could not add brightness, but we first started with a sample that was overly bright, didn't we? If you want to know what I mean by overly bright, load the piano sample from the trusty old Disk 1 and set Parameter 36 to a value of 99 or so. See what I mean?) The next, and less obvious, filter controller to be aware of is Wavesample Relative Filter Cutoff (70). This is similar to the Manual Filter Cutoff control, but it affects the filter cutoff point only for the wavesample selected using Parameter 26, Wavesample Select. This control's raison d'etre is to give you a way to balance the brightness of multiple wavesamples by being able to set filter cutoff points independently for each of them. Nifty, huh? The third, and last, filter controller to worry about when setting the base cutoff point of the filter is Keyboard Tracking, Parameter 38. The idea here is that if you were to set a filter cutoff point that sounded appropriate on the low notes of the keyboard, you may experience problems with the high notes not sounding bright enough, because the higher harmonics present in the upper notes would be overly attenuated by the filter. Keyboard tracking can rectify this problem by actually using the keyboard to control the cutoff point of the filter. In other words, the higher you play on the keyboard, the higher the keyboard tracking will set the cutoff point of the filter. Parameter 38 controls the amount of this effect. To check this one out, simply load a sound into the Mirage and vary the value of Parameter 38 while listening to notes played first on the extreme lower end of the keyboard, then on the extreme upper end.

So far all the controls that we've talked about are used to set the base cutoff frequency, the point at which the filter cutoff is set when there is no modulation input. (I know, I know - keyboard tracking is a type of modulation. But for my purposes here, it's easier to group it with this set of controllers.) There are a number of other ways to control the filter cutoff point, as you may already have guessed, you sly devils, you.

The first of these is the envelope generator. We talked about these a couple of months ago, but I'd like to go into a little more depth here. There are 5 parameters to deal with in the Mirage envelope generator (not counting the velocity sensing parameters). They are Attack (40), Peak (41), Decay (42), Sustain (43), and Release (44). Attack (40) controls how long it takes for the filter cutoff to reach its highest level, with Peak (41) determining just how high the filter cutoff will go. In other words, if you want a sound to go from dark to bright at a fairly slow rate, you would set the attack parameter to some fairly high value. If you wanted the sound to eventually end up being pretty bright, you would set the peak parameter fairly high. Attack controls how long it takes to raise the filter cutoff point (get brighter), while peak determines how high (bright) the filter cutoff will actually end up going. We must remember, however, that the filter can not add brightness to a sound, only attenuate it. So if you have some other controller, such as Manual

Cutoff (36) or Relative Filter Frequency (70) set to maximum, or if the cumulative effect of two or more controllers pushes the filter cutoff up to the maximum, any other controllers you may be using can have no audible effect. The filter simply has nowhere to go.

Next is the Decay Control (42), and it works in conjunction with the Sustain Control (43). The decay control determines how long it will take for the filter to go from the maximum value (set by the peak control) down to the value set by the sustain control. Thus, if the sustain control is set to 0, (and no other controllers are affecting the filter), the filter cutoff point will eventually reach a value of 0, (even if you continue to hold down the Mirage keys), effectively filtering out all frequencies. The effect is that the sound will continue to darken until it darkens itself right out of existence. If, on the other hand, you do not want the filter cutoff point to end up at 0, simply set the sustain control to a value higher than 0. This will have the effect of holding the filter "open" while the keys are being held, and the sound will sustain at this level of brightness until they are released. Last is the release control, and it affects the length of time it takes for the filter to finally decay to 0 once the key or keys have been released. Note that all the filter controllers discussed here, with the exception of the release control, are active only while the keys are depressed. As soon as you release the keys, the envelope generator immediately goes into the release position of its cycle, and all other control input to the filter is ignored.

But wait, there's more! Each component of the filter envelope has a velocity sensing (VS) counterpart. Attack VS (45) can be used to increase or decrease attack time according to how hard (alright - how fast) you play the keyboard. The effect is that if you play a key slowly, you can obtain a longer attack time than if the key is struck more quickly, allowing you to control, by touch, the length of time it takes for notes to swell. Peak VS (46) causes the filter cutoff point to go higher the harder the keys are struck, giving you touch control over brightness. Decay Kyb (47) is a bit different. In many acoustic instruments the decay time for high notes is shorter than for low notes . Decay Kyb causes the decay time to be affected by keyboard position; higher notes decay more quickly than low ones. The intensity of this effect is controlled by Parameter 48, Sustain VS. The harder you hit keys, the higher the filter cutoff point will be set, and your sound will sustain at a brighter timbre. Finally, we have Release VS (49). This one's kind of fun. With Release VS, the Mirage actually pays attention to how quickly you release the keys, and sets the release time accordingly. If you let go quickly, you get a short release, and the note decays quickly. If you let go more slowly, the note will take longer to decay. This can be a great effect on string samples.

It should be emphasized that the effect of all the filter controllers is cumulative; they are added together to form the actual filter cutoff point. With the exception of release and release VS, these controllers are active while one or more keys are

being depressed. Manual Filter Cutoff, Wavesample Filter Cutoff, and Keyboard are added together to form the base filter cutoff, (you can think of it as the basic brightness setting for your sample), with the effects from the envelope generators being added to this. And remember, if it doesn't make sense at first, mess with it till it does. Thanks for tuning in.

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.

SAMPLE SAMPLES & SAMPLE TRICKS

By Erick Hailstone

Recently, I attended a Mirage clinic and among other things heard many new samples. Some of these were the clinician's own as well as those he has picked up in his travels and some from local samplers. These events are going on all over the country so many of these sounds will show up in your area if they haven't already. It will be impossible to critique these by disk because they may show up in any conceivable combination.

Plucked violin (that Italian word I can't spell) - In the lower range you might not guess what it is but it is useable on it's own merit as well.

Jungle sounds - Multi-sampled bees, flies, monkeys, birds, and lions.

Vocal sounds - This sample contains any consonant and vowel combination imaginable. Some of it's pure, some processed with filters, delays, phase shifters, etc. This is one of the hippest things I've heard done with sampling; new, yet familiar organic sounds with lots of rich texture.

16 Multisamples - This one actually uses two samples per program. The mod wheel is set up to allow you to move from one wavesample to another or any mix in between.

Analog brass - This one's mostly standard brass patches from all your favorite synths.

Hanna Barbera - Cartoon sound effects from the originators of the Flintstones, Smurfs, and other assorted favorites.

Three Stooges - Actually, it's only one of them - Curly. Every phrase they could fit in they did. Woop!

Full organ - One big bad pipe organ with a few variations. There are several other organ samples around but this one stands out.

French horn - Not the best fidelity. I hope Ensoniq does one of these soon as I get a lot of requests for it.

Martin guitar - This is an acoustic steel string with the fidelity not as good as Ensoniq's nylon string but useable.

Performance - Funk bass on the lower octaves, guitar

playing R&B 9th chords, and drums. This is the kind of thing that really shows off the versatility of the Mirage. With this sample you can create funk grooves, the Mirage becoming a rhythm section all by itself.

Phone - Rings on any pitch.

Berlin - This sample was lifted off a recording of the pop group "Berlin" - a huge sound, combining vocal textures and synthesizers.

Keep on the lookout for these samples. There are always more on the way and I'll try to keep you advised on the commercial ones as well as those that seem to be floating around the country.

Now for something a little different:

Here are some fairly simple tricks you can do with the Mirage.

TRICK #1:
My first thought when hearing the Fender Rhodes (Disk 5, Bank 3) was that it was very good, very useful, but why waste the other programs switching to chorusing - especially since there is a noticeable pop when doing so? Also, if you have a way of turning the chorus effect on/off within a single program, you free some up for other variations. Even though most of the time you hear a Rhodes with chorusing these days, a dry Rhodes is still real nice for certain things. Start by loading Disk #5 U/L Sample 3. Set it for U/L Program 4. The following parameter changes are for both lower and upper.

    Parameter 33 (D.O. Detune) - set for 06
    Parameter 32 (LFO Depth)   - set at 01
    Parameter 35 (D.O. Balance VS) - set at 0

These few changes will allow you to turn the chorusing effect on and off with the mod wheel. As you rotate the wheel forward, chorusing will kick in at about 1/3 rotation. At 1/2 it is full strength. From there forward it dies away. You do give up vibrato control on the mod wheel. This is not something I would use on a Rhodes, but there are lots of alternatives. If you set 32 to 0, when you use the mod wheel you will get chorusing and vibrato. Another variation is to set the chorusing so that it is controlled by the velocity of the keyboard. First, perform the changes above, then change 34 to 0. Set 35 anywhere from 06 on. This value determines how hard or soft your touch will have to be to bring in the chorus effect. 12 - 15 seemed right for me. So there are several choices and these can be different for each half of the keyboard -

chorus controlled by the wheel on the upper and by velocity on the lower; the reverse and vibrato tossed in anywhere and anyway you choose. I'm sure you'll settle on a few combinations for most everyday playing, but having variations is nice for unusual applications.

This effect is useful on all the samples on this disk as well as most others. It's great on the Hammond organ sample and if you rock the mod wheel back and forth slightly from center, you get it to sound even more like a Leslie. Try rocking slow and fast.

TRICK #2
On Disk #1, Bank #2, there is a slap bass. The way it is setup you have electric bass from key 1 - 17 and a slapped sound from 18 - 29. Here are a couple of alternatives you might try.

Set Parameter 26 (Wavesample Select) to 01
Raise Parameter 72 (Topkey) to 29
Select 27 (Initial Wavesample) and listen to 1 - 3

You now have 3 quick variations. If you turn Parameter 28 (Mix Mode) off, you'll have three more variations.

Just to be safe, reload this sample. Set 26 to 01. Change 72 to 29. This gives a more uniform sound up and down the lower sample. Experiment with 34 and 35 for some more variations. If you set 35 at 0, the mod wheel will control the mix of the two wavesamples.

TRICK #3
Load Disk #2, Lower Sample 1, Program 1. Set Parameter 54 (Amplitude Release) to 15. By shortening the release time you have a more useful patch. You can play in a more staccato manner controlling the release with your touch. Now, turn Parameter 28 (Mix Mode) on, set 32 to 01, set 35 to 0. Again, we are using the Mix Mode to give you more variety. This should give you a pure mallot type sound and you'll still have the swelling sound coming in. Rock the mod wheel all the way forward and you'll get more of an electric piano - more fundamental and less upper harmonics. If you put the wheel right in the middle, you'll get a mix of both with chorusing. If you do these same sort of things with L2, you can mix (mod wheel) from organ to electric piano and have both in the middle.

Try these ideas with other samples and programs. With some they are very effective. Hope you find these hints effective.

Erick Hailstone studied composition and arranging at the University of Nevada and at Berklee College of Music. He has been involved with synthesizers and related technology for the past seven years. Primarily a guitarist, his orientation has been in performing and recording with these devices.

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MIRAGE-NET

The following people or organizations have agreed to help with questions:

Sampling - Mark Wyar, (216) 323-1205. Eastern time zone (OH). Calls between 6pm and 11pm.

Sounds - Martin Smith, Lavitae Contrar Studios. Pacific time zone (Vancouver, BC). Business hours. (604) 255-1025.

MIDI & Sequencing - Leslie Fradkin or Elizabeth Rose, MIDI-MAX Studios. Eastern time (NY). Calls between 10am and 9pm. (212) 628-5551.

MIDI & Sequencing - Markus McDowell. Any ol' time. (805) 987-9932 (Calif.)

Mirage hardware & firmware - Scott D. Willingham. Eastern time (NY). Days. (716) 477-8089.

Mirage Operating System - Mark Cecys. Eastern time (NY). Days. (716) 773-4085.

If you're interested in being listed on the Net, please give us a call. (503) 245-4763.

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To those of you who want further elaboration on the process involved in shuffling your sounds around from disk to disk - good news: Steve Coscia of Ensoniq has started on "Part II" of his earlier article on sound moving which should cover just that.

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Even as we write this, Ensoniq is busy at a trade show in Anaheim announcing two major new products: a 5-octave, velocity-sensitive, digital (but not sampler) synth and a full-size, 76-note, weighted action electronic piano. Projected prices of each are about $1300. We should have more information on these two new products in our next issue.

BACK ISSUES

Back issues are available for $2 each. Some back issues are no longer available in their original printed form and a photocopy will be substituted.

CHANGE OF ADDRESS

Please let us know at least four weeks in advance to avoid missing any issues. The Post Office will not reliably forward this type of mail. We need to know both your old and your new address.

SOME REAL SAMPLE IDEAS
by
Duane L. King

Sometimes I get frustrated with my Mirage because I really want to make good samples for it. I haven't had any trouble making bad samples. It's only when I try to make high-quality ones that I have problems. Now, we all know it can be done, we've played the factory disks. So how do we do it? I've been looking for the answer to this question for some time- ever since I made my first sample. All of my problems and frustrations with sampling can be traced back to one or more of these problem areas: 1) poor sampling environment, 2) aliasing of high frequencies, and 3) inadequate or missing equipment. It turns out that the key to good samples is the equipment that is between the sample and the Mirage. Don't give up because you don't have money to shell out for microphones, recording and signal processing equipment! There's a world of low-budget solutions out there. For starters, did you know you don't have to buy pre-formatted diskettes anymore? Ensoniq released their disk formatting program ($19.95). I regularly format and use the same type of diskettes in my Mirage that I use in my Apple Macintosh. These single sided, single density 3 1/2" Sony diskettes cost me between $2.00 and $3.00 each depending on where I buy them. What this means is if I buy Ensoniq's disk formatter and three unformatted diskettes at $3.00 each, I'm already saving money! (The pre-formatted diskettes were selling for about $13.95.) But don't think that every thing is rosy just yet. The Ensoniq formatting program works perfectly except for one little thing. They forgot to explain to you the fact that the diskettes you format with this program shouldn't be put in the Mirage until you have turned it on using a FACTORY FORMATTED DISKETTE. If you turn your Mirage on with one of your own formatted diskettes in it, your keyboard won't make a sound. It only wants to format diskettes. This is a small inconvenience though. Just remember to use one of your expensive factory diskettes when you turn on your Mirage and then you can switch to your home-grown samples on your inexpensive, home-formatted diskettes. We have to have diskettes to store our samples on and this is the cheapest way I've found to get usable diskettes.

Now, about the equipment that stands between your prospective sample and the Mirage. When I bought my Mirage, the first thing I had to do was sample my own voice. I'll bet you didn't think of doing that did you? O.K., so I'm not unique. But did you make your first 'live' sample using the right channel of a pair of stereo headphones for a microphone? I did, and it makes an incredibly lousy sample! I still don't own a mic. Even if I did, my voice still wouldn't make good samples. I don't have a trained singing voice. I don't even know anyone with a trained singing voice. But I do own a pretty good stereo cassette deck. So instead of singing, I use pre-recorded material as the basis of most of my samples. This eliminates the need for microphones and basically guarantees that the sampling environment will be clean. You can plug your cassette deck directly into your Mirage, but you won't have any gain control that way. If you have a quiet stereo amplifier, use one of the speaker outputs to drive the input on the Mirage, but be VERY careful with the volume control on your amp!! Experiment with the setting of parameter [75]. I normally leave it set to ON (line level input), but you may want to use the mic level setting. I hook the Mirage up to one of the B speaker outputs on the back of my amp. My speakers use the A outputs. If you don't have spare speaker outputs you will have to unplug one of your speakers when you are sampling. Then I select mono L+R output on my amp and A+B speakers. The mono setting is not mandatory and may not be desirable for samples of 'stereo enhanced' material. I use the A+B setting so I am hearing the material the Mirage is going to sample. The main advantage of going through your stereo system is the tone controls. Don't cringe! Most good stereo systems have graphic equalizers of some type (either built-in or add-on). You can use the equalizer to cut or boost certain frequency bands to get a good sample. Now what are we going to sample? No, not records. Most pre-recorded materials are protected with a copyright. If you use samples of copyrighted material in productions that make money, contact the owner of the copyright BEFORE you publish. Usually you can get the rights to use the materials at NO COST! Be sure to explain in writing exactly which song, and how much and what part of it you are using. If you modify the sample sufficiently then it becomes your property and you probably don't need permission to make money with it. DO NOT sample lyrics unless you want to pay for the right to use them! It's also a good idea to stay clear of recognizable melody lines. What does this leave us to sample for free? New material is appearing all the time. Have you seen Korg's new SDD-2000 sampling digital delay? Not interested? That's just because you don't know about THE TAPE! Korg packages a cassette tape with the SDD-2000. This tape contains 167 sounds on it that you can sample into the Mirage! The tape is not copyright protected! If the local Korg dealer won't sell you just the tape, contact someone who owns a SDD-2000 and offer to trade some of your samples for a copy of the tape. I found the percussion sounds and the voice sounds to be the most interesting. There are four or five different voice samples and fifteen or more percussion sounds. The tape also contains acoustic and electric drums, various bass samples, guitars, pianos, brass, etc. AND THAT'S NOT ALL! You also get barking dogs, mooing cows, breaking glass, alarms, gunfire, etc. This is a REAL BARGAIN! Get one! Another good source of samples is nature records. Don't laugh! I've gotten some awesome samples from a recording of the songs of

Humpback whales! Try looping short sections of a natural sound. The results you get can be surprising! If you are making non-commercial samples, try out some of the various sound effect records in your favorite record store.

What about the aliasing problem? When you sample gongs or other sounds with a lot of high frequencies you will overwhelm the sampling rate of the Mirage. We need to raise the sampling rate of the Mirage to handle really 'crisp' or 'sharp' sounds. Don't go out and buy the $50.00 input sampling filter. If you have a reel-to-reel with multiple speeds, a dual speed cassette deck, or a turntable with a speed adjustment you can live without the fancy filter and still get better samples than you can make otherwise. I have a dual speed cassette deck. For difficult samples I record them at 3 3/4 ips. When I'm ready to start the actual sampling session, I play the sample into the Mirage at 1 7/8. This lowers the sample by one octave. If the original recorded sound contained frequency components up to 20 KHz, then playback at 1/2 speed reduces that to 10 KHz. This is well with in the range of a plain vanilla Mirage. After you get a good sample use parameter [67] to raise the sound up one octave. My turntable has a speed adjustment that allows me to slow the turntable down by 3%. Yours may allow you to slow it down even more. Reducing the speed by 3% raises your effective sampling bandwidth by 435 Hz. That may be enough if you use your equalizer to reduce everything above 15KHz. (Many equalizers have a 15 KHz slider!) Yes, this is really a low-rent approach to the aliasing problem. But if it works, no one will know! Remember, all people will hear is the final product. They won't have any idea how you did it, and they probably don't care!

I haven't mentioned any solutions to the problem of making long loops that don't click, pop, or waver. That's because so far I have found only one way to make long loops that work properly. You must have access to THE SOUND LAB software! I didn't say you had to buy it! Just use it. Try this. Put a difficult-to-loop sample on a diskette, put it in you pocket, and stroll into your Ensoniq dealer's showroom. Ask for a demo of the Sound Lab software. When the salesman is ready to load a sample to show you how easy it is to make long loops, hand him your diskette. If he hesitates, tell him that the sample on your diskette is impossible to loop. What self-respecting salesman would turn down a challenge like this? Don't like this idea? Afraid it will only work once? Form a user group or a co-operative with other Mirage owners and purchase the software as a group.

Share your samples with other people (like me...). But before you do. TUNE YOUR SAMPLES! You almost have to buy a guitar tuner ($15.00) if you want all your samples (factory and home-grown) to be tuned the same. Load the factory piano sound and check the tuning of it. Now tune all your other samples to the factory piano. If you do this you will be a better person for it. Be sure to check the samples on Sound Disk #2.0 because they are not all tuned the same!

Here is a summary of the major tips and ideas in this article:
1. Don't buy pre-formatted diskettes, buy the Ensoniq disk

formatting program and make your own formatted diskettes.
2. You can use Sony single-sided, single density 3 1/2" (microfloppy) diskettes in the Mirage for $2.00 to $3.00 each.
3. Use your stereo system components when you make samples.
4. Don't use samples of copyright protected materials to make money.
5. Get THE TAPE shipped with the Korg SDD-2000. It has 167 samples on it.
6. Record the material you are going to sample at a fast tape speed and sample it at a lower tape speed. This effectively doubles the sample rate of the Mirage.
7. If you don't have a multi-speed tape recorder, use the pitch control on your turntable to slow the material down before sampling it.
8. Plan to borrow the Sound Lab software or form a group and purchase it.
9. Get a guitar tuner and tune all your samples to the same pitch.

Duane King is an engineer currently working for SCI Systems, Inc. in Huntsville, Al. Duane has programing experience in several languages and is presently working on adding computer control to his synthesizer collection. This article was hacked on his Mac.

DATA 1 DISK REVIEWS

By Gordon G. G. Gerbert

Vol. 1 - Drums and Percussion Sounds
Sound 1 (Bass drum, closed hi-hat, acoustic snare, open hi-hat, acoustic toms) - Weak, flat frequency response, 3 octaves of tom toms (no upper multi-sampling, waste of space).
Sound 2 (Reverb acoustic snare, reverb acoustic toms, bass drum, electronic bass drum, electronic toms, electronic snare) - A little better, but still lacks quality. Spacing a bit awkward. (Kick drum in the middle of the keyboard?!)
Sound 3 (Conga, timbale, clap, scratch, African percussion) - Lacking quality again. African percussion is just a continuation of the conga wavesample. The scratch sound is repeated on other disks.
THUMBS: DOWN

Vol. 2 - Strings and Voice Sounds
Sound 1 (Solo violin, stacked strings) - Good, useful sounds. The stacked strings have a good attack and thickness.
Sound 2 (Synth strings, voice 1) - Like the old days with the synth strings. Remember all the poly synths with the strings setting? (To me it sounded nothing like strings - but I liked the sound.) The Voice sound I love. Tomita-like breathy choir (bass-tenor range).
Sound 3 (Solo cello, voice 2) - Solo cello is a solo violin spaced so it has an extra octave on the bottom. Voice 2 has an extra octave on the top for alto range.
THUMBS: UP. Data 1's best effort. Still room for improvement.

Vol. 3 - Funk and Electronic Dance 1
Sound 1 (Slap and pull bass, laser) - They should have sampled the bass one octave down. Perfect example of not multi-sampling and ruining a good idea. Bass is good for only one octave. I don't know what the laser is good for unless you want to accompany your own video game. Four octaves of one wavesample.
Sound 2 (DX-7 bass, zap, Star Wars) - Very good DX-7 sound. Only an octave and a half though. Zap is the shooting sound in the movie "Star Wars." Star Wars is the sound the Wookie makes. Good sounds if George Lucas decides to call you up to do "Star Wars Strikes Back the Jedi - Part IV."
Sound 3 (Scratch 1, clap, scratch 2, Star Wars 2, laser 2, zap 2) - Scratch and claps are repeats of Disk 1. Star Wars, laser, & zap are repeats of Sounds 1 and 2.
THUMBS: DOWN. Good slap bass and DX-7 bass, but not worth getting unless George Lucas actually does call you.

Vol. 4 - Piano, Organ 1
Sound 1 (Rock organ) - Great (Deep Purple) Hammond sound. Lower sound is crunchy, dirty, grinding - classic Hammond. The upper wavesample is too clean and the last octave sounds nothing like a Hammond.

It should have been multi-sampled. The upper half ruined a great lower half sound.
Sound 2 (Vox combo, pipe organ) - If you like vox combo, you've got it. The pipe organ is a flute voice register. Nice sound.
Sound 3 (Electric piano) - If you miss those days when you couldn't afford a great electric piano and had to buy a Soundman Sears Special, this one's for you.
THUMBS: UP OR DOWN. See "Overall Summary" at end.

Vol. 5 - Digital Synth 1
Sound 1 (Funky bass, space bass) - Sounds like a preset synth with "Funky Bass" labeled on the switch. Space bass has a heavy sound.
Sound 2 (Omni, synth brass) - Omni is slow-attack, poly-synth "string" sound. Synth brass sounds like Yamaha CS60 brass (a little on the harmonica side).
Sound 3 (Fat bass, sound track strings) - Synthesizer bass with straight filter. What the name says it is. The sound track strings have a strange ambience. Good sound.
THUMBS: UP. Still room for improvement.

Vol. 6 - Horns Sounds
Sound 1 (French horn, bari sax, big brass) - No quality to it. The big brass is misleading - it sounds like a tuba and uses the whole upper half. Big brass to me is a whole horn section playing at the same time. Listen to the Ensoniq disk.
Sound 2 (Trombone, trumpet 1, trumpet 2, french horn 2) - Flat.
Sound 3 (Clarinet, french horn 3) - The clarinet is a joke. It's not even in the same octave range (in the cellar) as a real clarinet.
THUMBS: DOWN. This disk will make you cringe. It sounds like one dull wavesample varied in different octaves.

Overall Summary

NO effort or imagination in their samples. They lack in quality. Most sounds are flat (un-EQ'd), not multi-sampled (you get a good sound and then go up the keyboard and start grimacing as the sound gets worse). Repeated sounds are very frustrating.

Their biggest downfalls are NO PROGRAM VARIATIONS, NO SEQUENCES, and very few sounds use the Modulation Wheel. These all tend to push the reviews down.

Vol. 2 and Vol. 5 seem to be the best disks. There's still room for improvement. They don't compare to Ensoniq's disks.

Sorry if this seems harsh. I'd like to hear from anyone whose views differ. I still plan to be openminded to Data 1's future disks - hopefully, they'll take my criticisms constructively.

Gordon G. G. Gebert played with David Johanson in 1980, and in 1981-82 was on tour with Mystique. He is an active studio musician and the creative center the G-4 group. He has folders full of original material ready to be turned into dividends for the stockholders of some farsighted record company.

CLASSIFIEDS

USER GROUPS

Would like to start users group in Seattle area. Call Loren at (206) 878-8097, or leave a message at (206) 575-0900.

Cleveland, Ohio (including Lorain county) area Mirage owners: Am interested in exchanging samples & technique. Please give a call - Mark: (216) 323-1205.

M.U.S.E. - Mirage User Group for Elmhurst, IL area. Meetings soon to begin using the VES to loop sounds. Please contact J. W. Adams, 269 Cayuga, Elmhurst, IL 60126. (312) 834-3779.

Hollywood Mirage Owners User's Group. Hints and techniques. Sound trading and demos. Meetings held at Classic Sound Recording Studios. For info, call Patti (213) 664-7622.

Interested in contacting other Mirage owners in the Detroit area. Joe Woeff, 16653 Fairway, Livonia, MI 48154.

SAMPLES

Sound Parties for Mirage owners in LA area. For info, call or write Jon St. James, Formula 1 Music, 641 South Palm St., Suite D, La Habra, CA 90631. (213) 691-2710.

WANTED: A quality sample of Sound 22 from the OBERHEIM. Jay Quinlan, 213 15th Place, Manhatten Beach, CA 90266.

WANTED: A good sample of a DX-7 electric piano with plenty of "metallic-bell" attack content! Also wanted: a solo french horn sample. Mark Wyar, 1121 Middle Ave., Elyria, OH 44035.

SAMPLING? - Use S.O.S. If you own a sampling device or are into sampling in any form, you need S.O.S. S.O.S. cassettes contain dozens of sounds for you to sample. All sounds are professionally recorded on pro equipment then dubbed to high-quality chrome cassettes. Best of all you can sample direct from cassette deck to sampler, repeat the sound exactly again & again, & no additional instruments-devices-people are required. Mix outputs from two tapes playing different segments for totally new and different sounds. Easy cueing, great fidelity, they're GREAT!! Only $7.95 each including postage. Texas residents add 33 cents tax. ORDER TODAY FROM: S.O.S. CASSETTES, Rt 2 Box 552, Roanoke, TX 76262. Checks payable to: LAKE SOUND.

Buffalo and Niagara Falls Mirage owners: Interested in exchanging sounds? Call or write: Chris Ott, 6871 Sy Rd., Niagara Falls, NY 14304. (716) 731-3752.

I am interested in exchanging sounds by mail. I have a good size collection of user-created sounds. I am

also using an Apple II+ with Passport interface and software (in case you would like to swap sequences or programs). If you are interested, please send a list of your sounds/programs to: Paul Mattioli, 1106 2nd St., #335, Encinitas, CA 92024. I will forward a list of my sounds and programs.

SERVICES

Don't have MASOS? Don't want to hassle with arranging your sounds to give you all the patches you need for a whole song or set? I can custom design your disks for your specific needs - a must for live performance. P. Wacker, 4221 W Dunlap #250, Phoenix, AZ 85021.

EQUIPMENT

Mirage for sale (am getting rack-mount unit). VISUAL EDITING SYSTEM for sale, along with Advanced Sampler's Package. Requires Apple II+ or IIE. View and alter the waveform directly on the Apple screen. Makes loop selection fun instead of a burden. A must for quality looping and waveform clean-up. Call Arthur Cronos at (415) 668-7777.

ANNOUNCEMENTS

Anyone having a C-64/C-128, modem, Passport interface, and the new Sonic Editor from SONIC ACCESS, and who wants to upload and download sounds to your disk drive, call Tom at (803) 356-1597.

Would you void your warranty for 512k of RAM at a projected cost of $300-$400 (US)? We are developing a memory expansion for the Mirage that would allow for instant (one-button keystroke) access to 4 upper and 4 lower patches. It would be a hacker's kit which would involve installing a circuit board (easy) and attaching 5 or 6 wires to the existing Mirage circuit board (relatively easy for someone with HS level electronics knowledge or any service or repair technician). However, before we get involved in the setup for manufacturing we would like to get some idea for the level of interest for such a product. Please write to us offering encouragement, ideas, wish list. If you wish, we will attempt to consider such letters as reservations for the final product if it is viable. Please write to: MIRAGE UPGRADES, 2004 Fernwood Rd., Victoria, BC, Canada V8T 2Y9. Thanks! [Ed. - Me first! Me first!]

FREE CLASSIFIEDS!

Well, - within limits. We're offering free classified advertising (up to 50 words) to all readers for exchanging or selling your sampled sounds on Mirage-readable disks. Additional words, or ads for other products or services, are 15 cents per word. (Unless renewed, freebie ads are removed after 5 issues.)

COMPUTER PROGRAMMING OF MIRAGE PARAMETERS

SOME PROPOSALS

By Walter Daniel

I think that we've all run up against the limitations of the Mirage data entry system. Not only is working with one parameter at a time awkward, it's easy to lose track of which wavesample number, upper or lower program number, and parameter number that you're manipulating. There is a simple reason for the instrument having a one-parameter entry system – cost. A major expense in manufacturing any sort of electronic equipment is the labor needed to install and connect panel controls. If you can afford an Apple IIe/inter-face/Visual Editing System (VES) or Macintosh/inter-face/Sound Lab package, you can alter the various sound parameters with the computer keyboard, paddles, or mouse. However, I'm not convinced that these techniques are the final word in Mirage programming.

Computers are attractive for programming parameters because they can display much more information at a given time than can the Mirage 2-digit LED. Specifically, the computer can display upper/lower, program number, wavesample number, parameter number, parameter name, and parameter value all at once. No more wiping out a wavesample because you thought you were working on another one! Note that I am not referring to another VES, just a computer utility for programming purposes. This utility can use MIDI because the MASOS MIDI implementation provides access to programs, wavesamples, and parameters. Therefore, instead of creating a system based upon requiring the user to purchase yet another incompatible interface for his or her computer, the user can rely on their present MIDI card.

The data entry problem has not been circumvented just yet. The status displays are much improved, but better input techniques are possible. Instead of the up/down buttons on the Mirage, the utility could use keys on the computer keyboard. That really isn't much different, though. What about a joystick? Joysticks were not designed to deal with numerical data input and can be quite cumbersome. Perhaps the best data entry system would be a rotary or slide potentiometer. The VES uses game paddles, but they were designed for other purposes and are not sufficient for this application.

How about a special peripheral that plugs into a joystick port and consists of one rotary pot of the type found on many types of audio equipment? With indicator marks, the peripheral gives both visual and tactile feedback in addition to what is displayed on the computer screen. That way the user doesn't have to look up at the computer screen every time a parameter is altered. It would be nice to have up/down buttons as well for vernier control of wide-range parameters and for on/off functions. This special peripheral consists of an inexpensive potentiometer, two switches, a cord, and a joystick plug. The whole item could be packaged with the programming software, increasing the price a little but increasing data entry ease a great deal.

The issues of data entry ergonomics and status displays have been addressed, but the system is still hindered by working with one parameter at a time. This is where the "page" system as used by some synthesizers can be applied. Assume that the specialized peripheral bundled with the software has five sets of potentiometers and switches instead of the original set of one. Now, instead of calling up a specific parameter on the computer keyboard, the user calls up a specific page of related parameters. Imagine using an amplitude envelope page that consists of parameters 50 through 54: attack, peak, decay, sustain, and release. With your data entry peripheral sitting in your lap, you can adjust those five parameters interactively until you get the envelope just right. Having parameters that interact on the same page could save a lot of programming time!

By applying the page system further, I came up with an idea for a stand-alone peripheral that doesn't use a computer. What if the data entry board could be plugged into the Mirage external computer port? In addition to the five sets of potentiometers and switches, the peripheral would need LEDs for each set to display which parameter was assigned to that particular set. It would be desirable to have LEDs for each set to display the numerical parameter value in addition to the position indication of the knob. LEDs for page number, upper/lower program number, and current wavesample would be desirable as well. Because this peripheral would be in the programmer's hand, the LEDs need not be the large type as in the Mirage panel display. Perhaps the use of smaller LEDs would reduce the power requirements to the point that it could be supplied by the external computer port. Of course, software is needed to drive this peripheral. Maybe a special version of the operating system would need to be loaded into the Mirage much like MASOS is loaded. If possible, an easier method would be for the peripheral to have a chip that contains the programming for its functions. The real expense in this item would be the software; the potentiometers, switches, case, cable, and connector would cost only several dollars. I believe that a product like this could list for as low as $100, depending upon software costs.

Getting back to the computer viewpoint, consider the main reason for the VES or Sound Lab. Why do we wish to view waveforms? To locate loop points, of course. Instead of using a display system, the programming software could include an automatic loop point locator that matches value and even slope of the waveform. To reduce the burden on the computer, the user would specify a strict range of pages to be examined for the loop points. A program with a combination of page programming and computer-assisted loop point setting (even if it didn't display the waveform directly) would be a powerful tool.

There remains the ever-present problem of the computer for which to develop this programming utility/peripheral package. The Apple IIe with Passport interface is considered a standard by some, but the product would reach more users if it was compatible with more computers and interfaces. One obvious choice is the Commodore 64 - it's inexpensive and there is a Passport interface (and many others) for it. However, the 64 is limited in memory compared to other systems. Another possibility is to develop the programming software for the Commodore 128 in its 128k mode. Most 64 users could keep their present interfaces and peripherals and upgrade by the purchase of just the actual computer. The 128 in 128k mode is roughly equivalent to a IIe, but with better graphics and a faster microprocessor. One last computer to consider is the new Atari ST. It has a built-in MIDI interface, and the complete package of computer, disk drive, and monochrome monitor is $800.

I hope that I've brought some good ideas to light here and welcome suggestions and discussion. Perhaps some user out there who is more of a programmer could address some of the questions put forth. I am especially intrigued by the thought of a stand-alone page peripheral that plugs into the Mirage. It could make many of us more effective, faster sound programmers.

Walter Daniel may have studied Aeronautics and Astronautics at MIT, but he did minor in music (a "humanities concentration"). He is presently a graduate student and hockey goalie at Georgia Tech. One of these days he is going to finish - really - an independent recording.

THE INTERFACE

Dear Hacker,

Each issue of the newsletter gets better and better. I would like to see more detailed and informed coverage of MIDI - and not merely MIDI in general, but MIDI and the Mirage, including, perhaps, the publication of user-written programs.

I was particularly pleased to see an article by Ensoniq Midwest District Sales Manager Tom Darling and hope that you can encourage other Ensoniq employees to put pen to paper in the form of tutorials such as his. I would be particularly interested in hearing directly from the individual Ensoniq employees responsible for the factory disks. [Ed. - so would I]. How did they get their sounds and their loops down - the inside story. For example, how did they get such a smooth acoustic piano tone across the entire Mirage keyboard? Is it a real harp on disk #10 or some synthetic/sampled hybrid? How were the demo sequences produced - with the Mirage sequencer or with something comparable to Passport's MIDI 8+; who played and/or realized these sequences?

Still further, I would be interested in knowing which, if any, of these sounds were actualy created (ie, sampled, trimmed, looped, etc.) on the Mirage itself. My suspicion is that none of them were, or at the most, very few. Rather, I believe that sound disks #1 - #10 were "made" on a larger system - one with sophisticated signal processing software - with software capable of spectral analysis, energy tracings, full visual editing, auto looping, algorithmic splicing, etc., and then downloaded to the Mirage to merely set the "performance" parameters.

Along these same lines, I am surprised by the fact that the Ensoniq sound disks are not accompanied with "patch" sheets which fully document their settings. The only three patch sheets which the company publishes are those which accompany the MASOS disk in the very end of the Advanced Sampler's Guide. Do such patch sheets exist? Obviously, one could take the next month off and transcribe them by hand. However, it sure would be preferable for the sheets containing all the settings for sound disks #1 - #10 to be made available for publication in the Hacker.

I must say I am skeptical about getting any printouts from Ensoniq, though. I am doubtful, in particular, because of the fact that there is not a single printing feature included in the Mirage Visual Editor. What this indicates to me is that, even in the most advanced software that the company makes available, Ensoniq sees no need for the user getting a hardcopy of his work. I see this too, not only as a serious omission in the Visual Editor, but also as the reflection of a serious misunderstanding about how an individual - both novice and expert - proceeds to learn a new system. They must have assumed that all we "professional" musicians care about is getting a good sounding oboe from the store and "playing" with it - rather than understanding what makes this specific sampled/synthetic hybrid with this specific set of parameter values, a fairly convincing pseudo-oboe in a wide range of musical contexts. I would like to think that they are wrong and that the depth of the questions which continue to appear in the Hacker, and the quality of the newsletter itself, for that matter, are some indication to them.

As regards the problem of getting printouts from the Visual Editor, I have added lines to the code, but to no avail. My system is fairly standard: Apple IIe, Epson MX80 printer, PKASO EP 12-80/100 printer interface (Revision 6 1982), and the Passport MIDI interface Card Type I. Perhaps, you, or one of your readers (perhaps John O. Senior, himself) have experienced similar frustration and come up with a solution which could be passed along to similarly aggravated owners of the Visual Editor.

On another note, my local dealer told me a few things which I would like confirmed and elaborated upon if possible: (1), that Ensoniq is marketing its own Disk Formatter; (2), that the 1986 Mirage will be 12 dB quieter; and (3), that there will be an inexpensive 12 dB mod for the older units as well. What exactly is the mod, how will it work, and which noise (ie, aliasing, quantizing, radio, output preamp, etc.) will it be removing?

This whole issue brings to mind another question: What is the actual signal-to-noise ratio of the Mirage? For that matter, what are the true specs of the instrument - compared to the Emulator II let's say? Here's why I ask. The machine is noisy - why else the 12-dB mod? Yet on page 53 in the ASG we are told that the Mirage has a "120 dB dynamic range;" and on page 54 that "in normal, full-level recording, quantizing noise is also present, but it is 52 dB quieter than the signal, making it virtually inaudible." Do these two figures sound as contradictory to you as they do to me? Perhaps in Hailstone's 4-track studio, 52 dB signal-to-noise ratio is "inaudible;" it was certainly inaudible in the combination bus station/music store where I bought my Mirage. However, it is far from "virtually inaudible" when I record direct to my SONY PCM F1, or, for that matter, when I record on my portable cassette deck! What's the story?

Sure, the Ensoniq disks are very quiet, (much better than 52 dB signal-to-noise on them no doubt) but this, I suspect, is, as I stated above, due to the fact that they were "made" elsewhere, not on the Mirage, as ours generally are. And another thing, I don't quite understand how the "8-bit floating-point system" in the Mirage can have a higher dynamic range than a 16-bit PCM F1.

In regard to the instrument's specs, another seeming contradiction has to do with the "fixed" setting of the output filter. On page 50 of the ASG we are told that there is a 15-kHz limit on the output. On page 20 that the max filter frequency (71) is 16 kHz. Which is it? It also occurs to me, particularly as I was just about to purchase an Input Sampling Filter, (which would increase the sampling rate to 50 kHz), that if 15 kHz (or 16 kHz) is the "fixed" peak output frequency, why bother sampling at a rate any faster than 32 kHz? Before I buy I will wait for you to clear up this apparent contradiction.

Another thing I am curious about is the specific upgrades which have taken place in the various versions of the operating system. In the Hacker you have mentioned a few things here and there. There are also some tips in the ASG. However, would it be possible to put together, in one article say, an overview on the changes which have taken place and why? If one can assume that these operating system revisions are updates, it might prove useful to know what exactly is being improved and what exactly is being changed.

Of all the letters to appear in the Hacker so far, I was most impressed by Dick Lord's in Issue #4. What is Ensoniq's response to his request for an upgrade to the operating system which would allow the specifications of arbitrary tuning systems? He has my vote! Also, have they looked into enhancing their mix mode feature (as he suggested) to allow for the mixing of envelopes and other parameters as well as wavesample pairs? A further extension of the mix mode feature which would interest me greatly, would allow the user to mix, either via the mod wheel or key velocity, any number of wavesamples - not just two. This would provide the opportunity for a wide range of "remarkably subtle" to "stunningly bold" timbre modulations. What does Ensoniq think about implementing such a feature? Is it possible?

What about portamento, the speed controlled by mix wheel or key velocity? What about an arpeggiator? I believe the Emu II has both these features. Does Ensoniq plan on incorporating either or both of these two "standard" synthesizer functions in near future operating systems? If not, what's the reason?

I look forward to receiving the future issues of the newsletter and, in particular, your and Ensoniq's response to the questions, suggestions, and issues which I have raised in this letter.

Anxiously,

Dr. Richard Boulanger
1877 Deer Street
Somerset, Massachusetts 02727

[Ed. - As you probably already noticed, your questions regarding the Ensoniq formatter and the

various improvements to the Mirage were covered in the last issue. Readers may be interested in knowing that we've arranged to have Dr. Boulanger conduct an phone interview with Ensoniq's sample wizard(s). We should be able to share the results of this in a future issue. Regarding the noise specs for the Mirage - check out Ensoniq's response to the letter from R. D. Villwock elsewhere in this issue. Meanwhile, Ensoniq's response to some of your other points follows.]

[Ensoniq's response - The correct spec for the maximum setting of the output filter should be 15 kHz. The 16 kHz is a misprint. The spec for the dynamic range is determined by the 8 bits of sample information and the 8 bits of volume information. Together these give 16 bits worth of output information, or approximately 65,000 possible levels - 120 dB. The upgrade is to reduce the noise in the output circuitry. The S/N of the amplifier circuits (referenced to the output of the D/A converter) is now about 70 dB. What the Input Sampling Filter buys you is a much sharper roll-off at the high frequencies - approximately 100 dB per octave. This allows you to capture more of the highs in the source while still eliminating the frequencies that would generate aliasing noise.]

Dear Sir,

I have learned more from your informative letter than from the information provided in the in the advanced owner's manual. I think an article on grafting sounds together like Ensoniq did on disk #9 would be very useful for everyone to know.

I think the Mirage is a great device, I only wish it were constructed better. I had a key that wouldn't trigger any sound properly until I got a disk with a later operating system on it. I am now starting to have a problem with the volume control. There isn't a decent service center in Illinois so all I can so is keep my fingers crossed and hope that an even later operating system will get the bugs out of my machine.

Thank you.

Richard F. Bird
PO Box 59347
Chicago, IL 60659

[Ed. - next issue we should have an updated list of service centers.]

Dear Mr. T. Hacker,

Just got issue number 5 - first one I've seen and I'm delighted. You know they should include an instruction course with every purchase but this is still more help than I expected to find.

Two quick beginner questions:

1) Some things in issue #5 suggest that voice quality (in the Mirage library) may be due to a defective disk. Does that mean that the click points (audible loop points) and noise heard around some of the sounds, making them barely bearable (piano, human voices, flutes and others), may, in fact, not have to be endured?

2) Is the setting of the Input Sampling Filter another matter of painstaking trial and error, or can you offer a guide to approaching it? It'd seem that it couldn't just be set to the frequency of the sample (or a bit above) because of overtones. But, obviously, it's not meant to be left open or it wouldn't be there. I presume it's a trade-off between sound quality and noise level. When would you leave it open?

If you know of any other New Yorkers that are into communicating about Mirages, I'd appreciate their names and numbers (and as you pointed out - not have to bother you with questions).

Thanks a lot,

Mark Friedman
420 E 10th St., #4RE
New York, NY 10009

[Ed. - SOME of the click points and noise may be caused by a bad disk. In other cases, like the strings, that's the way it is. The best thing to do is to get a listen on another copy of the same sound. Regarding the filter; Ensoniq recommends (as a rule of thumb in the ASG) that the filter be set to one quarter the sample rate, and the sample rate be set to as high as possible and still leave enough sample time (1/sample rate) to capture the whole sound. Of course, when you start juggling memory allocation and getting good loop points, etc., you may have to deviate from this. Then it is just trial and error and subjective judgement on high-frequency content versus noise.]

Dear Mr. Hailstone,

I have enjoyed your articles in the Transoniq Hacker. In issue #5 you indicated that you were playing the Mirage from a Roland guitar synthesizer. I use a Roland GR-707 guitar and GR-700 synthesizer to drive my rack-mount Mirage. I agree that the results are truly amazing. However, I am having trouble figuring out how to get some of the Version 3 operating system updates to work with the Roland. While MIDI Function Enable (84) works, I can't see any advantages in using it. Changing sounds from the Mirage keypad is a lot easier and faster.

Have you had any success getting LFO Modulator Source (78), Mix Modulator Source (79), After Touch Modulation Depth (80), or, most importantly, Local On/Off (30) to work? I tried various combinations of Mirage Controller Numbers 0-9 with the GR-700 String Selector Switches and the Roland foot pedals and guitar controllers, but nothing seemed to work. Other questions include the following:

How is Local ON/OFF (30) supposed to work?

Is there a way to have the sequencer play but not sound notes from the guitar so that the GR-700 can be played along with the sequence?

Since the rack unit unit does not have a foot pedal control, any ideas on starting and stopping the sequencer from the Roland?

Have you been able to get any of the Roland controllers (foot pedals, guitar switches) to affect Mirage operations?

Other than using a Volume Pedal, any ideas on cutting the Mirage on/off during live performance?

Is there a way to simulate the Mirage Mod Wheel from the Roland?

Thanks in advance for any help you can give me.

Ron Lemos
West Covina, CA

[Erick Hailstone - Although in the past I have used the GR-700 with a Mirage, I don't actually own one and have not had an opportunity to connect the two with the latest software. Concerning your point on the MIDI Function Enable (84), you are right - the keypad is easier, but if you're several feet away, this remote function is certainly a good choice to have. The GR-700 does not send aftertouch information and modulation is only on or off (no variable intensity). This may be the source of some of your mismatches. The Local On/Off is a feature that makes sense if you want to disable the keyboard on the keyboard Mirage. The function is duplicated in the rack-mount because it uses the same disks and therefore the same operating system(s). I don't know of any way to start or stop the Mirage sequencer from the GR-700. As far as cutting the Mirage on/off during live performances, you could: simply change MIDI channels, or use a MIDI foot switch (J. L Cooper for one) which just shorts out the MIDI cable, or use a foot switch to short out the audio output of the Mirage, or just use an A/B box to switch its output to "nowhere." Hope this helps some.]

Dear Editors:

When I bought my Mirage I also purchased a Passport MIDI interface for my Apple IIe, and the MIDI/8 Plus supporting software. My dealer didn't stock these items, so I bought them sight unseen. They were shipped to my dealer who, being 80 miles away, then shipped them to me. When the software arrived I encountered Passport's inexplicable backup policy: the disk is copy-protected. You are entitled to a backup disk but you don't get it until you return your warranty registration card. And guess what? My disk wouldn't boot. I needed this system for a job I was working on. Frantic calls to Passport brought little help. They'd never heard of such a thing happening, but if I were to return my disk they'd examine it and send me a working version. I called my dealer, He called Passport and finally got them to agree to send me a disk right away if I would give

them my charge card number. I don't carry plastic, so that was of little help. At last, my dealer used HIS card to get me a working copy of a disk I'd already paid plenty for.

The second disk arrived and guess what? It didn't boot either. More calls to Passport who now said, "Oh yes, that's how a disk behaves when it's damaged." -- seems like they HAD heard of such a thing before. More hassles led to a third disk arriving which, glory be. actually worked. I used the software very skittishly until many, many weeks later my backup disk arrived. It, too, worked. The MIDI/8 Plus system seems to perform as advertised, no complaints. But there are lessons in this story for computerists, novice or pro:

A) Never buy anything without seeing it (the actual unit you're buying) in operation first.

B) Run, don't walk, to your nearest micro club and get some hacker to figure out how to back up your software. This is not piracy but protection of your investment.

C) Don't count on the manufacturer for help, understanding, or even an apology.

Sincerely yours,

Jim Hockenhull
X.Plane Associates
Pullman, WA

[Ed. - Sheeesh!]

Dear Hacker,

First, I want to congratulate you on becoming an indispensable part of Mirage ownership. You provide the necessary information regarding software updates and applications that Ensoniq would be hard-pressed to deliver on a monthly basis.

I would like your advice on two applications of the Mirage concerning the triggering of a sample:

1) I own a LinnDrum which unfortunately doesn't have MIDI capability. I would like to be able to trigger a wavesample (i.e. snaredrum) from the Mirage by programming the performance in the Linn and taking a trigger out to the Mirage. I believe it is possible to program the actual sample performance in the Mirage sequencer, and use the Linn as an external clock source. If I did this, what clock pulse does the Mirage want to see? The Linn has a clock rate selectable in degrees of 24, 48, and 96. If I start up the Linn, will the Mirage start in sync? It is quite frustrating to be able to sample at such a high degree, and not be able to access that sample this way for mixdowns!

2) Say I purchase a MIDI drum machine, and use its sync code to control both my Linn and the Mirage. Would it be possible to trigger a wavesample via MIDI? Would I be able to control which of the sixteen wavesample s in memory was triggered? I would appreciate step-by-step procedures in setting

this up!

I could purchase the Korg SDD2000 sampling/delay, or the Akai, and accomplish this via their trigger inputs, but it seems senseless to purchase another sampler that isn't nearly as good as the Mirage!

Again, thanks for all the useful information.

Sincerely,
Peter Bliss
New York, NY

[Clark's response - In answer to question one, it should be possible to sync the Mirage sequencer to the LinnDrum sync output. Theoretically, the clock rate of the Linn shouldn't matter, as the Mirage is capable of analyzing the clock rate at its input and setting itself accordingly. The Mirage should start playback when you hit "play" on the Linn (you may have to first hit "play" on the Mirage) and the two should be in sync providing the Mirage part was originally recorded in time with the Linn, and synced to the Linn. I doubt that this is what you want, though - it would be just as easy to play the Mirage part "live" during a tape over-dub. What you want, I think, is a device that will allow a particular sample from the Mirage to be triggered from the slave output of the Linn. The only one I know of (which doesn't mean that there aren't others) is the Roland Octapad system. This is a set of 8 drum pads in a box. When a pad is struck, a MIDI signal is sent to your slave device (in this case, the Mirage) and a note is fired accordingly. There are controls on the Octapads to allow you to select which note of the Mirage corresponds to each pad of the Octapad set. Also included are six quarter-inch inputs on the back of the system, into which you could plug six outputs from the Linn. These will allow you to select which Mirage sounds are triggered by which Linn sounds, and will also track dynamics. The system lists for about $550.

One other possibility might be to use something like J.L.Cooper's CV to MIDI box. This is a small box with inputs for control voltage and gate signals (such as are found on many analog synthesizers) and a MIDI output. You would need to convert the snare output of your Linn to a gate-type signal - a square wave which rises from zero to something like 10 volts, probably . This shouldn't be too difficult to do - consult your local technician. Applying the snare-controlled gate signal to the input of J.L.Cooper's device should cause a note of the Mirage to fire. The next step is to control which note fires. This is achieved by applying a voltage to the input of the Cooper box, in the range of 0 to 5 volts. 0 volts should correspond to the lowest note on the Mirage, and 5 volts to the highest. Notes in-between can be selected by varying the input voltage; 1 volt should get you the "C" one octave above the lowest "C"; 1/12 volt should get you the "C#" above the lowest "C", and so on. A small, monophonic analog synthesizer with CV out jacks might be ideal for this type of control. Used ones can generally be picked up dirt cheap these days.

As far as your second question goes, the answer is

yes, you can trigger a wavesample in the Mirage via MIDI. Be aware, however, that you won't have a heck of a lot of control over which wavesample, unless you re-arrange which wavesamples correspond to which Mirage keys. The drum machine sends a signal over MIDI with each drum sound usually corresponding to one key on the Mirage. However, be aware that not all MIDI drum machines will sync your Linn. In any case, remember the first commandment for techno-consumers: Try Before You Buy!

Dear Sirs,

I'd like to hear about any Mirage User Groups near Yugoslavia (Italy, Austria, or West Germany). Also, are there any official Ensoniq representatives near here?

Also, maybe you can help to clear up this problem: I've heard about some sort of warranty reply card. I did not get anything of the sort with my Mirage. My dealer "knows nothing" about that (my Mirage was bought in Munich).

Best wishes in '86.

Sincerely,

Andrija Pusic
Jozef Stefan Institute
E4, Jamova 39
61000 Ljubljana
Yugoslavia

[Ed. - Hopefully, some of our European readers will contact you regarding the user group. We have several readers in the area (although you're the only one in Yugoslavia), but we haven't heard of any user groups yet. Ensoniq response to your warranty card problem and question concerning representatives follows.]

[Ensoniq's response - Our European distribution is handled fairly independently - but, there SHOULD be a warranty card. Please contact Ensoniq Europe, 65 AVE DE STALINGRAD, B1000, BRUSSELLS, BELGIUM.]

Dear Sirs,

As an extremely excited new Mirage owner, I am insatiably hungry for every piece of information on this machine I can get. While our local dealer is supportive there aren't many units in our area yet. I'm working in a vacuum.

The potential of this instrument is astounding. Both musically and technologically it seems to inspire creativity.

Do you know of anyone working on an outboard RAM-disk for sound storage. How about a VES for the Amiga? It could be outstanding. Maybe a 20-Meg hard disk interface? We could go on forever.

How about sounds? The factory sounds are great - but I want more. My sampled sounds are ok but not perfect yet. I'm waiting for the VES - Apple software to arrive. Maybe that'll help. (I've got the Input Filter.)

Our group down here would love to build the RAM-disk. Got any names of tech people at Ensoniq for information? The pin out in your Issue #3 is not enough. Does Ensoniq openly support soft and hardware developers? Is there a development/license package available? Any info would be appreciated.

I'll be anxiously awaiting your reply.

Until then,

Burton Whicker
High Point, North Carolina

[Ed. - So far, all we've heard about the various "wish" items you mentioned are rumors - nothing concrete yet. The arrival of your VES will probably make a dramatic difference in your sampled sounds. Ensoniq's generally been pretty good about second-party type developers. You should also contact the people who have offered technical support in our "Mirage Net." There's also an announcement from a Canadian group elsewhere in this issue regarding memory expansion for the Mirage - check it out. Ensoniq's response follows.]

[Ensoniq's response - Our technical staff doesn't have much time to devote to helping outside developers - we're pretty busy on our own improvements and developments! But, we'll be happy to supply technical data and schematics on the Mirage to those who sign our standard non-disclosure agreement.]

Dear Hackers,

I'm really amazed to see how popular a "wish list" item an expanded sequencer has become for many of your readers. Obviously, any significant increase in the sequencer capacity would involve a correspondingly significant increase in memory size, and if Ensoniq eventually does make such a major change, wouldn't "you all" rather see that extra memory for something important to sampling?

The marketplace abounds with low to moderately priced sequencers for MIDI data, but, the same certainly cannot be said about multi-samplers. Instead of adding "bells and whistles" to the Mirage, wouldn't you like to have 12-bit sampling resolution and 20 to 30 seconds of full bandwidth sampling time? How about 16 polyphonic voices and full 88-note response when driven from a MKB-1000 or a KX-88?

Isn't anyone out there interested in an improved signal-to-noise ratio? The quantization noise alone (for an 8-bit, linear system like the Mirage) can be no lower than one part (1/2 LSB) in 254 of the maximum recorded level. Therefore, the best possible signal-to-noise ratio, S/N, is no more than a very marginal 48 dB. Every added bit could theoretically improve the S/N by another 6 dB and this makes a well-designed 12-bit system inherently capable of providing a 72 dB S/N. Still not exactly Compact Disk quality, BUT, a lot closer!

Now, I realize that Ensoniq SAYS they use a "floating point" encoding system, but to derive any benefit from such a technique, each stored sample point would have to include its own unique EXPONENT as well as the 8-bit MANTISSA that's being stored. As far as I can see, the only "exponent" part of the Mirage's alleged floating point encoding scheme is ostensibly provided by the various volume control mechanisms. To imply that this somehow magically improves the S/N is somewhat akin to saying that the performance of any low-S/N audio system can be improved if you can raise and lower the playback volume!

Admittedly, the fact that the wavesample volume envelope essentially multiplies the stored mantissa of each sample point by a potentially different value (assuming the envelope contour isn't just an organ gate), DOES provide some semblance of a "floating point" behavior. But to imply that the Mirage is anything at all like a 16-bit resolution system is pure fantasy! Besides, any improvement resulting from envelope dynamics will enhance a 12-bit system by the same mechanism. Unless some undisclosed, "secret" form of companding is utilized, it seems to me that the Mirage is simply an 8-bit system with less than 48 dB S/N.

Of course I realize that increasing the sample resolution from 8 to 12 bits involves more than just increasing memory size, however, 12-bit A/D and D/A converters are no longer prohibitively expensive, and memory is getting almost "dirt cheap." Note that the new Prophet 2000 uses 12-bit sample encoding AND has a 256k wavesample memory. It's not clear to me yet whether this is supposed to be 256k bytes or 256k, 12-bit words, but in either case it means both more resolution AND longer sampling time than the 128k-byte Mirage.

Come on Ensoniq, the Mirage was a fantastic breakthrough and still is an amazing product, but what are you going to do for an encore? May I suggest:

1) 16 seconds (or more) of 12-bit wavesample storage at full audio playback bandwidth.

2) 16 (or more) polyphonic voices and full 88-note response for the Rack Mount unit (I don't think you need to make one with a keyboard).

3) The ability to have 32 (or more) samples spread across the keyboard.

4) 50 or more super high-quality factory sounds of things that are the toughest to do - good, old fashioned acoustic instruments.

5) A price tag (still) under $2000.

That's MY "wish list" and an admirable challenge for

DATED MATERIAL
TIME VALUE

an innovative company.

R. D. Villwock
Glendora, CA

[Ed. - Glad to hear some challenging "wishs" and
comments. I think Ensoniq's feelings toward the
sequencer pretty much agree with yours. One of their
people has mentioned to us that it was really just
intended as sort of a "scratch-pad" kind of tool, and
wasn't meant to be a major feature. Of course, as
you mentioned, memory is getting cheaper, and if
there's a strong demand for this sort of thing - why
not both (larger sampling and sequencer memories)? A
few general observations - I think everyone will
agree that more bits will always convey more
information (Law of The Universe #14). The "problem"
in any high-tech field these days is that by the time
you're done with the design there's ALWAYS better and
cheaper sub-parts available than what you started
with. You're just about always "obsolete" in some
sense by the time you ship your first unit. At some
point, Marketing will generally yell at Engineering
"STOP ALREADY - We have to get something out the door
or we all die!" So you ship and, if you're a company
that's going to be around for awhile, Engineering
starts working on "the way we should have done it in
the first place." (If only we knew!) I think we'll
all know better what type of company Ensoniq's going
to be after we see what they do for an encore.
Ensoniq's response to your floating point comments
follow.]

[Ensoniq's response - We don't deny that 12 bits will
be better than 8 (and that 16 will be better than
12). No argument. Our diddling with the volume is
more of the nature of compressing the signal - this
does improve S/N ratios and is not the same as
"raising and lowering a volume control." To better
clarify the Mirage's noise specs: the 52 dB in the
ASG is a misprint. (Sorry about that.) The actual
limit on sampling noise is 48 db (as you mentioned).
The remainder of the system has a S/N ratio of
approximately 70 dB (after the recent 12 dB mod) -
referenced to the signal from the D/A.]