Transoniq Hacker

The Independent Ensoniq User's Newsletter

NOW THAT YOU CAN PLAY THE HARP...

By Erick Hailstone

One of the first things I do when I get a new disk is check out the accompanying sequence. (Brilliant hah?). I've been a musician for 20 years, studied orchestration, composition, arranging and still can write off a sound until I hear it in context. You could take almost any sample available for the Mirage, play one note for Joe Q. Public and find people who would not be able to identify it. If you happen to start with a sitar you're going to lose a lot of folks (this could be a great T.V. game show). There are several reasons for this. In some cases it would be the limits of technology: some samples are better then others. Another point would be how familiar we are with that sound. Most of us would guess correctly after hearing a single piano note but might not get a single note from a harmonica.

I'm going to examine some Mirage samples we've reviewed with an eye (or ear) on performance. All of a sudden you're a guitar player or a celloist. Now you've got to think like one.

To start off, try breaking things into general categories: Reeds, Brass, Percussion, Strings. Then break them down in other ways. Can it play chords or only one note at a time? Can it bend pitch up or down? In what type of ensemble does an instrument usually appear? What role does it play: time keeper, soloist, etc. You have to develop an ear to the nuances that make up these instruments. I'm primarily a guitarist and off the top of my head I can think of 10 or 20 ways of playing the same note. Depending on your experience with a certain instrument, you're going to have to study it to greater or lesser degrees.

In the future when I review new disks I will examine these ideas more closely. But for right now, let's look at what we've got so far.

Pianos. Most of us are going to get this one right because we've heard it all our lives. Pianos are percussive stringed instruments. A normal piano can not bend pitch or add vibrato. Its nuances are involved in how hard or soft you play it and how long you sustain notes. The Mirage does not have the same dynamic range as a real piano. One thing you can do to compensate for this is to use a volume pedal. It will allow you more control over relative dynamics. Electric pianos are different then acoustic pianos in many ways. If you have had little experience with them you'll find that you have to voice chords differently from time to time. Some chords you use on an acoustic piano will be too rich or thick on electric and vice versus.

Clavinet uses the same keyboard as a piano. There is a single string per note (piano has 2 or 3) and the strings are much shorter then piano giving it a bright plucked sound similar to a harpsicord. It's generally played with a short chopping style. Stevie Wonder popularized the clavinet using a wah wah pedal during the 70's. The lower end is effective for percussive bass. Try syncopating the root of a chord in the left hand with a triad in the right. Keep voices simple. Chorusing and a wah wah type filter sweep are common effects.

Anyone who's ever seen a Marx Brothers' movie knows what a harp looks like, right? There are not a lot of folks playing harps in modern music but there are a few. The harp is a stringed instrument that is plucked. It is most often used in classical music as part of an orchestra. The harp is characterized by long sweeping glissandos as shown on the bottom octave of Lower Sample 2, Disc 10. Broken arpeggios are also quite common.

Vibes, marimba, and xylophone all use mallots. When playing single lines, a player will have a mallot in each hand. The marimba's bars are made of wood and decay fairly quickly. Fast single lines are common as are alternating intervals of a 3rd played as 8th or 16th notes. Xylophone and vibraphone have metal bars and have quite a bit of sustain. Vibes have a damp pedal to control the sustain cut off. Modern players use 2 mallots in each hand so they can play 4 note chords. Because of the length of the mallots, the distance between notes can be quite great. There is also an electronic tremolo with vibes. This is a subtle effect that most modern players use sparingly if at all.

Let's look at the Slap Bass sound on Disk 1. It gives you 2 different sounds to work with. The first 1 1/2 octaves are notes plucked with a finger so that the next octave is popped. It's pulled away with enough tension so that when it's let go it pops back against the frets. It's a common technique in modern music. A bass player would alternate these two sounds making the upper sound much shorter in duration. A common trick is to play eighth notes alternating the popped sound every other note an octave up.

There are many other bass sounds on other disks. Rather than look at all of them, look at the role of the bass players. Although he may also take a solo, his role is most often supportive. He is a time keeper and works with the

drummer. In pop music he'll usually play beats 1 and 3 in 4/4 time. He will often accent what the drummer is playing with his bass drum. Every style of music has its own rules so these are generalizations. One observation if you are using an external sequencer - Clark and I were working on a project recently and had auto corrected a bass part. It played straight eighth notes PERFECTLY. MACHINE LIKE. It just didn't sound right. A human being will play a little ahead of the beat or behind it to establish a certain feel. We were able to create this effect by adding a small fraction of time to the first beat so all the following notes were slightly behind the beat. If you're using a sequencer which allows you to edit things try this when things sound too sterile. (The musical term for this is "rubato" - "robbed.")

How about drums? I could write a book on drums alone. KEYBOARD magazine has a regular column on programming drum machines. There are also a couple of books out on Roland drum machines that are also helpful. There are several books that teach drummers how to play different styles of music. A fundamental experience in reading music is necessary for these. You might also listen to some records called "DrumDrops." These are meant for practice but will show what drums sound like with the rest of the music stripped away. Because the Mirage is touch sensitive you have more control over nuances. For instance, if you listen to a jazz drummer playing a ride cymbal, he will accent the beat on 1 and 3 in 4/4 time (usually). One of the pitfalls nondrummers can fall into is playing too much. Most drummers cannot play 32nd note triplets for a long time at fast tempos and even if they could there aren't many occasions were it's very tasteful. Another point to consider as a drummer is that although the Mirage has lots of different tunings for cymbals, if you use too many too often it's not going to sound right. Drummers usually only have 3, 4, or 5 cymbals.

Guitars. There are several different types of guitars and the Mirage offers you many of them. Rock guitar and fuzz guitar are mainly solo sounds. When you hear them play chords it's usually fifths. These work well on the Mirage if they are sustained or have a reasonable amount of time between each new attack. Sampled notes all have the exact same pick articulation so the more notes you play in a row, the weirder it sounds. If you play straight eighths, you should vary the dynamics a bit to compensate for this. Rock guitarists have light tension strings. This allows them to bend notes, usually up a whole step, sometimes a minor third. You can also start with the note bent already to one of these intervals and then let it come back down to its starting points. Vibrato is used on a note to help it sustain longer. Experiment with different intensities and different speed vibratos.

Nylon string guitarists don't usually bend notes very much. Their vibratos are also more subtle. When playing chords, remember there are only 6 strings on a guitar so piano voicings have to be altered. Chords are either strummed or plucked. Plucking limits you to 4 notes because you use the thumb and first 3 fingers of the right hand. Strumming can be fast or slow. You'll have to arpeggiate chords fast or slow to get a similar effect. To get a finger picking effect, use a broken arpeggio. For example, play a root in the left hand. Then, with the right hand, play the root an octave up followed by the third. This is a typical pattern. Nylon strings usually use a less intense vibrato. Steel string guitars share many of the same qualities as nylon. A jazz guitarist usually uses a very high tension string so bending is harder and vibrato is generally used less. When playing chords, he tends to arpeggiate less and strums across the strings quickly to make the notes sound together. You can use the pitch wheel to simulate sliding from one note to the other.

There are many styles of music and each instrument can be played differently to put across a certain style so the best I can do is give general observations. Also, rules are made to be broken. So just because a real piano can't bend notes doesn't mean that you should feel restricted by acoustical limitations. However, if you don't want someone to know you're using a sampler, bending a chord is a sure way of letting the cat out of the bag.

Erick Hailstone studied composition and arranging at the University of Nevada and at the Berklee College of Music. He has been involved with synthesizers and related technology for the past seven years and is a partner in "The MIDI Connection," a Portland-based consulting firm. Primarily a guitarist, his orientation has been in performing and recording with these devices.

AN INTERVIEW WITH ENSONIQ'S SAMPLING WIZARD: THOMAS METCALF

Part I

by Richard Boulanger, PhD

Like most Mirage owners, I purchased my instrument for two reasons. The first was the quality of the sounds in the Ensoniq Library. I was particularly impressed by the evenness of the piano's tone across the entire keyboard and its timbral responsiveness to key velocity. At last, it would be possible to incorporate a wide variety of instrumental sounds in my recording and production work.

The second, and perhaps more important reason, given my background as a concert composer of "musique concrete," was the presumption that I could sample and compose with the extensive body of computer generated sounds I had produced at the various research labs where I had previously worked - MIT, Colgate, and CARL (UCSD).

The price was right too, but the bottom line was based on this implication: Since the Ensoniq samples were so good, my samples would be equally good.

Like most of you, I brought home the instrument, spent the first few days enjoying the strings and sax, vamping with little sequences, and messing with the configuration parameters. Then the surprise as I attempted my first samples. What went in were simple guitar, synthesizer, and vocal tones. What came out were muted, noisy, and clicking grunts - featuring a loop that only a mother could love.

Right away, I went out and spent an additional four-hundred dollars on the Apple Visual Editor, Koala Pad, and Passport Midi Interface. It was fun to look at the waveforms on the screen and made sampling a little easier, but my samples were still a long way from the Ensoniq piano, cello, harp, or sitar.

What's the story? Is the ability to sample my own sounds merely a sales gimmick? Maybe 8-bits isn't enough? Maybe I need the sampling filter too? (Great - another $150.)

Maybe they aren't even making these sounds on the Mirage at all?

In a letter to the Hacker (which appeared in issue #8), I voiced a number of these questions, suspicions, and frustrations. Some of them were answered, but better than that, I got a call from Jane Talisman. She wondered if I wouldn't be interested in doing an in depth interview with the Ensoniq "sampling wizard" as she called him. Then I could pose my many questions directly to him. It sounded good to me. I definitely wanted some answers.

My telephone interview with Thomas Metcalf took place on the morning of March 14th and the conversation lasted several hours. We discussed his role with the company, his job, his studio, his musical background, and some of his hard earned secrets to successful sampling. The best thing was to find out that he really does use the Mirage for all the Ensoniq disks. The establishment of this fact alone provided me a much needed shot of encouragement. I hope that some of the information in this interview does the same for the frustrated sampler in you.

Tom's Place (& Tom)

BEGINNINGS WITH ENSONIQ

Boulanger How did you get started with Ensoniq? Were you there from the beginning?

Metcalf For a lot of years I worked in a local music store and started to get into synthesizers while working there. I bought a Rhodes Chroma at that time. It's the only synthesizer I have ever owned and a great machine. For years and years before that I had been into building my own electronic music stuff. I was putting together a large modular system and had set up a home studio.

Boulanger So you have technical chops then?

Metcalf Yes. I was originally hired at Ensoniq as a tech.

The story goes like this: I was working at the music store and got my synthesizers and studio together and started recording and producing my own music.

Then I got married and became much more serious about my life. There wasn't enough money in the music store to make it, so I quit cold turkey. A friend of mine, John Senior (the designer of the Mirage Visual Editor for the Apple IIe), was working at a biomedical company called Interspec. He told me of an opening there for a tech, and I went and got the job.

Some time later, John Senior and Bill Mauchly left Interspec to come to Ensoniq. (Mauchly is one of the head software guys at Ensoniq.) We talked about it before they left. The idea was that as soon as something opened up at Ensoniq they would give me a call.

Boulanger I was under the impression that you, Senior, and Mauchly were three of Ensoniq's founders.

Metcalf No. The Ensoniq company was started by three ex-Commodore computer people - Bruce Crockett, Al Charpentier, and Bob Yannes. Basically, those three guys were responsible for the Commodore 64. They brought with them the corporate philosophy of creating inexpensive products that do a fair amount. That's very much in their thinking. This is one of the reasons that you will never see Ensoniq do a $5000 sampling machine.

Boulanger As a tech, did you have anything to do with the design of the Q-chip?

Metcalf No. Al and Bob did the Q-chip. As you know, it's the heart of the Mirage. The week after I was hired we went to our first NAMM show with an inexpensive digitally sampled drum machine. It actually never ended up being manufactured. As soon as we got back from the show, things started coming together on the custom chip, and we started working in earnest on the Mirage.

Boulanger So you did have some input on the hardware design of the Mirage?

Metcalf Yes. I did some of the layout on the board, and the building of prototypes. From a hardware standpoint I helped to get it off the ground in that way. I also did a little bit of design on a piece of circuitry in there which helped to make the thing quieter. That was basically the extent of my input on it.

SAMPLE BEGINNINGS

Boulanger How did you get involved in the sampling end of things?

Metcalf When the Mirage actually became a reality, there was no one around to do sounds. In the scramble to get things down for it, we divided things up - I went to work on the piano. Although, some of the other software guys were doing sounds and whatnot, it quickly became apparent that this was a real strong point of mine.

I owe that, probably, to all the years I put in on my own doing my music with synthesizers. I got pretty good at it I guess. Considering how long I did it just because I enjoyed doing it, I feel quite lucky to be getting paid for it now.

Boulanger I've noticed quite a boom in the Library. All of a sudden it jumped from sound disk 4 to sound disk 17. Does this reflect your new role with the company?

Metcalf Not really. Initially, there was a big learning curve with the Mirage. I had never worked with a sampler before. It was a

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case of learning what things work on it and what things don't. Also, in the very beginning, there was no visual editor. When the initial disks were done, you couldn't even see the waveform. It was very slow getting started.

Around sound disk #5 we hired Bill McCutcheon to do sampling too. I showed him everything I had learned up to that point. Also a gentleman from Japan came over and I showed him what I knew. We have actually put out a disk by him. I trained someone from the Netherlands too.

In addition, some things have been sent in from the outside. A name that comes to mind is David Miller. I think he lives in Oregon. He's real good at it. The "tah vocal" disk (#17) is his.

I think that the two full-time sound designers here at Ensoniq, and the high quality work being done on the outside explains why the library has taken off so dramatically.

MUSICAL BACKGROUND

Boulanger What is your musical background? Are you a classically trained musician or are you self-taught?

Metcalf I didn't start playing keyboards until my last year in high school. At that time I was studying with a classical pianist and got a lot of my technique together with him. I must admit that I've never been interested in playing other people's music though, and when it became apparent that I was showing my teacher more at lessons then he was showing me, I stopped.

As far as the literature goes, I've played some of the more interesting Prokofief piano works, but I never got heavily into doing much classical stuff.

Boulanger What is your professional performing experience? Did you play out at all? Do you play out now with your Mirage?

Metcalf For a while I was in an original band doing some really far out music. We were trying to get a record contract and all that, but nothing really materialized with it. After that I got involved in a thing that was even a little more out there, with a drummer I met at the music store. We got this concept of two synthesizer players and two percussionists. When we finally got the people together - it took about a year - I realized that I was kind of bored with the whole thing. The repertoire was growing and growing, but it was getting to the point where we were just sitting around playing this music over and over again. I kind of made the decision to do things on tape. On tape, you do it until you get it right, then you are done with it and you can move on. I left those guys, but they've gone on and now play out quite a lot. At present, I've gotten bored with the tape thing and I'm looking forward to getting something together to take out and play, but it will be on a small scale.

SEQUENCES

Boulanger You are full time working on sounds at Ensoniq; you supervise the work of another full-time sound designer; you've got piano chops and performance experience; is it you who plays the sequences on the disks? Is it McCutcheon? Who plays them?

Metcalf Anybody we can find. Basically what happens is that I or Bill will get a sound disk done. Sometimes its really apparent what kind of things you want to put on there. On the disk with the Fall-off Brass (#8), for example, it was obvious what kind of music we wanted. Bill Mauchly and I did it. I tend to do the things that are more like the tape I sent you.

Boulanger The tape which you sent me sounded like the solo work of Larry Fast - his early Synergy albums.

Metcalf Interesting. I don't listen to Larry Fast.

Boulanger I just bring him up to identify your musical style - someone the readers might know. Were the sequences done with the internal Mirage sequencer or with some software sequencer like Passport's Midi8+?

Metcalf There may have been one or two that were done with an external sequencer, but I honestly don't think so. All the sequences that I do are done on the Mirage, mainly because that's all I have in here to work with.

The position of the company, as far as the sequences go is: We want them to be good. We want them to show the sounds off. But we don't want to take outrageous amounts of time doing them.

Boulanger I think they are quite a sales point for the machine. It doesn't matter whether the salesman can play or not. It doesn't matter whether he knows the Mirage or not. All he has to do is plug in "Bandstand" and you can't help but say - "I must have one."

Metcalf You are reading our minds. That's the whole reason.

Boulanger Being a guitarist, the classical guitar sequence particularly appeals to me. Was that one done with an external sequencer?

Metcalf No. Bill Mauchly knew that piece and he just came in and played it.

THE ENSONIQ SAMPLING FACILITY

Boulanger So, the sequences are all done on the Mirage, but how about the samples? Are all the disks in the Ensoniq Library made on the Mirage too?

Metcalf Basically, the only thing that we use is a modified ASYST package which runs on an Apple IIe. It is an 8-bit linear data acquisition system. From a sampling standpoint, it is exactly like a Mirage. We modified it so that it has a continuously adjustable sample rate.

We needed ASYST to line up the frequencies for single cycle loops. Someone who bought a Mirage might use a variable speed tape machine to line up the pitch of the sound with the sample rate of the Mirage. We make our master recordings on a Sony PCM-F1 - A 16-bit linear, pcm digital recorder which stores the data on beta tape. The sample rate is 41K. Since the F1 doesn't have variable speed, we needed a way of adjusting the sample rate. We use the ASYST package for this.

Boulanger So the ASYST package is your way of maintaining the highest quality of your source material. You never need to transfer your digital master recordings to analog form.

Metcalf Exactly right. Originally we tried doing some recordings on an Otari two track mastering deck. The problem we found was that a lot of times we wanted to do some really drastic EQ on things. If you tried to boost a really high frequency band you are going to bring in some noise up there too.

The ASYST package is quite limited. Whereas it solves some problems it introduces some too. Our hardware modifications have made it quite finicky - sometimes it doesn't work at

all. The maximum amount of memory you could fill up is 40K so you can't do an entire Mirage memory half in it. We only use it when we have to line up cycles with the sample rate. The sounds with big loops in them are all done in the Mirage.

VISUAL EDITORS

Boulanger I assume that you use a visual editor now?

Metcalf You bet! Originally we had thought about cleaning up this ASYST program and maybe working out something with them to make it available to people. But there were problems with that - memory, finicky, etc. The thing that I run on ASYST is really a primitive form of the Apple Visual Editor. However, it doesn't do any of the MASOS functions. All it does is display the waveform and allow you to move around and look at things. You can also rotate the waveform. Beyond rotation and display, there wasn't much more it can do but ship the waveform over to the Mirage.

The decision was made to do a dedicated editing system - kind of an offshoot from the thing we had started on the ASYST. The purpose was not only to help me in making the factory sounds, but we had also made the decision to make a visual editor available to people.

THE INPUT SAMPLING FILTER

Boulanger Do you use the input sampling filter?

Metcalf Sure do. The same thing happened with the input sampling filter as with the visual editor. I was doing some sound, I think it was brass, and having a real problem with its high frequency content.

At home I had some filter chips. They were 7-pole elliptical filters. I thought that perhaps I might try building one of these things and use it. So I brought one in and built a prototype of the input sampling filter. It didn't do the auto switching within the Mirage like the new one does. Rather, it had a dip switch on the outside.

Anyway, I used it and it really helped! It made a big difference. I kind of talked the people here into making it available to users.

SAMPLING THEORY AND THE MIRAGE

Boulanger What exactly did the sampling filter do for you? I have a real problem with it. I don't own one yet because the specs are a seeming contradiction. If the output of the Mirage is fixed at 15kHz, what does it matter if I can sample at 50kHz? The maximum sampling rate within the Mirage - 33kHz - seems perfectly matched to the maximum output frequency of the instrument.

Metcalf Well you see, classic sampling theory kind of falls apart a little bit on the Mirage. The reason is that we use a totally different technique than anybody I know of. The Emulator II and Fairlight use a variable clock playback rate to put the sound back together again - to spit it out. We use a fixed playback rate. So when you play a sound at the pitch you sampled it at, or when you play a sound an octave higher, it is still only putting out information at, I think, about 30kHz.

Boulanger How exactly is this done?

Metcalf We use a technique called "sample skipping." Basically what that means is that, when you play back a pitch an octave up, it plays back every other sample. So if you have a sound which was sampled at 30kHz - with frequency information up to 15kHz - and you play it an octave up, essentially you are resampling what's in memory at 15kHz.

If you think about that for a minute, you realize that you are trying to sample something with a frequency response right up to the sample rate. When you do this you get what's called table-lookup noise. It's basically a form of aliasing.

Boulanger Given the fixed playback rate within the Mirage, and the mathematical impossibility of frequency data above 15kHz, why sample at 50kHz?

Metcalf What increased sample rates do for you on the Mirage, is to reduce the amount of table-lookup noise. This is because you have more samples representing each cycle of the waveform. So when you are skipping some of them to get the higher octave, you still have a more complete representation.

TRUE BENEFITS OF THE INPUT FILTER

Boulanger I'm almost sold. But tell me what is the immediate reward when I plug in the filter?

Metcalf First thing, it is not a magic black box. Don't expect that if you have a sound which you can't sample, that when you buy one of these things and run the signal through, it's going to sound as good as a 16-bit sampling machine. It's not.

What it comes down to is this. Because of the table look-up noise problem, things with a lot of high frequency components, things like brass for example, will present a real sampling problem. The onboard input filter is only a 4-pole filter with 24dB per octave rolloff. In order to get rid of those high frequencies which are causing you the noise problems, you have to close the input filter so low that you drastically affect the frequency range of the instrument that you didn't want to.

Boulanger You get "muted" rather than "fanfare" brass, right?

Metcalf That's it exactly. In order to get the noise in this upper frequencies down by 48dB let's say, you have to cut off the upper two octaves of the instrument's timbre. This is where the input sampling filter comes in. It's cutoff frequency is roughly 150dB per octave. So if you want to get these high frequencies out which are causing you problems, let's say 50dB down from your flat signal, you only have to set the cutoff at about 1/3 of an octave below the sample rate.

Boulanger Then besides giving you a more detailed representation of the waveform, the sampling filter allows you to get rid of extremely high frequencies, which are bound to introduce noise, while leaving a good deal more of the total instrument spectrum intact.

Metcalf Yes. It is a cleaner way of getting rid of the troubled frequencies. You can virtually eliminate the super-high frequencies while leaving a good deal more of the high frequencies intact.

Continued next month.

MAGIC SAMPLE RATES

By J. William Mauchly

It is possible to get very clean high frequencies out of the Mirage. The usual technique is to oversample a sound; this is the best general solution to the problem of high frequency distortion. There is another technique, however, which only works for sounds that will not be transposed. This article explains how to get rid of all distortion by playing back a sound at the exact rate that it was sampled. It's great for really clean cymbals and special effects.

The Mirage uses a proprietary oscillator chip to create digital waveforms. The output of the "Q" chip is fed to eight analog filters, which reduce the high-frequency aliasing noise. Another kind of noise, however, is also present, which often cannot be filtered out. This distortion gets much worse as the high frequency content of a sound increases. The trouble is that the noise shows up anywhere in the spectrum.

If you are curious about this problem, it is instructive to try to sample a high sine wave. Try a pure sound about two or three octaves above middle C, and make sure the sample time is set for 34 (microseconds). When played back, you'll hear the aliasing. There is another sine wave present, probably lower than the original. It bounces around from note to note, but it does follow a strict rule. As you transpose the sound closer and closer to the pitch of the original sound, the alias gets lower and lower in pitch. That's interesting - can you make it go away? Find the note on the keyboard where the alias tone is the lowest pitch. By using the fine tune control [68] of the wavesample, or master tune [21], you can get the alias to go subaudio. Alas, this is still not low enough; now the super-low frequency creates a tremolo effect as it interacts with the real signal. Here is the answer: when the alias goes to 0 Hz it will disappear.

Ah, but it's not quite that simple. The tuning of the Mirage is calibrated in 256ths of an octave. There is no "notch" in the tuning software which is exactly right to do the job. You get close, but not close enough; the distortion is still there.

Now the trick: the detune parameter [33]. This parameter detunes oscillator two in the smallest increments available in the hardware. These are smaller steps than those in the wavesample fine tune parameter. Set the mix [34] to 63, so that only oscillator two is heard. Now bumping the detune parameter can get you to that magic frequency where the distortion disappears. Completely. What's happening is that you are setting the playback sample rate of the sound so that it is EXACTLY the sample rate of the Q chip, which is 1/34 microseconds.

Now I warned you that that sine wave only sounds pure on that one key. But one key is enough for certain sampled sounds; a ride cymbal is a perfect example; a bell-tree is another.

Here are the constraints, in brief:

1. The sound must be sampled with the sample time at 34.
2. The mix [34] must be at 63.
3. The detune [33] should be set at 1. (Other combinations may work.)
4. The fine tune must be set according to this chart, depending on what key you want the sound to come back on:

KEY	Fine Tune [68]
C	4E
A	8E
D#	CE
F#	0E

You can find the right value of other notes by experimenting. The octave should also be set by ear. Octave transpositions will also be cleaner and have less distortion.

Admittedly, it's an awfully obscure technique. But it really does work; it sends the alias down to 0 Hz on that one key. The other technique, oversampling, reduces the amplitude of the alias. That is obviously a better answer for most sounds. I hope this tidbit will be of some use to those hackers who are always searching for the ultimate highs.

Bio: J. William Mauchly, son of the co-inventor of the ENIAC (the first digital computer) Dr. John W. Mauchly, has a degree in Computer Science from Temple University and is Senior Software Engineer at ENSONIQ Corp. After playing guitar and synthesizer professionally for several years, he became interested in computer music and digital processing. He started doing Fairlight consulting and microcomputer music programing around 1980. Since then, he has been music director for the Symposium on Small Computers in the Arts, and has been with ENSONIQ for two years. He was one of the designers of the Mirage and the ESQ-1, and author of the Mirage Advanced Samplers Guide.

CLASSIFIEDS

USER GROUPS

SYRACUSE AREA MIRAGE OWNERS UNITE: MIDIOTS is a growing Mirage user-group. Meetings, sample trading, and techniques are just the tip of the iceberg. If interested, contact: JIM LOGAN, 339 BURNS AVE, SYRACUSE, NY 13206. (315) 437-8761. Motto: Don't be an idiot, MIDI-it.

Recording studio interested in contacting other Mirage owners in N.Y.C. and Westchester area to start user group, exchange sounds and info. Al Hemberger, LIPS MUSIC, (914) 961-9637, Bronxville.

NY, NJ, CONN - Tri-state area. Exchanging samples and ideas. Will consider mailing across country with honest and sincere Mirage owners. Any interesting and clean samples out there? Gordon G. G. Gerbert, G4 Productions, 622 Odell Ave., Yonkers, NY 10710. (914) 969-5682.

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.

SAMPLES

MIRAGE ENTHUSIASTS: We at I.A.M. Productions have created one of the hottest sound disks ever. These new sounds not only explore new dimensions in percussion, but they also give a new twist to present day drum realism. Disk 1 "Exploration in Percussion and Drums" is now available. It contains 20 different percussive and drum sounds. Everything from our version of the everyday snare, to our own 3T bass. The price is $17.95 + $2.95 shipping and handling. Mail personal check or money order to: I.A.M. Productions, 412 North Eleventh Street, Newark, NJ 07107. Ask for details on upcoming sound disks and our future sampling contest.

NEW SOUND DISK FOR MIRAGE with Sequential Prophet 5, "The Legend," best sounds and Fairlight "Breathy" voices. Recorded in 24-channel recording studio. Sounds guaranteed faithfully. Price: $29.95. Please send check or international money order - account: Ljubljanska Banka Zagreb, Acc. No. 30101-620-42-727-70170-4298/99/. Address: DARANK DIGITAL, Davorin Chuvalo, Konjscinska 21, 41040- Zagreb, Yugoslavia, Europe.

MIRAGE OWNERS. New from OASIS - A virtual sound effects library at your fingertips. 10 new disks, 24 effects per disk, $19.95 each. Send $1 for catalog or $5 for catalog plus demo cassette (refundable with first purchase). To: OASIS SOUND LIBRARY, PO BOX 1006, FULLERTON, CA 92632.

I would be interested in trading or purchasing more usable samples with anyone in the Detroit metro or suburb area. Brian Caldwell, West River Rd., Grosse Ile, MI 48138. 671-1585 (around noon).

K-MUSE INC.'S "SOUND COMPOSER'S SERIES" The first comprehensive professional sound library produced by professionals. Simply the newest and best available! Set of ten disks: $199 retail, 10% discount for COD or prepay. The first sets available: R&B, ROCK & ROLL, LONDON, NEW YORK, SPIRITUAL, CLASSICAL, and COMEDY. K-Muse Inc., 18653 Ventura Blvd., Suite 359, Tarzana, CA 91356 or call (818) 703-1562 for info.

WANTED: A clean sample of a DX-7 electric piano (Bell-piano...) with plenty of "metallic-bell" attack content. Please contact Mark Wyar, 1121 Middle Ave., Elyria, OH 44035 with price and info. Thanks!

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. 5 months old. Dago hard shell case. $1585. David, (303) 449-7073.

Mirage for sale. Still under warranty. Over 30 disks and Sampler's Guide. I'm upgrading. $2000 firm. Yamaha CS 60 with all accessories: $695. Cerwin Vega cabinet: $165 or free with purchase. Gordon Gerbert, 622 Odell Ave., Yonkers, NY 10710. (914) 969-5682.

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!

SOFTWARE

Commodore 64 owners: The Data Dumpstor turns your 64 and 1541 drive into a storage device for MIDI system exclusive data from more than twenty Yamaha, Sequential, Oberheim, Korg, and other MIDI instruments. It can be patch data, sequences, drum machine patterns, etc. Send for a complete equipment list. Features include a 36k buffer and an Ultra-Fast MIDI file disk loading routine - loads 14k in under 10 seconds. Send MIDI data to several instruments at once. Perfect for MIDI studios, fast enough for live performance. Requires Sequential or Passport compatible interface. Send $59.95 for package, or $10.00 for complete manual and demo disk. (Deductible from order.) MUSIC SERVICE SOFTWARE, 801 Wheeler Rd., Madison, WI 53704.

IBM-PC and Mirage owners! Software is now available. For information, write: DSKIS, PO Box 8303, Cherry Hill, NJ 08002.

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.)

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.

RND(♪)

Ensoniq has just announced two new waveform editors; one for the Commodore 64 (which they developed in-house), and one for the IBM-PC (the package developed by Turtle Beach Softworks). Both will be available through Ensoniq distributors. We've got a review in the works for the C-64 package.

* * *

Speaking of what's in the works, we'll also have a review of the C-64 editor from Enharmonik. Clark Salisbury is putting together a first look at Ensoniq's new ESQ-1 synth (which could develop into a regular column). Meanwhile, Dick Lord has been taking his Mirage apart and has several articles in process (including modifications of the operating system which you should find interesting).

* * *

We've been asked to point out that the images of the display contained in Duane King's review of Sound Lab (Issue #10) shouldn't be construed to be the ACTUAL print outs that you can get from Sound Lab - they're just illustrations to indicate the type of info displayed.

* * *

Request/idea for quicky product: plastic laminated card with MASOS parameters similar to the card Ensoniq provides for operating parameters.

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.

MASOS - Pete Wacker. Mountain time (AZ). 3 pm to 10 pm. (602) 937-1177.

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

How I learned to Love Hexadecimal

By Jim DuLaney

Since the procedures for creating multisamples with MASOS are so dependent on a little knowledge about hex math, a little information on that subject might be useful. As a professional in the computer industry, I first had to come to grips with this about 15 years ago. I know that during the 70's there was a brief flurry of activity in "new math" or math based on numbering systems in bases other than 10. To those of you who failed this, or never had it, this article is dedicated.

Our familiar numbering system is a base 10 numbering system. In a base 10 numbering system, there are 10 single digit numbering representations (0-9), and there is no single digit which represents the number"10". The number "10" is the first number which causes an overflow to more than one digit. Simply stated, the mechanics of the base 10 numbering system are as follows:

```
Thousands  Hundreds  Tens  Units
   X          X       X     X
   :          :       :     This number * 10 exp 0,
   :          :       :     (1), plus
   :          :       :
   :          :       This number * 10 exp 1, (10)
   :          :       plus
   :          :
   :          This number * 10 exp 2, (100)
   :          plus
   :
   This number * 10 exp 3, (1000)
```

Equals the number represented by the Xs above.

In a base 16 numbering system, which is what hex is, there are 16 single digit numbering representations (0123456789ABCDEF), and there is no single digit which represents 16 which is the first increment where numeric overflow to two digits occurs. The mechanics of base 16 are the same as base 10 representation:

```
x4096   x256     x16     units
  X       X       X       X
  :       :       :       This number * 16 exp 0 (1)
  :       :       :       plus
  :       :       :
  :       :       This number * 16 exp 1 (16)
  :       :       plus
  :       :
  :       This number * 16 exp 2 (256)
  :       plus
  :
  This number * 16 exp 3 (4096)
```

Equals the number represented by the Xs above.

Each X could be a value from 0 - 15 (0123456789ABCDEF)

The obvious question at this point becomes "why bother with hex?" The answer is not quite so obvious. What I will try to show you here is that binary and hex are the same thing.

Among computer techno-weenies hex is an easier way of handling binary (base 2) which is what the computer really understands. A bit is the smallest significant unit of data storage in a computer. It is an entity which, like a coin flipped, can only be heads or tails. A bit can store a value of zero or one, and nothing else. Bytes are a collection of bits of a specified number (depending on the machine in question). In the Mirage, a byte consists of eight bits, and is entered, displayed, and manipulated in hex. Here's how it works.

In base two, each individual digit can only contain one of two values (0 - 1, off- on). In binary math (base 2), there is no single digit which represents the number two and the number 2 is the first time overflow dictates a two digit representation.

```
8      4      2      1
X      X      X      X
:      :      :      This number * 2 exp 0, (0)
:      :      :      plus
:      :      :
:      :      This number * 2 exp 1, (2)
:      :      plus
:      :
:      This number * 2 exp 2, (4)
:      plus
:
This number * 2 exp 3, (8)
```

equals the number represented by the Xs above. Each X could be a value from 0 to 1

From this diagram you can see that the highest decimal number which can be stored in a four bit "nybble" (half a byte) is 8 + 4 + 2 + 1 = 15. An eight bit byte, broken into two nybbles neatly displays as a two digit hex number. Pretty nifty, huh? Once you understand these basic mechanics it all becomes pretty clear.

Decimal	Hex	Binary
1	01	0001
2	02	0010
3	03	0011
4	04	0100
5	05	0101
6	06	0110
7	07	0111
8	08	1000
9	09	1001
10	0A	1010
11	0B	1011
12	0C	1100
13	0D	1101
14	0E	1110
15	0F	1111

Music and MIDI BBS
by John Connolly

I maintain an all Music and MIDI Bulletin Board Service in Portland, Oregon called MacMusic. I have owned a Mirage since they first appeared on the market, and have recently acquired both a rack-mount Mirage and a copy of Sound Lab. There will be at least 50 original samples on line at any given time which you can receive with your modem. The potential for this kind of service is great; it can be a common exchange for keyboard sounds, or a safekeeping place for traveling musicians. If your media gets lost or damaged, you call the BBS (short for Bulletin Board Service), and download (receive) the files you had uploaded there last week. If you want to have your own private area, leave a message addressed to the SYSOP and you will get a reply. Right now, I am using Sound Lab to move the samples on to the bulletin board. If you know of any other sound librarian programs for the Macintosh or any other computer please leave a message addressed to me on the bulletin board. In addition to sound samples, all of the latest information on Ensoniq products and operating systems will be available as text files. You would simply ask to T)ype a file, and you will see the file you requested typed on the screen.

Procedure for Calling MacMusic

You will need some form of communications program and a modem. If your communications program supports XMODEM protocol, you will be able to upload/download any file you want. If your communications program supports only ASCII, you will still be able to read any "Plain Text Files" on-line, including all info on Ensoniq products and operating systems. You may call at 300, 1200, or 2400 baud. Set the communications parameters to FULL DUPLEX, and most of the other settings don't matter. Issue a dialing command and dial (503) 646-2095. On a Hayes compatible modem, the correct command would be "ATDT 15036462095" followed by a carriage return. The modem will answer after the first ring, and you should get a message on your screen that looks something like "Connect 1200".

Hit a couple of carriage returns and you will see the welcome message with a picture of a Macintosh. Wait until the welcome message has finished displaying, and the BBS will ask you for "Your first name?". Type in your first name and hit return. You will then see the prompt "Your last name?". Type in your last name and hit return. You will then see the "Main Menu". Type an "A" for A)sk for Access and hit

return. The BBS will ask you to send a message to the Sysop, subject Access. You must then enter your name, address, phone number, and interests. If you are interested in low-cost long distance if you're calling from out of state, you may send $20 to JOHN CONNOLLY, 1430 SW BROADWAY, PORTLAND, OR. 97201. This will allow you to use a 1-900 phone number, keeping the cost down to $.50 a call, regardless of the length of the call. If you choose to have this service, you pay $20 Yearly Fee, $0.50 a call. No other access charges are required. If you would like to use the standard phone service and want to download files, you are requested to send $10 for a one-year subscription to the above address. You end the message by hitting return at the end of a blank line. The BBS will then ask you if you want to save the message, so type "S" and hit return. The last command of every menu is always "E" for E)xit. This will always take you back to the previous menu. All menu selections consist of typing a single character, followed by return. You branch to a section by typing the single letter corresponding to menu selection and hitting return. There are a series of nested menus, which help you "filter" through the files to find exactly what you're looking for. Eventually, you will see a listing of the file name, size, date uploaded, and a description. After seeing 22 lines of information, you will be asked "Resume listing (Y,N,C)?". If you respond with "Y", you'll see another 22 lines, with the same prompt again - if you respond "N", you will return to the Menu, if you respond "C", will get a continuous listing of all files in that area. If you want to upload a file, it will be temporarily stored in the N)ew files area. Give 1 to 2 days for it to appear in the specific file area. If you have any questions, please leave a message addressed to the SYSOP from the E)lectronic Mail menu selection in the message section. If you would like to add a new file area, send a message to me and I'll consider putting it in. Have Fun!

THE INTERFACE

Very respectable gentlemans,

Let me say a few words about Transoniq Hacker. It's very informative and well-put-together, and there is really much info - even more than in Ensoniq's official manual.

And now please a few questions:

- When will there be available a plug-in card for 16-bit sampling?
- Will there be available to buy a memory-expand card?
- Does additive synthesis, Fourier analysis software exist for the Mirage?

Very truly yours,

Davorin Chuvalo
Yugoslavia

[Ed. - I doubt that you'll ever get a 16-bit sampling card for the Mirage. For the memory expansion, you should contact the Canada group listed in the Announcements section of our Classifieds. Rumor has it that they've had a very good response from their ad and are proceeding with development. The Sound Lab (C-64) will do additive synthesis. A future update of Turtle Beach Softworks's Oasis program (IBM PC) will do Fourier synthesis. And the Sound Designer from Digidesign (Macintosh) will also be able to do Fourier synthesis.]

Hey Dudes,

What's the deal here? I'm having a rather difficult time isolating upper wavesamples on my pre-sampled Ensoniq disks. When I pull down the top key on all 8 wavesamples it (the Mirage) still plays the wavesample it was previously playing. Why are these wavesamples so disobedient to the top key command?

Next, so here I am having just a wonderful time moving wavesamples around to provide better live usage. I decide that lower wavesample 1 would do me better service in the upper bank of the disk. So, using the MASOS, I copy the lower wavesample to the upper wavesample. No problem, right? Wrong! Now my desired wavesample is combined with the wavesample which already occupied that position. Not quite what I had in mind. Sometimes I don't even get this far. Sometimes when using this magical Parameter 18 (or 17) my buddy the Mirage reads out CE. So just what is he trying to tell me?

Next, being the creative kind of guy that I am, I have done my fair share of sampling. This has turned out to be a very interesting and rewarding pastime. But, looping and me have not gotten along very well. I have followed sampling example 2 to the letter and yet when I hit my loop, the sound produced is not like the sound sampled. Am I doing something wrong or do I need the VES to produce good 1-page loops? I have had good success with long loops though. I hope you can help me figure these problems out. I am currently using the Mirage in the studio and am finding it very useful. It has also been a fabulous live performer. Your newsletter has been very helpful to me and I look forward to the coming issues.

One more question before I get back to work. Can you possibly recommend a book on analog synthesizers that will help me better understand envelopes and filters? I'm new in this world of keyboards and need all the help I can get.

Thanks Dudes,

Brad Dahl
Salt Lake City, UT

[Ensoniq's response - Sometimes it's hard to tell exactly what the problem may be from a letter. The Top Key problem may just be that you're working in the wrong half of the keyboard. Make sure that the half you're changing is the same as the half you're listening to. Regarding moving samples around, the best advice we can give is to start out by making a memory map (see Steve's article in Issue Number 6). The samples are not always in sequential location in memory, so you can end up with some unexpected results. For the looping, make sure you are looping on a steady-state portion of the sound (after the attack transient has died out). If a sound doesn't eventually decay into a reasonably static timbre, a short loop will not work. Regarding filters and envelopes; be sure to check out Clark's articles in Hacker Numbers 4 and 8. Ferro Productions (201-472-5316) also puts out a video tape and a book, "Secrets of Analog and Digital Synthesis" that may be of interest.]

Dear Hacker:

This letter will probably be more valuable to your readers than my last since it has answers instead of questions. I was the guy inquiring as to how to connect a VES to a rackmount Mirage and use a keyboard controller at the same time. Believe me, when you are editing loops, or making parameter changes with the VES and then you disconnect the VES to connect a control keyboard to hear the result and then have to completely reboot (load the VES again) it is a real pain. I don't know about all the VES, but with the Sonic Editor each time you disconnect the VES you have to start over. The Kamlet MIDI Merger solved my problem. Now I can edit and listen, all at the same time. The whiz at Sonic Access, Dean Neufeld, told me that an update for the program will be available soon so that you can trigger the loop sound from the computer without having to use another keyboard. Since most of us bought VES for looping, that makes sense. But for those of us that own racks. I can honestly recommend the Kamlet MIDI Merger. It's a dandy piece of gear that will also solve other master/slave problems in the studio.

I have no questions for you (since you have answered all mine in the first 8 issues). Keep up the good work....

Larry Dunn
Burbank, CA

[Ed. - Thanks for the news on the Merger. A switcher will also do the job. Actually, check out the changes to Sonic Editor mentioned in last month's Random Notes...]

Dear TH,

Congratulations on shearing through the thicket of possibilities and offering user-proven shortcuts for us mind-boggled Mirage owners. Your monthly newsletter is as much appreciated as it is counted upon. But, now for the questions:

When driving the rack-mount from a MIDI controller, how do I sync to a drum machine? Since there is no clock sync input, then how do I play and sync simultaneously? In other words, with one MIDI input - how do?

I recently, and luckily, traded my old Mirage for a newer model. And for those of you out there thinking about it - do it. The new keyboard is simply fabulous. Not to mention better sound.

By the way, any chance of the OS being updated to allow for breath-controlled volume from a DX-7? Mix and Mod are definitely not enough. Lyrycon Look Out.

Incidently, after having all sorts of glitching and note-on problems, I was lucky to obtain a new keyboard. Don't make the same mistake I made. Excessive noise and magnified loop points, are not related to disk problems. Demand service or board replacement. Don't let the dealers manipulate YOU - they tried with ME. You've got to be insistent.

Jim Logan
Syracuse, New York

[Ensoniq's response: You'll have the same problem with any MIDI sequencer with only one MIDI IN. You could try syncing the drum machine to the MIDI OUT of the rack or use a MIDI merger. Regarding the breath-controlled volume; changing the OS won't do it - the Mirage hardware does not support volume control over MIDI.]

Dear TH,

As a new Mirage owner and subscriber to Transoniq Hacker, let me congratulate all concerned for an outstanding product and a very informative publication. Ensoniq deserves great credit for proving up-to-date technology at a reasonable price and for giving purchasers technical information (e.g. system exclusive codes) in a manual that comes with the instrument. This level of price/performance and free flow of information ensures widespread acceptance and support. Now, about the Mirage operating system... Not providing a utility to copy it is silly. Obviously, anyone with the time and inclination can crack it and some have. Please, lord, don't let that monster "copy protection" spoil it for those who want to make full use of the Mirage without the burden of hacking protected software. I'll respect your copyright; please respect my honesty.

Musicians without much exposure to computers may not realize how fortunate they are to have MIDI. After long hours spent trying to get other types of computer components to play together, I was amazed at how relatively easy and glitch-free MIDI is. It is a real tribute to the cooperation and hard work of the MIDI standards people!

I am very intrigued by the Mirage Expansion Port. Presumably, it gives direct access to the bus. As

wonderful as MIDI is, bus-to-bus interfacing between Mirage and computer could provide capabilities bordering on the miraculous. I don't expect Ensoniq to market their own computer; reasonably priced computers with enough memory to handle this have recently been introduced by Atari and Commodore. So when will we see a sampler, full wavesample visual editor/librarian, and 100,000-note multitrack sequencer in one system? The pieces are all there. Hopefully, Ensoniq will make sure that the Mirage plays a central role when it's all put together.

Sincerely,
J.M. Rowe
Torrance, Ca.

[Ensoniq's response: The OS is not "copy protected." Ensoniq doesn't (but others do) provide a utility to copy the OS because we want to reduce the proliferation of outdated operating systems. We still spend a lot of time helping people with "problems" that are a result of using an obsolete OS.]

[Ed comments: The pin-out for the expansion port can be found in Issue #3. The Triton Disk Utility (advertised here in the past) WILL copy the Mirage O.S. $39.95, Triton Corp., 1869 Whitehaven Rd., Suite 111, Grand Island, NY 14072. (We usually recommend using it to replace and update all your disks with your latest version of the OS.) We've also got some articles coming up on hacking around in the operating system.]

To Ensoniq (e-mail):

About my Mirage... I have some questions about the old-to-new noise and frequency response upgrade. Basically, I'm wondering if after the upgrade the old Mirage becomes identical to the newer ones in terms of its sound sampling and generating ability. This question can be broken into two parts: 1. Is it electrically identical - same D/A and A/D converters, same filters, etc.? 2. Is the internal layout the same? The latter is important because I think I'm hearing some noises that are being caused by the various operating clocks beating against the playback sampling frequency (possibly through electromagnetic propagation or similar leakage). These noises were not as evident in the newer Mirage which I briefly used.

Sincerely,
MFK
PAN

[Ensoniq's response: The upgrade does not alter the D/A or A/D converters nor does it replace the filters. The frequency response of the filters has been increased by changing component values and the filter tuning routine in the EPROM. Additionally, pre/deemphasis has been added to reduce hiss.

The new Mirage circuit board layout is also improved and circuitry has been removed which makes new Mirages approximately 6 db quieter than old Mirages that have been upgraded. There is no way to bring the old Mirage boards completely up to the level of the new Mirage boards, even with the upgrade. This would require replacing the old Mirage board entirely. Specifically, the new and old units continue to use the same D/A, A/D and filters but other circuit modifications have been made, along with resulting circuit board layout changes.]

Fellow Hackers,

I recently considered having my Mirage updated to current specifications with the retrofit. I asked a local service representative what the increase in frequency response would be. He said the first generation Mirages rolled off at about 13,000 Hertz (something most of us suspected) and the retrofit would extend the response to 16,000 Hertz.

Well, the early Mirage promotional literature specified a frequency response of 16,000 Hertz! If this is the case wouldn't it be appropriate for Ensoniq to cover the cost of the retrofit? I feel that paying another $75.00 (parts and labor) to simply be unfair.

Any thoughts on this, or am I just bitter at having to shell out $50 for the Advanced Sampler's Guide (only to find out how nice an Apple IIe along with $350 worth of software would be for loop points), $20 for a sustain pedal, $40 for early disks, and, lest we forget, stuck with crummy keyboard action; only to have the new Mirages equipped with most of these goodies! (Except VES.) Whew... that felt better! I just hope that next year Mirages won't be equipped with a 16-bit microprocessor!

Does anyone out there know how the Emulator II achieves the quality of its samples with an 8-bit microprocessor? I've heard it has something to do with the way their software is encoded. Any chance for the Mirage to employ a similar method?

Thanks.
Gilbert Delgado
Miami, Fl.

[Ensoniq's response regarding frequency response and software: Frequency response is relative. The filters used in the Mirage (and most synthesizers) are not perfectly flat. Also, depending on equalization of sounds, and how much they've been transposed, the frequency response moves all over the place. The sampling rate of all Mirages allowed a theoretical 15 kHz sampling response - which was what the literature referred to. Ultimately, the sound is what's important.

It would be nice if we could give away upgrades and pay for service, but realistically, we can't afford to. As the literature says, "specifications subject to change without notice." This isn't just to protect us, it also gives us the opportunity to improve our/your product. As our manufacturing capacity and volume have increased, we've been able to include additional features in the Mirage without

Transoniq Hacker
5047 SW 26th Drive, Portland, OR 97201 (503) 245-4763

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Associate Editor: Jane Talisman
Technical Advisor: Clark Salisbury
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increasing the price. In support of early Mirage purchasers, we have extended their warranties. (Incidently, the upgrade also reduces the noise.)

As regards the Emu II: Actually, the number of bits of the microprocessor is not really relevant. Most samplers (Emu, Akai, Sequential) use 8-bit processors. The number of bits in a sample is independent of the CPU. Emu uses a special technique which is not adaptable to the Mirage.]

[Ed comments: Don't feel too bad about missing out on the later improvements and price cuts. Today, musicians have to get used to the idea that buying an electronic instrument is more like buying a computer than buying a piano. When I buy a computer, I KNOW that 6 months from now there'll be something better and cheaper. You just have to decide whether or not it'll fill your needs and whether having it early is more important than having it better. Just look at the improvements that come later as stepping stones to the even-better model that you'll be buying two or three years from now. I hope that next year's Mirages DO have a built-in 16-bit microprocessor (or whatever)! Progress - I love it!]

Dear Transoniq Hacker:

We are a 24-Track, 2", fully-professional recording studio (Soundcraft, Soundtrac Digital desk, Otari, Tannoy, dbx, DBX). We have downloaded a number of sounds for the Ensoniq Mirage, including: Hammond B3, Orch Choir, Moog Bass 1, Moog Bass 2, Glass Harmonica, Vibes, Harp, Harp Arpeggio, Tubular Bells, Power Synth, Church Bells, Power Piano, Harpsichord, Bagpipes, French Horn, Balalaika, Mandolin, Concert Flute, Thick Cello, Japanese Flutes, and Chinese Instruments.

We are starting a Mirage Sound Disk Exchange and will exchange any of our sounds for Kurzweil, Synclavier, Moog, Mellotron, EMU, Fairlight, Yamaha or other commercial sound disks for the Mirage. We are especially interested in Kurzweil Sound Block A sounds, any Synclavier sounds, Mellotron strings, brass and choir sounds DX 7 sounds, TX816 sounds, Oberheim 6 or 12 sounds, Roland Jupiter, JX-8P string sounds. Basically, we are interested in exchanging any commercial sounds for the Mirage.

Mirage owners who are interested in exchanging their disk sounds for our downloaded sounds should mail their disks to us air mail (special rate for cassettes - not expensive) and we will forward the disks they request within 7 days.

Disks should be sent to:
Track 24
262 Van Vollenhovenlaan
Utrecht 3527 JZ
Holland

Happy hacking!
Ed Duchsor