TRANSONIQ HACKER

The Independent Newsletter for Ensoniq Users

CROSSFADE LOOPING WITHOUT A VES...

and Why You Need One After All

By Walter Daniel

I studied David Meschter's article in Issue 15 with great interest and used the technique on some samples and ran into some problems. I was able to overcome these setbacks, so I'll detail my solutions in this article. Note that when I use a dollar sign ("$") in front of a number, that number is in hexadecimal (e.g. $FF). Also, when I use the number symbol ("#") in front of a value, that value is a Mirage parameter. For example, #60 refers to wavesample start.

THE DREADED LOOP END MARKER. I selected a nice vocal sample and tried the crossfade technique. The crossfade sounded reasonably smooth (except for the audible dip in volume - more on that later), but when I turned on the loop switch (parameter #65), I got a "thunk" at the loop splice. Convinced that I had made an error in the process, I reloaded the sample and crossfaded again. Thunk! I went crazy trying to figure out what in the world I was doing wrong. Finally, by accident, I noticed that the Mirage was lowering the loop end fine adjust (parameter #64) from $FF to $DF when I turned on the loop switch. No wonder the loops were terrible! The Mirage was insistent upon looping at a point 32 samples before the end of the crossfade.

But why was the Mirage lowering the loop end fine adjust? The instrument inserts a marker at the end of the loop to instruct the oscillators to jump back to the loop start. This marker is a string of sixteen zeroes. Note that data in the Mirage consists of eight-bit numbers (decimal values 0-255) with 255 corresponding to +127, 128 to 0, and 1 to -127 on a waveform plot. The value of 0 is always reserved for the loop end marker. To have a loop end with a fine adjust of $FF, the wavesample end page (parameter #61) must have a value of at least one greater than the loop end page (parameter #63). To have the loop end at page $FF, sample $FF, the wavesample would have to extend beyond the memory in the Mirage. To get around this problem, I used only half the memory in a bank just to get the ball rolling. This choice means wavesample start (#60) of $00, wavesample end (#61) of $80, loop start (#62) of $40, loop end page (#63) of $7F, and loop end fine adjust (#64) of $FF. For longer loops, you could choose, say, $60 for the loop start; to follow this method, make sure that the length before the loop equals the length of the loop itself. Also, make sure that the wavesample end is one greater than the loop end to avoid the marker problem.

THE DREADED ZERO CROSSING. I tried the technique on the vocal sample using the shorter memory allocation, but I still got a click at the loop splice. A different sample so looped also had a click, albeit not as severe. What was the problem now? I used a visual editing program for my computer to investigate. The problem was that the loops were not at zero crossings. The less severe click seemed to be due to the fact that its loop was closer to a zero crossing than the first one. Mirage loops should always have a zero crossing at the beginning of the loop start page to avoid discontinuities. Without a visual editor, you are looping blindly, so getting a zero crossing at the right place is purely luck. With a visual editor, you can easily see how many bytes the wavesample must be rotated to line up the zero crossing. Only long loops must be so rotated because short loops can have jumps (consider a one-page square wave). If for no other reason, you need a VES in order to line up zero crossings on start pages for long loops.

LINEAR AND LOGARITHMIC FADES. David Meschter pointed out the problem with MASOS linear fades - human hearing is logarithmic. After solving the loop end marker and zero crossing problems, I wasn't about to let these fades keep me from a perfect crossfade loop! My visual editor does not have logarithmic fades, so any solution would have to be in terms of MASOS commands. First, I would like for somebody to explain to me exactly what a "-3 dB fade" is. All that the value -3 dB means to me is that one signal has approximately 70.8% the amplitude of another. Which signals? At what memory locations? I'd really appreciate it if someone would drop the Hacker a line so that we can thrash out this subject. I want the mathematical formula!

BILINEAR FADES. A logarithmic curve is above a straight line except at the two endpoints where they intersect. I realized that a linear fade-in is the same as two linear fade-ins, the first from 0% to 50% over the first half of the altered memory, the second from 50% to 100% over the second half. If the logarithmic fade is above the linear fade, why not move the value of the midpoint (50% for the linear fade) up to the value of the logarithmic fade to reduce the error when using MASOS alone? I believe that this is where the mystical -3 dB has meaning. Is it that this midpoint has the value 70.8%? Anyway, I constructed my own logarithmic formula that turned out to have a midpoint value of approximately 74%. After some serious number crunching, I concluded that the two-part linear (i.e. bilinear) fade that was the closest to the logarithmic one had a midpoint of 82%. The bilinear fade crosses over the

logarithmic fade twice with about one-ninth of the error of a simple one-stage linear fade. For you mathematically adept types, I used Simpson's rule to integrate the square of the difference of the values of the bilinear and logarithmic fades over the interval. I integrated the square to avoid cancellation of error when the bilinear case is above the logarithmic one. If I ever get the scoop on -3 dB fades, I'll put together a math note on this subject for publication in a later issue.

To actually do these fades on the Mirage, I chose to use the scale factor of $C0 (approximately 75%) because it was a nice, even number. The process goes something like this: copy $00-$3F somewhere, do a bilinear fade-in from $00-$1F with scale factors $00-$C0 and from $20-$3F with scale factors $C0-$FF; do a bilinear fade-out on the loop portion from $40-$5F with scale factors $FF-$C0 and from $60-$7F with scale factors $C0-$00; finally, add the faded-in copy to the faded-out loop portion. The above bilinear fades sure sound smooth (i.e., no audible dip in volume) to me. What's that? You don't want to spend hours just changing the MASOS parameter values for these manipulations? The above process is simply too involved to be accomplished from the Mirage keypad. But in today's world, when you have a problem, people will shout only one thing - MIDI!

MIDI MASOS COMMANDS. If you ever delve deeply into the back of your Advanced Sampler's Guide, you'll find the MIDI implementations for both the standard operating system and MASOS. You'll also find that wavesample manipulation functions can be sent via MIDI. All source and end addresses plus both scale factors are sent with each command. If you have a visual editor that allows sending MASOS commands from the computer (e.g., Ensoniq MVES for Apple and Commodore 64, Sonus Sonic Editor for Atari ST, many others), your workload for bilinear fades will be greatly reduced. A typical visual editor will show all MASOS parameters, support altering values from the computer keyboard, and offer a menu of commands. It's much easier to type a few addresses than to keep punching on the old Mirage keypad. Having all the parameters on the screen at once is great for keeping operations under control. If you have a visual editor that does NOT support MIDI MASOS commands, then by all means write and request an update. It doesn't require much programming at all.

There is an undocumented feature of MIDI MASOS functions. If you read the MIDI implementation chart, you'll find that wavesample rotation commands can be sent over MIDI. What kind of rotation is it? Is it the one-sample-at-a-time command (parameter #66)? Does the Mirage simply use the value for the last rotation (parameters #19 or #20)? My experiments showed no relation to any of the three. Finally, by sheer accident, I discovered that the rotation amount is the number of bytes equal to the scale end factor. All addresses and scale factors must be sent for any MIDI MASOS command, so the Mirage just applies an otherwise unused byte. My Advanced Sampler's Guide (for which I had to shell out 50 bucks as an "accessory" for my early Pleistocene-era Mirage) makes no mention of this rotation amount setting. Perhaps Ensoniq included this information in later editions of the ASG, perhaps not. In any case, this command is even more convenient than parameters #19 and #20. Examine the plot for the loop start page, count the number of bytes needed to position a zero crossing at the beginning of the page, then send a MIDI MASOS command for that amount by typing on the computer keyboard the number of rotations required. No more endless changing of parameters #19 and #20 to get the zero crossing in place.

WAVEFORM DISPLAYS. There are reasons for examining the waveform other than for lining up zero crossings. Note that at the midpoint of the 75% bilinear fade, the added value could be up to 150% of the original sample value. If the amplitudes of the sample in those two regions are high enough, clipping is possible when the faded sections are added. To prevent clipping, examine the plots of the midpoint regions: $1F-$20 and $5F-$60 in the above example. If both regions have maximum amplitudes of (for example) 100, then the midpoints of the fade will have values of 0.75*100 = 75. Adding the two gives 75+75 = 150, a value beyond the maximum of 127 (or minimum of -127) allowable in the Mirage. If the regions have amplitudes of 127/1.5 = 85, clipping cannot occur. Sampled sounds usually have initial transients at the beginning that are louder than the sustained portion, so clipping is not too much of a problem since the loop regions are at lower amplitudes.

Plots are also useful for checking that the amplitude and phase of the added portions of memory are similar. Phasing occurs when the two faded sections are added while at different positions in the waveform cycle. If you were careful to sample the sound so that one cycle equals one page of memory, then you never have to worry about phasing in the crossfaded material. It's always a good idea to check that the original sections of the added waveform (before fading) are of the same amplitude so that the crossfade will be smooth in volume. Look at plots and note what the highest and lowest values are by using the scale or grid drawn by the program. An example for similar volume would be that one area is at values around 80, the other around 70 (close enough). If one area is at half the value of the other, then it might be a good idea to start over and resample.

CONCLUSIONS. I wish to stress that I am not engaged in David Meschter-bashing here. I simply ran into problems when following his article, all of which (loop end marker, zero crossing, linear fades) are due to the design quirks of the Mirage itself. I had no idea what crossfade looping was until I read and studied his article, so I owe him a debt of gratitude for making this subject clear. By the way, I would categorize his method as a special case of "endfade" looping, wherein data from just before the loop is faded into the end of the loop. It is a special case because the amount of data from before the loop used is equal to the length of the loop itself.

I believe that visual editors are necessary to create or find effective long loops. Having MASOS commands available from the computer is highly recommended. Where do we go from here? I'm preparing a couple of articles on the subject of long loops. In an upcoming Hacker, I'll cover basics of visual editors, searching for loop points, and a sneaky technique that sometimes works known as "back-and-forth" looping. Then possibly an article covering two crossfade techniques that use bilinear fades available to all with MASOS: reverse crossfade looping and endfade looping, detailing the types of sounds that usually can be looped with each technique. I hope to have screen dumps of waveform plots to illustrate some of the points in these articles. Once again, I'd like a clarification of the -3 dB fade issue so that I can calculate the optimum bilinear fade. If you know what the answer is, please send a note to the Hacker so that they can forward it to me. ■

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INSIDE INDIAN VALLEY MANUFACTURING

AN INTERVIEW WITH DAVE ZIEMBICKI

By Dr. Richard Boulanger

The following interview took place on April 9, 1987. What peaked my interest in Indian Valley Manufacturing was, of course, their MegaBank memory expander for the Mirage. Interest in MegaBank led to a number of interesting conversations with Dave Ziembicki the man behind MegaBank and the founder of Indian Valley Manufacturing - IVM.*

As I soon discovered, Ziembicki was one of the earliest members of the Ensoniq team - there at the very inception of the company. He was closely associated with the development of the Mirage and the ESQ-1. In September of 1986 he left Ensoniq to start Indian Valley Manufacturing, a company specializing in computer music peripherals. MegaBank is just the tip of the iceberg for Ziembicki's company, which is sort of a "spin off" from Ensoniq.*

As a Mirage or ESQ-1 owner, you already benefit, albeit quite unknowingly, from one or another of IVM's many product oriented services. A number of these services are revealed during the course of the interview. In addition you will gain some insight into the beginnings of Ensoniq, marketing strategies for both Ensoniq and IVM, the design strategies and future upgrades for MegaBank and its associated operating system RAMOS, first glance at some new peripherals for the Mirage and ESQ-1, and the announcement of IVM's intent, still in the planning stages, to solicit, duplicate, market and distribute original samples and ESQ-1 patches by freelance sound-designers like you and me. Interested? Read on.....

Before we get into the meat of the interview, I'd like to set the stage for my line of inquiry, and perhaps explain how I happened to be on the phone with Dave Ziembicki in the first place. If you are a Mirage owner, I am sure you have your own variant of this same story and perhaps you, too, have dialed (215) 723-3210 for relief.

I've owned my Mirage for two years now and have gotten a great deal of musical mileage out of it. In my home studio it has been indispensable; my library of available high quality samples is diverse and has pointed me toward new areas of musical exploration and production. After a period of study and development I began to take my Mirage-centered MIDI system out of the studio, both to give lectures and demonstrations at public schools and universities and, more importantly, onto the concert stage in order to perform the new works I'd composed in the studio.

Imagine if you will, the fleeting attention span of 200 elementary school students as you twiddle your thumbs waiting for your disk of Saturday morning cartoon themes to load. Granted, it may be quite tense when the dance floor is packed with sound-starved patrons hungrily awaiting your cover of Janet Jackson's smash single "Nasty!" I've been there.

But still, when you loose the attention of a six year old you never get it back. Instead of an open mind - eager to absorb exciting new facts about the propagation of sound waves and the workings of the inner ear, perched on the edge of their seat, patiently awaiting your next humorous musical and philosophical anecdote, this 30 second hiatus, this lack of control, this sign of technological incompetence under the name "load-all 1" triggers the child's natural instinct to: pull hair, kick chair, run over there, and basically not care! And you can forget the follow-up call from Chuck McDermott, principal of Durfee Elementary.

On the concert stage, frustrations surrounding solo performances at Brown and MIT found me preparing sale brochures for my Mirage. In both cases, I had expected to feature the Mirage as the centerpiece of my sound arsenal. However due to the deadtime associated with diskloads I had to revise the pieces around pale analog and digital shadows of my original samples. The Mirage itself played only a secondary role. Given that it was the mainstay of my work in the studio you can appreciate my frustration with its failure to provide the same support in performance.

I currently teach synthesis at The Berklee College of Music in Boston. Here extensive and elaborate facilities serve the programming and production needs of over 250 synthesis majors. In our advanced synthesis labs there are 12 workstations each containing a Kurzweil 250, Yamaha TX816, 16 channel mixer, Macintosh Plus, Kurzweil Midiboard, Oberheim Expander, RX11, SPX 90, and a Tascam 4-track cassette, Performer, Composer, Opcode, etc.

Berklee is pretty much a Kurzweil school and I've been getting spoiled. The Kurzweil 250, as you probably know, is a "performance oriented" sampler. What gives it this unique ability is the fact that hundreds of high quality samples are stored in ROM. Imagine having immediate access to the entire Mirage, K-Muse, and MUG libraries! Well, the very day I was posting the Mirage ad on the Berklee bulletin board, the January issue of the Hacker arrived with the full page add for MegaBank - a memory mod which wouldn't void the warranty, and would allow 18 banks to be accessed. Granted, it would not transform my Mirage into a Kurzweil 250, but then again it wouldn't cost me $8,000 either.*

Hello. Dave Ziembicki?

BACKGROUND

BOULANGER (RB): Tell me a little bit about your background. How and when did you get involved with Ensoniq?

ZIEMBICKI (DZ): I worked at Commodore with the four guys who started Ensoniq. One of them is no longer there, but the three principals who are still left are Bruce Crockett, Bob Yannes, and Al Charpentier. Three or four weeks after they left Commodore and started, what was at the time, Peripheral Vision, I came on board. This was back in 1982. We initially began to design computers but then swung into music. That's when we changed the company name to Ensoniq. Originally, I was involved with engineering, and then swung into manufacturing and purchasing. I kind of migrated to the manufacturing end because as Ensoniq grew that was an area that needed some attention. Yannes and Charpentier were certainly able to get the people they needed to do what I was doing on the engineering side.

RB: So your background is in engineering then?

DZ: I'm an engineering type.

RB: Engineering type?

DZ: I'm not an engineer, but I've done engineering. Let's put it that way.

THE BIRTH OF THE MIRAGE

RB: Can you give us some insight into those early days at Ensoniq as the Mirage was coming together.

DZ: The philosophy that we went in with, and this is pretty much the strategy at IVM as well, is to estimate the size of the market, determine the percentage of the market you can get, and build that number of units.

RB: That sounds like a logical game plan to me.

DZ: Well, the more common alternative is to come up with a new product idea and say "Gee, I don't know whether it's going to sell, so let's make a hundred or two hundred and see if they take off. Then maybe we'll put some money into advertising and make another hundred or two."

RB: It seems a more cautious approach which would require less cash up front.

DZ: When we initially conceived the Mirage we felt confident that we could sell 5000 and basically booked materials orders in that way. This way we would blanket materials in order to get better prices. That's why Ensoniq's price came out as an industry leader at the time. We decided to commit to more than just the standard prototype or pilot run. You see, we weren't out there saying "what will the market bear?"

It would have been pretty easy to come out with the Mirage for $3995 or $4495 given that the Emulator was up in the $6000 to $7000 range at the time, but we took the other approach. We considered what our overhead was going to be; determined a reasonable margin; considered what the dealers would need to see; and that's how we fixed the pricing. IVM operates pretty much the same way.

THE BEGINNINGS OF MEGABANK* AND IVM

RB: Did you start Indian Valley Manufacturing?

DZ: Yes. We came up with MegaBank - an idea shared by practically every Mirage owner.

RB: Absolutely. "Why don't they just put more RAM in it to get more sounds."

DZ: Two weeks after the product specification was finished at Ensoniq the issue of more RAM came up, but they "really didn't see a need." At the time, one sound was more than most were seeing. Having multiple sounds accessible would be nice, but it was just something they didn't want to get into. So I began developing the board on my own.

RB: I assume you were doing this at home on the side while working for Ensoniq.

DZ: Yes, I've done things like that before. In fact, that's the way a lot of products get done. For example, during the Commodore days the VIC 20 was pretty much done that way. Bob Yannes did it at home as a sort of side thing.

RB: You're still talking 1982, right? What took MegaBank so long?

DZ: We began on it, but it was a sort of hot and cold project. As my workload at Ensoniq changed I wasn't able to put in much time. Then out of the blue someone would say to me, "you could sell a ton of those if you could get them finished." So I'd put some effort back into it. My brother was involved from the very beginning. He is an engineer and he's responsible for the hardware design.

Still, we really didn't push on it until I spoke with Dan Garett, an Ensoniq sales guy who said "you know there's a pretty large market out there." The two of us sat down together, went through a business plan, and determined that we should finish it out.

RB: So this is when you started IVM?

DZ: Not exactly. We got further along and presented it to Ensoniq, but they were "really not interested." I told them that I was going to do it anyway and they said "fine." So we proceeded with it and I guess it was last September when I left Ensoniq and decided to really push it.

RB: Was the delay in releasing a product such as MegaBank merely a matter of time or were there technical difficulties as well?

DZ: The biggest problem with MegaBank* was that there are so many different versions of the Mirage out there, and if you look at it from an engineering standpoint, the timing in each one is little bit different. Therefore, trying to make a generic board that would work with the timing idiosyncrasies of all the Mirages, from the first to the last, proved a lot more aggravating than we thought it would.

THE MEGABANK* OPERATING SYSTEM: RAMOS

RB: For MegaBank* you developed a modified version of the Mirage operating system called RAMOS. Is there room in the code for further software modifications and are you currently planning any? I would imagine that your close affiliation with Ensoniq places you at a great advantage in this area.

DZ: You are quite correct. The advantages are that I am close and that I know the people at Ensoniq who do these things. My software was partially developed by people at Ensoniq as contract work for me. What we did was, we licensed the operating system and made changes to it. We had the information we needed to do this, which helped a lot. Furthermore, our system is quite hardware intensive. This leaves us a lot of software flexibility. We've done a lot in the hardware, so we don't have to worry about it. Thus, making software changes is pretty straightforward.

FORTHCOMING RAMOS REVISIONS

RB: Are there any specific changes which you are currently implementing?

DZ: At present we are working on two things. The first is a "Mass Save" function which would allow you to load your banks up in whatever arrangement you might like, and then save all three disks with a single command. You would be able to save all nine keyboards in this way, without having to do three separate saves.

RB: That will be a real convenience. Anything else?

DZ: Our next upgrade will also support MASOS. Inevitably, you make some decisions when you first do up a product that come back to haunt you. One of the decisions we made at the outset was that we weren't going to support MASOS. The guys who did my software figured it shouldn't be a problem since, to them, most people wouldn't be concerned with it. But as we got further into it, we were getting calls right and left saying "I use MASOS to do this and this and this." In particular, dumps from the ESQ-1 require MASOS. Not supporting MASOS from the start proved a serious limitation. This revision is not very far off at all.

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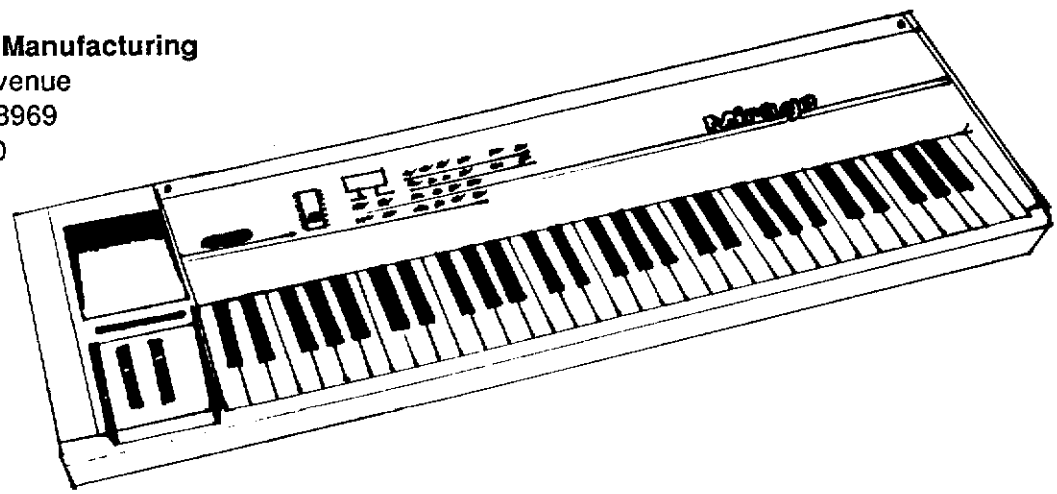

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INDEPENDENT ACCESS TO MEGABANK'S UPPER AND LOWER KEYBOARDS

RB: I would have liked the ability to independently mix lower and upper banks - lower bank 5 with upper bank 7, for example.

DZ: We've looked at that, and it's really not a hardware limitation for us. Rather, it 's sort of a software limitation. All of a sudden there are not enough buttons to do it effectively. We set up the keypad so that keys 1-9 give you your banks. How would you get bank 18? It would be difficult for the display to show it properly, and quite awkward to switch quickly between them.

RB: Funny, I figured that this was part of the problem and so I tried to come up with a feasible button combination. For instance, I figured that you could re-strike the bank load key twice, and if the display flashed, then you were loading the lower memory only. Something like that. Have you considered some function key scheme such as employed by MASOS, or even using the sequencer keys for that matter?

DZ: Yes, but we were concerned because we felt that the player who was playing more or less live would like the convenience of just hitting the number 6 and knowing what was going to be there, rather than, for example, saying, " I want upper this and lower that." We felt that with 9 full keyboards you would be able to structure your disks so as to get at anything you wanted.

RB: I certainly appreciate the convenience of accessing a single keyboard with a single button or preset number. If I am calling up the various presets by hand or by means of a simple slave relationship, the Mirage MIDIed to my DX7, for example, I definitely want to associate and load bank 6 with a single preset selection. Your scheme definitely fits the basic performer's needs. However, you are forgetting the performer/producer using his personal computer or MIDI sequencer to control the Mirage. Under this ever increasing performance setup, it would be highly desirable to independently access the lower and upper keyboard halves. By implementing this feature you would have, in effect, given me 18 banks rather than 9! That would be quite a significant increase of the available resource. In essence you would double the power of Megabank via a potentially small software revision. I hope you will look into it.

DZ: At present you cannot do that. You can change banks and you can change programs completely independently, but you have to stay within that keyboard. However, it is something we're looking at right now.

RB: From the performer's perspective, the system seems ideal, but from the composer/producer's perspective the ability to call separate upper and lower keyboards is equally important and, at present, an oversight.

DZ: Well it's not out of the question and it is something that we are looking at. Just when we would get that upgrade in, I don't know yet.

MORE RAMOS MODS TO CONSIDER

RB: While you're in there poking around, I might also suggest that you squeeze in a feature which appears in Dick Lord's Microtonal Operating System - the ability to transpose the entire keyboard by chromatic semitones. All operating systems should include this feature. This modification would allow the GB player to accompany singers in their key while playing the tunes in his own key. Another musical application might be in the pit orchestra, junior-high wind ensemble, or some ensemble situation where the Mirage is used to substitute for missing transposing instruments such as english horn (in F) or the bass clarinet (in Bb) or, for that matter, when the Mirage might be called upon to beef up a weak section by doubling the part. By including a step transpose function such as Dick Lord's, the keyboard player could just read from the written part and transpose the keyboard into the instruments key.

DZ: That's a good suggestion. Definitely something we can look at. You see this is exactly the way we get refinements into our products - through users calling us with ideas and feedback.

RB: Ok then, you asked for it. Two more items from my wish list. First, given that the sequencer is disabled how about implementing a performance oriented feature in its place, like an arpeggiator or even some form of MIDI delay routine? Second, I have always wanted to see "mix mode" enhanced so that, via the mod wheel or key velocity, one could control the relative strength of any of the 8 available wavesamples rather than adjacent samples only. An extension of this sort would make for some exciting possibilities in the area of timbre modulation. If I understand it correctly, this is sort of the Sequential "Vector Synthesis" approach. Too esoteric, right?

DZ: Well, no. Not necessarily. I'm not really that much of a musician, therefore I depend on information from other sources. We basically bounce ideas like this off the software guys who come back saying "oh yeah, we can do that" or "that's going to take six months."

THE CURRENT WORKING AGENDA

RB: What suggestions have you been passing by the software guys in the past few weeks?

DZ: Supporting MASOS is the big thing right now, but we are compiling a list, and we meet periodically to go over the list. First order of business is to go over any bugs that might come up. Fortunately, there haven't been any in the last couple of months. After that, we get into "I had a person who wants to do this" and we just go down the list. It's a meeting we have about once a month.

RB: And where might you currently be pointing them?

DZ: ***The thing we are looking at right now is how do we support MASOS and how do we make it easy. The other thing that people have been asking for is the ability to use the whole MegaBank board for ESQ-1 storage.*** That's not something which is impossible, it's just something that we haven't completed evaluating yet. I don't see it as a problem. The RAM is there, it's just a question of getting the data back contiguously.

RB: Could you combine all the memory for one long sample then?

DZ: I'm afraid not. The Q-chip limits us in that regard. It will only look at 64K chunks of memory.

MEGABANK NUMBERS

RB: Are there any numbers on Megabank* sales?

DZ: ***Well, we can't build them fast enough to supply the orders. There are hundreds on order right now and we haven't actively solicited beyond the ad in the Hacker and word of mouth.*** But we are going to begin pushing it as our manufacturing comes up to speed. I've gotten more calls then I ever expected. It's funny how you always trip over some little problem along the way, though. And it's always a different one, too. With the MegaBank,* one of the problems that we've run into is related to the fact that we like to burn a unit in for twenty-four hours before we ship it. Well, burning one in requires that you have a Mirage, and I don't really want to end up with ten Mirages sitting in my manufacturing area. So, we're addressing that problem now - the goal being to mass burn them in. It's something that we didn't think of and it got in our way a little bit.

REPACKAGING THE MEGABANK* HARDWARE

RB: Would you agree with me that it is quite frightening with the MegaBank cartridge hanging off the back of the Mirage like that? Transportation is very scary. I am always wondering if RAMOS will come up when I get to the gig.

DZ: ***The entire mod will be inside the case in about four weeks.***

RB: That would make me feel a lot better.

DZ: We had to address the new Mirage DSK which has no expansion slot. So we felt that since we had to do that anyway, we may as well put them inside on all of the Mirages.

RB: Taping it down when I travel is very clumsy.

DZ: I agree. As soon as we started shipping we realized what a potential problem that was. The original design idea had that cartridge not in plastic at all. It was originally a very small board that stuck out a half inch. No real problem. But then we had to put a few chips on there - partially to satisfy Ensoniq's warranty requirements. The next thing was "We should put it in plastic." "Let's use the same plastic as the other cartridge." An example of a logical decision which migrated into being a problem.

RB: I have Grey Matter's E in my DX7 and I must say that I feel very good about the fact that it's tucked away inside. It may very well be dangling by a thread in there, but I feel much safer about transporting the unit.

DZ: What you don't know won't hurt you, right?

RB: Absolutely. What about upgrades for us MegaBank* pioneers?

DZ: We'll make arrangements to upgrade them. I'm not sure what the cost will be, but it will have to go through service centers to maintain the Ensoniq warranty. We will do it at cost for registered owners.

CURRENT SOFTWARE REVISION

RB: In his review of MegaBank,* Erick Hailstone mentioned that the unit came with a formatting disk and an eight page manual. My unit arrived with a smaller set of instructions and no formatting disk. Has there already been a major revision of the operating system?

DZ: Yes. There was a software update on the formatting disk and everyone is getting a copy of that mailed out to them today along with an updated version of the operating instructions.

A PRACTICAL QUESTION CONCERNING MEGABANK'S OPERATION

RB: I have noticed that when I am switching between banks via MIDI, I sometimes hear a click or "thud."

DZ: I would suspect that you were sustaining a note while you were switching. Thus, the signal would not be at 0, and it is quite possible that a sudden transition would result in the "thud" you describe.

RB: Now that I think of it, this same thing occurs sometimes when I am switching presets on TX816 as well. However, it never occurs when I switch banks during a rest in the music.

DZ: That's correct. The whole system zeros out. So when it is not producing a note there shouldn't be a click.

RB: It occurs to me now that this phenomena associated with switching banks during a note might pose a problem if you do implement the independent switching of upper an lower keyboard halves, given that you are more likely to be sustaining tones in one keyboard half while you are calling up a new timbre in the other keyboard half. If this is the case, you might advise that one bear this fact in mind structuring and orchestrating sequences.

IVM'S NICHE GIVEN ENSONIQ'S SHIFT OF FOCUS

RB: It has been quite a long time now since Ensoniq has released any new disks for the Mirage or upgrades for that matter. I see their current repackaging campaign as a last ditch effort to clear the old circuit boards off the shelves. The company's attention seems to have shifted to the ESQ-1. Granted, the ESQ-1 is a phenomenally productive system, particularly because of its sequencer and multi-timbral capabilities.

DZ: I'm not a musician. But the sequencer is what impressed me about the ESQ-1.

RB: It's more than just the sequencer, though. I believe the ESQ-1 is such a success because of the human engineering of its user interface. Given the above observation, my impression of IVM, based on your current products and revisions to the operating system, is that you have picked up the ball and are running with it. Am I wrong in concluding that there is no longer any real effort on the part of the Mirage at Ensoniq?

DZ: Ensoniq has always wanted to support third party developers. Obviously, the more products that are out there for the Mirage, the more Mirages that they sell. From the inside, I know that Ensoniq is always working on new things. As sounds come up, I'm sure they try to get them on disk and get them out there.

RB: Still, my Mirage would be in some undergraduate's room in the Berklee dorm had I not recognized your company's efforts to continue developing the system.

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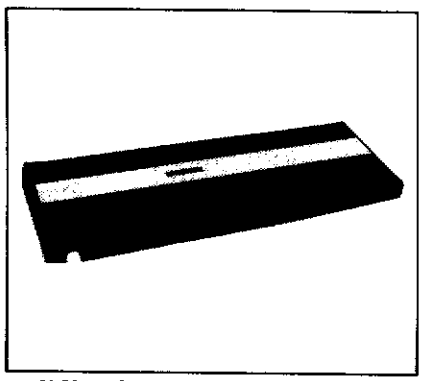

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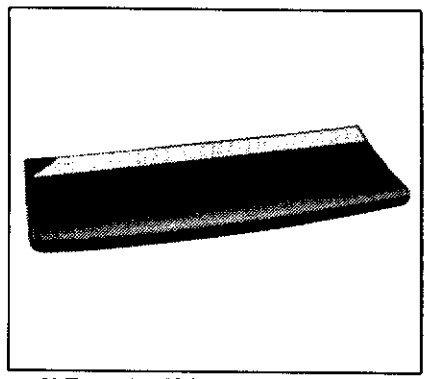
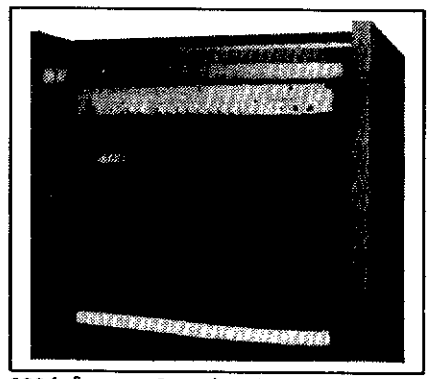


104K Ensoniq ESQ-1 Cover



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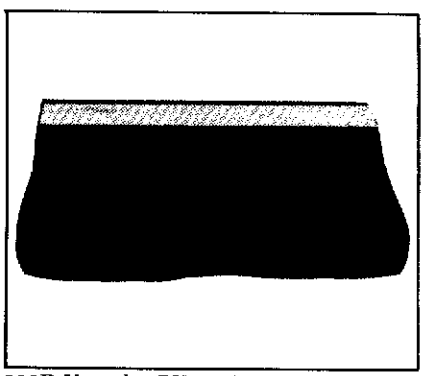

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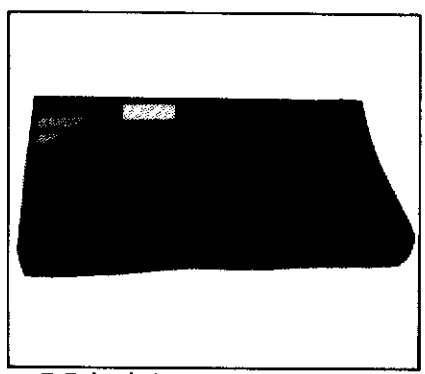

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107K	JUNO 2 ROLAND
108K	JX-8P ROLAND
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DZ: Well, Indian Valley Manufacturing is more or less a peripheral company. There are peripheral companies in music, but not too many that do add-ons that I am aware of. We're out there working on things like that. If we see things that we could sell 500 or a thousand of, then that's what we'll come out with. We're trying to move quickly to get a bunch of products out.

RB: I imagine that timing is quite an important factor?

DZ: Absolutely. As we built Ensoniq, and even going back to the days at Commodore, I always felt that development times for new products didn't need to be as long as they were. If you get the right people, people who are aware of the various ways in which you can loose time, then you can avoid many of these problems. Anybody who has done projects before, will look back and say "it could have been out there a month sooner if we had only done this." Having done things like the Commodore 64, and the Mirage and the ESQ-1, I have realized a number of ways in which development time can be significantly accelerated. That is what Indian Valley is striving to do.

RB: Can you give me an example of how you might be able to cut time in developing a new product?

DZ: For instance, if you do circuit boards it is important to have a good C.A.D. system. We're at the point now where we don't wire-wrap anything. For people unfamiliar with engineering, wire-wrapping is generally the first step. We avoid that step. We go right to board. It saves time. The first board you do never works anyway; so you may as well get to it quickly, find your mistakes, and then proceed. We've also made arrangements for getting boards fabricated quickly. If we design a board, we can have one in our hands in two days. Other people can do that too, but it generally costs them a fortune. We've reduced the cost.

NEW PRODUCTS FROM IVM

RB: Besides MegaBank* what new products are you currently working on?

DZ: We haven't announced this yet, but we have told a few dealers.

RB: An exclusive?

DZ: Yes. ***We are going to be releasing a stand alone rack mounted floppy drive.*** There are other people who have done it, but we're expecting our cost to be lower. We don't have a final number on it yet, but it will be under $400.

RB: Can you describe some of the uses for such a product?

DZ: Ensoniq's marketing research, data acquired from warranty cards and from speaking with dealers and owners, is that ***people would like to see an inexpensive drive for the ESQ-1.*** This is a practical alternative to investing in a rack mount Mirage. You may also want to use your Mirage for other things. Our MIDI floppy drive initially targets the ESQ-1, but it will be a "soft-load" system like the Mirage. This way, as the product takes off, we can add the system exclusives for everybody else's synthesizer.

RB: Would this serve the same purpose as the Yamaha disk in the new DX7IIFD - bulk data dumps?

DZ: Similar, yes. Initially, it would be for the ESQ-1, because we are very familiar with the Mirage and the ESQ software. In the long term, we will keep adding operating system changes that will bring in the Rolands, Yamahas, and everybody else.

RB: Do you have a release date yet?

DZ: We're hoping to be in production and shipping by June 1.

OTHER PLANNED IVM HARDWARE MODS

RB: Are there any other products or hardware modifications which you are currently developing? For example, there is a lot of interest in a stereo mod for the Mirage. Have you considered manufacturing one of these?

DZ: ***Our stereo mod board is now complete. We're about to prototype it.*** We know it works, but it's not high up on the list at the moment.

RB: How does your stereo mod differ from Don Slepian's stereo mod?

DZ: One of the Ensoniq engineers, who is very familiar with the Mirage, basically said "this is another way to do it." It uses the same components that are in the Mirage and I expect it to be very quiet.

RB: So you wouldn't be in a position to compare it with the Slepian mod. I'm sure you've seen his Electronic Musician article?

DZ: No, I would not be able to compare them. For example, along the way people have asked me what I think of the Virtual Engineering memory mod for the Mirage. I have nothing to say. I purposely don't look. I haven't seen one. I haven't bought one. I haven't asked anybody about one. It's just something I'd rather not know about. We want to manufacture the best products we can at a reasonable cost. If we're competitive enough, we'll sell a lot. If we're not competitive, then we shouldn't be out there.

RB: I assume that your stereo-mod would not void the Ensoniq warranty.

DZ: That's true.

RB: The new DSK is a stereo synthesizer. Is the IVM stereo-mod similar to the DSK implementation?

DZ: Very similar.

RB: What else is on your list?

DZ: We're looking at a MIDI thru, and a headphone amp - things like that.

RB: These seem targeted for the Mirage.

DZ: The Mirage and the ESQ-1.

RB: I feel that there is an incredible interest in a stereo-mod for the Mirage, and wish you would give it a higher ranking on your list of priorities, however, I can understand how there might not be the same cost incentive to do it.

DZ: Exactly. That's kind of how we're dictating which ones get worked on first. We ask ourselves, "which modifications, product enhancements, or stand alone products are going to bring us the kind of return that is going to allow IVM to grow."

OTHER IVM ACTIVITIES AND SERVICES

RB: What other activities are your company involved with?

DZ: Well, we duplicate all the disks for Ensoniq.

RB: You mean the entire sampling library?

DZ: Yes. That's something I've been doing for the last few years. In fact we've probably done 250 -300,000 disks. We also duplicate Dick Lord's temperament and operating system disks.

RB: What exactly is involved in this process?

DZ: We invested in some professional duplication equipment. Also, we invested some software dollars into being able to duplicate the Mirage format which is somewhat custom.

MARKETING AND DISTRIBUTION OF FREELANCE PATCHES AND SAMPLES

DZ: One of the things we're looking at currently is expanding our services to include marketing both ESQ-1 patches and Mirage samples created by freelance sound designers. You see, we're set up to make cartridges for the ESQ-1, too. In fact, we've produced all of Ensoniq's sound cartridges and sequence expanders for the last 4 or 5 months. We're set up to receive sound from anybody, and we're in a position to give them fully loaded cartridges, or even to market and distribute them.

RB: This is a really exciting opportunity! How might a potential Metcalf, Salisbury, or Hailstone send you their materials?

DZ: It's something that we haven't really structured yet. I would like people to be aware of the fact that we are interested in, and capable of doing it for them, but we do anticipate some problems. For instance, somebody might come up with five good ESQ-1 sounds, but that doesn't quite make a cartridge. Now we wouldn't be opposed to taking, say, five sounds from one guy and five sounds from another, building them into a cartridge that's for sale, and then just doing a royalty thing with the people who provide the sounds. Don't forget, we're using the same dealer network as Ensoniq.

RB: This is a fantastic outlet for the closet sampling wizard or programmer.

DZ: Sure, but here's another scenario which we anticipate. What one guy thinks is an excellent sound, the majority of people might feel isn't much of anything. In any case, right off the bat we're working with Valhala Music and people like that. Were supplying them with, if nothing else, the cartridge housings and so forth. We're licensed to do this by Ensoniq.

We're also set up to distribute software. For example, we distribute Turtle Beach's software and they are putting out a lot of new and interesting things right now .

RB: You really do have a lot of things going for IVM. Your MegaBank* memory upgrade has brought new life to my Mirage and increased its musical utility many times over. I'm sure that others who have added the mod feel the same way.

The stand alone MIDI-Disk, the stereo-mod, further enhancements to the Mirage via operating system upgrades, all promise to be exciting new tools and open many new creative possibilities. Even more significant, I think, is the fact that IVM will be providing an outlet for the marketing of user samples and patches via the Ensoniq distribution network. This is quite a remarkable and unique opportunity for many of us. I'm going home to sort through my samples right away. ■

Richard Boulanger, born 1956, holds a Ph.D. in Computer Music from the University of California, San Diego where he was employed as a research assistant at the Center for Music Experiment's Computer Audio Research Lab - C.A.R.L.. Active as both a composer and performer of instrumental as well as electroacoustic and computer generated music, Boulanger's compositions have been performed and broadcast in Europe, Australia, Canada, and throughout the U.S. His composition "Three Chapters from the Book of Dreams," written for an electronic violin developed at Bell Labs, and a real-time interactive computer system (including a Mirage), was awarded first prize in the 1986 NEWCOMP International Computer Music Competition. Boulanger currently resides in the Boston area where he continues his compositional research as a Fellow of the M.I.T. Experimental Music Studio and in his full-time role as Assistant Professor of Music in the Department of Synthesis at The Berklee College of Music.

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RND (♪♫♪)

Just got the wrong sort of phone call as I was wondering what to write here. So...

AN OPEN LETTER TO ADVERTISERS (and anyone else who's interested):

Sometimes it's a little surprising the number of "power plays" that have come up as our friendly little user newsletter has grown. While just about all of the people we deal with are a pretty great bunch of eggs, every so often someone tries pressuring for reviews, editorial coverage - that sort of thing. We want to make it really clear that we realize that our value to our readers lies in the expectation of impartial, objective coverage. We've run favorable reviews of products from advertisers who have a less than wonderful relationship with us, and unfavorable reviews of products from some of our most steady advertisers - it's really up to the reviewer. We try to find reviewers that, among other things, aren't in the business themselves (this is getting harder all the time), and don't have any particular axe to grind. If we have a review and an ad on the same product, we'll try to place them in the same general vicinity in the issue - but, THAT'S IT! No schedule shifting, no intentional biases, no bumping people around just because you're an advertiser. If you really need this type of thing, we'll still run reviews of your products (our readers want to know about them), but there's plenty of other places you can run your ads.

* * *

New Topic (new product rumor dept.): An interesting question has been going around Ensoniq circles: "What does every sampler do that's a pain in the neck?"...

* * *

Errata - in last month's hype section, the price of the Mirage Monitor from Leaping Lizards was given to us as $29.95. The actual price is $39.95.

* * *

Ensoniq now has five cartridges of factory sounds for the ESQ-1. The first set (VPC 1) is now included free with each unit. The others retail for $49.95 each and contain both "in-house" and third-party sounds. Many of the people you see here in the Hacker, either in articles, ads, or Hackerpatch show up on their list of credits. Reviews coming.

* * *

Check out the June issue of *Electronic Musician* - articles from Ensoniq, Jim Johnson, Walter Daniel, and Clark Salisbury.

* * *

TRANSONIQ-NET

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

ESQ-1 QUESTIONS - Tom McCaffrey. ESQUPA. (215) 750-0352, before 11 p.m. Eastern Time.

ESQ-1 QUESTIONS - Jim Johnson, (602) 821-9266. 5 to 10 p.m. Mountain Time (AZ).

MOVING SAMPLES - all over the place. "Mr. Wavesample" - Jack Loesch, (201) 264-3512. Eastern Time (N.J.). Call after 6:00 P.M.

MIDI USERS - Eric Baragar, Canadian MIDI Users Group, (613) 962-0549. Business hours, Eastern Time (Toronto, ONT).

MIRAGE/ESQ-1 COMPUTER BULLETIN BOARD - Provided by John Connolly of Portland, Oregon for information exchange and file transfer. "Ensoniq-Net": Phone (voice): 503-641-6260. Phone (BBS/computer): 503-646-2095. Free messages. Yearly membership for upload/download: $35.

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

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

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

MIRAGE HARDWARE & FIRMWARE - Scott D. Willingham. Pacific Time (CA). Days. (213) 938-6956.

MIRAGE OPERATING SYSTEM - Mark Cecys. Eastern Time (NY). Days. (716) 773-4085.

MASOS - Pete Wacker. Mountain Time (AZ). 3 pm to 9 pm. (602) 937-1177.

SOFTWARE - Paul Braun. (805) 583-5315.

BACK ISSUES

Back issues are $2. each. (Overseas: $3 each.) Issues 1 through 8 and numbers 11, 14 and 17 are no longer available. Subscriptions will be extended an equal number of issues for any issues ordered that are not available at the time we receive your order. ESQ-1 coverage started with Issue Number 13. The first two reprints in our "Quick and Dirty Reprint Series" are now available: MIRAGE OPERATIONS, for $5, and SAMPLE REVIEWS for $4. Each contains material from the first 17 issues.

HYPERSONIQ

NEW PRODUCT RELEASES

Another Mirage disk utility from LEAPING LIZARDS: LLDU-1. The normal Mirage operating system doesn't allow you to format new disks for your Mirage or make copies of itself onto another disk. Although a formatting disk is now included with the new Mirage, and other disk utilities have been available for some time, they still haven't been as quick or as handy as they could be. LLDU-1 has been designed to make formatting and copying operating systems as easy as possible. Formats and installs the operating system in 35 seconds in one quick step. Allows you to update all of your operating systems with one easy load. Only $24.95 + $2.50 shipping and handling. From: LEAPING LIZARDS, 10026 36th Ave. NE, Seattle, WA 98125. (206) 527-3431.

* * *

M.U.G., the International Mirage User's Group has produced a pair of video instruction tapes for the Mirage. For complete information, refer to their ad in the Classifieds. We should be running a review of these in the near future.

* * *

The Canadian MIDI Users Group (C-MUG) has announced the merger of C-MUG, Belleville, ONT and MIDICOM, Montreal, QUE into CMUG - Canada's largest group of MIDI users and electronic musicians. For more information (and ask for a copy of their newsletter) write: CMUG; PO Box 1043, Belleville, ONT, Canada K8N 5B6.

CHANGE OF ADDRESS

Please let us know at least four weeks in advance to avoid missing any issues. The Post Office really will NOT reliably forward this type of mail. (Believe us, not them!) We need to know both your old and your new address. (Issues missed due to late or no change notification are your own dumb fault - we mailed them!)

THE UPWARD CONCEPTS MIRAGE MONITOR DISK

Review by Gary Morrison

FOR: Mirage
PRODUCT: Mirage Monitor Disk
PRICE: $39.95 + $2.50 shpg.
FROM: Dick Lord, Upward Concepts, Bennett Rd, Durham, NH 03824, (603) 659-2721

WHAT IS IT?

Before I advise whether or not you should buy Upward Concepts' MIRAGE Monitor Disk, I probably should tell you what it is.

When you hit the "C" key on a piano, a fixed system of levers strikes the appropriate strings. The circuitry in the Mirage, however, doesn't do what it does quite so inherently. Instead, it contains generic circuits that are "programmed" to do what they do. This is a great idea, because we can reprogram them to do other things. For instance, they can be reprogrammed to play a "Bb" instead of a "C" when you hit the "C" key. This transposes the instrument to play more easily with various clarinets, trumpets and saxes.

The program which determines how the Mirage (or any computer for that matter) responds to you is called its "Operating System". On the Mirage, it is named "OS 3.2". Upward Concepts' Monitor Disk allows you to customize OS 3.2. It allows you to examine and modify the memory in which the operating system is stored, write your own functions, and save or load them on the Mirage's disk drive.

WHO IS IT FOR?

"Should I buy it?" you ask. Well, that depends on who you are and what other people do with it.

If you're a computer music hacker who enjoys messing around with assembly-language, wave-tables, tuning-tables, disk manipulation routines, etc., then don't waste a second - drop a check in the mail right away! Your Mirage will never be the same (especially if you forget to save the old OS before you start hacking!). As is apparent from looking at his "Preliminary OS 3.2 Notes", Dick Lord has saved us hackers an enormous amount of effort in offering us this tool - and at a great price, too.

If you're a three-gig-a-day keyboardist who really doesn't care much about the theory of computers or sound, I'd say don't buy it. You're not likely to get much out of it, nor are you likely to have the additional tools you need to use it.

How about you home-studio musicians who aren't horribly interested in performing tedious surgery on computer guts, but are always interested in new ways to use the Mirage? For you it depends on what we bit-pushers do with the monitor. If the pages of the Transoniq Hacker start becoming covered with monitor commands to add new capabilities to your Mirage, then you will find it very nice. You will probably need help in hooking it up initially, but after that, it's easy to use.

Now let me make clear, however, that the Monitor Disk is not a disk "for the rest of us". Any intelligent human being can use it to type in operating system modifications from an article, but only a special breed can do original work with it. You've got to love boolean logic, binary and hexadecimal number systems, memory organization, and 6809 assembly-language to create your own hacks to the operating system. Further, even if you have that knowledge, you need more than the disk and a Mirage to make good on it. Let me explain:

THE HITCH:

To use the full capabilities of the Monitor Disk, you have to somehow get a hold of a real weird beastie: a "dumb" ASCII terminal that talks over a MIDI port instead of the customary RS232 serial line. The monitor program runs on the Mirage's internal 6809 microprocessor, and the built-in keypad and two-digit display don't work very well for "hacking". This means that you have to get data out of the Mirage via its MIDI port.

To talk to the monitor, most of you will use a home computer running a terminal-emulator program, rather than using an actual ASCII terminal. Just about every home computer has a terminal emulator program available for it. The trick is getting it to speak MIDI instead of RS232. You've got three ways of doing this: first, you can create an RS232-to-MIDI "level-converter" and run a normal RS232-based terminal emulator through it. (The disk uses parameter 73 to let you change its baud-rates down from the MIDI to the traditional rates (1200, 4800 baud, etc.)). Second, you can write a terminal emulator program custom-built for your computer's MIDI port. Third, some computers will allow you to redirect RS232 output over to the MIDI port (according to Dick Lord, Apple's MacIntosh is such a machine).

Redirecting RS232 I/O over to MIDI is clearly the easiest approach, but best I can tell, the MacIntosh is one of the few computers with this ability. In short - don't bank on it, Bud, especially if your MIDI interface cannot step down to 1200-baud. Writing a terminal-emulator for your MIDI interface can be easy or hard depending on how much support your computer's operating system gives you. After having spent nearly two weeks doing so (most of which I found to be unnecessary, anyway), I definitely recommend just making the RS232-to-MIDI level converter instead. It will cost you anywhere from $10 to $30 depending on what kind of power-supply and prototyping boards you use. The users' manual that comes with the disk shows a schematic for it in the back. Unfortunately, there are two errors in it: first, a 270 ohm resistor from the output of the MIDI-in optocoupler and +5 volts is missing. I haven't tried the converter without the resistor, but, theoretically, it should be there. Second, the pin numberings on the optocoupler are correct for the Sharp PC-900 shown in the MIDI spec, but wrong for the HP6N138 shown in the users' manual. Make the following pin number substitutions and you should have no problems: 1=>2, 2=>3, 6=>8, 4=>6. Pin 5 is right on the diagram. HP6N138s are available from "back-of-magazine" mail-order houses like Jameco Electronics.

One other thing - you will probably want to buy a disk copy program along with the Monitor Disk. If you want to play it risky, you can probably get by with writing your own with the monitor's help, but that may prove too tedious (which, of course, is why I'm trying it!).

SO HOW DOES IT WORK?

Once you somehow get a MIDI-based dumb terminal, the monitor is great to work with. It basically consists of three monitor programs. The simplest, the "el-cheapo instant byte boffer" (ECIBB, sounds like a new UNIX command, eh?) is run from the Mirage's own keypad and display. You can't do very much with it, but if you want to make a quick memory-change, it is very convenient to have. The "mini-monitor" contains most of the commands you would want to use - modify memory, dump memory, and run at a specific address. The mini monitor and the ECIBB are built into this special implementation of OS 3.2, taking place of the sampling functions. (You can still sample, of course, but you will have to reboot the Mirage with the normal OS 3.2, or with MASOS to do so. The resultant samples you can use under the Monitor disk.)

The full-blown monitor (when loaded) resides in the wave-sample memory. I find that I tend to use the mini-monitor most, and will pull out the big monitor only when I want to do something exotic. The big monitor does have two really nice commands - "L" and "P", which allow you to downline load and save large code- and data-blocks in standard Motorola S-record format. This is great for downloading code from a 6809 cross-assembler. It also has primitive read and write disk sector commands along with block copy and block fill commands.

Now bear one thing in mind - this is a monitor, not a debugger. You can't trace code, examine or modify the register contents, or set break-points. Perhaps that's coming up later?

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MIDI/RS-232 CONVERTER PARTS LIST

By Philip Rosine

	Radio Shack part#
1488 quad driver	276-2520
1489 quad receiver	276-2521
74LS04 hex inverter (Radio Shack does not carry these any longer - they have a 7404, which will work) --	276-1820
H11A1 optocoupler (any equivalent) (Radio Shack part is a collection of 3 chips - one should work)	276-139
diodes - any small signal diode (3 required - 1 package)	276-1620
220 ohm resistor (red-red-brown) (5 required - 1 package)	271-1313

DB-25 connector (male or female - depends on your terminal.)

5-pin MIDI connectors (2 required)

Other stuff: PC board, wire, sockets for the ICs (recommended - you will need 3 14-pin and 1 8-pin socket). If you have the stuff, you can wire wrap this circuit.

Notes on the circuit:

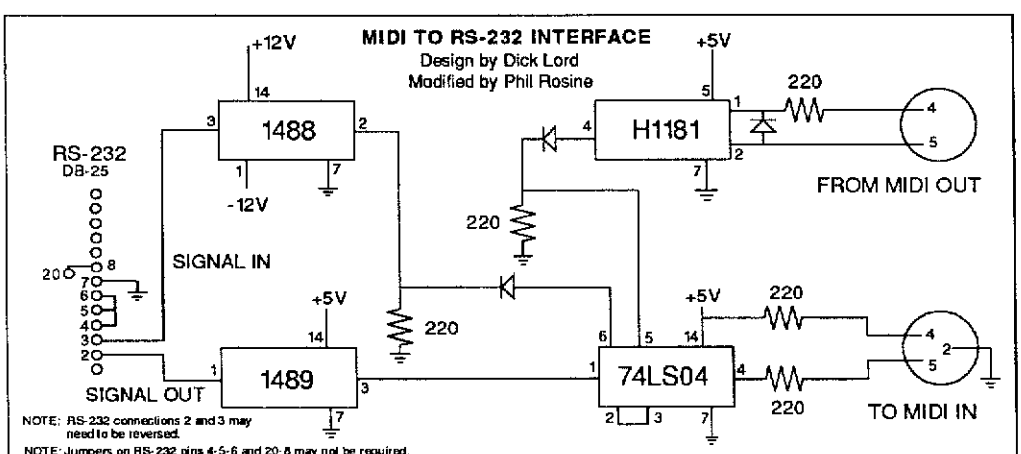
Dick Lord includes this basic circuit in the User's Guide for the Mirage Monitor Disk, but I found that I could not buy some of the parts at Radio Shack. After some experimentation, I came up with this modification of Dick's circuit which will use Radio Shack parts.

If you have never messed with RS-232 interfaces you are in for a treat, probably an unpleasant one. They always seem to be a pain in the part reserved for holding the piano bench down. RS-232 is one of the standard interfaces for connecting computers to each other. It involves sending serial digital signals using a negative voltage to indicate an off state and a positive voltage to indicate on. The voltages can be in the range of -15 to -3 for off and +3 to +15 for on, with -3 to +3 being meaningless. MIDI on the other hand uses 0 volts for off and +5 for on. This interface circuit is designed to translate between these systems.

There are three potential troubles with getting the interface to work: power, RS-232 port handshaking, and RS-232 send and receive channels.

Power required by the interface is +5 volts DC, +12 volts DC, and -12 volts DC. I stole the power from my terminal and ran it out through extra pins on the DB-25 connector. If you try to do this, be careful. If +/-12 are not available, you can try other voltages which may be available. Anything from +/-8 to +/-15 should work. DO NOT use anything in excess of +/-15. I have not tested the circuit using an unbalanced power supply to the 1488 chip, but it will probably work to use -8 and +12 volts. Dick Lord's article in TH #13 (pp 15-16) uses -8 and +5 to run a 1488. -8, +5 and +12 volts are available from the Mirage expansion port. -8 volts is on Mirage pin 3, +5v is on pins 43 and 44, and +12v is on pin 5. Avoid this solution if you can, but it should work okay. Check the articles in TH #3 and TH #13 on using the expansion port. If you do use the expansion port you can use pin 41 to get the MIDI out signal and pin 42 to get MIDI in. Pin 1 is ground. If you have the stuff, an external power supply is probably best.

The other problem comes in getting the RS-232 port of your computer or terminal to communicate. RS-232 is a flexible standard. One problem with RS-232 is the handshaking lines. RS-232 was designed for a computer or terminal to talk to a modem. To do this, several lines of the DB-25 are dedicated to passing information about the ready state of the terminal and modem (this is called handshaking), and the port may not transmit or receive data until the handshaking signals are right. Usually a terminal (computer) sends a high voltage on pins 4 and 20, and expects high voltages on pins 5, 6, and 8. You can arrange this by jumpering pin 4 to pins 5 & 6, and pin 20 to pin 8. These requirements can usually be checked with a voltmeter.



Since the RS-232 port was designed for a wide range of applications, its implementation varies widely between manufacturers. Normally pin 2 of the DB-25 connector is the signal out, and pin 3 is signal in, however, these may be reversed. If you can't get data through to your computer / terminal, try reversing them.

The pros use a device called a breakout box to debug RS-232 interfaces. If you have a friend in the computer communications game, call him or her and get them to help. It can be done with a voltmeter, but it's a pain. I did mine that way because my breakout box was on loan to someone else. To check the send and receive signals with a voltmeter, set the baud rate to 300 -- 1200 is too fast to register on most meters (the monitor program will set the baud rate on the Mirage). Send a lot of data to get a strong signal.

Good luck and happy monitoring.

Ok, I admit it. I did have a few minor gripes about the monitor. First, the block-copy command does not work with overlapped source- and destination-blocks. That's annoying, but forgivable. Also, the memory fill command does not fill the last byte in the range you ask it to fill. One additional command that would have been nice would be "search for byte string". These problems strike me as very minor, however, considering the power this package gives you.

WHAT ABOUT DOCUMENTATION?

The Monitor Disk comes with two pieces of documentation - the Users' Manual, and a set of OS 3.2 Notes. The initial copies of the disk are released with a preliminary set of OS 3.2 notes. I can't speak for what the final ones will look like, but the preliminary ones contained a disassembly of the OS 3.2. They were very sketchy, but interesting.

The Users' Manual was pretty decent. It was written pretty clearly and the illustrations were very good. I saw only a few problems. For instance, the explanation of the "binary dump" command was not clear. It is a byte-by-byte dump onto the terminal, not a binary version of the "display" command as I had suspected.

The documentation covers a lot of ground, from how to use the monitor to how the Mirage works. I had no problems messing around with the pitch tables to type in my favorite subharmonic-series based scale systems. Between the documentation and Dick Lord's on-going series of "Hacker" articles, "Playing Between the Keys", you should have few problems navigating around OS 3.2.

CONCLUSION:

In summary, I think that the MIRAGE Monitor Disk is a quite useful tool, and that I shall certainly be using it a lot in the future. Getting it to talk to you takes a bit of work, but once you've got that going, you'll find it absolutely indispensable for hacking. Even the non-technically minded will probably find it useful (for something other than a place to store your latest fog-horn sample) if we hackers start writing articles with type-in modifications to your Mirage's operating system. I hope that happens, because I think that the Mirage with its Monitor Disk are a real winning combination for all of you experimentive musicians out there. ■

Bio: Gary Morrison's day-gig is computer design engineering. His main fascination in music is xen-harmonics (unusual tunings). He aspires to become a recognized composer in that field.

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SOLICE 4	NOISTR 24	BLLCLV 44	KALMEM 64	BO STR 84	PLKBRS 104
CHFBAS 5	3FDBK5 25	TEKNO? 45	2PNOS+ 65	DIGPNO 85	ISLAND 105
SINPAD 6	SAKBUT 26	OBOE 46	HIT ME 66	WAVBEL 86	ICYORG 106
"MACH" 7	HOWNOW 27	STEEL 47	ACCRDN 67	ORGAN 87	3TRUMS 107
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ESQ1 QUESTIONS FROM THE TRANSONIQ NET

By Jim Johnson

This month, I thought I'd share some of the more common questions I've fielded over the past few months as the Western U.S. operator on the Transoniq Net.

Q: I'm working tonight with a singer who likes to sing in D flat. Is there any way to transpose the ESQ1's keyboard by a half step?

A: Ensoniq didn't provide a direct method to transpose the ESQ's keyboard, but there are a few ways to transpose the ESQ1 indirectly. The "brute force" method would be to simply go in and edit the tuning of each oscillator in each patch that you intend to use. Using the data increment and decrement buttons, increase or decrease the SEMI setting on each oscillator by the number of half steps you'd like to transpose by. A better solution, if you don't mind giving up the pitch wheel for the night, is to transpose the ESQ1's "straight synth" from a sequencer track. Here's how it's done.

First, patch the ESQ's MIDI out to its own MIDI in, and select an unused track in any sequence. Now set this dummy track to BOTH on the Mix/MIDI Status page, and assign the track to the same channel as the ESQ's base channel, as shown on the MIDI page. (Mode should be set to MULTI, on the same page.) Next set the Bend Range control to the number of half steps you'd like to transpose by (i.e. 7, to transpose up or down a fifth), and select the dummy track. Move the pitch wheel all the way up or down, and WITHOUT LETTING GO OF THE PITCH WHEEL, unplug the MIDI connection in the back. Unselect the dummy track by pushing the appropriate soft button, and you'll be back to the straight synth, which is now transposed by the amount of the pitch bend. You can select new programs on the straight synth without affecting this tuning, but be careful not to move the pitch wheel, as this will cause the synth to jump back to its normal tuning.

Q: I want to sync my ESQ1's sequencer to my four track tape deck. I have no problem recording a good sync track, but when I set the synth to TAPE SYNC and press the Start button, the sequencer takes off at an unsteady 150 BPM even before the tape is rolling! What gives?

A: A little arithmetic helps us solve this one:

(24ticks/beat) X (150 beats/minute) X (1 min/60 sec) = 60 ticks/second = 60 Hz

This is a familiar number, no? Although I've never experienced this first hand, my guess is that the problem is caused by 60 Hz hum on the cable from the tape deck to the ESQ1. Check for bad connectors, ground loops, and other potential sources of hum.

Q: When I'm laying down sequencer tracks, I like to put down a piano part and later double that part using a different voice on another track; but when I do this, some notes seem to drop out at random. What can I do?

A: You've run up against the ESQ1's eight voice limit. Remember, even though the ESQ's sequencer can CONTROL more than eight voices at once, the ESQ's synthesizer can only PRODUCE eight voices (or four layered voices) at one time. If you've recorded a dense part on one track and try to put another dense part on a second track, you will probably exceed this limit occasionally; when this happens, the new notes steal voices from the sustaining notes, creating the problem you've mentioned. The only way around this is to use a slave synth for the additional voices, or if you're recording in a multi track studio, record one sequencer track at a time by muting the other tracks on the Mix/MIDI page and then doing synched overdubs for the remaining tracks.

Q: I use my DX7 as a master keyboard when I'm recording sequences, but unfortunately the aftertouch data from the DX7 eats up the sequencer's memory in a hurry. Is there a way to disable the recording of aftertouch data?

A: This can be done by setting the PRESS control on the ESQ1's MIDI page to OFF. This not only disables reception of pressure or aftertouch data by the ESQ's voices, but by the sequencer as well.

Q: I really like my ESQ1, but I want to be able to load new waveshapes into it like I can on my Mirage. How can I do this?

A: I cringe every time I hear this question. Without meaning to offend anyone, let me say that this question shows a basic misunderstanding of the difference between a sampler and a synthesizer. Both instruments are used for the same purpose. namely, to provide musicians with complex, time varying waveshapes; but the way the two instruments approach the problem is completely different. On a sampler, time varying waveshapes are modified with simple modulation sources and techniques, while on a synthesizer, static waveforms are modified using complex modulation sources and a wider variety of audio processing methods. On a sampler, the only way to change a sound is to change the basic waveshape (I know, I'm oversimplifying), but on a synthesizer, IT'S NOT THE WAVESHAPES THAT COUNT, BUT WHAT YOU DO WITH THEM. The DX7 is a classic example; it only has sine waves on each oscillator, but what it does with them is something else!

On a more practical level, I imagine that it would be

possible to put new waveshapes in the ESQ1, but this would mean opening up the instrument and replacing the two waveshape ROMs every time you want a new set of waveshapes. And you'd better learn how to program the ESQ1 from scratch, too, because none of your original sounds will sound at all like they should with the new waveshapes installed.

The final "question" this month isn't really a question at all, but an answer to a question that I hope no one ever has to ask! This information was brought to my attention by Page Hite of Houston, Texas. Page bought two Yamaha TX81Zs, hoping to use them as expanders for his ESQ1 sequencer. Unfortunately, the TX81Zs have a few idiosyncrasies which make them virtually useless in this application. The problems have to do with volume control. First of all, the 128 presets in the TX81Z are set to receive MIDI controller 4 (the ESQ's CV pedal) for volume control rather than controller 7 (which Yamaha established as the "standard" controller for volume when they built the DX7). Since the ESQ's sequencer sends a zero value for controller 4 at the start of each sequence, the volume on each voice immediately drops to zero. This is correctable, sort of - simply transfer the needed voice into one of the 32 user editable voice locations and change the controller for volume on that voice. This means that the 160 programs in the TX suddenly become 32 useful programs.

The other problem is worse; even if you change the default volume controller on a program, the TX ignores incoming volume change messages for a short time after receiving a patch change, which means that the volume changes sent at the start of each of the ESQ's sequences are lost. Sending the program change/volume command a second time, either by selecting the sequence twice or creating a second track with identical settings (but no note data) will let the TX see the volume command. Page went to both Yamaha and Ensoniq with this information; Yamaha told him it was a "feature", not a bug, and he could get neither repairs nor a refund. Ensoniq promised to see if they could do anything about it, but since they're not the source of the problem I don't see what they can do. The moral of the story: always make sure any MIDI equipment you want to buy will do what you want BEFORE you leave the store. ■

Bio: Jim Johnson, electrical engineer, has played synths in several Phoenix, Arizona bands in the last few years. He's written for ELECTRONIS MUSICIAN, KEYBOARD, and - yet more - co-wrote Dr. T's Algorithmic Composer package. He is the owner of JAMOS Music, a MIDI programming and consulting firm.

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How do you make an article about the differences between the 'old' Ensoniq factory disks and the 'new' ones interesting? I don't know either. I've fretted over this problem for some time. Do I go into great detail or just summarize? Should I use charts or words? I finally decided to summarize the differences and present one chart at the end of the summary. Then for those hardy individuals (the ones who are still awake), I've included short descriptions of most of the new sounds. This should make most everyone happy.

Volume A and Volume B represent more than just a repackaging of the original factory disks. The sounds have been grouped. In both volumes, disk 1 is percussion, disk 2 is keyboard, disk 3 is vocals, disks 4 and 5 are orchestral sounds, disk 6 is folk instruments, disk 7 is rock/pop sounds, disk 8 is percussion, disk 9 is unusual stuff, and disk 10 is effects and hits. Since there are only 10 disks in each volume, this accounts for 20 disks.

The three disks that are bundled with the Mirage have been repackaged as disks 100, 101,and 102. This makes 23 disks in all. Under the old scheme we had 24 disks. So what happened to the 24th disk? Glad you asked...

Some of the disks stayed the same. Disk 12 became B9, disk 15 became B7, disk 17 became A3, disk 19 became A5, and disk 21 became B3. Disk 18 became A9 except for one little tweak. Lower 2, the Hammered Piano sound, program P3, parameter [50] (amplitude attack) was changed from 11 to 21.

Some of the sounds were tweaked when they were regrouped. The choir sounds (disk 7, lower/upper bank 3) had their filter frequency (parameter [70]) tweaked. The Stacked Strings sound (disk 11, lower bank 1) had keyboard tracking (parameter [38]) raised to 4 on program P1, and max filter frequency (parameter [72]) on wavesample 1 was lowered to 24.

The Cellos and Violins on disk 3 were resampled and appear on disk B4 as lower/upper bank 1. The Drums/Synth Bass (disk 1.4, lower bank 3) were resampled and appear on disk 102 as lower bank 3.

Disks 2, 13, and 22B have been deleted as part of the repackaging. Some of the individual sounds on other disks were also deleted; Slap Bass (disk 1.4, lower bank2), Fuzz Guitar (disk 1.4, upper bank 2), Electric Piano II (disk 8, lower/upper bank 3), Clavimba (disk 9, upper bank 1), Chainsaw Bass (disk 9, lower bank 3), Plucked Brass (disk 9, upper bank 3,) and Perc Stacked Strings (disk 11, upper bank 1).

Now for the good part - the new sounds! All the sounds on A10 and B10 are new (or were on "not for sale" disks). The digital piano sound (read that Roland RD 1000) on B3 lower/upper bank 3 is also new. The 4 Electric Bass #1 sounds (disks 102, lower bank 2) are new. The Marimba, Electric Piano-Organ, and Clav sounds (disk 102 upper bank 3) could be new or they could be resampled.

Totally confused? Hang on. Here is a handy chart that shows how the sounds were reorganized. Look at disk A1 on the chart. The first item on the first row is "20L1". This means that the sound on lower bank 1 of disk A1 came from disk 20, lower bank 1. See? Each of the rows under a disk name corresponds to one of the three banks on the disk and each of the columns corresponds to the lower or upper keyboard half. The numbers in italics represent sounds that were tweaked or resampled.

100	**101**	**102**	
1.4L1 1.4U1	3L1 3U1	8L1 8U1	
B3L1 B3U1	3L2 3U2	NEW A7U2	
22AL1 A4U1	4L1 4U1	*1.4L3 NEW*	
A1	**A6**	**B1**	**B6**
20L1 20U1	23L1 23U1	4L2 4U2	6L3 6U3
16L3 16U3	23L2 23U2	4L3 4U3	10L2 10U2
16L1 16U1	10L3 10U3	16L2 16U2	23L3 23U3
A2	**A7**	**B2**	**B7**
6L2 6U2	6L1 6U1	5.2L1 5.2U1	15L1 15U1
5.2L3 5.2U3	20L2 20U2	20L3 20U3	15L2 15U2
8L2 8U2	10L1 10U1	NEW NEW	15L3 15U3
A3	**A8**	**B3**	**B8**
17L1 17U1	14L3 14U3	21L1 21U1	5.2L2 5.2U2
17L2 17U2	11L2 11U2	21L2 21U2	9L1 9U2
17L3 17U3	11L3 11U3	21L3 21U3	9L2 1.4U3
A4	**A9**	**B4**	**B9**
11L1 22AU1	18L1 18U1	NEW NEW	12L1 12U1
22AL2 22AU2	18L2 18U2	14L2 14U2	12L2 12U2
22AL3 22AU3	18L3 18U3	*7L3 7U3*	12L3 12U3
A5	**A10**	**B5**	**B10**
19L1 19U1	NEW NEW	14L1 14U1	NEW NEW
19L2 19U2	NEW NEW	7L1 7U1	NEW NEW
19L3 19U3	NEW NEW	7L2 7U2	NEW NEW

OK. Let's talk about the new sounds. Lower bank two on disk 102 is four bass sounds. They're OK. Upper bank three on disks 102 has four sounds on it; Marimba, Electric Piano-Organ, and Clav. These all sound like synth samples. I suppose this could be the ghost of the original synth sound disk - disk 2.0.

On disk B2 lower and upper bank three contain samples from the Roland RD 1000 Digital Piano. It is bright and very good. It sounds like a piano instead of a miked piano. I was able to directly compare it to the RD 1000 - the sampled version sounds slightly brighter but is just as good as the original in every respect.

Lower and upper bank one on disk B4 contain the resampled Cello and Violin sounds from sound disk 3. To me it sounds basically the same as I remember the old samples sounding. That doesn't mean much because I don't have enough Mirages to do an A/B comparison. Listen to this one for yourself.

Every sound on disks A10 and B10 is new. You really need to hear all of them for yourself. Igor's Hit, Tchaikovsky's Hit, and possibly Carl's Hit were previously on "not for sale" disks. The Pipe Organ Hit on lower bank 1 of disk A10 is real neat with plenty of ambience. In the Weird Science department: A Length of Plastic Hose Whirled About the Head (upper bank 2 on B10). Very strange.

I don't even know the difference between a Mark Tree and a Bell Tree but now I've got them both. The Mark Tree-up (upper bank 2 on A10) reminds me of a certain martial arts TV program from the mid 70's. More piano violence has been perpetrated with Piano Harmonic (lower bank 1 on B10) and Sustain Pedal Snap (lower bank 2 on B10). I used to do the pedal snap on the family piano when I was a little shaver - this sample brings back some of those fond early childhood memories.

All these samples are good, but the most outrageous of them is the Snare Buzz Roll/Telephone samples on lower bank 2 of disk A10. When you load these in for the first time, play them yourself. They won't sound like much. Now you are ready to be totally blown away by the sequence! It is so bizarre I won't even waste my time trying to describe it! Quick! Run down to the music store! ■

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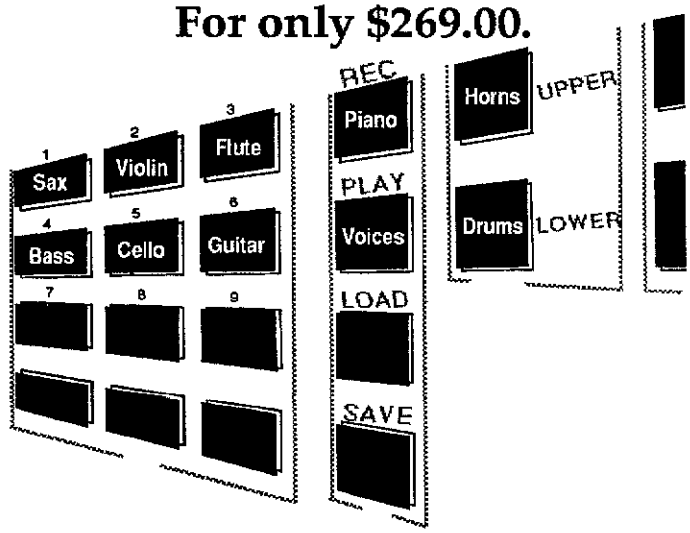

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PATCH REVIEW

By Christian Barth

FOR: ESQ-1
PRODUCT: Weinbeck Sounds, Vol. 1
PRICE: $16 for data sheets, $25 for cassette data tape.
FROM: Weinbeck Sounds, 485 Shelard Pkwy., Suite 203, St. Louis Park, MN 55426.

Some sounds are unique to the synthesizer. Once you've mastered the solo from the song "Lucky Man", the next step is to find some filter sweeps to add to your collection.

The name may not be familiar, but the sound certainly is. You can hear filter sweeps on the new REO Speedwagon and on lots of songs by the Cars. Horror and science fiction movies use them extensively; the best I've heard can be auditioned by renting the 1978 horror film "Phantasm" from your local video store. Filter sweeps are produced by holding notes (usually low ones) and adjusting the filter to change the tone and introduce some motion while notes are sustained. When the filter is raised, the sound becomes brighter; when it's lowered the sound becomes darker. The sweeping effect can be repeated automatically by an envelope routed to the filter.

This month we're listening to filter sweeps and other patches offered for sale by Weinbeck Sounds of Minneapolis. The assortment of 40 data sheets is also available on data cassette, which gets the sounds in your machine about 4 hours faster. The set consists of synthesized sounds such as filter sweeps, imitative sounds designed to mimic other instruments, and special effects.

There are three filter sweeps. FNTSY1 is a rich, sustained sawtooth tone which uses two envelopes to control the sweep effect. The sustain pedal will continue the note indefinitely. If you don't like the cheap little sustain pedal that came with the ESQ, you might try the Casio pedal, which works on my unit and is much more substantial. WHLSWP is similar but controlled by the mod wheel. NIGHT is a low bass sweep and it will really push your woofers. They're all great. If you're playing rock and roll in the clubs, especially hard rock and heavy metal, these sweeps are very effective and will give you a classy, hi-tech sound.

Most performers simply sustain a single low note (try the root of the key you're playing in) and let the sweep effect make the statement, either by itself or accompanied by a drum beat.

Another idea is to layer the sweep onto the left half of the keyboard and use it to create a sustain foundation for other patches. This a great way to give your home demo tapes and live performances a fat "wall of sound". The aural motion introduced by the repeating sweep keeps a simple sustained bass part interesting.

The other synthesized sounds are thin, bright, digital sounding. They are described as "glassy", "icy", "nasal", etc., and come with a very long sustain. In some cases this makes it difficult or impossible to use them in a performing context unless the song is very slow and only a few notes are played. You can cut down this sustain if you go to envelope 4. Just experiment with reducing some of the values until you hear something you like. With the sustain reduced, these voices are more suited for performing solos in a rock band.

If you like a fatter synth sound, try layering these patches onto OB BRS or something similar. Reduce the volume of OB BRS until it is suitably lower than the voice you're using. This technique can really fatten up an otherwise thin digital sound. It can also add many new colors to your basic synth brass patches.

The imitative patches consist of a few bass guitars, lots of organs, a harpsichord, some vocal choirs, and a copy of the Yamaha CP70 Electric Grand (wishful thinking here). The standout is the harpsichord patch. A while back, I raved about the harpsichord patch from Jim Johnson of JAMOS Music. Looking back, what I liked most about it was the percussive "pluck" at the end of each note which occurred as your finger left the key. The sound was dry with no sustain, and with a little reverb I liked it a lot.

Well, this new harpsichord patch is completely different. It captures the ring and sustain of a big harpsichord beautifully. As a solo patch it is very convincing. There's only one thing missing; there's no "pluck" at all when your finger leaves the key. For the serious musician in need of the ultimate patch, the solution is a layer of the two patches. This layer lets you adjust the amount of either the sustain or the pluck by adjusting the layer volume accordingly.

This demonstrates why synthesizer programming is more art than science. Both patch programers were listening to different harpsichords, and both drew different conclusions from the experience. Both patches work in their own way.

The eight (!) organ patches are all variations of the classic Hammond B-3 sound, mostly with that overdriven distorted sound made famous by Emerson, Lake and Palmer and Deep Purple. The ESQ can really shine doing organ voices, and these are no exception. The patches aren't given individual names, but are described by sketchy performance notes as "Deep Purple", "Santana", etc. These patches offer lots of different and usable organ sounds.

Weinbeck includes fifteen patches designed to create special audio effects. These effects patches are in horror/science fiction style. There are noises from deep inside spaceships, there are the sounds of never ending windstorms and wicked witches stirring their cauldron. To quote David Letterman, this is real family entertainment. As special effects go, they're really pretty good, and some are very weird. They're all more effective if you play them in stereo with a little reverb. If your act includes a lot of dry ice, sustained chords, long hair, and "Smoke on the Water", these patches are for you. ■

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PROGRAM: FAT 5

By: Doug Fietsch
Hawthorne, Calif.

A replication of the infamous Roland JX-8P "Fat Fifth" sound.

PROGRAM: HORN BL

By Erick Hailstone (MIDI Connection)

This patch gives a thick sound similar to Brass & reeds played together. It works best playing chords as a horn section would.

PROGRAM: ORCSTR

By: Weinbeck Sounds
Minneapolis, MN

"Orchestra" - play some chords. Speaks for itself.

PROGRAM: DULCMR

By: Jim Grimes
Harbor City, Calif.

Hammered Dulcimer - bring the Renaissance to your ESQ-1. A Dulcimer sounds like a cross between a zither and a harpsicord. This patch is a Hammered Dulcimer, struck with small flexible mallets. DULCMR is slightly metallic and will fit into a lot of applications.

ESQ-1 PROG FAT 5

BY: DOUG FIETSCH

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	7	0	SAW	ENV1	63	OFF	0
OSC 2	-1	7	2	SAW	LFO2	0	OFF	0
OSC 3	-2	11	31	SAW	LFO1	0	OFF	0

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	63	ON	OFF	0	LFO1	0
DCA 2	63	ON	OFF	0	LFO1	0
DCA 3	63	ON	OFF	0	OFF	0

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	0	0	50	ENV3	63	LFO1	0

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	54	8	OFF	0

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	21	OFF	ON	TRI	0	0	21	WHEEL
LFO 2	63	OFF	ON	NOI	63	63	63	WHEEL
LFO 3	9	OFF	OFF	SQR	63	0	63	WHEEL

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	4	0	0	31	0	9	0	0	0	9
ENV 2	-63	63	0	0	0	0	46	46	0	63
ENV 3	49	0	0	0	0	4	53	24	5	0
ENV 4	63	63	63	2	0	0	29	52	21	9

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

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

ESQ-1 PROG HORN BL

BY: ERICK HAILSTONE - MIDI CONNECTION

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	0	0	0	SAW	LFO1	0	ENV2	12
OSC 2	0	0	5	SAW	LFO1	3	ENV2	-9
OSC 3	-1	0	0	SAW	LFO2	0	OFF	0

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	63	ON	ENV1	44	LFO1	0
DCA 2	61	ON	ENV2	63	LFO1	0
DCA 3	63	ON	ENV2	50	LFO1	0

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	39	0	12	ENV3	63	LFO1	0

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	56	8	LFO1	0

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	22	OFF	ON	TRI	0	1	6	OFF
LFO 2	24	OFF	ON	TRI	0	1	6	OFF
LFO 3	22	OFF	ON	TRI	0	3	4	OFF

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	63	49	63	0	0	5	50	63	20	9
ENV 2	63	0	60	0	0	0	10	63	20	9
ENV 3	63	49	49	51	0	11	22	0	21	9
ENV 4	63	43	0	8	0	8	51	54	20	9

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

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

ESQ-1 PROG ORCSTR

BY: WEINBECK SOUNDS

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	0	0	SAW	LFO1	2	ENV1	3
OSC 2	0	0	5	PULSE	LFO2	1	ENV1	2
OSC 3	0	0	3	SAW	LFO2	2	LFO1	0

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	54	ON	OFF	0	OFF	0
DCA 2	54	ON	OFF	35	OFF	0
DCA 3	52	ON	OFF	0	OFF	0

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	53	1	25	ENV3	5	VEL	0

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	63	8	LFO3	61

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	20	OFF	ON	TRI	0	1	20	WHEEL
LFO 2	22	OFF	ON	TRI	0	21	20	WHEEL
LFO 3	6	OFF	ON	TRI	56	0	20	OFF

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	16	0	0	30	0	15	19	3	20	9
ENV 2	63	50	45	0	0	0	50	63	12	9
ENV 3	62	17	17	0	22	46	44	63	37	9
ENV 4	42	61	43	18	18	15	21	63	36	9

	SYNC	AM	MONO	GLIDE	VC	ENV	OSC	CYC
MODES	OFF	OFF	OFF	0	OFF	OFF	OFF	OFF

SPLIT/LAYER	S/L PRG	LAYER	LAYER PRG	SPLIT	SPLIT PRG	SPLIT KEY
OFF		OFF		OFF		60

ESQ-1 PROG DULCMR

BY: JIM GRIMES

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	0	6	VOICE1	OFF	0	OFF	0
OSC 2	-1	0	3	SQUARE	OFF	0	OFF	0
OSC 3	1	7	0	OCT+5	OFF	0	OFF	0

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	63	ON	OFF	0	OFF	0
DCA 2	63	ON	OFF	0	OFF	0
DCA 3	0	ON	ENV1	42	OFF	0

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	22	5	22	ENV4	32	ENV2	25

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	63	8	LFO1	38

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	20	OFF	ON	SQR	0	0	0	OFF
LFO 2	18	OFF	OFF	TRI	63	0	20	OFF
LFO 3	25	ON	OFF	TRI	56	0	20	OFF

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	63	5	0	63	29	51	56	0	0	1
ENV 2	63	16	6	63	0	0	0	32	16	0
ENV 3	63	28	1	63	32	0	40	47	46	15
ENV 4	63	47	0	50	63	0	34	45	19	9

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

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

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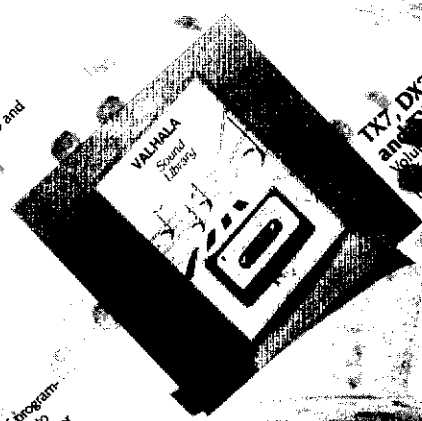

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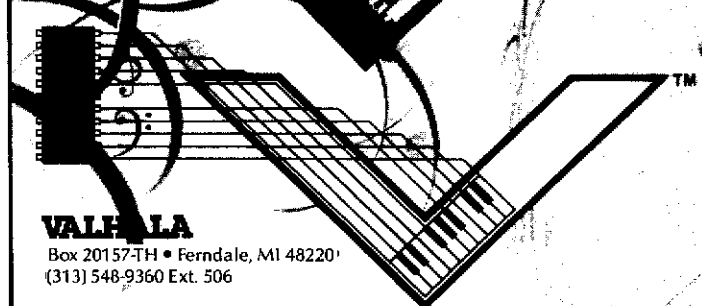

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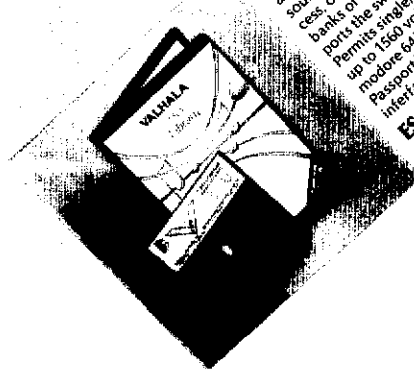

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THE INTERFACE

Dear TH,

Could you please tell me what causes dE, (disk error). I like to make disks with 16 different samples, spread out over the entire keyboard. I use parameter 17, and 18 to slide my samples, and I still can't figure out why some samples will slide perfectly into the memory allocation, and others, such as the "Tah" vocal, constantly push the end marker to FF, thereby ruining all the other samples. I make sure parameter 28 and 65 are off, and that the location and destination are equal in pages. When I finally get my 16 samples in the configuration that I want, I save it to disk. Everything appears O.K. until I load it from the disk, and then I get the dE. And once the dE is there, I can't get rid of it no matter what I do. I've tried just copying a factory sound over the location and still get dE. How can I wipe this dE off of my disks?

Also, what is the current software for the Mirage, and what new things will it do?

Sincerely,
Ian Willson
Oakland

[Ensoniq's response - You are talking about two different things here - 1) disk errors when loading sounds and 2) moving wavesamples around in the internal memory of the Mirage.

First, the dE message occurs when the Mirage can't properly read what is on the diskette. It usually results from a bad or damaged diskette (though in some cases, if the problem occurs frequently and with many different diskettes, it could mean a misaligned disk drive). Getting a disk Error message when trying to load a sound has nothing to do with the nature of that sound - it just means that the diskette cannot be read. Once you get the dE message when loading a particular diskette, the odds are that you will continue to get an error whenever using that diskette, since the fault is most often with the diskette and not the data. Some diskettes are simply defective, especially cheap, "generic" ones; plus there are a number of ways that a good diskette can get trashed - passing it through airport x-ray machines, leaving it next to a strong magnet such as a speaker, or exposing it to temperature extremes, to name a few. Just saving the data to a good diskette should solve the problem. If in fact you are using good quality diskettes, and you regularly experience dE messages you should take the unit to an authorized service center to see if there is a problem with the drive.

As to the second problem, I'm not sure exactly why the Copy Wavesample command isn't working if, as you indicate, you are doing it right. One fairly foolproof alternative is to use the Copy function (MASOS function #1) to copy the data from the source to the destination, and then individually adjust the wavesample parameters (60-65, 67, 68, 70 & 71) for the new wavesample. That's the way we do it here.]

Dear Hacker,

After reading Don Slepian's letter to the TH (in #22), my heart pounded! Introducing external sound into the envelopes and filters would open it up to a whole new type of synthesis (to my knowledge) and make a great add on kit. I'd like to get a schematic for the ESQ. Two questions:

1. Is it feasible to replace the existing wave ROM with EPROMS loaded with my own wares?

2. What are filter tuning and analog tests?

I am amazed at the value of the information I got out of my very first issue of TH - can't wait for the next.

Sincerely,
Douglas "Tajac Seghojin" Eddy
Hamilton, VA

[Ensoniq's response - 1) It would be possible to replace the wave ROMs, though it is unlikely that the results would be at all usable. First, of course (we always say this, but only because it's true) you would void your warranty. Second, the ESQ-1 waveforms are multisampled, so each waveform actually occupies up to eight locations in memory. So you would have to match up the proper waveforms and memory locations as to split points, octave range, etc. To compound matters, because there are different size waves in memory, they are not laid out in any particular order within the ROM. Rather, the various wavedata are arranged like a jig saw puzzle in memory. This would make it extremely difficult to know what to put where.

2) The Filter Tuning routine (initiated by holding the Record button and pressing the Filter button) lets the software test the ESQ-1's eight filters one at a time, and then set the cutoff frequency for each so that they will all behave the same. It is not necessary for you to tune the filters unless the unit has been re-initialized, though it can't do any harm. The Analog Test Page (Record/Compare) is used by service and test personnel to read the values of the ESQ-1's analog controllers - pitch and mod wheels pedal, Data Entry Slider, etc.]

Dear Transoniq Hacker,

First, let me say that I own an Ensoniq Mirage Multi-Sampler rack mount unit and an Ensoniq ESQ-1 keyboard. Generally speaking, I am very pleased with the instruments and the responsiveness of Ensoniq in supporting me.

That being said, I have a bone to pick with them. I figure that if I can get enough people to complain about a new policy of Ensoniq, that the powers that be might reconsider. Read on.

I bought my Mirage about 3 weeks ago. As part of Ensoniq's new marketing policy/price reduction, they are now including 14 sampled sound disks with the unit. "Great!", I said, "Now all I have to do is buy the other 9 or so disks and for a few dollars more I can have the whole set!" So I was all set to lay down the cash when I was informed that you can no longer buy the disks individually. You can now only buy libraries of 10 disks. There are 2 libraries conveniently numbered 'A' and 'B' at $59.95 each (how you can divide 23 disks into two libraries of 10 disks I haven't quite figured out, but when you consider that the Mirages display is in hexadecimal notation, I guess anything is possible). The rub is that these libraries together are composed of the 14 disks that I already got with my Mirage along with 6 more to round them out to 10 disks each. In other words, you pay for the 14 disks you get with the Mirage and then they expect you to pay for them again when you buy the libraries. Is it me?

A call to Ensoniq confirmed this. Their response was, "Well the disks used to cost $22 each so just figure that even though you already have 7 out of the 10 disks, that because of the price reduction, you are getting the remaining 3 disks for the same amount of money that they would have cost you ($66) before the price reduction." Good answer! That's just what I wanted to hear. Not only are they trying to rip me off, but they think I'm a jerk too!

But let's be fair. I figure maybe it's just a temporary aberration. My response to Ensoniq goes something like this:

1) If the "22 dollar theory" is valid, then I believe that not only am I only 'spending the same amount of money that they would have cost me before the price reduction' for the 3 disks that I don't have, but that I am also wasting $22 each for the other 7 disks. "Ah yes", they might say, "but you're not paying $22 each, but only $6 each." I say that since you brought up the $22 theory on direct then I can question it during cross examination (I used to watch Perry Mason a lot). Anyway, I can't even appreciate the $6 dollar figure considering that I never bought disks at the $22 price. And, by the way, $6 times 7 = $42 that I could spend on something else - maybe even Ensoniq products!

2) From Ensoniq's point of view, such practices can only cause enmity in their user community, something no one can afford in a business as competitive as the musical instrument business. Aside from doing sampling myself, something that I am working at (although I'm having a hard time justifying the expense of hiring an entire orchestra to hang around while I sample them), there are three alternatives that I can see for myself in this case and none of them are to Ensoniq's benefit:

1. I could bite the bullet and buy their libraries (this I refuse to do).

2. I could buy sound disks from another company - K-Muse for instance (this I have already done).

3. I could infringe on Ensoniq's copyright protection and make illegal copies of a friend's disks (no comment).

If anyone out there feels that this situation is screwy, call or write Ensoniq and say so. Perhaps, like me, you don't like being told that you're being ripped off and you'd better like it.

Yours truly,
Bob Levittan
Halesite, N.Y.

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[TH - Actually, Ensoniq has been far better than most companies in responding to their customers and constantly working to improve their cost/performance ratio. As products get their prices cut and packaging schemes shuffled around it's not unusual to end up with some anomolies like this. I'm sure many of their earlier customers are wondering "Jeeez - now they're getting 14 (!) free disks - and complaining about it yet!" "Rip-off" seems a little harsh to describe what amounts to a purchase you'd just as soon not make. (What do you say when someone actually steals something from you?) Ensoniq has some comments regarding how this came about and how to work around it.]

[Ensoniq's response - A little background: The repackaging of the sound disks was done in conjunction with the release of the Mirage DSK, as a part of the overall cost reduction of the Mirage product line. Most of the sounds from the original twenty-three sound disks, along with a few new ones, were reorganized into two sets of ten (Libraries A and B) plus the three sound disks which which now come with the unit. We feel that these libraries, with ten sound disks for under $60, represent a tremendous value.

We have always been committed to improving the value of each product as it becomes feasible to do so. Though programs like this are undertaken with the intention of benefiting our customers, it is possible for some to get caught between two programs, as you did.

All is not lost, however. You can order any of the original 23 sound disks which you need to complete your set (or any of the new libraries and diskettes) from your dealer (some still have the original 23 in stock) or directly from ENSONIQ. Write to ENSONIQ or call customer service at 215-647-3930 to get an order form. Also, you can rest assured that we will continue to release new sound disks for the Mirage, which will be available individually from your ENSONIQ dealer.]

Dear Hacker -

I would like to add a brief postscript to my letter which appeared in the April Hacker (Issue #22 - "damned thing" service problems). I posted a similar letter to Ensoniq and upon receipt an Ensoniq representative phoned me and said that they had not previously heard of this problem but that they would take care of it. And that they did. They tracked down my ESQ-1 (which by then was in Oakland, CA) and got it to a repair center.

Apparently all the bumping and thumping of travel in various UPS vans had "fixed" the problem since a 72 hour test didn't cause the symptoms to surface. Nevertheless, they replaced all the keyboard modules, burned in the unit, and returned it to me via UPS one-day service.

I really don't see how they could have done more and certainly many companies do a lot less. I am convinced that Ensoniq's stated commitment to quality is REAL and not just PR hype.

Finally, I must have been a bit asleep when I wrote the letter...it's SODIUM, not sulfur, impurities that cause deterioration of the gate breakdown voltage.

You have a great magazine - keep up the good work!

Mark Harris
Port Angeles, WA

[TH - It always warms our cynical little hearts when we get follow-up letters like this. Thanks!]

Dear TH,

J. Pierre Stroweis, in the April "Interface" brought up the subject of ground-loop induced 60-Hz hum while monitoring an ESQ-1 via a K7 recording deck. Ensoniq's response did not address the complete issue. They discussed the case where this problem results from lack of polarized AC power (two prong power cord), and make no mention of the more common cause of ground loop problems. This occurs when the third wire (ground) on the AC power plug completes a less than perfect continuity between the ESQ-1 chassis, monitor system ground, and the earth ground of the AC system at hand (nearly always less than perfect).

On page 3 of the ESQ-1 owners manual it specifies using a grounded AC power source. If the monitor system is also earth grounded, some amount of ground loop induced hum will probably result unless steps are taken to remedy the situation. The safest, most effective solution is to leave both ESQ-1 and monitor system chassis earth grounded, but isolate the ground in the audio connection with a good DI. (A Direct Input box is a converter that changes single-sided line level or instrument level signals into balanced mic level signals.) This DI must have a true floating ground between the input and output (transformer type) to break this ground loop. You can build your own DI.

Transformers run from a few bucks for a cheapy to about $60 (last time I bought them) for a Jensen model #JE DB-E. This solution requires a microphone input on a mixer, or another transformer at the amplifier end for use with a musical instrument amp.

Another solution costs less than a dollar, is usually just as effective, works with any single-ended audio connection (unbalanced), and can be tested almost immediately. Install a 3-prong to 2-prong adapter on the power cord of the ESQ-1. This floats the chassis ground at the AC power connection, and allows the monitor system to provide a single ground reference via the shield in the audio connecting cable. This will remove any ground loop induced hums and buzzes quite nicely. A possible hazard exists if the monitor system is something like a 35-year-old guitar amp with leaky caps and transformers, or otherwise has problems resulting in AC potential on the chassis (hot chassis syndrome). If the monitor system is properly wired and grounded, this option is safe, sane, and effective.

Another subject of concern is that a lot of latched-up ESQ-1's have been coming in for service with no other problem found. Perhaps the situation has been escalated by spring lightning storms or by spring fever induced lackadaisical attitudes of ESQ-1 operators. Some common symptoms are: some notes on some patches are too loud, too soft, or won't play at all - characters missing from, or incorrectly printed to the display - sequences that won't play, won't play properly, or can't be recorded on.

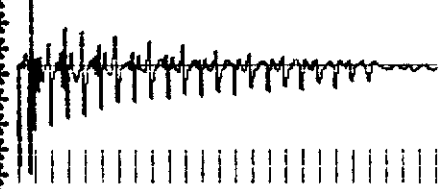
These latch-ups can be caused by a number of things not at all related to an actual ESQ-1 failure. Electrical or electrostatic interference caused by lightning, static discharge, or bad AC power are at the top of the list. Illegal signals presented to the MIDI input terminal will also do it. I once had a defective switch in my hard-wired MIDI switching setup that caused an open circuit at the MIDI input. My ESQ-1 did not like that at all. I also had some sequencer data file tapes made from a unit that had an actual hardware problem on the main board. Whenever I loaded one of these files into a good unit, the machine appeared to be broken. Any attempt to record new sequencer data would cause a "saving new track" message to be permanently displayed. A power down/up would bring it back to life, but the attempt to save new data trashed the sequencer memory.

If these or any other symptoms are plaguing you, try the reset procedure on page 95 of the operator's manual before bringing your ESQ-1 in for service. You already have a recent data save to reload into your instrument because you know how frustrating the lost data syndrome is...right?

Larry Church
Musician's Bench
Portland, OR

[Ensoniq's comments - Because of strict U.L. regulations, we cannot advocate ground-lifting any instruments, although it may be a common practice. Should any high voltage components break down, there is a potential lethal shock hazard in an inappropriately grounded system.]

MIRAGE-AID



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