Transoniq Hacker

The Independent Ensoniq User's Newsletter

RANDOM TIPS - FIRST SESSION (?)

By Clark Salisbury

Welcome to 1987! Okay, now, can anyone out there answer me how to make one half of the keyboard on the Mirage totally silent - and why on Earth anyone would want to do that, anyway?

Yes, it's time for RANDOM TIPS. You know - tighten up some of the loose ends, stick a bunch of the little things that don't warrant an entire column of their own together and see if we can come up with something that might be of some use. Hey - this might turn into a regular feature, even! Let me know if you'd like to see more of this kind of thing.

Anyway, my first random tip has to do with setting the wavesample start and end pointers. (I know I've mentioned this one before, but a lot of folks seem to have missed it, and it's worth repeating.) The idea is that you can use the same wavesample start and end pointers for two or more different wavesamples. Now, why would you want to do that? Well, I can think of at least a couple of reasons.

Example: you've got a great brass sample. It covers two octaves of the lower portion of the keyboard. However, the lowest notes have too long an attack time, making it difficult to play quick passages on the lower notes. So you decide to remove a few pages of memory at the beginning of the wavesample in order to speed up the attack time. But the problem now is that the higher notes have too sharp an attack. This is because when you play back the wavesample at the higher pitches, the playback time of the wavesample is shortened, and the attack portion can go by so quickly that it becomes pinched sounding. So here's what I do to remedy the situation.

Let's say that your brass sample occupies lower memory starting at 00, and ending at 7F (hex). First, select Wavesample 1 (hit Parameter 26, and give it a value of 1 if you're not using MASOS, or hit PLAY in the sequencer section, followed by the number 1 if you are using MASOS), then set the topkey (Parameter 72) to a value of 12 - thus covering the low octave of the Mirage with Wavesample 1. Next, select Wavesample 2, and set its topkey to a value of 24 (to cover the second octave on the Mirage). Now for the interesting part. Select Wavesample 1, and set its start point (Parameter 60) to something in the range of 2 to 12, whatever seems to work the best. This will cause the wavesample to begin playing anywhere from 2 to 12 pages into memory, effectively chopping off the very beginning of the sound, and shortening its attack time. Now select Wavesample 2, and set its start point (Parameter 60) to 00, and its end point (Parameter 61) to a value of 7F (the same end point as for Wavesample 1, you'll recall). Now the first octave of the Mirage will play the shortened version of Wavesample 1, and the second octave will play the normal sample. You'll probably need to tune Wavesample 2 to match Wavesample 1, and you may need to adjust the relative amplitude and filtering parameters.

And there are other applications. Having the ability to address the same memory area from two different wavesamples means you can have the same sample with different filter settings, or tunings, or amplitude settings on different areas of the keyboard. You can also use this technique to rearrange the order of your samples on the keyboard without having to do any copying of data (assuming you have some wavesamples that aren't being used for anything else available). For example, if you want Wavesample 1 and Wavesample 2 to trade places on the keyboard, simply switch the start and end pointers for Wavesample 1 to those of Wavesample 2, and vice versa. Likewise, you'll need to switch the topkey settings for the two wavesamples, as well, and you may need to retune your wavesamples and re-do their relative filter and amplifier settings.

I should warn you in advance, though. You can't use this system to set two different loops in the same waveform on the Mirage. Now why would you want to do that? Well, as some of you may have noticed, some loops on the Mirage seem to work fine in one area of the keyboard, but become unbearable in another. The reason, I suspect, is because the Mirage transposes pitch up and down not by varying the playback rate of the sampled waveform, but by removing samples from, or adding them to, the wavesample in question. This has the effect of causing it to take a longer or shorter time to play back a sample. Sometimes you'll get a loop that seems pretty good in one octave, only to find that it doesn't work that well in another octave. I assume this is because a sample, or set of samples, has been added to or subtracted from the wavesample in question, and the change has affected the loop point.

Oh well. On to tip number two. How many times have you wished that you could have both feedback and vibrato on Program 1 of the electric guitar sample? As it stands, the mod wheel is set up to control the mix between the guitar and the feedback sample on the upper keyboard half. Of course, you can set things up so that both vibrato and feedback are controlled simultaneously by the mod wheel (just set the value of Parameter [32] to 0), but there's a more

fun way to do this. First, get a pressure sensitive keyboard. Candidates include, but are not limited to, the Yamaha DX-7, Korg DW-8000, or Roland JX8-P or JX10-P, as well as some of the hand-held remotes, like Roland's Axis or Casio's AZ-1. Also, many of the controller keyboards, such as the Kurzweil Midiboard, or Yamaha KX-88 will do the trick. And if you already have a pressure sensitive keyboard, get another one. After all, us guys who work in music stores have to make a living too, you know. But back to the Mirage.

First, set the value of Parameter [32] (LFO depth) to 0. This enables us to use the mod wheel to control LFO depth. Next, set the value of Parameter [79] to 8. This allows us to control wavesample mix from the pressure data of our master keyboard. Now go play your new pressure sensitive keyboard. If you press down on the keys, you should be able to get the Mirage to fade from the guitar sample into the feedback sample. If things seem perhaps overly sensitive, use Parameter [80] to adjust the amount of effect that pressure data has on the mix.

As long as we're on the subject, how many of you got the pamphlet that went along with the 3.0 operating system update? How many of you got it but didn't read it? How many of you read it but didn't get it?

There's some nifty stuff you can do with OS 3.0 and higher - aftertouch controlled mixing is just one thing. And it's really quite simple.

Under OS 3.x, a couple of new parameters have been added. Parameter 78 allows an external controller to control LFO depth, and Parameter 79 allows an external controller to control wavesample mix. Each of these parameters has 10 values, with each value corresponding to a different type of controller (except for value 00, which corresponds to no controller). Setting Parameter [78], for example, to a value of 1 allows LFO depth to be controlled by an external mod wheel (providing the value of Parameter [32], LFO depth, is set to 0); setting Parameter [79] to a value of 1 allows an external aftertouch message to control wavesample mix (providing Parameter [28], mix mode, is set to "on"). Parameter [80] sets the amount of effect that the external controller will have.

You can have any external controller numbered 1 to 9 control either LFO depth or wavesample mix. Aftertouch is generally controller number 8, as you may have surmised from the example above. Other controller numbers are not always as consistent; the Yamaha data entry slider and Casio's master tune buttons on the CZ series of synthesizers both have controller number 6. But what would life be without inconsistencies?

Note that settings for these parameters are set for both keyboard halves; you can't have aftertouch control oscillator mix on one half of the keyboard and vibrato on the other half. Also note that these settings are considered "configuration parameters", and are not saved on the disk along with your normal sound parameters; to save these set-ups, you must save them using Parameter [14], for saving configuration parameters, and then use that disk to boot from whenever you wish to load those parameters back in.

By the way, how many of you use the save configuration parameters option? It's real handy for having your Mirage boot up in poly mode, on the correct MIDI channel, and with the MIDI thru enabled - as well as some other handy stuff. That was tip number 3. On to number 4.

One of my favorite things is using the Mirage drum sounds along with a regular drum machine; the combination of the generic drum sounds out of my trusty Roland TR-707 along with something like the ambient drums, or the Latin percussion from the Mirage library has made for some real fun with percussion tracks.

I usually program all the drum stuff into my computer right along with the keyboard parts - helps me to keep the various parts organized. And since most of the newer computer-based and hardware sequencers have more editing flexibility than most standard-issue drum machines, this arrangement suits me just fine. But one problem I've run into is that since some of my stuff can run into a lot of MIDI channels going at once, I often need to conserve channels as much as possible. One obvious way to do this is to put all the drum and percussion parts on one channel. Since the MIDI note numbers corresponding to various drum sounds on my TR-707 are all at the lower half of the keyboard, it seemed logical to use topkey commands and wavesample copying to move all my favorite Mirage percussion sounds to the upper half of the keyboard. Don't worry, I'm not about to go into details about how to do that here - that stuff has appeared in the Hacker before.

The problem that I had, though, was that once I had all my sounds on the upper half of the keyboard, there'd still be some sound or other left over on the lower half of the keyboard, and when I'd put the Mirage on the same MIDI channel as the drum machine, the sound on the lower half of the Mirage would be right there, playing the notes meant for the TR-707. And though the keyboard balance control, Parameter [24], helped some, it wouldn't completely get rid of the lower keyboard sound. So how to get the lower half of the Mirage to be silent? Well, there's a couple of ways.

The solution I arrived at was to first locate which wavesample was the offending party, and then simply to use Parameter [69], relative amplitude, to turn the sound all the way down. Works like a charm, although there will sometimes be a quiet, but audible tick when the Mirage plays the silent notes. But since the lower half of the keyboard was being played only at the same time that the drum machine was playing, it was absolutely inaudible. Oh. The other solution I came up with was to increase the attack time on the lower keyboard half to maximum value, so that by the time the envelope generator allowed the DCA to reach full volume, the percussion sample had already played through.

So there you have it - some of the things I've run across in my travels with the Mirage. Do you have an interesting tip, or a technique that you think might help someone else out of a jam? If so, please send it along to me c/o the Hacker, and we'll get your ideas into print, where any damn fool can get their hands on 'em. 'Til next time, then...

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

PLAYING BETWEEN THE KEYS

MODIFYING MIRAGE OPERATING SYSTEM DISKS

By R. H. Lord

In my last article, REPROGRAMMING TEMPERAMENT (Issue #17), it appeared that any changes that were made to the operating system after booting a disk would disappear once you turned the MIRAGE power off. It certainly would be nice if those modifications could be made on the disk so you could start right out with your newest "patch".

Fortunately, the ROM in your MIRAGE contains the necessary routines to access the disk and to read and write sectors. You need only enter a fairly short program to make use of these routines. Once the program has been entered, you can save it on a disk as a sound file and get it back any time you want to modify a disk.

Before starting, remember that we are going to be writing stuff over the present operating system on a disk, and just in case we screw up, it would be a good idea if you weren't using your only copy of your favorite sample. If you have one of the copy utilities that copies the operating system, make a new copy of 3.2 to play with. Otherwise, buy a blank sound disk with OS 3.2 or be willing to trash the disk you use.

By now, I assume that you have built the Monitor ROM card that was described in issue #13 of the HACKER. If you don't have access to a Monitor ROM, fear not. A disk with a Monitor program as part of the operating system will be available for sale very soon. Watch for the ad in the HACKER and be free from the tyranny of hardware kludges.

Using the "M" command of the monitor, enter the two program segments that appear in the listing. To do this, type "M0100" and when "0100 7F" appears, type "BD", then "F4", then "C6", etc. until you have completed the segment. Do the same for the write segment at 0140. When you have entered both segments and checked to see that the info has been entered correctly, you should save these routines onto a disk. Do this by returning to the MIRAGE with "JF14B". Now press "CANCEL", "1", "3", and "1" on the MIRAGE front panel, insert the disk you want to save the disk routines on, and press "START". The disk routines have now been saved as a sound file and can be loaded back whenever you need them by pressing "LOAD UPPER", "LOAD LOWER", "1", "START".

To use these routines, find the track and sector of the segment of the Operating system that you want to patch in the Sector Map. If you have a temperament you want to save on disk from the article in HACKER issue #17, then you will be patching hex 8BF1 - 8BFC which is on track 00 sector 02 of the disk. Return to the monitor with "LD UPPER", "LD LOWER", "0", "START" and enter the track and sector numbers in locations 00F0-1 by typing "M00F0" and then "00" and "02". After the 2, type "Return" to exit the "M" command. To read the sector from the disk, type "J0100". The disk should run and then you should be back in the monitor. What has happened is that the disk sector that you selected has been read into a buffer at memory locations hex 1000 through 13FF. The temperament table that resides at 8BF1-8BFC when loaded, will appear in this buffer at hex 13F1 thru 13FC. This is because the sector contains 1024 bytes of the program that will ultimately be loaded in memory from hex 8800 to 8BFF but are presently being loaded in hex 1000 thru 13FF.

To permanently enter your favorite temperament, enter the new table at hex 13F1-13FC just as you would have at hex 8BF1-8BFC. Once you have finished the patch, run the WRITE routine with "J0140". This will write the modified sector back onto the disk. (You did remember to cover the write-protect hole so you could write on the disk?) Your disk should now boot with your new temperament.

For the ambitious, who wish to modify other parts of the operating system, note that the Operating System Sector Map has a few odd twists. For some reason, ENSONIQ re-loads several segments. Though track 00 sector 05 loads from 9400 to 97FF, track 01 sector 00 re-loads part of this when it loads from 9600 to 99FF. To modify anything in locations 9600-97FF, patch sector 01:00, not 00:05. This same quirk appears at AC00 - ADFF where sectors 01:05 and 02:05 overlap. The sector map gets very messy after track 04 sector 05. These sectors are loaded into hex B000 thru BFFF. This area is mostly data used by the software in 8000 - AFFF and contains "System" and "Program" parameters that you can load and save from the OS, so hopefully you won't need to play with this part of the sector map.

That's all for this issue, so keep on HACKING.

MIRAGE DISK SECTOR READ/WRITE

These routines read a designated sector from the MIRAGE disk into a buffer located at $1000-$13FF and write the buffer back onto the disk. You can use the monitor program to set the track # (at $00F0) and sector # (at $00F1). Then jump to $0100 to read the sector into the buffer. Control returns to the monitor. You may modify the buffer and then write it back to the disk with a jump to $0140.

READ a disk sector into the buffer

```
0100  BD F4C6  READS  JSR SELECT   Enable disk drive
0103  86 40           LDA #$40     "READY" mask bit
0105  B4 E200         ANDA VIADB   Check ready line on VIA
0108  81 00           CMPA #0      test for low
010A  27 20           BEQ READE    No disk in drive
010C  B6 00F0         LDA TRACK    Get Track #
010F  B7 8002         STA TRKREG   Store in FDC track reg.
0112  BD F4A4         JSR SEEKTRK  Move head to track
0115  B6 8006         LDA STATUS   Check for FDC error
0118  26 12           BNE READE    Unable to find track
011A  B6 00F1         LDA SECTOR   Get Sector #
011D  B7 8003         STA SECTREG  Store in FDC sector reg.
0120  8E 1000         LDX #$1000   Set Buffer address
0123  BF 8004         STX BUFFREG  Of disk sector buffer
0126  BD F448         JSR READSEC  Read disk sector
0129  B6 8006         LDA STATUS   Check for Error
012C  B7 00F2  READE  STA STATR    Save status
012F  BD F4D6         JSR DESLCT   Disengage disk drive
0132  7E C010         JMP MONITOR  Return to monitor program
```

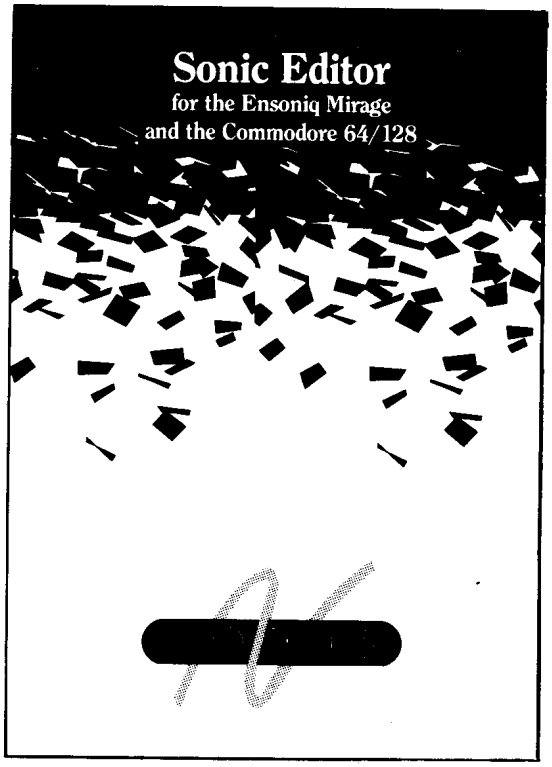
WRITE sector back to disk

```
0140  BD F4C6  WRITS  JSR SELECT   Enable disk drive
0143  86 40           LDA #$40     "READY" mask bit
0145  B4 E200         ANDA VIADB   Check ready line on VIA
0148  81 00           CMPA #0      test for low
014A  27 20           BEQ WRITE    No disk in drive
014C  B6 00F0         LDA TRACK    Get Track #
014F  B7 8002         STA TRKREG   Store in FDC track reg.
0152  BD F4A4         JSR SEEKTRK  Move head to track
0155  B6 8006         LDA STATUS   Check for FDC error
0158  26 12           BNE WRITE    Unable to find track
015A  B6 00F1         LDA SECTOR   Get Sector #
015D  B7 8003         STA SECTREG  Store in FDC sector reg.
0160  8E 1000         LDX #$1000   Set Buffer address
0163  BF 8004         STX BUFFREG  Of disk sector buffer
0166  BD F476         JSR WRITESEC Write disk sector
0169  B6 8006         LDA STATUS   Check for Error
016C  B7 00F2  WRITE  STA STATR    Save status
016F  BD F4D6         JSR DESLCT   Disengage disk drive
0172  7E C010         JMP MONITOR  Return to monitor program
```

SECTOR MAP OF OPERATING SYSTEM

Trk:Sec	Load Addr.
00:00	8000-83FF
00:01	8400-87FF
00:02	8800-8BFF
00:03	8C00-8FFF
00:04	9000-93FF
00:05	9400-97FF
01:00	9600-99FF
01:01	9A00-9DFF
01:02	9E00-A1FF
01:03	A200-A5FF
01:04	A600-A9FF
01:05	AA00-ADFF
02:05	AC00-AFFF
03:05	AE00-B1FF
04:05	B000-?
05:05	? - ?

RC030127



SONUS announces the "SONIC EDITOR" for the Mirage and Prophet and the Commodore 64/128

SONUS Corporation has released visual editing software for the Ensoniq Mirage™ and the Sequential Prophet™. These programs will work with either the Commodore 64 or 128 Computers and a Passport™ 242 or compatible MIDI interface.

The SONIC EDITOR is an easy to use, menu driven graphic waveform editor and sound management system. There are three main parts to the system: Parameter Options, Edit Mode and Program Library/Disk storage.

Parameters from the lower or upper keyboard half may be displayed. You may choose to display wavesample parameters or program parameters. The wavesample parameter display shows wavesample start and end, loop start and end, loop fine adjust, and top key value for each of eight lower or upper wavesamples. The program parameter display shows LFO frequency and depth; OSC detune, mix, and mix velocity sensitivity; Filter cutoff frequency, resonance, and tracking; Filter and amplitude APDSR's with corresponding velocity parameters.

The Edit mode allows you to have instant access to your sampled sounds and you can step through page by page to find the best loop points. The Commodore high resolution display will provide one page (256 bytes) of the selected wavesample to be shown on the screen at one time. The current page count is shown on the edit screen.

Three methods are provided for drawing and editing waveforms: scrolling the waveform left and moving a vertical cursor up and down using the game paddles or Koala Pad™; drawing freely on the screen using the Koala Pad™ or manually plotting points (samples) using the Commodore keyboard.

The Program Library provides on board storage for a great variety of single page waveforms along with preset parameters combined to give you 78 unique sounds available instantly from the Commodore keyboard. Each of the 78 waveforms may be viewed and edited from the edit mode and stored back into the program library. Functions are provided in edit mode to double and triple the frequency and to add waveforms together. This allows the addition of octaves and fifth in a single page waveform. Sets of 78 sounds (each containing a single page waveform and 36 preset parameters) may be stored on Commodore disks, and a library of 78 pre-programmed sounds is provided on the Sonic Editor disk.

Single page waveforms from the Program Library may be used to form multiple page wavesamples. Interesting sounds are possible when you send consecutive pages with different frequencies on certain pages.

The Sonic Editor program includes a Dot/Line Mode display and a Screen Print feature which allows you to print a copy of the screen at any time the Edit Mode is showing.

Sonic Editor provides "hands-on" access to the latest digital waveform technology. Use it to enhance the many capabilities of the Mirage or Prophet sampling keyboards and even to learn more about digital sound.

The SONIC EDITOR for the Ensoniq Mirage™ retails for $149.95, for the Sequential Prophet™ the SONIC EDITOR retails for $225.00

Sonus Offers a Complete Line of MIDI Products:

***MIDI Recording & Sequencing Software for the Professional*— Commodore/Apple:** Super Sequencer 64/128 · GlassTracks **Atari 520/1040 ST/Macintosh:** Prodigy Sequencer · Prodigy Score Writer

***Yamaha Software Products*— Commodore/Apple:** DX-TX 7/216/816 Double Banked Programmer Librarian · DX-TX 18 Banks of Sounds · DX-TX Support · DX21, 27, 100 Support · RX11/21 Librarian · FB01 Double Banker **IBM PC/XT/AT Compatibles:** IBM DX-Design, A Double Banked Librarian Programmer for the DX7/216/816 (works with MPU401 MIDI Interface and compatibles)

***The Ultimate MIDI Editing Package for Super Sequencer 64/128*— Commodore 64/128:** MIDI Processor 64/128

***Programs for the Casio Series Synthesizers*— Commodore 64/128:** Casio Programmer Librarian CZ101, 1000, 5000 · Casio Sound Disk

***MIDI Accessories & Hardware Products*— Commodore/Apple:** MIDI Interface · MIDI Interface w/Tape Sync **Macintosh:** MacFace MIDI Interface **Commodore Amiga:** Amiga MIDI Interface

***Professional MIDI Studio Products*—** MT70 2 In 8 Out A/B Selectable Thru Box · MDM 80 MIDI to FSK Tape Sync · MM90-MIDI Routing with Memory, MX 100 MIDI Routing System (Rack Mountable)

SONUS Corp. · 21430 Strathern · Suite H · Canoga Park, CA 91304 · **(818) 702-0992** · Telex: **650-297-9928**

RND

Well, as you can see, the software that was going to lead to a dramatic improvement in our visual appearance (Laserwriter printer drivers) didn't show up in time for this issue. Hopefully next month.

* * *

We've heard about three different visual editing systems being worked on for the Atari ST. Nothing actually out the door yet. From what little we've heard, these are supposed to be pretty HOT.

* * *

After months of rumors about memory expansion for the Mirage, last month, at the last minute, we received a full-page ad from IVM offering just that. Now in this issue a second company, Virtual Engineering, is also offering memory expansion. Hopefully, we'll have some evaluation units soon. For right now though, it looks like both of these companies are offering just what everyone's been clamoring for.

* * *

In January, Ensoniq's going to NAMM (along with everyone else), and the rumors are already flying about what new things they're going to spring on the world. Next issue we should have some actual news on this.

* * *

The first two reprints in our "Quick and Dirty Reprint Series" are now available: MIRAGE OPERATIONS, for $5.00, and SAMPLE REVIEWS, for $4.00. Each contains material from our first 17 issues on its respective subject.

* * *

TRANSONIQ-NET

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

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

MOVING SAMPLES - all over the place. 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 COMPUTER BULLETIN BOARD - Provided by John Connolly of Portland, Oregon for information exchange and file transfer. Phone (voice): 503-641-6260. Phone (BBS/computer): 503-646-2095. Free messages & e-mail to the Hacker. Yearly membership for upload/download: $25.

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

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

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

MIRAGE HARDWARE & FIRMWARE - Scott D. Willingham. 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.

HYPERSONIQ
NEW PRODUCT RELEASES

Digidesign has announced SOUND DESIGNER packages for both the Akai S900 and the Korg DSS-1. Both programs are similar to that for the Mirage, and both retail for $495 and run on the Macintosh. For Mirage owners this means a broader base of available samples - SOUND DESIGNER allows for samples to be exchanged by any of its versions for any of the samplers supported. For more information, contact Digidesign, (415) 494-8811.

Dick Lord (who has written several articles for us about hacking on the Mirage operating system and changing temperament) has turned some of his tricks into a product. UPWARD CONCEPTS is selling a new operating system for the Mirage that allows you to easily change temperaments. The new operating system will work with all Mirage compatible sound disks. $29.95. For more information, call or write: Upward Concepts, Bennett Rd., Durham, NH 03824, (603) 659-2721.

MIDImouse Music has released a new line of sound programs and samples: SONIC HORIZON Sound Programs (for the ESQ-1) and DIGITAL HORIZON Sample Libraries (for the Mirage). Sample libraries include Piano, Bass, Master Strings, Brass, Orchestra Classics, Anthology, Composer's Tool Kit, Drum Kit, Percussion, and Cosmos. Disks are $25 each, a set of 10 is $199.95. The first volume of 40 sounds for the ESQ (data sheets) is $24.95. For more information, call or write: MIDImouse Music, Box 272, Rhododendron, OR 97049, (503) 622-5451.

AT LAST !!!

Your Mirage® / Multisampler® Can Have

18 SOUNDS

Available INSTANTLY

In 1984, the **Mirage** was a breakthrough in low cost digital sampling. It brought the ability to play two different digitally sampled sounds and added greatly to the depth of performance. Sound storage on computer disk gave tremendous power and flexibility to the musician, with a pricetag within grasp, **but...**

keyboard players wanted more!!!

The standard factory **Mirage** stores only one keyboard of sounds. With the addition of an **IVM expander™**, your **Mirage/Multisampler** will store 9 full keyboards of sounds, **all available instantaneously!** These sounds can be accessed via keypad **or** MIDI program changes.

FEATURES:

-- Does **not** void the **ENSONIQ®** factory warranty *
-- Adds **8 upper** and **8 lower** sounds to the **Mirage**
-- Includes **easy loading** software which loads 3 upper & 3 lower sounds (an entire diskette) at once
-- 1 year limited warranty**
-- **Installation included**

ONLY $ 399.95 installed

(VISA, MASTERCARD, COD)

To order, or for more info, call or write:

IVM

69 Madison Ave. Telford, PA. 18969

(215) 723-3210

* to maintain the ENSONIQ warranty, the **expander** must be installed by IVM or an authorized agent

** for detailed warranty information, write to IVM for a copy of the **expander** warranty

RC030127

ESQ-TIPS

THE DX7 - ESQ1 CONNECTION

By Jim Johnson

When I first got wind of Ensoniq's new ESQ1, I was primarily interested in the sounds that the instrument could produce. Since I was already using a computer for sequencing, I was not too enthusiastic about the ESQ's sequencer, especially since nobody had ever made a decent on-board sequencer. All this changed when I got the instrument home. The amount of control that the ESQ's programmer section gives over the sequencer means that, for the first time, it is practical for a live performer to go out on stage with a single instrument that can handle sequencing and synthesis.

Of course, given the way most of us are about collecting equipment, very few will be satisfied with a single synth, even one as powerful as the ESQ1. Ensoniq, realizing this, decided to pack the sequencer with a number of features designed specifically for controlling external instruments. That's the good news. The bad news is that this power brings with it a great deal of added complexity. When coupled with the potential for controlling the ESQ1 from an external synth, the possibilities are literally mind-boggling.

This is a problem which is not unique to the ESQ1, but actually occurs when trying to interface any of today's super-instruments. Given that each machine has its own special set of capabilities, what is the best way to make them work together? This is by no means a trivial question, and one that is impossible to answer generically. Each set of instruments will require a unique setup to maximize the usefulness of the system. And while the studio musician may be able to repatch his instruments from time to time, take it from me: if you are in a live group and have to rewire your equipment every time you add a new song to your set, your days are numbered.

Sometimes I think I'm the only person in the world who doesn't own a DX7. Club musicians are especially fond of them, and it turns out that they are also excited about the ESQ, for the reasons mentioned above. While interfacing these two instruments may seem to be pretty straightforward, I have found that by putting a little thought into the different ways that the two instruments can be configured, a very powerful integrated live performance system can be assembled.

The Ultimate DX-ESQ Patch

Connect the MIDI out of the DX to the ESQ's MIDI in, connect the ESQ's output to the DX input, and if you have a drum machine, connect its input to the DX's MIDI thru jack. I know, this is no big deal; the real magic comes from the way the ESQ's sequencer tracks are assigned, as well as the two instruments' MIDI channel assignments. So get your fingers limbered up, create a new sequence, and set your machines up like this:

```
ESQ1: Basic Channel = 2, XCTRL = 5, PRES = Chan
      Sequencer: Tracks 1-6, Status = Local
                 Track 7, Status = MIDI, Channel = 3
                 Track 8, Status = Both, Channel = 1
DX7: Transmit Channel = 1 (fixed),
     Receive Channel = 3
```

So what does this buy you? Lots. So much that I'm not sure where to start. First of all, the sounds on the DX are now layered with the sound on the ESQ's track 8. This track will follow the DX's wheels, pedals, pressure, and even the breath controller, as long as the ESQ's voice is set to receive them. (The breath controller comes in through XCTRL, and the DX's mod pedal comes in as PEDAL on the ESQ.) Program selection and volume for the DX are controlled from the ESQ's MIX/MIDI page on track 7, while track 8 handles these functions for the layered voice. Now, every time you call up this sequence, the DX program and volume will be set, as well as the layered patch and its volume. Or if you prefer, you can control the balance of the two programs with the ESQ's DCA4 level and the DX's operator levels, and use the DX volume pedal to control the volume of the composite sound.

On the ESQ, tracks 1-6 can be used for sequencing the ESQ's internal voices, and the "straight synth" can be played directly from the ESQ's keyboard. (See page 91 of the ESQ1 manual for an explanation of the "straight synth"; in fact, the chart on this page is essential to understanding the ESQ's operation in a system.) Sequences can be recorded from the ESQ keyboard with no changes to the settings listed above. To record any track from the DX keyboard, you'll need to temporarily change that track's status to MIDI and its channel to 1, then back again for playback. One surprise you'll get when doing this is that no sound will emerge when the sequencer jumps from RECORD to AUDITION PLAY, even though the sequence is recorded properly. This problem disappears when the track status and channel are restored to their original settings.

One other quirk worth noting, for both recording and layering, is that the ESQ1 keyboard puts out a much higher maximum velocity level than the DX7, so DX sounds will be much brighter when played from the ESQ keyboard, and vice versa. This can be fixed by making minor changes to the velocity sensitivity settings on the envelopes on any affected voices. Even if you aren't programming your own voices from

scratch, you should dig into the ESQ's manual enough to learn how to do this and other small changes. Most commercial ESQ programs probably won't make use of pressure or the breath controller, since the ESQ doesn't have these; so if you want to use them, you'll also need to know how to add them to an existing voice.

With this setup, live performances are a breeze. The only buttons you will have to push are the ESQ's song select and patch select buttons; the DX is handled by the sequencer. If you've got a drum machine tied to the DX's MIDI thru, you won't even need to touch it (except to reload its memory between sets), since it will (hopefully) follow the ESQ's MIDI song select message. The days of fumbling through cue cards to find the correct patch numbers are long gone.

There are a lot of hidden capabilities in an ESQ based system that can be brought out with a little thought and planning. I would advise you to decide on a semi-permanent arrangement of your equipment as soon as possible, since it's a real pain to go back through a bunch of tracks and change their settings to work with a new setup. And if you don't have a DX, don't fret; if you're willing to do some head scratching, you'll be able to pull some neat things out of whatever equipment you use.

Bio: Jim Johnson, electical engineer, has played synths in several Phoenix, Arizona bands in the last few years. He's written for Electronic 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.

RC030127

MAY-SAUCE

BEYOND THE ADVANCED SAMPLERS GUIDE - PART III

By John Connolly
Technical Assistance: Mike Shawaluk

Hello all you Mirage/Computer nuts! Things have really been brewing since my last article. I have received several messages on Mirage-Net.

One question regards the SOUND LAB Sound file format. The program dump table, as described on page 91-92 of the Advanced Samplers Guide (ASG) says that the total length is 653 bytes. The header of a SOUND LAB Sound file is the same program dump table, but there are two extra bytes at the end - ignore these "pad" bytes, and start reading wavedata at position 656 (decimal). Then read exactly 65536 bytes and stop. The descriptive ASCII names formulate the Trailer of this file, 8 names of 64 bytes each, padded with 0's.

Another question I received regarded the ability to change individual parameters on the Mirage. A reader felt that it was "extremely inefficient" to have to change program parameters using "front panel commands" (page 84, section 3.1.1, ASG) and was wondering if there was another way to do it. Different Mirage operating systems respond differently to these "Front Panel Commands". Here's the scoop: the Front Panel Commands work with Version 2.0 of MASOS, and with Standard Mirage Operating Systems before 3.0. They do NOT work with Standard Operating Systems 3.0 or higher or MASOS 1.1, as stated in the ASG. This poses a big problem for software developers: If they can't change the Program Dump Table (page 91-92 ASG) externally, and they have to use Front Panel Equivalents, then all users that do not have Version 2.0 will be out of luck - software written to change parameters will not work. Interesting? This is just the beginning.

A user on Mirage-Net wrote a program which translates Sound Lab files to VISION Format. I provided him file-format information that I had received from Blank Software and Turtle Beach, and he wrote a conversion program for IBM users of Mirage-Net. After some beta-testing, we found that VISION owners, after sending the converted SOUND LAB Soundfile to the Mirage, would have a problem with the loops, although it did not show up on the VISION Screen. When he turned the loop off and then back on again, it fixed the problem.

Interesting that this is the identical problem that I had when sending a SOUND LAB Soundfile into a Mirage booted with the standard MASOS. The big question is: why is this happening? The answer is not as straightforward as it might seem. It all stems from the fact that Ensoniq has not published an explanation of what the Segment List is. We don't have a complete description yet, but generally this is what it is: a table of memory segments in the Mirage which describe where the individual waveforms reside. They are all two-byte, 16-bit numbers. Different versions of MASOS utilize memory differently, therefore something created with SOUND LAB won't work with VISION, until Reset the Loop Switches (Parameter 65 in each individual wavesample) have been turned off and back on again. What you are doing by resetting the loop switches is forcing the Mirage to correct the Segment List.

This brings up the subject we've all been waiting for: A NEW MASOS!!! Yes, as a result of all this, independent software developers have agreed to start working on what will be "the New MASOS". The ability to change parameters individually will be a feature that will be on the top of the list. This new MASOS will sell for $49.95, and will be marketed through Beaverton Digital Systems, PO Box 1626, Beaverton, OR 97075. Information about it will show up on the Mirage-Net in the next few weeks. This MASOS will be compatible with all MASOS versions, as well as do some pretty interesting stuff. Limited Multi-Timbral features will be included also. If you've ever wanted to formulate a "wish-list", now's the time!

Now to a different subject: receiving wavedata from the mirage. My prior articles only cover sending wavedata TO the Mirage. If you are interested in receiving wavedata FROM the Mirage, there are some different considerations. For one, if you using a polling technique to receive data, you will have to turn off all interrupts on your machine so that your program can concentrate on receiving data. The best way to receive is to go into a tight loop to receive the data, and re-arrange the 4 bit nybbles after the fact. Here's an example:

pseudo-code:

```
MIDIOut(240);
MIDIOut(15);
MIDIOut(1);
MIDIOut(16);
MIDIOut(0); (LOW BYTE OF START ADDRESS = 0,
             LOWER WAVESAMPLE)
MIDIOut(0);
MIDIOut(0); (HIGH BYTE OF START ADDRESS = 0)
MIDIOut(0);
MIDIOut(0); (LOW BYTE OF END ADDRESS = 0,
             LOWER WAVESAMPLE)
MIDIOut(0);
MIDIOut(1); (HIGH BYTE OF END ADDRESS = 1,
             HEX FF SAMPLES, MASOS BUG)
MIDIOut(0);
FOR J:=1 TO 512
BEGIN
MIDIByte[J]:=MIDIIn();
```

```
END;

Then, re-assemble the data nybbles this way:

FOR J:=1 TO 512 STEP 2
BEGIN
    FOR K:=1 TO 256
       BEGIN
       LSB:=MIDIByte[J];
       MSB:=MIDIByte[J+1]<<4; (SHIFT MSB LEFT 4
                               BITS FOR ADD)
       WaveArray[K]:=LSB+MSB;
       END;
END;
```

This would read in lower page one of wavedata from your Mirage to the array of byte, "WaveArray". Remember that there is a bug in version 2.0 of MASOS that requires you to specify one address past the sample you want, i.e., page one only contains 256 samples (0-255), but instead of specifying the ending address as Hex FF, you would use Hex 100 instead. Remember that these "absolute addresses," as they are called in the ASG, are the number of samples, NOT pages. There are 65536 samples in 256 pages, and 256 samples in 1 page. Enough Mania for now, if you need more assistance you can reach me at Mirage-Net, using a computer and a modem dial 503-646-2095. Thanks and merry sampling to all!!!

SOUND REVIEWS

ESQ-1 PATCH REVIEW

By Larry Church

As an authorized warranty technician for Ensoniq and a somewhat serious user of hi-tech music production tools, my curiosity about the ESQ-1 has been raging. Seldom has the opportunity occurred to get one on the bench (they don't seem to break much), so when my very own unit showed up last week I started exploring features that previously I had only hints and glimpses of.

The opportunity to review these patches came at an ideal time. Evaluating and analyzing the work of good synthesizer programming is a very efficient method of learning one's way around a new machine.

If you have never developed any programming skills, and have little or no idea what all those black buttons on the right side of the ESQ-1 are for, you may be bored with some of the following rhetoric on programming detail. You just want to know what the darned things sound like so you can decide whether or not to spend hard earned cash for some new voicings. Bear with me...I assure you, this collection of patches is not boring. You won't find, for example, a bank of ten brass sounds each with a variation of envelope or filter settings and all sounding like they could have been done on any one of a dozen different keyboards. In fact, there is little or no redundancy in the entire set. If you feel you need a collection of brass sounds to find the right one for your particular arrangement, then you'll have to look elsewhere. Better yet, get a little more familiar with the ESQ and edit existing patches to your particular taste and needs.

Checking my notes from preliminary work on this assignment, I found there was something valid to be said about nearly every patch in this set. However, I will attempt to contain my remarks to those most indicative of the overall quality of this product.

ROADS 2 is typical Electric Rhodes kind of sound popularized by that other great (but now somewhat dated) synthesizer we all know about. When played staccato, some very interesting metallic harmonics can be heard on the cutoff. Sustained notes have stereo vibrato done so well by the ESQ-1. Velocity controls brightness of attack and volume to a minimal degree.

STRING is a very useful lush string sound typically heard from a good analog synthesizer. Velocity controls sharpness of attack and has a slight effect on brightness and volume. Mod wheel adds a nice chorusing effect.

M.HARP is one of the more interesting patches from a programming point-of-view. When I first listened to it, I was not as impressed as I was after hearing it back on tape played over some music from the radio. It sounds a lot like the real thing in the mix. LFO volume modulation simulates hand tremolo typical of a harp player, although this effect is constant. A little manipulation of the LFO delay parameters could make this even more believable. Unlike that harp patch made famous by the Tina Turner tune ("What's Love Got To Do With It" - that other synthesizer again), this does not sound too good to be real. You can hear a little spit and growl, typical of the less-than-perfect nature of the instrument the patch simulates. The mod wheel increases the amount of volume modulation. When a third interval is played and the LFO's on the two voices are offset by the right amount, you can increase the mod wheel and nearly exactly simulate a trill played on the blues harp. I found that toggling the LFO reset and staggering the attack of the two notes by the right amount, this effect can be accurately repeated every time.

TUBES is a great sounding bell patch. When played staccato the decay of the fundamental and harmonic tones are as you would expect. If a note is held down, the upper harmonics swell up and sustain in a manner completely unnatural to an accoustic instrument. I like this effect a lot.

SWITCH is a layered kind of sound that doesn't use the layer function of the synthesizer. When played very softly, only one component is heard - a bell sound on the attack followed by an organ type sustain of that tone. Play the keys a little harder, and a string sound swells in after the bell attack. When played with lots of velocity, the bell sound disappears and leaves a synthesized string sound with a sharp attack and enough detuning and stereo movement to make it real interesting - a great application of velocity and envelope modulation.

MYSTRY is an incredible patch! It has the layer function on and set to string 2. Turn off the layer patch, and it still sounds like two or three synths layered together. The basic patch features a synth 1 waveform with a tubular bell type envelope that responds to velocity and two electric piano waveforms. Each DCO has its own human feel, vibrato and dynamic pan setting, and the bell sound is detuned by a fifth. Again, an incredible patch.

GOGEE is a unique sound that works well in the low range sustaining octaves or fifths to create lots of tension and suspense. It should be sent special delivery to the drama department.

CLAV 1 is a reasonably decent muted clavinet patch. I think I would find myself editing some of the envelope parameters to come a little closer when

using this in a mix.

CLAV 2 doesn't sound much like a clavinet to me. You could use this sound in place of a clavinet as it shares some of the same dynamic and harmonic characteristics; but as a clavinet patch, it doesn't live up to the quality of the instrument itself. When I asked Clark about a good old funky open clavinet sound (usually easy to achieve on a much less sophisticated synthesizer), he admitted having lots of difficulty getting there. We'll have to work on that one.

BASPLT has a split point and associated patch assigned to it. By the time I got to this patch, I had transferred the set from cartridge to internal memory and the split assignment was still looking for a cartridge program that was no longer there. I had to wonder, why sell a patch with a split written into it? Hopefully, anyone using the keyboard in split mode would know enough about it to choose their own split point and patches. The bass patch assigned to the lower end of the board is nice - kind of an electrified upright sound with exagerrated harmonic swell following the initial attack.

BASS 2 is a fine electric bass patch ESQ owners should be proud to add to their collection. Velocity controls the stuff on the attack allowing for considerable variation of attack without resulting in the need to compress the bass.

STRING 2 is somewhat redundant of the other string patch on Bank 1. Aside from an octave transposition, the difference is very subtle. I recorded some string lines with both patches compensating for the octave offset. I found it very difficult to tell the difference.

SHOQ is a very ethnic sounding oriental flute program. This one really got me curious, and I immediately had to check it out. I was very surprised to find it consisted only of sine waves - three of them - with various amounts of detuning and some LFO and envelope modulation on the attack, giving it a trill-like effect. Velocity causes slight additional offset of one of the sine waves, causing greater dissonance - a function of the patch I thought was particularly effective. When I complimented CLark on this patch, he sort of acted like he never finished working on the sound and complained that it seemed to have intunation problems. Turns out that the velocity offset was probably left over from something else he was working on and he forgot to turn it off! Mistakes can sometimes be rewarding.

WURLY is a good sounding, very useful electric piano patch but only sounds similar to a Wurlitzer in the midrange. The bass range has some very unnatural sounding harmonics when played with moderate-to-strong velocity. The top end would never fool anybody, but that probably makes for a better synthesizer patch. Every Wurly E.P. I ever tried to voice didn't really cut it at the top end, anyway.

PNOST is piano/strings. Sounds like the layer function is on with Wurly and string, but layer is off, and the effect is achieved within the single voice architecture. Could possibly be more interesting with some velocity variation on the piano attack.

CLARNT: I have to pick on this one just a little, as this used to be "my instrument". It is a simple patch consisting of one square wave period. Square waves always sound at least a little like a clarinet if played in the middle of the instrument's range, but they also sound a lot like a number of other things depending on the context and the listener's imagination. I won't forget my performance prof back in college harping on me about getting more buzz in my tone. A good clarinetist achieves a more complex harmonic structure than that of a square wave, and I would expect the ESQ-1 to be capable of getting more on a clarinet patch than this one has.

ORGAN/COMORG are fairly standard but nicely done sounds. COMORG, especially, is one of the best cheesy 60's organ patches I've heard.

TWEAK works well for synth bass - lots of harmonics and a good velocity modulated attack. It's the kind of sound you don't have to work up a sweat over trying to get it to fit in a mix. When time allows, I'll definitely try this patch layered with others for a solo sound.

MCCHO uses some LFO action to create an echo effect. If you're not familiar with this technique, you should take a look at this patch.

An overview of this set of programs shows that it's weak on organization. Sounds that are related in nature could have been organized in the same bank, possibly making it easier to recall which bank a particular patch is in. While this aspect of the product may be important to some, I would expect that most users would combine favorite sounds from the set with those from other sets to build banks of sounds organized to suit their individual application. THEESQ-1 plus a cartridge or two makes this very easy to do.

If your time is worth even a fraction of minimum wage, that would make the purchase of this set a good buy. If you are a novice programmer or strictly a user and have a need for something beyond that found in the factory programs, the value is phenomenal. If your skill level is greater, you may have some of this territory covered already. To the professional, one or two eye-opening patches can be worth many times the cost of a set. You'll find at least several here.

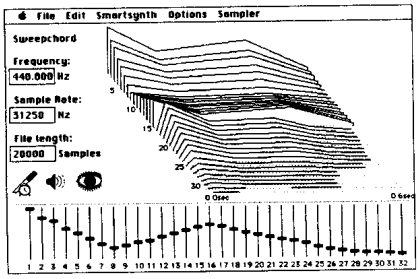
Author's Bio: Over the years, Larry Church has studied clarinet, flute, sax, and classical and jazz guitar. He became interested in electronics and started "Musician's Bench", an electronic service for musicians, in 1972. He is or has been authorized for warranty service on practically all major brands of synths and is presently seriously pursuing music production.

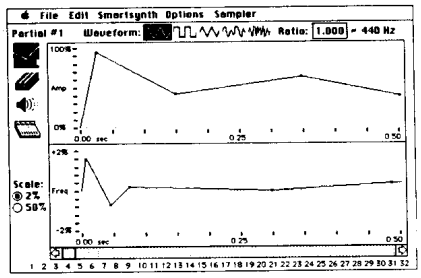
Add Digital Synthesis to your sampler!

SOFTSYNTH™

Softsynth is a revolutionary new approach to digital synthesis: an advanced 32 oscillator, digital additive synthesizer with more features and versatility than other digital synths. Best of all, it's an easy to use software program that runs on your Macintosh™ computer!

How is this possible? Softsynth uses *software-based synthesis* to create sounds you design using graphic programming screens. After you specify a group of harmonics and envelopes, Softsynth creates a high quality digital sound that can be transferred to your sampler for playback.

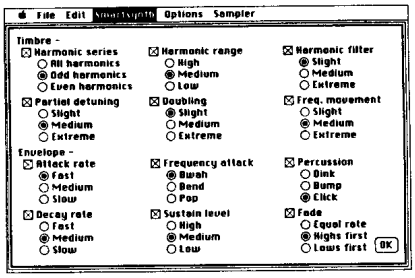




Additive synthesis is the most powerful and precise digital synthesis technique. Alas, hardware-based additive synthesizers are very expensive (usually over $10,000)! Softsynth offers an alternative—it is the first affordable, easy to use additive synth.

Softsynth provides precise control over all important synthesis parameters: *each* harmonic has a 40 (!) stage envelope, a 15 stage pitch envelope and a choice of five different wave shapes. Complete editing tools are provided that let you copy, paste and clear parameters between harmonics.

The unique *Smartsynth*™ function is even easier to use. You simply choose the characteristics of the sound you want to create, and Smartsynth will generate different variations of the sound each time you click the mouse!



Because Softsynth's sounds are software generated, they don't suffer from input sampling noise. Your Softsynth samples will sound "cleaner," and take advantage of the full playback frequency response and dynamic range of your sampler.

Add digital synthesis to your sampler—Softsynth provides the tools to create a wide range of exciting new sounds.

Current version works with: Ensoniq Mirage™/Multisampler,™ Sequential Prophet 2000/2002,™ Akai S900™ and S612,™ Korg DSS-1,™ E-mu Systems Emax™ and Emulator II™ (Emulator II version requires *Sound Designer*.™)

For more information contact:

digidesign

Requires Macintosh 512K, 512Ke or Macintosh Plus with a MIDI Interface.

RC030127

CLASSIFIEDS

USER GROUPS

MIRAGE INTERNATIONAL USER'S GROUP (MUG). Join the largest, most successful club for the price of one factory disk. Receive one complimentary disk of the latest samples. Correspond with members. Monthly lists of quality user samples to be traded, bought, and sold. One year membership: $20. Lifetime membership: $65 (two complimentary disks). Checks or M.O. payable to: G-4 PRODUCTIONS, MUG, 622 ODELL AVE. YONKERS, NY 10710.

16-Track recording studio is interested in exchanging samples. We have a huge selection. Also interested in starting a users group in northeastern and central Pennsylvania. Contact Ralph DeLong, Carillon Studios, 19 Turner St., Plymouth, PA 18651 or call (717) 779-9015.

Angle City Audio Software library for the Korg DW 8000, EX 8000, and DW 6000: Write for free information and receive 15 sample programs. DW 6000: 128 sounds and related materials for $25.00. DW 8000 and EX 8000: expanding sound library and Users Group. Now contains 256 sounds. $25.00 buys first 128 sounds, programming guide, membership in user sound exchange group, free telephone consultations, and newsletter. Additional DW/EX 8000 sounds are available to members at regular intervals at low cost. Audio demo $2.00. COD available, and our friendly (and unique!) money-back guarantee. Call and let us answer your questions. A.C. Audio Software, 2 Liberty Place, Middletown, CT 06457. 203-347-5166.

CHICAGO AREA USER GROUP. Membership list is about 20 and growing. Sound trading. Cheapest prices on blank diskettes available. Collaboration with other Mirage users when creating new sounds. (Help with looping, etc.) Meetings held at a recording studio. Mirage area rep to join us when in the area. No dues or membership cost. Interested in using Digidesign's additive waveform approach. John Adams, (312) 834-3779.

I am interested in starting or joining a user group for the Ensoniq ESQ-1. If there is anyone out there interested in trading patches, sequences and tips, contact me. Bob Wham, 1-214-454-6792, 4900 Joe Ramsey Blvd., #1303, Greenville, TX 75401.

SAMPLES

AAaaaarrggghh! I have just purchased a Mirage for use in my D.J. work, spinning 50's and 60's music. Every Saturday night I broadcast my show on a local FM commercial radio station and have the chance to turn on thousands of people to the wonders of the Mirage. I am looking for samples of anything involving the 50's and 60's, special effects, grunts, groans, moans, and whatever! I can exchange high-quality cassette recordings of my show or blank disks for your samples. Write: Stephen Rabow, 6916 Point of Rocks Road, Sarasota, FL 34242.

WANTED: RICH, FULL, ANALOG synth sounds a la RUSH and Van Halen. If anyone has quality samples from Oberheims, Prophets, Rolands, etc. and is interested in selling or trading, please call: DARIO ROAS, (301) 735-1934 after 9:30 pm or write: 2901 Logan St., Forestville, MD 20747.

2 Drum Disks. LOWER: Great Kik (less "clik," more "slap"); 3 Snares; O-C Hi-Hats; Toms. UPPER: Ride/Crash. 3 samples on each disk have various Snares and Toms - Kik/Cymbs are the same. Both for $13.00!! (+7% NY res.) NEO-SYNC LABS, Box 522, Chenango Bridge, NY 13745. (607) 722-8885.

Wanted: Mirage owners nationwide to exchange samples. Contact: Don Corrieri, 8329 Hillendale Rd., Baltimore, MD 21234. (301) 665-2946.

I would like to swap samples & discuss techniques for the Mirage. San Francisco area. Call: David Wise, (415) 346-2848.

Mind roasting samples for the Mirage sampled in a state of the art 24-track recording studio using ENHARMONIK VDS SYSTEM visual display/editor and synthesis module. Disk 1: "Mostly Percussion" 8 snare drums - gated, rimshot, hits, etc. Latin percussion - congas, timbales, tambourines, cowbells, cabasa. Unusual -2x4, garage door, wooden crates, and more! Disk 2: "Mostly Voices" neato voices! Breathy, percussive, phrased, etc. Whistles and burps, too! Disk 3: "Mostly SFX" sound effects. Nuclear bomb, guns, race cars, dogs, ducks, and a car wreck. Disk 4: "No Samples" These sounds are not sampled! They are created in software using digital synthesis algorithms in the VDS SYSTEM. Karplus Strong plucked strings, FM sounds, analog sounds, pulse waves, and much more! $10.00 per disk (California residents please add 6% sales tax.) Send check or money order to ENHARMONIK PRODUCTIONS, PO BOX 22243, Sacramento, CA 95822. (916) 383-1410.

We have ALL kinds of Mirage samples: Minimoog, bells, fat analog and DX7 synths, numerous drums, humorous, you-name-it. Professionally recorded and sampled in recording studios, computer-edited to save memory and disk-load time. From $17.95. Send $1 for listing. Livewire, Dept. TH, 79 Shrewsbury, Oceanport, NJ 07757.

WOW!! Novelty disks - The Three Stooges, Warner cartoons, Johnny Weismueller "Tarzans," Johnny Carson Show, etc. Fully guaranteed at $15.95 per disk. For list and prices, send S.A.S.E. to: Talance Recording, 906 E. Elmwood Ave., Burbank, CA 91501.

SERVICES

Customizing of disks (moving wavesamples). Jack C. Loesch. 201-264-3512 after 6 pm Eastern time.

DO YOU NEED A SEQUENCE? We will put any song (up to 1033 notes/events) on any of your disks or our blank disk! Just send us the sheet music or your own hand-written music. Write for more info and prices. CAMELOT BUSINESS ENTERPRISES, 4917 Rundlewood Rd. NE, Calgary, Alberta, CANADA T1Y 1B5.

WHY PROGRAM WHEN YOU COULD BE PLAYING?? Alternate sound patches for DX7/TX7, CASIO, KORG, DW8000, ROLAND JX8P/10, JUPITER6, MIRAGE, SPX90, and all JUNO's from only $15.95. Demo cassettes available. Send SASE, specify synth. Livewire Audio, Dept. TH, PO Box 561, Oceanport, NJ 07757.

EQUIPMENT

Will swap even: Classic Mirage keyboard for your rackmount. (Running out of room) Call Jane Talisman, (503) 245-4763.

Ensoniq Mirage keyboard, original version with S/N update kit, MASOS and Advanced Sampler's Guide, Triton disk formatter, Pro-Tec carrying case, 12 factory and 4 assorted disks. Used only in home studio. $1500 or trade for ESQ-1. Ed, (213) 329-4888. Los Angeles area.

SOFTWARE

More than a MUSIC SOFTWARE CATALOG... Complete, detailed information on leading MIDI software products including patch editors, sequencers, transcription examples, etc. We carry a complete line of software products for professional and home studio use. GET THE DETAILS BEFORE YOU BUY. Send $2 for P&H to Scherzando Music, PO Box 3438, Dept. THCAT, Milford, CT 06460.

Apple II+ Owners! THE SEQU LIVE- 50 Segments/10 Songs of a 4-track sequencing. Do whole set without reloading. Records Note on-off info only. Sets Tempo and Synth Patches when song is selected. Real-time recording with Auto-correct. Only Note-on's are corrected for more natural recording. THE SEQU STUDIO- Same as LIVE but with 25 Segments/1 Song, and Records Velocity and Sustain Pedal. (Requires Apple II with Applesoft, Passport/compatible MIDI card.) Only $19.95 Each. $34.95 for Both!!! Even if you have a High-end Sequencer, THE SEQU STUDIO, with its SEG/SONG format, makes an Ideal Drum programmer. NEO-SYNC LABS, Box 522, Chenango Bridge, NY 13745. (607) 722-8885.

ADDITIVE SOFTWARE SYNTHESIS for Apple II, II+, IIe, compatibles... Pure digital for maximum dynamic range and minimum noise. Twelve discrete oscillators/envelope generators for complex timbres. This synth-on-a-disk makes looping effortless. Check or money order only. $30 for Apple Demo Disk and Mirage Sound Disk. $100 for Program Disk and full documentation. Requires Apple II or compatible (48k or more), Passport compatible MIDI card, and Ensoniq Mirage Keyboard or Rackmount. (No MASOS required, but recommended.) Dealer Inquiries Welcome! Ronald Pejril, The Graduate College, Box 319, Princeton, NJ 08544. S & H included.

COMMODORE 64 SOFTWARE - Disk based patch librarians for the C-64 and Passport/Sequential interfaces. DX/TX LIBRARIAN: works with DX-1, 5, 7, 9, 21, 27, 100, and TX-7, 216, and 816. Print names and voice parameters. Single voice audition without erasing memory. 64+ voices included on disk. $35.00. OB-XP LIBRARIAN for the Oberheim X-Pander or Matrix 12. $35.00. DX/XP LIBRARIAN: The Oberheim/Yamaha combo - Works with all of the above! VDS SYSTEM: Visual display and editing for the Ensoniq Mirage. Hi-resolution graph of Mirage sampled waveforms. Editing. Software synthesis and analysis. Additive synthesis and FM synthesis. Display ALL Mirage parameters. $100.00. Send check or money order to: ENHARMONIK PRODUCTIONS, PO Box 22243, Sacramento, CA 95822. (916) 383-1410. (California residents please add 6% sales tax.)

Discount computer software and hardware. We are dealers for DIGIDESIGN, SONUS, ENHARMONIK, DR. T, HYBRID ARTS, MARK OF THE UNICORN, OPCODE, TRITON, and many other MIDI companies. LOW prices on RAM cartridges, MIDI mergers and interfaces, sequencing and visual editing software for MIRAGE and other synths. Send SASE (specify your computer) for pricing on our complete line of MIDI products for Apple, Atari, Commodore, Macintosh and IBM/compatible computers. Livewire Audio, Dept. TH, PO Box 561, Oceanport, NJ 07757.

MIRAGE VISUAL EDITING SYSTEM software for Apple II. Includes Apple disk & Mirage disk. $150. Call Marcus, (805) 987-9932.

PATCHES

ESQ-1 SOUNDS: 120 new, original sounds for the ESQ-1. Varied and useful. Available on data-cassette or data-disk (for any ESQ-1 editor librarian running on the C-64 or Atari ST) for only $30. For complete demo tape and samples send $4. LEISTER PRODUCTIONS, 14 Hill Blvd., Mechanicsburg, PA 17055. 717-697-1378.

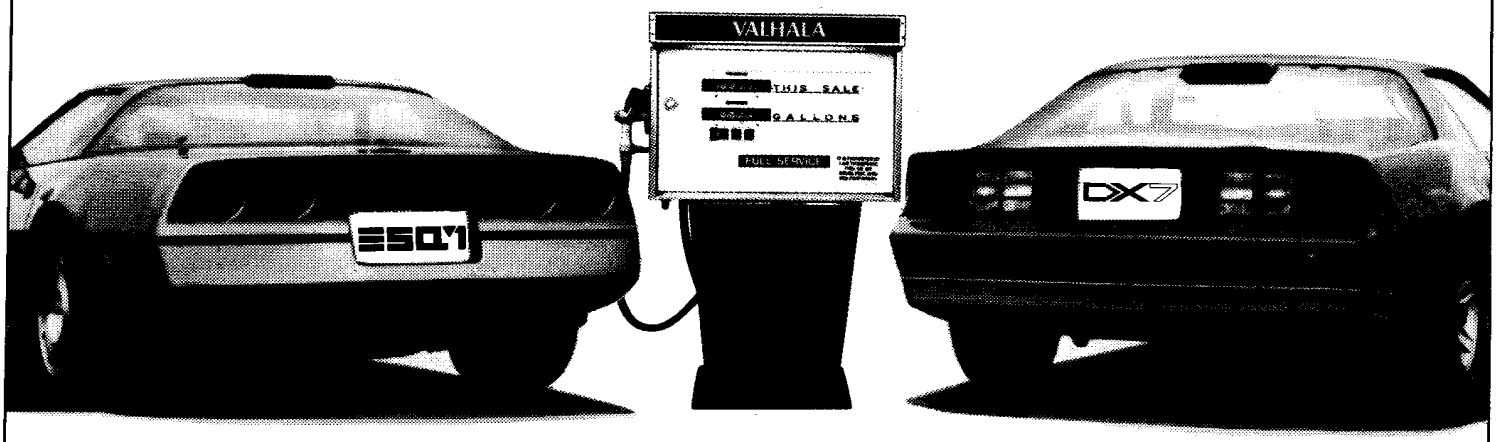
ESQ-1 owners: 40 new sounds for your synthesizer, on cassette with data sheets, $25. Also available, an ESQ-1 Patch Generation Program for the Commodore 64 with Sequential or Passport interface, $20. Jamos Music, 1970 N Hartford #17, Chandler, AZ 85224.

MISC

Ensoniq Sound Disk Parameter Listings: Turtle Beach Softworks announces it is selling a complete set of ASG style printouts of all sounds on all Ensoniq factory sound disks from #1 to #18. The set costs $24.95. Send to Turtle Beach, POB 5074, York, PA 17405. Custom listing service available too.

FREE CLASSIFIEDS!

Well, - within limits. We're offering free classified advertising (up to 40 words) to all subscribers for your sampled sounds or patches. Additional words, or ads for other products or services, are 20 cents per word. (Unless renewed, freebie ads are removed after 3 issues.)



The Drive to Center Stage Just Got Easier.

Valhala's Sound Products are the musician's fuel, a means of expression as vital as the instrument itself.

At Valhala, we feel if you don't get there, neither do we.

ES1 LIBRARIAN $99.95

The ultimate storage program for your patches and sequences. Simultaneously holds all of sequence memory and two banks of 80 voices in computer memory for instant access, or simultaneous access of up to ten banks of voices (400 voices) at one time. Supports the swapping of sounds between banks. Permits single/bulk sends and receives. Stores up to 1560 voices per diskette (39 banks). Written in 100% machine language. Commodore 64/128 with 1541/1571 disk drive and Passport/Sequential or compatible interface.

ESQ-1 VOICE CARTRIDGES

80 Voice ROM Cartridges $59.95

Four different 80 voice ROM cartridges are available at $59.95 per cartridge. ROM 801 thru ROM 804.

160 Voice ROM Cartridges $116.95 per cartridge

Two different 160 voice ROM cartridges featuring electronic switching of banks with visual indication by LED's. ROM 1601 contains the same voices as in ROM 801 and 802, likewise ROM 1602 contains the same voices as ROM 803 and 804.

ES1-A/B/C/D $39.95 per volume

Four volumes of original and expressive voices for the ESQ-1, Synthesizer. Requires Valhala's ES1 Librarian Program. Each disk contains 80 professionally programmed voices as featured in our ROM cartridges.

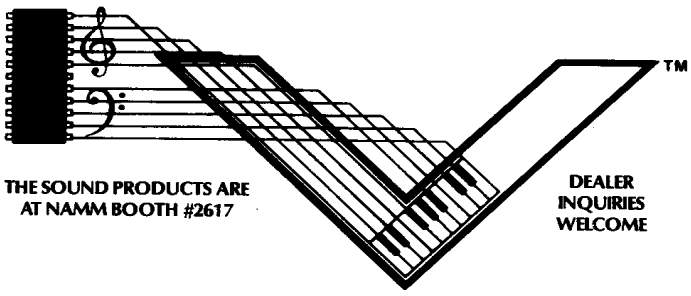
ESQ-1 DATA CASSETTES $19.95 per volume

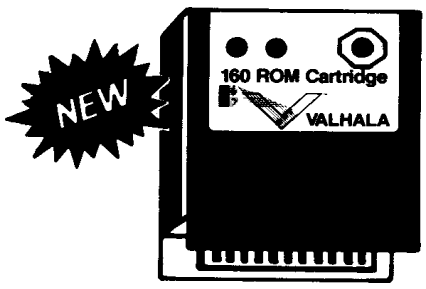
Eight volumes of expressive and original voices for the ESQ-1 on data cassette. Each volume contains 40 different voices as featured in our ROM cartridges.

All ESQ-1 voices professionally programmed by Rich Rozmarniewicz which includes Top 40, analog, DX sounds, strings, bass, woodwinds, brass, bells, percussive, pianos, voices, effects and more.

If not available at your local music store, please order direct. Valhala Music, Inc. • Box 20157-TH • Ferndale, MI 48220 • (313) 548-9360 ext. 506.

*ESQ-1 is a trademark of Ensoniq, Inc.





Continental USA add $3.00 Shipping/Handling. Michigan residents add 4% sales tax. Canada, Alaska, Hawaii add $7.50 S/H for surface, $12.00 for airmail. All other countries $10.00 S/H for surface, $15.00 for airmail plus $3.00 for each additional article. DX7/TX7 Demo tape: USA $7.50 p/p Foreign $10.00 p/p. All payments must be in U.S. Funds. Prices/Specifications subject to change without notice. VISA/MC orders less than $15.00 add $1.00 service fee.

RC030127

TECHNIQUES

HOW MY RECORD COLLECTION SHOWED ME HOW TO SAMPLE

By Dave Caruso

If you own a Mirage or another sampling instrument but only use it for playing pre-made disks, you are missing out. Do you WANT to sample but feel you don't have the time or patience? In my case I was looking at all the terminology and was overwhelmed into thinking I couldn't handle it. I recently found out how wrong I was.

I had never sampled in my life until a few months ago. After my first two weeks of sampling I was able to use almost every parameter on the reference card and had taken almost forty samples -- using no special equipment. Prior to that, my experience with the Mirage consisted of reading the ASG twice and practicing basic functions such as saving to disk, copying programs, etc. I was using the Mirage to play live and to record four-track demos.

Once terminology-phobia started to wear off with my reading the ASG, my monthly Hacker, and a few other articles on the subject, I finally sat down with all my documentation close by, plugged in my Mirage and did it.

By going through your records, cassettes, CDs, and videos you can find many examples of music (and other sounds) suitable for sampling. I've come up with a sort of musical "menu" -- a record listing -- for the sampling beginner to use in order to learn sampling and improve on it. Using pre-recorded material as a tool makes initial sampling easier.

The menu following this article is, by no means, comprehensive. My criteria for the list was (1) owning a good-sounding specimen of the song, (2) choosing a unique sound (no sense sampling the same sound over and over except to improve on it), and (3) getting a sample that is isolated in the song with a short space after it, usually in the introduction or fade-out of the song. Beginnings of samples are easy to catch whether they're isolated or not, either by pushing the sample button at exactly the right moment or by editing out unwanted material after sampling. It also became apparent that dance-mixes and EPS are great for sampling because different instruments often appear solo for several measures at a time.

With a good quality cassette deck record the short sections of all the songs containing the samples you want all on one tape, one after another. Record them at high speed, then use a slow speed to play them back for sampling. You can work from one cassette for all your samples, and since you only recorded short bits of songs, you won't have to do much fast-forwarding or rewinding.

Now choose a song from your tape and make a sample. The ASG and past Hacker articles have given good solid descriptions of the actual process, so I leave it to you to experiment. Here's a recap of the best tips:

--Use default sampling settings (P77=OFF) and set other parameters as shown in the ASG. Later, after the words "Nyquist" and "aliasing" fail to make you twitch you can work with the sampling parameters individually.

--Samples with no looping necessary are the best to start with.

--Choose samples which are loud, rich, and punchy first. Horn, drum, and full band "hits" are best. Longer samples can come later.

--Use your best stereo equipment. A good quality variable-speed cassette deck and a Mirage are all you need right now. The quality of your samples without an e.q. or any other processing equipment will be surprisingly good, variable speed deck or not! If you have signal processing stuff, use it later.

--Once you have your sample, use the glossary in your owner's manual, your parameter card, and your ear to adjust each parameter to suit the new sound. For instance: Edit the end of the sound with P61 and P65 (save to disk first in case it doesn't work out on your first try). Tune the sound with P67 and P68. Adjust the volume with P69 (or P24, if appropriate). Play with the envelope (P40-44 or 50-54). Try different filter settings (P70, 71, and 36-38). (See TH Issue #8.) Try adding LFO (P31 and 32). Set pitch bend to suit the sound (P22). Set velocity sensitivity (P23) or/and envelope modulation (P45-49 and 55-59). Select a top key with P72. On samples with a flam (drums) try taking out the first note so there's a single hit (P60--save to disk first).

Write down your sampling parameters for each sound for later reference. You might want to re-sample with different settings to see what happens.

You may find, as I did, that all of the above parameters and their functions will come into focus as you use them in real-life situations. As a bunch of definitions on paper they tend to confuse. Experiment, listen to the results, and save the work you like so you can make comparisons.

Bio: Dave Caruso is the primary songwriter, keyboard player and lead vocalist for the Detroit pop-rock band Caruso, winner of several national songwriting competitions. Dave also writes jingles for radio

SAMPLER'S MENU

WARNING: Copyright laws insist that this material should only be presented for educational purposes. It is in everyone's best interest to be extremely well-informed by a copyright attorney before samples made from copyrighted material are used for any purposes other than learning your sampling instrument.

ARTIST	SONG	ALBUM	COMMENTS
DRUMS: SNARE			
Bryan Adams	This Time	Cuts Like A Knife	Flam
Chicago	Stay the Night	Chicago 17	
John Cougar Mellencamp	Play Guitar	Uh-Huh	
Face To Face	The 4th Watch	Confrontation	Slow-attack filtered cymbal into snare crash
Elvis Costello	The Greatest Thing	Punch the Clock	
Power Station	Some like It Hot	Power Station	
Talking Heads	Stay Up Late	Little Creatures	
Don Henley	Johnny Can't Read	I Can't Stand Still	Flam
Psychodelic Furs	Heaven	Mirror Moves	Flam
Nena	99 Luftbaloons	99 Luftbaloons	Snare/Clap
David Bowie	Dancing With The Big Boys	Tonight	
Arcadia	Goodbye Is Forever	So Red the Rose	
Squeeze	Big Beng	Cosi Fan Tutti Frutti	
Daryl Hall & John Oats	Bank On Your Love	Big Bam Boom	Bkwd snare into snare flam
TOMS			
Genesis	Like It Or Not	ABACAB	
Daryl Hall & John Oats	Cold, Dark, and Yesterday	Big Bam Boom	
INXS	What You Need	Listen Like Thieves	
Billy Idol	Crank Call	Rebel Yell	
KICK			
Power Station	Some Like It Hot	Power Station	
A-Ha	Take On Me	Hunting High and Low	
Billy Idol	Blue Highway	Rebel Yell	Kick with choked cymbal at end
FINGER SNAPS			
Queen and David Bowie	Under Pressure	Greatest Hits (Queen)	End of song
STICK CLICK			
REM	Wendell Gee	Fables of the Reconstruction	
INXS	Golden Playpen	Shabooh Shoobah	
RIM CLICK			
The Cars	Since You're Gone	Shake It Up	
HORN HITS			
Earth Wind & Fire	Jupiter	All 'N' All	Minor chord, tonic on top "dry"
Earth Wind & Fire	Rock That	I Am	Major chord, 3rd on top, reverb
Phil Collins	Behind the Lines	Face Value	Unison/octave
The Jacksons	Lovely One	Triumph	
Genesis	No Reply At All	ABACAB	
GUITAR			
Book of Love	I, Touch Roses	Book of Love	Distorted rock chord with echo

HACKERPATCH

THOMPSON TWINS BASS

By Roy Smith (Turtle Beach Softworks)

Do you ever get tired of DX7 bass sounds and sampled bass sounds? If you long for a good analog Mini-Moog type bass sound, this one's for you. It is loosely patterned after the bass sound used by the Thompson Twins. This patch is velocity sensitive and gets "punchier" the harder you hit the keys. For a more 70's sound, add resonance to the filter.

Program Name : TWIN1

Envelopes

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
1	+63	+37	+00	00	00	00	24	48	00	01
2	+63	+38	+00	00	00	00	13	25	38	00
3	+63	+30	-28	26	22	00	26	30	32	22
4	+63	+47	+00	63	63	00	10	50	11	21

Filter

Freq	Res	Kbd	Mod1	Amt	Mod2	Amt
000	09	19	ENV 1	+63	OFF	+63

Oscillators

	Oct	Semi	Fine	Wave	Mod1	Amt	Mod2	Amt
1	-1	00	00	SAW	LFO 1	+11	OFF	+00
2	-1	00	00	SAW	LFO 1	+11	OFF	+00
3	-1	00	00	SAW	LFO 1	+11	VEL 2	+00

Split/Layer

S/L	Prog	Layer	Prog	Split	Prog	Key
Off	INT 01	Off	INT 01	Upper	INT 33	60

LFOs

	Freq	Reset	Human	Wave	L1	Delay	L2	Mod
1	20	Off	On	TRI	00	01	00	WHEEL
2	12	Off	Off	TRI	63	00	20	OFF
3	12	On	Off	TRI	63	00	63	WHEEL

Modes

Sync	AM	Mono	Glide	VC	Env	Osc	Cyc
Off	Off	Off	00	Off	Off	On	Off

DCAs

	Level	Output	Mod1	Amt	Mod2	Amt
1	53	On	ENV 2	+49	OFF	+00
2	62	On	ENV 2	+35	OFF	+00
3	62	On	ENV 2	+35	OFF	+23

	DCA 4	Pan	PanMod	Amt
4	+58	08	OFF	+63

RC030127

SWELL BRASS

By Erick Hailstone (MIDI Connection)

This patch is a very thick brass setting. The attack is such that it will swell in volume for about one second with filter sweep accompanying the change in volume. It is a very good patch for background textures.

ESQ'1 PROGRAM SHEET PROGRAM: SW BRS

	OCT=	SEMI=	FINE=	WAVE=	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	0	0	SAW	LFO1	4	LFO3	0
OSC 2	0	0	1	REED	LFO1	4	LFO3	0
OSC 3	-1	0	4	SAW	LFO1	4	LFO3	0

	LEVEL=	OUTPUT=	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	0	On	ENV2	63	LFO3	0
DCA 2	0	On	ENV2	63	LFO1	0
DCA 3	0	On	ENV2	63	LFO1	0

	FREQ=	Q=	KEYBD=	MOD#1	DEPTH	MOD#2	DEPTH
Filter	39	1	1	ENV3	63	ENV4	4

	Final Vol.(ENV 4)	PAN=	PAN MODULATOR	DEPTH
DCA 4	53	8	LFO1	0

	FREQ=	RESET=	HUMAN=	WAV=	LI=	DELAY=	L2=	MOD=
LFO 1	22	Off	Off	TRI	0	1	18	WHEEL
LFO 2	16	Off	Off	SQR	0	1	20	WHEEL
LFO 3	16	Off	Off	TRI	0	0	20	WHEEL

	L1=	L2=	L3=	LV=	T1V=	T1=	T2=	T3=	T4=	TK=
ENV 1	62	8	20	0	0	0	50	63	20	9
ENV 2	63	49	45	0	0	0	50	63	35	9
ENV 3	37	56	44	33	1	35	25	35	25	0
ENV 4	63	63	63	0	0	0	24	63	25	0

	SYNC=	AM=	MONO=	GLIDE=	VC=	ENV=	OSC=	CYC=
Modes	Off	Off	Off	0	On	On	Off	Off

	Split/Layer=	Split/Layer Program	Layer=	Layer Program	Split=	Split Program	Split Key=
Split/ Layer	Off	0	Off	0	Off	0	60

CHANGE OF ADDRESS

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

GLOCKENSPIEL & ACOUSTIC GUITAR

By Rich Rozmarniewicz (Eltekon Productions)

GLOCKN: OSC 2 using a sine wave is the heart of the patch. OSC 1 & 3 are generating the bell/tine quality of the sound. Only a slight amount of modulation is being used at the output of DCA 4. If the patch is too high in frequency, transpose OSC 1,2,3 down to OCT=0.

ACGUIT: OSC 2 using a sinewave is the basis of the patch. OSC 1 is creating the metallic sound of the guitar. OSC 3 is being used to create a pick/pluck type of envelope.

Note: When entering the data, you'll notice that there are some zeros on some of the LFO's and ENV's. This was done to indicate that these pages aren't being used. Entering the zero actually isn't necessary.

ESQ'1 PROGRAM SHEET PROGRAM: GLOCKN

	OCT=	SEMI=	FINE=	WAVE=	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	1	0	0	BASS 2	OFF	0	OFF	0
OSC 2	1	0	0	SINE	OFF	0	OFF	0
OSC 3	1	0	0	BELL	OFF	0	OFF	0

	LEVEL=	OUTPUT=	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	13	On	ENV3	32	OFF	0
DCA 2	56	On	OFF	0	OFF	0
DCA 3	36	On	ENV2	63	OFF	0

	FREQ=	Q=	KEYBD=	MOD#1	DEPTH	MOD#2	DEPTH
Filter	41	3	21	ENV1	33	ENV2	3

	Final Vol.(ENV 4)	PAN=	PAN MODULATOR	DEPTH
DCA 4	63	8	LFO1	22

	FREQ=	RESET=	HUMAN=	WAV=	LI=	DELAY=	L2=	MOD=
LFO 1	22	Off	Off	TRI	2	1	0	LFO1
LFO 2	0	Off	Off	TRI	0	0	0	OFF
LFO 3	0	Off	Off	TRI	0	0	0	OFF

	L1=	L2=	L3=	LV=	T1V=	T1=	T2=	T3=	T4=	TK=
ENV 1	63	17	0	37	0	0	22	37	0	0
ENV 2	63	16	-6	0	40	0	45	33	0	41
ENV 3	61	-8	1	0	0	0	32	0	0	3
ENV 4	63	30	-4	50	42	0	44	38	0	19

	SYNC=	AM=	MONO=	GLIDE=	VC=	ENV=	OSC=	CYC=
Modes	Off	Off	Off	0	Off	On	On	On

	Split/Layer=	Split/Layer Program	Layer=	Layer Program	Split=	Split Program	Split Key=
Split/ Layer	Off	0	Off	113	Off	0	60

RC030127

ESQ-1 PROGRAM SHEET PROGRAM: ACGUIT

	OCT=	SEMI=	FINE =	WAVE=	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	0	0	0	SYNTH2	OFF	0	OFF	0
OSC 2	0	0	0	SINE	LFO1	1	OFF	0
OSC 3	0	0	0	SYNTH2	OFF	0	OFF	0

	LEVEL=	OUTPUT=	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	52	On	OFF	0	LFO2	5
DCA 2	62	On	OFF	0	OFF	0
DCA 3	43	On	ENV3	-63	OFF	0

	FREQ=	Q=	KEYBD=	MOD#1	DEPTH	MOD#2	DEPTH
Filter	34	0	8	ENV3	5	ENV1	44

	Final Vol.(ENV 4)	PAN=	PAN MODULATOR	DEPTH
DCA 4	63	8	OFF	0

	FREQ=	RESET=	HUMAN=	WAV=	LI=	DELAY=	L2=	MOD=
LFO 1	11	On	On	TRI	2	1	10	LFO1
LFO 2	22	Off	On	TRI	0	1	20	LFO1
LFO 3	0	Off	Off	TRI	0	0	0	OFF

	L1=	L2=	L3=	LV=	T1V=	T1=	T2=	T3=	T4=	TK=
ENV 1	63	63	0	63	29	0	0	33	0	1
ENV 2	0	0	0	0	0	0	0	0	0	0
ENV 3	63	29	1	0	22	0	0	0	37	43
ENV 4	63	17	2	59	0	0	45	31	19	46

	SYNC=	AM=	MONO=	GLIDE=	VC=	ENV=	OSC=	CYC=
Modes	Off	Off	Off	0	Off	Off	On	Off

	Split/Layer=	Split/Layer Program	Layer=	Layer Program	Split=	Split Program	Split Key=
Split/ Layer	Off	0	Off	0	Off	32	60

AN ORGAN PATCH WITH LESLIE FOR THE ESQ-1

By Sam S. Mims (Syntaur Productions)

It's fairly easy to attain a good organ sound on most synthesizers. What I wanted was to program an organ with a built-in Leslie including the speed control. Most synths allow a single-speed Leslie simulation (via the LFO) that can only be changed in speed by manually changing the LFOs frequency during performance - a nuisance at best with the newer "knobless" digital synths. With three LFOs available on the ESQ-1, I devised a scheme that would generate both fast and slow Leslie simulations, with the mod wheel acting as a slow/fast switch.

LFO-1 is set at a frequency of 17, for the slow spinning effect, and is always affecting the DCAs and the filter. LFO-2 is brought in by the mod wheel to also affect the DCAs, the filter and, additionally, the oscillators (very slightly). When the mod wheel is turned up, LFO-2 comes in and effectively "masks" LFO-1 by playing exactly in phase at exactly twice the frequency.

The versatile routing of the ESQ makes this set-up possible, but the realism of the effect is greatly enhanced by the ability to set both positive and negative effects of the modulation to give more of a spinning (Doppler) effect, rather than a straight vibrato or tremolo.

One problem with this patch is that the low end of the keyboard is just as affected as the high end by the simulated Leslie, a somewhat unrealistic effect since the highs from the spinning horn are much more noticeably affected by a real Leslie. Some possible solutions, though compromises at best, are: a) to use the keyboard scaling as the LFO-2 modulator, rather than the wheel, thus the fast Leslie is only on the high keys (but is always on them), or b) to use velocity as the LFO-2 modulator, giving more complete control, at the expense of having to learn to play hard when you want fast Leslie, and soft otherwise.

If you're just playing right-handed organ parts, with the left hand on the wheel, the patch is quite effective. It's a pretty good simulation of the real thing - and it sure weighs less!

ESQ-1 PROGRAM SHEET PROGRAM: "LESLIE"

	OCT=	SEMI=	FINE =	WAVE=	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	00	00	OCT+5	LFO2	+00	OFF	+00
OSC 2	+0	00	03	OCT+5	LFO2	+01	OFF	+00
OSC 3	+1	07	00	OCTAVE	LFO2	-01	OFF	+00

	LEVEL=	OUTPUT=	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	52	On	LFO1	+16	LFO2	-06
DCA 2	45	On	LFO1	-03	LFO2	+07
DCA 3	00	On	ENV1	+63	LFO2	+08

	FREQ=	Q=	KEYBD=	MOD#1	DEPTH	MOD#2	DEPTH
Filter	017	07	40	LFO1	-07	LFO2	+10

	Final Vol.(ENV 4)	PAN=	PAN MODULATOR	DEPTH
DCA 4	63	08	LFO2	+10

	FREQ=	RESET=	HUMAN=	WAV=	LI=	DELAY=	L2=	MOD=
LFO 1	17	On	Off	TRI	41	00	00	OFF
LFO 2	34	On	Off	TRI	00	00	63	WHEEL
LFO 3	00	Off	Off	TRI	63	01	20	WHEEL

	L1=	L2=	L3=	LV=	T1V=	T1=	T2=	T3=	T4=	TK=
ENV 1	+63	+58	+55	00	00	00	07	08	20	00
ENV 2	+23	+00	+00	00	00	00	12	00	20	00
ENV 3	+63	+08	+00	08	00	00	50	63	20	09
ENV 4	+63	+63	+63	00	00	00	29	00	06	00

	SYNC=	AM=	MONO=	GLIDE=	VC=	ENV=	OSC=	CYC=
Modes	Off	Off	Off	00	On	Off	Off	Off

	Split/Layer=	Split/Layer Program	Layer=	Layer Program	Split=	Split Program	Split Key=
Split/ Layer	Off	--	Off	--	Off	--	60

SOUND REVIEWS

ENSONIQ SOUND DISKS 22A & 22B

By Erick Hailstone

These are the best strings sounds I have heard on the Mirage. A new technique called Free Running Loops allows a loop to be created that is virtually undetectable. To be able to do this with strings is amazing. One of the tradeoffs for employing this technique is that the user cannot send upper samples to lower locations and vice versa, hence an A & B disk, mirror images of each other. Apparently a new operating system is the source of these super loops,,,but WAIT!! Don't go bugging Ensoniq yet. This modified operating system is a Pandora's box that has enough side effects to throw most of us in the trash. Someday there may be a version of this available but a lot of thought is required before that point is reached.

SAMPLE 1
Lower & Upper: Low & High Strings Bowed

L1/U1: This is a string ensemble. It bares no similarity to the strings on sound disk 3. The differences are amazing; no detectable loop points, absence of noise, better frequency response, more inner detail. You can hear the bow pulling across the strings. Velocity controls brightness and brings the bowing noise out front. The sequence used here is "Eleanor Rigby" and if you've heard the Beatles version than this will give you some notion of the size of the ensemble.

L2/U2: Exactly the same only an octave lower.

L3/U3: The same as L1/U1 only the release time has been lengthened. After you let go the notes hang on briefly. This creates the ambience of a large hall with natural reverb.

L4/U4: The same release time as L3/U3 but is an octave lower.

SAMPLE 2
Lower & Upper: Low & High Strings Pizzicato

L1/U1: The sequence is from the movie "Fantasia". Yes, this is cartoon stuff. To start off with this is a very clean sample with a lot of character. Velocity controls how hard the strings are plucked. This is ensemble strings again. Being Pizzacato it naturally decays very fast. The mod wheel allows you to mix this Sample with one an octave higher. Pushed all the way forward you get the higher octave and in between you get a mix of both samples.

L2/U2: Appears to be exactly the same as L1/U1 but up an octave and the mod wheel has no effect.

L3/U3: The attack and filter settings are altered to give a softer attack. The mod wheel's function is identical to L1/U1.

L4/U4: This sound is not as bright as the others and decays even quicker resulting in a more muted sound. The mod wheel is the same as L1/U1.

SAMPLE 3
Lower & Upper: Low & High Strings Tremolo

The sequence here is just great. If you can pipe this music into the bathroom while your spouse or a friend (or both) is showering (if they scare easily take out a large life insurance policy) they will be treated to the theme music from the shower scene in the movie "Psycho". What a perfect way to start the morning.

L1/U1: This is also an ensemble. The note starts without tremolo. Almost immediately after the note begins tremolo occurs. The tremolo is moderate to fast 16th's. This sound is perfect for doing background music for the Lone Ranger or any type of serial; perfect for "Raiders of the Lost Ark".

L2/U2: Is the same with this exception: after you strike the note it performs a decrescendo (the volume of all instruments decreases together). The intensity of this effect is controlled by velocity. The harder your touch, the more pronounced the decrescendo and when touched lightly you barely notice it.

L3/U3 is just the opposite of L2/U2.

L4/U4: has a medium release with chorusing added and a slight filter sweep (whoosh). Unlike the previous sounds this one sounds slightly synthesized.

This disk knocks me out. It just sounds tremendous. In comparison to all the other string sounds I have heard for the Mirage it's like this one is in focus and the others are all blurred.

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

THE INTERFACE

Gentlemen:

As a daily user of some fairly "High Tech" video equipment in my job and also as the owner of a home computer sequenced MIDI studio which includes several digital and analog instruments along with a Rack Mirage I'd like to express my opinion and give some advice to those who are constantly berating the performance of the Mirage, or any other device.

1). I had some problems with juggling samples and moving them around etc. Instead of writing letters, I sat down with TH #6 and a little common sense and figured out for myself (with Clark's help) how these things work.

2). I had some problems with driving the Mirage from the sequencer in the Sequential Multi-trak which I use as a "scratch pad," and discovered that they were usually eliminated by disconnecting MIDI in to the Multi-trak. Occasionally I'll still get a stuck or skipped note, but when I recorded the Multi-trak sequence into my computer (C-64 with Passport Master Tracks) it plays back fine. I assume this has something to do with the path the MIDI signal follows, occasionally jumbling the signal.

3). I was a little concerned with the quality of samples I was getting until I worked at it a while and now I'm able to get respectable samples without a VES or ISF. Also, I've found I can use samples, which I initially just did for practice, in demos of songs as they were because in context they sounded great even though in isolation they were questionable.

4). I've had nothing but compliments on the factory disks, both alone and in the mix and I think they're great and very useful. I'd hate to have to constantly be hiring horn sections.

To sum up, let me say that I've seen time and again where people will blame the equipment not working properly when in reality they just don't know how to use it. So, whether it's a camera, VCR, Mirage, DX-7, computer or whatever, make sure that you've exhausted all possibility that you're missing something that you should be doing before you blame the equipment.

As my Uncle used to say, "It's a poor carpenter who blames his tools."

Sincerely,
Nick Toth
New Haven, CT

[Ed. - While this may be the case in some situations, I think most of the folks writing for help aren't "blaming" the equipment - they're just exercising one of the steps in "exhausting all possibilities that they're missing something." Also, as far as the "wouldn't it be nice" aspect of some letters - we're actively soliciting this type of info. It's not just complaints, it's marketing feedback gathered in the hope that it'll influence the design of the "Mirage II" or trigger some third party to start selling memory expanders, alternate operating systems, stereo mods, or whatever.]

Dear Hacker,

When will Ensoniq put a quality acoustic guitar sound on disk?

Ronald Johnson
S. Portland, ME

[Ed. - We think the one they have is pretty terrific.]

[Ensoniq's response - What can we say? For the most part, we've gotten nothing but compliments on the acoustic guitars on Sound Disks 5 and 23. The most important aspect of simulating an acoustic guitar is the playing techniques. Unfortunately, most keyboard players are not trained to play a keyboard using guitar techniques. This includes pitch bending, vibrato, appropriate chord structures, and strumming. Most people who don't find our guitars convincing change their minds when they hear the demo sequences.]

Dear Hacker:

How about some comments on the following items?

1). An auto-formating program. Could this be handled like the disk-formatting program, where the entire memory of the machine is devoted to this one task? The scenario I see is this: I boot up the Mirage with the auto-looping program, then I insert a disk with my sample on it. The loop points have already been approximated by ear. I instruct the Mirage to load the appropriate wavesample and to execute the auto-loop program. The machine then locates my approximate loop points and scans the memory within a few pages plus or minus of my points to find the nearest zero crossing and sets these as new loop points. I can then listen to the result and decide if I like it. I realize this wouldn't always work, but for those of us who simply can't afford a computer and VES, it would sure beat the heck out of trial and error.

2). In lieu of the above, is there some way to get the display to actually read out the value of a specific sample? This would make finding a zero-crossing a bit easier.

3). How about a way to hear the portion of the sample after the loop upon the release of a key? Some wind instruments have a slight pitch drop at the end of notes that could be captured this way.

4). LFO Delay? This is such an essential ingredient in so many sounds that I can't imagine why it was left off in the first place!

Keep up the good work!
Allen Green
Nashville, TN

[Ensoniq's response - Unfortunately, "zero-crossing" and even "zero-slope difference" autolooping doesn't work in most cases. (Try using "autolooping" on most products that offer it - it simply doesn't work.) The only universal looping method is cross-fade looping, but this requires extra digital processing which is only available for the Mirage when using a visual editor. Even then, there is no fixed algorithm which ensures a perfect loop. It still requires trial and error.

Regarding #3: The Mirage architecture isn't designed to do this.

Regarding #4: The mod wheel can easily be used for delayed vibrato. None of the Mirage library sounds have vibrato programmed into them as it tends to be a performance technique on most sounds.]

Hacker:

"Software Based Synthesizers" by Robert Pejril and others are beginning to unlock the full potential of the Mirage. However, none seem to allow the richness of harmonics to be determined by the pitch of the note played. Clark Salisbury, in his review of Robert [Ronald] Pejril's software, neglects to tell us whether or not the resulting waveforms sound good across all five octaves of the Mirage. My guess is the software really needs to generate up to 16 waveforms for each sound.

Any software based synthesizer, whether additive, FM or whatever, ought to allow the user to specify some parameter(s) which will vary the richness of harmonics across the keyboard and thus fully exploit the ability of the Mirage to store and play multiple waveforms.

Wish list for the Mirage: A function that will take each group of "n" consecutive samples in memory from a source, compute the average of each of the groups into consecutive memory locations in a destination. "n" could be any number.

Sincerely,
John C. James
Wilkes Barre, PA

[Clark's response - regarding playing the wavesample over all five octaves: synthetic wavesamples shouldn't be any different than sampled ones (just cleaner and with better loops) - it'll just depend on what you've created and what you're after whether or not it sounds "natural" over the entire keyboard. Some will, some won't. I didn't have the time to try to generate 16 different samples and do any comparisons, but the disk that comes with the program had some examples on it - and they sounded fine. (DX-7 type of stuff.)]

Dear Hacker:

Many effects units are now MIDI which use program change commands to control them through MIDI. They are numbered 0 - 127. My operating SYS 3 update allows for transmitting MIDI program changes. I found a small difference in program change numbers. I got 12 - 15 instead of 13 - 16 as stated in the Specs. Was this an error? I was using the Roland SRV-2000 Midi Reverb.

When I was MIDIed up to a friends DX-7 my Mirage was trying to keep up with him sliding his hand across the program change buttons. Parameter 84 should fix that. Looks like we have 12 program change commands.

Hypersonic please be on the look out for the new Sony D.A.T. Recorders that are C.D. quality Audio Tape Recorders. Newsweek Magazine said they will be out in '87. What features will they have that would be useful in a home studio? It would be nice to cut master tapes at C.D. quality.

My friend is having trouble with his Mirage. Basically, it was a problem that existed from day 1. He had to go back for service 8 times. Almost every problem stemmed from incompetence in servicing it. They kept telling him it's working when he made it is obvious that it wasn't. It's been in and out since May. Plus at least 400 miles of traveling so far. They replaced the main board and didn't set the new voltage properly and fried the disk drive, for example. He is one of the most avid Mirage fans around but the Ensoniq authorized service is so incompetent he is totally frustrated because he has had to work without a Mirage for several months now. The service center is in Mt. Prospect IL. I am sure he will eventually call Ensoniq on this. He is a member of my user group and asked that I leave his name and address; Joe Kohler, 1429 June Lane, Lombard, IL 60148.

How about these sound effects disks that Ensoniq is putting out? Why haven't we heard about them?

Can the modification to make the Mirage 8 out or stereo out be done without voiding the Ensoniq warranty?

Thank you for giving us users a format in which to voice our ideas and
concerns. I wish I could have downloaded this file to your computer!

Best wishes from us Hackers,
John Adams
Lombard, IL

[Ensoniq's response - As shown in the Version 3 OS manual, we refer to program numbers from 1 through 48 to maintain compatibility with the DX-7. The true MIDI program numbers range from 0 through 47 - one less than the numbers given in the DX-7 chart. (See the second chart in the Version 3 manual.) Given all possible combinations of loading and switching programs on the Mirage, there are actually 48 program change commands (again, see the chart).

We try to insure that all of our authorized service centers are technically competent. The only way for us to be sure is via customer feedback. If you have any experience with field service - good or bad - please let our customer service department know.

The sound effects disks for the Mirage were never available as items sold by Ensoniq.

Regarding the stereo mod - this isn't covered. Any modifications not authorized by Ensoniq and/or installed by an authorized service center will void the warranty.]

Dear Sirs:

Please add my name to the presumably long lists of ESQ-1 owners who would like to see a "MIDI - soft" or similar arrangement added or revised into their units.

I am a guitarist and as such I appreciate the MIDI Mode 4 implementation of the ESQ-1, but can not presently use it to create and playback sequences using any other voice generators other than the eight internal ones unless I repatch for every listen/perform pass. Hopefully this can be addressed in a software revision?

Sincerely yours,
Paul Asbell
Burlington, VT

[Ensoniq's response - What you really need is a combination MIDI thru box with a merger to merge your control data with the sequencer output. Without a merger, you would still need to repatch each time.]

Dear TH:

A few comments for your readers that may be of use.

Issue #16/23 - Regarding Yamaha QX7: I have experienced similar problems to those of Bob Natalini with a variety of sequencers, including the QX7. Missing bars, stuck notes and total jamming of the whole sequence. However, since using O.S. 3.2 have not had any problems.

Another common problem has been MIDI clock problems but since O.S. 3.2 none of these have occurred either and MIDI synching with Drum Machines and other sequencers has been fine.

The "4 note" problem has never occurred in my experience with the QX7 or any of the other common sequencers I have worked with, with the Mirage (i.e., QX7, QX21, CX5, QX1, Korg SQD-1, Roland MC-500). It does commonly occur at the record mode on a QX7 if 2 MIDI cables are connected simultaneously to the Mirage (in to out; out to in) and ECHO BACK is turned ON. What happens is that what is being played on the Mirage into the QX7 is also being sent back to the Mirage resulting in each note being played twice (this does not necessarily occur only with a QX7 though).

I have just tested a Mirage/QX7 combination with quantisation of up to eight notes at a time at maximum QX7 tempo and experienced no problems with irregular timing. Two of my customers operate the same system with no difficulties - always using O.S 3.2, ECHO BACK off (or alternating "local off" on the Mirage-P30 where other synths may be in the system). Sorry I can't be of more help.

As a last resort you may like to try to get hold of a Japanese manufactured Mirage which is what we use here in New Zealand as these seem to cause none of the problems you are having. Theoretically, there should be no difference internally but if you have tested a number of U.S. manufactured ones and still found the same problems then this is a slim possibility.

Issue #13/18 - Sequencer Timing: Regarding Jeff Cunningham's problems with the timing of the sequencer end by pushing the stop button, I always push the "play" instead which means that the sequence instantly starts again. It's easy to tell if you have timed the sequence loop right because you hear the join immediately without having to hear right through the sequence again. (This may also help Jim Dulaney - Issue #12/15).

Sustain Pedal: Anyone wanting a better sustain pedal might try using a Korg DS-1 which is a little more substantial.

Yours faithfully,
Warren Sang
Synth Systems Dept
New Zealand

[Ensoniq's response - There is no difference in system hardware or software between the Japanese and the US Mirage. We can't stress strongly enough the importance of using the latest operating system in your Mirage. One of the reasons we made the OS disk-based was to allow improvements in the software.]

Dear TH,

In a recent issue of the Hacker, a schematic was printed to drive the horizontal input of an oscilloscope and drive the vertical with a Mirage. I have built the boards, purchased all the components and assembled the project. I'm left with three problems:

1) No pin-outs on the schematic for U7 or U8 going to U5 or U6.

2) No chip # given for the clock. A 1 meg clock is hard to find. This is my biggest problem.

3) Moving S1 or S2 has no effect on the picture on the scope.

I am not a keyboard player, I'm a guitar player and I've never needed a digital circuit until now. I was convinced to build this for our local music store and I would really like to make it work. If it's possible, pass this on to him or someone knowledgeable with digital electronics as I need help!!

Thank you,
Paul Tyrrel
Lincoln, NE

[Joseph Palmer's response - I'm glad somebody's building one! The Hacker left out the pin numbers on U7 & U8. (Ed. - We were just checking to see if you were paying attention.) The correct wiring is as follows:

U5, pin 9 to U7, pin 11
U5, pin 11 to U7, pin 12
U5, pin 13 to U7, pin 13
U6, pin 1 to U7, pin 14
U6, pin 3 to U8, pin 11
U6, pin 5 to U8, pin 12
U6, pin 9 to U8, pin 13
U6, pin 11 to U8, pin 14

Regarding question #2: Unfortunately, there's no easy part number for the 1 MHz clock. Fortunately, they are made by several manufacturers. They usually just have the name of the manufacturer and "1.000 MHz" printed on them. The one I have comes in a little rectangular metal can, .4" x .8" x .15", with four pins. The four pins plug into what would be pins 1, 7, 8, and 14 of a 14-pin IC socket. You give it +5 v on pin 14, ground on pin 7, and a 1-MHz square wave comes out of pin 8. (No connection on pin 1.) These are available at many computer/hobby stores or from JDR Microdevices (they usually have an ad in the back of BYTE magazine).

Regarding question #3: (How did you get to this without knowing #1 & #2 ?) Anyway, it may not be clear in the schematic, but if Switch 1 is in the "0" position, there should be contact from U3, pin 1 to U5, pin 3. If it's in the "1" position, there should be contact between U3, pin 2 and U5, pin 3. (Remember, Switch 1 is the high digit of Parameter 73 and Switch 2 is the low digit.)

If you've fixed up the problems mentioned and you (or anyone else) still have troubles, give me a call at (415) 949-3353 between 6 and 10 pm California time.]

Dear TH (Clark),

Thanks again for your positive reaction to my software product. I am pleased overall with your evaluation, however, I'd like to clarify just a point or two....

You are correct in your finding that MASS requires MASOS to function. I assumed that the Mirage would support its own system exclusive code regardless of the operating system one boots with. Apparently, no matter how much sense that assumption makes, it remains incorrect. It seems that MASOS is necessary to send any sample data using MIDI to the Mirage, regardless of the software employed.

You are also correct, in part, in your evaluation of the envelope generators. I call these generators "six stage" meaning six parameters are involved in setting up the envelope. This is a grammar I've been accustomed to; however, others would call this a "three stage" envelope generator due to the fact that there are three discrete levels at which the envelope changes "slope".

The ATT, D1, and D2 parameters, however, do not refer to the amount of time taken to achieve each level. These parameters reflect ratios of time with respect to the overall length of the sound (in samples). This means that the oscillator with the longest overall envelope (simply add ATT, D1, and D2 - or look at the 3d page) will occupy (n-stablepages) pages of memory where n = the total number of pages and stablepages is the number of loop pages you set aside with stable envelopes. This is in stark contrast to other software synthesis programs which attempt to represent the sound in terms of seconds. I believe mine is easier to use in this respect, dealing with sound in terms of memory used instead of time (which is arbitrary in the sampler anyway), and certainly easier in terms of looping, because integer multiples used for the FREQ parameters will always yield perfect one page loops, regardless of envelope.

One final note: MASS is now running close to 50% faster due to a lot of cleaning up in the envelope "lookup" function and FM synthesis for the APPLE II/Mirage will be coming in a matter of a couple months, It will be made available at a special promo price to registered owners of MASS. Thanks again for your objective approach!! Keep hacking.

Yours truly,
Ronald (not Robert) Pejril
The Graduate College
Princeton, NJ

[Clark's response - Thanks for the additional info. Glad to hear about the speed increase.]

[Ensoniq's response - The data transfer codes are used only when sample editing and are therefore only included with MASOS. The standard operating system is performance oriented and uses this memory space for the sequencer and more performance MIDI features.]

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

BULK RATE
U.S. POSTAGE
PAID
PORTLAND, OR
PERMIT NO. 913

DATED MATERIAL - TIME VALUE

REQUESTED MATERIAL - PLEASE FORWARD

Editor: Eric Geislinger
Associate Editor: Jane Talisman
Technical Advisor: Clark Salisbury
Applications: Erick Hallstone

Advertising Rates: Please send for rate card.

Rates for Authors: 4 cents/word upon acceptance.

TRANSONIQ HACKER, 5047 SW 26th Dr., Portland, OR 97201.
(503) 245-4763.