Transoniq Hacker

The Independent News Magazine for Ensoniq Users

The SQ-1 and Subtractive Synthesis

Clark Salisbury

In terms of basic programming techniques, the SQ-1 follows more or less in the tradition of subtractive synthesis although there are elements of other forms of synthesis that come into play. Subtractive synthesis is a technology dating to the golden age of synthesis, back when the Minimoog was king and ARP was an upstart company. Subtractive synthesis has remained a viable technology to this day primarily because of the ease with which sounds can be created and because of its great flexibility.

The theory of subtractive synthesis is quite the opposite of additive synthesis discussed this last installment. Rather than creating complex sounds by combining simple sine waves, as with additive synthesis, we start with complex waves and subtract those components in the sound that we don't need. In other words, to create a clarinet sound first we'd start with a complex wave, perhaps a SQUARE wave. Within this wave are contained the harmonics needed to produce a reasonable imitation of a clarinet wave, but there are a number of other harmonics as well. These additional harmonics make the raw SQUARE wave too bright and buzzy to sound much like a clarinet, but if we subtract some of the upper harmonics we come much closer to obtaining a clarinet-type sound.

Basic Architecture in Subtractive Systems

The basic SQ-1 voice presents almost a classical subtractive synthesis signal flow. Sound originates with the wave (in classic subtractive systems, such as the Minimoog, this corresponds to the oscillator), moves to the filter (where upper and/or lower harmonics are "filtered out," or removed), then to the amplifier (where the overall dynamic contour of the voice is shaped), and finally to the output. In the SQ-1 the output is routed to the digital effects processor, presenting a minor departure from classical subtractive systems.

Wavetable and L/A Synthesis

One of the basic limitations in early subtractive systems was the difficulty involved in generating complex sounds. The original subtractive systems used analog oscillators which were capable of producing only a limited range of waveforms. Typically, only three or four basic waves, such as the sawtooth, sine, triangle and square waves, could be produced by an analog oscillator.

Not too many years ago, the idea was put forth that in place of the analog oscillator used in subtractive synthesizers, why not use digital wavetables—complex waves that could be derived from sampled data or generated on computers. This partially solved the problem of how to get complex sounds out of subtractive systems, but led to another problem which was that these wavetables could take up large amounts of memory. The earliest wavetable synthesizers used short wavetables in order to conserve memory, but as anyone familiar with sampling knows, looped short waves can be rather static sounding.

A partial solution to these problems was found in L/A synthesis. Basically, the theory behind L/A synthesis is that you don't need to stuff an entire wave into a synthesizer's memory. If you sample just the attack portions of sounds, and then graft them to the beginnings of more traditional synthesizer waves, you'll get a sound that

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seems quite complex but which takes much less memory than a sound based entirely on sampled data. The other obvious advantage is that the synthesizer now has the ability to generate musically interesting hybrid sounds—sounds which retain some of the complexities of sampled sound, but also have some characteristics of synthetic sounds.

Architecture of the SQ-1

The SQ-1 has the capability to combine all three of these technologies in the creation of sounds—its basic voice follows the blueprint for traditional subtractive synthesizers, but with many more choices of waves. There are traditional analog-type waves available—the trusty sawtooth, square and sine waves—as well as sampled and digitally generated wavetables, as might be found in wavetable synthesizers. There are sampled attack transients, as might be found in L/A systems, but any of the waves can be shaped into an attack transient if you feel like doing serious L/A style programming. And the addition of waves with dynamically changeable timbre—the transwaves—helps to give the SQ-1's sound a richness and movement not possible with any of the systems discussed so far.

Modulation

Perhaps one of the most important concepts to come to terms with when learning to program synthesizers is the concept of modulation. To modulate something, simply put, is to change it. We can modulate pitch, for example, to create pitch bends or vibrato. We can modulate the amplifier to shape the loudness of a sound and control how that loudness changes aver time. Filters can be modulated to control how a sound's harmonic content changes over time. Without modulation, the sounds produced by the new electronic instruments would be pretty dull and static, not unlike the sounds we produced in our brief adventure with additive synthesis last installment.

It is in the area of modulation that the SQ-1 excels. Not only are there a lot of choices for things to modulate in the SQ-1, but there are a lot of things to modulate them with and a lot of ways to control the modulation. So to get a handle on modulation, let's take a look at one of its more basic applications on the SQ-1, vibrato.

Vibrato, as you no doubt know, is a smooth, more or less subtle shifting of pitch up and down around the root pitch being played. The right kind of vibrato does much to add to the beauty of a sound, particularly solo sounds.

When creating a vibrato effect, as with any of the modulation effects, we must take into consideration three things: what is being modulated, what it is being modulated with, and if and how the modulator itself is being controlled. In the case of vibrato, these things may seem fairly obvious (although this will not be the case with every form of modulation you may encounter). Most obvious would be what it is we need to modulate—for a vibrato effect, we need to modulate the pitch. In the SQ-1, pitch modulation is a function of the 'Pitch' bank, so it follows that our modulator will need to be applied here.

Next we will need to determine what it is we will be using as a modulator. Since, theoretically, we are on the trail of a vibrato type of effect, we will select a Low Frequency Oscillator—or LFO—for this chore. LFO's are particularly suited to producing cycling, repetitive changes to some aspect or another of a sound and we'll be spending more time with them in a later installment. LFO's are accessed, logically enough, through the "LFO" bank.

Finally, we will need to determine if we wish to control some aspect of the modulation (such as vibrato depth or rate, for example) in real time or perhaps from some other controller. The most common application for vibrato would have the depth of the vibrato effect controlled by the mod wheel, although there are other choices for ways to control LFO depth. So we might want to take into account some of the ways that an LFO itself can be controlled and determine if any of them are applicable to our needs.

You can see that the basic approach to modulation is pretty straightforward. First, determine what it is you wish to modulate. Next, you'll need to decide what to use for a modulator, and finally, how (and if) you'll be controlling the modulator itself. Let's elaborate.

In the SQ-1, there are three basic areas where you might want to think about the application of a bit of modulation—pitch, tone color, and volume. Pitch modulation is accomplished via the "Pitch" bank of the SQ-1, where you can choose which of the various modulators you might want to apply to whatever voice you're working with. Tone color modulation is normally accomplished from the "Filter" bank where upper and/or lower harmonics can be filtered out. And finally, affecting changes to a sound's volume over time (or in real time) is accomplished via the "Output" bank. Here you can use any of the modulators to control how a sound's volume might change over time.

The SQ-1 also allows for modulation in some rather more esoteric ways. For example, the start point of a wave can be modulated from the "Waves" section, or the start and end points of the "Transwaves can be simultaneously modulated to create some beautiful effects. Also, you can modulate LFO rate and depth from any of the modulators, allowing you to create some very expressive patches. Not to mention the myriad possibilities available for modulation in the effects section. But for now, we'll be sticking to the more basic concepts—we'll be getting into all these other areas soon enough.

Once you've determined what it is you want to modulate, you'll need to select an appropriate modulator. Standard LFO's and envelopes are available, as well as velocity, keyboard position, an external pedal, and the pitch and mod wheels. You can select "Noise," which provides a random, somewhat unpredictable modulation, or "XCTRL" (external controller), which gives you a way to route in controllers from external sources via MIDI. Other controllers include pressure, timbre, and "Max On."

Don't worry—we're not going to try to cover all of these possibilities right now. Suffice it to say that a lot of options exist. For now, the important thing is to get onto solid ground with the basic concept of modulation. And as usual, we'll try to accomplish this by example.

Direct Dialing

Before we move into the nitty-gritty here, I think it's time to get familiar with the concept of "direct dialing" on the SQ-1.

Up until now, we've been accessing menu displays in the SQ-1 by

(Continued on page 4)

Front Panel

RND (♪♪♪)

News from the Hacker

Not too much news this month. You must have noticed the new cover layout. Once we got going on making changes it was hard to stop. (Of course, this makes Issue #68 a one-of-a-kind collector's item...)

Time for another call for fresh blood—we're looking for articles on the VFXsd and SQ-1 in particular. We also need Hackerpatches for both of these instruments. If you're interested in doing sound reviews for either one of them, please give us a call.

TRANSONIQ-NET
HELP WITH QUESTIONS

ALL ENSONIQ GEAR - Ensoniq Customer Service. 9:30 am to 6:30 pm EST Monday to Friday. 215-647-3930.

HARD DRIVES & DRIVE SYSTEM - Rob Feiner, Cinetunes. 914-963-5818. 11 am - 3 pm EST.

EPS QUESTIONS - Erech Swanston, Maestro Sounds. 718-465-4058. Call anytime. (NY) If message, 24-hr callback.

VFX QUESTIONS - Sam Mims, Syntaur Productions. 818-769-4395. (CA). 10 am to 11 pm PST.

SEQUENCING - Larry Church, Danlar Music, 503-692-3663. Call anytime.

SQ-80 QUESTIONS - Michael Mortilla, 805-966-7252 weekends and after 5 pm Pacific Time.

EPS & EPS-16 PLUS QUESTIONS - Garth Hjelte. Rubber Chicken Software. Pacific Time (WA). Call anytime. If message, 24-hour callback. (206) 242-9220.

ESQ-1 AND SQ-80 QUESTIONS - Tom McCaffrey. ESQUPA. 215-830-0241, before 11 pm Eastern Time.

ESQ-1 QUESTIONS - Jim Johnson, (503) 684-0942. 8 am to 5 pm Pacific Time (OR).

EPS/MIRAGE/ESQ/SQ-80 M.U.G. 24-HOUR HOTLINE - 212-465-3430. Leave name, number, address. 24-hr Callback.

SAMPLING & MOVING SAMPLES - "Mr. Wavesample" - Jack Loesch, (201) 264-3512. Eastern Time (N.J.). Call after 6:00 pm.

MIDI USERS - Eric Baragar, Canadian MIDI Users Group, (613) 392-6296 during business hours, Eastern Time (Toronto, ONT) or call MIDILINE BBS at (613) 966-6823 24 hours.

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

SQ-1 QUESTIONS - Pat Finnigan, 317-357-3225. 8:00 am to 10:00 pm EST.

HYPERSONIQ
NEW PRODUCT RELEASES

Electro Acoustics has released a set of new sounds for the Ensoniq EPS. This ten disk set consists entirely of sampled analog synthesizers, including the ARP 2600 and others. The sounds are unique synthesizer sounds rather than imitative sounds and are of an Avant-Garde or New Music character. There are a total of 24 different waveforms in the set, in 48 layers and 16 instrument files. Disks contain an average of 1132 blocks. Most instruments are looped, all use velocity, pressure and modulation wheel control in a variety of ways, and all are programmed in stereo. Great care was used in programming—these are not just raw samples. Each set comes with four pages of programming descriptions and playing suggestions. This set is compatible with both 12 and 16 bit EPS samplers. All instrument files will load into standard memory; no expander is required. $89.95. Additional info: Electro Acoustics, 1240-B Calle de Comercio, Santa Fe, NM 87501, phone: (505) 473-4318, or MacBeat: 1-800-622-2328 or 1-800-622-2354.

BACK ISSUES

Back issues are $2.50 each. 5 – 20: $2.00 ea. 21 & up: $1.75 ea. (Overseas: $3 each.) Issues 1-9, 11, 13-23, 27, 29, 30, 36, and 38 are no longer available. Subscriptions will be extended an equal number of issues for any issues ordered that are not available at the time we receive your order. ESQ-1 coverage started with Issue Number 13. SQ-80 coverage started with Number 29, (although most ESQ-1 coverage also applies to the SQ-80). EPS coverage started with Number 30. (But didn't really get going till Number 35.) VFX coverage got started in Number 48. The original VFX patch sheet was published in Issue #55. Permission has been given to photocopy issues that we no longer have available—check the classifieds for people offering them.

Tested and Approved Hard Drives for the EPSs

Note: The drives listed below are known to be compatible with the EPS and EPS-16 PLUS *at the time of testing*. Changes in firmware or hardware by drive manufacturers may make later versions incompatible (with the exception of **PS Systems** and **Eltekon** whose drives are configured to work specifically with Ensoniq products). Drives *not* included on this list may also work just fine. For up-to-date information about specific drives call Ensoniq Customer Service: 215-647-3930.

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CHANGE OF ADDRESS

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

selecting the edit bank we're interested in, such as the "Wave" bank, and scrolling to the menu we want. But there's a quicker way to navigate—we can think of it as "direct dialing."

You see, each of the menus in an SQ-1 edit bank has a number. This allows you to access any menu simply by pressing the edit bank button for the group of edit functions you want, and then pressing the number button which corresponds to the specific menu you are looking for. For example, if you want to go directly to the "Edit Voice" menu, simply hit the "Edit Sounds" button, the "Wave" button, and then the "screen 0" button. Since the "Edit Voice" menu is the first page of the "Wave" edit bank, pressing the "screen 0" button will take you directly there.

Don't worry about memorizing which screen buttons go with which pages—you can still scroll to find the pages you want. But as a convention, from now on we will be direct dialing to get to menus—it will help to get familiar with the internal structure of the SQ-1 and to assure that we're all on the same beam when navigating around the SQ-1 programming parameters.

The Nitty-Gritty

Now back to modulation. First, we'll need to select a sound to work with. The ROM sound called "French Horn" (program 13) should provide us with a good basic starting point—it has no crazy envelopes to deal with, no wacky filter sweeps, and the sound sustains long enough for us to hear any changes we make without having to repeatedly strike the keys.

First, we'll need to make sure that we're dealing with the correct voice—in this case, 'voice one' is the only one used in this program. We can verify this by hitting the "Edit Sounds" button, hitting the "Wave" bank button, the "screen 0" button and checking out the status of the "Edit Voice" page. You should be seeing the following in the display window:

"EditVoice=ONE
ON OFF OFF"

and the word "ON" in the lower corner should be flashing, to indicate that voice one is selected for editing. If it isn't, simply scroll until it is.

Now that we've selected the voice we'll need to route the LFO to it. Since we're after vibrato, and vibrato is a type of pitch modulation, it stands to reason that the "Pitch" bank is where we want to be. Click the "Pitch" button, and then the "screen 1" button to 'direct dial' to the "Env1/LFO/Mod Source and Amount" page. You should be seeing the following display:

Env1=+00 LFO=+01
Mod=NOISE * +02

These are all modulation inputs to the pitch of the current voice. Env1 and LFO are "hardwired" to control pitch mod—they appear as modulation sources along the upper line of the display, and can't be changed. The numbers showing next to them, however, can. These represent modulation amounts for the LFO and Env1. For now, select each of these parameters and set it to +00—we're going to be manually routing the LFO in so it will become obvious exactly how it's done. Now scroll to select the "Mod=NOISE" parameter (it should start flashing) and use the data slider and up/down arrow buttons to set it to "LFO"—the display should now show "MOD=LFO." You've just routed the LFO to control pitch modulation!

Next, scroll one more tick to the right (this will select the "Mod amount" parameter), and use the data entry slider/buttons to select an amount between -99 and +99 (modulation can be either positive or negative). Try a value of +50 for now. The SQ-1 display should be looking something like this:

Env1=+00 LFO=+00
Mod=LFO * +50

If you listen, the effect should be fairly subtle—this is because there is a level control located in the LFO section—it is used to control overall LFO depth—and it may not be set to a very high value. Let's check it out.

Click the "LFO" button, then the "screen 1" button. Select "Level=08," if it isn't already, by scrolling. Increase its value to 99 and try playing a note. You'll notice that the vibrato doesn't kick in too abruptly—the LFO is set to delay for a time of 46 before it fully kicks in. To change this, select "DELAY=" and experiment with different values. You'll find that lower values yield faster LFO rise times. For now, leave this set to 00—the LFO should kick in as soon as you play a note.

The LFO effect at this point is probably sounding pretty seasick, so let's back off on the LFO LEVEL—perhaps resetting it to its original value of 08 or so would sound better, but set it to whatever you find pleasing.

Select "Mod=" from the lower row of the display and use the data entry slider/buttons to set it to "WHEEL." This selects the mod wheel as a controller for LFO depth. If you push forward on the wheel now, you'll hear the vibrato effect increase. Now let's try controlling LFO level from something other than the wheel—how about key position? It's simple enough. Make sure that "Mod=" is still selected and use the data entry slider/buttons to set it to "KEYBD."

Now we can control LFO depth from the position of notes on the keyboard—as you play higher, the vibrato effect increases. Try setting "Level=" in the LFO section to 00—this way, you'll have no vibrato at all unless you are playing the higher keys.

Hopefully the program is by now becoming clear—select what it is you want to modulate (in this case pitch), select what it is you want to use to modulate it (in this case, an LFO), and select what, if anything, it is you want to use to control the modulator (in this case, the wheel or the keyboard). And don't worry if you doesn't all quite come together yet—we'll be spending more time with modulation in the next few installments. ▬

Clark Salisbury has been actively involved in the composition, performance, and recording of electronic music for over 8 years and is now producing his own pop-oriented compositions. His favorite color is chrome.

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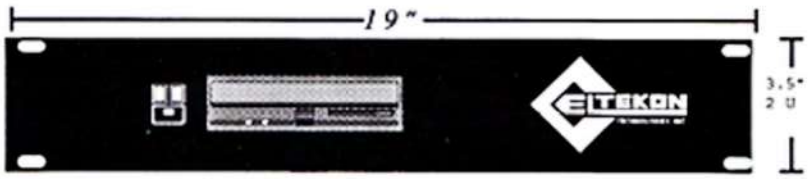

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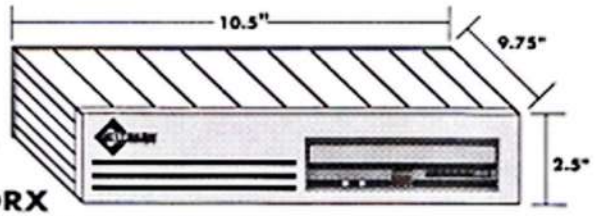

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Using the SQ-80 Sequencer in Live Performances

Brian Rost

When Ensoniq introduced the SQ-80, much attention was given to the extra waveforms, cross wave synthesis, and polyphonic pressure keyboard, but perhaps the greatest improvement was the addition of a disk drive. I'm not against tape interfaces, but for live performance use, the tape interface for the ESQ-1 is just too slow to be of much use for updating patch and sequencer memory. The disk drive makes the SQ-80 a powerful tool for sequencing in live performances.

Perhaps the biggest worry in using sequencers live is the reliability factor. When you hit the PLAY button, the last thing you want to hear is no sound. For that matter, maybe the last thing you want to hear is the right notes being played with the wrong sounds! Once you get to a gig and plug everything in, you need to get your gear set to the right MIDI channels, loaded with the right patches, set to the correct volume, and so forth. The ability of the SQ-80 to transmit sys-ex messages to the other equipment in your rig can make this a reality. Most sequencers are sold on the basis of their editing features, but face it, when you get ready to play the sequence back, all you need is the capability to select the next song and start it up. The SQ-80 sequencer excels at this, for live (as opposed to studio) use it's perhaps the simplest sequencer I've seen.

Ensoniq has included some clever housekeeping functions that make it simple to get set up for sequence playback at the gig. The most important of these is that the SQ-80 automatically saves the internal patch bank to disk every time you save the sequencer to disk. Then, when you go to reload the sequencer files, you are asked whether or not to reload the patches. Do yourself a favor and get in the habit of responding YES. This way, you never have to worry about whether or not you have the correct patches stored in memory.

It's true that only 40 patches are stored internally, while cartridges allow eighty or more patches to be stored, but then you run the risk of not having the correct cartridge installed at the gig. I won't suggest you chuck your carts, but whenever possible, you'll be better off if you can get all your patches into the internal bank. One additional advantage of this is that often custom patch edits are needed for each sequence. Perhaps the attack is too slow, the timbre is too bright, the vibrato is too fast, etc. If you tweak a standard patch and store it in internal memory, it will be stored away with the sequence for which it is tweaked.

Patch banks that are saved to disk with sequences reside in files 1-10, with the patches for sequence file #1 in patch file #1, and so on. You cannot name them but they are named automatically by the machine as SEQ-BANK-XX, where the XX represents the file number. Be careful here, since early revs of the SQ-80 operating system also allow you to write your own patch banks to these same locations. Starting with version 1.7, when saving patches using the DISK SAVE BANK command, only locations 11 to 40 can be accessed (however, using DISK LOAD BANK, you can access all 40 banks). I'd recommend that if you have one of the earlier OS revs, be careful to not use the bottom ten patch files for storing your patches.

Now let's look at what you can't save to disk—the settings on the MASTER and MIDI pages. On the MASTER page, make sure the settings for PEDAL and PRESS are correct. The pressure setting in particular may get toggled a lot while recording sequences, since it should be OFF when you don't need to use pressure. Live, you many want to have access to pressure while playing over the sequences. Then check PEDAL. My recommendation is that you should always use the CV pedal for either a modulator or a volume pedal and never change, in order to avoid headaches on the gig of remembering when to switch modes. Remember that the sequencer records only the pedal information, not what mode the pedal is in. The mode on the MASTER page is always what is used on sequence playback, so be careful here. Going to the MIDI menu, make sure that the base channel, the MIDI mode (omni, poly or multi) is what you want and also that the keyboard mode (local, MIDI or both) is correct. If you will be doing sys-ex transfers (which we'll talk more about later), make sure you have the ENABLE setting at KEYS + CT _ PC + SS + SX. This setting is not remembered on power-down, as a safety feature. You have to manually re-enable sys-ex every time you turn on the SQ-80. As with the parameters on the MASTER page, I'd suggest getting used to sticking to one setting here if you can. Don't overlook the other setting, either, just in case you may have changed something since the last gig.

Well, those folks who use just their SQ-80 can go to sleep now, while we discuss the problems of initializing all the other stuff in your rig. That includes all MIDI devices that will be driven from the SQ-80 during performance. The easiest way to do this is through sys-ex transfers. That presupposes your other gear has this capability, and believe me, a lot of stuff out there doesn't. Check your manual or call the manufacturer if in doubt. I'd suggest that any gear that you can't initialize using sys-ex should be a candidate for replacement or upgrade. The SQ-80 can only receive sys-ex dumps from equipment that can initiate transfers without requiring acknowledge messages in return. When you have to buy new MIDI gear, be sure to check for this capability before you lay your cash down.

Recording sys-ex dumps is simple, and the SQ-80 manual describes the procedure well. Configure your system as it will be used at the gig, then go from unit to unit and connect that unit's MIDI OUT to the SQ-80 MIDI IN. If you have a MIDI patch bay, that will be very simple. If you don't, you'll need to repatch a bit, but remember you only have to do this once. When recording sys-ex, the SQ-80 scans all MIDI channels and records any sys-ex messages it sees, until you tell it you're done or the 64K

RAM buffer fills up. Assuming you didn't overrun the buffer, you then write the buffer out to disk. When you dump the sys-ex from the SQ-80 back to your rig, all messages go out on the same MIDI channels they arrived on. This means you should set a base MIDI channel for every device in your rig and don't change it, otherwise, the message may be ignored.

Sys-ex messages are buffered in the SQ-80 sequencer RAM space, so before recording sys-ex, make sure you have saved any important sequence data, or it will be lost. At the gig, always transfer the sys-ex messages to your rig before loading sequences. Most synths have relatively small patch dumps, but drum machines and other sequencers (if you use them) will tend to have pretty large dumps. If it's not clear from the manuals for your gear how big the dumps will be, you can find out easily enough. Press CREATE/ERASE and you will see how much memory space is left in RAM; if you have an empty buffer this should read 65535. Now record a sys-ex dump from one unit. When you are prompted that the dump is complete, check the memory size again. Subtract the new number from the first and you know how many bytes long the sys-ex dump was. You can have a maximum of 65535 bytes in the buffer at once, so if you know how large the individual dumps are, you can determine if dumps from your entire rig will fit into a single buffer, and if not, decide how to separate the dumps into multiple buffers.

At the gig, it can be helpful if a single dump to each unit will leave you set for the entire gig. In the case of drum machines, which may have large dumps, this may not be possible. If multiple dumps are required throughout the gig, make sure you have labelled the files well so you don't get confused. As an example, if you have a bank of Beatles tunes sequenced, you could name the sequence file BEATLE-SQ and the sys-ex file BEATLE-SE so it's obvious that the two are related. If any of your gear allows incremental dumps, such as individual patches as well as all patches, or patches independent of other setup data, it's still best to dump the entire state of the unit. This way, there's no chance of dumping patches to an incorrectly initialized machine.

Now, of course, you may wonder if all the dumps were correctly received. One way to check quickly is make up a test sequence which verifies that your rig is configured correctly. For instance, just set up a series of sequence templates, with no note data. Each template should send out patch and volume changes to your gear. Select a couple of these templates, then check the front panels of your gear to see if they responded correctly. You could add a bar of music to the sequence to give you some audible confirmation. Be creative!

Some of your modules may require some manual settings to be made. Develop a routine of going through and making these settings in the same order every time, until it becomes a habit. One thing that's easily overlooked is the master volume of other devices. Since volume changes will be sent out by the sequencer, if the master volume is incorrect on some device, the overall mix will be wrong. I usually set all the volumes full on. If that's not practical, mark the correct setting of the knob with a grease pencil or tape. If you're desperate, consider setting the volume pot and removing the knob so it can't get bumped off its setting.

Now, you may ask, how long will all this setup take at the gig? Actually, once you have wired up your gear, only a few minutes. A full 64K sequencer or sys-ex file takes only 30 seconds to load from disk. Add in about five to ten seconds to get through the storage menus to let you find the file you want, and you can have your file loaded in well under a minute. In the case of sys-ex files, the transmission time once the file is loaded is but a few seconds. If you need to make only one sys-ex transfer to initialize your rig, you can do it within a minute. A minute later you can have a bank of songs loaded and ready to play. That's pretty quick.

As you can see, preparation in advance is really the key to successful live sequencing. To start with, you should debug the process of setting up your rig at home. The physical setup should be as simple as possible. Having your gear mounted and cabled together in racks can greatly simplify wiring up at the gig. At the very least, think about color-coding or labelling cables and using cable ties for groups of cables to keep things neat and easy to interconnect.

The SQ-80 can ease the actual setup if you take advantage of its disk storage features. So, let it do the dirty work while you concentrate on the music! ▬

Bio: Brian Rost is a bassist for the Hubcaps, a Boston-based R & B band. In his spare time he designs computer systems.

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Across the Waves of the SQ-80 Into EPS Territory

Converting Synthesizer Sounds to EPS Format – Part 2: The Hack

William Pont

Welcome back, Vikings of the SQ-80. I hope all of you have done your loops. For those "needing" a visual editor, below is a detailed story to get the best loop possible without one.

Now the time has come to finish what we started several issues ago (Issue #65). For those who missed it, this is the second part of a expedition to extract sounds out of the SQ-80 and recreate its programming on the EPS. So, without further ado, let's get aboard our Drakars, continue the voyage, and cross the waves to EPS euphoria.

The Perfect Loop

The shortest time a human ear needs to distinguish a sound is about a fifth of a second. Having sampled at 48 kHz, this equates to roughly 2000 words of memory when played on the lower octaves. Although this seems peanuts at 11 blocks, the SQ-80's piano sound consists of 7 samples and that way, becomes a sonic fatso at 61 blocks (not to mention some inharmonic loops...). To be a real disk-taxidermist, it is essential that you immediately loop your sound after sampling, and truncate to get the smallest possible sample. In fact, a single-page wavesample is what we really want.

The loop must be inaudible. Your ears are better judges than a visual editor. If you get lousy results using AUTO-LOOP, try this: Bring down LOOP-END from -----(99) to -----(98). Very often there is some rubbish right at the end of a sample making it impossible to find a good loop. If this fails, turn off the AUTO-LOOP. Find a loop manually, and move LOOPSTART up until the pitch of your loop approximates the pitch of the sample. Now increment or decrement the sample individually until you hear no difference in the sound as the loop kicks in. If there is some buzzing, adjust LOOP POS until it disappears. If the buzz persists, your loop is not perfect yet. Go to LOOP END fine adjust. This lets you adjust one single word at a time. Very often this solves the problem. With big samples however, the loop may sound near-perfect over a range of 10-15 individual samplewords. Bumping the rootkey to some ridiculous value may bring relief. The effect is a general lowering of the sample's pitch to way below normal so that you can hear the loop's repetition rate. You should now hear a very distinct ticking at the splicepoint. Adjust the LOOP END FINE until it goes away. Set the rootkey back to normal and golly, a perfect loop. If all this doesn't work, you'll have to find another looppoint or resample.

Now move the LOOP POS down to as low as it will go without the sound changing. Most of the SQ-80 waves are single cycles so this is easy. The adjustment we have just done reduced the loop to a single cycle as well, and no matter where the LOOP POS marker sits, it remains a single cycle. With the Inharmonic Loops the story is somewhat different; these waves require an extremely sharp ear for successful loops. Even with a loop identical to the original, you still get a pretty big sample—anything from 45 to 90 blocks.

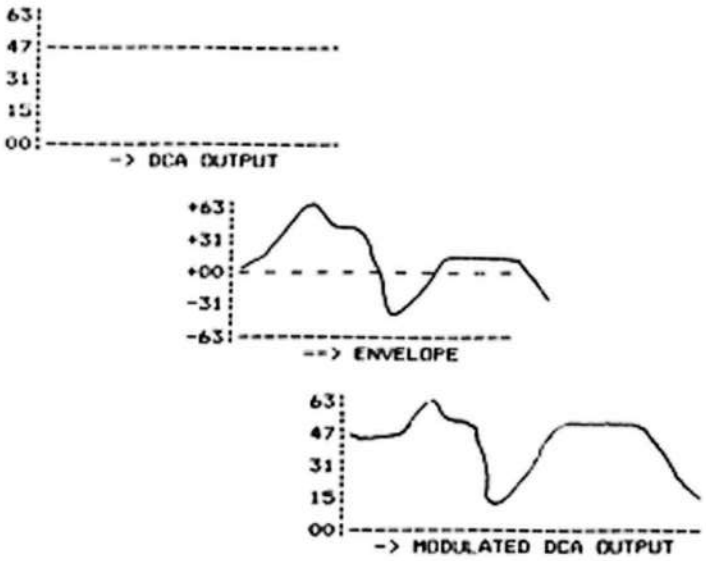
The last thing you ought to check is the SAMPLE START. Very often with static sound there is an audible "bump" right at the beginning of the sample—usually less than a page (255 words). I haven't a clue as to why this section of the sample is louder and/or distorted from the remainder, but this piece of data is useless, so set START behind it. Pull SAMPLE END all the way down until it goes no further. Then, and this is important, bring it up by one word. Mathematically: SE=SE+1. This odd move is necessary as in a lot of cases when LOOPEND = SAMPLE END, garbage is sometimes created in the last word of the sample after truncation. This causes extreme rattle in your loop, and if loopstart happens to also be sample start, you're in BIG trouble! You cannot shorten the loop any further; it is already a single cycle, remember? You get an audible buzz and, even if not, the sample will be out of tune. You will have to start all over again...

If all is well, you should end up with a tiny sample of about 700 words in the lower regions of the keyboard and roughly 255 to 300 in the upper.

One word of caution: You will be sampling a sampled sound. This means that the sounds already consist of digital data rather than the continuous waves of analogue sound. For this reason, you may have to take more than one sample of the SQ-80 sound to prevent aliasing in the upper octaves, even if the SQ-80 itself only uses one wavesample. A technical explanation is beyond the scope of this article.

Modulators And Envelopes

The question that is burning on everyone's lips is: What now? Glad you asked. Most of the SQ-80's parameters can be translated to EPS language, but not all! Stuff like modulators, octaves and volume is easy. Negative levels in the envelope pages? That's hard... The envelope generators of the SQ-80 can, quite unlike the EPS, generate negative levels. This doesn't mean that actual volume levels go below zero, but rather that the output of a DCA is modulated (by the envelope) above or below a certain manual or fixed setting. Confused? OK, here is an example. Suppose that the output of DCA1 is set at a level of 47. It has two modulators but we only use MOD1. Let's imagine that ENV2 is the modulator. If, at any point in time, a level in the envelope goes negative, the DCA output will fall below the manual setting and conversely, will exceed that setting if the envelope swings to a higher value, thus:



The values of an envelope will be added to or subtracted from the manual setting. When an EG is applied to an oscillator, the effect will be a rise or drop in pitch. Remember that there are limits. You cannot make a DCA's output go higher if it is already at maximum, only lower. If a DCA's output level is set at 00, then you can make it follow the (positive) envelope. A graphic image of that DCA output would be that of the envelope. How much or how little of the envelope is applied to the DCA or OSC depends on depth. Range: -63 to +63.

Now we really get into the nuts and bolts of the conversion and the secret is to knowing the equivalent of an SQ-80 parameter in EPS terms.

Volume Settings

I didn't have the SQ-80 long enough to establish dB values for the DCA outputs, but I guess it is more or less the same as the EPS. Values like -63 to +63 are relative to the manual settings of the various pages, only, you'll have to use your ears or if you don't have the SQ-80 anymore, draw the resultant envelope on graph paper and then apply it to the EPS envelopes. Yessir, if you want good sounds, there is a bit of work involved. Assuming that the SQ-80's DCS outputs follow the same convention as the WS Volume, Layer Volume or Instrument Volume on the EPS, we then get this list of "SQ-80 to EPS" parms:

OUTPUT	SQ-80	EPS
0 dB	63	99
-8 dB	47	75
-16 dB	31	50
-32 dB	15	25
-56 dB	04	06
x	00	00

It would be nice if Ensoniq could publish a list of REAL values for the SQ-80's parameters, such as DCA output in dB and filter cutoff (-3dB point) frequency. This one is missing in the EPS AAG as well.

Next, the ENVELOPE TIMING CONSTANTS (T1, T2 and T3):

SQ-80: EPS	SQ-80: EPS	SQ-80: EPS
0 = 0	22 = 18 (19)	44 = 55
1 = 1	23 = 20	45 = 57
2 = 1	24 = 22	46 = 58 (59)
3 = 2	25 = 23	47 = 60
4 = 2	26 = 25	48 = 61 (62)
5 = 3	27 = 27	49 = 63
6 = 3	28 = 28	50 = 65
7 = 3	29 = 30	51 = 66 (67)
8 = 4	30 = 31	52 = 68
9 = 4	31 = 33	53 = 70
10 = 4	32 = 35	54 = 71 (72)
11 = 4/5	33 = 36 (37)	55 = 73
12 = 5	34 = 38	56 = 75
13 = 5	35 = 40	57 = 77
14 = 6	36 = 41 (42)	58 = 78 (79)
15 = 7/8	37 = 43/44	59 = 80
16 = 9	38 = 45	60 = 81 (82)
17 = 10	39 = 47	61 = 83
18 = 11	40 = 48	62 = 85
19 = 14	41 = 50	63 = 87
20 = 15	42 = 52	
21 = 17	43 = 53	

All EPS values above 87 provide longer times. Dual values like 15 = 7/8 mean they have the same time value, but those with bracketed alternatives are "in-betweeners"—e.g., 60 = 81 (82). The EPS value 81 is shorter and 82 is longer than the SQ-80 value of 60. This is not a real problem unless you can tell the difference between 8.3 ad 8.6 seconds without using a timer...

LFO's

Thanks to an article by Jim Johnson, I am able to provide an accurate SQ-80 to EPS LFO table. Those wanting the actual frequencies of the ESQ-1/SQ-80 LFO(s) can find them in Jim's article: Lfo Synchronization and Magic Tempi, TH #26, August 1987.

LFO FREQ SQ-80: EPS	LFO FREQ SQ-80: EPS	LFO FREQ SQ-80: EPS
0 = 0	22 = 35	44 = 63
1 = 1-6	23 = 36	45 = 64
2 = 7	24 = 37,8	46 = 65
3 = 12	25 = 39	47 = 66,7
4 = 14	26 = 40	48 = 68
5 = 15	27 = 41,2	49 = 69
6 = 16	28 = 43	50 = 70,1
7 = 17	29 = 44	51 = 71,2
8 = 18	30 = 45	52 = 73
9 = 19	31 = 46	53 = 74
10 = 20	32 = 47	54 = 75,6
11 = 21	33 = 48,9	55 = 77
12 = 22	34 = 50	56 = 78
13 = 24	35 = 51,2	57 = 79
14 = 25	36 = 53	58 = 80,1
15 = 26,7	37 = 54	59 = 81,2
16 = 27	38 = 55	60 = 83
17 = 29	39 = 56,7	61 = 84,5
18 = 30	40 = 57,8	62 = 85,6
19 = 31	41 = 59	63 = 87
20 = 32,3	42 = 60	
21 = 34	43 = 61,2	

And you need is the envelope window A/B comparison:

SQ-80:	L1	L2	L3	LV	T1V	T1	T2	T3	T4/R	TK
EPS:	H2	H3/4	H5	S2-5	ATV	T1	T2	T4	T5-2R	KBD
	1	2		3	4			5	6	

This requires some clarification:

H2 thru H5 = Hard Velocity Levels
S2 thru S5 = Soft Velocity Levels
ATV = Attack Time Velocity
T5-2R = T5 or Second Release
KBD = KBD Time Scaling

These terms are all in the AAG and Musicians Manual. Some of you clever people have surely noticed some discrepancies in the figure above. Why is there no L1 in the EPS box and no T3? Well, that's why I've numbered the EPS box.

#1. Unlike the EPS, the SQ-80 does not have an "initial level"; it follows the more conventional AD (Attack Decay) type envelope, even despite it being a very advanced version. To correctly emulate this fact, leave the EPS L1 at zero in most SQ-80 conversions.

#2. There are only 3 Levels in the SQ-80. L3 is the same as EPS L5 which means that EPS L3 and L4 are SQ-80's L2. (This is beginning to sound more and more like an IQ-test.) Set these to the same value and time 3 to zero. More on time later.

#3. LV (Velocity Level Control) in the SQ-80 is more or less the same as the Soft Velocity Curve AND Soft Velocity Levels combined. If the SQ-80 has a value other than 00, then turn on the Soft Vel switch and set the parameters accordingly. The higher the number in the SQ-80 display, the lower its output as you play softer. Its range is 00L—63L and 00X—63X. The first value lowers the output in a linear fashion; the second lowers it exponentially.

#4. The same as Attack Time Velocity. It decreases TIME1 with increasing velocity.

#5. There is no TIME3 in SQ-80 conversions, so set it to zero. Just make very sure that L3 and L4 are the same value or you will get an abrupt change in the sound as the envelope runs through time 2—4.

#6. This is the trickiest of the SQ-80 Time parms. It serves a dual purpose. When it is set between 0—63, its EPS equivalent is T5. But when it's set between 00R—63R, you have a choice: Either set T5 = 00 and use 2nd REL or use T5 (not too high...) and 2nd REL. The best way to see how the SQ-80 envelope behaves in the RELEASE stage is to use a graph and then set the EPS envelope. Or, if you still have the SQ-80, use your ears.

So much for the SQ-80—EPS comparisons...A lot of you might still find it hard to see through the myriad parms. One that worried me initially was the fact that three of the four SQ-80 EG's were freely available and the EPS envelopes are all "hardwired" to AMP, FILTER and PITCH. How the heck was I going to apply the SQ's envelope to the EPS? Well, after some extended fiddling this is what I found:

- Press EDIT-AMP
- Scroll to VOLUME MOD = XXX *0
- Select ENV1 (14 others available)
- Set depth to anything between 0..99

Remember that if depth = 0, the amp envelope (ENV3) is in full control, and at 99, the assigned modulator with ENV3 totally disabled. If set to 50 both will have equal effect. The output will now follow the (pitch) envelope. It's slightly more complicated than on the SQ-80 where the pages are displayed in full glory. (The EPS shows one variable at a time except in the envelope level and times pages.) I have chosen ENV1 as the MOD source since there are not that many cases where the pitch of a sound is modulated (trumpets, calliope, helicopters, etc.) This envelope generator is idle most of the time, but when used for purposes other than pitch modulation, make sure to set PITCH MOD = OFF in the EDIT-PITCH page.

The AMP envelope is (unfortunately) not available as a Mod source, so negative modulation can not be applied here. It is a different picture with ENV1 and ENV2 in the EDIT page. Both have a MOD range of -99 to +99, so you have a limited way of negative modulation here. Play around and see. At the end of this lengthy hacker story, you'll find the parmsettings for a flying chopper. I know about 11 SQ-80 owners who all said it couldn't have been done on an EPS. Judge for yourself and uncover the power of a sampler like the EPS.

Ordinarily, there are no parmsheets for the EPS like those of the SQ-80. But since we are reconstructing SQ-80 sounds, we can use similar forms. So copy down all the parmsettings of each program that you like on the form at the back of the SQ-80 manual. If you don't have the manual, check out any Hackerpatch for that parmsheet. If you want all 40 internal programs, it's gonna take an evening. Did you know there is a disk circulating with 1600+ sounds on it? Keeps you going for a while, huh?

Last advice: Use factory sounds as your guinea pigs. They are very well "constructed," using that convention I told you about. Friend's sounds can be good also, but they all too frequently use a limited number of the available sounds and they do not keep to the "rule"; they tend to use the parameters randomly.

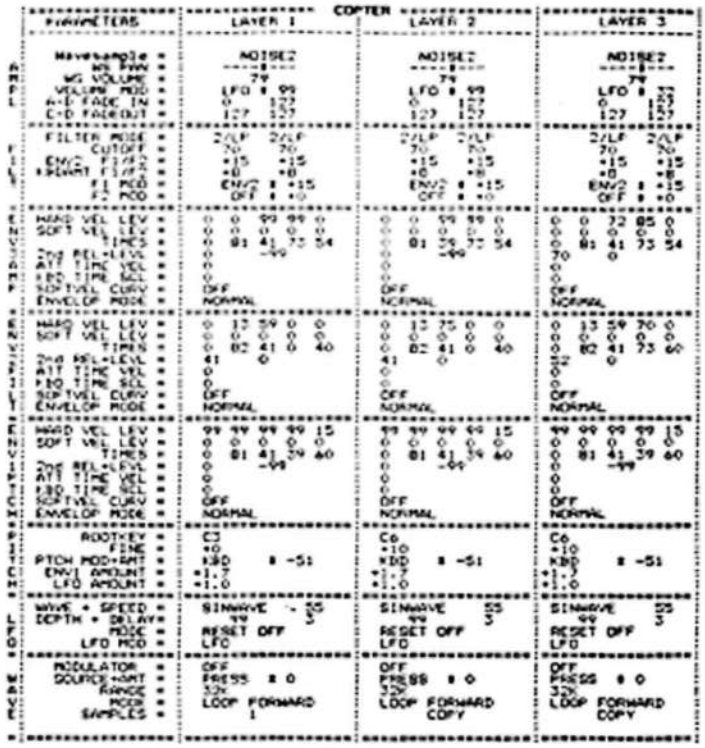
The 3 sounds are: FLOON, SQ STR, and COPTER. I will show the first steps for FLOON, then you are on your own.

1. Load STEAM
2. Load SINE
3. Copy Sinelayer to STEAM (layer 2 created)
4. Copy layer 2 Parms only (layer 3 created)
5. Delete the instrument called SINE
6. Rename STEAM to -FLOON-

You now have 3 layers: steam, sine, and a copy of sine. The parameters are given in the following charts. If you followed along exactly, your instrument size should be about 40 blocks for FLOON, 110 for SQ-STR, and 100 for COPTER. And remember: There are more than 2000 soundprograms for the SQ-80, so keep on hacking...

FLOON

PARAMETERS	LAYER 1	LAYER 2	LAYER 3
Wavesample	STEAM	SINE	SINE
WS PAN	0	0	0
WS VOLUME	84	99	99
VOLUME MOD	LFO ± 99	OFF ± 0	OFF ± 0
A-B FADE IN	0 0	0 127	0 127
C-D FADEOUT	60 127	127 127	127 127
FILTER MODE	2/LP 1/LP	2/LP 1/LP	2/LP 1/LP
CUTOFF	127 127	127 127	127 127
ENV2 FILTER	+15 +15	+15 +15	+15 +15
KEYWRT FILTER	+0 +0	+0 +0	+0 +0
F1 MOD	PRESS ± +15	PRESS ± +15	PRESS ± +15
F2 MOD	PRESS ± +0	PRESS ± +0	PRESS ± +0
HARD VEL LEV	57 99 99 38 0	99 99 99 99 99	0 99 99 99 99
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	10 0 99 0	0 44 50 40 0	5 64 50 40 20
2nd REL+LEVL	-27	-21	-21
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
HARD VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
2nd REL+LEVL	-99	-99	-99
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
HARD VEL LEV	0 0 0 0 0	0 0 0 99 99	0 0 0 0 0
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	0 0 0 0 0	0 0 20 99	0 0 0 0 0
2nd REL+LEVL	-99	30 -23	-99
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
ROOTKEY	C2	B3+	A3
FINE	+0	+11	+0
PTCH MOD+AMT	ENV2 ± +0	ENV1 ± -8	ENV2 ± +0
ENV1 AMOUNT	0	0	0
LFO AMOUNT	+1.0	+1.0	+1.0
PITCHTABLE	-	-	-
WAVE	TRIANGLE	TRIANGLE	TRIANGLE
SPEED	40	40	40
DEPTH	0	40	40
DELAY	40	40	40
MODE	RESET OFF	HUMANIZE	HUMANIZE
LFO MOD	WHEEL	OFF	OFF
MODULATOR	OFF	OFF	OFF
SOURCE	PRESS	PRESS	PRESS
MOD AMT	0	0	0
RANGE	32K	32K	32K
MODE	LOOP FORWARD	LOOP FORWARD	LOOP FORWARD
SAMPLES	1	1	1



COPTER

PARAMETERS	LAYER 1	LAYER 2	LAYER 3
Wavesample	NOISE2	NOISE2	NOISE2
WS PAN	0	0	0
WS VOLUME	79	79	79
VOLUME MOD	LFO ± 99	LFO ± 99	LFO ± 99
A-B FADE IN	0 127	0 127	0 127
C-D FADEOUT	127 127	127 127	127 127
FILTER MODE	2/LP 2/LP	2/LP 2/LP	2/LP 2/LP
CUTOFF	70 70	70 70	70 70
ENV2 FILTER	+15 +15	+15 +15	+15 +15
KEYWRT FILTER	+0 +0	+0 +0	+0 +0
F1 MOD	ENV2 ± +15	ENV2 ± +15	ENV2 ± +15
F2 MOD	OFF ± +0	OFF ± +0	OFF ± +0
HARD VEL LEV	0 0 99 99 0	0 0 99 99 0	0 0 72 85 0
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	0 81 41 73 54	0 81 26 73 54	0 81 41 73 54
2nd REL+LEVL	-99	-99	70
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
HARD VEL LEV	0 13 59 0 0	0 13 75 0 0	0 13 59 70 0
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	0 82 41 0 40	0 82 41 0 40	0 82 41 73 60
2nd REL+LEVL	41 0	41 0	82 0
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
HARD VEL LEV	99 99 99 99 15	99 99 99 99 15	99 99 99 99 15
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	0 81 41 39 60	0 81 41 39 60	0 81 41 39 60
2nd REL+LEVL	-99	-99	-99
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
ROOTKEY	C3	C6	C6
FINE	+0	+10	+10
PTCH MOD+AMT	KBD ± -51	KBD ± -51	KBD ± -51
ENV1 AMOUNT	+1.0	+1.0	+1.0
LFO AMOUNT	+1.0	+1.0	+1.0
WAVE + SPEED	SINWAVE 55	SINWAVE 55	SINWAVE 55
DEPTH + DELAY	99 3	99 3	99 3
MODE	RESET OFF	RESET OFF	RESET OFF
LFO MOD	LFO	LFO	LFO
MODULATOR	OFF	OFF	OFF
SOURCE + AMT	PRESS ± 0	PRESS ± 0	PRESS ± 0
RANGE	32K	32K	32K
MODE	LOOP FORWARD	LOOP FORWARD	LOOP FORWARD
SAMPLES	1	COPY	COPY

SQ-STR

PARAMETERS	LAYER 1	LAYER 2	LAYER 3
Wavesample	BOWING	SAW	SAW
WS PAN	0	0	0
WS VOLUME	99	99	99
VOLUME MOD	LFO ± 99	PRESS ± 99	PRESS ± 99
A-B FADE IN	0 0	0 0	0 0
C-D FADEOUT	127 111	127 127	127 127
FILTER MODE	2/LP 1/LP	2/LP 1/LP	2/LP 1/LP
CUTOFF	80 127	66 127	66 127
ENV2 FILTER	+15 +15	+15 +15	+15 +15
KEYWRT FILTER	+0 +0	+50 +H	+50 +H
F1 MOD	PRESS ± -22	PRESS ± +24	PRESS ± +24
F2 MOD	OFF ± 0	OFF ± 0	OFF ± 0
HARD VEL LEV	0 99 99 99 99	51 80 80 80 80	51 80 80 80 80
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	10 35 0 35 34	6 35 0 35 40	6 35 0 35 40
2nd REL+LEVL	-99	58 -39	58 -39
ATT TIME VEL	0 & 39	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
HARD VEL LEV	0 87 87 87 87	0 87 87 87 87	0 87 87 87 87
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	4 87 0 15 4	4 87 0 15 4	4 87 0 15 4
2nd REL+LEVL	-99	-99	-99
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
HARD VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
SOFT VEL LEV	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
TIMES	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
2nd REL+LEVL	-99	30 -23	-99
ATT TIME VEL	0	0	0
KBD TIME SCL	0	0	0
SOFTVEL CURV	OFF	OFF	OFF
ENVELOP MODE	NORMAL	NORMAL	NORMAL
ROOTKEY	B2	C2	C2
FINE	+0	+10	+10
PTCH MOD+AMT	OFF ± 0	OFF ± 0	OFF ± 0
ENV1 AMOUNT	0	0	0
LFO AMOUNT	+1.0	+1.0	+1.0
WAVE + SPEED	TRIANGLE 40	TRIANGLE 26	TRIANGLE 45
DEPTH + DELAY	0 40	20 0	10 0
MODE	RESET OFF	RESET OFF	RESET OFF
LFO MOD	WHEEL	WHEEL	WHEEL
MODULATOR	OFF	OFF	OFF
SOURCE + AMT	PRESS ± 0	PRESS ± 0	PRESS ± 0
RANGE	32K	32K	32K
MODE	LOOP FORWARD	LOOP FORWARD	LOOP FORWARD
SAMPLES	2	4	COPY OF LYR 2

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Faultily faultless, icily regular, splendidly null, Dead perfection, no more. Alfred Lord Tennyson (1809-1892)

Michael Mortilla

For: EPS, EPS-M, EPS-16 PLUS.
Product: Samples.
Price: $12 per disk.
From: First Generation, POB 748, Cocoa, FL 32923.

I am not alone in my belief that nothing is perfect. Perhaps absolute silence is perfection? If so, then music (noise) may be the perfect imperfection. Take a sine wave without modulation of any sort—you'll probably be bored in very short order if that's all you hear. Now modulate it, introduce imperfection and you have something of interest. Music (all art for that matter) is imperfection. A voice is only beautiful with its fluctuations in tone and pitch.

That said, we will now proceed to take a look at the products from First Generation. The little soapbox speech was prompted by FG's (that's how they refer to themselves) product information sheet. It's unclear just how FG does their sampling, but they give the following statement:

"All FG samples are absolutely 100% digital—no analog sources whatsoever. This gives the ultimate in fidelity, because no Analog-to-Digital conversion stages are involved. A sample from a wavetable synthesizer such as a D-50, M1, Proteus, or VFX goes through the following stages: the sample is first recorded to digital tape, converted to the instrument's sampling rate either digitally, or by analog through another D/A-A/D stage, played through the synthesizer's D/A output, and fed into the EPS's A/D. That's four to five stages of known errors! For comparison, have you ever heard a cassette tape after the third generation?"

I suppose this means that some of the problems related to sampling an analog source (such as noise and aliasing) have been eliminated, according to FG. Just how they do this isn't revealed, but I would like to add that it is possible to sample analog sources and still achieve very high quality samples. Also, to compare sampling an analog source to copying a cassette tape is not equitable. I hope that EPS owners will not give up sampling for fear that they will replicate error upon error, nor should they abandon the companies which offer high quality samples from analog sources.

At this point you are probably expecting to read a bad review. Not the case. The fact is that there are some exceptionally good sounds to be found on some of these disks (16 disks available at present). On the 10 disks I received for review, there were a total of 46 instruments. Some disks have 8 instruments, other just one. The disks are divided into the following groups—Synths, Sound Effects, Strings, Percussion and Brass and Woodwinds.

In the synth department, my favorite sound was AMON-RA. 512 blocks that really fill the air. Reminded me of the first time I sat at a church organ—that sense of deep power. But this is more than an organ sound—more like a B3 Star Cruiser. On the same disk (FG-14), OBELISK (547 blocks) and SAHARA (481 blocks) were interesting sounds as well. In both of these, patch 4 seemed more pleasing then patch 1. This was true of many instruments on these disks—"stereo" patches are buried to "save you polyphony." But why hide your light under a bushel? Put the deader mono sounds at patch 4 and show off your programming skills as soon as the instrument is loaded. First impressions and all that good stuff.

ECLIPSE, on the FG-10 disk, was also high on my list of audio delights. Rich with overtones and a deep, dark fundamental, it makes a solid background wash of mystery. Weighing in at just 293 blocks, it won't hog your RAM, either. The other sounds on that disk were also well done with VECTOR 1 being both a very rich synth chorus and a memory hog at 863 blocks. PHANTASM, on FG-05, is reminiscent of the low, sinister synth patch used in flick "*Blade Runner*." A fat sound but at a cost: 680 blocks. I hate to belabor the block numbers, but if you've got the standard EPS RAM, then it could be hard to fit much more then a sound or two at a time and if it's an EPS 16+ you're foolin' with, then these block numbers hold special significance. Do not hold instrument size against the folks at FG because regardless of the size, if you need big sounds you probably know that memory expansion is a must. It's possible to frappe blocks off and custom tailor instruments to fit more stuff in the EPS (Clark Salisbury did some very useful articles in the *Hacker* some time ago on this subject). On the consumer level, I'd rather get too much and have to tweak it then to get too little and have to pitch it.

On the demo disk (FG-06) there are 7 sounds which range from 42 to 543 blocks, the grabber here being TIBET. But again, it's a "deep bass vocal-like chorus with a slow sweep" and to capture the richness, you have to use up blocks. As far as the demo sequences go... I think programmers should program and hire professionals to do their demo sequences. There is little sense in showing off the short suit. The folks at FG sample way better than they sequence.

The sound effects are fun and may be useful if they fit your needs. KRAKATOA, on FG-02, is a whopping 1101 blocks and explodes into life. If you want the sound of a volcano exploding, then this is it! I tried to convert the sample rate but it just seemed to flatten out. Suffice it to say that they needed 1001 blocks and that's all there is to it. FG-16 is far more reasonable in terms of efficiency. The top end of ALTAIR IV sounds like they sampled old bed springs (good idea!) and in the low end sounds like some sort of laser gun. ARACHNIDS is a fun collection of giant insects, BLACK HOLE is like a sound from "*Star Trek, the Movie*" and NIGHTFALL is a strange effect depicting a "weird planetscape of alien nighttime creatures."

In conclusion, I am left with the impression that what FG does best is sample synths and sound effects. The "real" instruments were not as pleasing or as useful to my ear and there are already lots of fairly good acoustic EPS samples around. In the realm of synth and effects for the EPS, FG is up there with the best of them. ▬

Drum Tracks on the VFX-SD

Buster Whitlock

To me the VFX-SD is, bar none, the best all-around keyboard workstation on the market today. And what's really fascinating here is Ensoniq's approach to drum and percussion sounds. Instead of implementing a separate drum machine with a limited number of drum kits, the VFX treats the percussion waveforms like its other waveforms, like piano and strings. This arrangement offers three major advantages:

1. The sequencer setup is much more versatile for drum and percussion tracks.

2. The performance of these tracks can be much more dynamic and invariably more human.

3. "Drum synthesis," recently mentioned by Hacker readers, is a real possibility.

Let's look a little deeper into each of these possibilities...

The Setup

When I first began working with the SD, my initial inclination was to assign a drum kit to one track and to use the other tracks for different instruments. My experience using an ESQ1 and a Korg M1 had programmed me to conserve tracks because of the eight track limitation of these units. The 24 track sequencer on the SD however provides much greater flexibility, allowing the spreading of the rhythm section over several tracks and still having space for other instruments.

"But isn't that more of a headache than it's worth?" you may ask. That depends on your musical goals. But since you've purchased a VFX-SD rather than a Korg or Yamaha workstation you get to really enjoy the tricks one can perform with individual drum processing.

So what are these advantages? Well, one of them is using sounds from different drum kits within a sequence, without creating new kits, and writing them to memory. Of course, if you find yourself using a certain combination of sounds on a regular basis, you may wish to save it as a complete kit for future use. Another advantage of having different sounds on different tracks is the available option of replacing, for example, one snare drum sound with another in the final mixdown—again, without rewriting an existing drum kit.

Probably the most general use for individual drum processing is to control the volume mix of each individual sound group without rewrite. Again, if you consistently find yourself using a particular track setup with a lower volume on the bass drum, for instance, you should write the kit to memory for future use.

The Performance

The VFX-SD sequencer offers many options, not only in the track setup, but also in the rhythm performance itself. One of the things that can kill the realism of a drum track is over-quantization. Quantization allows the user to "correct" the timing of a track by moving each keyboard event to the nearest specified beat. In other words, quantizing to 1/4 notes will move all events to each quarter note beat; there will be no "activity" between quarter notes. This provides for perfect timing, but it also gives the impression of a "machine-like" performance.

To avoid over-quantization in a rhythm track, quantize only the bass and snare tracks. This provides an accurate basic beat, but allows the hi-hats, cymbals, and toms to maintain the "human" element in the sequence by placing these instruments on unquantized tracks. Note: In order to perform complicated drum rolls or hi-hat rhythms, it may be necessary to slow down the tempo while recording.

Another tool which improves the human feel of a drum track is the use of an alternate MIDI controller, such as the Roland Octapad. Such a controller can offer more realistic dynamic control, especially with tom rolls and hi-hat tracks and allows the player to feel more like a drummer than a keyboardist.

The VFX-SD sequencer also accommodates rhythm performance tricks, such as the flam. A flam occurs when a player hits a drum (typically the snare) with both drumsticks. Generally, the first stroke is softer than the second and is slightly before the beat. If you try this on the VFX, the interaction of the two sounds often causes a high-pitched flanging effect that is uncharacteristic of a natural flam. To make the effect more realistic, separate the two strokes into two identical separate sequencer tracks. Quantize both tracks to the nearest quarter note or eighth note (whichever suits your purposes). Now both notes should play together right on the beat, and should create the "flanging" sound. To create a true flam effect, lower the volume of the second track and shift the track backwards. Approximately -03 to -05 should give a pretty realistic timing delay. (If you have questions concerning quantizing or shifting a track, consult your manual.) Flams may be used to create a unique snare sound throughout a song, add a neat effect to slow tom rolls, or used on the snare at the beginning of a fast roll.

Another application of the "shift track" feature is creating an artificial delay effect. Sometimes I use the onboard effects unit for other tracks and still would like, for example, a slapback delay effect on the snare drum. If you have an extra sequencer track, this is a piece o' cake! After recording the snare track, copy it to an empty track location. Adjust the volume to deter-

mine the loudness of the delayed sound. Now shift this new track forward. The amount of shifting will be determined by the delay time you need. I have found that a +07 shift provides a good overall slapback delay. One drawback is that you use an additional voice, which may not be convenient for projects that require the use of all available VFX voices.

There are many other performance applications for rhythm tracks on the VFX-SD, from creating manual cymbal swells to stacking standard drum sounds for new and unusual timbres. The possibilities are endless...

Drum Synthesis

I suppose a lot of what's been discussed so far can be broadly labelled "drum synthesis," in that various components have been used to formulate an overall sound. Drum synthesis in the more traditional sense, however, is really a mind-blowing prospect! As products emerge that offer this capacity, like the VFX and SQ1, one can envision a whole new palette of percussive (and non-percussive) sounds that will evolve from this exciting new development. So where do we begin?

Start by replacing waveforms in traditional patches with drum or percussion waveforms. Tinker with the envelopes and filters. Play sounds in reverse. Start a sound halfway through a wavesample. Program a cross-fade from a snare to a bongo. Get crazy! Most of what you get will be pure garbage, but you may find a few keepers as you go—and you may learn something about your keyboard in the process. The main point is to develop (or stumble upon) sounds that express your personal feelings in a particular song (or that just sound cool). ▬

EPS Sound Disks from Nu-Tek

Bryce Inman

For: EPS, EPS-M, EPS-16 PLUS.
Product: Hot New Sound Disks.
Price: $19.95/disk, 3 or more: $15 each.
From: Nu-Tek Music, 11684 Ventura Blvd., Suite 347 Studio City, CA 91604 (818) 787-4251.

Since I don't have much time to do my own sampling, I'm always happy to see new companies springing up to offer new stuff. This time I received four disks for review from a company called Nu-Tek. So we cut to the chase and take a look at what's on these disks.

Rock Drum Set

There are three drum sounds on this disk. ROCK DRUMS is a standard drum kit with a couple of the samples sounding a bit muffled as if some of the highs have been cut and the cymbals are so-so but, in general, this is a usable kit with some real punch. The samples in the sound TAMBOURINES are among the best I've heard with a variety of bright, clear tamborines. ROKPERCUSION features a number of excellent percussive sounds, acoustic sounding rather than synthesized, and all quite useful.

1952 Steinway 9 foot Grand Piano

As is the case with any good piano sound, this one is multi-sampled to make it work across the entire keyboard. To my ears, however, the samples in this sound are not matched very well. The upper registers are beautiful and bright but the middle register tends to be a bit flat while the low end sounds rather harsh. This is not a bad piano and, used in context with other instruments, these shortcomings are not terribly obvious, but this sound is not on a par with some of the better piano samples I've heard.

Full Orchestra

This disk features a huge synthesized orchestra (brass, strings, woodwinds and bell) playing in unison. Huge, complex samples tend to be difficult to loop and this one is no exception. The loop on this sample is a bit wobbly and rather pronounced when a single note is played. Playing chords, however, helps to mask this problem. The patch buttons alternate between a brass section, a woodwind section and the entire orchestra with an added upper octave.

Korg WS Wavestation

The samples contained in the sounds on this disk feature the best sampling techniques and looping of all the four disks. ANALOGISH is a fat analog sound with a strong attack. PLUKMRMBA features a synthesized marimba sound combined with an airy synth pad. BOWSTRING is a dark synth string with a so-so loop. The last sound, TOYBOX, is gorgeous—sounds something like a souped up celeste with lots of bright, high frequencies.

Conclusion

The sounds on these four disks are generally good and a few which are very good. No killers, no duds. All the sounds make use of the patch select buttons. While none of the variations are earth-shattering, they help to make this a very usable set.

Bio: For eight years Bryce Inman traveled with a gospel music team called Sound Investment and taught music in Indiana (where the winters are too cold). Now he works as a free-lance music editor for Word, Inc. in Irving, TX (where the summers are too hot).

The ESQ1 Sequencer Internals Revealed– Part 6 (Song Data)

Joe Slater

Hi! We continue this series of articles by starting the discussion on the format of the all sequence MIDI dump data from the ESQ1 sequencer. For the most part, the information given should also apply to the SQ-80 sequencer (but, as frequently mentioned, I don't have one of those). **Warning:** The accuracy of the information revealed here has not been confirmed by Ensoniq, so be forewarned!

Previous articles described the one sequence MIDI dump. This is a subset of the all sequence MIDI dump, which consists of a header, followed by blocks of data. These blocks of data are one or more sets of a one sequence MIDI dump intermixed with one or more sets of a song. This article will discuss the format of a Song, which is rather simple compared to a sequence.

A song contains 6 bytes of header information, followed by one or more events (steps), ending with a System END Event. The header has the following structure:

Byte 1 --> HHHHHHHH : High Byte of Song Size
Byte 2 --> LLLLLLLL : Low Byte of Song Size
Byte 3 --> 00000000 : *UNUSED*
Byte 4 --> 00000000 : *UNUSED*
Byte 5 --> NNNNNNNN : Song/Sequence Number
Byte 6 --> SSSSSSSS : Number of Song Steps

The first two bytes combined is a 16-bit value representing the total size in bytes of the song data.

The next two bytes are always 0, and appear to have no use. I believe these bytes are present so that the first five bytes of this header is similar to the sequence header (see next paragraph).

The next byte represents the number of the song/sequence. The number here to represent the song continues in ascending order from the sequences. That is, sequences are numbered from 0..29, and the song number stored here is from 30..39 (for songs 1..10). Since the first five bytes of a song and sequence are similar, the ESQ1 can examine this byte of the block at random and determine if it is a sequence or a song, by the number stored here (I ASSUME the SQ-80 uses song values of 60..79 representing songs 1..20).

The last header byte represents the number of song steps, in the range 1..99.

The bytes following the header are actually N sets of three bytes, where N = the number of song steps. These song steps are ordered from the first to the last step. A song step has the following format:

Byte 1 --> SSSSSSSS : Number of Sequence to Play
Byte 2 --> RRRRRRRR : Number of Repetitions
Byte 3 --> TTTTTTTT : Transpose Amount

The first byte represents the number of the sequence to play. The ESQ1 limits this value to a range of 0..29, which represents SEQ-01..SEQ-30 respectively (I ASSUME the SQ-80 allows values of 0..59 representing SEQ-01..SEQ-60).

The next byte represents the number of repetitions (1..99); the number of times to repeat playing the sequence.

The last byte is a signed 8-bit number (-12..+12) which represents the number of semitones (half-steps) to transpose all notes in the sequence when playing.

After all song steps is the single byte 243 (i.e. F3h). This is the same number that was used in the sequence performance data to denote End of Sequence.

That's it! Rather simple, huh? The next article will complete the description of the ESQ1 data by describing the all sequence MIDI dump header. We close this article with sample code (Turbo C for the IBM PC) used to display a song:

```
typedef struct {
   unsigned int SeqNum    : 8;
   unsigned int Repeats   : 8;
            int Transpose : 8;
} SongEvent;

typedef struct {
   unsigned int SizeHiLo;
   unsigned int        : 16;
   unsigned int SeqNum : 8;
   unsigned int Steps  : 8;
} SongStart;

typedef struct {
   SongStart Hdr;
   SongEvent Events [1];
/* unsigned int F3h : 8; */
} Song;

#define RevBytes(w) ((w) >> 8) | ((w) << 8)

void ShowSong (Song *MySong) {

   int i;

   printf ("SONG-%02d - %u Bytes:\n",
           MySong->Hdr.SeqNum - 29,
           RevBytes (MySong->Hdr.SizeHiLo));

   for (i = 0; i < MySong->Hdr.Steps; i++)
      printf ("  STEP=%02u  TR=%+03d  SEQ=%02u  REP=%02u\n",
              i + 1,
              MySong->Events [i].Transpose,
              MySong->Events [i].SeqNum + 1,
```

```
                MySong->Events [i].Repeats);

    if (MySong->Events [i].SeqNum != 0xF3)
       puts ("  *** Missing Song END ****");

}
```

Bio: Joe is a proud owner of an ESQ1 (and other related unmentionables). He has been a professional Software Engineer for 10 years, and a Composer/Musician for 19 years. But the Composer/Musician side (and long hair) is definitely taking over.

Shootout at the Circle © Ranch

A Guide to Patch and Sample Copyrights

Tom McCaffrey

A recent *Transoniq Hacker* article provided a review of EPS samples of sounds produced by SQ-80 factory patches. The reviewer raised several questions about copyright protection of "re-synthesized" samples and other intellectual property. As an advisor to the Library of Congress's Music Synthesizer Technology Group, I'd like to respond to some of these questions and to provide some guidelines for copying and sampling copyrighted material. As will be explained, under current copyright law an individual is usually within his or her legal right to sample, copy, and sell samples of sounds produced by another synthesizer, regardless of whether the patch data which produces the sound has been copyrighted.

The copyright protection for a synthesizer patch protects the patch's data values from being copied. In other words, unless the programmer desires his or her work be in the public domain, it is clearly an infringement of the programmer's copyright for someone possessing that programmer's work to give those patches to a friend or to resell them. Another example of infringement would be a music store which gives away "free samples" of patches or other copyrighted material without the permission of the copyright holder. In either case the copyright holder has the legal right to prosecute the offender and collect damages.

On the other hand, the copyright office has long held that an individual sound in and of itself does not meet the necessary criteria for copyright protection. This makes practical sense when you consider the similarities of certain sounds produced by different sources, such as two instruments of the same kind. For example, two different snare drums (instruments, that is, not samples) when struck in a similar way may sound very similar; so similar, in fact, that a court of law may not be able to distinguish between them. Imagine if every drummer had to pay a royalty to the copyright holder of the sound of a snare drum every time he hit his drum! If copyright protection extended to this level of detail, we would all face tangling legal difficulties just playing our own instruments.

Because an individual sound is not copyrightable, the copyright office has ruled that an individual sample cannot generally be copyrighted. Considering that a sample is usually a recording of an individual sound, this ruling seems to make sense. Sampler data files, such as EPS instruments, however, are copyrightable as a compilation of more than one (uncopyrightable) sample if certain registration conditions are met. Thus, making unauthorized copies of these files would be a copyright infringement even though protection does not extend to the individual raw samples the file contains. Additionally, since sampler files also contain patch data, any data values programmed would also be protected.

With these facts in mind, I'd like to offer the following guidelines for copying or sampling sounds, patches, and sampler files when you do not have the consent of the original author:

1. Any product advertised for sale is generally not public domain. This is especially true if the product is marked with a copyright notice. Making unauthorized copies of patches, sampler data files, or computer software and giving or selling these copies to others is almost always an infringement of copyright law. One of the few exceptions to this is if the origin of the material can be traced to authors desiring their original work to be in the public domain.

The copyright law does allow you to make a limited number of copies of copyrighted data files for your own use. Thus, it is legal to transfer patches or sampler data files from your synthesizer to your own disk, cartridge, or computer without the consent of the author. It is an infringement of copyright to give or sell these copies to others.

2. Synthesizer patch data is copyrightable if certain registration conditions are met. The sound that a synthesizer produces is not copyrightable. (A performance on a synthesizer is, of course, copyrightable when recorded as a sound recording.)

The conditions under which a patch is copyrightable depend mostly on the number of programming options available on the synthesizer itself. For example, most current digital synthesizers should have little problem passing these criteria; however, synthesizers with limited programming abilities (such as some old analog synths) may not be registered. Also, creation of a new patch by layering two existing patches is not generally considered copyrightable.

3. It's generally safe to sample the sound of a synthesizer, or of an acoustic instrument or sound occurring in nature. It is generally an infringement to sample a copyrighted sound recording.

It's important to note that since copyright infringement is a

legal matter determined by the courts, the question of where the boundary is drawn between sampling and digital recording is not clear cut. Sound recordings, of course, are copyrightable, and someone who samples a copyrighted sound recording may be guilty of infringement. In these cases, it is up to the courts to decide the extent of the infringement, and damages, etc., and in these cases the outcome may be determined by such factors as the length of the sample and how recognizable the sample is.

4. Individual samples are not copyrightable, but the work of compiling raw samples into a sampler data file (such as an EPS instrument file) is often copyrightable along with any patch programming included in the file. Thus, unauthorized copying of these files is generally an infringement of copyright law.

Certain registration conditions must be met to copyright sampler data files. Most of these have to do with the amount of programming performed and the number of raw samples included in the file. The copyright office can answer specific questions about whether a particular sampler file is copyrightable.

5. It is okay to sell second-hand copyrighted materials such as patches, sampler files, or software to another person as long as you sell all copies of the material to the same person and do not keep any copies yourself after the sale.

Although these guidelines should keep you out of trouble, it's important to seek advice if you have a specific question about your rights under copyright law. The copyright office itself has several restrictions on whether a work of intellectual property is allowable for copyright registration; most of these apply regardless of whether the work is of a musical, artistic, or other nature. In the still groundbreaking area of computerized music, there are often complicated gray areas and areas of untested ground as new technologies show their faces. By contacting the office in Washington, D.C, they will provide information free of charge and can guide you through most copyright questions. ▬

Bio: Tom McCaffrey is a technology consultant and keyboard programmer in the Philadelphia area. He has acted as an advisor to the Library of Congress regarding synthesizer copyrights. For fun he produces "ear candy" for local radio and for ABC.

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Opcode's Editor/Librarian

Larry Church

Product: Editor/Librarian.
For: ESQ-1/SQ-80 (version 5.2) and Macintosh computer.
Price: $199.
From: Opcode Systems, Inc., 3641 Haven, Suite A, Menlo Park, CA 94025 (415) 369-8131.

Opcode has a series of editor/librarians available with versions for many popular MIDI synthesizers including Ensoniq ESQ-1/SQ-80. Individually these programs provide very thorough control over editing and library management tasks. With two or more synthesizers in a Macintosh based MIDI studio these Opcode editor/librarians combine files in "bundles" offering an exceptional degree of system management.

Upon opening the package containing Opcode's ESQ-1/SQ-80 Editor Librarian software, one of the first things to catch the eye is a bright purple brochure labeled "Before You Call Opcode With Your Bug." This wonderful document points out that a Macintosh running MultiFinder, especially with a system folder customized by unknown numbers of INITS and CDEVS, is not the most stable computing platform known to man. Things are likely to go wrong. This purple document gives the novice and experienced user alike some insight into the cause and solution of many a source of frustration. Some of this information I haven't seen in print anywhere else and should be in every Macintosh manual—hardware or software. Thanks, Opcode!

The software includes a copy-protected editor/librarian and a separate librarian desk accessory. The application disk contains an installer program with two hard disk installs for non-key disk operation. Alternatively the application disk can be used as a key disk for operation with any compatible system. Installing the application to hard drive was straightforward with no surprises or problems.

Opening the application causes various windows to become active. The Opcode standard MouseKeys window is first. (Miniature "keyboard" for mouse activated note preview.) Next is a FileType window requiring selection of file type. Choices are ESQ programs, ESQ sequences, New Bundle, New Library, or any bundle templates that have been stored to the folder (listed by name given to the file when stored). Choose New Bundle and a window opens to select a synthesizer types to add to the bundle. Sysex files for different synthesizer types can be combined here for complete system management. New Library opens windows that can contain any number of programs listed in alphabetical order.

When an ESQ file type is chosen, one more selection window appears with ESQ program and ESQ sequence check boxes. After checking the desired options the final window opens. This window holds the data and can be named and stored as a template or bundle. If stored as a template it can later be opened and directly get the New Bundle window just created avoiding the previous windowing procedure.

The ESQ windows have all the features you would ever expect to find and more. Bank windows display tables of 40 patch titles. Library windows are one column wide with scroll bars. Any programs in any window can be selected by shift-clicking and dragged to any other window for a nearly instantaneous method of moving patches between banks and libraries. If the Load/Send menu command "Send On Select" is checked, each selected program is sent to the ESQ edit buffer automatically. This is ideal for previewing library sounds in sequence arrangements.

Sequence windows can be contained in bundles, libraries of single sequences or titled files containing "all sequences." If a bundle contains sequences and patches, they can be sent to the destination synthesizer with one command (bundle window—send all banks). The Load/Send commands work just as you would expect, however, the rate of transfer is disappointing. ESQ-1/SQ-80 sysex data takes about 2 1/2 times as long to send when compared to the same files sent from an IVM disk drive. This could be a problem in a performance situation as generally seconds count.

The editor portion of the application is launched by selecting a program in a bank or library window, then clicking an edit button contained in the title bar of that window. All of the expected features (and more) are here again. Parameters can be selected and copied from one place to another. Especially impressive is the graphic envelope implementation. Four envelopes appear graphically in the lower left of the screen. When one of them is selected a larger envelope is drawn on the right side of the screen and the small version is replaced by numeric parameters that define the envelope. Break points of the envelope have handles to click and drag for intuitive visual envelope editing. The program edit window fills the entire screen and contains a lot of information. It has a cluttered appearance and requires some orientation before it feels as comfortable as the good ol' ESQ control panel. For ESQM owners this window offers a way-needed improvement for patch editing.

The application also includes a Patch Factory menu. The software will generate patches in accordance with instructions given by the user. There are several algorithms to choose from. For example, random patches can be generated with limitations set to parameter ranges by reference patches, or you might create a set of sounds gradually changing from one reference patch to another. Many useless sounds are naturally created but, to quote the manual, "there will be the occasional unimaginable gem." I found this to be occasionally true. More often, a sound is created that has potential but needs additional tweaking. Usually the keyboard scaling is way out of adjustment for instrument type sounds intended to be played over the range of

the keyboard. Sound effect patches seem to yield a higher "keeper" percentage. This is sorta fun!

With bank, bundle or Library windows to work with the desk accessory can be used. Installing the desk accessory seemed to pose no problem, but using the DA to send data to the ESQ consistently caused a system crash. Consulting the manual (as per purple brochure) my attention was called to the Update For Lib DA file. Double clicking on this file opens an update window allowing selection of the ESQ application. Choosing the ESQ applications produces a dialog window warning that, according to the file date, it should not need updating. I cancelled the function and, not being able to get the DA to work, called Opcode. Opcode tech support suggested proceeding with the function in spite of the warning. I did and it worked. (A small source of frustration not solved by the purple brochure.)

With the DA active you have complete access to all of your synthesizer sounds from within your favorite sequencing software. Watch out though! It's very easy to get carried away opening windows and run out of allocated memory (causing system crash) if you aren't paying attention.

One additional feature of considerable value deserves mention. The command "Capture MIDI File" is used to convert any outgoing MIDI data to a SYSEX file that can be pasted to other applications. For example, bundles may be pasted to a sequencer application for automatic program configuration of MIDI systems for each arrangement in a performance.

The software is easy to learn and a joy to use with one or two exceptions. The manual has a generic section discussing basic functions, and an ESQ section dealing with specifics of this family of instruments. The generic section specifies that when "parent" patches (splits, layers, etc.) are copied and pasted, the "child" patches are moved simultaneously. "Nifty," thought I. When tested, this didn't work. Upon checking, the ESQ section of the manual explains in detail how this is handled. It seems the generic section (with the misleading information) is referring to Roland or Yamaha "parent/child" patch functions and does not pertain to the Ensoniq section. ("Shucks," thought I)

The windowing routines are sometimes confusing at first, then slightly tedious after complete orientation. There are some preference options that can be toggled to reduce the number of windows involved, but there might have been a way to simplify this a bit more. If simplification at all compromised the remarkably comprehensive nature of the software I'll take all the windows. The results are worth it. THUMBS UP! ▬

EPS Hackerpatch

Mark Clifton

Yep, you knew it was coming, a patch for a sampler. The problem with programming samplers is the variation in waveforms. No two samples are ever alike. But my patch, "WAS A PIANO," can work with *any piano sample*! You can also use this with other samples for some interesting variations. I originally wrote it to show off the incredible sample editing faculties of the EPS.

It starts off with a choppy, wavering sound that changes amplitude over time. Then, on key off, the vibrato speeds up and decays. It sounds rather static in the middle of the keyboard, but I usually use the outer extremities of the keyboard. The lower part of the keyboard yields a chugging, industrial-type sound. The higher you play, the more artifacts creep into the sound. The very top half octave of the piano keyboard is the strangest—a burbling, "water" sound that is indispensable for those B-movie flying saucer emulations. It's not very musical, but it's sure fun!

WAS A PIANO for EPS

ENV 1

```
ENV MODE:  NORMAL
ENV:  CURRENT VALUE
HARD VEL:     99   99   78   50   0
SOFT VEL:     54   47   45   43   0
TIMES:        26   26   40   49   10
2nd RELEASE:  30       LEV:-27
ATTACK TIME VEL:  0
KBD TIME SCALING:  +50
SOFT VEL CURVE:  ON
```

ENV 2

```
MODE:  REPEAT
ENV:  CURRENT VALUE
HARD VEL:     99   99   0   0   0
SOFT VEL:     50   50   0   0   0
TIMES:         0   5   0   0   16
2nd RELEASE:  99       LEV: +99
ATTACK TIME VEL:  32
KBD TIME SCALING:  +0
SOFT VEL CURVE:  OFF
```

ENV 3

```
ENV MODE:  NORMAL
ENV:  SLOW STRING
HARD VEL:     31   99   99   99   99
SOFT VEL:     31   70   70   70   70
TIMES:        30   40   40   40   30
2nd RELEASE:  40       LEV:  -25
ATTACK TIME VEL:  40
KBD TIME SCALING:  +0
SOFT VEL CURVE:  ON
```

PITCH

```
PITCH MOD:  ENV 2  *  +0
ROOT KEY:  A3+     FINE:  -2
LFO AMOUNT:  +15.7
ENV 1 AMOUNT:  +00
RANDOM FREQ:  15     AMT:  +0
BEND RANGE:  GLOBAL
```

FILTER

```
MODE:  F1=3/LP       F2=1/HP
CUTOFF:  F1=56       F2=55
ENV 2 AMT:  F1=+48       F2=* -59
KBD AMT:  F1=+8       F2=+0
F1 MOD:  OFF  * +0
F2 MOD:  OFF  * +0
```

LFO

```
LFO MOD:  KBD
WAVE:  TRIANGLE       SPEED:  99
LFO DEPTH:  99        DELAY: 40
LFO MODE:  RESET ON
```

Hackerpatch

By Sam Mims

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

ESQ Patch: ELPSTR

Steve Munro, Guilderland Center, NY

The initial attack of this sound is electric piano (OSC 1) with strings blending in gradually. OSC 2 is part of the string sound, and OSC 3 adds fullness to it, with its volume modulated by KEYBD2 negatively to add more sound in the bottom range and less in the top. ENV 3 modulates the filter and has a decay slightly more rapid than ENV 4 (overall volume) so that the sound mellows somewhat before decaying. LFO 1 controls vibrato, LFO 2 controls panning, and LFO 3 adds some detuning to the oscillators. ENV 1, modulating the DCAs, brings in the string sound after the initial attack.

The Hack

Depending on your application, you may need a higher string sound; simply changing OCT of OSC 2 to 0 will raise this an octave. My ears wanted to hear more motion in the sound, so I changed the PAN MOD DEPTH (DCA 4 page) to +63, and set L2 of LFO 2 to 50. The other thing I thought ELPSTR needed was an electric piano that sounded more natural. To accomplish this, I called ENV 2 into service, and gave it the following parameters: L1=+63, L2=+45, L3=+05, LV=23, T2=03, T3=45, T4=19, other parameters=00. Then I applied this as MOD 1 on DCA 1 with a DEPTH of 63. Finally, I set the LEVEL of DCA 1 to 27.

ESQ-1 PROG: ELPSTR — BY: Steve Munro

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	0	0	0	ELPNO	LFO1	+1	OFF	-
OSC 2	-1	0	3	SAW	LFO1	+1	LFO3	+1
OSC 3	-1	0	0	SINE	LFO1	-1	LFO3	-1

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	63	ON	OFF	-	OFF	-
DCA 2	0	ON	ENV1	+63	OFF	-
DCA 3	0	ON	ENV1	+63	KYBD2	-17

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	25	0	35	ENV3	+43	OFF	-

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	63	0	LFO2	+25

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	22	ON	OFF	TRI	0	2	27	WHEEL
LFO 2	11	OFF	OFF	TRI	15	2	20	OFF
LFO 3	24	OFF	OFF	TRI	10	2	5	OFF

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	+35	+63	+63	10	10	0	35	0	25	0
ENV 2	-	-	-	-	-	-	-	-	-	-
ENV 3	+63	+30	0	30	0	0	30	50	29	15
ENV 4	+63	+63	0	24	63	0	0	63	29	9

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

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

SQ-80 Patch: WHALES

Jack Stephen Tolin, Milton, MA

Here is another typical SQ-80—er, I mean D-50—sound. Aftertouch offers a trimmed-down version with extended panning. The CV pedal adds just a little pitch motion. You may prefer to switch PRESS and PEDAL on DCA2 and LFO3.

The Hack

This is an exceptional patch, really showing off the ability of the SQ-80 (and of J. S. Tolin). It is straight from the D-50 book, with PLUNK creating an attack transient and the BREATH waveforms adding the sustaining pad. Some nice variations are simple to program. Try a VOICE3 pad, for instance, by substituting that waveform in oscillators 1 and 2. Also try different attack transients; my favorites here are METAL, MALLET, and PLINK. As a final variation, turn the AM (MODES page) on for a more percussive sound. Sorry—ESQ hackers are out of luck with this one.

Bio: Sam Mims is a studio session player and programmer in Los Angeles, and is keyboardist for Richard Elliot. He owns Syntaur Productions, a company that produces music for film and TV and markets sounds for Ensoniq keyboards.

SQ-80 PROG: WHALES — BY: Jack Stephen Tolin

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	11	30	BREATH	LFO1	+3	LFO3	+2
OSC 2	0	0	2	BREATH	LFO1	+2	LFO3	-2
OSC 3	0	0	0	PLUNK	OFF	-	PEDAL	-24

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	52	ON	ENV1	+39	OFF	-
DCA 2	52	ON	ENV1	+39	PRESS	-43
DCA 3	0	ON	VEL	+63	KYBD	+63

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	27	0	27	ENV3	+63	ENV2	+37

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	63	0	LFO2	+43

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	24	OFF	ON	TRI	0	0	0	WHEEL
LFO 2	12	OFF	ON	TRI	63	0	20	PRESS
LFO 3	25	ON	ON	SQR	0	0	0	PEDAL

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	+63	+20	0	63L	29	0	63	0	0	1
ENV 2	+30	0	0	63L	0	0	15	0	0	0
ENV 3	+63	+30	+1	63L	22	0	29	47	37	15
ENV 4	+63	+47	0	0L	63	0	26	63	37R	9

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

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

VFX Hackerpatch SINGIN.PNO

By: Brad Kaufman, Fair Lawn, NJ

NOTES: Here is another patch from the Fair Lawn Patch Farm.Enjoy!

THE HACK: SINGIN.PNO is a nice collection of electric piano hybrids; the sounds aren't quite real electric pianos, but they are smooth and very pleasing. Note that key pressure adds in some subtle tinkling high frequencies to the 00 patch select that sound almost like breaking glass. What sounds like a slow square wave LFO modulating the filter is really the VOCAL-X transwave being shifted around by the mod mixer. This was a bit too noticeable for my ears, so for Voices 1 and 4, I changed SRC-2 of the MOD MIXER to PITCH, then cut the MODAMT on the WAVE page back to -50. The final result is more of a smooth phasing. The waveforms of Voices 3 and 6 can be changed for different attack transients (with the 0* and *0 patch selects). My favorite was swapping PNO-PING for VOCALPERC, but many of the Percussion and Tuned Percussion waves work well here also.

– Sam Mims

WAVES	1	2	3	4	5	6
Wave	Vocal X	DPnoTine	PianoPing	Vocal X	Inharm X	PianoPing
Wave Class	Transwave	Waveform	TunedPerc	Transwave	Transwave	TunedPerc
Delay	0	2	0	1	0	0
Start	99		0	99	99	0
Direction			Forward			Forward
Vel Start Mod			0			0
Mod Scr	Mixer			Mixer	Off	
Mod Amt	-99			-99	0	

MOD MIXER	1	2	3	4	5	6
SRC-1	LFO	LFO	LFO	LFO	Keybd	Keybd
SRC-2	Mixer	Mixer	Mixer	Mixer	Press	Noise
SRC-2 Scale	1.0	1.0	1.0	1.0	0.9	0.6
Shape	Quant16	Quant16	Quant16	Quant16	Quant32	Quant32

PITCH	1	2	3	4	5	6
Octave	0	-1	+2	0	+1	+3
Semitone	0	0	0	0	+5	0
Fine	0	+5	0	0	0	0
Pitch Table	System	System	All C4	System	All C4	AllC4

PITCH MODS	1	2	3	4	5	6
MODSRC	Wheel	Off	Keybd	Wheel	Mixer	Mixer
MODAMT	+5	0	+95	-5	+95	+95
Glide	None	None	None	None	None	None
ENV1	0	0	0	0	0	0
LFO1	+1	+2	0	-1	0	0

FILTER 1	1	2	3	4	5	6
Mode	3LP	3LP	2LP	3LP	3LP	2LP
Cutoff	65	65	82	65	15	82
KBD	+15	+15	0	+15	+22	0
MODSCR	Veloc	Veloc	Veloc	Veloc	Timbr	Veloc
MODAMT	+16	+16	+18	+16	+20	+18
ENV2	+53	+53	0	+53	+76	0

FILTER 2	1	2	3	4	5	6
Mode	1HP	1HP	2HP	1HP	1HP	2HO
Cutoff	0	0	0	0	106	0
KBD	0	0	0	0	0	0
MODSCR	Off	Timbr	Off	Off	Off	Off
MODAMT	0	+58	0	0	0	0
ENV2	0	0	0	0	-52	0

OUTPUT	1	2	3	4	5	6
VOL	90	76	67	90	95	67
MODSRC	Off	Off	Off	Off	Off	Off
MODAMT	0	0	0	0	0	0
KBD Scale	-18	0	0	-18	+43	0
LO/HI Key	A0/B7	A0/B7	A0/B7	A0/B7	A0/C8	A0/B7
Dest Bus	FX1	FX1	FX2	FX1	FX2	FX2
Pan	0	50	50	99	50	50
MODSRC	LFO	Off	Off	LFO	Keybd	Off
MODAMT	+99	0	0	-99	+38	0
Pre-Gain	Off	Off	Off	Off	Off	Off
Voice Prior	Medium	Medium	Low	Medium	Low	Low
Vel Thresh	0	0	0	0	0	0

LFO	1	2	3	4	5	6
Rate	18	18	18	18		
MODSRC	Off	Off	Off	Off		
MODAMT	0	0	0	0		
Level	40	40	40	40		
MODSRC	Off	Off	Off	Off		
Delay	1	1	1	1		
Waveshape	Sine	Sine	Sine	Sine		
Restart	On	On	On	On		
Noise SRC RT						0

SELECT VOICE						
00	1	2	3	4	5	6
0*	1	2	3	4	5	6
*0	1	2	3	4	5	6
**	1	2	3	4	5	6

ENV1	1	2	3	4	5	6
Initial						
Peak						
Break 1						
Break 2						
Sustain						
Attack						
Decay 1						
Decay 2						
Decay 3						
Release						
KBD Track						
Vel Curve						
Mode						
Vel-Level						
Vel-Attack						

ENV2	1	2	3	4	5	6
Initial	99	99		99	99	
Peak	0	0		0	99	
Break 1	0	0		0	82	
Break 2	0	0		0	48	
Sustain	0	0		0	0	
Attack	2	11		2	0	
Decay 1	0	0		0	7	
Decay 2	16	0		16	58	
Decay 3	0	0		0	72	
Release	27*	27*		27*	32*	
KBD Track	20	20		20	0	
Vel Curve	Linear	Linear		Linear	Linear	
Mode	Normal	Normal		Normal	Normal	
Vel-Level	99	99		99	32	
Vel-Attack	0	0		0	0	

ENV3	1	2	3	4	5	6
Initial	99	99	99	99	82	99
Peak	99	99	99	99	72	99
Break 1	75	75	0	75	58	0
Break 2	56	56	2	56	45	2
Sustain	0	0	0	0	0	0
Attack	0	0	0	0	0	0
Decay 1	50	50	0	50	39	0
Decay 2	45	45	0	45	60	0
Decay 3	55	55	0	55	80	0
Release	25*	38*	10	25*	32*	10
KBD Track	9	9	0	9	76	0
Vel Curve	Cnvx2	Cnvx2	QikRs	Cnvx2	Linear	QikRs
Mode	Nrmal	Nrmal	Nrmal	Nrmal	Nrmal	Nrmal
Vel-Level	5	5	33	5	26	33
Vel-Attack	0	0	0	0	0	0

PGM CONTROL	
Pitch Table	Off
Bend Range	**
Delay	x1
Restrike	8
Glide Time	0

EFFECTS (1)	
Effect	Chors&Revb1
Decay	11
FX1	12
FX2	18

EFFECTS (2)	
Rate	18
Depth	20
Delay	20
Rate Mod	0
Depth Mod	0
Mix	50

EFFECTS (3)	
Waveshape	Sine
Mod Scr	Off
HF Cut	Off

PERFORMANCE	
Timbre	0
Release	0

Pressure Key

Classifieds

USER GROUPS

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WANTED

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Wanted: Ensoniq 4X exp with SCSI for EPS. Send info/data on 4X exp. David Dempsey, 539 W William St., Decatur, IL 62522.

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Will trade Leaping Lizards IGUANA program for access to your Mirage library. Prefer Tacoma or Seattle area. Steve Vincent, (206) 565-4701.

"Tsavo Sync Simulator" - a simple program which facilitates control of the Fostex R-8 through Creator/Notator and the Fostex MTC-1 is now "free." ($1.50 for the cost of the disk.) Send SASE to Trey Yancy, 919 East 48 1/2 St., Austin, TX 78751.

Midicaster is still available. The way-cool operating system that turns your Mirage into a very capable System Exclusive data librarian, a 20,000-note sequence player, a disk copier/formatter, and wave-draw synthesizer is still available for a limited time. For more information, or to order, contact the Midi Connection, 9343 SW 3rd, Portland, OR, 97219, phone: (503) 245-3752. And thank you for your support.

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The Interface

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U.S. Mail - The Interface, Transoniq Hacker, 1402 SW Upland Dr., Portland, OR 97221
Electronic mail - GEnie Network: TRANSONIQ, CompuServe: 73260,3353, or PAN: TRANSONIQ.
This is probably one of the most open forums in the music industry. Letter writers are asked to please keep the vitriol to a minimum. Readers are reminded to take everything with a grain of salt. Resident answer-man is Clark Salisbury (CS). Letter publication is subject to space considerations.

Achtung Hackers,

I just opened the box containing my brand new EPS 16+. I presume the "PLUS" means that there was a free introductory copy of TH enclosed! I'm blown away by your magazine.

Some questions:

1. How far advanced are the developments for the EPS 16+ CD-ROM?

2. Has Ensoniq ever considered implementing a stereo-sampling option?

3. Do you have a list of all software for Ensoniq products that run on the Atari ST (or any other computers for that matter?) The ST is THE computer for MIDI applications in Germany.

I am writing this in the euphoria caused by listening to the factory demos and reading about all the new goodies in the manual (a bit like opening Christmas presents for an old EPS user!) The success of the EPS 16+ will be complete if it receives the same kind of support here as it does from you in the USA.

All in all, I'm most impressed.

Yours truly,
Robert Schulze Lutum
Berlin, Germany

[CS – 1) Development of the hotly-anticipated EPS CD-ROM is very advanced – it should be available "real soon." Reportedly, it will contain the entire EPS SLT library, the entire EPS Signature Series, and the entire EPS 16+ library – some 580 sounds! Price hasn't been determined yet, but if the disk is priced as inexpensively as rumor would have it, and taking into account the relatively low cost of some of the newer CD-ROM players, the package should prove nearly irresistible to many EPS users (myself included).

2) Yes.

3) No.

Sorry. I always wanted to do that – keep the answers short and to the point. But I suppose I might as well elaborate.

Stereo sampling was actually considered for the EPS 16+, (as it has been in most of Ensoniq's sampler designs) but the idea was scrapped when it became apparent that it couldn't be implemented in the price range Ensoniq was targeting. At least not without leaving something else out – like the effects, for example. Stereo samples can be created on the 16+, however, either by sampling the left and right sides of a stereo source separately into two different layers and then panning one layer left and the other right, or by porting stereo samples into the EPS 16+ from a software program that supports stereo sampling, such as Passport's Alchemy for the Macintosh. The drawback, of course, is that stereo samples take up twice the memory of equivalent mono samples. Anyone out there interested in a 3600 block piano sound?

As for the question about software listings, neither we at the Hacker *nor the folks at Ensoniq have a comprehensive (not even close) listing of the type you describe. I think (in all humility) that your best bet is to read every single word of every single issue of the* Hacker *and to check through the ads in some of the electronic music industry publications such as* Keyboard *and* Electronic Musician. *OK, OK, you can read those other magazines too, if you insist. After you've read the* Hacker. *But you should be able to find most anything that's currently available through keeping up with these publications.]*

Dear Hacker,

Recently I became the proud new father of a bouncing baby SQ-1. Of course I've got some questions concerning the machine.

1. How can I un-layer specific sounds in memory (for instance, #22 DYNO PIANO in internal) to increase polyphony?

2. Is there a possibility of using some of the data given in ESQ and VFX patch charts to approximate those sounds on the SQ-1?

3. How might I change the "Grand Act" piano sound (in particular the top third of it) so it sounds more like a piano. Or, if you prefer, where might I find a decent piano patch for the SQ-1?

Sincerely,

Jeff Rhoads
Chambersburg. PA

[CS – 1) As you probably know, an SQ-1 sound can have up to three voices active, and each voice uses a note of polyphony for each note played on the keyboard. Any of these voices can be turned on or off from the "Edit Voice" menu. This menu is activated by pressing the 'Edit Sounds' button (labelled simply 'Edit') located directly to the right of the display window. Pressing this button should take you to the first page of the 'Edit Voice' menu, where you should be seeing the following in the display window:

"EditVoice=ONE
ON ON ON"

If you see something other than this in the display, press the "Wave" button to scroll through the menu's pages. You may need to press it a few times, but eventually you will arrive at this display. The upper line is showing that ONE voice is currently selected for editing – as opposed to ALL voices. This would be the setting you want. The lower line is showing which voices are active in the current sound – in this case all three are active.

You may turn off (or on) any voice in an SQ-1 sound simply by selecting it and using the up/down buttons. Select voice one, for example, by using the left/right arrow buttons to scroll until the word "ON" in the lower left-hand corner of the display begins flashing, then turn it off by hitting the down arrow button.

2) It is possible to roughly translate ESQ patches for the SQ-1 – if you are already pretty well acquainted with the programming intricacies of both machines. Unfortunately, there is no straightforward "plug in the numbers" type of formula for doing so. Attempting to list a corresponding VFX setting for each ESQ parameter would require a fairly intense amount of research and testing, and even then the waves and other parameters differ enough for each machine that any "by rote" approximation of patches would most likely produce pretty unpredictable results. On the other hand, most VFX-type parameters have a directly corresponding parameter in the SQ-1. I see no reason why you couldn't plug the data from VFX patch charts directly into the SQ-1. There will be some parameters that won't go, of

course, but for the most part you can probably just ignore them. The main thing you will need to do is to decide which three voices of the possible six on the VFX you want to use. Check out the notes included with the VFX patch chart, as well as the settings in the "Select Voice" box to help you make your determination (hint: The voice numbers printed in outline font are the voices active for a particular patch).

3) I'm afraid the answer to this question is a bit beyond the scope of this column. But let me refer you to the series on programming the SQ-1 which we began 2 issues back – it should help you get a handle on how to make the types of changes you want. As far as a recommendation for a better piano sound, I'm afraid I don't have one to make. You might want to check out Ensoniq's first cartridge of add-on sounds for the SQ-1, the colorfully named SC-2. I hear it's pretty good.]

Dear Hacker,

I am a public school music teacher recently turned on to the EPS world by a good friend, Pat Finnigan. With his help, I introduced my students to the EPS this past fall and have found it to be an incredible tool in the classroom. I wonder if Ensoniq is aware of the tremendous potential market for the EPS in the public schools? It costs less than a new piano and its sampling capability opens up a world of creativity for students. Coupled with a hard drive and a four-track recorder, a teacher has an in-room studio that can turn out REAL music, not the stuff most kids are used to in school.

I am in the process of building a library of samples, sequences, and lesson plans tailored to my classroom needs. Anybody else out there with similar interests?

Mark Koenig
640 Boonesboro Rd.
Greenfield, IN 46142
(317) 885-1850

[CS – Readers?]

Dear Hacker Interface,

Just to let you know that Hacker Classifieds work! I advertised for a copy of Soundprocess and got an immediate response from someone who gave me a good deal with a Mirage rackmount thrown in. Also, M.U.G. seems to have copies.

So, now I'm getting rid of the non-Ensoniq stuff (black boxes with non-changeable sounds) and am looking forward to happy hacking with a DSK and DSM. I have Bob Spencer's and Bruce Wallbillich's disks, and YES I would like to see a Soundprocess Hackerpatch although it might be a while before I could contribute anything useful.

Which brings up a question (from someone new to Soundprocess). Do sounds imported from MASOS into Soundprocess sound "thinner" than in MASOS? I'm thinking of the string bass, one of my favorite MASOS sounds. Is this due to the difference in oscillator allocation or the shortening of the decay, or has the sampling rate been converted down externally?

Also, are Ensoniq factory samples converted into Soundprocess still subject to legal requirements in terms of re-distribution and/or sale?

Sorry I wasn't able to buy Soundprocess when it first appeared, but a belated thanks to Mark Cecys (wherever you are).

Dave Casini
Hayward, CA

[CS – Although I'm not a Soundprocess user, I can think of no reason that sound imported into Soundprocess would be "thinner" than with any other Mirage OS. There is a limitation in terms of how big a sample can be, but this should affect only the length of the sound, not its quality. Perhaps one of the devoted Soundprocess users among our readers can shed some light.

As far as the question of distributing Soundprocess sounds which use Ensoniq samples, I wouldn't recommend it. While copyright laws are somewhat fuzzy on this point, the word from Ensoniq is that they consider these samples their property, and using them in the way you describe could be an infringement of Ensoniq's copyright.

By the way, since you mention M.U.G. I would like to take this opportunity to state that M.U.G. is no longer a distributor for my company's product, Midicaster. Midicaster should be purchased only directly from the Midi Connection – our classified ad appears elsewhere in these pages. If you have purchased Midicaster from M.U.G., please don't be concerned – we will continue to support you and your purchase regardless.]

[TH – We've been printing an occassional Soundprocess Hackerpatch and we'll print more – if people send 'em in!]

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Linndrum Kit 1
Linndrum Kit 2
Simmons SDS 5 Kit
Marimbas & Kalimbas
Vibes
Xylophone
Mallets & Steel Drums
Glockenspiel & Bells
Bells 2
Tympani & Kettledrum
Triangles, Finger Cymbals & Bell Trees
Tibetan Bell
Sound FX —
(1) Domestic Animals
(2) Wild Animals
(3) Cartoon FX
(4) Car FX One
(5) Car FX Two
(6) Transportation FX
(7) X-Rated
(8) Military and War FX
(9) Household FX
(10) Industrial FX
Fairlight II Soundtrax 1
Fairlight II Soundtrax 2
Fairlight III Brass 1
Fairlight III Brass 2
Fairlight III Orchestra
Fairlight III Reeds
Fairlight III Strings 1
Fairlight III Strings 2
Fairlight III Vocals
Fairlight III Percussion
Fairlight II Orchestra hits
Fairlight II Orchestra hits 2
Fairlight III Orchestra hits
Fairlight II Soundtrax 3
Fairlight II Soundtrax 4
Fairlight II Soundtrax 5
Fairlight II Soundtrax 6
Fairlight II Soundtrax 7
Fairlight III Snare Drums
Fairlight II Sound FX
Prophet 5 Strings
Prophet 5 Brass and Bass
Prophet VS -1
Prophet VS -2
Prophet VS TB/2000
D-50 1
D-50 2
D-50 3
D-50 4
VI -
(1) Cloud 9 & Christmas
(3) Lunapad&Barbarians
(4) Celestial and Stratos
(5) Ambrosia & Atlantis
(6) Galadriel & Gandalf
(8) Orchestras 1 and 2
(9) Orchestras 3 and 4
(10) Bottlebell, Metal Hit, Windbell
DX-1 - DX Rhodes and Bass
Oberheim 1 - Xpander
Oberheim 2 - Matrix 6-1
Oberheim 3 - Matrix 6-2
Oberheim 4 - Matrix 12
MiniMOOG - 1
MiniMOOG - 2
MiniMOOG - 3
Jupiter 8
Super JX/MKS-70
Juno 60/106
Prophet 10 - 1
Prophet 10 - 2
Korg DW-8000
ESQ-1
SQ-80
Kurzweil 250/1000
Arp Odyssey
Arp 2600
Mellotron 1 - Strings
Mellotron 2 - Flute & Choir
Chamberlin
Modular MOOG
MOOG Source & Taurus Pedals
Memory MOOG
PPG Wave - 1
PPG Wave - 2
PPG Wave - 3
Vocal Ensemble 1
Vocal Ensemble 2
Vocal Ensemble 3
Vocal Ensemble 4
Vocal Ensemble 5
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Rock & Roll Comp Set
Jazz Composition Set
New Wave Composition Set
New Age Composition Set
Rap Composition Set
Jazz & P-Bass
Fader Basses
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Rock Guitar 2
Heavy Metal Guitar
Jazz Guitar
Funk Guitar
Chapman Stick
Sonclav Hits 1
Sonclav Soundtrax 1
Sonclav Soundtrax 2
Sonclav Soundtrax 3
Sonclav Soundtrax 4
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Dear Hacker,

Through the years I have subscribed to MANY publications. But without a doubt, yours is the most well-balanced and informative I've read. Congrats to your staff and writers on an outstanding job!

By the way, do you think someone could write an article on using the EPS and ESQ-1 sequences together?

Again thank you for this magazine and thanks to Ensoniq for supporting it.

Mitch Germaine
EPS owner
Northbrook, IL

[CS – And thanks for all your support. I'm sure that there is someone who could write the article you describe – if it came our way, I'm sure we'd publish it.]

Hackers and Hackettes,

I am forming an Ensoniq users group in the Denver, Colorado area. If you are interested in joining, call me at (303) 337-4570, between 7:00 and 8:00 p.m., or write to 15735 E. Bails Drive, Aurora, CO 80017.

We can share ideas, patches, sequences and recording tips. We can have jam sessions, make new contacts and maybe even have our own newsletter.

Once I have an idea of how many people want to come and what days and times are good for people I will arrange a meeting place. So try and contact me this week.

Oh, and thanks for the space, Interface.

Sincerely yours,
Robert Yates
Aurora, CO

[CS – Our pleasure.]

Greetings,

Rave and Hardware Q?: First, had a Mirage which I then replaced with an EPS. The improvement in sound/features was (obviously) amazing. Now I have just replaced the EPS with an **EPS-16 Plus**, not expecting things to be much different. Why did I upgrade? Well, I have to admit I am a technophile and was upgrading to satisfy a blatant case of I-just-gotta-have-the-latest-Ensoniq-sampler syndrome. Boy was I stunned with what I got. The improvement

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in sound quality (even with FX off in the 20 voice mode with its lower play-back rate) over the EPS is almost as impressive as the Mirage to EPS switch. So Ensoniq, what gives? What is going on inside this box besides the 16 sample format? I have heard rumors of bit-stream (which I doubt), ex-Lexicon engineers having worked on the FX, and many other even more outlandish ones. I'd really appreciate knowing the truth (as far as possible). Rumors have the long term tendency to hurt rather than help, right? Perhaps TH will get an article together on the insides of the 16+? Anyway I am impressed (again).

OS 1.0 bugs: (If 1.1 fixes these, please ignore.)

Bug A) If I load an EPS bank and I sustain a note just before the 16+ goes into its "Translating data..." routine, the machine locks up (sustaining the note).

Bug B) Occasionally when you are playing-as-you-load, just as the sound loading is finishing you get (what sounds like a RAM dump) bits of the sample memory play for about 1 second then things go back to normal and you have to re-trigger the note you were playing to get it to sound again.

Bug C) When in "Event edit" mode and the cursor is on the event parameter and you scroll back, sometimes the machine locks up, or it may lock up (and buffer all your random button pressing as you inevitably do when you get a lock-up) and then executes it all in 1/2 second and things are back to normal.

Manual Gripe: On the issue of sequencing and sending program changes, the manual is fine. However, I can't find anywhere where it says how to set a track to transmit one program number (i.e., 127) from start to end. Here's my approach: a) Set the track and instrument to play the required MIDI instrument on the correct program number. b) Record the sequence, then BEFORE accepting the "Keep OLD NEW" page, hold down the track button, type in your required program number (Note while I do this the display shows up the pages of the number of buttons pressed, like it's not gonna work), then press YES to accept Keep NEW. The display now briefly flashes "Editing..." and that's it. Is the above wrong? Have I missed something in the manual? Is there an easier way? If not, has this been left out of the manual by mistake?

Wish List: And now to prove you can't satisfy everyone all the time not even for one second...I know it's too late for the EPS 16+, but how about full digital I/O on your next upgrade or new sampler? With all the devices (CD, DAT, etc.) with digital outputs, it seems a shame to convert it back to analog to get it into the EPS (no matter how nice your A/D converter is). The digital out would be great for the L and R channels at least. Also how about a software switch so we can use our standard pedals to stop and start the sequencer, and sampling. BTW: Thanks for the headphone jack.

A tip for EPS users: Remember when Ensoniq told us that we could use COMMAND SYSTEM, set no voices, as an ALL NOTES OFF? On the EPS 16+ it's a similar case of pressing the FX/Bypass button and scrolling. Similarly to clear memory for the EPS and 16+, I have recently made a practice of using COMMAND MIDI to access the SYS-EX RECORDER to clear all memory. Simply answer YES to "Must clear memory OK?" The "Waiting..." prompt appears and you press cancel/no and it forgets about SYS-EXing and you are ready to go. Only hassle is that EPS/EPS 16+ may want to perve at the OS disk.

TH Rave: If this is the complimentary copy that came with your new Ensoniq toy, SUBSCRIBE NOW! I did that three years ago and have never regretted it and I still get excited over the arrival of each issue. If it belongs to someone else...THIEF! No one ever lets their own copy of TH out of their sight, right?...and if it's a photocopy, we know who you are and you have one week to take out 4 subscriptions or the secret remotely controlled self-destruct mechanism built into all your Ensoniq gear will be activated.

Regards
Scott Fisher
Nedlands, Australia

(CS – I've encountered all three of the "bugs" you mention. The thing is, though, that (C) isn't really a bug, just a strange idiosyncrasy in the way that the EPS 16+ works.

What happens is that when you are in the event editor, you can select what type of data you wish to view. Unfortunately, when you scroll through the data, any other data (whether visible in the display or not) is also being scrolled through. So let's say that you have a sequence that's 16 bars long, containing mostly notes, with volume data at the beginning and end of the track. If you enter the event editor and set it to view only volume messages and then scroll, you'll have the problem you describe. As the event editor scrolls from the volume

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data at the beginning of the track to the data at the end of the track, it will try to play all the notes in between all at once. It appears to lock up for a few moments, but if you wait and don't do anything, eventually the EPS will play all the notes in the track, more or less all at once, as it scrolls to the end of the track. It sounds terrible, but it won't hurt anything.

As for your manual gripe, note that you can also insert program changes into a sequence wherever you want from the event editor. Just be careful about scrolling (see bug (C) above).]

[Ensoniq – As to digital I/O, the circuits to convert the data to and from the standard digital formats are still fairly expensive, but the price is sure to come down with time, and we will certainly keep this feature in mind for future products.

Here's a quick rundown of what goes on inside the EPS-16 PLUS:

The EPS-16 PLUS uses a true 16 bit linear A/D converter at the input and separate 16 bit linear D/A converters at the outputs.Data is stored internally as 16 bits. Input sampling is performed at 89.2 kHz and is digitally converted in real time to the selected sample rate. this allows better high-end reproduction of samples while minimizing aliasing. Most of the original EPS output circuitry was analog, including panning and gain control, all of which is done digitally in the EPS-16 PLUS.]

[TH – Perve?]

For the Interface:

I read the answer to the calibration error problem by Sam Mims where he says that a synth with that problem (a VFX-SD in my case) will eventually fail to operate and will need replacement of a circuit board and of the entire keybed. I took mine for repair and when I took it back it continued to have the problem but not to the same degree and the nice thing is that it gradually went away. It's been about four months now that I haven't had this problem. Can I assume that some day the VFX-SD will fail to calibrate? Was the repair long term effective?

I would like to see step by step directions on how to do a volume fade on the VFX-SD. I am following the manual with not much success. I would also appreciate more articles on the internals of SD's sequencer.

How is the third party sound review going?

Yours truly,
Mario Kefalopoulos
<U15708@UICVM.uic.edu>
Chicago

[CS – First, I'd say that if your keyboard is working at this time, I wouldn't be overly concerned. It does seem a bit strange that a problem would "fix itself," as yours seems to have, but if it's working alright now, I'd leave well enough alone and not worry about it too much.

As far as your problems with mixdown are concerned, I have found that following the steps in the owner's manual will work, but there is a voodoo ritual that you must also perform to get mixdown to work correctly every time.

First, be aware that the VFX-SD does not record mixdown or pan settings for a sequence track unless the corresponding song track has been defined. In other words, if you wish to record mixdown information for track three of a sequence which has been chained into song 1, you must be sure to define track three of song 1 by placing a sound (any sound) into the track. Also, I have found that the process works more reliably if you perform some steps in a specific order. What seems to work for me is to first select the "Volume" page, then begin recording, and then select the track for which you want to record volume changes. Also, make sure that "Record Mode= Mixdown" and "Edit Tracks=Seq" on the Seq Control page.]

[Ensoniq – We would repeat what Clark said: if you're not having problems, don't worry about it.]

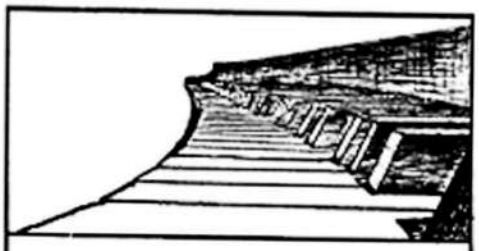
Dear Hacker,

I have just got one short question and request for assistance. Some time ago I purchased EPS-Sense software produced by Jeffrey Richter and Donna Murray. At the time it was stated that sample waves could not be displayed on the screen for editing purposes but the situation would be rectified in an upcoming OS update for the EPS and if that didn't happen the developers would adapt their program accordingly. Can you shed any light on this?

Thanks,
Zvonko Vuksan
Campbelltown SA, Australia

[TH – Jeffrey Richter tells us that, "Due to a bug in the current EPS O.S., EPS-Sense is distributed with two different executable programs. One of these follows Ensoniq's SYSEX MIDI specifications for wavesample transfer. This program will hang when used with the current O.S. but should work when the new O.S. comes out. Until the new O.S. is out, the other executable is able to read the wave data from the EPS."

According to Ensoniq's response in last month's Interface, the new O.S. is now in beta test.]



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EPS-M	2.4
EPS-16 PLUS	1.1
MASOS	2.0
MIRAGE	3.2
ESQ	3.5
ESQ-M	1.2
SQ-80	1.8
VFX	2.1
VFX-SD	2.1
SQ-1	1.0

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Cheers.

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"A lot of sounds out there are interesting, but the bottom line is: can you make records with them. With Voice Crystal cartridges you can. I'll definitely be featuring some of the sounds on our next GRP Rippingtons Album, 'Welcome to the St. James Club.' Thanks for making synth programming easier!"

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Album: "Tokyo Nights"
"Voice Crystals give the musician the best sounds for both the live and studio situations. It is simply the best sound library on the market."

Jan Hammer
Miami Vice TV Show and many Movie sound tracks.
"I use Voice Crystal patches because they are the most musical in their character. They fit my ideas like a glove."

John Lowry
Keyboards for Pena
Album: "Beyond Belief" (Word)
Solo Album: "Media Alert" (Word)
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Troy Luccketta Drums for Tesla
"I do the drumming for Tesla, but when I write music, I use the Voice Crystal sounds."

Tom Coster, Tom Coster, Jr.
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formerly of Santana

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The Rippingtons and Super Tramp
"One of the most demanding things about producing is finding the right new sounds for each project. With Voice Crystals I've found an endless variety of fresh sound for my synths and samplers. Keep it up guys!"

Mark Stick
Keyboardist for Angela Bofill
Album: "Angela Bofill/Intuition" (Capitol)
"I was given only a few weeks to prepare for the 1989 Good Friends National Tour. With no time for programming my own sounds, I turned to Eve & I Productions and Voice Crystal sounds. From Fat Analog sounds to complex Digital Timbres Voice Crystal really came through for me. Thanks Guys."

Terry Wollman Music Director for The Byron Allen Show Nationally Syndicated, NBC, CBS, ABC TV
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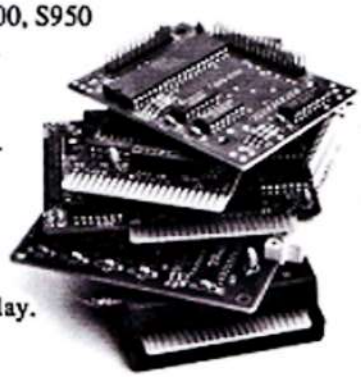

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