Transoniq Hacker

The Independent News Magazine for Ensoniq Users

VFX Clinic: Questions and Answers

Jim Johnson

The doctor is in.

Q: I'd like to use the VFX-SD's drum sounds to replace my old drum machine in my existing sequences. Is there any way to change the MIDI note assignments of the SD's drum sounds?

A: This one's a toughy. In actual fact, the answer to this question is "no"—there is no really good way to change the VFX-SD's drum note assignments in such a way as to line them up with any external drum note arrangement. But there are some tricks you can play in this area, so this might be a good time to look at the VFX-SD's drum key assignments.

The drum sounds found in the SD are permanently arranged in a fixed order, as described on pages 8-14 and 8-15 of the VFX-SD Musician's Manual. As far as the VFX-SD's software is concerned, the individual drum sounds don't exist: each one is just another sample in a multi-sampled "wave." For this reason, it's not possible to deal with drum sounds independently, and specifically to rearrange their order on the keyboard, just as it's not possible to rearrange the individual samples that make up a multi-sampled piano sound.

However, even though you can't rearrange the drum sounds on the keyboard, you can move the drum samples up or down on the keyboard by transposing them on each voice's PITCH page. Try this to see how it works: First, start with the KICK-DRUMS wave, with all PITCH settings at 0 and the PITCH TABLE set to SYSTEM. Play the keyboard and you'll see that the kick drums sound on C2 through G#2, with all other keys silent. Now change the OCTAVE setting for the voice you're working with to -1, and, lo and behold, those drum sounds now appear on C3 through G#3. (The low octave of the keyboard will now play the lowest kick drum transposed down, but that's really secondary to what we're discussing here.)

By assigning each of a program's six voices to a different drum wave, transposing the voices in this manner, and tailoring the OUTPUT settings of each voice appropriately, you can build up a drum kit that more closely matches the key assignments found most drum machines, but alas, it will never be possible to exactly duplicate an arbitrary drum key assignment, because the VFX-SD simply wasn't designed to do this.

Q: How can I select ROM, cartridge, and internal sounds from an external sequencer on my VFX? The instrument holds 180 sounds, but MIDI only has 128 patch change numbers!

A: Most other instruments that can hold more than 128 sounds use something called a "patch table" or "program map" to set up some sort of correspondence between MIDI program numbers and 128 of the machine's sounds. This is a reasonable approach, but it means that many of the instrument's sounds won't be accessible at all through MIDI, unless you change the patch map. It also

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adds an extra layer of programming complexity, which the VFX certainly doesn't need.

To avoid the problems associated with patch mapping, the designers of the VFX came up with an alternate solution. Normally, the internal programs are assigned to program changes 1 through 60, and cartridge programs to program changes 61 through 120. This arrangement leave 8 unused program change numbers at the top of the range... so Ensoniq's engineers decided to use those program change messages to change the way the other program changes work.

This arrangement is discussed on page 6-9 of the VFX-SD manual (in my copy, at least), but in case you don't have it handy, here's a recap.

Bank Select	Programs			Presets		
Program change	Internal	ROM	Cartridge	Internal	Cartridge	ROM
126	1-60		61-120			
127		1-60	61-120			
128				1-20	21-40	41-60

Program changes 126, 127, and 128 act as a sort of a "bank select" control. When any of these program changes are sent to the VFX, the "mapping" of the VFX's programs and presets to incoming program changes is set according to the table above. This means that if you want to reliably select an arbitrary program or preset in the VFX, you'll need to send two program changes: the first being a "bank select" message and the second a number from the table above.

For example, if you want to send select the first ROM program, you'd send program change 127, followed by program change 1. Similarly, if you want to select internal program 12, send—you guessed it—126 followed by 12. The cartridge program mapping is the same for each bank, so as long as you're not messing around with the presets, you can select these by sending a single program change between 61 and 120. If you are using presets, send program change 128 followed by the appropriate preset number. Remember, too, that the bank select message only has to be sent once, when you change banks; so if you never use the presets or ROM sounds, you could just send program change 126 at the beginning of your song and then forget about it.

Incidentally, in the above discussion, we've assumed that program changes are numbered from 1 to 128 (which is how Ensoniq, Yamaha and some other manufacturers number them). Others, however, number them from 0 to 127. When you're making use of this information, be sure to figure out which system your sequencer uses, and to subtract one from each of the program change values mentioned above if you're using the zero-based system.

Q: How can I set my VFX (or VFX-SD) to work as a multi-timbral controller with my system?

A: This is another complex question which has as many answers as there are systems. Still, if you're not using the sequencer (on the SD), there are some general setup rules that you'll want to follow if you want to get the most out of your VFX. I covered this subject in detail in TH, Issue 53 (November 89) but at that time, the VFX did not have the *EXT* track status, so much of what I wrote I then was aimed at getting around that problem. Here's an updated and condensed summary of the guidelines for using the VFX as a multi-timbral controller in conjunction with an external sequencer.

1) Set your VFX to MULTI mode.

2) Forget that it even has presets. (These just complicate life in a sequencing environment and don't add any functionality.)

3) Decide how many channels you want to dedicate to your VFX. (It can handle up to 12, but if you've got other synths, especially multi-timbral instruments, you'll want to restrict the number of channels it uses.)

4) Create a "multi" (or in the SD, a sequence) in which the first track's status (on the MIDI page) is set to *EXT*. For each channel that you want the VFX to play on, create a track with the appropriate channel setting, and with the status set to MIDI. (Remember that, since the VFX will always play on its base channel, you should not set any track to the same channel as the base channel.) Finally, set the track status for any remaining tracks to *EXT*.

5) Now connect the VFX's MIDI out to whatever it needs to be connected to (your sequencer input, or your MIDI merger/thru box), and connect its MIDI input to an output of your computer or the thru box. Of course, all of this depends on the exact arrangement of your gear (which makes writing this sort of article kind of dangerous), but the bottom line is that your VFX should receive the same MIDI data as all of your other instruments. If you're routing everything through your sequencer, set it to echo its input to the output, without rechannelization.

With this arrangement, everything the VFX plays is being sent to it from the outside world—either from the sequencer, or from its own keyboard via the sequencer or your MIDI merger. This may seem tricky, but here's the advantage: You can record on any sequencer track or play on any synth in your system (including the VFX) from the first track on the VFX, simply by changing the MIDI channel of that first track. Assuming you're only using 16 channels (things get way messy in a system with multiple MIDI outputs), your entire system can be accessed through just a few buttons on the VFX. Each channel that the VFX is set to play will act exactly like an external synth module, which makes it a lot easier to grok the way your system works as a whole.

There are several variations on this theme, as you might expect. You might want to use those extra tracks on the VFX to directly access some of your favorite synths by setting their channel settings appropriately, and then switch sounds by changing tracks. If your sequencer has any sort of channel filtering or selective rechannelization, there might be some way you could use that in this scheme, especially if your sequencer has multiple outputs. The important thing here is that, once you've decided on something that works, stick with it, because if you're continually changing your MIDI channel assignments, track statuses, etc. you'll quickly end up in MIDI hell, where you spend more time worrying about MIDI connections than you do making music. And that's a fate that nobody deserves. ▬

Bio: Jim Johnson, an electrical engineer, has played synths in several Phoenix, AZ bands. He's written for Electronic Musician, KCS, *and co-wrote Dr. T's Algorithmic Composer package.*

RND (♪♫♪)

News from Ensoniq

EPS-16 PLUS/EPS: The long awaited new *Signature Series* sound libraries for the EPS-16 PLUS/EPS samplers began shipping in March. ESS-13 is the first-ever release of vocal and kalimba samples from Maurice White, legendary founder/singer/composer from *Earth, Wind & Wire*. This is a special 5 disk set, priced at only $39.95. ESS-14 is sounds, grooves, and samples from *The System* (Mic Murphy and David Frank). Many of these sounds were sourced from the original master tapes of hit songs and productions of artists ranging from Chaka Khan to Phil Collins. This is also a special 5 disk set, priced at only $39.95. Of special note, these two release feature cover artwork from renowned artist Peter Max—an avid Ensoniq user! Each package is a limited-edition print from Peter's private collection, which he is sharing with Ensoniq users around the world. Enjoy!

SQ-1/SQ-R: Look for the newly released SC-3 for the SQ-1/SQ-R, 160 sounds and drum kits from a variety of developers. $99.95

Credit where credit is due dept. Due to scheduling changes, the current SC-2 card is actually sounds developed for Ensoniq by *Eye & I Productions*, not the various developers we credited in Hacker Issue #66. It's an excellent selection of sounds and we're proud to have Eye & I's support. Check it out!

VFX-SD: Look for the newly released VSD-1001, 120 Sound Programs on disk for only $19.95.

News from the Hacker

Lots of rumors about new developments from Ensoniq flying around lately. We hope to have some hard data by next month's issue.

Remember that nice empty SQ-1 Hackerpatch form we published in Issue 68? Well, START USING IT! We're all waiting...

Attention Big Name Famous People Using Ensoniq Keyboards: Please give us a call at 503-227-6848. We'd like to try something a little different for the Hacker.

News from Third-Parties

Bokonon Technologies has moved to a new location. New address: 525 N Halsted, #105, Chicago, IL 60622. Phone: 312-733-3244.

In case you've wondered... The sample collection being put out by Eltekon was put together by Erich Swanston of Maestro Music and Rob Feiner (who *insists* he's part of our bevy of writers).

TRANSONIQ-NET

HELP WITH QUESTIONS

ALL ENSONIQ GEAR - Ensoniq Customer Service. 9:30 am to noon, 1:15 pm 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 PRODUCTS

Latter Sound has released *Volume I*, 60 sounds and 20 presets for the VFX-SD. *Volume I* is grouped according to acoustical, ethereal, and exotic sounds and is divided into ten banks. The banks cover tiners, pianos, woodwinds, brasses, basses, choirs and organs, strings, guitars and mallets and non-pitched percussion. Three demo sequences and documentation are included. VFX-SD or SQ-80 disks: $40.00. Latter Sound, 307-d Mabry St., Tallahassee, FL 32304. Phone: 904-575-5561.

Digital Dreams announces the release of their third set of sounds for the Mirage running Soundprocess: *The Studio Set*. $16.95. Digital Dreams also has a new and improved address: Bruce Wallbillich, 9851 Jefferson Hwy., Hamilton 16, Baton Rouge, LA 70809.

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.

Cesium Sound

The Premier VFX Library

Professionally programmed by Nick Longo, most with multiple Patch Select variations.

Volume 1, grand and hybrid pianos, tine pianos, B3 organs, guitars and basses

Volume 2, drums, hits, tuned and exotic percussion

Volume 3, analog synths, leads, pads, sweeps, layers, power chords and unique timbres

Volume 4, ethereal, atmospheric, soundtrack, space

Volume 5, solo and ensemble strings, brass, woodwinds (saxes) choirs, etc.

Selected volumes	one	two	three	four	five
EPROM cartridges	$55	$95	$130	$160	$190
VFXSD, EPS, SQ-80, or MDF-1 disk	$40	$70	$90	$110	$120
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Unlimited sound storage, rearrange volumes, Atari or Mac

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Patchloader™ disk for Atari ST $40

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The Ultimate ESQ-1 Library

"Some of the patches are nothing short of stunning and are worth the price alone." letter to Cesium Sound

80 Voice Cartridges	40 Voice Volumes
A	1. Acoustic Keyboards 2. Electric Keyboards
B	3. Electric Guitars and Basses 4. Plucked Strings
C	5. Drums and Percussion 6. Pitched Percussion
D	7. Lead Synths 8. Synths Pads
E	9. Analog 10. Modern Rock
F	11. Techno 12. Metallic
G	13. Bells 14. Gongs, Jars, and Glass
H	15. New Age 1 16. New Age 2
I	17. Spectral 18. Space
J	19. Abstract Effects 20. Imitative Effects
K	21. Singing Voices 22. Strings
L	23. Woodwinds 24. Brass

Non-erasable EPROM cartridges A-L

each	four	eight	twelve
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Available on data cassette, Mirage, MDF-1, EPS, MC-500 disk, C64 librarian, and most librarian formats or loader disk.

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3. Lead Synths
4. Synth Pads
5. Analog
6. Techno
7. Modern Rock
8. Metallic
9. Drums
10. Pitched Percussion
11. New Age
12. Crystalline
13. Space
14. Bells and Voices
15. Harps and Strings
16. Brass and Woodwinds

one	two	four	eight
$12.00	$20.00	$30.00	$50.00

All 640 SQ-80 sounds $80.00
All 1600 ESQ-1 and SQ-80 sounds $128.00

Programmable EEPROM cartridges for ESQ-1, SQ-80
80 voice with any two volumes $50 blank $40
160 voice with any four volumes $75 blank $60

D-50 Sounds on ROM, RAM, & disk

"Nick Longo, the programmer, has made an outstanding contribution... I cannot believe I am hearing a product of synthesis."

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ROM cards	$50	$90	$160
RAM cards	$80 with any volume		$70 blank!

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2.) Basses
3.) Synths
4.) Pads
5.) Ethereal
6.) Pitched Percussion
7.) Woodwinds
8.) Strings

M1
9.) Acoustic Keyboards
10.) Electric Keyboards
11.) Basses
12.) Brass
13.) Woodwinds (sax)
14.) Atmospheric
15.) Drums and Percussion

Proteus
16.) Keyboards
17.) Addt'l Pianos
18.) Bass
19.) Guitars
20.) Drums
21.) Tuned Percussion
22.) Brass
23.) Saxes and Flute
24.) Voices and Strings

Drum Machines
25.) Roland 626
26.) Yamaha RX15, RX21L
27) TR808
28.) HR16 Kicks, Toms, Snares
29.) HR16 Cymbals
30.) R8 Kicks Toms and Snares
31.) R8 Cymbals and Percussion
32.) R8 Contemporary Percussion
33.) R8 Jazz
34.) R8 Special Effects
35.) R8 Jazz Brushes

VFX
36.) Keyboards
37.) Basses
38.) Strings
39.) Percussion
40.) Hits
41.) Analog
42.) Atmospheric
43.) Spectral
44.) Sweeps

Minimoog
45.) Synth Bass
46.) Lead Synths
47.) Synth Brass
48.) Pads and Strings
49.) Percussive

Matrix 6/1000
50.) Lead and Synth Bass
51.) Pads and Strings
52.) Brass and Percussive

"Real" Sounds
53.) Alto Sax
54.) Fender Rhodes
55.) Folk Guitar
56.) Funk Guitar w/Gestures
57.) Chorused Strat w/Gestures

DX7II
58.) Keyboards
59.) Basses and Effects
60.) Mallets and Bells
61.) Plucked Sounds

Addt'l FM
62.) Keyboards
63.) Basses

K1000
64.) Pianos and Organs
65.) Chorus and Strings

K1
66.) Layers
67.) Instruments

MIDI Bass
68.) Bass Sounds

Juno 60
69.) Misc. Analog Sounds

Prices	11.95 per disk	4-9disks $10.00 each	11-16 disks $9.00 each	19-49 disks $8.00 each	all 69 disks, $399.00
Shipping	$3.00	$3.00	$4.00	$5.00	$7.00

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Demo cassette $7.50, sound list with descriptions $1.50. Send Check, MO, or call. COD $5.00 additional shipping, cash or MO only.
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Qty	Description	Volumes, Cartridges, Format, etc.	Price

Losing Your Voice

Garth Hjelte

So tell me—has this ever happened to you? You're sequencing or playing your EPS and you find sustaining notes cutting off abruptly or unnaturally? What's probably happening is that you're using up all your available voices. The EPS has 20 sound generators within it, meaning it can only produce 20 sounds or pitches simultaneously. Sure, that's quite a few, but believe me, they get used up real fast.

DRAWBACK #1. Each layer uses one voice. If you have an instrument that operates four layers at the same time, that means you can only play five notes simultaneously (4 layers per note x 5 notes = 20 voices).

DRAWBACK #2. A voice is used as long as the sound exists; in other words, even if you've released a key, the voice will be unavailable until it fades completely as determined by the envelope. So, if we use our four layer, five voice instrument, and draw the release time out a ways, when we play it, we won't get very far without the first voices we play getting stolen out from under us.

OK, you say, what do we do about it? It's a game of tradeoffs. If you're having voice-stealing problems, here are a couple of suggestions:

A. MAKE SURE YOU ARE IN 20-VOICE MODE. The EPS has three playback modes: 12,16, and 20 voice. The reason? Well, 12 voice mode will play back samples at the highest frequencies the EPS can muster: 48kHz. 16 voice mode will do it at 39.1kHz, and 20 voice will playback at 30kHz. To me the sound differences between 12, 16, and 20 mode are relatively minimal and not worth sacrificing eight voices over. But it really depends on your application. There is a sonic difference, but not that much. Try testing the three yourself and see if you feel the tradeoff is worth it.

B. CHECK YOUR INSTRUMENT LAYERS. The more layers, the more voices used. Most string and pad sounds use two layers across the keyboard to create a stereo spread. To conserve voices, go ahead and eliminate one layer. Not all instruments need to be spread. Beware of multi-layer sounds. Sometimes there's a reason for lots of layers to be used on one patch, but sometimes not. See how they're being used.

C. DON'T OVER-ORCHESTRATE. Many times, as they say, less is more. Octaves in the bass are not always necessary. Limit the number of instruments playing at the same time and in the same frequency range. Too much creates mud. Avoid anything but fifths and octaves in the lower register. If you're using pads or block chords, cut out some of the notes within the chord, usually roots and/or thirds duplicated in other registers. Watch your voicings. This is especially true if you're playing complex jazz clusters. In those cases, try limiting inclusion of the root in your chords (except on top). Keep things short and necessary. When you play slowly, play more legato, but when you play fast, shorten up! This also makes those accelerando passages easier to accomplish. Let the music breathe. Above all (and this applies in a greater art-musical sense), imply and paint a picture of what you are trying to communicate. Use as little as possible to build a framework, and then DECORATE. Save the power for the dynamics and the climax. These are all hints to not only make your music shine with clarity, but will save voices from being stolen, which is our main topic.

D. BUY OR USE MORE EQUIPMENT. If you feel you've exhausted all these possibilities, that's what you'll have to do. This is the EPS's limit and it sort of has to be accepted. Don't expect an OS revision to up the voice count. It's in the hardware or, more specifically, the main sound processing chip (DOC II). In my situation, I had hoped to use the EPS for drums and as a drum machine as well as a good number of instruments going at the same time. I soon found the limitations of my new-found instrument as I heard all my crash cymbals clipping off early all the time. I had to bite my wallet and get a Roland R8 (highly recommended). Although I'm broke now, at least my music got a break.

In conclusion, be aware of your voices and use them wisely. They're the only ones you have! ▬

Bio: Garth Hjelte owns Rubber Chicken Software, a sampler sound company. He plays loud music in the Seattle area with wildly violent speed-metal bands, who mercilessly smash brand-new Fairlights onstage and then re-assemble them into small pocket calculators.

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.

MANUFACTURER	MODEL
PS Systems	All Models
Eltekon	All Models
Rodime	45plus, 60plus, 100plus, 140plus
Microtech	R45, N20, N40, N80, N100, N150
PL1	45 Meg Removable
Mass Micro	Datapack 45

Cesium Sounds for the SQ-80

John Bolles

Product: 40-Voice SQ-80 Lead Synth Bank.
For: SQ-80.
Price: $12 - all 16 SQ-80 Banks for $80, p/h $3.
From: Cesium Sound, 1442A Walnut St #300, Berkeley, CA 94709. (415) 548-6193; FAX (415) 540-1057.

Cesium Sounds (a.k.a. Nick Longo) has long been a major source of third-party support for Ensoniq instruments. His library for the SQ-80 contains sixteen banks of sounds in a variety of categories. The "*Lead Synth*" bank offers 40 unique and predominantly high-powered solo voices for this keyboard.

I've come across many ESQ-1/SQ-80 sounds which, although good, lack punch and, therefore, character to my ears. A mousy signal level turns me right off, no matter how pleasing the basic sound may be. When I hit the keys, especially to play leads, I want the sound to be hot, punchy, and edgy and I want it to cut. These sounds are HOT. They are lead patches, designed to jump out and grab you and they do. *ANASYN*—composed of triangle, square, and sawtooth(2) waves, and minimal frills (aftertouch vibrato)—delivers a strong, classic synth sound. *BRASYN* doesn't quite get that late-70's synth brass sound, but is very bright and punchy. It would also work extremely well as a rhythm sound; it is not so harmonically complex that it muddies up on chords. As a lead patch, everything is fine with *BRASYN* until you use aftertouch to introduce vibrato, which introduces some pretty awful noise. The modulation is supplied by LFO3, which modulates both the oscillators and the DCA's. By turning off LFO3 as a modulator on the DCA's, you can get rid of the noise and still retain a decent vibrato. This was apparently an intentional, but questionable, programming move.

VORTEX is without a doubt one of the *biggest* sounds I have ever heard come out of an SQ-80 and I was amazed to find that it was not accomplished with a layer. This features a slight delay in one of the oscillators and would make an excellent orchestra hit.

If you are in a mellower mood, *SYNNER* has a somewhat flutey sound with a bit of background hiss, giving it a slightly airy, soothing quality. Also in the laid-back vein (right next to the "hip"-atic artery) is *TAKEME*, which is percussive (EL PNO on OSC1 and a high-pitched FORMT3 on OSC2), yet mellow (TRIANG on OSC3).

Nick Longo scores big in the pseudo-signal-processing department. Surprisingly, Longo utilizes stereo imaging to interesting ends in many of these sounds—not exactly what you'd expect to find in a bunch of lead patches. In *PRESON*, aftertouch produces a left-to-right pan, which is reversed as pressure is reduced. On *MYLEAD*, *NULEAD*, and *MULEAD*, panning is modulated by ENV 3; the sound starts left and very quickly pans right. When played staccato, the effect is like panned digital delay, giving the impression of two distinct voices playing in near-unison at opposite sides of the field. If the note is held, the sound pans from the left to right and stays right until the key is released, at which point it pans back left. Several other patches utilize this programming device. *IKNOW*, *ROUNDR*, *STUNND*, and *PITCH* all have very nice-sounding pseudo-reverb added in. *PRESON*, in addition to the pan effect mentioned above, had a pretty convincing flange effect going, as well as sync.

STRSYN, as you might guess, is a string synth-type sound. But this is more a deliberately "synthetic" string sound rather than an acoustic simulation (after all, this is the *LEAD* patches bank). The interesting aspect of this patch is that Longo uses the GRIT 3 waveform for the attack portion. What? This is the famous "Cross-Wave Synthesis" synthesizer and he doesn't even use the Bowing attack transient? Right! Because GRIT 3 is enveloped for a nice, scratchy attack, AND sustains at a lower level to fill out the remaining portion for a full-bodied, complex sound.

My personal favorite in this bank is *LIES*. Play staccato and it's one of those bright, happy, "*Power of Love*"-type sounds. Sustain it and the sound simultaneously pans from left to right. It's hard to describe, but try to imagine what it would sound like if Peter Pan threw pixie dust into the air and the wind blew it up and away. A great sound for flying-off-into-the-ozone endings.

My main gripe is that some of these sounds are marred by obvious noise. *TRYSYN* and *LEADR2* start to growl after a second or so of normal sustain, and *BRASYN*, as stated earlier, does it when aftertouch is applied. I cannot fathom why a programmer as obviously talented as Longo is would let this kind of stuff slide by. I was especially disappointed by *TRYSYN*'s noise, because I was instantly struck by the beauty of that sound.

One other comment, which is highly subjective: Many of these patches, although *very* unique, sound "old-fashioned" to me. Most of the programs have captured that hollow, full-bodied sound that originally attracted me to analog synths years ago. I'm not sure this is the place to look for '90s (or even '80s) cool, digital-ice lead synth sounds. Since Longo is also capable of programming that kind of sound, I can only conclude that, with this set, he was after an analog synth sound. And at that goal, he has succeeded. People are always complaining that today's digital synths lack the warmth and punch of the early analog synths. Well, listen to these. And besides, with the Rhodes sound making a comeback and people climbing over each other to get Mini Moogs, in a few years, this may *be* the sound of the '90s.

The SQ-80 has always been described as having a certain grittiness and an analog-ish quality. For the most part, this group of Cesium pre-sets utilizes the SQ-80's inborn 8-bit grit to lend character to the sounds and brings out the SQ-80's analog heart like few other sounds I've heard. Moreover, Nick Longo utilizes the SQ-80's modulation capabilities to the max, especially in the area of simulating digital delay, flanging, and reverb, and creating panning effects. ▬

Crash, Bang, BOOM!
The Process of Elimination

Michael D. Mortilla

It has been said that idealism rises in direct proportion to one's distance from the problem. I guess that's why I am not very idealistic about system crashes. Before I got involved with all this computer music stuff, I worked solely on acoustic instruments. The worst that would happen is a string or a drum stick broke. Now that MIDI and computers are here, we have become quasi computer technicians and can no longer just play and write, but need to be aware of operating systems, compatibility, MIDI channels, SMPTE codes and a mass of parameters!

This may be a big undertaking (speaking of which, does anyone know for certain if Brahms was buried in a piano case?), but having been exposed to a profusion of system crashes over the past two years, I will attempt to help you avoid a similar fate. I have figured out how to avoid the most common crashes. Also, having been listed in the Transoniq Net since 1988, I have talked to dozens of people who were having problems and learned much from them.

The best insurance against surviving a crash is to back up your work. That may sound simplistic, but it is easy to get complacent with modern technology. We keep few notes and rarely have problems with disks. But when we do, we are really sunk. Always keep back up copies in duplicate if not triplicate for important work. And never assume that a file you just loaded is not corrupted. I recently did a concert in a theatre with a computerized lighting system. A technician came in to change one cue and didn't know there had been a power outage. He saved his work to a master and a back up and corrupted both disks! They were up all night reconstructing the cues. No one had taken any notes on lighting (it was all in the computer). I had a similar experience while working on a silent film. I had spent three weeks working on a violin solo to sync perfectly with the actor on screen (Charlie Chaplin). The day before the score was to be transferred, I decided to add a single harp note to the final chord. I entered a program change and the new note to the track with the violin and saved to my master and back up disks. The next morning I went to play back the score and the violin was gone! Yeeowza!! I remembered it and was able to get the score out on time, but it was not like the original. If you haven't gotten the point by now, save, save SAVE!

Ok, let's get to crash scenario number one: You're in the middle of a tender love song, suddenly, your speakers are filled with the sound of 10,000 sousaphones playing "*Crash of the Bumble Bee*" as deranged by Schoenberger!!!

Step One: Protect your ears, amp and speakers. *Turn down the volume first!* Crashing sound modules can produce a high density of notes at full volume. This can be too much for your audio system to handle. A limiter/compressor can go a long way toward protecting against serious damage.

Step Two: Shut off the crashed unit for at least 10 seconds.. If it's connected to any MIDI or SCSI devices, shut them off too. Garbled data has a way of moving quickly through computer lines (bad news really does travel fast!). If the unit in question is a disk based operating system (like the EPS or Mirage) then you can probably re-boot and be back in business. A ROM based OS (like the ESQ and many other synths, reverbs, etc.) is not always so obliging and may need to be re-initialized to the factory pre-sets. About 80% of the "help" calls I get from the Transoniq Net are solved with re-initialization.

So, hopefully, you've recovered from the crash and the song's playing again. But you get to the same point again and BOOM, crash time. It always seems to happen when the "*Rhino Kiss*" sample is playing with lots of pitch bends and mod wheel action, the piano part is churning out 32 note chords with lots of pedal, patch changes to all your synths (just in time to hit that big chord at the end of the kiss), a barrage of continuous controllers going to your effects device, a SYSEX dump to your DX and lots of poly-key pressure. Once again, *Yeeowza*.

Whoa, cowboy... This condition is known as "MIDI overflow." EPS owners know it as "Error #144." SQ-80 owners will know it as soft reset #1, but by any name, it is simply too much MIDI data in the information stream and if it's not thinned out, it will crash every time. It'll also happen when a MIDI loop occurs. This happens when a MIDI devices keeps sending data to itself. A good MIDI patch bay can help ease the crunch by allowing only certain data to flow to and from certain instruments and by increasing the size of the MIDI buffer. Individual units can also screen certain types of data. The SQ-80, for example, can screen out everything but notes, notes and controllers, notes controllers and patch changes, etc., and sometimes that can be enough to avoid the crash. If you don't need key pressure, disable it when sequencing. Pressure will be recorded even if it has no effect on a patch, this will add data to the MIDI stream and eat up memory.

SMPTE units can really throw a monkey wrench into the works, especially when they are sending out song position pointers along with their SMPTE location, etc. This will sometimes crash the EPS while in MIDI sync. I've found that disabling SYSEX helps this condition quite a bit. I never really appreciated how much data is being sent until I started working with a computer based sequencer. Ensoniq's on board sequencers are truly remarkable, but the fact is, you can't see all the extraneous data.

Another common causes of system crashes are easily (but not cheaply) fixed. Low voltage (brownout) or AC current fluctuation can be remedied with an AC line conditioner/regulator. We're not talking spike protection here, but a unit that provides constant voltage even when the power at the outlet is unstable. Spike protection is very cheap, but a line regulator will start at about $150 for the lowest level. A 1200 watt unit is about $250 and with battery back-up, about $500-800. A line regulator is a must for live performance, especially in a poorly wired club and in any theatre. Lighting dimmers (in theory) have no effect on outlets when properly wired. I have yet to play a theatre where

the voltage could be trusted. Also, if you do use lots of powerful equipment, try to spread it over several circuits to ease the load. In a home studio, avoid sharing circuits with the fridge or with a washer/dryer.

Poor ventilation may not cause crashes, but it won't do much to prolong the life of your equipment. Especially in racks, a $20 computer fan can do wonders for keeping units cool. Effects processors in particular are notorious for creating heat. Dust, smoke and moisture can destroy floppies, switches, key contacts, audio heads, lungs, etc. Covers help a lot. Vacuum regularly. Canned air can blow out hard to reach areas. I know a highly respected computer technician who claims that the most frequently used item in his tool kit is canned air. Sometimes that alone will solve many disk drive malfunctions. Static electricity can zap an IC before you can say Hitachi! You can get a static eliminator strip at most computer stores. I've heard that neutrinos can cause crashes! I still think it's little plastic men.

In a worst case scenario, there are such things as hardware crashes. Everything eventually breaks down, including us! Disks will fail and sometimes the computer just gets confused. But whatever the root of your problem, don't be in such a rush to run to the nearest service center. Troubleshoot first. Look closely at your system and how it's set up. Try to re-create the crash and remove one element at a time until it stops crashing and then add them back in until it happens again. Read your owner's manual, call the manufacturer and talk with other musicians or computer users. With a little luck, your crashes will be soft ones. You may be able to recover from them with dignity and with your work intact...intact...intact...intact (*YEEOWZA!*) ▬

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EPS DOS/SCSI Miscellaneous Ramblings

Part I

Al Smith

An earlier version of this article was published in TH in March of 1989 to coincide with the release of the EPS SCSI interface. Two years of SCSI use has provided technical feedback which has been used to revise and update the original article.

I. EPS DOS Overview

The EPS DOS is a variable length file system which uses the standard linked list data structure to track a file's physical location on the disk. The linked list is usually referred to as the file allocation table (FAT) or sometimes as the volume allocation block or some other similar name. There are a number of IBM PC books that explain variable length file systems and linked list data structures in more depth. If you're interested check out your local bookstore or library. The linked list works as follows:

Within the directory entry for a particular file is the pointer to the first block of data. This beginning block pointer is used to access its corresponding entry in the file allocation table which contains the pointer to the next block of data. This procedure is repeated until the block pointer is equal to the special end of file code. Note that one block on the disk is 512 bytes and is the same as one block of internal memory.

The general organization of any disk connected to the EPS (either internal floppy or external SCSI drive) is:

1) Three blocks of various system information
2) Two blocks for the root directory
3) File Allocation Table blocks (FAT) – the number of blocks depends on the size of the disk drive
4) EPS O.S. if it exists on the disk
5) User data (sound files, sequence files, subdirectories, etc.)

In a variable-length file system as files are saved and deleted, the disk becomes fragmented (or noncontiguous). That is, if there are X number of free blocks on the disk, they will not be grouped together at the end of the disk. Instead, there may be some free blocks in the beginning followed by allocated blocks followed by free blocks.

So what does this mean? The more fragmented a disk the longer it takes to load files. Storing files in contiguous blocks translates into contiguous tracks and sectors. This improves the file load time because it minimizes the movement of the disk drive heads. Loading large files that are contiguous can still require a substantial amount of head movement because the file allocation table entries must be accessed to get successive blocks of the file. On the EPS, each file allocation table block contains 170 block pointers. Due to O.S. memory limitations, only 1 FAT can reside in memory at any time. The larger the file the more FAT entries are required and this means that multiple FAT blocks are necessary to track the file. As a result, even though a file is contiguous, if it is large it will still require a substantial amount of head movement to load the required multiple FATS.

In order to bypass loading multiple FATS, a contiguous blocks field is maintained in the file's directory entry when a file is saved. When a file is loaded, if its length is equal to the contiguous blocks count, then the FAT does not have to be accessed. It starts loading at its beginning block and continues until its length in blocks is loaded. If its length is greater than its contiguous blocks, then the file starts loading at its beginning block, through the count in contiguous blocks and then must pick up the remaining file blocks using the FAT'S. With this in mind, there are a few simple techniques which can minimize a files load time:

1) Before saving any sounds first format the disk, then copy the O.S. and then create all sub-directories. Create extra directories even if you think you may never use them, and give them descriptive names like Factory Pianos, My Pianos etc.

Why? Subdirectories only take up 2 blocks on a disk. If you create subdirectories after you have saved files, you will introduce the possibility of fragmenting the disk. This will also keep all directories located in physically adjacent blocks which will help minimize load times, especially for bank files.

2) Saving sounds after a disk has been formatted will guarantee that the sounds will be stored contiguously and will load as fast as possible.

Why? A disk can be fragmented only by deleting files (instruments, sequences, sub-directories, etc). Once a disk is formatted all of its free blocks are contiguous. As files are saved, the remaining free blocks will decrease but will still be contiguous. These free blocks will always be the higher-numbered blocks which are towards the inner tracks of the disk.

3) Develop new sounds using floppy disk(s). Once you have perfected the sound, save it to a newly formatted floppy disk or hard disk (see also 2 above).

Why? When you are developing new sounds, often you will have multiple copies with different parameter settings. Once you get the sound right, you will usually delete the older versions, thus causing the disk to become fragmented. Also, by saving a finished sound to a different floppy disk or hard disk, you automatically create a backup of your sound.

4) If you are modifying an existing sound and you make it larger save it back to disk using a different name.

Why? If you save a file that already exists, it will first delete it and then resave it. It will, however resave the file where it was originally stored on the disk. If the new file is larger and there are other files already stored after it on the disk, then the "extra" blocks cannot be stored contiguously, but will have to be stored elsewhere on the disk and so begins fragmentation. Also note that fragmentation will occur if the new size of the file is smaller than it originally was. In this case, the file will still be contiguous (assuming it was before) but you will have a "hole" due to the smaller size.

By using the above suggestions you can either minimize fragmentation or avoid it altogether. The EPS DOS has been optimized for file loading when files are contiguous. For a sound of 1000 blocks in a contiguous file, the load time is about 2 seconds. If the file is fragmented the load time can take anywhere from 2 to 5 times longer.

II. EPS SCSI Implementation

The SCSI implementation on the EPS is Apple Macintosh Compatible. This was done because of the availability of Apple compatible SCSI hard drives and because Ensoniq uses MACs for sound development. From a software standpoint the same file system and DOS commands are used for both floppy and SCSI drives. On the hardware side, the floppy disk I/O uses channel 0 of the DMA (Direct Memory Access) controller and SCSI devices use channel 1.

All of the comments made in the DOS overview section are applicable to a SCSI hard drive, except that the number of file allocation blocks required for a particular hard drive depends on the size of the drive. The larger the storage capacity, the more file allocation blocks required. The suggestions made on minimizing file load times will provide more dramatic results on a SCSI hard drive.

Before moving on to the more technical stuff, there are three suggestions that should be given consideration if you are using a SCSI drive with the EPS:

1) Macros – You should familiarize yourself with macros and understand how to use them. They can minimize your time and effort when using a SCSI disk drive.

2) Backup – Keeping a backup of all files on your hard disk is a must. When our backup utility becomes available, this will be an easy though time consuming thing to do. However, there is an easy way to do backups even without a utility. For the factory sounds/sequences that you are uploading to a SCSI drive you already will have a backup. Then for any new sounds, etc. you develop, take the few minutes to copy it onto a floppy disk. If you develop new sounds on a floppy and then copy them to the SCSI drive you will always have a backup. The important point is to keep backups of all your files on floppy disk.

3) Documentation – Document how you have your files organized on your SCSI drive. For example, use a sheet of paper for each directory listing all the files in that directory. Because SCSI drives allow you to store a large number of files, it is easy to lose track of where a particular file is located. Since the EPS only has a 1 line display, it can take a long time to locate a file (don't forget macros, and document these also). The documentation will be useful if you ever have to rebuild a hard drive.

III. Miscellaneous SCSI Topics

1) What is SCSI?

The Small Computer Systems Interface (SCSI) is a standardized (for the most part) hardware and software communication protocol between computers (such as the Macintosh and the EPS) and peripheral devices (hard disk drives, etc.). The SCSI bus is essentially the cable that is used to connect the SCSI devices together. There are a total of 25 signal lines used on the EPS (and APPLE) implementation. Nine are data signals, nine are control, six are ground and one is for termination power. SCSI communicates through a parallel data path (8 data bits, and 1 parity bit). MIDI in contrast communicates in a serial manner.

The cable interfacing of SCSI and MIDI is similar because they are both daisy chained configurations. However, the number of signal lines and type of cable is different. In a MIDI connection, the output or thru of one device goes to the input of the next MIDI device and this continues until the last MIDI device in the chain. SCSI devices are also daisy chained except that there is no distinction between SCSI input or output connectors. Each connector is capable of both input and output functions. Most SCSI devices have two 50 pin SCSI connectors which are wired together internally.

Another similarity between SCSI and MIDI are that they both use an address to communicate with a specific device. Although MIDI does have different modes that allow communication with all MIDI devices at once, this cannot be done on the SCSI Bus. MIDI has sixteen channels (or addresses) and multiple MIDI devices can have the same address. SCSI has eight addresses (sometimes called the SCSI priority or ID) and each device on the SCSI bus must have a different address. Thus, there can only be a maximum of eight SCSI devices connected to the SCSI bus. The valid SCSI address (priority) range is from zero to seven, with seven being the highest priority. The priority of a SCSI device is important only if two devices are trying to control the SCSI bus at the same time. In this case, the device with the highest priority will gain control of the SCSI bus. The EPS has a fixed SCSI ID of three, while the Apple Macintosh has a fixed ID of seven.

2) EPS SCSI Communication Modes

Generally, the EPS implements only the initiator mode of communication. This means that the EPS must start a SCSI transfer between itself and another SCSI device. So, for example, it isn't possible for a computer to request information from the EPS. There is one exception to this which occurs during wavedata transfers. If SCSI is installed in the EPS and a wavedata transfer is requested, the EPS MIDI routine will request DOS to enter target mode. The EPS will then wait to be

selected by the computer via SCSI and then respond appropriately by sending or receiving the wavedata. The parameters are only transferred via MIDI if requested by the user. Due to the fact that the EPS will only enter the target mode for SCSI wavedata transfers it is possible to connect multiple EPS's on the SCSI bus even though the EPS SCSI ID is fixed at 3. You must however have each EPS that is on the SCSI bus set to a different MIDI base channel.

3) SCSI Termination

All SCSI configurations must have termination at both ends of the SCSI chain. A terminator is a resistor network on each SCSI signal on the SCSI bus. It prevents reflection or ringing on the signal lines allowing reliable high speed data transfers. The ringing would appear as a damped sine wave on the signal transitions, i.e., high to low and low to high. In general, a longer cable will produce more ringing (higher amplitude). If the amplitude of the ringing becomes high enough it can cause the SCSI bus controller to detect a change of state which would then cause an error. Terminating both ends of the SCSI bus will minimize the effects of ringing and help prevent errors from occurring on the SCSI bus.

The cable, however, must be treated as a whole because the SCSI bus is implemented by daisy chaining devices together. For example, if you have just one EPS and one disk drive then you will physically have one cable. If, however, you have an EPS and two or more disk drives and a computer then you will physically have multiple SCSI cables. These multiple cables daisy chaining all the SCSI devices together must be treated as one cable from a termination standpoint. Note that the combined length of all cables should not exceed 6 meters (about 19 feet). The termination should be placed on the devices that are located at the physical ends of the SCSI bus. In general, a system configuration (two or more SCSI devices) must have at least one terminator, but never more than two terminators. Damage can result if more than two terminators are present because the SCSI devices will be required to sink more current than their electrical rating allows. This will either permanently damage the SCSI device or cause failures during SCSI data transfers.

I have examined three types of terminators, two of which are external and one internal. The internal terminators are used by most SCSI disk drive manufacturers. They use resistor packs which implement the termination network on the SCSI drive controller board. The external terminator comes in two flavors: one resembles two 50 pin SCSI connectors mounted back to back encased in plastic; and the other resembles two 25 pin D-subminiature connectors mounted back to back encased in plastic.

The 50-pin external terminators are not used often because the majority of drive manufacturers supply internal termination on their drives. Some O.E.M.'s (Original Equipment Manufacturer's – for example, Microtech) remove the internal terminators and supply the 50 pin external terminators. This is done so that the end user can add or remove termination without opening up the disk drive. The 25 pin terminator is the type required by the EPS because it uses a 25 pin D- subminiature connector for the SCSI interface. Our recommended sources are Integrated Media Systems (415-326-7030 ; part # 5011690-01 Dyaxis SCSI terminator), Eltekon (313-462-3155 ; part # SCSI-Term) or PS Systems (619-578-1118 ; part # HD-Term25). Also by the time you read this we should have a new SCSI interface (model # SP-2) that includes removable terminating resistors and also an external terminator (model # SPT-1) that can be used on the SP-1 SCSI interface (same as Eltekon, PS Systems and IMS terminators).

The bottom line on termination is this: The SCSI bus should be terminated at the two devices that are at the physical end of the bus. So if you have two devices then both should be terminated. If there are more than two devices then the two devices at the end of the SCSI bus must be terminated and any devices in between must have their terminators removed. It is important to note that it is possible to get a SCSI system to work without strictly following the above rules. For example you may be able to get an EPS and SCSI drive to work by using a two foot cable and only terminating the SCSI drive. I DON'T RECOMMEND VIOLATING THE RULES FOR TERMINATION. For any termination scheme to work properly the rules must be followed. For SCSI this means terminating the SCSI bus only at the two physical ends of the bus. By choosing not to follow the termination rules means that you are compromising reliable data transfers.

One final point on termination. The new SP-2 SCSI interface with built in termination and the external terminators for the EPS requires that the power for the terminator be supplied by some other device on the SCSI bus. Most SCSI drives I have seen do supply termination power (except for some early versions of the 44Mbyte Syquest removable drive). Also MAC's with internal SCSI drives usually supply termination power (at least SE's and MAC II but maybe not the PLUS series). If you're not sure, call the customer service department of the company who you bought the drive from and ask them. Or take your drive to an Ensoniq Service Center and have their technician perform the following measurement:

1) Connect the SCSI cable to the drive

2) Turn on the SCSI drive

3) Using a voltmeter measure between pin 14 (ground) and pin 25 (termination power) at the 25 pin connector (the pins are always numbered, but you have to look closely to see them).

BE CAREFUL – if you accidentally slip off a pin while doing this you may damage the drive.

Any measurement between 4.25 and 5.25 volts is an acceptable value. Any reading less that 4.25 volts may cause problems because the logic level is too low. Any reading higher than 5.25 volts may cause problems because of excessive power dissipation in the SCSI drivers. ▬

End of Part One. Conclusion next month.

And Now for Something Completely Different... EPS Sound Disks from Electro Acoustics

Bryce Inman

For: EPS, EPS-M, EPS-16+.
Product: Sound Disks.
Price: $89.95 for 10 disk set.
From: Electro Acoustics, 1240-B Calle de Comercio, Santa Fe, NM 87501.

As I was initially playing with these sounds, I couldn't help but think of one of my favorite phrases from Monty Python's Flying Circus, "*And now for something completely different ...*" While I haven't heard every EPS sound available these days, I've heard enough to know that sounds like these are pretty rare. And though I haven't been to your place to look through your library of EPS sounds, I'm fairly certain that you don't have many like those sold by Electro Acoustics.

Describing these sounds is a rather difficult task. As I listened to these disks, they brought back memories of early experimental electronic music—what was then referred to as "musique concrete." This all jibes when you read the notes which accompany these disks; these sounds were created with "rare out-of-production analog equipment such as the ARP 2600."

Some rather creative names have been given to these sounds —"*Boing Free*," "*Tolkein Trio*," "*Far Reaches*," etc. But they don't give a clue as to how they sound (not that one could easily conjure up names that accurately describe them). In general, the sounds tend to be atonal; you would probably use them as effects rather than for melodic lines. (Although one of the few melodic sounds, "*Glass Harmonica*," is absolutely gorgeous!) As a whole, the sounds generated resemble electronic bloops and bleeps and other-worldly sonorities. To my ears these sounds are more reminiscent of Isao Tomita than Wendy Carlos (or Walter Carlos for those of you familiar with the earlier "*Switched on Bach*"). These are sounds that don't just sit there...they evolve through time. In addition, many of them are punctuated with rhythmic patterns patterns which don't follow a strict cadence.

It's obvious that great care has been taken in the preparation of these sounds. Other than a couple of extremely minor shortcomings, the samples are crisp and clean. The programming is also quite good. Most of the sounds are layered and programmed so that they fill or move about the stereo field. In addition, most of the sounds have been programmed to respond to pressure and/or velocity, giving a nice amount of control over their shape. Not all of the sounds are looped or need to be, but those that are work very well. The only thing these sounds lack is patch variations.

Most of the sounds on these disks are rather hefty, with the majority weighing in at 800-900 blocks. As a result, six of the disks in this set contain only one sound and the rest contain only two or three. This makes the $89.95 price tag seem a bit steep but, as I mentioned before, careful attention has been given to each sound in this collection.

I am delighted to see how far synthesizers have come in mainstream music—they've become almost indispensable—but I still love music which explores unique sonorities. I'm a big fan of Tomita (I'm listening to his interpretation of Holst's "*The Planets*" as I write this) and I'm delighted to see a set of sounds like this which keeps that spirit alive. ■

Bio: For eight years Bryce Inman traveled with a gospel music team called Sound Investment and taught music in Indiana. Now he works as a free-lance music editor for Word, Inc. in Irving, TX. Although he has decided to make Texas his home, he refuses to say "y'all" or "fixin'."

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Saraswati says: "Listen." Peace.

The ESQ1 Sequencer Internals Revealed—Part 7 (All Sequence Dump)

Joe Slater

Hi! We continue this series of articles by completing the discussion on the format of the all sequence MIDI dump data from the ESQ1 sequencer. **Warning:** The accuracy of the information revealed here has not been confirmed by Ensoniq, so be forewarned!

In this article we discuss the header of the all sequence MIDI dump. The ESQ1 manual states that this header is 306 (132h) bytes. Following the header is sequence and song data, which we have already discussed. The header information discussed *only* applies to the ESQ1. The SQ-80 is undoubtedly different. It may be similar in structure, but will at least differ in size because of the increased number of sequences and songs (Perhaps an SQ-80 owner could enlighten us).

There is much information contained in the header, which is really only of use to the ESQ1 itself during playback. This includes such things as song repetition count, song repetition countdown, song total steps, song current step, song transpose, sequence loop setting, ticks per beat, remaining beat ticks, current bar, as well as pointers to the current sequence, song, event, next event, etc. These values are *not* discussed, as they are only meaningful to the ESQ1 firmware. Many of these values will be reset when the all sequence MIDI dump is sent to the ESQ1 anyway. I strongly suggest clearing all of these values when sending to the ESQ1.

When describing the header, there will many gaps of unexplained data, which is the system information discussed above. Only the values considered useful, which also must be set properly when sent to the ESQ1 are discussed. The format of the header with single element values of interest are:

```
Byte 5   --> NNNNNNNN :     Current Sequence
Byte 8   --> SNNNNNNN :     Sequence Selected?, Current Song
Byte 52  --> HHHHHHHH :     High Byte of Data Memory Used
Byte 53  --> LLLLLLLL :     Low Byte of Data Memory Used
Byte 54  --> HHHHHHHH : [R] High Byte of Memory Avail For Data
Byte 55  --> LLLLLLLL : [R] Low Byte of Memory Avail For Data
Byte 56  --> HHHHHHHH : [R] High Byte of Memory Installed
Byte 57  --> LLLLLLLL : [R] Low Byte of Memory Installed
Byte 267 --> HHHHHHHH : [R] High Byte of Memory Free
Byte 268 --> LLLLLLLL : [R] Low Byte of Memory Free
Byte 269 --> NNNNNNNN :     Number of Sequences Defined
Byte 289 --> 0000000C :     Metronome CLICK=OFF/ON
Byte 301 --> HHHHHHHH : [R] High Byte of Memory Reserved
Byte 302 --> LLLLLLLL : [R] Low Byte of Memory Reserved
```

The entries marked with [R] are read-only entries. In other words, the ESQ1 will ignore these values when it receives them, and reset them accordingly. These are memory variables which are unique to each ESQ1. The only memory variable which must be set properly is the Data Memory Used variable. This value contains the total size of all sequences and songs. Note that the MIDI system exclusive all sequence dump alert message also sent this size value, but in reverse order. Also note that this size does *not* include the 306 bytes of header information. The memory variables are related with the following formulas:

[Memory Available For Data] = [Memory Installed] – [Memory Reserved]
and
[Memory Free] = [Memory Available For Data] – [Data Memory Used]

The remaining variables are now discussed. Byte 5 is the current sequence number (0..29). Byte 8 is the current song number (0..9), and the high order bit denotes if a song or sequence is currently selected. The value is 1 for sequence, 0 for song. Byte 269 is the total number of sequences (not songs) defined. The low order bit of byte 289 is the metronome click setting; 0 = OFF, 1 = ON.

The remaining values of interest in the header are arrays (or sets) of element values, related to the 30 sequences and 10 songs. When describing the format, only the byte number where the data begins is shown:

```
Byte 58..  59 --> [30x] HHHHHHHH LLLLLLLL : Seq Offset Ptrs
Byte 118..119 --> [10x] HHHHHHHH LLLLLLLL : Song Offset Ptrs
Byte 138..139 --> [30x] NNNNNNNN          : Seq Defined? Data?
Byte 168..169 --> [10x] NNNNNNNN          : Song Defined? Loop?
Byte 178..183 --> [10x] 6-Byte Name       : Song Name
```

The offset pointers point to the sequence/song data relative to the data that follows the header (don't include the header). In other words, the first sequence/song that occurs in the data would have offset 0. Offsets for sequences/songs that are undefined should also be ignored.

The Sequence Defined byte has the following values: 255 = Undefined, 127 = Defined but no data recorded, and 0 = Defined with data recorded.

The Song Defined byte has the following values: 255 = Undefined, 1 = Defined and LOOP = ON, and 0 = Defined and LOOP = OFF.

Each song name is comprised of 6 characters (bytes). The

character set used is the same as for Patch (Program) names. For the most part, this character set uses the same codes as the corresponding character in the ASCII character set. However, the ESQ1 uses some characters that do not exist in the ASCII character set. The characters 0..9 that have a dot to the right, have the following codes respectively: 33, 35, 37, 40, 41, 58, 59, 91, 92, and 93. The "pyramid" character has code 94. The "upside-down pyramid" character has code 95.

We end this article with sample code (Turbo C for the IBM PC) used to display an all sequence dump, calling functions that were defined in earlier articles. The next (and final) article will discuss some useful programming exercises, and include a correction to the Patch dump format (PCB) as shown in the ESQ manual. ▬

BIO: Joe is the 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.

Current Ensoniq O.S.s

EPS	2.4
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

```
typedef struct {
   unsigned char Sys1 [4];
   unsigned int  SeqNum   : 8;
   unsigned char Sys2 [2];
   unsigned int  SongNum  : 7;
   unsigned int  IsSeq    : 1;
   unsigned char Sys3 [43];
   unsigned int  MemUsedHiLo;
   unsigned int  MemDataHiLo;
   unsigned int  MemInstHiLo;
   unsigned int  SeqOffHiLo  [30];
   unsigned int  SongOffHiLo [10];
   unsigned char SeqDef  [30];
   unsigned char SongDef [10];
   unsigned char Name [10] [6];
   unsigned char Sys4 [29];
   unsigned int  MemFreeHiLo;
   unsigned int  SeqTot : 8;
   unsigned char Sys5 [19];
   unsigned int  Click    : 1;
   unsigned int           : 7;
   unsigned char Sys6 [11];
   unsigned int  MemSysHiLo;
   unsigned char Sys7 [4];
} ALLStart;

typedef struct {
   ALLStart Hdr;
   unsigned char Data [1];
} ALLSeq;

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

void ShowALL (ALLSeq *All) {

   int       i;
   ALLStart *Hdr = &All->Hdr;
   Sequence *Seq;
   Song     *MySong;

   printf ("MEMORY USAGE:\n");
   printf ("Installed          = %5u\n", RevBytes (Hdr->MemInstHiLo));
   printf ("Used by System     - %5u\n", RevBytes (Hdr->MemSysHiLo ));
   printf ("Available for Use - %5u\n", RevBytes (Hdr->MemDataHiLo));
   printf ("Used by Sequences - %5u\n", RevBytes (Hdr->MemUsedHiLo));
   printf ("FREE               = %5u\n", RevBytes (Hdr->MemFreeHiLo));
   printf ("Metronome CLICK    = %s\n", Hdr->Click ? "ON" : "OFF");
   printf ("SEQUENCES DEFINED = %u:\n", Hdr->SeqTot);
   for (i = 0; i < 30; i++)
      if (Hdr->SeqDef [i] != 0xFF) {
         printf ("  [%c%cSEQ-%02d]\n",
                 ((i == Hdr->SeqNum) && Hdr->IsSeq) ? '>' : ' ',
                 (Hdr->SeqDef [i] == 0)             ? '.' : ' ',
                 i + 1);
         Seq = (Sequence *)
               &All->Data [RevBytes (Hdr->SeqOffHiLo [i])];
         ShowSeq (Seq);
         ShowPerformanceData (Seq);
      }
   printf ("\nSONGS DEFINED:\n");
   for (i = 0; i < 10; i++)
      if (Hdr->SongDef [i] != 0xFF) {
         printf ("  [%c%6.6s] Loop=%s\n",
                 ((i == Hdr->SongNum) && !Hdr->IsSeq) ? '>' : ' ',
                 Hdr->Name [i],
                 Hdr->SongDef [i] ? "ON " : "OFF");
         MySong = (Song *)
                  &All->Data [RevBytes (Hdr->SongOffHiLo [i])];
         ShowSong (MySong);
      }

}
```

SQ Modulation – The Story Unfolds

Clark Salisbury

Welcome back to "SQ-1 Programming Made Painfully Obvious," our continuing series on programming the SQ family of synthesizers. Last month we began an in-depth look at modulation. As promised, we'll continue with modulation this time out.

To modulate something, simply put, is to change it. This is a very simple idea with some rather complex variations.

Each SQ-1 sound has up to three voices; each of these voices is composed of a wave which is routed through a filter, an amplifier, the output section, and the digital effects. Modulation can be applied to control various facets of the wave such as pitch and start index. Modulators can be applied to the filter to control its cutoff point, allowing you to shape the harmonic content of a voice in a number of ways. They can be applied to the amplifier to shape a voice's dynamic contour, the way a sound's volume changes over time. Modulators can be applied to the output section to allow for further dynamic control. And modulators can be applied to the digital effects to allow for real-time effects control, as well as to allow for some sophisticated types of control not always found in outboard effects devices.

There are a total of 15 components within the SQ-1 that can be used as sources for this modulation, as well as a few special purpose modulators, such as the ramps, which are applicable only in certain areas such as the digital effects. Among the general purpose modulators available within each voice is a Low Frequency Oscillator, or LFO—we've talked about LFO's a bit already. There are three envelope generators, which we will begin focusing on in this installment. There are two kinds of noise available, which (along with the other modulators) will be addressed in a later installments. Velocity and keyboard position can be used as modulators, as well as the timbre control, pedal controller, and pitchwheel. External controllers can be routed in from other MIDI devices via the "XCTRL" modulator, and pressure can also be routed in for use as a modulator. The ubiquitous modwheel is available, of course, and the "MAX ON" modulator rounds out our list.

Any of these modulators can be connected to the wave, filter, amplifier or output section, and most of them can be used to control a parameter of your choice in the digital effects section. As a matter of fact, in many cases you can use two or more different modulators simultaneously on a single destination, such as the filter. As complex as these routings can become, it won't behoove us to gallop too quickly through this material—it's most important that we form a complete picture of the possibilities presented by the modulation controls of the SQ-1. We'll start by taking a close look at envelopes.

So what is an envelope, anyway? Well, an envelope is a generic control signal used to modulate some component within the SQ-1. As a matter of fact, envelopes are so generic in nature that I can't think of a single synthesizer that did not have at least one envelope generator (the component which generates the envelopes in the first place—a brutally simple concept).

As it relates to the SQ-1, an envelope can run in any of three modes: normal, finish or repeat mode. For now, we'll be talking about the most common mode, normal.

In normal mode, an envelope is a one-shot controller, activated by a key depression. This means that once a key is played, the envelope runs once through its pre-determined cycle and stops, waiting to be activated again. What the envelope does once it has been activated depends on the settings that are determined on the envelope programming page, and what the envelope is routed to control. Let's do some hands-on, shall we?

For this example, select ROM program 77, "MALLETS." Press the "EDIT" button, then the "WAVE" button, and then "0." This takes you to the select voice page. From here we can see that there are two voices active in this program, voices one and two. For now, turn off voice two by scrolling to select it, then hitting the down arrow button. What we are left with is the basic mallet sound, but with only one voice active. Scroll to select voice one for editing—the word "ON" should start flashing.

Now press "AMP" and "0" to access the amplifier envelope—this is the envelope that generally controls overall dynamic contour. You should find yourself at the first page of the amplifier envelope menu. The display should look something like this:

LEVL =99 99 00 00
TIME =11 50 27 50

The upper row of numbers is showing envelope levels and the bottom row is showing envelope times, which determine how long it will take to go from one level to the next. In this example, the envelope begins at a level of 99, (the maximum level available), then takes a time of 11 to move to the next level, also 99. From there, it takes a time of 50 to move to the next level, which is 00, (the minimum available), and so on. Let's try a little experiment.

Play a note, and listen to how the sound decays as you hold down the key or keys. Now select time 2, the second parameter in the "TIME" row—it's currently set to a value of 50. Change this to 10 and play a note. Notice that the sound decays much more abruptly—that's because it is only taking a time of 10 to get from the second level, 99, to the third level, 00. Try setting the second time to a value of 99 and play a note. Notice that

you need to hold the key for quite a while before the note completely decays—because it's now taking the maximum time, 99, to go from the maximum level of 99 to the minimum of 00. Now let's try something a bit different.

Set time 2 back to its original value of 50. Now set level one to 00. The display should be showing:

LEVL =00 99 00 00
TIME =11 50 27 50

Now when you play a note you'll notice that the note fades in, rather than attacking percussively—this is because the SQ-1 envelope is now set to go from level one, 00, to level two, 99, with a time of 11. Now try setting time one to a value of 00—surprise! The percussive attack is back! You see, even though the envelope is set to start at a level of 00, it takes 00 time to get to the second level, which is 99 (full on). So you can control how long a sound takes to attack by using level one to set the initial level, level two to set the target level, and time one to control how long it takes to get there. Level three and time three function in precisely the same way, allowing you to create envelopes that have more complex attack/decay characteristics. Level four and time four, however, function somewhat differently.

Level four is what is known as the sustain level of the envelope. What happens is that the level set at level four will remain constant for as long as a key on the keyboard is held down—that is, once level four has been arrived at after the first stages of the envelope have run their course. For example, set level four of the envelope we've been working with to a level of 99, and hold down a single note on the keyboard. Notice that the note attacks percussively, gradually decays to silence, but then swells back to full volume a moment later. If you continue to hold a key down the note will continue to sustain. The envelope we've created should look like this:

LEVL =00 99 00 99
TIME =11 50 27 50

As you can see, this envelope is set to begin at a level of 00, then take a time of 11 to reach a level of 99, then take a time of 50 to reach a level of 00, and then to take a time of 27 to reach its final sustain level—99. See? This is easy! "But what is time four for?" you may well ask ask. Well, well, it's called the "release time," because it sets the amount of time it takes for the envelope to get from whatever level it's currently at back to 00 after the key has been released. To hear this effect in action, set time one to a value of 00, level three to 99, and set time four, (the release time), to a value of 00. The display should look like this:

LEVL =00 99 99 99
TIME =00 50 27 00

WHat we have is an envelope that goes immediately to a level of 99 (time one is set to 00) and stays there for as long as the key is held down (sustain level—level four—is set to 99). Notice that when the keys are released, the sound decays to zero rather abruptly—that's because time four (release time) is set to 00. Try setting time four to 60 or so—notice how the sound now takes a while to decay after the keys are released. Pretty nifty, huh? The higher you set the release time (time four) the longer it takes for the sound to decay once the keys are released.

Time to get a little ambitious here. Let's make a basic piano sound, using what's been gathered about envelopes so far.

First we'll need to select an appropriate wave to use, so press the "WAVE" button, and then "1" to move to the wave page (remember that we still have voice one selected for editing). As you can see, the "MARIMBA" wave from the "Tuned Percussion" group is currently selected. Let's change this to one of the piano wave.

Scroll to select the words "TUNED PERCS"—they should begin flashing. Now use the data slider or the down arrow button to cursor down to the "STRING WAVE" group (the piano waves are found, for the most part, in the "String Wave" group), and scroll once to select the "STRING ENSEMBLE" wave. You can now scroll up to find the piano wave you'd like to use. I'm going to use the "DIGITAL PIANO," but the choice of waves is up to you.

Once the wave has been selected, we'll need to return to the Amp envelope page—press "AMP," and you should be there. If not, press the "0" button as well.

Now let's think for a moment about what the dynamic contour of a piano sound is like. We know that it's percussive, so we'll probably want to start out at a high level with a very short attack time. Setting level one of our amp envelope to a value of 99 should accomplish just this.

We also know that a piano decays as the note is held, so we'll need to set our sustain level (level four) to 00—we wouldn't want the piano sound to continue to sustain while we hold the keys or sustain pedal down—it might start to sound a bit like an organ. We also know that the piano sound decays fairly rapidly once the keys are released. But the sound doesn't die away instantly—the notes ring on for a brief moment after the keys are released, so we'll need to set our release time (time four) to something appropriate—let's try a value of 40 for time four for now. Now all that's really left is to set how long it actually

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takes for the piano sound to decay while a key or the sustain pedal is actually being held.

The envelope we've designed, so far, should look something like this:

LEVL =99 00 00 00
TIME =XX 00 00 40

The wild card here is time one, which controls how long it will take for the piano sound to go from its initial level of 99 to its subsequent level of 00. You can figure out the setting for time one simply by listening to its effect on the sound—select it and adjust it while playing a few notes on the keyboard.

Through a bit of casual experimentation, I find that a value of 70 or so seems to work OK for the middle notes on the keyboard, but the low notes and high notes are suffering. The high ones sustain too long, giving the upper end of the piano an organ-y quality, while the lowest notes don't seem to sustain quite long enough. What we need is a way to use the keyboard itself to modulate the envelope times. This would allow us to have shorter envelope times for the high notes and longer envelope times on the lower notes. Fortunately, just such a parameter exists in the SQ-1, but there's a trick—it only works with time two and time three. This means that if we use time one to set the decay for our piano envelope, the "keyboard tracking" parameter (as it is called) will have no effect. So what we'll need to do is use either time two or time three for our decay parameter—fortunately, it's easily accomplished.

Simply set level two to a value of 99 and time one to a value of 00. In this way, the envelope still starts out at full on, but it immediately moves to the second level (since time one is set to 00, the minimum time possible). Now since we're using time two as our decay stage, let's set it to the value we originally roughed in for time one—70. Our envelope should now look like this:

LEVL =99 99 00 00
TIME =00 70 00 40

Now let's check out the "keyboard tracking" parameter. Press the "2" button, and you'll find yourself at the following display:

Mode=NORMAL
KeyboardTrk=+28

We'll talk about the mode parameter in our next installment, but for right now, we're interested primarily in the keyboard tracking parameter. As you can see, it's set to a value of +28—this is the value originally programmed for the marimba sound that we started with. Try setting this parameter to a value of +98, and play the highest and lowest notes on the keyboard and hold them. The effect obtained is a bit radical for our purposes, but it serves well to illustrate what keyboard tracking does. Try setting the tracking parameter to -98, and play the high and low notes again—the effect is now reversed, with the lower notes decaying quite rapidly, while the high ones hang on forever. With keyboard tracking set to +00, envelope times are equal for all areas of the keyboard—you may want to check this out as well.

At any rate, my tastes tell me that a keyboard tracking value of +28 works pretty well, but you'll probably want to play with this one to find out what sounds best to your ear.

That about wraps it up for this installment, but it hardly wraps up the subject of envelopes. We'll be jumping back in next time, and by then, we should be fairly well on our way to creating some pretty serious sounds—pushing back the envelope envelope as it were. Ahem. ▬

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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EPS TIPS:
What You Don't Know CAN Hurt You

Pat Finnigan

So, here we go again, loyal EPS users. You've turned your EPS inside out and there's no more features to learn, right? You're cranking out hits faster than you ever thought humanly possible. So you waltz into the studio, MIDI up to the studio's computer, set outputs and levels, load and press play. A minute into your tune and the engineer stops you from the other side of the glass, yelling something about "memory full." Three hours and 17 false starts later, you're no closer to the take than you were at 7:30. Engineer says he's got the studio booked at 11:00, so you pack up and go home scratching your head. . .

I don't know if anyone else has been through this scenario, but trust me, you don't want to if you don't have the answers in your back pocket. So before you blow an expensive day at the studio, lose an account because of a missed deadline, or just wanna practice good housekeeping on your EPS, here's a few tips I've found useful. Maybe they'll save you some time in the studio...

1) Edit *every* disk in your possession. Many, if not all, of the factory disks come shipped and configured "Send Keys to Both." Keep Local instruments local, and MIDI instruments MIDI. Since the EPS doesn't respond to "All Notes Off" commands, a panic button won't do you a bit of good except maybe lock your machine. Edit *every* disk you put into your EPS as if you're doing a SAM intercept on a Mac. Ridding yourself of bugs now prevents viruses later.

2) If you're running a MIDI rack off of the EPS, or even if you're not, press "Edit" and "MIDI," then scroll to the "Transmit On" page and set it to "Inst Chan" and then save to disk as "Save Global Parameters (Command + System). This will save you a ton of headaches when you can't get tone modules to play on the proper channels (if at all!) even after you've set the respective instrument buttons to the desired MIDI channels. And, it's a real timesaver when you walk into the studio, hook up and go, rather than adjust parameters for a half hour (let's see, $95/hr divided by 2? I just saved $45!). As they say, time is money. . .

3) Unless you have a specific need for different program numbers on local instruments, set them all to 1 by pressing "EDIT" + "INST" and scroll to the "MIDI Out Program=" page. These program numbers are sent out MIDI every time a pattern is called up in song mode: not a problem locally, but MIDI hell on outboard modules. While you're at it, unless you need it specifically, set "Pressure Mode" to "Chan" rather than "Key." Again, you'll keep the integrity of your MIDI data stream a lot cleaner without unnecessary information. Since poly aftertouch is interpreted as a continuous controller, it eats up memory faster than a mod wheel or a foot controller.

4) A dirty data entry slider in "Record" mode is just as dangerous as poly aftertouch. By now you've encountered jumping volume levels on track and instrument pages due to a grungy slider. Guess what? That fader is active on whatever page you were on in record mode, so you probably have some interesting, but unnecessary information recorded on your tracks. It's largely responsible for all editing functions anyway, so it's the MOST used piece on your EPS. I replace mine every two months, but I'm at my EPS some 8-10 hours a day. Since Ensoniq will frown on you dismantling your display board, have your trusty service tech clean your faders with Cramolyn. Don't use anything else, *especially* television tuner cleaner (it's abrasive!). The EPS is a *computer*, not a mixing board, so use Cramolyn *only*! It's available thru MCM; your tech will know where to get it. Money well spent...

5) Edit *all* of your sequences and songs. See #3 above. That unneeded information can be removed from tracks by:

a) Erasing Program Changes. I don't know where they come from, but I can reclaim a coupla free blocks by doing this on tracks that have no program changes inserted. Be careful if you use MIDI effect processors, mixers, harmonizers, etc. A cheap trick since the EPS has only 8 "real" tracks is to set a local instrument to "Both," set it to the same MIDI channel as your digital reverb, and insert a program change at, say, the chorus of a ballad to switch the reverb to a large hall, for instance, making the track perform double duty. Just make sure to follow proper programming convention and allocate *one* track consistently for that purpose so you don't accidentally erase program changes you need in this instance. Other than that, clear away. Fortunately, the gurus at Malvern provided us with a "Keep= Old—New" page for auditioning these changes, so check your work before you commit...

b) Erase unnecessary controllers. Tracks that don't use the CVP-1 pedal can be cleared of data by pressing "Edit" + "Track" and scrolling to the "Erase Controllers" page. Press "Yes" and select the track you wish to work on. Press "Yes" and scroll to the area of the song you wish to work with ("Bar 1 Thru 999" page), then use the right cursor to select "Pedal" and press "Yes." If you get a "No Data on Source Track," i) You're in Song mode and no data was present. Select the sequence containing the material to be edited and repeat the process, or ii) You're in sequence mode and there was, in fact, no data present. Move on to the next track.

c) Repeat steps Bi and Bii with other controllers that you don't use. If it seems like a tedious process, just think "Could I record that sequence *again*?"

6) Hard Drivers: I know you don't wanna hear this, but you

need to do the same thing to all your files, but there's something else that enters this equation: file fragmentation. Resaving new edited files over the old doesn't guarantee they'll occupy the exact same location on the drive as a directory byte is added to all files for directory management. So yeah, you should reformat your drive and rebuild your directories and resave to keep your drive at optimum speed for quickest loading times. If speed is not important, ignore this, as it takes a helluva lotta time. I've done it six times on a pair of Quantum 90 Meg drives, and worn out 2 display boards (under warranty, at least), so my grumpy letters to Ensoniq about backup software promised two years ago need no explanation (allegedly coming in the new O.S. 2.46, which will activate the "Copy/Backup/Restore" page to more than copying floppies). You *do* run differing Macro files for different session dates, don't you?

7) When you're invoking the "Sys-Ex" functions of the EPS, did you know that with a 4X expander, the contents of sequence memory remain intact? That's right! With the 4X, the 256K of a base EPS are partitioned off from sample memory, giving the dedicated 80K note sequence memory freedom from the rest of the instrument. If you got a 4X installed, try it. So the next time you're loading other instruments/modules with data, don't bother reloading the sequencer—that data never left, contrary to the "Must Erase Memory, OK?" page you see before the instrument lights go out...

8) Save early, save often, but get in the habit of saving to floppy occasionally, like every half hour or so (and not to the hard drive, see #5 about file fragmentation), because, sooner or later, crashes happen—usually in the middle of an important or irreplaceable project. Remember; it's really a 6 MHz Mac running the DOC chip, a 2X or 4X, a SCSI card, an OEX-8, or whatever options you have installed. Treat it like one and you won't suffer so badly when Murphy drops in for an unexpected visit...

9) Hard Drivers: If you run an OEX-8, set up directories or macros to access OEX-edited instruments and sequences/songs. My drives have 8k caches installed, but they still load OEX data faster when it resides in its own directory. With the cache it really shouldn't, but both my drives are close to full, so maybe it's a file management thing or something. My directories are pretty convoluted with 84+ meg floating around in there at 3600 RPM, so maybe it's just because the drives are full. Any ideas?

Follow these simple habits and you'll find yourself increasing productivity by another 50-75%. I'll never forget the look on one engineer's face when a 45-second spot choked a Yamaha C-1 tied up to the EPS. He asked me "How does that sequencer hold so much information?" I told him it only held 256K, upon which he turned the C-1 to me with the blinking message "Out of memory." Ah, the beauty of pattern-based sequencers...

The only thing busier than a maxed-out EPS are the boys in Malvern... ▬

Bio: Finnigan is a service tech turned musician who writes "secret" messages in sequences on his EPS's, wondering how much harder he can push this Malvern silicon before it reverts back to sand. His latest composition, "The Ensoniq Suite," *has been banned by Hans Solo, but is available on EPS disk since it isn't an audio medium and violates no community standards.*

EPS LFO Mayhem on 18 Wheels

T.V. Fio Rito

It's come to my attention that the *Hacker* is becoming overrun with humorless trend-sucking techno-yups who'd rather crunch numbers than give way to deep artistic urges. So go boot up your EPS. We're going to get a little aural excitement that'll firm up that brain stem and make you forget you ever had a limbic system. That's right—we're talking about left to right mod pans that'll make your head spin.

A promotional album for a truck manufacturer requires a sample of a semi roaring by from left to right, complete with Doppler shift. Since I want a pre-gig run thru, I need a sample that's "non-musical," if there is such a sound, so let's refer to that old Mirage instrument of a train going by. Any long sample will do, but load it in INST. 2. CREATE NEW INST. 1 and NEW LYR 1 and COPY desired WS from INST 2 to LYR1, INST.1. Delete INST 2.

Since INST.1, LYR 1, WS 1, hereinafter called "the train," is source data, you may truncate or reloop according to your whatever and apply the following parameters.

EDIT FILTER
CUTOFF F1 & F2 = 127
ENV 2 AMT F1 = –99 F2 = +99
KBDAMT F1 & F2 = +99
F1 & F2 MOD = WHEEL +99

There you have it. A filter fadein that really works! Now copy it to layer two, pan 1 left and 2 right, and wonder how the heck to reverse the filter on 2, not to mention how to simulate

the Doppler effect. Well, apply these to WS 2...

EDIT FILTER
CUTOFF F1 & F2 = 127
ENV 2 AMT F1 = +99 F2 = 0
KBDAMT F1 +99 F2 = –99
F1 MOD WHEEL +99
F2 MOD WHEEL –99

(Both ws's F1 3/LP F2 1/LP.)

IT WORKS! Now how am I going to get a pitch to drop and stay dropped? Why am I asking you? What would Elvis do? Train 1 ri–i–i–de...sixteen kilo bytes l–o–o–o–ng...Hmm...the train slows down when the pitch is lowered.

Okay, the compromise is: After I sample the truck going by, I'll let the LFO control the filter modulation instead of the wheel and set the LFO rates so that one LFO cycle lasts the same amount of time as the length of the truck sample or something. I haven't tried it yet, so experiment.

Now to get exciting. CREATE LYR 3+4 and COPY WS 1 to LYR 3 and WS 2 to LYR4.

EDIT PITCH:
LYR 1 + 2 PITCH MOD WHEEL –24
LYR 3 + 4 PITCH MOD WHEEL –25

That train just went turbo. I think I'll get your snare all wet now...Cut the guff, punk. Ya, you! Pack up your hang-ups and admit it. Music is a humor and you are an evil comedian. Your inner desires are to use a snare that will thrash an audience into a (safe) sexual frenzy, and if you don't want to do that, you can just beat it.

Here are some Heloisian adaptations suited to make moist, most membranophonic manifestations. We'll get that snare so sensitive it'll burst into spontaneous primal screaming if you don't hit it hard enough (what kind of attitude do you need to play a snare like that...?) and a subdued roar if you smack it and push (or that?). No doubt we're in for some lively music making, so go get a nice snare sample about 3/4 of a second long at 31.3 kHz and uses about 81 blocks. If not, then find something similar and apply the following parameters:

EDIT ENV 3
HARD VEL 99 40 49 56 00
SOFT VEL 44 47 45 43 00
TIMES 26 26 40 49 10
2ND RLSE 49 LEV +60
ATV 43 KTS +50
ENV MODE NORMAL

EDIT FILTER:
3 LOW 1 LOW
CUTOFF F1 = 127 F2 = 80
ENV 2 AMT +99 +99
KBDAMT –99 –99
F1 & F2 WHEEL –99

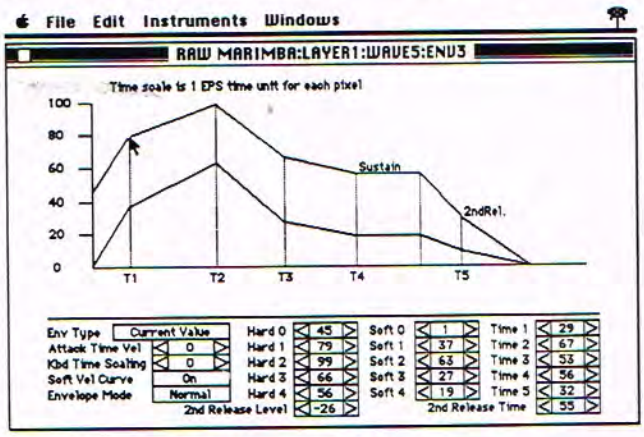
So I copied the above parameters to ESD 1004-POWER DRUMS-LYR 1- WS 5—and got pretty much the same effect. A reverb whoosh if released before the sample end.

The next thing to do is copy our nice long snare to the key on the right. Now there are two snares beside each other. Select WS 2 SAMPLE START and set the start point past the stick hitting the snare. Now BACKWARD NO LOOP and you have a reverse gate effect enhancable by layering and detuning. Try setting ENV 3 RELEASE to 0 and LEV to –99. Got the idea yet? The snare key is struck and when released, a whoosh fades out and you strike the reverse sample key to fade in a whoosh, anticipating the next strike of the snare and so on.

I guess somebody will be wondering what a whoosh is...it's this noise like a frisbee going by or the hissing of summer lawns or a cup of naphtha on a campfire or the tunnel of Brahman during rush hour... ▬

Bio.: T. V. Fio Rito lets Leisure Suit Larry and Passionate Patti play his first computer, the EPS. He's produced and arranged music for two Canadian indie album releases and has played guitar and guitar synth in various road bands for RCA and Citation country and western sangers.

A Picture is Worth a 1000 Words!



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Exploring the Use of Pedal and XCTRL Modulators on the ESQ-1

Brian Rost

The sequencer of the ESQ-1 is in many ways rather loosely coupled to the synthesizer part of the keyboard. This allows the two portions to act almost independently, but has some implications on the way data that must be shared between internal voices and the MIDI stream is interpreted. Two types of data in particular that don't work quite the way you might expect are the information stored for the CVP-1 pedal and XCTRL, the assignable external MIDI controller.

The CVP-1 pedal was a great feature to include at the time the ESQ-1 was introduced, since many manufacturers had abandoned control voltage pedals by that time. The earliest revs of the OS allowed the CVP-1 to be used only as a modulator, but with rev 2.0, the ability to use it as a volume pedal was added. To switch between modes, the PEDAL parameter on the MASTER page must be set. When set to MOD, the pedal functions as a modulator, affecting any internal patches using PEDAL as a mod source and also sending MIDI controller #4 out over MIDI, if enabled. Switching the mode to VOL, the pedal functions as a volume pedal and also sends MIDI controller #7 out over MIDI.

The pedal data is stored in the sequencer with no reference to the mode; the destination of this data on playback is determined by the current mode setting. This much is detailed in the owner's manual. This means that you cannot use pedal data on one track as a modulator and on another as volume data. Perhaps more confusing is that when recording a track using data from another controlling device appearing at MIDI IN, controller #7 data will be stored as such if the PEDAL mode is set to MOD, but if the mode is set to VOL, controller #7 will be recorded as pedal data as well. When such a track is played back, if the mode is switched to MOD, the pedal data will act as both volume and modulation information for internal patches. Controller #4 data will always be stored as pedal data. When such a track is played back, if the pedal mode is set to VOL, the pedal data received will map to volume.

Another little known fact (that is in the manual, but sort of glossed over) is that if you try to use XCTRL set to 4 as a workaround to get pedal modulation, nothing happens because the ESQ-1 actually ignores XCTRL when set to 4. When used as a MIDI slave unit (i.e internal voices driven directly from MIDI IN), the ESQ-1 responds to controllers #4 and #7 as two independent controllers, regardless of the setting of the PEDAL switch.

The XCTRL modulator was another good feature that many other manufacturers have overlooked. Ensoniq wisely reasoned that some of us might want to use controller devices other than the ESQ-1 keyboard on occasion (such as another keyboard, a guitar controller or a wind controller), and that those devices might send controller information beyond the ones the ESQ-1 generates (mod wheel, CV pedal, MIDI volume, sustain pedal). Two common ones are controller #2, breath control (found on Yamaha DX synths), and controller #65, portamento on/off.

The ESQ-1 sequencer will record exactly one assignable controller and that is chosen by the setting of XCTRL at the time of recording. However, much like the case of pedal information, the data is simply stored as XCTRL data and no reference to the MIDI controller number is saved. On playback, the ESQ-1 sends this data out over MIDI as whatever controller number XCTRL is set to at the time.

This has both good and bad implications; the good is that you can remap controller data (although in a rather primitive manner), the bad is that one and only one controller can be received or sent over MIDI.

To remap an external controller is simple; merely record it into the sequencer with XCTRL set to the incoming controller number, then on playback, change the setting of XCTRL to whatever controller number you wish. This has no effect on internal patches using XCTRL as a modulator, but tracks going out over MIDI will now send the remapped controller information. When the ESQ-1 is used as a MIDI slave, this remapping is not possible, because it requires use of the sequencer to work.

Knowing these subtleties of the PEDAL and XCTRL modulators can save you big headaches when using them with external MIDI gear. Now it's time to get back to making music! ▬

Bio: Brian Rost spends his evenings either hunched over his SQ-80 or playing bass with the HUBCAPS, a Boston-based roots rock band. To unwind during the day he designs computers.

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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: SWEEPZ

Glen Gafter, Kent, OH

This is a highly resonant, smooth filter sweep sound.

The Hack

This type of sound cries out for stereo motion. Glen has programmed some, with LFO 3 as a pan modulator. But I wasn't happy with the DEPTH of this (DCA 4 page) until I had it wide open at +63. For a more expressive sound, I wanted to add some velocity sensitivity to the filter opening, so that soft playing would not open the filter as far as hard playing. This was easy to accomplish by setting LV of ENV 3 to 40 (this envelope modulates the filter). For a nice sonic variation, try setting the WAVEs of OSC 1 and 3 to SQUARE.

SQ-80 Patch: REVORG

Craig Roth, Skokie, IL

This organ patch is not a tutti sound, but is more like a principal 8' with a flute 8' and 4'. It sounds great layered with a full-out pipe organ sound. Oscillator 1 has the basic organ sound, while OSC 2 handles breath for the pipes. OSC 3 adds a reverb. LFO 1 is set to noise, which produces the effect of various reflections around the room.

The Hack

This is a very natural pipe organ sound and I like it exactly as is. A few variations can be had by playing with the waveforms, such as substituting BREATH for OSC 2, or the other "organy" waveforms for OSC 3. OCTAVE and OCT+5 work fairly well, but Craig's choice is the best for my ears.

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.

ESQ-1 PROG: SWEEPZ — BY: Glen Gafter

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	0	0	0	SAW	LFO1	+2	ENV1	+3
OSC 2	0	0	5	PIANO	LFO2	+1	ENV1	+2
OSC 3	0	0	3	SAW	*OFF*	-	*OFF*	-

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	54	ON	*OFF*	-	*OFF*	-
DCA 2	54	ON	*OFF*	-	*OFF*	-
DCA 3	43	ON	*OFF*	-	*OFF*	-

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	17	17	23	ENV3	+48	*OFF*	-

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	63	8	LFO3	+15

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	20	OFF	ON	TRI	0	1	20	WHEEL
LFO 2	22	OFF	ON	TRI	0	21	20	WHEEL
LFO 3	9	OFF	ON	TRI	56	0	20	*OFF*

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	+16	0	0	30	0	15	19	3	20	9
ENV 2	-	-	-	-	-	-	-	-	-	-
ENV 3	+62	+17	+6	0	22	46	44	46	44	9
ENV 4	+42	+61	+43	22	32	15	29	63	58	9

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

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

SQ-80 PROG: REVORG — BY: Craig Roth

	OCT	SEMI	FINE	WAVE	MOD#1	DEPTH	MOD#2	DEPTH
OSC 1	-1	0	0	ORGAN	*OFF*	-	*OFF*	-
OSC 2	+1	0	2	VOICE3	*OFF*	-	*OFF*	-
OSC 3	0	0	0	4OCTS	*OFF*	-	*OFF*	-

	LEVEL	OUTPUT	MOD#1	DEPTH	MOD#2	DEPTH
DCA 1	0	ON	ENV2	+56	PEDAL	-20
DCA 2	0	ON	ENV3	+60	*OFF*	-
DCA 3	47	ON	ENV1	+35	LFO1	+5

	FREQ	Q	KEYBD	MOD#1	DEPTH	MOD#2	DEPTH
FILTER	100	0	49	*OFF*	-	*OFF*	-

	FINAL VOL	PAN	PAN MOD	DEPTH
DCA 4	63	8	ENV1	-26

	FREQ	RESET	HUMAN	WAV	L1	DELAY	L2	MOD
LFO 1	11	OFF	ON	NOISE	48	63	48	LFO2
LFO 2	6	ON	ON	TRI	41	51	41	*OFF*
LFO 3	-	-	-	-	-	-	-	-

	L1	L2	L3	LV	T1V	T1	T2	T3	T4	TK
ENV 1	-63	-63	-10	OL	0	1	0	32	13	0
ENV 2	+63	+63	+63	OL	0	13	0	0	13R	0
ENV 3	+60	+33	+30	OL	0	0	19	63	0	8
ENV 4	+52	+63	+63	OL	0	7	22	12	37	13

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

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

VFX Hackerpatch ATLANTIS By: Steve Munro, Guilderland Center, NY

NOTES: Here are vocal pads for all occasions.

The Hack: This program really demonstrates the sonic motion that is capable with the VFX. In this one patch, each voice has motion from dynamic stereo panning, from the flanging of the effects section (try setting MIN to 70 on the second effects page for even more), from modulators of the pitch, and from the sweeping of the transwave waveforms. The result is that no matter how long you sustain a note, it never gets static and boring. I thought voice 5 should have been tuned up an octave – it mushes up the bottom half of the keyboard when the ** patch select is used – so I set OCT to 0 on the PITCH page. The transwaves give ATLANTIS most of its unique character, as they are modulated to give a constantly changing timbre. It's very easy to get a multitude of new VFX-ish pads by simply substituting other transwaves in these voices. Solo voice 2, for instance (by double clicking on VOCAL-X on the SELECT VOICE page), go to the WAVE page, and scroll through all the transwaves until you find some you like. My favorites were the metallic DIGITAL-X, INHARM-X, SYNCHRO-X, FORMANT-X, ELECTRO-X, and RESONANT2, but several others work well also. Mix and match voices, and you've got a bevy of new sounds. – Sam Mims

WAVES

	1	2	3	4	5	6
Wave	ESQBellX	VocalX	VocalPad	Resonant2	VocalX	Strings
Wave Class	Transwave	Transwave	Breath	Transwave	Transwave	String
Delay	0	0	182	0	0	0
Start	0	99	0	0	99	0
Direction			Forward			Forward
Mod Src	Env1	Mixer		Mixer	LFO	
Mod Amt	+99	-99		+99	+3	

MOD MIXER

	1	2	3	4	5	6
SRC-1		Env1		LFO		
SRC-2		LFO		Env1		
SRC-2 Scale		4.0		8.0		
Shape		Quant16		Quant16		

PITCH

	1	2	3	4	5	6
Octave	+1	0	0	0	-1	0
Semitone	0	0	0	0	0	0
Fine	+4	0	-4	-1	0	+2
Pitch Table	System	System	System	System	System	System

PITCH MODS

	1	2	3	4	5	6
MODSRC	*Off*	*Off*	*Off*	*Off*	*Off*	*Off*
MODAMT	0	0	0	0	0	0
Glide	None	None	None	None	None	None
ENV1	0	0	0	+4	+10	0
LFO1	0	+2	0	0	+5	0

FILTER 1

	1	2	3	4	5	6
Mode	2LP	2LP	2LP	2LP	2LP	2LP
Cutoff	127	100	127	127	127	127
KBD	0	0	0	0	0	0
MODSCR	Keybd	*Off*	*Off*	*Off*	*Off*	*Off*
MODAMT	+99	0	0	0	0	0
ENV2	0	0	0	0	0	0

FILTER 2

	1	2	3	4	5	6
Mode	2LP	2HP	2LP	2LP	2LP	2LP
Cutoff	127	30	127	127	127	100
KBD	0	0	0	0	0	0
MODSCR	*Off*	*Off*	*Off*	*Off*	*Off*	*Off*
MODAMT	0	0	0	0	0	0
ENV2	0	0	0	0	0	0

OUTPUT

	1	2	3	4	5	6
VOL	94	82	99	59	99	82
MODSRC	*Off*	*Off*	Press	Press	*Off*	Press
MODAMT	0	0	+5	-8	0	+5
KBD Scale	0	0	0	0	-15	0
LO/HI Key	A0/A0	A0/A0	A0/A0	A0/A0	A0/A0	A0/A0
Dest Bus	FX1	FX2	FX1	FX1	FX2	FX1
Pan	17	40	50	0	50	50
MODSRC	Env1	Noise	LFO	Mixer	*Off*	LFO
MODAMT	+99	+99	+99	+99	0	+99
Pre-Gain	Off	Off	Off	Off	Off	Off
Voice Prior	Medium	Medium	Medium	Medium	Medium	Medium
Vel Thresh	0	0	0	0	0	0

LFO

	1	2	3	4	5	6
Rate	35	29	21	30	25	16
MODSRC	*Off*	Press	Press	Press	Press	Press
MODAMT	0	+10	+7	+15	+15	+7
Level	0	0	99	0	0	99
MODSRC	*Off*	Press	*Off*	Press	Press	*Off*
Delay	0	0	0	0	0	0
Waveshape	Tri	Tri	Sine/Tri	Square	Tri	Sine/Tri
Restart	Off	Off	Off	Off	Off	Off
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	0	0		0	0	
Peak	99	99		15	50	
Break 1	0	0		0	50	
Break 2	99	99		15	50	
Sustain	0	0		0	50	
Attack	50	50		50	28	
Decay 1	50	50		50	20	
Decay 2	50	50		50	20	
Decay 3	50	50		50	20	
Release	50	50		50	30	
KBD Track	0	0		0	0	
Vel Curve	Cnvx2	Cnvx2		Linear	Cncv3	
Mode	Repeat	Repeat		Repeat	Norml	
Vel-Level	0	0		0	0	
Vel-Attack	0	0		0	7	

ENV2

	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						

ENV3

	1	2	3	4	5	6
Initial	99	99	35	0	0	40
Peak	99	99	60	99	99	60
Break 1	99	99	99	99	99	99
Break 2	93	99	99	99	99	99
Sustain	99	99	99	99	99	99
Attack	20	26	0	42	7	0
Decay 1	20	20	40	20	20	35
Decay 2	20	20	40	20	20	36
Decay 3	20	20	40	20	20	40
Release	35*	30*	30*	35*	33	40
KBD Track	0	0	0	0	0	0
Vel Curve	Cnvx1	Cnvx1	Cnvx1	Cnvx1	Qlkrise	Cnvx1
Mode	Nrml	Nrml	Nrml	Nrml	Nrml	Nrml
Vel-Level	10	18	12	18	18	15
Vel-Attack	0	0	69	0	0	69

PGM CONTROL

Pitch Table	Off
Bend Range	2
Delay	X1
Restrike	0
Glide Time	0

EFFECTS (2)

Rate	35
Min	80
Max	80
ModSrc	KeyGate
MinMod	-29
MaxMod	0

Pressure Key

EFFECTS (1)

Effect	Flanger & Revrb2
Decay	70
FX1	35
FX2	55

EFFECTS (3)

MixLevel	53
Feedback	-75
HF Cut	Off

PERFORMANCE

Timbre	0
Release	0

Classifieds

USER GROUPS

Looking to form or join EPS users group in Rockland County, NY or North Bergan County, NJ. Dave, (914) 368-2544. Leave message. 150M sound library!

ESQ-1/SQ-80 owners wanting to trade sounds and/or sequences contact Kevin Casey, PO Box 111522, Aurora, CO 80042.

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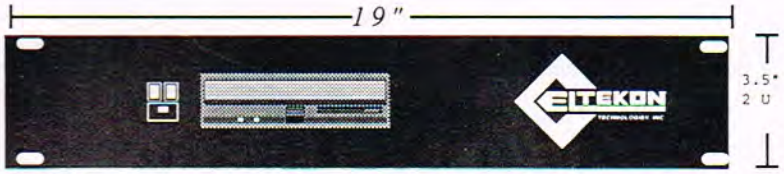

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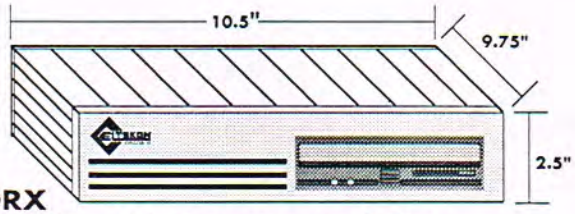

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This is probably one of the most open forums in the music industry. Letter writers are asked to please keep the vitriol to a minimum. Readers are reminded to take everything with a grain of salt. Resident answer-man is Clark Salisbury (CS). Letter publication is subject to space considerations.

Dear TH,

I'm a first time purchaser of an Ensoniq product (**EPS-16M**) and new to *Transoniq Hacker*. And I'm happy to join in with others in praise of both.

I have been trying to implement the MONO B mode with a view to controlling an external synth as well as the EPS simultaneously, without success. MONO B works fine with the EPS alone, but I flunk out when trying to control the external synth via a MIDI instrument. I can get simultaneous control with other MIDI IN modes, but without the individual channel control provided in MONO B. Am I missing something? If not, what are the chances of this being implemented in a future OS version?

Sincerely,
Richard Rawson
CompuServe: 73607,3354
Sacramento, CA

[CS – I'm assuming that you're talking about the re-transmit function, Richard. Unfortunately, the re-transmit function does not work with the MONO B mode – although it should work fine with MONO A. The chances that this situation will change in an upcoming OS are about the same as the chances that the next Disneyworld will be built in Baghdad – in other words, not too good. I wish I had a good suggestion for some kind of work-around, but you haven't really given me enough information about what you're trying to accomplish for me to come up with any reasonable ideas. If you'd like, write again, and say specifically what it is you want to accomplish, and with what equipment. Maybe we can come up with something.]

Dear Hacker,

I have an **EPS** and a Macintosh computer which I would like to connect to a single removable hard disk. Is this possible? If so, are there any problems with SCSI termination? I don't plan on having both programs for my Mac and sounds for my EPS on one cartridge (i.e., either the Mac will be on with the hard drive or the EPS with the hard drive – or the Mac will use programs from floppy disk and the EPS will use the hard disk). As I will eventually get a dedicated hard drive for the Mac, is it possible to have all the devices in one chain (i.e., mac + fixed drive + removable drive + EPS all in one SCSI chain)?

Mike Evans
CompuServe: R.EVANS21
Las Vegas, NV

[CS – You should be able to hook things up the way you want, Mike, but we should clarify a couple of points.

You can connect both the Mac and the EPS to the removable hard drive and use it with either product. For use with the Mac, you will need a cartridge formatted for the Macintosh; for use with the EPS, you will need to use a cartridge formatted for the EPS. Obviously, you will not be able to store data for both the Mac and the EPS on the same cartridge.

As far as termination goes, any configuration of SCSI devices involving the EPS should generally have a minimum of one and a maximum of two terminators. In either of the configurations you describe (EPS, Mac, and one hard drive, or EPS, Mac and two hard drives) the hard drive(s) should have terminators. If you were to add a third hard drive, however, it should not be terminated and it would need to be placed in the middle of the chain: Mac-->hard drive 1-->hard drive 2-->hard drive 3-->EPS. Hard drives 1 and 3 should have terminators, hard drive 2 should not.

While you should be able to use any removable-media drive based on Syquest technology, occasional minor problems can crop up. If you experience any difficulty with these types of drives, get in touch with Ensoniq customer service at 215-647-3930 – they should be able to help. Also, I'd recommend checking elsewhere in these pages for a listing of Ensoniq tested and approved hard drives before making any type of hard drive purchase. Note that drives not included in this listing may also work. Call Ensoniq customer service for the latest info.]

Dear Hacker:

Ensoniq's response to my last letter sounded encouraging; I half-expected the conventional "Thank you for the suggestions for future products, but we have no such plans at this time" answer! My drum machine options presently look like: 1) Alesis SR-16, if I just want good clean basics; 2) Kawai KD-5, if I want a little more flexibility in programming the sounds; 3) **SQ-R** rack. The prices go about $400/750/1100, so there's quite a spread. My gut feeling was, if I go the extra bucks for programmability, I might as well go for the rack. But, as Ensoniq suggested, I went down to my local music store for a closer look. Here's what I found...

The XD-5 certainly offers a lot of flexibility. Its multiple outputs, filter with adjustable resonance, ability to layer sounds, AM, and built-in effects (delay, flange, and gate) sound great. If I didn't know any better, I'd say that most of the features seem to have been "lifted" from a familiar keyboard (can you say EPS?). After a careful inspection, though, some defects become obvious; true, you can program your DCO pitch, DCA level, and filter cutoff to respond to an external modulator, but it seems that note velocity is your only choice! That doesn't leave a lot of room for expression; what about the other 14+ modulators that Ensoniq owners use? Guess we're out of luck!

I mean, there's only so much you can DO to "shape" a sound with just velocity; that's why God invented zoning! We use it by setting keyboard scaling to not only set the pitch (for a "tuned" sound), but to shape the timbre by slightly varying filter cutoff, envelope decay, relative volumes of the patch's voices, etc. To zone on an XD-5, it looks like I'd define my patch separately for EACH note by tweaking the velocity settings ever so slightly as I go up – and hope that when I'm done, I'd end up with a smooth transition in timbre across the zone. FAT CHANCE! Yes, I COULD do it to my liking in a couple of hours – and that might be acceptable if I only had to do it once for each sound. But I don't WANT my Blues snare to sound like my Top-40 snare! And I probably don't want ANY velocity differences to show up on my (ugh) Disco snare, either!

See, you need at LEAST two-dimensional control for most sounds if you want any semblance of realism. Now when I say control, I don't just mean how many ways the patch can be MODULATED; I mean how many ways the player can use EXPRESSION – velocity, keyboard position, mod wheel, aftertouch, etc. And I'm not talking realism as in accurate sonic reproduction (most drum machines have THAT now), but as in a believable sound that doesn't always repeat itself exactly (unless I want it to). Once the patch is built, you don't have any EXPRESSIVE control over LFO rate, envelope attack, etc., unless it was programmed in. So if you tell me I can brighten my patch by opening the filter, what good does it do if I can't open it up AS I PLAY? Let's take a cymbal as an example. If you had velocity opening up the DCA – and maybe a VEL-X-sensitive attack envelope on the filter – wouldn't that be enough? Not if you want to play toward the rim, or in toward the crown! Just detune it slightly? Sorry, it's

not the same! And what do you do for brushed and malleted sounds? Close up the filter, play softly, and say, "close enough"?? I WISH it were that easy.

The REAL problem is we think drums are different from all the other sounds – special, somehow – but they're NOT! Because they have a shorter duration due to their percussive nature, we usually get by with just varying their loudness. THAT's why most of the boxes out there give 'em ALL only one MIDI channel, give 'em each one, maybe two notes to play, and some sensitivity to velocity. How can you really be expressive and not sound mechanical under those conditions?

You see, a drum machine should ultimately be not a MACHINE, but a true musical INSTRUMENT – something that has enough performance variables to not only be sonically interesting but also to require some minimum level of skill to play well. The mere existence of these variables will practically GUARANTEE that I won't be able to play it EXACTLY the same two times in a row! That's REAL humanizing; played LIVE, not processed-in as an afterthought. I'd rather have 2 or 3 Mirage racks with their "low-tech" 8-bit sounds than ANY number of 16-bit beat-boxes (and I don't care HOW good they sound) because the racks can be made MORE expressive. So if your musical bag is Industrial Rock, Kraftwerk, Disco, or just bemoaning Man's seeming helplessness in the late 20th century, then a drum MACHINE should be fine for you – but not me. That's why I asked Ensoniq for a drum SYNTH – not just another 2-bit beat-box that'll eventually just sound "beat."

Sure – with all of its flexibility, the XD-5 is a step in the right direction – but we still have a long way to go. And as far as I'm concerned, Ensoniq is in the best position to GO that way, because they KNOW how to build expressive instruments (even if they DO have some PR problems telling the musical general public how expressive their stuff really is.). For me, the SQ-R's a lot closer – but it's still not there yet – and I can't go to $2K for an EPS rack just for drums! Just let me know when my new DSQ-1 Drum Synth is ready, ok guys???

Well hey, that's enough preaching for now – time to get off the soap box and pass it over to the next letter...

Thanks,
Dave Camp
New London, CT

[CS – Who was it who said "Drum machines just sound like perfectly timed noise to me"? You bring up some valid points. One of the reasons that the newer Roland drum machines have proved so popular, I think, is because they are designed more as instruments than many other "beat boxes" – with velocity-controllable pitch-shifting and cross-fading between waves, and velocity and pressure-sensitive pads that are actually pleasant to play on.

Ensoniq's position regarding the drum machine question (as well as the "Why don't you guys build a sequencer?" question and the "Why don't you guys build a digital signal processor?" question) has always been to point to their marketing philosophy; that is, they will tend to design technology that they feel the can produce to a certain standard of excellence and that will fill a need in the marketplace. And right now, they don't feel that the marketplace is crying out for a new drum machine.

Still, I think you're right – if Ensoniq wanted to, they could design a pretty dang happenin' drum box.]

[Ensoniq – Thanks for the commentary, we're glad to see that the competition still has a way to go to catch up to us! We'll call you when we've got it done. (Just kidding!)]

Transoniq Hacker,

I have been receiving your magazine now for five years. I have truly enjoyed reading and learning from this publication. I would like to make a proposal to you and your readers on something that has interested me for some time.

Obviously there has been a boom in the home studio market and we are all participating in it. So far you've been doing an excellent job of keeping us informed with tips and tricks of the trade, but there has been one thing lacking. One of the great joys of the home studio is making the music, but for the thousands or hundreds of thousands of us who do not get snatched up by a label, or who are not able to get out and play our own music, for whatever reason, the thing we lack is an audience or a market of our own.

Home Studio & Recording magazine has run several articles on the excellent music that is available on cassettes through several catalogue enterprises that have sprung up as a result of all this home studio music. Some of it is for sale at a profit, some just for mutual home studio satisfaction. HS&R also runs a column which reviews three or four tapes, gives info on the artists as well as a critical review of the music and where to contact the artist. Since this is such an indispensable vehicle for home studio artists to use to get feedback on their works, I am suggesting that the Hacker provide its own review column.

The readers would be able to send in their tapes and get feedback on their works. This would be an invaluable tool for readers to im-

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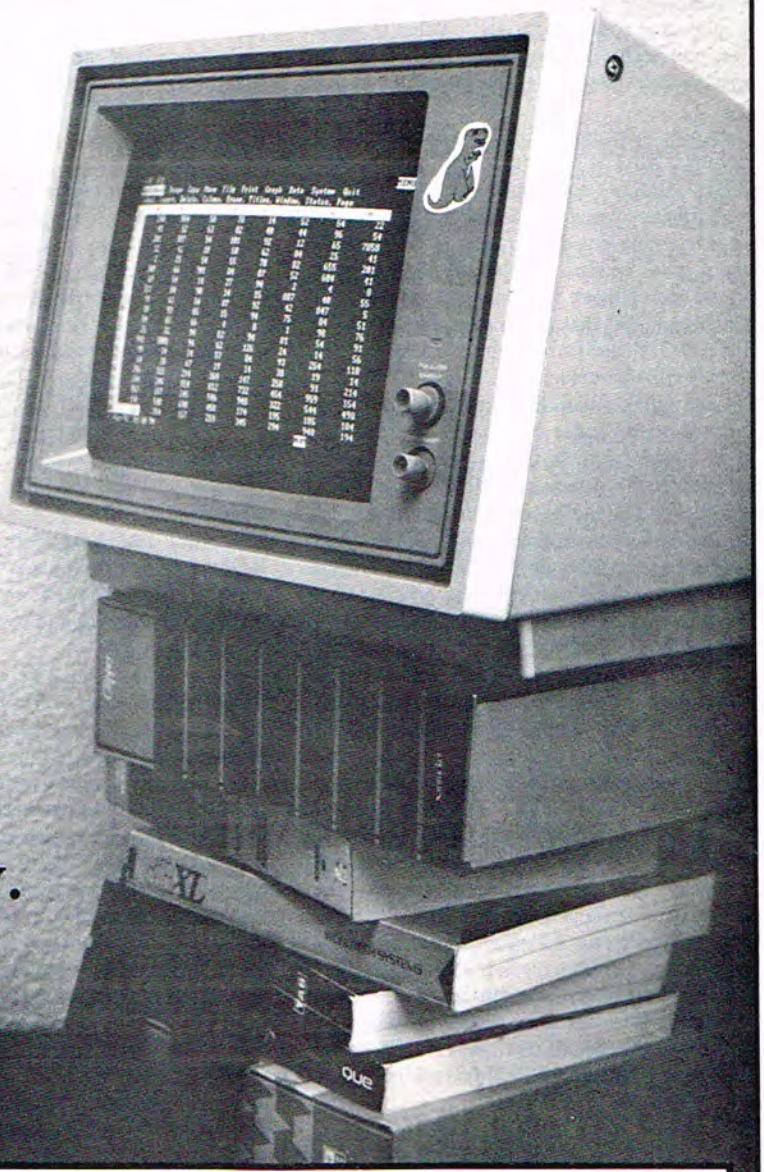

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fairlight II Soundtrax 4
fairlight II Soundtrax 5
fairlight II Soundtrax 6
fairlight II Soundtrax 7
fairlight III Snare Drums
fairlight II Sound FX
Prophet 5 Strings
Prophet 5 Brass and Bass
Prophet VS -1
Prophet VS --2
Prophet VS/78/2000
D-50 1
D-50 2
D-50 3
D-50 4
M1 -
(1) Cloud 9 & Christmass
(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 Oddysey
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
Voxes & Vocoder
Rock & Roll Comp Set
Jazz Composition Set
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Synclav Soundtrax 4
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prove and get the word out about what it is they've been doing.

There is genuinely too much new original music around – good stuff that shouldn't be ignored. We've created for ourselves everything but a way to hear it, to find out about it, and a way to enjoy it. Music is a communication that deserves to be heard.

Thank you for considering this. I really enjoy this publication and eagerly look forward to each issue.

Always scheming,
Daniel R. Mandel
San Francisco, Calif.

[TH – Note to TH readers: Actually, we've been giving a fair amount of thought to Daniel's suggestion and decided to give it a shot. We've contacted him and he's agreed to write a short introductory article which should appear in the next issue. Till then, musicians interested in this new feature should give us a call at 503-227-6848.]

Dear Transoniq Hacker,

I'm writing because I'm tired of being on the sidelines reading. I read the Hacker for tips in programming techniques as well as ideas for making new sounds. I own an **ESQ-1** and soon will be purchasing an **SQ-1** to merge with my ESQ, a drum machine, and a Roland R-8. I'll never forget the day I bought my ESQ-1. It was my '88 Christmas present to myself. I bought it at Sam Ash and they were completely sold out so I took the floor sample. It still runs like the day I bought it.

My first question is: Since the SQ-1 has a good percussion section and is an excellent sounding synthesizer, how come the good engineers at Ensoniq don't release a drum machine?

Second question: I've read about the phantom waveforms which can be obtained by letting the ESQ-1 read the waveforms off an SQ-80. Is it possible to record, via data cassette, to upgrade the waveforms?

Third question: Can you point to a few third-party vendors for patches that don't sound the same and have a lot of punch? (I already own Maartists and Q-Spectrum.)

To answer Mr. Cooter's question in Issue #67 on whether to hang on to his ESQ-1 – if you're still making great music why waste time learning a new synthesizer?

A dedicated customer,
Kenrick Gordon
Uniondale, NY

[CS – As to your first question, Kenrick, see the response to Dave Camp's letter above.

To access the 75 additional "waves" in the ESQ, I refer you to Gary Sterling's article in Issue #54 (Dec., 1989) of TH. In that article he describes a process whereby you create a program on the SQ-80 using wave #75 (the highest numbered wave in the SQ-80), and store that program to an EEPROM cartridge. When this program is then loaded into an ESQ, you can use it as a starting point for selecting waves numbered higher than the ESQ-1's standard 32. The reason for selecting the highest numbered wave in the SQ-80 in the first place is that the ESQ will not allow you to increment beyond the first 32 resident waves – although you can decrement back down from wave 75 using this technique. I do not believe that it is possible to obtain these results using a cassette for the data, but I may be wrong. Also, you should not consider this a "waveform upgrade" – it's really just a technique for getting the ESQ to play back scrambled data in place of it's normal waves. The sounds obtainable using this method may be interesting, or they may be pretty marginal. Also, they will vary depending on which ESQ-1 OS you are using.

As far as a recommendation for third party sounds, our policy is generally not to make off the cuff recommendations here – too often they backfire. You will find reviews of many products in back issues of the Hacker – information on obtaining back issues is contained elsewhere in this issue.]

[Ensoniq – Actually, storing and reading the program back from tape should work, at least in theory. And Clark is right, you are not upgrading to new waveforms, you're just "confusing" the ESQ-1 into a new timbre.]

Dear TH,

I have a few suggestions for future OS upgrades and products. This may encourage all the Ensoniq engineers to climb into a bus and treat my residence to a drive-by toilet- papering, but here goes:

1. What about adding an on-board arpeggiator and parametric-EQ? The on-board effects on the VFX-SD and EPS-16 Plus are a killer idea. I feel that this would be the next logical extension. (A filter can not do what a parametric-EQ could do to a patch or a sample.)

2. Would it be possible to have combinations of four effects at one time in an upgrade? (You have up to three combinations at the moment in the VFX-SD.) Even though the effects are not multi-timbral in the VFX-SD or the EPS-16 Plus, you could probably catch the most common effects combinations and turn off what you don't want to use (i.e., Reverb + Dist + Flange + PLY). This could simulate a sense of multi-timbral effects.

3. I feel a "Velocity Compressor" would be an excellent addition so that the velocity wouldn't fall below or go above a certain point. (This would be an excellent time-saving tool when editing.)

4. Finally, create an OS that eliminates wars, famine, disease, and encourages the general welfare of mankind and Clark Salisbury's sense of humor.

Most kidding aside, five years ago I was a musician that played almost exclusively acoustic piano for a living. Since that time, I have purchased a Mirage, ESQ-1, SQ-80, EPS, VFX-SD, and I soon hope to upgrade to an EPS-16 Plus. I have also purchased several years of Hacker subscriptions and learned a lot about these instruments. Thank you Ensoniq and TH for the guided tour through the world of electronic musical instruments. It has been a fascinating ride!!!

Finally, hats-off to Garth of Rubber Chicken Software for doing an excellent job editing a bunch of samples I couldn't live without. I hope fellow EPS owners will not be intimidated by his latest ad featuring the "Rubber Chicken Hit Man," and will "chick" out his products. Thanks Garth!

George Finizio
Somewhere, Over the Rainbow

[CS – 1: Even though there is no on-board arpeggiator in either the VFX-SD or the EPS 16+, you can create some pretty interesting effects by using the layer or voice delay function built in to these instruments.

For the EPS 16+, copy an existing layer (press "Command," then "Layer," scroll until you see "Copy Layer" and hit enter, and copy the parameters only – not "params and data"). Select the new layer (hit "Edit" and underline "Layer=XX," and set the value here to correspond to the newly copied layer). Press the the "Layer" button, and scroll until you see "Delay=XX." Here you can set the delay for anything from 0 to 5000 milliseconds, in 1 millisecond increments. If you create multiple layers in this way, and set each layer to a different delay time and tuning, you can create some very interesting pseudo-arpeggiator effects. And don't neglect the velocity control – you can use both positive and negative velocity amounts to control delay times.

This same technique can be applied to the VFX-SD as well, but you'll go about it a bit differently. First, set the delay parameter located in the "Program Control" menu to X8 – this multiplies all the delay times set in the wave section by a factor of eight, which will be necessary to achieve arpeggio-like effects (the normal voice delay range is only up to 250 milliseconds – not long enough to create convincing arpeggios). Now activate all six voices in the VFX-SD patch you're working with. If you want the arpeggio to play each

note using the same voice, you might want to copy one voice to the other five locations.

Once you've got the voices together, it's a fairly simple matter to adjust the delay time and tuning for each voice – delay time is adjusted from the "Wave" page, and tuning is adjusted from the "Pitch" page.

And if you're really into swirly stuff, apply one of the digital delay effects to the whole shebang – but keep some Pepto-Bismol handy.

As far as the parametric EQ, I agree it would come in pretty handy, but apart from using a combination of high- and low- pass filters to do band-pass filter effects, I don't have any real good work-around.

3: The velocity compressor is also an excellent idea. You can often achieve the same effect on some sequencers by first scaling velocities to some percentage of their original values – say, 25% – and then adding a specified value to all resulting values. In other words, if you have two notes, one with a velocity of 80 and another with a velocity of 50, scaling them by half (50%) and then adding 40 would give you velocities of 80 and 65, respectively. This won't work on the EPS or VFX, unfortunately, as they offer no way of adding velocities.

By the way, some think my sense of humor has been promoted quite enough already – but thanks for the thought.

Somewhere under the overpass.]

[Ensoniq – 1) Creating an arpeggiator would require a significant effort, and we aren't currently planning one. Maybe someday...

As far as parametric EQ, we are continuously developing new code for our ESP chip so we expect to be able to offer various new effects over time.

2) The number of simultaneous effects is determined by the speed of our signal processor. Depending on the complexity of the effects it is possible for us to create four or more simultaneous effects (in theory). The limitation on multi-timbral effects results from having a limit of three effects busses in the signal processing hardware. But then who else offers you even three busses in a keyboard?

4) We're trying!]

Hacker,

Question regarding program change control:

Unfortunately, I got my Roland A-80 keyboard controller before my **EPS-16M** and realized all I needed was a "Dinosaur" master keyboard to make beautiful music. Having committed myself to such a versatile keyboard I would really like to find out how much of its capacity I can use with the EPS and other MIDI instruments chained to the EPS for changing programs, controlling multiple channels, etc. After several hours of trial and error and gleaning what I can from the EPS Musician's Manual, I find myself bogging down deeper and deeper in fogdome. Is there another reference manual or other published work which really tells me what can and can't be done with MIDI control through the EPS?

Richard Rawson
CompuServe: 73607,3354
Sacramento, CA

[CS – There is no published work that we know of of the type you're interested in – but it would make for a great article if someone out there wanted to work it up (hint, hint).

In the meantime, you might want to make use of some of the phone numbers published in the Transoniq Net in the front of this issue – you should be able to get some pretty decent info from some of these people.]

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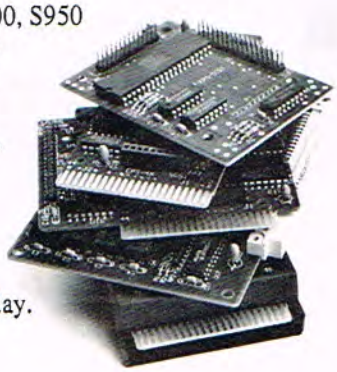

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