

Winter NAMM 2004

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A cold wave just hit the East Coast as I boarded a plane to California where the weekend weather was pleasant, the show hours long, the feet tired, and another NAMM show has been here and gone. Like many past shows, there wasn't a lot of revolutionary new technology, but there were a few pleasant surprises and some new ideas.

The usual disclaimers:

To the users – If it's not here, either it wasn't at the show, I missed it entirely, or it just didn't interest me. This report isn't a regurgitation of press releases; it's my impressions of what caught my interest. Hope you find something here that also interests you.

To the exhibitors – Same as above. If I missed you, sorry, better luck (or placement) next time. If I've misrepresented your product, feel free to e-mail me with a correction, or better yet, post to the rec.audio.pro newsgroup where you'll find the majority of my interested readers. Please don't expect a retraction unless it's really a gross error (my judgment) and don't ask me to modify this report. It's too much trouble once it's posted, and I'm posting it for free.

Note that I'm writing this right after the show and a number of the products described here are not yet posted to the manufacturer's web sites. I've put links here to make it easy for you to check, but you might not find any more info until they've recovered from the show and get back to web site maintenance. This was one of those years where a number of the manufacturers were still letting the paint dry on the drive over to the load-in at the Anaheim Convention Center. Be patient.

Now on with the show.

Microphones

Telefunken is one of the highly revered names when it comes to the classic professional microphones of the '40's and '50's. This German company, long out of the mic business, commissioned microphone designs from Neumann and AKG which have become prized and highly valued studio classics today. A couple of

years back, a couple of microphone nuts from Connecticut took it on to recreate some of the best microphones that bore the Telefunken name, calling their company Telefunken USA. As well, they went on a legal and archeological quest to obtain the right to the Telefunken trademark as well as manufacturing drawings and specifications for the microphone parts, and reverse-engineering (including materials) the parts for which there was no longer documentation.

Last year they came out with their first product, an exact replica of the Ela M251, selling for about the price of an original one in good condition, and a U47 with the electronics as rebuilt by Frank Church, a Hollywood studio engineer who modified stock U47s so they would be quiet enough to use for film sound. Telefunken USA has since expanded their line to include the stereo Ela M270, perhaps the rarest commercially made microphone in the world (they've only been able to find a record of one ever being built) and the M12, a replica of the AKG C12.

But a company doesn't survive long making nothing but copies of other products, no matter how good they are. New this show is the Telefunken M14, a new microphone which is a cardioid-only, single diaphragm version of the C12 with some of the electronics from the M251. While this is a break in the company tradition of exact replicas, their research showed that most people who have the classic multi-pattern Telefunken mics rarely if ever use them in the omnidirectional or figure-8 modes. By eliminating those modes, the diaphragm construction as well as the electronics is simplified, and they are able to provide a microphone with all the characteristics of the classic as most often used in contemporary studios. While not cheap at \$3,000, it brings this sound within range of many more studios. I expect this will become popular with the rental companies too, since it's new, replaceable and realistically insurable, and they can get as many as they need to meet their clients' demands, knowing that each one will work as well as the best, well restored original.

<http://www.telefunkenusa.com>

Now, one for the road, from RØDE – the new S1 is a new studio quality microphone designed for stage vocal applications. It's a supercardioid with a little presence peak at around 4 kHz and a bump around 12 kHz for clarity. The low end rolls off pretty steeply, beginning around 200 Hz, and is down about 8 dB at 80 Hz to compensate for proximity effect and keep low frequency sources such as a bass from creeping into the vocal channel. It's a phantom powered condenser mic with a body shape that's comfortable to the hand, and it has a heavy steel mesh outer screen with a multi-stage inner blast screen to minimize plosives. The capsule is internally shock mounted to reduce handling noise. Like all RØDE mics today, this one is built completely in their factory in Australia – no Chinese capsules or bodies. RØDE encourage interested singers to compare it to the popular Neumann KMS 105. At this point all I could compare was the price, and, yup, it's lower. No info on the S1 at the web site yet, but check <http://www.rodemic.com> for news when it comes along.

Direct boxes are close enough to mics to be included here since only one caught my eye. The BBE DI-1000 is a combination passive DI with employing Jensen transformer and active electronics. The passive or active version is selectable by a front panel switch. Since most instrument pickups tend to sound cleaner through an active DI, but many instruments sound smoother and warmer through a passive box, you can try both at the flip of a switch and choose the one that sounds best for the instrument and the session. In addition, when in the active mode, the DI-1000 also includes BBE's Sonic Maximizer processor for reducing the muddy bass and sprinkling the top end with sparkles if your taste runs in that direction. <http://www.bbesound.com>

Preamps

It seems that the flood of boutique microphone preamps has ebbed, and really only one caught my eye, from a tiny Chicago company, Electronaut. This two-channel tube preamp struck my fancy because it's very nicely laid out and completely hand built from top quality parts, however the metalwork – often the most expensive part of a product like this – frugally utilizes stock parts like brackets rather than custom machining when they'll serve the purpose. Input and output are through Lundahl transformers with tubes in between. The front panel appearance is very classic, with old timey VU meters, large knobs and heavy duty toggle switches (which control relays on the circuit boards to perform the actual switching) including a latching toggle switch for power. I love the brochure – a series of photos including some on the builder's workbench. Presently priced at \$2500, you can see more at <http://www.electronaut.info/products/index.html>

There were a couple of new entries in the popular “8 preamps in a box plus” category. Studio Projects was showing the prototype of an 8-channel single rack space preamp with a built-in stereo mixer, ideal for direct recording plus doing a quick reference mix either for tracking or for field recording. This is a bit of a preview of a not even yet ready to show small mixing console. No data yet, but check the web site shortly. <http://www.studioprojects.com>

The PreSonus Firepod is a single rack space unit with 8 preamp mic preamps which can also be line level inputs, with the first two selectable as high impedance unbalanced instrument inputs as well. In addition, inputs 1 and 2 have balanced send and return jacks for inserting processors in line with those channels. Why do you need insert jacks when you have line level analog outputs? Well, because the Firepod also includes 8 channels of 24-bit A/D conversion at up to 96 kHz sample rate on a Firewire output. The digital output of channels 1 and 2 will be compressed, equalized or effected with whatever you patch in. To fill out the Firewire port, it also carries MIDI in and out as well as a stereo S/PDIF pair. A headphone jack gives you a mix of the inputs for true no-latency monitoring. And if that isn't enough, the Firepod comes bundled with a copy of Cubase SE to get you started recording with a computer as long as you

have a Firewire port. Too new for the web site yet, but check at <http://www.presonus.com> in a while.

Practically from the introduction of the Mackie compact mixers, people have been asking for a rack-mounted set of eight of the mic preamps that made the company's mixers famous. Fifteen years later, they finally did it with the introduction of their latest line, the Onyx, with a still better yet mic preamp stage from the bench of long time Mackie design engineer Cal Perkins. The Onyx 800R features eight of the new preamps with switchable input impedance on the first two channels for fine tuning the load to the microphone. Inputs 1 and 2 incorporate an M-S stereo decoding matrix (pity the switch is rear-mounted with no front panel indicator so you have to watch this one!) while inputs 7 and 8 have a front panel 1/4" phone jack which can be used either as a line level input for visiting guitar processors or keyboard, or as a high impedance instrument pickup input. Rear panel line level inputs and outputs are on 25-pin D-subminiature connectors. The 800R also includes a set of 24-bit A/D converters going up to 192 kHz sample rate. Digital output is on another D-sub connector (AES/EBU or S/PDIF coax pairs) and a pair of ADAT Lightpipe connectors (4 channels each at high sample rates) for optical outputs. Being good citizens, the 800R includes a word clock input for digital data synchronization. You'll find info at <http://www.mackie.com/namm/800r.html> if you're reading this right after the show, but that link will surely move to the normal part of the web site soon.

Computer Recording

As long as your traditionalist writer has been avoiding acknowledging it, computer recording and mixing is here and deserves a place of its own in this report. While it's still not a big thing with me, there were a few highlights in audio interfaces, human interfaces, and computers specially built for audio applications. Here's what tickled my fancy.

Lynx Studio Technology has been making premium grade PCI audio I/O cards for several years and they're considered the top of the line by many. Last year, Lynx introduced their first digital-only card, the 16-channel AES16, with eight AES/EBU I/O pairs with jitter-reduction circuitry and a driver application which pretty much lets you route anything anywhere to build a 16-input mixer with submixes, and auxiliary sends. The latest addition to this line is the AES16-SRC, a 16 in/out AES/EBU adds 8 channels of sample rate conversion for mixing sources at different sample rates (or even asynchronous sources at the same nominal sample rate) as well as output sample rate conversion for mastering applications. In other Lynx news, drivers for OSX are now available for all the interface products including the AES16. Info sooner or later at: <http://www.lynxstudio.com/>

E-MU Systems was one of the early builders of keyboard samplers, which led them into digital recording (including inheriting the PARIS DAW system from

Ensoniq). They've been re-invented in recent years and now their hardware products are digital computer interfaces which can be used for recording, sampling (with E-MU software applications) or both. Their parent company, Creative Labs, has been making the SoundBlaster cards for general purpose applications for just about as long as there have been computer sound cards, with E-MU sound cards being the branch of the product line targeted to musicians. New this year is a system consisting of the model 1010 core card that provides a coax S/PDIF input and output and a TOSLink connector which can be either eight channels of ADAT Lightpipe or two channels of S/PDIF optical I/O. There's a connector to an optional breakout box, and a Firewire connector for video capture or an external hard drive. Two daughter PCI cards add additional I/O connectors on their I/O brackets. The Model 0202 provides a pair of balanced analog I/O on 1/4" TRS jacks, plus MIDI in and out. The Sync card provides word clock and SMPTE time code in and out as well as MIDI time code (MTC) out. Both cards can be installed simultaneously. The Audio Dock breakout box provides two mic inputs with phantom power, six line inputs, eight line outputs, two MIDI IN and OUT ports (one set on the front, one set on the rear), a front panel optical S/PDIF connector, a pair of RIAA-equalized RCA connectors for a turntable input, a headphone amplifier with a front panel jack and volume control, and a set of four stereo mini jacks for up to 7.1 surround monitoring.
<http://www.emu.com>

Edirol was one of the early adopters of the USB port for audio interfacing. They were the first to build a USB 2.0 audio interface and now they've come along with a Firewire interface. The FA-101 sports a pair of balanced mic inputs with phantom power which are switchable to line inputs, six additional balanced line inputs, eight balanced line outputs, and headphone monitoring with a volume control and jack on the front panel. It runs on all 8 cylinders up to 96 kHz, and serves as a two-channel interface at 192 kHz. <http://www.edirol.com>

Hardware control surfaces for MIDI instruments have been with us for a while, and when computer audio workstation programs got to be more than some people wanted to deal with using only a mouse to drag faders, these were adopted to recording, making something that looked and felt at least a little like a conventional mixing console. Peavey and CM Labs (CM Automation at the time) were early entries, with Mackie's HUI ProTools controller being the top of the heap for several years. The HUI protocol has been adopted by a number of DAW manufacturers now, and there are several new control surfaces that speak HUI as well as conventional MIDI commands (Mackie makes some of those too, as well as having incorporated the HUI protocol in the latest software version of their d8b digital console). Many of these control surfaces have been limited to eight or nine faders (8 channels plus a master) and use bank switching to control a software mixer in groups of eight channels.

For those who don't like all of that switching, TASCAM has introduced the new US-2400, a 24 plus master fader USB-interfaced control surface that offers both

MIDI and HUI protocols, touch-sensitive long throw motorized faders, and a rotary control, dedicated select, mute, and solo buttons for each channel. Additional buttons are assignable for common functions such as editing, track arming, or undo/redo. A set of transport control buttons and a smooth, weighted jog/shuttle wheel, and a joystick for surround panning round out the control section. There's a jack for a footswitch for punching in/out, and there's a mode which (assuming the DAW software can accommodate it) allows the entire row of 24 rotary knobs to act as a full channel strip controlling auxiliary sends and equalizer parameters. This one is control-only, no audio, a departure from TASCAM. If it looks and feels a little like the Mackie d8b console, that's because it was co-developed by TASCAM and Sanewave, a company owned by Bob Tudor, former chief software designer for Mackie for many years.
<http://www.tascam.com>

For those with more patience than table space, Behringer has introduced two new USB-interfaced control surfaces. The B-Control Rotary BCR2000 provides 32 rotary knobs arranged in four rows of eight, assignable to just about anything your software will allow under MIDI control. As I understand it, one group of controls is for level, the other three are assignable but I could have missed something in the translation. In any case, the knobs turn smoothly and a ring of LEDs around each knob indicate its position. The companion BCF2000 provides eight channels with a rotary control, two buttons, and a long throw motorized fader. Four additional assignable buttons can be used for things like transport control or editing. 32 presets can be stored for quick setup access. The prices are rock bottom, \$249 for the fader controller and \$195 for the box of rotary controls. All the details and even manuals are available at
<http://www.behringer.com>

I might be giving myself an undeserved pat on the back here, but for several years now I've been describing a product to a few likely manufacturers, telling them they should build it. In fact, in an article I wrote in the February 2001 issue of Recording Magazine about how to plan and design your own do-it-yourself projects, I used this as an example of something that you really needed, you couldn't buy one off the shelf, and it wasn't very difficult to build. What I described was a box to which you can connect several outputs and inputs, and easily route, for example, a sound card output to a few different monitors, with a volume control so you could adjust the volume without going to the computer, or select among a few different speakers, or send the output of a mic preamp to a sound card input as well as mix it with the playback output for a headphone monitor while overdubbing. We used to do this with a console and patchbay, but those don't fit the model of tabletop recording, so those handy functions have gone by the wayside.

A couple of years ago, Furman introduced the SRM-80 which was pretty much what I described, with the addition of a VU meter and switching for both passive and active monitors, but it disappeared from the market after a fairly short time.

At this show, they re-introduced it as the SRM-80A. This is pretty much the same as the original but with upgraded op-amps in its active buffer circuitry and more flexibility in the monitor switching. <http://www.furmansound.com>

Last year, Samson came out with the C-Control, something fairly similar at a very affordable \$99. This year I saw two more similar control stations, each with a little different set of features, as well as a simple volume control. Simple things first, the A-Designs ATTY is a hand-sized box with a pair of XLR balanced inputs and outputs, a volume control, and a mute button. It's nothing fancy, just the thing for adjusting the output level of your mic preamp going to the input of your sound card, or setting the listening level of your monitors.

<http://www.adesignsaudio.com>

The PreSonus Central Station takes things a little further. This single rack space unit provides four selectable stereo inputs, of which one is S/PDIF digital (TOSLink or coax) and one is unbalanced, with a level control. There are two line level outputs, each of which has the same selection of inputs. The main output is to both balanced TRS jacks and to the speaker selector, while the cue output goes to its own set of jacks, so you can monitor one source in the control room and send a different source to the headphones in the studio. The three stereo outputs to either powered speakers or power amplifiers can be individually selected, and each has a level control so you can set your alternate monitors to the same volume level. One of the speaker outputs can be set to remain on together with one of the other two so it can feed a subwoofer (and you can listen to your speakers with or without the sub) or feed a speakers in another room. The speaker outputs have mute, dim, and mono buttons. A meter to indicate the level of the selected source, and a master volume control rounds out the front panel. Talkback, which is routed to the Cue outputs, is controlled by a front panel switch or a footswitch plugged into a rear panel jack. The rear panel has an input for a dynamic talkback mic, or you can use one built into the front panel.

<http://www.presonus.com>

The Mackie Big Knob (which indeed has a big knob for the master volume) is another studio-oriented master controller with three sets of monitor outputs with level trims, outputs to two two-track recorders, a DAW (or another 2-track), a cue output designed to feed an outboard headphone amplifier, and a set of studio monitors. There's also a phono input with a thoughtful ground screw terminal for connection to a turntable ground. Like the PreSonus Central Station, there's a pair of headphone outputs, mono, mute, and dim buttons for the main volume, and talkback. <http://www.mackie.com>

Computer recording would be nothing without computers. Most people choose to roll their own or use whatever's lying around the house, but there are a few companies who are putting together systems dedicated to audio recording, choosing smooth working and reliable components, and often using creative packaging to reduce mechanical noise. At the Lynx booth, Sequoia Digital was

showing a turnkey system based on the top end Sequoia DAW software and equipped with the Lynx AES16 card, ready for your choice of A/D and D/A converters. They'll put together a system for other software (loaded or not) at your request. Not only do they supply the hardware and do the integration (finding the latest version of drivers and software and test it fully, but they'll also provide full documentation and quick start instruction.

<http://www.sequoiadigital.com>

At last year's show, Open Labs showed a concept product, an integrated workstation that included a musical keyboard and a set of modular user interfaces – mixer control surface modules, a QWERTY keyboard, touch screen display, integrated audio card, even an integrated UPS and power conditioner. These are now shipping, and they have a new product that looks like a rack-mount computer that's optimized for audio, and incorporating an integral audio interface based on the M-Audio Delta 1010. A range of motherboards and CPUs are offered, either Intel Pentium 4 or AMD Opteron, internal and removable hard drives, and extra-quiet fans. <http://www.openlabs.com>

Shoutmedia displayed one of the most elegant computer packages I've ever seen. Intel CPU, of course (Mac users stand up for your rights!) with fully passive cooling. The only moving parts are the disk drives. There's a massive finned heat sink on one side with a heat pipe connecting it directly to the CPU. The rest of the cabinet is cooled through heat pipes to a heat sink on the opposite side of the case. They offer other configurations including a more conventional rack mount case, a Shuttle PC, and a laptop, but the one with passive cooling was really special. <http://www.shoutmedia.com>

Software

Most of the usual suspects were there with the latest versions of the usual suspects. If you're already using a particular software product, you're probably well aware of the updates so I won't bother to tell you what's new here. I did run into a company that was new to me who had some interesting technology, though. Voice Imitation and Recognition Ltd. (VIR) from Israel have a series of DSP algorithms for voice analysis and modification, the most interesting of which is automatic voice imitation. This applies the pitch and character of a model voice to a target voice. I didn't get the sense that it could quite make a recording of my voice sound like Britney Spears or even Bob Dylan, but I could see using it to replace bits of spoken dialog in film sound or even to replace a word in a song that's just so mangled you can't use it and the singer is on tour in Elbonia and can't get back to the studio before the album is due out. The algorithm is implemented in several forms, in a hardware box, a real-time computer program, and an off-line (not real time) program. The off-line version does more analysis of the sample it's trying to imitate, so the results are better. The hardware and real-time versions are suggested for karaoke applications. Other interesting products from VIR are a pitch corrector and a program called Chorus Producer, which

generates harmonizing parts with different gender characteristics to the parts. You'll find some demo files at <http://www.e-vir.com>

Consoles

Yes, consoles. Seems like everyone's making a portable powered mixer for small club applications. No real standouts here, just more choices, and maybe a feature or price that will tickle your fancy. Newcomers to the field (though no stranger to mixers) are Soundcraft and Alesis.

Mackie, however, has been pretty busy. I described their new dXb digital recording console after the Fall AES show, and that was prominently displayed here also. Refer to that show report for details, but there are a couple of refinements. The dXb will be available in two models, the 200 and 400. The 400 is targeted toward post-production and video/broadcast production. It supports up to 96 inputs and outputs (up from the 72 in the model shown at AES) of which 72 have built-in DSP (EQ and dynamics – they leave that load off the CPU for the channels that you'll probably use for effect returns), has 24 fully routable mix busses assignable to the main stereo bus, outputs, or other channels, a 24x8 speaker assignment matrix for every conceivable surround monitoring configuration, and extensive surround mix support as well as support for video sync and Sony serial machine control. It will ship with a Universal Audio UAD-1 DSP card (did I hear two?) for a fairly wide range of effects in addition to native (on-board CPU) support for VST plug-ins. This one will weigh in at about the AES-announced price of \$20,000 with a reasonable collection of I/O modules.

The 200 is a somewhat slimmed down version designed to handle music recording chores. It's limited to 72 inputs and outputs (64 with DSP), 8 busses and, while it has full surround panning, it doesn't have all the speaker management. While it has slots for UAD-1 DSP cards, the card that was planned to be included at AES time has been removed from the basic configuration. The good news is that the cost is expected to be in the \$12,000 ballpark, more in the range of the small studio.

The actual configuration of the dXb I/O modules hasn't yet been fully worked out yet, but Mackie is definitely listening to the feedback from those who have seen the console or read about it. Initial thinking was 8-in-8-out modules, but now they recognize that people who want 32 analog inputs for live tracking won't necessarily need (nor want to blow a big chunk of their 72 output capacity) on 32 analog outputs when they might be sending the console output to a recorder or computer over Firewire or ADAT Lightpipe (or MADI if Mackie gets with the program). So they're doing some head scratching in Woodinville and Snohomish, home of co-developer Sanewave.

Another new digital console from Mackie is the TT24, targeted for live sound applications. While it's 24-bit 96 kHz inside, being a live sound console, it's got

plenty of analog I/O – 24 mic/line inputs, 8 line (only) inputs, two stereo tape/CD inputs, and a talkback mic input. Outputs are main left, right, and mono or center (from a third bus), 12 aux send outs, and eight group or matrix outputs. The matrix outputs can give you things like a broadcast mix with dedicated announce mics for the on-air host that don't go to the stage. In a sort of fader flip operation, one button puts the console in "monitor" mode where the main faders become aux send levels for the selected output, and the group faders become the auxiliary send masters. Each input channel has a 4-band parametric equalizer, compressor, and gate, with 4-band EQ on the auxiliary sends main and bus outputs, too. Those output equalizers have a clever feature – two additional sweepable notch filters that pop in at the push of a button. If you hear feedback, engage one and notch it out.

In addition to the faders and rotary pots on each channel, there's a touch screen with a matrix of buttons and knobs below it which are mapped to the screen display for whatever function you have called up. There's a ring of LEDs surrounding the rotary controls, and when they're not indicating the control position, they serve as channel level meters. There are 99 presets that store and recall the complete console configuration, two effect processors Two expansion slots allow for additional I/O and effects (to come) and the one for-sure card will link two consoles logically. A USB port allows you to connect a computer for a larger display, as well as to store and load presets. I think this may be one of the real strengths of this console. At around \$5,000, it could become fairly common rental stock. If a band owns one and has worked out EQ, dynamics, monitor mix routing, and effects for their shows, they could specify a TT24 for touring gigs. The band's engineer can plug in his laptop, load his stored presets, and each gig would start out with a known sound and settings. Of course it would have to be tweaked for the room and speakers, but it's a good start, and could save carrying a console on tour.

I can also see the TT24 filling the gap in installations where the Yamaha DM2000 is currently being used (even though it's overkill) because there's nothing else that has the capabilities that they need. 24 inputs and presets with a simple user interface are really important in that market, and at \$6,600 this looks like it could be a strong contender.

Last, but certainly not least, is the new Onyx console line from Mackie. Designed as an upgrade to (but at least not presently a replacement for) the VLZ Pro series consoles, the three models correspond roughly to the familiar 1402 (Onyx 1220), 1642 (Onyx 1620) and 1604 (Onyx 1640), differing in the number of inputs and outputs. The Onyx features new mic preamps and equalizer section (with bypass) and an optional Firewire card. Cal Perkins, who designed the XDR preamps in the previous series of Mackie mixers did the preamp and EQ design on the Onyx, and this time around, they put Cal's name on it, recognition that he deserves. These mixers are a few hundred bucks more than their VLZ Pro counterparts, and that money went into not making some compromises for cost

that were made on the earlier consoles. This time around I'm told that Cal got to use the ICs and capacitors that he really wanted, and the power supply runs cooler and has stiffer regulation than in the past. Some worthwhile sonic upgrades, I think.

The optional Firewire card provides digital direct outputs from all the channels (plus two more), and two digital returns for monitoring a digital playback. Understand that there are no control surface functions built into the Onyx mixers (I already harassed Mackie about that so you don't have to). It won't control your DAW mixer – you'll have to do that however you do that now. A practical application of the Firewire output is to take your laptop computer along on a gig, use the Onyx as your PA mixer, send the mic preamp outputs to the computer through the Firewire port, and take the tracks home to mix in your regular DAW setup.

Midas introduced their Verona series of 8-bus live sound consoles. If you think of the 4-bus Venice series as the Mackie you really wanted (a need which this year Mackie filled with their Onyx series), the Verona is the Mackie 8-bus you always wanted, but tailored to live sound rather than being the combo live/recording board where the Mackie is positioned. It's semi-modular in 8 channel chunks and features eight subgroups which can be assigned either directly as outputs from the channels or as sources for a 12x4 output matrix mixer. It comes in six frame sizes from 24 to 64 inputs with a 4-band sweepable equalizer with a high-pass filter, sweepable on the mono input modules, fixed on the stereo line input modules. Unlike many consoles in this size and class, the power supply is internal with a rear panel connection for an external auto-switching redundant power supply. I don't think they're showing a lack of confidence in their power supply by including this provision, but rather the wisdom that a failed power supply can take out the whole console, and the whole show.

Main outputs are left, right, and mono or center, depending on how a switch is set. In the "SIS mode", you get true center channel panning, kind of like the pan pots working between center and left, and center and right. With center panning engaged, when a channel is panned to the center, you get no left and right outputs, only center. There are eight auxiliary sends, two of which are individually switchable pre- or post-fader, with the other six switchable pre/post as a group. There are four independent mute groups which are programmable from the front panel. I neglected to get prices, but I expect it will be eventually posted to the web site <http://www.midasconsoles.com>

Converters

Analog-to-digital and digital-to-analog converters are the bridge between the analog and digital worlds, so I'll cover them here. Apogee has updated their AD- and DA-16 to the -16X, but it's almost like a new product with a very familiar and similar name. Apogee has always made better than average converters but for

many years there's always been something enough better to create a higher tier market. A lot of them use the same basic chips, but the difference between really good and great is in how those chips are applied – the analog circuitry ahead or behind them (depending on which way the conversion is going) as well as the cleanliness of the power supply and the data clocking. And of course someone is always upping the sample rate ante. The new 16X converters have a new power supply for better regulation and less noise getting from the power line to the critical circuits. In addition, the same direct digital synthesis clock circuitry used in their Big Ben master word clock is included in the 16X. For ProTools users, an optional X-HD card allows the 16-X converters to be used as a front and back end to the Digidesign HD Core card. An optional Firewire card gives you direct computer I/O with the Firewire 800 standard, and backward compatibility to Firewire 400. The DA-16X uses the transformerless symmetrically balanced analog output stage originally developed for the MiniDAC.

I had a chance to chat with one of the Apogee engineers at their booth, which is refreshing for a NAMM show, where the engineers are usually back at the factory finishing the products while the marketing folks are at the show selling them. We got to talking about word clocks and the fact that if the converter's internal clocking (the major component of which is a phase locked loop or PLL) is well designed, there's no reason why it should sound better using an external word clock than they sound with internal clocking – in fact there's a case for them not sounding as good. So how come the stories of "I hooked up an external word clock and all of a sudden my mixes took on a new depth, new warmth, and even the studio coffee tasted better." He said that they had been wondering the same thing and started looking not just at the amount of clock jitter, but in the character of the jitter – the spectrum, or rather, since it's noise, the probability density curve, and found that for the same peak-to-peak amplitude, the presence of some jitter just sounded worse than other jitter. This is where they're directing their experiments, and why there might actually be a perceived difference in sound quality that we can't explain by the conventionally measured (and advertised) numbers.

I didn't see the details on the power supply improvements until I was looking thorough the brochure, so I didn't discuss details with the engineer guy. They describe this as "synchronous switching" which makes me wonder if they aren't synchronizing the power supply switching in the DC/DC converter with the word clock so that any noise that makes it through the power supply is in phase with the word clock and at a portion in the cycle where it will do the least damage. <http://www.apogeedigital.com>

Signal Processors

It's always interesting to see what Groove Tubes comes up with, and they didn't disappoint me this year. The Glory Comp all tube compressor is a mate to the popular ViPRE mic preamp. It operates on the variable-mu principle of gain

reduction's all tubes, and it's as beautifully constructed as the ViPRE. Multi-position switches are used in place of potentiometers for repeatability of settings, and a transformer coupled push-pull output stage can drive any load with a whopping output level upwards of +30 dBu. There's a built in two-band side chain equalizer which can be used for de-essing, but it's really more effective in limiting the bandwidth over which gain reduction occurs for selective compression. Healthy toggle switches and old time looking knobs and meter (switchable to read gain reduction, input or output level, or to calibrate plate and cathode currents adjustable from the front panel through recessed screwdriver-slotted pots) give it a classic appearance. There's a switch to select between logarithmic and linear release curves as well as the conventional ratio, threshold, attack, and release controls. The gimmick is the Glory knob (with its range from Earth to Heaven) which adds second harmonic distortion to taste. A little goes a long way, but it's there if you need it. <http://www.groovetubes.com>

Electro-Harmonix was showing their new NY-2A dual compressor (the similarity to and pun on the classic LA-2A is intended) but unfortunately they weren't demonstrating it very well. It was patched into a small mixer in a way that its effect couldn't be heard in the headphones, and the guy at the booth said he was told not to change the hookup, so all I could do was watch the meters and the cool fluorescent "Magic Eye" vacuum tube output level indicators. Like the UREI LA-2, the controls are minimal and it uses an electro-optical gain reduction element, but one cool feature is the three position switch which selects between an electroluminescent panel, an LED, and an incandescent lamp as the light source for the gain reduction photocell for a variety of attack and release curve shapes. I've heard good things about this compressor, so if you have an opportunity to try it out under more favorable conditions, do so. No info yet, but check <http://www.ehx.com> later on.

Fishman, the acoustic guitar pickup folks, showed the interesting Aura, which they call an "Acoustic Imaging Blender" (and which I call a signal processor). Developed in conjunction with Akai Professional, as far as I can tell, it uses impulse-based modeling technology to emulate the characteristics of a well recorded acoustic guitar and apply that processing to a pickup signal. In addition to this process, it includes a 3-band equalizer, a tuner, and a sweepable feedback notch, and both XLR (mic level) and 1/4" instrument level outputs. It ships with 16 models, with some tweaks that can be stored as presets in the 50 memory locations, and the promise of new downloadable "images" from the Fishman web site <http://www.fishman.com>

Lastly in this area, the device that wins my vote for the best name, the TX-1 Vacuum Tube Agonizer from Metasonics just plain makes things sound like they're broken when it's engaged. The three modes are "pound, strangle and grind" and, as promised, it really sounds awful, the answer to the ever popular musical question "How do I make my vocal sound like it's coming through a torn speaker?" The ad copy sounds silly, but this is a serious product that does what

nothing else does (unless it's truly broken) and it's part of a line of modular synthesis products that are also interesting. I make it a point not to quote from brochures in these reports, but since this isn't up on the web site yet (there's a like to a teaser that simply says "Coming soon: IT SUCKS") I'll give you a taste, particularly because it expresses a view with which I strongly disagree:

"Specifications: You have got to be kidding. It is truly sad to see a 'responsible' adult making purchasing decisions for music equipment based on specifications. Music devices represent an arcane area of technology which is highly subject to fashion, fads, personal opinion, and that pesky 'artistic license' business. We'll make it easy for you, suckboy. We will simply warn you, if you buy a TX-1, your wife will leave you and your dog will chew your genitals off."

Definitely an interesting company with an interesting sense of humor.

<http://www.metasonix.com>

Recorders

Not all of us want to carry our computers on remote gigs or mix our multitrack tapes to computer, so there's still a need for a stand-alone stereo recorder to replace our soon-to-become-extinct DATs. Alesis has pretty much owned that market for the past few years with their Masterlink, but now stand-alone high resolution DVD recorders are starting to appear. Fostex (who was curiously absent from this show) has one, and now there's one coming from ESI. The M-Fire M9600 is a three rack space unit that supports the current DVD video format, recording 24-bit 96 kHz disks that can be played in a standard DVD player. Since it uses a conventional DVD computer drive, it also works in CD mode, recording standard 16-bit 44.1 kHz CDs. It also supports rewritable media, either CD-RW or DVD-RW. Inputs are analog (XLR and RCA connectors) through internal converters or AES/EBU or S/PDIF coax digital.

<http://www.esi-pro.com>

Can you believe it? The Portastudio is 25 years old this year. Since this is older than many of you reading this report, TASCAM deserves a special pat on the back for keeping the concept of the integrated multitrack recorder and mixer alive and growing, from a modest 4-track cassette capable of recording two tracks simultaneously to a full blown hard disk system. To celebrate the silver anniversary, TASCAM introduced the 2488 Portastudio, a full featured 24-track, 24-bit 44.1 kHz recording and mixing workstation with an internal 40 GB hard disk drive. A built-in CD-RW drive lets you back up your work or record Red Book audio CDs. Borrowing a few ideas from their high end SX-1 music production workstation, the 2488 also includes a 64-voice General MIDI synthesizer and a MIDI file player. Of course there are some compromises – no high sample rates, recording to no more than 8 tracks simultaneously (though it will mix 24 tracks from disk plus 8 additional inputs and effects), and only 4 phantom powered XLR mic inputs (though the other four inputs on 1/4" phones jacks double as mic

inputs, and the XLR combo jacks double as line inputs, plus there's an S/PDIF input and output pair), it will cover a lot of bases. There are eight assignable dynamics processors which can be used either during tracking or mixdown, as well as a dedicated stereo compressor on the main mix output. A built-in LCD screen is used for metering, EQ graphic display, and waveform editing. Automation? Good question. I just sort of assumed that it had the usual expected features, but I didn't ask, and looking over the brochure, it doesn't say. It's possible that you will need to use the MIDI input (via USB) and an external sequencer to handle automation tasks. Take this as a warning, not a fact, because honestly, I don't know for sure.

Not a bad trip at all – from the original 144 Portastudio in 1979 for \$899 to the 2488 in 2004, listing at \$1499. <http://www.tascam.com>

Useful Gadgets for the Studio

One of my favorite parts of this show is the gadgets. Signal processors and mic preamps get plenty of review space in the trade magazines, but those little things that are just handy to have around the studio don't have the glitz and often you don't hear about them until you stumble across them in a store or another studio. Here are some that tickled my fancy.

Peterson has been building electronic tuners about since the days of steam power and in recent years have come into the digital age with digital tuners and an LCD which nicely emulates the easy-to-read mechanical strobe disk of their original design. The latest in the series is the StoboStomp, a virtual strobe tuner built into a solid, die-cast stomp box with a backlit display that can be read equally well on a dark stage or a well lit studio floor. Of course it doesn't have to go on the floor, it's small enough to set next to your console where you can hang it off a spare auxiliary send or monitor bus.

In addition to the standard chromatic, equal tempered scale, it comes preloaded with custom offsets from equal temperament which Peterson has optimized for guitar and bass, as well as space for programming your own custom tunings with offsets to a resolution of 0.1 cent. It also handles four half-steps down and three capo positions so you can read the open position note on the display even though that's not the real note you're not playing. There's a full hardware bypass (straight through, without the tuner floating across the instrument pickup) for those who are concerned about having something in line that affects the sound. When not using the bypass mode, it serves as a DI with a mic level XLR output. It's 9V battery powered with a nice easy-to-change battery compartment (no tools needed) and there's also an input for an external power supply. A clever power loop lets you power other 9V pedals from the tuner's external power supply, perhaps eliminating one wall wart, always a good thing. If it did any more, you wouldn't need a guitarist, and if I remember correctly, it's only \$189. Another one not yet on the web page, but coming soon to <http://www.petersonstuners.com>

It's becoming more important to have clean and safe AC power, and power conditioners are often a subject of discussion among studio folks. Most of us just plug in to MOV (metal oxide varistor) protected multi-outlet strips and say our prayers, but for those who want to do a little better, Furman has been one of the first names to come to mind when thinking of rack mount outlet strips with surge protection and EMI filtering. Most power strips employ what's known as "shunt mode" surge protection, which puts a voltage-variable resistor across the power line. The resistance is high at normal line voltage, but when a spike or surge comes along that exceeds the device's threshold, its resistance becomes low and it shunts the excess voltage to ground. There are two problems with this. First is that the MOV gets weaker every time it works, and eventually it burns out, usually without your knowledge, so you no longer have protection. The second problem is that routine noise on the power line that's not great enough to do any damage, but which can get through the MOV and get into your audio through the ground. (I wrote about this in the January 1999 issue of Recording if you want to know more)

The new Furman PL-8/PL-8 Plus Series II power conditioner utilize series mode protection, which, rather than an MOV across the line, employs a low-pass LC (inductor/capacitor) filter in series with the power line, filtering out transients without shunting them to ground or destroying the protective components. In the PL-8 tradition, the Series II sports eight outlets on the rear of a rack mount panel, and a pair of pull-out lamps on the front to illuminate other rack gear. The new model uses LEDs rather than incandescent lamps for cooler operation. One of those great ideas is the addition of a BNC connector on the rear for attaching a Littlelite gooseneck lamp so you can see that spaghetti pile in the back of the rack. The Plus version includes an LED ladder voltmeter on the front panel.

For the applications where you don't have a rack, for instance fixed PA installations or perhaps instrument amplifiers, the same filtering and series mode surge protection is available as the Power Factor Pro (which actually has nothing to do with power factor correction – phase shift between voltage and current due to highly inductive or capacitive loads - despite what the literature says) in a slope front "brick" format.

Also new from Furman is the SB-1000 uninterruptible power supply (UPS) with multi-tap voltage regulation over an input range of 109 to 130 V, surge suppression (shunt mode), and battery backup that will handle a 5 amp load for 3 minutes (long enough to shut down safely) or power a typical computer and monitor for 32 minutes (which sounds kind of optimistic to me). It's one rack space high, but it's really more suited for tabletop use than rack mounting since it doesn't have ears, probably due to its weight (20 pounds) and depth (14.5 inches) which would require rear support. To bolster its application on the desktop, it also has an RJ-11 telephone jack in and out for surge protection of a modem. This is the sort of thing that most of us buy at a computer store and

stash under the table, but bear in mind that most home/office UPSs don't provide any line voltage regulation other than to start making power when the input drops below threshold. Info on the new conditioners and UPS at <http://www.furmansound.com>

Another one of those why didn't I think of its is the multi-outlet extension cord from cable manufacturer C. B. I. This is a 25 or 50 foot 14 or 12 gage extension cord with up to six outlets along its length. Actually, I did think of it, and have built a few of these up myself using 12 gage rubber covered power cable and metal quad outlet boxes, but this one is ready to go. It's handy for plugging in a few amplifiers or a string of powered monitors that are spread across the stage without plugging extension cord into extension cord. I'm pretty sure I've seen something like this on construction sites, so maybe it's just an old product packaged for sale in music stores, but in any case, I'll bet it will come in handy. <http://www.cbicables.com>

Great snakes alive! The Light Viper is a 32 x 8 fiber optic snake than can run over a mile on a fiber optic cable smaller in diameter than a single mic cable. There's a set of 24-bit 96 kHz converters at each end with three gain settings. At high gain, you get enough gain to use it as a mic preamp, bringing a line level signal back to your console, and AES/EBU outputs are simultaneously available along with the analog outputs. It's a modular system that can be configured in 8 channel increments to suit your needs. I wish I had this back when I was operating my remote recording truck and hauling around a few hundred pounds of cable. Just to get an idea of the cost, the gozinta and gozouta ends for a 32 send and 8 return snake will run about \$5,800 with the cable at \$1.14 per foot plus \$347 for cable terminations. <http://www.lightviper.com>

The ButtKicker is now a bootkicker. Guithammer has been manufacturing the ButtKicker for a few years now, a device about the size of a bowling ball that's designed to bolt to a drummer's stool so he can feel his kick drum and enhance his, ahem, playing experience. Drummers tell me that it really helps them to keep their rhythm. People have installed these in their favorite easy chairs for that earthquake experience in their home theaters (there are even a couple of commercial furniture manufacturers who offer a chair already equipped) and now the founder of the company (who happens to be a bass player) has attached it to an Auralex Gamma Pro platform to provide the same tactile feedback to a bass player standing on stage or in the studio. A particularly useful trick is to mix the bass with some kick drum, and you'll get a really good sense of whether you're locked in with the drummer. While this isn't really a new product, the new application is worth a mention. <http://www.thebuttkicker.com>

The Sound Enhancer from Manifold Horn Technology is another one of those why didn't I think of its. It isn't a brand new product this year but it was new to me and I thought it was clever enough to call your attention to it. It's a platform for an instrument amplifier which gets it several inches off the floor and tilts it upward so

it's not firing straight at your shoes, but up toward your ears so you can hear it better. What's devilishly clever is that the box is built like a folded horn loudspeaker enclosure, turning around the back wave from an open back amplifier cabinet and directing it out a front-facing port. There are five sizes appropriate for different sized cabinets and while not designed for any specific speaker, does provide some horn loading which serves to lower the distortion of the speaker itself. There's no question that this will change the sound of your amp, and I thought in a good way (but of course this is a matter of preference). I'll say that the difference in both volume and low end with and without it is dramatic. If you'd prefer a cleaner sound but need the volume you get by turning your amp up too far, this could help. And if you like the sound when you turn it up to 11, you might be able to get away with a smaller amp for the same stage volume. And, because the sound is directed at you and away from what's behind you, you might even, heaven forbid, be able to lower the stage volume.

What is new this year is a collapsible version for those guitarists who run from gig to gig in taxis or on the subway and can't conveniently haul another box about as big as their amplifier. The panels are hinged, so I suppose that rattling hinge pins could someday become a concern, but it looks reasonably solid. When collapsed, it can be folded up and strapped to the amp with a couple of bungee cords. <http://www.soundenhancer.com>

At the Fall AES show, Latch Lake Music introduced a new heavy duty mic stand and an assortment of clamps that allow placement of multiple booms for instruments that require several mics, or to reduce clutter when musicians are playing close together. Here the stand was shown with a boom terminated in a bracket in which was mounted a Great River (half rack size) NV1 mic preamp. The idea is that if you're both the musician and engineer, you can have your preamp right where you're playing so you can make adjustments without going back to your rack. Another handy studio product from Latch Lake is an oversized microphone jam nut. That's the skimpy threaded ring that comes with every mic stand (and which you probably lose) that jams up against the bottom of the microphone clip or shock mount. The Latch Lake version is a bit over 1" in diameter and about 3/16" thick, big enough to grab and really lock down the mic in the right position. The nut is stamped "Big Mic Nuts For Big Mic Nuts." <http://www.latchlakemusic.com>

Speaking of mic stand accessories, Atlas Sound (long time maker of mic stands and hardware) has a new quick-disconnect to separate the vertical shaft from the weighted base. It's fairly common practice for sound companies and touring sound engineers to separate the base from the shaft for more convenient packing, and the fine threads take considerable time to unscrew and a bit of care to re-assemble at the next gig. This quick-disconnect makes it come apart with a properly placed toe. It looks really sturdy, with three steel balls locking into a groove, so it doesn't appear to compromise the stability of the stand. <http://www.AtlasSound.com>

One mic stand accessory that looks like a good idea but didn't quite make it for me is the Kiss cup holder. It clamps to a stand and is designed to hold a coffee cup, soda can, or water bottle. The problem is that it wasn't deep enough to make me feel like whatever you put in it would be very secure. I tested it with my 16 ounce Crystal Spring bottle and it was easy to topple. It might be good for a handful of M&Ms if the holes in the bottom aren't too big.

<http://www.kisscupholders.com>

Stuff I Can't Classify

Big Bends Nut Sauce is a lubricant for guitar nuts, not players, the thing the string goes over on its way to the tuning peg. The maker claims that a little bit applied to the nut groove and the bridge will make the instrument easier to tune and stay in tune better, as well as extend string life. It's the high tech version of rubbing a pencil lead over the nut or bridge. If it really works, and I see no reason why it shouldn't, it could be a handy thing to have around the studio to do a little on-the-spot instrument maintenance if a player is having trouble tuning. I took home a sample tube (I haven't tried it yet) and had it packed in my suitcase along with a pile of show literature. I was randomly selected for special security screening at the airport – no, they didn't see me and think I looked like a terrorist, I got my boarding pass from a machine in the terminal – and the inspector looked at this with more interest than anything else in my luggage. I think he thought it was an “adult product.” <http://www.guitaristonly.com>

TASCAM has been big on “trainers” – a CD player that lets you adjust speed, repeat a phrase over and over, and mix an instrument with the CD playback for practice. Expanding their line which now includes a bass and guitar trainer (with appropriate processors for each instrument to simulate an amplifier and effects) is the new CD-VT1 portable CD Vocal Trainer. It includes vocal effects, pitch change (so you can sing in the CD's key even if you can't) and vocal suppression or removal so you can practice along with a recording. There are even two mic inputs and two headphone jacks so you can practice a duet. A line level output lets you record your performance. <http://www.tascam.com>

The Edirol P-1 is a storage device for playing back up to 80 still pictures, WAV, MP3 files, or MIDI files. It can be used to play backing tracks for your solo stage show, and also display visuals along with them. Mic and line inputs allow you to record directly to the P-1, or there's a USB port for loading from a computer. There's a suite of video transition effects (wipes) and images can be triggered by MIDI or by audio level for on-the-beat transitions. This might be just what you need or it could trigger some new ideas for performance. <http://www.edirol.com>

I really miss the days when our trade shows had big machines that click and whirl, like tape duplicators and cassette loaders. I can't get very excited about CD duplicator towers and disk printers that look like what I have on my desk (though

the ones with a robot arm are pretty cool) but the exhibit of woodworking machine tools by Grizzly came close to scratching this itch. The really cool new tool was the Plek Pro, a system for dressing guitar frets. This isn't something a guitarist or studio would purchase; it's a production tool for guitar makers or busy repair shops. The guitar clamps into a movable rig, then probes press down on the strings to measure the action, scan the fret height for potential buzzing frets, display the fret profile on a screen, and when you figure out what you want to do, sets up to six cutting and dressing modules into motion to level and contour the frets. It clicks, it whirs, it buzzes, it takes up a lot of space. I liked it a lot. I don't plan on buying one, but if my guitar repairman had one, I'd visit more often. Take a look at it. <http://www.plek.com>

Instruments and Stuff

What would a music trade show be without musical instruments? When I was more interested in synthesizers and MIDI instruments, I used to spend more time in those areas, but now I tend to do a quick fly-by in the guitar areas and just stop where things catch my eye. I don't even bother to pick up literature and don't always remember the names so I can only tell you my impressions. There are always some unusual shaped guitars on display and one that made me do a double-take was the one that has a body shaped like a Stratocaster but put on backwards – with the neck attached at the heel end. In fact, the neck end (now the heel end) was even routed out like there should be a neck there. I don't know, maybe this was supposed to be a double neck guitar that you flip around like an airplane propeller and they didn't have time to attach the second neck (just kidding of course). And picks! It seemed that in a certain area of the show covering several aisles, about every fourth booth was selling picks. Metal picks, stone picks, all sorts of plastic, picks curved this way and that, picks with Velcro straps, picks with non-slip grip surfaces. About the strangest one was made of a firm rubber compound, sort of like an artist's eraser. They told me it was good for acoustic guitars because it didn't make any pick noise. It did produce a unique sound, kind of reminiscent of a ukulele – in fact, I have a couple of old uke picks that are made of felt that are quite similar in tone.

Being an acoustic guitarist myself, and owning a couple of nice Martins, I stopped by the Martin booth to see the 1 millionth Martin. Egad! It looks like they took a D28 and passed it around to every inlay craftsman who does custom work for them saying "Here's your piece of the canvas. Do something on it." The workmanship is superb, but I thought that it was so tasteless as to be almost a cartoon of pearl work. It would have been a much more fitting honor to make a standard D28 with a little tasteful decoration. Take a quick glance at <http://www.martinguitar.com/news/articles/million.html> or for more detail and a 3 MB download, grab http://martinguitar.com/news/newsletter/PDF/Vol_16.pdf

There were two interesting alternate controllers that I noticed. The Haken Continuum Fingerboard is a cross between a traditional polyphonic keyboard

(you play it with your ten fingers) and a fretless string instrument (it doesn't have discrete pitches). It tracks the X (along the keyboard), Y (across the keyboard) and Z (pressure) position of the fingers. Basically, the position along the length determines pitch, but you can place your fingers accurately to play notes and chords, or you can slide along the keyboard to produce glissandos. Since it's polyphonic and can send output on more than one MIDI channel, you can slide in both directions at once, giving a glissando both up and down. Pressure is usually assigned to some dynamic control such as tremolo or volume. Movement across the width of the keyboard can be assigned to modify the timbre or can, for example, be a simple volume control. It boggles the mind, and I expect can stimulate a creative player. <http://www.hakenaudio.com>

I probably would have passed right by the Samchillian TiP TiP TiP CheeePeeee had I not received a press release the week before the show from Plugzilla mentioning that this keyboard, playing a VST instrument plug-in through the Plugzilla (a stand-alone plug-in player) and its inventor would be at the booth. It looks like a very distressed ergonomic computer keyboard, which it is (the distressed part is artist expression) and it, along with its pedalboard controller and a sound module constitute the instrument. You don't play it like a regular musical keyboard, it's based on playing intervals. In other words, pressing a key doesn't play the same note with every press, each successive press plays the next interval. The inventor, Leon Gruenbaum, has worked out patterns of keys mapped to upward and downward interval changes so that it can be played rapidly by alternating fingers. It's great for making bleep-and-bloop music, not what I'd want to listen to all night, but it's a great attention getter. In fact, I was chatting with Brent Casey of Studio Projects at his booth and, knowing that he's interested in synthesizers, mentioned this to him. His eyes lit up and he asked "Wow! Is he here?" Brent had seen him Gruenbaum playing in Times Square and was fascinated by what he heard. I hope he got to play hooky long enough to go downstairs to check it out. You can, and hear some sound clips at <http://samchillian.com/aboutsam.html>

Wrapup

Well, that's about it for cool stuff from here. Just a couple of observations – a couple of regular exhibitors, Line 6 and Fostex, who usually have something new and interesting to me, were conspicuous by their absence. I'm sure both are still in business, but I was surprised not to see them here. Show attendance was up 10% over last year with 74,236 registrants and 1,340 exhibitors indicating that the industry, which has been in a slump, is moving toward recovery. It's getting more and more tiring as I get older. I wish (the organization and the exhibitors are going to kill me for this) the show ran Thursday and Friday, then was closed for the weekend (or open to the general public) and then resumed again on Monday for another two days. After a couple of days, I get dazed but I know there's more to see. I didn't get over to the main Yamaha display (it's off site in an adjacent hotel) until the last part of my last day at the show and discovered

that they had just given the last demonstration of their voice synthesis technology. I would like to have heard that.

Next year I'll have more effective ear plugs.