Viewpoints: Experience & Science Combined

Real Time Installation at Ultra Sound Rehearsal Studios (Jack's Viewpoint)

by Jack Alexander

Imagine my surprise when Gene Sinigalliano of Ultra Sound Rehearsal Studios in New York City informed me that I would be specifying the hardware for his big install, subject to a bit of reality based on budget and financial negotiations with the chosen manufacturers. No cut sheets, no sales pitches, no music pastor, no house soundman, no leasing companies, no architects, no contractors, no pressure of any kind except to get the thing as good as it could be.

And best of all, I had a technically astute client, who dealt in high-tech instrument amps and specialty tubes. He even had the same brand of home hi-fi reference speakers as moi - unbelievable.

Well, I did get pitched, of course, and politely (more or less) declined the advances of most of the sales types. I got on the old boy network and did some research on a few issues, but basically it was ridiculously easy to write a spec based on known performance. This does not mean that alternative products suck (though in some cases it does) - but it does mean that sales and marketing departments had no effect on any decisions, period.

The site had 16 existing rooms, and five new. The new rooms are now done, and the others are being retrofitted with the same products and acoustic arrangements. For the record, we went with a 3-way Martin cabinet looking like the EM186, (though technically a modified WT3), set up to fly horizontally so as to achieve the coverage Gene required. Amps were Lab.Gruppen switchers - a great amp that was chosen in Viewpoints last issue (July/August 02). Each room got an XTA DP224 for speaker management, along with a Midas Venice console, and TC Electronic FX processing. Mogami was used for all the mic cables and the signal wiring in the racks. XLR's were the gold pin anodized Neutriks. Mics (this was a surprise) were the Sennhieiser 835. Gene found some weird Neutrik connector that locked (and I mean locked) the mic to the cable, which meant that sleazos would have to chop the cable to steal the mic.

Martin WT3 passive for keys, Proudfoot bass traps and WT3

Gene and his crew performed the install, and Doug Jones and I flew in to finalize. First, Doug had to verify that all the various bits of fuzz and trapping he'd specified were in the right places. Aside from a few obvious adjustments based on visuals, this was done with TEF, and that weird little laser gadget that ties in with it. As the TEF arrived DOA, most of the work happened day 2, when a second TEF box

active main.

was provided by the manufacturer.

As these were rehearsal systems, where people would only have vocal mics and digital keyboards in the rig, and would play LOUD, the mains would serve as monitors and FOH, firing back at the performers from their hanging positions over a mirror.

Microphone choice was critical to the success of the enterprise, and had been narrowed down to a few contenders. I roughed some crossover data into the XTA in the first room, using a known generic vocal mic (the old, not Beta, 57).

This mic has a history (often in its shock mount version, the SM56) of high useable gain before feedback in loud (guitar band) situations, with people such as Stevie Ray Vaughn and Alvin Lee, and I had dealt with both and knew that the 57 was a reasonable benchmark for initial programming. It is not my favorite vocal mic - I prefer the Beyer 88 (more money and handling noise issues with the 88, though) and love whatever that capsule is on the high-end Sennheiser wireless system. But mics on this rig, though critical, were going to have some price point limits, due to security and durability issues. The 57 was a start.

We then tried all the competing vocal mics, quite a few, actually, and the Sennheiser 835 sounded richer and deeper and louder than anything else.

A couple competing products were more defined in frequencies above 4K, but weren't as stable at higher SPL and lacked the smooth powerful presence peak below 315Hz we heard in the 835. Items with what we will call designer response curves were immediately revealed in this relatively small space as too something or other - maybe they would be better in big rooms but the 835 was obviously the mic for Gene.

Detail of Neutrik security XLR and 835.

So day 2 arrived and we had a functioning TEF and some 835s. Various acoustical treatment components were added and adjusted until TEF blessed that situation. This, as it turned out, made my life hugely easier.

I opened up the center-of-room vocal mic and started playing with the crossover points on the Martins with my laptop and the XTA. We had some suggested crossover data from the manufacturer, but the 835 at the SPL Gene needed dictated otherwise, and I settled on points that were more or less confirmed by Doug's measurements.

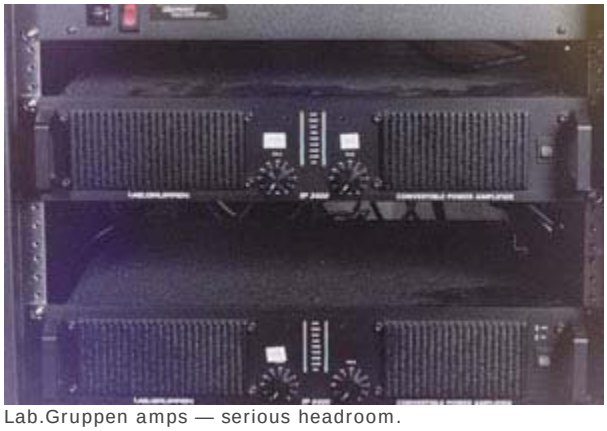
Then we lit that mic bigtime, futzed a little with the gain settings in the XTA, did a little box delay work, and a few bits of parametric EQ. Doug had a look with the TEF at the system again,

and indicated I'd overdone a cut, (though he confirmed that the frequency of the cut made sense) and I switched the reduction from -6 to -4.

I would never use any gadget to select a focus point for an EQ (or any other) act, but on the coarse gain front, TEF was most helpful in limiting the amount of reduction and maximizing system gain. It can be argued that all TEF did was confirm something based on the response curve of that mic into that room, and that my choice of cut frequency had nothing to do with the real (objective/scientific) response of the box. I would agree - but speaker boxes do not usually live in anechoic chambers when used in live sound. It is the performance in **that** room at **that** crazy SPL with **that** mic that matters - absolutes are for research; the world of live performance is almost completely relative.

This is why I howl with laughter at techno dorks that think that they can achieve the maximum emotional response from a system by setting it up with test equipment. **If the programming of the system is not initially proven at show level with primary mics open, then at some point it will have to be.**

If the FOH engineer is locked out of the speaker management system, then he will do this on the strips. If he is up to it, and has access to the speaker management system, then he will tidy the bumps of the loudest mics on the show in the controller, allowing him to run his strips in a more linear fashion. If he is a controller freak, and has access, then he can do all the system programming (even internal box delay settings, though it isn't easy) working back from the main vocal mic. Niceties in the low end, as I've mentioned before, can be adjusted based on playback of known bass intensive program material, avoiding any adjustments over 125Hz previously finalized with the vocal mic protocol.


Lab.Gruppen amps — serious headroom.

So we open up the other vocal mics in the room, and, as some Brit once said, therein lies the rub. So what do you do, go to the controller and adjust the EQ to compensate for the increased number of open mics and their negative effect on feedback stability? Dumb, as then you are changing parametric EQ on the main send for three to four different vocal mics as a group, instead of addressing the characteristics of each separately. Best to fix the room with the fuzz, the speaker system in the controller, and the individual inputs individually on the desk, even though there will usually be some overlap between the various problems and their solutions.

So each input strip on the Midas was adjusted for max gain before feedback for each mic at its position by futzing the frequency selects and gain settings on the individual channels.

Gene gave this a listen, and it still wasn't quite enough. We angled the boxes in and down a bit, just like any experienced monitor engineer would do with his foot, except these were in the air and it was a lot more work. A bit more EQ on the strips, and the thing snapped together. As we went to each subsequent room, Doug TEF'd the space and the treatment adjustments were made. The system programming from the first room held throughout all the other rooms. All I had to do was adjust the EQ on the channel strips and we had the desired aggressive sounding outcome. Be in no doubt that I never would have gotten away with this if the rooms had not been acoustically neutralized by the TEF/fuzz arrangements.


Rear view of one of Ultra Sound's 21 racks.

In the normal fairly crummy acoustic, I would have had much more EQ, and things would have sounded markedly worse. Live engineers live their careers fixing acoustical problems, except when working outdoors, and it was a real pleasure not to have to fight the room. It makes you wonder what would happen if venue owners took a little more advantage of our acoustician brethren and spent some money on getting their rooms right. At the same time, there is no way that any gizmo could have done what we were able to do with the strip EQ on the little Midas - a human voiced feedback tweak based on the human voice of a monitor engineer using the same mic technique and frequency domain (screaming) that would be prevalent in the venue user group.

Gene even had us tweak one of the old rooms - he didn't have the Lab.Gruppens in this one yet, but the rest of the new kit was installed. The amps in the rack were from one of the vendors not invited to our little shootout at the college.

TEF confirmed the fuzz, and I dumped the XTA data from the other rooms into the 224, and it lined up right pretty, by ear and by TEF. We whacked the strip EQ together on the mics, and all was well.

Remember now, it measured well, and sounded like the other rooms, but with amps I didn't trust. This lack of trust was not based on double blind testing, or measurement, or marketing, but on personal experience with this product line operating into real loads at various venues over the years. When Gene called a few weeks later to inform us that his clients were happy, and all was well, he also informed me that the only ripple in this exercise was the fact that the amps I didn't trust had burned a couple drivers.

Does this prove that it is better to be cynical and experienced in a limited artform, rather than fair and scientific? Ask the poor S.O.B. who had to climb the ladder and replace the drivers in those boxes.

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