

LIVE SOUND

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INSIDE

NOW & THE FUTURE

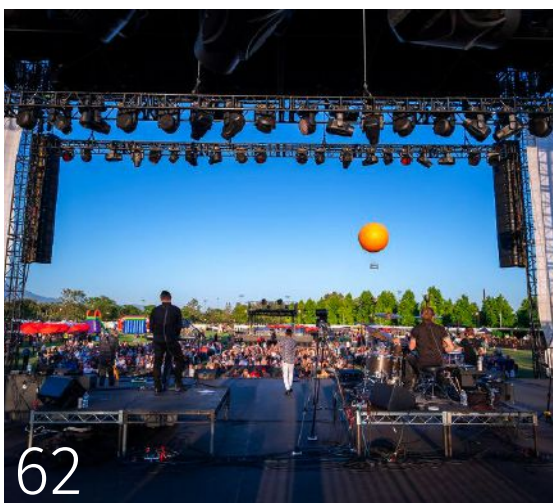
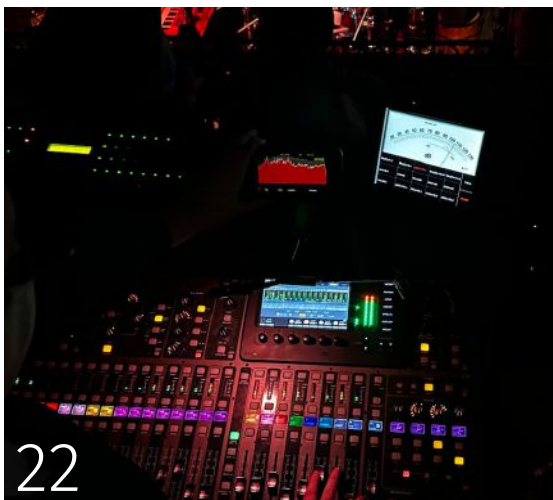
Behind the scenes on the audio tech for The Theatre in Toronto.

THE SIGNAL TO NOISE PODCAST HOLIDAY GIFT GUIDE FOR 2024

APPLYING MEASUREMENT TO CREATE SENSIBLE POLICIES IN SMALLER ROOMS

FOUR TECHNIQUES TO PUT THE "FINISHING TOUCHES" ON THE MIX





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WORTHWHILE ENDEAVOR?

The case for deploying plugins at corporate events.

by Ben Jones

The audio people that we interact with regularly tend to give us our perception of the industry as a whole, whether or not they're actually representative. In my circle of folks, externally-hosted plugins, meaning software running on a laptop or dedicated server outside the console, have been a standard part of mixing music for a long time. Especially the Waves server, which, regardless of your opinion, has been the go-to for achieving many artists' signature sound regardless of the console.

Even knowing this, my bubble of colleagues gave me the impression that these plugins and systems are not worth the risk when it comes to live corporate events. The stakes are too high and a failure will get you fired, although recently I've felt that sentiment changing.

So to break out of my echo chamber, I sought out mix engineers to interview who are doing high-profile corporate shows and utilizing external plugins. I found engineers that have been

using some version of plugins for many years and others who are recent converts because of new technology. All of them currently think it's worth the risk.

TWO SIDES OF THE COIN

The fact that plugins are "worth the risk" or not is a value judgment: "The chance of a thing improving and by how much versus the chance of failure and how catastrophic." Since everyone wants to avoid a show stopping fiasco, here are some best practices to reduce the chance of failure.

Use robust connections. Ethernet and BNC are both locking connectors, unlike USB, and only transmit audio; neither side is providing power to the other (excluding PoE). Systems that are designed for live audio transport usually feature redundant options. On a smaller scale, this can involve additional connections between two hardware components, ranging all the way up to completely separate, duplicate hardware devices and connections.

Also, be judicious about processing power. Modern technology is powerful, but this has also enabled more resource-intensive audio effects. Staying well below the stated maximum processing will decrease the chance of failure further. Then, accepting that the chance of failure can never be 0 percent, it's wise to program insert-bypass buttons (to remove plugins from the chain) and compensate for gain so it's less "catastrophic" and more "inconvenience."

On the other side of the equation, “how likely is a plugin to make a signal better, and by how much?” This is very situation-dependent. Some of those interviewed only inserted plugins at a certain threshold of problematic. For example, a very reflective room that would benefit from an external expander plugin. Others have a standard setup with many chains inserted that are tweaked slightly between similar jobs.

One sentiment that was shared by all contributors is that the addition of plugins should be a small gain after executing all the fundamentals as well as the situation allows. Wayne Pierce put it simply, “I put up speakers until I run out of room or budget.” More loudspeakers, (strategically placed) putting out less sound each, using console processing, is always a better choice than a few high-volume loudspeakers with a noise suppression plugin.

At the source level, microphone choice and presenter performance are other variables to consider. A gentle reminder to talk louder only goes so far, so our efforts are better spent deciding how to capture their sound. Choices between lavs, headsets, and handhelds as well as omnidirectional versus cardioid elements all influence the volume and character of what is picked up.

After the loudspeaker system design and microphone selection, the console processing is the next fundamental to optimize. Using built-in EQ to tune loudspeakers and then ringing out a lav on stage is a good start to getting the most gain before feedback.

Gates, de-essers and possibly dynamic EQ are also inside many consoles these days and allow more control. Because a lot of larger corporate work is done on Yamaha consoles, there’s also usually the Portico 5045 Enhancer and Dugan Automixer, both of which can help too. After exhausting all the capabilities of the console, if there are specific problems that should be addressed, it might be time to consider external processing of some kind.

Note that all of this is assuming a larger modern digital console. For most of us in the corporate space, there are many days when we don’t get to pick the console that rolls off the truck. It can be quite a mixed bag in terms of in-the-box processing. Adding external plugins can help a console punch above its weight class. Shaun Ramage utilizes his plugin hosting setup from general sessions when using budget mixers in important



Dugan automixers can be a handy tool in corporate applications.



Platforms such as LiveProfessor (from audioström as) have brought studio plugins into the live event industry in an accessible way.

breakouts. He polishes the sound with expanders, dynamic EQ and an automixer. Not only does it sound better, but it gives him more headroom and therefore peace of mind.

GROWING OPTIONS

There’s an argument to be made that it’s not the operator’s responsibility to provide additional gear necessary for an event. On the other hand, many mixers choose to provide laptops and a playback system that is included in their day rate, and external plugin processing could be seen as similar in that way.

Personally, I agree it’s a dangerous precedent, but I also understand that as mixers we are judged mostly on the end product and therefore should do everything to make it as good as possible. As with many tools it’s hard to add a line item rental, but a consistent quality product will hopefully lead to more gigs.

For those who want to carry their own plugin rigs, Waves has historically been the de-facto standard, but non-server computer hosting has exploded recently, fueled in large part by the performance of Apple silicon. Personal laptops are now capable of running multiple chains of intensive plugins without the risk of hitting the processing limit. LiveProfessor, Gig Performer, SuperRack Performer, and VST Rack (among others) have brought the whole world of studio plugins from the recording and post-production world into the live event industry in an accessible way. In the past, RME interfaces have been popular bridges from consoles to computers.

Now, many are moving to new interface technology like the Yamaha RUio16-D.

Brian Frost wasn't using external plugins before the release of the RUio16-D. He originally purchased it as a general purpose interface, but slowly discovered the power of VST Rack. Now he runs up to 16 plugin chains on channel inserts and his M2 Max Macbook does not struggle at all.

For those consistently working on Yamaha consoles, it's obvious why it's an attractive option. It has native redundant Dante integration, redundant power, and best of all, the automatic bypass feature which keeps the dry signals flowing even if a plugin or the whole computer fails. The only complaint I've heard is the limitation of 16 Dante channels each way. Of the engineers I talked to, all of those using a laptop for processing are currently utilizing the RUio16-D.

Those convinced by this new technology are joining a group of mixers that have been supplying their own digital processing since before 2010. In those days some people carried their own large racks of analog gear, but the trailblazers had processors with eight channels of digitally controlled EQ in 1RU. Ken Newman was one of these early adopters who transitioned to a personal Waves server early on and has had very few problems over the years.

Some engineers choose not to use Waves anymore after one or more negative experiences. Those that I spoke to who commonly use Waves servers believe consistency is the main factor in their success. Having a personal rig with the same server, dedicated control computer, Yamaha card, cables, firmware, plugins, etc., every time is a great defense against unnecessary troubleshooting and downtime. After the primary is running as intended, some also add a redundant Waves server with automatic failover.



A Yamaha RUio16-D interface.

MORE ADVANCED TOOLS

For those who like the idea of dedicated hardware processing for plugins but aren't comfortable with Waves servers, a Universal Audio interface might be worth exploring. As Ryan John (also previously senior product manager at UA) explained to me, the processing is done inside the Apollo interface for UAD plugins. This means the control computer can die and the processed signal is not interrupted.

That's obviously appealing to the live sound market, and UA used to produce the LiveRack processor that was geared towards us, but it's been discontinued. Now the only option is the Apollo line, which is not currently marketed for live sound. Nevertheless, there is still a loyal set of engineers who like the workflow and sound quality of both the LiveRack and Apollo. While UA is known for many high-quality plugins, for corporate use, the most interesting offering is C-Vox, a CEDAR-developed plugin for active noise suppression.

Unless you use a Yamaha RIVAGE every day, chances are your console doesn't have a built-in noise suppression plugin like DaNSe. Popular plugin options for active de-noising are Waves WNS, NS1, Izotope Rx Voice Denoise, and CEDAR DNS 1 and 2. Many engineers, like Andy Leviss, pair one of these with an expander, usually either a Portico 5045 inside the console or a Waves PSE externally. His preference is to insert the expander on the input and utilize Voice Denoise on the buses.

Similarly, the Waves Dugan Automixer can help with clarity and retaining maximum gain when using multiple mics. An external automixer can be useful if the console doesn't have an automixer or just does not have enough channels of it.

Another plugin category missing from some desks is dynamic EQ and multiband compression. Waves F6, Fab Filter Pro-Q 3, as well as Waves C6, and Fab Filter Pro-MB, are all low-la-

tency capable and can also replace a purpose-built de-esser. Even using consoles that have some of these tools built in, I found that some engineers preferred the sound or workflow of an external option. A separate screen just for plugins is often quicker than navigating to effects inside the console.

These more advanced tools may be the initial reason for many choosing to dive into external plugins, but once a system was in place, those I spoke with realized they could easily add a bit more. They could now employ better dynamics like an SSL G Bus compressor, Waves Max Volume, or a true peak limiter (with look ahead) which few consoles have natively. This explosion of possibilities continues when a band shows up and any software reverb is now an option. Ollie Morish even had a client request Auto-Tune one time and it was an easy addition to his existing system.

My contributors were split on where they prefer to add plugins in the signal path; some prefer direct channel inserts and some prefer a bus insert workflow. Opinions vary about which option makes more sense for certain tools but everyone agreed that record/stream buses should be processed differently from the PA feed. This ranges from subtle changes like allowing slightly more room noise in the recording to keep it natural, to a full master bus chain. Aram Piligian is partial to the Shadow Hills Mastering Compressor along with an Izotope Ozone Maximizer for true peak limiting while operating at low latency.

ADDRESSING LATENCY

The topic of latency is often brought up when contemplating adding additional processing to the audio chain. Wireless mics, digital consoles, system processors, and amplifier processing all add some amount of delay to our signals. In music, timing has to be as precise as possible, doubly so for musician monitoring (where under 5 milliseconds is generally suggested). This applies much less in the corporate space where most of the live content is talking. It might be worth avoiding extra processing for the foldback monitor to avoid a speech jamming effect, but even up to 10 or 20 ms (more than most options add) of delay to the PA will likely not be noticeable to the audience. The record feeds are impacted even less as more delay is often required to sync the audio to the video.

Plugins have been a part of digital consoles since the beginning. As Pete Wiejaczka was telling me, early digital consoles did not have great onboard effects and relied on an external Waves server for high-quality studio plugins that could keep up with the new fidelity of line arrays. Since then, the pattern has been that the tools that push people to external devices eventually become features that manufacturers add to their desks.

First, it was well-modeled compressors, reverbs, and delays.



The new Fourier Audio transform.engine plugin host server.

Now we are getting dynamic EQ and multi-band compression. It feels like the next step will be active noise suppression as is already available in the Yamaha Rivage series.

At the same time, other manufacturers are pushing to equip the external plugin users. Aside from the RUio16-D, Fourier Audio recently announced the transform.engine plugin host server which allows any VST3 plugin to be hosted natively. This is meant to challenge Waves in the touring market and in response Waves has announced the SuperRack LiveBox which also allows any VST3 plugin to be processed in *their* server.

Overall, there are a ton of options for how to incorporate external processing into a modern workflow. I plan to wade slowly into the world of plugins for corporate events and probably other types of jobs I do too. Based on the advice of my contributors, the first step is to build a personal rig and test it thoroughly at home or the shop.

Once I implement it on site, I plan to start small by inserting plugin chains on duplicate channels or busses that are only being recorded for me. From there I plan to scale up to having a few specific plugins on my record bus. Eventually, I'd like to be comfortable enough to use noise suppression for the PA feed.

*Note: the author thanks these individuals for sharing their time and expertise: [Brian Frost \(FOH/broadcast mixer\)](#), [Ryan John \(freelance audio engineer and product designer\)](#), [Andy Leviss \(freelance FOH and co-host of the Signal To Noise podcast\)](#), [Ollie Morrish \(audio engineer\)](#), [Ken Newman \(FOH and corporate A1\)](#), [Wayne Pierce \(corporate A1\)](#), [Aram Piligian \(audio engineer for music, corporate and special events\)](#), [Shaun Ramage \(freelance FOH and corporate A1\)](#), and [Pete Wiejaczka \(mix engineer/special event sound designer\)](#). **LSI***

Ben Jones is an audio engineer who enjoys learning new things and is always striving to be better. During his time pursuing a music education degree he discovered the world of live sound and his passion for the technical side of it. He can be reached at BenJonesTech1@gmail.com.