



# PATCHBAY PEEPSHOW 201

The Ultimate Advanced Patchbay Setup Guide

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# Designing Your Patchbay

## ***Who Needs A Patchbay? What's The Point?***

First off, I'm not sure why I said "a" patchbay. If you can get by with one, consider yourself blessed. You are lucky. I have four money-chewing, rack-eating TT patchbays and two TRS patchbays at the moment.

I recorded music for a living for eight years with no patchbay. I wasn't using hardware during mixing. I had the same preamp that I basically used for all overdubs, and most of my drum tracks shared the same inputs as well. This was not convenient and I was constantly cussing while I looked for a flashlight to back into the jungle known as my rack. I made it work, but it was definitely the "duct tape" solution. A person has to pick their priorities, but anyone with external hardware that varies in usage is going to suffer a MAJOR workflow hit when working without a patchbay unless they have enough overall I/O to ensure all gear can be hooked up simultaneously. (We'll get into that.) I like a well-setup patchbay....a lot, but I do not love the patchbay invention.

What I love is a system that gets out of the way of my noisemaking and saves me a bunch of times. In most cases a patchbay will help greatly with this. Patchbays can cause more problems than good. My first attempt with patchbays proved this. More options rarely equate to more musical fun. It's often better to work with a "just bring what you've got" mentality.

## ***The Michael Jordan Nike Rattlesnake Argument For Sound And Workflow***

Everyone knows that Michael Jordan wore Nikes in his hey day. Whether his tools made that much impact on his playing is always up for debate (and the kind of thing that is being argued right this second on recording forums all over the web as we speak).

My take on this recording thing is that it's the humans that make the recordings and a small subset of the human element is a human is going to want tools that work well for them for the task at hand.

Regardless of whether Michael Jordan wore Nikes, Reeboks, or something Roman soldiers use to lug around, he's not going to be nearly as effective if we make him carry a rattlesnake around with him on the court.

Some sessions are stressful and full of anxiety. It's easy to get overloaded fast with live bands. On the worst of days, a recording gig with everything going wrong makes me feel quite similar to how I'd feel if there were a rattlesnake

across the room. (I'm not carrying the damn thing!) It's a bad place to be. I don't like snakes.

With that kind of weight on a person's shoulders, an audio engineer will never be fully effective. Engineering is often a creative gig, but the brain isn't good at being technical and creative at the same time. When tech problems arise, creativity generally goes out the window.

So in a world where we make such an enormous emphasis on facets that couldn't be less consequential in the big picture (Would *Back In Black* be any less of an album if tracked on an API, Trident, or MIDAS live console? Probably not.), the one thing I can assure you is that you will not be your best if you are stressed and cussing technical issues.

I'd rather be comfortable, confident, and in high spirits using the worst of gear than I would using Neumann, Neve, and Prism with all hell breaking loose. I'm positive I'll sound better with the crappy gear if I'm firing on all cylinders. You will too.

The good thing is that a great setup doesn't have to be a fortune. I'll show you how.

### ***An Argument For Reliability***

Mac had a slogan a while back that said, "It Just Works". Based on that point of view, Mac makes billions selling computers that are half the speed of equally priced Windows-based computers. It's clear that reliability is a *huge* damn deal. What do you do when your DAW refuses to load? If you are like me, you cuss and plot ways to get even.

I think we can all agree that a simple setup is more reliable than a complicated setup. The less links in the chain, the less likely you'll have problems. Nothing shocking there.

When you decide you want to use an Eventide H3000 (A hell of a tool!) as an insert in your DAW channel, you have added significantly to the number of links in your chain. Let's assume you didn't like the Pitch N Modulation plugin in your DAW and you want the Eventide H3000 instead. Here's a run down.

1. External Effect Plugin must work reliably.
2. External Plugin routing to your digital-to-analog converter channels of choice must be correct.
3. Audio Interface must be reliable.
4. DA converter must work reliably.
5. Wiring from DA converter to patchbay must be reliable. (6 solder points.)

6. Wiring from patchbay to Eventide H3000 must be reliable. (6 more solder points)
7. Eventide H3000 must be reliable.
8. Wiring from Eventide H3000 to patchbay must be reliable. (6 more solder points)
9. Wiring from patchbay to analog-to-digital converter must be reliable. (6 more solder points)
10. AD converter must be reliable.
11. Audio Interface must be reliable again.
12. External Plugin routing from AD converter must be correct.

We've just added 12 links to a chain. It's one thing to restart a computer. It's another thing to pull out the soldiering iron. It may seem that I'm being a sissy here. Maybe so. Want to know how many problems on this list HAVEN'T happened to me? Zero. Every damn one of them has malfunctioned at some point during a tracking or mixing session. (Usually, it's me that malfunctions.) This has cost me time and money.

I chose the Eventide H3000 in this example because it's a bold SOB. It has an obvious character and there are elements to the H3000 that haven't been realized fully in plugin land as of this writing. I have to admit that as much as I absolutely love what the H3000 does (for so many sounds), I have to admit that every time I want to use it, I debate if it's worth the damn trouble. It reminds me of that feeling of working 15 hours, plopping down on the couch, and realizing the remote control is nowhere to be found. There's a certain, "Ah!!! Sh\*t!!!" feeling to it as there are so many times things go wrong that simply don't go wrong in plugin land.

This doesn't mean I don't use it. It just means that the sonic component is just one of many factors involved in selecting a tool and that reliability should be factored in.

I will say without reservation that I don't bother using my \$1,200 Emperical Labs Lil Freq for mixing. It's too clean and not near bold enough to go through those 12 factors mentioned above. I really prefer using plugins. I don't feel like I'm missing anything.

Don't get my started on the workflow of repeatability. SMILEY

Update: I sold the Eventide H3000 the day I got the Soundtoys Microshift. The Microshift only focuses on that one sound and that was enough for me to sell the Eventide. No more reliability issues.

With that said, I do feel that there are still specific sounds where hardware makes sense. A hardware piece is much more likely to sound unique. Assuming a person is ingrained in the "1970s Way Of Recording" and has all the necessarily

equalizers, compressors, reverbs, delays, modulation, snakes, etc I see absolutely no reason to change that. However, it's my official advice for anyone not sure to do as much in the box/computer (otherwise known as ITB) as possible. For those specific channels where you'd like to use hardware, use an external plugin and fight through the 12 steps above. Maybe your setup will be more reliable than mine.

If you are an ITB guy who is just curious – Which is probably where I came in – demand audio clips proving X is better than Y.

## ***Rant Over***

Now that I've given you the warning speech let's get into specifics. I won't bug you much anymore. I promise.

## ***Designing Software***

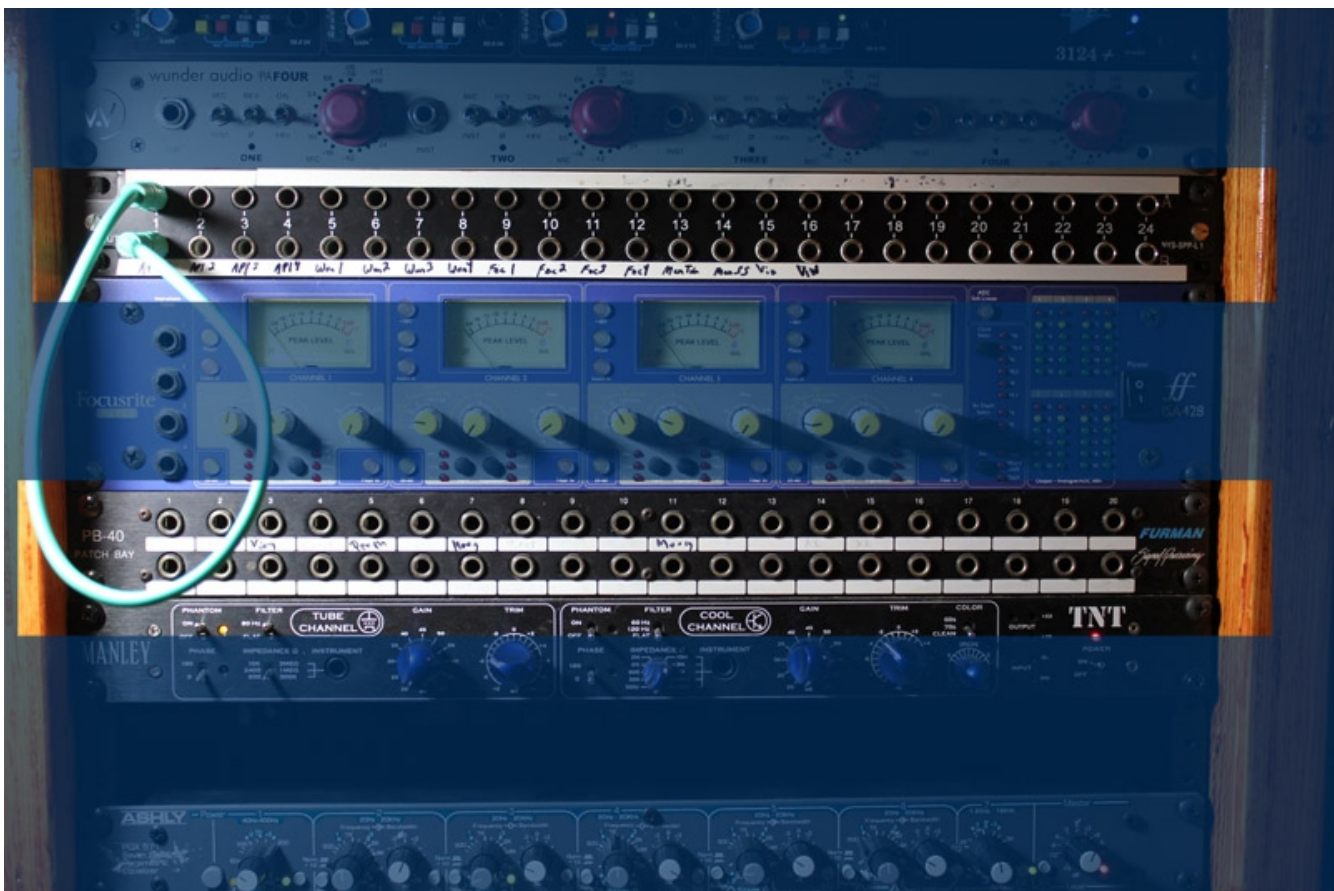
I keep looking for software tools to aid in patchbay design. I've not found any. I guess it's not really that big of deal. Even when I designed my 4 TT-patchbay back in 2010 that was WAY over the top, the only real issue is fitting the blocks together. For example, if you've got an 8-channel preamp sent to a patchbay, the odds are strong that Ch#1-8 are going to stay 1-8 even if you move them to 17-24 on a patchbay. We can think of that Ch#1-8 as a "block".

I doubt if software is ready to help you in terms of workflow. No tool I've heard of actually helps with normals and such. So really it boils down to any design tools being little more than block counters. A typical TT patchbay has 48 rows. If you've got a block of 24 rows used up, how many rows are left? We don't need software for calculating that. I've stuck with good ol' pencil and paper and done fine.

## ***Mounting Your Patchbays***

I highly recommend wasting some rack space when installing your patchbays. A patchbay with a 1U spacer (black piece of sheet metal that does nothing but fill the gap) may chew up an additional 1U of rack space. It'll also make it possible for you to actually get back there and unplug your connections, replug your connections, or troubleshoot a bad connection.





Take a look at this picture. If you look in the blue you'll see a Focusrite ISA428, a TRS patchbay, and a Manley TNT. Both of these preamps are high end. That means they are probably close to 12" deep. The patchbay is maybe 2"-3" deep. I had a JP-8080 synth flowing to the top of 1/2, but channel #1 wasn't working correctly. You know how hard it was to get my fingers in there? I had to take out the Manley TNT to reach it.

That is no way to live. The whole point of patchbays is to make your life easier and faster. Invest the 1U of space so you can actually get your hands in there.

Additionally, plan your snakes with an additional 18" of slack and make sure every connector can reach the top space of the rack (in case you change your mind later). This slack will look messy if you don't deal with it. However, it also allows you to pull the patchbay out. In the future, all my patchbays will have plenty of slack and will have a 1U blank space underneath them.

### ***Labeling With Additional Space***

You may notice that most of the patchbay labels don't look great. They require extreme abbreviations, extremely small font, and I'm trying to jam as much in

there as possible. While I always recommend printing your labels with a printer, take a moment to consider buying 1U metal plates for above and below your patchbay. Then, you've got radically greater label space to work with. Trust me, this is not a sexy element to patchbay design, but once you get close to the finish line and you don't remember what "FN" is before you even mount the thing, you'll wish you had more space to be more thorough. It'll make using your patchbay much simpler.

## ***Contingency Plans***

For you guys in a hurry, I'll spoil this one. Building in additional channels beyond what you probably need is one of the fastest, easiest, and maybe even cheapest ways to ensure reliability. You've got an 8-piece band that is sick of waiting. If Channel #9 is dead, move that mic to channel #10. You have extra channels. Figure it out later.

Here's the long story which gives more context.

As you'll see, I'm a strong advocate of traveling as light as possible in regard to patchbays. You don't want to be the woman with the 125lb suitcase for an overnight trip on your next session. Trust me, lugging this thing around just makes you old and tired in a hurry.

I'm actually combing through this thing a final time and I noticed a major flaw in my original 2010 design (again!). As you'll see, there was a time when I had quite the preamp collection. I had 16 high end preamps that they teach the kids to slobber over. (Old people are less impressed. ) That's the problem. I only had 16 inputs and I was doing live bands and such.

I had a problem where channel #11 on the patchbay that connects my Focusrite ISA428 to the console channel was screwy. My system was so complex that getting back there to work on it was a disaster. It would be easier to replace a clutch on a Ford F250. I needed that channel for tom #2 bottom. My drum recording style requires the bottom mic. Without the bottom mic, I had big problems. This led to me cussing the patchbay. I was nervous. The vibe of this session started out upbeat and rocking. I could feel it dwindling. That, I could not compromise on.

The drummer needed some help in many areas. Basically, his entire kit was a disaster. Instead of working on his kit and working on his playing to give me what I wanted, I focused on that damn tom bottom channel. Ultimately, I had to make the call to just hit record and I'd deal with it later.

The band, one of my favorites I've ever done, did their thing. It was a blast, but the drum tones were BAD....really bad. I actually lost money on the product paying my assistant to use Trigger on everything. He'd used Trigger on the session a week before and it probably took him 10 minutes a song. This was different. I illustrated this in [Operation Drum Rescue](#). Of course, the iLok died and we lost Slate Trigger. \$50, two weeks later, and only one week past the deadline we had our iLok and the mixes finished.

This is a long, damn story to say that that 16 high end preamps didn't help me on that session. What would have helped me was having 24 inputs. It wouldn't have mattered if they were API or Behringer. Not a bit! With 24 inputs I could have switch Tom #2 bottom over to the next input and had it working in 5 seconds. I could have been laughing and joking with the band. I could have helped the drummer with his trash can/shoe box snare drum. I could have actually ENGINEERED the damn thing. I could have explained to him just how crucial it was to crush that snare (punk/metal) and do so consistently. It would have made the gig more fun for the band and radically improved the results.

You'll see in my modern designs that I like to have 16 inputs in the live room and 8 inputs in the control room. Both are overkill on purpose. If one channel is screwed up, I don't have to troubleshoot. I won't troubleshoot. Instead, I'll just switch to the next input.

I highly recommend you build in a few more extra inputs than what you actually need.

## ***Cable Runs***

When you use a nice interface like the RME UFX or Focusrite Saffire, you plug an XLR cable in and hit record. The cable is 20' long or so.

Here's a breakdown of cable lengths on my original 2010 patchbay design.

1. Vocal mic in live room
2. 50' snake to get to patchbay
3. Patchbay normalled to API preamp. 3' cable.
4. API normalled to patchbay. 10' cable.
5. Patchbay cable 18"
6. Patchbay to Lil Freq EQ. 10' cable.
7. Lil Freq EQ to patchbay. 10' cable.

8. Patchbay cable 18"
9. Patchbay to Distressor. 10' cable.
10. Distressor to patchbay. 10' cable.
11. Patchbay cable 18"
12. Patchbay to La3a. 10' cable.
13. La3a to patchbay. 10' cable.
14. Patchbay cable 18"
15. Patchbay to console 8'
16. Console inserts send 10'
17. Console inserts return 10'
18. Console to direct out. 8'
19. Apogee AD-16x. Cable 2'

I just added up 167' of cable. Ahh! This is how a "1970s Way Of Recording" has to be done if you stay entirely modular. Do I really need the option of having the Lil Freq either before or after the Distressor? That depends on the engineer. (For me now, I KNOW I need an EQ before the Distressor to keep the Distressor from reacting to mud.)

167' of cable is not really a sonic problem. I've seen the numbers. The concept is called "capacitive reactance" for you nerd types. The capacitance of the cable of a long haul reacts to the impedances of the gear before and after it. Whatever. The point is most people lose about 1dB of top end with 500' of cable. That's a microphone hooked to a preamp. Once your up to line-level none of that matters much. So don't get wound up about 167' of cable ruining your sound quality. It won't. You probably won't notice.

However, 147' of cable IS expensive. It's messy as hell. These are all balanced connections which means it's 3 solder points on each side that could fail. That's 57 solder points for this vocal recording I personally performed. I see now that I forgot to plug the mic into the snake. That's another 20' of cable, 6 solder points, and 2 jacks.

We'll later get into asking a very simple question? Do we need all of this? My answer in 2010 was, "Yes!!....I think so.". I probably was a bit more timid on the "I think so" part. I was playing the game and doing what I was told. I didn't

quite realize at the time I was being shipped off to 'Nam. (The establishment tends to do that.)

Now I'd question my design heavily and cut out any and all unnecessary stuff. It's much easier when you figure out a way of working that makes sense to you. When it's all new, you never really know until you try. It's just a shame that there's such a pull to this type of setup when the benefits are very hard to quantify for most. I still haven't figured out what I gained from all of this.

## The Laws Of Patchbay Design

1. Automate (normal) those tasks you do under the most pressure.
2. Automate (normal) those tasks you find yourself doing all the time.
3. Murphy's Law crashed our patchbay design law party.
4. Because of Law #3, the less elaborate your patchbay can be, the better.
5. When in doubt, free up as much RAM as possible
6. When in doubt, expect the simplest usage.
7. Keep all numbers consistent as much as possible.

## The Laws In Detail

...and in order.

### **Law #1: Automate (normal) those tasks you do under the most pressure.**

Without a doubt, it's important that I have my mind clear when all hell is breaking loose. When I'm mixing on my own time, a problem is no big deal. If I'm ready to kill someone, I go for a two mile run. When I have 39 patch cables plugged in, the band is acting like a bunch of apes (eating bananas...jumping...etc) and I know that the vibe of the session is about to crash if I can't get the tom mics to work, I do not want to be fiddling around with anything I don't have to.

In these situations I demand extreme levels of reliability and as much simplicity as I can get my hands on. Anything I can do to make the high-stress situations easier now should be done.

### **Law #2: Automate (normal) those tasks you find yourself doing all the time.**

This one is fairly obvious. What isn't obvious is #1 should go before it. Automation is great for speeding up sessions, but it should never make a hard session harder. I find it to be a bit of a pain to hook up my current go to vocal chain EVERY time I record vocals.

Microphone > Rane MS1b > Ashly PQX-571 equalizer > Distressor > La-3a > Converter

This pain is not that big of deal because I'm only doing it when I'm overdubbing vocals. Of course, this pain occurs often because I overdub vocals quite a bit more than I record drums. I accept that pain...or do I? (Foreshadowing!)

### **Law #3: Murphy's Law crashed our patchbay design law party.**

Think you are immune to things going wrong? If you are a computer nerd and used to incredible reliability, get ready to learn about what happens when things go wrong in the real world. Seriously. The hardware world isn't nearly as forgiving.

I've already ranted considerably in "An Argument For Reliability" on the 12 additional links in the chain it takes to replace X plugin with an Eventide H3000. The more of that stuff you do, the more problems you are going to have. Count on it.

I was born in 1980. I grew up with Nintendo and Windows. (Windows, finally growing up with Windows 7.) I'm happier with a mouse in my hand than I am at the average birthday party. I'm used to solving problems by playing with settings. Computers generally work or they don't. They really are in some kind of halfway intermittent place.

When we move to hardware and patchbay land, you will see some strange anomalies that people in my generation, even the very technical, may not be used to dealing with. Bad patch cables are sometimes hard to find. Sometimes a patch looks perfectly fine, but shorts out randomly in ways you wouldn't expect. Fixing the metering on channel 8 of a console may mean yanking out 127 connections, flipping the console over (a 2 man job), taking out 96 screws, and then just plugging in a loose cable. In short. Things go wrong. Travel light. Expect a fight.

### **Law #4: Because of Law #3, the less elaborate your patchbay can be, the better.**

In Law #2 I decided I hated having to patch in every little component of my lengthy vocal chain so often, but I couldn't normal it because of Law #1. I decided to conduct an experiment. I bypassed the patchbay with the Rane MS-1b, Ashly EQ, Distressor, and La-3a and simply hardwired them with standard XLR cables. So now if I use the Rane, I get my Power Channel strip.

I fully expected to want all that ENORMOUSLY IMPORTANT flexibility (wisdom-bred sarcasm). It turns out, all that damn flexibility was the thing driving me bonkers. Now I either use the channel strip or I don't. It's an easy solution. I've not ran into one situation where I really needed that Distressor or La3a on something else. If I did, I'd use the channel strip for that. I have wished I had more than one channel strip, but that's not a patchbay problem.

Simplifying has been great for me. Interestingly, the more we simplify, the less



the patchbay is useful.

One aspect that can't be underestimated is the point in which the back side of the rack consumes you. When you are putting a complicated system in place you start with one snake. Things are nice and tidy. A few hours later you have a complete mess. You don't know what's going on, and worst of all, from that point on behind the rack and console becomes the dungeon room you *do not* want to go into. It really does become the hunting cabin infested with snakes. (That, is why they call them audio snakes. It has nothing to do with their long, slender shape. It's because they should be feared particularly in large quantities!)

### **Law #5: When in doubt, free up as much RAM as possible**

RAM is a computer term, but we all know what it feels like to run out of RAM (short term memory) in our own brains. When we have 50,000 things going on at once, we don't perform well. That's the short term memory problem and it has nothing to do with our ability to remember the capital of Egypt. If you aren't sure which path to go, use the method that requires the least amount of short term memory and would be the easiest to teach a new guy.

Even if you are great at performing technical tasks under stress and pressure, it's much, much harder to write lyrics to your answer to "Baby Got Back" while knowing that ch #8 is cutting in and out, the computer's CPU meter is in the red, the bass player's headphones aren't working, and the drummer's two year old is running loose pulling knobs off of your preamps. Yes, I've experienced all of those.

This sounds a bit vague now. We'll be referencing it soon. Keeping the RAM usage down in our noggins is a huge help to this whole endeavor not only in patchbay time and costs, but reducing stress, increasing fun, and being more creative.

### **Law #6: When in doubt, expect the simplest usage**

The ability to do anything anywhere anytime is cool. You own a 747. You can fly from Los Angeles to Perth, Australia right this second and get there in 20 hours or something. I don't even own a Cessna. I can get there in 30 hours or 40 hours, I'd guess. At what point is that extra 20 hours worth actually buying a 747? A person would need to make a hell of a lot of trips for this to make financial sense. So maybe a Leer Jet is a better choice. Even then, we are looking at a BIG TIME investment and cost.

The interesting thing about this simpler idea of not even owning a plane is that if I'm really determined, I can certainly get anywhere I'd want to go. It may take



longer and be a massive pain in the butt, but I will get there in a period of time that was unheard of 100+ years ago. (Mark Twain wanted to go from San Francisco to New England. It involved riding a horse through Panama! That was the fastest way then. He made it.)

Back to patchbays. If you really want the ability to go anywhere anytime, you will pay for it. Cash is one thing. Time and workflow is another. Maintenance is another! If it doesn't make sense to use 42 direct outs on the console when you only have 16 AD converter channels, only hook up 16 direct outs to the patchbay. As you'll see, I went ahead and hooked up 42 direct outs on the first try. That's an extra 26 ¼" TRS connectors, 26 balanced cables, 156 solder points, and possibly even required me getting an additional patchbay all so that I'd have the option of recording the direct out from any channel on the console. Why and when would this ever happen? It wouldn't and it didn't. I can always use those first 16 channels in one way or another.

If it's an emergency I can always yank out a cable from the console and toss in my temporary cable. That takes 12 seconds. Designing a system that can do everything all the time and executing it will waste tremendous amounts of money and time. It's nothing but waste if you don't utilize those benefits. Travel light.

### **Law #7: Keep all numbers consistent.**

This is an extension of Law #5, but it comes up enough that I decided to give it its own law. I have this tendency to put the stereo out of my DAW just to the right of the master volume on my analog mixers. I've been doing that for years.

I have logic behind it. On the Toft ATB32 these days I keep the Cubase stereo out on ch #23-24. I don't like putting the output of Cubase on ch 1-2 because if I'm recording a drum kit with 12 mics I'd have to start with ch #3.

Imagine I look up at Cubase and see that Track #4 is goofed up. I'm not getting any signal. I could search for the 4<sup>th</sup> mic on the drum kit and 4<sup>th</sup> mic on the snake, and 4<sup>th</sup> preamp. That all sounds good. What about on the mixer? Anytime I use the mixer I have to add two in my head and look at channel #6. Dumb! It makes a lot more sense for that 4<sup>th</sup> mic to come up on ch #4 on the console.

This becomes the most useful when recording a live band with multiple headphone mixes. (Something I generally try to avoid.) The drummer wants more bass and more kick drum in his headphones. The singer wants less bass, more overheads, and more reverb. The electric guitar player wants less bass. They barked all of these orders out at the same time. You have to go to the bathroom and you noticed the guitar sounded a little weird like a mic fell over.

Now on top of all that remember that you need to add two to every channel. Nope. That's just inefficient.

With all that said, if I'm going to put the stereo out on one of the later pairs of channels on the console, it also makes a ton of sense to feed ch #23-24 with converter ch#23-24 if I have it. I don't have it, unfortunately, so there's a limited case where I bend my own rule and use AD out #15-16.

As you'll see in a later design, I tossed the DAW's stereo out onto a monitoring-only mixer. (The mixer is not directly in line with the signal path to the DAW.) In that particular case I was using converter output ch#1-2 for that stereo mix. Nothing wrong with that. But stupid me put that stereo mix on ch#15-16 on the monitoring mixer. Why? I have no explanation, because it was a stupid idea. When I have the choice and there's no great reason to, I should put 1-2 on 1-2 everywhere I can. I should put 15-16 on 15-16 everywhere I can. All of this is to free up RAM. I need a damn good explanation when I deviate.

Keep your numbers consistent. Shoot me an email when this pays off for you. SMILEY

## **Law #8: Make Yourself Documentation**

Bothering to patch in something you use every day is no big deal. Why? Because you patch it and you leave it. You don't break that connection until you need to. You'll forget you even have cables patched in for that item to work. Hold that thought.

When all hell is breaking loose, if you follow my laws you always have the option of just yanking out all the patch cables and everything will work. That's what you'll design. That's what you'll triple check to confirm when you implement the design. That's a luxury you always have in the worst of times.

You can design for every day occurrences to be as automated as possible. The problem is you'll forget what to do when the eight monkeys show up and are swinging from your chandelier. There will be two or three patches that you've done 4 times before, but you really don't remember what you ended up doing even if your labeling is solid.

I've found that a few patches each day for whatever I'm specifically working on isn't that big deal of deal. The fact that I'm so traumatized by a few not-so-great experiences is evidence. You may be wired differently than I am, I guess.

The answer to either setup is to have clear cut documentation. The labeling is of epic importance in terms of workflow. We've already covered this. However, having a backup on Google Docs or something you can get to on your recording

computer that lays it all out for you in times when you may be in a near-panic state is huge. Sending the band out for a smoke break lets you clear your head, read what you were thinking, have that “Oh yeah!” moment of clarity, and fix the problem.

### **Law #9: If A Switch Can Do It.....**

Using a patchbay to alter routing requires patch cables. It also requires a certain bit of concentration. You may find situations where you can skip the patchbay and use a switch instead. For example, my Toft ATB32 console has a switch to select between the Line-Ins and the XLR inputs on each channel. This means if I really wanted to I could have 8 channels of hardware synths placed on the Line Ins and have the preamps connected to a snake in my live room. If I wanted to switch between mics or synths I could simply press the switch on each channel.

As long as it doesn't conflict with a different way of working, this is vastly superior to having to pull out 16 cables to switch between the varying options and using the additional cables that would normally go to and from the patchbay.

### **Law #10: Know Every Input In And Out**

When I bought my Toft ATB32 in October 2010, I probably read the manual 10 times before I started my design. I'm not a huge fan of the manual. After 10 reads I didn't completely understand the full capacity of the routing. I generally do okay in the tech world and I don't think it was my stupidity holding me back on this one. Scheduling forced me to design my patchbay system before the console showed up. There was no time to figure the console out by trial and error.

I opted to ignore the “Monitor” inputs, because I wasn't sure how I could use them for headphone mixes. It just seemed safer to go with what I know and utilize the patchbays extensively.

Quick Info: A “Monitor” input on an “In Line” console basically gives you an extra Line-Level input for every channel. On Channel #1, it's like you have Channel #1a and Channel #1b. The complications arise in what features like EQ, aux sends, etc are available to #1a vs #1b or both.

This is a cool thing when you're doing a Michael Jackson mix of 160 tracks and you need to fit them on an analog console. Those “Monitor” inputs can flow to the 2bus with level control.

The reality is after using the console for three years and re-reading the manual

again, I still don't understand all the "Monitor" features enough to design a rig with them. The good thing about being 33 instead of 30 is I simply would not start such a design without fulling the foot-freakin'-master of every single element of that console. I'd start shooting emails, making forum posts, and I'd kick and scream to find out the info I need. It's been way too much work not utilizing relatively genius features in a console that were explained poorly.

### ***The 80/20 Rule***

You've heard of this rule. The 20% least important stuff in your life takes up 80% of your time and the 80% most productive stuff only takes 20% of your time.

Most of us are probably overdubbing a single musician a majority of the time. That could be done with a 2-channel interface. However, with my rig at least, I have to think about secondary headphone mixes for drummers recording with a bass player who doesn't know the songs. Yeah, that doesn't happen too often.

With patchbay design, you will see quickly, that setting up a patchbay to handle what you do on a typical Saturday is pretty straight forward, inexpensive, reliable, and reasonable.

As you'll see in an upcoming build, just a adding piece of stereo hardware can require the addition of multiple patchbays, hundreds of dollars of cabling, and will result in a general downgrade in reliability and sometimes simplicity.

I promised I wouldn't rant too much about certain gear choices. I'm going to stick to that promise here. Those of you into the hardware should stick to your guns if you like the workflow and can afford it. I simply want to remind people that the infrastructure for such setups can get very expensive and its resale value is notoriously dismal.

Ironically, there is almost always a real world solution that's faster and better than designing for every conceivable situation. I just mentioned a drummer not wanting to hear the bass player. If it's that big of deal, that bass player can just sit out a song. That is often a better solution than scraping up some lame brain procedure I came up with 9 months before.

## ***How To Grossly Simplify Your Patchbay(s)***

### **#1 - Reduce Your Options**

Anytime you see a possibility you've probably never needed before, the odds are strong that you may never need that possibility. Be skeptical of every option you add. Keep in mind that with a large channel console, it's very easy to chew up an entire patchbay with something as mundane as channel inserts. (An option I invested in but never used.)

I could save a ton of time and money if I eliminated options. Again, a patchbay is just a cable with an option that happens to require a bunch of cables and connectors. If you really think about it, how many freakin' options do you need for a hihat mic? I just need to get it into the DAW. That takes a preamp and a converter. If the drummer needs to hear more hihat (I can't remember ever hearing that request) then I crank it up in his headphone mix via the DSP Mixer thing on the interface.

#9

### **#2 In The Box Is Free...Almost**

I read recently that the new RME Totalmix FX has 4,000 channels. I laughed when I read it. It's like saying a car goes 4,000 miles per hour. Then I thought about it. Digital replicates itself quite easily. Analog, on the other hand does not. Analog needs components, physical space, and *cables*. Cables are the arch nemesis. So are the jacks they connect to.

Remember that plugging straight into a mic preamp from a microphone requires one, single cable with a male XLR and a female XLR. That's it. If you add a patchbay, you now need two cables, and 4 connectors (which need to work together).

Doing something as simple as making a hardware reverb available for tracking and mixing can lead to needing to run aux sends to a patchbay, the reverb units ins and outs to a patchbay, the digital to analog converters to a patchbay, and the analog to digital converters to a patchbay. They all need connectors. This stuff adds up in a hurry.

So when you make the decision between hardware reverb and impulses, compressor plugins vs compressors, or any other ITB option verse a hardware option, that ITB option is free at least in terms of infrastructure. Remember, the RME Totalmix FX has 4,000 channels! Not a single wire! Impressive. Granted, the RME Totalmix FX has no sound to it, but DAMN is the sound of my Toft ATB32 subtle....I mean so subtle I don't even care.

### **#3 Demand Evidence For Multipreamp Designs**

At one point I had enough invested in my mic preamps that if I sold them I could buy a new Kia. As I've gotten rid of them, I've found that I miss ZERO of them. I hear everything I want to hear in the Rane MS1b, which I consider a high end preamp on everything I've used it on. I consider the whole preamp variety thing to be entertainment for audio engineers. It's along the lines of the life impact of a woman having 49 pairs of shoes. I don't think her life improves that much.

I'm a rocker. I like distortion. I like nastiness. The role of Neve in that is radically overestimated in my view.

I'm not trying to preach about preamps. What I am advocating is looking into streamlining your tools. If you can be 100% happy with 16 of the same preamp for your live room, you avoid that extra patchbay needed to select between X snake for X preamp.

With my current views, that's one less hurdle between myself and the music. That's a good thing! Use your gut.

### **#3 Consider One Power Channel**

I love having tracks as finished as possible. It's hard to beat how clean a Distressor will stay on a highly dynamic lead vocal. Of course, mud needs to be EQ'd out before that. I love the La3a with it's sidechain high frequency boost as a de-esser/high frequency limiter. This power channel speeds things up and makes sure that I can avoid having to process dozens of layers of vocals from scratch ITB.

The magazines often mention having multiple power channels. One for vocals, one for bass, one for electric guitar. Of course, the bass is supposed to be some tube thing with an La2a (although I've heard an 1176 on bass and thought it was awesome.) The vocal chain is supposed to have a fast 1176 thing, etc.

I seem to do pretty well with just one channel. I wouldn't mind having a duplicate for when I have stereo sources to deal with.

Other than that one power channel, I'm 100% content with carving out whatever I need to ITB. It just makes sense in my mind that if I have 16 channels of drums and I don't have 16 surgical equalizers, 16 compressors, 16-multiband compressors, and 16 waveshapers that I'd rather work in the context when I do. That's just me.

I find it very efficient to have the one big dog Power Channel in which I can do lots and lots of digging and the rest being straight from preamp to converter with nothing in between. It's an all or nothing thing I guess. I like that.

If you need a Power Vocal Channel and a Power Electric Guitar channel and these are different chains, I recommend at least considering hard wiring those individual chains.

If you really need an API 3124 > API 550b > Tube Tech CL1b for your guitar chain see if it's possible to hard wire it. Patching in all those different components is just one more thing to mess with. Some guys are going to need to share tools. I get that. Just take a look at committing.

## **Consider One Big Ol' Digital Console**

Yet another way to go with this patchbay avoidance is to get a big ol' console. Forum member, Danny Danzi, posted his setup. He owns a Tascam DM4800. I remember quite a bit of his setup being hard wired. At the time I really wondered why. Now I *know* why.

It's been a while, but I seem to remember that he had the Line 6 bass rackmount gadget and he plugged it straight into the console on one of the later channels. It was set in stone. #17 or whatever was his bass channel. There were no options for routing. There were no analog compression schemes (although I suspect the compressor in the console is quite nice). That was it.

MIX Magazine tells us our rig would be cooler if we had an 8x10 Ampeg with 4 mics on it with each of them through a \$9k signal chain. I've played a good chunk of that game. No one would have a clue on a Danny Danzi recording if he used the Line 6 bass thing or the MIX Magazine setup. You simply wouldn't know because Danzi has got that Line 6 thing dialed in and that's all that matters.

So while Danzi's setup on this one may not be remotely sexy, I suspect it's an absolutely phenomenal way to work.

Speaking of his console, look at this.





I've not read the manual so double check this info. However, I see what appears to be 8 balanced sends and returns. That sure looks like it means we could have our Eventide H3000, Bricasti Reverbs, and up to 8 total channels of fun ol' hardware permanently routed into the console that we could utilize how we wanted with the digital patchbay thing within the console.

The right way for everyone? Probably not. A damn good way too many people are underestimating? I guarantee it! Man, I wish I wouldn't have been chasing "analog magic" in 2010 and instead got a tool like this. Impressive!

I just wanted to point out that with a "digital patchbay" a person can hard wire all their analog crap, and not have to fiddle with all the downsides of hardware patchbays....that is if you really need all the analog stuff anyway.



## ***Huge Tips To Save Time And Money***

### **Create A Checklist**

When I started, I read my console's manual and took a look at the back to make a checklist of both things I knew I needed and also a checklist of things I needed to figure out. It's extremely easy to forget something seemingly trivial in the big picture (like inserts on subgroups) but a simple thing may mean you need to order an extra shipment and delay you several days.

### **Plan, Plan, and Plan**

Before even turning your soldering iron on, MAKE SURE to draw out *everything* you need. Write out a few scenarios so you know your patchbay design is working. What do you do if you decide to add a mic under the snare drum at the last minute? Go through the steps on your patchbay to make sure you've got that figured out. How do you create a parallel compression bus when mixing? You get the idea. Make several possible situations you plan to be in and make sure you can flow through the entire chain to make sure it works.

Please take screenshots of your drawings and post them on the [RecordingReview forum](#). We'll take a look at 'em.

Remember that most items are going to use both sends and returns on the patchbay taking up more than just one point or jack. I've found the best way to keep track of the amount of space used is to draw quick and dirty blocks with both a bottom row and a top row, write down the # of ins/outs used, and then without really thinking about which patchbay should contain each section create a block for every facet you require. In other words, I draw up the rules and just start brain storming. When something doesn't fit, I move it.

Photoshop has been incredibly helpful for designing patchbay systems. After using it for the patchbays in this book, I can't imagine life without it.

Once you have mapped out the patchbay needs, then you need to sort around and figure out exactly how many patchbays you need and where you can place random little extras. It may not be overly intuitive to place Aux Send outputs on the same patchbay as your Preamp Outs, but when you only need a few jacks on the patchbay, it makes quite a bit more sense than buying an additional patchbay for just a few additional inputs.

When everything feels right and you've worked through all the scenarios in your head, then you need to think about connectors. It's highly unfortunate that there

is no excepted standard for this stuff. For example, I mention using the Behringer ADA8000 and ADA8200 in a few of these designs. They offer XLR ins and outs. That's great if you plug a snake straight into them, but not so great with my 16ch live snake. The first eight channels of that live snake go to the TRS patchbay first. I'll need to either convert the snake to TRS for those first eight channels or come up with some adapter cables. It's going to take either money or time either way. Channels 9-16 from the snake are already XLR, avoiding the patchbay, and will plug straight into the #2 Behringer ADA8000. No problem.

This kind of stuff is everywhere. You will drive yourself bonkers with certain hardware using TRS, certain hardware using XLR, etc. It's horrifying. Plan for it!

## **Order A Bit Too Much**

Unless you know that this is THE rig and your setup isn't going to grow, it's safe to say that you are going to expand. Plan for it. The worst thing on Earth is being just 3 1/4" TRS jacks short of finishing your setup. Obtaining these kinds of things locally can be a nightmare. A person is much better off ordering them in bulk and having a few extra. At \$1.30 a pop, it's well worth the \$13 just to have the extra jacks on hand when you need them.

Be reasonable about this, but especially if you are a DIY type guy don't be shy about ordering a few extra components.

## **Designation Strips**

I'm not sure who these sick jerks are, but I'm positive they once worked for the IRS or at least have a history of pedophilia. Apparently, someone thought it would be a good idea to call their product a "designation strip" instead of calling it, what we refer to in the English language, as a label.

So in the event that you buy a Switcraft patchbay and you can't find the freaking clear plastic label holders, you may want to search under the scumbag term "designation strip".

## ***Evolving Your Patchbay***

There's a lot of guessing when it comes to how you'll use your patchbay. Some things will annoy you. Some things will be horrifying. Some things will rock. It's in your best interest to correct any flaws in workflow from time to time. I like to keep a Google Docs file for this. When something ticks me off, I make a note of it.



## **From Snakes**

### **Live Room**

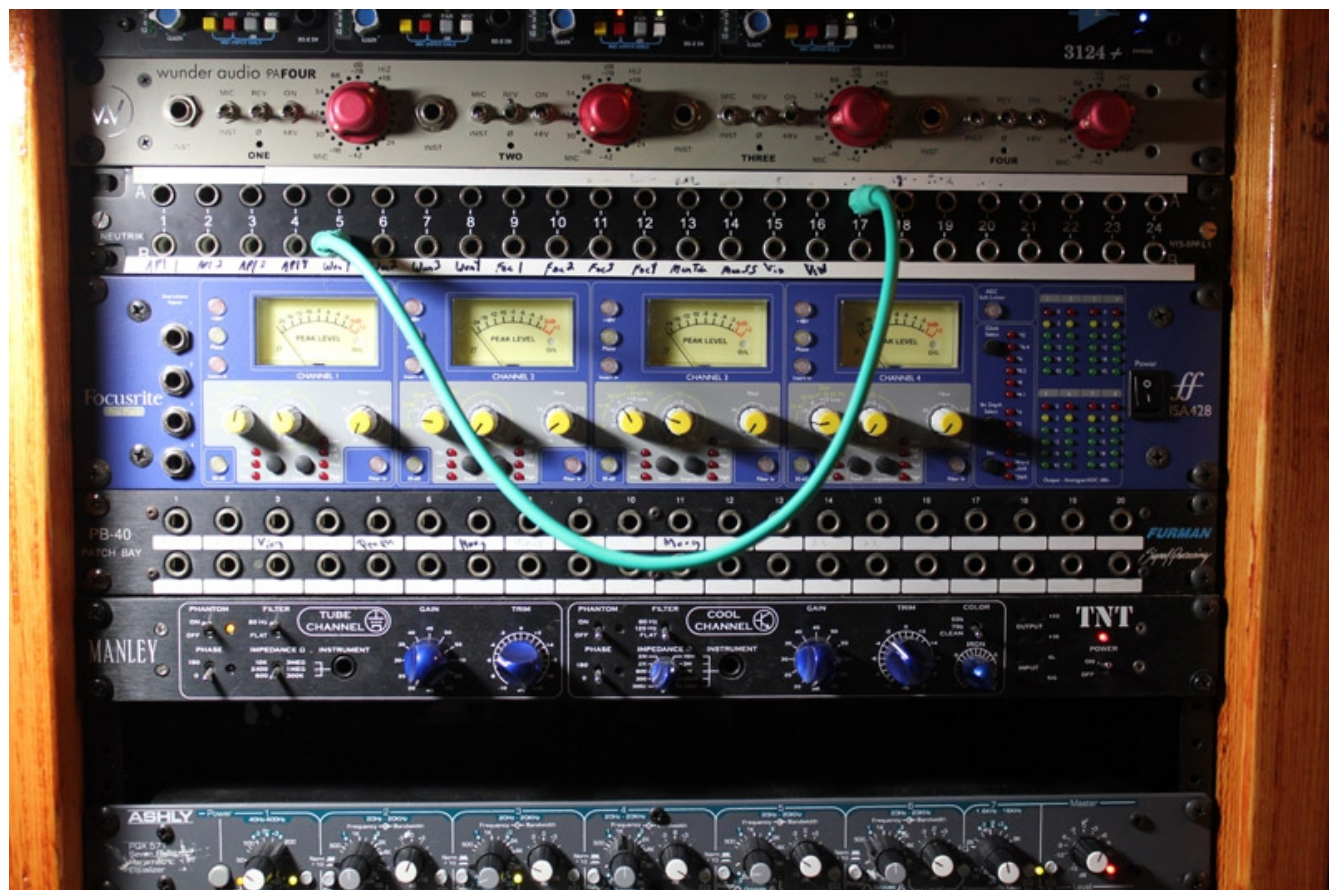
I have a standard live sound 16-channel snake I keep out in the live room that I've shortened by 50'. I kept an old TRS-style 48-point patchbay specifically for this. My live room snake comes to the top 1-16 on the patchbay (FROM Live Room).

FROM Live Room (1-16) are normalled to my external preamps. I've considered normalling these to console inputs, but have never needed it. I have my API 3124 on 1-4, Wunder PaFour on 5-8, Focusrite ISA 428 on 9-12, Manley TNT on 13-14, and Vintech 1272 on 15-16. FROM Control Room (17-24) are normalled to nothing.

### **From Control Room Snake**



TOP ROW 17-24 on the patchbay are FROM my 8ch control room snake. I like to track in the control quite a bit.

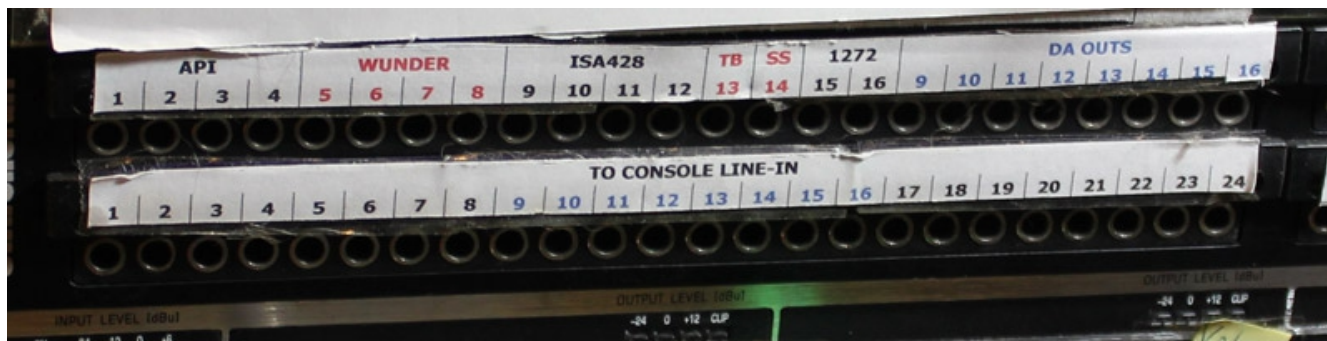


If I want to use the Wunder PaFour on a vocal I'm recording in the control room, I'll just plug the mic into the first channel of my rack mount snake thing and use a single TRS cable to patch #17 (FROM control room snake channel #1) on the top row TO #5 (Wunder PaFour's first channel) on the bottom row. (Pictured above.)

Some say you don't want a patchbay between your microphone and the preamp. This is good advice if you have 500 ft of cable in between the two. I don't. I hear and measure no discernible difference with this method and if you require the use of a variety preamps in multiple rooms there is no other way to do it.

This is a situation where I've dedicated an entire patchbay to the idea of using a variety of preamp. This patchbay and the additional 16 cables that it uses wouldn't exist if I hard wired the snake to the preamps. Some love the kind of choice this setup delivers. Others find excessive freedom to be enslavement.

## From Preamps To Console Line Ins



*Illustration 1: My main TT patchbay. The output FROM my hardware preamps is on the top. The bottom row flows TO the console line-ins.*

In order to take advantage of my ATB32s EQ, routing, monitoring, etc I want to route the preamps to my console line-ins. The output of my external preamps come in on my TT Patchbay #1. Here's a *gorgeous* close up.

### ***Tracking vs Mixing***

If I'm mixing on the console or using it for summing, I need the output of my DA converters to flow to the console channels. If tracking is default I need the mic preamps to normal to the console channels. (I've explained this in Law #10. I should have understood my console features better as there are options on my Toft that could have reduced patchbay usage.)

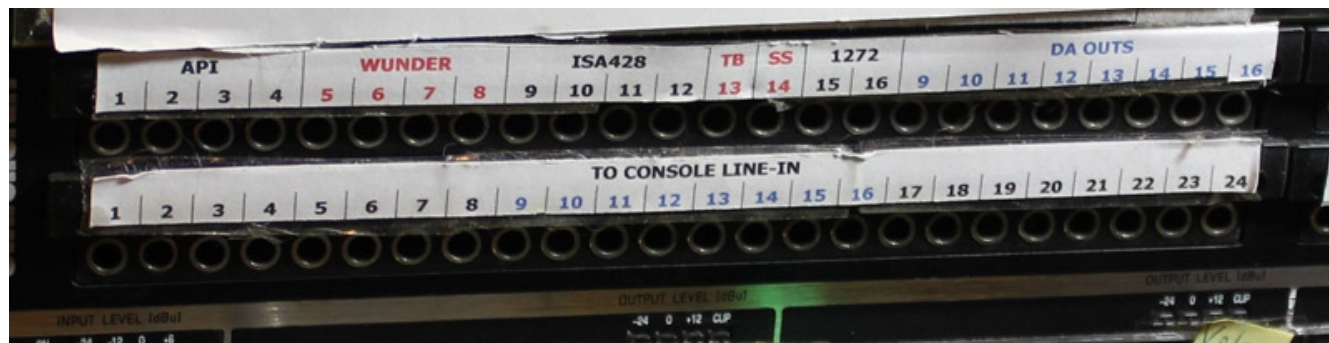
As we've already covered, Law #1 says I should set it up for tracking for my situation. I originally decided that mixing took precedence in this case as I didn't want to be fiddling with basic routing while mixing all the time. This was a major mistake that I've corrected here. I learned Law #1 the hard way.

Now my preamps are normalled to a specific channel. I know the first channel of my Vintech 1272 is going to be on #15. I know the first channel of the Focusrite ISA428 is normalled to channel #9 on the console. Etc.

If channel #15 on the console is acting screwy, I can always use a patch cable on the top row #15 (FROM Vintech 1272 in the illustration above) and patch it TO channel line-in #9 or whatever on the console. I rarely have a need for this and that's exactly why the normals are so useful.



## The Digital To Analog Outs

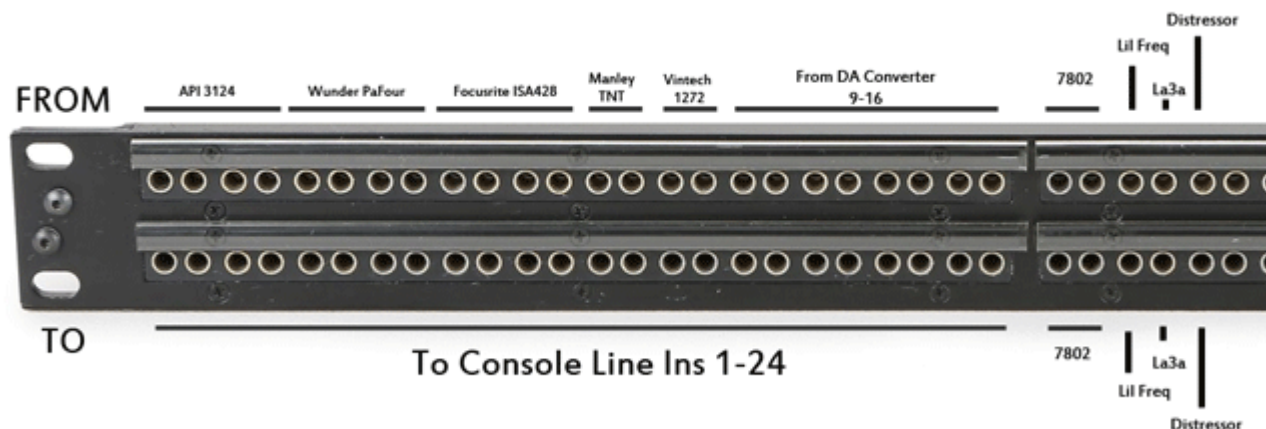


Take a look at Illustration above. In the top right you'll see DA outs. These are the outputs from my Apogee DA-16x digital-to-analog converter. I use the last two channels of the Apogee to monitor the stereo out signal from Cubase.

You can see eight of these channels are normalled to console line-ins channels 17-24. This may seem like an odd choice, but it turns out that channels 23-24 on my console are closest to the master volume fader and it made sense to make those the stereo monitoring channels. This allows channels 17-22 on the console to be useful if I need any misc audio outs from Cubase. This could range from anything to a band needing separate click track levels in their headphones, to me bypassing the console and using these for External Effects sends, to creating a custom mix in the RME Ultramix DSP mixer thing.



## Analog Hardware



I had the following analog hardware:

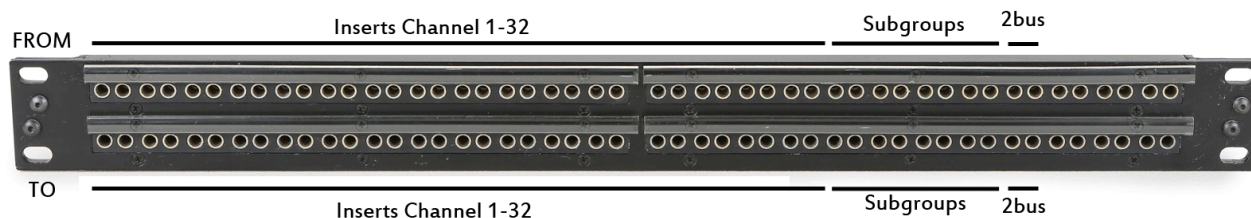
- Distressor
- La3a
- Emperical Labs Lil Freq
- Chameleon Labs 7802 stereo compressor

I tossed those on the right side of the patchbay that contains FROM my preamps TO my Console Line Ins.

To complicate things even further, I have two 18-space racks: One on each side of the console. I decided on overkill once again and reserved enough snake for 8 channels of hardware on the right rack and 8 channels on the left rack. The space between them required that Rack L utilize a 10-foot snake while Rack R (where the patchbays are located) would be content with 2-foot snakes. This is where the finalizing thing gets tricky. I have to think a year or ten ahead. Because the length of the snake, that rack can never move!

*Note: I was way off on my 10-year plan. Hitler was closer with his 1,000 year Reich dreams. (He made it 12.) My setup is entirely different nowadays. I imagine most people will have trouble predicting their 10-year plans.*

## Console Inserts



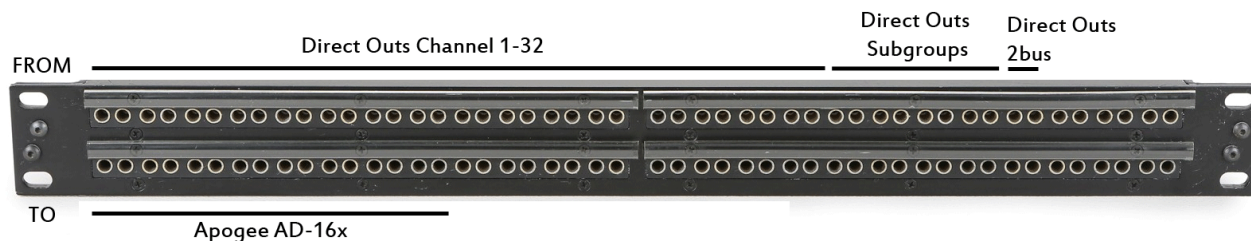
Each channel, subgroup, and 2bus has an insert option on the ATB32. For those of you counting along at home, that equates to 42 inserts. That chews up all but 6 rows on a TT patchbay.

Also keep in mind that if you don't plug a jack into an insert on the console, no signal flows through that insert. If you place a jack in, it flows through the snake, to the patchbay, from the patchbay, and back to the mixer. Is 20' of extra cable in the path not doing anything going to hurt you? I don't know. Probably not. However, you can see why people who have elaborate patchbays may actually need fancy pants cable. The cable runs end up being fairly shocking compared to us guys who are used to just plugging straight into a preamp and interface.

## Update

*For what it's worth, I ditched the console inserts entirely later on. Why? Easy. When tracking, let's say I'm using the Manley TNT tube. I go ahead and run straight from the Manley TNT to my Distressor before hitting the console. I don't route the Manley to the console and then to the Distressor so I avoid the inserts. This would be a problem, though, if I used the console preamps.*

## Console Direct Outs

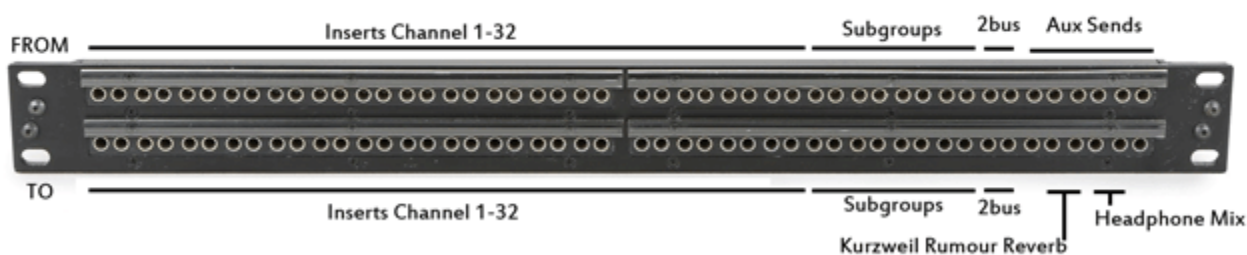


This is another design issue I debated. The console has 32 Direct Outs, 8 Subgroup Outs, and 2 outputs for the 2-bus. These outputs are great for feeding

my AD converters/interface. The only problem is I don't have 42 inputs of AD conversion. I can't imagine ever *wanting* to make an album where I record 42 tracks simultaneously anyway. At the moment I only have one Apogee AD-16x converter with 16 inputs.

One benefit to this setup is if I decided I needed 8 or 16 additional inputs some day, I could order the converter and connect a db25 cable for each bank of 8 channels and I'd be rocking. It really would be that simple. (Ignoring issues with power, word clock, input level calibration, etc.)

## Headphones and Reverb



I went FROM the 6 Aux Sends on the Toft to the patchbay in the top right here. I had #1 normalled to nothing. I used 2/3 for the Reverb sends. (Reverb really doesn't need a stereo send. This was a mistake.) I used 4/5 for the headphone mix. Yes, the one single headphone mix available in a studio with all this crap in it.

### To Effects

I had a Lexicon PCM90, Eventide H3000, and I wanted to use the Kurzweil Rumour in mixing, too.

## Subgroup Recording

One benefit of the console that I was excited about was the ability to blend multiple signals and record them to a single track. Maybe I want to record a Fender Twin and a Recto together. Now I can blend them via the faders, route them to a subgroup, and then just record the subgroup. The fun of that has worn off considerably particularly with folder tracks in Cubase getting good. Another fun one would be to send all the drum close mics to a compressor on a bus and record that to a track on the way in addition to the "clean" tracks. That I've done with varying degrees of success. Both of these require recording the outputs of a subgroup.

So basically, because I wanted to actually use my stupid console some, I need at least 42 of those direct outs wired to a patchbay. That kills the entire top of a TT patchbay with only 6 channels left to spare. I probably could have just done the

first 16 channels and the 8 subgroups and gotten away with it.

I have the direct outs of my console channels (FROM 1-16) normalled TO my Apogee AD-16x analog to digital converter. It was no big deal to route the outputs of the 2bus, subgroups, etc to the AD if necessary as well.

At one point I had it setup for where subgroup direct outs were normalled to the Apogee converters, but due to Law #1 I changed it. It worked pretty well for overdubbing. I had Subgroup #1 Direct Out normalled to the Apogee DA-16x ch#1 IN. In Cubase, my main mono track was taking its input from that Apogee DA-16x ch#1. So if I wanted any channel routed directly to the Cubase track, all I had to do was make sure it was routed to Subgroup #1. Pretty cool. Now, I patch that in and use it when overdubbing because it is handy. It's just due to Law #1, I don't want to have to fiddle with subgroups when recording a live band.

## **Effects Returns**

I could always run the reverb returns back to a channel console line-in and that would work just fine. In fact, that's usually how I'd want to do it. However, the ATB32 had 16 (8 stereo) effects returns that have some cool routing features built in and I want to try using them. (Yes, TRY using them....I may just prefer the line-ins). Anyhow, that ended up requiring yet another freakin' patchbay.

Fast Forward: I ditched this recently. No need for what I do.

## **Misc**

After all this big stuff was taken care of, I looked around and found gaps where I there were smaller issues. For example, I only needed 6 Aux Sends coming FROM the console so I tossed them on the top row wherever I had 6 free channels (remember my console has 42 direct outs and  $42+6=48$ ) so this worked out perfectly with my 48-row TT patchbays. There are probably others I'm missing, but this is meant to be more of a commentary than a schematic.

## **Conclusion**

When I look back on all of this now, I don't feel that any of this monstrosity of complexity helped me. Would any of this had been any better than an excellent audio interface preamp routed straight to the converter like an RME Fireface? In most cases I'd say what I've outlined here offered zero benefits either sonically, workflow, or otherwise. Maybe I'm jaded.

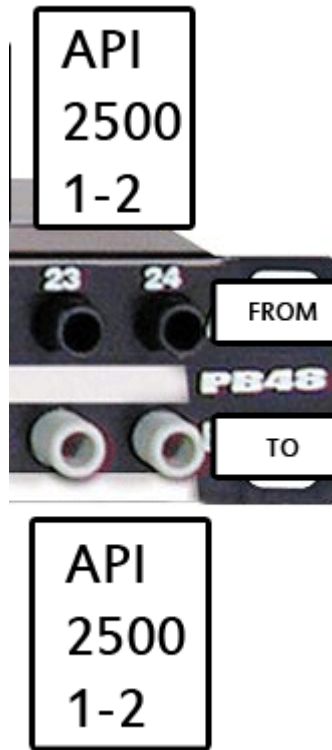
I view all of my experiments with analog as trying to be cute. I was trying out the real studio thing...the 1970s way of recording. I mean no offense to anyone

using these more complex studio schemes, but when I look back now I consider it a complete waste of time other than finding out what not to do.

## **Expandability**

If we wanted to add hardware, we could do so with no problem. Let's toss in an API 2500 compressor for the two buss. We don't have enough I/O to have it normalled to both inputs and outputs. The normals need to be ready for big tracking days. So we'll have to patch it in. No big deal.

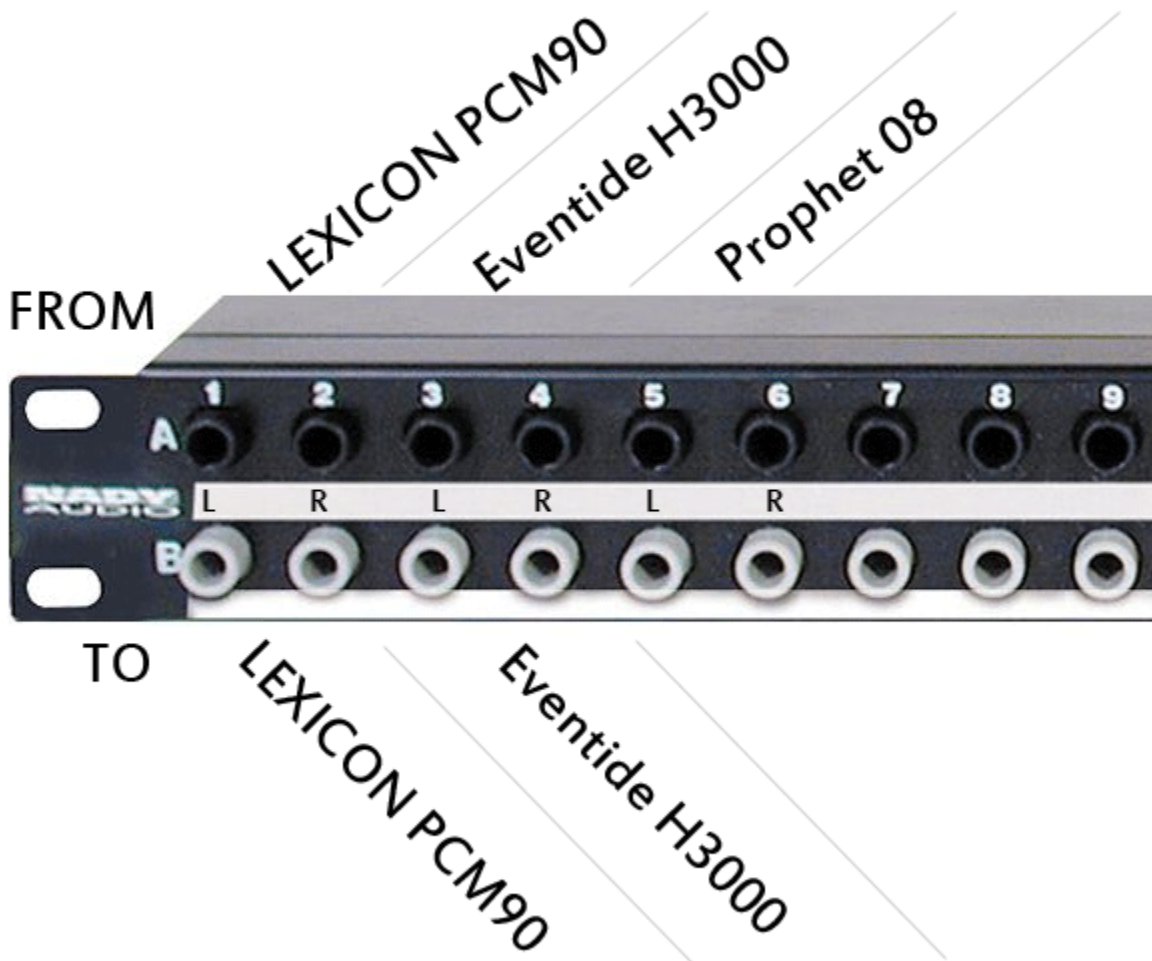




***Don't Be A Sissy, Brandon***

Alright, so let's have more fun here. Let's say I have an API 2500, a Lexicon PCM90, an Eventide H3000, and DSI Prophet 08 synth. What would we do?

We'd need another TRS patchbay.



FROM Lexicon PCM90 Outs – Patchbay Top Row 1-2  
TO Lexicon PCM90 Inputs – Patchbay Bottom Row 1-2

FROM Eventide H3000 Outs – Patchbay Top Row 3-4  
TO Eventide H3000 Inputs – Patchbay Bottom Row 3-4

FROM DSI Prophet 08 Outs – Patchbay Top Row 5-6

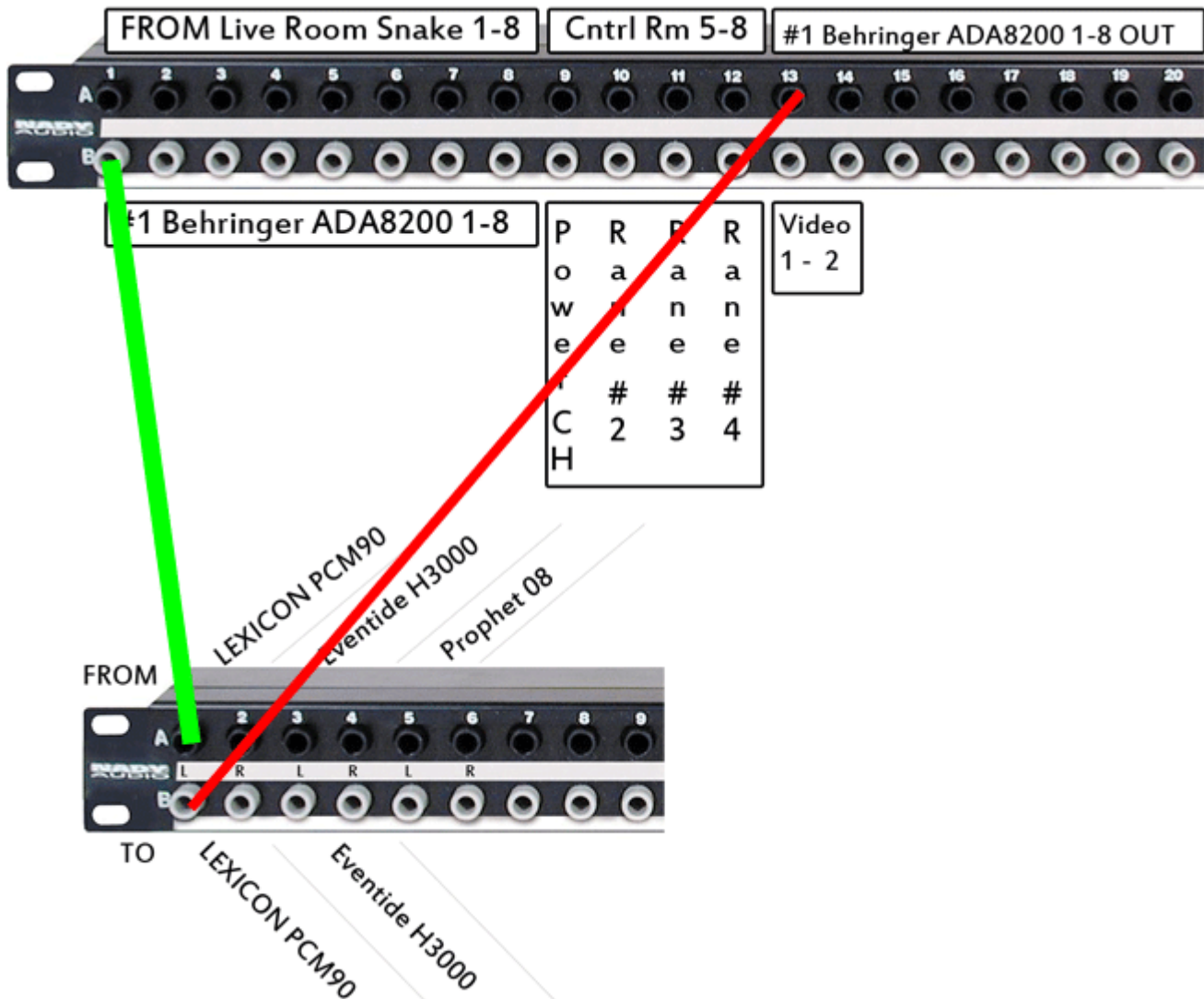
The good news is all of these tools are awesome. The bad news is we'll have to patch 'em in if we want to use them. If your DAW is smarter than Cubase 6 has been and can actually remember your External Effects routing, this may not be too bad.

If you've got the cash to blow and have enough ADAT inputs on your interface, I'd



consider dedicating an 8ch AD/DA converter to your effects. You could hard wire those and just use them digitally when you needed to. That would save some time if you are interested.

## What To Patch?



In the middle of The Big Picture patchbay image on the Top Row you'll see FROM #1 Behringer ADA82000 1-8 out. We've got 1-2 normalled to our video computer, but could bust it any time at our convenience (red). We still have ADAT out 3-8 which are on patchbay channels 15-20. That's six outputs and will feed our effects nicely.

You'll see the Behringer #1 inputs on the bottom left. These aren't being used unless tracking is going on in the live room. This is where the outputs FROM your hardware will go (green). It would make the most sense to use 1-2 for the

Lexicon, 3-4 for the Eventide, etc following Law #7 (Keep All Numbers Consistent).

## **Conclusion**

Wow! When I ditched my console and go with the RME UFX, I can do everything I do now in the digital domain and I only need 1 TRS patchbay. Dudes/chicks, I have well over \$2k and 300 hours invested in my patchbay system. This would be more reliable, dramatically less expensive, use up a much smaller footprint, be less stressful to use, be less stressful to troubleshooting, and the damn thing would even be portable again.

## **Downsides:**

1. Won't look as cool for clients
2. I don't ever use the Toft equalizers. They are so wide they are tone controls, I guess. Some people would miss that. I'm 100% content with digital EQ like Voxengo Gliss EQ.
3. Headphone mixes may need to be addressed with the mouse instead of with faders.
4. That's all I can think of.
5. I'll have to patch in the video computer's mix for doing videos. That'll take 3 seconds.

I won't tell you what is right for you. However, I hope this is an illustration of what is possible if a person is willing to think inside the box. SMILEY

## **Notes**

- I've had outstanding luck with my RME HDSP9652, a PCI card that accepts 3 ADAT I/O. Since I like RME, I want to try a design with the RME UFX here for our thought experiment. It's Totalmix FX could entirely replace my Toft ATB32 it seems.
- My Behringer ADA8000s in my mobile setup have been excellent. I've got some formal shootouts planned for them to see how they do with my Apogee converters. After this [Ethan Winer experiment](#), things are looking up for the ADA8000. I figure the upgrades in the ADA8200 will make it

- suitable for my tastes, but I'm only speculating.
- I've had a Behringer headphone amp since 2001 and the thing has been flawless. It's probably been used 20,000 hours or more.

So let's patch it up! Take your time with these and focus on what I've written. Follow along and mentally place the patchbay together.

## Thinking Out Loud

In this portion I'm just gonna brainstorm solutions to this mess. I'm putting this here so you can get a feel for my thought process.

### **Live Room Inputs**

>>From 1-8 Live Room Snake To Patchbay / From patchbay to First Behringer ADA8200

I originally went straight to the first Behringer ADA8200 directly to avoid the patchbay (Law #3 – Murphy Crashed Our Party), but I remembered I needed access to the live snake for using the Power Channel during overdubs in the live room.

The other reason for this was I knew I wanted 8 misc outputs that were patched up for things like reamp boxes and any curve balls that may come my way. I decided it used the least amount of RAM (Law #5) to the first Behringer ADA8200 on the patchbay both for the inputs and the outputs.

From 9-16 Live Room Snake Directly To Second Behringer ADA8200. No patchbay needed.

*At the moment, we have our 16 channels from the live room working. The first 8 flow to the patchbay and are normalled to the converter. The second 8 go straight to the converter for simplicity.*

### **Control Room Inputs**

From 1-4 Control Room/Vocal Booth Snake Hard Wired To 1-4 Preamp Inputs on RME UFX 1-4. No patchbay needed.

From #5-8 Control Room/Vocal Booth Snake To Patchbay Normalled to #5 Power Channel, #6,7,8 to additional Rane MS1bs each hardwired to Line Inputs 1-4 on RME UFX.

*This is just a hair screwy. I'd prefer the Power Channel be #1, but the RME UFX*

*already has their preamps setup 1-4 and I've decided to stick with this and simply remember that the Power Channel is #5. No biggie.*

*Note: Using the routing matrix in the RME Totalmix Effects I could actually put those UFX preamps (1-4) on inputs 5-8 and the Rane preamps on 1-4. For now I'm going to avoid that, but you never know what real world usage will dictate. It's often tough to find real world examples of why the routing matrix is so awesome. This is one of those cases, at least if you REALLY needed to move those inputs around.*

## Updates

- As you can see here we are leaning heavily on the RME's Totalmix FX mixer. There's no great way to get around the need for mixer functionality in a zero-latency environment be it analog or digital. It would be nice if DAWs were zero-latency, but they can't be without hardware. The DSP-based mixer will be used for all our routing, headphone mixes, and headphone effects.
- The lack of faders you can reach with your hand that make no "click" sound from the mouse could be an issue when tracking quiet sources in the control room. I'm looking for a [clickless mouse](#). We'll see.
- I chose the RME UFX specifically because I knew it had advanced DSP mixer functionality. We could do most of the same things with a little Mackie mixer (and we will). For some reasons our brains have little problem buying a \$400 mixer, but struggle with replacing that \$400 mixer entirely with an audio interface that may smoke it on every level we can think of.
- My agenda for this thought experiment was to see how far I could avoid the patchbay thing. It doesn't mean it's the least expensive. The use of the RME ARC remote control should avoid most of the workflow problems associated with using a DSP mixer, but I'm only speculating. I've never touched it. This UFX has two independent headphone amps, but I'm skipping those here as I want the ability for 8 headphone amps leaving the stock UFX headphone outs there just in case.

## Outputs

FROM RME UFX 1-2 Out TO Focal Monitors - No patchbay  
FROM RME UFX 3-4 Out TO NS-10 Monitors - No patchbay  
FROM RME UFX 5-6 Out TO Headphone Amp #1 - No patchbay  
FROM RME UFX 7-8 Out TO Headphone Amp #2 - No patchbay

FROM Behringer ADA8200 1-8 OUT to Patchbay MISC Patchbay – No Normals

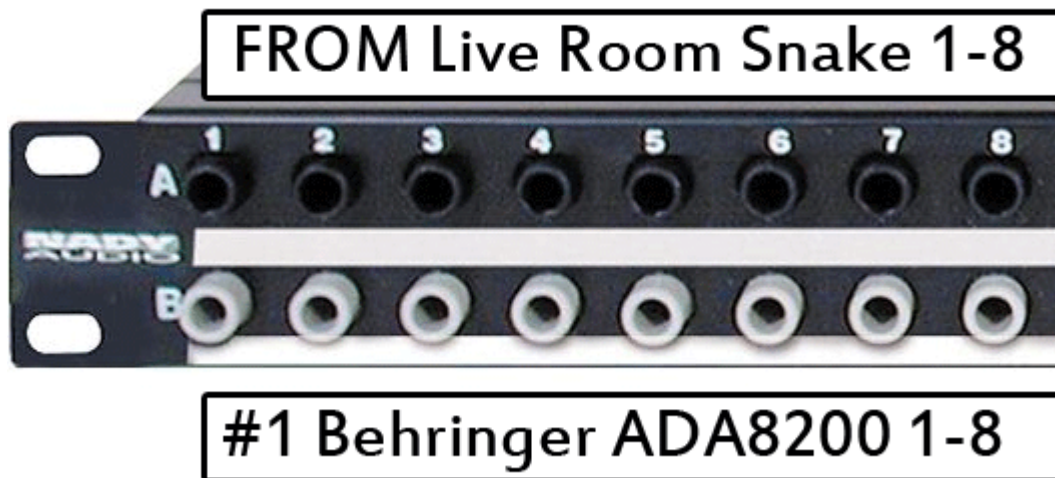
FROM Patchbay To Video Computer

FROM Video Computer to monitors

When we are working on videos, we run the audio output from the video computer to the analog console now. We should be able to maintain similar functionality with the Multimix FX software by running that audio to Line Inputs 5-6 on RME UFX.

## The Patchbay Design

Alright, so I'm condensing my design notes down. Let's see what we need for our patchbays.



>> From 1-8 Live Room Snake To Patchbay TOP 1-8

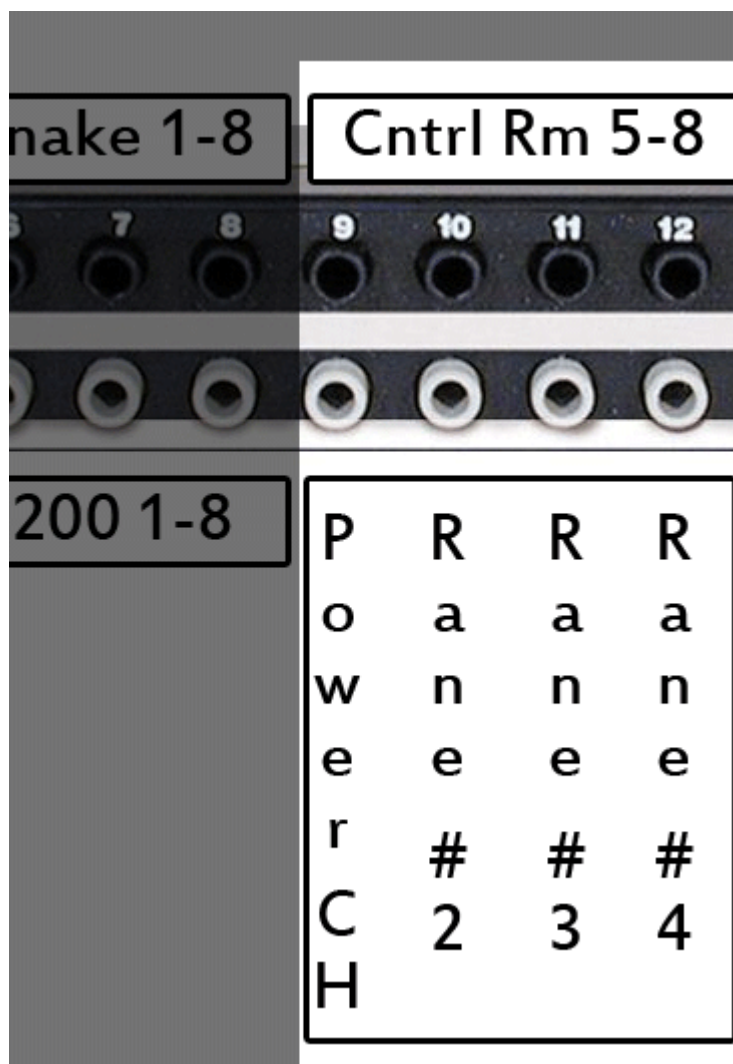
Normalled to...

>> First Behringer ADA8200 XLR inputs (8 TRS- XLR male cables) Patchbay  
BOTTOM 1-8



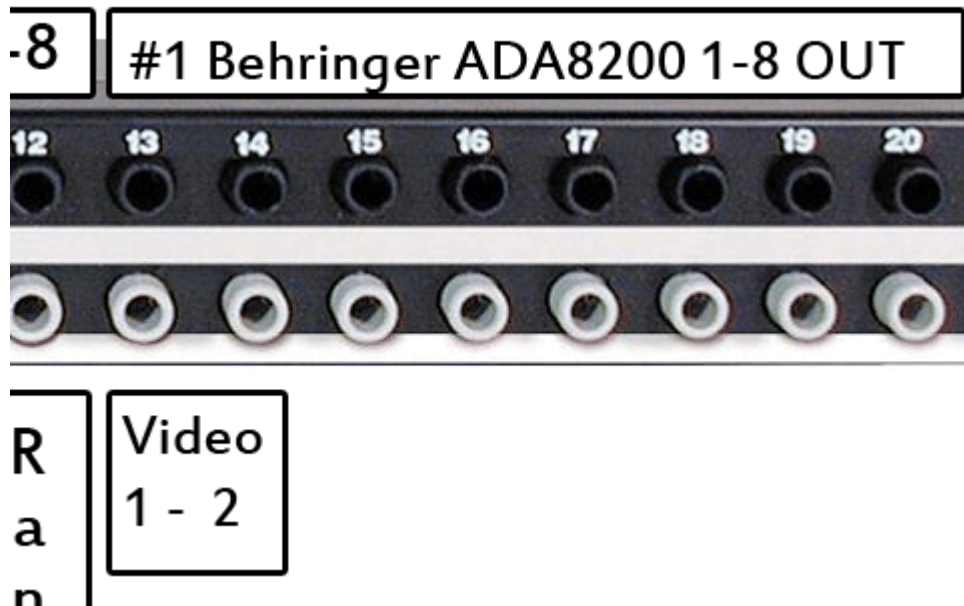






>>From #5-8 Control Room/Vocal Booth Snake To Patchbay TOP 9-12  
Normalled to...

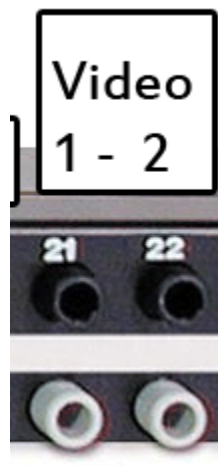
>>#5 Power Channel, #6,7,8 to additional Rane MS1bs each hardwired to Line  
Inputs 1-4 on RME UFX.



>>FROM Behringer ADA8200 1-8 OUT to Patchbay TOP 13-20 MISC Patchbay Normalled to...

>>TO Video Computer Input 1-2 on Patchbay BOTTOM 13-14

15-20 On the bottom stay empty for now. This gives us flexibility in the future.



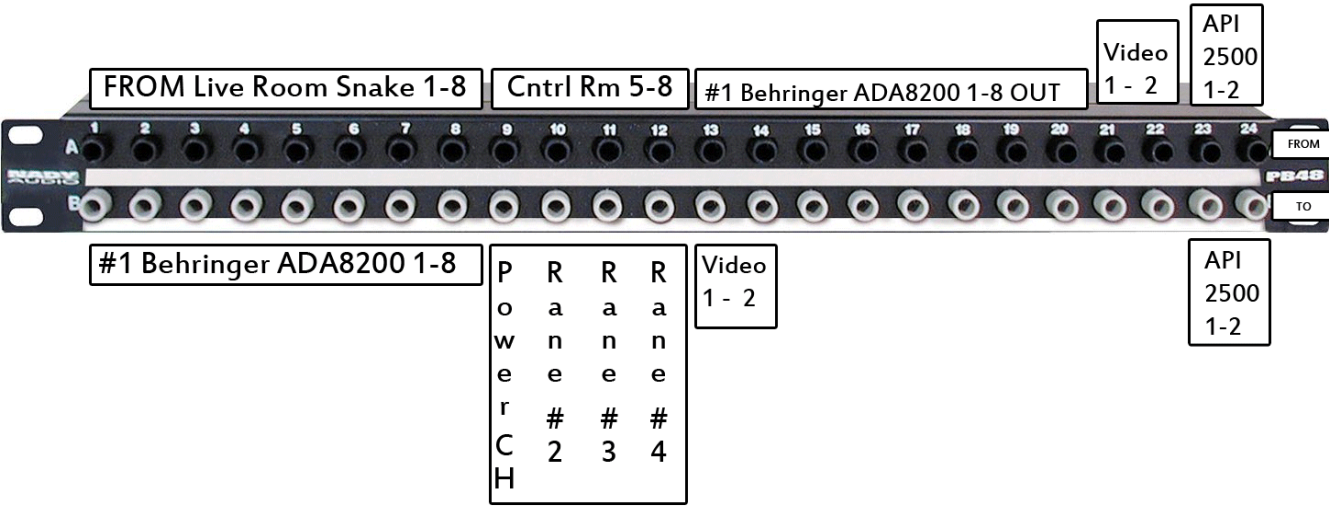
>>FROM Video Computer to Patchbay TOP 21-22 Normalled to...

>> Nothing

We'll have to patch in the FROM video computer sound. That's unfortunate, but not a big deal. Law #1 is a pain sometimes, but it pays off big time in big

sessions.

The Big Picture



## **My Latest Ideas**

My ideas always evolve, but not only am I happier now with my recording quality than ever, I'm finding ways to spend pennies on the dollar, and I'm doing it in ways that offer the fastest workflow I've ever had.

This is a patchbay book. My views on preamps could be a bit off topic, but from a patchbay design standpoint preamp views, hardware during mixing, and analog summing all required me to make outrageous investments in my patchbay and cabling system and now I've done away with all of those tactics.

I plan to redo my patchbay system so I can condense, simplify, and remove unnecessary clutter in my studio. Here goes.

### ***My Console Pres Are Just Fine***

My Toft ATB32 preamps are excellent. They are already patched to their respective channel. I'll be running my live room 16-channel snake straight to those preamps. No patchbay needed. I would prefer having all Rane MS1b preamps. I wish they made 8 channel units! The ATB32 preamps are no hindrance to my goals in any way.

### ***All Hardware Or None***

I will not be using additional hardware on any of those 16-channels. I'll just record straight to the computer. No hardware. I'm very content with ITB processing. It never made sense to me why I may have 16 mics on drums, but only two compressors. I used to stress out about which hardware to use where. Now I just forgo the whole affair. How's that for simplicity? That sounds like a lot less stress and a lot less that can go wrong.

### ***I'm Thrilled With My Rane MS1b***

I love my little Rane MS1b preamp. It's so close to my Martech MSS-10 in formal shootouts that I can't say I care about the difference between the two. Rane really got this one right. I plan on using it for all overdubs all the time no matter what. It'll be part of my Power Channel. As of this writing, that Power Channel is Rane MS1b > Ashly PQX-571 EQ > Distressor > La3a. I'd love to replace the high end compressors with something equally capable eventually. I'm not sure the Distressor can be replaced. The La3a probably can without much struggle.

## ***Full Accessibility***

That power channel must be accessible from either the control room, vocal booth, or live room.

## ***Why Use The Power Channel?***

Other than that Power Channel, I have no need for any hardware during tracking. So why even using the Power Channel if I'm that content with simply tracking a preamp into a converter on some many tracks? Easy, when I'm doing vocals I can usually get close to what I want on the way in. While I still need to do tests to formalize this, it sure seems that the Distressor on the way in is the cleanest way to get vocals compressed that I have access to. If nothing else, having the vocals about right on the way in saves me tremendous work during mixing. Last night, for example, we did the gang vocal thing and recorded 16 layers of some yelling. All 16 layers are pretty much right with only minimal bus processing required. Without that processing on vocals, it could take forever to mix all the lead vocals, doubles, triples, ad lib, harmonies, etc. The other major benefit is vocals in headphone mixes benefit tremendously from getting the vocals compressed and EQ'd about right.

## ***I Hate Mixing With Hardware***

I hate mixing with hardware. Individual hardware pieces usually are more unique in character than plugins. However, they are a pain in the butt to hook up. Cubase forgets my stupid External FX way too often.

I often open mixes from 3-6 months ago. Bands run out of money, play a few gigs, and then come back. Trying to recall a sound is a brutal waste of time and I'm a guy who has no time for such things. I'm just too busy.

The Eventide H3000 was an incredible piece of gear. I loved it from the very first second I heard it. While it does way more than Microshift, that's what I was using it for 99% of the time. With the Soundtoys Microshift, that problem is 100% solved in my opinion.

I'm using impulses of my Lexicon PCM90. No one could tell them apart in double blind tests including myself. The impulses of the PCM90 are awesome and free. Analog summing does nothing through the Toft ATB32 that I would pay for. It takes about an hour to perfectly calibrate the console for the summing. Otherwise the mix changes every freakin' time. I realize this is a topic of controversy. Anyone on the fence, do not trust my opinions. We don't need to

resort to opinion and feelings. Instead, ask any advocate of analog summing of before and after clips. I've yet to hear one that did anything for me. YMMV.

### ***No Hardware, No Problem***

Since I will be using no hardware during mixing, I can radically simplify my setup. That means I have a Power Channel that is all hard wired and I have no other hardware processors in my studio. Period. This is what I want. Just imagining a studio where I'm not bogged down by the complexities, unreliability, and headaches of a mess of a system seems like a breath of fresh air to me.

Few people in the patchbay design phase are going to look at a patchbay-based system as a headache. It's like the scene in Band Of Brothers where the main guys are going into Bostogne while the guys coming out look like they've been through WW2. (Pun intended.) Be careful.

### ***The Toft ATB32 Does No Damage***

They've done a great job keeping the Toft ATB32 transparent enough to do no damage. That was quite an achievement 20 years ago at this price point. You see, in the old days gear ruined audio. A few toys screwed up the audio, but we decided we liked that. Those are classic now and cost a zillion dollars. Getting a console that doesn't ruin audio is a big damn deal. Great job, Toft! The only problem is bypassing a console doesn't ruin audio, either.....

### ***Make The Toft ATB32 Unnecessary?***

I'm still working out the preamp thing exactly. It would be ideal if I could just use 8ch ADAT preamps and run those straight to my RME HDSP9652. The RME has a handy DSP routing matrix and mixer thingy. Using that to send to a little mixer for headphone mixes would mean my Toft is unnecessary. I don't think I'd miss it for anything. I'm an ITB guy. Of course, I'd have to get it fixed before I could sell it and that may be a nightmare. Hmmm. The struggle continues.

### ***Conclusion***

What's funny here is what I've outlined could be done with any audio interface with high end preamps. (Yes, I believe high end interface preamps are possible in theory, but can't confirm it just yet.)

From a patchbay standpoint, what do I need? Let's get to it.

1. The ability to record 8 mics/line-level thingies from the control room / vocal

- booth. One of those could be my Power Channel.
2. The ability to record 16 mics from the live room. I need the option for the Power Channel.
  3. I need reverb for vocal headphone mixes immediately accessible.
  4. I need stereo out from my DAW with switching between my pretty monitors (currently Focal), my ugly monitors (currently NS-10m's), and headphones.
  5. When doing video tutorials, I need the ability to mix the DAW output with my voiceover, hear that real time, and send it via analog signal to my video computer.
  6. I need an output for guitar reamping.
  7. I need the ability to create 4 different headphone mixes which I can hear myself. (I HATE asking a drummer if he can hear the bass. I want to hear HIS mix so I can get what he needs.)

I'm thinking out loud while I write this. My needs are relatively humble. It's amazing what a slippery slope it was going with the "1970s Way Of Recording". I'm glad I did it just to know that I don't like it. It's okay to like it. It's okay to not want any part of it.

This REALLY shows the outrageous amount of waste in my current setup. A tremendous amount of this can be done digitally. By ditching features like console inserts and direct outs for every channel that I never used anyway (following Law #6), I could have avoided so much waste.

## **Ready Build 001: Using A Hardware Compressor With Your Stock Interface**

You've just picked up a Distressor or some other cool hardware compressor. You want to add it to your stock audio interface.

First off, STOP!! If your audio interface doesn't have inserts (a way to access the signal post-preamp, but before the converter) you pretty much can't use the hardware compressor during tracking in any reasonable way other than using an external preamp.

If you only plan on using the hardware compressor during mixing you won't need the inserts. You will need at least a 3ch in, 3ch out audio interface. (The 2 outputs are used by the stereo outs in your recording software and flow to your studio monitors or headphones so you can hear. No, I don't recommend recording without hearing what you are doing.)



## ***The Easy Way***

The simplest, easiest way is always to hard wire with none of the choice that patchbays provide. Let's do that first.

You create an External Effect in your DAW. That External Effect will send signal out #3 OUT > Distressor > #3 In. The loop is completed. You did it with two cables. Not bad.

## ***In Comes The Need For Choice***

Let's say you like your Distressor and want to use it during tracking, too. You can do it. When we need the choice of how to hook something up, in comes the patchbay. Just keep in mind we now have more than double the cables and the patchbay itself.

Let's go with a TRS patchbay because they are cheaper, easier to hook up, easier to change our minds, and you may already have the patch cables on hand.

The easiest way is to design (not necessarily to use) is to only put those nodes or choices on the patchbay and nothing else. (This won't be possible with a complex setup so enjoy it.)







FROM Out #3

TO In #3

FROM Distressor

TO Distressor

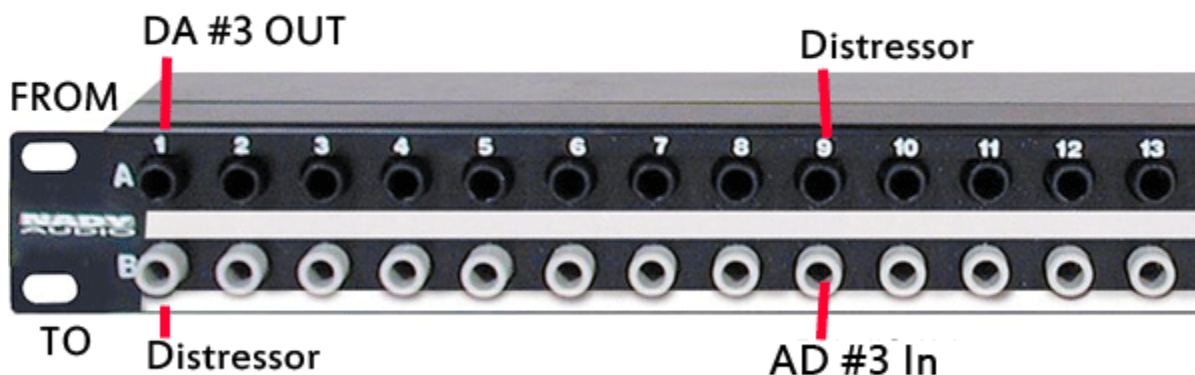
Here's one way. (Not a very good way.)

To use it we'd, do this:



Yup, those are the world's straightest patch cables. We go FROM the DA #3 Out and TO the Distressor. We then go FROM the Distressor TO the DA#3 in. Pretty simple, but not that efficient.

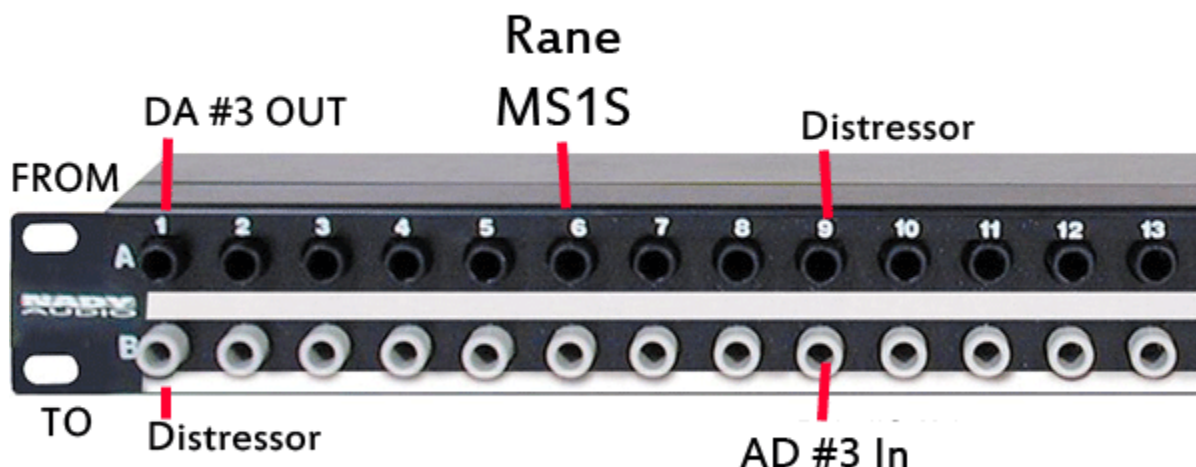
We could also do this.



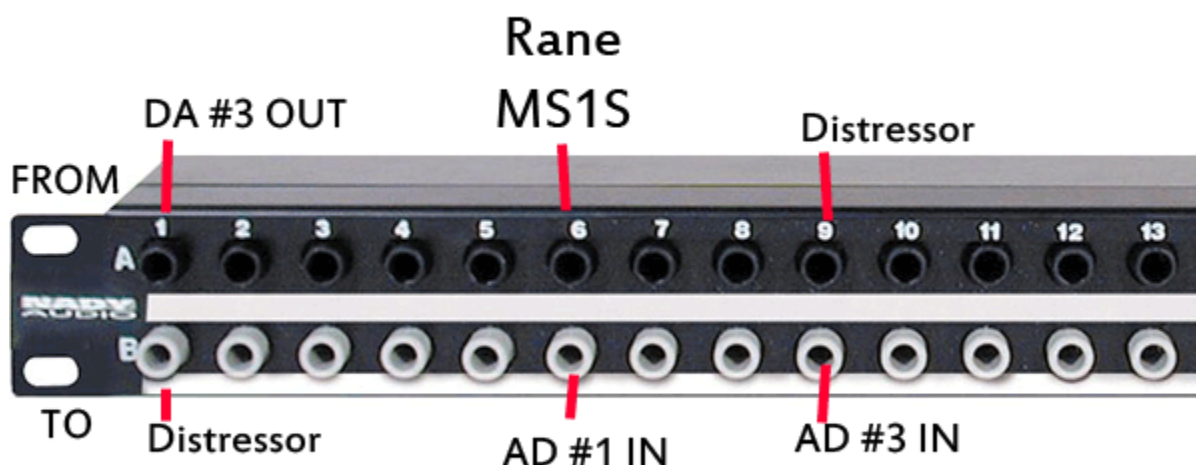
I'm using the built in normals on the patchbay. No patch cable are needed. The signal flows FROM DA#3 >> TO Distressor using the built in normal. Then we go FROM the Distressor >> To DA #3 In. It's automatic. If this was all we needed to do hard wiring would still be smarter, but this is the most efficient way to do it with a patchbay. We'll have to put our boots on soon, though.

There's a problem here. The whole purpose of not hard wiring the Distressor was for choice. So what else are we going to plug that Distressor into? Most audio interfaces don't have inserts and so putting a hardware compressor after them isn't reasonable. Let's buy an external preamp. I'm going with the Rane MS1S. I love the older MS1B and maybe this one is close.

We could just slap the output of the Rane MS1S onto the top row.



There she is. Why Channel #6? Why not? (Don't answer that, yet.) Honestly, I put zero thought into it. This current design will need to be organized very soon, but with only a few elements, it's not so bad. We've got another issue. We need to get from that preamp to the first input on the audio interface (AD #1 In).

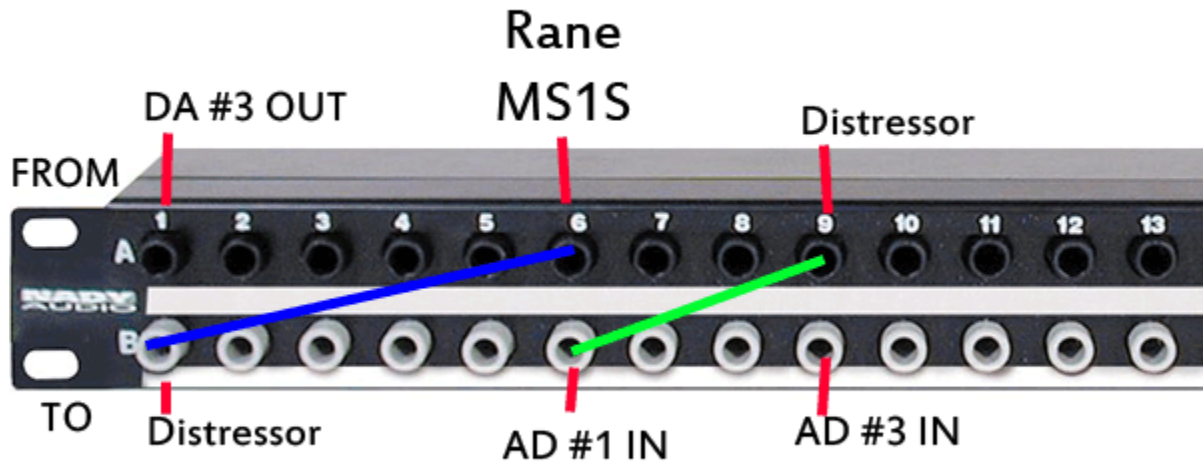


Okay, that problem is solved. What's going on here?

1. The default operation with no patch cables is to use the Distressor for mixing using Out #3 and In #3 on the audio interface. I call them "DA" for digital-to-analog converter, but it's all the same.

2. Currently, the Rane MS1S external preamp is normalled to AD #1, which is the first input on our audio interface.

If we want to use the Distressor in tracking, we do this.... Let's call him The Jimmy Setup.



We toss a cable in Top Row #6 to grab the signal from the Rane MS1S. We shoot that TO the Distressor. FROM the Distressor we patch to AD #1.

*Note: I mentioned previously that if we only wanted to use the Distressor during mixing, we could have hard wired it to DA #3 and AD #3. Two cables. Done. In order to use it for both mixing and tracking we now need six cables. (Not counting two patch cables.)*

We've still got other issues to work out, possibly.

If this is all you need to do, you can stop reading here. Done. Unfortunately, this is a bit ugly. Everything has clearly been tossed on to the patchbay with very little thought for workflow and such. It wouldn't matter much for this current setup as it is very, very simple. However, this could be a nightmare in a hurry if we added just a few more options.

## Things I Hate About This One

1. AD #1 In is randomly placed on Bottom Row #6 which makes no sense.
2. There are two gaps in between AD #1 In and AD #3 In. There should be only one gap and that should be for AD #2.
3. The very first top row jack is DA #3. I don't like that a bit. The first should



always be #1 if we are going to make this thing work under fire.

4. While less of an issue with a simple design, we've broken Law #1. The most pressure is on you while you are tracking. The Rane should be normalled to the Distressor and the Distressor normalled to AD #1.

## Let's Fix It



Now you can see that our digital to analog converters are showing up 1-3 on the patchbay. That's prettier and a lot more logical. The same thing can be said about the analog-to-digital converters 1-3.

You'll notice that AD1-3 starts on #9. Why? The reason for that is some genius once upon a time decided that we'd do audio channels in banks of 8. ADAT converters do the 8 channel thing. Many audio interfaces do the 8 channel thing. Consoles often come in 8-channel, 16-channel, 24-channel, or 32-channel offers. So I've kinda went along with that even though for our purposes here, it probably wasn't all that essential.

## Simplicity In Use vs Simplicity In Infrastructure

This is an ongoing gray area problem in which you will have to figure out where they stand each and every individual time.

I placed DA #1-3 on the top row. Digital to analog converters 1-2 are *always* going to flow to the studio monitors. That's how we hear. It's not an option. We don't need choice there. Now we have to bother using two extra cables to get from the patchbay to our monitors. Even worse, if the patchbay acts screwy, we'll hear that in our monitors. Reliability is compromised somewhat.

## My Approach

What I find is the more complex a setup, the more essential it is to have DA 1-3 in the logical sequence. Imagine a studio with lots of hardware and a console. When I had hundreds of points of choice and they were all labeled strangely, placed where ever, and aren't in predictable locations, I had a massive problem

that slowed workflow to a crawl.

This is good news and bad news. It means a simple design doesn't need to be over thought. Ultimately, The Jimmy Setup is just freakin' fine for that application. It'll work and work well. It's so simple you won't forget what's going on if your labels are remotely legible.

Most people aren't doing to build Ocean Way Studios and will not need 100 hardware pieces patched in. So don't feel bad that I hated the workflow of the Jimmy Setup. It's the least expensive, most reliable way of doing this patchbay thing if the setup is humble enough to not feel complicated.

I imagine the rather simple, quick, n dirty tactics used in The Jimmy Setup are going to be best for most of you who have just a few pieces of hardware, but wouldn't call yourselves "hardware guys" and wouldn't say you have an "analog studio". I say use it. Throw only the essential points of choice on the patchbay and nothing else. Use as few of cables as possible. When your rig grows (and therefor needs to grow up), reorganize it a bit.

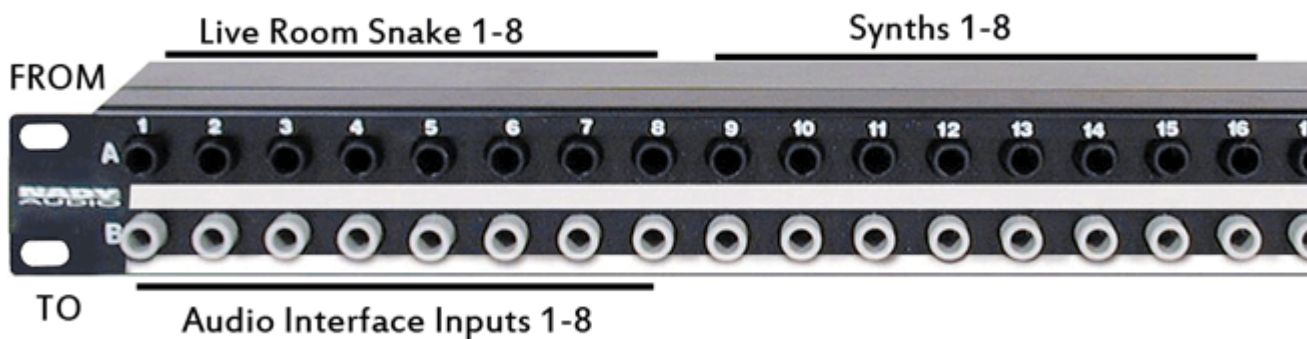
## **Back To The 80/20 Rule**

80% of the work and cost of elaborate patchbay design is making sure the thing is easy to use. It doesn't take a genius to see that my version of the design above is going to use a lot more cables. I don't like that.

From here on out, you'll probably be seeing me do it "The Brandon Way" where the focus is workflow. Simplicity of use is the name of the game for me. Although I hate to make reliability second, if I can't work the patchbay practically mindlessly and quickly with the band tearing the walls down, I have major problems. I'm willing to pay for that in elaborate setups. Simple setups don't need anything that crazy.

## Ready Build 002: Using Hardware Synths

Synths are relatively easy to deal with because we don't have to route signal to them. I'm assuming you have an 8ch audio interface, an 8ch snake in your live room, and 4 stereo synths (8ch). We want the option of recording drums in the live room or the 8 synth channels.



Top Row #1-8 FROM Live Room Snake 1-8

Bottom Row #1-8 To Audio Interface Inputs 1-8

Top Row #9-10 FROM Synth #1

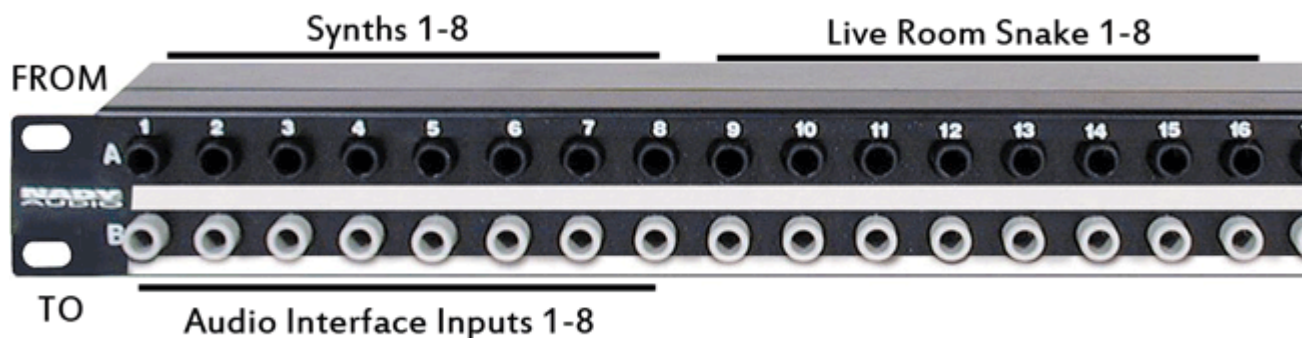
Top Row #11-12 FROM Synth #2

Top Row #13-14 FROM Synth #3

Top Row #15-16 FROM Synth #4

I'm assuming that Synth time is easier than recording real drums. This is why I normalised the snake to the audio interface inputs. If you decide that synth production is crazier, then normalize your synths to the audio interface like this.





Top Row #1-2 FROM Synth #1

Top Row #3-4 FROM Synth #2

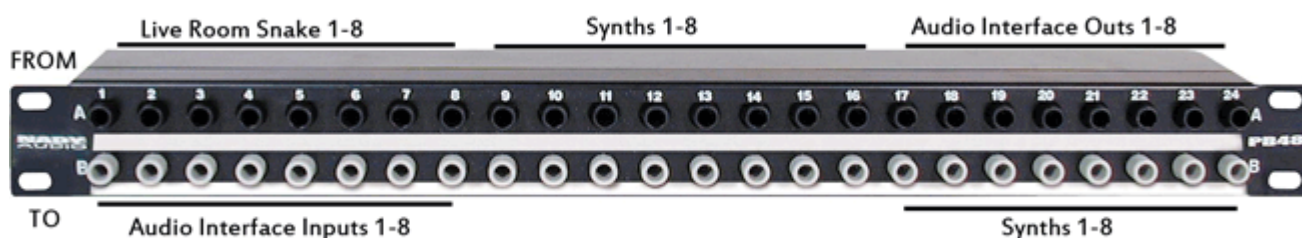
Top Row #5-6 FROM Synth #3

Top Row #7-8 FROM Synth #4

Bottom Row #1-8 To Inputs 1-8 on Audio Interface

Top Row #9-16 FROM Snake 1-8

Some synths do let you wreck audio with effects, vocoders, etc. It's nice to have those options when you are feeling creative. In that case, all we have to do is add 8 outputs from the audio interface and stereo sends to the 4 synths.



Top Row #17-24 FROM Audio Interface Ch#1-8

Bottom Row #17-18 To Synth #1 Left and Right Inputs

Bottom Row #19-20 To Synth #2 Left and Right Inputs

Bottom Row #21-22 To Synth #3 Left and Right Inputs

Bottom Row #23-24 To Synth #4 Left and Right Inputs

Guess what! We've just chewed through an entire 48-point TRS patchbay so we could use 4 synths. I told you that you'll need more patchbays than you think.

### ***Mixer Alternative***

An alternative to this would be to get a cheapo mixer with 4 stereo or 8 mono inputs and run it into a stereo input on your audio interface when needed. You'd only be able to record one stereo track at a time this way (combining up to 4 synths at once), but you'd avoid much of the patchbay.

Don't forget Law #9: If A Switch Can Do It...On my Toft ATB console, there's a switch to allow a person to select between Line Ins or Preamp Ins. In that case, I could just route my synths to Line In 1-8 and the snake to preamps 1-8. No patchbay needed.

## **READY Build 003: Operation Toft**

Here's one I'm suddenly curious about. I've done builds with no console and they seem appealing. Right this second I'm very close to selling the console and coming up with a digital solution probably just using an audio interface.

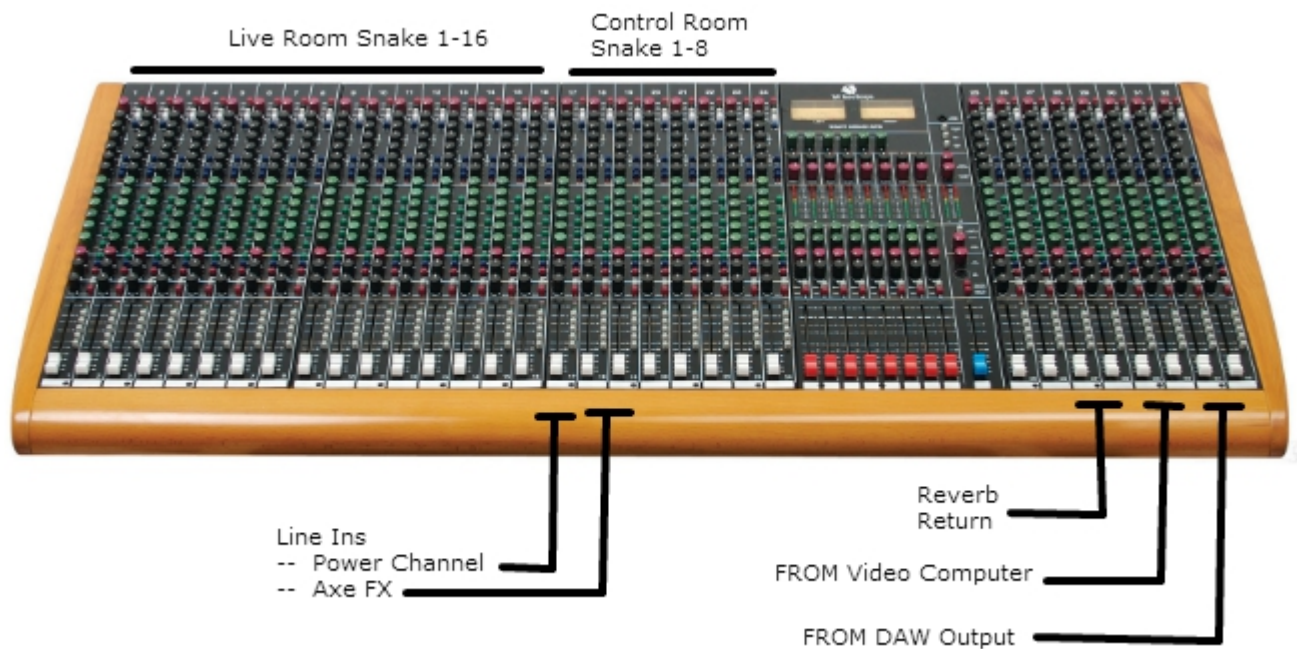
However, what if I embraced all my current views on gear, but stuck with the Toft ATB32 console using as few of patchbays, cables, infrastructure, and bs that I can? Basically, what if I used the Toft like any normal guy who didn't go way overboard?

I may get a little sloppy on the patchbay on purpose just to keep infrastructure to a bare minimum. I can always fix the mess at my convenience.

### ***Requirements***

- 24 total channels recording simultaneously
- 16 channels from the live room
- 8 channels from the control room
- I need access to my Power Channel in either room.
- I need immediate access to reverb at any time.
- I need options for two separate headphone mixes
- I need to get audio to and from my video computer.
- I need my Axe FX available immediately.





## Breakdown

- Live Room Snake 1-16 hard wired to Toft Mic Preamps 1-16
- Control Room Snake 1-8 hard wired to Toft 17-24 Preamps.
- Toft ch# 25-26 nothing
- FROM Reverb Return hard wired to Toft 27-28
- FROM Video Computer hard wired to Toft 29-30
- FROM DAW hard wired to Toft 31-32
- FROM POWER CHANNEL hard wired to Line In #17
- FROM Axe FX hard wired to Line In #18-19
- Direct Outs 1-24 hard wired to AD converters 1-2
- FROM Aux 1 hard wired to Kurzweil Rumour
- FROM AUX 2-3 TO Headphone Amp #1
- FROM AUX 4-5 TO Headphone Amp #2
- TO Video Comp FROM Bus 7/8

## Patchbay

Ha! Ha! Haaaaaa!!! Says Dr. Marvin in What About Bob?. You won't get the joke until you see my 2010 setup. I'm saving that for last so you'll be armed with

the kind of knowledge to get the joke.



Top Row #1 - FROM LIVE SNAKE #1

Bottom Row #1 - To Toft ATB32 #1 preamp

Following Law #1, we want the drums to be rocking with no cables patched in. This gives us the option to snag the live room #1 snake for use with the Power Channel. Following Law #9 we keep our numbers consistent.

Top Row #17 - FROM Control Room Snake #1

Bottom Row #17 - TO Mic Preamp #17 on console

This gives us access to the control room snake for access to the power channel.

Bottom Row #18 - TO Power Channel

The power channel will be normalled to Line In #17 on the console. So, following Law #5 we are keeping our numbers consistent. Following Law #9, the switch on ch #17 on the Toft can let me select either the Preamp In or the Line In. The Power Channel will be hard wired to #17 Line In.

## ***Downsides***

If I wanted to run the Axe FX through my Power Channel that's not an option. You know what? Good! The Axe FX is capable of monster tones and has all the tools it needs built in. Some people will think I'm about to "waste" my Distressor by not using it. Even fewer people will not drool all over their guitars with the idea of using an La3a. I've A/B'd the La3a on high gain guitar against the stock Cubase compressor and couldn't hear an improvement. (Shootout [here](#).) Either way, I over tweak and love the luxury of freeing myself from that. You may be more sane and want to run the Axe FX to the patchbay. With this simple of a

setup, changing that over would take seconds. I'm dedicated to simplicity on this one.

No subgroup recording. If I want the audio subgroup outs available for tracking, I'll have to patch 'em up. With my current views, I have no interest in combining signals with the Toft. Let's keep it simple, not hook 'em up and not ever look back. I'll let you know when I change my mind. SMILEY

## ***Conclusion***

There are actually some slick ways we could have done this with a smaller Toft console. However, the big 32ch console does much of the heavy lifting. The big lesson here is that if you've got a big ol' console than you can hardware everything and not need a lot of patchbays. The sheer quantity of inputs gives the "choice".

A person has to be willing to accept the sound of the console. In my opinion the Toft ATB32 barely has a sound in this configuration which is great to me. When I first got it, I had a mess on my hands with synths, external preamps, analog summing, and using hardware FX. I've never fought war (except with dirt claudes and super soakers), but this feels like coming home from one.

What an outrageously simply way to kick ass involving very few cables, and allowing me to do everything I need to do. My assistant Ruprect better love it. If he can't follow this, he's doomed.

## READY Build 004: Big Rig, No Console

My goal is to meet all my live band needs without a console. Let's see.

### Requirements

- 24 I/O for doing big, live bands in the studio.
- I require 2 zero-latency headphone mixes to my headphone amps with two more available on the front of the audio interface.
- I require reverb to be immediately available in headphones at any time.
- I require 16 inputs from the live room
- 8 inputs from the control room
- I require the option to use my Power Channel while tracking in either the live room or the control room.
- No analog console.



*Illustration 2: In this build, we are going to replace my Toft ATB32 with this RME UFX's internal Totalmix FX mixer.*

### The Gear

In this case, I'm not going to worry about cash too much. I'm going to satisfy my needs without too much thought. The emphasis here is hooking up the gear and making sure I have all the tools and features I need. There easily could be better options.

**Audio Interface:** RME UFX

**Extra:** RME Arc remote control for UFX

**Power Channel:** Rane MS1b > Ashley PQX-571 > Distressor > La3a

**Additional Preamp/Converters:** (2) Behringer ADA8200 (If you hate Behringer, feel free to substitute in Audient ASP008 or something else.)

**Additional Preamps:** 3 Rane MS1bs if I can find 'em. These won't be used much so they aren't all that critical.

**Headphone Amps:** 2 Behringer Powerplay PRO-XL HA4700

## Notes

- I've had ultra mega outstanding luck with my RME HDSP9652, a PCI card that accepts 3 ADAT I/O. Since I like RME, I want to try a design with the RME UFX here for our thought experiment. Its Totalmix FX could entirely replace my Toft ATB32 it seems.
- My Behringer ADA8000s in my mobile setup have been excellent. I've got some formal shootouts planned for them to see how they do with my Apogee converters. After this [Ethan Winer experiment](#), things are looking up for the ADA8000. I figure the upgrades in the ADA8200 will make it suitable for my tastes, but I'm only speculating.
- I've had a Behringer headphone amp since 2001 and the thing has been flawless. It's probably been used 20,000 hours or more.

So let's patch it up! Take your time with these and focus on what I've written. Follow along and mentally place the patchbay together. This is a design for me. It's radically more complicated than some of the previous builds.

## Thinking Out Loud

In this portion I'm just gonna brainstorm solutions to this mess. I'm putting this here so you can get a feel for my thought process.

### ***Live Room Inputs***

>>From 1-8 Live Room Snake To Patchbay / From patchbay to First Behringer ADA8200

I originally went straight to the first Behringer ADA8200 directly from the live room snake to avoid the patchbay (Law #3 – Murphy Crashed Our Party), but I remembered I needed access to the live snake for using the Power Channel during overdubs in the live room.

The other reason for this was I knew I wanted 8 misc outputs that were patched up for things like reamp boxes and any curve balls that may come my way. I decided it used the least amount of mental RAM (Law #5) to the first Behringer ADA8200 on the patchbay both for the inputs and the outputs.

From 9-16 Live Room Snake Directly To Second Behringer ADA8200. No patchbay needed.

*At the moment, we have our 16 channels from the live room working. The first 8 flow to the patchbay and are normalled to the converter. The second 8 go straight to the #2 Behringer ADA8200 for simplicity.*

## Control Room Inputs

From 1-4 Control Room/Vocal Booth Snake Hard Wired To 1-4 Preamp Inputs on RME UFX 1-4. No patchbay needed.

From #5-8 Control Room/Vocal Booth Snake To Patchbay Normalled to #5 Power Channel, #6,7,8 to additional Rane MS1bs each hardwired to Line Inputs 1-4 on RME UFX.

This is just a hair screwy. I'd prefer the Power Channel be #1, but the RME UFX already has their preamps setup 1-4 and I've decided to stick with this and simply remember that the Power Channel is #5. No biggie.

*Note: Using the routing matrix in the RME Totalmix FX, I could actually put those UFX preamps (1-4) on inputs 5-8 and the Rane preamps on 1-4. For now I'm going to avoid that, but you never know what real world usage will dictate.*

*It's often tough to find real world examples of why the routing matrix is so awesome. This is one of those cases, at least if you REALLY needed to move those inputs around.*

## Updates

- As you can see here we are leaning heavily on the RME's Totalmix FX mixer. There's no great way to get around the need for mixer functionality in a zero-latency environment be it analog or digital. It would be nice if DAWs were zero-latency, but they can't be without hardware. The DSP-based mixer will be used for all our routing, headphone mixes, and headphone effects.
- The lack of faders you can reach with your hand that make no "click" sound from the mouse could be an issue when tracking quiet sources in the control room. I'm looking for a [clickless mouse](#). We'll see.
- I chose the RME UFX specifically because I knew it had advanced DSP mixer functionality. We could do most of the same things with a little Mackie mixer (and we will). For some reasons our brains have little problem buying a \$400 mixer and \$300 reverb, but struggle with replacing that entirely with an audio interface that may smoke it on every level we can think of.
- My agenda for this thought experiment was to see how far I could avoid the patchbay thing. It doesn't mean it's the least expensive or best. The use of the RME ARC remote control should avoid most of the workflow problems

associated with using a DSP mixer, but I'm only speculating. I've never touched it. This UFX has two independent headphone amps, but I'm skipping those here as I want the ability for 8 headphone amps leaving the stock UFX headphone outs there just in case.

### ***Outputs***

FROM RME UFX 1-2 Out TO Focal Monitors - No patchbay  
FROM RME UFX 3-4 Out TO NS-10 Monitors - No patchbay  
FROM RME UFX 5-6 Out TO Headphone Amp #1 - No patchbay  
FROM RME UFX 7-8 Out TO Headphone Amp #2 - No patchbay

FROM Behringer ADA8200 1-8 OUT to Patchbay MISC Patchbay - No Normals

FROM Patchbay To Video Computer

FROM Video Computer to monitors

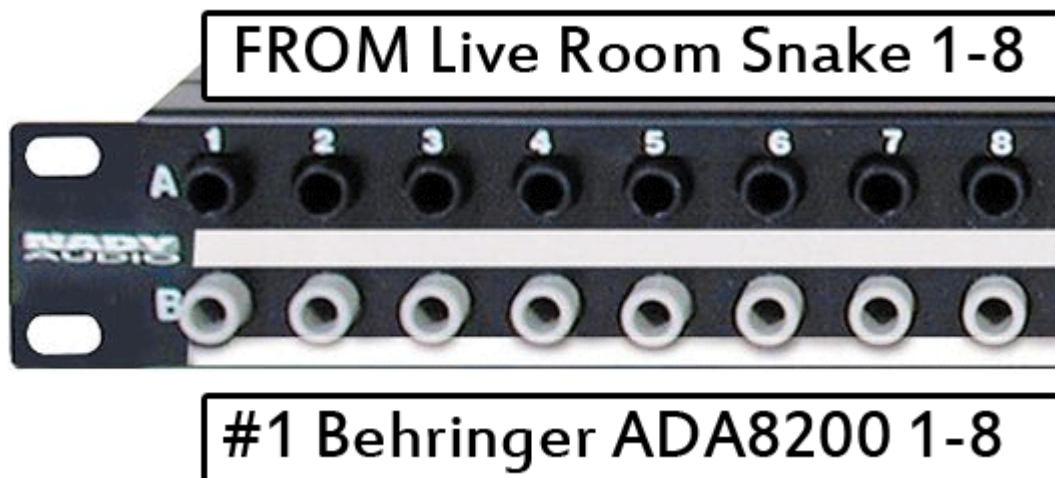
When we are working on videos, we run the audio output from the video computer to the analog console now. We should be able to maintain similar functionality with the Multimix FX software by running that audio to Line Inputs 5-6 on RME UFX.

### **The Patchbay Design**

Alright, so I'm condensing my design notes down. Let's see what we need for our patchbays.



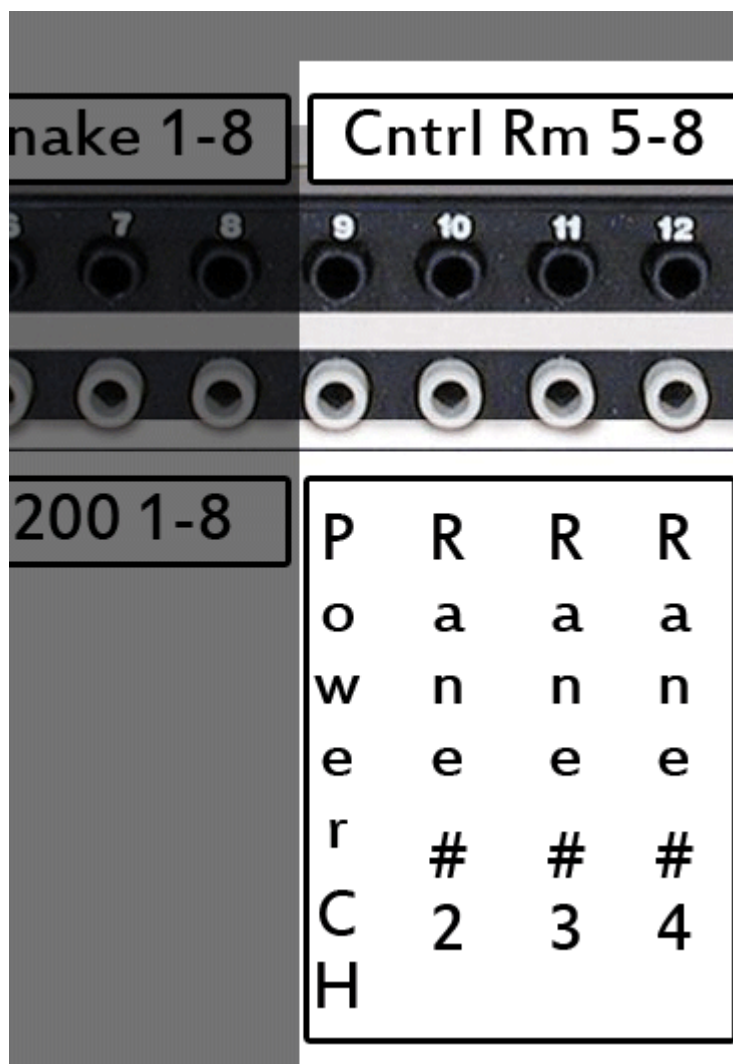




>> From 1-8 Live Room Snake To Patchbay TOP 1-8

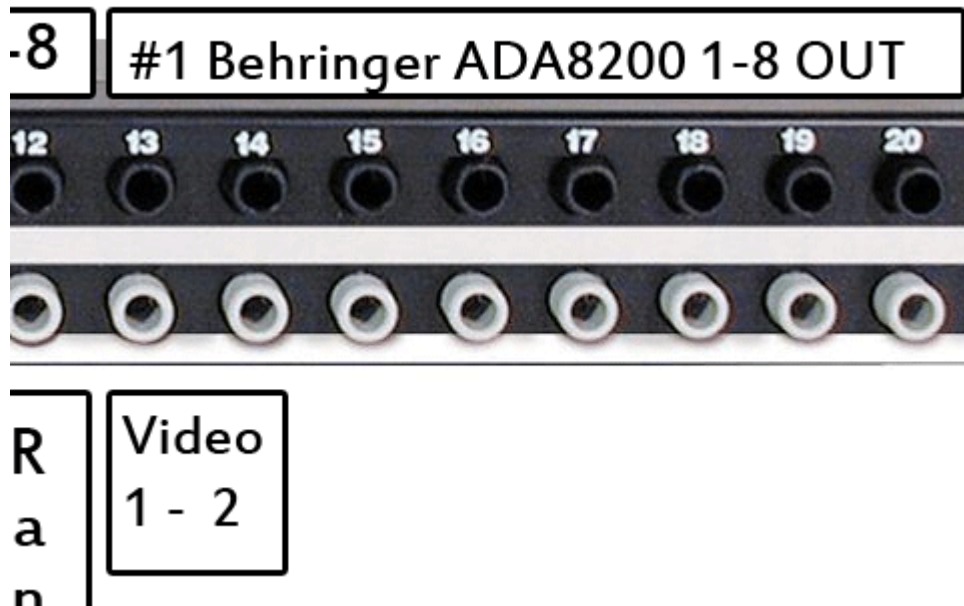
Normalled to...

>> First Behringer ADA8200 XLR inputs (8 TRS- XLR male cables) Patchbay  
BOTTOM 1-8



>>From #5-8 Control Room/Vocal Booth Snake To Patchbay TOP 9-12  
Normalled to...

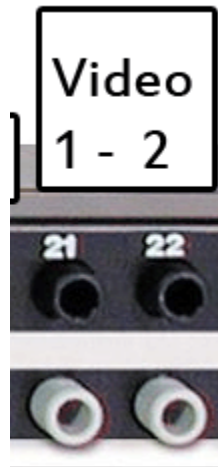
>>#5 Power Channel, #6,7,8 to additional Rane MS1bs each hardwired to Line  
Inputs 1-4 on RME UFX.



>>FROM Behringer ADA8200 1-8 OUT to Patchbay TOP 13-20 MISC Patchbay Normalled to...

>>TO Video Computer Input 1-2 on Patchbay BOTTOM 13-14

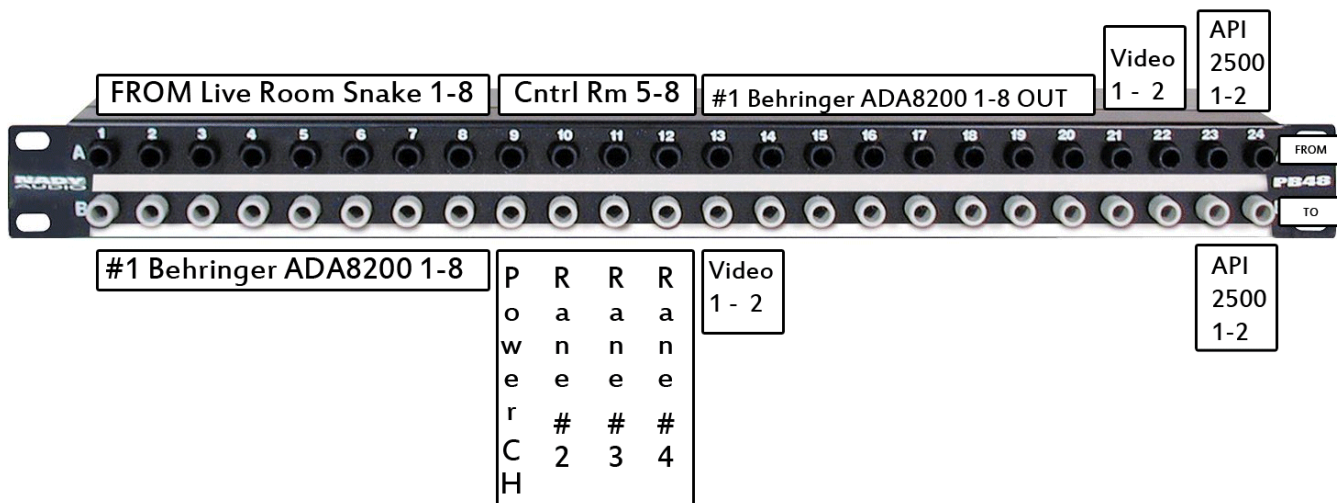
15-20 On the bottom stay empty for now. This gives us flexibility in the future.



>>FROM Video Computer to Patchbay TOP 21-22  
 Normalled to...  
 >> Nothing

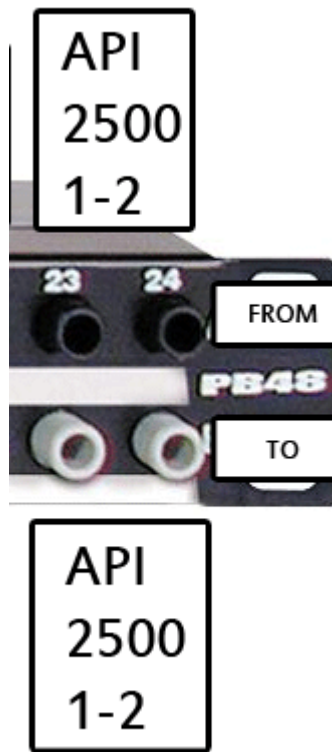
We'll have to patch in the FROM video computer sound. That's unfortunate, but not a big deal. Law #1 is a pain sometimes, but it pays off big time in big sessions.

## The Big Picture



## Expandability

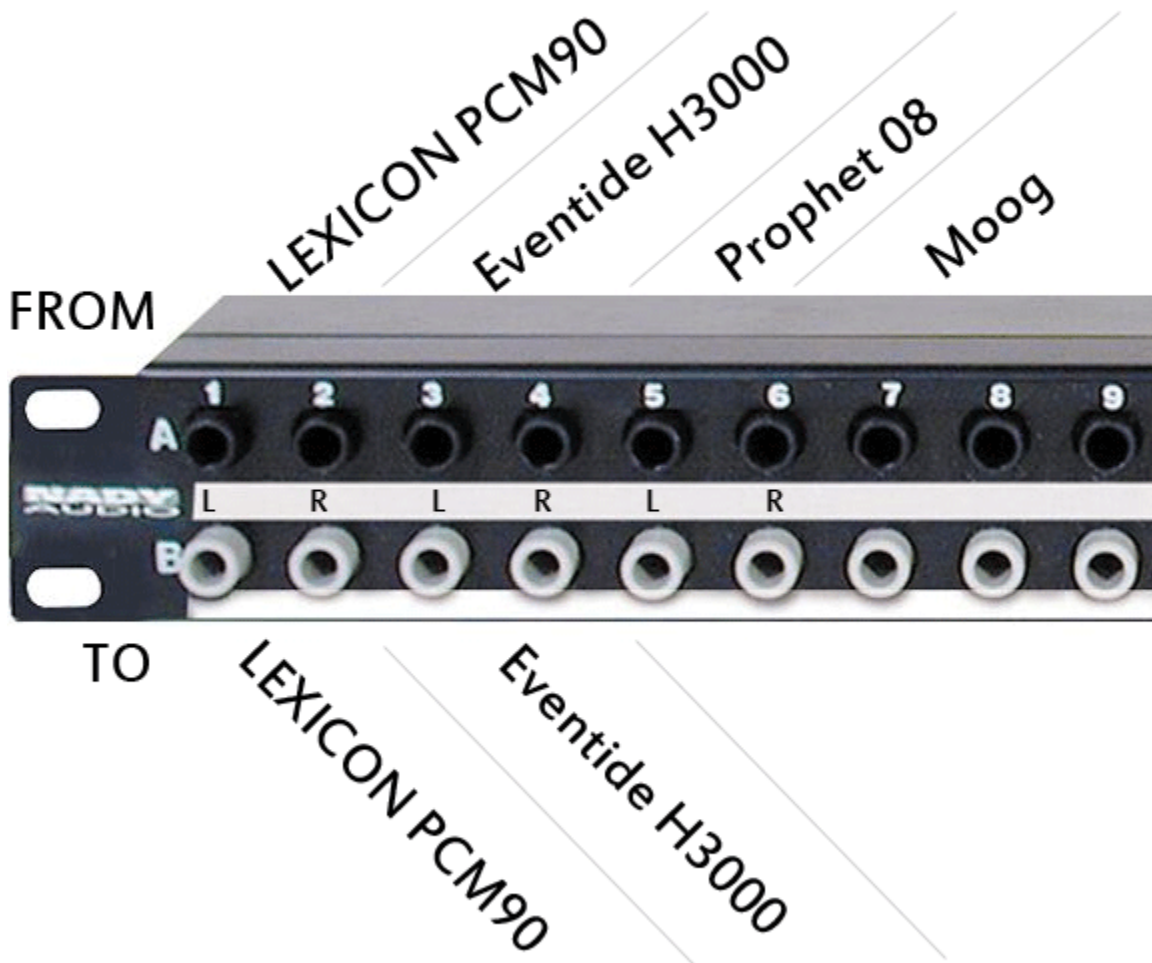
If we wanted to add hardware, we could do so with no problem. Let's toss in an API 2500 compressor for the two buss. We don't have enough I/O to have it normalled to both inputs and outputs. The normals need to be ready for big tracking days. So we'll have to patch it in. No big deal.



***Don't Be A Sissy, Brandon***

Alright, so let's have more fun here. Let's say I have an API 2500, a Lexicon PCM90, an Eventide H3000, and DSI Prophet 08 synth. What would we do?

We'd need another TRS patchbay.



FROM Lexicon PCM90 Outs – Patchbay Top Row 1-2  
 TO Lexicon PCM90 Inputs – Patchbay Bottom Row 1-2

FROM Eventide H3000 Outs – Patchbay Top Row 3-4  
 TO Eventide H3000 Inputs – Patchbay Bottom Row 3-4

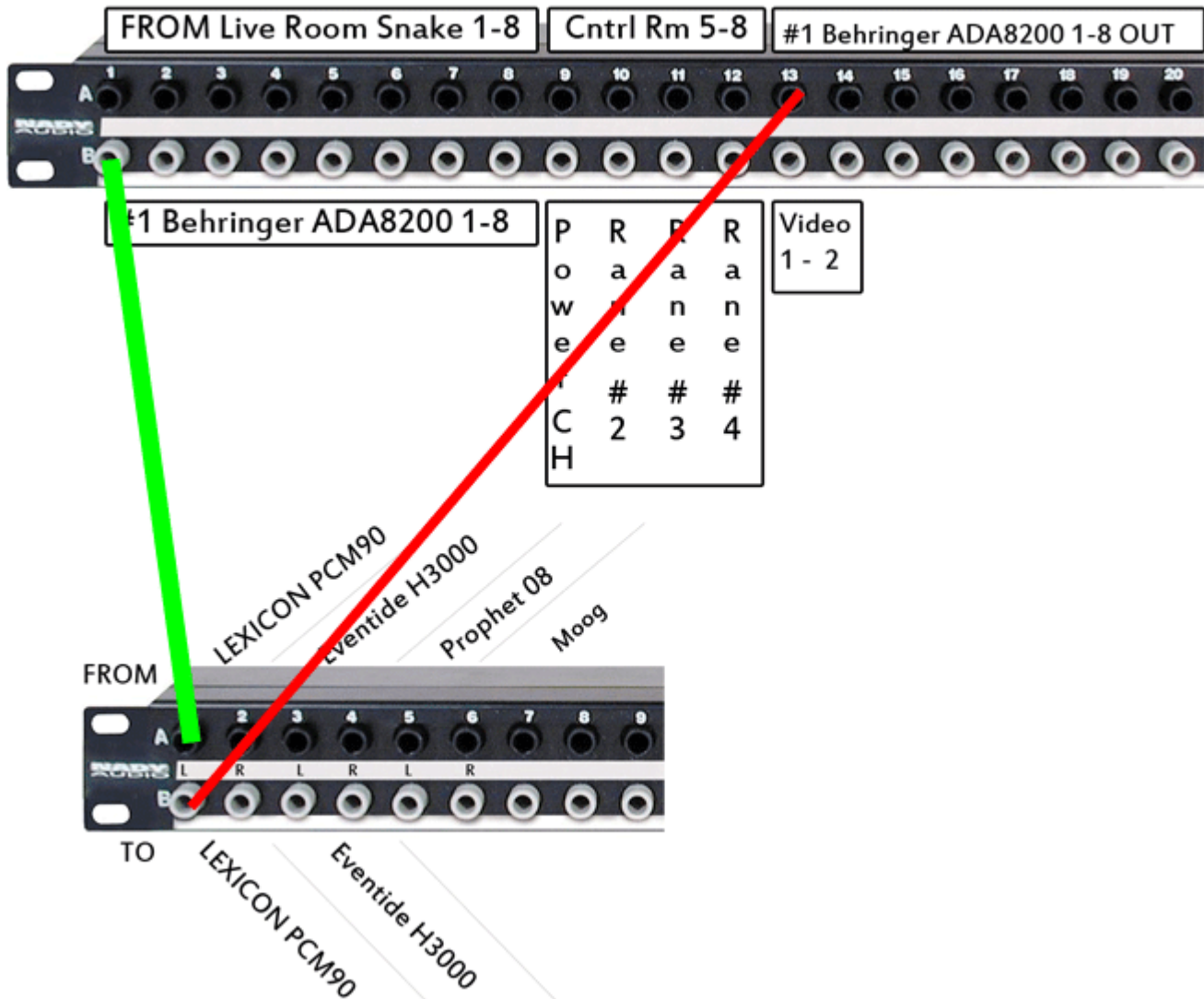
FROM DSI Prophet 08 Outs – Patchbay Top Row 5-6  
 FROM Moog Voyager Outs – Patchbay Top Row 7-8

The good news is all of these tools are awesome. The bad news is we'll have to patch 'em in if we want to use them. If your DAW is smarter than Cubase 6 has been and can actually remember your External Effects routing, this may not be too bad.

*Note: I'm not necessarily advocating these tools. I've had them all and sold them all. Great tools, though!*

If you've got the cash to blow and have enough ADAT inputs on your interface, I'd consider dedicating an 8ch AD/DA converter to your effects. You could hard wire those and just use them digitally when you needed to. That would save some time if you are interested.

## What To Patch?



In the middle of The Big Picture patchbay image on the Top Row you'll see FROM #1 Behringer ADA82000 1-8 out. We've got 1-2 normalled to our video computer, but could bust it any time at our convenience (red). We still have ADAT out 3-8 which are on patchbay channels 15-20. That's six outputs and will feed our effects nicely.

You'll see the Behringer #1 inputs on the bottom left. These aren't being used unless tracking is going on in the live room. This is where the outputs FROM your hardware will go (green). It would make the most sense to use 1-2 for the Lexicon, 3-4 for the Eventide, etc following Law #7 (Keep All Numbers Consistent).

## **Conclusion**

Wow! If I ditched my console and went with the RME UFX, I can do everything I do now in the digital domain and I only need 1 TRS patchbay. Dudes/chicks, I have well over \$2k and 300 hours invested in my patchbay system. This would be more reliable, dramatically less expensive, use up a much smaller footprint, be less stressful to use, be less stressful to troubleshoot, and the damn thing would even be portable again.

## **Downsides:**

1. Won't look as cool for clients
2. Headphone mixes may need to be addressed with the mouse instead of with faders.
3. I'll have to patch in the video computer's mix for doing videos. That'll take 3 seconds.

I won't tell you what is right for you. However, I hope this is an illustration of what is possible if a person is willing to think inside the box. SMILEY



## READY Build 005: Big Rig, No Console, and More Hardware

### **What If We Really Want A Lexicon PCM42 Delay?**

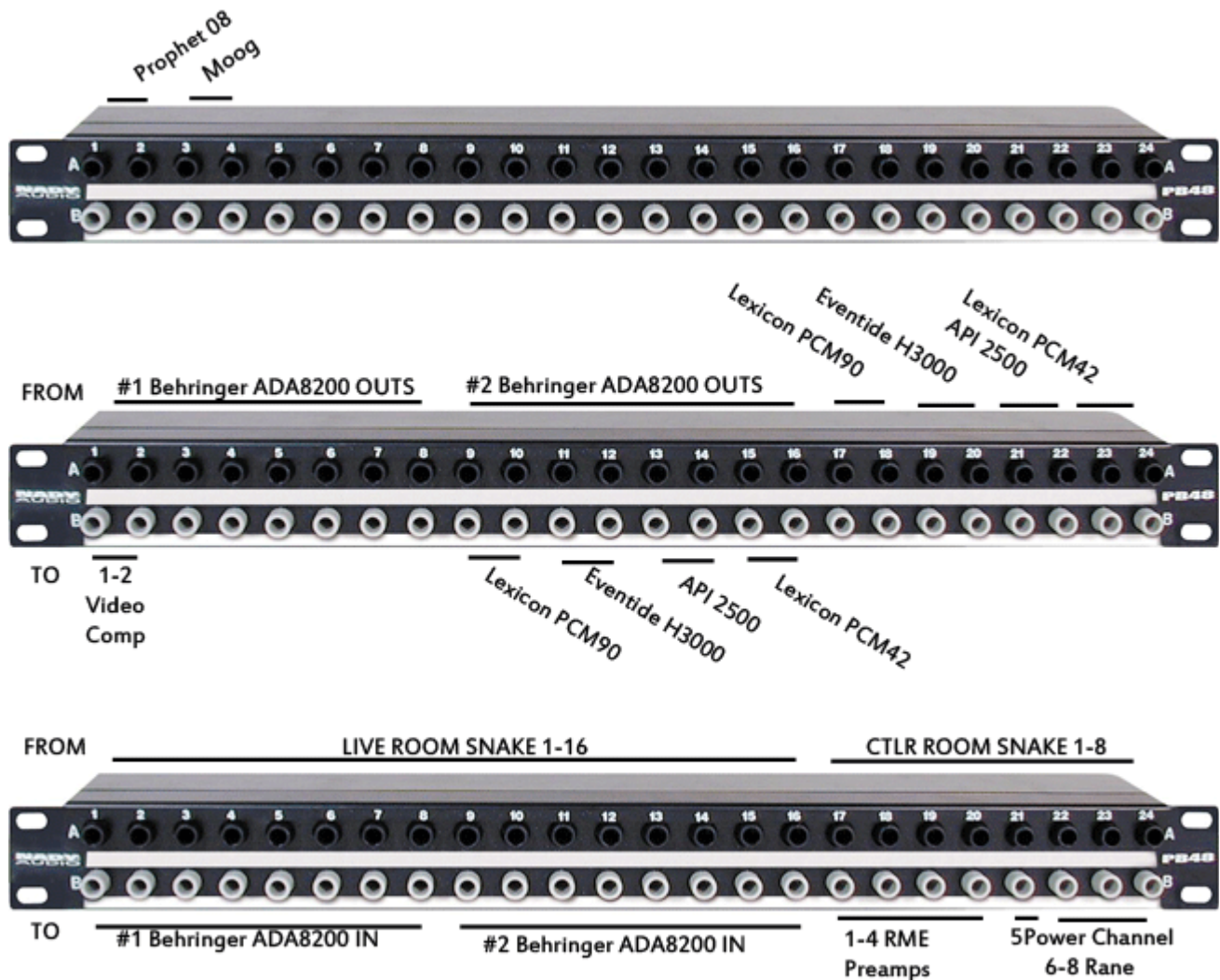
You can have it, but we've got a problem. We kept this patchbay simple for a reason. If we add just one more stereo device and use them all at once, we are out of I/O as is. That's going to need a redesign:

We still have the #2 Behringer ADA8200. We kept it simple and ran our snake directly to it to avoid the additional patchbay, cable, and connector needs. If we need more than 8 channels of I/O offered by #1 Behringer ADA8200, we'll need to put the #2 Behringer on the patchbay as well. This adds a little cost and increases the odds of something going wrong so balance that out with your needs.

So in this particular case, adding that 5<sup>th</sup> stereo effect would require some redesign. We'd need to change some things. For example, if we are going to have AD Inputs 1-16 available on the patchbay, I highly recommend going in order 1-16. You don't want 1-8 on the left one patchbay and 9-16 on the right of some other patchbay. That will mean moving some things around, but as long as all the normals stay in tact you should be in good shape.

### ***The Redesign***

Here's what I've got.



### Changes:

1. We now have three patchbays.
2. The third patchbay is barely being used. As you can see, we only have two FROMs in use for the Prophet 08 and Moog Voyager.
3. Now we have the entire live room snake 1-16 and 1-8 control room snake going to the patchbay.
4. #2 Behringer ADA8200 outs are now normalled to the inputs of our hardware.
5. You can see that adding just one piece of hardware required quite a bit more cabling and patchbays.
6. Switching from a Prophet 08 to a VSTi like Zebra2 or Massive would let us ditch that top patchbay. That's not for everyone, but those costs need to be factored in.

## Intuition vs \$\$

We could avoid the third patchbay the easiest if we hardwired the control room snake to RME preamps 1-4 like I did originally. This is purely a personal preference, but following Law #5 (Use Less RAM), I decided that it just made sense to me to have the 24 snake channels on the top row. When we were using radically less snake channels through the patchbay and kinda doing a piece meal sort of thing, it was okay to ditch it. Now this feels more intuitive. The complexity dictates more intuitive work flow.

On the other hand, intuition is one thing. A person could remember that 1-4 are hardwired without much trouble. If a person was willing to risk it they could stick with the original design as much as possible.

For example, in the original design, the outputs of #2 Behringer ADA8200 weren't in use at all. Now they are on the patchbay. We could hard wire the effects to ADA8200 as much as possible.

## Added Expenses

This was considerably more expensive just to gain one old delay. IMO, delays generally need to be ruined and ITB is more than equipped to handle that.

The factor that I hate the most is adding channels 9-16 from the live snake to the patchbay. Before they were hardwired. The snake is XLR. The Behringer ADA8200 is XLR. They match perfectly with no additional expense.

The TRS patchbay, obviously, is not XLR. We need 8 XLR female to TRS adapter to connect the snake to the patchbay. Then we need another 8 adapters (XLR male to TRS) to go to the Behringer ADA8200.

*Note: In this case you wouldn't want "adapters". You'd want an 8ch snake (XLR male to TRS) and another 8ch snake (XLR female to TRS).*

The prices for this are going to vary. I see on Musicians Friend, the budget-oriented Hosa runs about \$50 for one snake. So \$100 is what it costs in cabling this one decision.

\$100 is a small price to pay for something that makes a mix rock. I'm not sure this one Lexicon PCM42 delay qualifies, but there may be other effects that do.

That ball is in your court.

## **These Are “Added” Expenses? What About “Just” Expenses?**

Let's talk about the cabling just a moment for our patchbay system. Again, you can always shop around, buy used, buy in bulk on Ebay, or make your own snakes. I made my own. It's a time-consuming mofo. Now that I have a kid I simply could not do it. No way. I don't have the time.

So I'm just going to assume everyone is going to pay \$50 for a Hosa 8ch snake going one way and another \$50 Hosa 8ch snake going another way anytime XLR to TRS connections are needed that require a full snake.

## **Snakes**

1. FROM Live Room Snake 1-8 To Patchbay >> 8ch snake
2. FROM Live Room Snake 9-16 To Patchbay >> 8ch snake
3. TO #1 Behringer ADA8200 >> 8ch snake
4. TO #2 Behringer ADA8200 >> 8ch snake
5. From Control Room Snake\*
6. TO RME / Rane preamps >> 8ch snake
7. FROM #1 Behringer ADA8200 Outs >> 8ch snake
8. FROM #2 Behringer ADA8200 Outs >> 8ch snake
9. TO Hardware Effects >> 8ch snake
10. FROM Hardware Effects >> 8ch snake

## **Individual Stereo Cables**

>>From Prophet 08

>>To Video Comp

### **\*From Control Room Snake**

This highly depends on your design. I use a custom setup I made from a Redco "Pre-punched XLR Rack Panel". I wired it myself and therefor can pick what whatever connectors I want on the ends. You may need adapter snakes here, too.

*Note: Remember this is just for the cables that go to the patchbay. Hardwired gear is not being factored in.*

## **Physical Logistics**

With every one of these snakes I assumed all your gear is in the same location. Imagine an 8ch snake with Male XLR connectors to connect to all your hardware

effects.

If your hardware effects are in 3 different racks, that one snake won't be able to reach them all. In that case, you could tack on additional XLR cables to make the reach. Otherwise, you'd probably be best off with a snake for each rack with all of those snakes flowing to (possibly additional) patchbays. That could very well take another redesign.

## **The Bill**

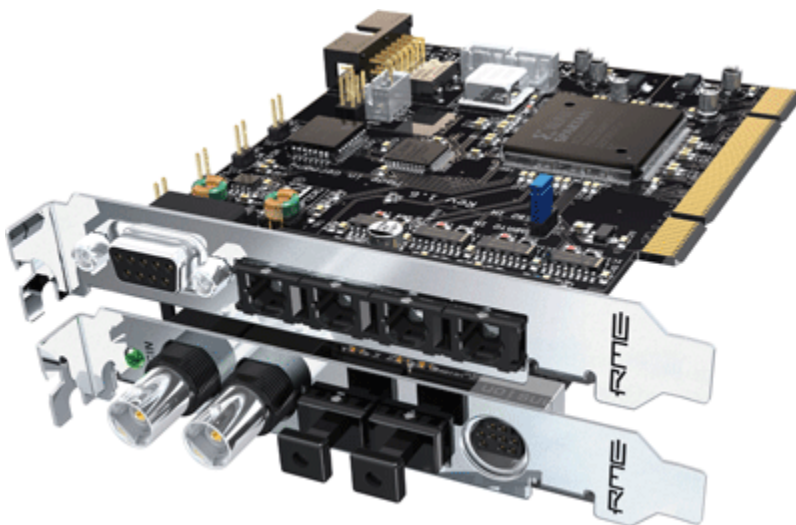
I'm counting at least 9, 8ch snakes. So add \$450 (retail) to the cost of this patchbay setup.

## **Conclusion**

Just adding a slight bit of hardware can get expensive if a person scales their patchbay system to be more intuitive with more complexity. You can always ditch my notions of "intuition", mostly stick with the original design, and add only the bare minimum. This puts more pressure on outstanding labeling and documentation, but can save some big bucks.

## READY Build 006: The Budget Rig For Brandon

I want to do something very similar as with the UFX, but I want to utilize stuff I have laying around the studio mostly collecting dust. My aim here is by showing how I approach the design of a rig and setup of a patchbay from a different angle it may give you some insight into your own setup.



### **Audio Interface: RME HDSP9652 PCI Card**

No analog inputs. I'll be utilizing the three 8ch ADAT I/O slots for 24ch I/O. It has no FX in its Totalmix mixer thing, but everything else within it should be more or less the same as the UFX. I've owned this interface card for 3 years and have never had a problem. It's PCI so the time is ticking on how long it'll be available in computers. I figure I'll be able to find a motherboard for it at least until 2015 or so and that computer should last a good three years. We'll see. They do make a PCIe version, but it's much more difficult to snag hyper deals on these like can often be done on Ebay.

### **Converters: Behringer ADA8000**

I have two of these now for 16 I/O. Let's buy another one on Ebay for \$150 or so for a total of 24 I/O. I've used them on location and they did fine for me. I've not tested them against my Apogee AD-16x and DA-16x converters. They may lose and they may lose significantly. However, I've lost faith in most high end tools and for this budget thought experiment I have no problem running with them even if I would need to finish up controlled tests before actual implementation.

### **Mixer: Mackie 1604**

I started life as a recorder in 2001 with a Mackie 1604. I've hung onto it. It'll only be used for master volume control of the monitors and headphone mixes.

The benefit of this one is I can be positive that I'll have real time control again over all headphone mixes and reverb controls. It will never be in the signal path so it's impact on sound (good or bad) will be zero.

### **Hardware Reverb: Kurzweil Rumour**

The Rumour is an awesome little reverb box. I love it and wish it was a plugin. It's not and so I'm not going to fiddle with it in mixing. Life is too short. It will be used for my headphone mix reverbs exclusively.

### **Power Channel**

I'll continue to use my Power Channel consisting of Rane MS1b > Ashly PQX-571 > Distressor > La3a for all overdubs either in the live room, control room, or vocal booth.

### **Requirements**

- I'll have a 16ch snake in the live room
- 8ch snake in the control room
- I want the option to use the power channel when tracking in either room
- The ability to make real time mixes to feed the video computer.
- I need to hear the video computer on my studio monitors.

### **Overview**

This setup give us 24 I/O with stuff I have around the house. If it sounds like crap I'll swap out out the Behringer ADA8000s. No biggie. That doesn't effect the setup here. (That's one of the reasons I love the ADAT format so much. The modular nature makes it easy to upgrade, go portable, etc.)

This rig will not be all that portable. It'll require a PC tower for the PCI card. I'm cool with that here.

I get all the monitoring options and headphone fixes I need, and reverb will always be one fader away.

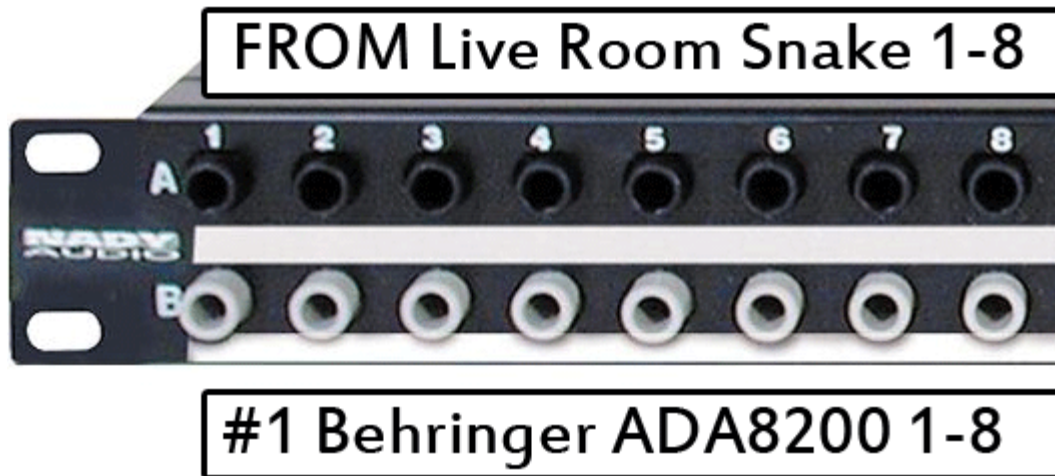
I'm going to be hooking my Power Channel straight into a Behringer preamp on the ADA8000. Suicide? Maybe. Some people hypothesize that running an expensive preamp into a cheap preamp may contaminate it. I doubt it. That's something I'd have to test in real life. I'm expecting it to sound just fine.

### **Let's Patch It Up**

I've stolen as much as possible from the first build.



## Live Room



>> From 1-8 Live Room Snake To Patchbay TOP 1-8

Normalled to...

#1 Behringer ADA8000 XLR inputs (8 TRS- XLR male cables) Patchbay BOTTOM 1-8

This gives us access to the Power Channel in the live room, but keeps those first 8 snake channels normalled to the ADA8000 so we don't have to think in busy drum sessions.

>> From 9-16 Live Room Snake will be wired directly to the #2 Behringer ADA8000 inputs. No patchbay needed.

## Control Room



>> From #1-8 Control Room/Vocal Booth Snake To Patchbay TOP 9-16

Normalled to...

#3 Behringer ADA8000 1-8.

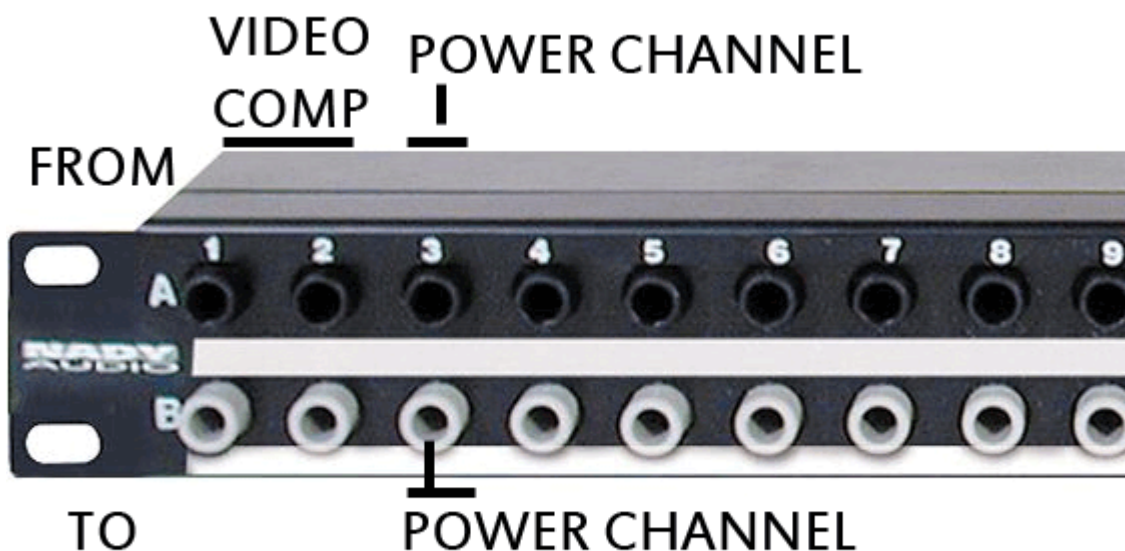


## Misc Outs



#1 Behringer ADA8000 1-8 To Patchbay TOP 17-24

## Video Computer



>> FROM Video Computer Outputs 1-2 to Patchbay #2 Top Row 1-2

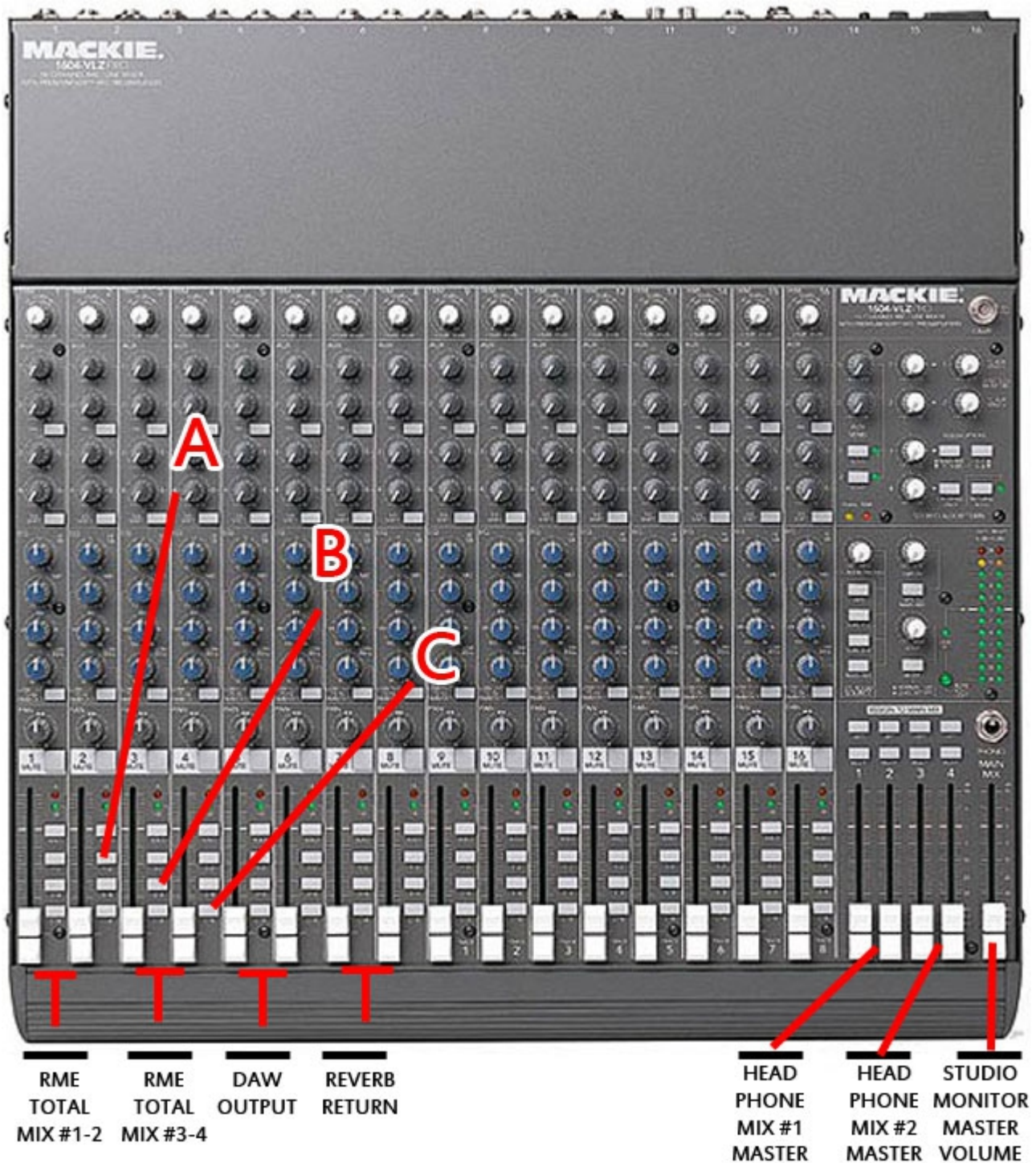
It looks like I need a second patchbay for the video computer's inputs. I have requirements of 16 inputs from the live room and 8 inputs from the control room. I could hard wire the video computer in and that would be fairly convenient. This would mean I would need to give up two permanent inputs either in the live room or control room. The last thing I want to do when I have a huge drum kit is run out of inputs. The same thing occurs when I've got a live band filling up my control room. The solution is to pull out another patchbay. Because of Law #1, I want it as simple and cable-less as possible when the band is there. For all other times, I can just patch in the Video Computer's stereo outputs to #3 Behringer ADAT 7-8 or whatever.

## Power Channel

>> Top Row Top Patchbay #3 FROM Power Channel  
>> Bottom Row Top Patchbay #3 TO Power Channel

To use the Power Channel we'll have to patch it in every time as it's not normalled to any ins out outs. That's no big deal. Otherwise, all control room inputs default to a ADA8000.

## ***Outputs***



## Subgroup Routing

This will be basic for anyone familiar with subgroups.

A) This button lets me select if I want the signal to flow to Bus 1-2 or not.

B) This button lets me select if I want the signal to flow to Bus 3-4 or not.

C) This button lets me select if I want the signal to flow to Stereo Out or not.

Subgroup 1-2 will flow to headphone amp #1.

Subgroup 3-3 will flow to headphone amp #2.

The master fader will flow to my studio monitors.

## **DAW Output**

>>FROM #2 Behringer 5-6 Out TO Mackie 1604 Ch5-6 to studio monitors - No patchbay

Channel #5-6 will be the level of my DAW output. It'll be assigned to Subgroup 1-2, Subgroup 3-4, and the Stereo Out because we'll want to hear it in the first headphone amp, the second headphone amp, and the studio monitors.

I'll use a passive switch to A/B with my Focal monitors or my NS-10M monitors after the Mackie's master out.

## **RME Totalmix Outs**

>>FROM #2 Behringer 1-2 Headphone Mix Out TO Mackie 1604 ch1-2

>>FROM #2 Behringer 3-4 Headphone Mix Out TO Mackie 1604 ch3-4

These will be the mixes I make in the RME Totalmix software. They'll be the live mics, DI's, etc. I can make any mix I want in the RME Totalmix. If I've got a live band, I'll need to get the drums, bass, guitars, and vocals all in there just right. If I'm doing a voiceover, I only need vocals in there. Totalmix 1-2 is one mix. If I happen to need a second mix, I've got it on Totalmix 3-4.

## **Headphone Outs**

>>FROM Mackie Subgroup Out 1-2 TO Headphone Amp #1 – No Patchbay  
Explanation in a second.

>>FROM Mackie Subgroup Out 3-4 TO Headphone Amp #2 – No Patchbay  
Explanation in a second.

## **Reverb**

>>FROM #2 Behringer ADA8000 7-8 Out TO Kurzweil Rumour Reverb Inputs ch1-2

>>FROM Kurzweil Rumour Reverb Outputs 1-2 TO Mackie 7-8

Ideally, I'd keep the Mackie ch#7-8 on unity. Then I'd go into Totalmix, click on 7-8, and figure out from which channels I want to send reverb. It'll probably be just vocals most of the time, but I could just as well put it on saxophone, guitar, or anything else I felt like.

The big advantage here is I have immediate access to reverb on the Mackie. Most likely, I'll be using input #1 for all my overdubs and so I can always have input #1 sent to the reverb box in Totalmix.

### ***Putting It All Together***

This is an unconventional way of doing it. I realize that. I'm used to shaping headphone mixes real time for singers. It's incredibly important to my workflow to be able to adapt on the fly without any mouse clicks. Would it be the end of the world if we had to stop and re-adjust levels in Totalmix for a quiet bridge? I don't know. Probably not, but this fits my way of working fast. It's so much more fun when we don't have to hit stop for that bridge and we can keep the flow going.

The same thing with reverb. If the singer benefits from me cranking up the reverb at certain times on their voice, I want that option and this is something I like having real faders for simply because faders make no noise.

Mostly, I picked the Mackie because it's here. There could be better options for this. That doesn't matter, really, from a design standpoint.

### **Clean Signal Path**

The Mackie is entirely out of the signal path going into my DAW. It's just on the monitoring end. That's the first concept to get across. If the Mackie sounds like Rosie O' Donnell, no big deal. It's not on the real tracks anyway. It is on the studio monitors, but I'm not too worried about that at the moment. If I need a different solution for the studio monitors I can use a different output and a passive attenuator.

### **A Big Live Band Session**

It's not always practical to get everyone one headphone mix, but I do not believe in giving every band member an individual headphone mix. These band people are strange cats. If you handed them vice grips, they'd find a way to tear their own head off. If you give them reigns over their own mix, they'll just mute everyone else and crank their own instrument up to the point their ears bleed. It happens literally every time. Let an artist make their own headphone mix and then take a listen when they go to the bathroom. Obviously, there are *some*



musicians capable of such a task. I'd guess there are nine of them.

I do find the need to have two different headphone mixes every once in a while. I can live with that. I've got two headphone amps with 4 headphone outs each. That should work for everything I do.

After preamp levels are set I go to Totalmix #1 and get a mix. That flows to Mackie 1-2 > Subgroup 1-2 >> Headphone Amp #1. I've got reverb there on Mackie 7-8 if I need it, and the DAW out from 5-6 is there if I need it, too.

Really, the Totalmix could do all of this, and for a live band it would probably suffice, but.....

### **A Vocal Session**

For a vocal session, I want full control and I want it fast. I want to focus solely on the Power Channel, get what I need in terms of EQ and compression, and then immediately switch to producer mode.

I'll make sure the singer is being sent to the reverb, and then I just do a quick mix on the Mackie. I have full control of everything real time with no mouse clicks.

### **Video Computer**



#### **FROM Patchbay To Video Computer**

I've normalised the outputs of #2 Behringer ADA8000 1-8 to the video comp. I may have been able to hard wire that, but at this stage of the game, this feels better.

#### **FROM Video Computer to monitors**

In order to hear the video computer we can just use the Totalmix and send that signal to the Mackie ch#3-4. We can always temporarily route ch#3-4 to the Stereo Out on the Mackie so we can hear it on the monitors. That's no big deal.

#### **Sending Voiceover + DAW Out To Video Computer**

When we used the Toft ATB32, we simply routed the DAW out and the voiceover microphone to Bus 5/6 and sent that to the video computer. That could be

possible on the Mackie, but I don't have another bus and I really don't want to deal with the Mackie on the patchbay.

Make a custom mix in Totalmix. Send to Rec Comp. This time we can go back to the Totalmix and use #9-10 which flows out #2 Behringer ADA8000 1-2. There we can come up with a blend of our voiceover microphone and the audio out from the DAW.

In order to hear that, we could clone that mix to Totalmix 1-2 via the DSP routing matrix. We'd immediately hear ourselves via the usual monitoring setup with the Mackie. Cool!

### ***Why Not Mix Headphone Mixes On The Mackie?***

We could send 14 channels to the Mackie being tracked live and do the entire headphone mix there. I don't want to do this. I don't want that many cables. I don't want to have to look for elements at different places. I'd imagine the analog side of me says, "Yeah! We'll do an analog mix on the Mackie real fast." The problem with that is mostly labeling. Which channel is the bass? The Mackie would need to be labeled each and every session just as the correct channel(s) on each snake, DAW inputs, etc. This feels like too much work to me.

Also, unless we use the Aux Sends, the Mackie really only does one stereo mix.

### ***Without The Mackie?***

The only thing the Mackie is really doing here is giving me that hands on fader stuff the guys who still haven't gotten comfortable with a mouse always talk about for real mixing. In this case, the only reason I'm using the thing is that I need this to be silent.

What's cheaper? Throwing up a vocal booth or using an old mixer collecting dust? That's the only issue.

If we wanted to pull this off without the Mackie, it would be easy. We'd just deal with the mouse clicks. The reverb send in the Totalmix would flow to Kurzweil Reverb since we don't have the fancier Totalmix FX. That reverb would need to get back into the Totalmix for headphone use.

Getting that reverb back into the RME is going to chew up two ins and two outs. The two outs don't matter as I have plenty to spare. The two ins are iffy. I really want 24 inputs simultaneously. We could setup the patchbay to normal to the reverb from some random output. That's a bit unideal. Following Law #1, I want

all 24 inputs available during the crazy times. We may need to compromise. So my point is a person who doesn't have an interest in buying a new or old mixer could do almost the same thing if they just used a mouse.

There could be other ways to get around this reverb issue. Some guys use reverb plugins in their DAW. There will be latency, but that latency will just appear as reverb predelay. I often use predelay of 100ms or more. I've never heard of latency that high on an interface. So that's a free way of handling it and as long as your DAW project template had concessions for it, it wouldn't be too damn bad.



## Build: The Great 2010 What Not To Build

In previous builds, I was painstakingly thorough on achieving every single requirement, showing you what I did, and making sure you have a strong handle on what I was up to and why I did it.

This 2010 setup of mine was an all-out onslaught. It was the D-Day Invasion at a time of peace. I have no explanation for my actions.

I'm doing my best to remember as I'm in a persistent state of improvement. I think there is a lot to learn from what I did wrong here and I want to get that across.

### ***Requirements***

- 16 total inputs to DAW at any one time.
- 16 channel snake in live room
- 8 channel snake in control room
- Ability to use API 3124, Wunder PaFour, Focusrite ISA428, Manley TNT, or Vintech 1272 on any channel at any time.
- Ability to use any of my hardware in any order on any preamp.
- Ability to route any of my preamps to any channel on the console.
- Immediate access to hardware reverb on headphones for vocal mixes
- Zero latency headphone mixes to 2 Behringer headphone amps. (Identical mixes in both. I was in a big phase where the whole band should have the same mix for a while. I still *like* that idea, but I seem to like it more than bands do and have evolved it some. I know there's going to be a cheap way to do this using Dumbphones soon.)
- Ability to record subgroups.
- Ability to be inserts on subgroups.

I figured I'd go ahead and explain my patchbay setup so you can get some ideas, say "that's stupid!", and maybe we'll fill in some gaps in your understanding. Take a second and study the orange lines. Those correspond to the patchbay just above the blue Focusrite ISA428.



*Illustration 3: My incoming mic-to-preamp patchbay. The orange indicates the range of channels described by the text.*

## In Closing

A patchbay ends up being nothing more than choice. The right choice when you need it is priceless. Too much choice is horrifying. Get in there, throw a rig together, get your hands dirty, and then adapt.

Make sure to follow the Laws Of Patchbay Design closely. They'll serve you well. Keep in mind that there is room for gray area with those rules. I've had some pretty crazy sessions with 7-piece bands and 7 girlfriends piled into my humble little studio. It was *nerve wracking* times 10,000. Most sessions aren't nerve wracking and they never seem to pay as well.

If you decide to break my laws, I won't lose any sleep over it. However, do so at your own risk. I've put years of thought and experience into those laws and I'm finally at a point where I don't feel a need to amend them too often.

## ***Do You Need A Patchbay At All?***

It's not too late to change your mind. I've done my best to give you the cold-hearted truth. I believe it's my job in this guide to inspire a bit of skepticism on your part. As mentioned in the preface, The "1970s Recording Studio" automatically means you need a ton of infrastructure. I see infrastructure as a big, damn pain in the butt hurdle between us and our music. In a time where technology has reduced these hurdles to a tiny little crumb it's silly not to utilize that technology if making music is the most important thing.

It drives me crazy that there is a constant pressure towards the "1970s Way Of Recording". Most of this pressure is just romanticizing the past. Very little of it actually makes music better. So be careful when people tell you that you need \$2k+ in patchbays and cabling. I'd ask them to show you, too.

While I can see many home recorders benefiting heavily from a single, 48-point TRS patchbay I can't imagine why 99% of the home recorders out there would need an elaborate system. My advice is to travel as light as possible. Get (and use) as few patchbays as you require. Don't go overkill. Don't decide that every single "node"/connection in your studio needs to be modular. It probably doesn't. It's easy to start small and work your way up.

I made my studio 100% modular with every single patch point flowing through the patch bay. What did this achieve? It cost a freakin' fortune in both money and time. It resulted in piles and piles of snakes in the back of my rack that made it next to impossible to perform maintenance or make changes.

As hard as I tried to stay ultra-organized and clean (not my strong suit anyway) it got out of control. My console needed 127 ¼" TRS connections just plugging the console in. You've probably seen how thick an 8 or 16 channel snake is. Imagine 12 of those 16 channel snakes! The truth is I use a tiny fraction of that functionality now. Few people will.

A 70s rocker on the RecordingReview forum mentioned that you need analog stuff for rock music. He had never tested it. He was just repeating rumors he's never tested. Albini seems to dig the old school way of working and his stuff sounds great. (Ask him what he spent on patchbays! It'll hurt! I guarantee it. I've heard some guys have spent \$20k in wiring for their analog-ish studios.) My experience is that I can make a rock band sound just as nasty as I they want to by using not-so-analog tools. There's a lot of hype, a lot of guessing, and a lot of philosophizing in regard to "analog" sounds in digital land. I wish there was more listening.

Then again, some guys just like a certain workflow. It's all good. Just do a little homework to figure out what you like and pick the most efficient path to making the kind of recordings you want to make.

### ***Lastly***

If you have any questions or comments, I'm always around. You can post a thread at the RecordingReview forum. I work my ass off to make sure it's the most friendly forum with the best advice FOR YOU on the planet. Don't hesitate to email me at [brandon@recordingreview.com](mailto:brandon@recordingreview.com).