



PATCHBAY PEEPSHOW 101

The Ultimate Beginner's Guide To Patchbays

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Fair Warning

Before we jump into this patchbay business you need to make a decision on how you want to work. When I jumped in, I had no idea of how and what I wanted to do with my patchbay. I knew I wanted to be able to use any of my toys at any time on any thing. However, I didn't realize how I would be using those toys and when. My goal is to ask you the right questions so you can better suit your needs right off the bat.

To be specific, I didn't know the role my tools would play during tracking and mixing. Would I use my Distressor on lead vocals during mixing? Would my Lexicon PCM90 be my go-to reverb send for headphone mixes or would it be used exclusively during mixing? What would my La3a compressor do?

I really wanted to try out analog summing. I guess I wanted to bus all my digital-to-analog (DA) converter's outs to the patchbay to flow to the console for analog summing. I wasn't sure. I bought 32 outs of DA converters (a pair of Apogee DA-16x units) to do just this. If analog summing was my default method of workflow, that's 32 channels I'd have to be routed by default (normal) to 32 line-ins on the console.

However, what about when I wanted to track a live band with 16 microphones using external preamps? If my DA converters are chewing up all the console's line inputs, I'd have to patch in each of those 16 preamp outputs to the console inputs during tracking. That sounds like a mess!

Don't worry about all of this now.

The reason I bring all of this up is before we can talk about what a patchbay is and what it can do for you, we need to specify exactly what your needs are. My needs have changed tremendously since I've conducted formal tests of hardware reverbs vs impulses of those reverbs, analog summing vs ITB summing, and high end preamps vs preamps in the Toft. Few will like my findings for reasons that mostly elude me.

I've found almost every "old world" way of doing things (Let's call it the 1970s Way Of Recording) has been a dead end of unreliability, terrible workflow, outrageous prices, and no better sonic results in the end. That's a bold opinion, I guess, that does go against the grain of what you may hear around the web. However, I think the ball is in their court to prove that the 1970s Way Of Recording and its outrageous hit to the credit card and the clock is somehow worth it to the typical guy slugging it out at home with huge expectations or even my clients who have to help pay for my toys.

One thing that the fans of the old school 1970s Way Of Recording fail to mention (besides the fact that a huge majority of these studios are out of business for a reason) is they generally had a tech guy. A full time employee was dedicated to fixing these studios. Most studios only had Studio A, Studio B, Studio C, and

maybe Studio D. Think about that. Just to keep four separate studios going they'd rely on at least one full-time tech. What a disaster! (Granted, I'm generalizing and speculating a bit here. The point is the amount of acceptable maintenance for a pro studio in 1970 is decidedly different than what you will probably find acceptable now.)

I'll forgo the massive amount of crap that is broken on my console I've barely had for 2 years. You hear people glorifying the old days when an audio engineer was a "real" engineer. Think back to Bill Putman starting Universal Audio with stuff he made.

The difference now is you don't have to make your own stuff. You don't have to invent consoles, solder snakes, and build reverbs out of garden hoses. (Seriously). You can spend your time actually recording.

If you aren't interested in soldering every connection in your studio, being a DIY guy, or replacing caps in that console, you probably should be asking what, exactly, the 1970s Way Of Recording WILL do for you. Someone should have no trouble providing audio clips. For my own needs and ways of working I've not been impressed. I tend to be skeptical and my recording goals are lofty. You may find value in old school methods and I can respect that.

From a purely workflow and \$\$\$ standpoint, I avoid hardware as much as possible. My very hefty experiment in the fancy studio has mostly failed. I have 5 soon-to-be-sold hardware synths, a soon-to-be-sold Lexicon PCM90, and an Eventide H3000 that sold recently. It's so easy to underestimate the costs of the snakes that simply run the audio outs from those synths to the patchbay (even when I make the snakes myself). The infrastructure is enormous with these tools. I can't pound that into your brain enough. If you are cool with that type of investment in infrastructure, don't let me stop you. I know I underestimated those costs a few years ago.

An Argument For Reliability

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 H300 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 that shouldn't be ignored.

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. 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 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 Empirical Labs Lil Freq for mixing. It's 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 mix recalls. 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.

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 necessary 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.

Using A Patchbay

I love it when clients walk in and see my rig and go "Holy crap!" They look at the patchbay and their eyes glaze over like they've just seen the cockpit of a Boeing 767 for the first time. The truth is the thing is simple enough for a first grader to operate.

With any standard , normalised audio patchbay each top jack flows to the jack right below it. It's as if your patchbay did nothing and you had a cable plugged into the top jack and into the bottom connecting the two.

For example....

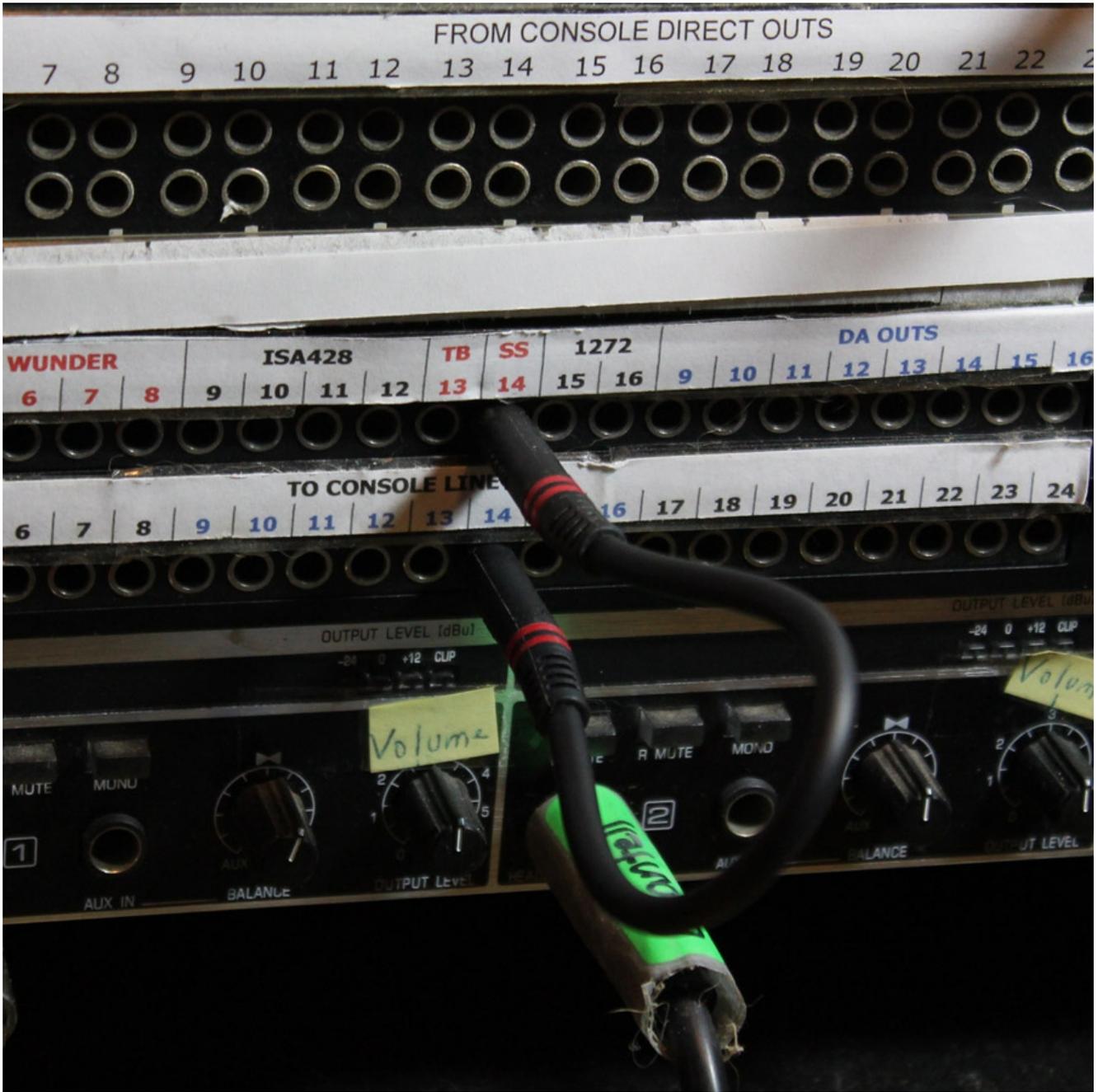


Illustration 1: Here's a picture of a cable connecting my Manley TNT Tube mic preamp to Channel #14 on the console. You see the signal flows FROM the top TO the bottom.

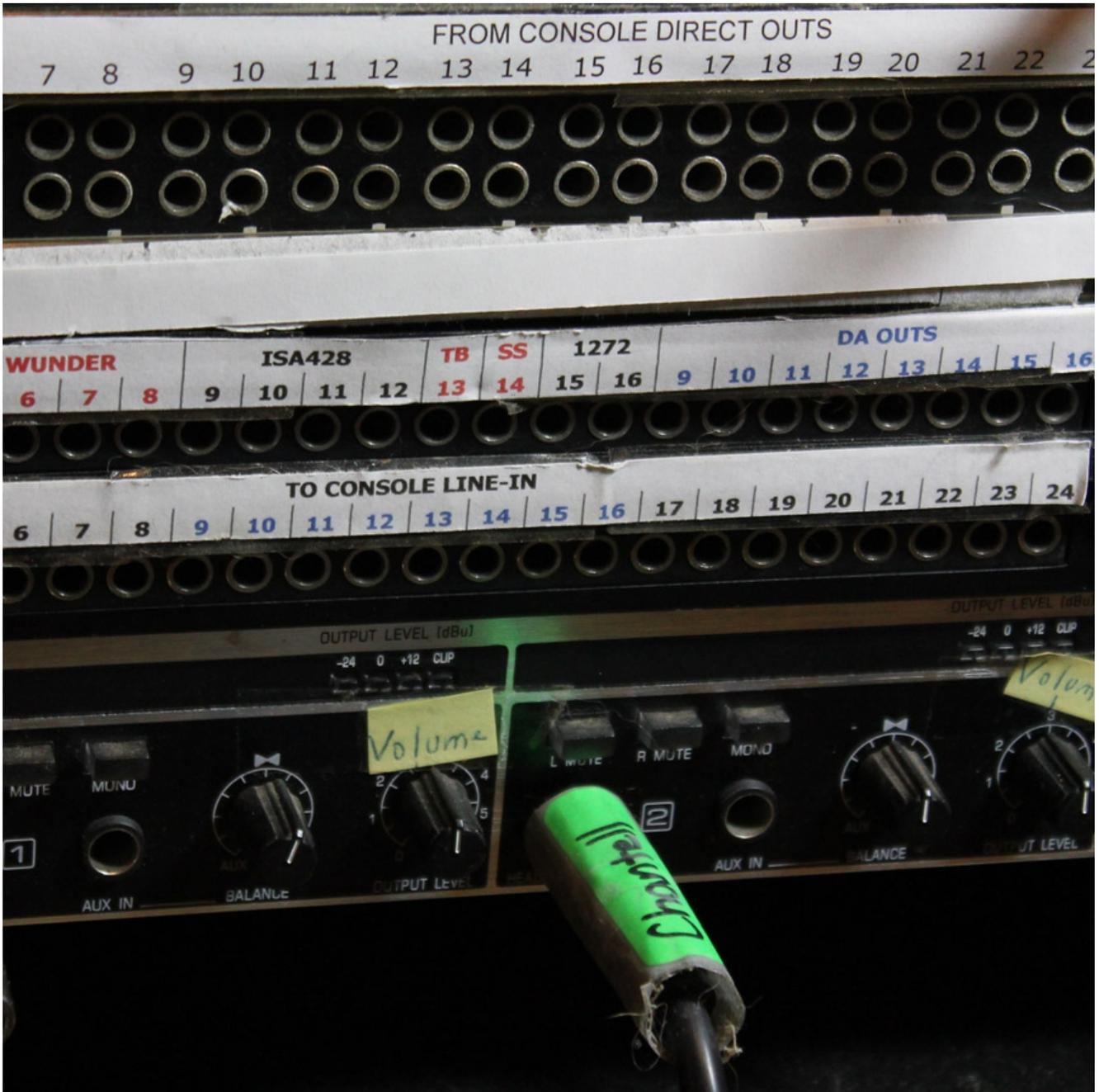


Illustration 2: Here's me doing the exact same thing. The Manley preamp is routed to Channel #14 just as before. The normalled patchbay is doing the work internally unless we break that connection by adding cables.

To remember, I always remember some song starts out with a guy saying with a non-London UK accent, "Let's do it, again....from the top." Whatever. Invent your own idiotic tricks to remember this junk. Or you can just do this....



Illustration 3: FROM on top and TO on bottom. Pretty sophisticated, huh?

Patchbay signals flow from the top to the bottom. Because I'm an idiot and forgot things like clubs vs spades (until Motorhead came along) I have FROM on the top of every top row on my patchbay. This means this signal is coming out of something (a snake, a preamp, an effects processor, etc).

If you can remember "From the top to the bottom" you almost have a patchbay mastered. Let's learn the details for our own amusement.

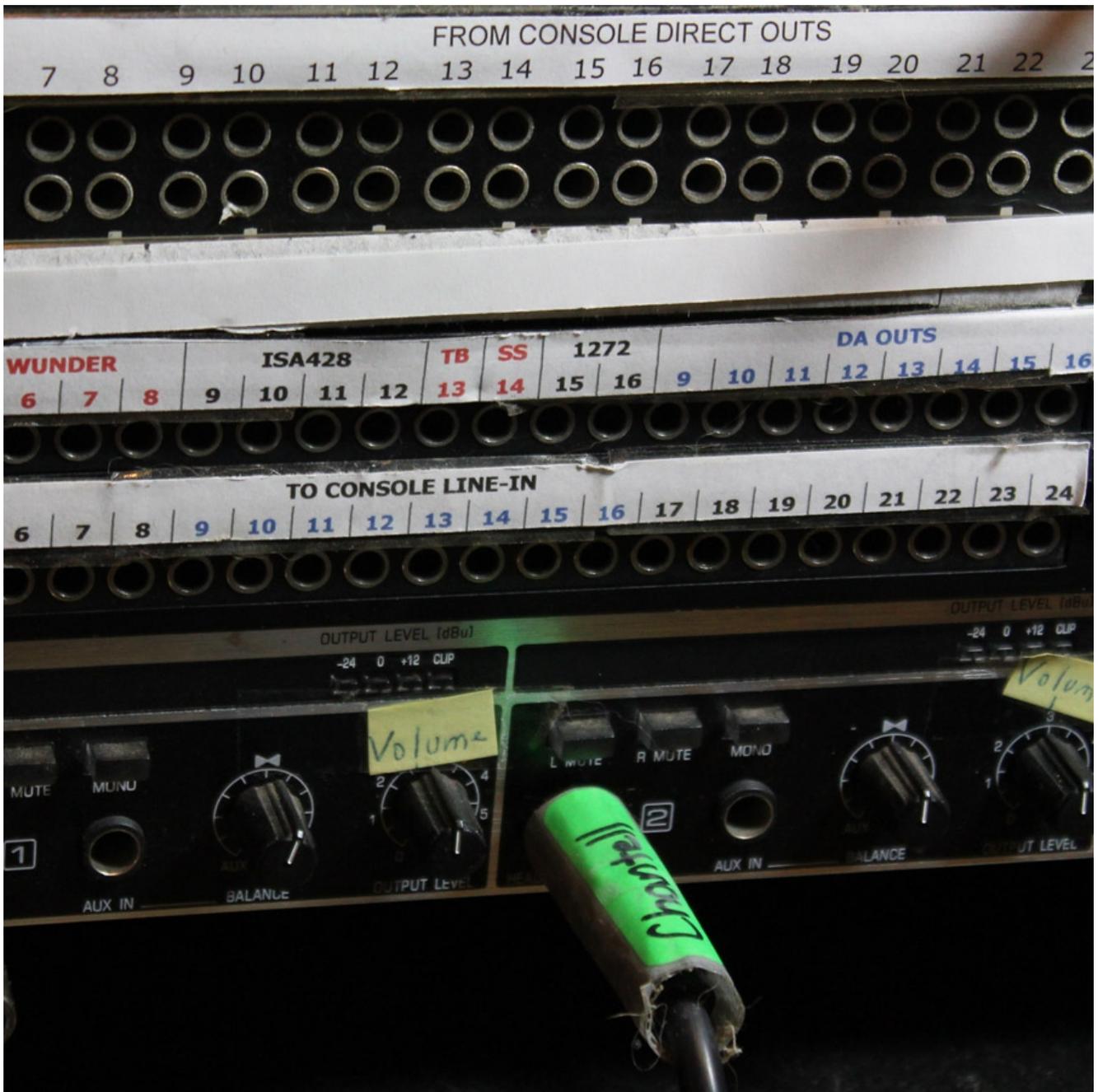
So What Is Normalling?

You hear all this jive of full normalled, half normalled, etc on the web. Most simply, a "normal" is where the signal flows with no intervention and no patch cables. You could call this the "default setting". Most beginners don't realize a normalled patchbay has an invisible patch connecting each top jack to the jack below it.

As we covered above, this is identical to physically placing a patch cable in the top and then placing the other end in the bottom. Normalled patchbays speed up workflow. It's nice when you don't have to think about 32 channels on the snake flowing directly to 32 channels on the console when the guitar player is griping about his headphone mix and the bass player can't figure out how to plug his bass in. The normalled stuff is already hooked up. You simply have to patch in the non-default stuff. If you have stuff patched in, simply yank it all out. Done!

While the general view online is to push the normalling issue as if half-normal and full-normal are polar opposites, the truth is the difference is rather subtle in most applications. In fact, the difference between half-normalling and full-normalling is effectively ZERO to me and my setup 99% of the time. Before we can talk further about normalling, we need to talk about breaking the signal. (Breaking is something I'm much more fluent in. SMILEY)

Let's start with this situation.



We are going to use the Solid State Channel of my Manley TNT mic preamp (red SS #14) and run it to my console. My patchbay is normalled so signal from each top jack automatically flows to the bottom jack. I don't have to do anything to get the Manley to flow from to channel #14 on the console (blue #14). It's doing that internally. The bottom row flows to my console inputs.

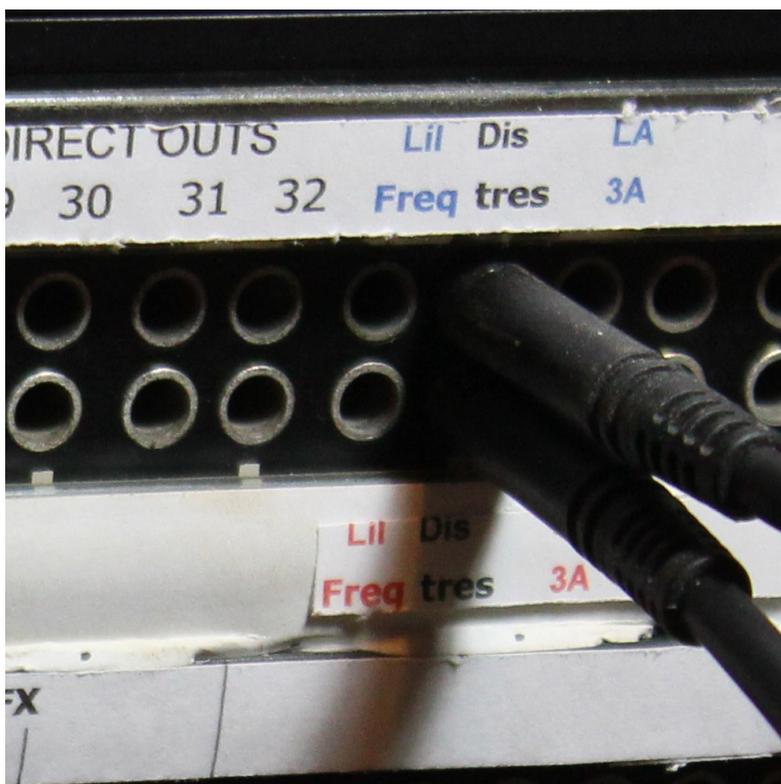
Let's break it!



Let's say I want to use my Distressor after the Manley preamp. I'll jam a patch cable into the top. (Remember this jack as Position Delta...like we are fighting a war...because WE ARE!!!). Now I want to go FROM the Manley TNT Solid State Channel (red SS #14) TO the Distressor.



The TO channels are on the bottom row. So I jam the other end of that patch cable into bottom row that says Distressor. Done. We now have signal going to the Distressor and this can easily be verified by beating on the insanely-priced German condenser and seeing the Distressor compression meter go nuts. I recommend the heaviest hammer you've got.



We now need to get that signal FROM the Distressor. We find the FROM Distressor on a top row. We jam a patch cable in there. Now we need to get the other end of that little booger to the console line-ins on Channel #14.

Note: I have my setup so that the Distressor output (FROM the Distressor) is on top of the send TO the Distressor. This is just my method. It's certainly not the only method. I don't see many people doing it. We could have the FROM the

Distressor on the top row on just about any patchbay slot if we wished.

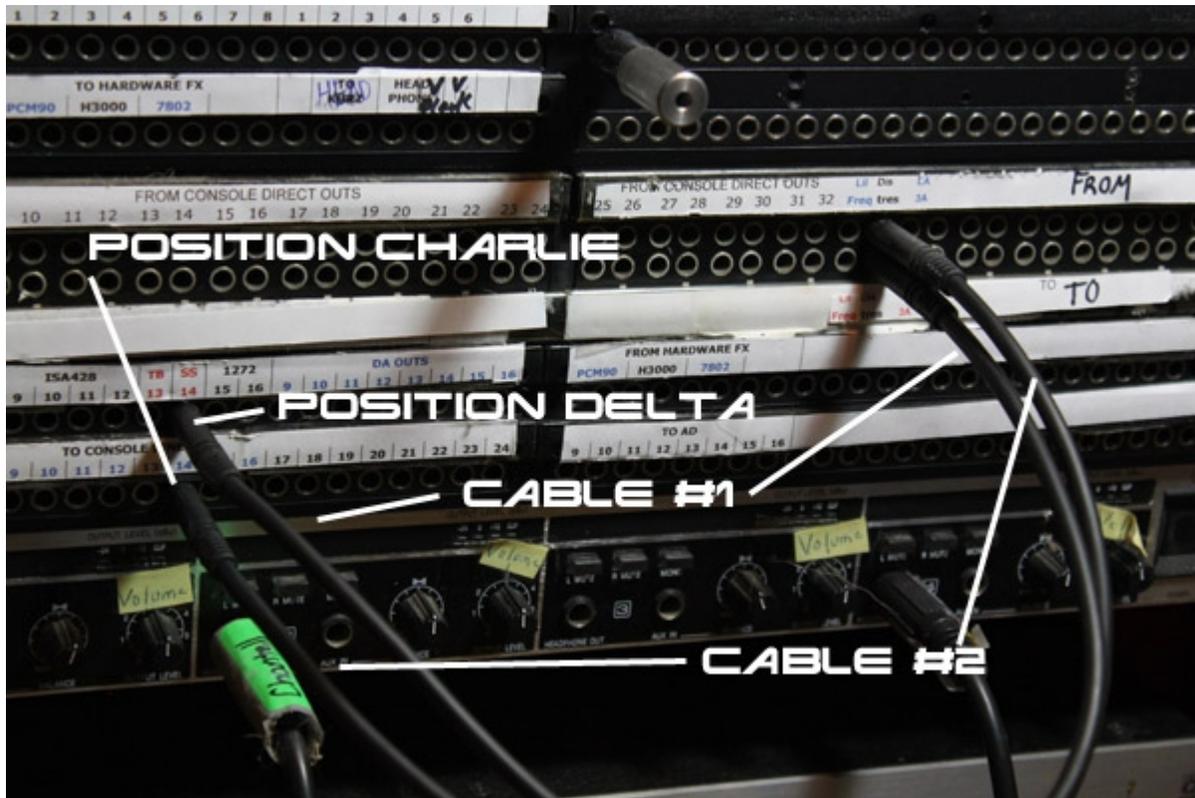


Illustration 4: Sorry, all my cables are black. I'll do my best to label them. Take your time when looking at this mess of a picture.

This pic here looks kinda confusing, but take your time and focus on one thing at a time. This is exactly what a typical use of the patchbay would look like if you were dumb enough to buy only black patch cables. (Black really is the coolest color. SMILEY) Follow the signal flow. Start at position Delta where our Manley TNT is feeding us signal FROM the preamp. Follow Cable #1 down into the abyss. You'll see it flows TO the Distressor. Then the Distressor comes back to the top (FROM) row and we sent that TO Position Charlie where it can flow to Console Channel #14.

If you get this, you can work a patchbay. It really gets no more complicated than that.

Now, it does get a bit hairy when my assistant, Ruprect, sees 9 patch cables and freaks out. AHHHH! He panics because he is a woman. (No offense, women who don't panic. SMILEY) If you take your time and stay calm the patches are always one thingy flowing to another. Nothing more.

Breaking Signals

Okay, so back to breaking signals. Remember Position Delta. This was the jack on the top of the patchbay which was connected to the output of our Manley TNT Solid State Channel preamp. It is normalled to the jack below it (Position Charlie) which flows to the console #14.

A full-normalled patchbay will break the internal normal connection when we plugged that patch cable into the top row (Position Delta). The signal no longer flows through the normal on to Channel #14 on the console.

A half-normalled patchbay does not break the signal when a jack is placed in the top row. Instead, signal flows to both the bottom row and wherever your patch cable is going. The normal is only broken when a jack is placed in the bottom row.

Q: Why the redundancy?

A: Why not? Okay, wrong answer. We'll get to that.

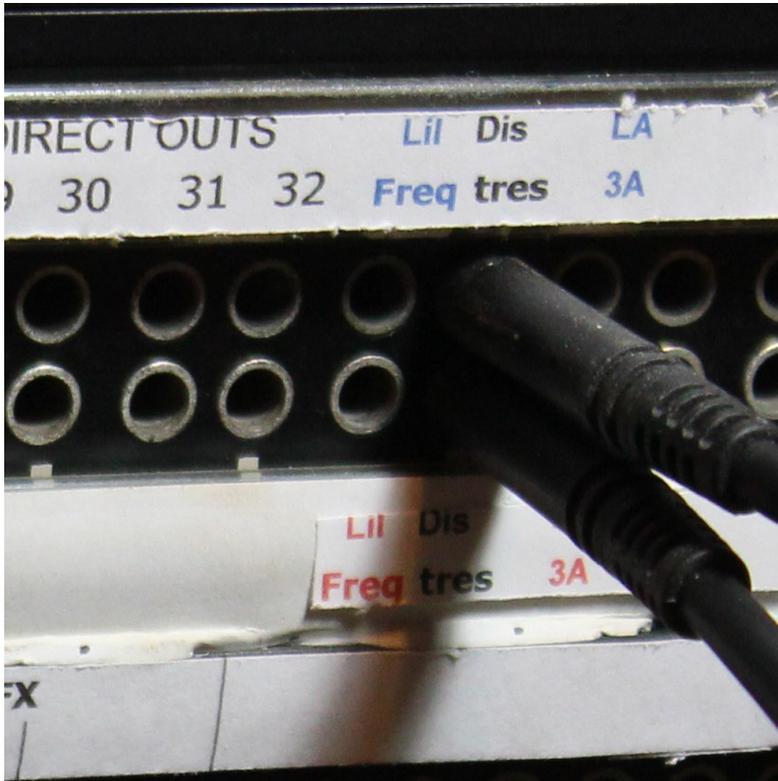
Half-normal has no fancy switch on the top row to break the signal. You plug a patch cable into the top row the signal still flows to the bottom row AND to where ever your patch cable goes. This is a passive splitter. It's sometimes called a "Y-Cable".

[Bill_Cosby]NOW!!![/Bill_Cosby] With half-normalled patchbays, the bottom row does have a breaker switch. When we finish patching in the Distressor and that cable is jammed into Position Charlie (ouch!) then the internal normal is busted, broken, nada, and is replaced with our new, manual connection.

So in redneck English, what does this mean? It means two things.

- 1) A half-normalled patchbay has the basic functionality of a primitive, passive, crappy splitter.
- 2) If you toss a cable into the top jack you could get some unexpected screwiness if you don't break that normal by putting a jack in the bottom.

Let's say Console CH#14 is acting a little screwy and we want our current example (Manley TNT > Distressor) to now flow to CH#1. With a half-normalled patchbay, the signal will be split at Position Delta (after the Manley preamp) to flow to CH#14 on the console and to the Distressor which flows to CH#1. It can be confusing when you try to mute the vocal on CH#1 and still hear it uncompressed on CH#14.



Advanced Look

My hardware compressors and EQ have a slightly strange configuration. The FROM is the output of the Distressor, the TO is the input to the Distressor. Yup, without breaking the signal, I've got the output plugged (normalled) into the input. If the Distressor made some kind of noise on it's own a feedback loop is very possible. I've never had that problem. Any time I use the Distressor, I'm breaking those default connections making feedback impossible.

I've found this to be a huge time saver in the workflow department and it makes labeling the patchbays simpler. Best of all, I don't have to remember separate locations for the Distressor's inputs and outputs.

Review

After this quick and dirty chapter you can now work a patchbay.

- Signal flows FROM the top TO the bottom.
- You understand that a full-normal patchbay breaks the signal any time a cable is plugged in (either top or bottom rows).
- A half-normal patchbay only breaks the signal when you put a cable in the bottom row.
- A half-normal patchbay can function as a passive splitter.

What To Buy

The Used Dilemma

It's worth noting that used patchbays often go cheaper than used toilet paper. You can save big bucks by going used and you can lose a lot of money by selling patchbays you purchased new. A patchbay is hard to wear out, but they do corrode and the contacts can become dirty if they've sat in a damp basement since 1984. I'd imagine the average 10-year old patchbay in Arizona or Morocco is in pretty good shape. In other words, I consider a used patchbay that's lived in a desert to be a generally safe way to save a lot of money. Not everyone agrees and that's why they are so cheap. YMMV In most cases, buying two used patchbays is cheaper than buying one new patchbay. The likelihood that one will be prime time is pretty high. Do your homework.

A patchbay is a mechanical gadget. Components can wear out. Rust and oxidation are bad news. While I'm a hell of a skeptic about magical audio stuff, in simple mechanical devices it's usually pretty obvious to see where the money goes. As you'll see in this chapter, some setups are easier to correct than others. Use your best judgment

Warning: Is The Patchbay Normalled At All?

I purchased two Switchcraft patchbays from Redco.com. The ad said they could do full-normalled, half-normalled, or no normalled. I assumed there was some kind of switch to flip to do what I needed to do. Nope. \$700 in patchbays and I have to physically solder 2 little jumper wires for each channel. That's 2 wires and 4 solder points times 48 channels times two patchbays. (384 solder points) End of the world? No. Is that a day of work lost because I didn't research the issue further? Yes!

Again, **ONLY BUY ALREADY-NORMALLED PATCHBAYS.** If you aren't sure, ask! A majority of patchbays for audio work are normalled by design. Demand this! There is **NEVER** a time that you will want a non-normalled patchbay. You don't have to plug anything in to the "default" setting, but from a workflow standpoint you always want the option of default routing. Always!

To Buy Half-Normalled Or Full-Normalled?

Great question! After more than five years of patchbay use, I've still not come across a time when half-normalled was beneficial. It's very possible that someone out there is using that method to their advantage. Frankly, I'm not a fan of the passive splitter due to the signal drop and impedance issues. To put it

simply, recording gear generally wasn't designed to be split in this fashion. I'd be surprised if splitting in this fashion hurt anything, but passive splitting certainly isn't ideal in most conditions.

For my money, if I have a choice between full-normal or half-normal, I'm going with the full-normal patchbay every time. In fact, I'd probably spend an extra \$10 to get the full-normal just to avoid the issues I mentioned in the previous chapter where signals can show up unexpectedly in two different places.

When I patch a thingy to another thingy, in my head that's the only place that signal is going. When the signal also ends up elsewhere it's nothing but a hassle that slows down sessions.

Patchbay Options

What Type Of Patchbay?

While there are all kinds of different styles of patchbays out there, only a few really come to mind for serious audio work.

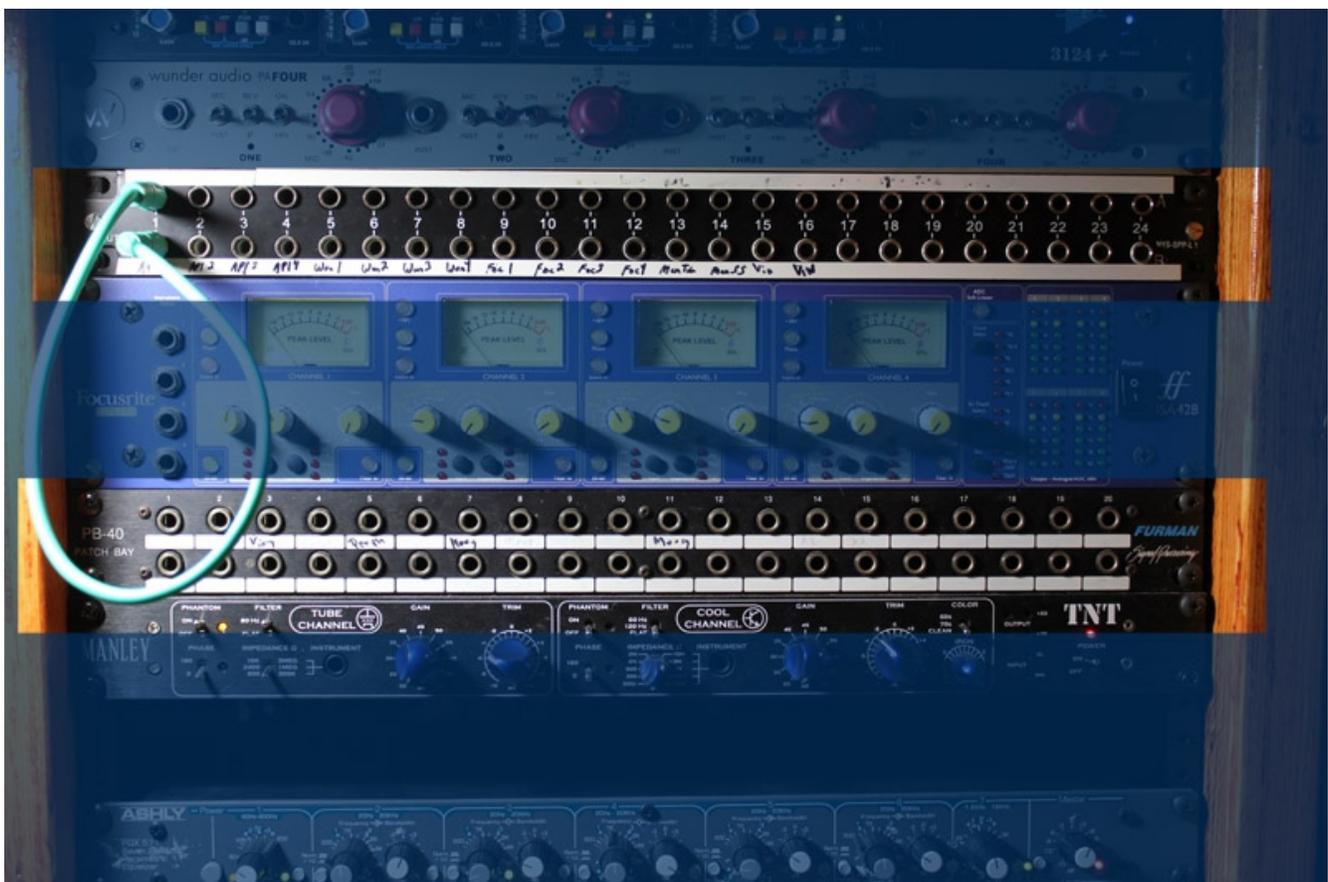
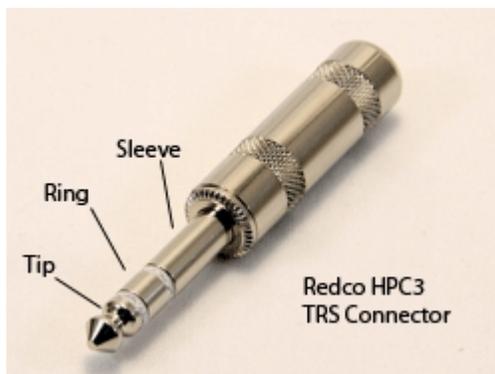


Illustration 5: Highlighted here are my 2 1/4" TRS patchbays

TRS Patchbay



The TRS-style patchbay uses the standard balanced, 1/4" TRS connectors that look like guitar cables, but they are balanced (they use an extra wire to reduce noise just like XLR microphone cable and the jack has tip, ring, and sleeve as opposed to guitar jacks which have just tip and sleeve.). A TRS patchbay takes 1/4" TRS in both the front and the back with usually 24 jacks per row and two rows. These are very plentiful and it's not uncommon to find them on Ebay for as low as \$18 although a new name brand TRS patchbay is somewhere in the \$100 route, give or take, with a new Behringer going for about \$50.

Check Ebay For Patchbays DO THIS DO THIS DO THIS

I've heard varying accounts of the Behringer so I prefer to go with a well-established mid-priced patchbay. Then again, swapping out a TRS patchbay takes relatively zero time compared to other options so the repercussions from going cheap on this are quite small.

Pros:

- Inexpensive
- Readily available in used circles if you are so inclined
- Can use over-the-counter TRS patch cables which are not cheap but radically less expensive than specialty cables needed for other patchbay styles.
- These patch cables can often be bought in bulk
- People on a tight budget can utilize the molded plastic style of connector on their patch cables and save big bucks.
- Easy to re-use, unplug, and replug WHEN (not if) necessary
- Switching out patchbays takes seconds and this frees up the option to go cheap and used.
- No soldering needed.

Cons:

- Store-purchased TRS cables are NEVER cheap

- Store-purchased custom cables with either a XLR female or XLR male to TRS can get even more expensive and are hard to avoid.
- Connectors are required on both ends*
- With all 24 total rows, you'll need quite a few of these.

* What am I talking about? My console, when fully decked out, uses 127 1/4" connectors. By using the dB25 method all my snakes have a \$0.40 8-channel dB25 connector on one end and the 8 TRS connectors on the other end. If I was to use a TRS patchbay with the console, I'd need to buy 127 more 1/4" connectors or utilize cables with 1/4" on both ends. This adds cost in a hurry. The real debate here is whether a person needs their console fully decked out. Of course, this extra connector is what makes it so easy to change your mind and work in the back of a TRS patchbay in the first place.

Cable Length Savings

If your hardware is in the same rack as your TRS patchbay, you may be able to get by with premade 12", 18", 24", 36", and 48" TRS cables depending on the size of your rack. These are often sold in bundles and can be bought much cheaper than individual cables. This method sure saves cash over 20' snakes.

Adapter Cables

I highly recommend you buy a few extra 1/4" TRS to XLR Male and 1/4" TRS to XLR Female cables. I'll be very surprised if you don't thank me in two years if you plan on buying any hardware at all. Some of my hardware only accepts XLR cables. Some of my hardware only accepts 1/4" TRS. Some accepts both. It's a huge pain when UPS shows up with my new toy and didn't think about the patchbay connections. If I don't have the connections I need I have to order it, pay shipping costs, and wait. Bla!

On a recent studio move, I'd guess I needed about a dozen of each of these types of connectors.

Don't Underestimate Your Needs

While 48 total jacks on the front may seem extensive, it is not. Do not underestimate how many ins and outs you are going to chew up. We'll get into that in Patchbay Peepshow 201. (My original setup used (4) 96-point patchbays and my system wasn't all THAT elaborate.)

Rack Space?

Since it's quite easy to run out of your standard TRS patchbay channels, a person will chew up quite a bit of rack space in the process if their needs are anything more than minimal as they add more TRS patchbays to their setup. I'd say that rack space is on the cheap end of the scale. (Racks are another thing you should consider making yourself to save exorbitant amounts of money.)

My Opinion: *As I mentioned in the preface, I'm very much against the 1970s Way Of Recording. If you keep your patchbay needs in line, this is the most reliable, least expensive, least time consuming way to get all the benefits of patchbays. If your needs are relatively modest I can't imagine you'd need anything more than a one or two TRS patchbay. Even if your needs expand to a six or seven TRS patchbays, this is still a very reasonable way of sleighing the beast.*

Direct Solder TT Patchbay

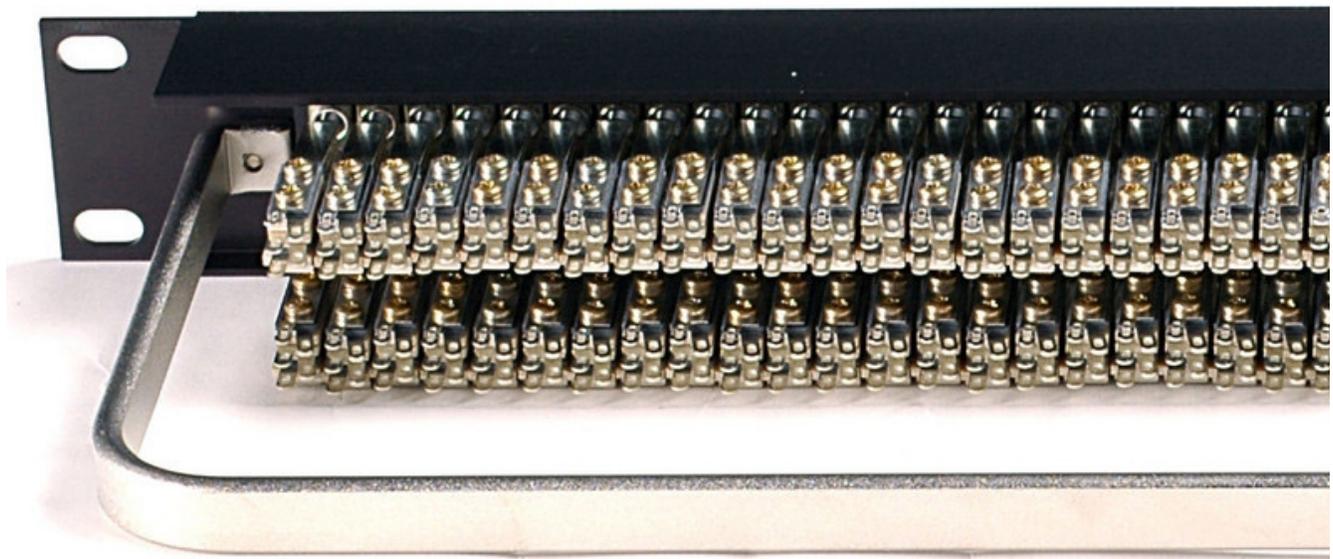


Illustration 6: This is a standard TT Patchbay back side. You must solder your snakes/connectors to it. This particular model has no default normalling. Ahh!!!!



Hosa TTQ105 TRS to TT
Patch Cable

The standard TT connector looks a bit like a 1/4" TRS jack that has been stomped on by an elephant. Okay, that's a bad example. The damn thing is smaller. Work with me here.

The TT-style patchbay usually comes with 48 points per row on two rows for a total of 96 points. You can often find 'em for under \$100 on Ebay, but brand new they start at \$300, give or take. It's not uncommon to see them in the \$500-600 range although I really can't imagine what precious metals they are stuffing in those. With that said, these are mechanical devices and if you used them 10 trillion times they would wear out. The relatively permanent nature of these things does make the prospect of the contacts going bad rather disastrous.

Don't underestimate just how enormous of a job maintenance is. In the pic above they've got the patchbay on some table for us. Imagine it's upside down, in a pile with three other patchbays, the air conditioner is broken, you can't even reach channel #34 without cutting your hand off, there are 10,000 little cables everywhere, your back hurts, you are sweating like crazy, and you ran out of cuss words three hours ago. In short, I feel maintenance is a job too many underestimate. SMILEY.

If you are going to go BIG and need every little potential point in your mostly analog studio connected to a patchbay, TT is the only way to go. I went the TRS patchbay route and it wasn't even 10 months later that I moved up to a much more elaborate system to go with my console

You'll notice that TT patchbays have no 1/4" TRS connections in the back. They don't have XLR connections, either. In most cases, you get 3 hunks of metal for each point. What would you do with those?

Well, one way is to solder the three leads from a balanced cable directly to it. You can then put a 1/4" TRS jack, XLR male, XLR female, or whatever you want on the

other end. This almost always requires a very custom setup and that means labor is going to come at a cost. To purchase prebuilt patchbay with pre-wired snakes is a fortune and they go for nothing on Ebay used. It's hard to see if your long-term needs would be met by a used custom version.

Having double the I/O in one rack space without the need for 1/4" and XLR connectors going into the patchbay is going to save you rack space. This is generally only an issue for those with an epic amount of hardware.

Pros:

- Doubles the inputs per 1U of rack space when compared to TRS.
- Skipping the need for connectors in the back of the patchbay can save big bucks.
- Used prices are very reasonable

Cons:

- Requires TT patch cables which aren't cheap to purchase. You'll be shocked by the prices.
- DIY TT cables are very expensive. I tried making my own but for 2 TT connectors, it cost \$12. That was the cheapest I found. Ouch!
- Direct soldering isn't for everyone. It takes a lot of time. A person must be good at soldering and have all the correct tools.
- Costs a fortune if a custom solution is purchased brand new
- While required direct soldering makes TT great for more "permanent" setups. There isn't any room to experiment and figure out what you prefer. Moving your setup will be a nightmare as cable lengths have to be adequate for your move.
- You will change your setup. You will be up a creek.
- If a solder joint breaks it's an absolute nightmare to get that patchbay out unless you were smart enough to leave plenty of slack in your snakes.

TT Conclusion: DON'T EVER FREAKIN' DO THIS!!

If there is even a 1% chance that your system will change in the next 10 years, do not utilize a permanent TT system where your TRS and XLR cables are wired directly to the patchbay.

Repeat: Never EVER EVER EVER EVER go this route.

DB25 TT Patchbay

The db25 TT really falls under the TT category, but I felt obligated to mention it as a totally different "style" of patchbay. Instead of utilizing direct-to-patchbay soldering, db25 patchbays require zero soldering in the back....sorta. You simply plug in a snake with a the little jack that looks like a printer from 1995 and go. Without a doubt, this is the fastest, easiest, and most flexible patchbay system for *elaborate* studio setups.



Illustration 7: Here's the back of the Redco TT/DB25.

The db25 patchbays ain't cheap (rarely going for under \$500) and an 8-channel snake will run you about \$100 on Ebay. So you are looking at a robo investment to go this route if you aren't making your own cables. You can make an 8-channel snake yourself for less than \$1 for connectors and \$2/ft for the cable (covering all 8 channels). Just keep in mind that soldering these things is a bit tedious. Then again, it's not like soldering directly to a patchbay ISN'T tedious.

Big, Damn Deal: The difference between a direct-solder TT patchbay and a

DB25 patchbay is you have the ability to adapt your system to a new workflow. I can't tell you how important it is for you to be able to adapt. Your gear, views, and uses will change. No doubt about it. I'd imagine that no one has gotten it right the first time.

Example1: As is, my API 3124 and Wunder PaFour outputs flow through an 8 channel snake with the appropriate XLR outs on one end and a db25 connector on the other. If I decide I hate external preamps and want to become a hardware synth recluse, I can simply pull out the db25 connector going to patchbay inputs 1-8 and plug in the db25 connector from my synth snake. Now my synths show up (normalled) on Channels 1-8 on the board. Done! Great!

Example2: I expected my console to sound awesome for analog summing when designing my patchbay. I had 24 channels flowing from DA converters to the 1-8, 9-16, and 17-24 on the console. The default setup for analog summing with the mixer was a pain in tracking. I had to manually patch in every single preamp when tracking and I HATED this. I decide I wasn't hearing the benefits of analog summing in my situation.

I pulled out the from-DA-converters db25 snakes flowing to the console inputs (1-8, 9-16, and 17-24) and switch over to preamps being normalled to the console. In English, I set the console up to be ready for tracking by default instead of ready for mixing. It meant swapping out three sets of dB25 connectors. No big deal.

Example3: I'm no longer using any of the preamps mentioned in Example1.

These options simply do not exist without a crane and wrecking ball if you solder your cables directly to the patchbay. You'll be relying on some rather extreme ability to predict the future. Good luck with that. SMILEY

Pros:

- Zero soldering required to the patchbay
- System is totally modular. Tearing it apart is as simple as unplugging a few old school printer cables (db25). If you change your mind in 2 years, setting up your system is dramatically easier and faster.
- If you move your studio around, it's no big deal to unplug your snakes.
- Maintenance is dramatically simplified since you can unplug all the snakes, pull out the patchbay and work on it on your workbench.
- The fastest, easiest way to put together an *elaborate* patchbay system
- For the bold DIY type, the time-consuming dB25 snake soldering allows you a chance to fly through your DVD collection and will save you big bucks.

Cons:

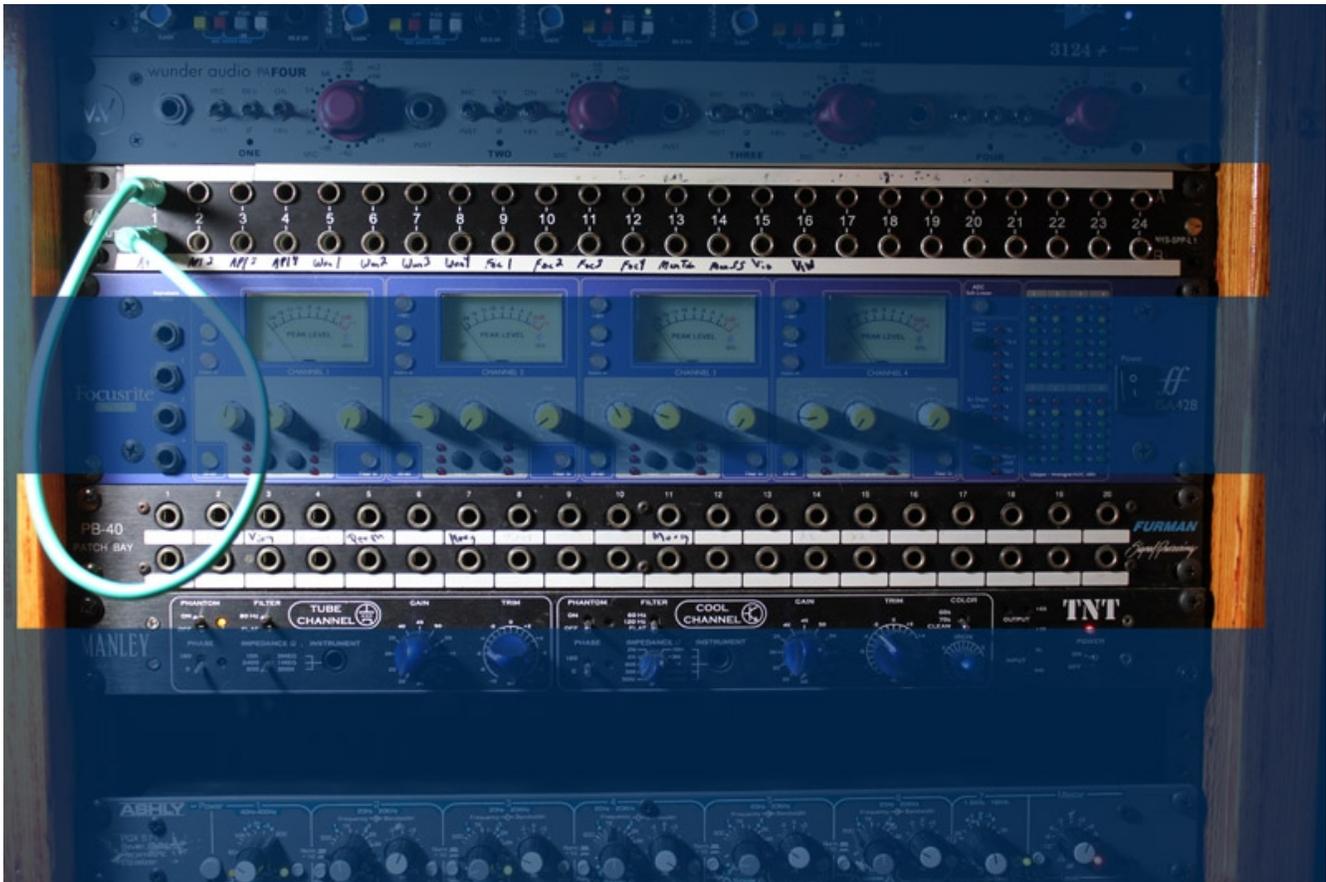
- Extremely expensive to purchase the patchbay and the cables.
- Creating snakes with the db25 connectors is a bit tedious as you are working within tight spaces. It's not impossible, but it is a step up in the difficulty department when compared to the other patchbays and connectors.
- You will pay heavily for store-purchased db25 snakes. The db25 method generally makes the most sense to people building their own snakes because the price is quite reasonable even if the labor requirements are not.

Patchbay Maintenance

I knew changing out patchbays would be a pain. I dramatically underestimated how monumental of a challenge this is in an elaborate console system. The way I first did it (wrong), I simply can't pull out one patchbay to work on it. Those heavy snakes are entangled in ways that make this impossible. That's the bummer of having 4 TT patchbays! Even worse, if you pull a little too hard on a stuck snake, you may break a solder joint. Soldering a patchbay within the rack is about like working on the Hubble Telescope (based on all my experience in space). I hope you have an astronaut suit!

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. Yes, that's the formal definition of a high end preamp. The patchbay is maybe 2"-3" deep. I had a JP-8080 synth flowing to the top of 1-2 in the bottom patchbay, 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.

For The DIY Guy

Additional Costs

I grossly underestimated the cost and time that goes into putting together my audio snakes. Gross is an understatement as well. It would be like saying the Vietnam War was "unideal". I think the FUBAR term fits better in this case.

It's easy to be misled by the price tag of used patchbays, particularly in the TRS variety. You can definitely snag a full functional patchbay used for \$20 plus shipping. If you use all the I/O (inputs/outputs) for that patchbay, you'll need 48 TRS jacks just on the patchbay end (inside the rack). Assuming you are used to dealing with 1/4" TRS on the other side, you are looking at another 48 TRS jacks. (This can happen, but rarely does.) That's 96. The cheapest I've found TRS jacks is \$1.30 a piece. That gets us in the \$120+ range and doesn't factor in the cable or what's on the other side of that cable. A 24-channel snake will run a person a good \$4 per foot. In this case, remember we need to get to the patchbay and back out of it to wherever we are going. So if you need one 10-foot snake, you may actually need two (depending on what you are up to).

All of this is assuming you are cutting costs by several orders of magnitude and doing the snake wiring yourself. Buying these snakes is....well, I don't want to even think about that.

A Return To The White Coat Days

Ever see pictures of the 1950s when an audio engineer wore a white coat as if he was a nuclear engineer? Well, guess what. That's you! When it comes to patchbays, I don't think you can buy an over the counter solution, unfortunately.....at least not completely. There is no automatic, preset setup that will just work well. You will have very specific needs and in order to address those, you will most likely need to do it yourself. That's why I wrote Patchbay Peepshow 201 to cover the 10 Laws Of Patchbay design.

Commercial products will save you time. There are reasons that db25 snakes are so expensive. One of those is probably due to the fact that they are worth it. I know they are a pain to make. Looking back I wish I would have been writing and recording songs instead of doing all that wiring.

I'm a bit nerdy, but for the most part, I've found the process to be fairly therapeutic. I didn't plan on blowing 14 freakin' days stripping wires and making my room smell like a Catholic church, but there is something to chilling out and

building stuff that I rarely get to partake in. For what it's worth, my original patchbay system was comprehensive. Most of you could do what you needed in a tiny fraction of the time.

On second thought, that's 14 days of work I missed. With the cash I spent I could have taken the old lady on a nice vacation. A much simpler patchbay would have used a fraction of the time and money and may have benefited my life quite a bit more.

Tools To Invest In

There are some things you'll want to invest in:

- A 30 watt soldering iron. I've had great luck with the [Stahl Tools SSVT Variable Temperature Soldering Station](#). I've not had great luck with cheapo \$5 soldering irons so I do recommend spending a little extra.
- [Dual Helping Hands](#) with Magnifier - The coolest thing on Earth. I'd get two.
- Plenty of solder (not all solder is created equal so do your homework)
- Wire strippers with 26 GA ability. (26 gauge is a tiny wire and that's exactly what you'll need for quite a few audio applications.)
- Cheapo Vice grips
- Small pair of needle-nose pliers with curved tip
- A larger needle-nose pair of pliers
- Cable ties
- Every DVD you own handy
- \$10 lamp that allows you direct light down onto a table.

Most of this stuff any self-respecting, insensitive male is going to have on hand. If you don't, you should rethink your life. SMILEY That's another topic. Regardless, hopping into doing your own soldiering work is straight forward, relatively simple, will pay for itself in 2 movies (you'll see in a minute), and you'll come out with the confidence that comes from understanding things on a deeper level. Okay, screw the last part. It's cheaper and better. 'Nuf said. It's just going to chew up time.

So How Long Does It Take To Make A Snake?

From my random notes:

As I've been doing this patchbay mess for 12 days now, I'm a little bit more adept. My buddy/bandmate, came over to help last night. He's a fast learner, but probably wasn't exactly sure what solder even was before last night.

We watched Casino, a 90-minute documentary about the naughty film industry, and then a 45-minute thing on the mind of a serial killer. In that time, he took a 20-channel snake, stripped both ends, tinned them, and soldered female (non-pin) XLR jacks to one side. All that will be needed is to solder the other side of those leads directly to my patchbay. I can do that with an additional 20-30 minutes. So, this 20-channel snake took two dudes a little a little over 2 long movies.

Just for context, this one snake will be used as both the send and return for my compressors and other misc hardware on Rack Left. In the grand scheme of things, it's a very small percentage of my total setup.

Note: Watch movies you've seen enough times where you don't have to look up often.

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.

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. This stuff is covered in depth in Patchbay Peepshow 201. It may not be overly intuitive to place Aux Send outputs on the same patchbay as your Preamp Outs, but you may have to choose between that and buying another patchbay.

Order 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.

Designation Strips

I'm not sure who these sick scumbags 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 Swithcraft patchbay and you can't find the freaking clear plastic label holders, you may want to search under the elusive term "designation strip".

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. (That'll be more obvious in Patchbay Peepshow 201.) 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 patchbays and a whole lot can go wrong with that.

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 of 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.

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. 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 and don't feel impaired in the slightest bit.

While this is getting beyond the scope of the book a bit, be skeptical of nearly every convention in recording land. The 1970s Recording Studio doesn't sound automatically awesome. That's a BS myth. Talented people sound awesome. I recommend you find specific hardware tools if you feel the plugins have shortcomings in achieving your sonic vision. Demand audio clips of anything that's going to require massive infrastructure to pull off.

If you agree with my sonic tastes, you'll save a fortune on gear. If you don't, you can always expand into analog hardware as you see fit. Since you already have patchbay experience, you'll know what to expect in the additional infrastructure costs and won't view the summing price as simply the summing box and DA converters.

Patchbay Peepshow 201

I hope you've enjoyed Patchbay Peepshow 101. I generally try to stuff more fun into my writing, but it's pretty damn difficult to make a patchbay read like a guy slipping on a banana or those people bouncing down the ship in that nightmare known as Titanic.

I've created the 10 Laws Of Patchbay Design and stuff them along with multiple builds for radically different studios (including my own) in Patchbay Peepshow 201. I wish I could go back in time and give myself [Patchbay Peepshow 201](#). It would have saved me thousands of dollars and hundreds of hours of time.

Take a look at [Patchbay Peepshow 201](#).