

EDUCATION-CONVERSATION-INSPIRATION

A FEW HAPPY EGNATER FANS

Joe Perry (Aerosmith)	Dan Donegan (Disturbed)
Bruce Kulick (Kiss)	Wireworks Studios (Michael Wagner)
Larry Rolando (Nashville studio musician)	Phil Collen (Def Leppard)
Doug Wimbush (Spyro Gyra)	John Kempainen (Black Dahlia Murder)
Steve Vai	Breaking Benjamin
Brent Mason	Tariq Arkoni
Tim Pierce	Brian Monrony (Tom Jones)
Peter Frampton	Anthrax
Dan Huff	George Lynch
Chris Polland (MegaDeath)	Kirk Hammett
Keith Howland (Chicago)	Mudvayne
Randy Jacobs	Muse
Danny Jacobs (Cher)	Sevendust
Andre Cotou (Celine Dion)	Dimebag Darrell
Davey Johnston (Elton John)	Nuno Bettencort
Linkin Park	Bob Seger/Silver Bullet Band
Duffy King	Chris Komozi (Michael Bolton)
John Shanks (Melissa Etheridge/Walt Disney)	Ty Tabor (King's X)
Melissa Etheridge	Doug Pinnick (King's X)
Indigo Girls	Wally Farkas (Galactic Cowboys)
Green Day	Michael Wilton (Queensryche)
Dave Barry (Cher/Janet Jackson)	Ted Nugent

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SESSIONS

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30 YEARS OF INNOVATION

**TECH
TALK**

A roadmap to finding your tone

SESSIONS

EDUCATION-CONVERSATION-INSPIRATION

WATTS VS VOLUME AND OTHER STUFF.....

There is some confusion about the relationship between watts and volume (loudness). There is much discussion about how this many dB is twice as loud as that many and that many dB is double the power and blah blah lot's of techie rambling but no real world explanations. I'll try. Let's say you have a guitar amp with a knob to adjust the power (watts). Now say this amp is 20 watts at its maximum power setting and 1 watt at the lowest knob position. It would be reasonable to assume that 20 watts should be loud enough to play with the band and 1 watt would be whisper volume. Anyone who has had the opportunity to test this theory has found quite the contrary. 20 watts through a reasonably efficient speaker is quite loud. 1 watt through the same speaker is also quite loud.

What's up with that? Have you ever seen the specs for a 12" speaker? A typical guitar speaker will produce about 95 to 100dB at 1 meter (about 3.3ft) with 1 watt of input power. Now put 2 or 4 of that same speaker in a cabinet and the output is even higher. What this is saying is that even with a mere 1 watt of power, that speaker will put out the volume about equal to a person yelling. Obviously not "TV watching" volume. To obtain that whisper volume, you might need

as little as 1/10 of a watt but..... at that low a volume, most guitar speakers start to sound terrible. In addition, there is a phenomenon that occurs with human hearing that is documented by Fletcher and Munson (two really smart guys) that graphs the way we hear things at different volumes. Look it up on the internet. The Fletcher/Munson curves show how our ears, at lower volumes, are less responsive to low and high frequencies. That means the quieter you play, the more we tend to want to boost the bass and treble to compensate for our own hearing. Ever seen the "loudness" contour switch on a home stereo? That is what the switch does. It boosts the treble and bass to make it sound better quiet. On a guitar amp you often find knobs for boosting the low and high end in the power amp section. Typically these controls are called Presence for the high end boost and Resonance or Depth or Density (Egnater) for the low end. At low volumes you typically turn those controls up but the louder you play, the more you find you need to turn them down. Fletcher/Munson again.

Because we make guitar amps with variable power (Rebel) and switchable power (Tourmaster and Modular), we get inquires about this all the time. Often players will use one of our amps and it appears

- 1) Turn the amplifier power off.
- 2) Replace the blown HT/Power tubes fuse.
- 3) Remove all the power tubes
- 4) Turn the amplifier power on and wait 30 seconds.
- 5) Move the STANDBY switch to the PLAY position.
- 6) Wait 30 seconds again and now turn the amp off.
- 7) Remove and recheck the HT/ Powertubes fuse.
- 8) If the fuse is blown, you are screwed. Nothing you can do right now will make it work.... sorry. Hope you brought a backup amp. If the fuse is not blown, one of your power tubes is shorted, which is good news.
- 9) Put one, and only one of the power tubes back in.
- 10) Turn the POWER switch on, wait 30 seconds and now turn the STANDBY on.
- 11) Next POWER and STANDBY off.
- 12) Recheck the HT/Powertubes fuse. If it is not blown, that tube is good. If it is blown, the tube is bad so get rid of it.
- 13) If the fuse is good, leave that tube in and install another one. Same drill, blown fuse=Bad tube, good fuse=Good tube. See the pattern? If you install the tubes one at a time like this, when you put the shorted one in, the fuse will blow. Once you determine

that a tube is, in fact, shorted you have options. If the amp only has two power tubes, you will want to put one of your spare tubes in. Of course you brought them with you right? One note here, I suggest you buy a matched set of four power tubes for your amp. Use two and keep two for the spares. If they are from the same set, you won't need to rebias them and you are good to go. If your amp has four power tubes, you have two choices.

You can get through the show with just two power tubes with somewhat reduced power and headroom and not worry about replacing any tubes. To do this, simply leave in only two of the known good tubes. Install them as one on each end of the row of tubes and leave the center pair out or, put the good pair in the center sockets and leave each end out. Doesn't matter which way.

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absolutely no sound at all, do this:

a. This tells you either the amp or the speakers are dead. Here is a simple and quick speaker test. Get your 9 volt battery that you, of course, have in your emergency kit. Pull the speaker cable end out of your amp and hold it in one hand. Take the 9 volt battery and touch the two battery terminals to the tip and body of the plug simultaneously.

You will hear a fairly loud “thump” noise from your speaker cabinet each time you touch the battery. If you hear the “thump”, you just verified the speakers and speaker cable are good and can be removed from the list of possible problem components. If you don’t hear the “thump” either your cable or your speaker cabinet is at fault. By the way, you can use this same test for your combo amp speakers.

b. A special note is in order here. If you are having the “no or very little sound”, do not...I repeat DO NOT just turn everything up louder or, worse, full up and try to play. This is not an acceptable repair technique. If your speaker cable or cabinet is bad, doing this will quite possibly blow up your tube amp that was probably not broken until you did this. Plus, if you have everything cranked and, by some chance things suddenly start working, you will probably damage your amp, speakers or hearing.

c. Next is the amp itself. First unplug everything from the amp except for the power cord. One very common failure is a shorted power tube. Many amps have a fuse that is dedicated to protecting the power tubes and transformers.

It is usually on the rear panel labeled something like HT or High Voltage or Power Tubes. Remove and inspect this fuse. If it looks burned inside, this is pretty much a sure indication of a shorted power tube. Often a fuse “looks” fine but can still be open (blown).

Learn how to measure continuity with your multimeter and use it to verify if the fuse is open or not. If the fuse reads just a couple of ohms on your meter, it is not blown and power tubes are not likely the problem.. If you get no reading, infinite or a very high ohm reading, it is blown.

If you do have the misfortune of blowing a power tube, which of course will only happen at the most importune time, there is a way out. It does require you carry a couple of extra power tubes and at least four of the correct value HT fuse for your amp. If you do find the fuse is open, your amp will not produce any sound which is why we are talking about this here.

Follow this procedure to get your self out of trouble and back “up and running”:

that the power cut feature doesn’t do much. Please allow me to explain.

Let’s say you are playing an amp at home or in a music store at relatively low volume. Recall what was said earlier about how little power it really takes to get a fairly loud volume. If you’re playing quiet, you might be using even less than 1 watt to obtain the loudness you’re at. If you have a chance, try this on a Rebel. Play fairly quiet and turn the WATTS knob from 20 watts to 1 watt. What do you hear? Very little change! Why? Because at that volume you probably are not even using up 1 watt let alone 20 watts. Sort of like driving a car at 5MPH. It doesn’t matter if the engine is a 100HP or 500HP, you are still only going 5MPH and using very little HP to maintain that speed. Same with your amp. To cruise along at low volume requires very little power (watts). Having the extra horsepower (watts) doesn’t make the amp louder when you play at low to medium volume.

Now try this with your Rebel. Set the power to 20 watts, turn the master full up and turn up the gain knob until you start to hear some distortion. It will be loud. While you’re playing turn the WATTS knob down. You will clearly hear and feel the way less power creates a spongier, lower volume tone. Some players are saying the knob isn’t really cutting the power but is reducing the

headroom. Call it what you will, the result of reducing power is more of a “feel thing” than a volume thing. Ultimately the idea is to set it to where you like the sound and be happy..... play your guitar.

While we’re on the subject of the Rebel, there has been some talk about how, when panning from the 6V6 tubes to the EL84 tubes, the tone difference is not what some expected. It is believed that by simply changing power tubes you can make a Fender (6L6 power tubes) sound like a Marshall (EL34 power tubes) or a Vox (EL84 power tubes).

What you are hearing in the Rebel when you go from 6V6 to EL84 is the real difference in the sound of those two types of tubes. It may not be quite as dramatic as many believe but that is the reality of it. The tonal difference between various types of tubes is more subtle than many believe. A few people have even been disappointed when using the TUBE MIX features because their expectations of what should happen were really not based in fact. The intangible characteristic is the change in “feel” between different types of tubes.

These subtle differences do become more apparent at higher volume when the power tubes are “pushed” a little more into overloading. What you are hearing in the Rebel is “the truth” about power tubes.

SOUND DISPERSION

Ever wonder why your 4x12 cabinet sounds better when you stand off to the side? Did you consider why the pros mic a speaker from the edge instead of in the center?

Ever have people in the audience tell you your guitar tone is really loud and shrill but it sounds great to you onstage? This is a result of the directionality of loudspeakers. Speakers inherently do not project all frequencies equally. As the frequency increases, the dispersion decreases.

In non technical terms, this means the higher you play on your guitar neck, the more directional your sound will be. By nature, speakers tend to be somewhat non-directional at lower frequencies. This means you can stand off to the side of your cabinet and you will hear basically the same bass and lower mids as your audience is hearing right in front of your speakers.

On the other hand, and this is where the trouble starts, higher frequencies tend to “beam” from the speaker. While you are standing off axis from your cabinet (not directly in front of it) you are hearing an even balance of lows, mids and highs and feeling pretty pumped about your awesome tone. Unfortunately, unbeknownst to you, the listeners directly in front of your cabinets are being killed by the high end that is

“beaming”. FYI, contrary to what one might deduce, having more speakers in a 2 by 2 arrangement, as in a 4x12 cabinet compounds the problem and makes the beaming even worse. Next time you play take a moment to walk from side to side and squat down in front of your speakers. You will be amazed at the difference between listening off axis (to the side) and listening on axis (directly in front).

Have you ever seen a band in a small place where you are hearing the stage volume and wonder why the guitars sound so bright? Doesn't that guitar player hear that obnoxious high end? That knucklehead must be deaf!?!? More likely he is standing close to his cabinets and all that high end is just blowing past his/her legs so he/she doesn't even hear it.

OK...so now I've pointed out how we've all been playing for years believing everyone in the crowd thinks our tone is as awesome as we think.....or is it? Great, so what can you do about it? The key is to place your speakers so you are hearing the same thing as everyone else.

If you can get the cabinets far enough behind you, you probably will pretty much hear everything just fine. If that is not possible, try placing the cabinets pointing across the stage sideways instead of forward at the audience. At least then you

IDENTIFYING SPEAKER OR TUBE PROBLEMS

So your band is going on in an hour. You're setting up your gear and something is wrong with your amp... maybe? The following is a systematic troubleshooting guide for when this happens.

1) DON'T PANIC!

Here are the items you should carry with you in case of trouble.

- 1) Spare guitar cables
- 2) Spare speaker cables
- 3) Spare fuses for everything
 - a. Look at the fuse holders on all your gear and get replacement fuses for each one.
- 4) A spare preamp tube and power tubes.
- 5) A new 9 volt battery even if you don't use pedals (you'll see why later)
- 6) A reliable digital multimeter. Doesn't need to be fancy or expensive.
- 7) A small flat blade screwdriver for bias adjustment.
- 8) Band Aids. In case of injury. Has nothing to do with fixing your gear but they sure come in handy when you are bleeding.
- 9) A spare tire for your car. You wouldn't go anywhere without a spare tire would you? Same goes for your gear that you count on to work every time. Stuff goes wrong. If you are pre-

pared, you won't need to freak out.

Your “rig” is just a combination of “sub-systems” consisting of, but not limited to, your guitar, cables, effects, amp and speakers. The trick is to quickly and accurately eliminate each component to narrow the trouble down to one part of the “system”. A systematic approach using process of elimination will quickly tell you which component in your “system” has failed.

SYMPTOM = NO SOUND:

- 1) The first quick check is obviously to make sure everything is securely plugged in and all power indicators are lit on everything and the amp is not in STANDBY. I can't tell you how many times something didn't work simply because a plug was not fully inserted. Also, many amps have a MAIN and an EXTENSION speaker output. Verify you are using the MAIN output first. I've made that mistake myself.
- 2) Accurately verify if everything is absolutely, 100% dead or can you hear some tiny sound (hum, hiss, a little guitar, anything at all) coming from the speakers. This is important information because there are two different approaches to troubleshooting depending on which symptom you encounter.
- 3) If you are sure there is

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• Many loops are designed for line level operation, or at least higher than normal guitar level. Though some floor type and tabletop effects may work, many loops are designed basically for rack mount type effects units, not guitar level floor pedals. You will know an effect is not made for high level if, when you plug it the effect into the loop, you notice distortion and/or a loss of volume. If you do experience a distortion problem with effects, this can often be remedied by reducing the master controls on the channels and increas-

ing the main master setting, if the amp has that capability. There are also units available to change the levels that may help, such as the Ebttech Line Level Shifter. Unfortunately, in the guitar amp world (unlike in the pro-audio world), there is little or no cooperation or dialogue between the amplifier manufacturers and the effects gadget/pedal makers.

Consequently, you may often encounter level compatibility problems that are difficult to remedy without external gadgets (such as the Ebtech box) to make them work properly.

will only be killing your other band members instead of the audience. Chances are you often want to kill the drummer or bass player anyway, right? The best thing you can do is to tilt your cabinets so that they are pointed at your head. I guarantee you will set your controls way different from what you normally do.

There are a number of possible options to combat the beaming problem. A few companies make a solid disc that you install in front of the speakers to help disperse or attenuate the high end.

These discs have met with some success though they do introduce some phasing issues. Also, because there is a solid piece in front of the speaker, if one places a microphone in front of the disc (which happens quite often at shows), it can sound weird because the disc is altering the sound into the mic. There are some other smart people attempting to address the problem.

Most involve using some form of foam piece in front of the speakers. The method we find works best for both live, and when placing a mic in front of the speakers, utilizes a sound absorbing 4" x 1" foam disc placed on the back side of the grill cloth directly in front of the speaker. The discs are made of an acoustical foam material that attenuates the beaming highs instead of blocking them.

I'm always surprised whenever

this subject is discussed and many guitar players make the statement "I hate the way my guitar sounds when I stand in front of my speakers". The answer is not to simply stand off to the side so it only sounds good to you because everyone else is still hearing the sound that you hate. Remember why we play music? It is for others to enjoy.

We should always make a conscious effort to think about what the audience is hearing, too.

On that happy note.....

*Be the one who makes the shovels,
not the one who digs the ditches*
- Ed Kreske

EFFECTS LOOP OVERVIEW

There are two common types of loops on guitar amps, series and parallel. Both are explained below.

SERIES LOOP:

Basically an insert patch point. When an external effect is patched into the series send and return jacks, the path is interrupted and 100% of the signal is routed through the effect. This puts some special demands on the effects unit. It must be essentially transparent, meaning it shouldn't "mess" with your tone.

The input and output levels must be properly set for maximum headroom and lowest noise. Proper setting of the levels can be achieved using the following method:

1. Set your amp/preamp volume levels for normal playing levels. Connect a high quality shielded cable from the series send jack to the effect input.
2. Adjust the effects unit input level to "just peak" while playing your most aggressive licks.
3. Now connect another high quality shielded cable from the effect output to the return jack.
4. Adjust the effects unit output level to match the volume you heard before connecting the return cable. You can check this by pulling the cable in and out of the return jack while playing and verifying there is no substantial volume difference.

This is called "unity gain". A cool "techie" phrase for "you get out what you put in". If your effects gadget does not have level controls, it can be assumed you will get unity gain when plugged in.

PARALLEL LOOP:

This is a more specialized loop. It has the advantage of maintaining your dry signal (it doesn't mess with your tone), while allowing you to mix in the amount of effect you want.

The Egnater parallel loop is a bit different than most. Typically, parallel loops found on most guitar amplifiers have a wet/dry mix control that turns down the dry signal (messing with your tone) while simultaneously turning up the effects level. The Egnater parallel loop is unique in that it never messes with your dry tone. It simply mixes in the amount of effect using the effect knob on the front panel, much like the effects buss on a mixing console. The direct signal remains unaltered and the effects are simply mixed back in.

There are a few basic rules that must be adhered to. This also puts some limitations on the specific uses for the parallel loop:

1. Very important, your effects unit must be set for 100% wet. This means to set the mix levels on the effect so that there is no dry signal passing through the unit. Think of

the mixing console again. You would not want to have any dry signal going through the effects buss because you would then be mixing in not only the effect but also the unwanted dry signal that comes out of the effects unit. This can even be detrimental to your tone because the dry output signal of many effects units is out of phase with the input. Consequently, as you turn up the effects return knob, you may actually be mixing the "icky" out of phase signal back in with your awesome dry signal and...you guessed it...messing with your tone. Often loops on guitar amps are said to "suck tone". This "tone sucking" is more likely caused by improperly setting the effects mix than the loop design.

EFFECT'S LOOPS:

Now let's address the specific uses, advantages, disadvantages and limitations of each type of loop.

1. The series loop, by nature of the fact that it breaks the direct path and processes 100% of the signal, makes it so that essentially any line level gadget will work. You can use echo, reverb, noise reduction, tremolo, equalizers etc. in this loop. Remember to follow the procedure for setting for "unity gain".

ADVANTAGES ARE:

Works fine with just about any effect. No special requirements, other than the "unity gain" settings, are needed.

Basically Plug and Play.

Disadvantage is that your entire signal passes through the effects unit and may... mess with your tone.

The parallel loop, on the other hand, has more limited uses but has the distinct advantage of not messing with your tone in the same way. This loop is ideally suited for what are called "time based effects". This includes echo, reverb, chorus, flanging. These types of effects work in parallel with your direct signal (think about the mixer again).

Now the bad news...remember the dry signal is always present. You cannot use effects that require processing 100% such as equalizers, noise reduction/gates, tremolo or compressor/limiters.

ADVANTAGES ARE:

Doesn't mess with your tone. Disadvantage is the limited uses and may require reprogramming your effects unit for 100% wet.

SPECIAL NOTES:

- A concern is the fact that many multi-effects units have a combination of all of the different effects. This means, using the parallel loop, you must be aware of which effects can and can't be used. For ease of operation, we recommend using the series loop if you intend to use a mix of different "time based" and non-time based effects in one unit.

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