

Tok Tech

Simplifying the technical jargon about music and sound!

Last issue was all about the mixing console (the heart of your sound system), so this time lets take a closer look at amplifiers – the “muscle” of your audio system.

Amplifiers electronically enlarge small, weak audio signals into large (sometimes HUGE) output signals which are then fed to speakers. The small, weak line level signals coming from your mixer or effects units are multiplied many times over by the amplifier until they become strong enough to drive a speaker cone to produce sound by creating pressure waves in the air.

Amplifiers in modern sound systems are usually in a “stereo” format however this is somewhat misleading as they are generally two separate “mono” amplifiers in one casing. One to power “left” side and one to power “right” side speakers – but you can couple them to work together as a single, more powerful amp when required. Amplifier specifications are generally stated as something like 2 x 200W @ 8 ohms – which means that the amp will deliver 2 (one for each “side” of the stereo amp) x 200 watts of power into 2 x 8 ohm speaker loads when those speakers are connected one to each “side”. This is useful when matching speaker power with amp power. REMEMBER if you add more speakers to each “side” of the amp you lower the ohm’s rating and increase the power of the amp!

Now that we know we have two separate mono amps in one box, let’s connect some signals and some speakers – audio signals are fed to the amplifier INPUTS (left and right) via cable; usually with 6.3mm jack plug or 3 pin XLR connections on the rear panel of the amp. Speakers are then connected to the OUTPUT connectors (again, left and right) of the amp – usually a 6.3mm jack or “speakon” type connector which we have discussed in earlier columns. These are high voltage outputs of amplified signal, so take care – turn the amp down to zero before connecting or disconnecting speakers to avoid damage.

Next we need power (240V AC in PNG) to power the amplifier’s circuits and give it the ability to multiply the weak INPUT signals into loud, strong OUTPUT signals to the speakers. Some of the AC power current is used by the amp in this multiplication process.

Choosing the right power amplifier to match your speakers (or vice versa) is critical to good sound systems. **DON’T OVERPOWER OR UNDERPOWER YOUR SPEAKERS.**

Choose an amplifier that matches the power handling capacity of your speakers, with a little power to spare. I like to use a 1.5 times power rating eg. If my speakers are rated at

200W and they are a 4 ohm load (usually written on the back of the speaker) I will choose an amplifier that delivers 300W at 4 ohm load giving me 1.5 times the rated speaker power. This gives me some additional “headroom” and I don’t have to run the amp as hard – just let it cruise along providing plenty of power to the speakers and not overheating.

Underpowering speakers (like using a 50W amp for 200W speakers) will only lead to distortion as you push the amplifier harder to get the desired volume. This kills speakers just as fast as pushing too much power into them!

Make sure you are matching the correct power specification – an amplifier rated at 200W per channel into an 8 ohm speaker load will actually be twice as powerful if you only connect 4 ohm speakers to it (remember Ohm’s Law we looked at in an earlier column?). At 4 ohm load your amplifier will be able to deliver 400W of power to the speakers, so be careful and READ THE MANUAL or at least read the back panel of the amp and speakers to get the proper match before you start to hook up your system.

Since we have two separate amplifiers in the same box in a “stereo” amp, we can actually combine these two amps to make one BIG one via a process called “bridging”. Many amplifiers have a separate “Bridge” output on a single speaker output connector on the back panel. This should only be connected to the speaker load indicated on the amp panel eg. Minimum 4 ohm load. This effectively uses the power of both amplifiers to drive one output AT TWICE THE POWER of the indicated “per side” rating of the amp’s instructions.

I hope this all assists with making good choices when matching you speaker and amplifier power ratings to get a balanced and matched audio system.

We’ll take a look at speakers in our next issue of Tok Tek.

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