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## For best audio performance Use Quality Speakers and Hook Them Up Right

Here's a little about how speakers are rated. Understanding this will help you make an intelligent choice when shopping for them:

Speakers have four important ratings: **Efficiency, Impedance, Max Power Handling and Frequency Response.**

**Efficiency rating** > the speakers' *standardized sound pressure level* or **how loud it can go**. Some speaker manufacturers call this Sensitivity. The rating is in Decibels (dB) and measured at a specific distance from the speaker with a standard amount of power. Generally, you'll see ratings from 86 to 104dB. (Firecrackers or a Garbage Truck generate approx 90dB of sound.)

- The human ear *hears* a 10dB increase as twice as loud. A 96dB speaker will sound twice as loud as an 86dB speaker at the same volume setting.

**Impedance** > is the "Ohms" rating. You need to know the Impedance in order to calculate and match the total Impedance load. Matching the total Impedance with the amplifiers load rating will ensure maximum power delivery while not overloading the amplifier.

- Calculate the total Impedance by dividing the number of *like* speakers into the "Ohms" rating of one speaker. For example, two 8-Ohm speakers connected in parallel (+ to +, - to -) have an Impedance of 4-Ohms. (8-Ohms divided by 2 speakers = 4-Ohms)
- Once the total Impedance is calculated, connect the speakers to the corresponding tap on the jukebox Audio Output Panel.

**Max Power Handling** > how many Watts a speaker can absorb without being damaged. Some speaker manufacturers call this Total Power or Max Power.

- *The total power rating of a speaker does not indicate how loud a speaker can go, it simply indicates how many Watts the speaker can handle before it "blows up."*
- Rock-Ola's standard Peavey system can deliver up to 450 Watts RMS *per channel*.
- If connecting a single speaker to the 8-Ohm tap, it must be able to handle 450 Watts... 8-Ohm speakers connected to the 4-Ohm taps need to be able to handle 225 Watts each... the 2-Ohm taps are 112 Watts for each speaker... etc.
- A speaker's Nominal Power rating is usually ½ of the max power rating.

**Frequency Response** > This is the ability of a speaker to reproduce audio frequencies. Generally the wider the response, the better a speaker will sound. A speaker with a frequency response of 38Hz to 22,000Hz (22kHz) will sound much better than a speaker with a range of 90Hz to 12,000Hz (12kHz).

**Speaker Wire** > Besides using the right speakers for the job, you need to use the correct gauge speaker wire. Speakers draw current the same as any other electrical appliance. A 4-Ohm load will draw close to 8 Amps. You cannot get that amount of current to flow efficiently with 18ga or 16ga "zip cord." The lack of current flow (resistance) will cause a loss of volume. A minimum 14ga, high quality speaker wire should be used.

**When choosing loudspeakers, you want to get the highest Efficiency and widest Frequency Response possible... remembering not to exceed the maximum power.**

In the figure below, the red numbers above the tap show how much power may be delivered to a single 8-Ohm speaker when it's connected to that particular tap. The black numbers above the tap show the impedance.

A common question is "How many and what type of speakers should I use?" The answer depends on how much space you need to fill with sound, the volume level desired, the quality of the sound, the type of speakers you intend to use, etc. To create sound, speakers "vibrate" the air. The more air you vibrate, the more sound you'll get. There are two ways of achieving that. Use several smaller (Peavey Impulse® 652S) speakers or fewer large (12" to 15") speakers. By the way, we highly recommend Peavey's PR® Series Enclosures. They are efficient, can handle a ton of power, cost effective and sound really great.

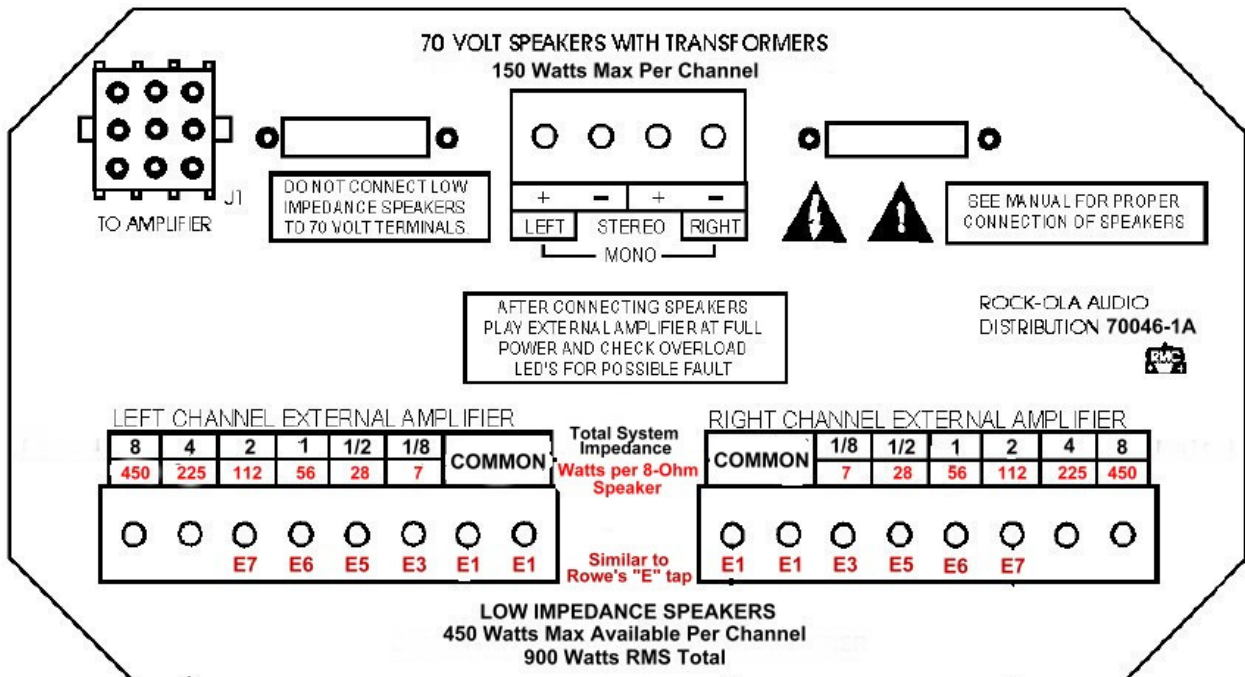
Keep in mind; when fewer speakers are used that means they will likely be mounted farther apart. That will probably create "hot" and "cold" spots. That's why it is preferred to use several smaller speakers placed equidistantly (and away from the corners) in the listening area. That placement will cause the sound to be even in the listening area.

When connecting speakers, normally the goal is to match Impedance. If you were using four 8-Ohm speakers per channel, you would normally connect them to the 2-Ohm tap. However, you must make sure the speakers you're using can handle the power that will be delivered by the amp.

For instance, in the above scenario, you're using MTX brand Model AAL-8 speakers that have a Total Power rating of 100 Watts. The amp will deliver up to 112 Watts if they're connected to the 2-Ohm taps. This may damage the speakers. You have two alternatives. Either connect to a lower tap or get speakers that can handle the power. In this case, lowering the connection to the 1-Ohm tap will deliver up to 56 Watts to each speaker, which just happens to be Nominal Power for the AAL-8's.

Bottom line, there is no "rule of thumb" when installing a sound system... Use common sense and remember that the key to a good sound system is that you "need to move air."

## Audio Distribution Assembly 70046-1A\*



\* This image is intended for training purposes only. It is not an accurate representation of actual equipment. Always refer to the appropriate service documentation for proper equipment use.

**E-Rock PV and Wall Rock PV External Speaker Power Distribution Chart**  
**900 Watt Peavey Amplifier has 2 Channels @ 450 Watts Each**

Use the below charts to determine the correct connections for your speaker installation. This chart is per channel. Speakers are connected in parallel. ( + to +, - to - )

**If connecting 8-Ohm Speakers**

# of 8-Ohm Speakers Per Channel	Connect to Tap	Max Power Delivered to Each Speaker*
1	8	450
2	4	225
3	2	112
4	2	112
5	1	56
6	1	56
7	1	56
8	1	56
9	1/2	28
10	1/2	28
11	1/2	28
12	1/2	28
13	1/2	28
14	1/2	28
15	1/2	28
16	1/2	28

**8-Ohm Power Distribution per Channel**

Transformer Tap	Maximum # of 8-Ohm Speakers Per Channel	Max Watts Per Speaker*
8	1	450
4	2	225
2	4	112
1	8	56
1/2	16	28
1/8	64	7

Note: 70-Volt Taps provide 150 Watts Max per channel

**WARNING:**

\*Be sure the speakers used have the correct Max Power rating for the tap to which they're connected. For example, a speaker rated at 250 Watts peak will be damaged if connected to the 8 tap. Consult your speakers documentation for their particular power specifications.

**If connecting 4-Ohm Speakers**

# of 4-Ohm Speakers Per Channel	Connect to Tap	Max Power Delivered to Each Speaker*
1	4	450
2	2	225
3	1	112
4	1	112
5	1/2	56
6	1/2	56
7	1/2	56
8	1/2	56
9	1/8	14
10	1/8	14
11	1/8	14
12	1/8	14
13	1/8	14
14	1/8	14
15	1/8	14
16	1/8	14

**4-Ohm Power Distribution per Channel**

Transformer Tap	Maximum # of 4-Ohm Speakers Per Channel	Max Watts Per Speaker*
8	Cannot Do	Overload
4	1	450
2	2	225
1	4	112
1/2	8	56
1/8	32	14

Note: 70-Volt Taps provide 150 Watts Max per channel

**WARNING:**

\*Be sure the speakers used have the correct Max Power rating for the tap to which they're connected. For example, a speaker rated at 250 Watts peak will be damaged if connected to the 4 tap. Consult your speakers documentation for their particular power specifications.