Naylor Engineering
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N A Y L O R

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Important Information About Speaker Impedance

Naylor Model	Size	Watts	Magnet	Voice Coil	Impedance
SD1040	10"	40	30 oz	1 ½"	8 Ohms
SD50	12'	50	40 oz	1 ¾"	8 or 16 Ohms

Here is some information to help you when setting up Naylor Speakers or any other speakers for that matter. It's important for the total speaker impedance (or load) to match the output impedance of your amplifier. If you have an output impedance switch on your amp it will make things a lot easier. If not you can still get the total speaker impedance to match your amp if you have the right speaker combination and the right wiring configuration.

Be sure and use good wire for your speaker connections. The size or gage of the wire should be no less than 16AWG.
The smaller the gage number the bigger the wire (14 AWG is larger than 16AWG). Below are some examples of speaker and wiring configurations for various setups.

SERIES WIRING:

Series wiring is a lot like a string of Christmas lights, one bulb right after another. If one bulb fails then all the other lights go out. It's the same with speakers wired in series. If one speaker fails in the circuit the other speakers in the circuit will not receive any power because the complete circuit has been broken.

Total Impedance = R1 + R2 + R3 + ...
For example: *8 Ohm + 8 Ohm   = 16 Ohm.*

If you have mixed impedances you end up with odd impedances.
For example: *8 Ohm + 4 Ohm   = 12 Ohm*
                       4 Ohm + 16 Ohm   = 20 Ohm
                       8 Ohm + 16 Ohm   = 24 Ohm
Most amps will not like odd impedances so always match the speakers to give the correct total impedance (4,8,or 16).

(R1) 8 Ohms   (R2) 8 Ohms

+   −
16 Ohms Total
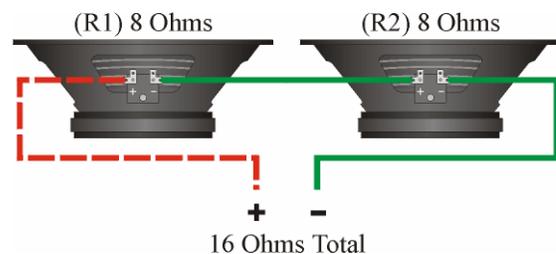
PARALLEL WIRING:

Parallel wiring connects all of the positive terminals together and all of the negative terminals together. If one speaker fails in the circuit all of the other speakers will still receive power because the complete circuit has not been broken.

Total Impedance = (R1 x R2) / (R1 + R2)
For example: *16 Ohm x 16 Ohm   =256 Ohm*
                       16 Ohm + 16 Ohm   =32 Ohm
                       256 Ohm / 32 Ohm   =8 Ohm

You can also quickly figure the total impedance for a parallel circuit if all the speakers in the group are of the same impedance. To do so take the impedance of one of the speakers and divide it by the total number of speakers in the circuit.
For example: *(4) 16 Ohm speakers in parallel would be 16 Ohm / 4 = 4 Ohms.* Once again you should not mix speakers of different impedances, as this will cause the total impedance to be odd.

(R1) 16 Ohms   (R2) 16 Ohms

+
8 Ohms
Total
−

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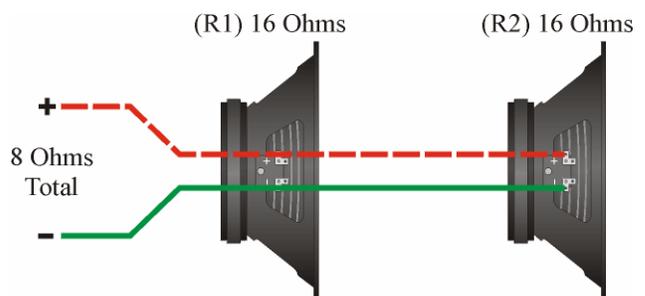
SERIES-PARALLEL WIRING:

Series parallel is a combination of both. If one speaker in the series circuit fails then that circuit is dead but the other series circuit will still have power because it is in parallel to the other series circuit. This type of configuration is most often used in a four-speaker setup such as a 4 X 12 cabinet. The formula is of course a combination of both series and parallel calculations.

For example: *(4) 16 Ohm speakers in a 4 X 12 Cabinet:*

1. Wire two groups of (2) in series.
    (16 Ohm + 16 Ohm = 32 Ohm for each group)

2. Next wire those two groups in parallel.
    Total Impedance = (32 x 32) / (32 + 32)
    32 Ohm x 32 Ohm   = 1024 Ohm
    32 Ohm + 32 Ohm   = 64 Ohm
    1024 Ohm / 64 Ohm   = 16 Ohm Total

(R1) 16 Ohms   +   (R2) 16 Ohms   = 32 Ohms

(R3) 16 Ohms   +   (R4) 16 Ohms   = 32 Ohms

+   −
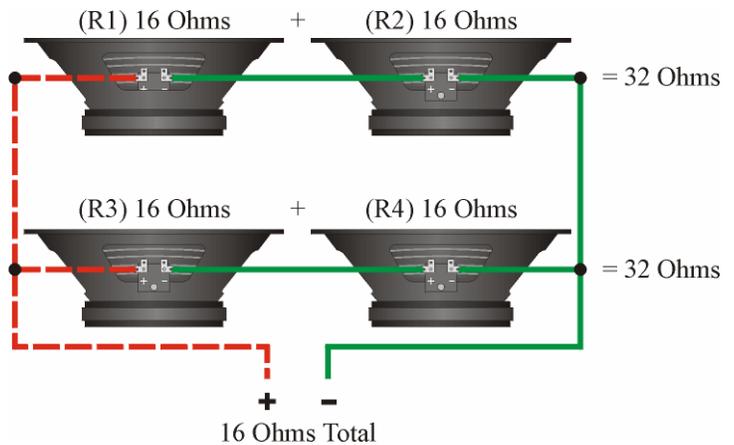
16 Ohms Total

TIPS:

- Remember the total impedance of your speaker setup will change if you have two speaker cabinets plugged into your amp. For example a Marshall stack with (2) 16 Ohm 4 X 12 cabinets would be a total impedance of 8 Ohms if you plug both cabinets into <u>parallel</u> output jacks on your amp. In this case you would set the output impedance switch on your amp to 8 Ohms. Check your amps owners manual for details regarding speaker output jacks.

- The tip of a ¼" plug is always positive (+) and the sleeve is always negative (-). Make sure you do not mix these up or your speakers will not be in phase.

+   −   Tip +   Sleeve −

Have Fun and take some time to get things right, you'll be much happier if you do.

If by chance you end up blowing your Naylor speaker we offer re-cone kits that can be used to repair your speaker and will save you from having to by a new one.

Thank You,
David E King
Naylor Engineering

If you have any questions or need assistance, please contact Naylor Engineering at (214) 946-2556 Monday – Friday 9:00 AM - 5:00 PM, CST, or fax us anytime at (214) 943-8862