

Speaker Output Voltage vs Line Resistance

LOOP resistance is the wire resistance to the speaker and back.

16 AWG Wire has a LOOP RESISTANCE of 8 ohms per 1000 ft.

14 AWG Wire has a LOOP RESISTANCE of 5.05 ohms per 1000 ft.

12 AWG Wire has a LOOP RESISTANCE of 3.2 ohms per 1000 ft.

To obtain LOOP resistance:

(Loop length in ft. multiplied by appropriate LOOP RESISTANCE for the selected wire gauge) ÷ 1000

EXAMPLE: Devices at 600ft using 16 AWG: $(600 \times 8) \div 1000 = 4.8$ ohms (approx. 5 ?)

The tables are based on a total load of 50 watts.

Outputs will be higher if the amplifier is not loaded to 50 watts.

25 Volt System:

LOOP Resistance	Actual Speaker output
1 Ohm	86% of rated output
2 Ohm	74% of rated output
3 Ohm	65% of rated output
4 Ohm	57% of rated output
5 Ohm	51% of rated output
6 Ohm	46% of rated output
7 Ohm	41% of rated output
8 Ohm	37% of rated output
9 Ohm	34% of rated output
10 Ohm	31% of rated output

Method for calculating actual output for each speaker.

1. Measure LOOP Resistance
2. Look up "Actual Speaker Output" percentage.
3. Multiply Speaker tapping in watts by this percentage.

Example: Amplifier output with speakers at various tappings totaling 50 W.

LOOP resistance = 4 ohms.

What will be the actual output of each speaker?

Answer: Refer to LOOP resistance column for 4 ? and read across to "Actual Speaker output" column. This shows that each speaker will actually deliver only 57% of its rated output.

Thus a speaker tapped at 1 watt will only deliver 0.57 watts.

70 Volt System:

LOOP Resistance	Actual Speaker output
1 Ohm	98% of rated output
2 Ohm	96% of rated output
3 Ohm	94% of rated output
4 Ohm	92% of rated output
5 Ohm	90% of rated output
6 Ohm	88% of rated output
7 Ohm	86% of rated output
8 Ohm	84% of rated output
9 Ohm	82% of rated output
10 Ohm	80% of rated output

Method for calculating actual output for each speaker.

1. Measure Loop Resistance (= "Z" ohms)
2. Look up "Actual Speaker Output" percentage.
3. Multiply Speaker tapping in watts by this percentage.

Example: Amplifier output with speakers at various tappings totaling 50 W.

LOOP resistance = 4 ohms.

What will be the actual output of each speaker?

Answer: Refer to LOOP resistance column for 4 ? and read across to "Actual Speaker output" column. This shows that each speaker will actually deliver only 92% of its rated output.

Thus a speaker tapped at 1 watt will only deliver 0.92 watts.

The above examples illustrate the advantage of a 70 V speaker system.