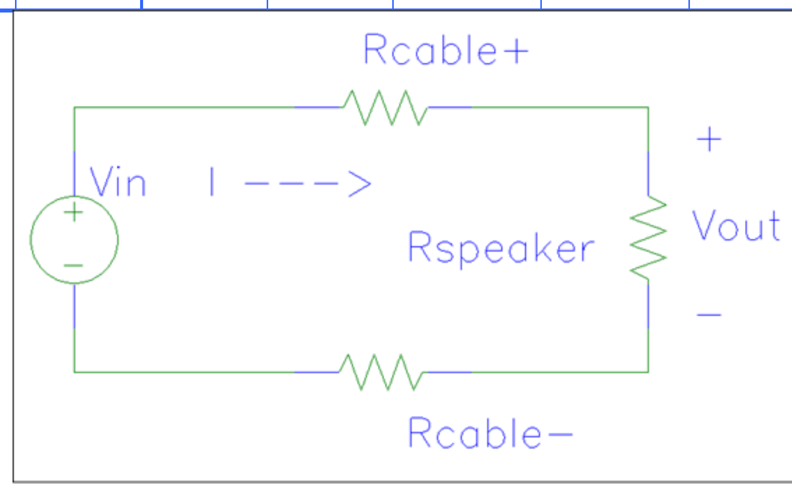
Speaker Cable Transmission Distance as a Function of Conductor Size vs. Loss															
AWG	Power Loss in Cable (% Loss & dB Loss)														
	4 Ohm Speaker					8 Ohm Speaker					70V Speaker				
	1%	5%	11%	21%	50%	1%	5%	11%	21%	50%	1%	5%	11%	21%	50%
	0.04	0.2	0.5	1	3	0.04	0.2	0.5	1	3	0.04	0.2	0.5	1	3
6	22 ft	109 ft	277 ft	571 ft	1930 ft	43 ft	218 ft	554 ft	1141 ft	3859 ft	1058 ft	5338 ft	13580 ft	27965 ft	94548 ft
8	14 ft	69 ft	174 ft	359 ft	1214 ft	27 ft	137 ft	349 ft	718 ft	2428 ft	666 ft	3359 ft	8546 ft	17598 ft	59498 ft
10	9 ft	43 ft	110 ft	226 ft	764 ft	17 ft	86 ft	219 ft	452 ft	1528 ft	419 ft	2114 ft	5377 ft	11072 ft	37434 ft
12	5 ft	27 ft	69 ft	142 ft	480 ft	11 ft	54 ft	138 ft	284 ft	959 ft	263 ft	1327 ft	3376 ft	6952 ft	23505 ft
14	3 ft	17 ft	43 ft	89 ft	302 ft	7 ft	34 ft	87 ft	179 ft	604 ft	166 ft	836 ft	2127 ft	4380 ft	14809 ft
16	2 ft	10 ft	27 ft	55 ft	185 ft	4 ft	21 ft	53 ft	110 ft	371 ft	102 ft	513 ft	1305 ft	2687 ft	9085 ft
18	1 ft	7 ft	17 ft	35 ft	117 ft	3 ft	13 ft	34 ft	69 ft	234 ft	64 ft	323 ft	823 ft	1694 ft	5726 ft
20	1 ft	4 ft	11 ft	22 ft	74 ft	2 ft	8 ft	21 ft	44 ft	147 ft	40 ft	204 ft	518 ft	1068 ft	3610 ft
22	1 ft	3 ft	7 ft	13 ft	46 ft	1 ft	5 ft	13 ft	27 ft	91 ft	25 ft	126 ft	321 ft	661 ft	2234 ft
24	0 ft	2 ft	4 ft	9 ft	29 ft	1 ft	3 ft	8 ft	17 ft	57 ft	16 ft	80 ft	202 ft	417 ft	1409 ft

For simplicity, assumptions include use of tin coated copper conductors at 20C, Minimally compliant DC resistance (ASTM), and a flat response with ideal source, cable, & load. Larger, solid, and/or uncoated conductors will transmit farther than the values presented. Use of an electrical model other than the purely resistive model shown will yield differing results. Performance in any system may vary with frequency. Damping factor, among other considerations, are outside the scope of this table and should be considered if required by the intended application. 70 volt line drive systems, while considered a potential for Hi-Fi performance, follow the same cable loss physics as the higher current (lower impedance) system. For the sake of this calculation, a 25W, 70V system (196 Ohms) was used.

Derivation:
Rc=(Rcable+) + (Rcable-)
Vin = I * (Rs+Rc)
Vo = I * Rs
Vin = Vo/Rs * (Rs+Rc)
Vo/Vin = Rs/(Rs+Rc)
alpha = 20*log(Vo/Vin)
10^(alpha/20) = Rs/(Rs+Rc)
Rs = 10^(alpha/20) * (Rs+Rc)
Rc = Rs * (10^(-alpha/20) - 1)



How to Use the Guide

*70 volt line distributed systems, while potentially as high performance as 4 or 8 Ohm applications, follow the same cable loss physics as the higher current (lower impedance) system. For the sake of this calculation a 25 watt 70 volts system (196Ω impendance) was used.

Step One	Select the appropriate speaker impedance column.
Step Two	Select the appropriate power loss column deemed to be acceptable.
Step Three	Select the applicable wire gauge size and follow the row over to the columns determined in steps one and two. The number listed is the maximum cable run length.
Example	The maximum run for 12 AWG in a 8 Ohm speaker system with 11% or 0.5dB loss if 138 ft.