

WEST PENN WIRE

LoudSpeaker Cable Distances

Yr.2011

AWG	4 Ohm Speaker			8 Ohm Speaker			70V Speaker*		
	Power (%) / Loss (dB)								
	11% 0.5	21% 1	50% 3	11% 0.5	21% 1	50% 3	11% 0.5	21% 1	50% 3
8	360	740	2500	720	1480	4990	17560	36000	122000
10	230	470	1500	460	940	3170	11180	22990	77740
12	140	305	1150	285	610	2285	6920	14890	56000
14	90	195	740	185	395	1480	4490	9650	36300
16	60	125	470	115	250	935	2840	6100	22950
18	40	90	340	85	190	685	2070	4450	16720
20	25	50	195	50	105	390	1170	2520	9500
22	15	35	135	35	70	275	820	1770	6650
24	10	25	85	20	45	170	520	1120	4210

* 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 25 watt 70 volt system (196 Ohms) was used.

COMMERCIAL SPEAKER CABLES (Loadspeakers)

NON-PLENUM CABLES LISTED BELOW

NON PLENUM P.N	DESCRIPTION
224	2 cond. 18 Awg. Unshld
225	2 cond. 16 Awg. Unshld
226	2 cond. 14 Awg. Unshld
227	2 cond. 12 Awg. Unshld

244	4 cond. 18 Awg. Unshld
245	4 cond. 16 Awg. Unshld
246	4 cond. 14 Awg. Unshld
248	4 cond. 12 Awg. Unshld

C210	2 cond. 10 Awg. Unshld Direct Burial
HA210	2 cond. 10 Awg. Unshld CL2 Rated
C208	2 cond. 8 Awg. Unshld

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PLENUM CABLES LISTED BELOW		
PLENUM P.N.		DESCRIPTION
25224B		2 cond. 18 Awg. Unshld Plenum
25225B		2 cond. 16 Awg. Unshld Plenum
25226B		2 cond. 14 Awg. Unshld Plenum
25227B		2 cond. 12 Awg. Unshld Plenum
25246B		4 cond. 14 Awg. Unshld Plenum
25248B		4 cond. 12 Awg. Unshld Plenum
25210		2 cond. 10 Awg. Unshld Plenum

RESIDENTIAL SPEAKER CABLES		
NON-PLENUM CABLES LISTED BELOW		
NON PLENUM P.N.		DESCRIPTION
HA225		2 cond. 16 Awg. Unshld
HA226		2 cond. 14 Awg. Unshld
HA227		2 cond. 12 Awg. Unshld
HA245		4 cond. 16 Awg. Unshld
HA246		4 cond. 14 Awg. Unshld

AWG	DCR/ft	DCR round trip		
8	0.000662	0.001324		
10	0.00104	0.00208		
12	0.00165	0.0033		
14	0.00262	0.00524		
16	0.00419	0.00838		
18	0.00666	0.01332		
20	0.0105	0.021		
22	0.0169	0.0338		
24	0.0267	0.0534		

R _{speaker}	4	8	196
R _{cable} factor			
0.5	0.05925373	0.05925373	0.05925373
1	0.12201845	0.12201845	0.12201845
3	0.41253754	0.41253754	0.41253754

$$10^{(-R_s/-20)}-1$$

To Find the cable distance $4 * \text{factor} (.0593) / \text{loop Res} (.00524) \text{ 12Awg}$

Example: 12 AWG with a 4 ohm load with a .5dB Speaker Resistance.

$$4 * .0593 / .00524 = 45\text{ft.}$$