Getting Started Quickly

Place the loudspeakers at the correct angle
(ITU-R BS.775-1)
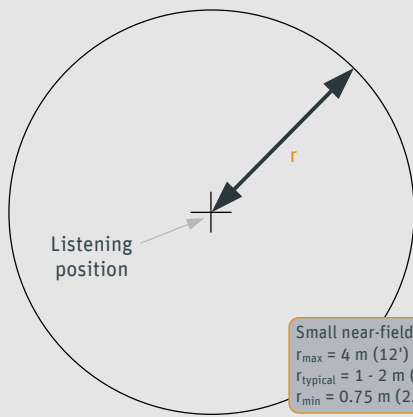
0°
-30° 30°
-100° 100°
-110° 110°
-120° 120°
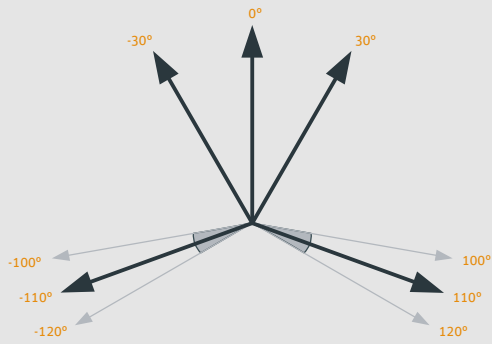
For 2-channel stereo use ±30°

For 7.1 high definition systems
(no international standards)

0°
-30° 30°
-90° 90°
-150° 150°
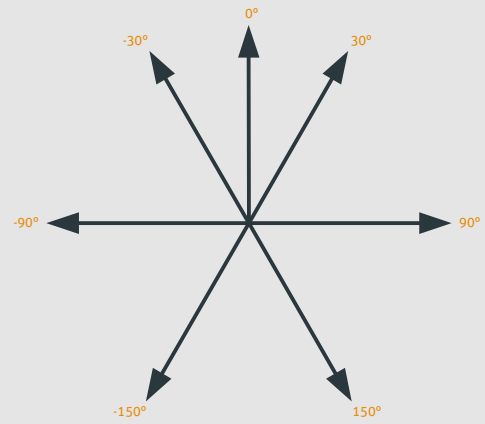
Place the loudspeakers at the same distance

r

Listening position

Small near-field systems:
$r_{max} = 4$ m (12')
$r_{typical} = 1 - 2$ m (3 - 6')
$r_{min} = 0.75$ m (2.5')

Delay closer loudspeakers by 30 µs/cm (76 µs/inch)
Use the furthest loudspeaker as a reference

$$t_{del} = 30 \ \mu s * (r_2 - r_1)$$
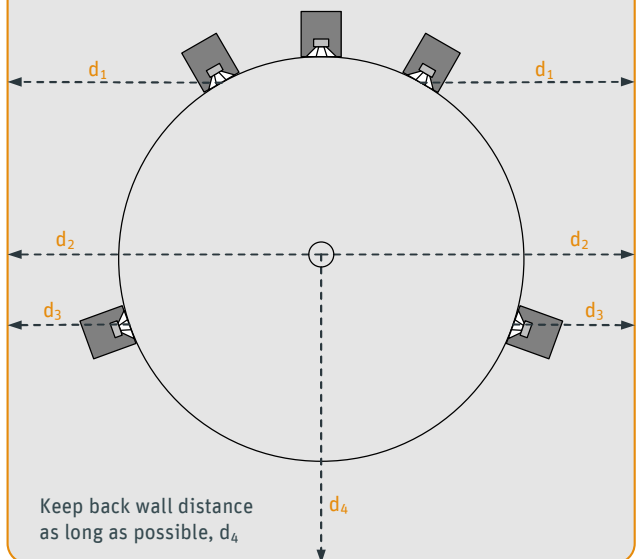
r_{diff}
r_1
r_2
ref
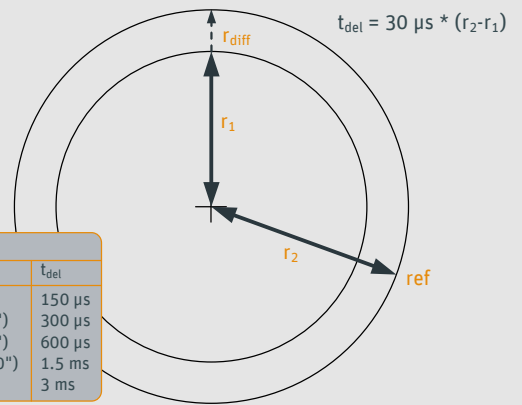
Delays:	
r_{diff}	t_{del}
5 cm (2")	150 µs
10 cm (4")	300 µs
20 cm (8")	600 µs
50 cm (20")	1.5 ms
1 m (3')	3 ms

Horizontal: Point loudspeakers at listening position
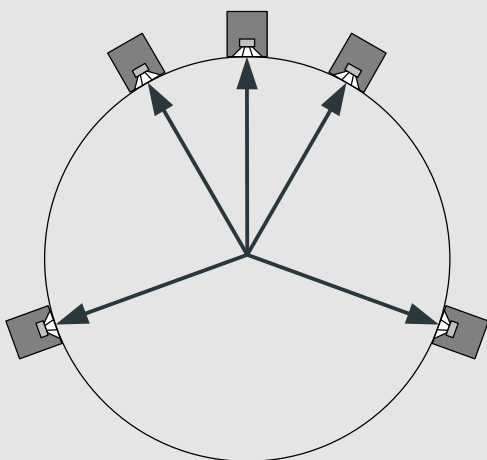
Use the acoustical axis as a reference

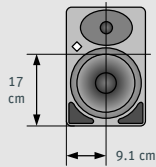## Symmetrical loudspeaker and object placement in the room improves stereo imaging, d_1, d_2, d_3

d_1 d_1
d_2 d_2
d_3 d_3
d_4

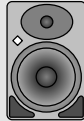Keep back wall distance as long as possible, d_4

Getting Started Quickly

Acoustical axis and cabinet orientation

Use acoustical axis as a reference point

17 cm

9.1 cm

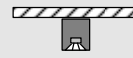Recommended cabinet orientation for a wide usable listening area

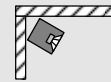Not recommended cabinet orientation, except for fixed listening positions

Acoustical controls

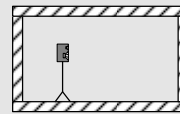| Against a wall | Solid: | Bass = -5 dB |
| | Soft: | Bass = -2.5 dB |

| In a corner | Bass = -7.5 dB |
| | Low-Mid = -1.5 dB |

| Near a desktop | Small: | Low-Mid = -1.5 dB |
| | Large: | Low-Mid = -3 dB |

Free standing	Live:	Treble = -1 dB
		Bass = -2.5 dB
	Dead:	All 0 dB

Distance from the wall

f_n
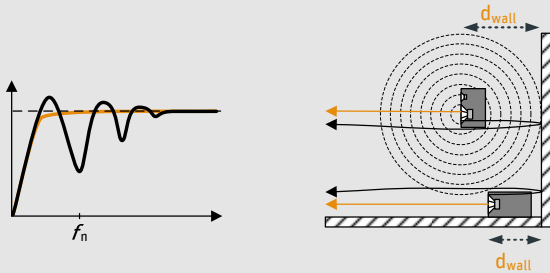
d_{wall}

d_{wall}

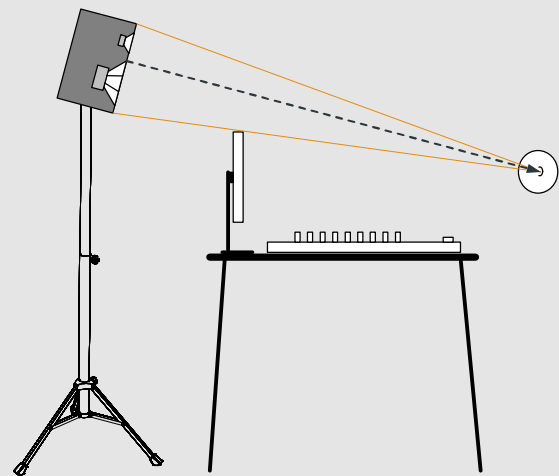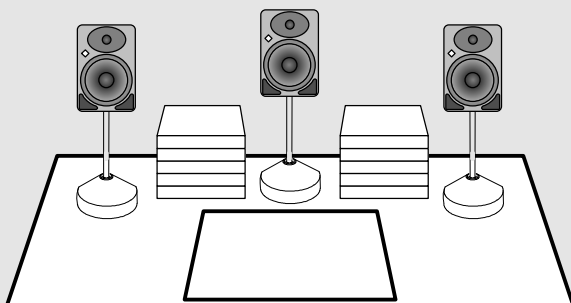| Full Range Loudspeakers | Avoid d_{wall} = 0.8 – 2.0 m |
| Bass Managed Loudspeakers | Avoid d_{wall} = 0.8 – 1.0 m |
| Subwoofers | Avoid d_{wall} = >0.8 m |

Vertical plane: Point the loudspeakers at the listening position.
Avoid objects between the loudspeaker and listening position.

Arranging the desktop: uncluttered and symmetrical

Avoid reflections for a smooth midrange