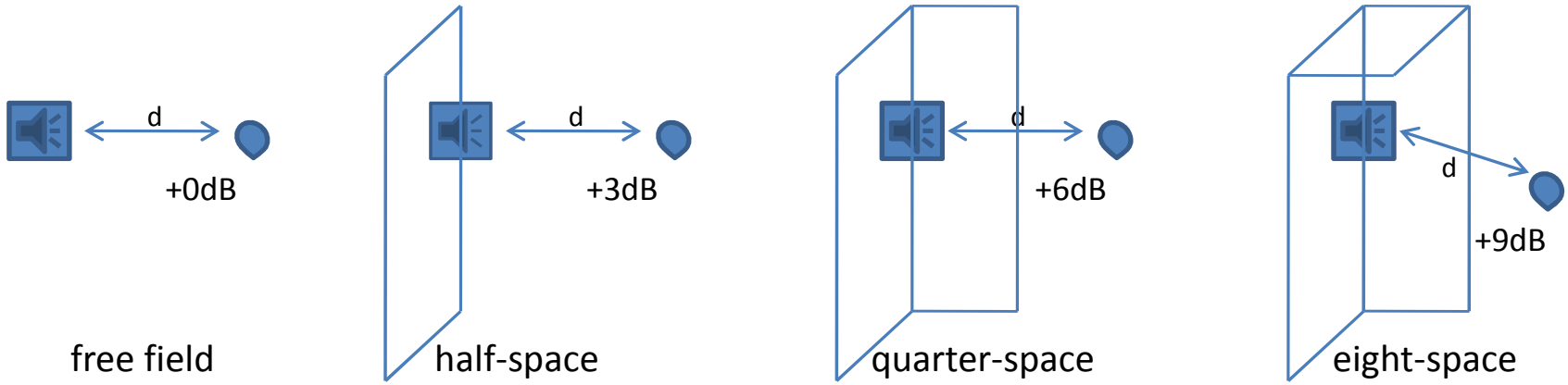
Surround setup in real life implementations

1. Wall mounted vs. Floorstanding speakers

Often rear surround or back speakers are non-floorstanders and thus mounted directly onto the wall resulting in the folowing issues:

1.1. different acoustical behaviour due to :
- Smaller size of the speaker & impact on bass-management
- often higher placement on wall + optional tilting towards listening position

1.2. Boundary condition reflection boost (1 to 3 walls)
=> volume levels must be lowered accordingly (-3, -6, -9dB) for those channels



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1. Wall mounted vs. Floorstanding speakers

1.3. Room dimensions

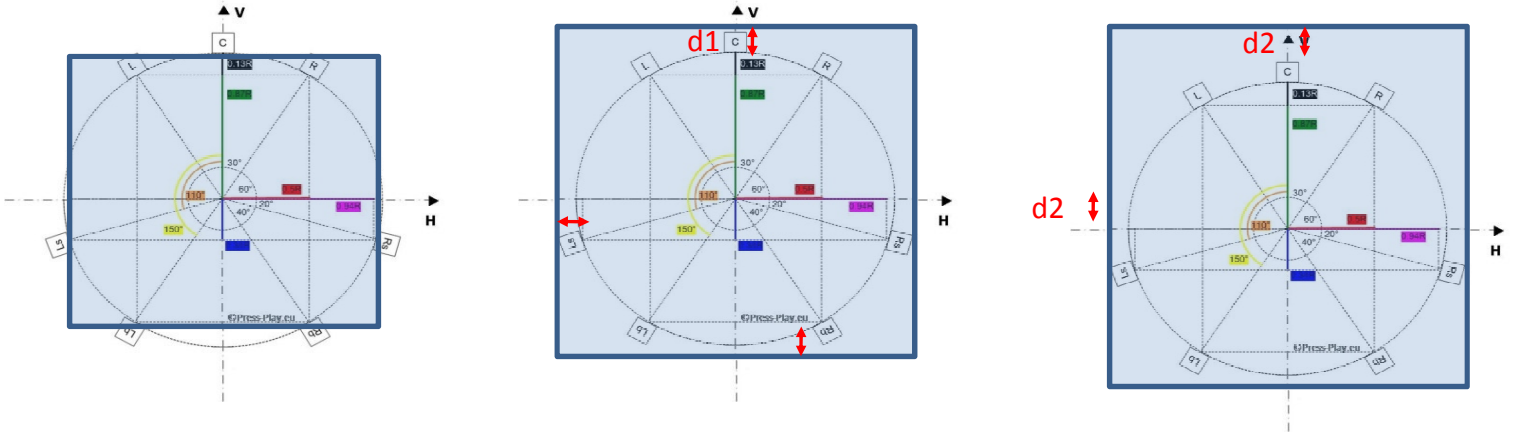
The ITU calibration dircle indicates the minimum room dimensions : the rectangle traced by the frontplate of the speakers.

Here one has to add the depth of each speaker (d1) + the distance towards the wall (d2).

For the front floorstanding (and center) speakers, this additional distance will make the room larger lengthwise.

In case of wall mounted speakers for surround (rear & back) there will be no additional distance and the width stays the same.

This results in a shift of the listening position sweet spot towards the rear.



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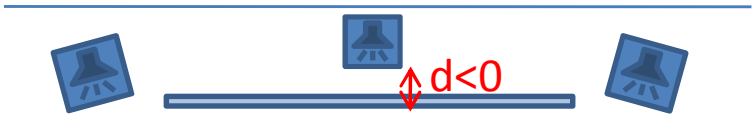
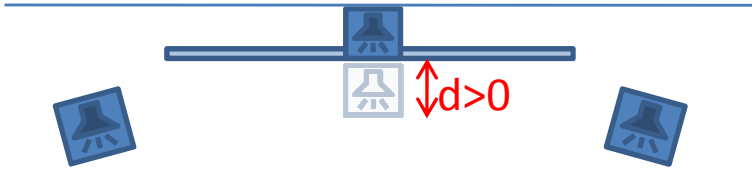
2. Center speaker alignment

2.1 screen depth

= Difference in distance between the front of the center speaker and the viewing plane of the screen (projection, lcd, plasma, tube).



If the center speaker is slightly further away than the front speakers and the screen is aligned to it, the total distance can be increased by adding screen depth to compensate.

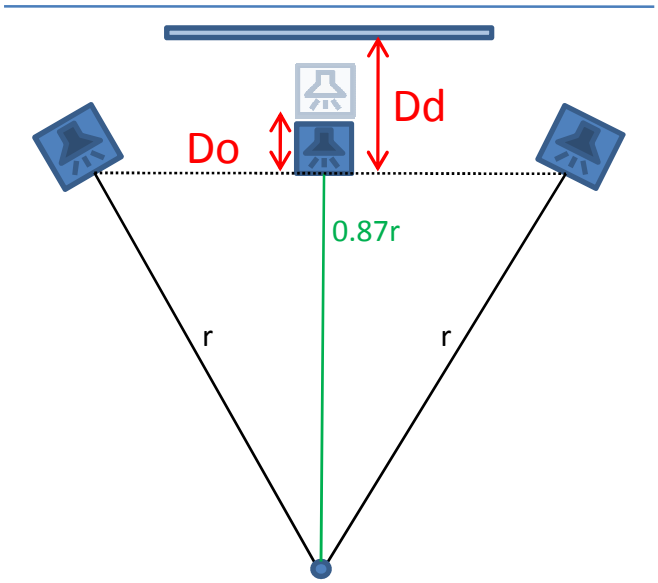


Surround setup in real life implementations

2. Center speaker alignment

2.2 Front speaker line up

When all 3 front speakers are lined up free standing or wall mounted, the center speaker distance will be shorter than the front L&R speakers [offset Do = 0.13r].
When this occurs we need to compensate once again with the screen depth parameter (Dd)



In figure 2 when all front & center speakers are wall mounted, only the offset correction applies as the screen depth compensation is almost irrelevant.

Surround setup in real life implementations

3. Room limitations

3.1. Long narrow rooms

As the ITU radius provides the maximum distance for any speaker in reference to the listening position and the front center speaker:

- The distance to the rear speakers **< =** distance to the front speakers
- When rear speakers have to be placed further to the back of the room (e.g. obstacles), it requires a shift to the rear of the listening position sweet spot (d1) and thus a longer radius (r1), longer front distance and shorter rear distances (r-d2).