



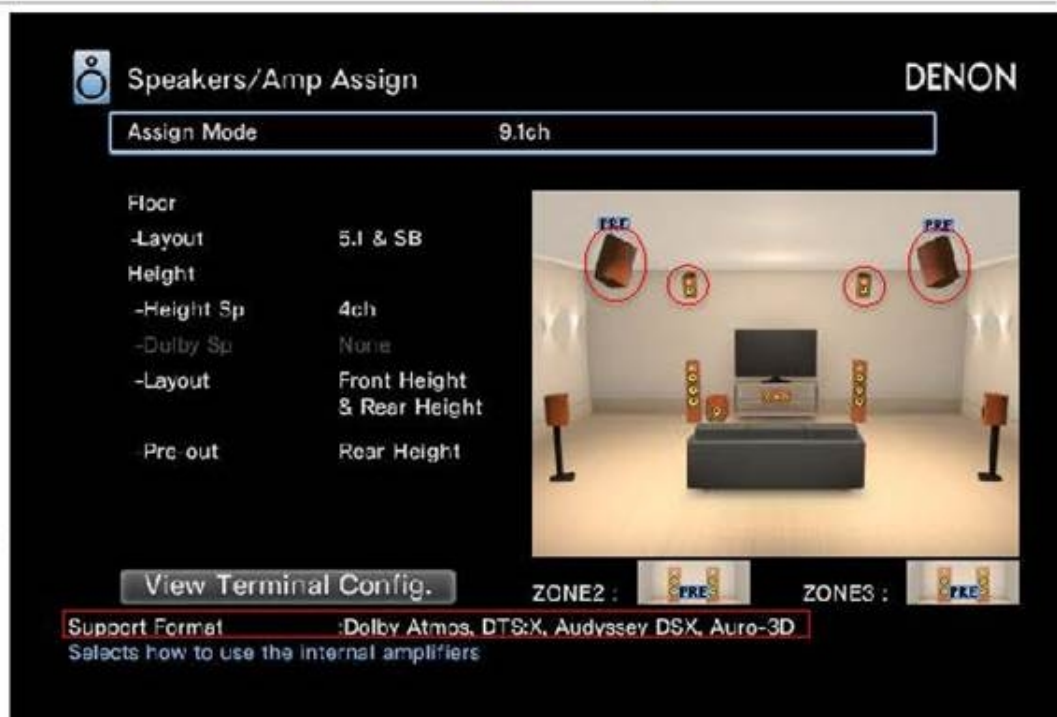
<http://58.64.214.132/wordpress/?p=92868>

Auro-3D Playable with Rear Height speakers

Starting from 2016 , after
DTS:X update ,

AVR-X7200WA ,
AVR-X6200W
AVR-X4200W

Can make use of
Rear Height = Surround Height
and play 5.1.4 Doby Atmos or
5.1.4 DTS:X under 9.1 Auro-
3D set up





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DTS:X

- DTS:X is the next-generation object based audio codec
- New, immersive and interactive listening experiences.
- Simple - Flexible speaker layouts and remapping
- Speakers can be put wherever needed
- Dialog control when defined as an object
- Lossy and Lossless
- Support of up to 11.2 channels
- Backward compatible with DTS HD-Master
- Other than DTS:X material will get up-mixed by DTS Neural:X

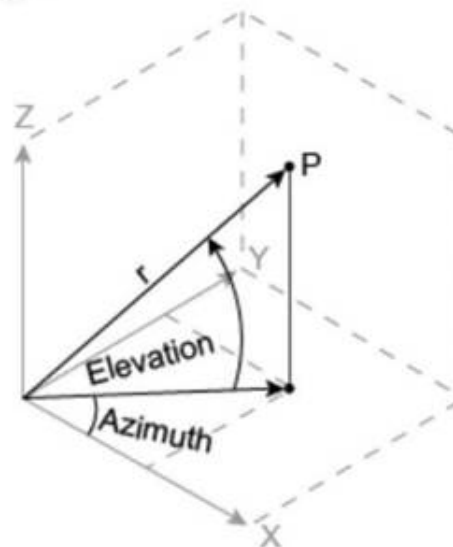


A circular diagram representing the 12-tone chromatic scale. The diagram consists of three concentric circles. The outermost ring contains 12 black diamond-shaped labels: C, Cb, Ch, Rc, R, Rb, Rw, Rh, Rhs/Rim, Rss, Rs, and Rsr. The middle ring contains 12 white diamond-shaped labels: Lh, L, Lb, Lw, Ls, Lsr, Ltr, Lhr, Lts/Ltm, Lss, Lr, and Lrr. The innermost ring contains 12 white square labels: Oh, Ch, Rtf, Rtr, Rhr, Rsr, Chr, Ltr, Lhr, Lts/Ltm, Lss, and Lrr. The diagram is labeled 'LFE 1' at the top left and 'LFE 2' at the top right. A watermark 'POST76 玩樂網' is visible in the center.

DTS :X SPEAKER LAYOUT

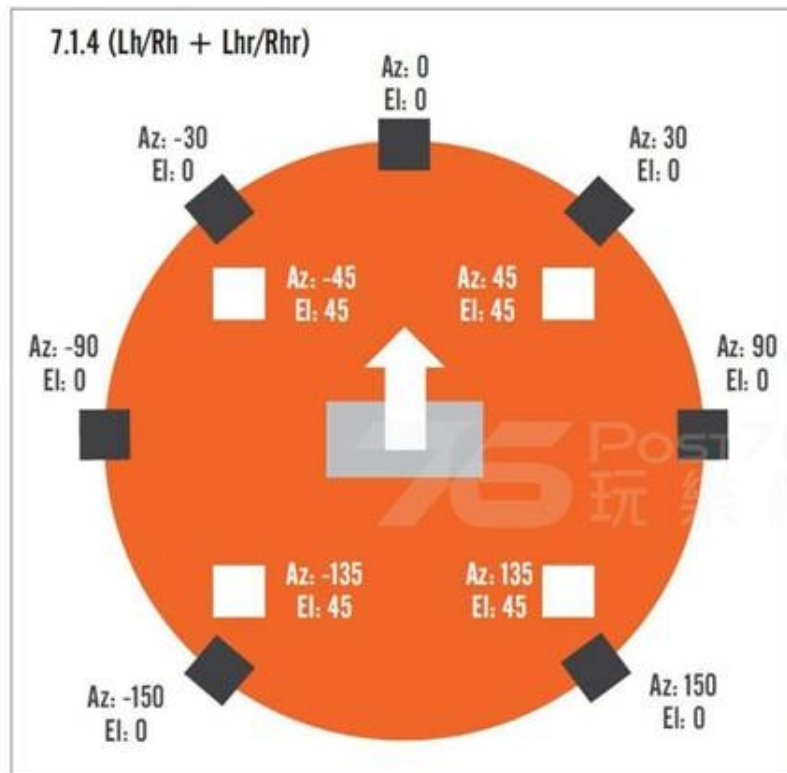
KEY

- **Baseline** - In this case, the baseline is drawn directly from the ideal listening position to the center speaker, which is placed directly in front of the ideal listening position at head height.
- **Horizontal Plane** - In this case, a head height plane that is completely parallel to the ground
- **Azimuth Angle** - a horizontal angle measured clockwise from the baseline.
- **Elevation Angle** – a vertical angle measured upward from the horizontal plane



DTS :X SPEAKER LAYOUT

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Floor speakers are equidistant from center of circle, facing sweet spot.

White speakers are heights. Heights are equidistant from center of circle and are facing sweet spot.

NOTE: All angles are represented on a 360 degree compass with North being 0. To the right are +degrees and to the left are -degrees.



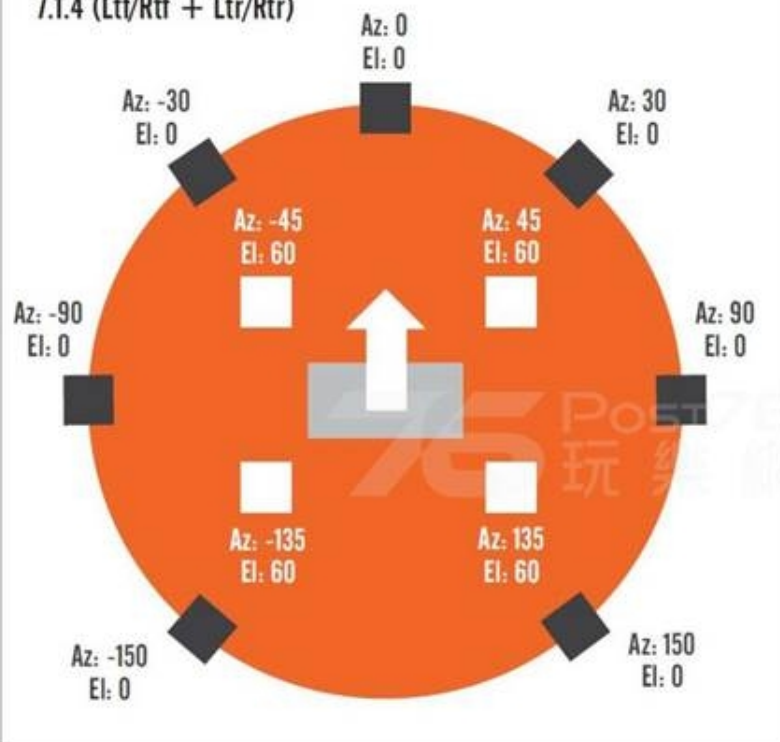
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DTS :X SPEAKER LAYOUT

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7.1.4 (Ltf/Rtf + Ltr/Rtr)



Floor speakers are equidistant from center of circle, facing sweet spot.

White speakers are heights. Heights are equidistant from center of circle and face toward the ground.

NOTE: All angles are represented on a 360 degree compass with North being 0. To the right are +degrees and to the left are -degrees.

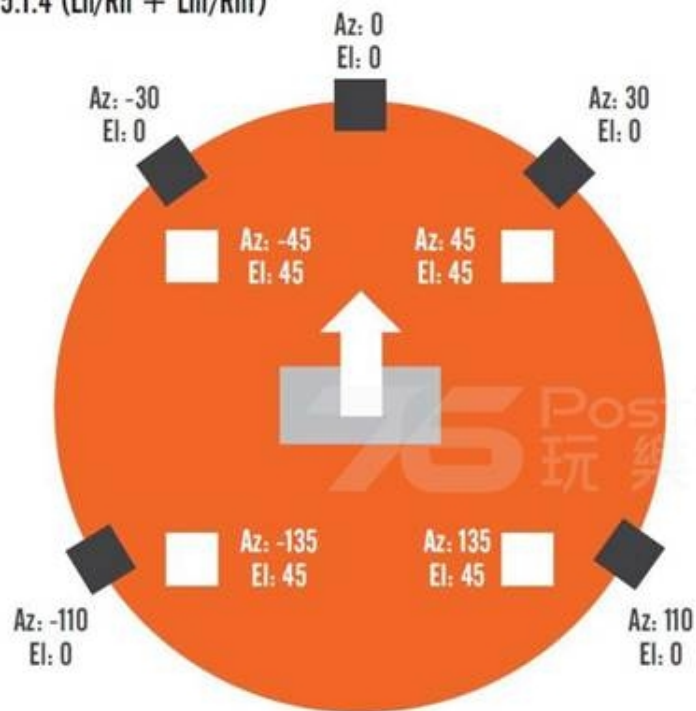


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DTS :X SPEAKER LAYOUT

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5.1.4 (Lh/Rh + Lhr/Rhr)



Floor speakers are equidistant from center of circle, facing sweet spot.

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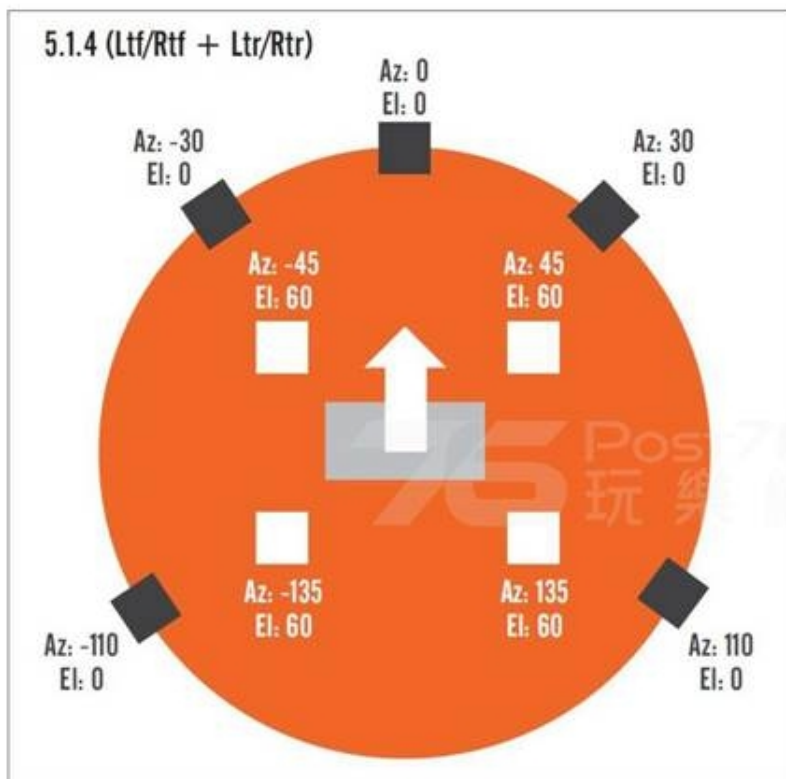


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DTS :X SPEAKER LAYOUT

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5.1.4 (Ltf/Rtf + Ltr/Rtr)



Floor speakers are equidistant from center of circle, facing sweet spot.

White speakers are heights. Heights are equidistant from center of circle and face toward the ground.

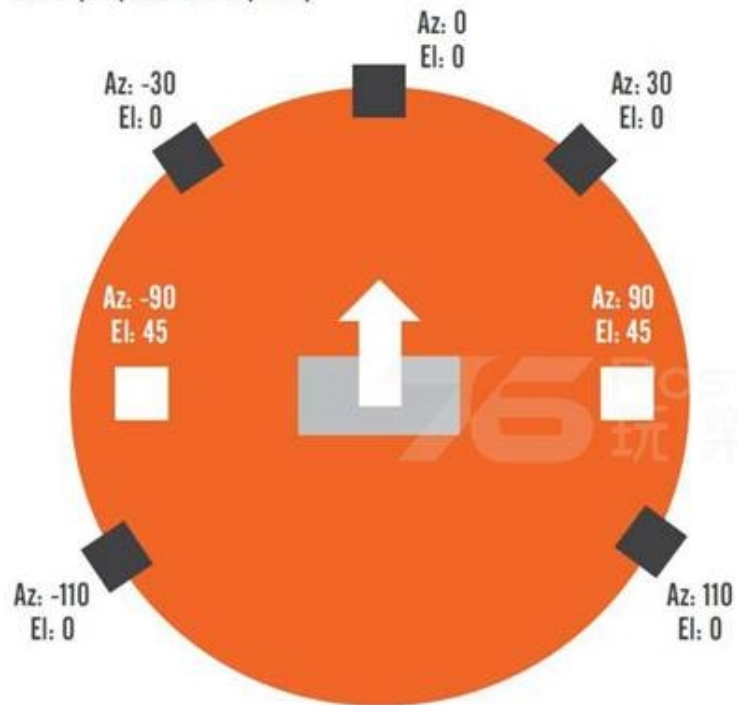
NOTE: All angles are represented on a 360 degree compass with North being 0. To the right are +degrees and to the left are -degrees.



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DTS :X SPEAKER LAYOUT

5.1.2 (Lhs/Rhs or Ltm/Rtm)



Floor speakers are equidistant from center of circle, facing sweet spot.

White speakers are heights. Heights are equidistant from center of circle and are facing sweet spot or facing the ground.

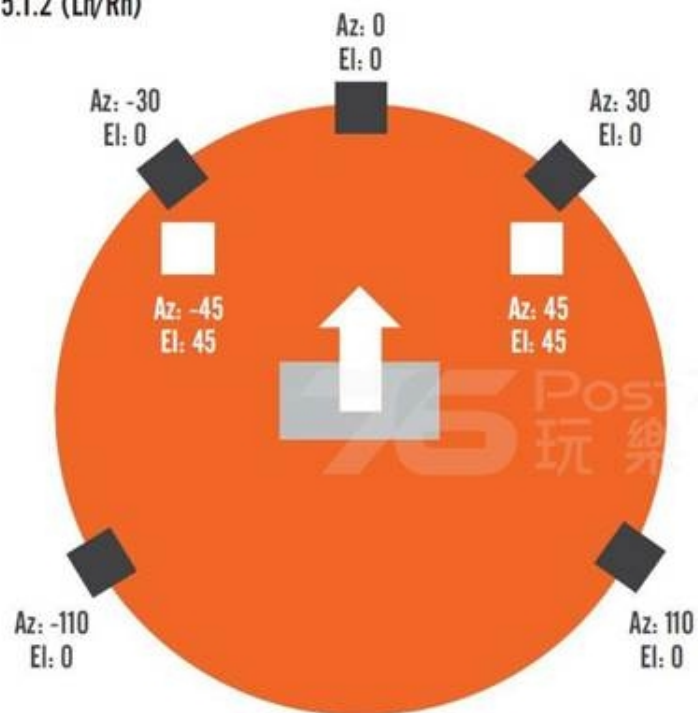
NOTE: All angles are represented on a 360 degree compass with North being 0. To the right are +degrees and to the left are -degrees.



DTS :X SPEAKER LAYOUT

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5.1.2 (Lh/Rh)



Floor speakers are equidistant from center of circle, facing sweet spot.

White speakers are heights. Heights are equidistant from center of circle and are facing sweet spot.

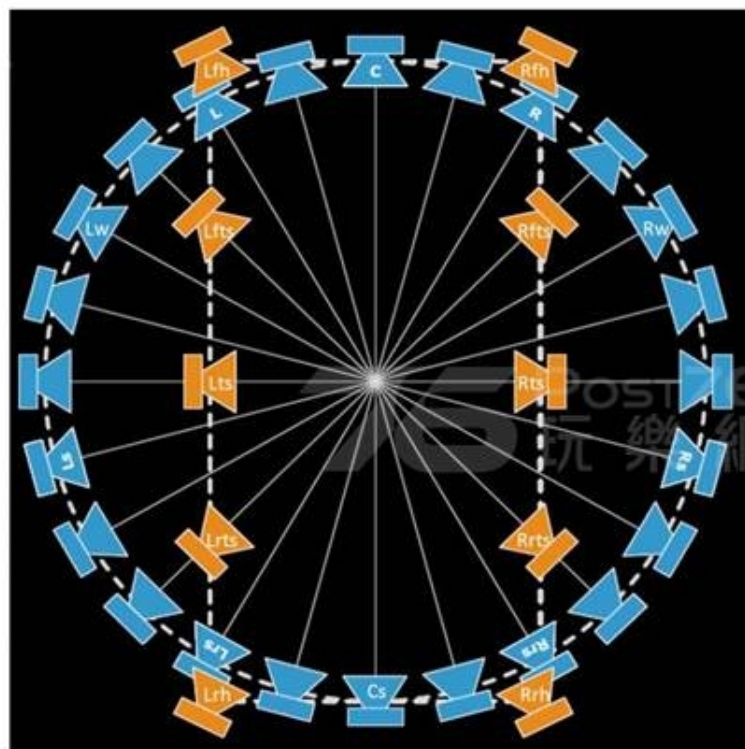
NOTE: All angles are represented on a 360 degree compass with North being 0. To the right are +degrees and to the left are -degrees.



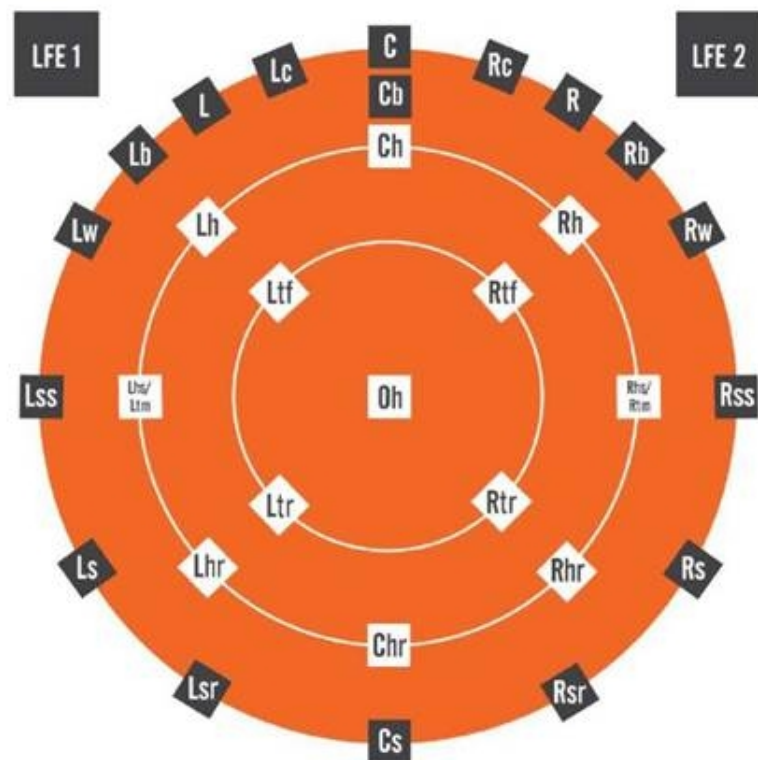
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DOLBY ATMOS VS DTS:X

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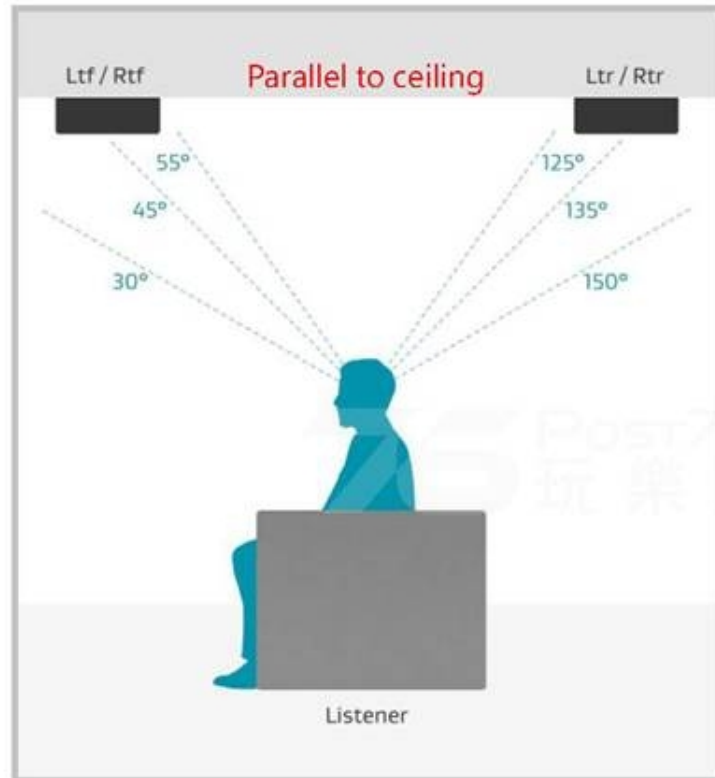
Dolby Atmos 24.1.10



DTS:X 30.2 76 POST76
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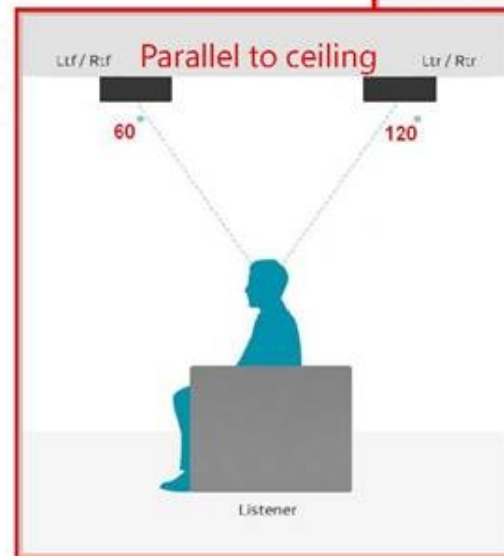
DOLBY ATMOS VS DTS:X

7.1.4 / 5.1.4



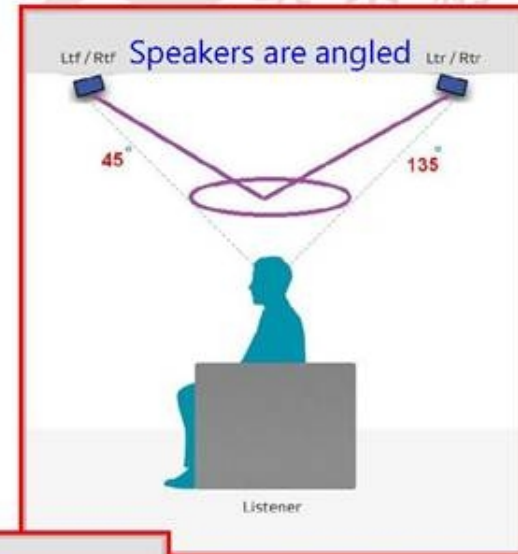
Dolby Atmos
Over Head Speaker angle

7.1.4 / 5.1.4



DTS:X
Over Head
Speaker
angle

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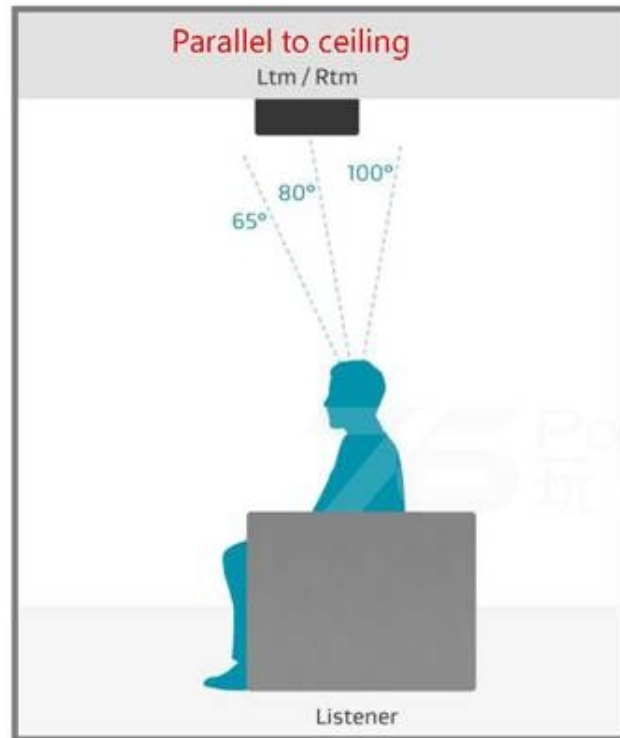
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DOLBY ATMOS VS DTS:X

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Speakers are angled

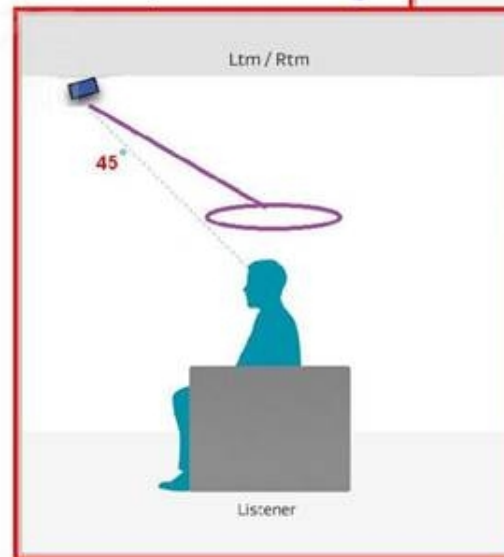
5.1.2



Dolby Atmos
Over Head Speaker angle

5.1.2

Speakers are angled



DTS:X
Over Head
Speaker
angle

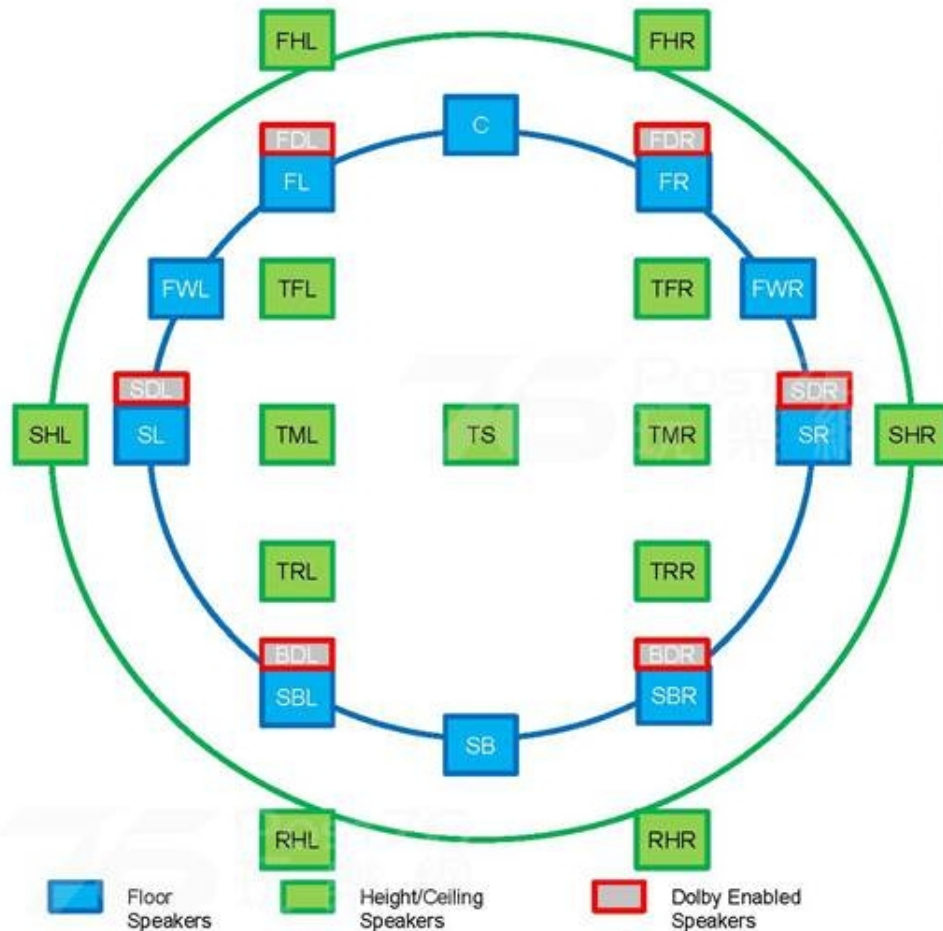
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Sound format vs Speaker Output

SUPPORTED SPEAKERS

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Our Denon models all speakers (exclude top surround) are active when playing DTS:X



Speakers	Dolby Atmos	Auro-3D	DTS:X
Front	✓	✓	✓
Center	✓	✓	✓
Surround	✓	✓	✓
Surround Back	✓		✓
Front Wide	✓		✓
Front Height	✓	✓	✓
Top Front	✓		✓
Top Middle	✓		✓
Top Rear	✓		✓
Rear Height	✓	✓ under negotiation	✓
Surround Height		✓	✓ (Feeds RH)
Top Surround		✓	
Front Dolby	✓		✓ (Feeds FH)
Surround Dolby	✓		✓ (Feeds TM)
Back Dolby	✓		✓ (Feeds RH)

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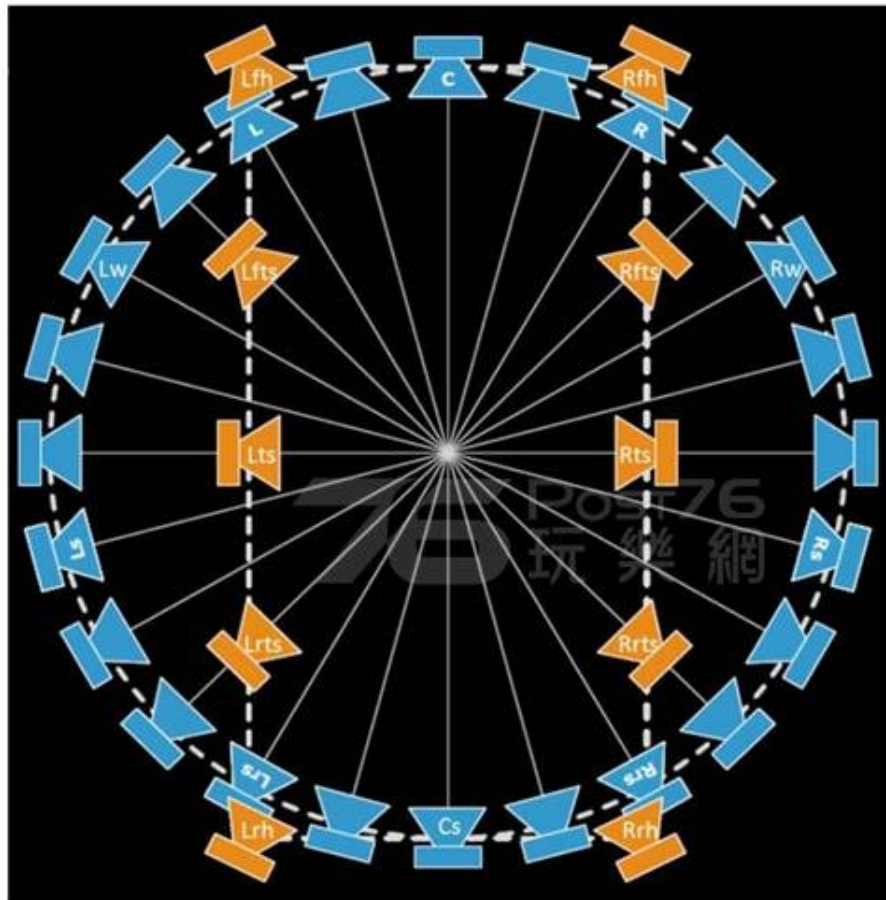
DOLBY ATMOS®

Dolby Atmos Mixing Studio



Scalable Playback in Home Theater

Maximum Ch = **24.1.10** , totally 35 channels



Ground Speaker

L, C, R

Ls, Rs

Lsr, Rsr, Cs

Lw, Rw

Height Speaker

Lfh, Rfh

New Ltf, Rtf

New Ltm, Rtm

New Ltr, Rtr

New Lrh, Rrh

How Current AVR Support Dolby Atmos

- Ground Floor Speaker : Totally there are 24 speaker locations

Current AVR can only support 10 speaker locations

L, R, C, Ls, Rs, Lsr, Rsr, Lw*, Rw*, Cs*

Height Speakers : Totally there are 10 speaker locations

Current AVR can only support 10 speaker locations

Lfh, Rfh, Ltf, Rtf, Ltm, Rtm, Ltr, Rtr, Lrh, Rrh

*** AVR can support Maximum 7.1.4 Channels**

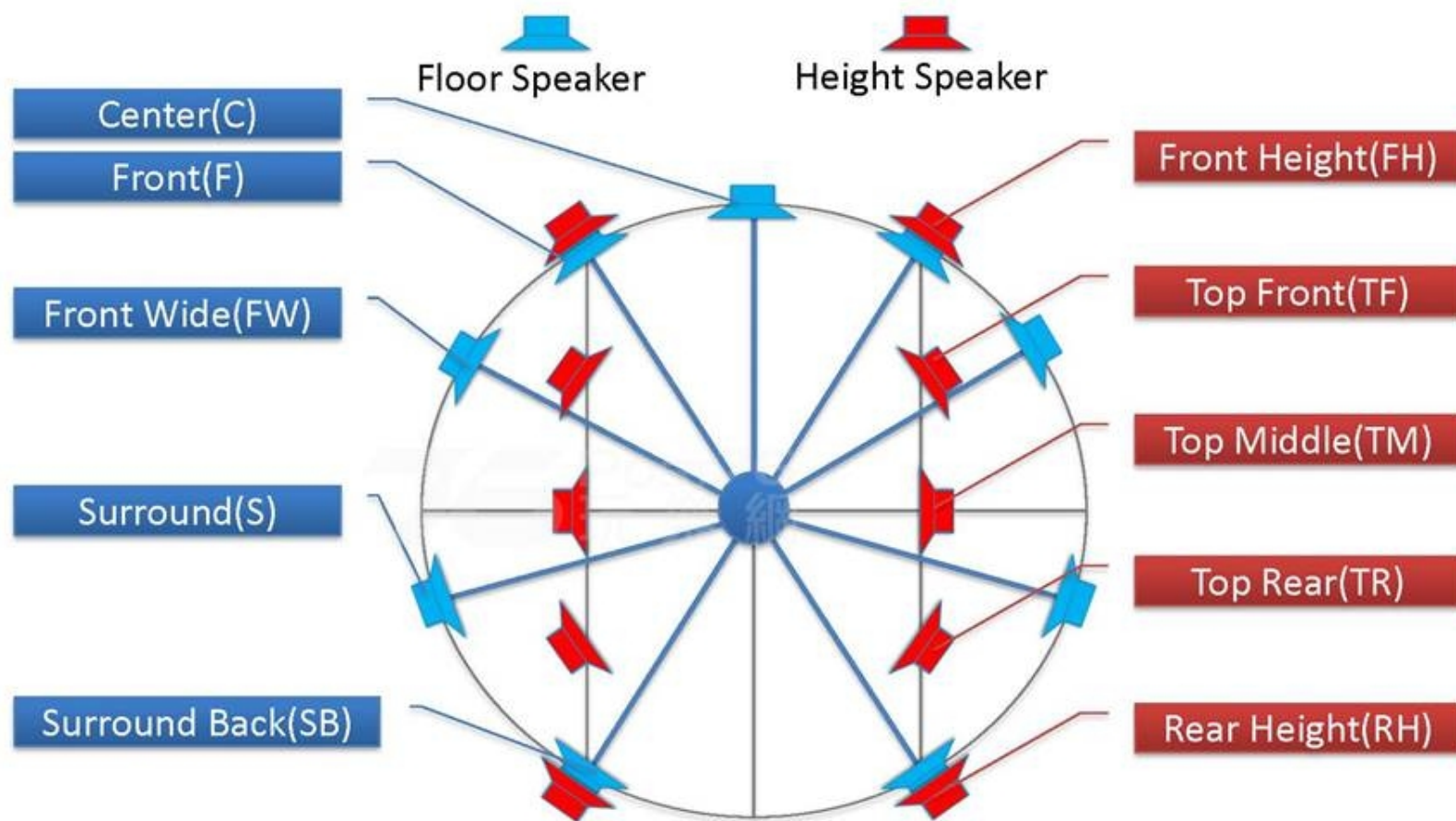
7 = Ground floor speaker

1 = Subwoofer

4 = Height Speaker

How Current AVR Support Dolby Atmos

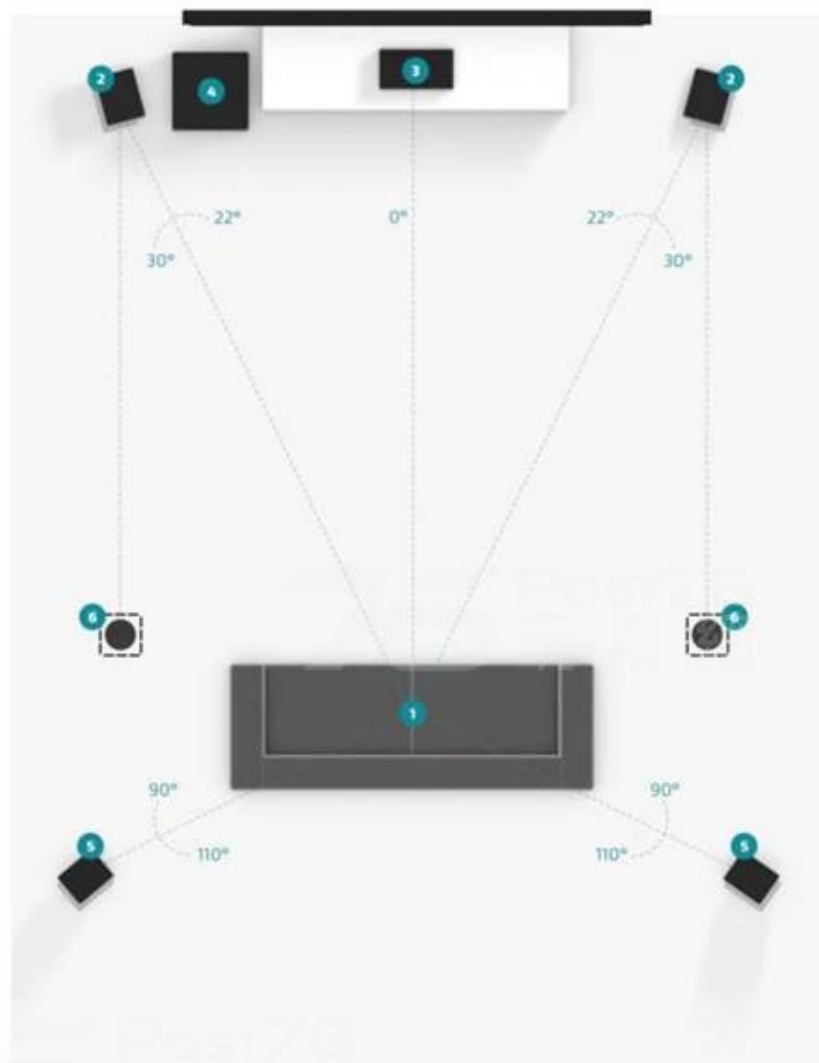
Here is what we can support for Dolby Atmos Speaker set up



In-Ceiling Speakers

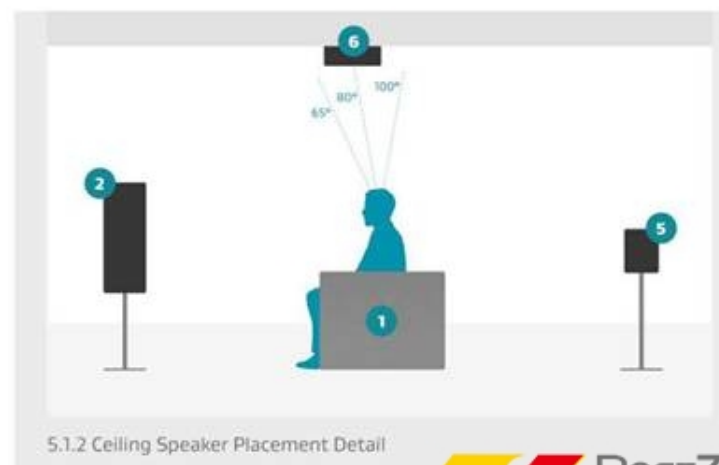
- Solution for custom installs and enthusiasts where discrete speakers can be installed
- No present Dolby specification; current full-range products will work
- May be preferable solution for nonstandard ceilings (cathedral or sharply angled)
- Angle dispersion > 90 degree





5.1.2 Overhead Speakers

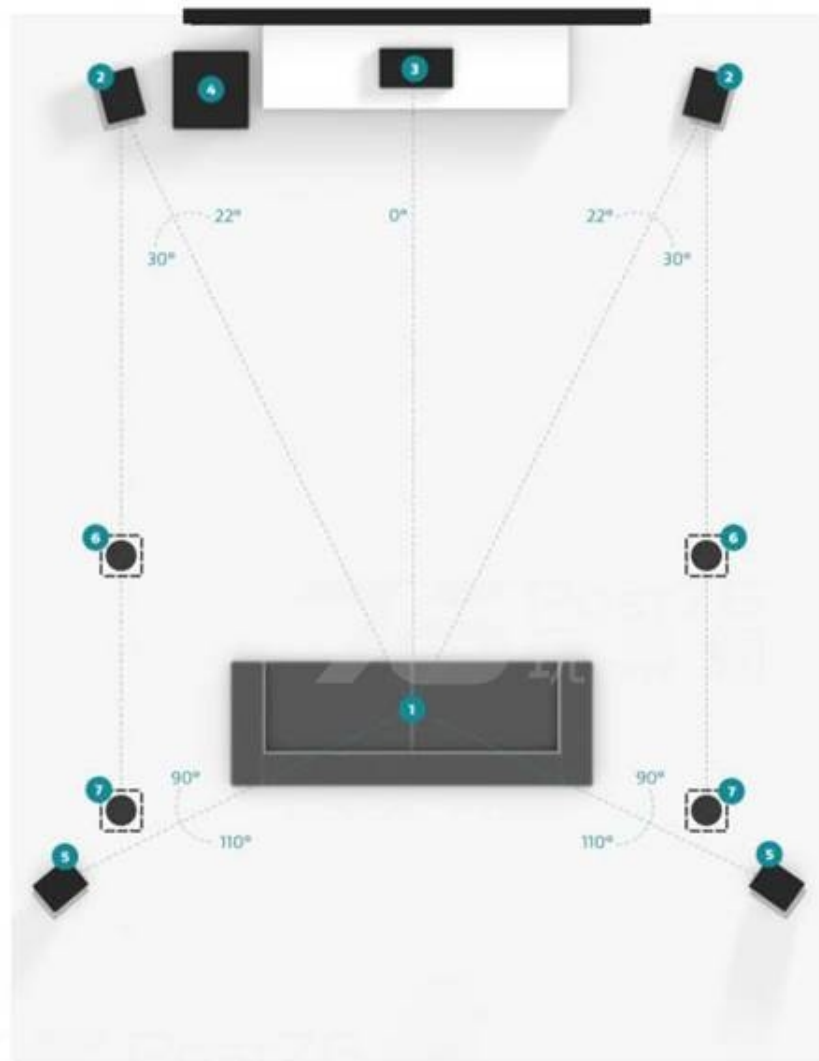
1. Seating Position
2. Left and Right Speakers
3. Center Speakers
4. Subwoofer
5. L, R Surround Speakers
6. L, R Overhead Speakers



5.1.2 Ceiling Speaker Placement Detail

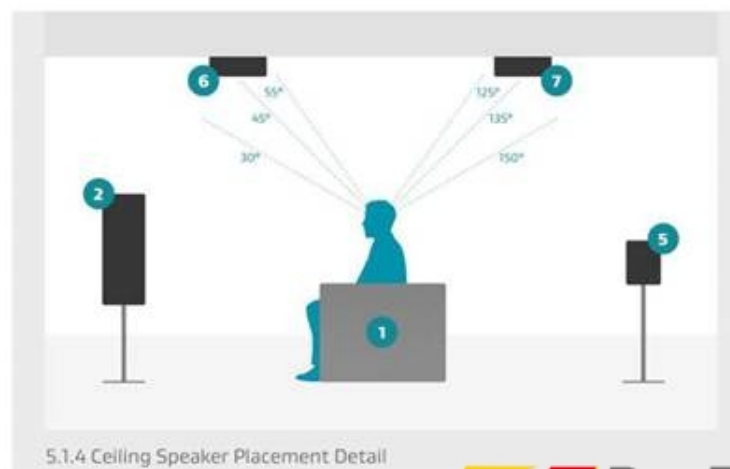
In Ceiling Speaker 5.1.4

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5.1.4 Overhead Speakers

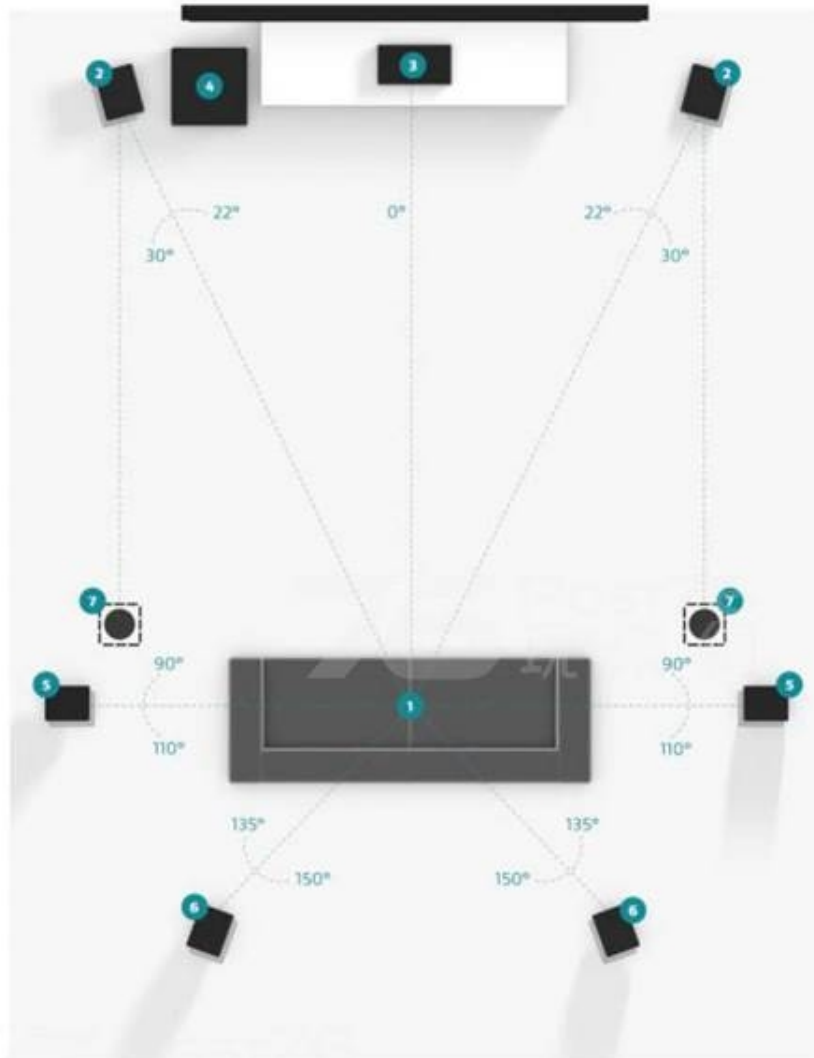
1. Seating Position
2. Left and Right Speakers
3. Center Speakers
4. Subwoofer
5. L, R Surround Speakers
6. L, R Front Overhead Speakers
7. L, R Rear Overhead Speakers



5.1.4 Ceiling Speaker Placement Detail

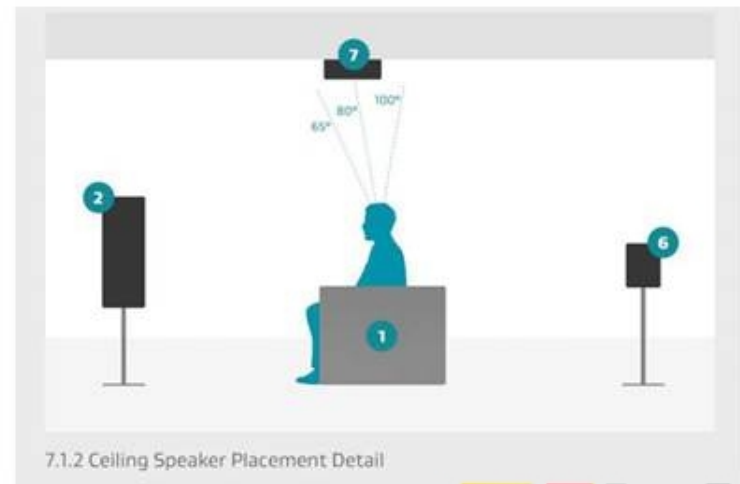
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In Ceiling Speaker 7.1.2



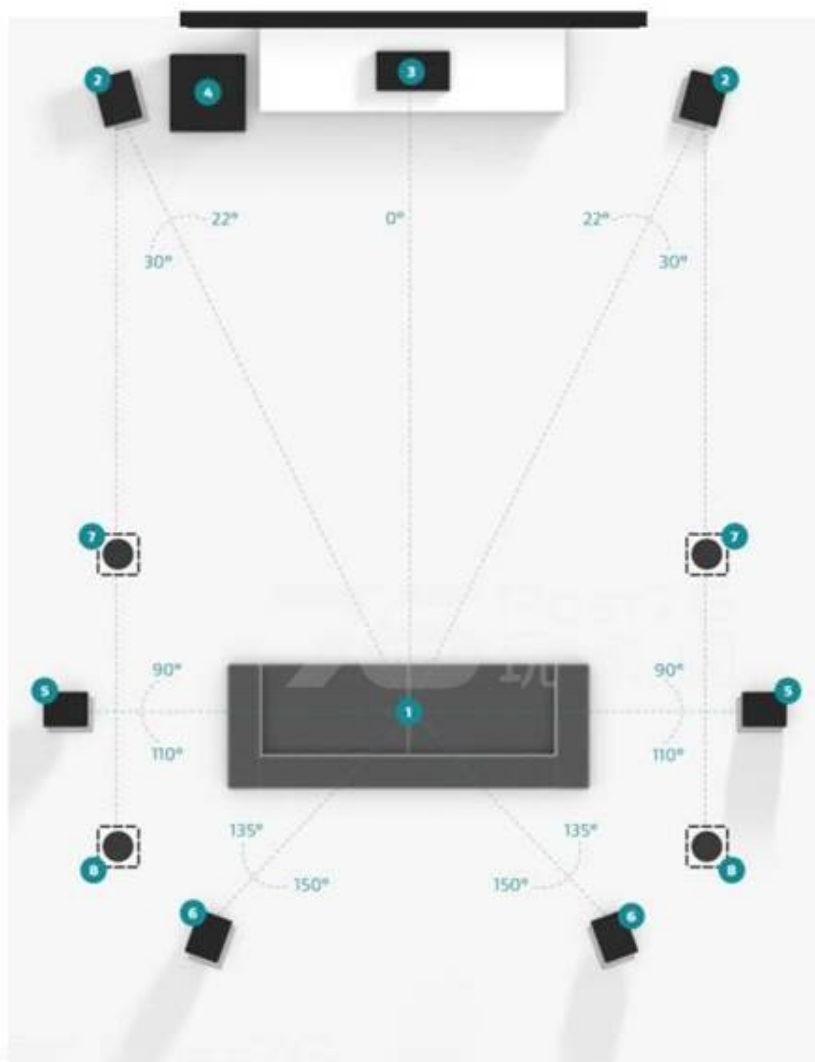
7.1.2 Overhead Speakers

1. Seating Position
2. Left and Right Speakers
3. Center Speakers
4. Subwoofer
5. L, R Surround Speakers
6. L, R Back Speakers
7. L, R Overhead Speakers



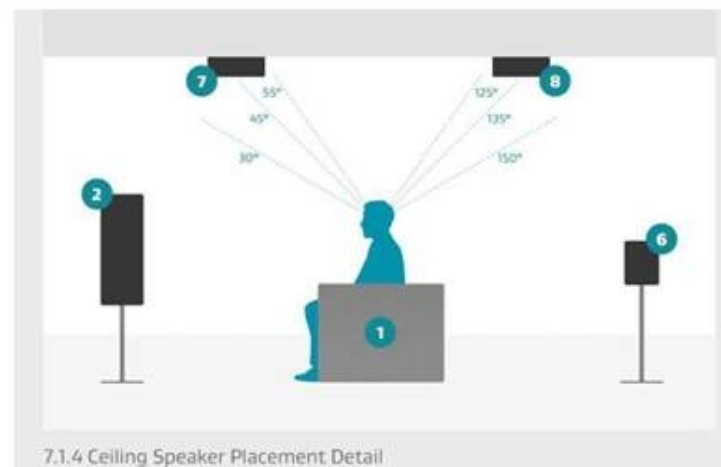
7.1.2 Ceiling Speaker Placement Detail

In Ceiling Speaker 7.1.4



7.1.4 Overhead Speakers

1. Seating Position
2. Left and Right Speakers
3. Center Speakers
4. Subwoofer
5. L, R Surround Speakers
6. L, R Back Speakers
7. L, R Front Overhead Speakers
8. L, R Rear Overhead Speakers

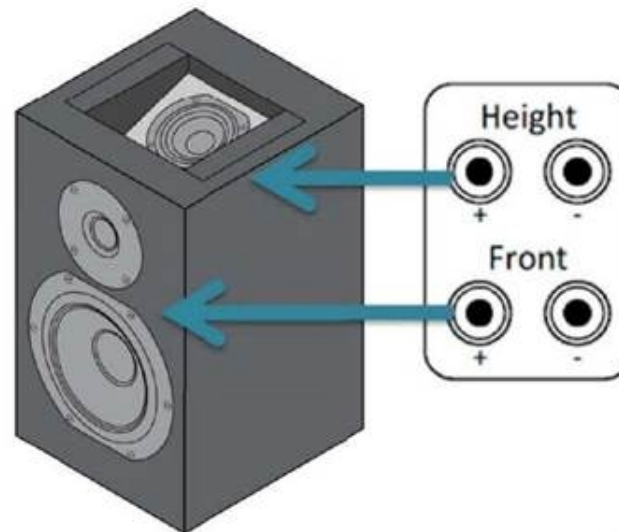


7.1.4 Ceiling Speaker Placement Detail

Dolby Atmos Enabled Speakers

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- Dolby licensed technology
- Easy entry for most consumers into the world of Dolby Atmos
- Multiple speaker-type options: integrated or add-on



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Dolby Atmos Enabled Speakers – Add On Type



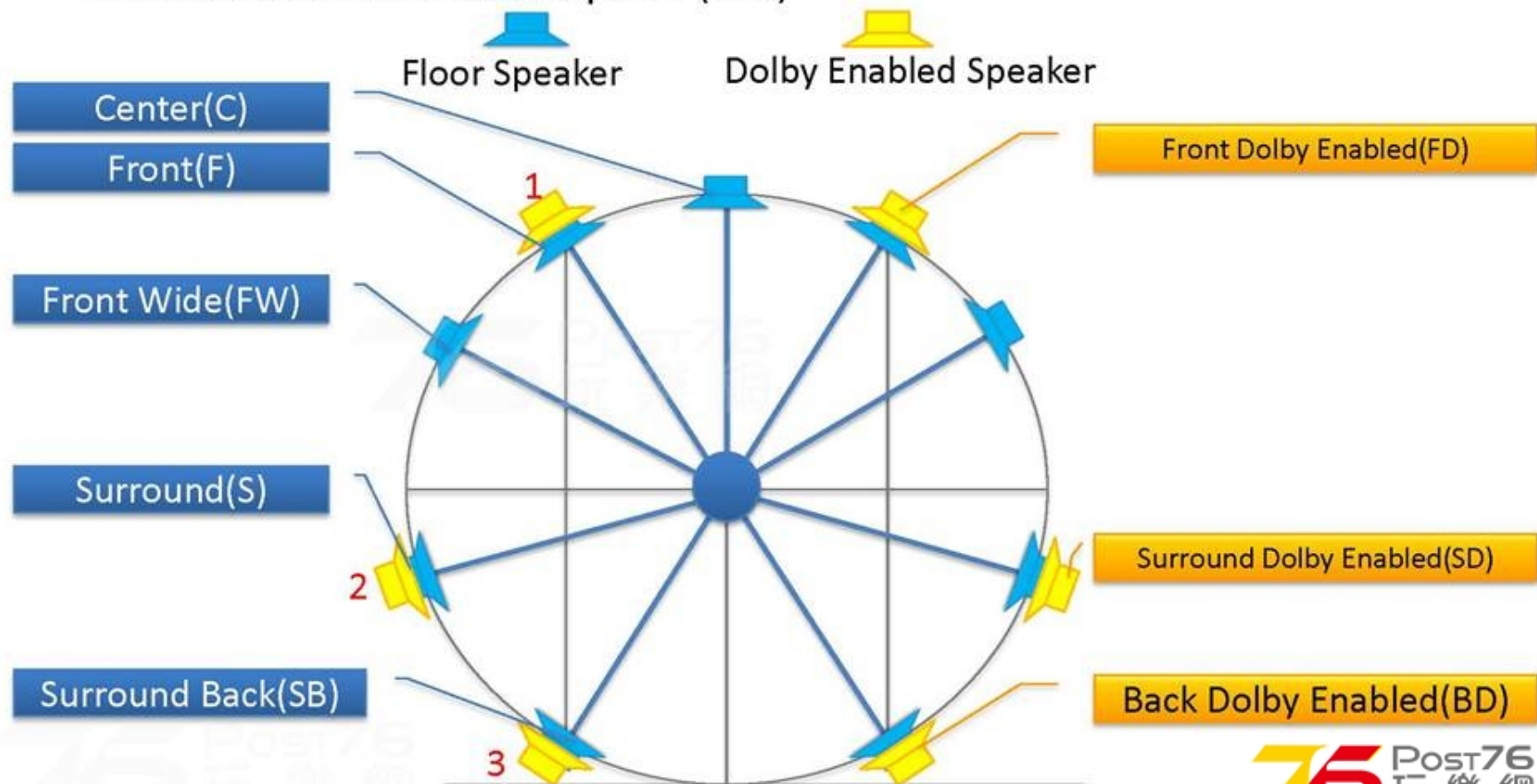
Add-on Dolby Atmos Modules
for Front Left and Right Speakers



- When using one pair Dolby enable speaker , we can place on top of existing
 1. Fronts Speaker
 2. Surround Speaker
 3. Surround Back Speakers
- Small drivers is being used , so cross over frequency is usually at 150 or 180 Hz

Dolby Atmos Enabled Speakers - Locations

- Under 5.1.4 configuration , 2 pairs of Dolby Enable Speaker is placed on top of Front and Surround speaker (1+2)
- Under 7.1.4 configuration , 2 pairs of Dolby Enable Speaker is placed on top of Front and Surround Back sepaker (1+3)



Dolby Atmos Enabled Speakers

Suggested **ceiling height** is from 9' to 12' (2.7 m to 3.6 m); minimum is 8' (2.4 m); maximum is 14' (4.2 m).

A flat, **acoustically reflective ceiling** is recommended: drywall, plaster, hardwood, or other rigid, non-sound-absorbing material. Works fine around skylights, beams, air ducts, and so on.

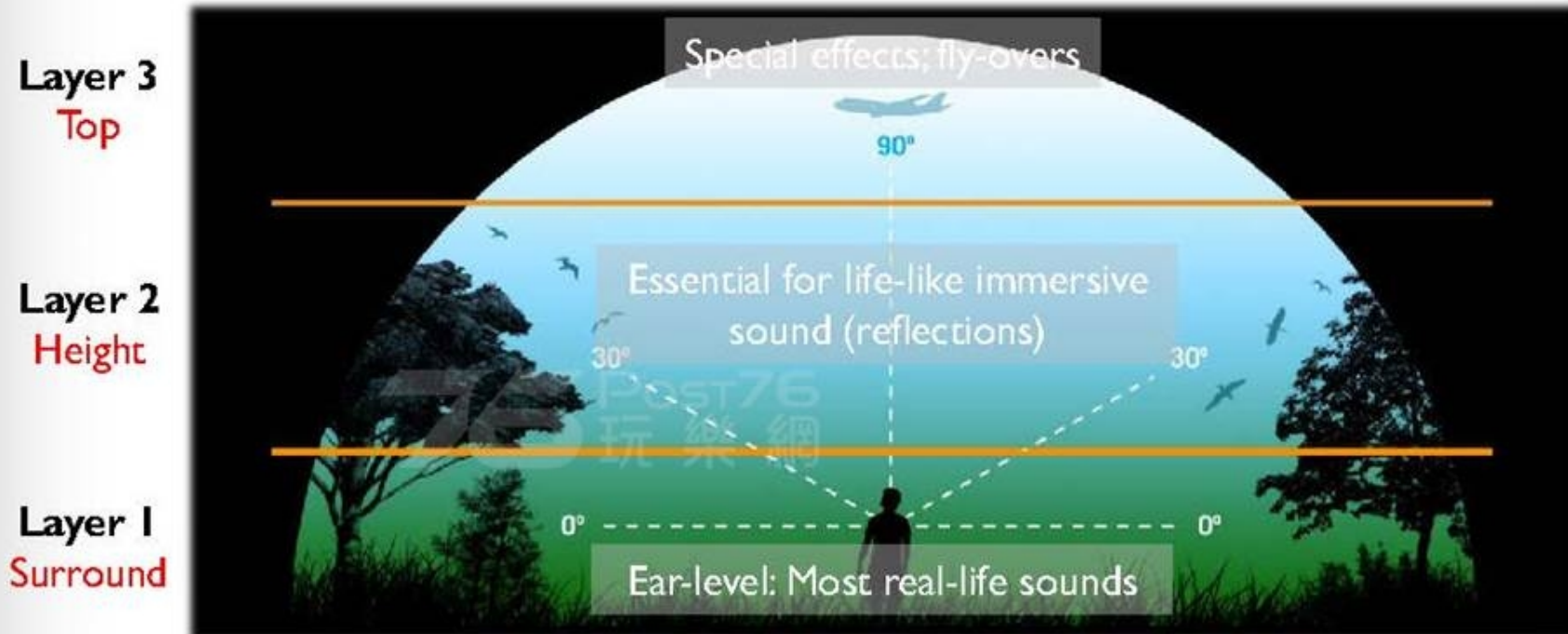
Speaker placement should be at least 3' (0.9 m) feet away from seating position.

Floor (listener plane) speaker height should be typically at ear level (typically 3.9' or 1.2 m).

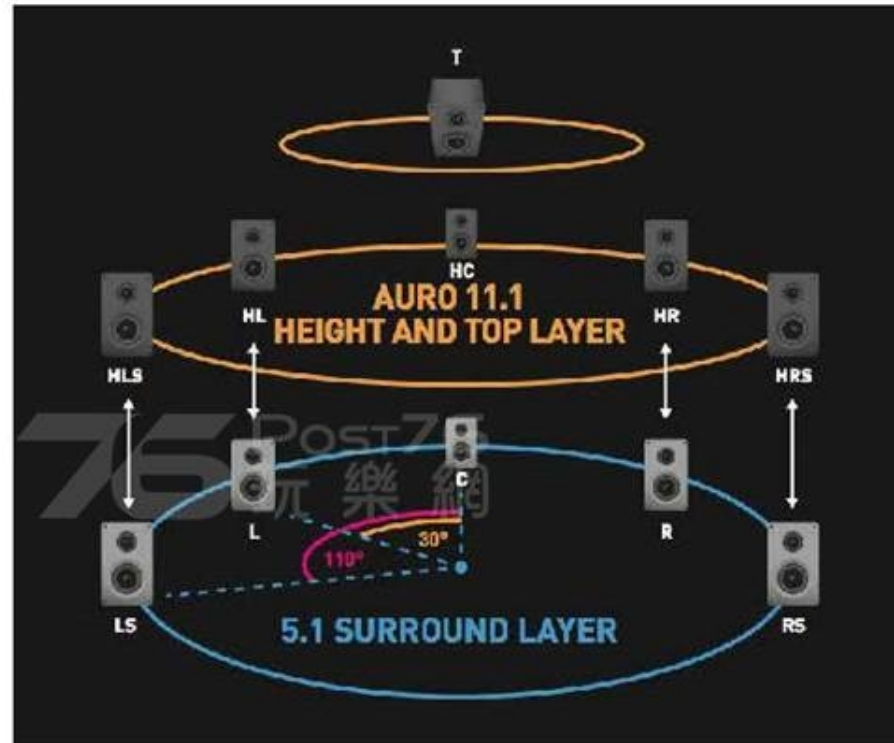




3-layer concept



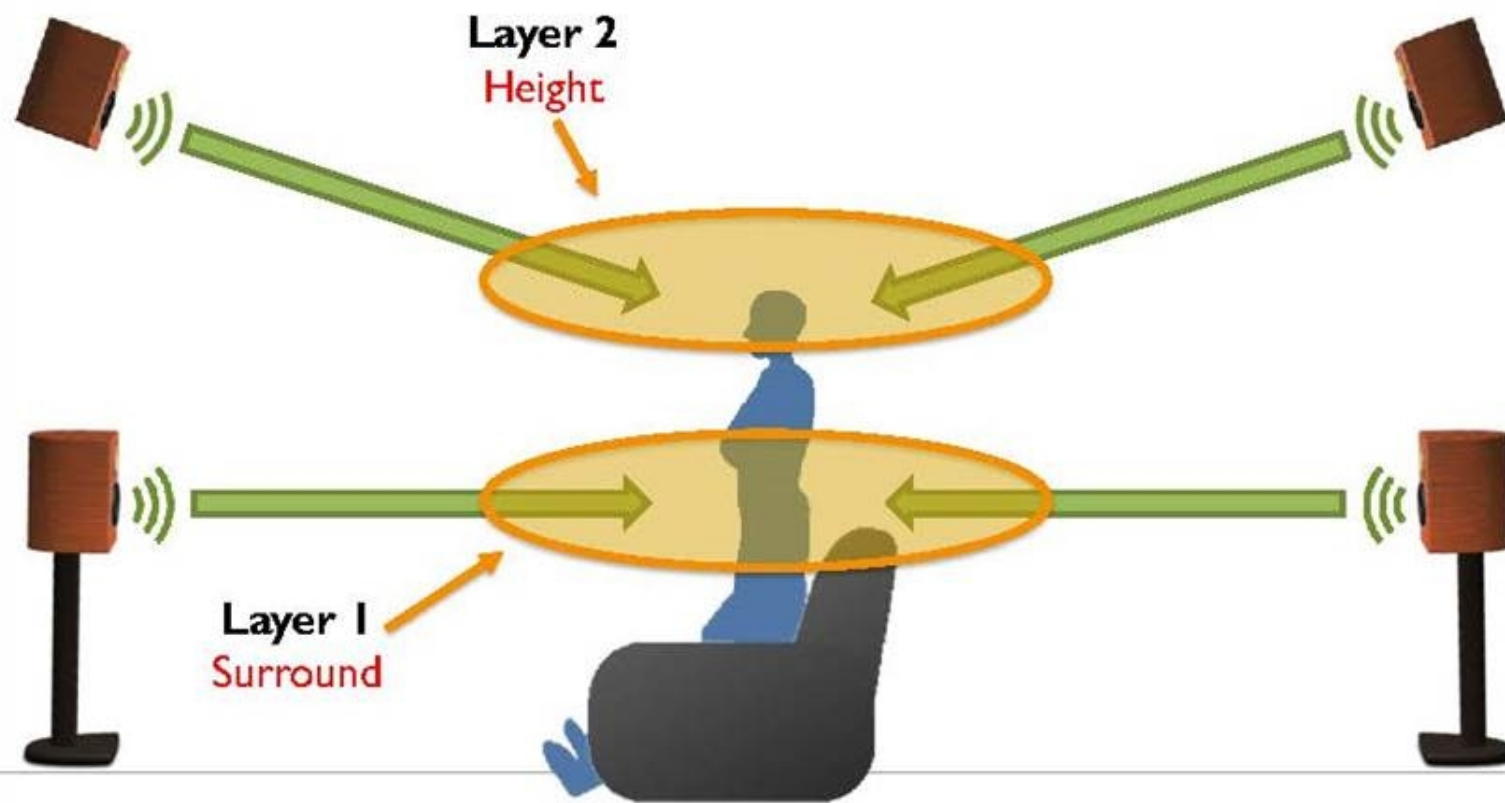
3-layer concept



Auro 9.1 setup



Aiming of the Height Speakers



Voice of God



Different modes



Dolby Atmos Playback in 9.1 Auro-3D

