

The Ligeti Hall

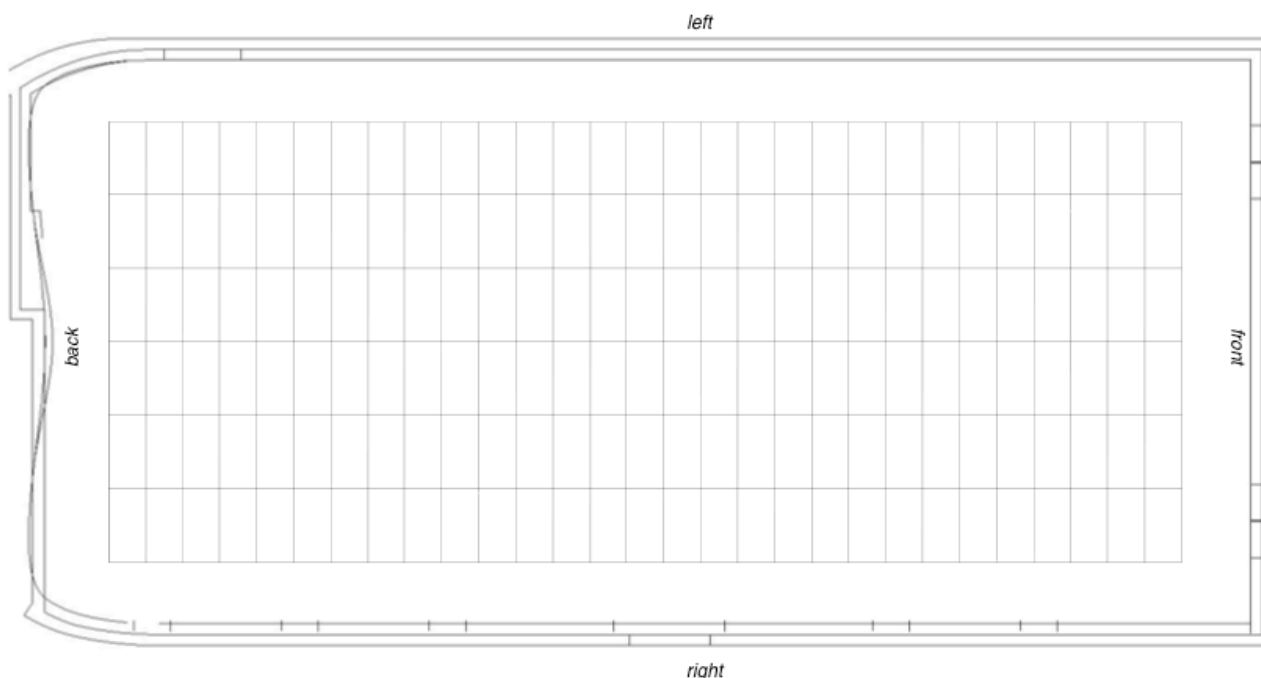
The *Ligeti Hall* has been our main laboratory during the *CoS* project. It is located at the *House for Music and Music-Drama*, the *Mumuth*.

(<http://www.kug.ac.at/en/studies-further-education/studies/infrastructure/das-mumuth.html>)

The *Ligeti Hall* is 15.5 m. wide by 33 m. long. The real ceiling is at 11.5 m, but there is a structure at 8 m. high with corridors alongside and nine gangways crossing transversally the hall.

The floor is composed of 29 x 6 tiles of 1m x 2m, surrounded by a corridor along all its perimeter.

As you see in the figure, there is a pre-defined orientation (front, back, left, right), and although this is not a precondition for its use, it is the 'canonic' approach and serves as a convention for a common understanding. At the back there are the main entrances to the Hall.



Below there are some photos from which you will be able to get some idea. It is rather difficult, however, to make photographs of the hall which may convey a real feeling of its breadth, or clearly show the speakers.

Installed in the hall there are two loudspeaker-systems, adding up to a total of 105 speakers, to which one can add a variable number of flying speakers, including two large subwoofers.

The Motor-Telescope Speaker System : The Hemi

This is the main system of speakers at the *Ligeti Hall*. Our own nicknames : Hemi or Dome.

It comprises 33 active speakers on fixed positions but with variable elevation, azimuth and tilt, controlled by computer.

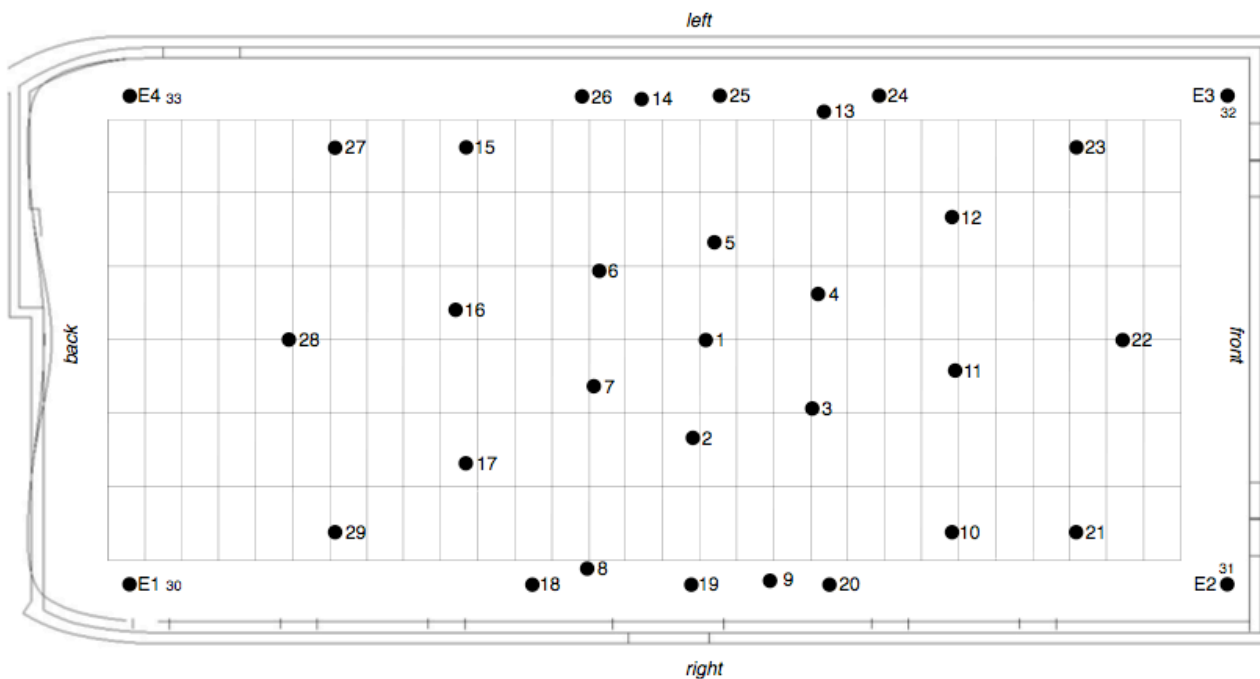
Speaker: Kling-und-Freitag K&F CA 1001 – SP (a 2-way active system: 10" / 1")

Elevation : Minimum: 1.66 m; Maximum: variable, but approx. 7.50 m.

Azimuth : From 0° to 360°

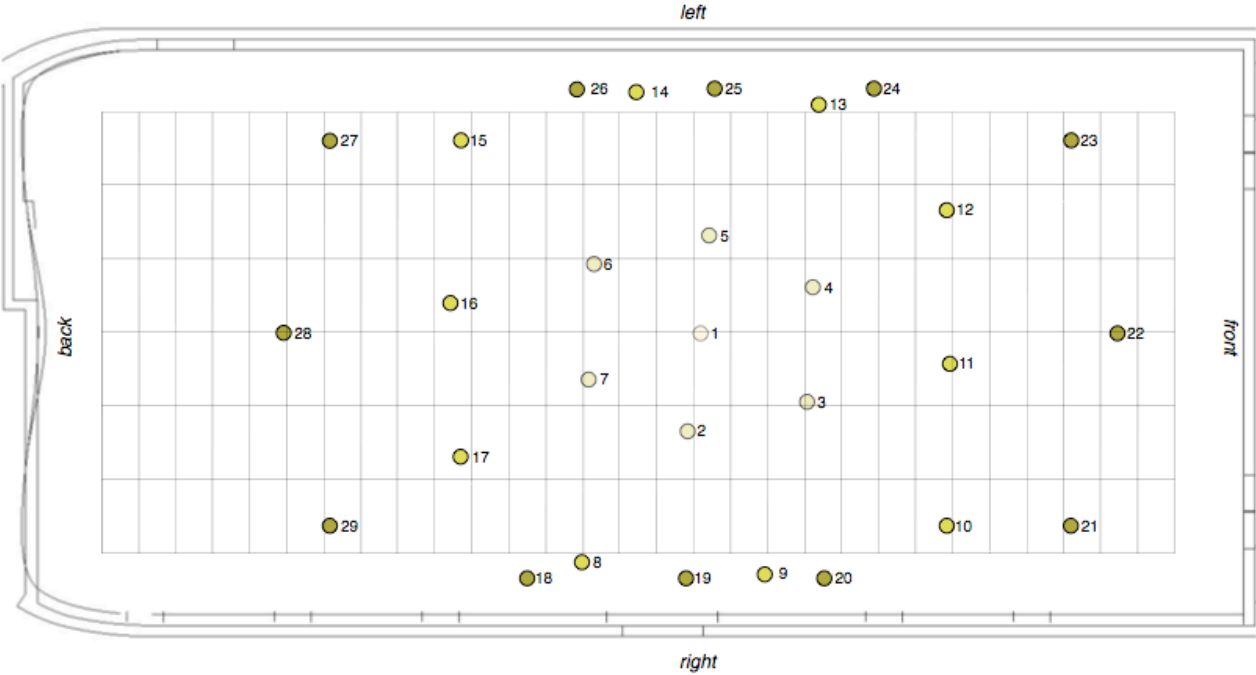
Tilt : From -90° to +90°

The following figure shows the positions of the 33 K&F's in the Hall.



This position scheme comes from the design of an ambisonics dome of twenty-nine speakers, plus four extra corner speakers (E1, E2, E3, E4).

The next figure shows the dome of speakers (the lighter, the higher), composed of three “elliptical” rings of 12, 10 and 6 elements, plus a centered highest element.



A photograph of the dome (from back to front) :



This photograph shows the screen of the computer controlling the parameters of the 33 speakers. Motors make different types of noises, and it takes time to change configurations. Otherwise it is quite straightforward, you can recall a complete configuration, and vary individually any of the three parameters (elevation, azimuth and tilt) for each speaker.

Mumuth Graz - Steuerung Motorteleskope [C:\Programme\Mumuth Steuerung Motorteleskope (Daten)\jem\cos (Sep2012\hemiaucode)]

Aquator "Minimalhöhe für Veranstaltungen von 235cm"
und weiter hinauf gezogenem Nordpol (1-7)
erstellt von P. Plessas August 2010. (+ corners at some)

Systemmeldungen:
24.10.2012 08:44:09: Verbindung zu SPS hergestellt
24.10.2012 08:44:11: Initialisierungsdatei gelesen
24.10.2012 08:44:12: Initialisierung abgeschlossen
24.10.2012 12:42:09: Störung Überstrom Kippen 5

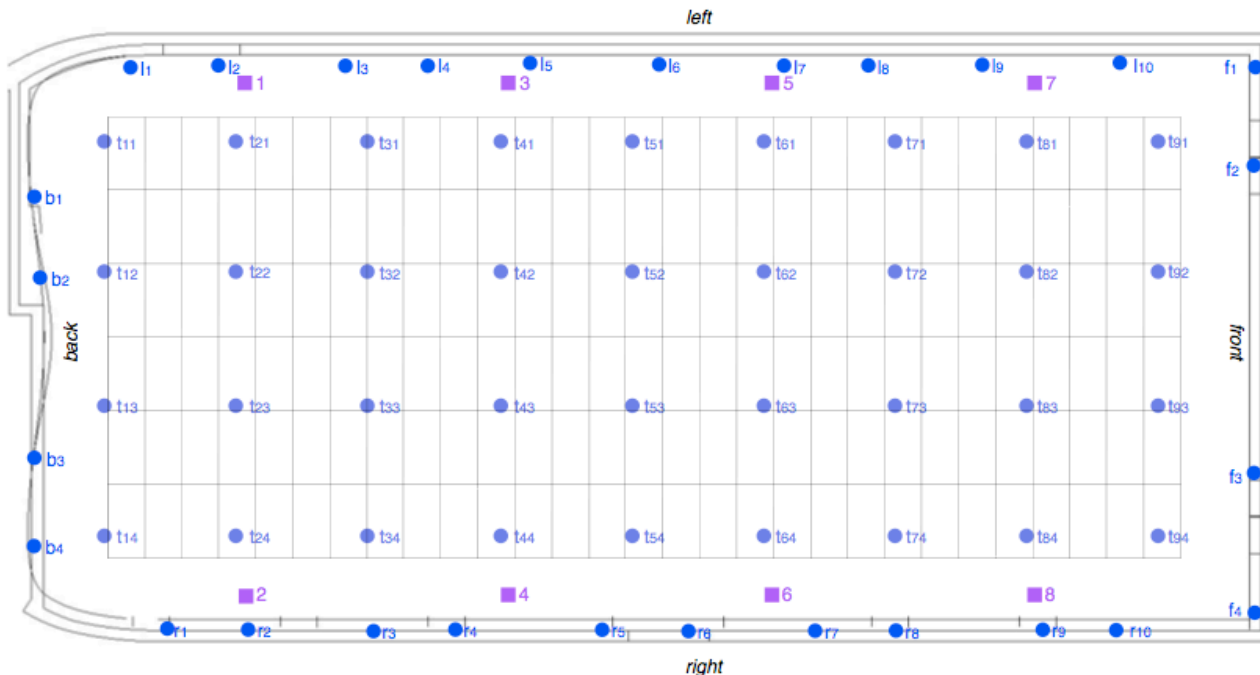
Nr.	Position Motorteleskop				Position Bügel Drehen				Position Bügel Kippen				Nr.	Position Motorteleskop				Position Bügel Drehen				Position Bügel Kippen			
	Ist	Soll	Auf	Ab	Ist	Soll	Li	Re	Ist	Soll	vor	rück		Ist	Soll	Auf	Ab	Ist	Soll	Li	Re	Ist	Soll	vor	rück
1	836	836	Auf	Ab	90	90	Li	Re	-89	-89	vor	rück	17	563	563	Auf	Ab	27	27	Li	Re	-31	-31	vor	rück
2	789	789	Auf	Ab	81	81	Li	Re	-68	-68	vor	rück	18	235	235	Auf	Ab	55	55	Li	Re	3	3	vor	rück
3	789	789	Auf	Ab	146	146	Li	Re	-63	-63	vor	rück	19	235	235	Auf	Ab	86	86	Li	Re	5	5	vor	rück
4	790	789	Auf	Ab	203	203	Li	Re	-64	-64	vor	rück	20	235	235	Auf	Ab	117	117	Li	Re	3	3	vor	rück
5	788	789	Auf	Ab	265	265	Li	Re	-68	-68	vor	rück	21	235	235	Auf	Ab	152	152	Li	Re	-3	-3	vor	rück
6	789	789	Auf	Ab	328	328	Li	Re	-62	-62	vor	rück	22	235	235	Auf	Ab	180	180	Li	Re	-1	0	vor	rück
7	792	789	Auf	Ab	22	22	Li	Re	-63	-63	vor	rück	23	235	235	Auf	Ab	207	207	Li	Re	-3	-3	vor	rück
8	586	586	Auf	Ab	62	62	Li	Re	-33	-33	vor	rück	24	235	235	Auf	Ab	235	235	Li	Re	3	3	vor	rück
9	586	586	Auf	Ab	105	105	Li	Re	-34	-34	vor	rück	25	235	235	Auf	Ab	267	267	Li	Re	0	0	vor	rück
10	655	655	Auf	Ab	142	142	Li	Re	-32	-32	vor	rück	26	235	235	Auf	Ab	297	297	Li	Re	3	3	vor	rück
11	588	588	Auf	Ab	173	173	Li	Re	-34	-34	vor	rück	27	235	235	Auf	Ab	333	333	Li	Re	-1	0	vor	rück
12	566	566	Auf	Ab	206	206	Li	Re	-31	-31	vor	rück	28	235	235	Auf	Ab	1	0	Li	Re	0	0	vor	rück
13	586	586	Auf	Ab	243	243	Li	Re	-34	-34	vor	rück	29	235	235	Auf	Ab	27	27	Li	Re	0	0	vor	rück
14	589	586	Auf	Ab	285	285	Li	Re	-34	-34	vor	rück	E1	200	200	Auf	Ab	30	30	Li	Re	0	0	vor	rück
15	649	647	Auf	Ab	322	322	Li	Re	-32	-32	vor	rück	E2	200	200	Auf	Ab	150	150	Li	Re	0	0	vor	rück
16	587	587	Auf	Ab	353	353	Li	Re	-34	-34	vor	rück	E3	200	200	Auf	Ab	210	210	Li	Re	0	0	vor	rück
													E4	200	200	Auf	Ab	330	330	Li	Re	0	0	vor	rück

Further, there is the possibility to count with a number of variable position (flying) speakers set on stands, plus a couple of K&F sub-woofers (K&F SWi 118E – SP).

At the end of the document there is a photograph with a setup including a number of flying speakers. This is the setup of my piece *Topoi*.

The Constellation Speaker System : The Sky

The original purpose of this set of speakers is as a Virtual Variable Acoustic System at the Hall. It comprises 64 x small speakers plus 8 x “small” subwoofers. The *Sky* has been our own nickname

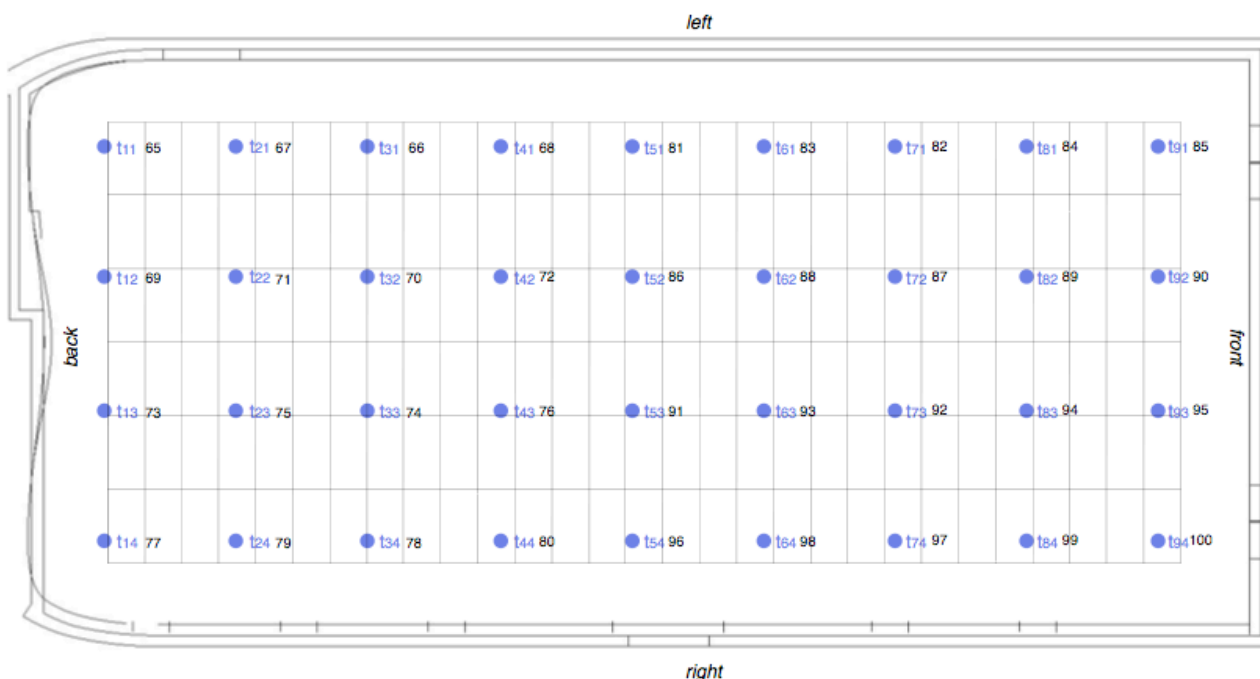


Speakers : Meyersound MM4 miniature speakers. 1-way passive (4”) & Meyersound MM-10 miniature subwoofer. Passive (10”)

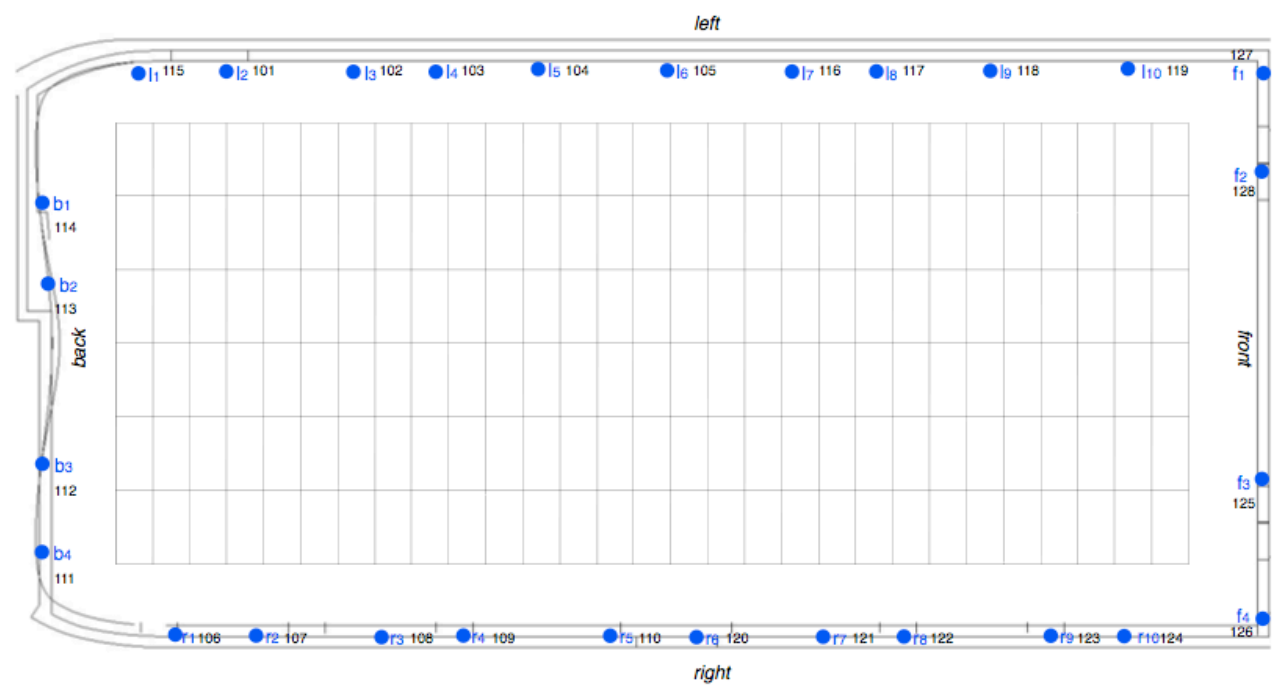
In the next figures, a graphic "analysis" of the different elements composing the global *Sky* system.

Name convention : t = top; f = front; b = back; r = right; l = left

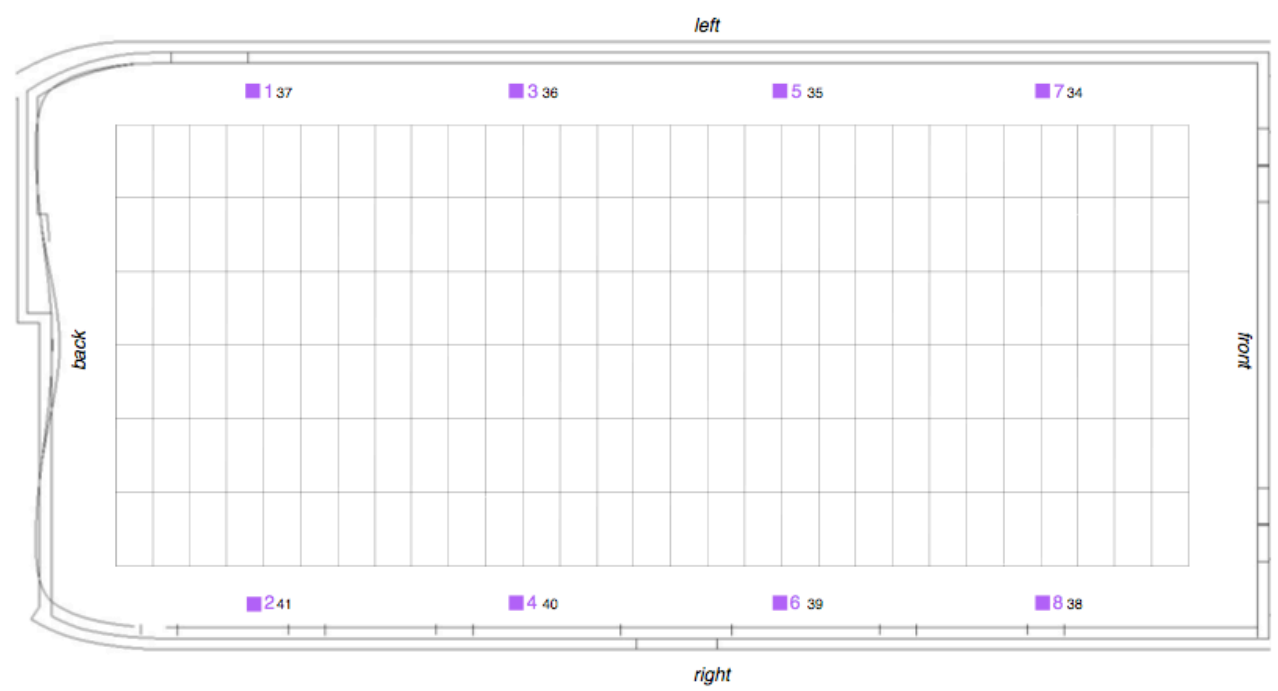
36 x sky-Top speakers, placed on the ceiling structure looking downwards. Height : 8 m. approx.



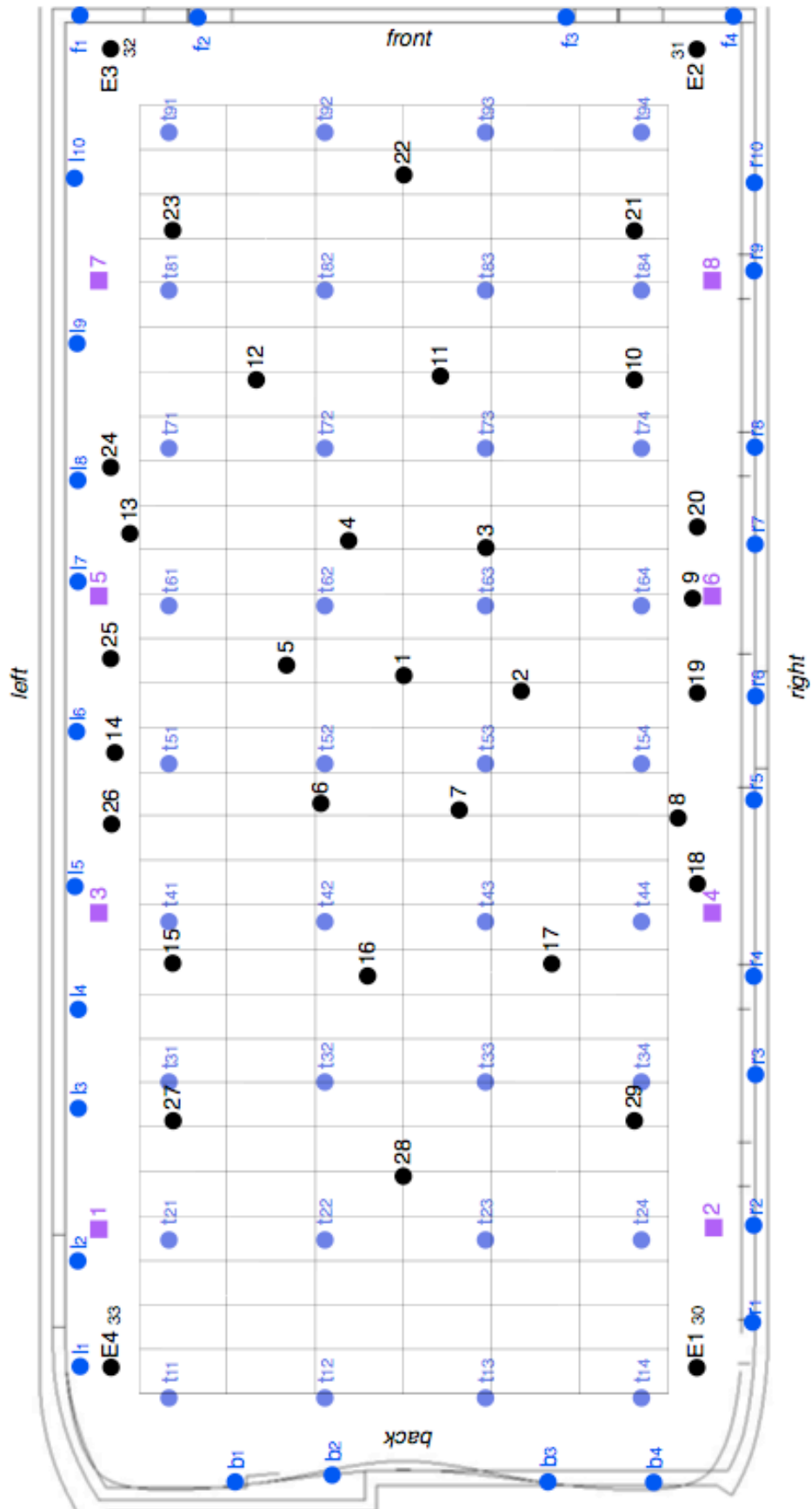
28 x sky-Wall speakers placed on the walls looking horizontally. Height : 5.5 m. approx.
(Wall : Back, Front, Right & Left)



The 8 x sky-subwoofers, on the ceiling structure looking downwards.



The whole set of pre-installed speakers



View of the hall from back to front with all *Hemi* speakers in their lowest elevation.



View of the Hall from front to back with several flying speakers

