



If you are reading this brochure then you very probably are attending a Fohhn / IOSONO Immersive Sound / Yamaha AFC3 demonstration in the Fohhn Soundlab. We hope you are enjoying the experience !

The Fohhn Soundlab is a relatively anechoic 'dry' space measuring 30m x 15m x 6m, used by the German loudspeaker manufacturer Fohhn to conduct electro-acoustic tests. But the Soundlab is also used as the home of two of the most advanced sound systems in the world: the IOSONO Immersive Sound system by Barco, and the Yamaha AFC3 Acoustic Field Control system, utilizing a Fohhn fixed-installed 3D loudspeaker system.

The Fohhn 3D loudspeaker system features 18 LX10 ceiling speakers, 24 LX100 side column speakers and 4 AS40 subwoofers. All speakers are individually driven by 12 Fohhn D4750DSP power amplifiers, receiving 46 audio channels through MADI using two D.O.TEC Andiamo 32 channel MADI D/A converters.

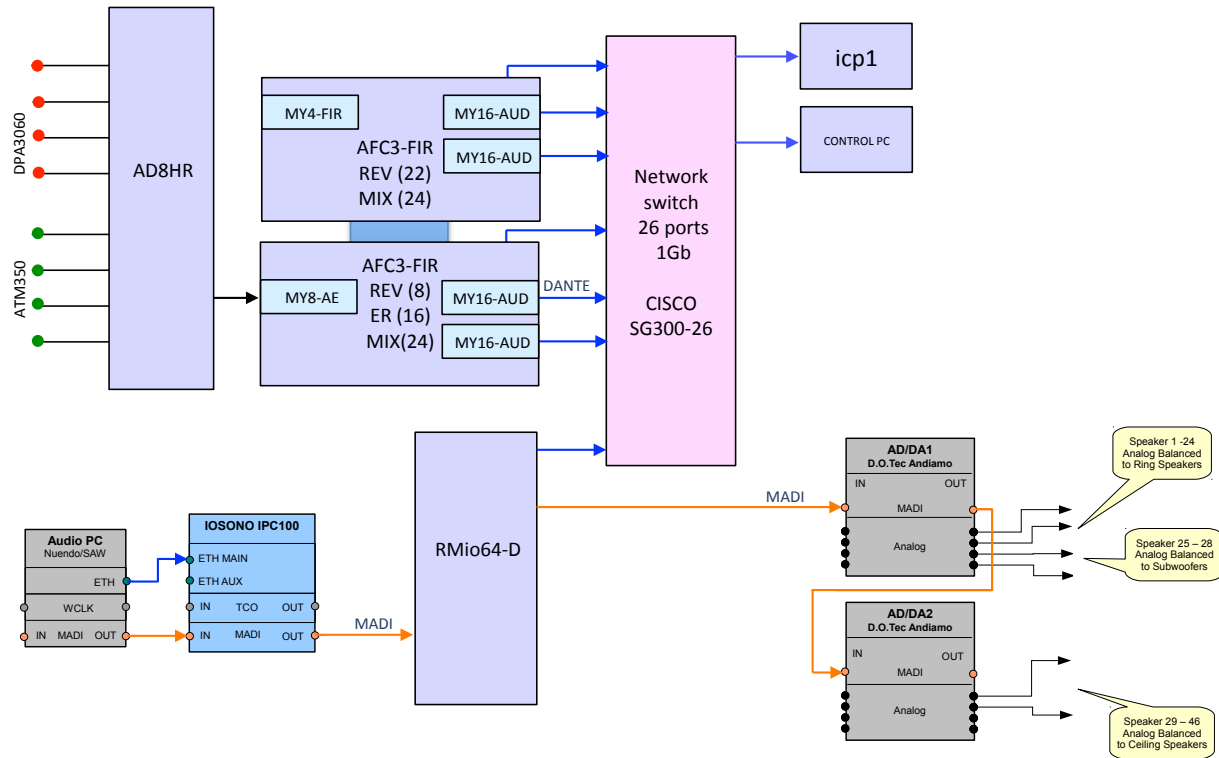
The IOSONO Immersive Sound system is a powerful SSF (Synthesis of Sound Field) system, capable of creating audio events in a 3-dimensional space using wave field synthesis rendered in real time by the IOSONO ICP100 audio processor. 3D mixes can be produced using IOSONO workspace software, or by the IOSONO plug-in software Spatial Audio Workstation (SAW) exclusively for the Digital Audio Workstation Steinberg's Nuendo. With a full production setup (Nuendo, SAW) the system is ready for mixing 3D soundfields, also many sound examples and complete demos are available for playback in the SoundLab system.

The Yamaha AFC3 system is the latest generation of ASF (Assistance of Sound Field) system, capable of enhancing the acoustic response of a space in real time using microphones and loudspeakers. AFC3 is a hybrid regenerative system, offering acoustic enhancement responding to sound sources anywhere in the room, using high density convolution techniques to generate a natural acoustic response - even in the relatively dry acoustic environment of the Fohhn Soundlab.

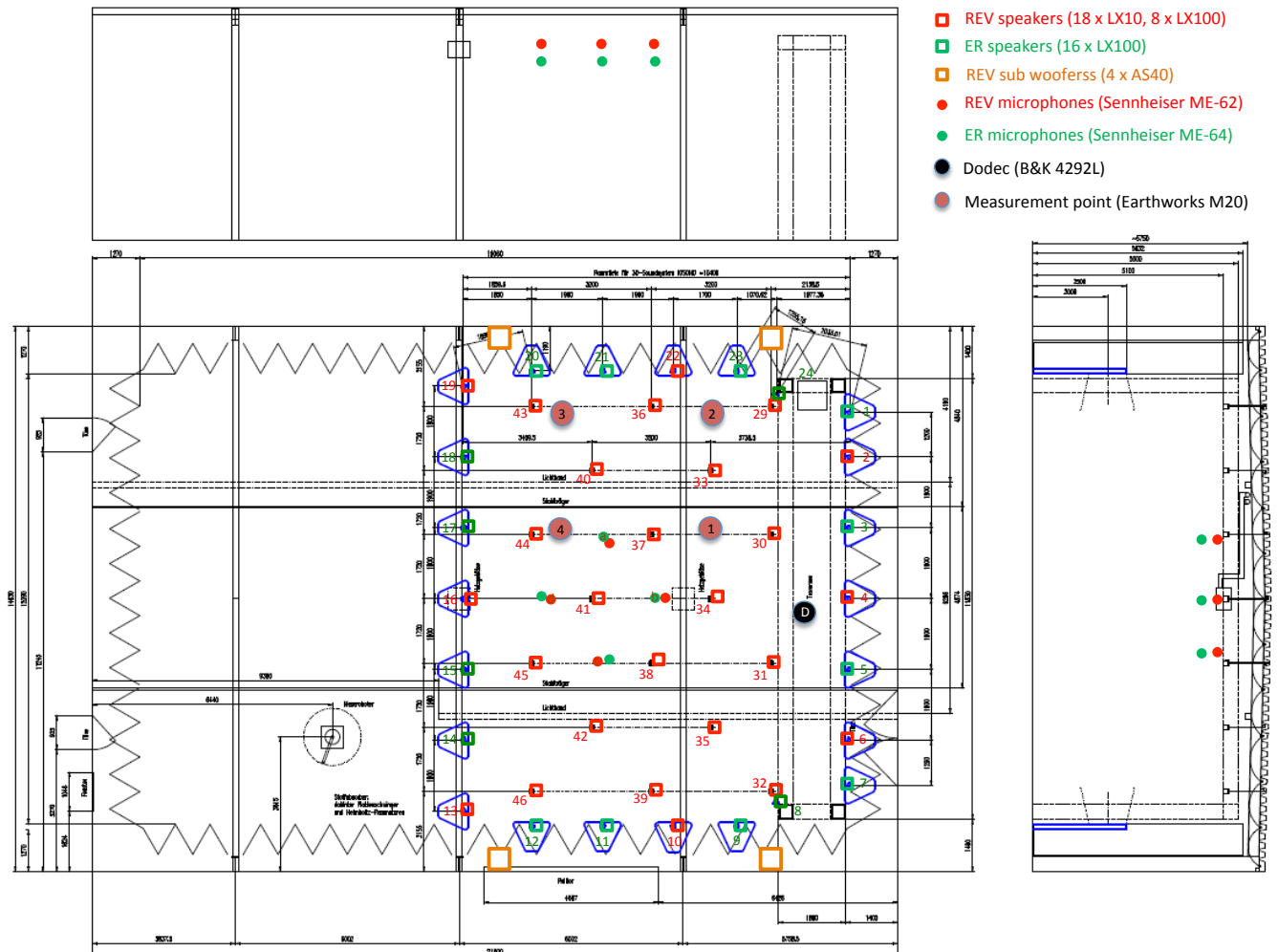
The IOSONO system is connected to a Yamaha RMio64-D MADI/DANTE bridge, converting the MADI stream to a Dante network connecting to the AFC3 system. The AFC3 DSP frames have a 48 channel mixing matrix built in to merge the IOSONO channels with the AFC3 channels before transmitting them through the MADI stream to the amplifier rack. Because both systems can be used simultaneously, pre-produced 3D rendering can be combined with real time acoustic enhancement to create true immersive and interactive 3D audio experiences. Because both systems use the same networked audio infrastructure and electro-acoustic components, systems can be offered at a very cost-efficient level.



BLOCK DIAGRAM

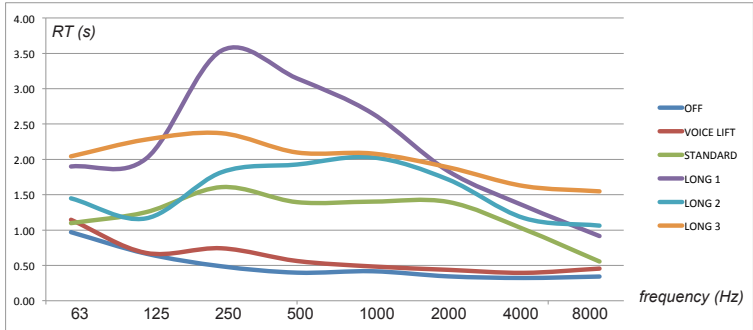


TRANSDUCER PLACEMENT



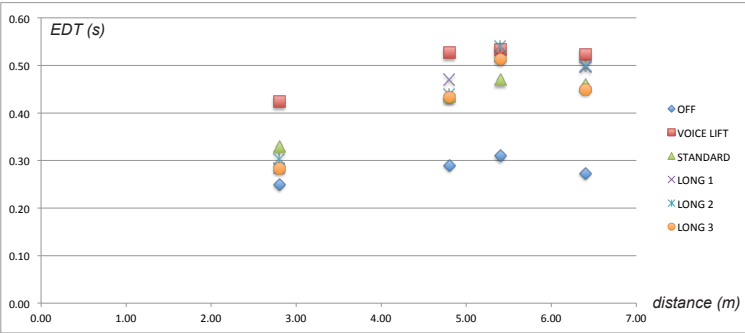
MEASURED REVERBERATION TIME (4-point average)

average RT	63	125	250	500	1000	2000	4000	8000
OFF	0.97	0.67	0.49	0.40	0.42	0.35	0.32	0.34
VOICE LIFT	1.15	0.68	0.74	0.56	0.49	0.44	0.40	0.46
STANDARD	1.10	1.25	1.61	1.40	1.40	1.40	1.01	0.56
LONG 1	1.90	2.01	3.54	3.15	2.65	1.83	1.35	0.92
LONG 2	1.45	1.17	1.82	1.93	2.03	1.72	1.17	1.06
LONG 3	2.04	2.28	2.37	2.10	2.08	1.89	1.62	1.55



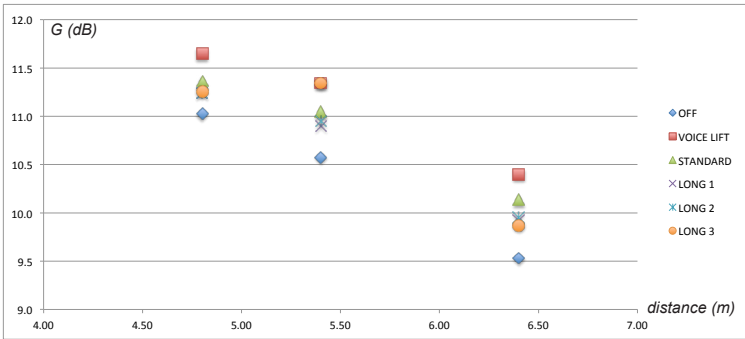
MEASURED EDT (av. 500Hz, 1kHz, 2kHz)

EDT	2.8	4.8	6.4	5.4
OFF	0.25	0.29	0.27	0.31
VOICE LIFT	0.42	0.53	0.52	0.53
STANDARD	0.33	0.43	0.46	0.47
LONG 1	0.28	0.47	0.50	0.52
LONG 2	0.30	0.44	0.50	0.54
LONG 3	0.28	0.43	0.45	0.51



MEASURED STRENGTH G (ref. 1m)

G	2.8	4.8	6.4	5.4
OFF	14.17	11.03	9.53	10.58
VOICE LIFT	14.50	11.65	10.40	11.34
STANDARD	14.48	11.36	10.14	11.05
LONG 1	14.30	11.24	9.92	10.90
LONG 2	14.34	11.24	9.95	10.95
LONG 3	14.32	11.26	9.87	11.34



press F1-F6 to select functions and presets.

press 'HOME' to access the four pages.

1 -> 2 -> 3 -> 4 -> 1



page 1

button	preset	RT(0.5/1k/2k av.
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F1	off	0.39s
F2	standard	1.4s
F3	long 1	2.54s
F4	long 2	1.89s
F5	long 3	2.02s
F6	voice lift	0.5s



page 2

button	function
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F1	unmute AFC3 system
F2	mute AFC3 system
F3	adjust liveness level *
F4	adjust subs level (don't use) *
F5	adjust center speakers (don't use) *
F6	no function

* opens new page, adjust with rotary dial, return by pressing 'cancel'



page 3

button	preset
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F1	long 4 (RT not measured)
F2	EC (test mode)
F3	no function
F4	no function
F5	no function
F6	no function

page 4: no active buttons