a Multi-Point Measurement

TRINNOV AUDIO

CALIBRATION - Part.2

Multi-Point Measurement III.a

Multi-Point Algorithm

A lot of Multi-Point algorithms use averaging methods :

- Only relevant to estimate the average energy of the acoustic system (the phase is not considered).
- Unable to estimate the transient response of the loudspeakers and the behaviour of the room.

Trinnov's approach to Multi-Point measurement :

- Do not combine measurements into a single measurement supposedly representative of the global behaviour of the loudspeakers in the room.
- Implements algorithms that compute filters that achieve the best possible improvment for frequency and phase responses while considering every single measurement point.

Why Multi-Point ?

- The purpose is not only to optimize a wider area but also to get more information from measurements and increase reliability by taking differences occuring in the listening area into consideration.

- At some frequencies, the different positions may show big differences and eventually cancel each other.

- As a consequence, it is strongly recommended to always compare both the different positions measurements and the resulting filters to make sure it does not result in null filters.

Fondamental Rules

There are no rules.

- Multi-point is not better than single-point measurement, it all depends on the goal.

- The compromise consists in choosing what's best between an optimum correction for a single point and a smoothed correction for a wider area.

Fondamental Rules

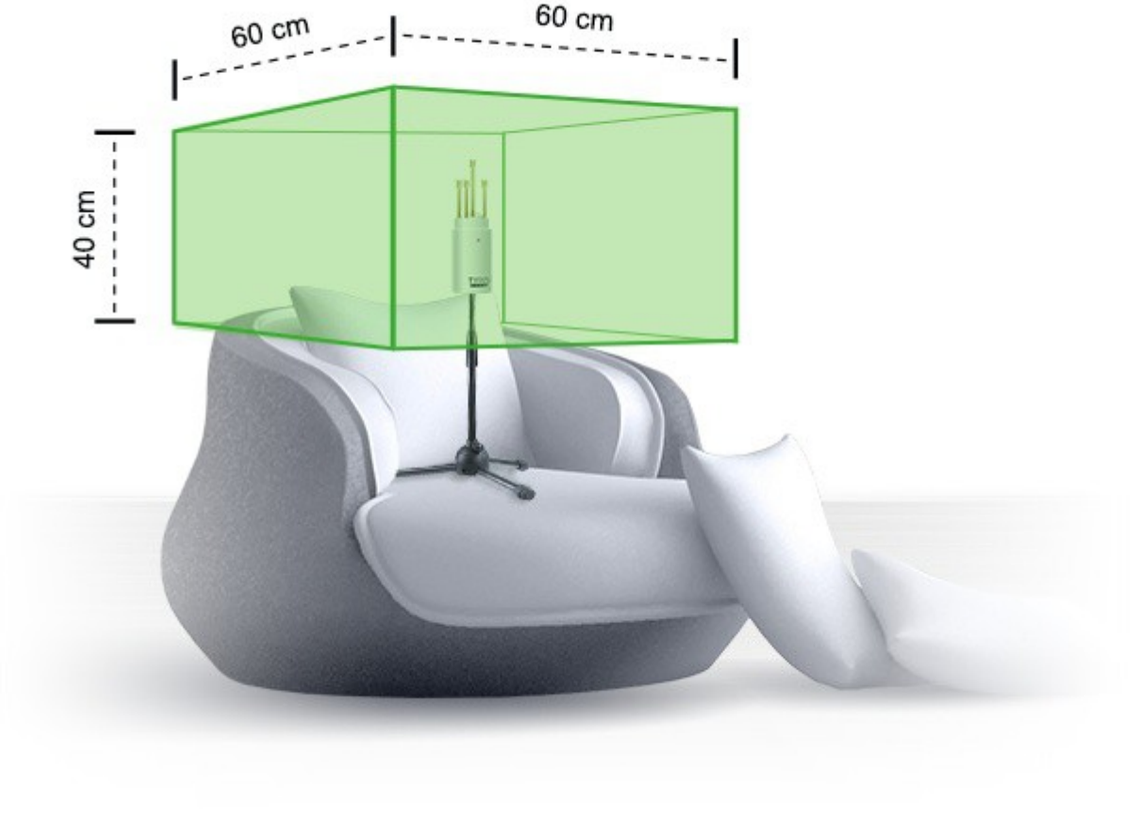
The Optimizer graphs are your friends.

- The result is difficult to apprehend without objective information such as graphs.

- Analysing multi-point measurement helps to arbitrate.

Multi-Point Measurement

Single position in Small/Large rooms

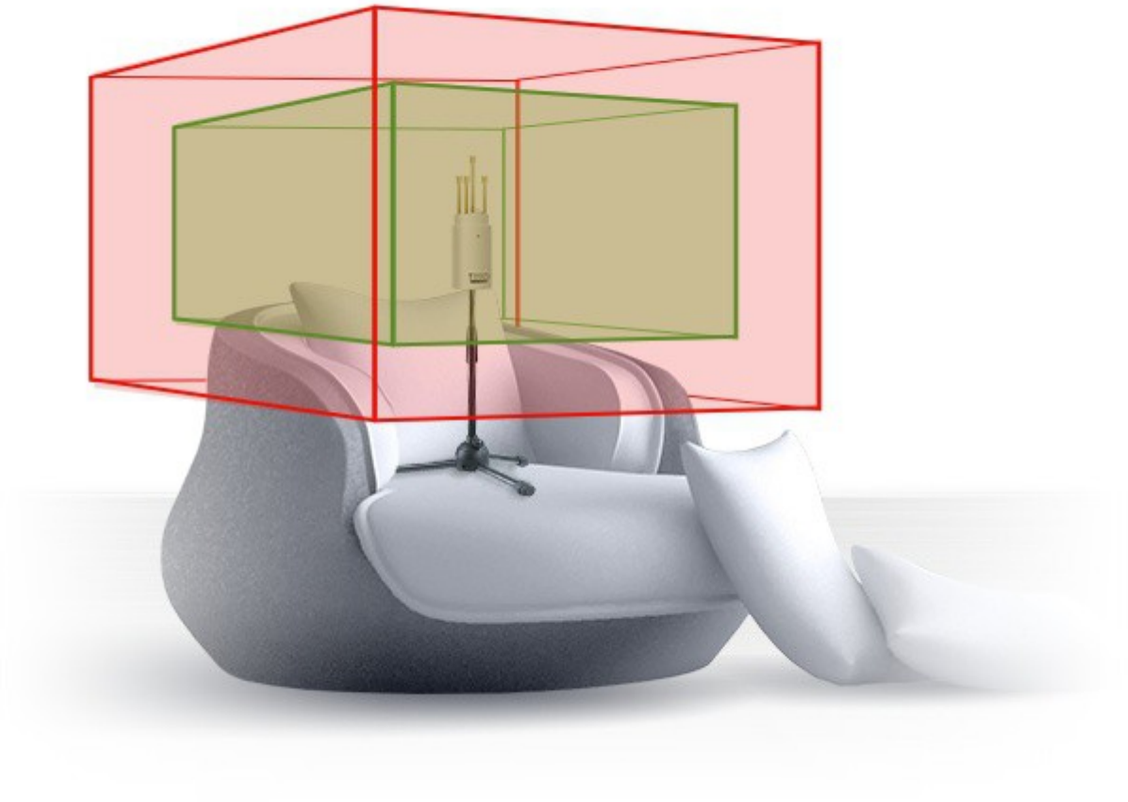


- Additional measurements can be made aside, at the front, at the back and above reference points.

- Depending on the dimensions of the room, the size of the cube/sphere can vary from 40 to 80 cm wide.

Multi-Point Measurement

Single position in Small/Large rooms

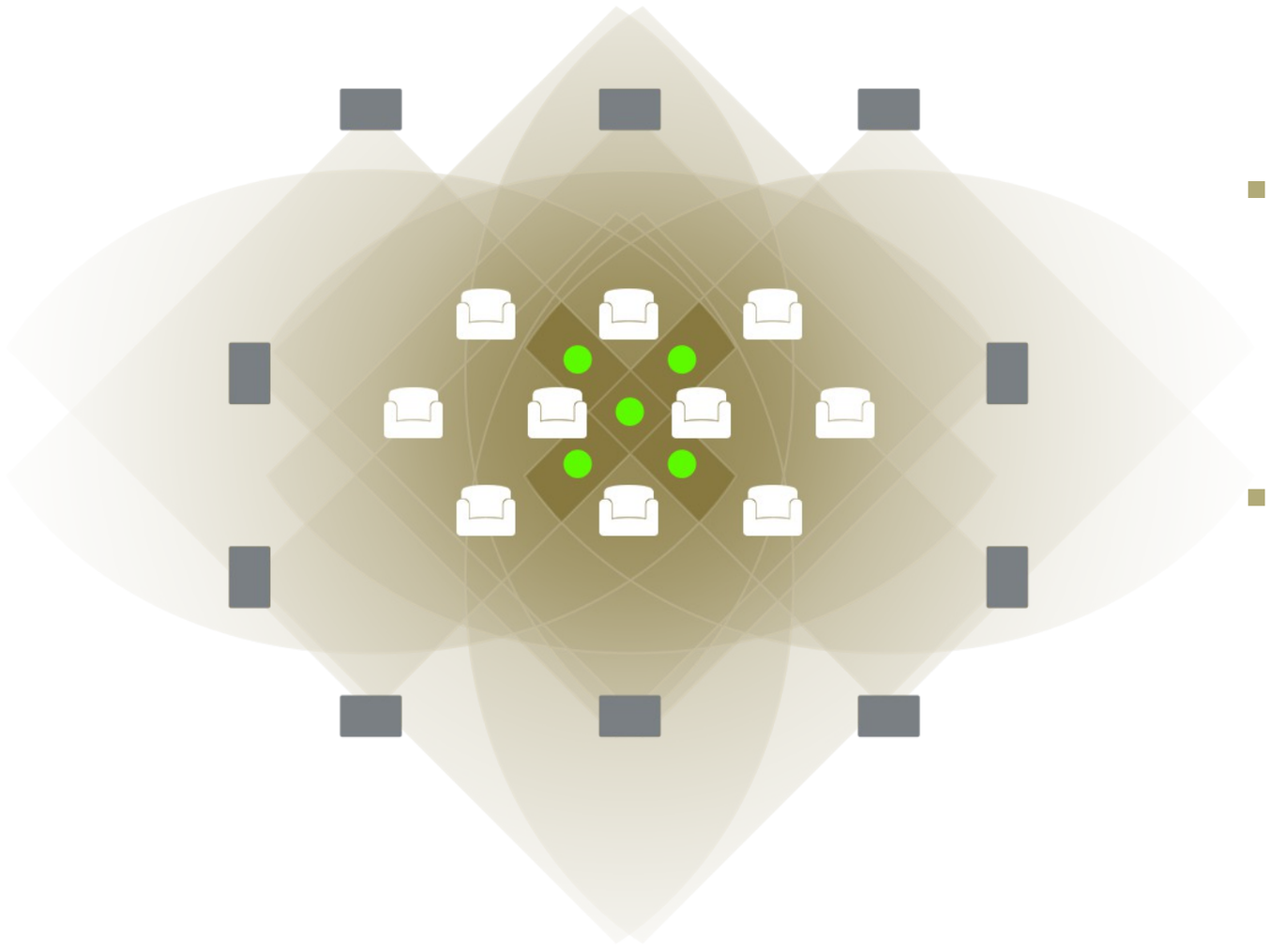


- Beyond a certain limit, the multipoint becomes irrelevant.

- Make sure there is no obstacle between the speaker and the microphone as you move the measurement position.

Multi-Point Measurement

Multiple positions in Small/Large rooms



Conceptual representation

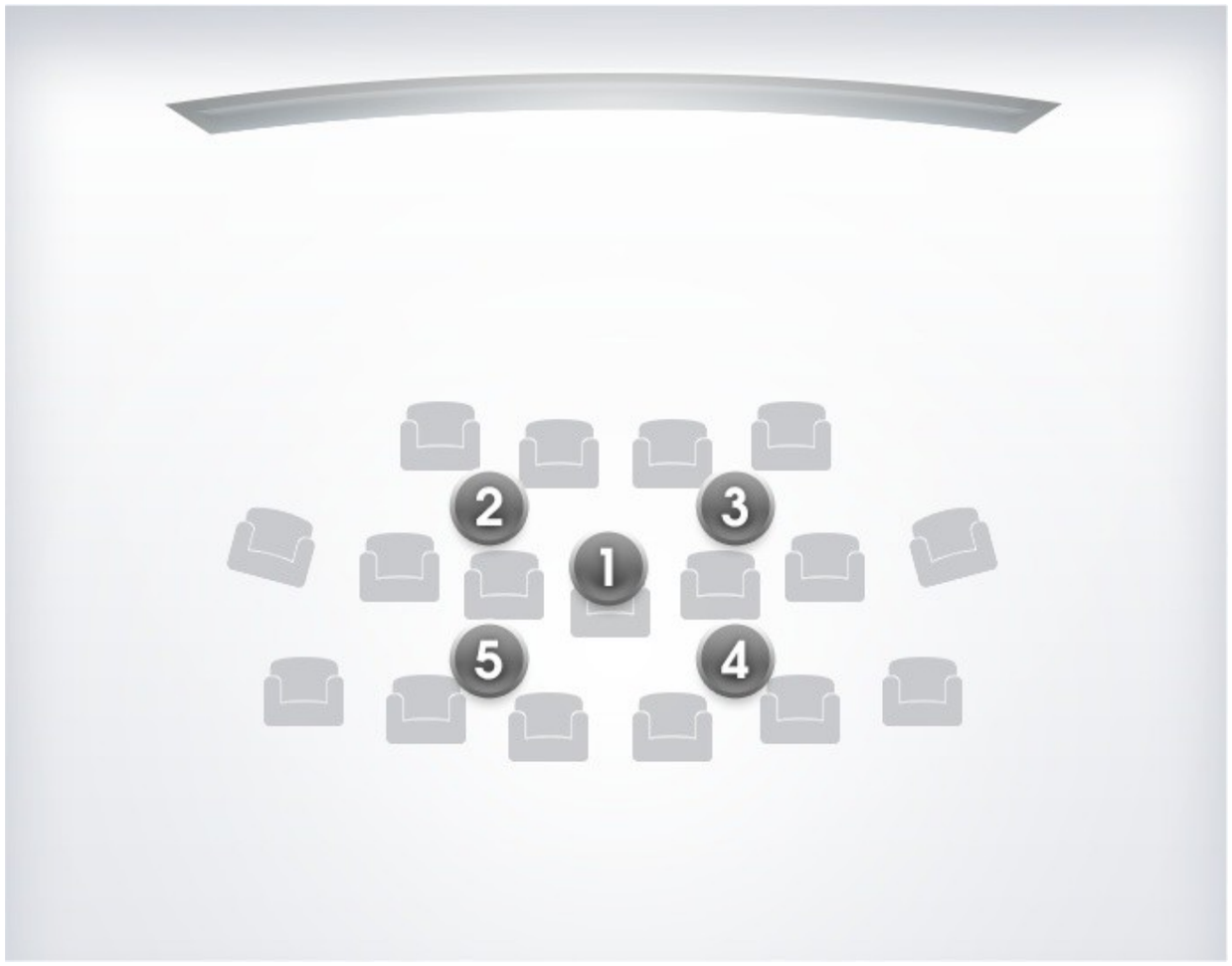
- The most relevant positions are within the area covered by every speakers.
- Enlarging the measurement zone beyond this area can be irrelevant.

Multi-Point Measurement

Multiple Position in Large Rooms

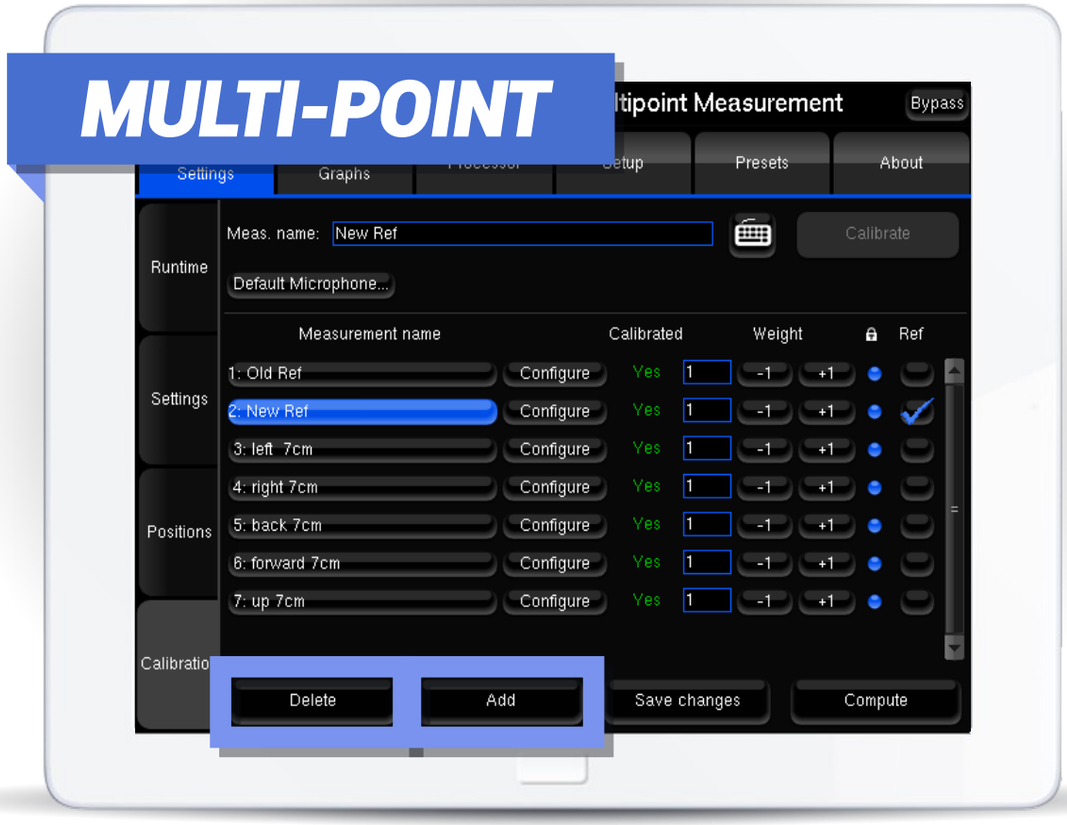
- In large rooms, the purpose of multipoint calibration is to optimise a wider area.

- The same rule as for small rooms applies : the risk of cancellation increases with the size of the measurement area.



Multi-Point Measurement

Sequential Multi-Point Measurement



- Multi-point measurement can be performed sequentially using the same microphone.
- Adjust the number of measurement by using the Add and Delete buttons.
- Run calibrations until all status are « Yes ».
- Measurements can be renamed.

Multi-Point Measurement

Multi-Microphone Measurement

- Instead of sequential procedure, the system allows a single multi-microphone measurement (Calibration kit provided for commercial cinemas only).

- From the Calibration page, the Configure button displays this page.

Multi-Point Measurement

Weighting

- The Multi-Point engine allows to emphasis the point of your choice by affecting weights to each measurement.

- Instead of deleting a position, you can set a 0 weight to exclude a measurement from the calculation.

Multi-Point Measurement

Weighting

- In this example, the Reference position has the same weight as the other points altogether.

- In total, the measurement information of the reference point will be considered for 50 % of the computation (5/10).