September 21

MEASUREMENT IN THE IMPULSE RESPONSE OF THE MOREL LOUDSPEAKER

The aim is to reach the optimal starting point in order to analyze the response of the virtual room.

In order to do that, a flat response of the morel loudspeakers is necessary.

If subjected to an exponential sweep signal, the Morel exhibits non completely flat behaviour in the spectrum, the goal, thus, is to stimulate the loudspeaker by using an suitably predistorted signal that is able to compensate the irregularities.

POSITIONING

The recording are carried out in a dead room, sufficiently far away and isolated from unwanted reflection (garage).

1.9 meters from the first obstacle

1.5 meters distance from the floor

1.5 meters distance mic to the loudspeaker

The mic is aligned with the space between the woofer and the tweeter.

Distance from the ceiling🡪?

Immagine che contiene schizzo, strumento, design

Descrizione generata automaticamente

SET UP:

Immagine che contiene altoparlante, Cassa di risonanza, Subwoofer, elettronica

Descrizione generata automaticamente Immagine che contiene microfono, Apparecchiature audio

Descrizione generata automaticamente

Immagine che contiene computer, computer, schizzo, design

Descrizione generata automaticamente

Play sweep Receive from mic

ICP

YAMAHA Ti01608

Audio interface

(eternit in exit)

AMP. INNOSONIX

(eternit in exit)

SWITCH ETERNIT

Microphone type PCB piezoelectronics 🡪?

Crossover points:

40-2500 Hz woofer Butterworth filter 12bB /octave

>2500 HZ tweeter

SWEEP:

2 seconds

22-22000Hz fade in- fade out

As a first step the inverse filter is created using Kirkeby method (if we convolve the inverse sine sweep with the sine sweep we will obtain a Delta Dirac, obtaining the ideal impulse response in time).

Convolving the inverse of the sine sweep with the recorded sound I obtain the impulse response of the loudspeaker.

The Kirkeby inverse filter is used again to obtain the inverse of the IR.

With the convolution of the inverse of the IR with the initial sweep I get the predistorted sweep signal that guarantee a flat response if the loudspeaker is stimulated by it.

The Morel loudspeaker shows already a quite flat response but the predistorted sweep ensures a needed equibalanced stimulation.