

## TAD TSM 2

he passive crossover filters used in the TAD and Rey Audio (Kinoshita) monitors are all very similar, in their layout and basic functioning, to the TN-2 model used in the TAD TSM-2 (= Exclusive 2402)

This filter consists of:

- **6th order Low Pass** on the Woofer (in a semi-balanced topology, i.e. the first inductance is split in two halves and placed on either branch of the filter, and the following two inductors and placed on either branch),

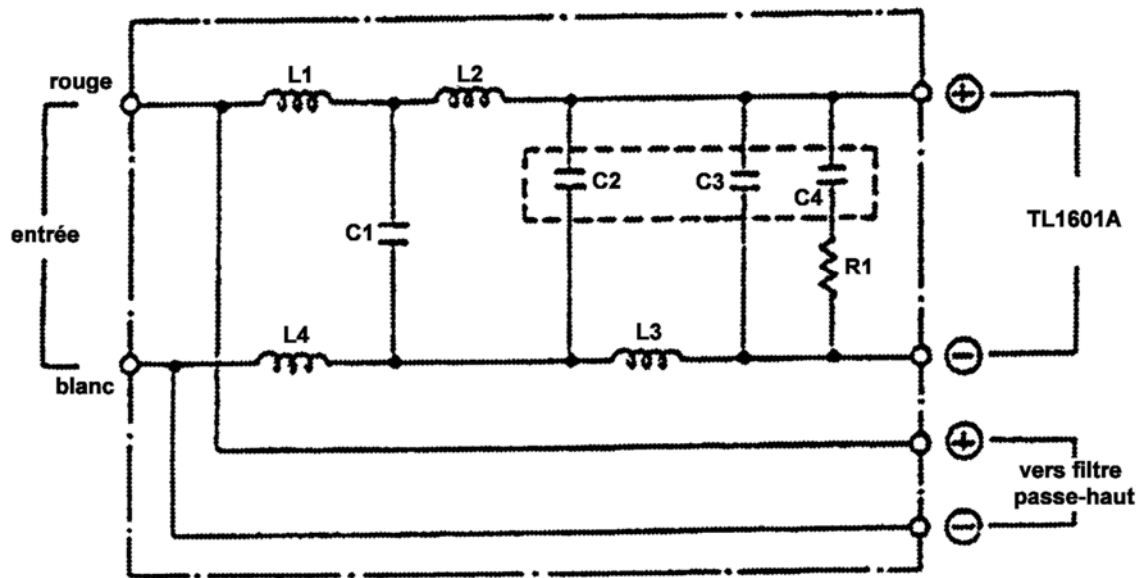
- **2nd order High Pass** on the compression driver+horn,

- plus impedance correction (Zobel on Woofer and series RLC on horn), and an equalization contour (parallel RLC) and L-Pad attenuation on the horn.

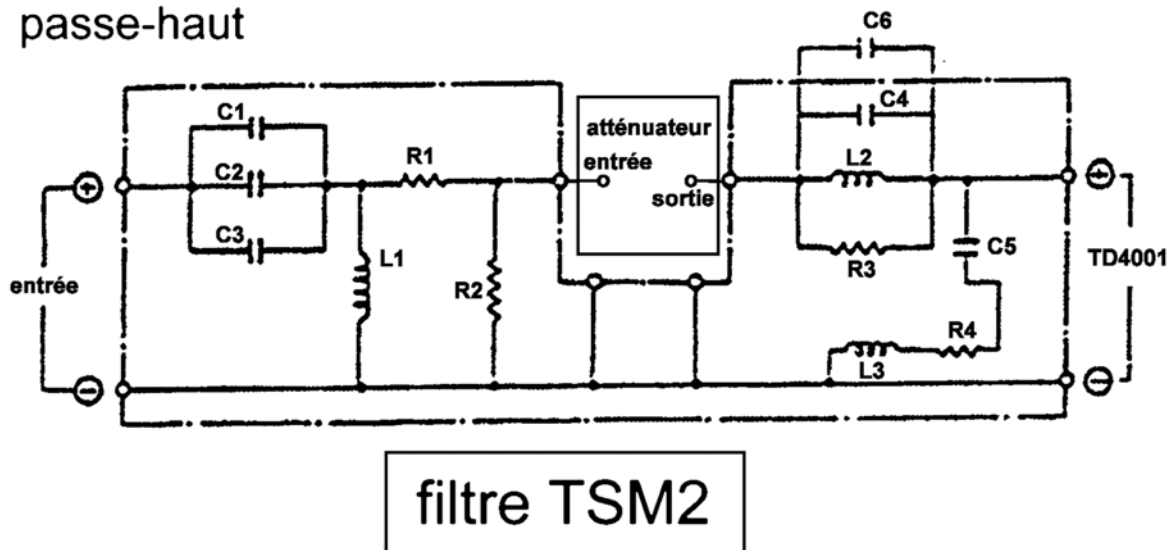
The purpose of the asymmetrical slopes (6th/2nd) is to compensate for the physical offset between the acoustic centres (based on the technical drawings of the TSM-2, the driver's diaphragm is ~33 cm behind the base of the woofer cone).

It should also be noted, though, that the TH-4001 horn itself imposes a steep ( $> 4$ th order) high-pass in the vicinity of its cut-off frequency ( $F_c = 320$  Hz), which means that it is actually **impossible to obtain a true 2nd (or 3rd, or even 4th) order high-pass transfer function**. The resulting high-pass is instead the combination of the electrical high-pass (2nd order) with the intrinsic acoustical high-pass happening approximately one octave below that ( $>4$ th order).

passee-bas



passee-haut



filtre TSM2

**Low-Pass Woofer (6th ord. Linkwitz-Riley @ 650Hz)**

$L1 = L4 = 1.6 \text{ mH}$ ;  $C1 = 56 \text{ }\mu\text{F}$ ;  $L2 = 3.0 \text{ mH}$ ;  $C2 = 33 \text{ }\mu\text{F}$ ;  $L3 = 1.5 \text{ mH}$ ;  $C3 = 6.8 \text{ }\mu\text{F}$

**Zobel (impedance comp. Woofer)**

$C4 = 20 \text{ }\mu\text{F}$ ;  $R1 = 8.2 \text{ Ohm}$

**High-Pass Horn (2nd ord.  $Q = 0.9$  @  $1.31 * 650 = 850 \text{ Hz}$ )**

$C1 + C2 + C3 = 10 + 10 + 3.3 = 23.3 \text{ }\mu\text{F}$ ;  $L1 = 2.2 \text{ mH}$

**Fixed L-Pad (-10dB)**

$R1 = 5.6 \text{ Ohm}$ ;  $R2 = 3.3 \text{ Ohm}$

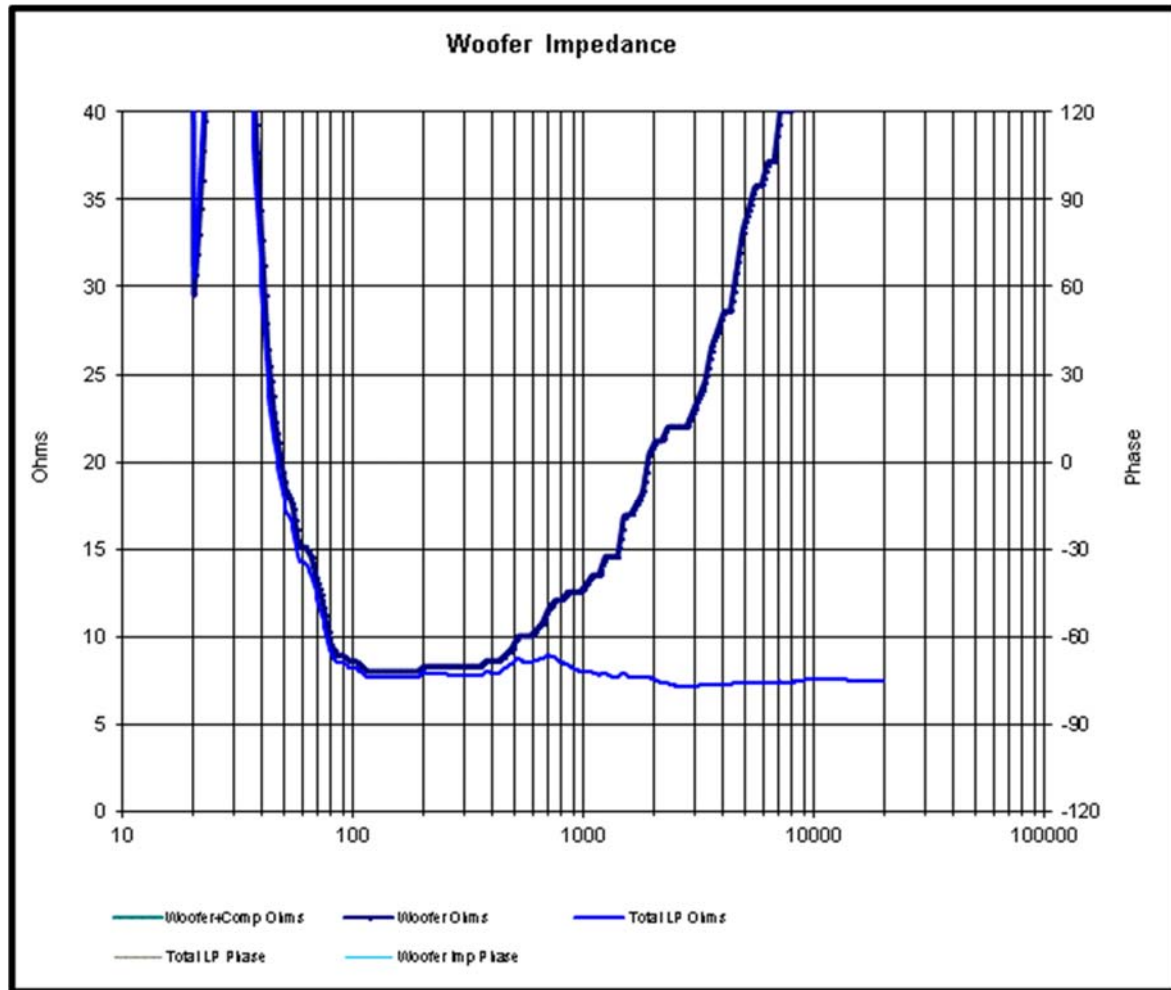
**parallel RLC (equaliz. horn)**

$C4 + C6 = 15 + 15 = 30 \mu\text{F}$ ;  $L2 = 0.2 \text{ mH}$ ;  $R3 = 3.3 \text{ Ohm}$

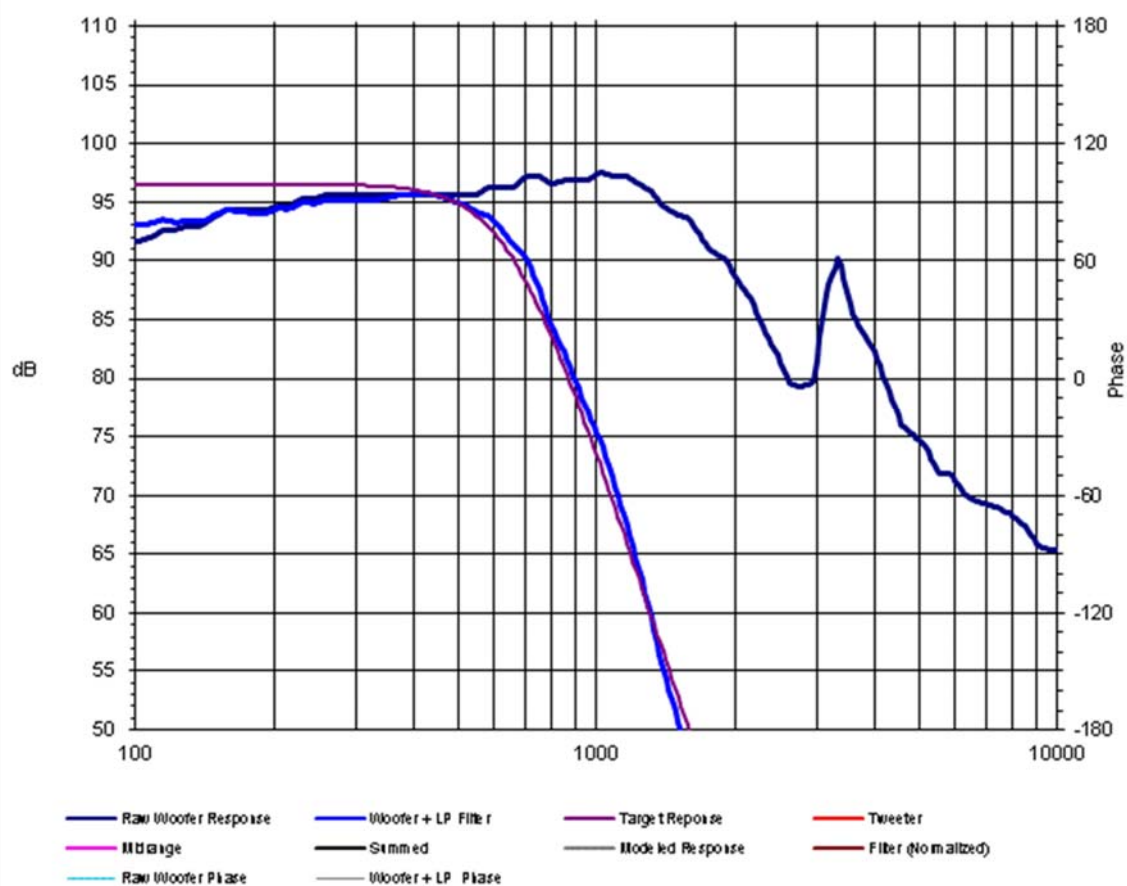
**series RLC serie (impedance comp. horn)**

$C5 = 15 \mu\text{F}$ ;  $L3 = 1.1 \text{ mH}$ ;  $R4 = 22 \text{ Ohm}$

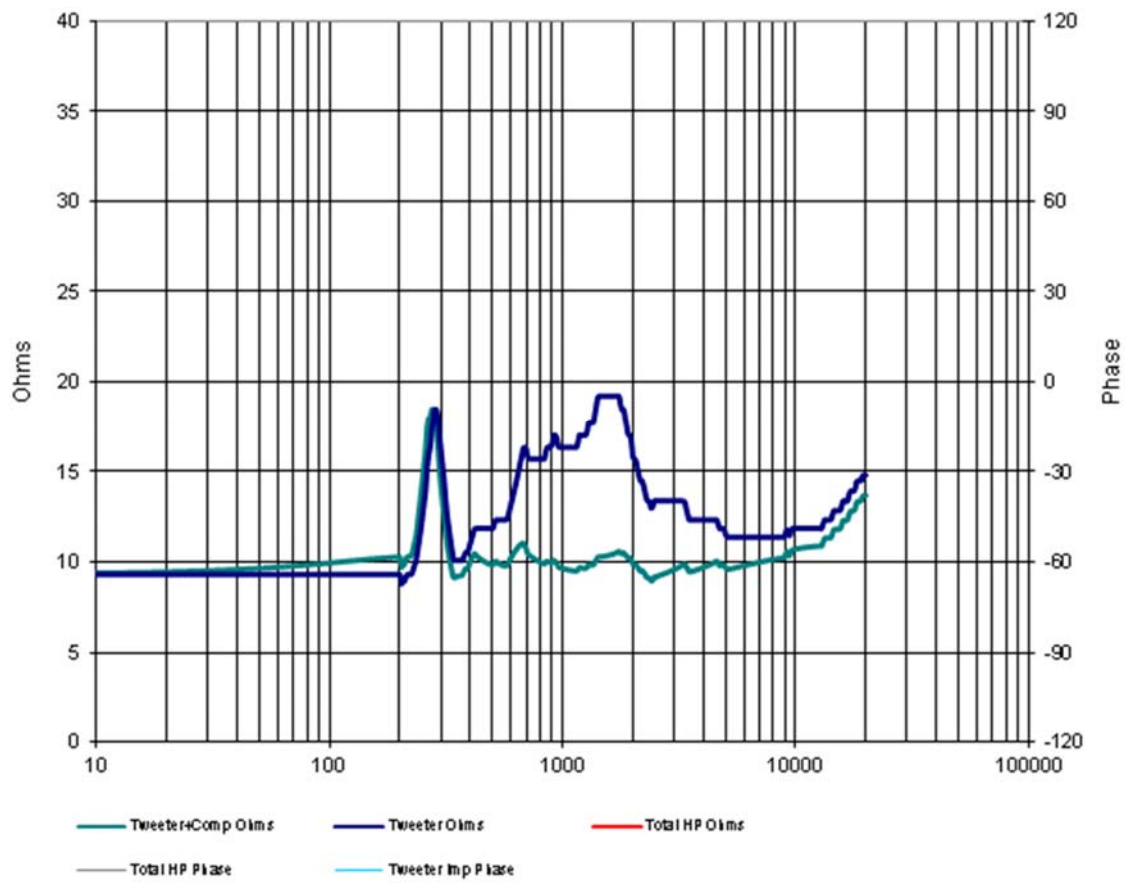
Here are the modelled results of the application of these values to the individual speaker units:



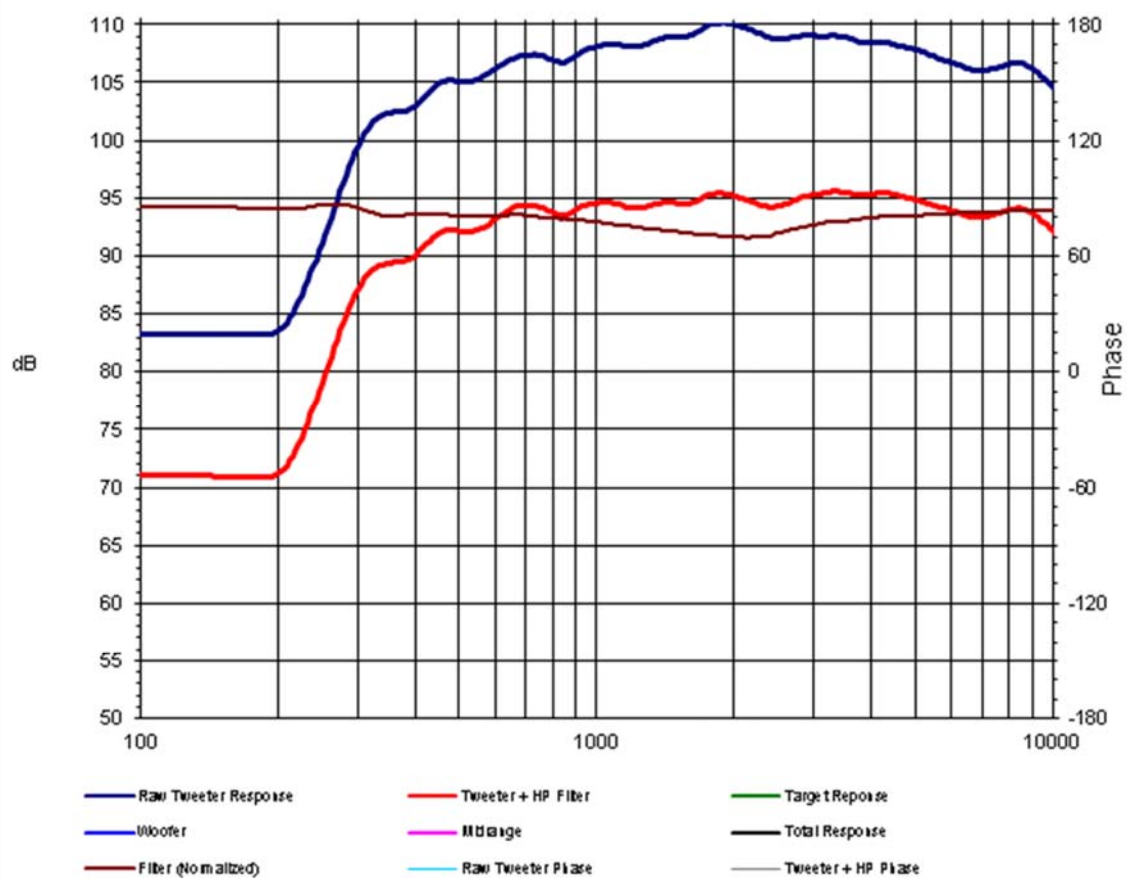
# Woofer And Low Pass Response

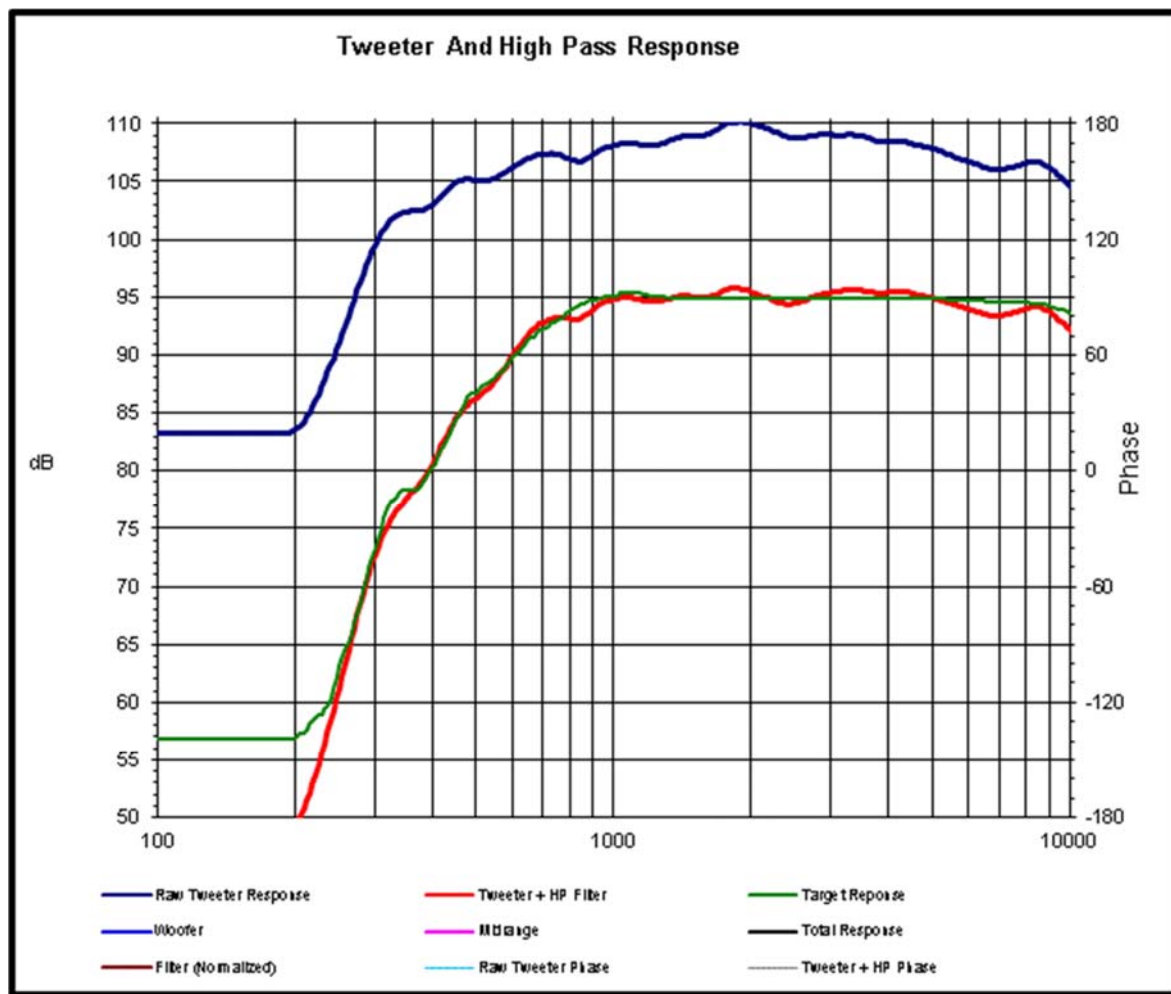


Tweeter Impedance

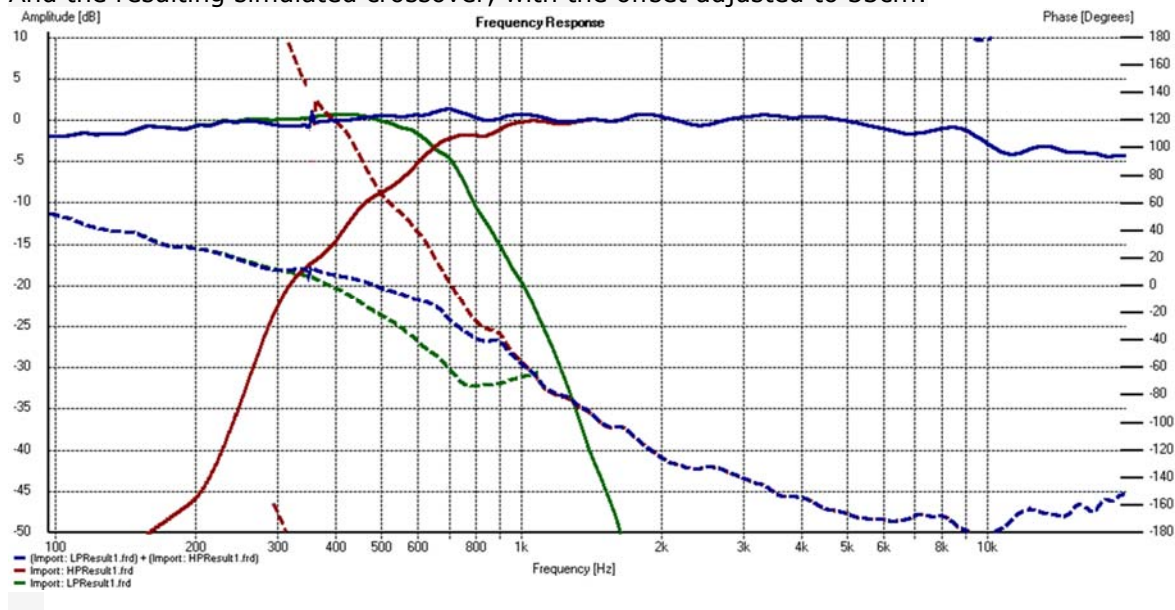


# Tweeter And High Pass Response

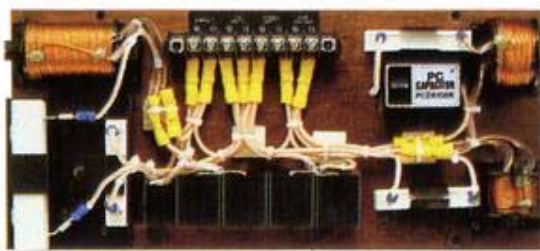
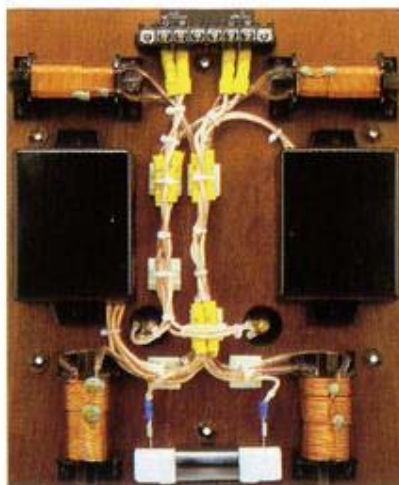
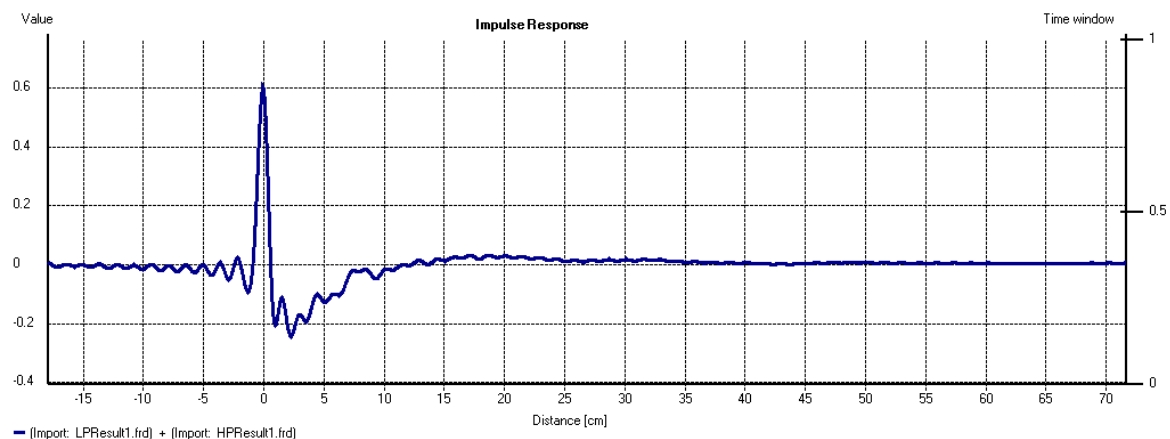




And the resulting simulated crossover, with the offset adjusted to 33cm:



And the associated Impulse Response:



**TAD TN-2** 130,000yen(around the 1991 time)  
150,000yen(around the 1993 time)

#### Description

The dividing network of an 8-ohm specification for driving one TL-1601a.



It is adopted as Exclusive model2402.

In order to investigate a low loss and a low leakage thoroughly, OFC was adopted as all the product lines and choke coil coils, and the press joint type which used the OFC sleeve is adopted as the connection way. Moreover, formation of an enlargement metallurgy plating of a terminal, a development, adoption of the quality capacitor, etc. are performed. measure.

By forming line feed character circuitry into a balance circuit, it has succeeded in exclusion of the inter leakage resulting from an earth line.

Furthermore, HF circuitry and line feed character circuitry are separated completely, and the design is performed, such as blotting out muddiness of the sound near a cross over frequency, so that the performance of each combined unit can be pulled out.

Rating of a mode	
Form	2 way dividing network
Cross over frequency	650Hz
The maximum input	300W
Impedance	8ohm
Level control	Built-in: Fixed-10dB With outside: Succession good transformation
A constant loss	TN-2 L.F.0.4dB
Damping characteristics	TN-2 L.F.: -36dB/oct TN-2 H.F.: -12dB/oct
Dimensions	TN-2 L.F.: Width 250x height 300x depth of 102mm TN-2 H.F.: Width 330x height 59x depth of 150mm
Weight	TN-2 L.F.: 3.0kg TN-2 H.F.: 1.8kg
Furnished accessory	Fixing screw (tapping screw M4x25) x10 Common washer x10 Y form termination x14 Sealing optical-property x1 Level controller x1