

SINGLE TEST:

15-CM BROADBAND

### **EAD E100HD MKII**

**Swedish Broadband – now from Denmark**

**Price: 200 EUR Marketing: HiFisound, Münster**

**The Swedish loudspeaker specialist EAD, or Esoteric Audio Devices, introduced the MkII version of its 15-Centimetre Broadband E100HD.**

**We did not want to try your and our own patience until the next broadband comparison test – therefore you will find our test report here.**

The E100 HD MkII is manufactured by Scan Speak in Denmark. The chassis now has a nice basket with a 150 mm diameter (previously it has been 140 mm), equipped with generous openings below the centring spider. Membrane and actuator geometry remain unchanged.

For several years, the Swedish manufacturer EAD produced the loudspeaker chassis for the British loudspeaker specialist Ted Jordan under licence. Now EAD markets its broadband under its own brand name. And now the Swedes are bringing Scan Speak aboard as a subcontractor/supplier.

The E100HD MkII is based on the E.J. Jordan JX92S (Test in HOBBY HiFi 2/2001). Just like the latter, the E100HD MkII is equipped with a light metal membrane with a cone-shaped dust protection cover. The membrane is embedded in rubber rim and in a basket made from stable light metal pressure casting.

#### **Thiele-Small-Parameter and chassis recommendation**

In its MkII version the E100HD offers a lower resonance quality of 0.39 (previously 0.48), which provides optimal conditions for the bass reflex use. The now lower resonance frequency results from a larger moving mass (5.9 instead of 4.7 grams) and from the more flexible membrane suspension. This results in a somewhat higher equivalent volume (26 instead of 22 litres). The recommended chassis is smaller than before: 22 to 28 litres of bass reflex design are proving to be optimal. The predecessor was comfortable with 27 to 29 litres. The previous lower volume flexibility was the result of the higher resonance quality at the time. The achievable bottom limit frequency with the MkII version is slightly lower; it is now slightly below the 30 Hz mark (previously it was 32 Hz).

Despite the newly added basket opening under the centring spider the mechanical losses are somewhat higher than before (1.0 vs 0.79 kg/s). Since the coil carrier consists of aluminium and therefore offers fertile ground to eddy current, it cannot be determined how much of the losses are due to the fine dynamic and what part is “only” due to the efficiency factor.

#### **Impedance control**

Besides the E100HD MkII, EAD also supplies the E100, which is of almost identical design. The difference is the better impedance control of the E100HD, which is the result of a copper cap on the T-shaped magnetic pole core. This construction method reduces the inductivity of the voice coil and thus enables a higher power input in the high-frequency range. This results in a sound pressure increase in the high-frequency range and subsequently a clearer and stronger high-frequency sound reproduction besides a higher upper limit frequency. The acoustic frequency curve shows an even better linearity than before. The upper limit frequency remained unchanged with 20 kHz.

Last but not least, through the impedance control the distortions decrease: In general, the chassis impedance changes in dependence on the membrane displacement. Through minimisation of the voice coil inductivity the fluctuation range of the impedance is reduced. Then the power input of the voice coil also shows a lower changeability, depending on the instantaneous position of the voice coil – and thus distortions are reduced.

Accordingly, our measurements show impressively low distortion values. The harmonious values consistently weaken with increasing order – which is an ideal tonal performance.

## Conclusion

With the E100HD MkII, EAD supplies an outstanding broadband with absolute convincing frequency response linearity and lowest distortions. Due to favourable Thiele-Small-Parameter it also provides distinct deep bass talent.

## Chassis recommendation

Chassis type	Bass reflex	Bass reflex
Resistance in signal path	0.2 ohm	1.0 ohm
Chassis volume	22 l	28 l
Tuning frequency	35 Hz	32 Hz
Bottom limit frequency (-3 dB)	33 Hz	28 Hz
Bass reflex tunnel diameter	50 mm	50 mm
Bass reflex tunnel length	170 mm	160 mm

## Technical data

### Thiele-Small-Parameter:

Re	= 5.7 ohm	Vas	= 26 l
Le	= 0.13 mH	Cms	= 2.9 mm/N
Fs	= 39 Hz	Mms	= 5.9 g
Qms	= 1.4	Rms	= 1.0 kg/s
Qes	= 0.54	B*	= 3.9 N/A
Qts	= 0.39	7(1 kHz)	= 6.4 Ohm
Sd	= 80 qcm	Z(10 kHz)	= 8.8 ohm

### Voice coil data

Diameter:	25	mm
Winding height:	11.8	mm
Carrier material:	Aluminium	
Coil material:	Copper round wire	
Air gap depth:	5	mm
Linear displacement Xmax:	3.4	mm

### Electric and acoustic data

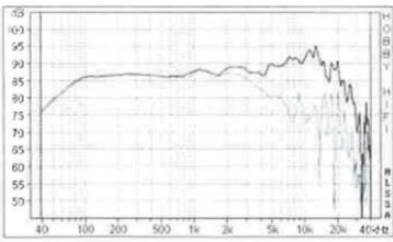
Nominal impedance DIN:	8 ohm
Minimum impedance:	5.9 ohm/350 Hz
Impedance at 1 kHz:	6.4 ohm
Impedance at 10 kHz:	8.8 ohm
Sensitivity in the low-frequency range (free field):	82 dB
Transmission range:	fu - 20 kHz

### Measurements, materials

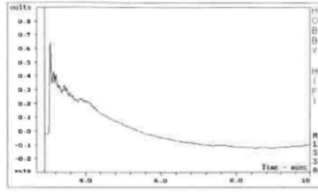
Outer diameter:	150	mm
Installation diameter:	112	mm
Milling depth:	5	mm
Installation depth (not milled):	62	mm
Membrane material:	Aluminium	
Rim material:	Rubber	
Dust cap material:	Aluminium	

Basket material:	Light metal pressure casting
Magnet material:	Ferrite
Ventilation method:	Pole piece holes 7 mm

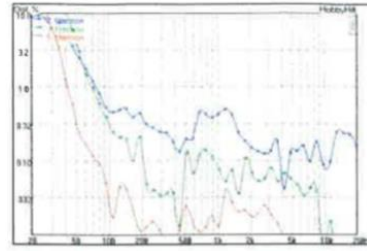
Rear ventilated centring spider  
Perforation of the coil carrier



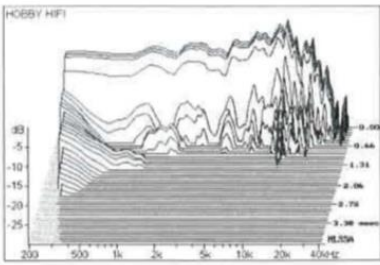
Acoustic pressure frequency response in infinite baffle axial and under 30°  
Broadband, linear, balanced - the most you can get.



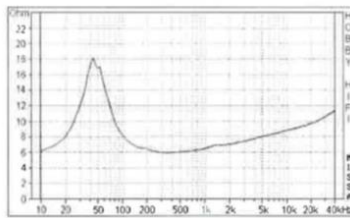
Step response in infinite baffle axial. Superimposed during the initial milliseconds, overall very fast and consistent.



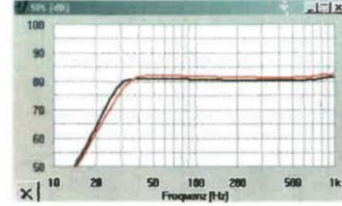
Distortion factor frequency response K2, X3 and K5 at 90 dB, medium sound pressure level  
Very low, hearing physiologically optimally graded distortion.



Waterfall spectrum in infinite baffle axial, outstanding, fast and consistent swing off.



Impedance-frequency-response open-air Low voice coil inductivity, strongly dampened resonance maximum through eddy-current losses.



Low frequency simulation according to chassis recommendation in column 3 mH 0.2 ohm (red) and 1.0 ohm (black) resistance in signal path.  
In the relatively large bass reflex chassis clear reflex tuning and very low critical frequency