



Eighteen Sound
an AEB S.r.l. Company

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Application Note #5:

**Building an effective, high
performance, two way,
8" loudspeaker system**

Eighteen Sound Technical Department
July, 2007



2 way 8" kit

- Two way loudspeaker system for high performance in a small and portable enclosure
- The 8MB400 woofer is combined with the ND1070 HF neo driver mounted on a XT120 horn to obtain a smooth frequency response, good directivity control and high power handling
- The passive crossover network design greatly simplifies the system setup
- ND1020 compression driver could be used as an alternative, cost effective choice



2 way 8" kit

8MB400



GENERAL SPECIFICATIONS

| | | |
|---------------------------|--------------|--------------------|
| NOMINAL DIAMETER | 200mm | (8 in) |
| RATED IMPEDANCE | 8 ohms | |
| CONTINUOUS PINK NOISE (1) | 280 W | |
| SENSITIVITY (2) | 95 dB | |
| FREQUENCY RANGE (3) | 55 ÷ 5200 Hz | |
| MAX RECOMM. FREQUENCY | 3000 Hz | |
| RECOMM. ENCLOSURE VOLUME | 10 ÷ 40 lt. | (0,35 ÷ 1,41 cuft) |
| VOICE COIL DIAMETER | 51 mm | (2 in) |
| NET WEIGHT | 3,6 kg | (7,95 lb) |

THIELE-SMALL PARAMETERS (4)

| | | |
|------------------------------|---------------|----------------|
| Fs | 64 Hz | |
| Re | 5 ohms | |
| Sd | 0,0227 sq.mt. | (35,19 sq.in.) |
| Qms | 3,23 | |
| Qes | 0,43 | |
| Qts | 0,38 | |
| Vas | 23,9 lt. | (0,85 cuft) |
| Mms | 18 gr. | (0,04 lb) |
| BL | 9,3 Tm | |
| Linear Mathematical Xmax (5) | ± 5,8 mm | (± 0,23 in) |
| Le (1kHz) | 0,96 mH | |
| Ref. Efficiency | | |
| 1W @ 1m (half space) | 93,7 dB | |

ND1020

ND1070



GENERAL SPECIFICATIONS

| | | |
|-----------------------------|---------------------|-------------------------|
| THROAT DIAMETER | 25,4 mm (1 in) | 25,4 mm (1 in) |
| RATED IMPEDANCE | 8 ohm | 8 ohm |
| DC RESISTANCE | 5,8 Ohm | 5,3 Ohm |
| MINIMUM IMPEDANCE | 6,5 Ohm at 5000Hz | 7 Ohm at 4000Hz |
| LE (AT 1KHZ) | 54 µH | 67 µH |
| POWER HANDLING | | |
| CONTINUOUS PINK NOISE (1) | 30W above 2 kHz | 50W above 1,6 kHz |
| CONTINUOUS PROGRAM (2) | 60W above 2 kHz | 100W above 1,6 kHz |
| SENSITIVITY(1W@1M) (3) | 108,5 dB | 109 dB |
| FREQUENCY RANGE | 1600Hz ÷ 20kHz | 1600Hz ÷ 20kHz |
| RECOMM. XOVER FREQUENCY | 1600 Hz | 1600Hz (12dB/oct slope) |
| DIAPHRAGM MATERIAL | Polyethylene | Pure Titanium dome |
| VOICE COIL DIAMETER | 34,4 mm (1 1/3 in) | 44,4mm (1 3/4 in) |
| VOICE COIL WINDING MATERIAL | Edge-wound aluminum | Edge-wound aluminum |
| MAGNET MATERIAL | Neodymium | Neodymium |
| FLUX DENSITY | 1,8 T | 1,8 T |
| BL FACTOR | 6 N/A | 8,2 N/A |

XT120



GENERAL SPECIFICATIONS

| | | |
|---------------------------|---|--------|
| THROAT DIAMETER | 25,4 mm | (1 in) |
| HORIZONTAL COVERAGE(+6dB) | 90° (+1, -10) average range (2KHz ÷ 12,5KHz) | |
| VERTICAL COVERAGE (+6 dB) | 60° (+15, -10) average range (2KHz ÷ 12,5KHz) | |
| DIRECTIVITY INDEX | 15 dB (+2,5 ÷ 1,5) average range (2KHz ÷ 12,5KHz) | |
| USABLE FREQUENCY RANGE | Above 1,5 KHz | |
| RECOMM. CROSS.FREQUENCY | 2 KHz or more | |
| SENSITIVITY (ON AXIS) (1) | 108 dB | |
| FREQUENCY RANGE | 2KHz ÷ 18KHz | |

MOUNTING INFORMATION

| | | |
|---------------------------|--|-----------|
| OVERALL DIMENSIONS | | |
| MOUTH HEIGHT | 150 mm | (5,9 in) |
| MOUTH WIDTH | 200 mm | (7,8 in) |
| DEPHT | 103 mm | (4,1 in) |
| MOUTH MOUNTING DIMENSIONS | | |
| | 4 ø6 holes on the edge of rectangle with 165 mm x 115 mm (6,5 x 4,53 in) sides | |
| REAR HEIGHT | 128 mm | (5 in) |
| REAR WIDTH | 170 mm | (6,7 in) |
| NET WEIGHT | 350 g | (0,75 lb) |

- The enclosure should be made of baltic birch plywood (15mm thickness)
- The vents are from PVC plumbing connections
- Bolts are M5x35mm
- M5 T-Nuts are recommended
- Handling, rigging and connectors are user's choice
- It's recommended to well damping the cabinet interior
- An example of the optimal damping material disposition is shown in the bottom right image
- An high density dampening material, such as Dacron or other synthetic fibers, is required for best acoustic performance

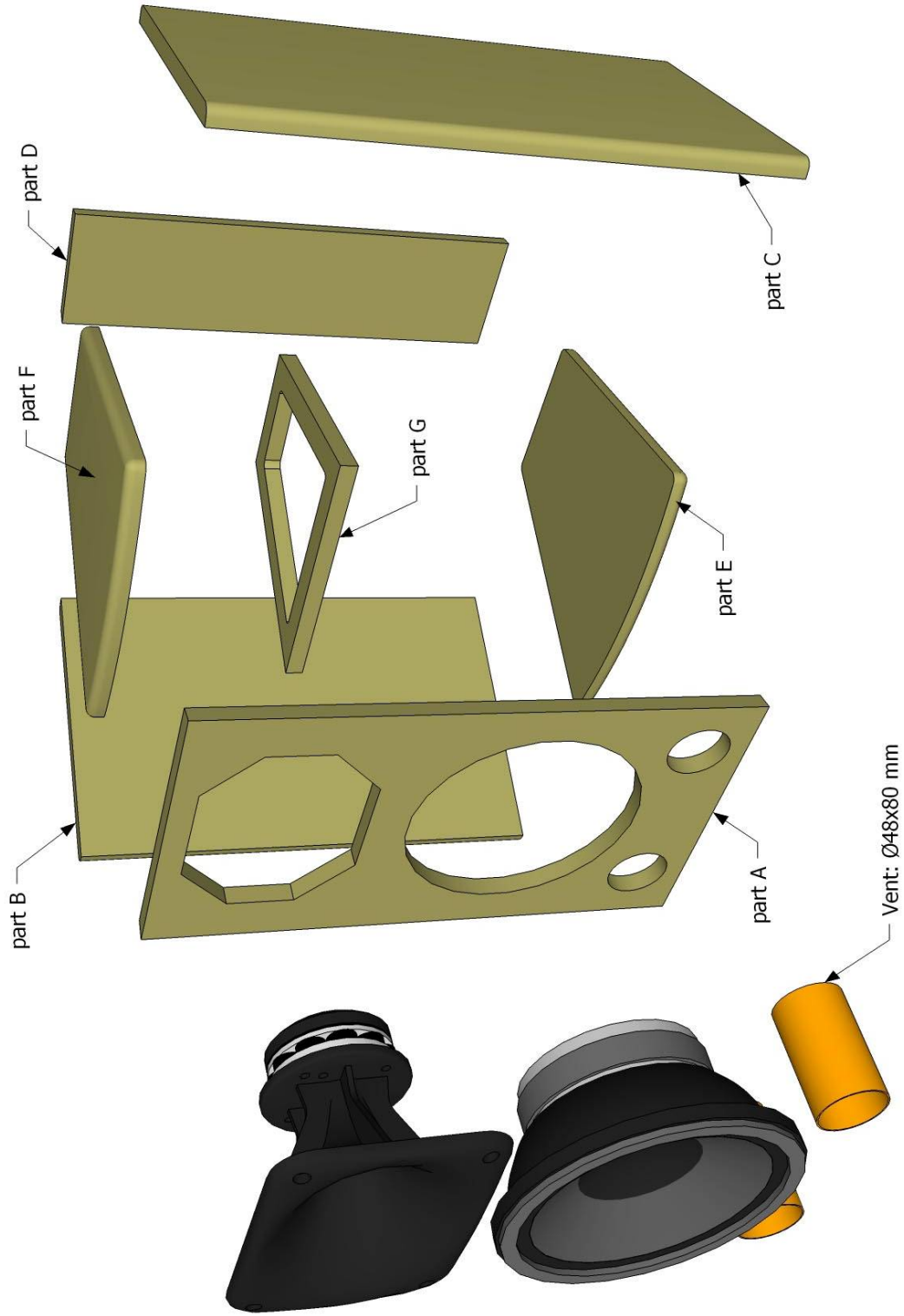
Internal view and damping



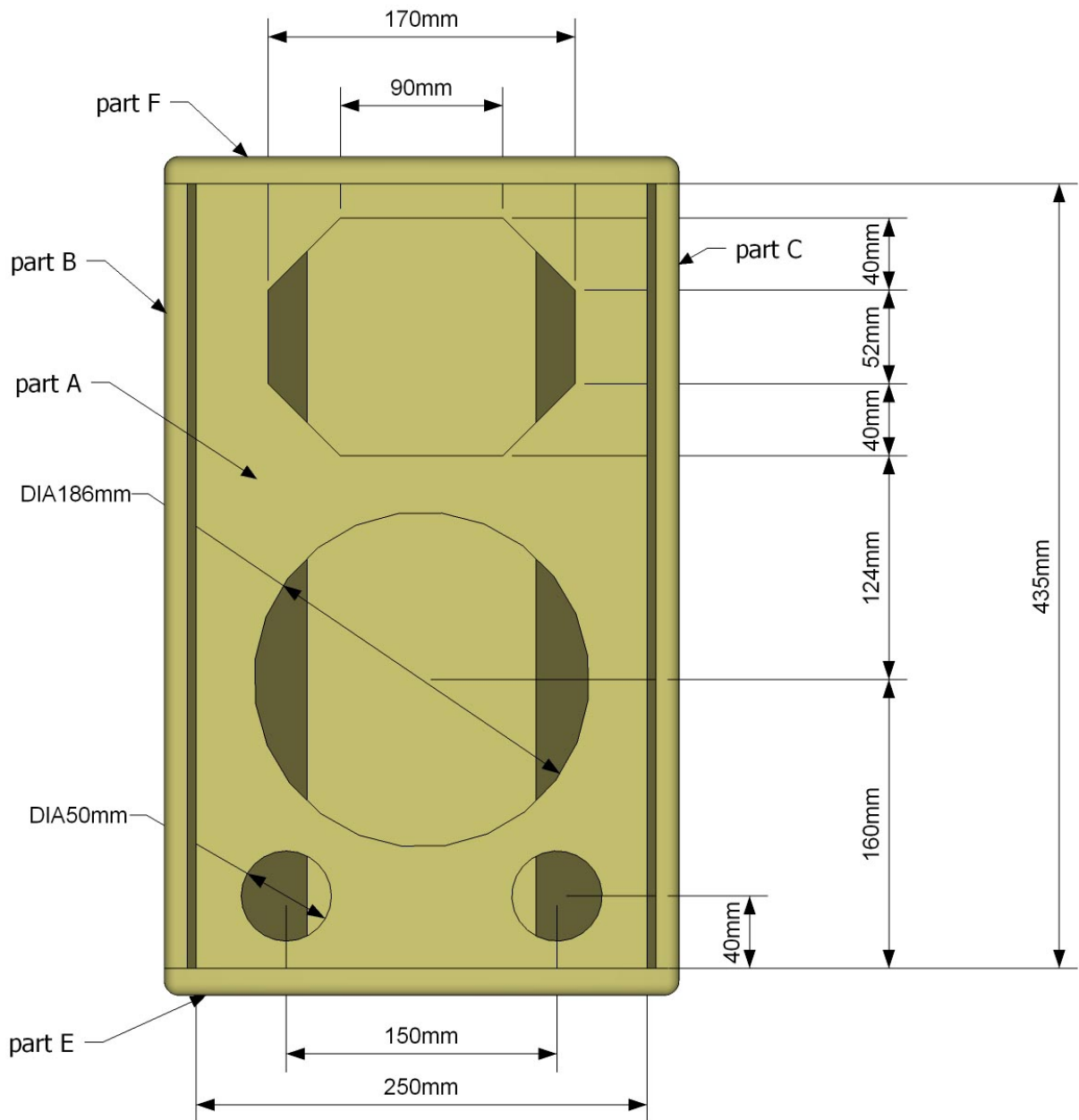
Exploded view



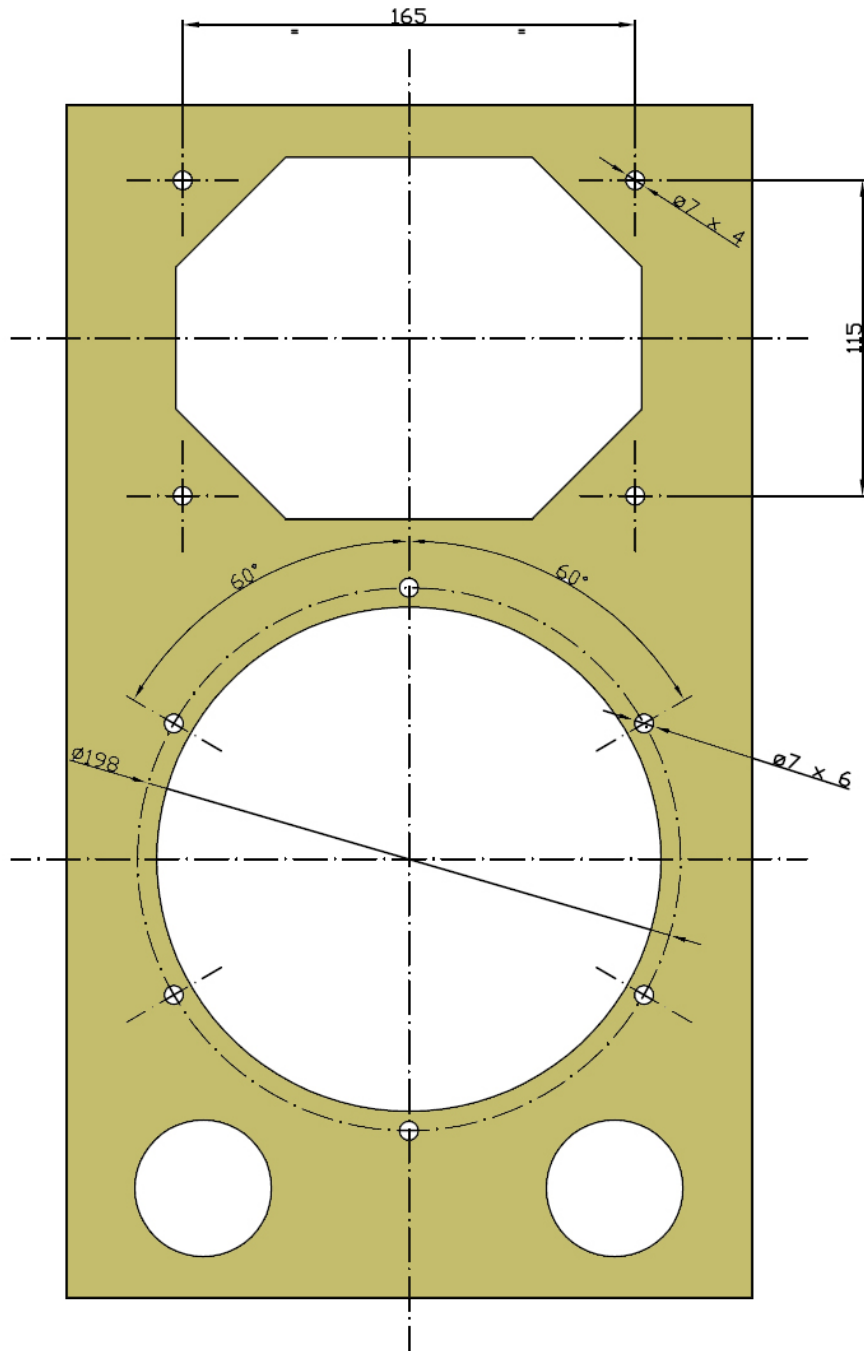
2 way 8" kit



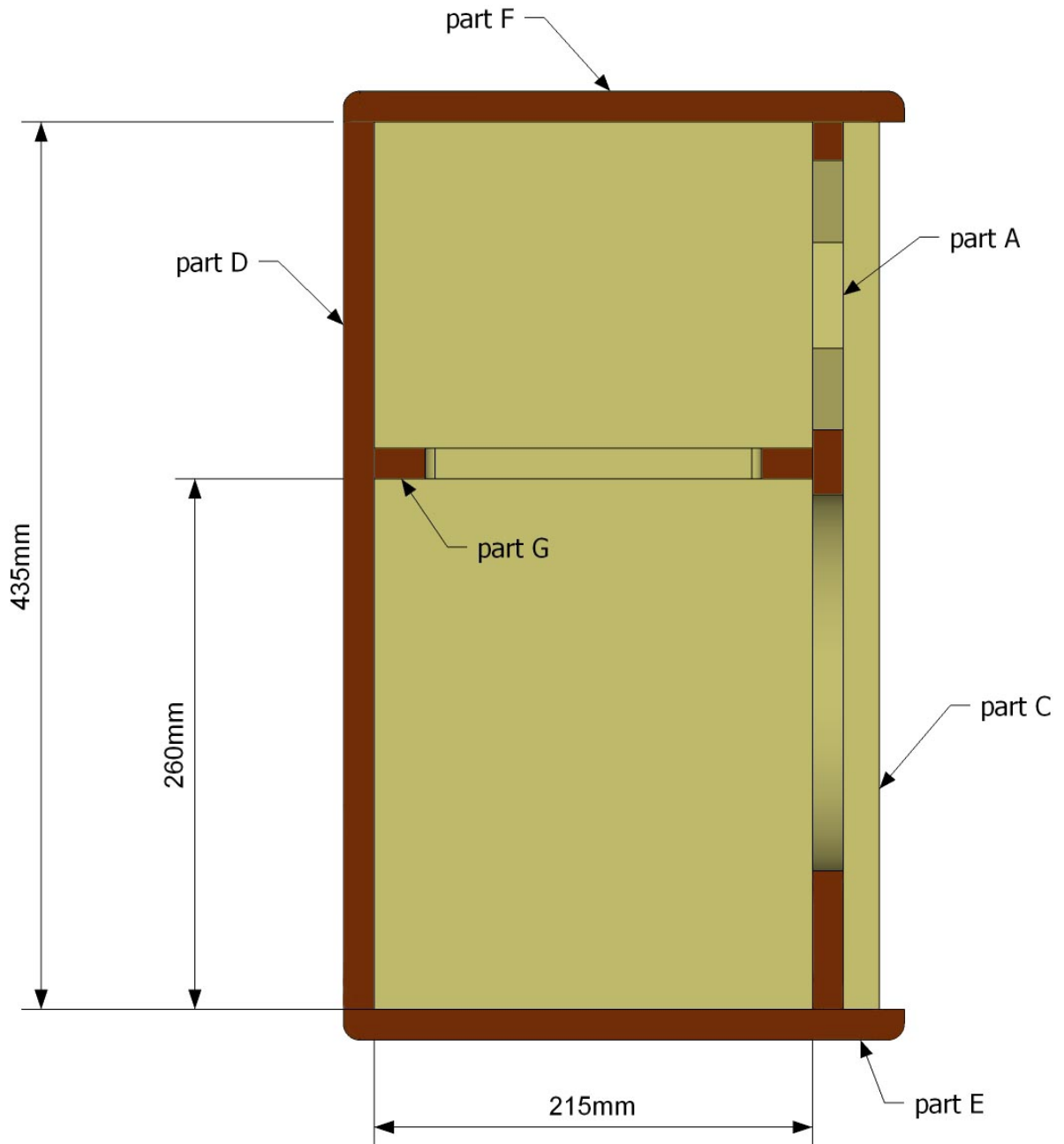
Front view



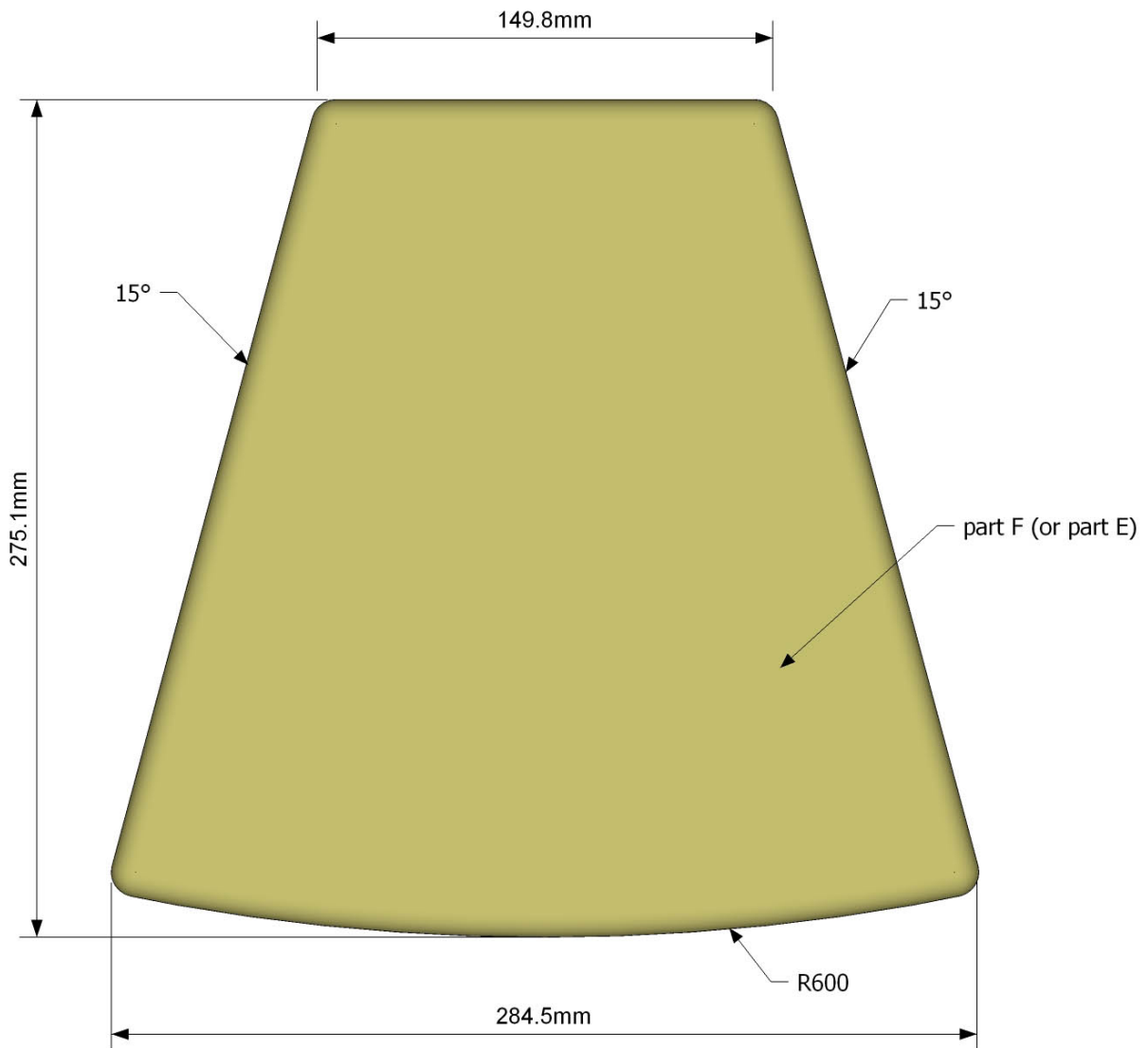
Front panel: bolts holes



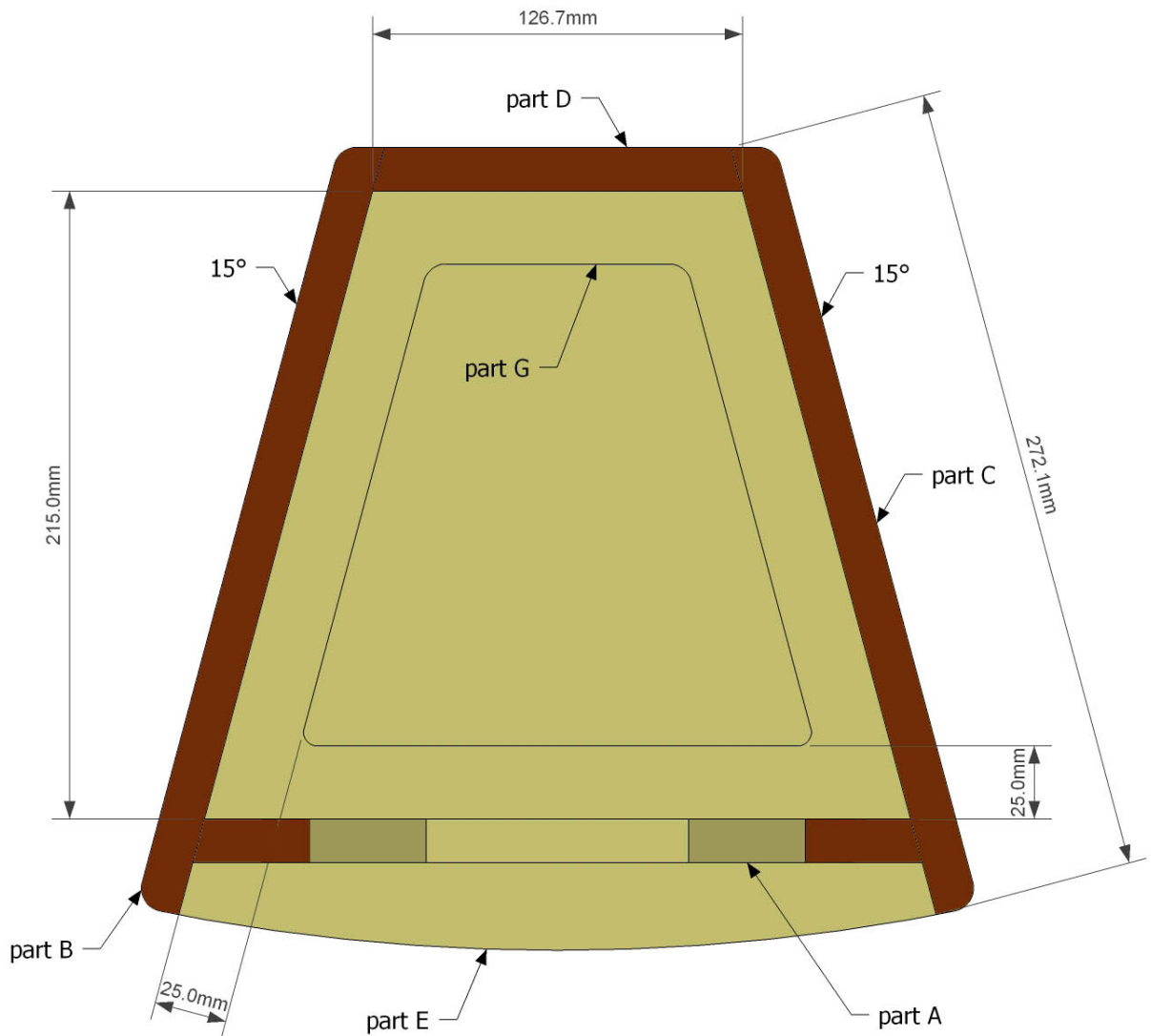
Side view



Top-bottom view



Top view section

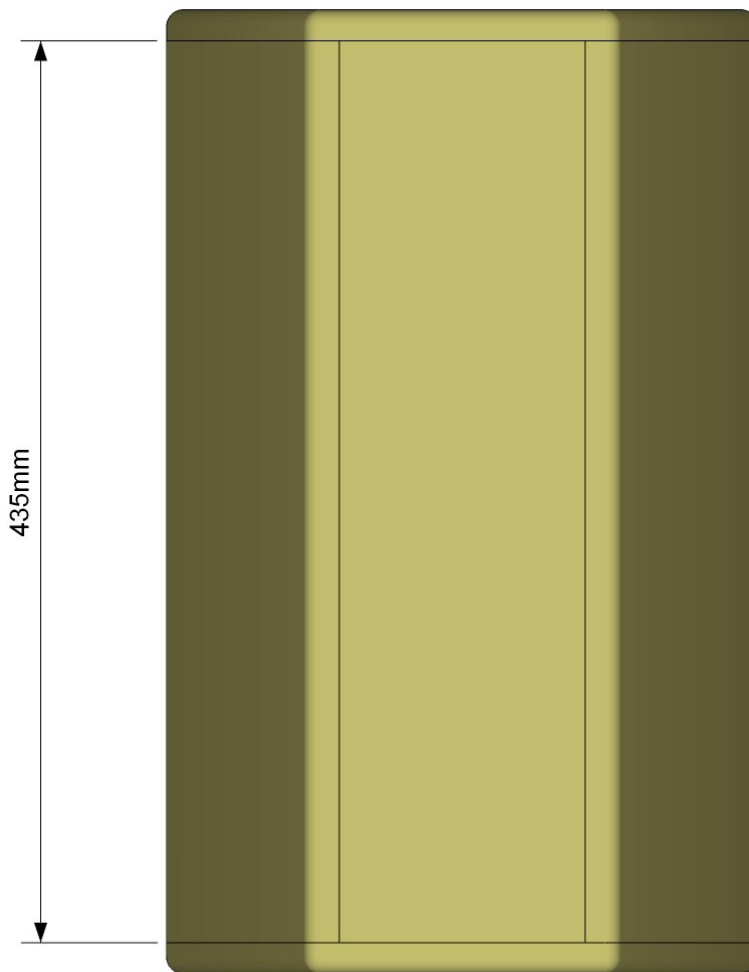


Horn height section

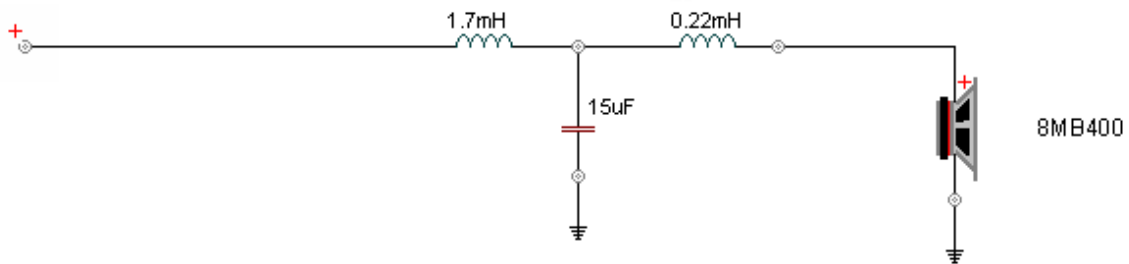
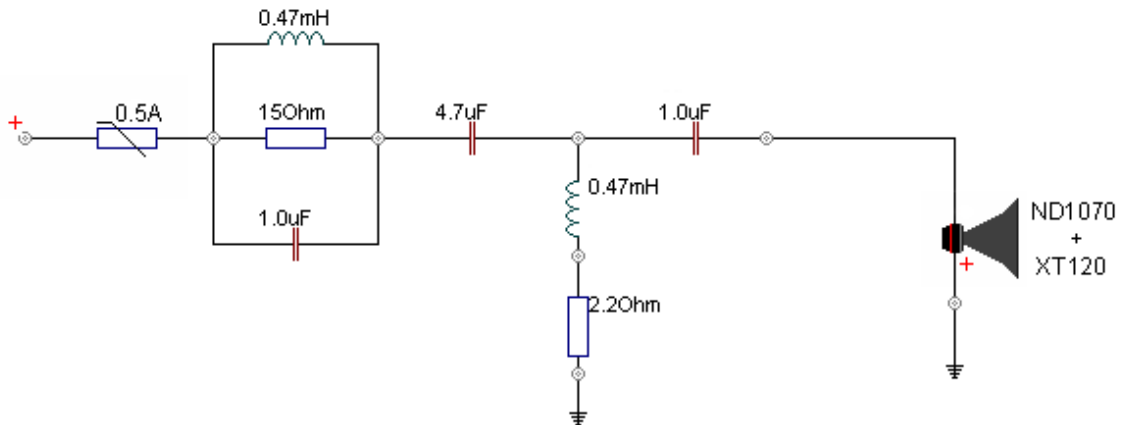


2 way 8" kit

Back view



Crossover schematics

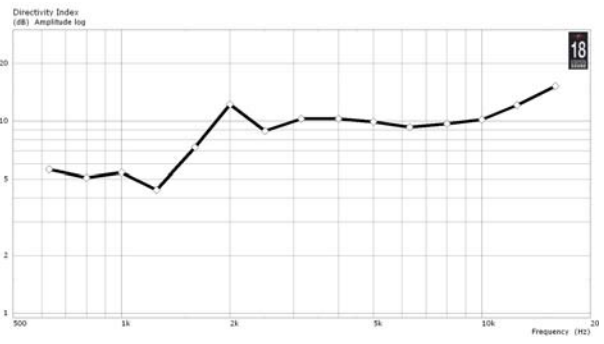
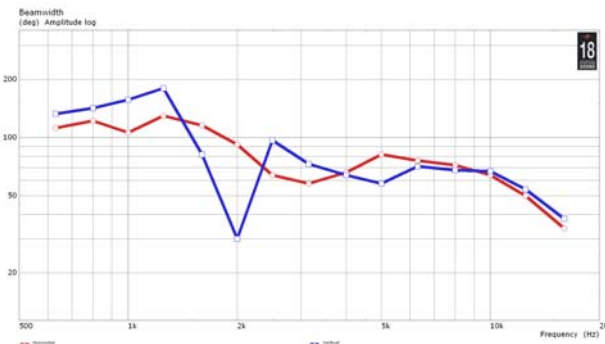
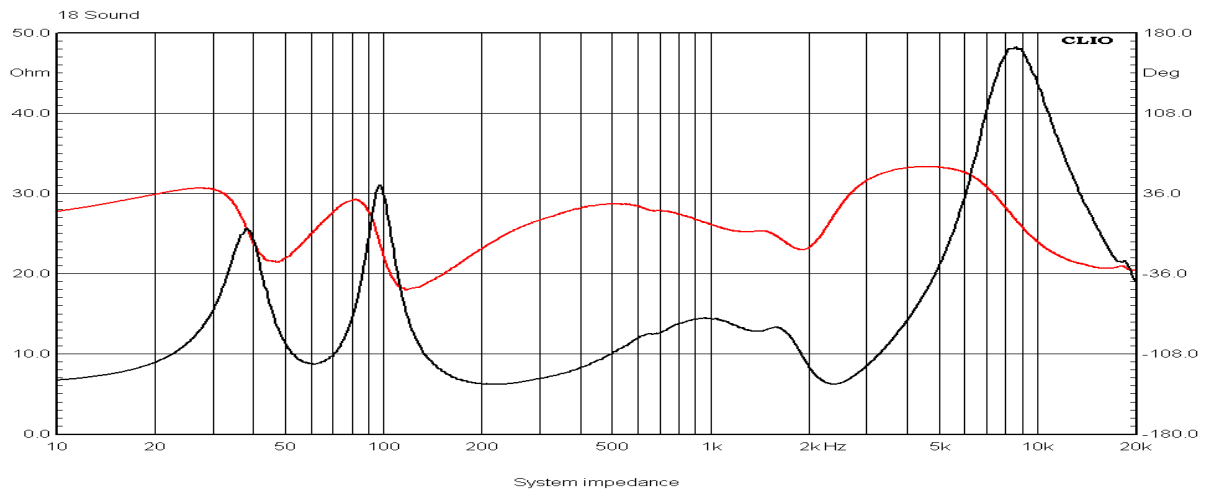
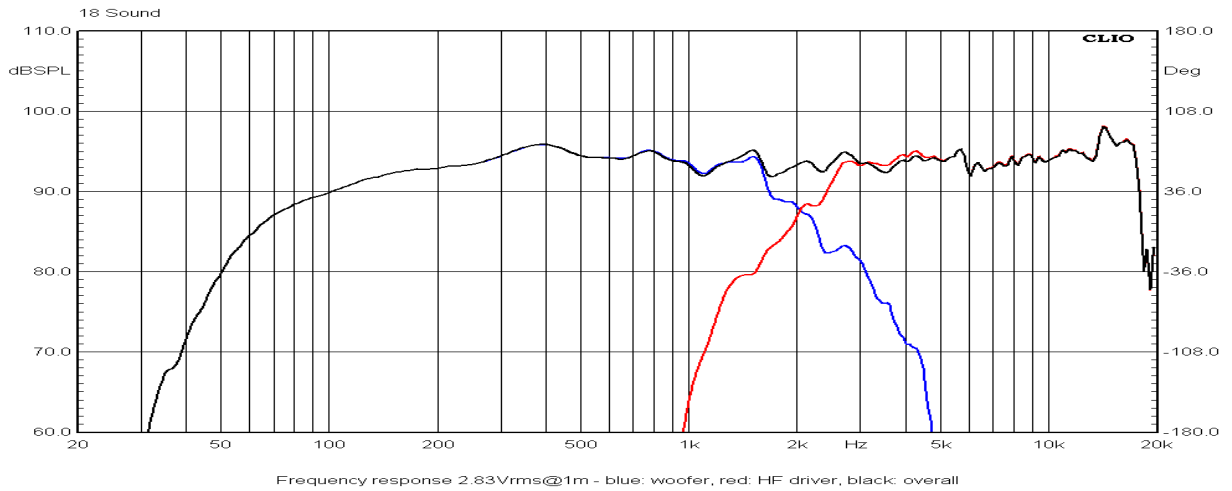


| Components list | | |
|-----------------|---------|-----------|
| Type | Value | Note |
| Inductor | 0.47mH | <0.4 Ohm |
| Resistor | 15 Ohm | > 10 W |
| Capacitor | 1 uF | 5% ->250V |
| Capacitor | 4.7 uF | 5% ->250V |
| Inductor | 0.47 mH | <0.4 Ohm |
| Resistor | 2.2 Ohm | > 10 W |
| Capacitor | 1 uF | 5% ->250V |
| Inductor | 1.7 mH | <1 Ohm |
| Capacitor | 15 uF | 5% ->250V |
| Inductor | 0.22 mH | <0.4 Ohm |
| PTC | 0.5 A | |

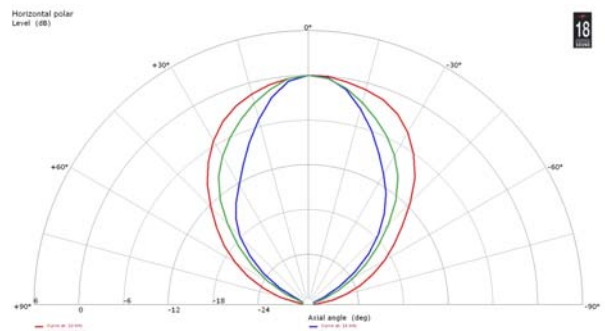
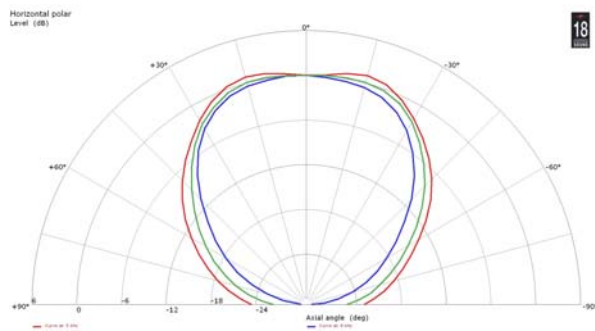
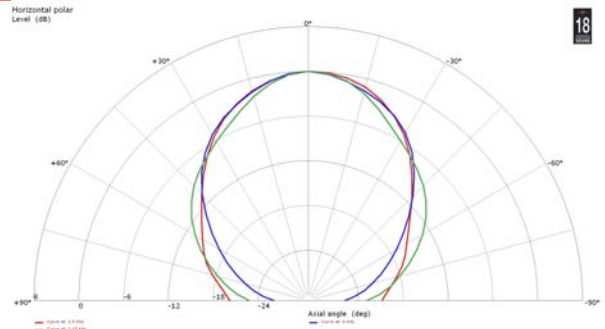
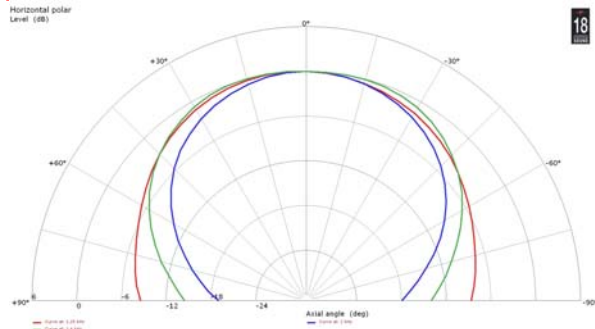


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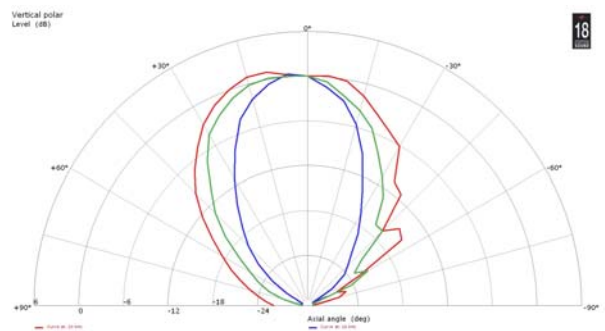
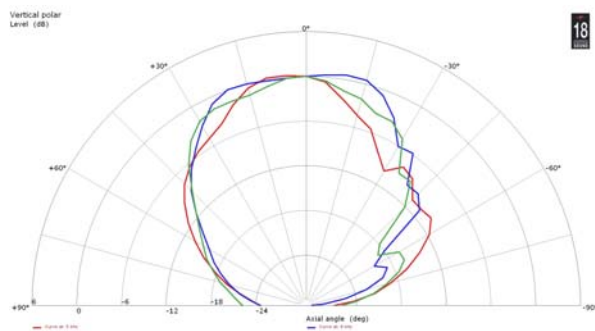
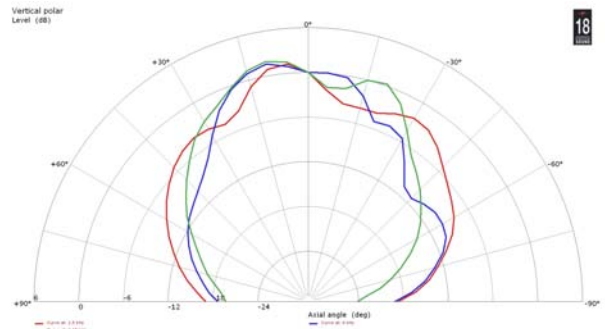
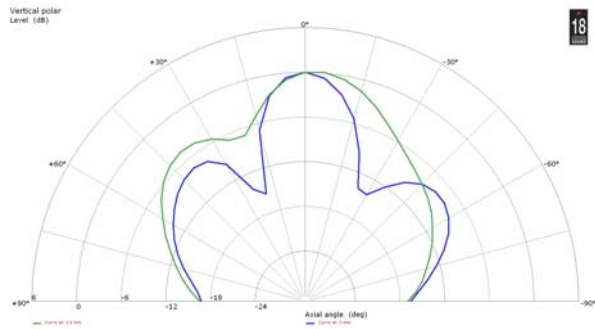
Measurements: 8MB400 + ND1070/XT120



Horizontal polar response



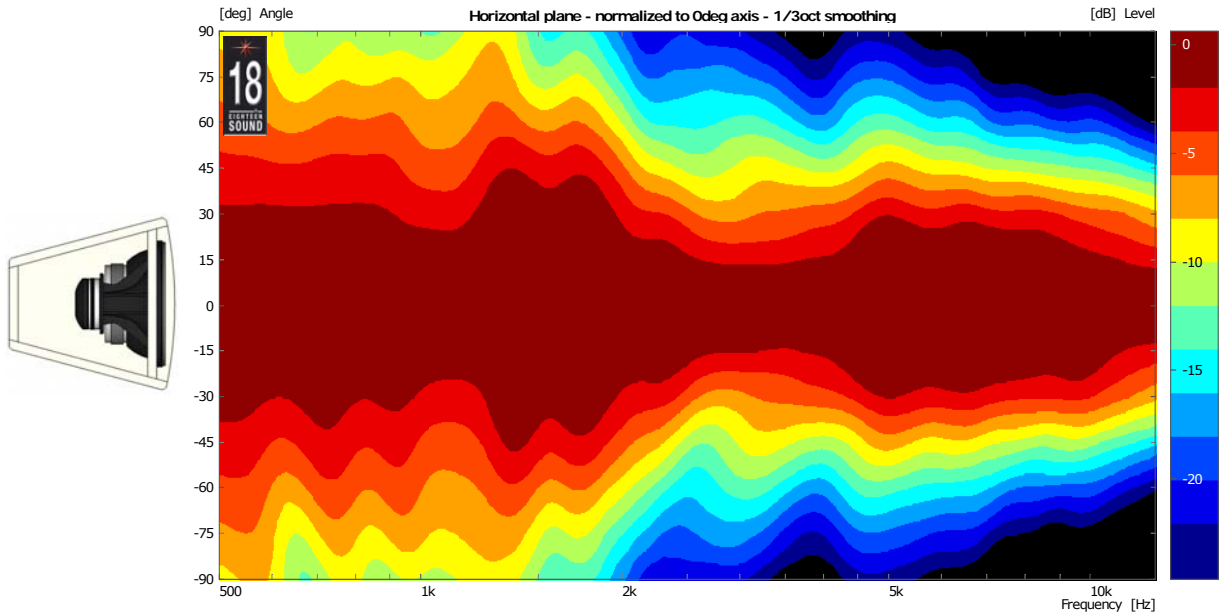
Vertical polar response





2 way 8" kit

Horizontal polar map



Vertical polar map

