



ACOUSTIC & ELECTRO-ACOUSTIC CONSULTANTS

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Loudspeaker Test Report

Manufacturer: Penton (UK) Ltd

Type: Ceiling

Model: RCS 5/TCO

For: Penton (UK) Ltd.

Report No.: 1191/LS/RCS 5TCO

Prepared By: A. N. Stacey B.Sc., AMIOA.

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Electro-Acoustics:
Sound System Design
Conference Systems
Reverberation Enhancement
Emergency Evacuation System Design

Environmental Acoustics:
Noise Nuisance
Traffic Survey
HSE – Hearing Risk
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Speech Intelligibility:
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RASTI Measurements
Word Score Measurements

Architectural & Building Services:
Acoustics:
Building Services Noise
Room Acoustics
Reverberation Control
Noise Control

Offices in: Hong Kong and USA

VAT No 645 5591 14

1. Object

- 1.1. The object of this Report is to present measurements of the acoustic performance of the RCS 5/TCO device.

2. Scope

- 2.1. The following characteristics were measured

- On-axis frequency response
- Polar response
- Impedance
- Applied voltage
- On-axis 3rd octave band sound pressure level

from which the following are calculated

- a) Directivity Index (dB), tabulated and graphical
- b) Directivity factor, Q
- c) Effective octave band impedance
- d) Octave band Sensitivity (dB @ 1m, 1W/oct)
- e) Overall Sensitivity:
 - dBA @ 1m, 1W
 - dBlin @ 1m, 1W
 - 250Hz-4kHz @ 1m, 1W
 - Speech shape @ 1m, 1W
- f) Acoustic Power (dB-PWL @ 1W), tabulated and graphical
- g) Octave band Power Apportionment (%)
- h) Impedance bode plot
- i) Expected maximum Sound pressure level (dB @ 1m)
- j) Frequency response chart
- k) Polar response charts

3. Method

- 3.1. The device was mounted in Free Space as shown in figure 1 – Mounting method A.
- 3.2. The measurements were made in an anechoic chamber.
- 3.3. Measurements were made as detailed in AMS Test Method document No. IR/1a/LS/Meth.
- 3.4. All measurements were made in general accordance with BS 6840: Part 5: 1995.

4. Results

- 4.1. The On-axis 3rd octave frequency response of the device is shown graphically in the appendix.
- 4.2. The Impedance bode plot of the device is shown graphically in the appendix.
- 4.3. Polar plots of the device are shown graphically in the appendix.
- 4.4. Tabulated values of Directivity index, Directivity factor, Sensitivity, Acoustic Power, Power Apportionment, Impedance and Maximum SPL are shown in the Summary data sheet given in the appendix.
- 4.5. The Directivity Index has been calculated using Gerzon' equal angle, weighted area method.

5. Notes

- 5.1. Sensitivity
The octave band sensitivity is produced in its useful form for calculations. It should be noted that the octave band sensitivity is given as dB @ 1m, 1W/Oct. To determine the output when only the overall power is known, then only the overall dBA or dBlin values should be used. For more detailed information refer to AMS Acoustics Data Sheet 'Loudspeaker Sensitivity – Interpretation of Results'.
- 5.2. Polar Plots
For convenience each polar plot has been normalized to 0dB. For this reason caution is advised when comparison of levels between octave bands is made. The reference axis frequency response should be used for comparison purposes.

6. Engineers Notes

Reference plane located parallel to driver and at grille.

Reference point located concentric to driver and at grille.

Loudspeaker Information

Manufacturer : Penton (UK) Ltd
Model Code : RCS 5/TCO
Type : Ceiling
Colour : White
Serial No. : None
Batch No. : None
Other Markings : None
Backbox : None
Grille : As Supplied
Weight (grammes) : 1200
Depth (mm) : 66 mm
Width (mm) : 190 mm
Height (mm) : 190 mm
Special Features : -

Internal Details

Driver Types/Sizes : 1 x 133mm concentric driver
Driver Serial No.(s) : None
Driver Markings : Penton label
Damping Material : None
Available Tappings : 10W, 5W, 2.5W, 1.25W (100V)

Electrical Details

Resonant Frequency(s) : See Impedance Plot
Cross-Over Frequency(s) : NM
Nominal Impedance (ohms): 8
Inductance : NM
Capacitance : NM

NM = Not Measured, NA = Not Applicable

Originator:

Countersigned:

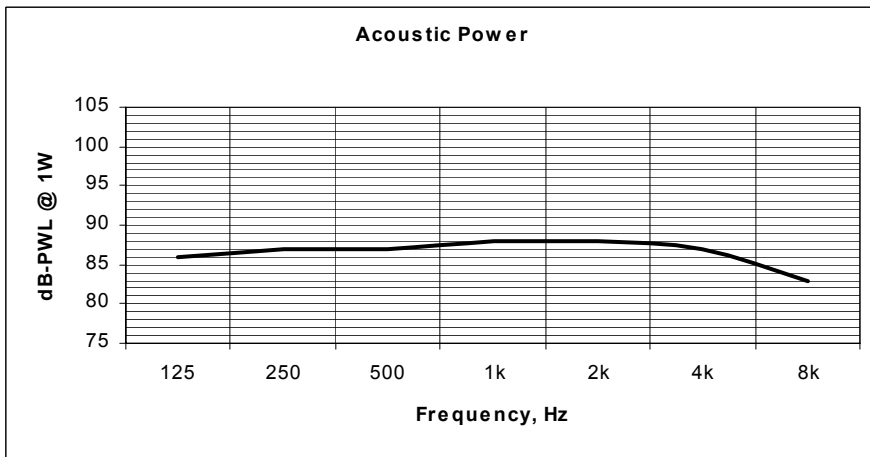
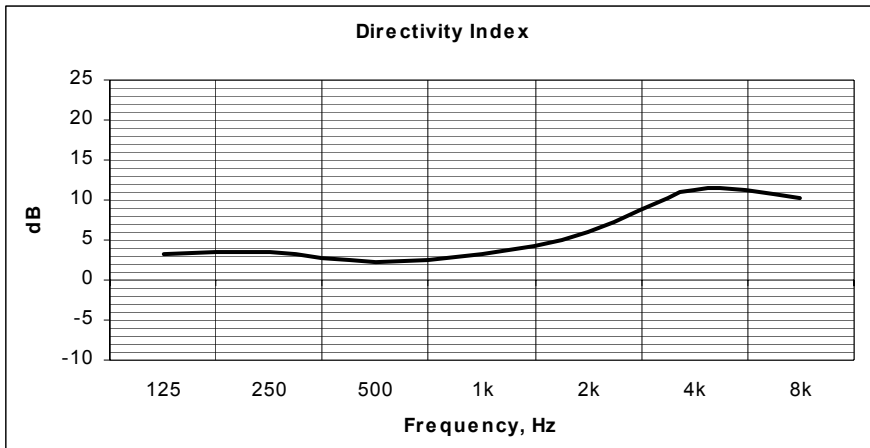


Manufacturer : Penton (UK) Ltd
 Model Code : RCS 5/TCO
 Mounting : Half Space, Free Field
 Transformer Tapping : 10W

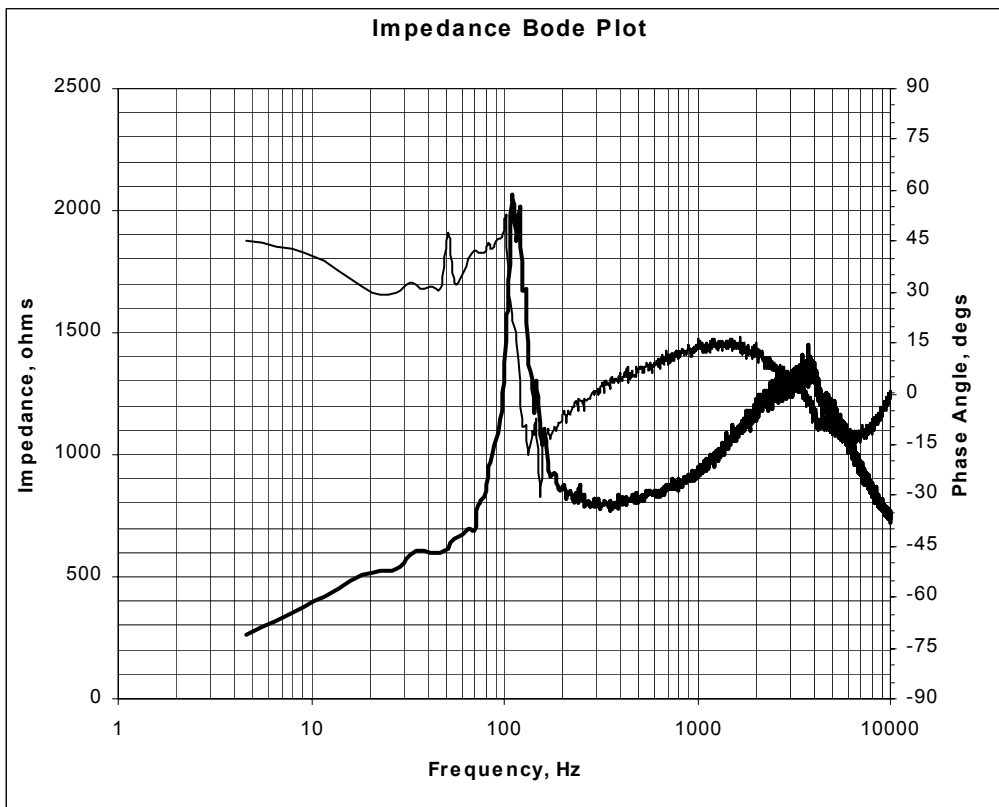
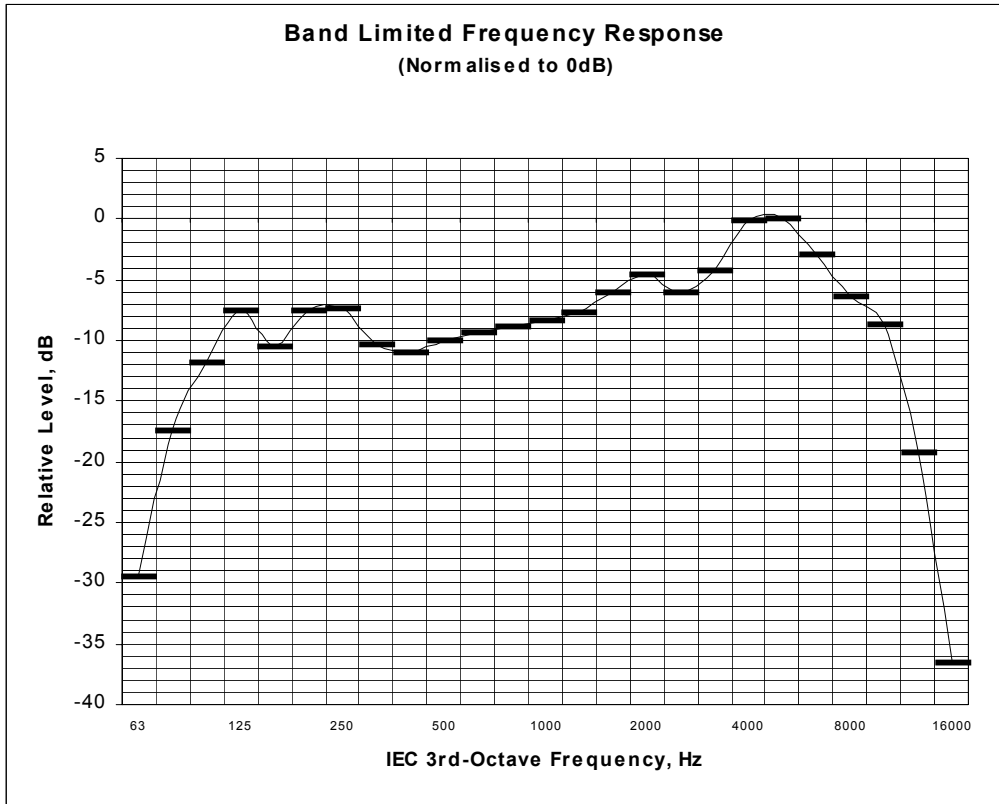
Reference Axis Located at : 0 degrees

Parameter	Frequency (Hz)							dB	dBA
	125	250	500	1k	2k	4k	8k		
Axial Q	2.1	2.3	1.7	2.1	4.0	13.6	10.6		
Directivity Index (dB on Axis)	3.2	3.6	2.3	3.2	6.0	11.3	10.3		
Sensitivity (dB @ 1m, 1W/Oct)	88	88	86	88	92	96	91	91	91
Sensitivity(dB @ 1m, 1W)250Hz-4kHz								91	91
Sensitivity(dB @ 1m, 1W)Speech Shape								88	83
Acoustic Power (dB-PWL @ 1W)	86	87	87	88	88	87	83		
Apportioned Power (%)	11	17	16	15	12	12	15		
Effective Impedance (Ohms)	1161	827	819	909	1141	1234	872		
Expected maximum SPL (dB @ 1m)	89	90	88	90	93	97	93	101	101

Test Signal: Pink Noise(100Hz-10kHz)

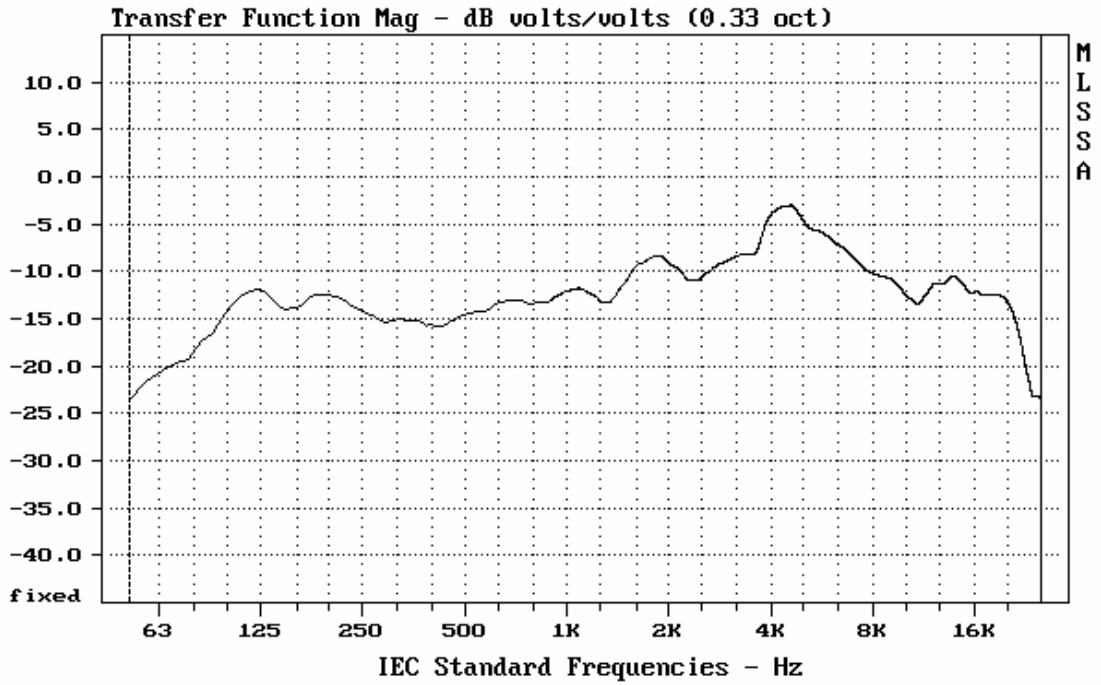


RCS 5/TCO

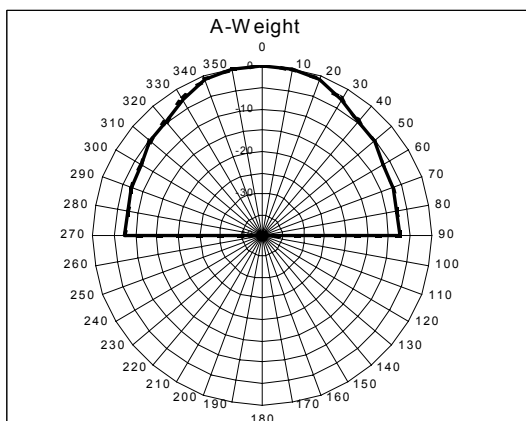
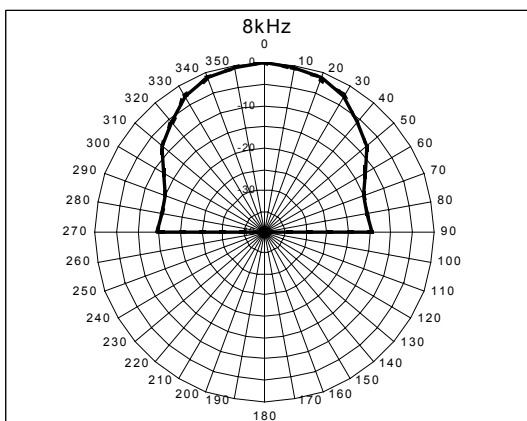
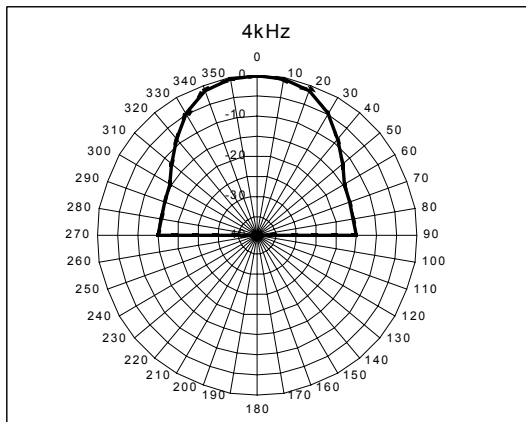
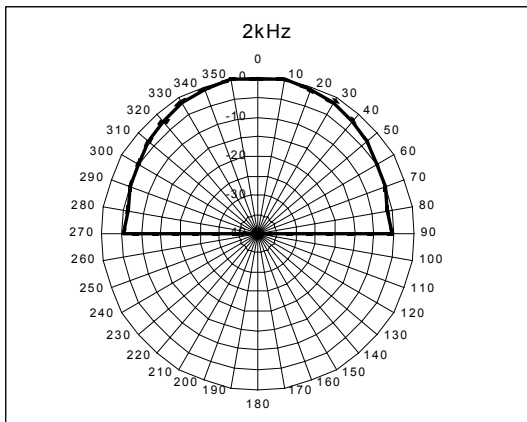
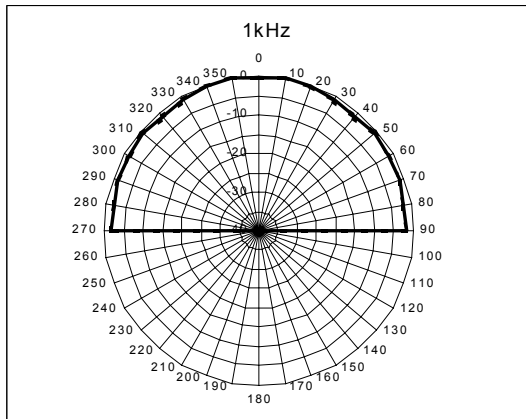
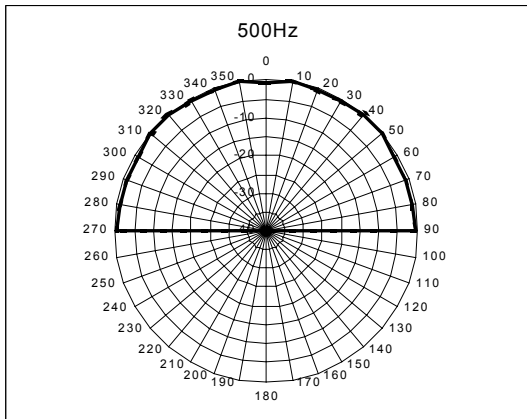
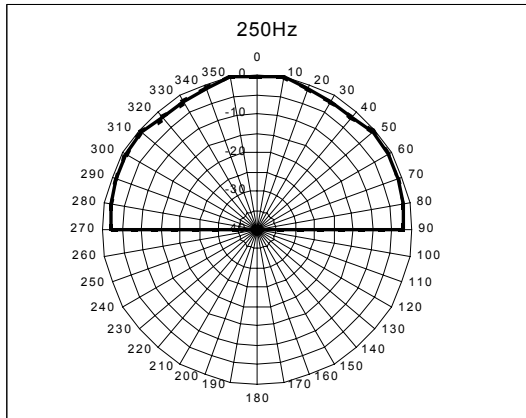
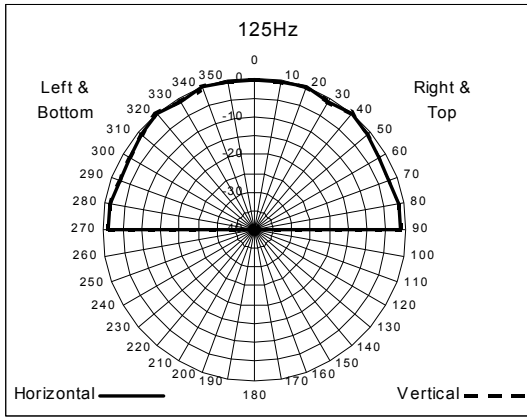


RCS 5/TCO

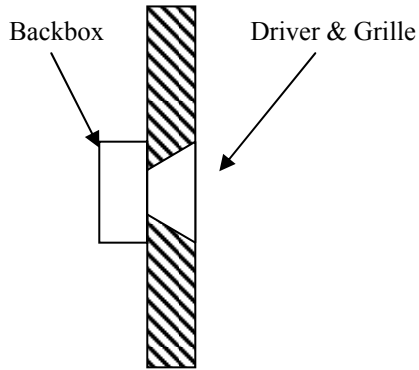
Wide Band Frequency Range
(Valid from 60Hz to 20kHz)



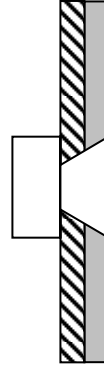
Note: The wide band frequency response is derived using MLS methods and does not relate to the sensitivity values given in the summary sheet.



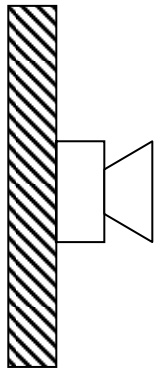
Loudspeaker Mounting Methods



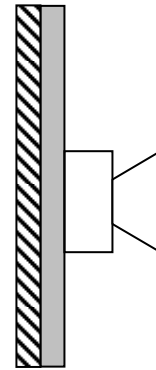
Mounting Method A
Loudspeaker Mounted
in a Reflective Baffle



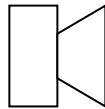
Mounting Method B
Loudspeaker Mounted
in an Absorbent Baffle



Mounting Method C
Loudspeaker Mounted
on a Reflective Baffle



Mounting Method B
Loudspeaker Mounted
on an Absorbent Baffle



Mounting Method E
Loudspeaker not Attached to any
Surface and Radiation Unaffected by
nearby Reflecting Surfaces