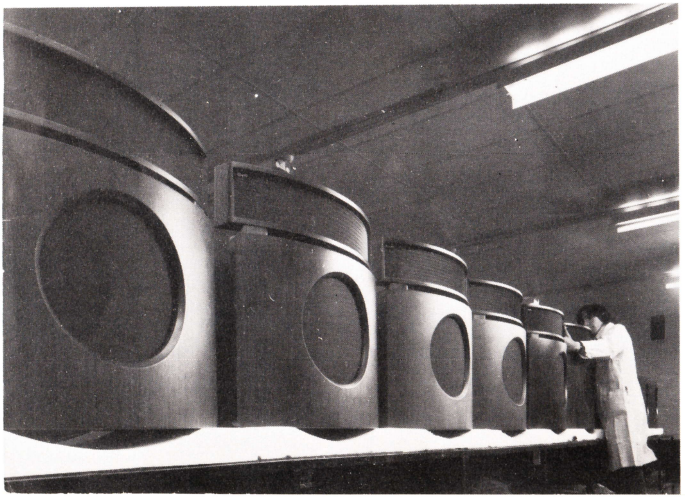
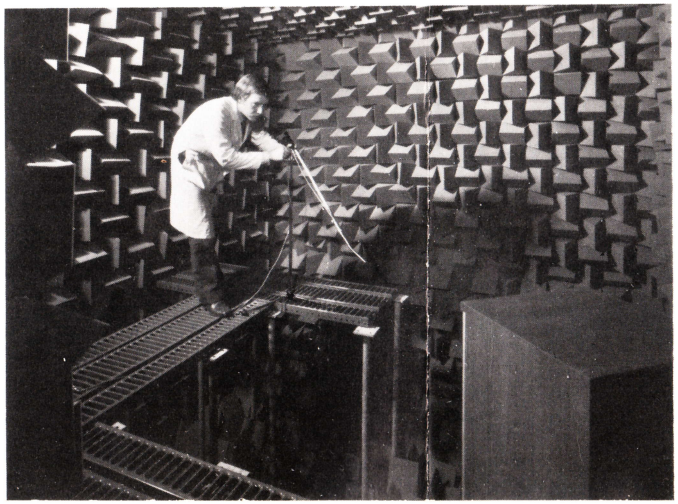
B&W
Loudspeakers





Above: members of the B & W research and development team photographed in the laboratory

Left: measurement of loudspeaker performance in the anechoic chamber

Factory photographs (from top):
System assembly;
Drive unit production;
DM70's passing through the final stages

B&W

How B & W's dedicated team produces loudspeakers that are sought after throughout the world of critical listening

A world reputation for excellence is not easily won – especially in such a competitive and specialised field as the manufacture of monitor loudspeakers. At B & W we know that success comes only in direct ratio to performance; the critical ear of the world is the judge.

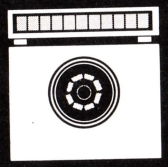
That is why we put tremendous emphasis on two key factors: research and quality control. Indeed, one in three of the whole B & W workforce is engaged in these aspects of speaker design and production.

The successful research and development team we have brought together works in continual pursuit of perfection in sound reproduction. We see to it that this big investment in research is followed all the way through, with extra-critical standards of quality control at every stage of production. And we must add that all this goes on in a modern, purpose-built factory that is the envy of the entire industry.

The Duke of Norfolk presenting John Bowers of B & W with the Queens Award to Industry for export achievement

1973

B & W



Model DM70 Improved

Height on Stand	820 mm (32½″)
Width	682 mm (27″)
Depth	390 mm (15½″)
Weight	45·5 kg (100 lb)
Volume	79 litres
Suitable Amplifier	25–100 watts
Nominal Impedance	8 Ohms
Sensitivity at 400 Hz	17 watts for 95dB at 1 metre
Frequency Response	± 4 dB 60 Hz–15 kHz
Bass Unit	305 mm
Treble Unit	640 mm × 130 mm Electrostatic
Crossover	500 Hz
Cabinet Finishes	White, Walnut

Drive Units
DW13/70. This low frequency unit of nominal piston diameter twelve inches (305 mm) is of size consistent with the enclosure volume and method of acoustic loading used. The resulting system resonance is 40 Hz, the unit itself having a free air resonance of approximately 28 Hz.

The cone is formed from long fibre paper material, with mass adjustment and damping (to discourage cone break-up) provided by critically positioned rectangular sections of synthetic rubber attached to the cone face. The massive ceramic magnet assembly, in conjunction with the low impedance of the voice coil, ensures high damping leading to excellent transient-handling capacity.

Electrostatic mid-high frequency unit
The 702 electrostatic module (patent number 1239658; further patents applied for) is a development of the proven 701 and covers all audio frequencies above 500 Hz. By virtue of the relatively small vertical dimension of the unit, the vertical distribution is excellent in the mid-frequency region and the curved geometry of the eleven integrated modules in each 702 provides very wide and uniform frontal radiation of sound with a strong rear radiation pattern which can be controlled to suit ambient conditions or personal judgment.

In terms of distortion, new standards are set and reference to the figures, in following pages, showing harmonic content will demonstrate the extremely low levels of the commonly troublesome odd harmonics at high sounds power outputs.

The power handling of this mid-high frequency unit confirms research findings that it is within the mid-frequency band (say 500 Hz to 5 kHz) that maximum power is applied. The concept of the 702 electrostatic unit provides coverage of all audio frequencies above 500 Hz reducing intermodulation distortion and Doppler effect.

The current trend of increasing power available from solid state amplifiers made the prime development feature in the 702 an increased power handling capacity over its predecessor. An in-depth development programme has resulted in an electrostatic unit which retains all the virtues of the original 701 but has improved sensitivity and increased power handling. Additionally a protection device has been incorporated making the 702 completely safe with all existing amplifiers.

Crossover and Filter Unit
The 500 Hz crossover frequency between the DW13/70 bass unit and the 702 electrostatic unit ensures that both these transducer elements operate over their optimum frequency ranges. Care has been taken in the design of the low-pass section of the filter to ensure that maximum amplifier damping may be transferred to the bass unit by the use of heavy gauge copper in the series inductor, over a ferrite core. In addition, an impedance- and level-controlling transformer forms a part of the bass unit filter.

"The B & W 70 . . . is unquestionably one of the best systems available at present"
T.A., AUDIO (USA)

"What has been achieved with the new loudspeaker combination '70 can be construed as a master work in the field of modern electro-acoustics and a milestone of development for the next decade"
H. H. Klinger, FUNK-TECKNIC (Germany)

"The more I hear the '70's the more I am quite certain they are in a class of their own . . . to put it plainly, the best yet, beyond a shadow of doubt"
Tom O'Brian, Music Critic RADIO EIREANN

"The DM70 is a sophisticated loudspeaker with an exceptional performance that will delight the critical ear."
Donald Aldous, RECORD REVIEW

"I was really astounded when I heard the new 70's. They are indeed a major step forward"
John Freestone, RECORD REVIEW

"The DM70 brings a new approach to loudspeaker design and justifies all the efforts John Bowers and his team have expended on it"
John Gilbert, GRAMOPHONE

as selected for the DESIGN CENTRE LONDON

Accepted by the Design Centre for inclusion in their Index

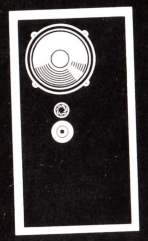
B & W
Model DM70 Improved *the loudspeaker for the perfectionist*

The DM70 was said to have set the standard for its decade – now the DM70 Improved represents a significant advance even on that uncompromising standard. This great monitor loudspeaker fulfills the most stringent demands of those to whom cost is secondary to performance. It delivers a thrilling re-creation of sound to highest concert hall levels.

The DM70 Improved represents a truly successful marriage between two highly advanced systems. Such a speaker demands the very finest amplifying and ancillary equipment. When good recordings are given the benefit of reproduction through equipment of this standard, the resulting sound is open and free from colouration and distortion; the exhilaration of a live performance becomes a vivid reality.

The excellence of this loudspeaker's performance is complemented by its clean, functional styling. DM70 Improved – truly a magnificent performer.

B & W



Model DM2A

Height	644 mm (25½″)
Width	353 mm (14″)
Depth	345 mm (13¾″)
Weight	22·2 kg (49 lb)
Volume	51 litres
Suitable Amplifier	25–60 watts
Nominal Impedance	8 Ohms
Sensitivity at 400 Hz	13 watts for 95 dB at 1 metre
Frequency Response	± 4 dB, 60 Hz–20 kHz
Bass/Mid Unit	152 mm
Upper-Mid Unit	35 mm
Super-High Unit	19 mm
Crossovers	3 kHz, 14 kHz
Cabinet Finishes	White, Teak, Walnut, Rosewood

Drive Units
DW 200/2. Bass/Mid-range unit consists of 152 mm diameter piston of critically contoured Bextrene with mid-frequency dome driven from a 38·5 mm voice coil on an aluminium former. The entire voice coil is coated with bonding agent and heat cured to ensure long term stability at high operating temperatures. A long throw voice coil with rubber roll surround ensures high amplitude/low distortion operation and a massive magnet assembly weighing some 4½ lb (2·1 Kg) gives excellent damping and transient response. Pressure die-cast chassis of alloy material. All units are hand-assembled; cones treated with critical damping compounds and frequent quality response curves and distortion measurements are taken on Bruel & Kjær equipment.

HF1300 Mk. II Upper mid-frequency unit as used in the BBC monitor type LS3/6, offering wide dispersion from a virtual point source.

A 19 mm low diaphragm mass plastic dome-type unit extending the response to above 25kHz.

Crossover & Filter Network
Third order Butterworth filters throughout and band stop section following the first low pass section to further linearise the mid-frequency response. Stop band attenuation of 18dB per octave for all units. All components of close tolerance and LF inductors are of low distortion Ferrite construction to reduce winding resistance and ensure maximum amplifier damping to voice coil. All capacitors are close tolerance polyester dielectric – not electrolytic. A total of 19 components plus a printed circuit board used in each crossover unit.

The upper mid-frequency unit is fed via a switched attenuator giving the useful facility of controlling tonal balance to suit ambient conditions.

Cabinet
Constructed throughout of 750 density chipboard with balancing veneers. Material thickness not less than 19 mm, with 25 mm baffle thickness and with bracing formed by line dividers, additional bracing, and general construction, the entire enclosure is a most rigid structure. Considerable care has been taken that the excellent acoustic line operation is complemented by an enclosure giving minimum 'readout' or colouration.

Acoustic Loading
The L.F. loading is by means of the B &W eighth wave line (U.K. patent applications 31793/71 & 5257/72) the vent of which acts as an augmenting sound source to the unit at extremely low frequencies. The multimaterial absorbent layout of acoustic line together with the special line contour ensure that the unwanted rear radiation of the DW 200 unit in the lower-mid frequencies is effectively absorbed.

"The DM2 is certainly the best loudspeaker I have heard this year"
Paul McGoldrick, POPULAR HI-FI

"The DM2 Monitor passed all tests with outstanding results . . . I have no hesitation in placing this speaker in the top echelon of modern high quality systems"
John Gilbert, GRAMOPHONE

"These are I am convinced, the smoothest and least 'peaky' speakers I have ever heard"
John Freestone

"Perhaps the greatest merit of this design is the remarkable achievement of producing a bass mid-range radiator that is so completely suited to its task"
Jan Kool, LUISTER (Holland)

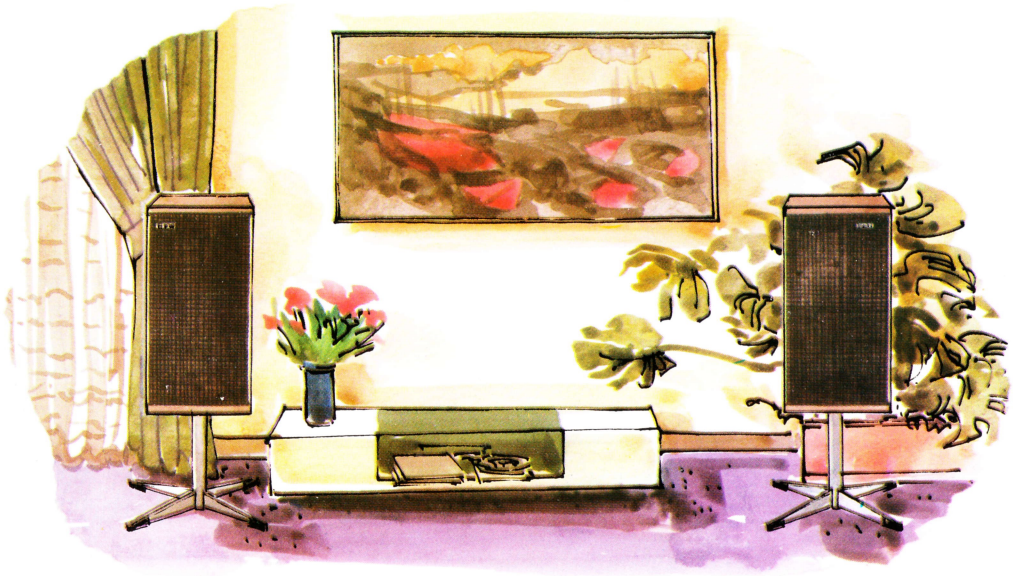
"The measured performance shows one of the smoothest mid-range frequency responses that we have ever seen"
ELECTRONICS TODAY INTERNATIONAL (Australia)

B & W
Model DM2A *medium-sized loudspeaker for the most discriminating listener*

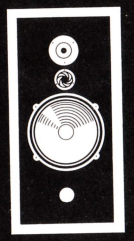
The comparison of live against reproduced speech has long been accepted as a stringent test of loudspeaker performance. Even the discerning ears of the technical audio press confirmed, at a special demonstration, that the DM2A passes this ultimate test.

Our advanced research into acoustic line rear loading plus the use of sophisticated techniques and materials has resulted in a monitor which satisfies both the professional and the critical home listener – while employing an enclosure of just $25\frac{1}{2}$ in × 14 in square.

The brief to our design team included improvement upon the power handling capacity and mid-frequency linearity of our established DM3 monitor. In both respects their success surpassed expectations. A useful feature of the DM2A is the addition of a switch to compensate for the wide variations of mid-frequency characteristics found in different rooms.



B & W



Model DM4

Height	530 mm (21″)
Width	255 mm (10″)
Depth	256 mm (10″)
Weight	11·1 kg (24½ lb)
Volume	21 litres
Suitable Amplifier	10–30 watts
Nominal Impedance	8 Ohms
Sensitivity at 400 Hz	3·6 watts for 95 dB at 1 metre
Frequency Response	± 5 dB 80 Hz–20 kHz
Bass/Mid Unit	143 mm
Upper-Mid Unit	35 mm
Super-High Unit	19 mm
Crossovers	3·5 kHz, 14 kHz
Cabinet Finishes	Teak, Walnut, Rosewood, White

Drive Units
DW200/4. Bass/Mid-range consists of 143 mm piston diameter critically contoured Bextrene cone driven from a 26 mm voice coil on an aluminium former. The entire voice coil is coated with bonding agent and heat cured to ensure long term stability at high operating temperatures. A long throw rear suspension with a specially flexible PVC front suspension (Vitrone – a trade name of Stanley Smith & Co) is used to ensure both a continuation of the long throw linear characteristic provided by the rear suspension and an excellent mid-frequency termination. The winding length of coil enables the long throw characteristic to be held within its travel and accounts for the low distortion characteristic of this unit at low frequencies. A pressure die-cast chassis of alloy construction is employed with a high flux ceramic magnet assembly. All units are individually hand assembled; cones treated with critical damping compounds and frequent quality control response curves and distortion measurement taken on Bruel & Kjær equipment.

HF1300 Mk II Upper and mid-frequency unit is as used in BBC monitor type LS3/6 and offering wide dispersion from a virtual point source.

High Frequency Unit
A 19 mm low diaphragm-mass plastic dome type unit extending the response above 25 kHz.

Crossover and Filter Network
Third order Butterworth with close tolerance components are used, giving stop band attenuation of 18dB per octave. Series LF inductors on Bass Unit are of low distortion Ferrite construction to reduce DC resistance and ensure maximum amplifier damping is applied to voice coil. All capacitors are close tolerance Polyester dielectric (not electrolytic). Crossover frequencies chosen to optimise performance of each unit.

Cabinet
Constructed of 19 mm 750 density chipboard throughout with inside balancing veneers. All battens pinned and glued.

Acoustic Loading
L.F. loading is by means of a very dense critically damped enclosure with a small controlling vent to optimise the response between 60 Hz and 120 Hz and provide considerable reduction in cone excursion from 30 Hz to 60 Hz. Inner surfaces of cabinet are absorbent lined, with the addition of long fibre natural wool, reducing standing waves, reflections and colouration from the enclosure to a minimum.

"The DM4 is right at the top of the heights of quality small speakers in our opinion"
HI-FI ANSWERS

"With an advertising motto like 'perfection at a price', one would tend to expect a lot from the Bowers & Wilkins DM4 speaker system, and we were not disappointed"
ELECTRONICS (Australia)

"The DM4's certainly produced an incredible bass punch and a mid-range sound volume that we would have expected from a big Tannoy"
HI-FI ANSWERS

"The DM4 is intended to take its (DM1) place and go a little further as well. There was one striking feature that came to our notice; that was the excellent stereo effect. The reviewer has no need to mourn the passing of the DM1 and congratulates Messrs B & W once again"
Ralph West, HI-FI NEWS

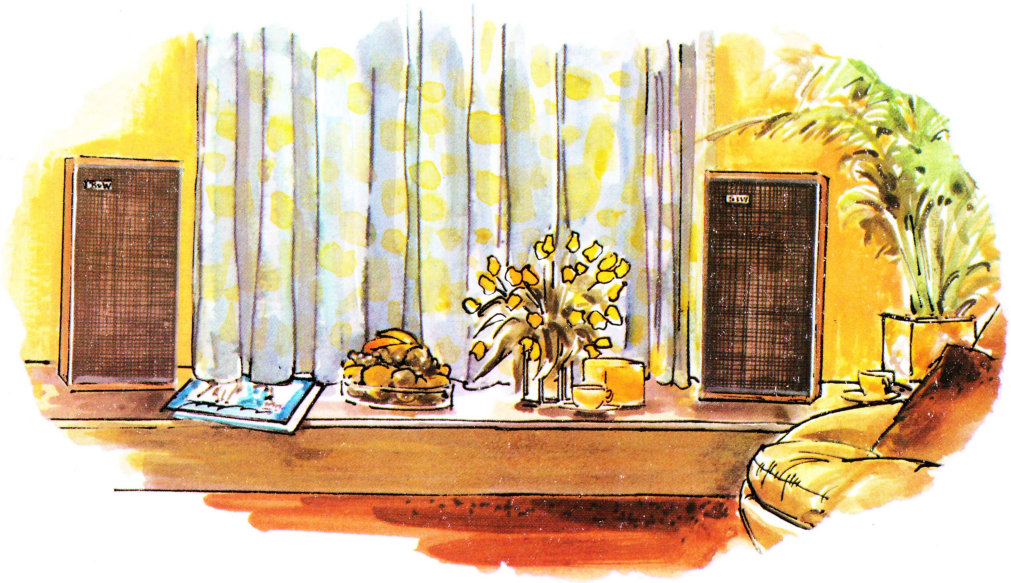
"Uncorrected, the DM4 reproduces the violin as it is heard at reference level"
Jean-Marie Marcel, REVUE DU SON (France)

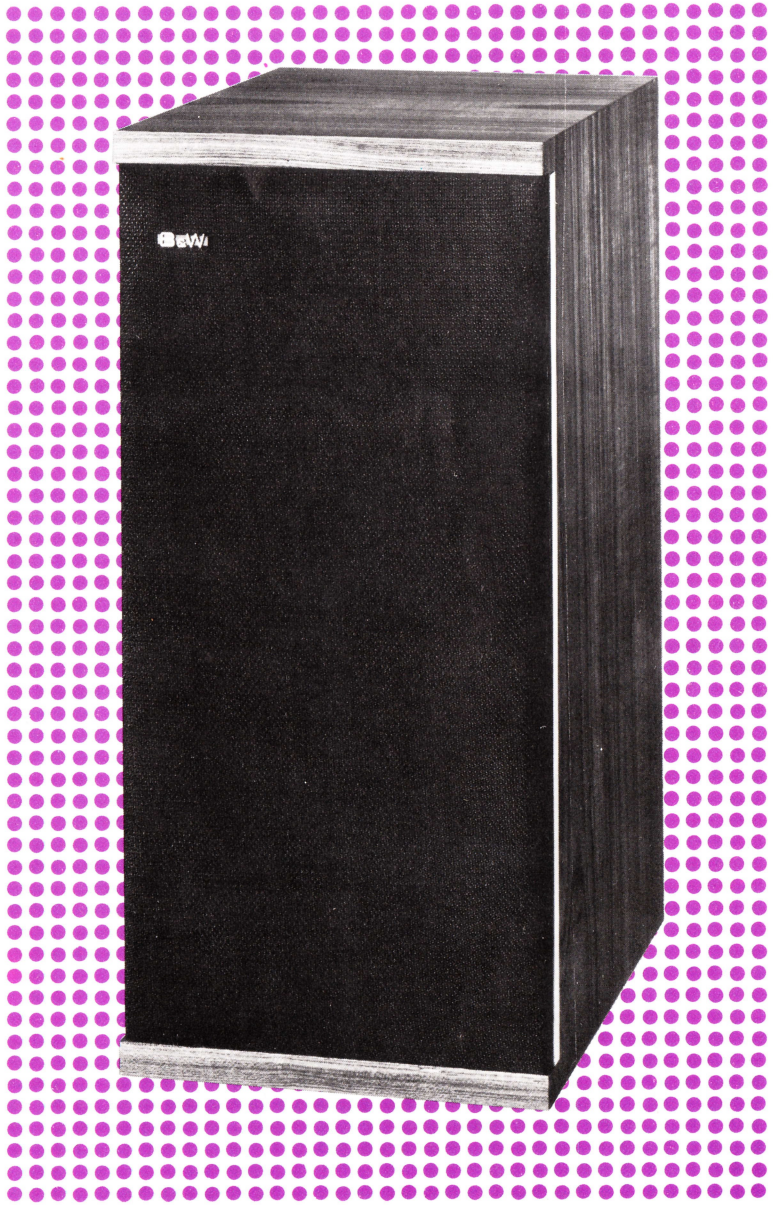
B & W
Model DM4 *smaller monitor loudspeaker of quite exceptional performance*

Professionally and domestically there is an established need for a monitor system designed and built to the highest standards, yet in a really compact format. We responded to this need several years ago with our DM1 – which achieved nothing short of fame as a precision, three-unit miniature. Although this model ran counter to contemporary opinion that a small loudspeaker must be cheap, our judgment proved right in terms of value, performance . . . and world sales.

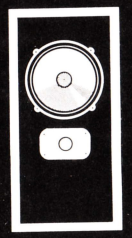
Our design team has continually extended and improved upon this original concept, using techniques and materials developed only in the past few years. Now, with the DM4, we come even closer to the perfect reproduction of original sound, with still greater sensitivity and increased power handling.

The DM4 has quickly earned an enviable reputation for out-performing speakers of much greater size.





B & W



Model D5

Height	454 mm (18″)
Width	226 mm (9″)
Depth	172 mm (7″)
Weight	6·35 kg (14 lb)
Volume	11 litres
Suitable Amplifier	10–25 watts
Nominal Impedance	8 Ohms
Sensitivity at 400 Hz	10 watts for 95 dB at 1 metre
Frequency Response	± 5 dB 80 Hz–20 kHz
Bass/Mid Unit	124 mm
High Frequency Unit	25 mm
Crossover	3 kHz
Cabinet Finishes	White, Teak, Walnut

Drive Units
DW150/5. Bass/Mid-range unit consists of 124 mm diameter piston of critically contoured Bextrene driven from a 25 mm voice coil on an aluminium former. The entire voice coil is coated with a bonding agent and heat cured to ensure long term stability. A long throw voice coil with rubber roll surround ensure long travel/low distortion characteristic. A pressure die-cast chassis of alloy material is employed, with a high flux magnet assembly. All units are individually hand assembled, cones treated with a critical amount of damping compound and frequent quality control response curves and distortion measurements taken on Bruel & Kjær equipment.

PCH24/8. Upper mid and high frequency unit consists of a specially treated ultra lightweight dome assembly operating from a 25 mm voice coil. The response of this unit is remarkably flat with a broad and balanced polar characteristic showing excellent transient behaviour to at least 25 kHz.

Crossover and Filter Unit
The third Order Butterworth high-pass and low-pass sections give 18dB per octave attenuation in the stop band and ensure optimised operation of both units. LF series inductors on Bass Unit are of low distortion Ferrite construction to reduce DC resistance and ensure maximum amplifier damping is applied to voice coil.

Cabinet
Construction throughout is of 12 mm high density chipboard with balancing veneers on both sides. All battens are pinned and glued, and the front baffle is of 12 mm laminated ply. The front grille material produces negligible deterioration in system response and is backed with an open weave material to render units virtually invisible.

“These units have an exceptionally clean overall response for their size and price”

“We compared them with the now obsolete B & W DM1, as this unit received such favourable comment in the press . . . the bass response, lack of colouration, power handling and mid-range clarity were all somewhat superior to the earlier system, and the price is lower. B & W can only be commended”

“We particularly liked the typically high B & W standards of finish”

“Bass was flat to about 70 Hz and still quite clean to about 40 Hz, a commendable performance”

Geoffrey Richards, HI-FI ANSWERS

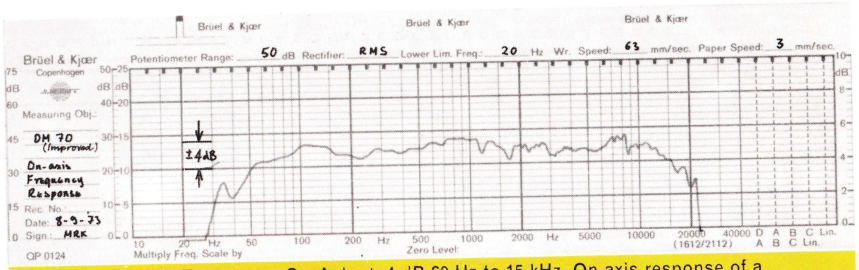
B & W
Model D5 *compact, two-way loudspeaker system for the discerning ear*

We put the basic research we had done in developing the successful B & W monitors to work on the production of a compact, two-way system for critical home users – and the D5 is the happy result.

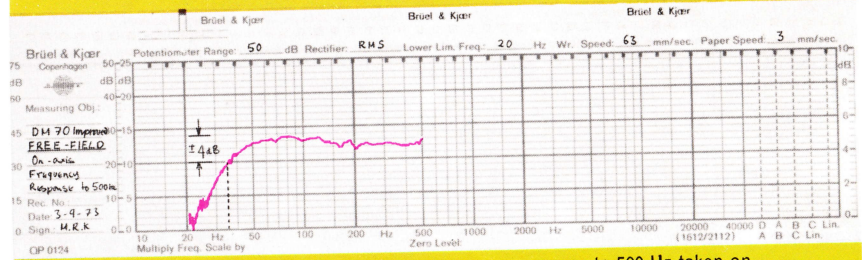
Here is the perfect answer to the growing demand for a first-class small loudspeaker which gives above-average performance for less cost than a true monitor system. The bass/mid range unit is smaller than that employed in the DM2 and DM4 monitors – yet our recent work with new materials and measuring techniques in linear extension of mid-frequency response brings the D5 surprisingly close to their performance.

For the serious home listener who must consider cost and space as well as quality, the D5 loudspeaker system represents outstanding value on every count.

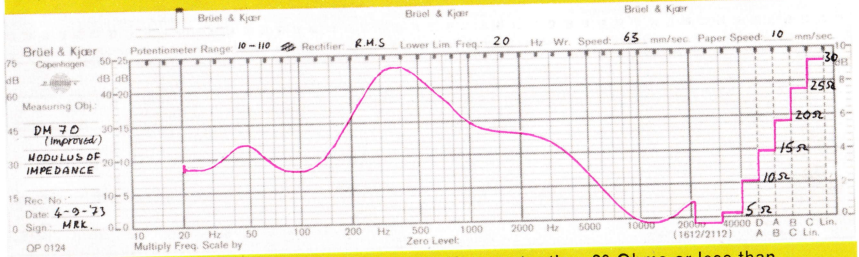
DM70 Improved



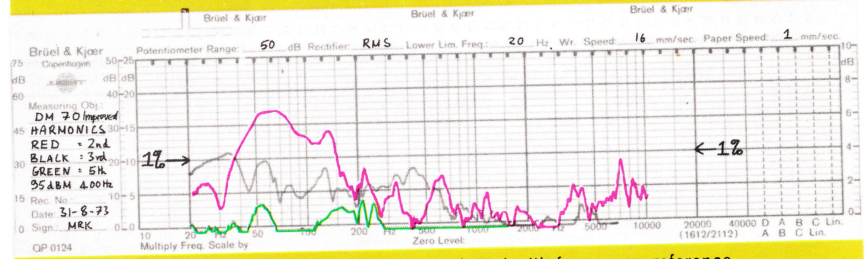
Frequency Response. On Axis ± 4 dB 60 Hz to 15 kHz. On axis response of a production sample DM70 taken in R & D Anechoic Chamber. B & K equipment used throughout, with type 4133 microphone at one metre



Free-field Frequency Response. Frequency response up to 500 Hz taken on 5 metre tower in open. Comparison with above plot shows limitation of Anechoic Chamber at very low frequencies only

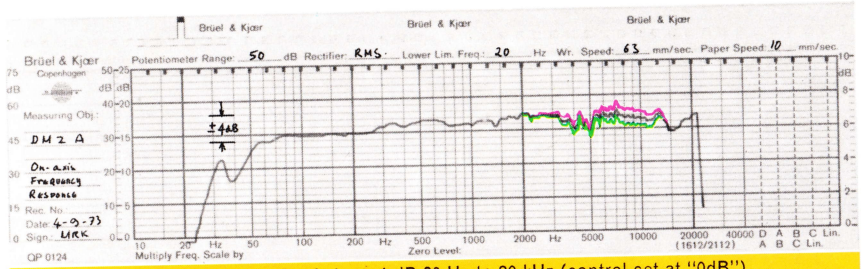


Impedance. Nominal impedance 8 Ohms. Not greater than 30 Ohms or less than 4 Ohms 20 Hz to 9 kHz, the impedance minimum occurring in a frequency region of very low music energy

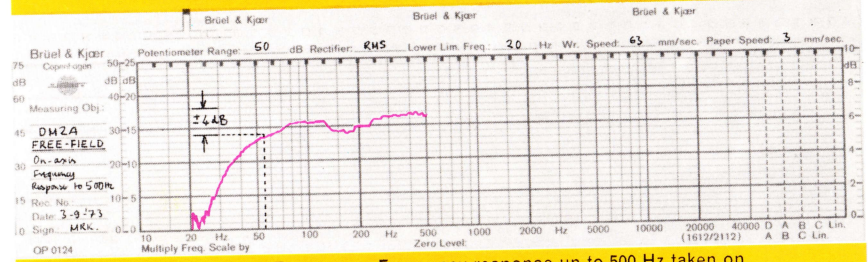


Harmonic Distortion. Harmonic analysis plotted with frequency, reference level of 95 dB at one metre at 400 Hz. B & K Heterodyne Analyser and Tracking Multiplier used

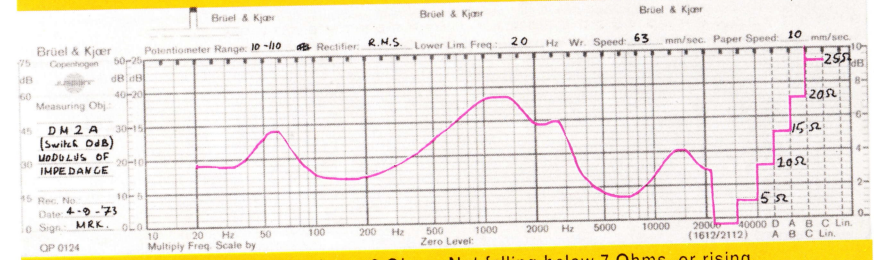
DM2A



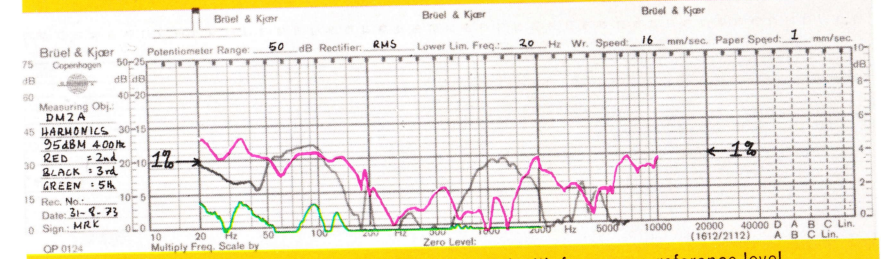
Frequency Response. On Axis ± 4 dB 60 Hz to 20 kHz (control set at "0dB"). On axis response of a production sample DM2A taken in R & D Anechoic Chamber. B & K equipment used throughout, with type 4133 microphone at one metre



Free-field Frequency Response. Frequency response up to 500 Hz taken on 5 metre tower in open. Comparison with above plot shows limitation of Anechoic Chamber at very low frequencies only

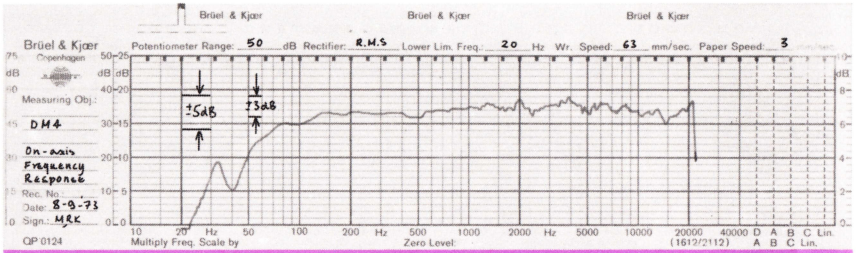


Impedance. Nominal impedance 8 Ohms. Not falling below 7 Ohms, or rising above 22 Ohms throughout entire frequency range 20 Hz to 20 kHz (control set at "0 dB")

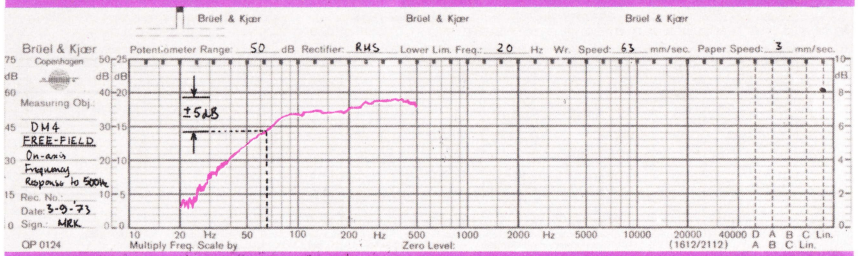


Harmonic Distortion. Harmonic analysis plotted with frequency, reference level of 95 dB at one metre at 400 Hz. B & K Heterodyne Analyser and Tracking Multiplier used

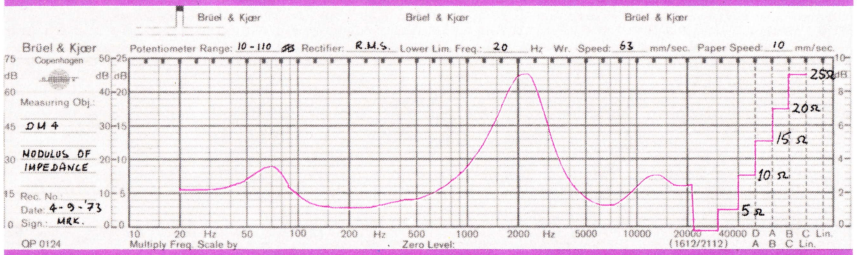
DM4



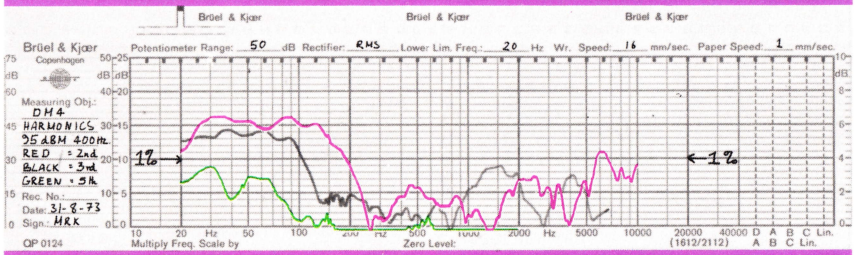
Frequency Response. On Axis ± 5 dB 80 Hz to 20 kHz, ± 3 dB 140 Hz to 14 kHz.
On axis response of a production sample DM4 in R & D Anechoic Chamber.
B & K equipment used throughout, with type 4133 microphone at one metre



Free-field Frequency Response. Frequency response up to 500 Hz taken on
5 metre tower in open. Comparison with above plot shows limitation of
Anechoic Chamber at very low frequencies only

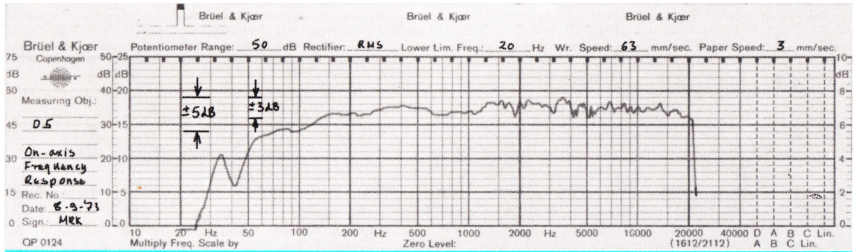


Impedance. Nominal 8 Ohms. Not falling below 6 Ohms, or rising above 25 Ohms
throughout entire frequency range 20 Hz to 20 kHz

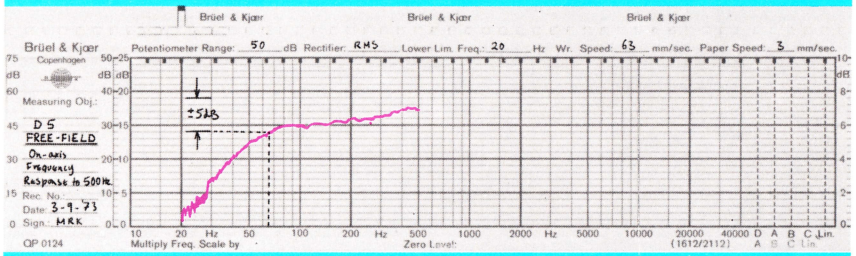


Harmonic Distortion. Harmonic analysis plotted with frequency, reference
level of 95 dB at one metre at 400 Hz. B & K Heterodyne Analyser and
Tracking Multiplier used

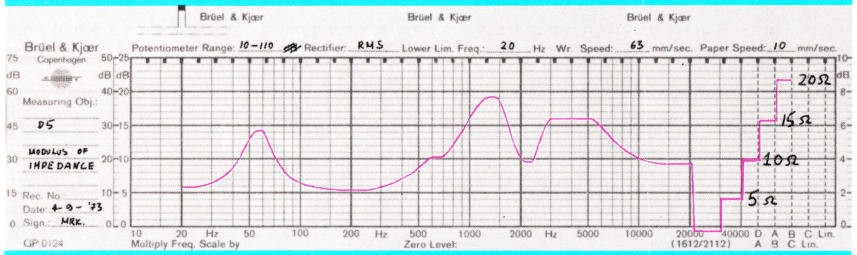
D5



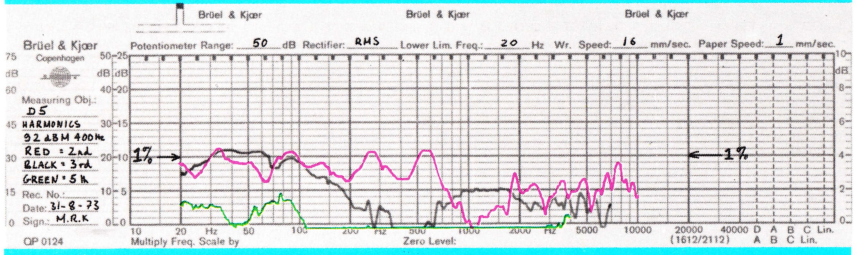
Frequency Response. On Axis ± 5 dB 80 Hz to 20 kHz, ± 3 dB 150 Hz to 3 kHz.
On axis response of a production sample D5 taken in R & D Anechoic Chamber.
B & K equipment used throughout, with type 4133 microphone at one metre



Free-field Frequency Response. Frequency response up to 500 Hz taken on
5 metre tower in open. Comparison with above plot shows limitation of
Anechoic Chamber at very low frequencies only



Impedance. Nominal 8 Ohms. Not falling below 6 Ohms, or rising above 18 Ohms
throughout frequency range 20 Hz to 20 kHz



Harmonic Distortion. Harmonic analysis plotted with frequency, reference level
92 dB at one metre at 400 Hz. B & K Heterodyne Analyser and
Tracking Multiplier used

DM70 Improved

TRANSIENT RESPONSE
Tone-burst oscillograms taken in Anechoic Chamber at standard one-third octave intervals. B & K microphone type 4133

DM4

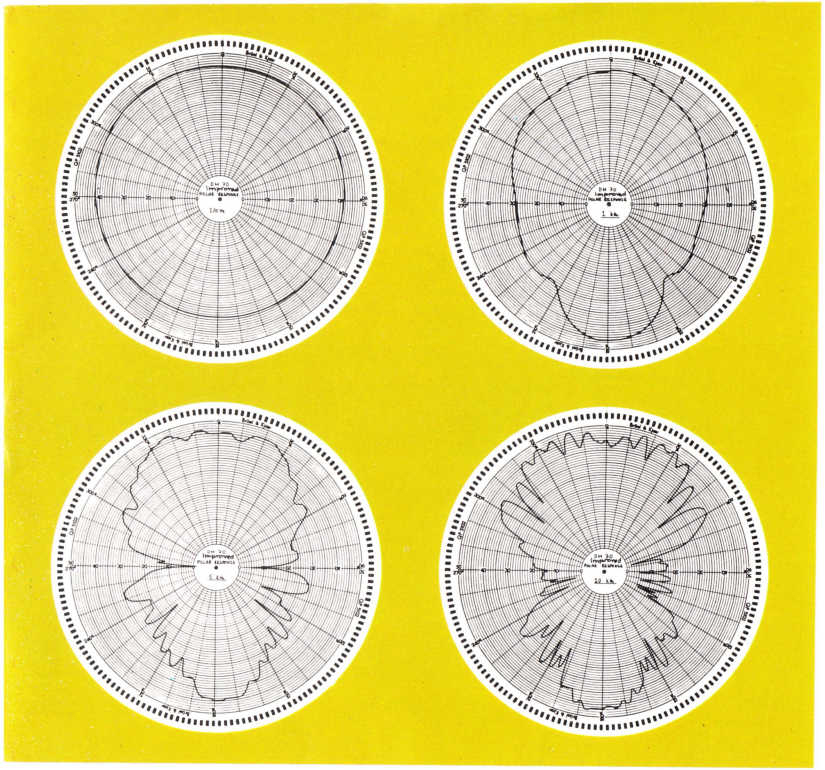
TRANSIENT RESPONSE
Tone-burst oscillograms taken in Anechoic Chamber at standard one-third octave intervals. B & K microphone type 4133

DM2A

TRANSIENT RESPONSE
Tone-burst oscillograms taken in Anechoic Chamber at standard one-third octave intervals. B & K microphone type 4133

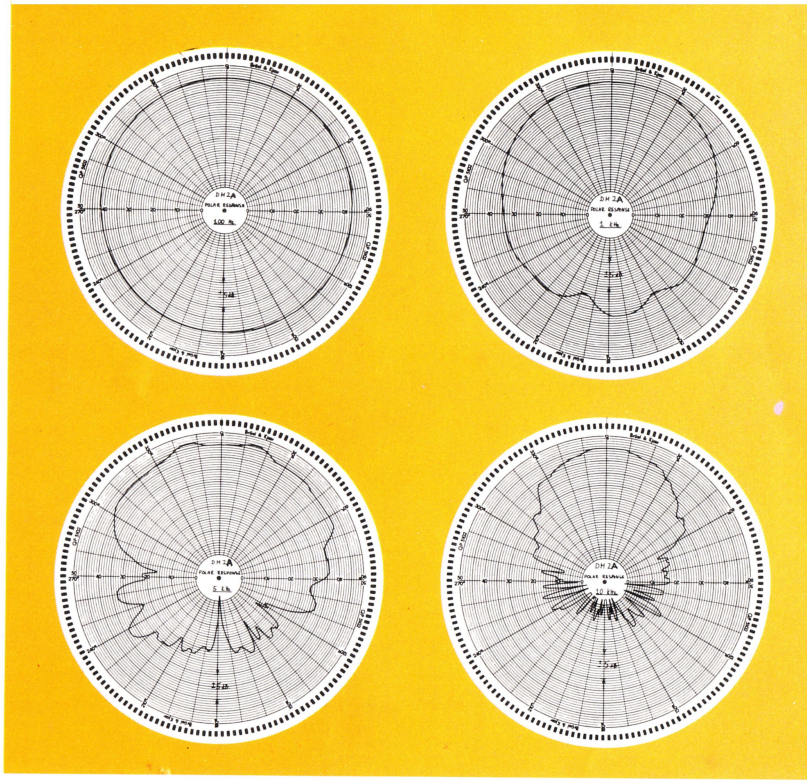
D5

TRANSIENT RESPONSE
Tone-burst oscillograms taken in Anechoic Chamber at standard one-third octave intervals. B & K microphone, type 4133



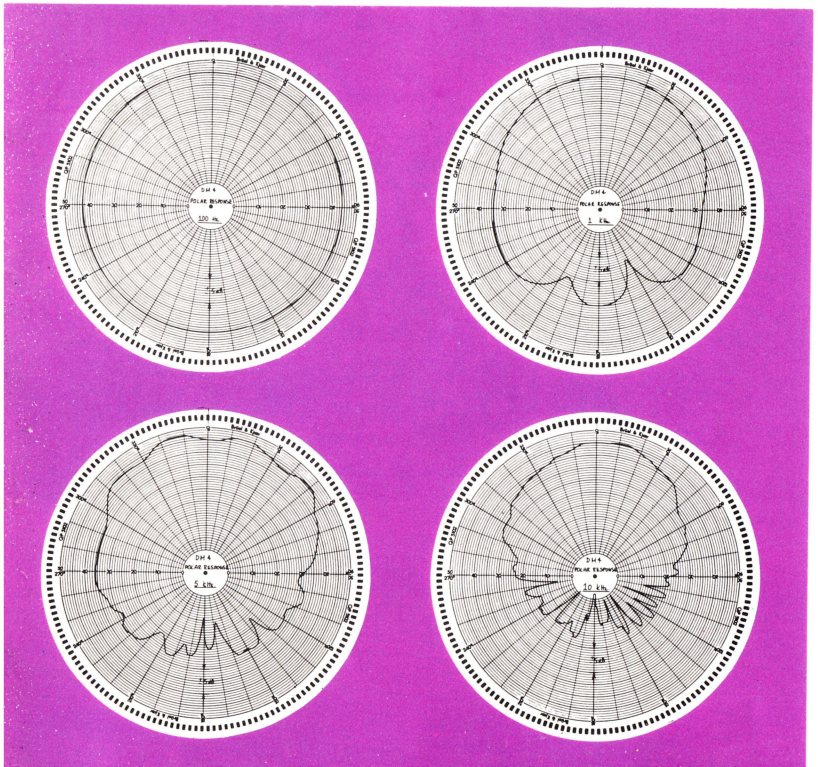
DM70 IMPROVED

POLAR RESPONSE
Horizontal distribution of sound for a range of frequencies



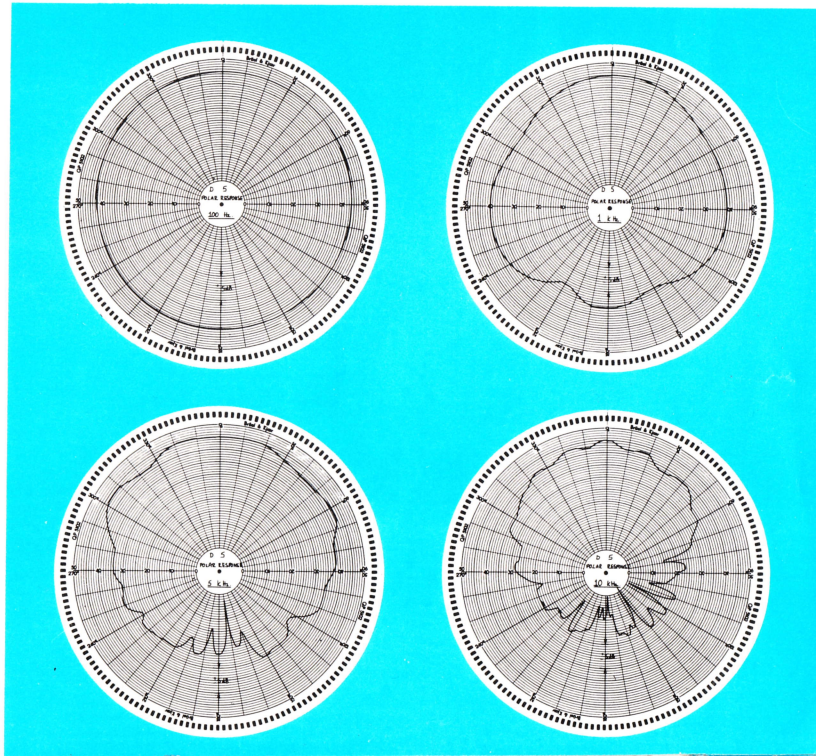
DM2A

POLAR RESPONSE
Horizontal distribution of sound for a range of frequencies



DM4

POLAR RESPONSE
Horizontal distribution of sound for a range of frequencies



D5

POLAR RESPONSE
Horizontal distribution of sound for a range of frequencies

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