

DITTON
15
XR



Celestion
DITTON 15 XR

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Celestion Ditton 15XR loudspeaker

The completely new Ditton 15XR is a sophisticated bookshelf loudspeaker system using all new components but drawing on the valuable experience gained with the world renowned Ditton 15.

The design of 'compact' or bookshelf loudspeakers demands the solution of special problems if proper bass reproduction is to be obtained. With the introduction of the highly successful Ditton 15, Celestion perfected a principle now universally known as the ABR. This device has a rigid diaphragm with linear roll neoprene suspension. Its motional mass is precisely calculated and acoustically coupled within the hermetically sealed enclosure. When signals are applied to the main bass drive unit the tuning is such that the ABR is in phase through a frequency band in the region of 60 Hz down to 30 Hz. Bass frequencies are thus shared between the main and auxiliary diaphragms.

That the ABR confers substantial benefits particularly where the enclosure dimensions have been limited, as in the Ditton 15XR, has been endorsed repeatedly by the technical Press. In addition to extending bass response downwards, giving a more realistic musical balance, an intrinsic function of the ABR is to reduce the required excursion of the main bass unit, thereby further reducing harmonic and doppler distortion. Both power handling and efficiency are also improved, resulting in increased dynamic range and therefore greater musical realism.

Power Amplifier Requirements for your Loudspeakers

In the specification section there are two methods of stating power handling.

1. Maximum input programme watts (without clipping).
2. Maximum continuous RMS sine voltage in specific frequency bands.

These methods have been adopted to establish a closer relationship between loudspeaker power handling and amplifier output capability, and to give reproducible information. There being no accepted definition of a programme watt, clarification of our use of the term and its limitations is necessary. We see the programme watt as a gauge of the energy content of a hypothetical music programme which reveals certain characteristics in both the amplifier and the loudspeaker. Consideration of these characteristics and their influence on the way that the equipment is rated will help our understanding.

Average music programme has a relatively low power content; through a sensitive speaker such as the Ditton 15XR one watt of electrical input becomes an appreciable level of sound output. However, superimposed on this low average level are transients, short term bursts of high peak power which the equipment must reproduce.

The limit of an amplifier's ability to handle peaks without clipping or distorting the wave form happens when the signal begins to overload the amplifier. As overloading specifically relates to the amplitude of the signal, so a continuous sine wave is subject to the same clipping limit as a transient peak, despite the lesser energy content of the latter. Part of the energy content appears as heat, but an amplifier is designed to absorb this heat and so prevent damage. The amplifier rating therefore is directly governed by its peak performance within a given distortion level, and it is usually expressed as the RMS value of a continuous sine wave input, whose amplitude verges on clipping. In this particular case, the ratio between RMS watts and peak watts is 1 : 2, e.g. 50 RMS watts rated amplifier will handle and deliver 100 watt peaks before clipping occurs. A moving coil loudspeaker is usually limited by the temperature at which the voice coil begins to degrade. This temperature being caused by heat generated which cannot be dissipated. The amount of heat generated depends on the average power content and duration of the signal fed to the coil. Loudspeakers are therefore rated on the average power level which they can handle for sustained periods in closely specified conditions, and this type of rating has little relationship to the peak performance of the loudspeaker. In order to illustrate the thermal limits of our loudspeakers, we have published figures to show the maximum continuous sine wave voltage input in specific frequency bands, in each case the duration of the test was 10 minutes with the signal being applied at the frequency at which maximum current was measured.

In matching loudspeakers to amplifiers, merely to relate the amplifier peak based rating to the loudspeaker average based rating, even though both may be expressed in watts RMS, does not give a satisfactory match, and also seriously limits the transient response of the speaker. To approximate more closely to the amplifier rating, we show a maximum figure quoted in programme watts as a safe estimate of the short duration programme peaks which this loudspeaker should handle. This figure coincides with the top limit of the amplifier requirements shown. Please remember, however, that programme material with an excessive content of high frequency energy renders the loudspeaker vulnerable to tweeter burn out, and that an amplifier which is over-driven and clipping can generate excess high frequency energy and an overall power greatly exceeding its rated output. Also, please note that tone controls increase output, just as volume control does, so avoid large amounts of tone compensation at high level.

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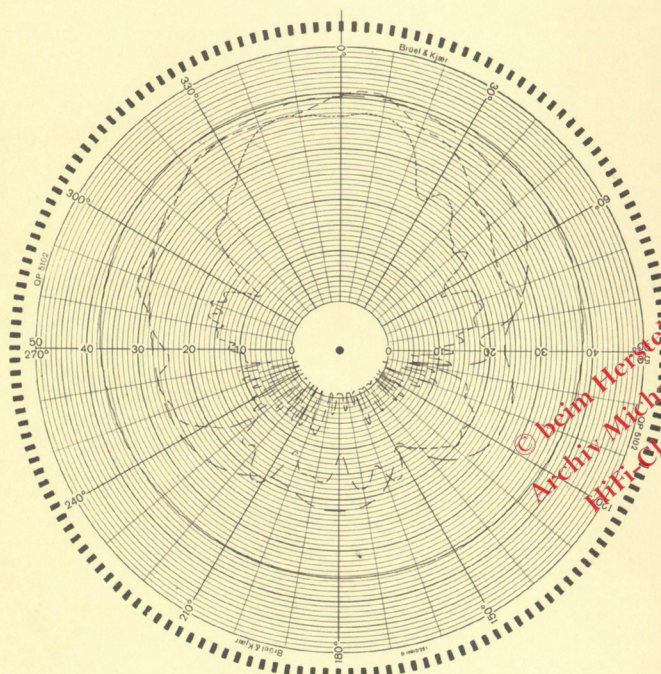
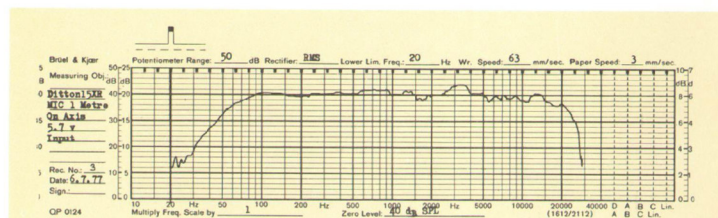
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These diagrams are reproduced for the interest of the technically minded; the diagram on the right shows frequency response; the upper limit of the trace is of course that of the laboratory equipment; the uniformity of this curve speaks volumes for the excellence of the drive units and of the crossover developed by Celestion engineers. It is hardly surprising that Celestion pressure units are specified by the B.B.C. for both studio and domestic monitors and also incorporated by many manufacturers. The polar diagram below depicts the relative response at selected frequencies through a radius of 360° obtained by rotating the loudspeaker in an anechoic chamber whilst applying precisely regulated input signals and recording the output from the loudspeaker using a fixed calibrated microphone and automatic curve tracing equipment. It will be noticed that even the highest frequencies are well maintained through a very broad arc, ensuring an excellent stereo effect over a wide listening area. Meticulous design of the flush-mounted HD 1000 super tweeter and precise integration with the 8" bass midrange unit ensures this exceptional performance.

Arranging your loudspeakers for good listening . . .

The optimum placement of your loudspeakers is somewhat dependent upon room acoustics and furniture siting. However, the basic arrangement for stereo reproduction is obtained by having the two speakers about 3 metres apart angled at approximately 45°. There are many alternatives and the Ditton 15XR can be placed either vertically or horizontally (the insignia can be turned as required); the most popular setting is on bookshelves or wall brackets. Placing loudspeakers in the corners may cause 'boomy' reproduction by exciting natural room resonances. The Ditton 15XR should ideally be placed above floor level, i.e., with the base not less than 25 cm off the floor. However, the siting of your loudspeakers is a personal matter and the Ditton 15XR may be located almost anywhere with excellent results.

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SPECIFICATION

Dimensions: 22 × 9½ × 9½ inches
56 × 25 × 24 cm

Internal Volume: 23 litres

Nett Weight: 8.2 kg, 18 lbs.

Impedance: 8 ohms

Amplifier Requirements:

10 — 60 watts RMS

Frequency Response:

Overall: 30 Hz. — 28 kHz.
Specific: 60 Hz. — 20 kHz. ± 4 dB
45 Hz. — 26 kHz. ± 4 dB
— 10 dB

System Resonance: 35 Hz.

Crossover Frequencies: 2.4 kHz

Power Ratings:

(1) Maximum Rated Power — 60 watts programme (without clipping)

(2) Continuous Sine Wave Voltage Rating

9.7 volts RMS max. 30 Hz. — 2.6 kHz.
7.0 volts RMS max. 2.6 kHz. — 20 kHz.

Sensitivity: 5.1 watts pink noise input produces 90 dB SPL at one metre in anechoic conditions

Harmonic Distortion: at 90 dB SPL

1.2% at 100 Hz. 0.69% at 400 Hz.
0.86% at 1 kHz. 0.46% at 4 kHz.
1.13% at 10 kHz. 0.91% at 15 kHz.

Finishes: Teak or Walnut

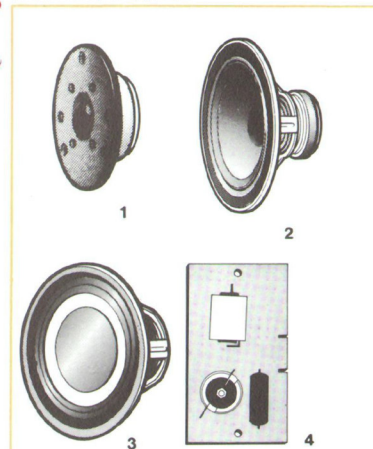
1. The latest type HD 1000 tweeter designed and produced by Celestion to the highest standards. The frequency range of this unit is from 2.5 kHz to 28 kHz. The domed diaphragm ensures good dispersion and low distortion.

2. Anechoic cellular foam wedge and lining absorbs unwanted acoustic energy within the enclosure and prevents the formation of standing waves which would be detrimental to the loudspeaker performance.

3. New NS8 8 inch (21 cm) bass midrange drive unit with specially plasticized fibre cone to prevent resonances whilst the neoprene roll front suspension and concentric rear suspension permits the 1 inch (2.54 cm) long coil the large movements essential for the correct reproduction of low bass notes, with minimal distortion. A powerful 51,000 Maxwells (11,000 Gauss) magnet system weighing 1.1 kg. controls these excursions, and all the components are housed in a new pressed steel plated chassis.

4. Units mounted flush to eliminate diffraction effects and tunnel resonances; covered by acoustically transparent grille cloth for maximum presence.

5. ABR (Auxiliary Bass Radiator). New 8 inch (21 cm) unit with front neoprene roll suspension and pressed steel plated chassis, developed to work in concert with the bass/midrange unit. For explanation of Celestion ABR principle, please see text opposite.



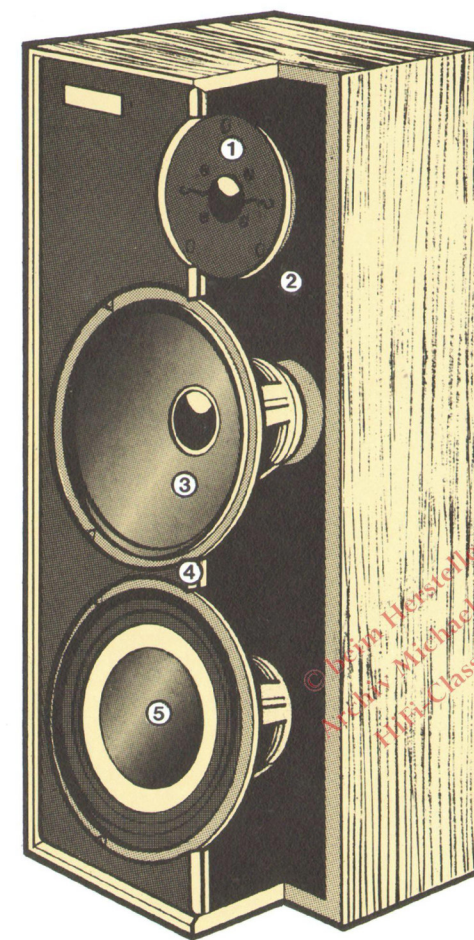
A closer view of the Ditton 15XR component units

1. Tweeter Type HD 1000 noted for exceptional performance as supplied for use in B.B.C. and other monitors.

2. Specialised long throw 8 inch unit ensures accurate bass response.

3. The ABR, a major innovation secures better bass in this compact system.

4. Inductance-capacitance crossover network precisely separates high and low frequencies.



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SP 3254 7.79

The Celestion policy is one of continuous improvement and the Company reserves the right to modify specifications without notice.

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