



Reference Series Model 107

REFERENCE SERIES MODEL 107 (1986-90)

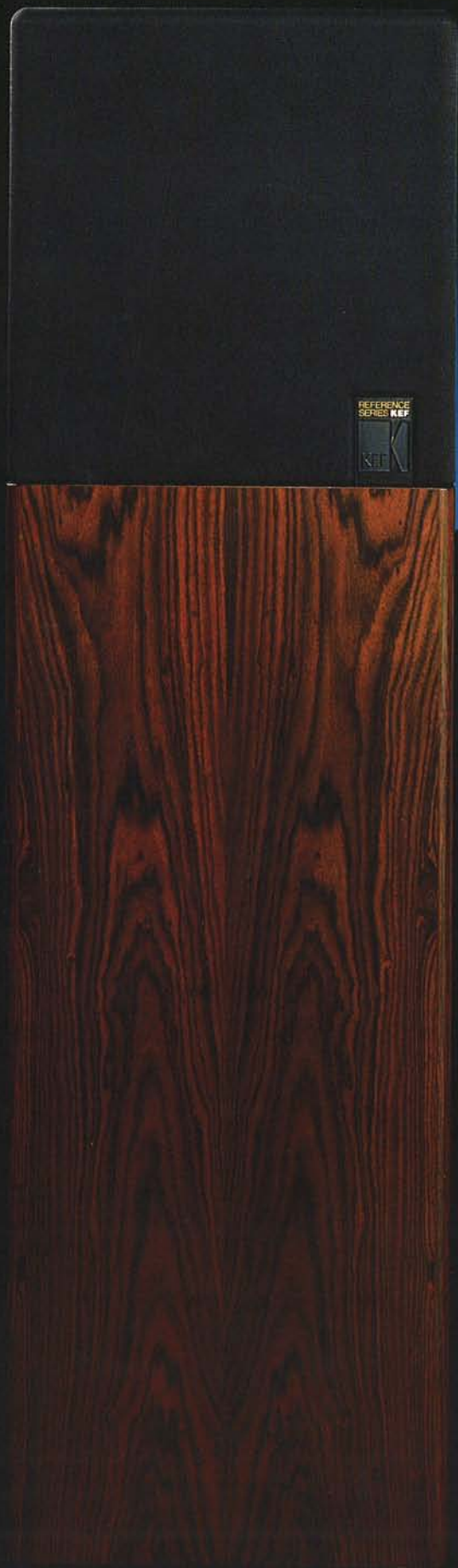
This innovative model provided quite outstanding performance with an unusually high degree of user convenience. This was achieved by combining many of the tried and tested Reference Series features with a new concept in active low-level equalisation, KUBE (KEF Universal Bass Equaliser). The result was a unique combination bass extension down to a genuine 20Hz, and good sensitivity, from a surprisingly compact system which is sonically flexible enough to be tailored to its specific surroundings.

Model 107 combined the separate mid/treble enclosure from the 105/2 with the coupled cavity bass loading technique developed for the 104/2 and established itself as one of the world's finest loudspeakers. The midrange driver was a new polypropylene-coned B110 allowing higher sensitivity with improved strength and durability. As with the 102 and 103/3 the KUBE was an integral part of this system and essential in obtaining its specified performance.

Specification	Model 107
System Type	Three-way, floor standing
Enclosure type	Coupled cavity
Size	1165 x 330 x 448mm (45.9 x 13 x 17.6 inches)
Weight	45kg (99 lb)
Nominal Impedance	4ohms resistive (20Hz-20kHz)
Rated maximum power	300W programme (into 4 ohms)
Frequency response	20Hz to 20kHz +/-2dB at 2m on reference axis

Sensitivity	90dB at 1m on reference axis for a pink noise input of 2.83V (anechoic conditions)
Maximum output	112dB on programme peaks under typical listening conditions
System	SP3059
Drive units	2 x B250 bass unit (SP1215), B110 midrange unit (SP1209), T33 tweeter (SP1210)
Crossover	SP2059 and 2070

KEF REFERENCE SERIES
MODEL 107.



THE BESPOKE LOUDSPEAKER – PRECISE TAILORING FOR YOU AND

The KEF Reference Series Model 107 is a remarkable loudspeaker.

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THE LOW-FREQUENCY SYSTEM.

Model 107 uses the twin coupled-cavity bass loading method perfected by KEF in Model 104/2. Tight control is maintained in the region around 90Hz where music power is concentrated. The arrangement of the twin 250mm (10") woofers allows the main distortion components generated in each woofer to cancel each other out. This results in a very much lower level of non-linear distortion than is achievable using conventional techniques.

The diagram shows the construction of this bass system, which radiates vertically through a port in the top face, well clear of the floor and any likely room furnishings, and immediately adjacent to the midrange drive unit for the best output integration.

The bass driver axes are vertically orientated, with each unit working from its own sealed enclosure towards the central cavity. A metal rod connects the two magnet systems rigidly together cancelling the forces set up in the units themselves, and thereby preventing the transfer of energy to the main enclosure.

An inherent advantage of the complex cabinet construction is that the internal dividing panels, by adding strategic non-symmetrical stiffening, help to prevent vibration in the main cabinet structure.

THE MIDRANGE AND HIGH-FREQUENCY SYSTEM.

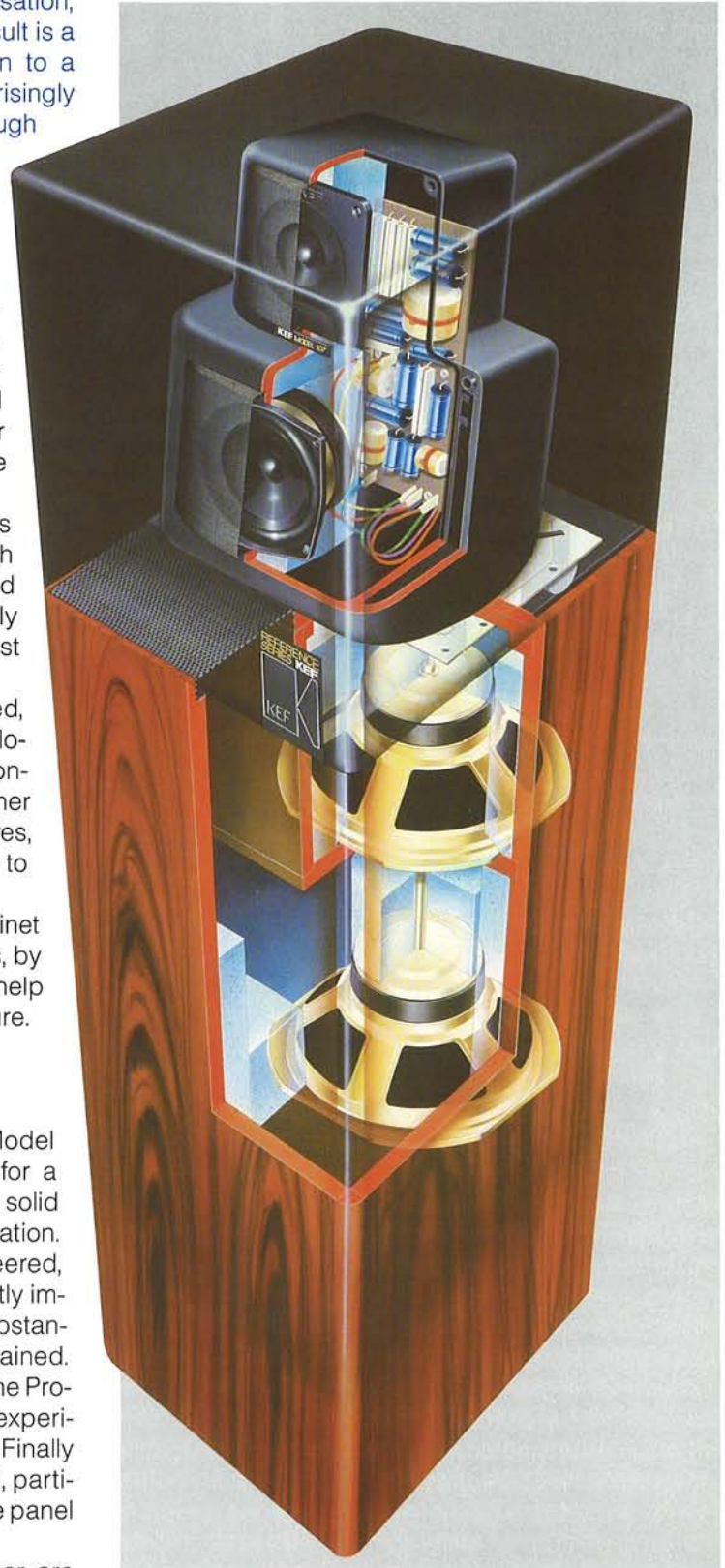
The special head assembly, which set Model 105 at the forefront of stereo performance for a decade, is still the best way to combine a rock solid stereo image with negligible midrange colouration. The head itself has been extensively re-engineered, to give slightly larger internal volume and greatly improved structural rigidity. The shape, which substantially eliminates diffraction effects, has been retained.

During the development programme for the Professional Series KM1 Monitor, KEF engineers experimented with several new damping materials. Finally chosen was an extremely high density material, particularly useful in controlling midrange enclosure panel resonances.

Quantities of this mineral-loaded polymer are injected into the cavity walls of the 107's head assembly, with a thick layer covering the entire inside of the rear panel. The head assembly is then bonded together, ensuring even lower levels of midrange colouration than were present in the original 105 head design.

to be 'tailored' to its specific surroundings.

At the heart of this new model is a re-examination of the role of the dividing network, using a hybrid technique which overcomes the hitherto immutable relationship between box size, bass extension and efficiency.



Connection between bass cabinet and the head is made by high quality gold plated XLR connectors.

Also deriving from KM1 development are the latest versions of superficially familiar drive units.

The B110 midrange unit has an improved voice

YOUR LISTENING ROOM.

coil and a new polypropylene cone, raising inherent sensitivity and power handling to exceptional levels. High frequencies are generated by the refined, ferro-fluid cooled T33 high-frequency unit.

COINCIDENT SOURCE.

Combining this head assembly with upward-vented low-frequency energy enables the entire audio bandwidth to be directed towards the listener from an area little larger than the human head. Integration is thus optimised, ensuring exceptionally smooth dispersion into the listening room. Low-frequency directional effects are almost non-existent when compared with conventional forward-facing bass units, and the bass vent's height above the floor (823mm) virtually eliminates uneven floor reinforcement effects.

The head assembly may be rotated, allowing the main enclosure to be orientated to suit the furnishing arrangements within the room, while maintaining optimum sound balance and stereo imaging at the listening position.

KUBE.

KUBE is an active low-level equaliser providing two types of equalisation, one fixed, the other variable.

The fixed equalisation controls the response of the midrange and high-frequency sections of Model 107. It provides frequency shaping with sensitivity matching between the two loudspeakers to better than 0.5dB. The variable equalisation allows the user to optimise low-frequency performance to suit both listening environment and programme material.

KUBE: THE HYBRID NETWORK.

Normal crossover networks perform three quite distinct functions. They divide the frequencies between the different drive units in the system. They ensure an appropriate load match for the driving amplifier. They provide equalisation to shape the overall response of the system.

Model 107 uses a conventional passive network situated within the loudspeaker cabinet to perform the first two functions. KEF's Conjugate Load Matching technique is used to maintain sensitivity and present a simple purely resistive 4 ohm load for the amplifier to drive.

In a passive network, equalisation involves substantial loss of sensitivity, and therefore of dynamic range. Active equalisation avoids all such losses. The equalisation elements of Model 107's network are contained within KUBE, thus creating a unique 'hybrid' active/passive design which increases bandwidth and maintains dynamic range.

KUBE: USER-VARIABLE LOW-FREQUENCY EQUALISATION.



The listening room could be described, a little melodramatically, as the final frontier in loudspeaker engineering. For years designers have tried to produce the perfect loudspeaker, but since all speakers interact both with the room in which they are used, and with their position within that room, their efforts have always been irrevocably marred.

The perfect room does not exist. All rooms are different from one another, and every room will impose its own 'signature' to detract from the potential of the loudspeaker. It is unlikely that any speaker can sound equally well in all rooms, and certainly not in all positions within those rooms.

An ideal reproducing system must have a very extended low-frequency response if the true character of the lowest musical sounds and recorded ambience are to be accurately conveyed.

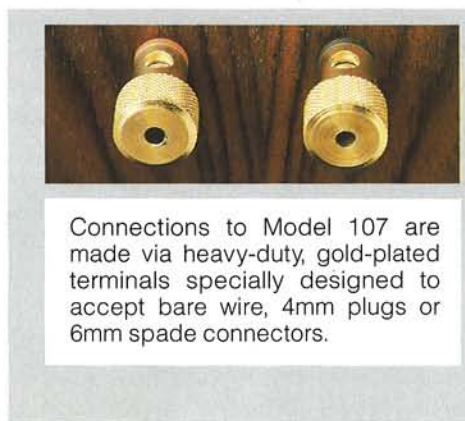
Although such information is present on the finest modern recordings, it is seldom heard correctly due mainly to deficiencies in the low-frequency performance of conventional domestic loudspeaker systems.

Room problems also are generally most serious at low frequencies. Sound is radiated from the enclosure in all directions, and the wavelengths correspond to

the main dimensions of the room. This causes reflections and standing waves, which have a deleterious effect on the loudspeaker's performance.

Most important is the reflection effect that nearby surfaces have upon the tonal balance of a loudspeaker system, which can cause a doubling of relative loudness of mid and low bass frequencies if the loudspeaker is close to a corner compared with the balance when standing in free space. KEF KUBE provides the user with the most effective means ever devised for adjustment of system balance to suit room conditions and musical preference.

The Contour control compensates for the effects of nearby room boundaries. Lower cut-off frequency is variable in four steps, 50, 35, 25 and 18Hz. Response shape (Q) is continuously variable from 0.3 (over-damped) to 0.7 (maximally flat).



WHAT ABOUT THE MUSIC?

Quite simply, every aspect of 107's design has been carried out with specific demands of music reproduction in mind. Coupled Cavity bass loading places maximum power handling and tight control where the musical demands are greatest. Conjugate Load Matching and hybrid network design ensure that the system's dynamic range and sensitivity are maximised.

Colouration. The speaker has no significant sonic 'fingerprint' to interfere with the sound as recorded. Colourations caused by diffraction interferences are eliminated by the contoured head assembly, and those caused by resonances are subdued by damping and the force-cancelling system employed in the low-frequency section.

Stereo Image. Good stereo imaging means different things to different people. In Model 107 precise matching of amplitude and phase, and careful control of on and off-axis response ensure that the directional and ambient information contained in the recording is preserved accurately in reproduction.

MODEL 107.

Frequency Response	20Hz – 20kHz \pm 2dB at 2m on reference axis.
Directional Characteristics	Within 2dB of response on reference axis up to 15kHz for \pm 10° vertically, up to 10kHz for \pm 30° horizontally.
Maximum Output	112dB spl on programme peaks under typical listening conditions.
Enclosure Volumes	Low frequency enclosure: 72 litres. MF/HF enclosure: 8.5 litres.
Amplifier Requirements	Suitable for use with amplifiers capable of providing between 50 and 300W into 4 ohms resistive load.
Nominal Impedance	4 ohms resistive from 20 – 20,000Hz.
Characteristic Sensitivity Level	90dB spl at 1m on reference axis for pink noise input of 2.83 V rms, band limited 50Hz – 20kHz (anechoic conditions).
Weight	45 kg (99 lb).
Dimensions	1165 (h) x 330 (w) x 448 (d) mm. 45.9" x 13" x 17.6"
Height of Origin of Reference Axis	1020mm (40") above base of cabinet (not including feet).
Angle of Reference	+ 1.5° from horizontal.

NOTE. Further information on the technology incorporated in the Reference Series Loudspeakers is contained in the brochure "The KEF Reference Series", available from your Dealer, or direct from KEF (part No: PL 544 EN01).

The low-frequency system employed in Model 107 was only designed after KEF had undertaken a research project with the daunting title of 'Amplitude Probability Distribution and Density in Recorded Music'.

This project involved extensive computer analysis of the low-frequency content of actual recorded music software, ranging from digital and analogue master-tape through compact discs to analogue LP disc.

For years loudspeaker designers have dreamed of reproducing accurately the difficult bottom octave below 40Hz. Conventional technology requires an enclosure volume greater than 500 litres for satisfactory performance at high efficiency. Such cabinets are clearly impractical for domestic use.

In the KEF Model 107 an enclosure volume of only 72 litres provides response extending downwards to 18Hz and below, with all that implies in terms of bringing recorded music to life. With KEF Model 107, no longer is it necessary to trade bandwidth and size for efficiency. With KUBE the listener has both at his fingertips.

KUBE.

Description	Active equaliser.
Controls	Contour: Continuously variable shelf control allows all frequencies below c. 160Hz to be varied \pm 3dB. Extension: Switched rotary control allows lower cut-off frequency to be set to 50Hz, 35Hz, 25Hz, 18Hz. Q factor: Continuously variable between 0.3 and 0.7 calibration at: Q = 0.3 – overdamped Q = 0.5 – critically damped Q = 0.7 – maximally flat (Butterworth).
Rear Panel Connections	Signal Input/Output and Tape Input/Output via gold plated phono (RCA) sockets.
Input Impedance	50 Kohms.
Source Impedance	< 10 ohms.
Signal to Noise Ratio	94 dBA ref 1V rms.
Power Supply	Factory set for nominal 110 or 220 V 50-60Hz.
Weight	1.9 kg (4¼ lb.)
Dimensions	70 (h) x 160 (w) x 210 (d) mm. 2.7" x 6.4" x 8.2"

KEF reserve the right to incorporate developments and amend specifications without prior notice in line with continuous research and product improvement.



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