



REFERENCE SERIES

MODEL 1104

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MANUAL

59 111

KEF have introduced a Reference Series of Loudspeakers intended to achieve the finest performance and able to sustain high sound pressure levels without damage to the speakers.

The current trend in higher amplifier power demands a robust loudspeaker construction, capable of safely handling higher peak sound pressure levels. The continual refinement of programme sources make more insistent demands to diminish both distortion and colouration.

The Model 104 is the first development in this range of reference speakers and is designed for shelf mounting or as a small floor standing system when used in conjunction with a suitable base or stand.

KEF design philosophy is founded on the premise that the studied use of plastics and metal alloys can improve sound reproduction, product reliability and consistency beyond the potential of traditional materials.

Twelve years of continuous engineering development have resulted in KEF's introduction and mastery of new techniques. During this period the Company introduced:-

1961 the first Melinex dome tweeter.

1962 the first flat fronted, foil stressed plastic bass unit.

1966 the first vacuum formed Bextrene diaphragm.

1967 the first pipe loaded dome mid-range unit.

Model 104 has benefited from all this experience and knowledge – a fact which is at once evident from its lucid natural sound.

## MODEL 104

The Reference Series Model 104 is a three-way speaker system employing synthetic, laminated diaphragms for all three units.

A 13 x 9 inch bass radiator is acoustically coupled with an 8 inch driver at frequencies below 45Hz. This combination gives clean bass down to 30Hz with higher efficiency than would be possible using a single large diaphragm with the same motor assembly.

The T27 tweeter extends the range smoothly beyond 30kHz.

A 6 element filter constructed with close tolerance components accurately controls balance and divides the input signal at 3,000Hz.

To adapt the speaker response to varying room conditions an acoustic contour control, located behind the grille, is adjustable to provide three response shapes in the mid-frequency range.

Cabinets and grilles have been developed with the same care expended on the units. High density structural materials, internal bracing, sound absorbent damping and layered bituminous anti-resonant linings create an unusually resonance-free enclosure. The sculptured micro-cellular grille protects the diaphragms without impairing sound quality with high frequency attenuation remaining less than 1dB up to 20kHz.

## ROOM SIZE

The Model 104 is suitable for rooms varying in size up to 300 cubic metres (10,000 cu. ft.)

## AMPLIFIER REQUIREMENTS

The Model 104 can safely be used on normal programme material with amplifiers and receivers rated at up to 50watts into 8ohms (normally equivalent to 75watts into 4ohms).

Even larger amplifiers can be used provided that care is taken to avoid fault conditions, such as switching transients and instability during the 'warm-up' period.

## ELECTRICAL CONNECTIONS

If the objective is the realistic reproduction of varied musical programme, a minimum amplifier power of 15watts is recommended in ordinary domestic rooms.

The Model 104 is intended to operate with amplifiers which require 8ohm loads. If the loudspeaker is connected to lower impedance outputs no harm will be done, but the maximum volume obtainable without distortion may be reduced.

The speakers should be connected to the amplifier using the cable supplied. If longer runs are necessary, suitable low resistance extension cables are available from specialist hi fi retailers. Alternatively make up a new cable using 24/.02 lighting flex.

In cases where the 2 pin DIN connectors are inappropriate, connections may be made via the 4 mm sockets.

## PHASING

For mono reproduction using one speaker, it does not matter which way round the loudspeaker terminals are connected: with a stereo installation it is essential to observe correct polarity. The positive terminals of all KEF speakers are marked with a plus (+) sign. This should be carefully carried through the wiring to the output terminals of the amplifier. The cables provided ensure correct phasing.

A quick check on phasing can be made by placing the speakers close together and playing a mono signal through both channels. Note the quality of the low frequency reproduction and then repeat after reversing the leads to *one* of the loudspeakers. The bass will be much fuller and rounder when the phasing is correct. An organ recording is often well suited for this test.

## MOUNTING

The Model 104 may be used on shelves or other furniture, heights varying between 50cm and 127cm

above the floor (20–50 inches). It may stand either vertically, i.e. KEF badge uppermost, or horizontally. In the latter event the tweeters (badge end) should be closest together in a stereophonic installation. The KEF badge may be easily rotated to suit the adopted cabinet position.

The Model 104 can also be used on the floor but to avoid over emphasis of the lower frequencies the cabinet should be raised by at least 20 cm (8 in) above the floor. KEF stand 104F is designed for this purpose and is available from your dealer. Wall mounting of speakers can sometimes solve an otherwise difficult installation problem. If wall mounting is required please consult your dealer.

**SPEAKER LOCATION** In almost all domestic installations the most suitable acoustical locations are precluded by either practical or aesthetic considerations. The choice of location is in any case usually limited and of necessity a compromise between many conflicting requirements. Initial tests should be made with long flexible leads, moving the speakers between all feasible locations whilst listening to voice reproduction and classical music played at a lifelike volume level. The speakers should be placed 2.5 – 4.5 metres (8–15 feet) apart depending on room size and listening distance.

The sharpest stereo image is usually obtained with the speakers angled slightly inwards so that the axes of the high frequency units intersect in the listening area. It is sometimes preferable to angle the speakers so that their axes intersect at a point well in front of the listeners. This arrangement often provides an acceptable stereo image over a wider area.

**TEST RECORD** With a new installation it is a good idea to check that the electrical connections have been properly carried out in regard to phasing, etc. A suitable

## ROOM ACOUSTICS

record for this purpose is the 'Enjoyment of Stereo', SEOM6, issued by EMI Records Limited.

All domestic rooms are small enough to exhibit strong eigentone resonances which are closely grouped at the lower end of the audio frequency range. No simple acoustic treatment can obviate these and serious low frequency colouration, i.e. boominess, may be expected if these resonances are strongly excited. A loudspeaker located close to a corner will produce the strongest bass response, because it will excite the maximum number of resonances in the location. However, the tonal quality may be unpleasant in character due to over-emphasis of the 100–400Hz region. A test with male speech will expose the problem. Moving the speaker out of the corner a distance of one or two feet will usually avoid the trouble.

Another source of trouble can be structural resonance in floors and lightweight partitions. It usually helps to keep the loudspeaker out of direct contact with the room structure by the use of a base or plinth. In serious cases the speaker should be isolated by a thick pad of foam rubber or similar material.

Loudspeakers should never be fixed to flimsy partitions as this will impair the low frequency performance.

## ACOUSTIC CONTOUR CONTROL

Recognising that the acoustics of many rooms are not ideal, an Acoustic Contour Control has been fitted to provide a measure of correction. The adjustment varies the shape of the frequency in the critical mid-range between 200Hz and 5,000Hz.

This control is located behind the grille. To remove the grille gently pull the foam panel from the top above the KEF badge.

The 'flattest' response will be obtained with the control set in the 'Reference' position, which should be selected for initial listening tests. If the

## WARRANTY

sound quality is considered too hard the minus (-) position should be tried, but if the sound is dull switch to the plus (+) position. A variation in the mid-range response of approximately 4dB can be achieved with this control (see diagrams).

Should the sound quality be unsatisfactory further consideration should be given to the location of the loudspeakers.

The quality of KEF speakers is under surveillance and control at all stages of production, commencing with the critical inspection of incoming raw materials and components. Frequent inspection of sub-assemblies at many subsequent stages ensures a very high standard of consistency and reliability. Final testing is carried out using the most sophisticated techniques involving many more criteria than the mere inspection of a frequency response curve, which in any case may give little assurance of consistently reliable performance.

The confidence assured by these stringently effective methods is confirmed by the extremely low percentage of field failures due to faulty manufacture. KEF give a FIVE year warranty to the original purchaser.

Your KEF Model 104 will give many years of satisfactory service if installed and operated according to these instructions. In the event of trouble you should notify the dealer, from whom you purchased the product, quoting the serial number and date of purchase.

Overseas users should contact their local distributors - names and addresses can be supplied by KEF. Difficulties may arise if products are exported to territories where no agent has been appointed. In such cases, KEF will always endeavour to give assistance.

The Warranty does not reduce your rights in Common Law but may facilitate rapid service.

## SPECIFICATION

**Dimensions:** 630 × 330 × 260 mm  
24.8 × 13 × 10.23 in

**Internal Volume:** 35.5 litres

**Weight:** 15.8 kg 34.75 lb net

21.0 kg 46.2 lb packed

**Nominal Impedance:** 8 ohms (see curve)

**Rated Max Power:** 50 watts programme

The undistorted power output of an amplifier with which the loudspeaker may be satisfactorily operated on normal programme material over an extended period of time

**Continuous Power rating:** 20 volts (50 watts) 100-2,500Hz  
reducing to 8 volts (8 watts)  
above 3kHz

**Overall Frequency Range:** 30-40,000Hz

**Specific Frequency Response:**

measured at 1 metre on axis of the HF unit in anechoic conditions  $\pm 2$ dB 50-20,000Hz  
 $\pm 5$ dB 35-35,000Hz  
-10dB at 30Hz

**Dividing Frequencies:** 45 Hz (acoustically coupled)

3,000 Hz (electrical cut-off  
slope 18 dB/8ve)

**Acoustic Contour Control:** 3 positions  $\pm 2$ dB  
centred on 1.5kHz

**Harmonic Distortion:** <1% THD 100-30,000Hz  
rel 96dB SPL at 400Hz

**Sensitivity:** 12.5 watts into nominal 8 ohms  
produced 96dB at one metre and  
400Hz in anechoic conditions

## DRIVE UNITS

### SUB LF RADIATOR BD139 SP1042

Developed from the world famous B139 bass unit, this radiator redirects the low frequency energy from the rear of the B200 to augment bass output. Its effect extends low frequency performance, raises efficiency and reduces distortion. Fitted with precision tuned sandwich type diaphragm in die cast aluminium chassis.

### LF RADIATOR B200 SP1039

Features a new visco-elastic damped Bextrene diaphragm with high temperature motor assembly and PVC surround.

**Total Flux:** 132,500 maxwells

**Flux Density:** 13,500 oersteds

**Nominal Pole Dia:** 33 mm

**Fundamental Resonance:** 25Hz

### HF RADIATOR T27 SP1032

Melinox dome with integral damped roll surround. The frequency range extends at least one octave above the upper hearing limit.

**Total Flux:** 24,700 maxwells

**Flux Density:** 12,500 oersteds

**Nominal Pole Dia:** 20 mm

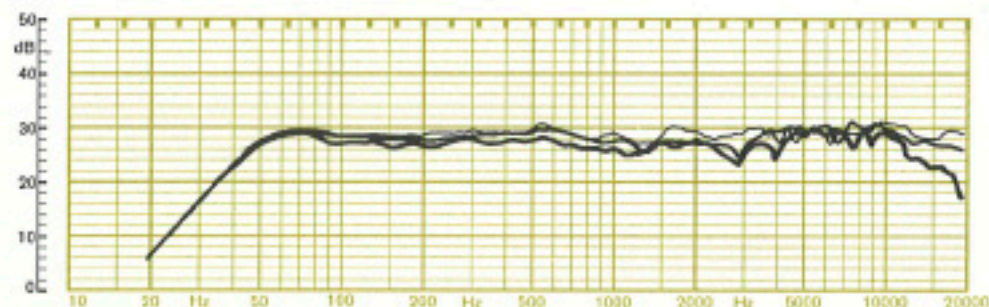
**Effective Moving Weight:** 350 milligrams

**Fundamental Resonance:** 1,100 Hz

## DIVIDING NETWORK

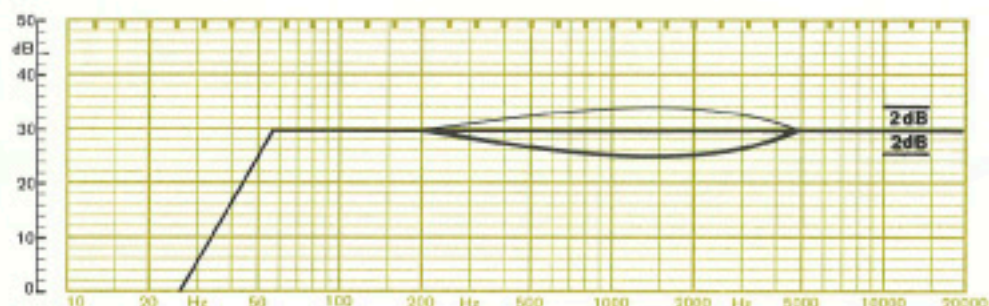
### DN15 SP1041

A six element network dividing at 3,000Hz, roll-off slope 18 dB/8ve on both sections. Selected high stability components and low loss capacitors at all critical points. THD due to filter network remains less than 0.2% at full output of 50 watts.



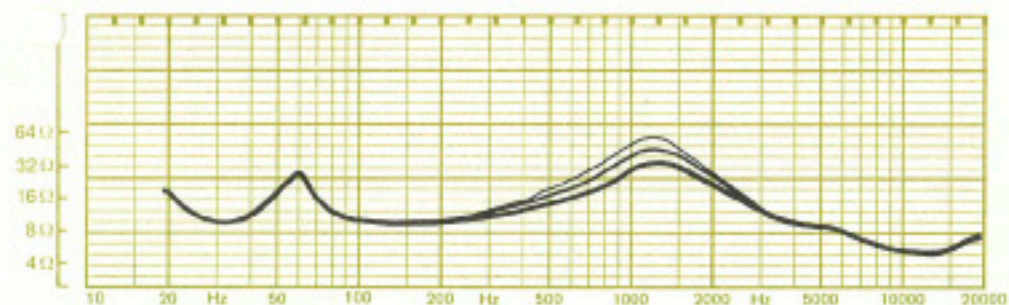
**MODEL 104** Horizontal Dispersion  
Microphone 1 metre on HF unit axis with acoustic contour at - position

- on axis horizontally
- 30° off axis horizontally
- 45° off axis horizontally



**MODEL 104** Acoustic Contour Control

- + position
- Reference position
- - position



**MODEL 104** Impedance Curves

- - position
- Reference position
- + position



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# THE SPEAKER ENGINEERS

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MUSIC  
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SERVICE  
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OF OUR TEAM WILL BE WITH  
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*Or press finger HERE*