

Sphere Microphone KFM 6



Instructions

KFM 6

Recording technique

In several respects, the procedure for setting up the sphere microphone resembles that used with other pressure transducers. Experience and a willingness to experiment will produce excellent results, but finding the optimum position may take a little longer than is customary with, for example, an ORTF pair. Accordingly, we would like to offer some hints and explanations to help you use the KFM 6 to the best advantage.

Orienting the microphone relative to the center of the sound source is simplified by spotting a reddish-violet LED located at the 0°-"stereo axis" of the KFM 6. Recessed into the sphere, it radiates only into a narrow angle. It is lit whenever the microphone is powered, and can be seen clearly, even at distances of several meters. The 0°-axis is located at the midpoint of the two extreme positions from where the LED can still be barely seen. Since these points are often less than a meter apart, the KFM 6 can be aligned in both the lateral and vertical planes with great precision.

Each channel is identified with a color code, marked on one of the capsule mounting screws and on the corresponding output connector of the AKSU/2U adapter cable. With the KFM 6 mounted in an upright position, yellow indicates the left channel (I) and red the right channel (II).

N.B.: When the KFM 6 is suspended from the ceiling, left and right markings will be reversed so that right (I) = yellow,

left (II) = red. (Since the LED is always directed toward the sound source, it is not possible to invert the KFM 6 and maintain the same channel orientation.)

The recording angle of the KFM 6 which corresponds to the reproduced stereo stage is about 90°. Therefore the sound source that is to be recorded should lie within a pickup angle of $\pm 45^\circ$ from the 0°-axis. When a closer placement is selected, the recording will become "drier" because the reflections coming from the room will be less prominent than the direct sound. Furthermore, a "ping pong" effect may occur as the angle encompassing the sound source becomes wider than the pickup angle of the microphone. Bear in mind that the KFM 6 has been designed mainly for sound reproduction using loudspeakers. When the listener and the loudspeakers are positioned at the corners of an equilateral triangle (which is usually accepted as the ideal case), the 90° recording angle is scaled down accordingly, as reproduced sound sources must be restricted to an angle of $\pm 30^\circ$. Since any sound reaching the microphone at an angle exceeding the maximum pickup angle will not be reproduced any further to the left or the right than sounds coming from $+ \text{ or } - 45^\circ$, all these sound sources will be crowded into the right and left speakers respectively. Conversely, when working at a greater distance, the contribution from the room will increase relative to the direct sound and the sound

source(s) will tend to concentrate in the middle of the stereo image. This may be desirable as, for example, when solo instruments are being recorded. Of course the maximum pickup angle will not be fully utilized in such a case. Another parameter to be considered is the height at which the KFM 6 is being suspended. As with its distance from the sound source, the user is free to experiment. Normally the KFM 6 is inclined downward so that the LED is pointed at the centre of the sound source. Since the position of microphones is largely a matter of taste, we urge the reader to take these hints only as a general guide.

The KFM 6 is designed to work with any standardized (DIN or IEC) 12 - 48 V phantom power supply, thus making the user independent of the actual powering voltage. In practice the voltage may drop even below the minimum value stated in the standard, as when a large number of microphones must be supplied simultaneously. Even in this case the KFM 6 will work perfectly, provided that a current of 4.4 mA per channel is available.

It should be noted that the maximum sound pressure level is 7 dB below the value stated for 48 V when a 12 V phantom powering is used.

Another advantage of the KFM 6 is that it does not require transformers in order to work with unbalanced inputs. Full output level can be ob-

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tained with this arrangement, provided that a power supply unit with decoupling condensers is used as, for example, our NG 52 Uv.

Furthermore, the output level of the KFM 6 is much greater than might be expected, being about 15 - 20 dB more than the microphones of the Colette Series.

This further reduces possible electrical interference picked up in the microphone cables. Another advantage is that, for recordings made in high sound pressure levels, the output of the KFM 6 may be connected directly to the line inputs of the recording device, provided they are sufficiently sensitive.

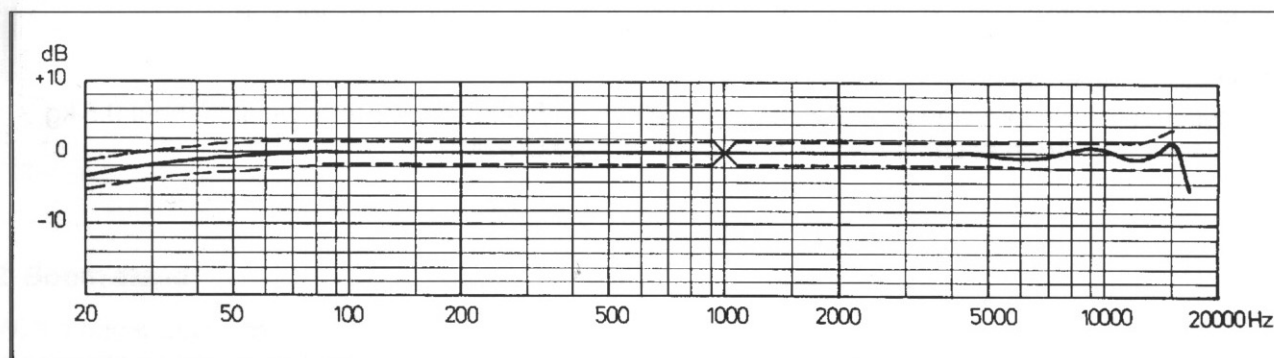
Conversely, care must be

taken not to overload microphone inputs with the high output of the KFM 6, for electrical clipping may still occur at the input stages of some recorders and mixing desks, even when the level controls are adjusted to give normal meter indications. An attenuator may be required in such circumstances, but if so it should be placed close to the actual input connectors in order to take advantage of the interference-reducing properties of high levels mentioned earlier.

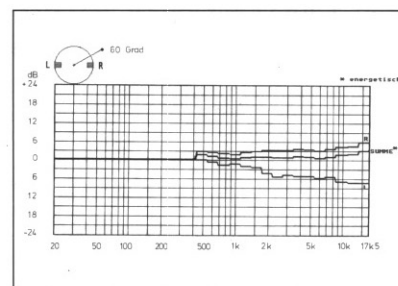
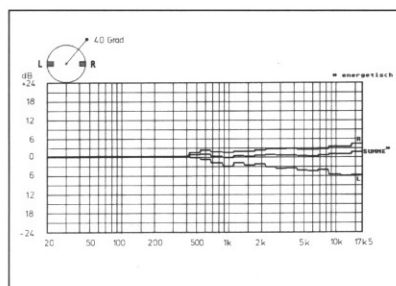
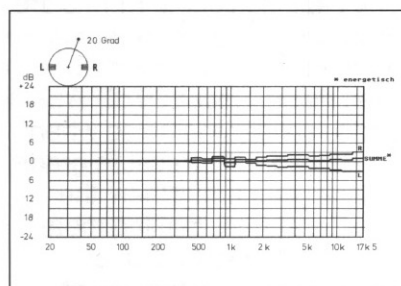
A summary of the technical characteristics of the KFM 6 is given here:

Since the frequency response for each channel of the KFM 6 depends on the

angle of incidence, it is shown on the stereo main axis (0° incidence) where it is constant, and then in individual channel plots plus the sum of their energies in separate graphs taken at angles of 20° , 40° and 60° .



Frequency response on the stereo-axis. The response in the diffuse soundfield is very similar and lies within the tolerances shown.



Third octave band frequency response curves at an angle of 20° , 40° and 60° . Upper curve = right, lower curve = left, middle curve = sum of energies of left + right.

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The following data were measured at a distance of 1 meter from the capsule on its axis. A 48 V phantom power supply was used with a load resistance of 1 k Ω .

Classification of the special capsules:	pressure transducer
Recording angle providing full stereo reproduction:	about 90°
Frequency range:	20 Hz - 16 kHz
Sensitivity:	100 mV/Pa (10 mV/ μ bar)
Equivalent noise level, DIN/CCIR:	25 dB
Equivalent noise level, DIN/IEC A-weighted:	17 dB-A
Signal-to-noise ratio re. 1 Pa, DIN/CCIR:	69 dB
Signal-to-noise ratio re. 1 Pa, DIN/IEC, A-weighted:	77 dB-A
Maximum Sound Pressure Level for 0.5% THD:	123 dB
Output voltage at maximum SPL:	about 2.8 V
Output impedance:	150 Ω
Minimum recommended load impedance:	600 Ω
Powering:	12-48 V phantom (DIN/IEC standards)
Current consumption per channel:	about 4.4 mA, independent of the supply voltage
Amplifier connector:	XLR-5M type
Weight:	about 1.1 kg
Diameter of the sphere:	200 mm
Accessories:	- Suspension device with universal ball-and-socket joint. Total weight: about 0.5 kg - Adapter cable AKSU/2U (XLR-5F to 2 x XLR-3M)

Please note:

Make sure that both channels of the KFM 6 are powered by a suiting phantom powering device. Otherwise the KFM 6 will not operate. When using the AKSU/2U both connectors have to be plugged in.

When the KFM 6 is turned on, a short but loud singing may be heard. As with any other microphone it is therefore recommended that the user mutes the inputs before powering the KFM 6.

How to protect the KFM 6 against wind

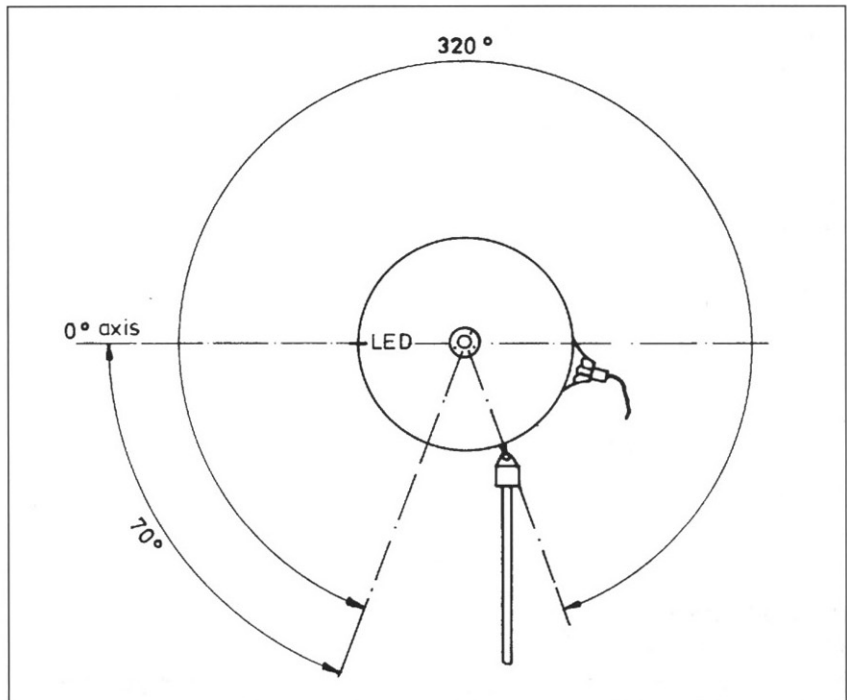
The capsules of the KFM 6 are pressure transducers which are much less sensitive to wind noise (about 25 dB-A) and to solidborne noise when compared with pressure gradient transducers. When the wind is strong, making measures for the reduction of noise necessary the use of foam wind screens with open pores is recommended.

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Mounting the Schoeps KFM 6 with its suspension devices

1. Simple stand

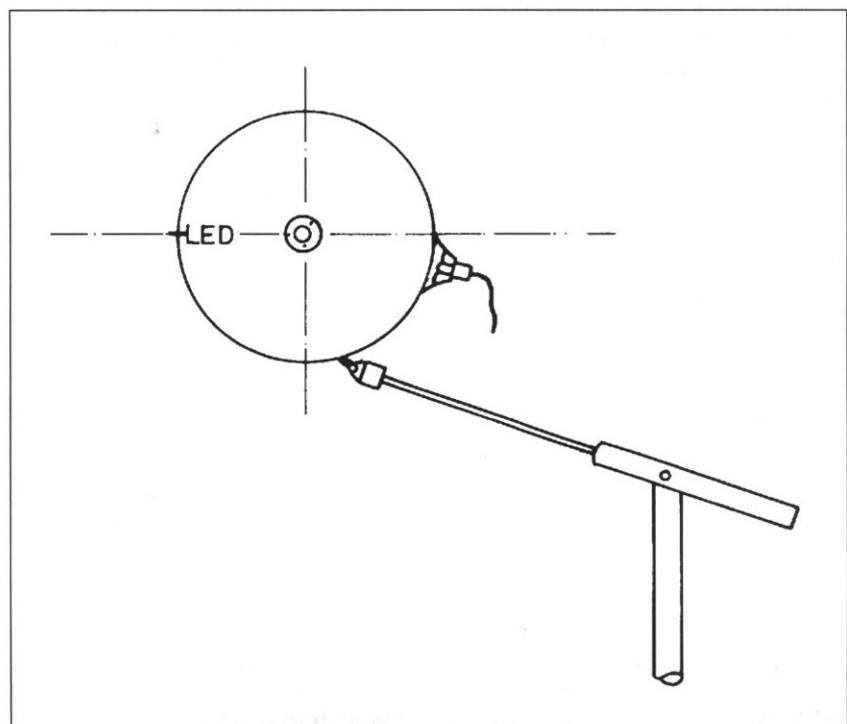
With the universal ball-and-socket joint supplied, even a simple vertical stand without a boom arm allows the KFM 6 to be used in almost any conceivable position. The maximum swivelling range is about 320° , although for typical applications most settings will be 0° - 70° .



2. Boom stand

With a boom stand, the variety of possible applications of the KFM 6 is further expanded. It is, for example, possible to point it downwards at a right angle (range from 0° - 360°).

Please note: the stand must be prevented from tipping over when a long boom is used.

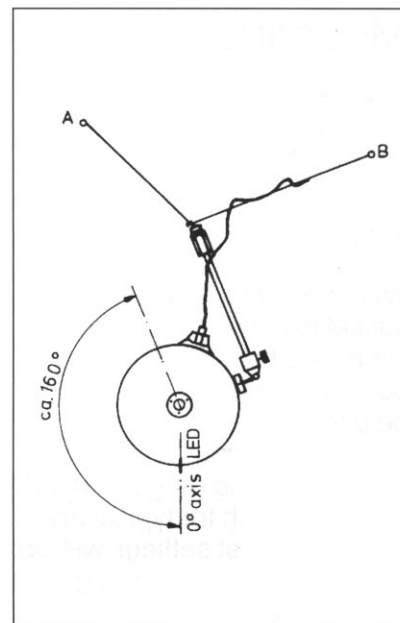


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3. Suspended between two points in a room

The accessories supplied with the KFM 6 include a universal ball-and-socket joint and a hanging attachment with a metal crossbar, which has several holes for fastening ropes. The range of possible inclinations is indicated in the drawing at the side. When the ball-and-socket joint is loosened, the microphone will align itself vertically under the influence of gravity. By twisting and tilting the KFM 6 at its ball joint the 0°-axis can be adjusted to the desired position. Because of its three-dimensio-

nal freedom the suspension device allows the KFM 6 to be properly positioned even in the most unfavorable circumstances as, for example, where fastening points are located at different heights and at different distances from the sound source. Once the KFM 6 is hooked onto the rope, the hexagon nut is tightened so as to squeeze the rope and prevent sliding.



4.1 Suspended from a microphone cable

Microphone cables of sufficient tensile strength allow the KFM 6 to be suspended directly without using any rope. The cable is simply clamped between the hook and the cross-

bar (fig. 4.1 a). Thin auxiliary lines can then be tied to the ends of the crossbar to prevent the microphone from twisting (fig. 4.1 b).

Warning:

Because of its weight, the sphere should NEVER be hung from its XLR connector and cable!

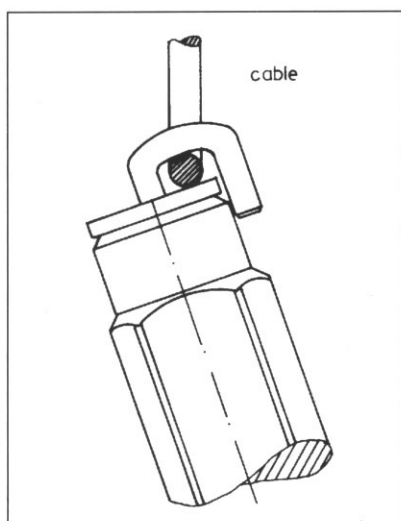


Fig. 4.1a

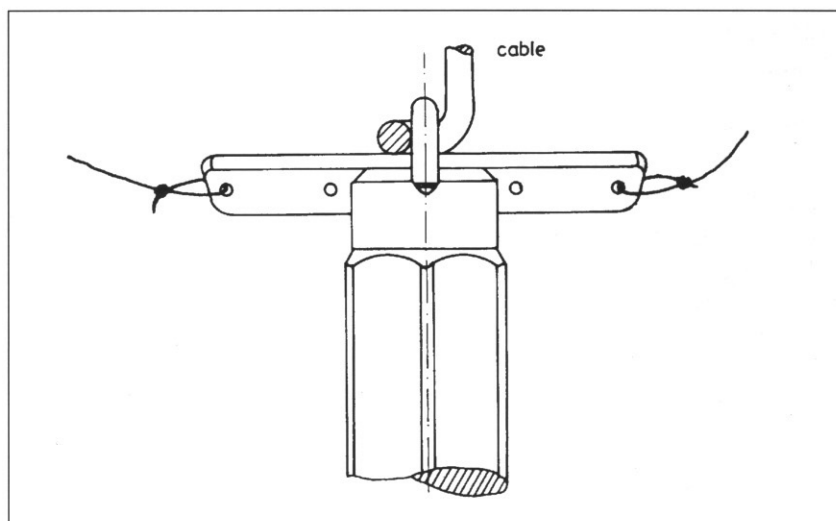


Fig. 4.1b

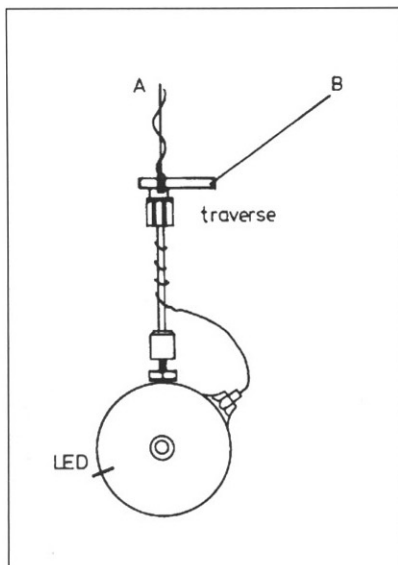
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4.2 Fastening the crossbar

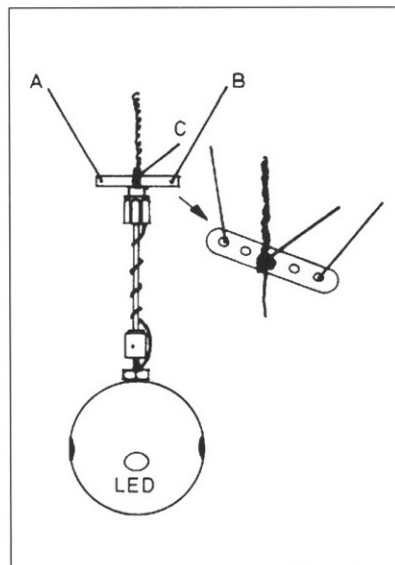
Ropes up to 5 mm in diameter can be attached to the crossbar. In addition, each of the five

holes can accommodate a hook. This offers a variety of suspension possibilities:

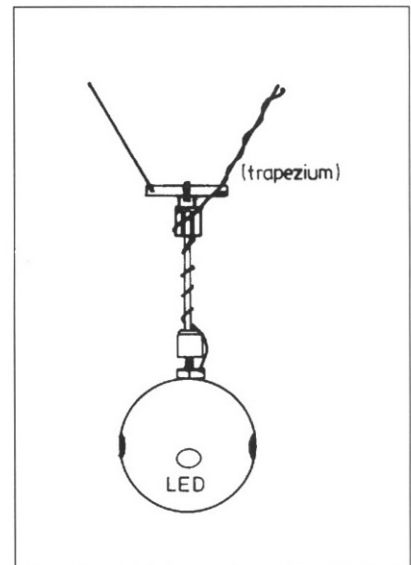
Adjusted rearwards



Positioned with 3 lines



Suspended



Hints:

The suggestions offered so far for mounting, connecting and positioning the KFM 6 have been made to the best of our current knowledge and belief. In principle, however, the manufacturer cannot accept responsibility for any personal or property damage resulting from the inappropriate use of the KFM 6. Decisions regarding the suitability of mounting

arrangements and the connection of the KFM 6 to other equipment must be taken at the risk and sole responsibility of the user. It is up to that person to examine the KFM 6 and its accessories before using them. Only if all parts are in perfect condition should they be placed in service. Particularly during the mounting and dismantling of

the KFM 6, but at all times while it is in use, the user must ensure that no one can be injured by the microphone falling from the ceiling or from a stand. Security ropes should be used where possible.

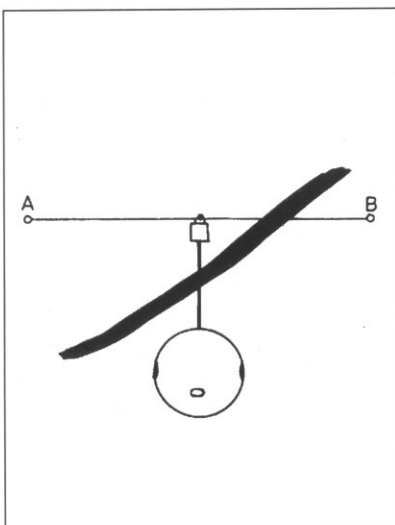
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Please be shure to observe the following points

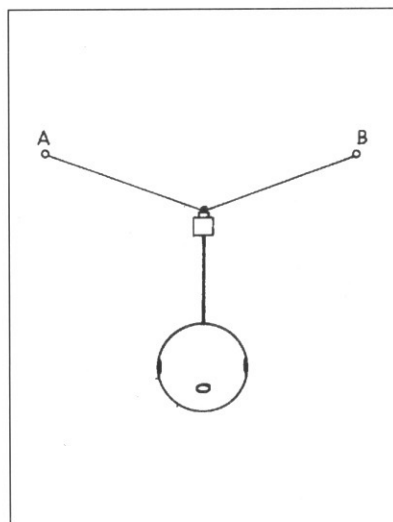
- NEVER suspend the sphere from its cable and connector!
- The lines used to hang or position the KFM 6 should have a high tensile strength. Stranded steel line, sheathed in plastic, is recommended.
- Avoid excessively long weight-bearing lines.
- To avoid the danger of being severed, lines and cables should not be attached to, close to, nor stretched over objects having sharp edges.
- The ability of the fastening points (e.g., nails, pegs, eyelets) to support the load should be tested before and after the microphone is suspended. Bear in mind the resolution of forces in the rigging lines, and do not over-tighten them or use excessive force.
- We suggest that you provide yourself with an assortment of 3/8" screw fastenings and tools, and store them with the microphone.
- Tighten the KFM 6's fastening screws firmly, especially their locknuts.
- When using stands, take care to prevent their tilting and becoming unstable.

Care of the KFM 6:

- The surface of the KFM 6 consists of a grey non-light-reflecting lacquer. Should it ever need cleaning, you can either cautiously wash it with a moistened cloth, perhaps with a little non-abrasive washing-up detergent added, or rub its surface with a non-abrasive colorless rubber eraser. In severe cases the KFM 6 can be wiped off with a cloth dampened with a little solvent such as alcohol or benzine (but not acetone!), provided it is used sparingly. Too much solvent, or solvent applied too often, can damage the lacquer.
- Despite its size and weight, the KFM 6 is a precision product with sensitive components. Protect it during transport and rigging.
- Accessories such as stands, clamps, and cables should also be treated with care.



To be avoided! High tensile in the rope.



Recommended.