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SOUND REPRODUCTION EQUIPMENT

4104

NOISE-CANCELLING MICROPHONE

Principal Features

- ★ Better than 20db average discrimination between voice and background noise.
- ★ Provides speech of broadcasting quality completely free from breath noises.
- ★ Flat frequency response at the controlled talking distance.
- ★ Light in weight, robust in construction.
- ★ Ideal for commentating purposes where background noise level is high.

Standard Telephones and Cables Limited

DESCRIPTION

THE 4104 NOISE-CANCELLING MICROPHONE

The 4104 ribbon microphone is a pressure gradient transducer especially designed for use by broadcast commentators. The instrument is invaluable for the reproduction of high quality speech from noisy surroundings as a considerable degree of background noise cancellation is acheived.

As a result of extensive research it has been possible to produce a close-talking microphone which permits speech of excellent broadcasting quality to be reproduced substantially free from disturbing effects due to distortion, breath noises, background noises, etc. A highly damped ribbon unit ensures freedom from non-linearity and low frequency surges.

The principle of operation is as follows: With pressure-gradient instruments, the low frequency response rises more rapidly than does the middle and high frequency response as the sound source approaches the microphone. The 4104 microphone is so designed that it has a flat frequency response to a close sound source at a controlled distance, and consequently the frequencies below about 1000 c/s of any more distant sources are considerably attenuated. As these lower frequencies form a very important part of background noises, good discrimination is obtained between wanted and unwanted sounds. (Refer to Figure 1).

Careful design of the case and magnetic system gives a frequency response and a freedom from non-linear distortion which are vastly superior to those of previous close talking microphones. Care has also been taken in the design to ensure that a balanced response is obtained between sounds issuing from the mouth and nose respectively. Any deficiency in the response to the latter leads to a stuffy and unnatural speech quality.

The microphone is normally fitted with a mouth guard and breath shields. The former ensures that the speaker's mouth is at the correct distance; the latter suppresses disturbing noises from the lips and nostrils and also completely obviates the unpleasant blasting effects caused by the more explosive consonants.

The instrument is effectively shielded against electrostatic and electro-magnetic fields. A fully shielded miniature toroidal input transformer in the handle steps up the ribbon impedance to 30 ohms.

As the microphone may have to be held for long periods, care has been taken in the mechanical design to obtain low weight and to provide a natural holding position. A specially light and flexible cable of small diameter is fitted.

The microphone is not unduly affected by wind and can be used in air streams of velocities up to about 20 m.p.h. The use of a simple wind shield enables good results to be obtained in winds up to 40 m.p.h. or more.

The design of the 4104 microphone incorporates elements covered by Patent No. 737096 owned by the British Broadcasting Corporation.

SPECIFICATION

4104-C (Typical Values)

MEAN SENSITIVITY

Open-circuit voltage per 10 dynes/cm² (10 micro-bar)	0·085 mV
Open circuit voltage level per 10 micro-bar, ref. 1 mW	—82 db
Power delivered into 30 ohms for 10 micro-bar, ref. 1 mW	—72 db
American ASA rating, ref. 1 mW	—168 db

ELECTRICAL IMPEDANCE

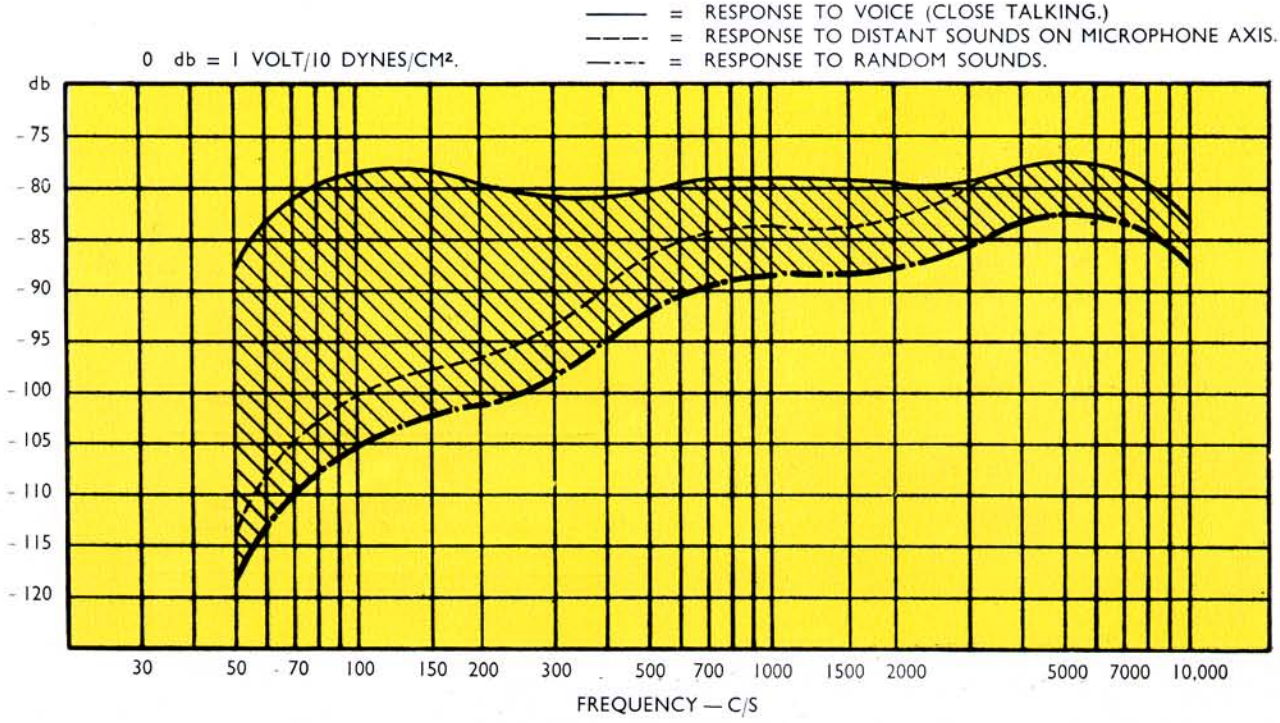
Nominal impedance .. .. 30 ohms.

(A 300 ohm version of the 4104 microphone is available to special order.)

NOTE: The microphone is normally operated into an impedance which is high compared with 30 ohms. It may, however, be terminated by an impedance as low as 200 ohms without appreciably impairing the frequency response, though there will be some loss of sensitivity and a reduction of the signal-to-noise ratio.

FREQUENCY RESPONSE

Figure 1. Typical frequency response curve (impedance = 30 ohms). Shaded area gives discrimination against background noise (random).



EQUIVALENT ELECTRO-MAGNETIC HUM PICK-UP

Less than 0·0002 dynes/cm² equivalent acoustic input for 1 milligauss at 50 c/s.

DISTORTION

Less than 1% total harmonics at +120 db above 0·0002 dyne/cm² (20 micro-Newtons per square metre).

WEIGHT

10 oz (283 g) approximately.

FINISH

Bronze enamel with rubber covered handle.

DIMENSIONS

Length overall — 8 in. (20,3 cm)

Head unit — height $1\frac{3}{4}$ in. (4,4 cm) width $2\frac{1}{4}$ in. (5,7 cm) depth 3 in. (7,6 cm).

CABLE

Normally supplied fitted with 20 ft (6,1 metres) of light-weight screened pair cable.

CABLE REPLACEMENT

To replace the cable, the rubber handle grip should be withdrawn and the handle front plate removed. This gives access to the cable connections.

CARRYING CASE

Each microphone is supplied complete with a metal carrying case as illustrated. The microphone, cushioned on a sponge rubber pad, is held in the lid of the case between supports around which the cable is wound.

Finish: Grey enamel with chrome fittings.

Overall case dimensions: length 15 in. (37,8 cm) width $4\frac{7}{8}$ in. (12,3 cm) height $5\frac{1}{8}$ in. (13 cm).

WARNING

Do not attempt to check the continuity of this microphone as doing so is liable to damage the ribbon.

COMMUNICATIONS GROUP

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