

MOVING-COIL MICROPHONES

S.T. & C. No. 4017A or W.E. Co. No. 618A.

These two microphones are identical in construction and performance, the two code numbers merely indicating different manufacturers. The microphone is of the moving-coil type, the field being provided by a permanent magnet so that no polarising current is required. It is used only for outside broadcasting.

The microphone has a clamped duralumin diaphragm with a dome-shaped centre portion extending to the inner edge of the moving-coil. The moving-coil is composed of aluminium ribbon wound on edge and insulated with baked phenol varnish which also serves as a binder for holding the adjacent turns together, and for fastening the coil to the under side of the diaphragm. The magnetic field in which the moving coil is situated is provided by a cobalt steel permanent magnet.

In order to obtain a good frequency response characteristic, the various mechanical impedances which comprise the operating parts of the microphone are so arranged and dimensioned as to form the analogue of an electrical low-pass filter circuit with a definite cut-off frequency below which the response is relatively uniform. This cut-off occurs at a frequency of the order of 10,000 c/s.

The perforated metal grid covered with silk, which protects the diaphragm from injury and the metal housing of the instrument, are insulated from the moving-coil and form a shield which is connected to earth through the central terminal on the back of the housing. The moving-coil is connected to the two outer terminals.

The microphones as originally supplied were provided with a socket and a special plug for connecting the cable. The casing was connected to the central terminal of the socket and the moving-coil to the two outer contacts. The two conductors of the shielded cable were connected to the outer pins and the earthed shield to the central pin. A cam was provided on the plug which pressed the contact members together after the plug was inserted in the socket, and also served as a lock to prevent the plug from being accidentally withdrawn while the microphone was in use. Access to the terminals of the plug could be had by removing its cover plate.

It was found that the pins in the special plug and socket forming part of the microphone could become bent, so that when the plug was inserted in the socket it was possible to force one of the plug pins down between the socket proper and one of the outer compression springs, and thus give rise to a disconnection. On new microphones, as stated, the plug and socket have been replaced by terminals on the microphone case. On existing microphones terminals have been provided on the plug so that it is now never necessary to remove the plug from the socket.

For suspension purposes a ring carrying 4 suspension lugs is provided, which can be clamped on to the microphone case.

The impedance of the microphone is approximately 30 ohms over the transmitted frequency band, and this is stepped up by a transformer (No. 155, impedance ratio 10/1) to approximately 300 ohms for feeding into the amplifier.

MOVING-COIL MICROPHONE

S.T. & C. TYPE

Technical Instructions

Item 2.2. April, 1938

Each microphone is supplied with a 40 foot length of two-conductor microphone cable. The conductors (slate and green) should be connected to the moving-coil terminals of the microphone and to the primary terminals on the top of the transformer box supplied, and the lead from the cable screen should be connected to the centre terminal in each case. The centre terminal on the transformer box should also be connected to earth, and its secondary terminals should be connected to the input of the fade unit.

Moving-coil and ribbon microphones can be used together successfully with a common fade unit and amplifier, the effect of the correction for ribbon microphones provided in modern O.B. amplifiers being small enough to be ignored when the moving-coil microphones are used. Ribbon microphones are, however, considerably less sensitive than moving-coil microphones, consequently when they are used under similar conditions, the fade controls for the ribbon microphones will require to be set about 10 studs higher than those for the moving-coil microphones. The LT+ and LT- terminals of the OB/4 unit should be connected together and to earth.

If ever moving-coil and Reisz microphones are to be employed together, unless the fade unit OB4/2 specially designed for this purpose is available, separate OB/4 fade units should be used for the two types in order to prevent D.C. from being applied to the secondary windings of the moving-coil microphone transformers. The setting of the fade controls for moving-coil microphones will need to be about 10 studs higher than those for Reisz microphones.

This microphone has directional properties similar to those of the Reisz, but its principal advantages over that microphone are freedom from 'blasting' and absence of 'background,' while the fact that no polarising current is required results in greater flexibility in use.

The microphone is quite robust and if handled with reasonable care there is very little that can go wrong with it. In the event of failure, the microphone should be returned to the Equipment Engineer with a report. No attempt should be made to test the continuity of the circuit with an Avometer or other instrument, since the coil is extremely delicate.