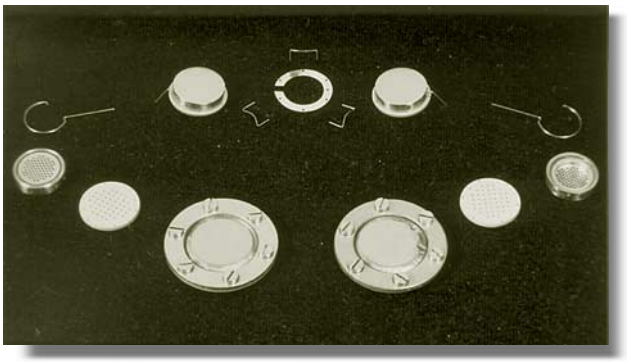
Miniature Multi-Pattern Microphone KM 56

While studio practices commonly rely on individual microphones with fixed directional characteristics, the industry has also become accustomed to using microphones with switchable directional characteristics. Following Neumann's launch of their first two miniature microphones – the omnidirectional KM 53 and the cardioid KM 54 – the requests for a switchable pattern miniature microphone became increasingly urgent.

The two existing small diaphragm microphones measure 21 mm in diameter. This dimension served as the basis for developing the next member of this family. The microphone amplifier, or more correctly the impedance converter, does not present a problem. Realizing a switchable microphone however, was a challenge awaiting resolution.

For the microphone capsule itself, substantial parts of two cardioid KM 54 capsule are used. The photograph shows the individual components. Each half of the capsule consists of a membrane, back electrode and delay plate. The two capsule halves are mounted together back-to-back with a distance foil, thus forming a dual membrane capsule, similar to the proven M 7 capsule from U 47, U 48 and M 49 fame, but considerably smaller.



With the plate voltage for the microphone's AC 701 (k) tube set at 120 Vdc, the various required voltages for polarization of the capsules can be derived from voltage dividers. A coaxial switch, set by a ring placed on the bottom part of the microphone, facilitates the selection of the appropriate bias to the rear element. With the output signals of the capsules added together, the two cardioid responses are combined to correspond to the three major directional patterns: omni, cardioid and figure-8.

Of course, contacting the capsule needs to be executed differently from that of the M 7, where the connections to the membranes are achieved via a screw contact in the capsule center. Contacts for the nickel diaphragm of the miniature capsules use the rim. The connections to the back plate electrodes are made via insulated holes through contact springs forming a ring inside, at the perimeter of the electrodes. The double membrane capsule is then installed in a plastic mounting support with three contacts.

By virtue of its small dimensions the directional properties of the KM 56 are practically independent of frequency. The response is very flat for low and mid frequencies and exhibits a gentle rise of up to 5 dB around 7 kHz. This is a characteristic desired for its function as a built-in presence boost and gives the microphone an especially open and present sound.

The new miniature microphone was called KM 56 and was built from 1955 until 1970. It was mainly used as a supporting microphone for musical recordings – especially piano – and as an announcer's microphone. The KM 56 was particularly popular in Japan, where the model was used in large numbers by the NHK radio station.