



## ***SM 2 - The First Neumann Stereo Microphone***

In the mid 1950's, the recording and broadcasting industries made major breakthroughs in the development of stereophonic sound recording and transmission. Neumann has supplied technical equipment to the recording industry since 1928, and in 1955 introduced a novel editing device for their industry standard disc cutters. In 1956, a cooperative venture with the record label TELDEC resulted in the first stereo disk cutter head ZS90/45. Although stereo records could not be made with two monaural disk cutter heads, the stereo program material, however, could be captured with two monaural microphones.

For example, for A-B stereo recordings two cardioid microphones can be set up at some distance from one another to record the left and right channels. When "Sender Freies Berlin" (Radio Free Berlin) conducted their first stereo test broadcast on December 26, 1958, the right and left channels were transmitted on two different FM frequencies, which could then be heard on two separate monaural FM receivers. Mono compatibility with stereo broadcasting was not achieved until 1963 with the introduction of the multiplex pilot tone system.

Full mono compatibility of recordings is only possible with intensity stereophony, where identical microphones are placed at virtually the same location, thus avoiding phase differences caused by different distances to the sound sources. In some of these coincident techniques the microphones may have different directional patterns. In other cases they have the same pattern, but are set up along the main axis pointing in different directions. To simplify this recording process, Neumann developed a single appropriate microphone.

Their latest miniature microphone at that time, the KM 56, possessed many features readily adaptable for use in the first Neumann stereo microphone. It has a small dual-diaphragm capsule, switchable to any of the three main directional patterns: omnidirectional, cardioid, or figure-8. In a stereo microphone two capsules of this type are mounted one above the other in a single head. Combined with two microphone amplifiers, placed alongside one another in a tube measuring only 30 mm in diameter, the SM 2 was created.



The power supply for the SM 2 features two rotary switches for adjusting the directional patterns of both channels independently to any of the three main patterns: omnidirectional, cardioid or figure-8. A further three intermediate settings can be selected, for a total of nine different patterns per element. In addition, the upper transducer can be rotated over a range of 270 degrees referenced against the lower capsule. The resulting microphone is ideal for the various types of intensity stereophony. For use as an X-Y microphone, identical (unidirectional) patterns are selected for both channels, and the recording 'aperture' is controlled by the angle between upper and lower capsules against the main axis. In M-S technology, the capsules are positioned with the patterns for the M-channel set to cardioid and on axis, while the S-channel is set to figure-8 and offset by 90 degrees. The cardioid microphone thus picks up the complete sound event exactly like the principal microphone for a monaural recording. All directional information is captured by the figure-8 pickup. In M-S stereo recording technology the two microphone outputs are combined in a matrix to form the sum and difference signals, which become the left and right channels.

True to its pedigree, the sound quality of the SM 2 is very similar to that of the KM 56. It was produced between 1957 and 1966. Even today, audio professionals consider it a "secret weapon" for piano recordings.

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