

# Microphone Impedance



Figure-1 Kenwood MC-60A Microphone

## What is Impedance?

**Impedance (Z) measured in Ohms (W)** is a basic electrical term, which measures the amount of Reactance (X) or 'opposition'; a device has to Alternating Current (AC) flow. Technically it is the "combined effect" of Capacitive Reactance ( $X_c$ ), Inductive Reactance ( $X_L$ ), and Resistance (R) to Alternating Current (AC). **An Audio Frequency (AF) Signal created by a microphone is Alternating Current (AC) signal within the audible range of the human hearing (20 Hz – 20,000 Hz) and has this combined effect.** Figure-1 illustrates a Kenwood MC-60A microphone.

## What is Microphone Impedance?

When dealing with microphones, one consideration which is often misunderstood or overlooked is the microphone's impedance rating. Perhaps this is because the impedance rating isn't a 'critical' factor, that is, microphones will still continue to operate whether or not the best impedance rating is used. All microphones have a specification referring to their impedance to Audio Frequency (AF) Alternating Current (AC) signals. **To ensure the best quality and most reliable audio reproduced by a microphone and amplified by the audio circuitry of the transmitter, attention should be paid to matching the impedance of the microphone to the impedance of the transceiver.** This specification may be written on the microphone itself or in the transceiver manual. There are three general classifications for microphone impedance. Different manufacturers use slightly different guidelines but the classifications are roughly:

1. **Low Impedance** (less than 600W)
2. **Medium Impedance** (600 - 10,000W)
3. **High Impedance** (10,000W and greater)

**Note: Some microphones have the ability to select different impedance ranges.**

### ***Which Microphone Impedance to Choose?***

High impedance microphones are usually quite cheap. Their main disadvantage is that they do not perform well over long distance cables where they begin producing poor quality audio (in particular a loss of high frequencies). In any case these microphones are not a good choice for serious work. In fact, although not completely reliable, one of the clues to a microphone's overall quality is the impedance rating. ***Modern transceivers use low impedance inputs and a low impedance microphone is usually the preferred choice.***