If the planar electrode is connected to ground (earth) and the diaphragm of the condenser mic held at potential V_{bias} by a very high resistance R_{bias}, then a time-varying *AC* voltage signal $V_R(t) = I(t) \cdot R_{bias}$ appears across this resistor due to the time-varying *AC* current $I(t) = dQ(t)/dt = V_{bias} \cdot dC(t)/dt = -\left(\varepsilon_o A_{dia} V_{bias} / d_{gap}^2(t)\right) \cdot \left(dd_{gap}(t)/dt\right)$ flowing through this resistor and the planar capacitor to ground. The capacitor C_{block} blocks the *DC* voltage V_{bias} present on the metalized diaphragm, but allows the *AC* voltage signal $V_R(t)$ to pass through it – which is then amplified by some kind of voltage amplifier – *e.g.* a vacuum triode voltage amplifier {back in the hey-day of vacuum tubes} or a high-input impedance FET (Field-Effect Transistor) amplifier or *e.g.* a low-noise high-input impedance FET-input op-amp (operational amplifier).

Condenser microphones intrinsically have {very} high output impedance, and require a bias voltage {*aka* "phantom power"} for them to operate, as well as a high input impedance preamplifier of some kind. If designed properly, the condenser mic + mic preamp system together will have very good, flat frequency and phase response and also have low intrinsic noise.

Again, condenser microphone elements with omni-directional response are completely sealed (except for a small ambient pressure equalization port) as shown in the figure below: