

Precision Potentiometers for Artificial Horizons

NOBLE METAL WINDINGS AND BRUSHES

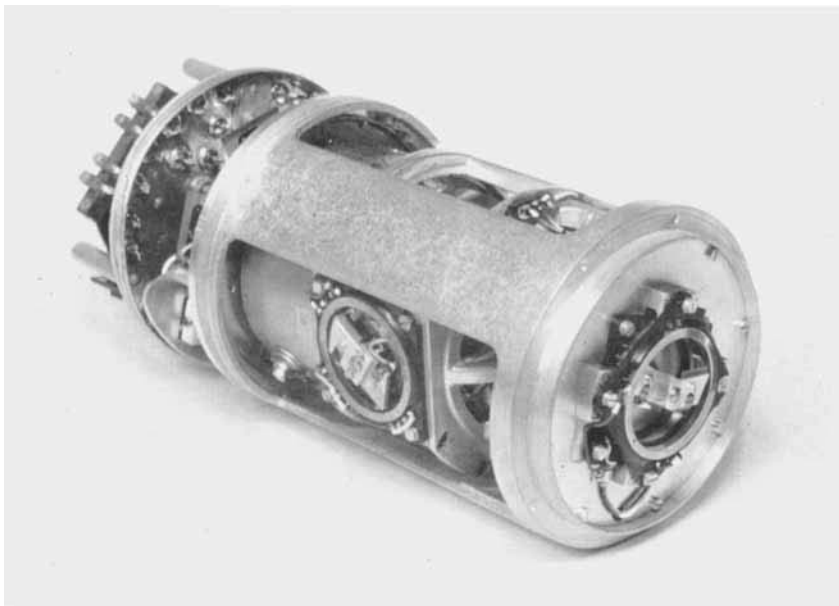
The artificial horizon is a gyroscopic flight instrument that indicates the attitude of an aircraft relative to the earth's surface. Its transparent outer face carries a "front-on" representation of the aircraft; behind this, and coupled mechanically to the gyro system of the instrument, is the horizon bar. Deviation of the aircraft from its normal position parallel to the earth's surface through pitch or roll is displayed to the pilot by the displacement or rotation of the horizon bar relative to the representation of the aircraft on the instrument face.

The use of automatic pilots and other navigation devices demands that information on attitude is also presented electrically in the form of two signals whose magnitudes

at any instant are related to the pitch and roll angles of the aircraft. This is achieved by the use of two potentiometers coupled to the gyroscope gimbals.

It is essential that such potentiometers should combine a very high order of reliability with an extremely low operating torque. The use of tarnish-free noble metal alloys for both the windings and the brushes is therefore mandatory.

In the Ferranti artificial horizon shown here 10 per cent iridium-platinum alloy has been used for the windings of the two potentiometers and 40 per cent silver-palladium for the brushes. Both potentiometers are linear to within $\pm 0.25^\circ$ and have a resolution of 12' of arc.



This view of the Ferranti artificial horizon shows the potentiometers and the wiper assemblies