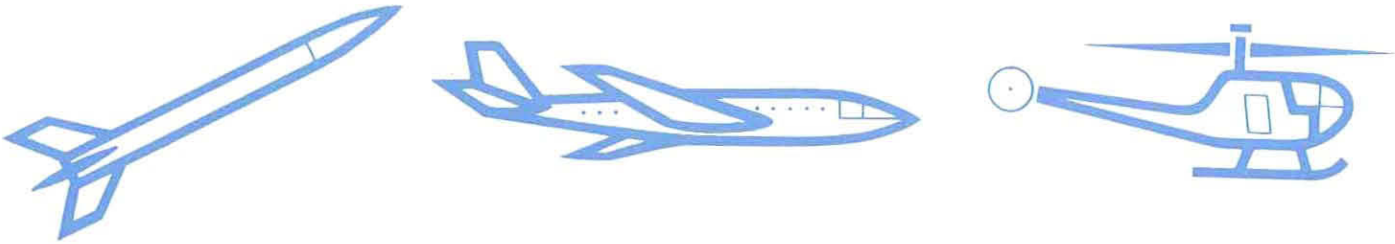
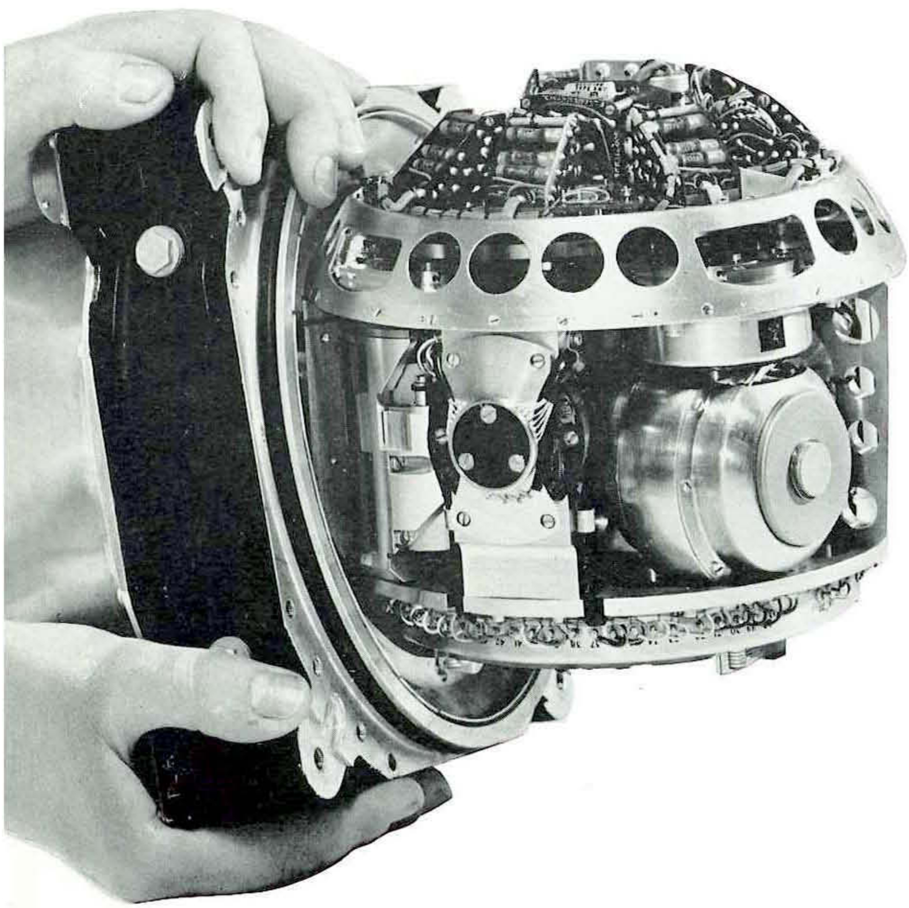
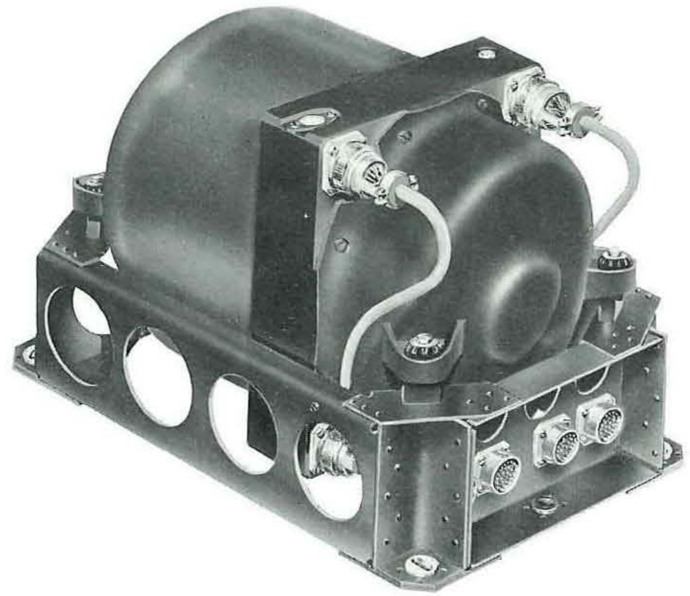




Elliott E.3 stable platform

Elliott E.3 stable platform



introduction

The Elliott E.3 Stable Platform meets the modern requirement for a small compact unit which is light, accurate, reliable and low in prime and maintenance costs. At the same time, it is very versatile and can be used as an Inertial Measuring Unit or as a source of Attitude and Heading Reference. Outputs in analogue or digital form can be fed into any suitable computer.

general description

Stabilization in space is effected by three miniature gyroscopes, and acceleration is measured by force feedback accelerometers.

Direct drive d.c. servo-motors control the platform and contribute largely to the overall accuracy by the complete elimination of gearing. All electronics associated with platform stabilization and accelerometer operation are contained within the sealed covers.

The unique azimuth mechanism consists of four separate assemblies, three containing gyroscopes and one containing two horizontal accelerometers. All assemblies are coupled by a precision linkage which ensures azimuthal relationship to a fraction of a minute of arc.

operational experience

The E.3 System has been tested and evaluated by the Ministry of Aviation both for en route performance and for its unique solution to the problem of initial azimuth alignment, which utilises the take-off run to achieve an initial azimuth alignment of the order of 0·1° and eliminates the need for expensive alternative alignment equipment.

Extensive operational trials include nearly 3,000 hours of flight experience in a B.O.A.C. Boeing 707. The performance, reliability and simplicity of operation has led to the selection of the E.3 as part of a doppler inertial navigation facility for a new military aircraft. Other applications for which the E.3 has been specified include marine (heading reference), aircraft systems evaluation (attitude reference), hovercraft (heading and speed along track) and aerial survey (navigation and camera stabilization).

Elliott E.3 stable platform

principal features

1 GYRO ACCURACY Any gyroscope of the appropriate frame size may be fitted. Gyroscopes with random drift rates in the range 0·25°/hr to 0·01°/hr under flight conditions, can be provided. The platform construction is such that these are readily interchangeable to achieve the degree of accuracy required. With a basic platform therefore, the range of gyroscopes available allows variations in performance up to full inertial capability to be specified.

2 ACCELEROMETER OUTPUTS The accelerometers fitted have a short term zero stability of 3×10^{-5}g and a scale factor stability of 0·03%.

3 ANGULAR READ OUT Azimuth read out is available to an accuracy of 1 min arc using dual speed synchros. Pitch and roll read out is available with a standard accuracy of 10 min arc. High accuracy synchros can be fitted to suit requirements.

4 PLATFORM STABILIZATION High performance servos are used, ensuring that in normal flight, the platform movements will not exceed 0·1 min arc in the vertical plane, and 0·25 min arc about the azimuth axis.

5 ADVANTAGES OF THE SEPARATE AZIMUTH AXIS WITH 'BOOMERANG LINKAGE' SYSTEM

A/ Optional independent orientation of the accelerometer assembly if an additional small servo is fitted on that axis, giving increased flexibility in the choice of co-ordinate system used.

B/ Accessibility of all gyroscopes, accelerometers, major components and platform electronics, without dismantling the factory preset bearing preloads, allows for ease of servicing.

C/ Low weight.

D/ Ease of manufacture and associated low costs.

E/ Low gimbal friction.

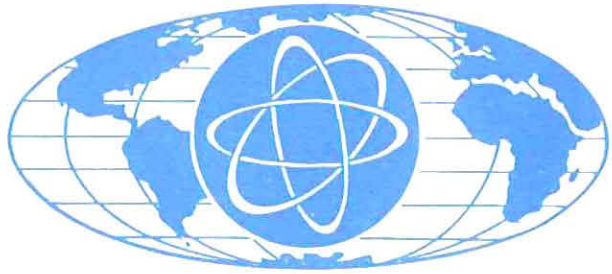
F/ High inertia about the pitch and roll axes, assisting stabilization.

6 ELECTRONICS The electronic system employs the latest techniques and meets operational requirements throughout a wide range of temperatures.

technical information

INSTALLATION DATA

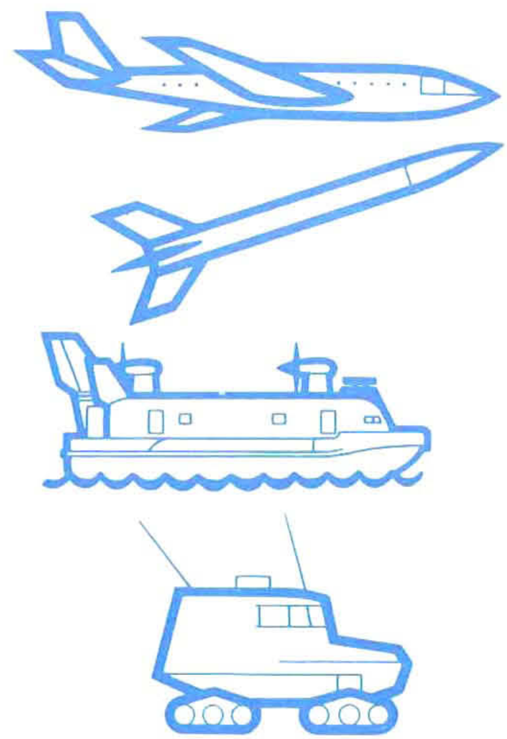
The platform can be anti-vibration mounted to suit specific requirements.
Under normal operating conditions cooling is not required.
Full freedom about the azimuth and roll axes $\pm 60°$ about pitch axis.



DIMENSIONS

Diameter	8·5 in (21·6 cm)
Length	13 in (33·0 cm)
Weight	25 lb (11·35 kg)

applications



IN THE AIR

In any role where a light, compact and robust navigator or attitude reference unit is required. The platform design is such that it can be integrated with Doppler for long-range navigation.

IN SPACE

As a stable reference element.

AT SEA

To replace or augment conventional navigation systems; for Roll Stabilization and measurement of ship's attitude.

ON LAND

In any application where a North seeking Attitude and Azimuth reference is required—Polar Exploration—Desert Navigation—Military and Civil Surveys.

ELLIOTT

inertial navigation division

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