

MARCONI
ELLIOTT
AVIONICS

AUTOMATIC
MAP READER



A NEW CONCEPT IN MAP READING

Portable

Uses unprepared maps of any scale

Compatible with any navigation source

Self contained microprocessor

Cockpit mounting unnecessary





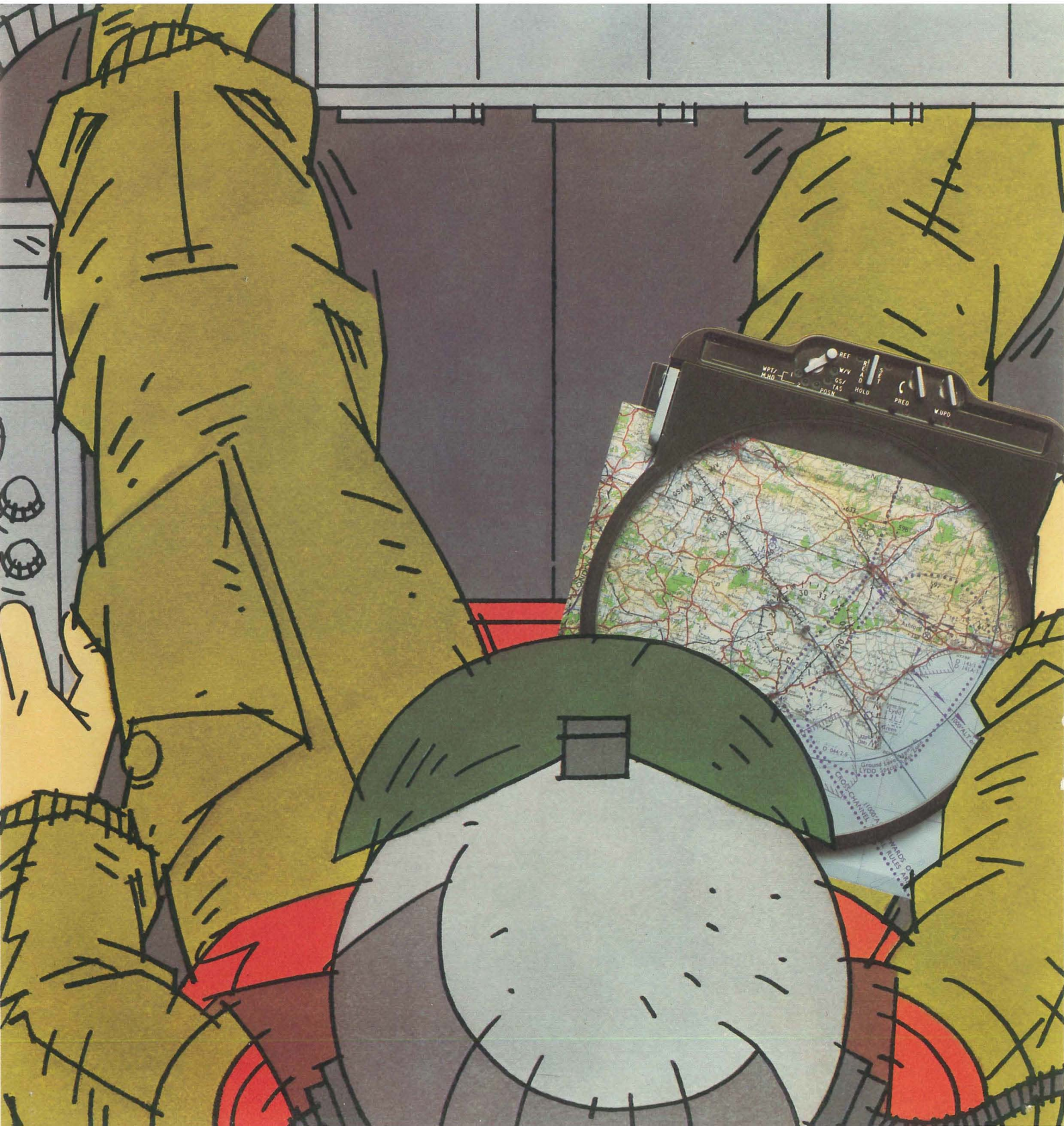


INSTALLATION

The Automatic Map Reader is designed to be used as crew kit. The practical problems of a crowded cockpit coupled with high levels of crew workload have been considered in determining the installation. Conventional airborne map reading entails holding the map or locating it

on a knee mounted map board or pocket. The AMR is entirely compatible with these practices and is designed to be held in a gloved left or right hand or attached to the knee by an adjustable strap. Connection to the navigation data source is via an umbilical cable to a convenient airframe location. For installations requiring the knee

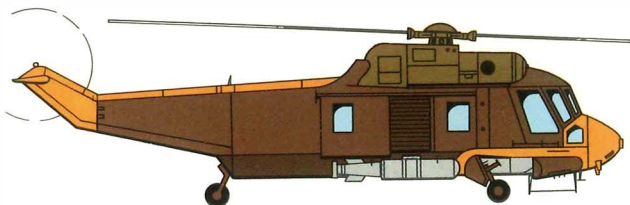
mount either the left or right knee may be used. The mounting strap allows for easy map changing, stowage along the thigh and rapid removal in the event of emergencies. If desired and where space permits the AMR can be held and operated with one hand and be stowed in a convenient location when not in use.



APPLICATIONS

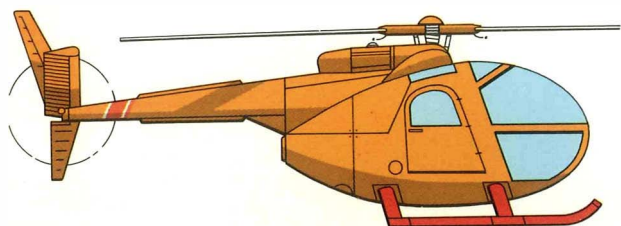
The Automatic Map Reader is applicable to both civil and military aircraft due to the inherent simplicity of the device and the consequent low cost. It can be interfaced with a wide

variety of navigation equipment which is already installed on existing fixed wing aircraft and helicopters. Important applications are:-



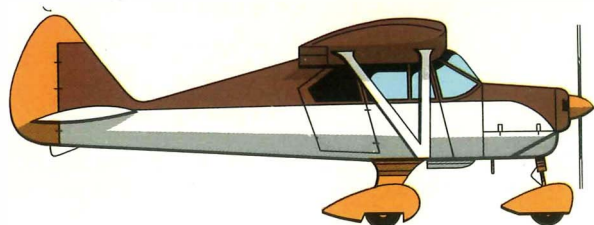
ARMY HELICOPTERS - When provided with data from a Doppler Navigation System the AMR is ideally suited to nap-of-

the-earth operations where frequent correlation between visual fixes and indicated position is required.



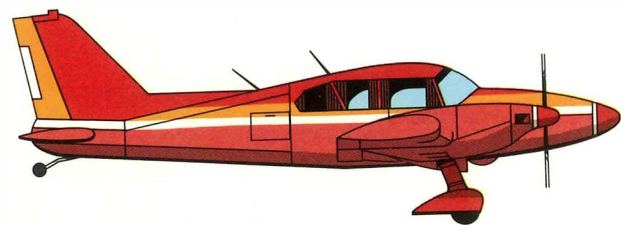
LIGHT OBSERVATION HELICOPTERS - The need to provide the crew with excellent all round visibility precludes the use of instrument panel space for map displays. A portable AMR is

therefore an ideal solution. It can be coupled to either a Doppler or a Radio navigation data source depending upon the particular role of the helicopter.



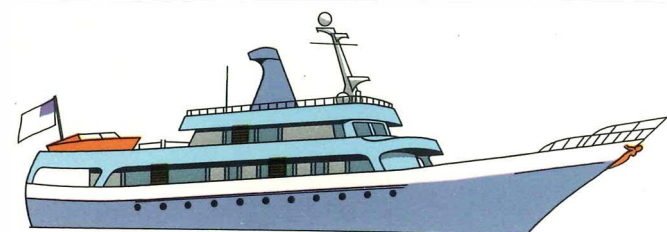
GENERAL AVIATION - Where light aircraft are used for business or pleasure purposes, conventional map displays are often precluded on cost grounds.

The AMR not only overcomes this restriction but also the need to incur the expense of acquiring and maintaining specially prepared maps.



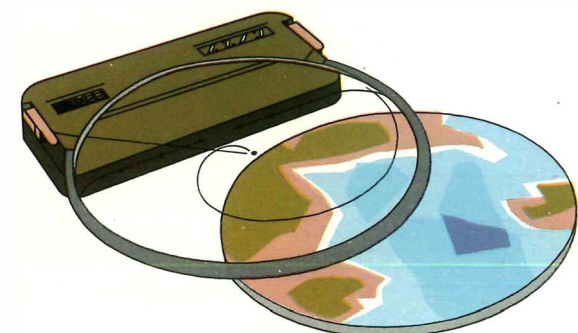
DEAD RECKONING NAVIGATION - For use in underdeveloped regions of the world where ground navigation sources are either absent or incomplete, the AMR can be used in conjunction with the prime aircraft air data and

heading sources as a DR navigation system. The DR computations are performed by the AMR electronics using estimated wind vectors inserted into the system by using the discs as a cursor and scribe.



MARINE APPLICATIONS - The AMR can be used in small offshore vessels for automatic charting. When supplied with speed and heading information it

can be programmed to allow for wind and drift effects and provide a continuous position display.



ALTERNATE CONFIGURATIONS - The design allows for minor changes in the layout of controls and indications to suit the above applications. Hand straps and a pencil holder can also be located in a variety of positions. A version is also planned which uses circular map cassettes. These cassettes, inserted into the AMR

in the same way as a standard map enables continuous along track map orientation without the need to reset datum positions. This option is suited for applications requiring very high frequency of map changes and rapid correlation with ground terrain features. It does of course incur the disadvantage of requiring prepared maps.

PRINCIPAL CHARACTERISTICS

The Automatic Map Reader provides a display of aircraft position using the intersection of a spiral and a radial line engraved on two separate transparent discs superimposed on a standard map held beneath them. The map may be folded in any desired way and inserted into the AMR in any orientation. The intersection of the spiral and radial lines is achieved by rotating the discs by motors via an edge gear tooth form in accordance

with an algorithm which converts position coordinates obtained from a navigation source into angular rotation of the two discs. Positional feedback is incorporated to ensure integrity of the display. A range of simple lever controls and push buttons enables the AMR to be used in a number of modes including slewing of the discs for setting up initial conditions. All the electronics associated with the AMR are located in the display head which is coupled to the aircraft navigation system via the umbilical cable.

At the heart of the electronics is a

microprocessor chip micro-programmed to control the operation and interfacing requirements of the AMR. Apart from the disc motors which are supplied from 28V d.c. aircraft supply, the electronics require simple low power rails generated from an integral power supply unit. Two printed circuit boards contain all the electronic components and the AMR control switches and indicators are wired directly into them. The total weight of the AMR is less than 3 lb. and the configuration shown is 12 inches by 10 inches, and less than 1 inch deep.



Marconi-Elliott Avionic Systems Limited
Airport Works, Rochester, Kent, ME1 2XX

INSTRUMENT SYSTEMS DIVISION

A GEC-Marconi Electronics Company

Telephone: Medway (0634) 44400

Telegrams: Elliotauto Rochester

Telex: 96333/4

260/628/20/J04

MARCONI-ELLIOTT AVIONICS