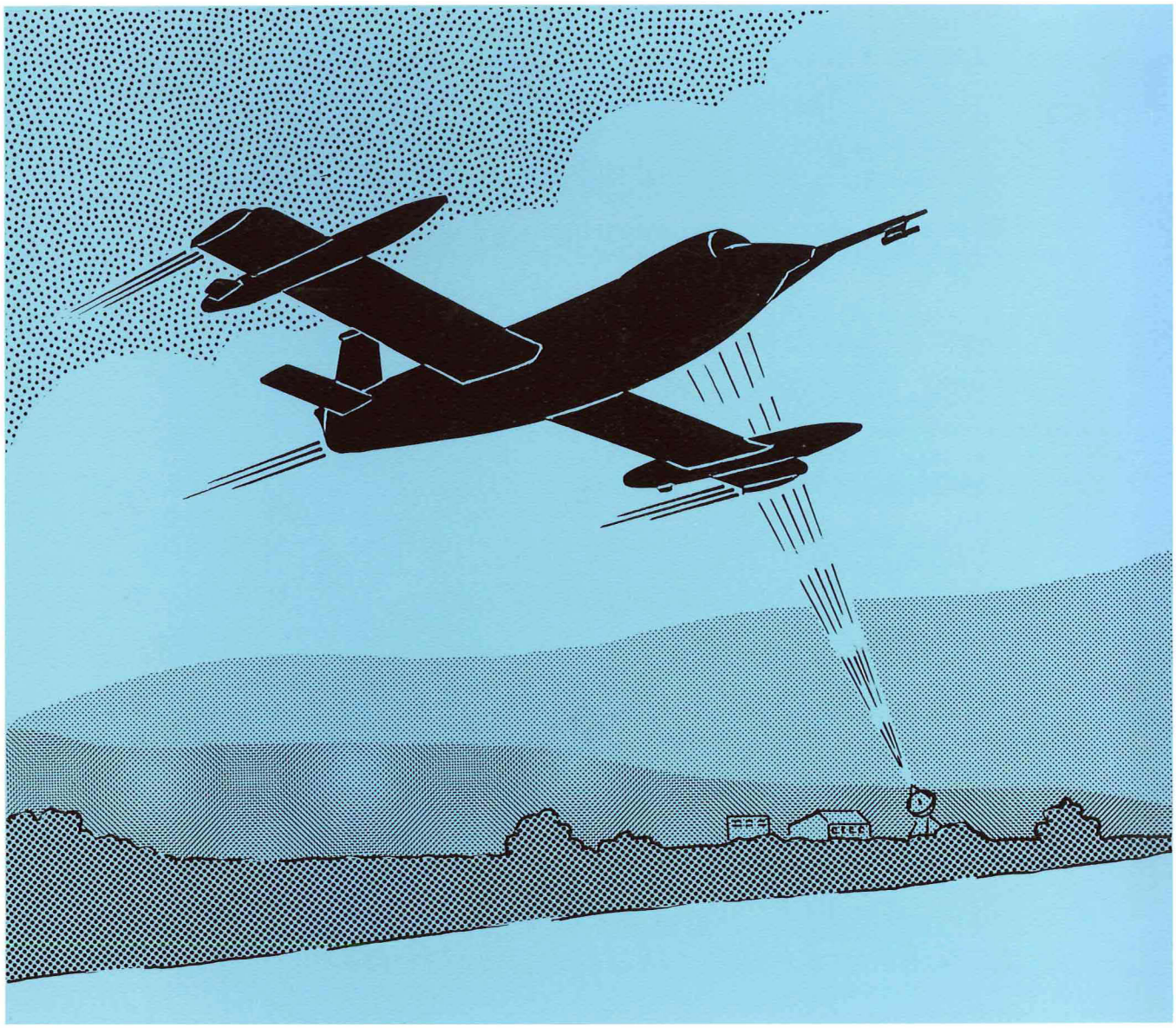
MARCONI-ELLIOTT
AVIONICS

Remote Piloted Vehicles — Autocontrol



Introduction

Marconi Elliott Avionic Systems experience to date in RPV has been mainly concerned with target aircraft. They have designed and manufactured the autopilot systems for the Canberra and Meteor strike aircraft when they were converted to the remote piloted target role. The Australian Jindivik which was designed as a pilotless target with a top speed of 500 knots and 65000 ft altitude uses an Elliott autopilot for control. Over 440 of these successful Jindiviks have been manufactured and they are still in quantity production and being further developed to meet the changing needs of missile systems. MEA are at present working on a packaged universal autocontrol system which will enable present day jet strike aircraft to be easily converted to the RPV role. The aircraft chosen for the initial application of this system is the Sea Vixen and this work will be carried out in close co-operation with Flight Refuelling Ltd. who are responsible for the aircraft conversion.

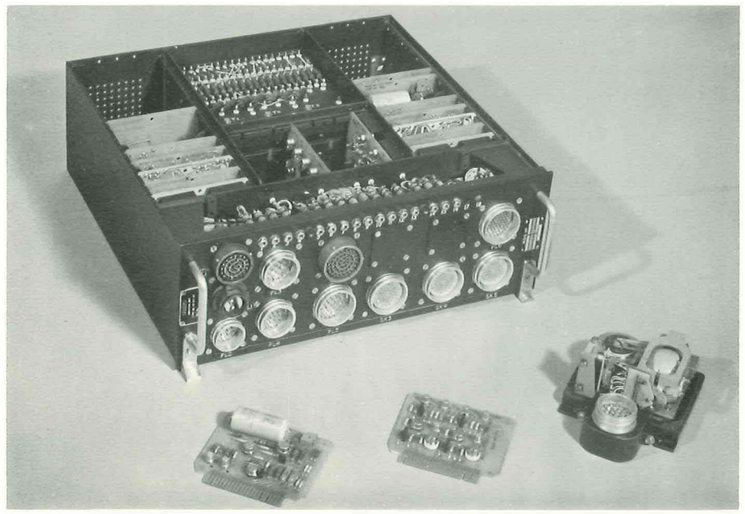
Jindivik

The control system in the Jindivik provides full ground control of the aircraft after engine start on the runway until it lands. The aircraft is stabilised in two planes, pitch and roll. The autopilot provides the following modes, Climb, Level Cruise, Height Lock, Descent and Approach. Aircraft attitude can be varied in all modes by beep commands which call for set rates of change. These demands are cancelled by the selection of straight command. In the short term the aircraft is held on a straight path by an integrating yaw rate gyro.

The Height Lock mode currently uses barometric pressure but MEA has designed a height lock system using information from a Radio Altimeter which is at present undergoing flight trials. This enables the aircraft to fly at a preset height which may be varied within a limited range during flight over the sea or a fairly regular terrain. This represents a considerable increase in the usefulness of the Jindivik to meet the present requirements for sea skimming targets.

As Jindivik does not include a navigation system — the aircraft is controlled from the ground via position radar information. Its use as a target or otherwise is limited to relatively small areas.

Drone Pack



To enable modern day aircraft to be converted into RPV and changed back to the normal manned role a special autocontrol package is under development. This package, sometimes called an "iron pilot", is interchanged with the aircraft ejection seat and is fitted onto the ejection rails. The aircraft would normally need wiring and hydraulic system modifications but these are kept to a minimum. The Sea Vixen aircraft has been chosen to develop this system. This will have all the autocontrol facilities of the Jindivik with the additional ability to perform high 'g' manoeuvres and high rates of roll and pitch. A navigation system will be incorporated in the overall control system of the aircraft.

The initial purpose of this project is to use the aircraft as a droned target, but the flight control computer has been designed on the plug in card principle with space for modification. Therefore it would be possible to programme the aircraft for a variety of roles and missions.

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

FLIGHT CONTROLS DIVISION

A GEC-Marconi Electronics Company

Telephone : Medway (0634) 44400
Telegrams : Elliotauto Rochester
Telex : 96333/4

MARCONI-ELLIOTT AVIONICS

Printed in England

Ref. No. 250TP0257-F04