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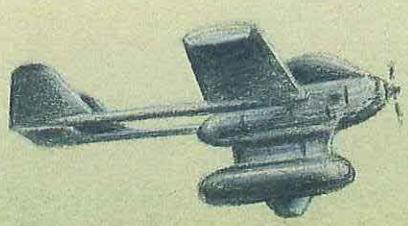


PHOENIX

Target Acquisition and Surveillance System

The Integrated Battlefield Surveillance System

GEC Avionics is prime contractor for the development and supply of the British Army's Phoenix Battlefield Target Acquisition and Surveillance System. This fully integrated RPV system will greatly enhance the acquisition of targets, adjustment of depth fire and collection of real time, high value intelligence.

Phoenix brings together state-of-the-art equipment and system concepts enabling the user to have available a fully integrated solution to battlefield surveillance and target reporting.

The system concept also provides the operators with highly stabilised real time thermal imagery presented in a manner that enables accurate automated target reporting during day and night operation and in poor weather.

The remotely piloted fixed wing air vehicle, comprising a taxi and mission pod, is launched from a vehicle-mounted hydraulic catapult and recovered after the mission by parachute.

A jam resistant two way data link enables information to be relayed between the air vehicle and Ground Data Terminal.

Operator workload is minimised by simple menu driven displays and a digital map overlayed with air vehicle position and sensor viewing area.

The Air Vehicle is of rugged modular construction for easy maintenance and handling. The powerplant, replaceable as a complete assembly, features a 19kW two stroke engine with electronic ignition and fuel injection, controlled by an Engine Management System. The electrical power output, rated at 1kW, can be varied to match other roles. Also contained within the taxi as complete assemblies are subsystems for flight control and navigation, recovery and pod stabilisation.

For the Target Acquisition and Surveillance role, a thermal imaging sensor is carried in a mission pod located beneath the RPV fuselage thus ensuring full 360° non obscured observation. This mission pod concept enables the system to be easily adapted for a variety of roles.

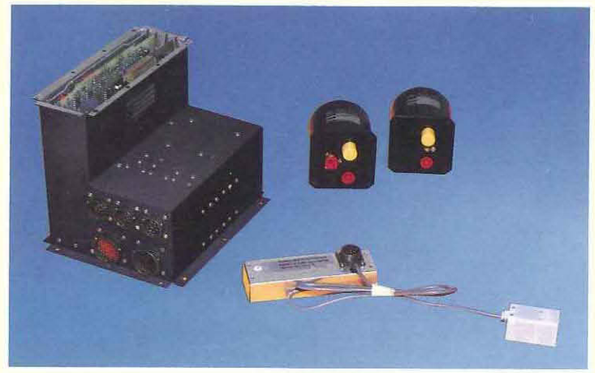
A high degree of survivability is provided by reduced thermal, visual, acoustic and radar signatures.

The manpower requirements of the complete system are reduced by simplified maintenance, a high degree of modularity and comprehensive built in test facilities.

The Phoenix system offers a complete solution to battlefield surveillance including Integrated Logistic Support to the equipment user.

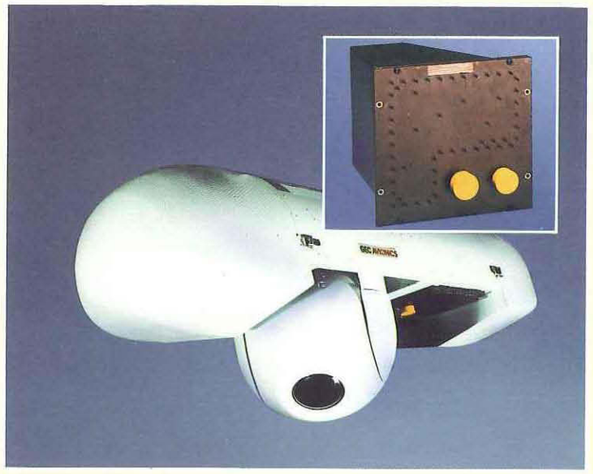
Flight Control/Navigation

- microprocessor based unit
- provides
  - autonomous flight modes
  - commanded flight modes
  - navigation
  - preprogrammed missions
  - preprogrammed recovery
  - comprehensive self monitoring of air vehicle functions
- integrated with sensor pointing for ease of operator workload



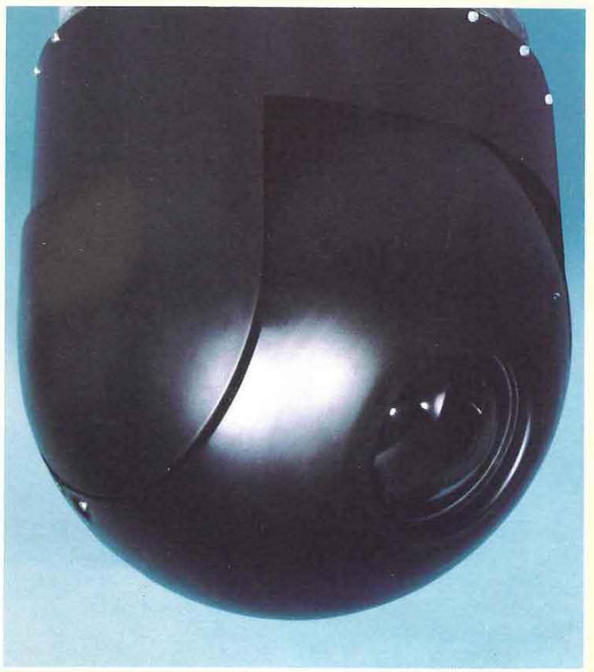
Pod

- self contained interchangeable payload carrier
- roll stabilised for
  - flat turn capability
  - horizon up imagery presentation
  - antennae polarisation
- microprocessor based electronics provide:–
  - antennae steering signals
  - sensor steering signals
  - video signal processing
  - telemetry data processing
- adaptable to manned aircraft for training use



IR Sensor

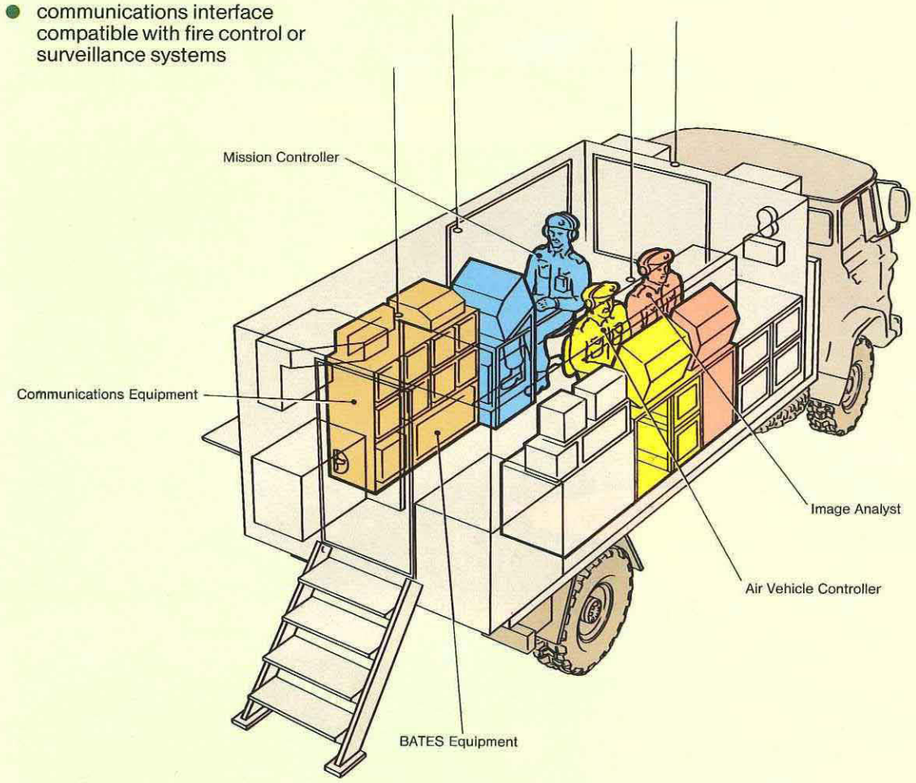
- based on high utilisation of in-service TICM II electronics
- continuous zoom telescope with x2.5 to x10 magnification
- stabilised to ensure high degree of picture stability
- compressor cooling extends endurance
- 625/50Hz or 525/60Hz video standard compatible
- sensor protection provided by rotating the turret within its housing



Ground Control Station

The Ground Control Station is an environmentally sheltered mobile control centre with three operating positions and features:

- advanced man/machine interfaces
- preprogrammed menu driven operation overlayed on VDU
- minimised workload in high stress environment
- communications interface compatible with fire control or surveillance systems
- high resolution flicker free imagery
- choice of orientation of imagery
- enhanced survivability in threat environment
- NBC protection
- multiscale map display integrated with the thermal imagery picture



Phoenix is designed to interface with other battlefield systems to enhance the C^3 function

Command

- immediate response to tasking
- ability to switch missions
- rapid collection of intelligence
- capable of rapid deployment

Control

- rapid adjustment of fire
- direct operational integration with BATES or similar target engagement system
- high degree of tactical mobility, enhances survivability of ground elements

Communication

- rapid analysis and passage of intelligence information
- immediate passage of fire orders
- provision of secure voice and data nets for tasking and reporting
- easily adaptable to work with other C^3 systems yet capable of operating as a stand alone system

The Heart of the System

Mission Controller

- receives and sorts tasks into missions
- implements mission priorities
- executes changes and replans missions
- interfaces with tasking agencies

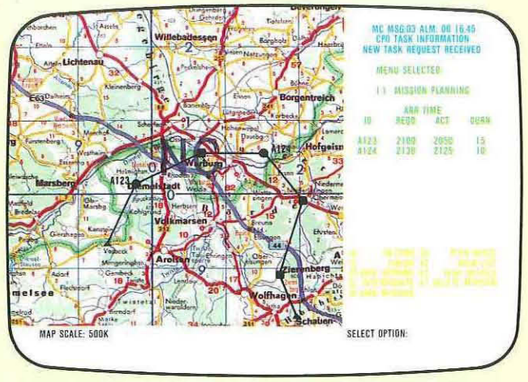
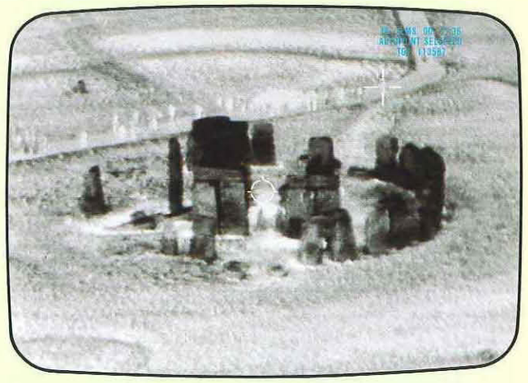


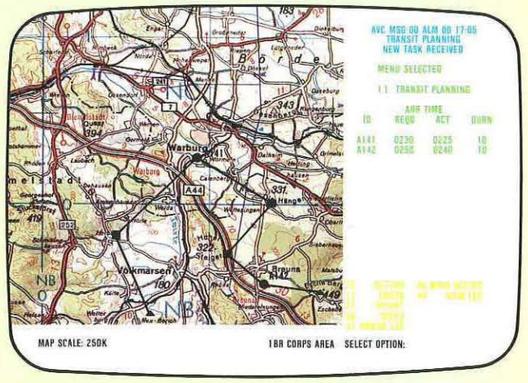
Image Analyst

- plans the search patterns
- programmes sensor scan mode
- controls sensor scan by flying the sensor footprint using joystick
- detects, recognises, identifies and marks the target
- operation aided by zoom thermal imagery telescope



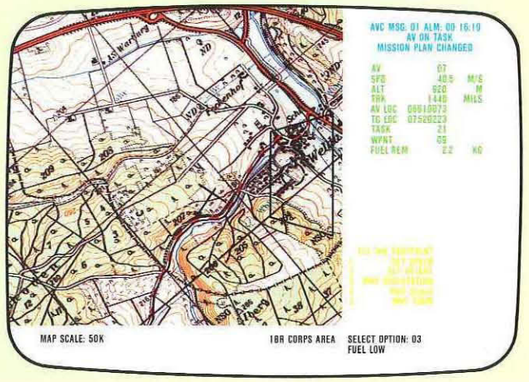
Air Vehicle Controller

- generates flight plan
- executes flight plans
- controls air vehicle on task
- initiates autonomous flight modes



Digital Map Display

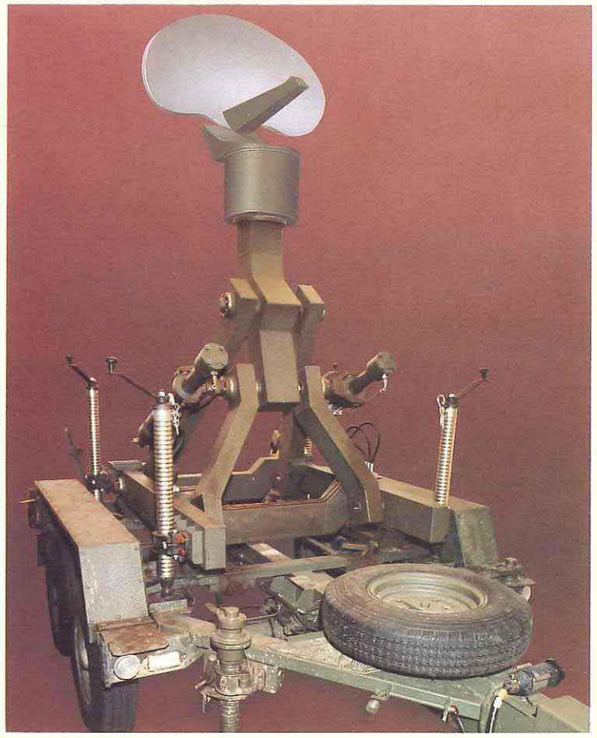
- available to all three crew
- available with multiple scales and zoom facility
- rotates to show track up, north up or horizon up
- overlayed with air vehicle position and sensor footprint



Communications

The Data Link provides the radio frequency communication between the Ground Control Station and the Air Vehicle. It is comprised of three essential elements:

- Ground Data Terminal
- Transmitter/Receiver units
  - integral with GDT trailer
  - airborne in mission pod
- highly directional antenna system

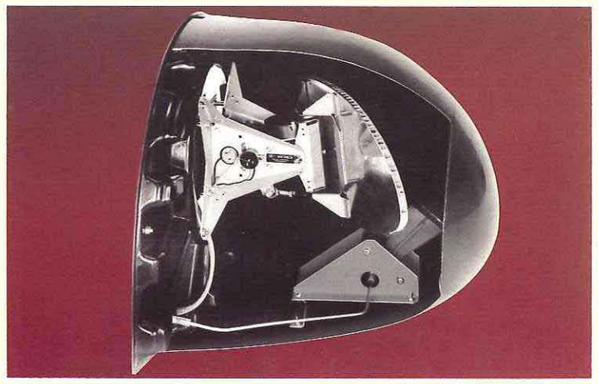


The Ground Data Terminal

- trailer mounted Land Rover towed unit, sited remote from GCS
- in built jam resistance
- unattended operation with self contained generator
- hydraulically erected mast

Transmitter/Receiver

- command link for ground to air data
- video link for air to ground data
- housekeeping air to ground data



Air Vehicle Antennae

- high beam steering angle achieved in small space
- wide directional visibility
- automatically switchable between two directional antennae mounted fore and aft in the pod

Deployment Support

The launcher is a self contained unit mounted on a pallet and adapted to fit a wide variety of military vehicles.

An hydraulic catapult is integrated with

- pump/generator power pack
- hydraulic crane
- deicing and decontamination units
- AV engine starter and warm up unit
- access platform

to provide reliable and quickly repeatable launches.

Support is provided by:

- a launch support vehicle which carries spare AV assemblies – pod and taxi
- a recovery vehicle which removes air vehicles from the landing zone and returns them to the launcher

Integrated Logistic Support

- automated data base reflects both equipment structure and heirarchy
- database provides
  - configuration management
  - maintainability predictions
  - spares provisioning data
  - maintenance option reports
  - reliability growth data
- comprehensive technical manual support package
- flexibility to permit many different logistic support options

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In its present form, Phoenix will be produced as a complete Battlefield Target Acquisition and Surveillance System for the British Army. However, as an integrated system comprised of a number of well defined subsystems, Phoenix can be easily adapted to other roles and users.

Air Vehicle

The role of the system can be varied by changing the function of the mission pod payload. Interchangeable mission pods can be fitted to the Air Vehicle to provide a variety of alternate roles which could include:

- Electronic Warfare
- Air Defence Suppression
- Laser Designator
- Communications Relay
- Decoy
- NBC Monitor

Ground Control Station

The special-to-type man/machine interfaces can be reconfigured to match the air vehicle role.

The system is designed to be easily integrated with any specific battlefield communication and C^3 system.

Data Link

The sophisticated requirements for Phoenix can be simplified to provide an alternative interface between the Air Vehicle and the Ground Control Station to suit any need.

Management – Logistics

The experienced and multi-disciplined team of subcontractors led by GEC Avionics Flight Controls Division as Prime Contractor for Phoenix can adapt the existing system to meet a multiplicity of roles for any particular user. This established management team can offer full programme management, design capability and logistics support for the system.

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