

# GEKO

Mission Support System (MSS)

# inzpire

## SYSTEM INFORMATION



Inzpire's GECO mission system is designed to meet the situational awareness requirements of the diverse aviation mission planning and execution environment.

The system combines award-winning software with modern, high-performance hardware to deliver the right information, at the right time, in the right format to military aircrew. This helps aircrew to make the correct decision quickly, ultimately enhancing the safety of operations.

GECO is designed by ex-military aircrew who work closely with skilled engineers, all of whom have experience of developing avionics products for military use.

GECO has been in service with the UK's armed forces since 2009 and is combat proven during operations around the world. It is used by the Royal Jordanian and Indonesian air forces; and is also supplied to a variety of original equipment manufacturers alongside their aircraft.

There have been over 1000 GECO systems fielded on over 20 different platforms including Apache, Puma, Blackhawk and Chinook helicopters; and F-16, Hawk and Texan fixed-wing aircraft.

The GECO system comprises 2 elements:

- A ground-based element (either a desktop, laptop or rugged laptop PC). This is used to: manage data; plan missions; rehearse and debrief missions using 2D or 3D multi-layer map/satellite imagery; configure GECO tablet PCs; and upload mission data to GECO tablets and/or aircraft avionics if required.
- An element for airborne use (a high-performance tablet PC). This provides a moving map and electronic flight bag (EFB), which is normally mounted on the pilot's leg. Other options - such as cockpit mounting - are possible.



## SYSTEM BENEFITS

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The GECO system delivers a variety of benefits to the customer:

### **Increased Mission Effectiveness**

Providing the right information, at the right time and in the right format. This enables military aircrew to make the right decision quickly.

### **Enhanced Safety**

GECO provides critical safety information such as aircraft emergency handling procedures, terrain awareness and obstacle avoidance guidance.

### **Value for Money**

GECO is a carry-on system which utilises high-specification, commercially-available hardware, meaning there is no need to undertake costly aircraft modifications.



At the heart of the GECO system is an intuitive 2D/3D multi-layer map and satellite image which displays tactical and aeronautical data as selectable overlays.

Because features and data are presented in a single integrated application, there is no need to move between applications to access information in GECO. The intuitive user interface ensures minimum 'heads-in' time and maximises 'heads-out' time.

## GROUND-BASED SYSTEM FEATURES

### Data Management

The ground-based element of the GECO system supports data storage and management.

### Mission Planning (Figure 1)

Missions can be planned quickly and accurately through GECO's highly intuitive user interface. The mission plan is constantly checked by GECO, and warnings will be displayed if any pre-set conditions - such as minimum fuel state - are at risk of being exceeded. Feeds to real-time data, such as NOTAMs from approved providers, are integrated into the system.

### Performance Planning

GECO uses platform-specific performance data to quickly and accurately calculate complex information such as take-off and landing data, centre-of-gravity position and hover performance. The system will provide warnings if the aircraft is approaching performance limitations.

### Mission Rehearsal (Figure 2)

Once the mission is planned, it can be rehearsed using 2D or 3D views from a simulated cockpit environment under a variety of weather conditions. During rehearsal, it is possible to edit the mission without the need to stop the rehearsal or return to the planning stage.

### Safety Calculations

As the mission is planned, GECO automatically calculates safety-related information including aircraft performance, safety altitude and night-vision device flying parameters. This automation reduces planning time, allowing for longer mission preparation.

### Aircraft Upload

As well as uploading to the GECO tablet, the GECO mission planning station can be customised to upload to aircraft avionics. Already in use on a wide range of platforms, upload capability can include routes, tactical overlays, radio presets, and cockpit display settings.

### Mission Debrief (Figure 3)

After the mission, recordings from all participating aircraft can be merged in order to provide a detailed debrief. GECO tablets can be configured to record missions; alternatively, data can be downloaded from aircraft systems or other sources, allowing analysis of valuable data such as cockpit or sensor video and audio.

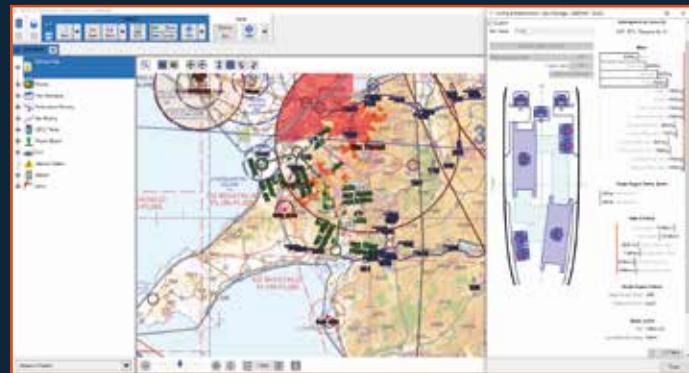


Figure 1

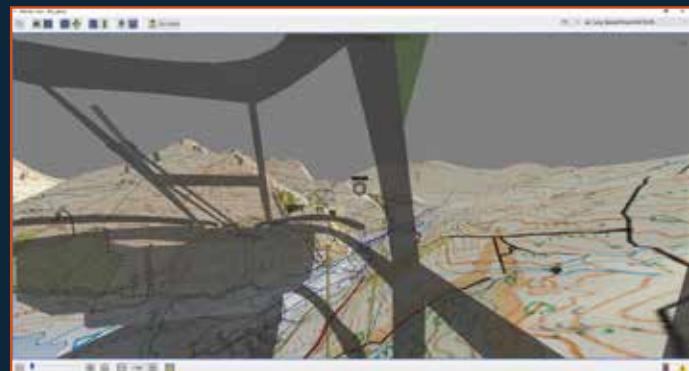


Figure 2

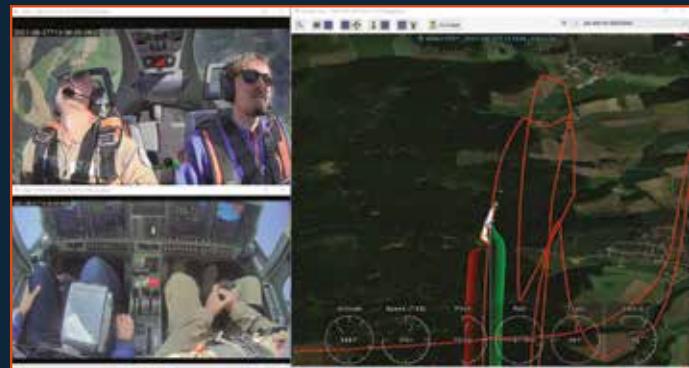


Figure 3

# AIRBORNE SYSTEM FEATURES



## Moving Map

The moving map shows aircraft position and can zoom between multiple mapping scales and satellite imagery. Navigation routes can easily be planned and overlaid. The GECO system automatically calculates track, timing and fuel information, allowing accurate navigation.

## Obstacles

GECO calculates the aircraft flightpath and alerts aircrew when an obstacle from the digital database is a hazard. This increases situational awareness, enhancing safety.

## 3D Map Views (Figure 1)

In addition to the 2D map, GECO also provides 3D views. The 3D cockpit view provides the ability to view the planned route, surrounding terrain and vertical obstructions, which are overlaid. The 3D point view provides the ability to rapidly achieve 'eyes on' targets and other ground features, and improves situational awareness of the surrounding area.

## Document Library

The GECO system includes a searchable document library into which all required in-flight guides, squadron SOPs, briefing packs and aeronautical publications can be loaded and rapidly located if required during the mission.

## Aircraft Checklist Hosting

Normal and emergency checklists, including hyperlinked versions, can be hosted on GECO allowing more efficient routine manoeuvres and emergency aircraft handling. Checklists can be easily updated to accommodate new updates.

## Performance Calculations

Available on the airborne system as well as on the ground, performance planning on the GECO tablet allows the crews to dynamically re-plan as a mission evolves during execution.

## Terrain Awareness Mode (Figure 2 left)

Terrain awareness mode gives the user an indication of the elevation of surrounding terrain. Terrain higher than the current aircraft altitude is shaded red. This feature is particularly useful for helicopter users, easily identifying low ground in case of a problem with the aircraft.

## Surface Threats and Intervisibility Calculations

Surface threat engagement zones and intervisibility calculations are displayed to indicate safe routes through engagement zones using terrain screening.

## Beyond-Line-of-Sight Connectivity

GECO can utilise a data connection such as satphone or cellphone networks to provide messaging and asset tracking beyond line of sight, both air-to-air between tablets and air-to-ground from tablet to base station.

## In-Flight Management of Tactical Data

GECO can store and display a wide range of tactical data types including user points and shapes, Airspace Co-ordination Orders, tactical geo-referencing systems such as "Keypad" or bullseye systems and multiple co-ordinate systems, including conversion between co-ordinate types.

## External Sensor Display (Figure 2 right)

GECO is capable of displaying feeds from external devices. Examples of walk-on sensors already available for GECO are ADS-B and AIS receivers providing air and maritime information within a walk-on tablet.



Figure 1



Figure 2

## GECO SYSTEM HARDWARE

inzpire is constantly searching for the best commercial hardware available as the platform for the GECO system. This means that our customers can access cutting-edge technology whilst achieving excellent value for money. GECO software is compatible with a wide range of hardware options. At present, Inzpire recommends use of Panasonic Toughpad tablets. Key features of this tablet range include:

- High performance Ublox M8 GNSS receiver.
- High resolution, sunlight-readable display, which is also night-vision device compatible.
- Flying-glove-friendly touch screen.
- 256GB+ solid state drive storage.
- Four-hours minimum operating time on a single battery which is also 'hot swappable' in flight, giving extended operating time.
- Compliant with MIL STD 810, which means it is able to meet demanding ruggedness requirements for operation in a fast jet or helicopter cockpit.
- Compliant with MIL STD 461 for electromagnetic compatibility.
- Compatible with a range of high-quality encryption products, enabling operation at classification levels up to and including SECRET.

A variety of hardware options are available for the ground-based element of GECO depending on basing, deployment, security and ruggedness requirements. The software can be deployed either onto Inzpire-sourced hardware or onto any existing customer hardware which meets the required minimum specifications.



## GECO SYSTEM DATA



The GECO system can be loaded with navigation databases from a variety of sources including Jeppesen, NavBlue and the military Digital Aeronautical Flight Information File (DAFIF). These provide information on airfields, airways, airspace, navigation aids and approach plates, all of which are easily accessed using GECO's search function and can be overlaid on the map.

Current operations demand access to numerous data types. GECO is able to support a wide range of geographic, aeronautical, imagery and document formats including those shown in the tables on the next page. Compatibility of other formats can be quickly established by Inzpire's software experts, who can also modify GECO software to accept new formats.

Many current customers have access to national sources of data which they choose to import and manage themselves. Should nationally-sourced data not be available, Inzpire can tailor a solution to meet the requirement.

## TRAINING AND SUPPORT



To ensure that personnel are able to gain maximum benefit from GECO and to ensure that outstanding levels of availability and capability are maintained throughout the contract term, a comprehensive training and support package is available. The structure of this package can be tailored to meet individual customer's needs.

Ahead of entry into service, Inzpire's team of ex-military training specialists routinely deliver initial training for aircrew and ground-based mission support staff. Periodic top-up training can also be provided once GECO is in service.

To support operations and thereby ensure maximum system utility, a UK-based support service is available and can be accessed via telephone or email. Annual support visits are also available to undertake routine maintenance tasks, to assist with data management if necessary and to provide updates to the latest available version of GECO software, thereby bringing additional capability. During support visits, operator feedback is sought to establish candidate enhancements for future GECO software versions.

# CUSTOMER-FOCUSED MULTI-AIRCRAFT SOLUTION



## STANDARDS

**Safety:** Def Stan 00-056

**Security:** UK MOD accredited to SECRET

**Software:** RTCA DO-178C (Software Level D), RTCA DO-200

## HARDWARE QUALIFICATION

**EMC:** MIL-STD-461F

**Environmental:** MIL-STD-810G

**Ingress Protection:** IP65

## GECO SYSTEM DATABASES

Maps and Imagery	CADRG/CIB, ASRP, MrSID, GeoTIFF, JPEG, TIFF, BMP, GIF, PNG
Digital Terrain	DTED, OS Terrain 50
Obstacles	XVOD, AIXM, Shapefile
Aeronautical	Jeppesen, ARINC 424, DAFIF, TAPs, HLS/MAD and Enroute Books
Aircraft Performance	Bespoke databases prepared by Inzpire on behalf of customer organisations
Documents	PDF
Postcodes and Towns	Ordnance Survey Database
Shapes, Lines and Spot Points	KML, GML, AML, Shapefile
Spec Imagery	TIFF, JPEG, BMP, GIF, PNG, MrSID, PDF, PPT
3D Models	GECO bespoke database prepared by Inzpire on behalf of customer organisations

## EXTERNAL MISSION DATA

NOTAMS	Live NOTAMs
Route Definitions	CADS, CRD
Tactical Data	ACO, ATO
Weather	GRIB

## REAL-TIME RECORDING/DISPLAY

Aircraft Avionic System Data	Information from aircraft data buses/systems (e.g. AIS data) can be displayed on the GECO digital map.
GECO Tablet Flight Debrief Data	GECO bespoke database created by the GECO Tablet during flight
Aircraft Instrumentation	Aircraft flight instrumentation data can be downloaded to the GECO Mission Planning System and 'replayed' using a common timeline in support of mission debrief activities
ADS-B	GECO can display this advanced surveillance technology that shares and highlights local participating aircraft position and track information
AIS	GECO can be loaded with an AIS maritime database and accept AIS information such that a maritime surface vessel picture can be displayed, integrated and recorded

Since 2009 Inzpire's GECO systems have been providing critical on-board and off-board mission support to military operations around the globe.

## POINT OF CONTACT



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