

# UPGRADES AND MODIFICATIONS

## 2022 - 2023

Intelligent solutions for  
your toughest challenges



# MEET YOUR AIRBORNE MISSION REQUIREMENTS

As a leader in technologically advanced, intelligent solutions that help redefine the aerospace and defense industry, Collins Aerospace continues to develop additional capabilities, upgrades and enhancements for our DB-110 reconnaissance system.

Building on decades of experience, we offer a comprehensive portfolio of high-reliability airborne products, installation, support and training that can help you meet your airborne mission requirements.





# DB-110 TO MS-110 RETROFIT UPGRADES

## Move your fleet forward while minimizing cost and schedule

Get advanced capabilities and minimum downtime for your fleet with in-country upgrades to MS-110 for your existing DB-110. By performing upgrades in-country, you remove the risk of shipping damage, reduce the total retrofit schedule and decrease the time to initial and full operating capability.

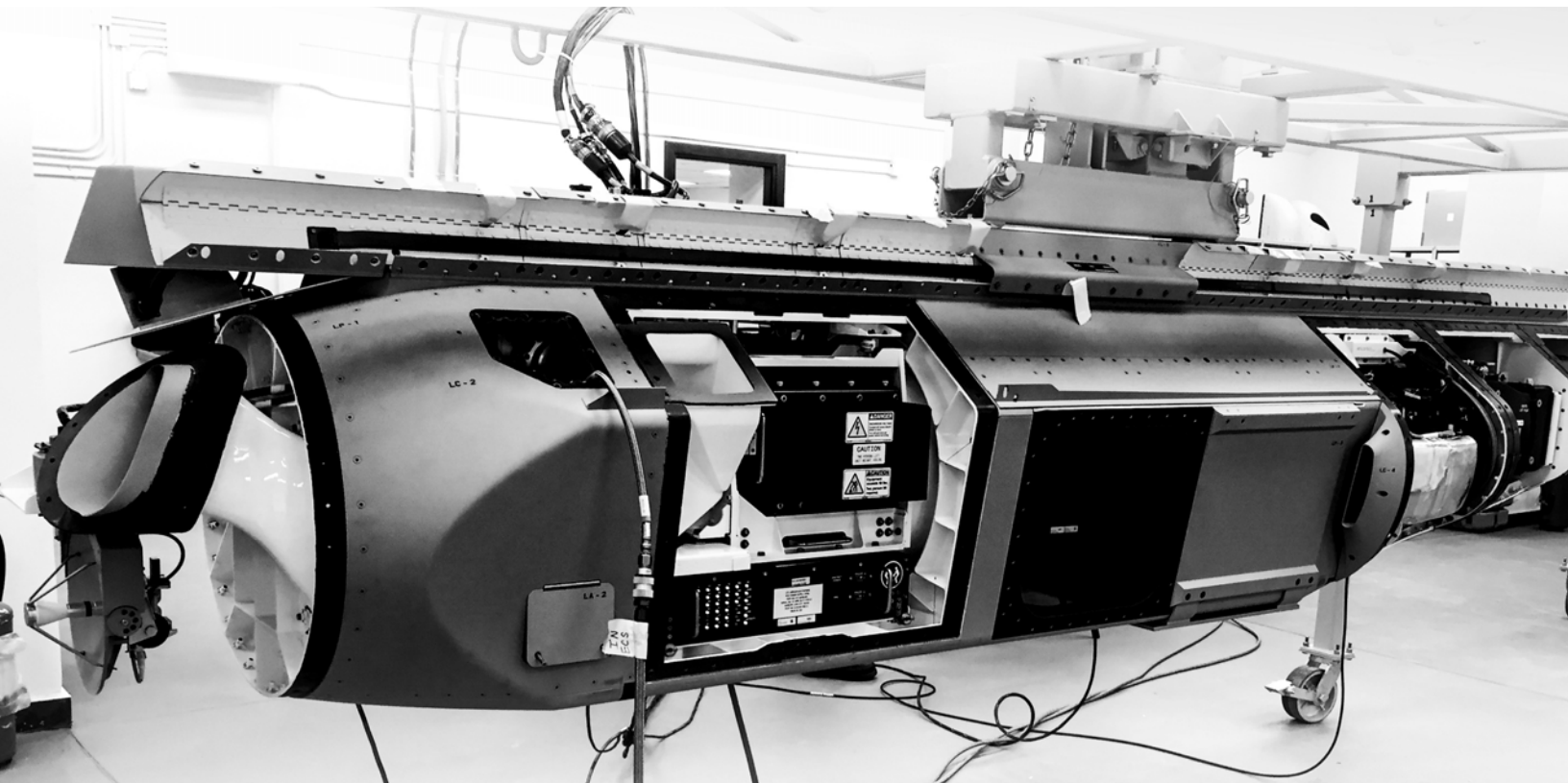
Upgrades are performed in your facility by Collins Aerospace engineering and field service experts. With attention paid to every detail, we ensure successful delivery of advanced MS-110 capabilities. Once upgrades are complete, MS-110 will integrate seamlessly into your existing reconnaissance (recce) CONOPS.

## KEY FEATURES & BENEFITS

- Leverages cost from DB-110 to obtain MS-110 capability at reduced cost
- Offers MS-110 improvements while minimizing operational downtime
- Significant reduction in schedule to both IOC and FOC
- Reduced risk of equipment damage in transit
- On-site presence of Collins Aerospace DB-110 and MS-110 experts
- Seamless integration of new MS-110 capability

## INTEGRATION

Integration can take place at either a Collins or customer facility



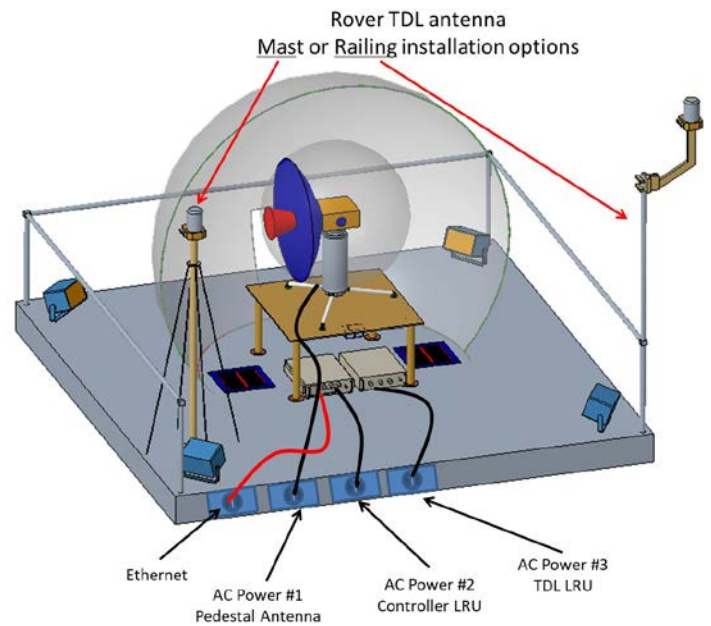
# REMOTE DATA LINK

## Your data – wherever you fly

Collins Aerospace has partnered with L3H Communications to develop a new data link paradigm. Our remote data link (RDL) node can be placed anywhere there is access to a secure military network. Command and control and data throughput are provided via ethernet from a Collins ground station connected to the same network from anywhere inside your country.

Our RDL does not rely on being co-located with a traditional ground station (FGS or TGS). It offers improved maintenance, functionality and performance for a fraction of the cost of previous generation technologies.

As an additional offering, our RDL can be delivered with fully integrated tethered data link functionality, enabling immediate access to intelligence on the airborne platform through ad hoc data linking.

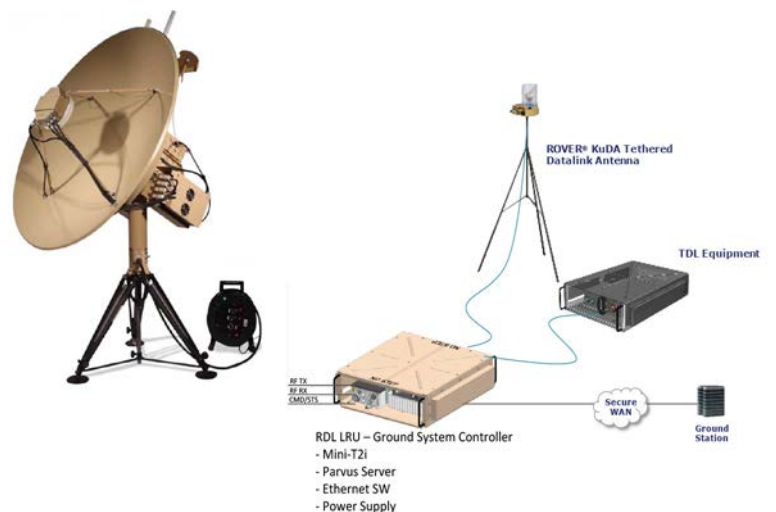


## KEY FEATURES & BENEFITS

- Multiple antennas connected to single ground station, reducing infrastructure required for more data link coverage
- Reduced antenna setup time
- All data link equipment located at antenna
- No dedicated fiber optic line required to connect to antenna
- Connection over ethernet, no distance limitation
- Includes tethered data link functionality

## INTEGRATION

RDL can be integrated with the ground station with a software upgrade



# TETHERED DATA LINK

## Your data when you need it

Collins tethered data link (TDL) can be integrated with any existing DB-110 system upon upgrade to MS-110. Using a location signal transmitted from the aircraft, our TDL enables a reliable link through precise knowledge of aircraft position.

Through Collins SCi-Gather, an information management tool, a tethered data link enables users to see the data that exists in the imagery catalog on an airborne pod. Ground users can request data and have it delivered to their ground station. The Collins SCi-Progress task management tool notifies users when their information is available and ready for exploitation.

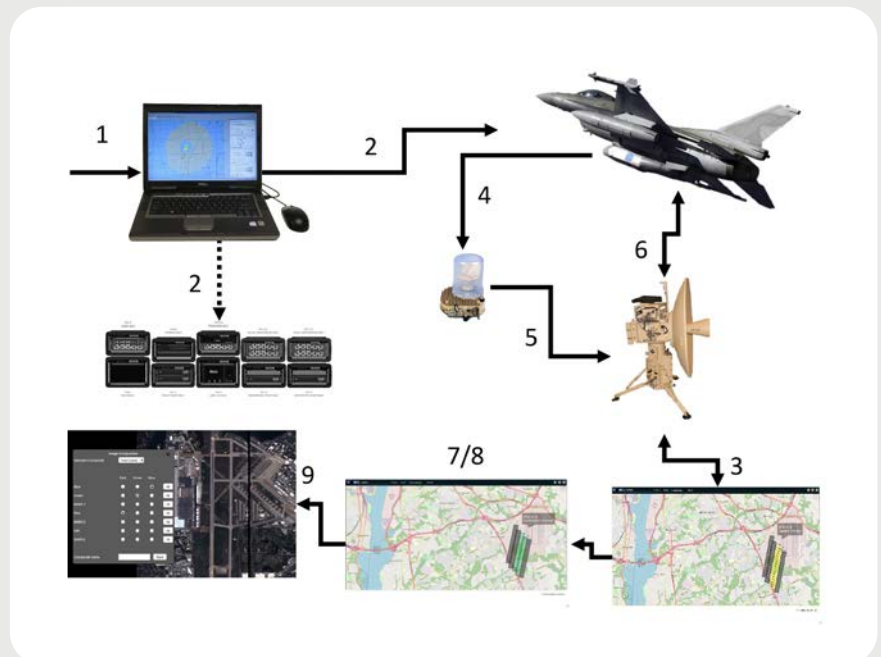
## KEY FEATURES & BENEFITS

- Proven hardware (L3H Rover 6i Transceiver and KuDA Antenna)
- Supports AES 256-bit encryption
- Interfaces to ground station through existing means
- Reliable air-to-ground connection
- Increased situational awareness of airborne imagery catalog
- Geographic selection of regions of interest prior to takeoff

## INTEGRATION

- Integrate by connection to existing STE
  - Requires ground station (GS) software upgrade
  - Requires data link upgrade
  - Requires airborne software upgrade

1. Mission is planned by pilot
2. Pod and GS (optional) receive necessary data from RMPS
3. GS Operator inputs "regions of interest" into SCi-Gather
4. Pod begins transmitting Location Signal, picked up by TDL antenna
5. Antenna Steering Info is sent to the STE either from a mission plan or through the location signal from the TDL antenna
6. A high rate network connection is set up between the pod and GS
7. Any requested imagery (Planned/Pilot/GS) is sent to the ground and populated into SCi-Gather/Discover
8. User is notified via SCi-Progress that new imagery is available
9. Imagery is screened and exploited by the GS Operator



# RMPS MISSION PLANNER UPDATE (WORLDWIND)

## Reduced intelligence cycle duration through smart processing

By incorporating the Worldwind visualization engine into the Collins recce mission planning system, we significantly improved performance of the system, offering speed improvements that were impossible with the previous system.

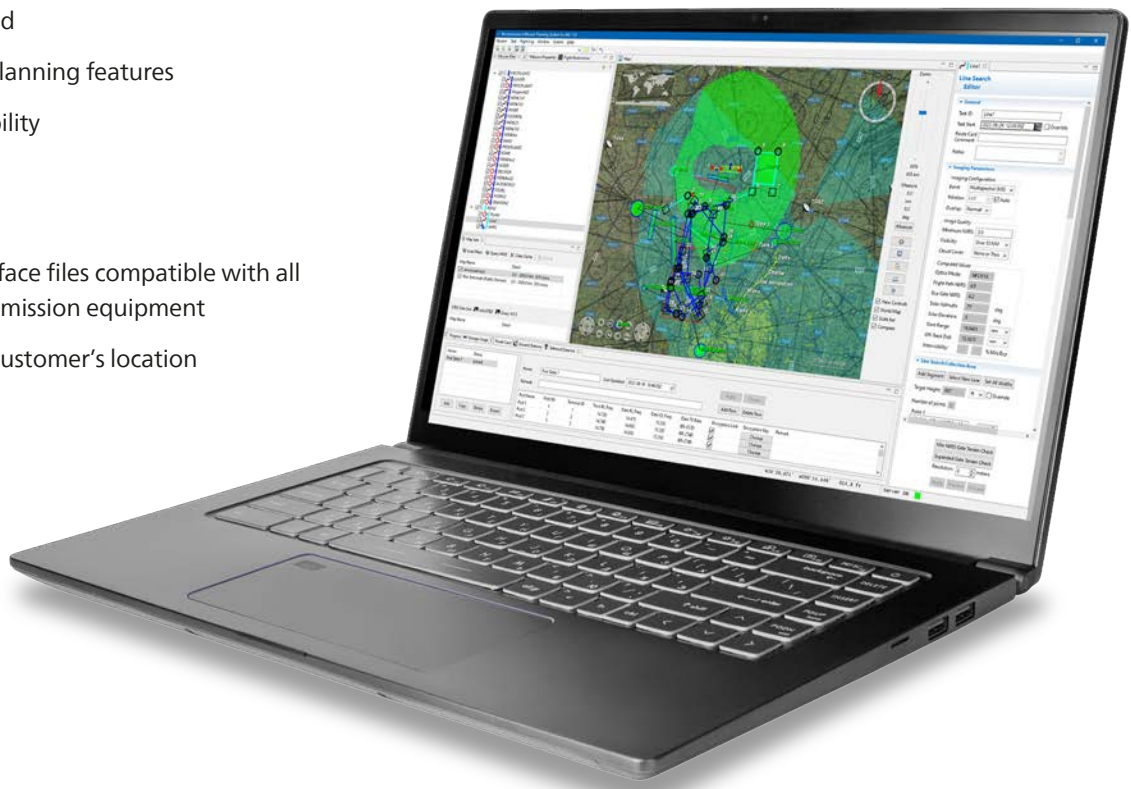
Incorporating the new engine allows implementation of key mission planning features, such as the UNDO feature, which substantially increase the efficiency and usability of the system.

### KEY FEATURES & BENEFITS

- No external security dongle required
- Increased speed
- New mission planning features
- Increased usability

### INTEGRATION

- Produces interface files compatible with all existing prime mission equipment
- Performed at customer's location



# CCTCU/ACTCU UPGRADE TO REVISION (REV) D & F

## Upgrade during repair to gain increased reliability

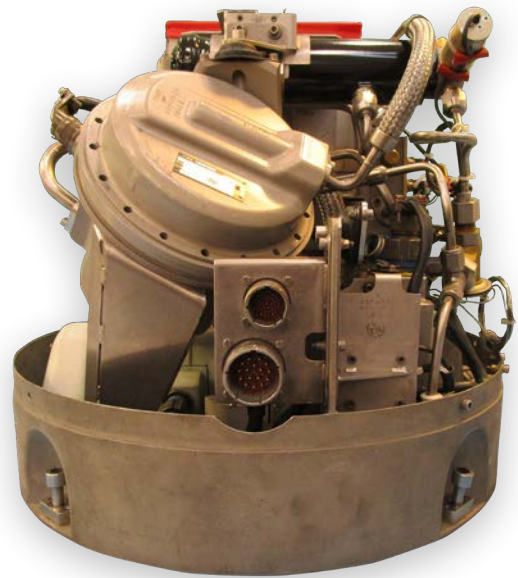
The camera compartment temperature control unit (CCTCU) and avionics compartment temperature control unit (ACTCU) are the most mission-critical, top driver of failures of the DB-110 reconnaissance system across the entire DB-110 fleet. The most frequent components requiring replacement in the CCTCU/ACTCU units are the discharge hose, inverter and scroll compressor.

The manufacturer has developed reliability improvements in the updated revisions of the CCTCU and ACTCU that address top repair drivers. Rev D component upgrades include compressor, inverter, high pressure switch and plug. Rev F includes the redesign of the flexible discharge hose. Combined, these upgrades are addressing more than half of the reasons for removal.

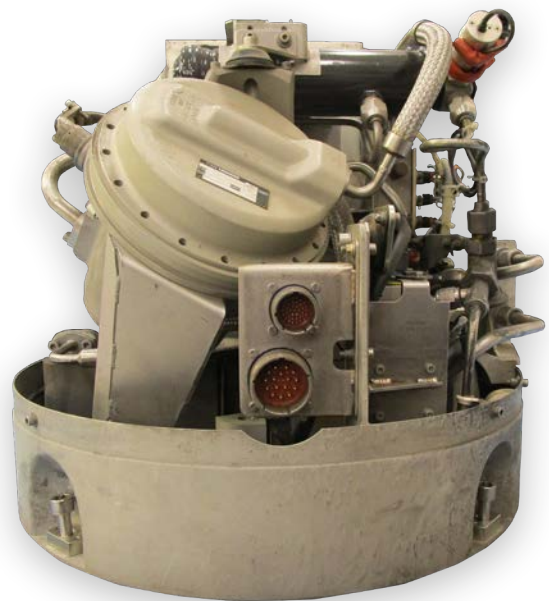
Collins and the U.S. government recommend that all DB-110 reconnaissance system customers consider upgrading CCTCU and ACTCU units to include Revs D & F during the next repair.

### KEY FEATURES & BENEFITS

- Upgrading provides the latest and best design and reliability
- Repair cost is optimized by implementation of upgrade on attrition basis during a repair
- Upgrading work scope will cover most of the repair work scope – cost savings will be on shared activities (tests, findings, etc.) and the repair upgrade scope will be significantly reduced



CCTCU



ACTCU



# TRAINING (COURSE CATALOG/ ANNUAL FOLLOW-ON TRAINING)



Collins offers a complete training package for the DB/MS-110 reconnaissance systems. Training is offered to meet initial learning, as well as advanced training expectations

Collins offers training courses necessary to develop and conduct operations and maintenance (O & M) training for both the airborne and ground segments of the DB/MS-110 recce system. Specifically, the training course offered includes a detailed outline of the planned courses, which will enable the end user to operate, maintain, troubleshoot and repair the airborne and ground segments of the DB/MS-110 recce system.

### KEY FEATURES & BENEFITS

- Course offerings for new and established customers
- Most training will occur at the end user location
- Some courses can be offered at either end user location or Collins locations in Westford, MA (USA) or Malvern, England (UK)

EVENT	DAY 1-30	DAY 31-60	DAY 61-90	DAY 91-120	DAY 121-150
Site setup (30 days)					
Ground station maintenance (10 days)					
Ground station operator (25 days)					
Aircrew familiarization (15 days)					
Airborne maintenance familiarization (5 days)					
O-Level advanced maintenance (5 days)					
Datalink operations and maintenance (10 days)					
MS-110 installation and checkout (35 days)					
Aircrew advanced (5 days)					
I-Level advanced maintenance (20 days)					

# IMAGERY ANALYSIS TRAINING (ISR NATO LEVEL COURSE)

## Advanced training, based on the NATO standards, for DB/MS-110 customers

Collins provides a complete range of intelligence, surveillance, and reconnaissance (ISR)-related training programs. The programs provide students with the most in-depth and professional imagery-based training courses possible. Although the course is specifically designed for Collins Aerospace in support of the DB-110/ MS-110 programmer using the SCI-Toolset®, all courses are continuously updated with the latest methodologies, the most modern analysis software and a large variety of imagery datasets derived from a wide range of sensors and platforms. Training courses are based on extensive up-to-date operational and practical know-how and expertise, vast technological capability and deep theoretical understanding.

### KEY FEATURES & BENEFITS

- Courses priced on a minimum of six (6) students
- Courses can be extended to a maximum of ten (10) with an additional price per student
- Students will be selected by their own Air Force to be trained as an Imagery Analyst (IA)
- Basic IA course emphasizes the most basic topics
- Advanced IA and Combined IA courses prepare participants for advanced analysis work on optical and infrared (IR) imagery, introducing them to full motion video (FMV) and synthetic aperture radar (SAR)

Based on experience, topics are tailored to the customer's specific area of interest and presence in the area. Industrial objects are limited to extraction sites and oil refineries and air defense systems are limited to system site layout. These topics can be expanded in consultation prior to the start of the training course.

During practical sessions on optical imagery and IR, instructors emphasize instructed elements and additional objects/equipment/materials not covered in the lecture, which then could be considered as advanced knowledge. By doing so, the students learn the basics in the minimum amount of time.

- Extension of Collins provided introduction to imagery analysis training
- Addresses customer's feedback requesting advanced IA training
- NATO standard course
- Course is provided at vendors location



# POD COVERS

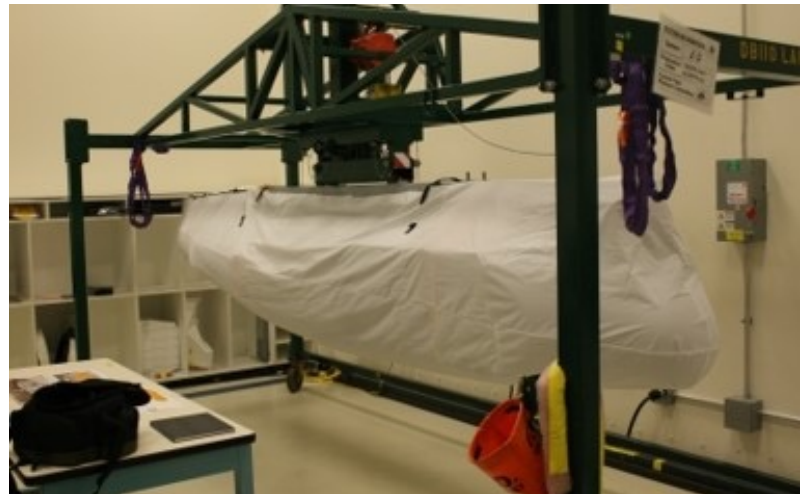
## Protecting your investment from dirt and fuel intrusion

Leaving the pod attached to the aircraft (uncovered) when not in operation can expose it to environmental factors and aircraft fuel/hydraulic seepage. Fuel and hydraulic fluid has entered the camera bay on multiple end-user pods.

Our pod cover protects it from sand, dust and aircraft fuel/hydraulic while in storage or in between sorties. Preventing fuel from entering the camera bay reduces potential image distortion. Preventing sand and dirt from entering the pod can increase the reliability of shutter equipment. Keep the cover on your pod when not flying. Multiple colors are available for safety or to match the aircraft.

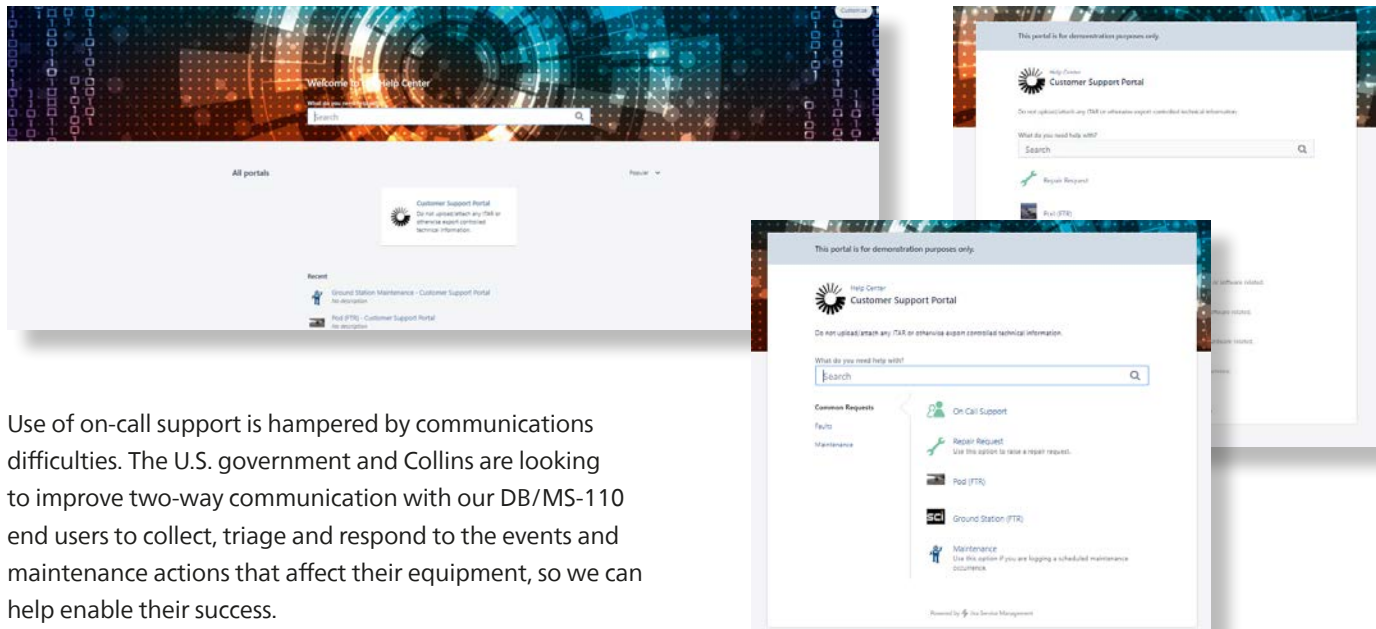
### KEY FEATURES & BENEFITS

- Cover material is a Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)-compliant
- Protects from extreme weather conditions and harsh chemicals
- Drain holes on the bottom and overlapping flaps between the aircraft mounts are closed with Velcro straps so fuel seepage runs off the cover
- Designed for quick installation and removal





# GROUND STATION — USER SUPPORT PORTAL



Use of on-call support is hampered by communications difficulties. The U.S. government and Collins are looking to improve two-way communication with our DB/MS-110 end users to collect, triage and respond to the events and maintenance actions that affect their equipment, so we can help enable their success.

## KEY FEATURES & BENEFITS

- Capable of adding and removing attachments
- Mandatory selection box confirming no ITAR
- Two-factor authentication
- Only nominated user granted access through agreement with Collins
- Managed solely by Collins
- HTTPS connection data is transmitted securely
- Granular permissions to control each users access to data
- Separation of different customer/end users data
- User-friendly interface for submitting FTRs and on-call support queries
- Customer-visible record for repair and returns
- Enables customer visibility into on-call support, FTR and repair and return metrics
- Provides a digital space for end-users to record maintenance actions and share that information with Collins and USG
- Allows for consistent entry of data to add fidelity to metrics generation and reporting
- Develops a safe and secure springboard from which to broaden information exchange between Collins, USG and end-user
- Access to the portal is available any time for system users. This enables them to give instant feedback preventing potential loss of relevant information.
- Secure web-based application

# IMAGERY GEOLOCATION IMPROVEMENT

## More accurate geolocation information on collected imagery

Sensors are often capable of generating high volume swathes of imagery. Inaccuracies in the geo-information provided by the airborne platform reduces the ability of the user to carry out change detection and create seamless large area mapping. SCi-Contour provides the building blocks to produce geographically accurate map layer products from a series of images using the embedded Automatic Image Registration (AIR) technology. This offers an optimized dimension to existing sensor capabilities, enhancing the tools available to imagery and intelligence analysts.

### KEY FEATURES & BENEFITS

- Visualization of single band or multi-spectral imagery from sweeping and grid sensor imagery scenes as seamless single image
- User-triggered image correction
- Correction of hard-to-register imagery
- Image layer generation from multiple image scenes
- Timeline to visualize multiple capture scenes with the ability to screen through time to highlight change

- Export of map layer tile sets in Web Map Tile Service (WMTS) format use in other geospatial applications
- Standalone desktop viewer to support the visualization of exported image MBTiles
- Uses SCi-Toolset to improve geo-location registration of collected imagery
- Reduces positioning errors typically associated with long range oblique photography
- Improves accuracy for better decision making

### INTEGRATION

- Field-level integration of SCi-Toolset
- SCi-Contour module



*Section of 132 frames of dual band (EO/IR) mission task prior to panorama generation*



*Snapshot of a panorama from 132 frames of dual band (EO/IR) imagery. The image above shows 9NM<sup>2</sup> (30km<sup>2</sup>).*

# PREVENTIVE MAINTENANCE PHASE FOR PODS

## Ensure safety and operation

Preventive maintenance tasks are developed and published in the technical manuals for 50 and 100 hours, as well as 300 hours/three years, and 600 hours/five years (whichever comes first). These procedures are performed by users or Collins personnel and aim to reduce unscheduled removals and repairs.

Pods are approaching an expected mid-life of 2500 hours/10 years (whichever comes first) with no defined tasks for overhaul or mid-life structural inspection. If pods are not inspected for structural integrity at mid-life, they may develop unseen cracking and damage that can lead to additional damage if not mitigated.

Funding the 2500 hour/10 year preventive maintenance task will develop the following:

- List of tasks to perform at Collins and at pod OEM
- Inspection documents and procedures
- Kit contents for hardware replacement
- Technical manual source data to add the inspection to the manuals
- Pricing/lead time for inspection of one pod

### KEY FEATURES & BENEFITS

- Pod will receive a thorough inspection and testing to include pod structure, radomes, nitrogen system and liquid cooling system
- Any findings will be documented and repaired
- Pod will be repainted
- Collins executes/manages the key functions to the end state



To learn more, go

→ [collinsaerospace.com](https://collinsaerospace.com)

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