Statement of Work (SOW)

Avionics Modernization and Navigation System Upgrades for Gulfstream (GV) Serial Number 570

1.0 Introduction/Background

NASA Armstrong Flight Research Center intends to modernize flight deck display systems and inertial navigation capability on Gulfstream (GV) Serial Number 570 to improve operational efficiency, reliability, and safety, and to provision the aircraft for future growth. The modernization includes installation of Honeywell PlaneDeck DU885 LCD primary flight displays with Synthetic Vision (PDSV) and replacement of the existing Honeywell Laseref Inertial Reference Units (IRUs) with Laseref IV units, certified under applicable Supplemental Type Certificates (STCs).

2.0 Scope of Work

The Contractor shall accomplish two integrated avionics upgrade packages during a single coordinated maintenance visit:

- **ASC183B DU885 PlaneDeck Installation with Synthetic Vision (PDSV).** Replace six DU880 CRTs with six DU885 LCDs; integrate PDSV; install related controls, database loader, and wiring modifications; remove legacy cooling hardware; and perform associated rack modifications. This modernization provides high resolution graphics, SVS terrain/obstacle/runway depiction, Jeppesen electronic charts/maps, moving maps, new cursor control devices (CCD), and DL1000 database loader capability. Effectivity: all Gulfstream V aircraft. PDSV Certification: Gulfstream STC.
- **Triple Honeywell Laseref IV Upgrade.** Remove existing Laseref IRUs and install three new Laseref IV IRUs in the avionics racks, certified using Gulfstream's existing STC, including any Honeywell core/credit processing and alignment inspections.

The estimated downtime for the combined work scope should not exceed 20 working days, contingent on lead time prerequisites and final induction schedule at a mutually agreed authorized facility.

3.0 Description of Tasks / Technical Requirements

The following definitions differentiate between requirements and other statements contained in this statement of work:

Shall	This is the only verb used for binding requirements.
Should/May	These verbs are used for stating non-mandatory goals.
Will	This verb is used for stating facts or declaration of purpose.

3.1 Project Management

The Contractor shall provide project management support for the work accomplished under this statement of work such as schedule, cost, and technical supervision.

3.2 Project Status Reports

The Contractor shall provide weekly status updates for the two designated avionics-upgrade items. These updates may be delivered via email or brief teleconference, as appropriate. Each weekly update shall include:

- A summary of progress made during the reporting week.

• Identification of any technical, schedule, or integration issues requiring Government awareness or action.

• A running list of action items and the current status of each (open, in progress, or closed).

• Updated percent-complete estimates for each of the two avionics-upgrade items relative to planned milestones.

3.3 Kickoff & Planning

Contractor shall conduct a project kickoff within **1 month** of award to confirm objectives, schedule, milestones, deliverables, and facility induction plan. Contractor shall deliver the Kickoff Presentation to the COR and copy the CO per delivery instructions.

3.4 Contract Surveillance

NASA reserves the right to conduct surveillance inspections at any location and at any time where work is being conducted during the contract period to ensure compliance with contract requirements. The Contractor shall support these surveillance activities as required.

4.0 Baseline Contract

4.1 ASC183B DU885 PlaneDeck Installation (PDSV)

4.1.1 Display System Replacement. Contractor shall remove six (6) DU-880 CRTs and install six (6) DU-885 LCD display units with PDSV software, including modifications to DU racks, mating plugs, connectors, and interface wiring.

4.1.2 Cooling Hardware Removal. Contractor shall permanently remove existing DU cooling fans, filters, ducting, and associated wiring.

4.1.3 CCDs & Controls. Contractor shall install pilot and co-pilot Cursor Control Devices (CCDs) in cockpit side consoles with associated wiring and two annunciator/switches above the Display Controllers to activate/deactivate PDSV (pilot and co-pilot).

4.1.4 Database Loader Upgrade. Contractor shall replace existing DL-900/950 loader with DL-1000 for improved field loading of software/databases (FMS/Charts/Maps), leveraging USB/SanDisk media for database updates across all displays.

4.1.5 Symbol Generator (SG) Software Upgrade. Contractor shall remove SGs and coordinate shipment to Honeywell for PDSV software load; upon completion, SGs shall be reinstalled.

4.1.6 Interior Access. Contractor shall perform interior removal/reinstallation (e.g., headliners, sidewalls).

4.1.7 Functionality & Features Verification. Contractor shall verify PlaneDeck capabilities including Class 3 Jeppesen charts, moving map navigation aids, SVS PFD terrain/obstacle/runway depictions, pilots electable video inputs, maintenance pages, new CCDs, DL1000 loader operation, and reliability improvements.

4.1.8 Certification Basis & Authorized Facilities. Contractor shall accomplish installation under the applicable Gulfstream STC and at a Gulfstream authorized facility.

4.2 Triple Honeywell Laseref IV Upgrade

4.2.1 Removal/Installation. Contractor shall remove existing Laseref IRUs and install three (3) Honeywell Laseref IV IRUs in avionics racks, aligned and leveled per STC requirements.

5.0 Prerequisites, Concurrent Requirements, and Data

5.1 Quality Management System

The Contractor shall have a quality management system that is compliant with the requirements of the current Society of Automotive Engineers (SAE) AS9100, *Quality Management Systems - Requirements for Aviation, Space, and Defense Organizations*.

5.2 NASA Aircraft Inspections and Maintenance

The Contractor shall allow NASA civil servant and/or NASA contractor personnel to perform aircraft inspection and maintenance actions, if necessary, at the Contractor's facility to keep the aircraft flight worthy during the modification period.

Documentation and records of all non-routine (O&A) repairs shall be included along with the completed work cards. Documentation shall include signature sign-off and inspection compliance.

5.3 Closeout Report and Documentation

The Contractor shall provide all pertinent reports and/or documentation verifying maintenance actions, installation/removals with the appropriate data. Documentation of completion of relevant STCs for the upgrades shall be provided.

6.0 Reviews & Acceptance

6.1 Deliverables

Item No.	Task Ref.	Deliverable Description	Qty.	Due Date	Delivery Instructions
4.1	3.2, 3.3	Kickoff Presentation	1 EA	Within 1 month after award	Electronic delivery at briefing; copy to CO within 1 week
4.2	4.1	PlaneDeck DU-885 Installation Completion Package	1 EA	At installation completion	As installed config, test results, SVS activation record; electronic to COR/CO
4.3	4.2	Laseref IV Upgrade Completion Package	1 EA	At installation completion	As installed config, align/level records; electronic to COR/CO
4.4	5.3	Closeout Report and Documentation	1 EA	Final month of contract	Electronic delivery to COR and CO

6.2 Acceptance Criteria

- Delivery of completion packages (Section 4.1/4.2) with evidence of STC compliance, as installed configuration records, successful test procedures, and discrepancy resolution/approved deferrals.
- Customer inspection and aircraft acceptance per Work Authorization terms at the performing facility.
- The NASA Airborne Science Data and Telemetry System (NASDAT) serves as the airborne platform for the Airborne Science Program (ASP) Sensor Network system, providing experimenters and their instruments with direct Ethernet access and satellite

communications. The Contractor shall coordinate with Government engineers and technicians to evaluate any NASDAT related wiring impacts resulting from the upgrades. This coordination shall include a review of all wiring changes to ensure continued compatibility with existing NASDAT internal modifications, including its use of IRU data. Acceptance requires successful completion of this review and Government confirmation that all NASDAT functions operate properly following the upgrades.

6.3 Warranties

- The Contractor shall submit, and recover whenever possible, warranty claims for the Government for parts and labor. The Contractor shall maintain internal records of the warranty program, which shall be available for review of Government personnel. The Contractor shall pass through to the Government any supplier warranties acquired by the Contractor as a result of the work performed under this contract.

7.0 Government Furnished Items / Equipment (GFI/GFE)

The Government will, as applicable, provide: aircraft access, existing aircraft records/data, and any Government provided services explicitly identified. The Government will **not** proceed with installation approvals until the NASA CO/COR authorization is provided where required.