Flight Standardization Board Report

Revision: 4
Date: xx/xx/xxxx

Manufacturer
Gulfstream Aerospace Corporation

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1. RECORD OF REVISIONS

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2. INTRODUCTION

Aircraft Evaluation Groups (AEG) are responsible for working with aircraft manufacturers and modifiers during the development and Federal Aviation Administration (FAA) certification of new and modified aircraft to determine:

1) The pilot type rating;
2) Flightcrew member training, checking, and currency requirements; and
3) Operational suitability.

This report lists those determinations for use by:

1) FAA employees who approve training programs;
2) FAA employees and designees who certify airmen; and
3) Aircraft operators and training providers to assist them in developing their flightcrew member training, checking, and currency.

3. HIGHLIGHTS OF CHANGE

The purpose of Revision 4 is to comply with a new format for the Flight Standardization Board Report (FSBR). Major modifications include the deletion of currency levels depicted in the Master Differences Requirements (MDR) Table, renaming of Operator Differences Tables to Differences Tables, and deleting regulatory repetitive information.
4. BACKGROUND

The Transport Aircraft Long Beach AEG formed a Flight Standardization Board (FSB) that evaluated the G-IV as defined in FAA Type Certificate Data Sheet (TCDS) #A12EA.

In March 1997, the FSB conducted flight evaluations of the Honeywell HUD 2020 System. The flight evaluation and the associated Airplane Flight Manual Supplement (AFMS) were found to be operationally suitable. See Appendix 5, Head-Up Display (HUD) System.

The Enhanced Vision System (EVS) installed on this aircraft has been found to be operationally suitable. See Appendix 6, Kollsman Enhanced Vision System (EVS).

The G-IV Display Unit (DU)-885 Modification was found to be operationally suitable. See Appendix 7, G-IV Display Unit (DU)-885 Modification.

In August and October 2012, the FSB evaluated the Honeywell NZ-2000 Flight Management System (FMS) 6.1 Software with Satellite-Based Augmentation System (SBAS)/LPV GPS and found the installation to be operationally suitable. See Appendix 8, Honeywell NZ-2000 FMS 6.1 Software with SBAS/LPV GPS.

In January 2015, the FSB conducted an evaluation of the UniLink UL-800/801 Future Air Navigation System (FANS) 1/A+, UniLink Data Link Communications System and found it to be operationally suitable. See Appendix 9, UniLink UL-800/801 Future Air Navigation System (FANS) 1/A+, UniLink Data Link Communications System (ST03422CH).

In September 2015, the FSB conducted an evaluation of the Honeywell Mark III Communications Management Unit (CMU) for FANS 1/A+ (ST-06-2014-0026) and found it to be operationally suitable. See Appendix 10, Honeywell Mark III Communications Management Unit (CMU) for FANS 1/A+ (ST-06-2014-0026).

In February 2016, the FSB conducted flight evaluations of the G-IV Honeywell CD-830 Control Display Units (CDU) (ST04037 AT-D) and found it to be operationally suitable. See Appendix 11, G-IV Honeywell CD-830 Control Display Units (ST04037 AT-D).

In March 2016, the FSB conducted an evaluation of the G-IV Primus Elite Advanced Features (PEAF) Modification (STC04297 AT-D) and found it to be operationally suitable. See Appendix 12, G-IV Primus Elite Advanced Features (PEAF) Modification (STC04297 AT-D).

5. ACRONYMS

- 14 CFR  Title 14 of the Code of Federal Regulations
- AC  Advisory Circular
- ACO  Aircraft Certification Office
- ACFT  Aircraft
- ACS  Airman Certification Standards
- ADS  Automatic Dependent Surveillance
• ADS C  Automatic Dependent Surveillance Contract
• AEG  Aircraft Evaluation Group
• AFCS  Automatic Flight Control System
• AFM  Airplane Flight Manual
• AFMS  Airplane Flight Manual Supplement
• AFN  Facilities Notification
• ANP  Actual Navigation Performance
• AP  Autopilot
• APU  Auxiliary Power Unit
• ASC  Aircraft Service Charge
• AT  Autothrottle
• ATC  Air Traffic Control
• ATS  Air Traffic Services
• ATP  Airline Transport Pilot
• AV  Audiovisual Presentation
• CDL  Configuration Deviation List
• CDU  Control Display Unit
• CPT  Cockpit Procedures Trainers
• CFR  Code of Federal Regulations
• CHDO  Certificate Holding District Office
• CMU  Communications Management Unit
• CNS  Communications, Navigation, and Surveillance
• CPDLC  Controller Pilot Datalink Communications
• CRT  Cathode Ray Tube
• DC  Display Controller
• DU  Display Unit
• ECL  Electronic Checklist
• EDS  Electronic Display System
• EFB  Electronic Flight Bag
• EFIS  Electronic Flight Instrument System
• EFVS  Enhanced Flight Vision System
• EGPWS  Enhanced Ground Proximity Warning System
• EICAS  Engine Indicating and Crew Alerting System
• EVS  Enhanced Vision System
• FAA  Federal Aviation Administration
• FADEC  Full Authority Digital Electronic Control
• FANS  Future Air Navigation Systems
• FDOS  Flight Deck Observer Seat
• FFS  Full Flight Simulator
• FGS  Flight Guidance System
• FMA  Flight Mode Annunciator
• FMS  Flight Management System
• FSBR  Flight Standardization Board
• FSTD  Flight Simulation Training Device
• FTD  Flight Training Device
• GLSSU  GPS Landing System Sensor Unit
• GNSSU  Global Navigation System Sensor Unit
• HA  Hold-To-Altitude
• HO  Handout
• HUD  Head-Up Display
• ICBI  Interactive Computer-Based Instruction
• ICS  Intercom System
• IFIS  Integrated Flight Information System
• IMC  Instrument Meteorological Conditions
• IRS  Inertial Reference System
• ISDU  Inertial System Display Unit
• LCD  Liquid Crystal Display
• LPV  Localizer Performance with Vertical Guidance
• MCDU  Multi-Function Control Display Units
• MDR  Master Differences Requirements
• MFF  Mixed Fleet Flying
• MMEL  Master Minimum Equipment List
• MTOW  Maximum Takeoff Weight
• Multi RNAV  Multiple RNAV Approaches
• NAS  National Airspace System
• ND  Navigation Display
• NM  Nautical Mile
• NWS  Nose Wheel Steering
• ODR  Operator Differences Requirements
• PANS  Procedures for Air Navigation Service
• PFD  Primary Flight Display
• PIC  Pilot in Command
• PLI  Pitch Limit Indicator
• POI  Principal Operations Inspector
• PTT  Part Task Trainers
• QRH  Quick Reference Handbook
• RNAV  Area Navigation
• RNP  Required Navigation Performance
• SBAS  Satellite-Based Augmentation System
• SID  Standard Instrument Departure
• SG  Symbol Generator
• STAR  Standard Terminal Arrival
• STC  Supplemental Type Certificate
• SU  Stand-Up Instruction
• TACAN  Tactical Air Navigation
• TAWS  Terrain Awareness and Warning System
• TC  Type Certificate
6. DEFINITIONS

These definitions are for the purposes of this report only.

6.1 Base Aircraft. An aircraft identified for use as a reference to compare differences with another aircraft.

6.2 Current. A crewmember meets all requirements to operate the aircraft under the applicable operating part.

6.3 Differences Tables. Describes the differences between a pair of related aircraft and the minimum levels operators must use to conduct differences training and checking of crewmembers. Differences levels range from A to E.

6.4 Master Differences Requirements (MDR). Specifies the highest training and checking differences levels between a pair of related aircraft derived from the Differences Tables.

6.5 Mixed Fleet Flying (MFF). The operation of a base aircraft and one or more related aircraft for which credit may be taken for training, checking, and currency events.

6.6 Operational Evaluation. An AEG process to determine pilot type rating, minimum crewmember training, checking and currency requirements, and unique or special airman certification requirements (e.g., specific flight characteristics and no-flap landing).

6.7 Operational Suitability. An AEG determination that an aircraft or system may be used in the National Airspace System (NAS) and meets the applicable operational regulations (e.g., Title 14 of the Code of Federal Regulations (14 CFR) parts 91 and 135).
6.8 **Qualified.** A crewmember holds the appropriate airman certificate and ratings as required by the applicable operating part.

6.9 **Related Aircraft.** Any two or more aircraft of the same make with either the same or different type certificates (TC) that have been demonstrated and determined by the Administrator to have commonality.

6.10 **Seat-Dependent Tasks.** Maneuvers or procedures using controls that are accessible or operable from only one flightcrew member seat.

6.11 **Special Emphasis Area.** A training requirement unique to the aircraft, based on a system, procedure, or maneuver, which requires additional highlighting during training. It may also require additional training time, specialized training devices, or training equipment.

6.12 **Specific Flight Characteristics.** A maneuver or procedure with unique handling or performance characteristics that the FSB has determined must be checked.

7. **PILOT TYPE RATING**

7.1 **Type Rating.** In accordance with the provisions of the current edition of AC 120-53, Guidance for Conducting and Use of Flight Standardization Board Evaluations, 14 CFR parts 1, 61, and 135, the pilot type rating is designated “G-IV”.

7.2 **Common Type Ratings.** Not applicable.

7.3 **Military Equivalent Designations.** Military aircraft that qualify for the G-IV type rating designation can be found at www.faa.gov under “Licenses & Certificates,” “Airmen Certification,” “Online Services,” “Aircraft Type Rating Designators.” This webpage is kept up-to-date and can be found at: https://www.faa.gov/licenses_certificates/airmen_certification/.

8. **RELATED AIRCRAFT**

8.1 **Related Aircraft on Same TCDS.** Not applicable.

8.2 **Related Aircraft on Different TCDS.** Not applicable.

9. **PILOT TRAINING**

9.1 **Airman Experience.** Airmen receiving initial G-IV training will benefit from prior experience operating multiengine transport turbojet aircraft in accordance with part 91 or 135. Additionally, a working knowledge of systems, such as Automatic Flight Control System (AFCS), autothrottle (AT), FMS, Integrated Flight Information System (IFIS), Electronic Checklist (ECL), Electronic Flight Bags (EFB), HUD, highly integrated avionics systems with electronic flight displays, high altitude operations, military, and FMS experience may be necessary to complete the training in a timely manner. Pilots without this experience may require additional training.
9.2 Special Emphasis Areas.

Pilots must receive special emphasis on the following areas during ground training:

Nose Wheel Steering (NWS) failure on landing—The NWS may fail upon touchdown, caused by an uncommanded steering input that results in directional deviation and NWS system reversion to free-castering mode. Tiller steering and rudder pedal controlled NWS will be inoperative. This will require the use of rudder and differential braking to maintain directional control on the runway. The NWS failure is indicated by the amber “STEER BY WIRE FAIL” Engine Indicating and Crew Alerting System (EICAS) message. The accompanying aural indication will be inhibited. This item must be included in initial and recurrent training.

Pilots must receive special emphasis on and perform in the following areas during flight training:

NWS failure on landing—Flight training in a simulator should include: 1) prior completion of the Airplane Flight Manual (AFM) Before Landing checklist to inhibit the associated aural warning, and 2) the fault being induced upon nose wheel touchdown. The simulator should be capable of triggering the malfunction automatically upon nose wheel touchdown. This item must be performed in initial and recurrent training. This maneuver should not be conducted inflight.

9.3 Specific Flight Characteristics. Maneuvers or procedures required to be checked as referenced in the Airline Transport Pilot and Type Rating for Airplane Airman Certification Standards (ACS). There are no specific flight characteristics.

9.4 Seat-Dependent Tasks. Pilots must receive training in these seat-dependent tasks:

   a) HUD (left seat) initial, upgrade, and recurrent training.
   b) EVS (left seat) initial and recurrent training.
   c) NWS Tiller (left seat) initial, transition, upgrade, and recurrent training.
   d) Passenger Oxygen System activation (right seat) initial training.

9.5 Regulatory Training Requirements Which Are Not Applicable to the G-IV. None.

9.6 Flight Simulation Training Devices (FSTD). There are no specific systems, procedures, or maneuvers that are unique to the G-IV that require a specific FSTD for training.

9.7 Training Equipment. There are no specific systems or procedures that are unique to the G-IV that require specific training equipment.

9.8 Differences Training Between Related Aircraft. None.
10. **PILOT CHECKING**

10.1 **Landing From a No-Flap or Nonstandard Flap Approach.** The probability of flap extension failure on the G-IV is not extremely remote due to system design. Therefore, demonstration of a no-flap approach and landing during pilot certification or a part 61, § 61.58 proficiency check, part 91, § 91.1065 competency check, 14 CFR part 125, § 125.287 competency check, or part 135, § 135.293 competency check is required.

**NOTE:** Refer to FAA Order 8900.1, Volume 5, Airman Certification, when the test or check is conducted in an aircraft versus a full flight simulator (FFS).

10.2 **Specific Flight Characteristics.** Maneuvers/procedures required to be checked as referenced in the Airline Transport Pilot and Type Rating for Airplane ACS. There are no specific flight characteristics.

10.3 **Seat-Dependent Tasks.** There are no seat-dependent tasks.

10.4 **Other Checking Items.**
   a) Reference Appendix 5-Head-Up Display (HUD) System.
   b) Reference Appendix 6-Kollsman Enhanced Vision System (EVS).

10.5 **FSTDs.** There are no specific systems, procedures, or maneuvers that are unique to the G-IV that require a specific FSTD for checking.

10.6 **Equipment.** There are no specific systems or procedures that are unique to the G-IV that require specific equipment.

10.7 **Differences Checking Between Related Aircraft.** There are no checking differences.

11. **PILOT CURRENCY**

There are no additional currency requirements for the G-IV other than those already specified in parts 61, 125, and 135.

11.1 **Differences Currency Between Related Aircraft.** There are no differences currency requirements.

12. **OPERATIONAL SUITABILITY**

The G-IV is operationally suitable for operations under parts 91, 125, and 135.
13. MISCELLANEOUS


13.2 Flight Deck Observer Seat (FDOS). The FDOS in the G-IV is part of the TC’d design. The FSB evaluated the Forward Observer Seat using the criteria in AC 120-83, Flight Deck Observer Seat and Associated Equipment, and found that it is operationally suitable for §§ 125.317(b) and 135.75(b).

13.3 Landing Minima Categories. Refer to 14 CFR part 97, § 97.3. The G-IV is considered Category D aircraft for the purposes of determining “straight-in landing weather minima.”

13.4 Normal Landing Flaps. The G-IV normal “final flap setting” per § 91.126(c) is flaps 39.
## APPENDIX 1. DIFFERENCES LEGEND

### Training Differences Legend

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<td>A</td>
<td>Self-Instruction</td>
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<td>• Crew has already demonstrated understanding on base aircraft (e.g., updated version of engine).</td>
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<td>• Flightcrew operating bulletin (HO)</td>
<td>• Minor or no procedural changes required.</td>
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<td>• No safety impact if information is not reviewed or is forgotten (e.g., different engine vibration damping mount).</td>
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<td></td>
<td></td>
<td></td>
<td>• Once called to attention of crew, the difference is self-evident.</td>
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<tr>
<td>B</td>
<td>Aided Instruction</td>
<td>• Audiovisual presentation (AV)</td>
<td>• Systems are functionally similar.</td>
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<td>• Tutorial computer-based instruction (TCBI)</td>
<td>• Crew understanding required.</td>
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<td>• Stand-up instruction (SU)</td>
<td>• Issues need emphasis.</td>
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<tr>
<td></td>
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<td>• Standard methods of presentation required.</td>
</tr>
<tr>
<td>C</td>
<td>Systems Devices</td>
<td>• Interactive (full-task) computer-based instruction (ICBI)</td>
<td>• Training can only be accomplished through systems training devices.</td>
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<tr>
<td></td>
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<td>• Cockpit Procedures Trainers (CPT)</td>
<td>• Training objectives focus on mastering individual systems, procedures, or tasks versus highly integrated flight operations or “real-time” operations.</td>
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<td>• Part task trainers (PTT)</td>
<td>• Training devices are required to ensure attainment or retention of crew skills to accomplish more complex tasks usually related to aircraft systems.</td>
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<td>• Level A or B full flight simulator (FFS A-B)</td>
<td>• Training requires mastery of interrelated skills versus individual skills.</td>
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<td>• Motion, visual, control loading, and specific environmental conditions may be required.</td>
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<td>Level C/D FFS or Aircraft</td>
<td>• Level C or D full flight simulator (FFS C-D)</td>
<td>• Motion, visual, control loading, audio, and specific environmental conditions are required.</td>
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<td>• Aircraft (ACFT)</td>
<td>• Significant full-task differences that require a high fidelity environment.</td>
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<td>• Usually correlates with significant differences in handling qualities.</td>
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## Checking Differences Legend

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<td>A</td>
<td>None</td>
<td>None</td>
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<tr>
<td>B</td>
<td>• Oral or written exam</td>
<td>• Individual systems or related groups of systems.</td>
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<td>• Tutorial computer-based instruction (TCBI) self-test</td>
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<tr>
<td>C</td>
<td>• Interactive (full-task) computer-based instruction (ICBI)</td>
<td>• Checking can only be accomplished using systems devices.</td>
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<td>• Cockpit Procedures Trainers (CPT)</td>
<td>• Checking objectives focus on mastering individual systems, procedures, or tasks.</td>
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<td>• Part task trainers (PTT)</td>
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<td></td>
<td>• Level 4 or 5 flight training device (FTD 4-5)</td>
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<tr>
<td>D</td>
<td>• Level 6 or 7 flight training device (FTD 6-7)</td>
<td>• Checking can only be accomplished in flight maneuver devices in a real-time environment.</td>
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<td>• Level A or B full flight simulator (FFS A-B)</td>
<td>• Checking requires mastery of interrelated skills versus individual skills.</td>
</tr>
<tr>
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<td>• Motion, visual, control loading, and specific environmental conditions may be required.</td>
</tr>
<tr>
<td>E</td>
<td>• Level C or D full flight simulator (FFS C-D)</td>
<td>• Significant full-task differences that require a high fidelity environment.</td>
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<td>• Aircraft (ACFT)</td>
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APPENDIX 2. MASTER DIFFERENCES REQUIREMENTS (MDR) TABLE

This section reserved for future related aircraft.
APPENDIX 3. DIFFERENCES TABLES

This section is reserved for future-related aircraft.
APPENDIX 4. HEAD-UP DISPLAY (HUD) SYSTEM

The G-IV FSB participated in three in-flight evaluations of the Honeywell HUD 2020 System during its development between December 1995 and September 1996, using Honeywell’s CE-650 and G-IV aircraft. In March 1997, the FSB conducted certification flight tests, along with the Los Angeles Aircraft Certification Office (ACO), in Honeywell’s G-IV aircraft. Flight testing consisted of approximately 40 HUD approaches at seven different airports, using CAT I and CAT II procedures, during day, night, Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). Additional evaluations were conducted in Honeywell’s HUD simulation facility in Glendale, Arizona.

The FSB also evaluated Honeywell’s proposed Gulfstream G-IV AFMS for HUD Operations and Gulfstream’s proposed HUD CAT II appendix to the G-IV AFMS for Category II Operations. Honeywell made a number of FAA-required changes to the HUD symbology and proposed AFMS to obtain an FAA Supplemental Type Certificate (STC). Once these changes were made, the FSB found the HUD operationally acceptable for all phases of flight and for U.S. CAT I and CAT II operations.

FSB SPECIFICATIONS FOR TRAINING. Flightcrew member training must be accomplished using a Level C full flight simulator (FFS), with a daylight visual display, or a Level D FFS. The FSB has determined that each pilot in command (PIC) of an aircraft equipped with a HUD system should receive a minimum of 4 hours of ground school training followed by a minimum of 4 hours of FFS training in the left seat of a Level C, with a daylight visual display, or Level D FFS. A HUD 2020 System equipped aircraft may also be used for in-flight training. In-flight training should consist of a minimum of 4 hours of flying in the left seat of the HUD 2020 System equipped aircraft. A person who progresses successfully through flight training, is recommended by an instructor, and successfully completes the appropriate HUD proficiency check by a person authorized by the Administrator, need not complete the recommended 4 hours of flight training. The FSB recommends special training emphasis in the following areas:

Ground Training:
1) Crew coordination.
2) Crew briefings and callouts.
3) Duties of pilot flying and pilot monitoring.

Flight Training:
1) Use of caged, uncaged, and clear modes (especially in crosswind conditions).
2) Use of the pitch limit indicator (PLI) during wind shear escape.
3) Approaches to ‘black hole’ airports using the flight path angle (FPA).
4) Use of the acceleration cue as a potential FPA.
5) Relationship of the glide path angle to the symbolic runway.
6) Use of the flare symbol as a cue (not as guidance) and approaches into the top of an undercast during daylight and night conditions.
7) Recovery from unusual attitudes.
8) Traffic Collision Avoidance System (TCAS) resolution advisory.
9) Takeoff using the FPA to meet a required climb gradient.
**FSB SPECIFICATIONS FOR CHECKING.** Flightcrew member checking requires a proficiency check conducted in a Level C FFS, with a daylight visual display, in a Level D FFS, or on a HUD 2020 System equipped aircraft. The proficiency check will include at least one takeoff and departure procedure and one instrument approach and landing utilizing the HUD.

**FSB SPECIFICATIONS FOR CURRENCY.** None.
APPENDIX 5. KOLLSMAN ENHANCED VISION SYSTEM (EVS)

The content of this Appendix has been removed. Refer to 14 CFR § 61.66 for training, recent flight experience, and proficiency requirements for EVS operations.

EVS installed on this aircraft has been deemed operationally suitable for EVS operations defined under § 91.175(1) and (m) and § 91.176(b) to 100 feet above touchdown zone elevation.
APPENDIX 6. G-IV DISPLAY UNIT (DU)-885 MODIFICATION

The DU-885 modification changes the G-IV as follows:

1) Replaces six DU-880 cathode ray tubes (CRT) with six DU-885 liquid crystal displays (LCD).
2) Adds two Cursor Control Devices, an XM Weather receiver, and a data loader.
3) Adds the following functions:
   a) Charts—Displays approach charts, airport maps, Standard Instrument Departures (SID), Standard Terminal Arrivals (STAR) and noise procedures on the Enhanced Navigation Display (ND). Airplane position is also displayed on the charts that are geo-referenced.
   b) Maps—Displays the FMS moving map over geopolitical boundaries augmented with navigational aids and XM weather on the ND.
   c) Video—Displays multiple video inputs on the ND.
   d) Database Configuration—Displays database status on the ND and permits uploading charts and map data.
   e) DU maintenance—Continuously tests the DU and displays a list of the failed tests on the ND (ground use maintenance function only).

Pilots transitioning from the DU-880 to the DU-885 system should be trained on the differences using any one of the following Level C differences training devices: interactive computer based instruction, FFS, CPT, PTT, or level 4 or 5 flight training devices (FTD). There are no checking or currency requirements for this transition.

Level C differences training is the minimum training level required for G-IV with Display Unit DU-885 Modification equipped aircraft. When flightcrews are assigned to the G-IV with Display Unit DU-885 Modification, operators and training providers must ensure that the level of training given is adequate for flightcrews to fully understand the differences between these aircraft.

It should be noted that this report only addresses training, checking and currency for G-IV qualified pilots that are transitioning to the G-IV with Display Unit DU-885 Modification equipped aircraft. No training, checking, or currency determinations have been made for pilots transitioning from the G-IV with Display Unit DU-885 Modification equipped aircraft to the G-IV aircraft.

For airplanes having the current terminal charts database loaded on the DU-885s and operable on both DU 2 and 5, no additional paper charts are required.
APPENDIX 7. HONEYWELL NZ-2000 FMS 6.1 SOFTWARE WITH SBAS/LPV GPS

In August 2012 and October 2012, the Gulfstream G-IV FSB evaluated the Honeywell NZ-2000 FMS 6.1 Software with SBAS/LPV GPS, and found the installation to be operationally suitable.

BACKGROUND

The G-IV FMS provides lateral and vertical navigation data to the AT system, AFCS, and electronic display system (EDS). A Global Positioning System (GPS) Landing System Sensor Unit (GLSSU) provides GPS position sensor data to the FMS, and ILS-like guidance to the EDS and AFCS to provide Satellite-Based Augmentation System (SBAS)/Localizer Performance with Vertical Guidance (LPV) approach capabilities. The change from a Global Navigation System Sensor Unit (GNSSU) to a GLSSU for the Gulfstream GIV aircraft, form the functional differences encompassed in Aircraft Service Change (ASC) 477, and adds the following functions:

- Addition of Cockpit LPV switch/annunciators.
- Software upgrade to NZ-2000 computers (NZ 6.1).
- GNSSU receivers and antennas upgraded to SBAS/LPV capable GLSSUs and antennas.
- Updated Magnetic Variation Tables.
- En Route Vectored Operation.
- Vectors to Final (VTF) Approaches.
- FMS linked chart functionality (for DU-885 equipped aircraft only).
- Automated Hold-to-Altitude (HA) Leg Sequencing.
- Approach Procedures Support for Circling and Tactical Air Navigation (TACAN) approaches, and multiple Area Navigation (RNAV) approaches to the same runway (Multi-RNAV) approaches).
- SBAS/LPV Operations, DO-229D, Class Delta-4 “ILS look alike”.
- Software enhancements to lateral guidance and flight planning for curved path calculations.
- Software enhancements to path computation to reduce vertical splits.
- Software enhancements to system speed, quality and robustness.

Pilots transitioning to the Honeywell NZ-2000 FMS 6.1 Software with SBAS/LPV GPS should be trained on the differences using Level C training. Level C is (full task) ICBI. There are no checking or currency requirements for this transition.
In January 2015, the G-IV Flight Standardization Board (FSB) participated in an evaluation of ST03422CH for the UniLink UL-800/801 Future Air Navigation System (FANS) 1/A+, UniLink Data Link Communications System and found the installation to be operationally suitable.

The UniLink Future Air Navigation System (FANS) 1/A+ UniLink Data Link Communications System implementation is intended to improve safety of flight, enhance efficiency, and increase air traffic capacity. Air traffic capacity increase is promoted by augmenting voice transmissions between crews and Air Traffic Control (ATC) with datalink messages during flight in oceanic and remote areas that have limited or no radar coverage. Features of this implementation include Air Traffic Services (ATS) Facilities Notification (AFN), Automatic Dependent Surveillance-Contract (ADS-C), and Controller-Pilot Datalink Communications (CPDLC) text data transmissions.

FANS 1/A+ is principally composed of three applications:

1. Controller-Pilot Datalink Communications (CPDLC) – CPDLC allows datalink messages to substitute for traditional voice communications for routine communications between a crew and an air traffic controller. CPDLC messages can be used to request and grant clearances, to inform the ground of the aircraft’s position and situation, and to provide instructions to the crew.

2. Air Traffic Services Facilities Notification (AFN) – AFN allows the aircraft and an ATS provider on the ground to exchange addresses, as well as information about which FANS applications they support.

3. Automatic Dependent Surveillance-Contract (ADS-C) – This application requires no crew action. ADS-C allows ATS providers to query the aircraft to provide position reports and other situational data at regular intervals or in response to events specified by the ATS provider, such as a change in altitude or lateral deviation.

Future Air Navigation Systems (FANS)/RNP/Actual Navigation Performance (ANP)/CNS/CPDLC/ADS. Flightcrews operating aircraft equipped with FANS software should receive appropriate instruction in its general operational functions, appropriate uses for areas of operation, routes, or procedures to be flown. General training should address communications, navigation, and surveillance (CNS) functions covered by FANS, RNP, and ANP. In addition, sufficient training in use of data link communication and Automatic Dependent Surveillance (ADS) to ensure adequate knowledge, skill, and proficiency for flightcrews to operate the above system(s) in typical daily operations (requiring their use) should be provided.

Specific Training. Pilots flying G-IV aircraft with the UniLink UL-800/801 Future Air Navigation System (FANS) 1/A+, UniLink Data Link Communications System (ST03422CH) upgrade described above must undergo training in the areas defined below:
• FANS-1A and ATN CPLDC.
• Log on – Log off.
• Clearances.
• Emergency.
• Request.
• Offset.
• Reports (RPTS) List.
• Message Logs.
• Position Reporting.
• ADS-C Contract.
• AFMS.
• UniLink UL-800/801 Future Air Navigation System (FANS) 1/A+, UniLink Data Link Communications System operator’s manual.
• Advisory Circular (AC) 90-117 (current edition).

**Special Emphasis Items:**

a) Emphasis on data entry formats for FANS-1/A.
b) Emphasis on proper manual entry of ATC clearances into the source FMS. Emphasis on data entry for Emergency Mayday, Procedures for Air Navigation Service (PANS), and associated elements.

**Training—Checking:**

a) The FSB determined that the minimum pilot training required, on the G-IV, for a pilot upgrade to the G-IV UniLink UL-800/801 Future Air Navigation System (FANS) 1/A+, UniLink Data Link Communications System (ST03422CH) is Level C. The minimum acceptable training method for Level C training would be ICBIs, CPTs, or PTTs (e.g., FMS or TCAS).
b) Level A checking (no checking requirement) has been determined by the FSB.
On September 3, 2015, the G-IV FSB conducted an evaluation of the Honeywell Mark III Communications Management Unit (CMU) for FANS 1/A+ ST-06-2014-0026 and found it to be operationally suitable.

**Specific Training.** Pilots flying G-IV aircraft equipped with the Honeywell Mark III Communications Management Unit (CMU) for FANS 1/A+ ST-06-2014-0026 must undergo training in the areas defined below:

- FANS-1A and ATN CPLDC.
- Log on – Log off.
- Clearances.
- Emergency.
- Request.
- Offset.
- Reports (RPTS) List.
- Message Logs.
- Position Reporting.
- ADS-C Contract.
- AFMS.
- Pilot’s Guide-Mark III Communications Management Unit (CMU) with Control Display Unit (CDU) for Legacy Systems (Including NZ 6.1 FANS).

**Special Emphasis Items:**

a) Emphasis on data entry formats for FANS-1/A.
b) Emphasis on proper manual entry of ATC clearances into the source FMS.
c) Emphasis on data entry for Emergency Mayday, PANS, and associated elements.

**Training—Checking:**

a) The LGB AEG determined that the minimum pilot training required, on the G-IV, for a pilot upgrade to the Honeywell Mark III Communications Management Unit (CMU) for FANS 1/A+ (ST-06-2014-0026) is Level C. The minimum acceptable training method for Level C training would be ICBIs, CPTs, or PTTs.
b) The minimum checking requirement is Level A (no checking requirement).
APPENDIX 10. G-IV HONEYWELL CD-830 CONTROL DISPLAY UNITS
(ST04037 AT-D)

On February 19, 2016, the G-IV FSB participated in an evaluation of the G-IV Honeywell
CD-830 Control Display Units (CDU) Modification for (ST04037 AT-D) and found it to be
operationally suitable.

The CD-830 is functionally similar to previously certified CDUs (CD-810, CD-820) with the
exception of the replacement of various mechanical pushbutton keys with touchscreen targets
and line selections on the CD-830 display. The following changes with the pilot interface have
occurred to accommodate a larger screen:

- All line select hard keys will be moved onto the display as touchscreen buttons.
- All mode keys (PERF, NAV, FPL, PROG, DIR) will be moved from beneath the display
to above the display.
- A new MENU mode key will be added above the display. The CD-820 VIDEO and
GRAPHIC mode keys will be moved to line selections in the new MENU mode.
- The new MENU mode will add a Clean Touchscreen (CLEAN TS) line select key which
freezes the touchscreen display for cleaning.
- The CD-820 BACK and function (FN) hard keys will now appear as touchscreen buttons
on the display.
- PREV / NEXT keys will be moved to right side of the keyboard and their orientation
changed to top and bottom relationship. The BRT / DIM keys will be re-located beneath
the PREV / NEXT keys and their orientation changed to a side-by-side relationship.
- Airshow video control functions may be accomplished through RTN / ENTER
touchscreen buttons at the lower corners of the display.
- The CD-810 / CD-820 DSPLY annunciation will no longer be displayed as it was a
carryover from the CD-800 monochrome display.
- The CD-820 MSG annunciation will now annunciate as FMS MSG when the FMS has
issued a message to the scratchpad.

The CD-830 is not intermixable with either the CD-810 or CD-820.

Special Emphasis Items: None.

Training—Checking:

a) The G-IV FSB has determined that the minimum pilot training required on the G-IV for a
pilot upgrade to the Honeywell CD-830 Control Display Unit (ST04037 AT-D) is level
A. The minimum acceptable training method for level A training would be achieved by
issuance and familiarity with Operating Manual and AFMS.
b) The minimum checking requirement is Level A (no checking requirement).
APPENDIX 11. G-IV PRIMUS ELITE ADVANCED FEATURES (PEAF) MODIFICATION (STC04297 AT-D)

On March 15, 2016, the G-IV FSB participated in an evaluation of the G-IV Primus Elite Advanced Features (PEAF) Modification for STC04297 AT-D and found it to be operationally suitable. DU 885 PEAF includes the addition of Synthetic Vision System (SVS). SVS depicts terrain, obstacles and airports with texture and colors on the Primary Flight Display (PFD). It obtains the data from the TAWS database.

The DU-885 Primus Elite Advanced Features (PEAF) modification adds the following features to the G-IV DU-885 as follows:

- PFD with SVS.
- TCAS added to the Enhanced Map.
- XM Satellite Weather added METAR and TAF features.
- Improved database loading via the DL-100.
- Added additional maintenance pages.

Special Emphasis Items: Airspeed Tape is reversed on G-IV SV PFD.

Training—Checking:

a) The G-IV FSB has determined that the minimum pilot training required on the G-IV for a pilot transitioning from the DU-880 or DU-885 to the G-IV Primus Elite Advanced Features (PEAF) Modification DU-885 (STC04297 AT-D) is Level C. The minimum acceptable training method for Level C training would be ICBIs, CPTs, or PTTs. Gulfstream DU-885 Primus Elite Advanced Features (PEAF) Level C Training has been found to be acceptable.

b) The minimum checking requirement is Level A (no checking requirement).

It should be noted that this report only addresses training, checking and currency for G-IV qualified pilots that are transitioning to the G-IV with Display Unit DU-885 PEAF modification equipped aircraft. No training, checking or currency determinations have been made for pilots transitioning from the G-IV with Display Unit DU-885 PEAF Modification equipped aircraft to the G-IV aircraft.