Gulfstream

G450

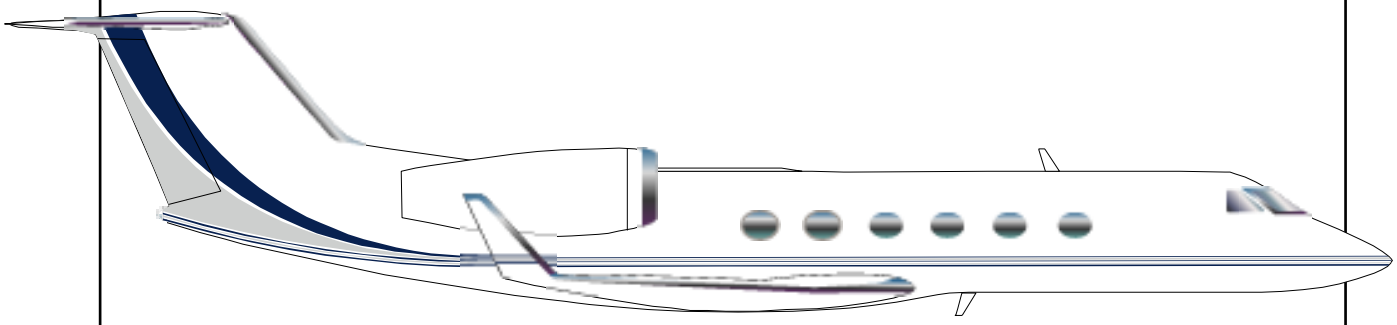
AIRCRAFT SERVICE CHANGE

NUMBER 905

SUBJECT:

INDICATING/RECORDING (ATA 31)

PLANEVIEW® MASTER OPERATING SYSTEM
SOFTWARE UPDATE



July 26, 2006

GULFSTREAM AEROSPACE

SAVANNAH, GEORGIA

PILOTS INFORMATION SHEET

PLANEVIEW MASTER OPERATING SYSTEM SOFTWARE UPDATE

This service change installs the PlaneView Master Operating System (MOS) software EB7031236-00407 on G450 aircraft.

Airplane Flight Manual (AFM) Revision 11, or later-approved version, will be required as a result of this service change.

PLEASE DETACH AND GIVE TO FLIGHT DEPARTMENT PERSONNEL

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PLEASE RETAIN THIS COPY WITH THE ASC BOOKLET

The design change effected by this document is FAA approved. If a compliance time, inspection interval or process requires FAA approval; such approval will be noted by the affected words appearing with an asterisk or note designating FAA approval.

The design of this Aircraft Service Change (ASC) is approved by aircraft type design data for installation on aircraft registered for operation in accordance with applicable regulations of the United States Federal Aviation Administration. Individual approval should be obtained from the appropriate airworthiness agency prior to installation on aircraft registered outside the United States.

The design of an ASC is configured to a standard ("greenie") production aircraft. If spare wires, pin connections or locations called out have been used for another modification, the installing agency must ensure the development, documentation and approval of any required deviations.

The following instructions, in step-by-step form, are written as a guide to perform this ASC. Compliance with safe maintenance practices as recommended in the Aircraft Maintenance Manual and FAA regulations is required.

Gulfstream considers this ASC a means to enhance aircraft capabilities to meet individual operator requirements. The modification is not related to any safety or airworthiness condition.

Subject:	Indicating / Recording Systems (ATA 31) - PlaneView Master Operating System Software Update
Purpose/Discussion:	This service change installs the PlaneView Master Operating System software EB7031236-00407 on G450 aircraft. This service change enhances the overall performance and reliability of the PlaneView Avionics System.
Description/Man-Hours Required Per Aircraft:	This service change installs updated Master Operating System software, P/N EB7031236-00407. This ASC must be installed in conjunction with G450 ASC 014A. Approximately 10 man-hours will be required for this installation. Appendix A of this ASC provides detailed PlaneView software information including; known anomalies and planned resolutions, operational information issues, and issues under investigation.
Approved Engineering Data:	The source data for this aircraft service change is: 1159ASC47905 Rev "-", Top Drawing – Certification Charlie II (MOS)

Prerequisites:	G450 ASC 903 or ASC 904 - PlaneView Master Operating System Software Update
Concurrent Requirements:	G450 ASC 014A - PlaneView Avionics Enhancement- must be installed in conjunction with this service change.
Associated Documents:	G450 Aircraft Maintenance Manual (AMM), Chapters 20, 31 and 34
Flight Manual Revision/Supplement Required:	Airplane Flight Manual (AFM) Revision 11, or later-approved version, will be required as a result of this service change.
Publications Data:	Data concerning this service change will be published in a future revision of the affected manual(s). This booklet will provide technical data until the revision(s) are published.
Effectivity:	This service change is applicable to Gulfstream G450 aircraft, serial numbers 4001-4057. This or a similar change will be installed during Initial Phase on Gulfstream G450 aircraft, serial number 4058 and subsequent.
Effect on Spares:	None
Special Equipment/Tools Required:	Aircraft's PC Laptop with Remote Terminal Tool version 16.3.2 or later. Refer to Gulfstream PlaneView Maintenance Applications disk version 4.1 or later, PN 1159LAP59000
Skill Type Required:	Knowledge of the Gulfstream G450 PlaneView avionics system will be required for this installation.
Price:	Prices are subject to change without notice.
Installed Price:	*See notes

*NOTE:	This ASC will be installed at no charge for a period of 24 months from the release date noted on the cover of the aircraft service change if installed at Gulfstream Aerospace or a Gulfstream G450 Authorized Warranty Repair Facility. All other installations are subject to the prevailing labor rate of the installing agency.

*NOTE:	This ASC Kit will be provided at no charge for a period of 24 months from the release date noted on the cover of this Aircraft Service Change. After the 24-month period has expired, this ASC Kit/s will be priced and sold.

*NOTE:	Coverage is granted per the terms and conditions of the Gulfstream Aircraft Sales Agreement to the original purchaser or subsequent owner with appropriate Assignment of Warranties on file with Gulfstream.

MODIFICATION INSTRUCTIONS:

A. Prepare aircraft for safe maintenance. Refer to G450 AMM, Chapter 20-20-10.

B. Ensure Steps A through E of ASC 014A, PlaneView Avionics Enhancement, have been complied with.

C. Apply electrical power to aircraft. Refer to G450 AMM, Chapter 20-20-10.

NOTE:	Correct setup of the aircraft laptop with the CMC Remote Terminal Tool is **critical** to the successful loading and operation of all software. Follow Data Load Guide procedures CAREFULLY. **Ensure any firewalls, anti-virus programs or wireless LAN connections are disabled and the laptop is connected to 60 Hz aircraft power.**

D. Load the following software in accordance with GIVX-GER-9934, Section 2.0, PlaneView Software Loading.

1. PlaneView Master Operating System software, Component of Top-Level System, P/N EB7031236-00407.

*NOTE:	Testing of this installation and the installations found in G450 ASC 14A should be conducted only after all of the hardware and software installations are completed. GIVX-SGER-905 is the only required test.

E. Comply with G450 ASC 014A Steps F 1 through 10.

F. Verify all software loads in accordance with GIVX-SGER-9934, Rev. "F" or later, Section 6.0. ASC. Enter 16 digit INDS serial number recorded in ASC 014A Step A.2. to access charts information as required.

NOTE:	The following changes were incorporated into the base Certification Charlie II LDI for the Central Maintenance Computer (CMC): • AGM reset test is removed. • AGM Member system status is removed. • Nuisance AOA maintenance faults reported to the CMC and a blue 'Check CMC' CAS message being displayed has been prevented when the AOA heaters are selected off.

G. Perform Return-to-Service (RTS) Checkout Procedure GIVX-SGER-905 provided with this service change.

H. Verify Top-Level System software part number on Configuration Management Software (CMS) screen matches the part number on the CD-ROM. Refer to Figure 1.

I. Remove disk from laptop and store in aircraft.

J. Discard previously used version of the PlaneView Master Operating Software CD-ROM.

K. Remove electrical power from aircraft. Refer to G450 AMM, Chapter 20-20-10.

L. Ensure work area is clean and clear of foreign objects (FOD).

M. Document the following information on the attached service reply card and in the aircraft logbook. Refer to Figure 1.

- Top-Level System Part Number
- Media Part Number
- Media Serial Number

N. Document the necessary information on the PlaneView Configuration Record located within the MISCELLANEOUS section of the aircraft's permanent maintenance records.

O. Record compliance with this aircraft service change in the aircraft's permanent maintenance records and return aircraft to flight status.

P. Report compliance with this aircraft service change to Gulfstream CMP via electronic transmittal or fill out and fax the attached Service Reply Card.

WEIGHT AND BALANCE DATA:	The weight and balance of the aircraft is not affected by this service change.

ELECTRICAL LOAD ANALYSIS DATA:	The effect of this change on the aircraft's electrical loading will be "0".

PARTS REQUIRED PER AIRCRAFT:				
Item	**Part Number**	**Nomenclature**	**Qty.**	**Notes/Alt./Substitutes**
1.	EB7031236-00407	Master Operating Software	1	*
2.	GIVX-SGER-905	Return to Service Checkout Procedure	1	*

*NOTE:	All drawings, publications and media software will be issued to the latest revision.


Top Level System Part Number
Media Part Number
Media Serial Number
Honeywell
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All Rights Reserved
Cage Code 55939
COMPONENT OF TOP LEVEL SYSTEM PN:
EB7031236-00407
Mod -
144 AD
DMF- 062006
Disk 1 of 1
Do Not Copy This CD
Made in the U.S.A
ECCN 7D994
Schedule B
8524.31.0070
Use of this software is subject to the license agreement contained on the CD
Operational Software - Gulfstream GIV-X Planeview
Media PN: MM7033384-008 Mod -
Media: UCN 10069202
Honeywell Proprietary

Figure 1

"July 26, 2006"

SERVICE REPLY CARD

PLEASE FAX THIS PAGE TO GULFSTREAM AEROSPACE CMP
FAX # 912-965-3598.

THE FOLLOWING AIRCRAFT SERVICE CHANGE HAS BEEN COMPLIED WITH:

ASC NUMBER	A/C	AIRCRAFT TYPE	COMPLIANCE DATE
979050		G450	

AIRCRAFT HOURS: _____

AIRCRAFT LANDINGS: _____

PREVIOUSLY COMPLIED WITH (PCW): _____ DATE: _____

NOT APPLICABLE: _____ DATE: _____

DISC INFORMATION					
MEDIA TITLE		TOP LEVEL SYSTEM PART NUMBER	MEDIA PART NUMBER	MEDIA SERIAL NUMBER	CMP CODE TLS / MM
MOS	OFF:				319010 / 319012
	ON:				319010 / 319012

SIGNATURE	TITLE / CERTIFICATE NUMBER	COMPANY

COMMENTS / SUGGESTIONS / ACTIONS TAKEN:

APPENDIX A

PLANEVIEW SOFTWARE INFORMATION UPDATE

(updated July 14, 2006)

Open Issues and Planned Resolutions

NOTE:	**THIS INFORMATION IS ADVISORY ONLY**. This appendix contains neither approved flight procedures nor official guidance. Consult the latest guidance in the airplane flight manual (AFM) or quick reference handbook (QRH) for flight procedures. Updates to this appendix can be found in the Waypoints section of myGulfstream.com at the following link: (https://www.mygulfstream.com/portal/customer/pilots/).

Anomaly	Resolution
During Radar Altimeter Test, the Flight Controls System page weight-on-wheels indication will amber cross hatch and the ECS load valve will close. Corrects with release of Rad Alt test button.	***Resolved in Cert Delta.***
Occasionally pilot and copilot display sensors power up defaulted to ADS 3 and RAD ALT 1. Condition may be associated with a low voltage APU start. To resolve the issue, select desired sensor.	***To be resolved in Cert Delta.***
NAV 1 and/or NAV 2 may power up with DME Hold selected on. Must select DME Hold off from the MCDU Nav Radio detail page.	***For consideration in Cert Delta.***
If a step climb is entered in the flight plan and the flight continues past the Bottom of Step Climb point, the Vertical Track Change message will be displayed each time the FMS re-calculates performance data. Frequency of the message display increases during large turns. To clear message delete step climb segment from performance init.	***For consideration in post Delta cert.***
VNAV path deviation may not match between pilot and copilot with possible automatic disengagement of VNAV. Vertical direct-to will re-sync the VNAV path deviation.	***Investigation under way to determine cause of problem – will correct in Cert Delta if cause is determined.***
Infrequent auto throttle power lever changes for speed control with an active speed target. Disconnect auto throttle and re-engage to stabilize power lever movement.	***To be resolved in Cert Delta.***
Selection of the DLK key may not always result in display of the Datalink menu page. Standby and Misc pages are typically observed. Re-select DLK key. May require as many as 3 attempts.	***To be resolved in Cert Delta.***

Anomaly	Resolution
Uplink weather display does not update the SEND button status in a timely manner if both pilots have been accessing the uplink weather selection tab. To clear, exit the Uplink WX dialog and re-attempt several minutes later.	***To be resolved in Cert Delta.***
Failure rate of the weather requests was 40-50%. From the method of data transmission from the ground and improper construction of the multiple segments which result in marking the data failed. Verify request construction and re-attempt selection with fewer segments.	***To be resolved in Cert Delta.***
Performance calculations may incorrectly use the approach speed for descent predictions. This can occur if the TO waypoint is in the approach procedure or if the TO waypoint is within the approach distance (15nm) defined in the PERF INIT DEP/APP page. This error is the result of direct clearance to the approach waypoint from 1000+ miles. Avoid direct-to selections of waypoints from distances of greater than 1000 nm.	***To be resolved in Cert Delta.***
Single Engine Performance Predictions show speeds that are 100 knots faster than the single engine cruise speeds.	***To be resolved in Cert Delta.***
Autothrottle speed command receives erroneous signal as flaps transit through 2°, 12° and 22° up or down when the autothrottles are engaged in speed select mode. The speed target change may not show on the Flight Guidance Panel. The erroneous command will gradually erode at a rate of 1 knot per second to the correct speed target. Disengage autothrottles to avoid speed change.	***To be resolved in Cert Delta.***
Datalink sends inaccurate position reports at higher latitudes (60°N) or higher where the tolerance limits of 3 minutes of longitude equates to 1.5 NM or less. Datalink reports passing the position earlier than actual point passage.	***Will be addressed in Cert Delta.***
Flex EPR cannot be selected for takeoff unless a NAV source is selected in the FMS *(NOTE: this applies to G450/G350 aircraft only)*	***Will be addressed in Cert Delta.***
FMS predictions of time enroute and fuel consumed for the last flight plan leg prior to top of descent (TOD) are inaccurate. The groundspeed and fuel flows for this leg will be lower than actual, thus the FMS predicted time enroute will be longer than actual and actual fuel used will be more than the figure shown on the FMS page. The degree of inaccuracy is dependent on the length of the leg that precedes TOD.	***Entering a pilot defined waypoint or route waypoint just prior to TOD will minimize time and fuel inaccuracies.*** ***Fixed in Cert "D".***

Operational Information Issues:

If operating on emergency batteries (E-batts), you don't have to select EMER on ACPs to talk on Radio 1. Selecting EMER on ACPs only bypasses PlaneView avionics interfaces and connects the ACPs directly to Comm 1. Selecting E-batts or extending the EMER switch de-powers a relay which ties ACP 1 and 2 transmit directly to Comm 1.

The Electronic Charts are loaded using the Honeywell blue disk in the DMU. The E chart program resides on the AGMs and the individual approach charts are on the PCMCIA card in the DMU. You can do a full load and load both or you can target load just the PCMCIA card. If the AGM programs are out of date, it will show which AGMs are out of date in amber on the Database page of the CMC. If the airport data or AGM programs are out of date, when the Electronic Charts are opened, there will be an amber note saying the data may be out of date. If everything is current, then the letters on the Elec Chart open page will be white. Select the X in the top right corner of the Elec Chart page to go to the actual program.

If you experience power-up issues and do not want to dispatch with these issues, the recommended course of action is to recycle the last power source that was applied, i.e. if problems arise on application of battery power, turn battery power off for 30 seconds and then re-apply. If problems arise after application of external power or APU power, then you may be able to regain normal application by cycling those switches only. If this doesn't fix the issue, then removal of all power and waiting 30 seconds followed by a normal start is the best procedure.

The datalink interface is now provided by Global Data Center. If you're one of their customers you can request the EPIC/PlaneView user's manual which has a good description of the operation of the new interface.

The logic on the EVS cooling valve message has been revised to only annunciate when the cooling valve is not in the correct position. You'll no longer get the message below 18,000'.

You must push the engine start switch for one second or more. A momentary button press on start switch may not command the start valve to open (SVO icon not displayed) and you may get a SVO Maint Required amber message (like the GV). If so, you'll need to shutdown and restart to clear the message.

The small "inverse airplane" icon on approach and airport electronic charts indicates that the chart is drawn to scale and the spotter should be shown. With SIDS / STARS, and some airports are not to scale and a spotter will not be shown.

Waypoint list altitudes are predicted altitudes only. Check the FMS for the constraints. Also, you can only get WP list on DU 1 or 4 after selection of an engine page, then WP list. This is per design.

All four APMs have to be up and valid to do an EVS raster alignment. APM 1 is in NIC 1 which is on MAU 1A; APM 2 is on NIC 4 which is on MAU 2B; APM 3 is on MRC 1; APM 4 is on MRC 2.

In normal operations, there's a Master/Slave audio warning system. Thus you can hear items like the AP and AT disconnect at the same time as Ground Proximity altitude callouts. If MW 1 or 2 fails, audible warnings are annunciated sequentially and each audible warning has to annunciate completely before the next warning can sound. Thus, if you disconnect autopilot during landing at say 45', you will hear the autopilot disconnect tones but the 40' and 20' EGPWS callouts may be delayed such that they appear to be inaccurate (e.g. the 40' call at 20').

Operational Information Issues Continued:

If operating on battery power only, the Horizontal Stabilizer will show failed on the Flight Controls page. Once the HMG master is on and up to speed (HMG fault light out) the stabilizer will work normally. Normal operation can be confirmed by going to emergency stabilizer and using trim switch.

An amber flashing WX will be shown up on the HSI and INAV displays if the radar is transmitting but is not selected for display on either display. Also, at ranges less than 5 half range, WX will not be available and the WX annunciation will flash amber.

It is normal for the aileron indication to fill completely at approximately 2/3 of full travel on the Flight Controls display.

If the FMSs experience a power interruption, temporary NOTAM information will be lost.

If an MRC fails, the other MRC will take over the Comm, Nav and HF tuning and display functions. The radio page on the MCDU will remain fully functional except for the loss of the ADF and Transponder in the failed MRC.

A "stuck" microphone logic is incorporated in the ACPs. After a 30 second mic use period, the transmitter will disengage. This feature also applies to SATCOM - you must release the mic button every 30 seconds in order to keep the transmitter online. *This operational logic is per design; however a new CAS message and MCDU message annunciating the condition is scheduled for Cert Delta.*

Whenever the Checklist Function is selected using the button on the Display Controller, the checklist will appear in the lower 1/6 window of Display Unit #3 as the default location of this function. The checklist may be positioned to any other location using the appropriate selection on the Display Controller or CCD.

If selecting menu options on the I-NAV display results in only a short menu containing only "show info" and "center map" then this indicates that there is a disagreement between the AGM nav database and the FMS nav database. This most likely will occur when the FMS database is updated on the regular cycle, but the AGM database update is omitted.

In Cert "C-II" the automatic Advanced Graphics Module (AGM) reversion feature has been disabled while in flight. If an AGM or Display Unit (DU) fails while in flight, it may not be recovered. The Display Unit Control switches that were used to select an alternate AGM for a Display Unit have no effect in the ALT position while airborne.

However, the inflight display format conversion will automatically switch according to the established default settings to ensure the preservation of a PFD display for each pilot and the display of CAS messages and Engine Data. If the display format has switched due to a DU or AGM failure, that display format is "latched". If the failed AGM or DU subsequently recovers and is found to be usable, the "latched" display format may be released from the "latched" condition by depressing the 2/3 display button on the display controller for three (3) seconds. A different display format may then be selected.

If the aircraft is on the ground and a DU or AGM is found to be inoperative, the manual DU Control Switches may be positioned to ALT (on the ground only) in order to configure the operational DUs and AGMs in accordance with the MMEL for dispatch – however, one DU (# 3) will then be inoperative. The following matrix shows the effect of the ALT position selection:

Operational Information Issues Continued:

AGM condition / switch position	*DU 1*	*DU 2*	*DU 3*	*DU 4*
All AGMs operable / NORM	*AGM 1*	*AGM 2*	*AGM 3*	*AGM 4*
AGM 1 FAIL / DU 1 ALT	*AGM 2*	*AGM 4*	*X*	*AGM 3*
AGM 2 FAIL / DU 2 ALT	*AGM 1*	*AGM 4*	*X*	*AGM 3*
AGM 3 FAIL / DU 3 ALT	*AGM 1*	*AGM 2*	*X*	*AGM 4*
AGM 4 FAIL / DU 4 ALT	*AGM 1*	*AGM 2*	*X*	*AGM 3*

The automatic engagement of autothrottles by the Envelope Protection System is inhibited in Cert "C-II". The autothrottles will not engage if the aircraft speed approaches V_{max} or V_{min}.

All known software conditions that caused DU blanking issues have been resolved in Cert "C-II"; however, the AFM and QRH procedures have been updated to provide guidance in dealing with DU blanking caused by faulty Network Interface Controllers (NICs) and/or Advanced Graphic Modules (AGMs).

Issues under Investigation:

If the Preview mode is used to tune an onside ILS on the Progress page and then subsequently switching to the offside Nav or FMS sources and cycling through the offside Nav or FMS sources using the DC, the onside Nav previously tuned to the ILS in Preview will revert back to autotune.

Occasionally on power-up or after a power interruption, *FMS #1* will not accept any input.

When using the "what if" initialization mode on the MCDU to review the flight plan at a different Mach speed but not selecting the new speed for use and subsequently making a change to the flight plan (e.g. deleting a waypoint), the "what if" Mach speed is automatically selected and placed in the current performance initialization data on the MCDU.

Datalink automatic position reporting may fail after 1½ to 2 hours of flight *or if VHF Datalink is lost.*

Weather Radar status is shown in red on CMC WX Summary page; however, radar functions normally. This is thought to be a CMC interface communication problem.

If the existing flight plan is replaced by an identical flight plan via datalink, all three FMSs may reset.

Uplink wind information is displayed with a green area shown that does not correspond to any of the wind velocity color cues on the wind speed reference legend.

Unless the throttles are at idle, Flex EPR takeoff cannot be selected.

Entering a Flight Plan with over 100 waypoints will result in a corrupted Custom Database. When the flight plan with 100+ waypoints is closed on the FMS, the other two FMSs will go to a cold start and the FMS used to enter the Flight Plan will go to single mode with a corrupted Custom Database. To view a presentation on how to restore the FMSs to normal operation click here.