

500W Series
Instructions for Continued Airworthiness
Bell 407

Reg. No. _____ S/N _____

Dwg. Number:
190-01226-13 Rev. 3

Garmin International, Inc.
1200 E. 151st Street
Olathe, Kansas 66062 USA

Record of Revision

Rev.	Date	Description of Change
1	04/09/15	Initial Release
2	06/18/15	Updated Airworthiness Limitations section
3	02/08/17	Updated troubleshooting table section to add GDL 88H and GTX 3X5

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1. INTRODUCTION

1.1 Purpose

This document is designed for use by the installing agency of the Garmin Model 500W series GPS/WAAS Nav/Com as Instructions for Continued Airworthiness in response to Title 14 CFR Part 27.1529, Part 27 Appendix A. This ICA includes information required by the operator to adequately maintain the Garmin 500W unit and additional equipment installed under STC SR02080SE.

1.2 Scope

This document identifies the Instruction for Continued Airworthiness for the Bell 407 series rotorcraft modified by the installation of the Garmin Models 500W series GPS/WAAS Nav/Com unit and additional equipment under STC SR02080SE.

1.3 Document Control

This document shall be released, archived, and controlled in accordance with the Garmin document control system. When this document is revised, refer to Section 2.15 for information on how to gain FAA acceptance or approval and how to notify customers of changes.

1.4 Permission to Use Certain Documents

Permission is granted to any corporation or person applying for approval of a Garmin Model 500W series to use and reference appropriate STC documents to accomplish the Instructions for Continued Airworthiness and show compliance with STC engineering data. This permission does not construe suitability of the documents. It is the responsibility of the applicant to determine the suitability of the documents for the ICA.

1.5 Definitions

The following terminology is used within this document:

- 1) **ACO:** Aircraft Certification Office
- 2) **AEG:** Aircraft Evaluation Group
- 3) **CFR:** Code of Federal Regulations
- 4) **FAA:** Federal Aviation Administration
- 5) **ICA:** Instructions for Continued Airworthiness
- 6) **PMI:** Principle Maintenance Inspector
- 7) **STC:** Supplemental Type Certificate

2. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

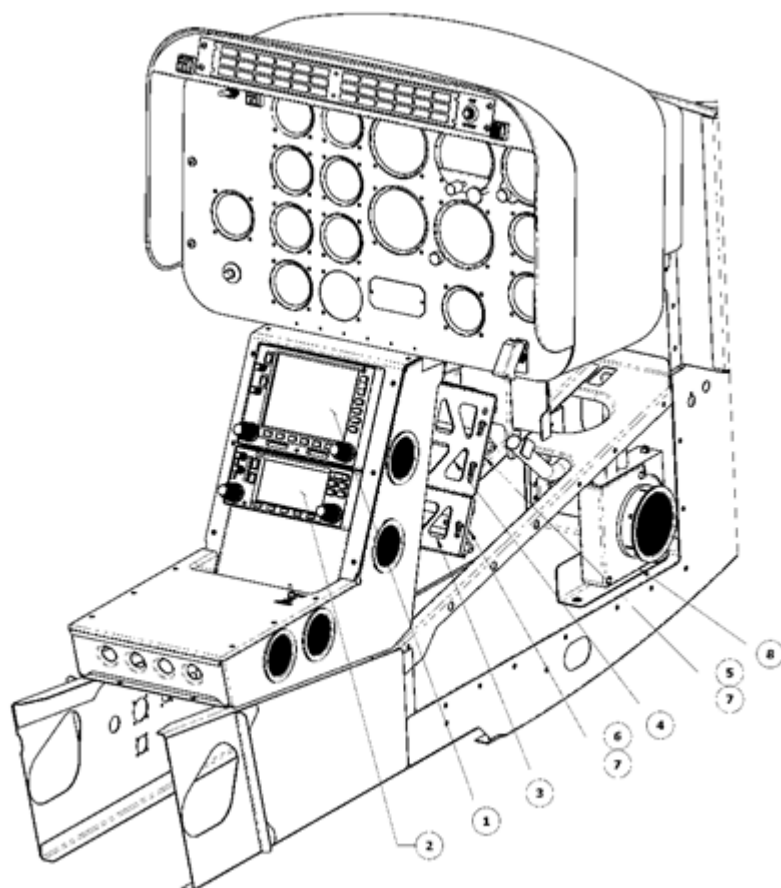
2.1 Introduction

Content, Scope, Purpose and Arrangement:	This document identifies the Instructions for Continued Airworthiness for the modification of the rotorcraft by installation of a 500W series GPS/WAAS Nav/Com unit under the Garmin Bell 400W/500W HTAWS STC SR02080SE.
Applicability:	Applies to Bell model 407 rotorcraft altered by installation of a 500W series GPS/WAAS Nav/Com unit under the Garmin Bell 400W/500W HTAWS STC SR02080SE.
Definition of Abbreviations:	See Section 1.5
Precautions:	None
Units of measurement:	None
Referenced publications:	Garmin 005-00610-03 Rev. 2 <i>"Equipment List 400W/500W Series Installation Bell 206 and 407 STC"</i> or later FAA Approved Revisions Garmin 190-01226-01 Rev. 3 <i>"500W Series Rotorcraft STC Installation Manual"</i> or later FAA Approved Revisions
Additional Maintenance Data:	Garmin 190-01226-10 Rev. 1 <i>"400W/500W Series Installation Bell 407"</i> or later FAA Approved Revisions
Retention:	This document, or the information contained within, will be included in the rotorcraft's permanent records.

2.2 Description of Alteration

This STC upgrades existing avionics for the Bell 407 rotorcraft as summarized below.

The Garmin Model 500W Series GPS/WAAS Nav/Com is a 6 ¼ inch wide unit mounted in the avionics console of the Bell 407. The 500W Series units combine a large number of easily accessible controls to use the color multi-function display, Nav and Com transceiver, GPS/WAAS navigator in a single unit. A GPS/WAAS antenna is installed on the top of the Bell 407 forward engine cowl. A monitored avionics cooling fan is installed in the instrument panel support with a fan fail fault annunciation located in the existing caution and warning annunciator panel.



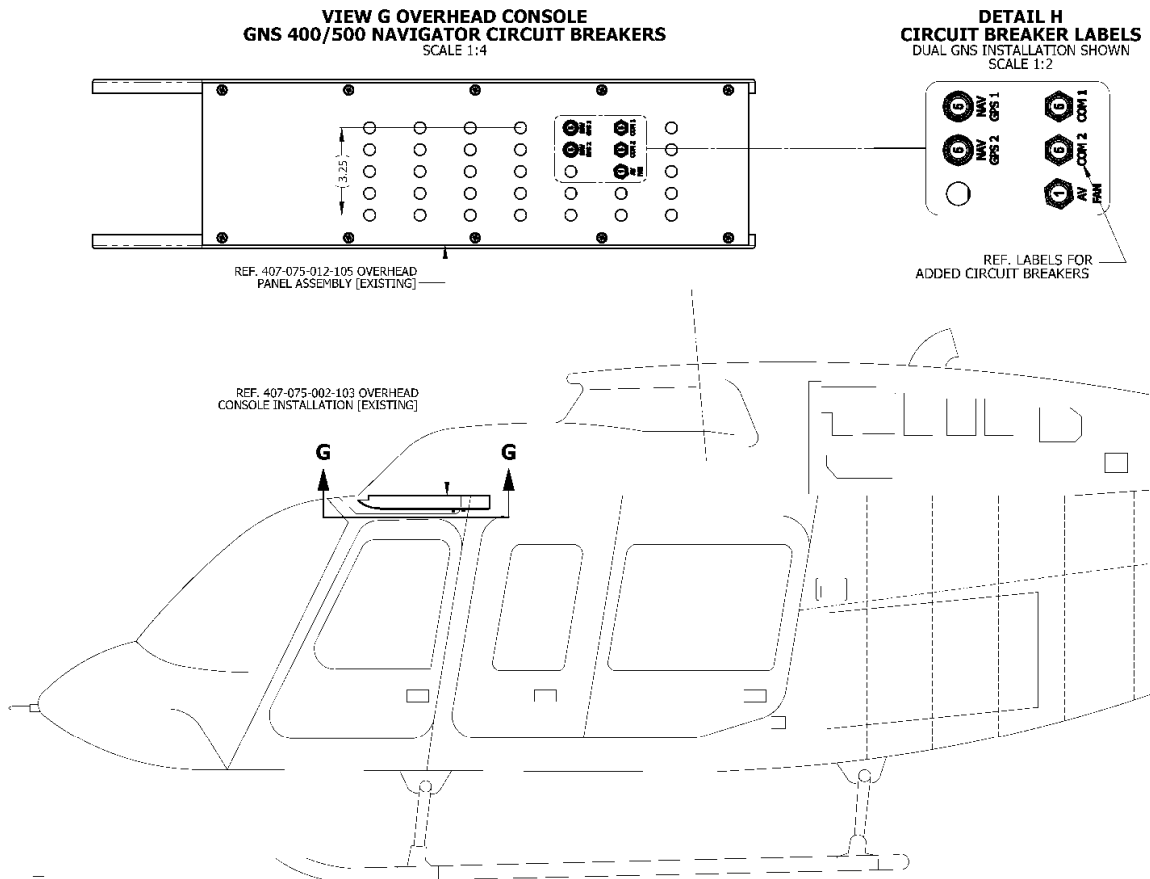
1	(1)	8	013-00103-00	GFC 3XX 3-PORT COOLING FAN
1	(1)	7	011-00351-00	CONNECTOR KIT GNS 430W GNS 430AW
-	(1)		011-00351-01	CONNECTOR KIT GNC 420W GNC 420AW
-	(1)		011-00351-03	CONNECTOR KIT GPS 400W GPS 500W
-	(1)	6	011-00676-00	BACKPLATE SUB-ASSEMBLY 400W SERIES NAVIGATOR
1	-	5	011-00671-00	BACKPLATE SUB-ASSEMBLY 500W SERIES NAVIGATOR
1	-	4	115-00345-00	MOUNTING RACK 500W SERIES NAVIAGATOR
-	1	3	115-00243-00	MOUNTING RACK 400W SERIES NAVIAGATOR
-	(1)	2	011-01061-XX	GNS 430AW NAVIGATOR
			011-01060-XX	GNS 430W NAVIGATOR
			011-01059-XX	GNC 420AW NAVIGATOR
			011-01058-XX	GNC 420W NAVIGATOR
			011-01057-XX	GPS 400W NAVIGATOR
1	-	1	011-01066-XX	GNS 530AW NAVIGATOR
			011-01064-XX	GNS 530W NAVIGATOR
			011-01062-XX	GPS 500W NAVIGATOR
5XX	4XX	ITEM NO.	PART NUMBER	DESCRIPTION
QTY.				

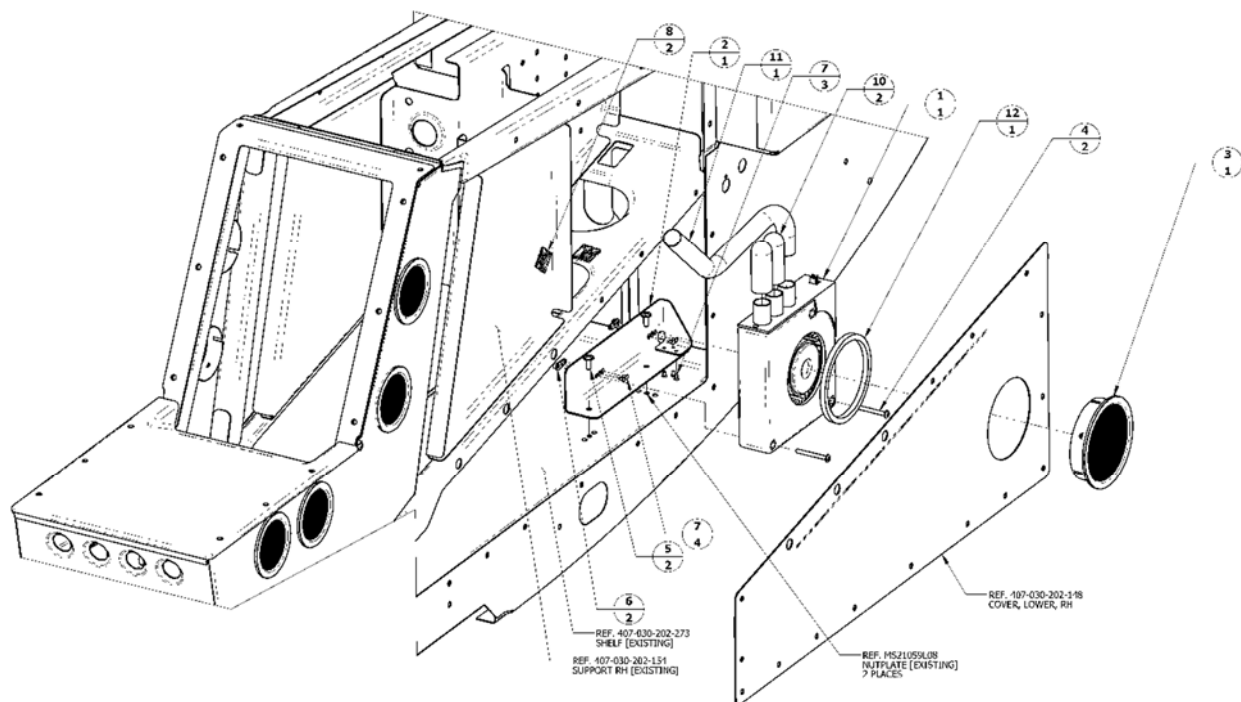
This STC also provides the data for installation of optional HTAWS annunciators and optional cyclic stick switches for remote control of COM and HTAWS functions.

The 500W Series unit can interface to the Garmin G500H system GDU 620 PFD/MFD for display of navigation information and HTAWS annunciation.

Rotorcraft modified under this STC are restricted to VFR only, including rotorcraft that may not have previously been restricted to VFR. To clarify this operation limitation, a placard with the text, "APPROVED FOR DAY/NIGHT VFR" is required to be in the pilot's view.

The installed equipment is connected to an avionics bus that receives power as soon as the battery and avionics master switches are turned on. Circuit breakers are installed in the panel located in existing overhead console, as shown below (Note: circuit breakers for dual navigator installation are shown).

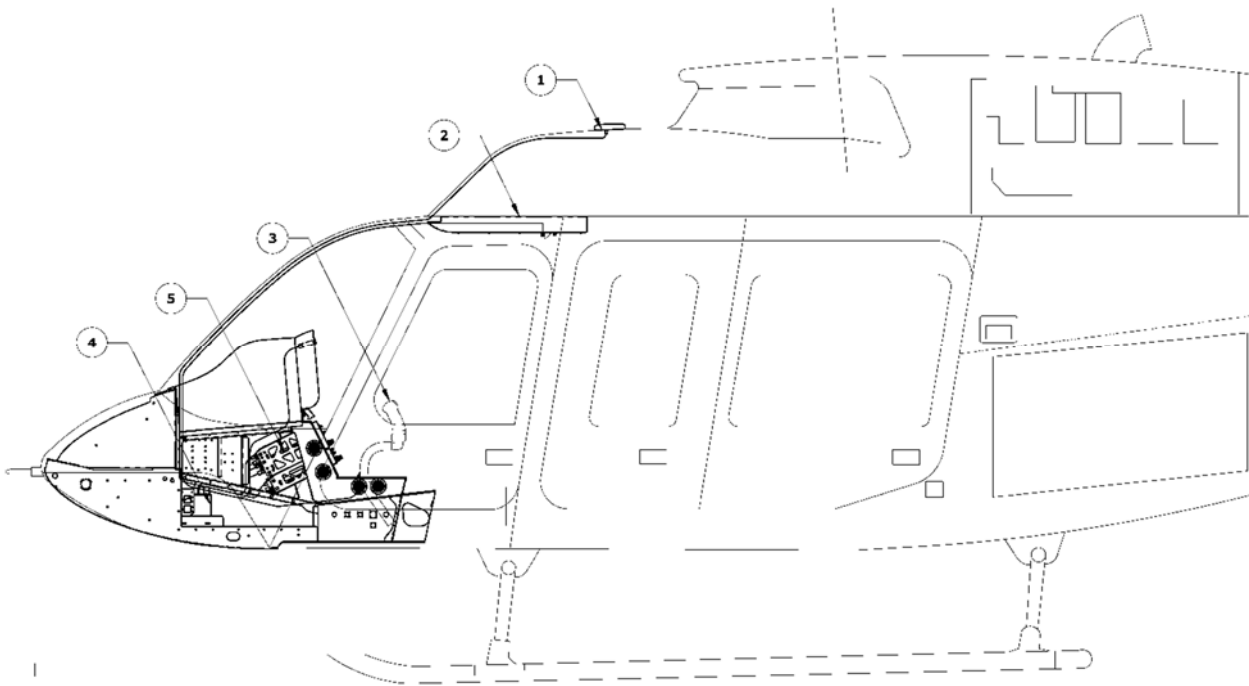




A/R	13	MIL-A-46106	ADHESIVE SEALANT, SILICONE RTV, ONE COMPONENT	
1 FT	12	MIL-R-6130	SILICONE SPONGE, MEDIUM DENSITY, GENERAL PURPOSE	
2 FT	11	5700-1	AIRDUCT, FLEXIBLE, 5/8 INCH	EDMO
2	10	218089	CAP, EPDM, ID 0.625 [STOCKCAP.COM]	
5	9	MS3367-3	STRAP, TIEDOWN, ELECTRICAL COMPONENTS, ADJUSTABLE, SELF CLINCHING, PLASTIC	
2	8	MB3APT	MOUNTING BASE, CABLE TIE, HIGH TEMPERATURE, HEAVY BOND ADHESIVE	TYTON
7	7	MS20426AD3-3	RIVET, SOLID, COUNTERSUNK 100 DEG. PRECISION HEAD, 3-32 IN OD, 3/16" LONG	
2	6	MS21071L06	NUT, SELF LOCKING, PLATE, ONE LUG, REDUCED RIVET SPACING, LOW HEIGHT, 0.1380-32UNC-3B	
2	5	AN525-832R6	SCREW, WASHER HEAD, CROSS-RECESSED, 0.1640-32UNC-3A, 3/8 INCH LONG	
2	4	MS51957-37	SCREW, MACHINE, PAN HEAD, CROSS-RECESSED, CRES, 0.1380-32UNC-2A	
1	3	011-02558-00	LOUVER, ROUND, SCREENED, 3-INCH, BLACK, FAA-PMA	GARMIN
1	2	190-01226-10-01	BRACKET, COOLING FAN	
1	1	013-00103-00	AVIONICS COOLING FAN WITH FAULT DETECTION	GARMIN
QTY.	ITEM NO.	PART NUMBER	DESCRIPTION	SUPPLIER

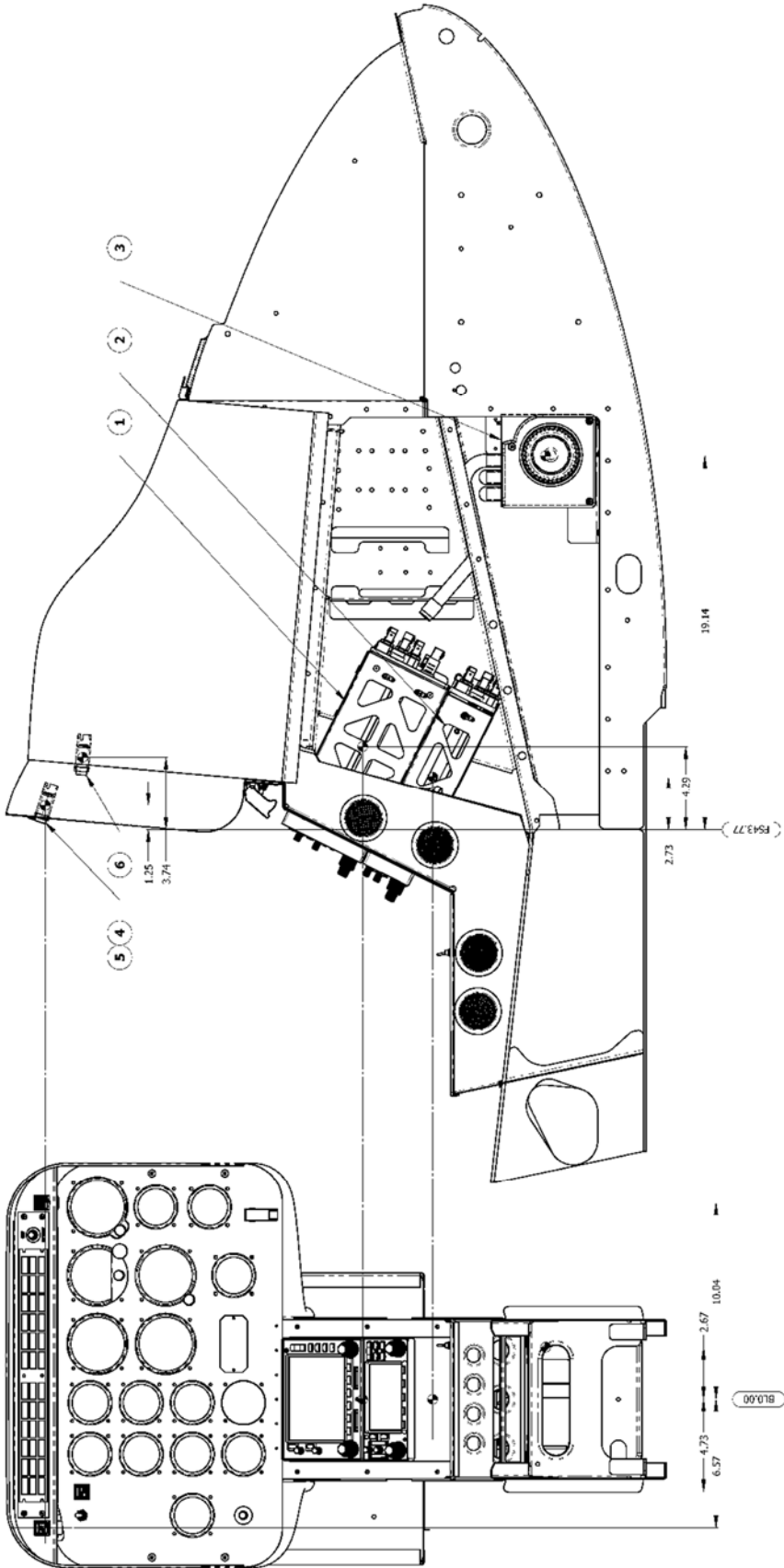
The installed 500W Series equipment can be accessed as described below:

LRU Access: Bell models 407



1. GA 35/36/37 ANTENNA: FS84.0 for dual antenna installation; FS79.0 for single antenna installations. Remove environmental seal, remove four antenna screws and lift the antenna enough to disconnect antenna connector.
2. OVERHEAD CIRCUIT BREAKER PANEL: Remove studs securing circuit breaker panel to rotorcraft overhead console to access unit circuit breakers
3. CYCLIC CONTROL GRIPS: remove by extracting mounting screw at bottom of grip.
4. COOLING FAN: FS24.63 Access by removing 407-030-202-148 COVER, LOWER, RH. Remove two screws, disconnect connector and air duct.
5. 500W SERIES UNIT: FS39.5 Access or remove by using a 3/32 allen head screwdriver to loosen the locking mechanism through the access hole on the front of the unit. Note: location may vary slightly depending whether or not a dual navigator system is installed.

2.2.1 Weight and Balance Information



7	GA 37 GPS/WASS + XM ANTENNA	013-00245-00	0.50	79.00 [84.00]	39.50 [42.00]	0.00 [5.00]	0.00 [2.50]
	GA 36 GPS/WASS ANTENNA	013-00244-00	0.47		37.13 [39.48]		0.00 [2.35]
	GA 35 GPS/WASS ANTENNA (UNIT ONLY)	013-00235-XX					
6	SWITCH, RP MODE, HTAWS	LED-41-11-BB-E11ND	0.06	40.03	2.40	-4.73	-0.28
5	STATUS ANNUNCIATOR, HTAWS	485-00003-01		42.52	2.55	10.04	0.60
4	CAUTION AND WARNING INDICATOR, HTAWS	LED-40-17-BB-E11R9				-6.57	-0.39
3	GFC X33 3-PORT COOLING FAN	013-00103-00	0.70	29.92	20.94	2.67	1.87
2	GNS 430AW NAVIGATOR	011-01061-XX	6.20	41.04	254.45	0	0
	GNS 430W NAVIGATOR	011-01060-XX					
	GNC 420AW NAVIGATOR	011-01059-XX	5.50		225.72		
	GNC 420W NAVIGATOR	011-01058-XX					
	GPS 400W NAVIGATOR	011-01057-XX					
1	GNS 530AW NAVIGATOR	011-01066-XX	8.20	39.48	323.74	0	0
	GNS 530W NAVIGATOR	011-01064-XX					
		GPS 500W NAVIGATOR	011-01062-XX		6.80		
ITEM	DESCRIPTION	PART NUMBER	WEIGHT [LB]	ARM [IN]	MOMENT	ARM [IN]	MOMENT
				LONGITUDINAL		LATERAL	

- [1] Rotorcraft weight and balance is required after installation of the 500W Series Unit. Refer to the 500W Rotorcraft STC Installation Manual listed in paragraph 2.1 of this document, for additional information, including overall size and center of gravity location of all LRUs.
- [2] The longitudinal arm is measured in terms of the fuselage station (FS).
- [3] The lateral arm is measured in terms of the butt line (BL). The centerline of the helicopter is BL0.00. The moment arms to the left side (looking forward) are negative (-) and the moment arms to the right side are positive (+).
- [4] Location of the 500W Series unit and GPS antenna may vary slightly depending whether or not a dual navigator system is installed.
- [5] FS and BL numbers in square brackets apply to dual antenna installation.
- [6] GNS navigator weight includes the unit, unit mounting rack, back plate, and connectors

2.3 Control, Operating Information

See the Pilot's Guides or the 500W Rotorcraft STC Installation Manual for system operation and self-test information. The 500W Rotorcraft STC Installation Manual is listed under the reference documentation in paragraph 2.1 of this document, and the Pilot's Guides are listed in the related documents section of the 500W Rotorcraft STC Installation Manual.

2.4 Servicing Information

None. In the event of system failure, troubleshoot the 500W Series unit in accordance with Section 2.6.

2.5 Periodic Maintenance Instructions

The 500W Series units are designed to detect internal failure. A thorough self-test is executed automatically upon application of power to the units, and built-in test is continuously executed. Detected errors are indicated on the equipment via failure annunciations.

Maintenance of the components installed by this STC is on condition, except as noted in the following table.

Table 1 Periodic Maintenance Inspections

Item	Interval	Description/Procedure
500W Series Unit	12 Months	Conduct a visual inspection (look for signs of wear, deterioration, or damage to wires, backshells, or connectors) of the 500W Series unit and wiring harnesses to ensure installation integrity: 1. Inspect the unit for security of attachment. 2. Inspect all knobs and buttons for legibility. 3. Inspect condition of wiring, routing and attachment/clamping. 4. Inspect related antennas for proper sealing and attachment. 5. Inspect integrity of shield terminations. 6. Inspect for signs of corrosion on equipment, racks and it's backplates and rack mounting.
500W Series Mounting Rack	12 Months	Inspect the mounting rack for any signs of excessive wear, corrosion, or damage. Check mounting rack corners for cracks. Check integrity of connector plate attachment to the back of mounting rack. Check the tightness of fasteners attaching mounting rack to rotorcraft structure and re-torque 12 to 15 in-lbs if required. Replace unit mounting rack if any damage has been found.
Avionics Cooling Fan	12 Months	Conduct a visual inspection (look for signs of wear, deterioration, or damage to wire harness and connector) of the cooling fan to ensure installation integrity. Inspect for signs of corrosion on equipment and mounting bracket.
500W Series Mounting Rack	Every 2000 flight hours or ten (10) years, whichever is first	Perform an electrical bonding test: 1. Remove 500W Series unit from mounting rack 2. Measure the resistance between the mounting rack and a nearby exposed portion of aircraft metallic structure and verify it is less than 10 milliohms. In the event of a bonding test failure, remove the rack and verify that the countersunk areas around the holes that are used to attach the rack are free of corrosion or other debris. Clean countersunk areas using an approved solvent per Bell specification BHT-ELEC-SPM CHP8. Reattach the rack and re-verify the resistance between the mounting rack and nearby exposed portion of aircraft metallic structure and ensure that the resistance is less than or equal to 2.5 milliohms. Reinstall the 500W Series unit in the mounting rack.

Item	Interval	Description/Procedure
GPS Antennas (Only if antenna is installed by this STC)	Every 2000 flight hours or ten (10) years, whichever is first	Perform an electrical bonding test on antennas installed by this STC: 1. Disconnect coaxial cable(s) from the antenna connector(s). 2. Measure the resistance between the antenna connector and a nearby exposed portion of the antenna foil ground plane. 3. Verify the resistance is equal to or less than 10 milliohms. 4. Reconnect the coaxial cable(s) to the antenna connector(s) and ensure it is secured. In the event of bonding test failure, remove antenna, and clean and prepare the hardware mating surfaces as follows: Clean countersunk areas of the antenna. Clean countersunk areas using an approved solvent per Bell Specification BHT-ELEC-SPM, CHP 8. Reinstall using unit replacement procedures contained in the installation drawing listed in paragraph 2.1 of this document. Any reworked antenna installation shall have a resistance of less than or equal to 2.5 milliohms.
HTAWS Annunciators (if installed)	Every 2000 flight hours or ten (10) years, whichever is first	Perform an electrical bonding test: 1. Measure the resistance between the metallic body of each Visisun annunciator and the console assembly and verify that the resistance is less than or equal to 20 milliohms. In the event of bonding test failure: 1. Inspect the grounding strap which is installed between the annunciator panel and the instrument panel. Ensure that the fastener hardware is secure and that the strap is not damaged. If damaged, replace the bonding strap. For annunciator installation with annunciator mounted in instrument panel verify mating surfaces are clean and free of corrosion. 2. If problem persists, remove the bonding strap and clean the mating surfaces of the bonding strap and annunciator/instrument panel per Bell specification BHT-ELEC-SPM CHP8. For installations with the annunciator mounted in instrument panel clean the mating surfaces. 3. Reinstall the bonding strap (or annunciator when mounted in instrument panel) and verify that the resistance between the annunciators and the console assembly after prepping bonding surface is less than 10 milliohms.

2.5.1 Cleaning the Front Panel

The front bezel, keypad, and display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical-cleaning agents. Care should be taken to avoid scratching the surface of the display.

2.5.2 Display Backlight

The display backlight lamp is rated by the manufacturer as having a usable life of 20,000 hours. This life may be more or less than the rated time depending on the operating conditions of the 500W Series unit. Over time, the backlight lamp may dim and the display may not perform as well in direct sunlight

conditions. The user must determine by observation when the display brightness is not adequate. Contact the Garmin factory repair station when the backlight lamp requires service.

2.5.3 Battery Replacement

The 500W series has an internal keep-alive battery that will last about 10 years. The battery is used for GPS system information. Regular planned replacement is not necessary. The 500W series will display a 'low battery' message when replacement is required. Once the low battery message is displayed, the battery should be replaced within 1 to 2 months.

If the battery is not replaced and becomes totally discharged, the 500W Series unit will remain fully operational, but the GPS signal acquisition time may be increased. This acquisition time can be reduced by entering a new seed position each time the unit is powered on. There is no loss of function or accuracy of the 500W Series unit with a dead battery.

The battery must be replaced by the Garmin factory repair station or factory authorized repair station.

2.6 Troubleshooting Information

If error indications are displayed on the 500W series unit, consult the Troubleshooting section contained below:

Table 2 Troubleshooting Guide

Problem	Possible Cause	Solution
The 500W Series unit does not power on.	The unit is not getting power to the main connector P5001.	Make sure power is connected to the main 78-pin connector P5001, pins 19 and 20 and ground to P5001, pins 77 and 78. Check circuit breakers and main avionics switch.
The 500W Series unit does not compute a position.	Not receiving signals.	Check the GPS antenna connections. Make sure the aircraft is clear of hangars, buildings, trees, etc.
		Wait 20 minutes for unit to complete cycle.
GPS signal levels drop when avionics are turned on.	Noise interference from other avionics.	Turn all avionics off, then turn on each piece one at a time to isolate the source of the interference. Route GPS cable and locate GPS antenna away from sources of interference.
The GPS signal levels are very low.	Improper antenna installation or coax routing.	Check GPS antenna installation, connections, and cable routing. The GPS antenna must be mounted on the top of the aircraft.
	Antenna shaded from satellites.	Make sure the aircraft is clear of hangars, buildings, trees, etc.
	RF interference at 1575.42 MHz from VHF COM.	Move GPS antenna further from the COM antenna. Add a 1575.42 MHz notch filter in COM coax. Fix or replace the COM. Disconnect the ELT antenna coax to check for possible re-radiation.

Problem	Possible Cause	Solution
The 500W Series unit does not transmit.	• The PTT input is not being pulled low.	• Check that the PTT (mic key) input is pulled low for transmit.
	• No transmit power to the COM.	• Make sure power input is connected to the COM 25-pin connector P5002 11 and 12 and ground to P5002 21 and 22.
	• The input voltage is too low.	• Increase input supply voltage to >12VDC. (>24VDC for 530AW models)
The sidetone level is too low or too high.	• Wrong type of headsets, or level needs adjustment.	• If necessary, adjust the sidetone level. Sidetone adjustment is found on the COM Setup page.
OBS Resolver won't calibrate.	• Incompatible resolver or improper connection.	• Check the resolver specifications and wiring.
OBS indication on 500W Series unit does not agree with OBS setting.	• 500W Series unit resolver input not calibrated correctly. • Resolver has not been calibrated.	• Check wiring and calibration.
500W Series unit is not receiving heading from compass system (ARINC 429 heading input used)	• ARINC 429 input port speed not correct	• Check ARINC 429 input port speed setting for port that device is connected to and verify that the speed is correct for that device.
	• Wiring connections are incorrect.	• Check wiring.
RMI pointer does not indicate correctly	• Desired RMI source has not been selected.	• Check the OBI source selection on the Main CDI/OBS Config page.
	• Wiring connections are incorrect.	• Check wiring.
Tuning data not updating DME	• Incorrect configuration.	• Check the DME Channel Mode on the VOR/LOC/GS CDI page.
	• Wiring connections are incorrect.	• Check wiring.
ARINC 429 device is not receiving data from the 500W/530W.	• 500W Series unit ARINC 429 output not configured correctly.	• Check ARINC 429 output port setting for port that device is connected to.
	• ARINC 429 input port speed not correct	• Check ARINC 429 input port speed setting for port that device is connected to and verify that the speed is correct for that device.
	• Wiring connections are incorrect.	• Check wiring.

Problem	Possible Cause	Solution
RS-232 device is not communicating with the 500W/530W.	• 500W Series unit RS-232 port not configured correctly.	• Check RS-232 port setting for port that device is connected to.
	• Improper setup on the remote device.	• Verify the configuration of the other device.
	• Device not compatible, or improper connection.	• Verify 500W Series unit RX is connected to remote device TX and 500W Series unit TX is connected to remote device Rx.
	• Multiple TX lines connected together.	• Verify that there is only one TX source per RX port.
	• Wiring connections are incorrect.	• Check wiring.
Fan Fail Annunciation.	• Wiring connections are incorrect.	• Check wiring.
	• Fan has failed.	• Replace fan.

2.6.1 500W Series Alerts

The 500W Series will display a number of alerts. These are listed in the following table.

Table 3. 500W Series Alert Troubleshooting Guide

Alert Text	Possible Cause	Solution
ADS-B traffic has failed	The ADS-B traffic system may have lost GPS position or detected an internal fault.	- Check the applicable ADS-B traffic source status page in Aux mode - Contact Garmin technical support.
ADS-B transmit has failed	ADS-B unit is not able to transmit a message due to a failure with the ADS-B system or antenna(s).	Check system and antenna wiring. If problem persists contact Garmin technical support.
ADS-B is not transmitting position	The ADS-B unit has detected a position input fault.	Verify GPS position source is functional. If problem persists contact Garmin technical support.
ADS-B fault - Check ADS-B Status Page	An equipment fault has been detected.	Contact Garmin technical support.
ADS-B - Connection has been lost	The GNS is configured for a traffic device but is not receiving data from it. Traffic will not be displayed on the GNS.	Verify traffic system is configured correctly. If problem persists contact Garmin technical support.
ADS-B Traffic Alerting not available	The ADS-B traffic system is reporting that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable.	Ensure the aircraft has a clear view of the sky. If problem persists contact Garmin technical support.
Airport terrain database integrity error	The 500W Series unit has detected a problem with a database on the Terrain data card. The message "<database name> database integrity error" indicates the data base in error.	The data is not usable, try reloading the information onto the card. If that does not solve the problem replace the card.
Audio database error out of date or missing	The 500W-series unit has detected a problem with the built-in HTAWS Audio Data-base. HTAWS audio alerts are not available.	Contact Garmin technical support.
Aviation database integrity error	The 500W Series unit has detected a problem with a database on the NavData® card. The message "<database name> database integrity error" indicates the data base in error.	The data is not usable, try reloading the information onto the card. If that does not solve the problem replace the card.
Basemap database integrity error	The 500W Series unit has detected a failure in the built-in basemap (land data) database. Land data does not appear on the Map Page. Other unit functions continue to work normally.	Reload the Basemap database
Boot block verify failed - Return unit for repair	System integrity testing has determined that the boot block has become corrupted.	Contact Garmin technical support.
CDI key stuck	The CDI key is stuck in the enabled (or "pressed") state. Try pressing the CDI key again to cycle its operation.	Contact Garmin technical support.

Alert Text	Possible Cause	Solution
CDI key disabled	• “Ignore CDI key” has been selected on the MAIN CDI/OBS CONFIG page.	• Go to the MAIN CDI/OBS CONFIG page and deselect “Ignore CDI key”
Check unit cooling	• The 500W Series unit has detected excessive display backlighting temperature. The backlighting has been automatically dimmed to reduce the temperature.	• Check for adequate ventilation or check cooling airflow. Refer to Section 2.7 of the Installation Manual.
COM has failed (530W only)	• The unit has detected a failure in its communications transceiver.	• Contact Garmin technical support.
COM is not responding (530W only)	• Internal system-to-system communication between the main processor and the COM transceiver has failed. Operational status of the COM transceiver is unknown.	• Contact Garmin technical support. If the COM board is still working, it will automatically tune to 121.500 MHz. Transmit and receive functions may still operate regardless of the displayed frequency.
COM needs service (530W only)	• The unit has detected a failure in its communications transceiver. The COM transceiver may still be usable.	• Contact Garmin technical support
COM push-to-talk key stuck (530W only)	• The external push-to-talk (PTT) switch is stuck in the enabled (or “pressed”) state.	• Try pressing the PTT switch again to cycle its operation.
	• Wiring is incorrect.	• Check Wiring
COM remote transfer key is stuck (530W only)	• The remote COM transfer switch is stuck in the enabled (or “pressed”) state.	• Try pressing the switch again to cycle its operation.
		• Verify the wiring is correct.
		• If the message persists, contact Garmin technical support.
COM transfer key stuck (530W only)	• The COM flip-flop key is stuck in the enabled (or “pressed”) state.	• Try pressing the switch again to cycle its operation.
		• If the message persists, contact Garmin technical support.
COM transmitter power has been reduced (530W only)	• The unit has detected excessive unit temperature. The COM transceiver transmit power has been automatically reduced to compensate for the condition.	• Check for adequate ventilation or check cooling airflow. Refer to Section 2.7 of the Installation Manual.
	• Insufficient voltage level	• Check the input voltage
Configuration error - Config service req'd	• The configuration information has been lost or corrupted.	• Reconfigure the unit
Data transfer cancelled (crossfill is busy)	• An attempt to transfer flight plan data during a unit-to-unit crossfill was cancelled.	• The host unit is busy. Wait until any previous crossfill operation is complete, before reattempting the transfer.
Data transfer cancelled (data invalid)	• An attempt to transfer a single user waypoint during a unit-to-unit crossfill was cancelled. No waypoint was specified on the Crossfill Page.	• Select a user waypoint and re-attempt the transfer.

Alert Text	Possible Cause	Solution
Data transfer cancelled (version mismatch)	•An attempt to transfer data during a unit-to-unit crossfill was cancelled. The database versions of the two 500W-series unit are not identical.	• If necessary, update the database(s) so they match.
Data transfer error, please re-transmit	•An error was detected during unit-to-unit crossfill of user data (user waypoints and/or flight plans).	• The data transfer should be re-attempted.
Display backlight failure	•The 500W Series unit has detected a failure in the display backlighting.	• Contact Garmin technical support.
Do not use for navigation	•The 500W Series unit is in Demo Mode and must not be used for actual navigation.	• Check that the DEMO MODE SELECT pin, P5001 Pin 75, is not connected.
G/S has failed (530W only)	•The unit has detected a failure in its glideslope receiver.	• Contact Garmin technical support.
G/S is not responding (530W only)	•Internal system-to-system communication between the main processor and the glideslope receiver has failed. Operational status of the glideslope receiver is unknown.	• Contact Garmin technical support.
G/S needs service (530W only)	•The unit has detected a failure in its glideslope receiver. The glideslope receiver may still be usable.	• Contact Garmin technical support.
GDL 69 is not responding	•No data is being received from the GDL 69.	• Check for proper configuration
		• Check wiring
		• Contact Garmin technical support.
GDL 88 ADS-B traffic has failed	•The GDL 88 is reporting that it has a problem processing ADS-B traffic data. The traffic picture may be degraded.	• Refer to the GDL 84H/88H STC Installation Manual.
GDL 88 Traffic Alerting not available	•The GDL 88 is reporting to the GTN that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable.	• Ensure the aircraft has a clear view of the sky. If problem persists contact Garmin technical support.
GDL 88 Connection has been lost	•The GNS unit cannot communicate with the datalink	• Check for proper configuration
		• Ensure the GDL 88 is powered up
		• Check wiring
GDL 88 ADS-B transmit has failed	•The GDL 88 is not able to transmit an ADS-B message due to a failure with the GDL 88 system or antenna(s)	• Check the GDL 88 status page in Aux mode
		• Refer to the GDL 84H/88H STC Installation Manual
GDL 88 ADS-B is not transmitting position	•The GDL 88 has detected a position input fault	• Refer to the GDL 84H/88H STC Installation Manual
GDL 88 ADS-B fault - Check GDL 88 Status Page	•The GDL 88 has detected an equipment fault	• Check the GDL 88 status page in Aux mode
		• Refer to the GDL 84H/88H STC Installation Manual
	•GPS antenna cable is shorted	• Verify that the center conductor is not shorted to the braid in the coaxial cable.

Alert Text	Possible Cause	Solution
GPS is not responding – check GPS antenna (main software version 3.20 and later).	Internal system-to-system communication between the main processor and the GPS receiver has failed. Operational status of the GPS receiver is unknown.	Contact Garmin technical support.
GPS needs service	The 500W Series unit has detected a failure in its GPS receiver.	Contact Garmin technical support.
GTN transfer canceled, version mismatch	The protocol version or database version don't match between the GTN and GNS units	Load the most current cycles of the navigation database to each unit
Insufficient Terrain Database Resolution	The installed terrain database does not have sufficient resolution to support HTAWS	Load a 6 arc second terrain database
Large magnetic variance	- A valid value of magnetic variation is not available for this location. - Verify all course angles	Contact Garmin technical support.
Loss of integrity — cross-check NAV	Improper antenna installation or coax routing	Check GPS antenna installation, connections, and cable routing. The GPS antenna must be mounted on the top of the aircraft.
	Antenna shaded from satellites	Make sure the aircraft is clear of hangars, buildings, trees, etc.
	RF interference at 1575.42 MHz from VHF COM.	Move GPS antenna further from the COM antenna. Add a 1575.42 MHz notch filter in COM coax. Fix or replace the COM. Disconnect the ELT antenna coax to check for possible re-radiation.
Low Battery - Unit Needs Service	Time data may have been lost due to a memory battery failure.	Contact Garmin technical support.
MAIN processor requires service	The 500W Series unit has detected a failure in the main system processor.	Contact Garmin technical support.
No altitude input is being received	No altitude data is being received from RS-232 (Serializer: Icarus, Rosetta or Shadin) or grey code inputs.	Refer to Table 2 "RS-232 device is not communicating with the 500W/530W".
No basemap data available	The 500W Series unit has detected a failure in the built-in basemap (land data) memory. Land data does not appear on the Map Page. Other unit functions continue to work normally.	Contact Garmin technical support to reload the basemap data.
Not receiving input data on 429 Channel #1 or #2	No data has been received on the ARINC 429 channel #1 connection for a period exceeding five seconds.	Refer to Table 2 "ARINC 429 device is not receiving data from the 500W/530W"
Not receiving input data on 232 Channel #(1 through 5)	No data has been received on one (or more) of the RS-232 channel connections for a period exceeding ten seconds.	Refer to Table 2 "RS-232 device is not communicating with the 500W/530W"
Not receiving traffic data	No traffic data is being received.	Check for proper configuration
		Check the wiring

Alert Text	Possible Cause	Solution
		• Contact Garmin technical support.
NRST key stuck (GPS 500 only)	• The NRST key is stuck in the enabled (or “pressed”) state.	• Try pressing the NRST key again to cycle its operation. If problem persists contact Garmin technical support.
OBS key stuck	• The OBS key is stuck in the enabled (or pressed) state. Try pressing the OBS key again to cycle its operation.	• Contact Garmin technical support.
OBS not available	• No destination waypoint has been selected.	• Select a waypoint
	• The GPS receiver cannot currently determine its position.	• Refer to Table 2 “The 500W Series unit does not compute a position.”
Obstacle database integrity error	• The 500W Series unit has detected a problem with a database on the Terrain data card.	• The data is not usable. Try reloading the information onto the card. If that does not solve the problem replace the card.
RAIM position warning	• Although sufficient GPS satellite coverage may exist, Receiver Autonomous Integrity Monitoring (RAIM) has determined the information from one or more GPS satellites may be in error.	• Wait for GPS satellite geometry to improve.
Searching the sky	• The 500W Series unit is searching the sky for GPS satellites.	• Wait 20 minutes for unit to complete cycle or until the current position is located.
Stored data was lost	• All user waypoints, flight plans and system settings have been lost due to a memory battery failure or system reset.	• If system was not reset contact Garmin technical support.
TAWS has failed	• The 500W Series unit has detected a failure in its TAWS system.	• Ensure that terrain database is inserted in right most card slot.
		• Reload the terrain database.
		• Contact Garmin technical support.
TAWS inhibit key stuck	• The external TAWS inhibit key is stuck.	• Verify that the wiring is not shorted to ground.
		• Contact Garmin technical support.
TAWS mute caution key is stuck	• The external HTAWS aural suppression input is stuck	• Try pressing the TAWS mute key again to cycle its operation. If problem persists contact Garmin technical support.
TAWS reduced protection key is stuck	• The external TAWS reduced protection key is stuck	• Try pressing the TAWS reduced protection key to cycle its operation. If the problem persists contact Garmin technical support.
TERRAIN configuration conflict	• The current Terrain configuration is not supported by the hardware.	• Reconfigure the unit.
		• Reconfigure TERRAIN settings

Alert Text	Possible Cause	Solution
TERRAIN configuration has changed	The unit's terrain settings have changed since it was last turned on in normal mode.	Contact Garmin technical support
Terrain database integrity error	The 500W Series unit has detected a problem with a database on the Terrain data card.	- Reloading the information onto the card. - Replace the card.
TERRAIN has failed	The unit has detected a failure in the terrain system.	- Ensure that Terrain database is inserted in the right most card slot. - Reload the TERRAIN database. - Contact Garmin technical support.
Traffic device has failed	The 500W Series unit cannot communicate with the traffic system and/or the traffic system is reporting a system failure.	- Check for proper configuration - Check for correct wiring - Refer to the Traffic system installation manual.
Traffic device needs service	The traffic device is reporting a system failure.	Refer to the Traffic system installation manual.
User card format unknown	A data card has been inserted, but the format of the card is not recognized.	Reload the information onto the card. If that does not solve the problem replace the card.
VLOC has failed (530 only)	The GNS 530W has detected a failure in its VLOC receiver.	Contact Garmin technical support.
VLOC is not responding (530W only)	Internal system-to-system communication between the main processor and the VLOC receiver has failed. Operational status of the VLOC receiver is unknown.	Contact Garmin technical support.
VLOC needs service (530W only)	The unit has detected a failure in its VLOC receiver. The VLOC receiver may still be usable.	Contact Garmin technical support.
VLOC remote transfer key is stuck (530W only)	The remote VLOC transfer switch is stuck in the enabled (or "pressed") state.	- Try pressing the switch again to cycle its operation. - Contact Garmin technical support.
VLOC transfer key stuck (530W only)	The VLOC flip-flop key is stuck in the enabled (or "pressed") state.	- Try pressing the VLOC flip-flop key again to cycle its operation. - Contact Garmin technical support.
Stormscope device has failed	- The 400W- Series unit cannot communicate with the WX-500. - The WX-500 is reporting a system failure.	- Check for proper configuration - Check the wiring - Refer to the WX-500 installation manual for additional troubleshooting information.
Stormscope heading has failed	The WX-500 is reporting invalid heading data.	- Check for proper configuration of WX-500 - The failure may be within the WX-500 or other connected equipment.

2.7 Removal and Installation Information

If any work has been done on the rotorcraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the 500W Series unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

Whenever removing or installing units, remove power from the LRU by removing rotorcraft power or opening the LRU circuit breaker.

2.7.1 500W Series Unit

2.7.1.1 Removal

1. Insert a 3/32-inch hex drive tool into the access hole at the bottom of the unit face.
2. Rotate the hex tool counterclockwise until the unit is forced out about 3/8 inches and can be freely pulled from the rack.

2.7.1.2 Installation

1. Slide the 500W unit in the rack straight in until it stops, about 1 inch short of the final position.
2. Insert the hex drive tool into the access hole at the bottom of the unit face.
3. Rotate the hex tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.

NOTE



The installation configuration and user settings are stored internally in the 500W Series unit, and will be lost when the 500W Series is replaced with a new unit.

Original 500W Series unit is Reinstalled

If the original 500W Series is reinstalled, then no configuration is required.

New, Repaired or Exchange 500W Series is Installed

If the 500W Series unit is removed for repair and reinstalled, or if the 500W unit is removed and replaced with a different 500W Series unit, then verify the correct software versions are on the 500W Series unit as specified in the Equipment List 400W/500W Series Installation Bell 407 STC listed in paragraph 2.1 of this document. In addition, complete the 'Post Installation Configuration & Checkout Procedures' contained in the 500W Rotorcraft STC Installation Manual listed in paragraph 2.1 of this document to restore the proper installation configuration settings.

2.7.1.3 Return to Service

After removing and reinstalling the 500W Series unit per the instructions above, verify that the power-up self-test sequence is successfully completed and no failure messages are annunciated.

Note: There are no special handling requirements for the 500W Series units.

2.7.2 GA 35 GPS, GA 36 GPS, and GA 37 GPS/XM Antennas

2.7.2.1 Removal

1. Remove the screws from the outside of the rotorcraft.
2. Remove old sealant.
3. Lift the antenna off the rotorcraft and detach the coax (from the outside). If a GA 37 antenna verify coax(s) are properly labeled with correct color band. Note: GPS coax is labeled with a blue band and XM cable with a yellow band.

2.7.2.2 Installation

For GA 35, GA 36, or GA 37 GPS antenna installation, follow the installation procedures contained in the installation drawing listed in paragraph 2.1 of this document.

2.7.2.3 Return to Service

After removing and reinstalling the GPS antenna, verify the 500W Series unit power-up self-test sequence is successfully completed and no failure messages are annunciated. If the unit is unable to acquire satellites, move the rotorcraft away from obstructions which might be shading GPS reception. If the situation does not improve, check the GPS antenna installation.

2.7.3 Cooling Fan

2.7.3.1 Removal

1. Remove screws from 407-030-202-148 COVER, LOWER, RH.
2. Disconnect air duct from cooling fan port.
3. Remove 407-030-202-148 COVER, LOWER, RH.
4. Disconnect cooling fan electrical connector located next to fan cooling ports.
5. Remove two (2X) cooling fan screws and remove cooling fan.

2.7.3.2 Installation

1. Install cooling fan using removed hardware.
2. Reconnect electrical connector to cooling fan.
3. Connect air duct to cooling fan port.
4. Verifying silicone sponge foam used to seal cooling fan intake remains in place on 407-030-202-148 COVER, LOWER, RH and properly seals the fan intake to the louver installed in 407-030-202-148 COVER, LOWER, RH. Reinstall 407-030-202-148 COVER, LOWER, RH using removed fasteners.

2.7.3.3 Return to Service

After removing and reinstalling the cooling fan verify proper operation of the cooling fan. Apply power to the avionics, verify the cooling fan is operating and the FAN FAIL light on the annunciator panel is not illuminated.

2.8 Diagrams

Rotorcraft specific LRU locations and wire routing diagrams are contained in the 400W/500W Series Installation drawing Bell 407, listed in Section 2.1 of this document. Point to point wiring diagrams are in the Appendix of the 500W Rotorcraft STC Installation Manual. Refer to the GNS 500W Series Post-Installation Checkout Log retained in the rotorcraft permanent records for a list of the interfaced equipment and port configurations.

2.9 Special Inspection Requirements

2.9.1 Post-Lightning Strike Inspection

In the event of a suspected or actual lightning strike to the rotorcraft, the GA 35, GA 36, or GA 37 GPS antenna installation shall be inspected to ensure that there is no structural damage around the areas where lightning may have attached. If there is visible sign of damage to the antenna then it must be replaced.

Verify that the 500W series unit receives and displays GPS satellite information normally.

2.9.2 Post-Hard Landing Inspection

In the event of a hard landing complete all the inspections specified in Table 1 Periodic Maintenance Inspections.

2.10 Application of Protective Treatments

None, N/A.

2.11 Data Relative to Structural Fasteners

Location (see Installation Drawing)	FASTENER TYPE AND TORQUE			
	6-32 Screw 4±2 inch-pounds	6-32 Screw 12-15 inch-pounds	8-32 Screw 12-15 inch-pounds	10-32 Screw 12-15 inch-pounds
500W Unit Mounting Rack		X		
GPS Antenna				X
Cooling Fan	X			
Cooling Fan Bracket			X	

2.12 Special Tools

For electrical bonding testing, a milliohm meter is required.

2.13 Additional Instructions

None

2.14 Overhaul Period

The system does not require overhaul at a specific time period. Power on self-test and continuous BIT will monitor the health of the 500W Series unit. If the unit indicates an internal failure, the unit may be removed and replaced. See troubleshooting section 2.6 contained in this document.

2.15 ICA Revision and Distribution

To revise this ICA, a letter must be submitted to the ACO along with the revised ICA. The ACO will obtain AEG acceptance, and approve any revision to the Airworthiness Limitations in Section 3. After FAA acceptance/approval, Garmin will release the revised ICA for customer use, and provide any required notification of the revision.

The latest revision of this document will be available through any Garmin dealer or from Garmin customer assistance. A Garmin Service Bulletin, describing ICA revision, will be sent to dealers if revision is determined to be significant.

2.16 Assistance

FAA Flight Standards Inspectors or the certificate holder's PMI have the required resources to respond to questions regarding this ICA. In addition, the customer may refer questions regarding this equipment and its installation to the manufacturer, Garmin. Garmin customer assistance may be contacted during normal business hours via telephone 913-397-8200 or email from the Garmin web site at www.garmin.com.

2.17 Implementation and Record Keeping

Modification of an rotorcraft by this Supplemental Type Certificate obligates the rotorcraft operator to include the maintenance information provided by this document in the operator's rotorcraft maintenance manual and/or the operator's rotorcraft scheduled maintenance program.

3. AIRWORTHINESS LIMITATIONS

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

There are no additional Airworthiness Limitations as defined in 14 CFR § 27, Appendix A, A27.4 that result from this modification.

FAA APPROVED

 01-MAR-2017
Michael Warren Date
ODA STC Unit Administrator
ODA-240087-CE