

CHAPTER 38

AVIONICS

<u>Section</u>	<u>Title</u>	<u>Page</u>
38-10	Garmin G500H Electronic Flight Instrument System (EFIS) Installation	38.1
38-11	LRU Installation – Garmin Display Unit (GDU)	38.1
38-12	LRU Installation – GSU 75H ADAHRS	38.1
38-13	LRU Installation – GMU 44 Magnetometer	38.3
38-14	LRU Installation – GPS Installation	38.5
38-20	Garmin GTX 3X5 Transponder Installation	38.8
38-30	Garmin GMA 350Hc Audio Control Installation	38.10
38-40	Avionics for R44 Helicopter S/N 2363 & Subsequent and R44 II Helicopter S/N 13697, 13698, 13702, 13705 & Subsequent	38.11
38-41	C024 Electrical System Installation	38.11
38-42	C036 Electrical Components Installation	38.11
38-43	C058 Cyclic Grip Assembly	38.12
38-44	C800 Aspen PFD and MFD Installations	38.12
38-45	C802-2 COM Radio (Garmin GTR 225B) Installation	38.13
38-46	C803-1 ADS-B In Receiver (Garmin GDL 88) Installation	38.15
38-47	C804-15 Transponder (Garmin GTX 330 ES) Installation	38.17
38-48	C822-2 Audio Control (Garmin GMA 350H) Installation	38.20
38-49	C831 GPS (Garmin GTN 600/700 series) Installation	38.23
38-50	Optional Avionics	38.26
38-51	C807-1 King KTR 909 UHF Transceiver Installation	38.26
38-60	Avionics Software	38.29

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CHAPTER 38

AVIONICS

38-10 Garmin G500H Electronic Flight Instrument System (EFIS) Installation

The Garmin G500H is an integrated avionics display system that provides flight instrument, moving-map navigation, and additional situational awareness information to the flight crew via the Garmin Display Unit (GDU).

NOTE

Refer to Garmin G500H Instructions for Continued Airworthiness.

38-11 LRU Installation – Garmin Display Unit (GDU)

Refer to § 13-70 for GDU maintenance procedures.

38-12 LRU Installation – GSU 75H ADAHRS**A. Description**

The remote-mounted Garmin GSU 75H ADAHRS (Air Data, Attitude, and Heading Reference System) provides altitude, airspeed, attitude, and heading data to flight instrumentation.

B. Schematic

Refer to Figure 14-37 for Garmin GSU 75H ADAHRS Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker at panel.
2. Hinge left seat forward and remove C748-5 cover assembly.
3. Float ships: Remove screws securing F950-13 cover assembly to C232-3 floor and remove cover.
4. Disconnect airframe harness from GSU 75H ADAHRS at connectors.
5. Disconnect pitot and static tube fittings from ADAHRS and plug fittings.
6. Remove screws securing ADAHRS to F950-9 or F950-11 support assembly. Carefully remove ADAHRS from under left seat.

38-12 LRU Installation – GSU 75H ADAHRS (continued)

D. Installation

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker at panel.
2. Position GSU 75H ADAHRS on F950-9 or F950-11 support assembly and install screws. Verify security.
3. Remove plugs from fittings and connect pitot and static tube fittings to ADAHRS. Verify security. Perform pitot and static system leak checks per § 95-10.
4. Connect airframe harness to ADAHRS at connectors.
5. Float ships: Position F950-13 cover assembly on C232-3 floor and install screws. Verify security.
6. Push in EFIS circuit breaker (5 amp) at panel. Turn battery & avionics switches on.
7. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.
8. Install C748-5 cover assembly and hinge left seat back.

E. Scheduled Maintenance and Inspections

Refer to Garmin G500H EFIS Maintenance Manual, Section 5 Periodic Maintenance.

NOTE

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

F. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel, hinge left seat forward, and remove C748-5 cover assembly.
2. Inspect condition of and verify no obvious damage to GSU 75H ADAHRS, pitot-static tubes, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform ground checks per Part D steps 5 thru 7.

38-13 LRU Installation – GMU 44 Magnetometer**A. Description**

The GMU 44 magnetometer senses the earth's magnetic field. Data is sent to the GSU 75H ADAHRS for processing to determine aircraft magnetic heading. This unit receives power directly from the GSU 75H ADAHRS and communicates with the GSU 75H ADAHRS using an RS-485 digital interface.

B. Schematic

Refer to Figure 14-37 for GSU 75H ADAHRS Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker at panel.
2. Remove tailcone cowling per § 4.300.
3. Supporting GMU 44 magnetometer, remove hardware securing magnetometer to F950-4 bracket.
4. Remove MS21919WDG12 clamp and disconnect magnetometer harness from F951-1 harness assembly at connectors. Remove magnetometer.

D. Installation

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker at panel.
2. Position MS21919WDG12 clamp on GMU 44 magnetometer connector.
3. Install hardware securing magnetometer to F950-4 bracket. Verify security.
4. Connect F951-1 harness assembly to magnetometer harness at connectors.
5. Push in EFIS circuit breaker (5 amp) at panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.
7. Install tailcone cowling per § 4.300.

38-13 LRU Installation – GMU 44 Magnetometer (continued)**E. Scheduled Maintenance and Inspections**

Refer to Garmin G500H EFIS Maintenance Manual, Section 5 Periodic Maintenance.

NOTE

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

F Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and remove tailcone cowling per § 4.300.
2. Inspect condition of and verify no obvious damage to Garmin GMU 44 magnetometer, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel. Perform ground checks per Part D steps 5 thru 7.

38-14 LRU Installation – GPS Installation**NOTE**

Refer to Garmin GTN 600/700 Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The G500H system requires connection to at least one WAAS-enabled GPS receiver. Garmin's Wide Area Augmentation System (WAAS) utilizes ground reference stations that monitor GPS satellite data and issue correction messages which are broadcast via satellite to WAAS-enabled GPS receivers, improving accuracy, integrity, and availability.

One GTN 700-series, or one or two GTN 600-series, GPS(s) may be installed in the G060 upper console.

Also refer to § 38-49 for Garmin GTN 600/700 GPS Installation.

B. Schematic

Refer to Figure 14-38 for GTN 600/700 GPS Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required at panel.
2. Loosen radio key securing GTN 600/700 GPS(s) to tray in upper console.
3. Carefully unplug/remove GPS(s) from tray.

D. Installation

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required at panel.
2. Carefully plug-in/install GTN 600/700 GPS(s) in appropriate location in tray in upper console.
3. Tighten radio key securing GPS(s) to tray. Verify equipment security.
4. Push in GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required at panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTN 600/700 Pilot's Guide. Turn battery & avionics switches off.

38-14 LRU Installation – GPS Installation (continued)**E. Antenna**

Refer to § 16-70 for antenna locations & R44 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on number of COM installations and additional equipment installed.

Removal

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required at panel.
2. Using plastic scraper, remove B270-1 sealant from around GPS antenna at corners where it attaches to tailcone.
3. Disconnect antenna cable from antenna. As required, remove B270-13 sealant from fastener holes. Remove hardware securing antenna (and D322-3 spacers for NAV) to tailcone (or chin for glideslope) and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required at panel.
2. a. For GPS antenna:
 - i. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
 - ii. As required, apply light coat B270-13 sealant to screw threads and install screws securing antenna to tailcone. As required, seal around screw heads and fill fastener holes using B270-13 sealant and allow to dry. Verify security.
 - iii. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.
- b. For NAV antenna:
 - i. Install hardware and D322-3 spacers (slots down) securing antenna to tailcone. Verify security.
- c. For glideslope antenna:
 - i. Install screws securing antenna to chin. Verify security.
3. Connect antenna cable(s) to antenna. Verify security.
4. Perform ground checks per Part D steps 4 and 5.

38-14 LRU Installation – GPS Installation (continued)**F. Scheduled Maintenance and Inspections****NOTE**

All factory-installed Garmin units are “on condition” and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to GPS(s), copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

38-20 Garmin GTX 3X5 Transponder Installation**NOTE**

Refer to Garmin GTX 3X5 ADS-B Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The Garmin GTX 3X5 have Extended Squitter (ES) ADS-B Out broadcast capability with options for a built-in WAAS GPS (ADS-B compliant).

The GTX 345 includes ADS-B In (traffic and weather) and Bluetooth® to transmit ADS-B data to wireless devices. Requires an independent display (such as GTN 600/700 GPS or wireless device) to view ADS-B In data.

B. Schematic

Refer to Figure 14-27 for Garmin GTX 3X5 Transponder Installation electrical schematic.

C. Removal

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker at panel.
2. Loosen radio key securing GTX 3X5 transponder to avionics tray.
3. Carefully unplug/remove transponder from tray.

D. Installation

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker at panel.
2. Carefully plug-in/install GTX 3X5 transponder in appropriate location in avionics tray.
3. Tighten radio key securing transponder to tray. Verify equipment security.
4. Push in XPDR (3 amp) circuit breaker at panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTX 3X5 ADS-B Maintenance Manual and Instructions for Continued Airworthiness. Turn battery & avionics switches off.

38-20 Garmin GTX 3X5 Transponder Installation (continued)**E. Antenna**

Refer to § 16-70 for antenna locations & R44 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on optional equipment installed.

Removal

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker at panel.
2. Using plastic scraper, remove B270-1 sealant from around transponder antenna at corners where it attaches to B322-12 doubler.
3. Remove screws securing doubler to cabin skin and disconnect antenna cable from antenna. Remove hardware securing doubler to antenna and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out XPDR (3 amp) circuit breaker at panel.
2. Remove paint & primer from between cabin skin and B322-12 doubler to ensure electrical ground.
3. Install hardware securing transponder antenna to doubler. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to doubler and allow to dry.
4. Connect antenna cable to antenna and install screws securing mounting plate to cabin skin. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections**NOTE**

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

38-20 Garmin GTX 3X5 Transponder Installation (continued)**G. Special Maintenance and Inspections**

1. Turn battery & avionics switches off. Open circuit breaker panel.
2. Remove GTX 33 transponder per Part C. Inspect condition of and verify no obvious damage to transponder, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing.
3. Secure circuit breaker panel. Install transponder per Part D.

38-30 Garmin GMA 350Hc Audio Control Installation**NOTE**

Refer to Garmin GMA 350Hc Maintenance Manual and Instructions for Continued Airworthiness.

A. Description of New Features

The Garmin GMA 350Hc audio control is a GMA 350H (refer to § 38-48) with Bluetooth® wireless technology.

B. Schematic

Refer to Figure 98-14 for Garmin GMA 350Hc Audio Control Installation electrical schematic.

C. Maintenance

Refer to § 38-48 C822-2 Audio Control (Garmin GMA 350H) Installation for maintenance instructions.

38-40 Avionics for R44 Helicopter S/N 2363 & Subsequent and R44 II Helicopter S/N 13697, 13698, 13702, 13705 & Subsequent**38-41 C024 Electrical System Installation****A. Description**

The main switch panel has rocker-style switches and is located above the radios on the avionics panel. An avionics master switch, located in the main switch panel near the alternator and battery switches, controls a relay which interrupts power to the avionics bus (system is fail-safe ON). The clutch actuator switch, the ignition switch, and also the clock are located on the upper console near the primary instruments. The outside air temperature/voltmeter is located on the upper console lower panel.

B. Schematic

Refer to Figure 14-21 for C024 electrical system schematic.

38-42 C036 Electrical Components Installation**A. Description****1. Instrument Lighting**

A light at the top of the windshield illuminates the instruments. Instrument lighting is active when the nav lights switch is on; a dimmer knob above the switch adjusts brightness.

a. LED-lamp replacement

- i. Remove hardware securing G196-6 light assembly to windshield stiffener. Remove two cap screws securing cover and LED-lamp assembly to housing. Disconnect lamp wires from airframe harness and remove lamp.
- ii. Connect C238-2289 (white) airframe harness wire to LED-lamp assembly red wire, and C238-2290 airframe harness wire to lamp black wire. Install cover (chamfer facing away from housing) and install two cap screws. Install hardware securing G196-6 light assembly bracket on windshield stiffener with bracket tilted up. Verify security.
- iii. Turn battery switch and NAV LIGHTS switch on and verify proper operation with dimmer knob. Turn battery switch and NAV LIGHTS switch off.

2. Full Throttle Caution (Amber) Light

Refer to § 37-70 for full throttle caution light rigging check and switch adjustment procedures.

B. Schematic

Refer to Figure 14-21 for C024 electrical system schematic.

38-43 C058 Cyclic Grip Assembly**A. Description**

The angle of the pilot's cyclic grip can be adjusted fore and aft relative to the cross tube. The most forward position provides the most control clearance at aft cyclic.

B. Grip Angle Adjustment

1. Loosen cap screws securing pilot's cyclic grip, block assembly, and bar to grip weldment.
2. Rotate grip about weldment to desired angle. Special torque cap screws to 40 in.-lb.

C. Removal and Installation

Refer to §§ 8.121 and 8.122 for cyclic grip assembly removal and installation procedures.

D. Schematic

Refer to Figure 14-21 for C024 electrical system schematic.

38-44 C800 Aspen PFD and MFD Installations

Refer to § 13.510 for Aspen PFD and MFD Installations.

A. Schematic

Refer to Figure 14-23 for C800-1 Aspen PFD Installation electrical schematic.

Refer to Figure 14-24 for C800-3 Aspen MFD Installation electrical schematic.

38-45 C802-2 COM Radio (Garmin GTR 225B) Installation

NOTE

Refer to Garmin GTR 225B Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The C802-2 COM radio (Garmin GTR 225B) has an airport frequency database, can monitor standby frequencies, and stores most-used frequencies. The C802-2 COM radio is a dual voltage unit, suitable for 14V and 28V systems.

B. Schematic

Refer to Figure 14-25 for C802-2 COM Radio Installation electrical schematic.

C. Removal

1. Turn battery switch off and pull-out COM radio circuit breaker (5 amp for 28 volt or 10 amp for 14 volt) at panel.
2. Loosen radio key securing C802-2 COM radio to avionics tray.
3. Carefully unplug/remove radio from tray.

D. Installation

1. Turn battery switch off and pull-out COM radio circuit breaker (5 amp for 28 volt or 10 amp for 14 volt) at panel.
2. Carefully plug-in/install C802-2 COM radio in appropriate location in avionics tray.
3. Tighten radio key securing radio to tray. Verify equipment security.
4. Push-in COM radio circuit breaker (5 amp for 28 volt or 10 amp for 14 volt) at panel. Turn battery and avionics switches on.
5. Perform appropriate functional checks per Garmin GTR 225B Pilot's Guide. Turn battery and avionics switches off.

E. Antenna

Refer to § 16-70 for antenna locations and R44 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on number of COM installations and additional equipment installed.

38-45 C802-2 COM Radio (Garmin GTR 225B) Installation (continued)**E. Antenna (continued)**Removal

1. Turn battery switch off and pull out COM radio circuit breaker (5 amp for 28 volt or 10 amp for 14 volt) at panel.
2. Using plastic scraper, remove B270-1 sealant from around COM antenna at corners where it attaches to tailcone.
3. Disconnect antenna cable from antenna. As required, remove B270-13 sealant from fastener holes. Remove screws securing antenna to tailcone and remove antenna.

Installation

1. Turn battery switch off and pull out COM radio circuit breaker (5 amp for 28 volt or 10 amp for 14 volt) at panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. As required, apply light coat B270-13 sealant to screw threads and install screws securing antenna to tailcone. As required, seal around screw heads and fill fastener holes using B270-13 sealant and allow to dry. Verify security.
4. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.
5. Connect antenna cable to antenna. Verify security.
6. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections**NOTE**

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery & avionics switches off. Open circuit breaker panel & upper console.
2. Inspect condition of and verify no obvious damage to COM radio, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

38-46 C803-1 ADS-B In Receiver (Garmin GDL 88) Installation

NOTE

Refer to Garmin GDL 88 Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

Refer to § 38-47 for ADS-B system descriptions.

B. Schematic

Refer to Figure 14-26 for C803-1 ADS-B Installation electrical schematic.

C. Removal

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Under the left front seat, disconnect airframe harness from GDL 88 receiver at connectors.
3. Remove screws securing GDL 88 receiver to C904-1 mount assembly, and remove GDL 88 receiver.

D. Installation

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Under the left front seat, position GDL 88 receiver on C904-1 mount assembly and install screws. Verify security.
3. Connect airframe harness to GDL 88 receiver at connectors.
4. Push in XPDR circuit breaker (5 amp) at panel. Turn battery and avionics switches on.
5. Perform appropriate functional checks per Garmin GDL 88 Pilot's Guide. Turn battery and avionics switches off.

E. Antenna

Refer to § 16-70 for antenna locations and R44 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on number of COM installations and additional equipment installed.

38-46 C803-1 ADS-B In Receiver (Garmin GDL 88) Installation (continued)**E. Antenna (continued)**Removal

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Using plastic scraper, remove B270-1 sealant from around GDL 88 antenna at corners where it attaches to belly.
3. Disconnect antenna cable from antenna. Remove hardware securing antenna to belly and remove antenna.

Installation

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. Install hardware securing antenna to belly. Apply small bead B270-1 sealant around antenna at corners where it attaches to belly and allow to dry.
4. Connect antenna cable to antenna. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections**NOTE**

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery and avionics switches off. Open circuit breaker panel and access left front seat.
2. Inspect condition of and verify no obvious damage to GDL 88, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and left front seat. Perform ground checks per Part D steps 4 and 5.

38-47 C804-15 Transponder (Garmin GTX 330 ES) Installation**NOTE**

Refer to Garmin GTX 330 ES Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

GPS-based Automatic Dependent Surveillance-Broadcast (ADS-B) Out equipment transmits information to air traffic control and ADS-B In equipment receives information from air traffic control or from other aircraft. The R44 may be equipped with ADS-B Out or with ADS-B Out and ADS-B In systems.

Both ADS-B systems operate mostly automatically. ADS-B equipment is programmed with aircraft specific-data at installation. ADS-B systems use the primary GPS for position information. Additional flight-specific data is entered by the pilot using transponder controls. ADS-B data is transmitted via the transponder's Extended Squitter (ES) on frequency 1090 MHz.

The ADS-B In system receives data via a receiver on frequencies 978 MHz and 1090 MHz. Received data (traffic and weather) is displayed on the primary GPS screen.

ADS-B Out equipment (transponder and primary GPS) or ADS-B Out and ADS-B In equipment (transponder, primary GPS, and receiver) must be powered and in normal operating modes for proper system function. ADS-B Out system faults are annunciated on the transponder and primary GPS screens. ADS-B In system faults are annunciated on the primary GPS screen.

Change of aircraft registration may require ADS-B equipment programming by qualified maintenance personnel.

Refer to R44 Pilot's Operating Handbook Section 9 for additional information.

B. Schematic

Refer to Figure 14-27 for C804 transponder & blind encoder electrical schematic.

C. Removal

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Loosen radio key securing C804-15 transponder to avionics tray.
3. Carefully unplug/remove transponder from tray.

38-47 C804-15 Transponder (Garmin GTX 330 ES) Installation (continued)**D. Installation**

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Carefully plug-in/install C804-15 transponder in appropriate location in avionics tray.
3. Tighten radio key securing transponder to tray. Verify equipment security.
4. Push in XPDR circuit breaker (5 amp) at panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTX 330 ES Pilot's Guide. Turn battery and avionics switches off.

E. Antenna

Refer to § 16-70 for antenna locations and R44 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on optional equipment installed.

Removal

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Using plastic scraper, remove B270-1 sealant from around transponder antenna at corners where it attaches to B322-12 doubler.
3. Remove screws securing mounting plate to cabin skin and disconnect antenna cable from antenna. Remove hardware securing mounting plate to antenna and remove antenna.

Installation

1. Turn battery switch off and pull out XPDR circuit breaker (5 amp) at panel.
2. Remove paint & primer from between cabin skin and B322-12 doubler to ensure electrical ground.
3. Install hardware securing transponder antenna to mounting plate. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to mounting plate and allow to dry.
4. Connect antenna cable to antenna and install screws securing mounting plate to cabin skin. Verify security.
5. Perform ground checks per Part D steps 4 and 5.

38-47 C804-15 Transponder (Garmin GTX 330 ES) Installation (continued)**F. Scheduled Maintenance and Inspections****NOTE**

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery and avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to transponder, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

38-48 C822-2 Audio Control (Garmin GMA 350H) Installation**NOTE**

Refer to Garmin GMA 350H series Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The C822-2 audio control (Garmin GMA 350H) includes improved background noise suppression, 3D audio (if stereo headsets are used), and a manual ICS squelch mode to adjust audio thresholds for each occupant.

B. Schematic

Refer to Figure 14-29 for C822-2 audio control (Garmin GMA 350H) electrical schematic.

C. Removal

1. Turn battery switch off and pull out AUDIO PANEL circuit breaker (5 amp) at panel.
2. Loosen radio key securing Garmin GMA 350H audio control to avionics tray.
3. Carefully unplug/remove audio control from tray.

D. Installation

1. Turn battery switch off and pull out AUDIO PANEL circuit breaker (5 amp) at panel.
2. Carefully plug-in/install Garmin GMA 350H audio control in appropriate location in avionics tray.
3. Tighten radio key securing audio control to tray. Verify equipment security.
4. Push in AUDIO PANEL circuit breaker (5 amp) at panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GMA 350H series Pilot's Guide. Turn battery & avionics switches off.

38-48 C822-2 Audio Control (Garmin GMA 350H) Installation (continued)**E. Antenna**

Refer to § 16-70 for marker beacon antenna location and R44 Illustrated Parts Catalog (IPC) Chapter 6.

Removal

1. Turn battery switch off and pull out AUDIO PANEL circuit breaker (5 amp) at panel.
2. Using plastic scraper, remove B270-1 sealant from around CI 102 marker beacon antenna at corners where it attaches to belly panel.
3. Remove hardware securing C794 forward belly panel to belly and disconnect C850-210 antenna cable from antenna. Remove screws securing antenna to panel and remove antenna.

Installation

1. Turn battery switch off and pull out AUDIO PANEL circuit breaker (5 amp) at panel.
2. Remove paint and primer from antenna mating surfaces to ensure electrical ground.
3. Apply light coat B270-11 adhesive to screw threads and install screws securing CI 102 marker beacon antenna to C794 forward belly panel. Verify security.
4. Connect C850-210 antenna cable to antenna. Install screws securing forward belly panel to belly. Verify security.
5. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to belly panel and allow to dry.
6. Perform ground checks per Part D steps 4 and 5.

F. Scheduled Maintenance and Inspections**NOTE**

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

38-48 C822-2 Audio Control (Garmin GMA 350H) Installation (continued)**G. Special Maintenance and Inspections**

1. Turn battery and avionics switches off. Open circuit breaker panel and upper console.
2. Inspect condition of and verify no obvious damage to audio control, radio tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and upper console. Perform ground checks per Part D steps 4 and 5.

38-49 C831 GPS (Garmin GTN 600/700 series) Installation**NOTE**

Refer to Garmin GTN 600/700 series Maintenance Manual and Instructions for Continued Airworthiness.

A. Description

The C831 GPS (Garmin GTN 600/700 series) interface is a combination of touch screen technology with traditional buttons and knobs. GTN 600/700 series GPS(s) may be installed in the pilot-side console location only. Note: R44 ADS-B Out system requires Garmin GTN 600/700 series GPS (refer to § 38-47).

B. Schematic

Refer to Figure 14-31 for C831 GPS (Garmin GTN 600/700 series) installation electrical schematic.

C. Removal

1. Turn battery switch off and pull out all COM circuit breakers (5 amp for 28 volt or 10 amp for 14 volt) and all GPS circuit breakers (5 amp for 28 volt or 7.5 amp for 14 volt) as required at panel.
2. Loosen radio key securing C831 GPS(s) to tray in pilot's side console.
3. Carefully unplug/remove GPS(s) from tray.

D. Installation

1. Turn battery switch off and pull out all COM circuit breakers (5 amp for 28 volt or 10 amp for 14 volt) and all GPS circuit breakers (5 amp for 28 volt or 7.5 amp for 14 volt) as required at panel.
2. Carefully plug-in/install C831 GPS(s) in appropriate location in tray in pilot's side console.
3. Tighten radio key securing GPS(s) to tray. Verify equipment security.
4. Push in all COM circuit breakers (5 amp for 28 volt or 10 amp for 14 volt) and all GPS circuit breakers (5 amp for 28 volt or 7.5 amp for 14 volt) as required at panel. Turn battery and avionics switches on.
5. Perform appropriate functional checks per Garmin GTN 600/700 series Pilot's Guide. Turn battery and avionics switches off.

38-49 C831 GPS (Garmin GTN 600/700 series) Installation (continued)**E. Antenna**

Refer to § 16-70 for antenna locations and R44 Illustrated Parts Catalog (IPC) Chapter 6.

NOTE

Antenna installation depends on number COM installations and additional equipment installed.

Removal

1. Turn battery switch off and pull out all COM circuit breakers (5 amp for 28 volt or 10 amp for 14 volt) and all GPS circuit breakers (5 amp for 28 volt or 7.5 amp for 14 volt) as required at panel.
2. Using plastic scraper, remove B270-1 sealant from around GPS antenna at corners where it attaches to tailcone.
3. Disconnect antenna cable from antenna. As required, remove B270-13 sealant from fastener holes. Remove screws securing antenna to tailcone and remove antenna.

Installation

1. Turn battery switch off and pull out all COM circuit breakers (5 amp for 28 volt or 10 amp for 14 volt) and all GPS circuit breakers (5 amp for 28 volt or 7.5 amp for 14 volt) as required at panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. As required, apply light coat B270-13 sealant to screw threads and install screws securing antenna to tailcone. As required, seal around screw heads and fill fastener holes using B270-13 sealant and allow to dry. Verify security.
4. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to tailcone and allow to dry.
5. Connect antenna cable to antenna. Verify security.
6. Perform ground checks per Part D steps 4 and 5.

38-49 C831 GPS (Garmin GTN 600/700 series) Installation (continued)**F. Scheduled Maintenance and Inspections****NOTE**

All factory-installed Garmin units are "on condition" and do not require scheduled periodic maintenance. Units feature a BIT (Built-In Test) function during each initial power-up that will detect internal failure(s) and alert pilot.

NOTE

Refer to § 38-60 for avionics software information.

G. Special Maintenance and Inspections

1. Turn battery and avionics switches off. Open circuit breaker panel. Remove hardware securing pilot's side console shell assembly to tray and carefully pivot shell assembly upward (GPS[s] and faceplate may be also be removed).
2. Inspect condition of and verify no obvious damage to GPS(s), tray, copper bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel and pilot's side console. Perform ground checks per Part D steps 4 and 5.

38-50 Optional Avionics38-51 C807-1 King KTR 909 UHF Transceiver Installation**NOTE**

Refer to King KTR 909 UHF Transceiver Installation Manual.

A. Description

The C807-1 King KTR 909 UHF Transceiver is an AM UHF communications radio capable of receiving or transmitting voice or data within a 225 -399.975 MHz frequency range. Tuning information is supplied by the control unit located on the lower instrument panel.

B. Schematic

Refer to Figure 14-28 for C807-1 King KTR 909 UHF Transceiver electrical schematic.

C. Control UnitRemoval

1. Turn battery switch off and pull out COM circuit breaker (10 amp) at panel.
2. Open instrument console. Release tabs and unplug connectors from control unit.
3. Remove hardware securing control unit to lower panel and remove unit.

Installation

1. Turn battery switch off and pull out COM circuit breaker (10 amp) at panel.
2. Open instrument console. Position control unit on lower panel and install mounting hardware.
3. Plug connectors into control unit (tabs will lock). Verify equipment security.
4. Close instrument console.
5. Push in COM circuit breaker (10 amp) at panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per King KTR 909 UHF Transceiver Pilot's Guide. Turn battery & avionics switches off.

38-51 C807-1 King KTR 909 UHF Transceiver Installation (continued)**D. Transceiver**Removal

1. Hinge forward left seat forward and detach C748-5 cover assembly.
2. Disconnect coax cable from transceiver. Release tab and unplug connector from transceiver.
3. Loosen thumbscrew securing transceiver in mounting rack, hinge locking mechanism outboard, and slide transceiver outboard from rack.

Installation

1. Hinge forward left seat forward and detach C748-5 cover assembly.
2. On mounting rack, loosen thumbscrew and hinge locking mechanism outboard. Slide transceiver inboard onto rack. Hinge locking mechanism inboard and tighten thumbscrew. Verify security.
3. Plug connector into transceiver (tab will lock). Connect coax cable to transceiver.
4. Attach cover assembly and hinge seat forward.
5. Perform ground checks per Part C, Installation, steps 5 and 6.

E. Antenna

Refer to § 16-70 for antenna locations.

Removal

1. Turn battery switch off and pull out COM circuit breaker (10 amp) at panel.
2. Using plastic scraper, remove B270-1 sealant from around transceiver antenna at corners where it attaches to belly.
3. Hinge aft right seat forward and remove hardware securing C903-6 cover to compartment. Disconnect antenna cable from antenna.
4. Remove hardware securing antenna to belly and remove antenna.

38-51 C807-1 King KTR 909 UHF Transceiver Installation (continued)**E. Antenna (continued)**Installation

1. Turn battery switch off and pull out COM circuit breaker (10 amp) at panel.
2. Remove paint & primer from antenna mating surfaces to ensure electrical ground.
3. Install hardware securing antenna to belly. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to belly and allow to dry.
4. Connect antenna cable to antenna. Verify equipment security.
5. Position C903-6 cover in compartment and install mounting hardware. Verify security.
6. Perform ground checks per Part C, Installation, steps 5 and 6.

F. Scheduled Maintenance and Inspections**NOTE**

Refer to King KTR 909 UHF Transceiver Installation Manual.

G. Special Maintenance and Inspections

1. Turn battery and avionics switches off. Open circuit breaker panel and instrument console. Hinge forward left seat forward.
2. Inspect condition of and verify no obvious damage to transceiver, mounting tray, control unit, bus bars, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing. Verify equipment security.
3. Secure circuit breaker panel, instrument console, and forward left seat. Perform ground checks per Part C, Installation, steps 5 and 6.

38-60 Avionics Software

Modern avionics software is complex and subject to rigorous testing by RHC to assure proper function and integration in the aircraft. Only specified software versions and software configurations have been FAA-approved for installation in Robinson helicopters. Software updates should not be attempted without a thorough understanding of approval status and compatibility. Technical support from either RHC or the avionics manufacturer will likely be required. In some cases, updating software for one item of avionics may require additional avionics to be updated to assure compatibility.

As long as RHC-installed equipment is functioning properly, there is no continuing airworthiness requirement to check or update software levels in Robinson helicopters; RHC will issue an SB (or FAA will issue an AD) for any mandatory updates.

Consult www.robinsonheli.com > Customer Support > Avionics Support > Avionics Software page for approved software configurations.

NOTE

The above statements apply to avionics operating software. Databases (e.g. charts, terrain, etc.) may be updated regularly using avionics manufacturer's recommended procedures.

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