

**CHAPTER 97****AVIONICS**

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## CHAPTER 97

## AVIONICS

97-10 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.

97-11 LRU Installation – Garmin Display Unit (GDU)

Refer to § 95-70 for GDU maintenance procedures.

97-12 LRU Installation – GDC 74H Air Data Computer**A. Description**

The GDC 74H Air Data Computer (ADC) compiles information from the pitot-static system and an Outside Air Temperature (OAT) sensor. The GDC 74H computer provides pressure altitude, airspeed, vertical speed, and OAT information to the G500H EFIS system. The GDC 74H computer communicates with the GDU display and GRS 77H AHRS using an ARINC 429 digital interface.

**B. Schematic**

Refer to Figure 98-10 for GDC 74H Air Data Computer Installation electrical schematic.

**C. Removal**

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Hinge left seat forward and remove F748-1 cover assembly.
3. Disconnect airframe harness from GDC 74H air data computer at connectors.
4. Disconnect pitot and static tube fittings from computer and plug fittings.
5. Remove screws securing computer to F950-2 support assembly. Carefully remove computer from under left seat.

97-12 LRU Installation – GDC 74H Air Data Computer (continued)**D. Installation**

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Place GDC 74H air data computer on F950-2 support assembly and install screws. Verify security.
3. Remove plugs from fittings and connect pitot and static tube fittings to computer. Verify security. Perform pitot and static system leak checks per § 95-10.
4. Connect airframe harness to computer at connectors.
5. Push in EFIS circuit breaker (5 amp) on circuit breaker 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 F748-1 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 § 97-60 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 F748-1 cover assembly.
2. Inspect condition of and verify no obvious damage to Garmin GDC 74H Air Data Computer, 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.

97-13 LRU Installation – GRS 77H AHRS**A. Description**

The Garmin GRS 77H Attitude and Heading Reference System (AHRS) provides aircraft attitude information to the G500H EFIS system. The GRS 77H interfaces with both the GDC 74H Air Data Computer and the GMU 44 magnetometer. The GRS 77H also utilizes GPS data forwarded from the GDU 620. Actual attitude and heading information is sent to the GDU 620 using an ARINC 429 digital interface.

**B. Schematic**

Refer to Figure 98-11 for GRS 77H AHRS Installation electrical schematic.

**C. Removal**

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Hinge left seat forward and remove F950-3 cover assembly.
3. Disconnect airframe harness from GRS 77H AHRS at connectors.
4. Loosen thumbscrews securing AHRS to F950-1 support assembly. Carefully remove AHRS from under left seat.

**D. Installation**

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Place GRS 77H AHRS on F950-1 support assembly and tighten thumbscrews. Verify security.
3. Connect airframe harness to GRS 77H AHRS at connectors.
4. Push in EFIS circuit breaker (5 amp) on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin G500H Instructions for Continued Airworthiness. Turn battery & avionics switches off.
6. Install F950-3 cover assembly and hinge left seat back.

97-13 LRU Installation – GRS 77H AHRS (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 § 97-60 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 F950-3 cover assembly.
2. Inspect condition of and verify no obvious damage to Garmin GRS 77H AHRS, 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 4 thru 6.

97-14 LRU Installation – GMU 44 Magnetometer**A. Description**

The GMU 44 magnetometer senses the earth’s magnetic field. Data is sent to the GRS 77H AHRS for processing to determine aircraft magnetic heading. This unit receives power directly from the GRS 77H and communicates with the GRS 77H using an RS-485 digital interface.

**B. Schematic**

Refer to Figure 98-11 for GRS 77H AHRS Installation electrical schematic.

**C. Removal**

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker panel.
2. Remove tailcone cowling per § 53-23.
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.

97-14 LRU Installation – GMU 44 Magnetometer**D. Installation**

1. Turn battery & avionics switches off and pull out EFIS (5 amp) circuit breaker on circuit breaker 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) on circuit breaker 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 § 53-23.

**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 § 97-60 for avionics software information.

**F. Special Maintenance and Inspections**

1. Turn battery & avionics switches off. Open circuit breaker panel and remove tailcone cowling per § 53-23.
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.

97-15 GPS Installation**NOTE**

Refer to Garmin GTN 600/700 series 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 § 97-56 for Garmin GTN 600/700-series GPS Installation.

**B. Schematic**

Refer to Figure 98-12 for GTN 600/700-series 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 on circuit breaker panel.
2. Loosen radio key securing GTN 600/700-series 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 on circuit breaker panel.
2. Carefully plug-in/install GTN 600/700-series 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 on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTN 600/700 series Pilot's Guide. Turn battery & avionics switches off.



97-15 GPS Installation (continued)**E. Antenna**

Refer to § 6-80 for antenna locations and R66 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 on circuit breaker 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 B322-10 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 on circuit breaker 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 B322-10 spacers (thick edge inward) securing antenna to tailcone. Verify security.
- c. For glideslope antenna:
  - i. Install screws securing antenna to chin. Verify security.
3. Connect antenna cable to antenna. Verify security.
4. Perform ground checks per Part D steps 4 and 5.

97-15 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 § 97-60 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.

97-20 Radar Altimeter Installation**A. Description**

The FreeFlight RA-4500 radar altimeter has ARINC 429 output for communication with electronic displays such as the G500H EFIS system. Radar altitude data can be displayed on the PFD portion of the Garmin GDU 620 display.

**B. Schematic**

Refer to Figure 98-13 for Radar Altimeter Installation electrical schematic.

**C. Removal**RAD-40 Indicator

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel.
2. Remove perimeter screws securing instrument face to upper console and carefully pull face aft, or remove Garmin GDU 620 Display per § 95-70.
3. a. For Above-Console Installation: Remove hardware securing B560 enclosure assembly to instrument console and remove hardware securing B560 faceplate to RAD-40 Indicator.  
b. For In-Console Installation: Supporting RAD-40 indicator, remove hardware securing B421-1 visor assembly, A590-4 cover plate, and indicator to instrument face.
4. Disconnect console harness from indicator and carefully remove indicator.

ATG-410 Tone Generator

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel. Open instrument console or remove Garmin GDU 620 Display per § 95-70.
2. Supporting ATG-410 tone generator, remove screws securing tone generator to keel panel. Carefully remove tone generator and disconnect console harness.

RA-4000/RA-4500 Radar Altimeter

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel. Hinge front left seat forward.
2. Disconnect airframe and antenna harnesses from RA-4000/RA-4500 radar altimeter.
3. Supporting radar altimeter, remove screws securing radar altimeter to F542-2 support. Carefully remove radar altimeter from under left seat.

97-20 Radar Altimeter Installation (continued)**D. Installation**RAD-40 Indicator

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect console harness to RAD-40 Indicator.
3. a. For Above-Console Installation: Install hardware securing B560 faceplate to indicator & install hardware securing B560 enclosure assembly to instrument console.  
b. For In-Console Installation: Supporting indicator, install hardware securing B421-1 visor assembly, A590-4 cover plate, and indicator to instrument face.
4. Install perimeter screws securing instrument face to upper console or install Garmin GDU 620 Display per § 95-70.
5. Push in RADAR ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

ATG-410 Tone Generator

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect console harness to ATG-410 tone generator.
3. Position tone generator on keel panel and install screws. Verify security.
4. Close instrument console or install Garmin GDU 620 Display per § 95-70.
5. Push in RADAR ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

RA-4000/RA-4500 Radar Altimeter

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect airframe and antenna harnesses to radar altimeter.
3. Supporting RA-4000/RA-4500 radar altimeter, install screws securing radar altimeter to F542-2 support. Verify security. Hinge front left seat aft.
4. Push in RADAR ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-20 Radar Altimeter Installation (continued)**E. Antenna**

Refer to § 6-80 for antenna locations & R66 Illustrated Parts Catalog (IPC) Chapter 6.

Removal

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel.
2. Remove hardware securing F469 scuff plate and carpet assembly to floor, remove plate, and peel back carpet as required. Remove hole plug.
3. Disconnect antenna cable from antenna.
4. Remove screws securing antenna to chin. Repeat steps for opposite-side antenna.

Installation

1. Turn battery & avionics switches off and pull out RADAR ALT (2 amp) circuit breaker on circuit breaker panel.
2. Connect antenna cable to antenna and install screws securing antenna to chin. Verify security.
3. Install floor hole plug. Install hardware securing F469 scuff plate and carpet assembly to floor. Repeat steps for opposite-side antenna.
4. Push in RADAR ALT (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Freeflight Systems Instructions for Continued Airworthiness. Turn battery & avionics switches off.

**F. Scheduled Maintenance and Inspections**

Refer to Freeflight Systems Instructions for Continued Airworthiness.

**G. Special Maintenance and Inspections**

1. Turn battery & avionics switches off. Open circuit breaker panel. Open instrument console, remove perimeter screws securing instrument face to upper console, or remove Garmin GDU 620 Display per § 95-70. Hinge front left seat forward as required.
2. Inspect condition of and verify no obvious damage to RAD-40 Indicator, ATG-410 Tone Generator, RA-4000/RA-4500 Radar Altimeter, 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 close instrument console, install perimeter screws securing instrument face to upper console, or install Garmin GDU 620 Display per § 95-70. Hinge front left seat aft as required.

97-30 Garmin GTX 33 Transponder Installation**NOTE**

Refer to Garmin GTX 33 Transponder Maintenance Manual and Instructions for Continued Airworthiness.

**A. Description**

The Garmin GTX 33 is a remote-mounted transponder with extended-squitter ADS-B broadcast capability. The GTX 33 has no control panel face; it is controlled via the Garmin GTN 600/700-series GPS navigator.

Refer to § 97-55 Garmin GTX 330 ES Transponder Installation.

**B. Schematic**

Refer to Figure 98-14 for Garmin GTX 33 Transponder Installation electrical schematic.

**C. Removal**

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove hardware securing F640 face assembly to avionics panel and remove face.
3. Loosen screw and swing handle across GTX 33 transponder to unlock. Carefully unplug/remove transponder from tray.

**D. Installation**

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug-in/install GTX 33 transponder in appropriate location in avionics tray.
3. Swing handle across transponder to lock and tighten screw. Verify equipment security.
4. Install hardware securing F640 face assembly to avionics panel.
5. Push in XPDR (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin GTX 33 Transponder Maintenance Manual and Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-30 Garmin GTX 33 Transponder Installation (continued)**E. Antenna**

Refer to § 6-80 for antenna locations & R66 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 (5 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around transponder antenna at corners where it attaches to B322 plate/doubler.
3. Remove screws securing plate/doubler to cabin skin and disconnect antenna cable from antenna. Remove hardware securing plate/doubler to antenna and remove antenna.

Installation

1. Turn battery & avionics switches off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from between cabin skin and B322 plate/doubler to ensure electrical ground.
3. Install hardware securing transponder antenna to plate/doubler. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to plate/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 § 97-60 for avionics software information.

97-30 Garmin GTX 33 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.



97-40 Garmin GDL 69A XM Receiver Installation**NOTE**

Refer to Garmin GDL 69A XM Receiver Instructions for Continued Airworthiness.

**A. Description**

The GDL 69A XM Satellite Radio receives broadcast weather data and audio entertainment. The GDL 69A has no control panel face; weather data and audio controls are displayed on the G500H EFIS MFD or by a GTN 600/700-series GPS navigator. The GDL 69A interfaces with the audio panel to distribute the audio signal.

A subscription to XM Satellite Radio service enables GDL 69A capability.

**B. Schematic**

Refer to Figure 98-15 for Garmin GDL 69A XM Receiver Installation electrical schematic.

**C. Removal**

1. Turn battery & avionics switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Remove hardware securing F640 face assembly to avionics panel and remove face.
3. Loosen screw and swing handle across GDL 69A receiver to unlock. Carefully unplug/remove receiver from tray.

**D. Installation**

1. Turn battery & avionics switches off and pull out XM (5 amp) circuit breaker on circuit breaker panel.
2. Carefully plug-in/install GDL 69A receiver in appropriate location in avionics tray.
3. Swing handle across receiver to lock and tighten screw. Verify equipment security.
4. Install hardware securing F640 face assembly to avionics panel.
5. Push in XM (2 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
6. Perform appropriate functional checks per Garmin GDL 69A XM Receiver Instructions for Continued Airworthiness. Turn battery & avionics switches off.

97-40 Garmin GDL 69A XM Receiver Installation (continued)**E. Antenna**

Refer to § 6-80 for antenna locations & R66 Illustrated Parts Catalog (IPC) Chapter 6.

**NOTE**

Antenna installation depends on optional equipment installed.

Removal

1. Turn battery & avionics switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around XM antenna at corners where it attaches to F706-1 cowling.
3. Remove screws securing antenna to cowling and disconnect antenna cable from antenna. Remove antenna and rubber gasket.

Installation

1. Turn battery switches off and pull out XM (2 amp) circuit breaker on circuit breaker panel.
2. Install hardware securing XM antenna (with rubber gasket) to F706-1 cowling. Verify security. Apply small bead B270-1 sealant (0.1 inch max in height) around antenna at corners where it attaches to cowling and allow to dry.
3. Connect antenna cable to antenna. Verify security.
4. 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 § 97-60 for avionics software information.

**G. Special Maintenance and Inspections**

1. Turn battery & avionics switches off. Open circuit breaker panel.
2. Remove GDL 69A XM receiver per Part C. Inspect condition of and verify no obvious damage to XM receiver, circuit breaker, and wiring. Verify no loose, chafed, or broken wires or terminals. Verify no evidence of arcing.
3. Secure circuit breaker panel. Install XM receiver per Part D.

97-50 Avionics for R66 S/N 293, 520, 522, & Subsequent97-51 Cyclic Grip Assembly**A. Description of New Features**

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 § 67-12 for cyclic grip assembly removal and installation procedures.

**D. Schematic**

Refer to Figure 98-1 for F024 electrical system schematic.

97-52 Aspen EFD Electronic Flight Instrument System (EFIS) Installations

Refer to § 95-80 for Aspen EFD EFIS Installations.

**A. Schematic**

Refer to Figure 98-16 for Aspen EFD500H Display Installation electrical schematic.

Refer to Figure 98-17 for Aspen EFD1000H Display Installation electrical schematic.

97-53 Garmin GTR 225B COM Radio Installation**NOTE**

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

**A. Description of New Features**

The new C802-2 COM radio (Garmin GTR 225B) includes similar communication features available in the earlier R66 COM radio (KY196A [28V]), but also includes an airport frequency database, ability to monitor the standby frequency, and improved user memory channel functionality. The new COM radio is a dual voltage unit, suitable for use in 14V and 28V systems.

**B. Schematic**

Refer to Figure 98-9 for C802-2 COM Radio Installation electrical schematic.

**C. Removal**

1. Turn battery switch off and pull out COM radio (5 amp) circuit breaker on circuit breaker 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 (5 amp) circuit breaker on circuit breaker 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 (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTR 225B Pilot's Guide. Turn battery & avionics switches off.

**E. Antenna**

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

**NOTE**

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

97-53 Garmin GTR 225B COM Radio Installation (continued)**E. Antenna (continued)**Removal

1. Turn battery switch off and pull out COM radio (5 amp) circuit breaker on circuit breaker 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 & remove antenna.

Installation

1. Turn battery switch off and pull out COM radio (5 amp) circuit breaker on circuit breaker 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 § 97-60 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 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.

97-54 Garmin GDL 88 ADS-B In Receiver Installation**NOTE**

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

**A. Description of New Features**

Automatic Dependent Surveillance-Broadcast (ADS-B) "Out" equipment transmits aircraft specific-data and position information to air traffic control via GPS-based surveillance (rather than radar-based surveillance). ADS-B "In" equipment receives data from other aircraft or from air traffic control. The R66 may be equipped with ADS-B Out or with ADS-B Out and ADS-B In systems. Refer to § 97-15.

The ADS-B In system receives data via the C803-2 ADS-B (Garmin GDL 88) universal access transceiver (used as a receiver) on frequencies 978 MHz and 1090 MHz. Received data is displayed on the primary GPS screen. Refer to § 97-16.

**B. Schematic**

Refer to Figure 98-10 for C803-2 ADS-B Installation electrical schematic.

**C. Removal**

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Under 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 (5 amp) circuit breaker on circuit breaker panel.
2. Under 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 (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GDL 88 Pilot's Guide. Turn battery & avionics switches off.

97-54 Garmin GDL 88 ADS-B In Receiver Installation (continued)**E. Antenna**

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

**NOTE**

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

Removal

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker 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 (5 amp) circuit breaker on circuit breaker 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 § 97-60 for avionics software information.

**G. Special Maintenance and Inspections**

1. Turn battery & 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.

97-55 Garmin GTX 330 ES Transponder Installation**NOTE**

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

**A. Description of New Features**

Automatic Dependent Surveillance-Broadcast (ADS-B) "Out" equipment transmits aircraft specific-data and position information to air traffic control via GPS-based surveillance (rather than radar-based surveillance). ADS-B Out equipment will be required for R66 operation in certain airspace in the United States after January 1, 2020. ADS-B "In" equipment receives data from other aircraft or from air traffic control. ADS-B In equipment is not required for R66 operation in the United States. The R66 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 installed 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 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 have power and must be in normal operating modes for systems to function properly. 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 R66 Pilot's Operating Handbook Section 9 for additional information.

**B. Schematic**

Refer to Figure 98-11 for C804-15 transponder & blind encoder electrical schematic.

**C. Removal**

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



97-55 Garmin GTX 330 ES Transponder Installation (continued)**D. Installation**

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker 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 (5 amp) circuit breaker on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTX 330 ES Pilot's Guide. Turn battery & avionics switches off.

**E. Antenna**

Refer to § 6-80 for antenna locations and R66 Illustrated Parts Catalog (IPC) Chapter 6.

**NOTE**

Antenna installation depends on optional equipment installed.

Removal

1. Turn battery switch off and pull out XPDR (5 amp) circuit breaker on circuit breaker panel.
2. Using plastic scraper, remove B270-1 sealant from around transponder antenna at corners where it attaches to B322-11 mounting plate.
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 (5 amp) circuit breaker on circuit breaker panel.
2. Remove paint & primer from between cabin skin and B322-11 plate 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.

97-55 Garmin GTX 330 ES Transponder 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 § 97-60 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 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.

97-56 Garmin GTN 600/700-series GPS Installation**NOTE**

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

**A. Description of New Features**

The new C831 GPS (Garmin GTN 600/700 series) includes similar navigation features available in the earlier R66 GPS (Garmin GNS 400/500 series), but the interface offers a combination of touch screen technology with traditional buttons and knobs.

One GTN 700 series, or one or two GTN 600 series, GPS(s) may be installed in the pilot-side console location only.

Note: R66 ADS-B Out system requires Garmin GTN 600/700 series GPS. Refer to § 97-15.

**B. Schematic**

Refer to Figure 98-12 for C831 GPS installation electrical schematic.

97-56 Garmin GTN 600/700-series GPS Installation (continued)**C. Removal**

1. Turn battery switch off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker 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 GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker 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 GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GTN 600/700 series Pilot's Guide. Turn battery & avionics switches off.

**E. Antenna**

Refer to § 6-80 for antenna locations and R66 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 GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker 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.

97-56 Garmin GTN 600/700-series GPS Installation (continued)**E. Antenna (continued)**Installation

1. Turn battery switch off and pull out GPS 1 (5 amp) and GPS 2 (5 amp) circuit breakers as required on circuit breaker 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 § 97-60 for avionics software information.

**G. Special Maintenance and Inspections**

1. Turn battery & 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.

## 97-57 Electrical System Installation

### **A. Description of New Features**

#### 1. Main Switch Panel

The main switch panel is located at the top of the avionics stack. Rocker-style switches are utilized for ergonomic comfort for this new location, and for the new console geometry (earlier R66s utilized paddle-style switches). Some secondary instruments such as OAT and clock and hourmeter are also relocated.

### **B. Schematic**

Refer to Figure 98-13 for F024 electrical system schematic.

## 97-58 Intercom System Installation

### **NOTE**

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

### **A. Description of New Features**

The new Garmin GMA 350H audio control includes improved squelch and background noise suppression, 3D audio (if stereo headsets are used) which allows inputs from separate radios to sound as if they are coming from separate locations around the listener, and some control functions via voice command when a momentary pushbutton switch is depressed on the pilot's cyclic grip.

### **B. Schematic**

Refer to Figure 98-14 for F060 Intercom System Installation (Garmin GMA 350H Audio Control) electrical schematic.

### **C. Removal**

1. Turn battery switch off & pull out ICS (5 amp) circuit breaker on circuit breaker 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 & pull out ICS (5 amp) circuit breaker on circuit breaker 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 ICS (5 amp) circuit breakers on circuit breaker panel. Turn battery & avionics switches on.
5. Perform appropriate functional checks per Garmin GMA 350H series Pilot's Guide. Turn battery & avionics switches off.

97-58 Intercom System Installation (continued)

**E. Antenna**

Refer to § 6-80 for marker beacon antenna location and R66 Illustrated Parts Catalog (IPC) Figure 6-13.

Removal

1. Turn battery switch off and pull out ICS (5 amp) circuit breaker on circuit breaker 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 F794 forward belly panel to belly and disconnect F850-210 antenna cable from antenna. Remove screws securing antenna to panel and remove antenna.

Installation

1. Turn battery switch off and pull out ICS (5 amp) circuit breaker on circuit breaker 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 F794 forward belly panel. Verify security.
4. Connect F850-210 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 § 97-60 for avionics software information.

97-58 Intercom System Installation (continued)**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 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.

97-60 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](http://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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