

**GTS 8XX Traffic System**  
**Instructions for Continued Airworthiness**  
**as installed in**

\_\_\_\_\_

**(Make and Model Airplane)**

**Reg. No.** \_\_\_\_\_ **S/N** \_\_\_\_\_

**Dwg. Number:**  
**190-00993-01 Rev. 3**

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**Record of Revision**

<b>Rev.</b>	<b>Date</b>	<b>Description of Change</b>
1	24-Nov-2009	Initial Release
2	29-Oct-2010	Corrected referenced part numbers and added coaxial cable check after a lightning strike.
3	June 13, 2012	Removed "later FAA approved revisions"; added info re: coaxial cable rework; added requirement for milli-ohm meter for electrical bonding testing.

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# 1. INTRODUCTION

## 1.1 Purpose

This document is designed for use by the installing agency of the Garmin GTS 8XX Traffic System as Instructions for Continued Airworthiness in response to 14 CFR § 23.1529, and Part 23 Appendix G. This ICA includes information required by the operator to adequately maintain the Garmin GTS 8XX Traffic system installed under Approved Model List (AML) STC.

## 1.2 Scope

This document identifies the Instructions for Continued Airworthiness for the modification of the aircraft for installation of the Garmin GTS 8XX Traffic System installed under Approved Model List (AML) STC.

## 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 3.15 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 GTS 8XX Traffic System 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) **BIT:** Built-In Test
- 4) **CFR:** Code of Federal Regulations
- 5) **FAA:** Federal Aviation Administration
- 6) **ICA:** Instructions for Continued Airworthiness
- 7) **LRU:** Line Replaceable Unit (GTS computer, Antenna, or PA/LNA)
- 8) **MFD:** Multi-Function Display
- 9) **PMI:** Principal Maintenance Inspector
- 10) **STC:** Supplemental Type Certificate
- 11) **TAS:** Traffic Advisory System
- 12) **TCAS:** Traffic Alert and Collision Avoidance System

## 2. AIRWORTHINESS LIMITATIONS SECTION

There are no additional Airworthiness Limitations as defined in 14 CFR § 23, Appendix G. G23.4 that result from this modification.

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

## 3. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

### 3.1 Introduction

Content, Scope, Purpose and Arrangement:	This document identifies the Instructions for Continued Airworthiness for the modification of the aircraft by installation of the Garmin GTS 8XX Traffic System.
Applicability:	Applies to aircraft altered by installation of the Garmin GTS 8XX Traffic System.
Definition of Abbreviations:	See Section 1.5
Precautions:	None
Units of measurement:	None
Referenced publications:	Garmin 190-00993-00 Rev. 5, " <i>GTS 8XX AML STC Installation Manual Part 1: Overview and Limitations</i> ", or later revision  Garmin 190-00993-04 Rev. 5, " <i>GTS 8XX AML STC Installation Manual Part 2: Mechanical Installation</i> ", or later revision  Garmin 190-00993-05 Rev. 5, " <i>GTS 8XX AML STC Installation Manual Part 3: Electrical Installation</i> ", or later revision  Garmin 190-00993-03 Rev. 5, " <i>GTS 8XX AML STC Installation Manual Part 4: Configuration, Checkout and Maintenance</i> ", or later revision
Retention:	This document, or the information contained within, will be included in the aircraft's permanent records.

The GTS 8XX AML STC Installation Manual is referenced extensively throughout this document. To improve readability references to specific parts of the installation manual are abbreviated as follows:

Reference	Document Title	Part Number
GTS-IM1	GTS 8XX AML STC Installation Manual Part 1: Overview and Limitations	190-00993-00
GTS-IM2	GTS 8XX AML STC Installation Manual Part 2: Mechanical Installation	190-00993-04
GTS-IM3	GTS 8XX AML STC Installation Manual Part 3: Electrical Installation	190-00993-05

Reference	Document Title	Part Number
GTS-IM4	GTS 8XX AML STC Installation Manual Part 4: Configuration, Checkout and Maintenance	190-00993-03

### 3.2 Description of Alteration

The Garmin GTS 8XX Traffic System consists of one traffic unit (GTS 800, GTS 820 or GTS 850), one or two directional antennas (GA 58) and for the high power systems, a low-noise amplifier (GPA 65).

Traffic units are distinguished as follows:

- GTS 800: Traffic Advisory System (TAS) with 40 watts transmit power
- GTS 820: Traffic Advisory System (TAS) with 250 watts transmit power
- GTS 850: Traffic Collision Avoidance System (TCAS I) with 250 watts transmit power.

The GTS 820 and GTS 850 traffic units require installation of the GPA 65: Power Amplifier/Low-Noise Amplifier (PA/LNA).

A GTS 8XX traffic system requires installation of one top-mounted directional antenna (GA 58) and allows for connection to an optional bottom-mounted antenna (GA 58 directional or C74c approved omni-directional).

Refer to the Appendix of this document or the GTS 8XX System Configuration and Checkout Log retained in the aircraft permanent records for a list of which GTX 8XX and antennas are installed.

Installation of the Garmin GTS8XX Traffic system, specific for the aircraft installation, is documented in GTS-IM2 (190-00993-04) and GTS-IM3 (190-00993-05).

### 3.3 Control, Operating Information

See GTS-IM1 (190-00993-00) for a system description and system limitations. The GTS 8XX Traffic system does not have a direct pilot interface. Refer to GTS-IM3 (190-00993-05), Appendix A for a list of display equipment that can be interfaced to the GTS 8XX. Pilots Guide information published for those displays will provide operating information.

See GTS-IM4 (190-00993-03), Section 3 for checkout and self-test information.

### 3.4 Servicing Information

None. In the event of system failure, troubleshoot the GTS 8XX Traffic System in accordance with Section 3.6 Troubleshooting Information below.

### 3.5 Periodic Maintenance

All GTS 8XX Traffic System LRUs are designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in tests are continuously executed. Detected errors are indicated on the cockpit MFD used to display traffic information from the GTS 8XX. Detected errors are displayed as failure annunciations.

Operation of the GTS 8XX Traffic System is not permitted unless the inspections described in this section have been completed within time intervals prescribed in Table 1 below.

**Table 1 - Maintenance Intervals**

<b>Item</b>	<b>Description/Procedure</b>	<b>Interval</b>
Equipment Removal & Replacement	Removal and replacement of: GTS 8XX Traffic Unit, (one of the following) GTS 800 TAS Unit (low power) GTS 820 TAS Unit (high power) GTS 850 TCAS I Unit (high power) GPA 65 Antenna Amplifier (for high power installations) GA 58 Traffic Antenna(s) (top-mounted antenna, plus optional bottom-mounted antenna)  Removal and replacement instructions are contained in Section 3 of this document and in GTS-IM4 (190-00993-03), Section 4.	<b>On Condition</b>
Equipment Visual Inspection	Conduct a visual inspection on the GTS 8XX traffic unit and its wire harness to insure continued installation integrity.  1. Inspect the GTS 8XX unit for security of attachment 2. Inspect condition of wiring, routing, and attachment/clamping.	<b>24 Calendar Months</b>
Antenna Visual Inspection	Conduct a visual inspect on the GA 58 antenna(s) for proper sealing and attachment.  In the event attachment is not secure, re-attach antenna and complete the Electrical Bonding Test <i>[see below for instructions]</i> .  In the event antenna seal shows signs of damage or decomposition, complete the Electrical Bonding Test <i>[see below for instructions]</i> and re-seal antenna.	<b>24 Calendar Months</b>
Antenna Visual Inspection - Suspected lightning strike	In the event of a suspected or actual lightning strike to the aircraft, the GA 58 Antenna(s) and its associated installation shall be inspected.  If the GA58 Antenna was struck by lightning then the antenna and the surrounding installation shall be inspected to ensure that there is no structural damage around the areas where lightning may have attached.  At the antenna end ensure there is no damage to the connectors on the antenna and on the coaxial cable. Ensure that the coaxial cable connectors are securely attached to the antenna connectors.  Execute the system checkout procedure identified in GTS-IM4 (190-00993-03), Section 3, to ensure the system is operating correctly.	<b>Suspected or actual lightning strike</b>

Item	Description/Procedure	Interval
Electrical Bonding Test	<p>An electrical bonding test must be performed on GA 58 Antenna(s) installed by this STC.</p> <p>For top-mounted GA 58 Antenna:</p> <ol style="list-style-type: none"> <li>1. Gain access to the antenna installation.</li> <li>2. Disconnect all four coaxial cable antenna connectors (GA 58 antenna, connectors P1-P4).</li> <li>3. Measure the resistance between the body of the connector on the antenna base and a nearby exposed portion of aircraft structure (example: exposed rivet on fuselage stringer).</li> <li>4. Verify the resistance is equal to or less than 10 milliohms.</li> <li>5. Reconnect all four antenna connectors ensuring each connector is secured.</li> </ol> <p>Repeat for optional bottom-mounted GA 58 Antenna.</p> <p>In the event of bonding test failure, remove antenna, clean and re-attach using unit replacement procedures in GTS-IM4 (190-00993-03), Section 4. The fresh attachment should yield resistance less than or equal to 2.5 milliohms.</p>	<p><b>Every 2000 flight hours or ten (10) years, whichever is first</b></p>

### 3.6 Troubleshooting Information

If error indications are displayed for the GTS 8XX Traffic system, consult GTS-IM4 (190-00993-03), Section 5, Troubleshooting. Refer to the GTS 8XX System Configuration and Checkout Log retained in the aircraft permanent records for a list of the interfaced equipment and system configuration data (example log provided in GTS-IM4 (190-00993-03)).

### 3.7 Removal and Replacement Information

If any GTS 8XX LRUs are removed and reinstalled, verify that the LRU unit power-up self-test sequence is successfully completed and no failure messages are annunciated for the GTS 8XX Traffic system. See the unit replacement procedures in GTS-IM4 (190-00993-03), Section 4.

If any work has been done on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the GTS 8XX system unit power-up self-test sequence is successfully completed and no failure messages are annunciated for the GTS 8XX Traffic system.

In the event that an individual coaxial cable assembly requires rework, refer to GTS-IM4 (190-00993-03), Section 6.1 for instructions.

Refer to Appendix A of this document or the GTS 8XX System Configuration and Checkout Log retained in the aircraft permanent records for GTX 8XX equipment and antenna location.

Refer to GTS-IM4 (190-00993-03), Section 4 for particular LRU and antenna removal/installation procedures and special handling precautions.

### **3.8 Diagrams**

Aircraft specific LRU locations and wire routing diagram are contained in Appendix A of this document.

GTS-IM1 (190-00993-00), Appendix A provides diagrams that indicate lightning zones to guide antenna installation. GTS-IM2 (190-00993-04), Appendix C and Appendix D provide diagrams showing sample installation for LRU locations. GTS-IM3 (190-00993-05), Appendix C provides point-to-point wiring diagrams for GTS 8XX LRUs and interfaced equipment.

Refer to the GTS 8XX System Configuration and Checkout Log retained in the aircraft permanent records for a list of the interfaced equipment and unit configuration data (example log provided in GTS-IM4 (190-00993-03)).

### **3.9 Special Inspection Requirements**

There are no special inspection techniques required.

### **3.10 Application of Protective Treatments**

Data relative to protective treatments, such as primers or sealants and installation requirements can be found in GTS-IM2 (190-00993-04), Section 2.

### **3.11 Data Relative to Structural Fasteners**

Data relative to structural fasteners, such as type, torque, and installation requirements can be found in GTS-IM2 (190-00993-04), Section 2.

### **3.12 Special Tools**

Refer to GTS-IM3 (190-00993-05), Section 2.1 for a list of electrical installation tools required.

For electrical bonding testing, a milli-ohm meter is required.

In addition to electrical tools GTS-IM1 (190-00993-00), Section 2.4.3 identifies a ramp tester tool to aid system checkout and GTS-IM4 (190-00993-03), Section 2.2 identifies the GTS 8XX Install Tool (a software tool) used to configure the system during installation.

No other special tools are needed.

### **3.13 Additional Instructions**

There are no Commuter Class airplanes on the AML at this time.

There are no additional ICA instructions for this STC.

### **3.14 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 GTS 8XX system. If any LRU indicates an internal failure, the unit may be removed and replaced. See GTS-IM4 (190-00993-03), Section 5 for Troubleshooting information.



### **3.15 ICA Revision and Distribution**

To revise this ICA, Garmin will follow the Garmin ODA procedures manual SOP-055/ACP-016 for Instructions for Continued Airworthiness. The latest revision of this ICA document is available on the Garmin website ([www.garmin.com](http://www.garmin.com)). A Garmin Service Bulletin describing ICA revision will be sent to Garmin dealers if a revision is determined to be significant.

### **3.16 Assistance**

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](http://www.garmin.com).

### **3.17 Implementation and Record Keeping**

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

## APPENDIX A - EQUIPMENT LOCATION AND WIRE ROUTING

### A.1 LRU LOCATIONS

The following table describes the location of the applicable GTS 8XX Traffic Unit (identify the traffic unit installed):

LRU	LRU included in this installation?	Description of Location
GTS 800 TAS Unit	<input type="checkbox"/> Yes <input type="checkbox"/> No	
GTS 820 TAS Unit	<input type="checkbox"/> Yes <input type="checkbox"/> No	
GTS 850 TCAS I Unit	<input type="checkbox"/> Yes <input type="checkbox"/> No	

The following table describes the location of the GA 58 Directional Antenna (identify location for top-mounted antenna and optional bottom-mounted antenna):

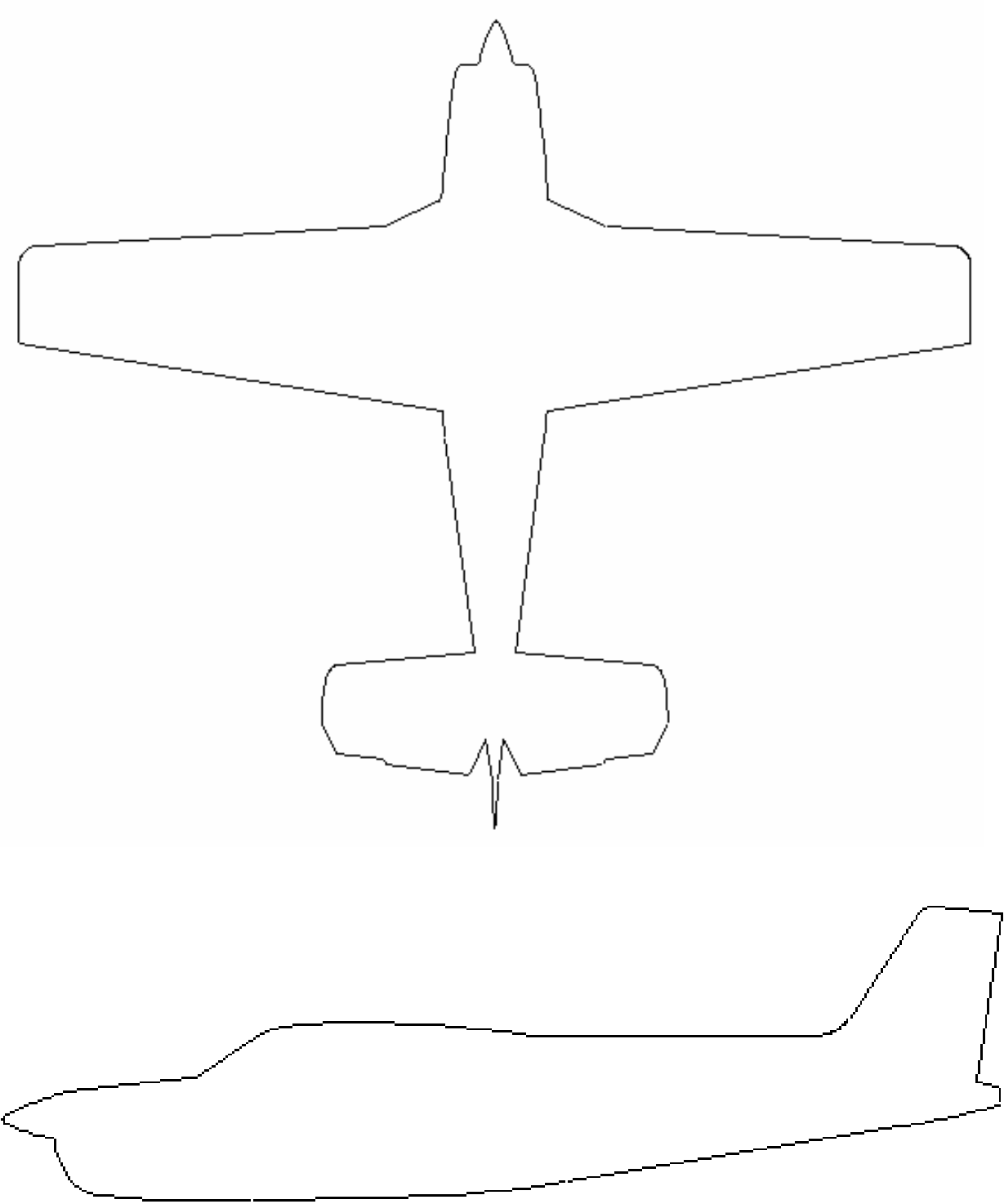
LRU	LRU included in this installation?	Description of Location
GA 58 Antenna #1	<input type="checkbox"/> Yes <input type="checkbox"/> No	
GA 58 Antenna #2 (Optional)	<input type="checkbox"/> Yes <input type="checkbox"/> No	

The following table describes the location of the GPA 65 PA/LNA amplifier unit (installed with either a GTS 820 or GTS 850 traffic unit):

LRU	LRU included in this installation?	Description of Location
GPA 65 PA/LNA	<input type="checkbox"/> Yes <input type="checkbox"/> No	

**A.2 WIRE ROUTING – SINGLE-ENGINE**

The following diagram depicts approximate location of LRUs and antenna(s) along with the wire routing for the GTS 8XX LRUs throughout the aircraft structure for a single-engine aircraft:



**A.3 WIRE ROUTING – TWIN-ENGINE**

The following diagram depicts approximate location of LRUs and antenna(s) along with the wire routing for the GTS 8XX LRUs throughout the aircraft structure for a twin-engine aircraft:

