

**GDL 90 STC Instructions for Continued Airworthiness**

Garmin AT, Inc.  
2345 Turner Rd SE  
Salem, OR 97302

19 September 2007  
Part #: 560-0279-01 Rev C

**GDL 90 UAT Data Link Sensor System  
Instructions for Continued Airworthiness**

Part Number: 560-0279-01  
Document Revision: C  
19 September 2007

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### Revision Log

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-00--	26-Feb-04	Initial Release	7835	mak
-00A	26-Apr-04	Update document revisions for original STC issue (2.1). Remove PO Box from signature block.	7891	mak
-00B	08-Jun-04	Update MDL to Rev B for original STC issue (2.1).	7943	mak
-01--	04-Nov-04	Add GSL 71 information (1., 1.1, 2.1, 2.2, 2.3, 2.4, 2.5, 2.5.2, 2.5.3, 2.6, 2.7.2, 2.8, 2.12, 2.13, 2.14 ). Update document versions for GDL 90 v2.0 CSA (2.1). Correct FAR reference (2.5.3).	8040	mak
-01A	12-Nov-04	Update document revisions for final submittal (2.1). Correct GSL 71 failure display reference (2.5).	8048	mak
-01B	24-Mar-2006	Clarify this document is ICA (§1). Move revision process from §2.15 (§1.1), definitions from §1.4 (§2.1), and assistance from §2.16 (§1.4). Update the list of reference publications and clarify retention (§2.1). Detail inspection steps (§2.5). Clarify the procedure for periodic check of altitude sources (§2.5.3). Add reference to see §2.1 for information on all UAT and GPS antenna types (§2.8).	8330	tlm mak
-01C	23-Apr-2007	Revise section to describe document control, move revision & distribution to new section 2.16 (1.1). Add contact information (1.4). Update documents, add GA 35 GA 36 GA 37 (2.1). Include MicroAPM (2.3, 2.5). Change annual to preceding 12 calendar months, clarify display inspection, (2.5). Indicate error indication locations, point to configuration logs (2.6). Use AC 21-40 wording (2.15).	8451	mak

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## Table of Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>4</b>
1.1	DOCUMENT CONTROL .....	4
1.2	AIRWORTHINESS LIMITATIONS SECTION .....	4
1.3	PERMISSION TO USE CERTAIN DOCUMENTS .....	4
1.4	ASSISTANCE .....	4
<b>2</b>	<b>INSTRUCTIONS FOR CONTINUED AIRWORTHINESS .....</b>	<b>5</b>
2.1	INTRODUCTION .....	5
2.2	<i>DESCRIPTION OF ALTERATION</i> .....	5
2.3	<i>CONTROL, OPERATING INFORMATION</i> .....	6
2.4	<i>SERVICING INFORMATION</i> .....	6
2.5	<i>PERIODIC MAINTENANCE INSTRUCTIONS</i> .....	6
2.6	<i>TROUBLESHOOTING INFORMATION</i> .....	8
2.7	<i>REMOVAL AND REPLACEMENT INFORMATION</i> .....	8
2.8	<i>DIAGRAMS</i> .....	9
2.9	<i>SPECIAL INSPECTION REQUIREMENTS</i> .....	9
2.10	<i>APPLICATION OF PROTECTIVE TREATMENTS</i> .....	9
2.11	<i>DATA RELATIVE TO STRUCTURAL FASTENERS</i> .....	9
2.12	<i>SPECIAL TOOLS</i> .....	9
2.13	<i>ADDITIONAL INSTRUCTIONS FOR AIRCRAFT OPERATING UNDER FAR 121/135</i> .....	9
2.14	<i>OVERHAUL PERIOD</i> .....	10
2.15	<i>IMPLEMENTATION AND RECORD KEEPING</i> .....	10
2.16	<i>ICA REVISION &amp; DISTRIBUTION</i> .....	10

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Part #: 560-0279-01 Rev C

## 1 Introduction

This document contains Instructions for Continued Airworthiness (ICA) compliant with 14 CFR 23.1529 and Appendix G requirements. The ICA includes information required by the operator to adequately maintain the equipment installed under the GDL 90 UAT System STC. The GDL 90 UAT System includes the GDL 90 UAT and the Micro APM, and may also include the optional GSL 71 UAT Control Panel. The GDL 90 and GSL 71 products have built-in-test features that notify the flight crew in the event of system or unit failure, and the procedures herein augment those built-in-test functions. This document refers to other documents for specific information that is either part of the installation package or an existing part of the aircraft's permanent record.

### 1.1 Document Control

This document shall be released, archived, and controlled in accordance with the Garmin AT document control system. When this document is revised, refer to Section 2.16 for information on how to gain FAA acceptance or approval and how to notify customers of changes.

### 1.2 Airworthiness Limitations Section

The airworthiness limitations section is FAA approved and specifies inspections and other maintenance required and under §43.16 and §91.403 of the Federal Aviation Regulations (FAR) unless an alternative program has been FAA approved.

There are no mandatory replacement times for the GDL 90 UAT in this STC installation. There are no mandatory structural inspections associated with this STC.

### 1.3 Permission to Use Certain Documents

Permission is granted to any corporation or person applying for approval of a Garmin GDL 90 UAT or GSL 71 Control Panel 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.

### 1.4 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 AT. Garmin AT customer assistance may be contacted during normal business hours via telephone 800-525-6726 or email from the Garmin web site at [support.salem@garmin.com](mailto:support.salem@garmin.com).

## GDL 90 STC Instructions for Continued Airworthiness

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2345 Turner Rd SE  
Salem, OR 97302

19 September 2007  
Part #: 560-0279-01 Rev C

## 2 Instructions for Continued Airworthiness

### 2.1 Introduction

Content, Scope, Purpose and Arrangement:	This document identifies the Instruction for Continued Airworthiness for the modification of the aircraft for installation of the Garmin GDL 90 UAT and/or GSL 71 UAT Control Panel.
Applicability:	Applies to aircraft altered by installation of the Garmin GDL 90 UAT system.
Definition of Abbreviations:	AEG – Aircraft Evaluation Group BIT – Built-In Test FSDO – Flight Standards District Office GPS – Global Positioning System ICA – Instructions for Continued Airworthiness LED – Light Emitting Diode MFD – Multi-Function Display PMI – Primary Manufacturing Inspector POI – Primary Operations Inspector STC – Supplemental Type Certificate UAT – Universal Access Transceiver WAAS – Wide Area Augmentation System
Precautions:	N/A, None
Units of measurement:	N/A, None
Referenced publications: (or later FAA approved revisions)	*560-1049-02 Rev. C GDL 90 Installation Manual *560-0278-01 Rev. D Master Data List *560-0215-04 Rev. C A-41 UAT Antenna Information *560-0253-00 Rev. B A-40 UAT Antenna Information *560-0949-01 Rev. D A-33 GPS Antenna Install Guide *560-5047-00 Rev. F A-34 & GA 35 GPS Antenna Install Guide *190-00438-01 Rev. D GA 56W Antenna Instructions *190-00522-01 Rev. B GA 55A, 56A, 57 Antenna Instr. *190-00848-00-Rev. A GA 35, GA 36, GA 37 Antenna Installation Instructions *560-0410-00 Rev. B GSL 71 Pilot's Guide *560-0411-00 Rev. D GSL 71 Installation Manual  560-7031-0 Rev. -- GDL 90 Maintenance Manual Note: The maintenance manual document is only required for Garmin-approved repair stations.
Retention:	*This document (or later FAA-approved revisions), or the information contained within, should be contained in the permanent aircraft record as part of the ICA. The GDL 90 product CD 140-0063-xx contains the required documents.

### 2.2 Description of Alteration

Installation of the Garmin GDL 90 UAT Data Link Sensor with UAT antenna, GPS/WAAS antenna, and other system interfaces. The GDL 90 UAT interfaces to the pilot through optional

## **GDL 90 STC Instructions for Continued Airworthiness**

Garmin AT, Inc.  
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19 September 2007  
Part #: 560-0279-01 Rev C

existing equipment, such as the Garmin AT MX20 Multi-Function Display. The GDL 90 UAT may also interface to the pilot through the optional GSL 71 UAT Control Panel, which may be installed under this STC.

### **2.3 Control, Operating Information**

The GDL 90 UAT does not have a direct pilot interface. If the GDL 90 is interfaced to optional external controllers or display systems, consult the appropriate controller or display User's Guide for system operation and self-test information.

If the optional GSL 71 UAT Control Panel is installed, consult the GSL 71 documents listed in paragraph 2.1 of this document.

Aircraft-specific configuration information for the GDL 90 is stored in the MicroAPM. This information may be accessed using a PC as described in the GDL 90 Installation Manual listed in Section 2.1 of this document.

### **2.4 Servicing Information**

None. In the event of system failure, return the GDL 90 or GSL 71 unit to the manufacturer or an approved repair station.

### **2.5 Periodic Maintenance Instructions**

The GDL 90 UAT and MicroAPM are designed to detect internal failures. A thorough self-test is executed automatically upon application of power, and built-in test is continuously executed. Detected errors are indicated by failure LEDs on the GDL 90, and maintenance is on-condition. If the GDL 90 is interfaced to an optional external controller or MFD, detected errors may also be indicated by annunciation on the interfaced controller or MFD.

Note: The MicroAPM is installed in the wiring harness near the GDL 90 unit.

Operation of the GDL 90 is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. Conduct a visual inspection on the GDL 90 UAT Data Link Sensor and MicroAPM units and its wire harness to insure continued installation integrity:

- a. Inspect the GDL 90 and MicroAPM for security of attachment
- b. Inspect related antennas for proper sealing and attachment
- c. Inspect condition of wiring, routing, and attachment/clamping.

The GSL 71 UAT Control Panel is also designed to detect internal failures. A self-test is executed automatically upon application of power, and built-in test is continuously executed. Detected errors at start-up are indicated by "TEST" "FAIL" on the GSL 71 LED display. Detected errors during use are indicated by "UAT" "FAIL" on the display.

## **GDL 90 STC Instructions for Continued Airworthiness**

Garmin AT, Inc.  
2345 Turner Rd SE  
Salem, OR 97302

19 September 2007  
Part #: 560-0279-01 Rev C

Operation of the GSL 71 is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. Conduct a visual inspection on the GSL 71 UAT Control Panel and its wire harness to insure continued installation integrity:

- a. Inspect the GSL 71 for security of attachment
- b. Inspect all knobs and buttons, and the LED display, for proper legibility
- c. Inspect condition of wiring, routing, and attachment/clamping.

### **2.5.1 GDL 90 UAT Battery Replacement**

The GDL 90 UAT has an internal keep-alive battery that will last about 10 years. The battery is used for retention of internal ram memory data and GPS system information. Regular planned replacement is not necessary. The GDL 90 UAT “maintenance” LED will be lit when replacement is required. The GDL 90 UAT will also send a “low battery” message for display on an optional controller or MFD when replacement is required. Once the low battery message is displayed, the battery should be replaced within 1 to 2 months.

If the battery is not replaced and becomes totally discharged, the GDL 90 UAT will remain fully operational, but the GPS signal acquisition time may be increased. There is no loss of function or accuracy of the GDL 90 UAT with a discharged battery.

The battery must be replaced by the Garmin AT factory repair station or factory authorized repair station. Refer to GDL 90 UAT Maintenance Manual, listed under reference documentation in paragraph 2.1 of this document, for battery replacement instructions.

### **2.5.2 GSL 71 Cleaning**

The GSL 71 front bezel, keypad, and display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical cleaning agents. Extreme care must be taken to avoid scratching the surface of the display.

### **2.5.3 Altitude Encoder Calibration**

The pressure altitude source used by the GDL 90 UAT must within the previous 24 months have been tested and inspected and found to be in compliance with Appendix E of 14 CFR 43 (“Altimeter System Test and Inspection”) Sections (a) - Static pressure system, (b) - Altimeter, and (d) - Records, subject to the following notes:

- 14 CFR 43 Appendix E Section (c) does not apply to ADS-B equipment. Instead, verify that the altimeter data output is correctly provided to the UAT equipment by using one of the following procedures:
  - Use the GDL 90 Maintenance port to verify the ownship pressure altitude data, as discussed in the GDL 90 Installation Manual.
  - If equipped with a GSL 71 UAT Control Panel, the “Pres Alt” display field may be used to verify the altitude data provided by the altitude encoder.
  - The altitude value may be viewed on a UAT ADS-B Traffic display (MX20 or equivalent) that is receiving UAT ADS-B messages from the equipment under

## **GDL 90 STC Instructions for Continued Airworthiness**

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19 September 2007  
Part #: 560-0279-01 Rev C

test. Configure any such display for a baro setting of 29.92 inches, if applicable, so that the display shows the uncorrected pressure altitude.

- If the GDL 90 altitude source is shared with a transponder, and is in compliance with FAR 91.413 (ATC Transponder Tests and Inspections), no additional altitude encoder tests are necessary. Use any of the above methods to verify that the altitude data is provided to the GDL 90.

### **2.6 Troubleshooting Information**

Error indications are displayed on the GSL 71, optional interfaced display/controller, or the GDL 90 LEDs.

If error indications are displayed on the GDL 90 UAT LEDs, consult the Troubleshooting section contained in the GDL 90 UAT Installation Manual listed under reference documentation in paragraph 2.1 of this document. The 'GDL 90 Post-Installation Checkout log' in the aircraft permanent records includes the configuration information for the installation. (See the table at the end of Section 4 in the GDL 90 Installation Manual for a sample log.)

If error indications are shown on the GSL 71 LED display, consult the Troubleshooting section contained in the GSL 71 Installation Manual listed under reference documentation in paragraph 2.1 of this document. The 'GSL 71 Post-Installation Checkout log' in the aircraft permanent records includes the configuration information for the installation. (See the table at the end of Section 3 in the GSL 71 Installation Manual for a sample log.)

### **2.7 Removal and Replacement Information**

#### **2.7.1 GDL 90 UAT**

If the GDL 90 UAT unit is removed and reinstalled, verify that the GDL 90 UAT unit power-up self-test sequence is successfully completed and that no failure messages are annunciated on any interfaced controller or MFD.

If the GDL 90 UAT unit is removed for repair and reinstalled, or if the GDL 90 UAT unit is removed and replaced with a different GDL 90 UAT unit, then follow 'Equipment Setup and Configuration' procedures contained in the GDL 90 UAT Installation Manual listed in paragraph 2.1 of this document, and verify that the GDL 90 UAT unit power-up self-test sequence is successfully completed and that no failure messages are annunciated on any interfaced controller or MFD.

If any work has been done on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify that the GDL 90 UAT unit power-up self-test sequence is successfully completed and that no failure messages are annunciated on any interfaced controller or MFD.

Note: There are no special handling requirements for the GDL 90 UAT.



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### **2.7.2 GSL 71**

If the GSL 71 unit is removed and reinstalled, verify that the GSL 71 unit power-up self-test sequence is successfully completed and that no failure messages are annunciated on any interfaced MFD.

If the GSL 71 unit is removed for repair and reinstalled, then follow 'Post-Installation Checkout' procedures contained in the GSL 71 Installation Manual listed in paragraph 2.1 of this document, and verify that the GSL 71 unit power-up self-test sequence is successfully completed and that no failure messages are annunciated on any interfaced MFD.

If any work has been done on the aircraft that could affect the system wiring or any interconnected equipment, verify that the GSL 71 unit power-up self-test sequence is successfully completed and that no failure messages are annunciated on any interfaced MFD.

Note: There are no special handling requirements for the GSL 71.

### **2.8 Diagrams**

Refer to the GDL 90 UAT Installation Manual and/or the GSL 71 Installation Manual (both listed under reference documentation in paragraph 2.1 of this document) for drawings applicable to this installation. The GPS antenna is located on top of the fuselage. See the GPS antenna installation guide for the type of antenna installed (GPS antenna guides are listed under reference document paragraph 2.1 of this document). The UAT antennas are located on top and/or bottom of the fuselage. See the UAT antenna installation guide for the type of UAT antenna installed (listed under reference document paragraph 2.1 of this document).

### **2.9 Special Inspection Requirements**

None, N/A.

### **2.10 Application of Protective Treatments**

None, N/A.

### **2.11 Data Relative to Structural Fasteners**

None, N/A.

### **2.12 Special Tools**

No special tools are required for system checkout. See GDL 90 UAT or GSL 71 Control Panel Installation Manuals listed under reference documentation in paragraph 2.1 of this document.

### **2.13 Additional Instructions for Aircraft Operating under FAR 121/135**

1. Aircraft Electrical Loads: Perform aircraft electrical system load analysis. See GDL 90 UAT and/or GSL 71 UAT Control Panel Installation Manuals listed in Section 2.1 of this document.

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2. Methods of balancing flight controls: N/A.
3. Special Repair Methods applicable to the airplane: See certificate holder's General Maintenance Manual for instructions.

### ***2.14 Overhaul Period***

The system does not require overhaul at a specific time period. Power on self-test and continuous BIT will monitor the health of the GDL 90 UAT and/or GSL 71 UAT Control Panel. If the unit indicates an internal failure, the unit may be removed and replaced.

### ***2.15 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.

### ***2.16 ICA Revision & Distribution***

ICA revisions must be submitted for ACO approval. The ACO will obtain AEG acceptance, and issue evidence of approval. After ACO approval, Garmin AT will release the revised ICA for customer use, and provide any required notification of the revision.

The latest revision of this document is distributed on the GDL 90 Product CD (P/N 140-0063-xxx), shipped with each new GDL 90 or GSL 71 unit. The latest revision is also available on the Garmin website ([garmin.com](http://garmin.com)). A Garmin Service Letter, describing ICA revision, will be sent to dealers and/or GDL 90 or GSL 71 owners of record if revision is determined to be significant.