

## **Apollo CNX80 STC Instructions for Continued Airworthiness**

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

24 November 2003  
Part #: 560-0986-00 Rev E

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Document Revision: E  
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Printed in the USA

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Revision Log				
Rev	Date	Description	EN	By
--	23-Apr-03	Initial Release	7625	dfs
A	30-May-03	In reference publications in paragraph 2.1, changed revision of 560-0982-00 to Rev. A, 560-0984-00 to Rev. B, and 560-0987-00 to Rev. A.	7654	dfs
B	19-Jun-03	Updated document after FAA Small Aircraft Directorate review	7662	CES
C	26-Jun-03	Update MDL to Rev D & Install Manual to Rev C (2.1). Add "for AEG approval" to the first sentence (2.15) as requested by FAA Small Aircraft Directorate.	7662	mak
D	29-Oct-03	Update revision level for referenced documents to include company name change from UPSAT to Garmin AT (2.1). Update company name in this document. Add definitions section (1.4).	7729	mak
E	24-Nov-03	Update per ACO & AEG requests. Describe how ICA revisions are distributed (1.1). Clarify no special handling (2.7). Correct approval process (2.15).	7729	mak

<b>Garmin AT, Inc.</b>		Cage Code 0XCJ6	P. O. Box 13549 Salem, Oregon USA
Title:	<b>Apollo CNX80 STC Instructions for Continued Airworthiness</b>		Number: <b>560-0986-00</b>
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## **1 Introduction**

This document is designed to assist the installing agency of the Apollo CNX80 in preparing Instructions for Continued Airworthiness in response to Flight Standards Handbook Bulletin HBAW 98-18 and Federal Aviation regulation (FAR) Part 23.1529, and Part 23 Appendix G. They include information required by the operator to adequately maintain the Apollo CNX80. This product has 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.

### **1.1 Document Distribution**

This document, or the information contained within, will be retained in the aircraft's permanent record. The latest revision of this document will be distributed on the CNX80 User CD (P/N 140-0056-xxx), shipped with each CNX80 unit. The latest revision will also be available on the Garmin AT website (GarminAT.com). A Garmin AT Service Letter, describing the ICA revision, will be sent to dealers and CNX80 owners of record if revision is determined to be significant. Each revision will be approved as described in Section 2.15 of this document.

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.

### **1.2 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 Apollo CNX80 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 AT Apollo CNX80 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 Definitions**

AEG – Aircraft Evaluation Group  
BIT – Built-In Test  
FSDO – Flight Standards District Office  
GPS – Global Positioning System  
ICA – Instructions for Continued Airworthiness  
PMI – Primary Manufacturing Inspector

POI – Primary Operations Inspector  
STC – Supplemental Type Certificate

## 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 AT Apollo CNX80 GPS Nav Com.
Applicability:	Applies to aircraft altered by installation of the Garmin AT Apollo CNX80 system.
Definition of Abbreviations:	N/A, None
Precautions:	N/A, None
Units of measurement:	N/A, None
Referenced publications: (or later FAA approved revisions)	560-0982-00 Rev. E CNX80 Installation Instructions 560-0984-00 Rev. C CNX80 Pilot's Guide 560-0987-00 Rev. E Master Data List 560-7027-00 Rev. A CNX80 Maintenance Manual 560-0949-01 Rev. B A-33 GPS Antenna Install Guide 560-5047-00 Rev. B A-34 GPS Antenna Install Guide
Distribution:	This document should be contained in the permanent aircraft record.

### 2.2 Description of Alteration

Installation of the Garmin AT Apollo CNX80 GPS/WAAS Nav Com with GPS/WAAS antenna and other system interfaces. The CNX80 combines a large number of easily acceptable controls to use the high-resolution color multi-function display, Nav and Com transceivers, GPS/WAAS navigator and transponder controller al in a single unit.

### 2.3 Control, Operating Information

See Apollo CNX80 Pilot's Guide, listed under reference documentation in paragraph 2.1 of this document, for system operation and self-test information.

### 2.4 Servicing Information

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

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### **2.5 Periodic Maintenance Instructions**

The Apollo CNX80 is designed to detect internal failures. A thorough self-test is executed automatically upon application of power to the units, and built-in test is continuously executed. Detected errors are indicated on the equipment via failure annunciations and maintenance is on-condition. At an annual inspection conduct a visual inspection on the CNX radio and radio wire harness to insure continued installation integrity. Visually inspect wiring harness to insure no chaffing or wire routing problems.

#### **2.5.1 Display Backlight**

The display backlight lamp is rated by the manufacturer as having a usable life of 18,000 hours. This life may be more or less than the rated time depending on the operating conditions of the CNX80. Over time, the backlight lamp may dim and the display may not perform as well in direct sunlight conditions. The user must determine by observation when the display brightness is not suitable for its intended use. Contact the Garmin AT factory repair station when the backlight lamp requires service.

#### **2.5.2 Battery Replacement**

The CNX80 has an internal keep-alive battery that will last about 10 years. The battery is used for internal ram memory and GPS system information. Regular planned replacement is not necessary. The CNX80 will display a 'low battery' message when replacement is required. Once the low battery message is displayed, the battery should be replaced within 1 to 2 months.

If the battery is not replaced and becomes totally discharged, the CNX80 will remain fully operational, but the GPS signal acquisition time may be increased. This acquisition time can be reduced by entering a new seed position each time the unit is powered on. There is no loss of function or accuracy of the CNX80 with a dead battery.

The battery must be replaced by the Garmin AT factory repair station or factory authorized repair station. Refer to CNX80 Maintenance Manual, listed under reference documentation in paragraph 2.1 of this document, for battery replacement instructions.

### **2.6 Troubleshooting Information**

If error indications are displayed on the CNX80, consult the Troubleshooting section contained in the CNX80 Installation Manual listed under reference documentation in paragraph 2.1 of this document.

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

If the CNX80 unit is removed and reinstalled, verify the CNX80 unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

If the CNX80 unit is removed for repair and reinstalled, or if the CNX80 unit is removed and replaced with a different CNX80 unit, then follow 'Equipment Setup and Configuration'

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procedures contained in the CNX Installation Manual listed in paragraph 2.1 of this document, and verify the CNX80 unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

If any work has been done on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the CNX80 unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

Note: There are no special handling requirements for the CNX80.

### **2.8 *Diagrams***

Refer to the CNX80 Installation Manual (listed under reference documentation in paragraph 2.1 of this document) for drawings application to this installation. The GPS antenna is located on top of the fuselage. See A33 or A34 Antenna Installation Guide (listed under reference document paragraph 2.1 of this document) for antenna description.

### **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 CNX80 Installation Manual 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 CNX80 Installation Manual listed in Section 2.1 of this document.
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 CNX80. If the unit indicates an internal failure, the unit may be removed and replaced.

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### ***2.15 Revision***

To revise this ICA, a letter must be submitted to the ACO for approval along with the revised ICA. The ACO will obtain AEG acceptance, and issue an approval letter for the revised ICA. After ACO approval, Garmin AT will release the revised ICA for customer use, and provide any required notification of the revision.

### ***2.16 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 AT. Garmin AT customer assistance may be contacted during normal business hours via telephone or email.

### ***2.17 Implementation and Record Keeping***

For operators under FAR 91, the owner/operator is responsible for ensuring the ICA is made part of the applicable §91.409 inspection program for their aircraft.

For operators under FAR 121/135, this ICA must be incorporated into the operator's approved maintenance program through coordination and approval with the certificate holder's PMI/POI as applicable.