

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

CRAIG AVIONICS SUPPLEMENT TO
THE AIRPLANE FLIGHT MANUAL FOR
CESSNA 172N
REGISTRATION NO. N1355F
SERIAL NO. 17272998

This document must be carried in the aircraft at all times. It describes the operating procedures for the Garmin GNS-430 navigation system when it has been installed in accordance with Garmin Installation Manual 190-00140-02 Rev ____ (Rev A or later) and FAA Form 337 dated January 31, 2014.

For aircraft with an FAA Approved Flight Manual, this document serves as the FAA Approved Flight Manual Supplement for the Garmin GNS-430. For aircraft that do not have an approved flight manual, this document serves as the FAA Approved Supplemental Flight Manual for the Garmin GNS-430.

The information contained herein supplements or supersedes the basic Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this document, consult the basic Airplane Flight Manual.

FAA APPROVED _____
EA-FSDO-65

412 Yellowbird Rd.
Portland, ME 04102

FAA APPROVED: DATED: _____

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

The revision date is shown at the bottom of each revised page.
The vertical bar on the outer margin indicates the latest revised
portion of each revised page.

REVISION NO.	DATE	PAGES AFFECTED	REMARKS	FAA APPROVAL
--------------	------	----------------	---------	--------------

Original

ALL

FAA APPROVED: DATED: _____

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
	REVISIONS	2
I.	GENERAL	4
II.	LIMITATIONS	4
III.	EMERGENCY PROCEDURES	6
IV.	NORMAL PROCEDURES	6
V.	PERFORMANCE	8
VI.	WEIGHT AND BALANCE	8
VII.	AIRPLANE & SYSTEM DESCRIPTION ...	8

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

SECTION I GENERAL

1. The GNS-430 system is a fully integrated, panel-mounted instrument, which contains a VHF Communications Transceiver, VOR/ILS Receiver, and a Global Positioning System (GPS) Navigation Computer. The system consists of a GPS antenna, GPS receiver, VHF VOR/LOC/GS antenna, VOR/ILS receiver, VHF COMM antenna and a VHF Communications Transceiver. The primary function of the VHF Communication portion of the equipment is to facilitate communication with Air Traffic Control. The primary function of the VOR/ILS receiver portion of the equipment is to receive and demodulate VOR, Localizer, and Glide Slope signals. The primary function of the GPS portion of the system is to acquire signals from the GPS system satellites, recover orbital data, make range and Doppler measurements, and process this information in real-time to obtain the user's position, velocity and time.
2. Provided the Garmin GNS-430's GPS receiver is receiving adequate usable signals, it has been demonstrated capable of and has been shown to meet the accuracy specifications for:
 - VFR/IFR enroute, terminal and non-precision instrument approach (GPS, Loran-C, VOR, VOR-DME, TACAN, NDB, NDB-DME, RNAV) operation within the U.S. National Airspace System in accordance with AC 20-138C.
 - One of the approved sensors, for a single or dual GNS-430 installation, for North Atlantic Minimum Navigation Performance Specifications (MNPS) Airspace in accordance with AC 120-33.
 - The system meets RNP5 airspace (BRNAV) requirements of AC 90-96 and in accordance with AC20-138C, and JAA GAI-20 ACJ 20X4, provided it is receiving usable navigation information from the GPS receiver.

Navigation is accomplished using the WGS-84 (NAD-83) coordinate reference datum. Navigation data is based upon use of only the Global Positioning System (GPS) operated by the United States of America.

SECTION II LIMITATIONS

1. The Garmin GNS-430 Pilot's Guide, P/N 190-00140-00, Rev P dated December 2009, or later appropriate revision, must be immediately available to the flight crew whenever navigation is predicated on the use of the system. In addition to the Pilot's Guide, the 400/500 Series Garmin Optional Displays Pilot's Guide Addendum P/N 190-00140-13 Rev G, or later appropriate revision also must be immediately available to the flight crew if lightning detection, or Traffic Information Service (TIS), are interfaced to the system.

The 400/500 Series Display Interfaces Pilot's Guide Addendum P/N 190-00140-10 Rev D, or later appropriate revision also must be immediately available to the flight crew if the BFGoodrich WX-500 Stormscope or the BFGoodrich SKYWATCH Traffic Advisory System (TAS) is installed. The GNS-430 must utilize the following or later FAA approved software versions:

FAA APPROVED: DATED: _____

Craig Avionics
 Concord Municipal Airport
 83 Airport Road
 Concord, NH 03301

Airplane Flight Manual Supplement for
 Cessna 172N equipped with GNS-430
 VHF Communications Transceiver
 VOR/ILS Receiver/GPS Receiver

2. The GNS-430 must utilize the following or later FAA approved software versions:

Function	Sub-System Version				
	Main	GPS	COM	VOR/LOC	G/S
Initial Approval	2.00	2.00	2.00	1.25	2.00

The main software version is displayed on the GNS-430 self-test page immediately after turn-on for 5 seconds. The remaining system software versions can be verified on the AUX group sub-page 2, "SOFTWARE/DATABASE VER".

3. IFR enroute and terminal navigation predicated upon the GNS-430's GPS receiver is prohibited unless the pilot verifies the currency of the data base or verifies each selected waypoint for accuracy by reference to current approved data.
4. Instrument approach navigation predicated upon the GNS-430's GPS receiver must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS equipment database. The GPS equipment database must incorporate the current update cycle.
 - a) Instrument approaches utilizing the GPS receiver must be conducted in the approach mode and Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix.
 - b) Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the GNS-430's GPS receiver is not authorized.
 - c) Use of the GNS-430 VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be present on the external indicator.
 - d) When an alternate airport is required by the applicable operating rules, it must be served by an approach based on other than GPS or Loran-C navigation, the aircraft must have the operational equipment capable of using that navigation aid, and the required navigation aid must be operational.
 - e) VNAV information may be utilized for advisory information only. Use of VNAV information for Instrument Approach Procedures does not guarantee Step-Down Fix altitude protection, or arrival at approach minimums in normal position to land.
5. If not previously defined, the following default settings must be made in the "SETUP 1" menu of the GNS-430 prior to operation (refer to Pilot's Guide for procedure if necessary):
 - a) **dis, spd** $\overset{n}{m}$ k t (sets navigation units to "nautical miles" and "knots")
 - b) **alt, vs** $\overset{f}{t}$ fpm (sets altitude units to "feet" and "feet per minute")
 - c) **map datum** .WGS 84 (sets map datum to WGS-84, see note below)
 - d) **posn**deg-min (sets navigation grid units to decimal minutes)

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

NOTE: In some areas outside of the United States, datum other than WGS-84 or NAD-83 may be used. If the GNS-430 is authorized for use by the appropriate Airworthiness authority, the required geodetic datum must be set in the GNS-430 prior to its use for the navigation.

SECTION III EMERGENCY PROCEDURES/ABNORMAL PROCEDURES

1. If Garmin GNS-430 navigation information is not available or invalid, utilize remaining operational navigation equipment as required.
2. If "RAIM POSITION WARNING" message is displayed the system will flag and no longer provide GPS based navigational guidance. The crew should revert to the GNS-430 VOR/ILS receiver or an alternate means of navigation other than the GNS-430's GPS receiver.
3. If "RAIM IS NOT AVAILABLE" message is displayed in the enroute, terminal, or initial approach phase of flight, continue to navigate using the GPS equipment or revert to an alternate means of navigation other than the GNS-430's GPS receiver appropriate to the route and phase of flight. When continuing to use GPS navigation, position must be verified every 15 minutes using the GNS-430's VOR/ILS receiver or another IFR-approved navigation system.
4. If "RAIM IS NOT AVAILABLE" message is displayed while on the final approach segment, GPS based navigation will continue for up to 5 minutes with approach CDI sensitivity (0.3 nautical mile). After 5 minutes the system will flag and no longer provide course guidance with approach sensitivity. Missed approach course guidance may still be available with 1 nautical mile CDI sensitivity by executing the missed approach.
5. In an in-flight emergency, depressing and holding the Comm transfer button for 2 seconds will select the emergency frequency of 121.500 MHz into the "Active" frequency window.

SECTION IV NORMAL PROCEDURES

1. DETAILED OPERATING PROCEDURES

Normal operating procedures are described in the Garmin GNS-430 Pilot's Guide, P/N 190-00140-00, Rev A, dated October 1998, or later appropriate revision. Normal operating procedures for the Traffic Information Service (TIS) interface and the Weather Data Link interface are described in the 400/500 Series Garmin Optional Displays Pilot's Guide Addendum P/N 190-00140-13, Rev G, or later appropriate revision.

Normal operating procedures for the BFGoodrich WX-500 Stormscope of the BFGoodrich SKYWATCH Traffic Advisory System (TAS) interface are described in the 400/500 Series Display Interfaces Pilot's Guide Addendum P/N 190-00140-10 Rev D, or later appropriate revision.

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

2. PILOT'S DISPLAY

The GNS-430 system data will appear on the Pilot's CDI. The source of data is either GPS or VLOC as annunciated on the display above the CDI key.

NOTE: It is the pilot's responsibility to assure that published or assigned procedures are correctly complied with. Course guidance is not provided for all possible ARINC 424 leg types. See the GNS-430 Pilot's Guide for detailed operating procedures regarding navigation capabilities for specific ARINC 424 leg types.

3. CROSSFILL OPERATIONS

For dual GNC-400 Product Series installations, crossfill capabilities exist between the number one and number two GNC-400 systems. Refer to the Garmin GNS-430 Pilot's Guide for detailed crossfill operating instructions.

4. AUTOMATIC LOCALIZER COURSE CAPTURE

By default, the GNS-430 automatic localizer course capture feature is enabled. This feature provides a method for system navigation data present on the external indicators to be switched automatically from GPS guidance to localizer/glide slope guidance as the aircraft approaches the localizer course inbound to the final approach fix. If an offset from the final approach course is being flown, it is possible that the automatic switch from GPS course guidance to localizer/glide slope course guidance will not occur. It is the pilot's responsibility to ensure correct system navigation data is present on the external indicator before continuing a localizer-based approach beyond the final approach fix. Refer to the GNS-430 Pilot's Guide for detailed operating instructions.

5. DISPLAY OF LIGHTNING STRIKE DATA

For installations that interface the BFGoodrich WX-500 Stormscope and the GNS-430, lightning strike data detected by the WX-500 will appear on the GNS-430. For detailed operating instructions regarding the interface of the GNS-430 with the WX-500, refer to the WX-500 Pilot's Guide and the 400/500 Series Display Interfaces Pilot's Guide Addendum, P/N 190-00140-10, Rev D, or later appropriate revision for the WX-500 Stormscope interface.

6. DISPLAY OF TRAFFIC ADVISORY DATA

For installations that interface the BFGoodrich SKYWATCH Traffic Advisory System (TAS) and the GNS-430, traffic data detected by the TAS will appear on the GNS-430. For detailed operating instructions regarding the interface of the GNS-430 with the SKYWATCH, refer to the FAA Approved Flight Manual Supplement for the SKYWATCH, the Pilot's Guide for the SKYWATCH and the 400/500 Series Display Interfaces Pilot's Guide Addendum P/N 190-00140-10, Rev D, or later appropriate revision for the SKYWATCH Traffic Advisory System interface.

Craig Avionics
Concord Municipal Airport
83 Airport Road
Concord, NH 03301

Airplane Flight Manual Supplement for
Cessna 172N equipped with GNS-430
VHF Communications Transceiver
VOR/ILS Receiver/GPS Receiver

7. DISPLAY OF TRAFFIC INFORMATION SERVICE DATA

For installations that interface the GTX-330, TIS surveillance data uplinked by Air Traffic Control (ATC) radar through the GTX-330 Mode S Transponder will appear on the moving map and traffic display pages of the GNS 430. For detailed operating instructions regarding the interface of the GNS-430 with the GTX-330, refer to the 400/500 Series Garmin Optional Displays Pilot's Guide Addendum, P/N 190-00140-13, Rev B, or later appropriate revision for the TIS System interface.

**SECTION V
PERFORMANCE**

No Change

**SECTION VI
WEIGHT AND BALANCE**

See current weight and balance data.

**SECTION VII
AIRPLANE & SYSTEM DESCRIPTIONS**

See GNS-430 Pilot's Guide for a complete description of the GNS-430 system.

United States of America
Department of Transportation -- Federal Aviation Administration
Supplemental Type Certificate

Number SA00705WI-D

This certificate issued to

Garmin International, Inc.
1200 East 151st Street
Olathe, KS 66062

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified herein meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations.

Original Product - Type Certificate

Number: A3SO
Make: Piper Aircraft, Inc
Model: PA-32-260

Description of Type Design Change:

Installation of the Garmin GNS 430 or 430A in accordance with Garmin Master Drawing List, Drawing No. 005-00051-00, Rev. V dated 04/25/02 or later FAA approved revision and FAA Approved Airplane Flight Manual Supplement (AFMS) for Piper PA32 with Garmin GNS 430, Document No. 190-00140-03 Rev. B dated 10/22/99 or later FAA approved revision.

Limitations and Conditions:

Compatibility of this design change with previously approved modifications must be determined by the installer. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: November 26, 1997

Date reissued: October 17, 2007

Date of issuance: October 02, 1998

Date amended: October 29, 1999; July 25, 2002

By direction of the Administrator

Original signed by Robert Murray

(Signature)

Robert Murray
DAS Administrator
DAS-240087-CE
Garmin International

(Title)



Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

FAA FORM 8110-2(10-68) PAGE 1 of 2 PAGES

This certificate may be transferred in accordance with FAR 21.47.