ENSTROM F-28F/280FX OPERATOR'S MANUAL

AND

FAA APPROVED

ROTORCRAFT FLIGHT MANUAL

SUPPLEMENT

GARMIN GNS 430W/530W NAVIGATION SYSTEM

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REPORT NO. 28-AC-031

HELICOPTER SERIAL NO._____

HELICOPTER REGISTRATION NO._____

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THIS SUPPLEMENT MUST BE CARRIED IN THE HELICOPTER AT ALL TIMES IF EQUIPPED WITH THE GARMIN GNS 530W INSTALLATION. CHAPTERS 1, 2, 3, AND 4 ARE FAA APPROVED.

FAA APPROVED BY: _____
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FAA APPROVAL DATE: JANUARY 19, 2009

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LOG OF REVISIONS

Rev. No.	Date	FAA Approved
Original	1-19-2009	Joseph Miess

APPROVED FOR THE MANAGER
CHICAGO AIRCRAFT CERTIFICATION OFFICE
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FEDERAL AVIATION ADMINISTRATION

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ROTORCRAFT FLIGHT MANUAL SUPPLEMENT
GARMIN GNS 430W/530W NAVIGATION SYSTEM

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ROTORCRAFT FLIGHT MANUAL SUPPLEMENT

GARMIN GNS 430W/530W NAVIGATION SYSTEM

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GARMIN GNS 430W/530W GPS/WAAS NAV COM

INTRODUCTION

Intro-1. General

This supplement contains the operating instructions, procedures, and limitations for the Garmin GNS 430W or 530W. The supplement is divided into two basic parts, the FAA approved RFM Supplement and Supplemental Data provided by the Enstrom Helicopter Corporation (Enstrom). Chapters 1, 2, 3, and 4 make up the FAA approved RFM Supplement. It is required by Federal Regulations that this supplement be carried in the helicopter at all times if the Garmin GNS 430W or 530W unit is installed.

Intro-2. List of Abbreviations

Abbreviations noted in this supplement are listed in Intro-1.

Intro-1. List of Abbreviations

BC	Back Course
CB	Circuit Breaker
CDI	Course Deviation Indicator
COM	Communication
DR	Dead Reckoning
DSP	Digital Signal Processing
GPS	Global Positioning System
GS	Glideslope
ICAO	International Civil Aviation Organization
ICS	Intercom System
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Localizer-type Directional Aid

Intro-1. List of Abbreviations - Continued

LNAV	Lateral Navigation
LOC	Localizer
LPV	Localizer Performance with Vertical guidance
METAR	Meteorological Aviation Report
MLS	Microwave Landing System
NAD	North American Datum
NAV	Navigation
NDB	Non-Directional Beacon
NEXRAD	Next Generation Radar
OBS	Omni Bearing Selector
RFM	Rotorcraft Flight Manual
SDF	Simplified Directional Facility
SW	Software
SYS	System
TAF	Terminal Aerodrome Forecast
TAS	Traffic Advisory System
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Collision Avoidance System
TIS	Traffic Information Service
TSO	Technical Standard Order
TX	Transmitter
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation
VLOC	VOR Localizer
VOR	VHF Omni-Directional Range
VOX	Voice Activated
WAAS	Wide Area Augmentation System
WGS	World Geodetic System

CHAPTER 1. OPERATING LIMITATIONS

1-1. General

1. Rotorcraft operations with the GNS 430W/530W are limited to VFR only. IFR procedure training is allowed during VFR/VMC. Planned/deliberate flight during IMC is not authorized.

2. A placard in close proximity to the GNS 430W/530W shall state:

GPS TO BE USED FOR VFR ONLY

1-2. Pilot's Guide

1. The Pilot's Guide and Pilot's Guide Addendum listed in Table 1-1 must be available for the flight crew whenever navigation is predicated on the use of the GNS 430W or 530W.

Table 1-1. Pilot's Guide References

400W Series Pilot's Guide and Reference	P/N 190-00356-00 Rev. C (or later revisions)
500W Series Pilot's Guide and Reference	P/N 190-00357-00 Rev. C (or later revisions)
400W/500W Series Optional Displays Pilot's Guide Addendum	P/N 190-00356-30 Rev. C (or later revisions)
400W/500W Series Display Interfaces Pilot's Guide Addendum	P/N 190-00356-31 Rev. C (or later revisions)

1-3. System Software

1. The system must utilize the Main and GPS software versions listed in Table 1-2 (or later FAA approved version). The software versions are displayed on the self-test page immediately after turn-on approximately 5 seconds or they can be accessed in the AUX pages.

2. Subsequent software versions may support different functions. Check the 400W or 500W Series Pilot's Guide for further information.

Table 1-2. Approved Software Versions

Software Item	Approved Software Version (or later FAA approved versions)			
	SW version		As displayed on unit	
	430W	530W	430W	530W
Main SW Version	2.00	3.00	2.00	3.00
GPS SW Version	2.4	3.0	2.4	3.0

1-4. Navigation Database

1. One of the navigation database cards listed in Table 1-3 must be installed.

Table 1-3. Approved Navigation Database Cards

Part Number	Description
010-10546-00	Data Card, WAAS, World Wide
010-10546-01	Data Card, WAAS, Americas
010-10546-02	Data Card, WAAS, International

1-5. Terrain Database

1. The TAWS function in the GNS 430W/530W is not approved for rotorcraft use.

2. The GNS 430W/530W requires a Terrain database card to be installed in order for the Terrain feature to operate. Table 1-4 lists the compatible database card for the GNS 430W/530W. The database card contains the following data:

a. The Terrain Database has an area of coverage from North 75° Latitude to South 60° Latitude in all longitudes.

b. The Airport Terrain Database has an area of coverage that includes the United States, Canada, Mexico, Latin America, and South America.

c. The Obstacle Database has an area of coverage that includes the United States, and is updated as frequently as every 56 days.

NOTE

The area of coverage may be modified as additional terrain data sources become available.

Table 1-4. Approved Terrain Database Card

Part Number	Description
010-10201-21	Data Card, TAWS/Terrain, 256 MB

1-6. Navigation

1. No navigation is authorized north of 89° north latitude or south of 89° south latitude.

1-7. VNAV

1. VNAV information may be utilized for advisory information only.

1-8. Weather Display

1. If an optional weather receiver is interfaced to the GNS 430W/530W, the weather information displayed is limited to supplemental use only and may not be used in lieu of an official weather data source.

1-9. Traffic Display

1. Traffic may be displayed on the GNS 430W/530W when connected to an approved optional TCAS, TAS, or TIS traffic device. These systems are capable of providing traffic monitoring and alerting to the pilot. Traffic shown on the display may or may not have traffic alerting available. The display of traffic is an aid to visual acquisition and may not be utilized for aircraft maneuvering. Display of this traffic data and related operations are described in the applicable pilot's guide.

1-10. Nav/Com

1. An aircraft radio station license may be required when operating internationally.

CHAPTER 2. NORMAL PROCEDURES

2-1. General

1. The normal operating procedures for the GNS 430W or 530W are described in the applicable Pilot's Guide listed in Table 1-1. The pilot shall review and clear all messages after power up.

2. The terrain functionality is not recommended for use in rotorcraft.

2-2. Approaches

1. During GPS approaches, the pilot must verify the 430W/530W is operating in the approach mode (LNAV, LNAV+V, L/VNAV, or LPV).

2. When conducting approaches referenced to true North, the heading selection on the AUX pages must be adjusted to TRUE.

3. Accomplishment of an ILS, LOC, LOC-BC, LDA, SDF, MLS, VOR approach, or any other type of approach not approved for GPS overlay, is not authorized with GPS navigation guidance.

4. Use of the GNS 430W/530W VOR/LOC/GS receiver to fly approaches not approved for GPS requires VOR/LOC/GS navigation data to be present on the external indicator (i.e. proper CDI source selection).

NOTE

GPS is to be used for VFR only. IFR procedure training is allowed during VFR/VMC.

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CHAPTER 3. EMERGENCY PROCEDURES

3-1. Emergency Procedures

1. Refer to the basic RFM.

3-2. Abnormal Procedures

1. If the GNS 430W/530W GPS navigation information is not available, or is invalid, utilize other remaining operational navigation equipment as appropriate. If the 430W/530W loses GPS position and reverts to Dead Reckoning mode (indicated by the annunciation of “DR” in the lower left of the display), the moving map will continue to be displayed. The aircraft position will be based upon the last valid GPS position and estimated by Dead Reckoning methods. Changes in airspeed or winds aloft can affect the estimated position substantially. Dead Reckoning is only available in Enroute mode; Terminal and Approach modes do not support DR.

2. If a “Loss of Integrity” (INTEG) message is displayed during:

a. Enroute/Terminal: Continue to navigate using GPS equipment and periodically cross-check the GPS guidance to other approved means of navigation.

b. GPS Approach: GPS approaches are not authorized under INTEG; execute missed approach or revert to alternate navigation.

3. During a GPS LPV precision approach or GPS LNAV/VNAV approach, the GNS 430W/530W will downgrade the approach if the Vertical alarm limits are exceeded. This will cause the vertical guidance to flag as unavailable. The procedure may be continued using the LNAV only minimums.

4. During any GPS approach in which precision and non-precision alarm limits are exceeded, the GNS 430W /530W will flag the lateral guidance and generate a system message “ABORT APPROACH loss of navigation”. Immediately upon viewing the message the unit will revert to Terminal alarm limits. If the position integrity is within these limits, lateral guidance will be restored and the GPS

may be used to execute the missed approach, otherwise alternate means of navigation should be utilized.

CHAPTER 4. PERFORMANCE DATA

4-1. General

1. Refer to the basic RFM.

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CHAPTER 6. WEIGHT/BALANCE AND LOADING

6-1. General

1. This installation is included in the basic aircraft weight. Refer to the basic RFM.

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CHAPTER 7. SYSTEM DESCRIPTION AND OPERATION

7-1. System Description

1. The GNS 430W/530W GPS/WAAS Navigator is a panel-mounted product that contains a GPS/WAAS receiver for GPS approved primary navigation under TSO C146a, and also VHF Com and VHF Nav radios in an integrated system unit with a moving map and color display. The graphical display is used to depict traffic, weather, or terrain data.

2. The GNS 430W/530W uses GPS and WAAS (within the coverage of a Space-Based Augmentation System complying with ICAO Annex 10) for enroute, terminal area, non-precision approach operations (including “GPS” and “RNAV” approaches), and approach procedures with vertical guidance (including “LNAV/VNAV” and “LPV”).

3. The GNS 430W/530W integrates a Jeppesen® database that contains location reference for all airports, VORs, NDBs, Intersections, Flight Service Stations, published approaches, Special Use Airspace and geopolitical boundaries.

4. The GNS 430W/530W may be interfaced with optional sensors and tracking systems, such as weather and traffic. Information is laid directly over Jeppesen and topographical map databases. The system interface is shown in Figure 7-1.

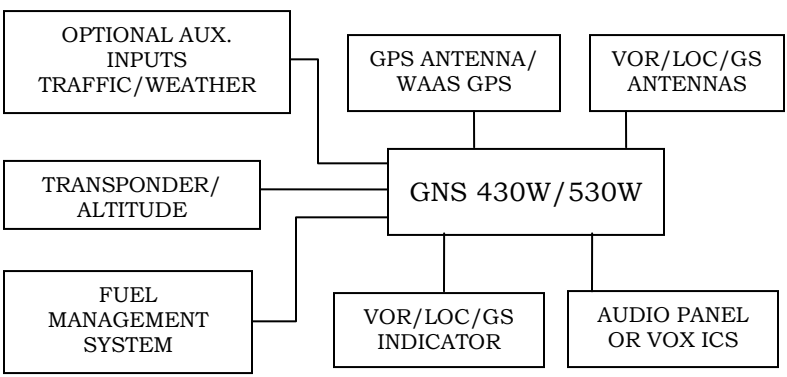

Figure 7-1. GNS 430W/530W System Interface

5. Power to the GNS 430W/530W is provided via the **GPS/COM/NAV** circuit breaker (CB) (5 Amp) and the **COM TX** circuit breaker (CB) (5 Amp) located on the left side of the instrument console.

7-2. Operation

1. Operation of the GNS 430W/530W is controlled by the **C/ PWR/VOL** knob.

2. The GNS 430W display and controls are shown in Figure 7-2. The GNS 530W display and controls are shown in Figure 7-3. A brief explanation of the keys and knobs is provided in Table 7-1.

3. Two front-loading datacard ports are used for the Jeppensen and terrain database updates.

Figure 7-2. GNS 430W Display

Figure 7-3. GNS 530W Display

Table 7-1. Display Keys and Knobs

Keys and Knobs	Functions
C PWR/VOL	Controls unit power and communications radio volume
VLOC VOL	Controls audio volume for the selected VOR/LOC frequency
COM/VLOC large knob **PUSH C/V** small knob	Tune the MHz value of the COM or VOR/LOC standby frequency. Tune the kHz value of the COM or VOR/LOC standby frequency. Press to toggle between the COM and VLOC frequency fields.
COM flip-flop	Toggle between the active and standby COM frequencies
VLOC flip-flop	Toggle between the active and standby VLOC frequencies
RNG (range)	Press up or down to select desired map scale
D→ (direct to)	Establish a direct course to a selected destination/waypoint
MENU	Access for features and settings
CLR (clear)	Erase or cancel an entry
ENT (enter)	Approve, confirm, or complete operation
GPS large knob **PUSH CRSR** small knob	Turn knob to select between the various page groups. Turn to select desired pages within a group. Press the knob to display the on-screen cursor.
Continued on Next Page	

Table 7-1. Display Keys and Knobs - Continued

Keys and Knobs	Functions
CDI (course deviation indicator)	Press to toggle the navigation source (GPS or VLOC)
OBS (omni-bearing selector)	Used to activate OBS selection or as a suspend key. As a Suspend key, it is used to select manual or automatic sequencing of waypoints.
MSG (message)	View system messages, important warnings, and requirements
FPL (flight plan)	Used to create, edit, activate, and invert flight plans, access approaches, departures, and arrivals.
VNAV (vertical navigation)	Used to create a 3-D profile for guidance to a final altitude at a specified location
PROC (procedures)	Used to select approaches, departures, and arrivals from the flight plan

4. Refer to the 400W or 500W Series unit Pilot's Guide defined in Table 1-1 for complete GPS, VHF COM and NAV, and Multi-Function Display operations.

5. For information on traffic or data linked weather, refer to the applicable Pilot's Guide Addendums (defined in Table 1-1) for optional displays and interfaces.