GNS 400W/500W Series SW Version 5.30 Upgrade Supplement

This supplement provides information regarding new features that have been added with software version 5.30 for 400W/500W Series units.

You may download documents at https://fly.garmin.com/support/ or contact Garmin Customer Support for a printed copy.

Documents That Have Been Revised For SW Verson 5.30

- GNS 400W Series Pilot's Guide & Reference (Garmin P/N 190-00356-00) Rev K
- GNS 400W/500W Series Garmin Optional Displays Addendum (Garmin P/N 190-00356-30) Rev M
- GNS 500W Series Pilot's Guide & Reference (Garmin P/N 190-00357-00) Rev K
- GNS 400W Series Quick Reference (Garmin P/N 190-00356-01) Rev K
- GNS 500W Series Quick Reference (Garmin P/N 190-00357-01) Rev J

Later versions of the document will include all changes from previous versions.

Pilot Guide Upgrade Supplements

The following table lists the previous revisions of the Pilot Guides and The Upgrade Supplements which, taken together, provide operating information for main software version 5.30. For instance, if the current Pilots Guide is Rev G, then the v5.00 and v5.20 Upgrade Supplements should be downloaded and printed to use with the Rev G manual to provide equivalent instructions to the latest, Rev J Pilots Guide.

Current Pilot Guides			**Required Supplements**							
Pilot Guide	**Part Number**	**Rev**	190-00356-39[2] v5.30 Supplement	190-00356-38[2] v5.20 Supplement	190-00356-37[1] v5.10 Supplement	190-00356-36 v5.00 Supplement	190-00356-35 v4.00 Supplement	190-00356-34 v3.30 Supplement	190-00356-33 v3.20 Supplement	190-00356-32 v3.00 Supplement
400W Pilots Guide or 500W Pilots Guide	190-00356-00 190-00357-00	K								
		J	x	x						
		H	x	x	x					
		G	x	x	x	x				
		E, F	x	x	x	x	x			
		D	x	x	x	x	x	x		
		C	x	x	x	x	x	x	x	
		A, B	x	x	x	x	x	x	x	x
Garmin Displays Addendum	190-00356-30	M								
		L	x							
		K	x	x						
		J	x	x	x					
		H	x	x	x	x				
		F	x	x	x	x	x			
		D	x	x	x	x	x	x		
		C	x	x	x	x	x	x	x	
		A, B	x	x	x	x	x	x	x	x
Display Interfaces Addendum	190-00356-31	C							x	

1. For non-GDL 88 installations, only pages 1 through 5 of the v5.10 supplement are required.
2. The v5.20 supplement is only required for installations that include the Flight Stream 210.

GNS 400W Series Pilot Guide Changes for Rev K

Page 167, "GS > 30 kt" changed to "In Air."

To record or reset the departure time:

2. Turn the **large right** knob to highlight the reset mode field, under "Departure Time". (The reset mode field will indicate "Pwr-on" or "In Air".)
3. Turn the **small right** knob to select the desired reset mode. ("Pwr-on" will record a departure time when the 400W-series unit is turned on. "In Air" will record a departure time once the GPS-computed ground speed exceeds 30 knots.)

To view, use or reset total trip time:

2. Turn the **large right** knob to highlight the reset mode field, under "Total Trip Time". (The reset mode field will indicate "Pwr-on" or "In Air".)
3. Turn the **small right** knob to select the desired reset mode. ("Pwr-on" will record trip time, in hours/minutes/seconds, any time the 400W-series unit is turned on. "In Air" will record trip time any time the GPS-computed ground speed exceeds 30 knots.)

   In the case of a helicopter installation, the Total Trip Criteria is "Pwr-on" or "In-air."

Page 181, ADS-B messages added.

ADS-B traffic has failed — The ADS-B traffic system may have lost GPS position or detected an internal fault. Contact dealer for service.

ADS-B transmit has failed — ADS-B unit is not able to transmit a message due to a failure with the ADS-B system or antenna(s). Contact dealer for service.

ADS-B is not transmitting position — The ADS-B unit has detected a position input falut. Contact dealer for service.

ADS-B fault - Check ADS-B Status Page — A fault has been detected. Check the ADS-B unit Status page in Aux mode.

ADS-B - Connection has been lost — The GNS is configured for a traffic device but is not receiving data from it. Traffic will not be displayed on the GNS. Contact dealer for service.

ADS-B Traffic Alerting not available — The ADS-B traffic system is reporting that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable. Ensure the aircraft has a clear view of the sky. If the problem persists. Contact dealer for service.

Page 182, text added.

Cannot navigate locked FPL — You have attempted to navigate a flight plan (FPL) with one or more locked waypoints. A waypoint can be "locked" when the NavData® card is replaced and the waypoint(s) does not exist in the new database or if attempting to crossfill user waypoints when no empty user-defined waypoint slots exist (will create a "lockd" point in flight plan).

Page 184, message title changed.

GDL 88 Traffic Alerting not available or GDL 88 CSA Failure — The GDL 88 is reporting that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable.

GNS 500W Series Pilot Guide Changes for Rev K

Page 180, "GS > 30 kt" changed to "In Air."

To record or reset the departure time:

2. Turn the **large right** knob to highlight the reset mode field, under "Departure Time". (The reset mode field will indicate "Pwr-on" or "In Air".)
3. Turn the **small right** knob to select the desired reset mode. ("Pwr-on" will record a departure time when the 500W-series unit is turned on. "In Air" will record a departure time once the GPS-computed ground speed exceeds 30 knots.)

Page 181, "GS > 30 kt" changed to "In Air."

To view, use or reset total trip time:

2. Turn the **large right** knob to highlight the reset mode field, under "Total Trip Time". (The reset mode field will indicate "Pwr-on" or "In Air".)
3. Turn the **small right** knob to select the desired reset mode. ("Pwr-on" will record trip time, in hours/minutes/seconds, any time the 500W-series unit is turned on. "In Air" will record trip time any time the GPS-computed ground speed exceeds 30 knots.)

Page 199, ADS-B messages added.

ADS-B traffic has failed — The ADS-B traffic system may have lost GPS position or detected an internal fault. Contact dealer for service.

ADS-B transmit has failed — ADS-B unit is not able to transmit a message due to a failure with the ADS-B system or antenna(s). Contact dealer for service.

ADS-B is not transmitting position — The ADS-B unit has detected a position input falut. Contact dealer for service.

ADS-B fault - Check ADS-B Status Page — A fault has been detected. Check the ADS-B unit Status page in Aux mode.

ADS-B - Connection has been lost — The GNS is configured for a traffic device but is not receiving data from it. Traffic will not be displayed on the GNS. Contact dealer for service.

ADS-B Traffic Alerting not available — The ADS-B traffic system is reporting that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable. Ensure the aircraft has a clear view of the sky. If the problem persists. Contact dealer for service.

Page 200, text added.

Cannot navigate locked FPL — You have attempted to navigate a flight plan (FPL) with one or more locked waypoints. A waypoint can be "locked" when the NavData® card is replaced and the waypoint(s) does not exist in the new database or if attempting to crossfill user waypoints when no empty user-defined waypoint slots exist (will create a "lockd" point in flight plan).

Page 202, message title changed.

GDL 88 Traffic Alerting not available or GDL 88 CSA Failure — The GDL 88 is reporting that the CSA application has failed. Traffic alerting on ADS-B traffic is unavailable.

400W/500W Garmin Optional Displays Pilot's Guide Addendum Changes for Rev K

Cover, added the GTX 33/345

Page 1, changed "GTX 330" references to "GTX 3xx series."

TIS Operation

NOTE: *Part One of this Addendum assumes the user has experience operating the 400W/500W Series units and the Garmin GTX 3xxTransponder.*

The Traffic Information Service (TIS) provides a graphic display of traffic advisory information in the cockpit for non-TCAS (Traffic alert and Collision Avoidance System) equipped aircraft. TIS is a ground-based service providing relative location of all ATCRBS (Air Traffic Control Radar Beacon System) Mode A and Mode C transponder-equipped aircraft within a specified service volume. The TIS ground sensor uses real-time track reports to generate traffic notification. TIS Traffic display is available to aircraft equipped with a Mode S Data Link such as a Garmin GTX 3xx Transponder. TIS Traffic from a GTX 3xx Transponder can then be displayed on a Garmin 400W/500W Series unit. Surveillance data includes all transponder-equipped aircraft within the coverage volume. Aircraft without an operating transponder are invisible to TIS. TIS displays up to eight traffic targets within seven nautical miles horizontally from 3000 feet below to 3500 feet above the requesting aircraft.

Page 4, changed "GTX 330" references to "GTX 3xx."

The TIS audio alert is generated from the GTX 3xx whenever the number of Traffic Advisories on the 400W/500W display increases from one scan to the next.

Page 5, changed "GTX 330" references to "GTX 3xx."

- NO DATA — "NO DATA" is displayed when no data are being received from the GTX 3xx. The pilot should be aware that this status may be a normal mode of operation in a dual transponder installation where the GTX 3xx with TIS is not the selected transponder. The GTX 3xx may not be powered on.
- DATA FAIL — "DATA FAIL" is displayed when data are being received from GTX 3xx, but there was a failure detected in the data stream. The pilot should see the dealer for corrective action.
- FAILED — "FAILED" is displayed when the GTX 3xx has indicated it has failed. The pilot should see the dealer for corrective action.

Page 9, changed "GTX 330" references to "GTX 3xx."

Introduction

TIS warns the user with voice and visual traffic advisories whenever it predicts an intruder to be a threat (see illustration). Voice and visual data are sent from the GTX 3xx.

Power-Up Test

- If the system fails the power-up test, the "NO DATA", "DATA FAIL", or "FAILED" message is displayed. See your installer for corrective action if the "DATA FAIL", or "FAILED" message is displayed. The "FAILED" message indicates the GTX 3xx has failed. The "DATA FAIL" message indicates data are being received from the GTX 3xx but a failure was detected in the data stream. The "NO DATA" message indicates that data are not being received from the GTX 3xx.

NOTE: *"NO DATA" may be a normal mode of operation in a dual transponder installation where the GTX 3xx with TIS is not the selected transponder.*

Page 69, changed "GTX 330" references to "GTX 3xx," changed the part title, rewrote the first paragraph, and deleted the second paragraph.

Part Seven: Garmin ADS-B Interface

Section 1: Introduction

The GNS has the ability to display ADS-B information from a variety of compatible Garmin sources. This includes ADS-B traffic information, FIS-B weather products, and traffic information from TIS-B as well as legacy TCAS/TCAD systems. The display output will vary slightly depending on the specific devices connected and the operating environment. Refer to specific device operating manuals for more detailed information.

Page 70, changed "GDL 88" to "compatible device" and deleted the last paragraph.

Section 2: FIS-B Weather

Flight Information Services (FIS) Description

The Flight Information Services (FIS) function provides text and graphic weather information for aircraft equipped with a compatible device. No subscription is required for FIS-B services.

Caption on the second figure is changed to:

UAT FIS-B Graphic Weather Info with the GDL 88 (or similar device)

Page 70, changed "GDL 88" to "ADS-B device"

NOTE: *If both a GDL 69 and ADS-B device are interfaced to the GNS then the textual METARS and TAF pages will show the most recent data and the source of the data will be indicated (FIS-B or XM).*

Page 75, "GDL 88" replaced with "ADS-B" or "ADS-B" added.

Section 3: Traffic

Introduction

The GDL 88 or ADS-B may receive traffic from several sources including external sources (ADS-B, ADS-R, and TIS-B) and onboard sources (TAS/TCAS) and creates a single, fused traffic picture to provide to the flight crew. Using relative altitude, relative bearing, range, directionality, ground track, and other identifying information (ICAO address, flight ID, call sign, tail number), the GDL 88 or ADS-B should determine when tracks from multiple sources represent a single traffic target, selects the most accurate position source for the target, and sends the data to the display.

ADS INC - ADS Incomplete. When the GNS display an ADS operating mode of ADS-INC, this means that the aircraft is either not receiving data from the ground stations or is not on the address list for the ground stations. In either case the traffic picture observed by the pilot on the GNS display does not include some or all targets observed by ATC and is thus incomplete. Other participating ADS-B traffic will be displayed, TCAS/TCAD traffic (if installed) will be displayed, and targets sent by ground stations to other aircraft may be displayed.

ADS N/A. If the ADS-B with TCAD/TCAS or ADS-B is configured on the GNS and the ADS-B reports invalid heading, invalid track, and a valid GPS position, the ADS-B will be indicated as N/A (not available).

Caption on the second figure is changed to:

The Standby Screen appears when the ADS-B passes the power-up test.

Power-Up Self-Test

1. If the GDL 88/ADS-B series unit passes the power-up test, the Traffic Page is displayed on the 6-NM display range and in the normal altitude display mode.
2. If the display indicates that the GDL 88/ADS-B series unit has failed, please refer to the failure response section in the Pilot's Guide for actions to take.

Page 75, the first paragraph after the note under "User-Initiated Test" was deleted.

Page 77, "GDL 88" replaced with "ADS-B" or "ADS-B" added.

Switching Between Standby and Operating Modes

The GDL 88/ADS-B must be in operating mode for traffic to be displayed. The ability to switch out of standby into operating mode on the ground is especially useful for observing the airspace around the airport before takeoff.

To switch into Operating Mode:

To set the mode to Operating when the GDL 88/ADS-B is not connected to either TCAD or TCAS:

1. Press the **cursor** knob and highlight "ADS OFF". Turn the **small right** knob to select "ADS ON?".
2. Press **ENT** to confirm and place the GDL 88/ADS-B series unit in operating mode.
3. Press the **cursor** knob to exit the menu option and view the updated mode.

To set the mode to Operate on the GNS units connected to a GDL 88/ADS-B with TCAD or TCAS, the pilot will need to place either or both the GDL 88 (ADS) and TCAS/TCAD the Operating mode.

NOTE: *If no heading source is installed then the GDL 88/ADS-B and a TCAS/TCAD cannot both be commanded ON while on the ground.*

NOTE: *Whenever switching out of Standby mode, the ADS-B unit goes to the 6-NM display range. If your aircraft has a squat switch and you do not manually switch out of standby, the ADS-B unit will automatically switch out of standby 8 to 10 seconds after takeoff.*

To switch into Standby Mode:

To set the mode to Standby when the ADS-B unit is not connected to either TCAD or TCAS:

2. Press **ENT** to confirm and place the ADS-B unit in Standby mode.

To set the mode to Standby on the GNS units connected to an ADS-B unit with TCAD or TCAS, the pilot will need to place either or both ADS and TCAS/TCAD to the Standby modes.

NOTE: *If your aircraft has a squat switch,* ***STBY*** *is not displayed while you are airborne but will go into standby 24 seconds after landing. This delay allows the ADS-B unit to remain in the operating mode during a touch-and-go maneuver.*

Page 78, "GDL 88" replaced with "ADS-B" or "ADS-B" added.

Traffic Page

When interfaced to a GDL 88 or ADS-B Datalink Sensor, GNS 400W/500W series units can display ADS-B and TIS-B traffic on the Traffic and Nav Map Pages. When using TCAD or TCAS, ADS-B and TIS-B traffic may be overlayed on the Map Page, but only if a valid heading source is provided.

Caption on the last figure is changed to:

Traffic With GDL 88/ADS-B

Page 79, "ADS-B" added to the captions of the first four figures.

Traffic With GDL 88/ADS-B With TCAS

Traffic With GDL 88/ADS-B With TCAD

Traffic With GDL 88/ADS-B and Invalid Heading or Track

Traffic With GDL 88/ADS-B With TCAS Operating and ADS-B Failed

Page 80, "GDL 88" replaced with "ADS-B" or "ADS-B" added.

NOTE: *Traffic data will be shown on the Traffic and Nav Map pages even without heading. When using TCAD or TCAS, ADS-B unit traffic data is only displayed on the Map Page if suitable aircraft heading data is available. See the Garmin 400W or 500W Series Installation Manuals available at your authorized Garmin service center for details.*

Configuring Traffic Data on the Map Page

When using TCAD or TCAS, GDL 88/ADS-B series unit traffic data is only displayed on the Map Page if suitable aircraft heading data is available.

Page 81, "GDL 88" replaced with "ADS-B."

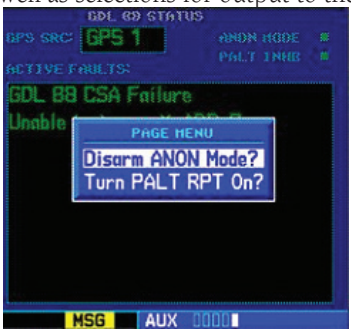
Highlighting Traffic Data Using Map Panning

The Panning, function allows you to view more information about traffic by highlighting the traffic symbol with the panning target pointer. The pointer will move from one target to another if left active as the traffic list provided by the ADS-B is resorted as targets change priority.

Page 82, "GDL 88" replaced with "ADS-B"

ADS-B Status

The ADS-B Status page displays information about the ADS-B operating status and lists active faults, as well as selections for output to the ADS-B unit.



ADS-B STATUS page menu allows Arming/Disarming Anon mode and turning Pressure Altitude Reporting On/Off.

Pressure Altitude Report (PALT RPT)

The ADS-B unit requires the use of an ownship pressure altitude for transmission of required ADS-B Out data values and to calculate the vertical separation and vertical closure from target aircraft.

1. Turn the **large** knob to select AUX group.
2. Turn the **small** knob to select the ADS-B Status page.
3. Press **MENU** to display the menu.
4. Turn the **small** or **large right** knob to highlight the desired choice and then press **ENT**.

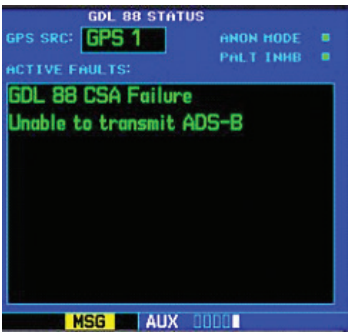
Anonymous (ANON) Mode

The Anonymous Mode, when armed, will replace the Flight ID with a temporary randomized number for privacy while the position information will still be provided. The call sign will be sent as "VFR." To enable Anonymous Mode, the Squawk Code on the installed transponder must be set to the VFR code and the Anonymous Mode must be armed. Anonymous mode may not be available depending on the specific installation.

1. Turn the **large** knob to select AUX group.
2. Turn the **small** knob to select the ADS-B Status page.
3. Press **MENU** to display the menu.
4. Turn the **small** or **large right** knob to highlight the desired choice and then press **ENT**.

Failure Response

Errors indicated by a "FAILED" message on the screen prevent continued use of the ADS-B unit. If the unit is configured (not integrated with TCAD/TCAS system) and reports an invalid heading, invalid track, and valid GPS position, "UNAVAIL" will be displayed in the center of the page. See the ADS-B Status page for information on Failure Response.



ADS-B STATUS page, lists some of the problems with the ADS-B, that might cause the failure.

Page 83, "GDL 88" replaced with "ADS-B unit." Some text deleted.

RYAN TCAD

Ryan TCAD is a system that provides audio and visual alerts for traffic near your aircraft. The information from this system can be interfaced through the ADS-B unit to the GNS 400W/500W series. Operating instructions and details on the modes of operation are described in the Ryan TCAD operator's handbooks.

Setting Altitude Display Mode

The TCAD has four altitude display modes: Normal (±2,700 feet), Above (-2,700 feet to +9,000 feet), Below (-9,000 feet to +2,700 feet), and Unrestricted (±9,900 feet). The GDL 88 continues to track up to 30 intruder aircraft within its maximum surveillance range, regardless of the altitude display mode selected.

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