

## ALERT LEVEL DEFINITIONS

**NOTE:** Refer to the Pilot's Operating Handbook (POH) for corrective pilot actions.

The Alerting System uses four alert levels, as installed in the Cessna Nav III aircraft.

**NOTE:** Aural alerts associated with abnormal conditions and advisories are managed through the audio panels. Refer to the Audio Panel and CNS Section for more information.

**Warning:** This level of alert requires immediate attention. A warning alert appears in the Annunciation Window and is accompanied by a continuous aural tone. Text appearing in the Annunciation Window is red. A warning alert is also accompanied by a flashing **Warning** Softkey annunciation. Pressing the Warning Softkey acknowledges the warning alert and stops the aural tone, if applicable.

**Caution:** This level of alert indicates the existence of abnormal conditions on the aircraft that may require pilot intervention. When a new caution alert appears in the Annunciation Window, it is shown in black on amber inverse video in conjunction with the **Caution** Softkey and is accompanied by an aural tone. Pressing the **Caution** Softkey acknowledges all amber messages and extinguishes the softkey. Once acknowledged, caution messages are displayed until the issue is corrected.

**Safe Operating Advisory** (if equipped): This level of alert indicates crew awareness is required. It is shown in green text in the Annunciation Window.

**System Message Advisory:** This level of alert provides general information to the pilot. Message Advisories appear in the Alerts Window and are not shown in the Annunciation Window. When a Message Advisory occurs, the system provides a white flashing **Messages** Softkey annunciation. Pressing the softkey acknowledges the message advisory alert, and displays the associated text in the Alerts Window.

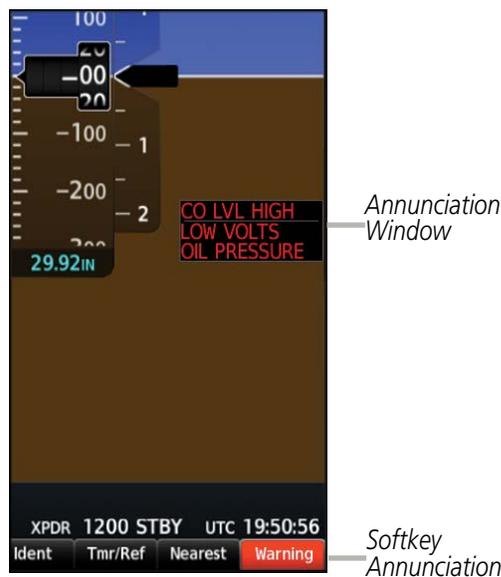


Figure A-2 Annunciation Window



Figure A-3 Warning and Caution Softkey Annunciations

## AUDIO ALERTING SYSTEM TEST

The system issues audio alert tones when specific system conditions are met. Should the #1 GIA 63W fail, audio and voice alerts are not generated. The annunciation tone may be tested from the Aux - System Status Page.

### Testing the system annunciation tone:

- 1) Use the **FMS** Knob to select the Aux - System Status Page.
  - 2) Select the **ANN Test** Softkey.
- Or:
- 1) Press the **MENU** Key.
  - 2) Highlight 'Enable Annunciator Test Mode' and press the **ENT** Key.

## SYSTEM MESSAGE ADVISORIES

This section describes various system message advisories. Certain messages are issued due to an LRU or an LRU function failure. Such messages are normally accompanied by a corresponding red 'X' annunciation as shown previously in the System Annunciation section.



**NOTE:** This section provides information regarding message advisories that may be displayed by the system. Knowledge of the aircraft, systems, flight conditions, and other existing operational priorities must be considered when responding to a message. Always use sound pilot judgment. The Pilot's Operating Handbook (POH) takes precedence over any conflicting guidance found in this section.

Message	Comments
<b>ABORT APR</b> – Loss of GPS navigation. Abort approach.	Abort approach due to loss of GPS navigation.
<b>ADC1 ALT EC</b> – ADC1 altitude error correction is unavailable	GDC1 is reporting that the altitude error correction is unavailable.
<b>ADC1 AS EC</b> – ADC1 airspeed error correction is unavailable.	GDC1 is reporting that the airspeed error correction is unavailable.
<b>AHRS1 CAL</b> – AHRS1 calibration version error. Svc req'd.	The #1 AHRS calibration version error. The system should be serviced.
<b>AHRS1 CONFIG</b> – AHRS1 config error. Config service req'd.	AHRS configuration settings do not match those of backup configuration memory. The system should be serviced.
<b>AHRS1 GPS</b> – AHRS1 using backup GPS source.	The #1 AHRS is using the backup GPS path. Primary GPS path has failed. The system should be serviced when possible.
<b>AHRS1 GPS</b> – AHRS1 not receiving any GPS information.	The #1 AHRS is not receiving any or any useful GPS information. Check POH limitations. The system should be serviced.
<b>AHRS1 GPS</b> – AHRS1 not receiving backup GPS information.	The #1 AHRS is not receiving backup GPS information. The system should be serviced.
<b>AHRS1 GPS</b> – AHRS1 operating exclusively in no-GPS mode.	The #1 AHRS is operating exclusively in no-GPS mode. The system should be serviced.

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Message	Comments
<b>AHRS1 SERVICE</b> – AHRS1 Magnetic-field model needs update.	The #1 AHRS earth magnetic field model is out of date. Update magnetic field model when practical.
<b>AHRS1 TAS</b> – AHRS1 not receiving airspeed.	The #1 AHRS is not receiving true airspeed from the air data computer. The AHRS relies on GPS information to augment the lack of airspeed. The system should be serviced.
<b>APR DWNGRADE</b> – Approach downgraded.	Use LNAV minima when approach is downgraded.
<b>ARSPC AHEAD</b> – Airspace ahead less than 10 minutes.	Special use airspace is ahead of aircraft. The aircraft will penetrate the airspace within 10 minutes.
<b>ARSPC NEAR</b> – Airspace near – less than 2 nm.	Special use airspace is within 2 nm of the aircraft position.
<b>ARSPC NEAR</b> – Airspace near and ahead.	Special use airspace is near and ahead of the aircraft position.
<b>APR INACTV</b> – Approach is not active.	The system notifies the pilot that the loaded approach is not active. Activate approach when required.
<b>CHECK CRS</b> – Database course for LOC2 / [LOC ID] is [CRS]°.	Selected course for LOC2 differs from published localizer course by more than 10 degrees.
<b>CNFG MODULE</b> – PFD1 configuration module is inoperative.	The PFD1 configuration module backup memory has failed. The system should be serviced.
<b>CO DET SRVC</b> – The carbon monoxide detector needs service.	A failure has been detected in carbon monoxide detector has been detected. The detector may still be available. The system should be serviced when possible.
<b>CO DET FAIL</b> – The carbon monoxide detector is inoperative.	A failure in the carbon monoxide detector has been detected. The system should be serviced.
<b>COM1 CONFIG</b> – COM1 config error. Config service req'd.	The COM1 configuration settings do not match backup configuration memory. The system should be serviced
<b>COM1 PTT</b> – COM1 push-to-talk key is stuck.	The COM1 external push-to-talk switch is stuck in the enable (or “pressed”) position. Press the PTT switch again to cycle its operation. If the problem persists, the system should be serviced.
<b>COM1 RMT XFR</b> – COM1 remote transfer key is stuck.	The COM1 transfer switch is stuck in the enabled (or “pressed”) position. Press the transfer switch again to cycle its operation. If the problem persists, the system should be serviced.
<b>COM1 SERVICE</b> – COM1 needs service. Return unit for repair.	The system has detected a failure in COM1. COM1 may still be usable. The system should be serviced when possible.
<b>COM1 TEMP</b> – COM1 over temp. Reducing transmitter power.	The system has detected an over temperature condition in COM1. The transmitter operates at reduced power. If the problem persists, the system should be serviced.
<b>COM2 CONFIG</b> – COM2 config error. Config service req'd.	The COM2 configuration settings do not match backup configuration memory. The system should be serviced
<b>COM2 PTT</b> – COM2 push-to-talk key is stuck.	The COM2 external push-to-talk switch is stuck in the enable (or “pressed”) position. Press the PTT switch again to cycle its operation. If the problem persists, the system should be serviced.

Message	Comments
<b>COM2 RMT XFR</b> – COM2 remote transfer key is stuck.	The COM2 transfer switch is stuck in the enabled (or “pressed”) position. Press the transfer switch again to cycle its operation. If the problem persists, the system should be serviced.
<b>COM2 SERVICE</b> – COM2 needs service. Return unit for repair.	The system has detected a failure in COM2. COM2 may still be usable. The system should be serviced when possible.
<b>COM2 TEMP</b> – COM2 over temp. Reducing transmitter power.	The system has detected an over temperature condition in COM2. The transmitter operates at reduced power. If the problem persists, the system should be serviced.
<b>COPILOT RADIOS MUTED</b> – Copilot radios are muted.	The copilot radios are set on mute.
<b>DATA LOST</b> – Pilot stored data was lost. Recheck settings.	The pilot profile data was lost. System reverts to default pilot profile and settings. The pilot may reconfigure the MFD & PFD with preferred settings, if desired.
<b>DB CHANGE</b> – Database changed. Verify user modified procedures.	This occurs when a stored flight plan contains procedures that have been manually edited. This alert is issued only after an navigation database update. Verify that the user-modified procedures in stored flight plans are correct and up to date.
<b>DB CHANGE</b> – Database changed. Verify stored airways.	This occurs when a stored flight plan contains an airway that is no longer consistent with the navigation database. This alert is issued only after an navigation database update. Verify use of airways in stored flight plans and reload airways as needed.
<b>DB MISMATCH</b> – Navigation database mismatch. Xtalk is off.	The PFD and MFD have different navigation database versions or types installed. Crossfill is off. Check the Aux-System Status Page to determine versions or regions. Also, check the Aux-System Status Page for a database synchronization function not completed. After synchronization is complete, power must be turned off, then on.
<b>DB MISMATCH</b> – Obstacle database mismatch.	The PFD and MFD have different obstacle database versions or types installed. Check the Aux-System Status Page to determine versions or regions. Also, check the Aux-System Status Page for a database synchronization function not completed. After synchronization is complete, power must be turned off, then on.
<b>DB MISMATCH</b> – Standby Navigation database mismatch.	The PFD and MFD have different standby navigation database versions or types installed. Check the Aux-System Status Page to determine versions or regions. Also, check the Aux-System Status Page for a database synchronization function not completed. After synchronization is complete, power must be turned off, then on.
<b>DB MISMATCH</b> – Terrain database mismatch.	The PFD and MFD have different terrain database versions or types installed. Check the Aux-System Status Page to determine versions or regions. Also, check the Aux-System Status Page for a database synchronization function not completed. After synchronization is complete, power must be turned off, then on.
<b>DIG GMA1 MANIFEST</b> – DIG GMA 1 software mismatch, communication halted.	The digital audio controller has incorrect software installed. The system should be serviced.
<b>DME CHECK RANGE</b> – DME range disagreement. Check position sensors.	A failure or disagreement has been detected in a DME receiver. Check position sensors.
<b>FAILED PATH</b> – A data path has failed.	A data path connected to the GDU or the GIA 63W has failed.

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<b>FPL TRUNC</b> – Flight plan has been truncated.	This occurs when a newly installed navigation database eliminates an obsolete approach or arrival used by a stored flight plan. The obsolete procedure is removed from the flight plan. Update flight plan with current arrival or approach.
<b>FPL WPT LOCK</b> – Flight plan waypoint is locked.	Upon power-up, the system detects that a stored flight plan waypoint is locked. This occurs when an navigation database update eliminates an obsolete waypoint. The flight plan cannot find the specified waypoint and flags this message. This can also occur with user waypoints in a flight plan that is deleted.  Remove the waypoint from the flight plan if it no longer exists in any database, OR update the waypoint name/identifier to reflect the new information.
<b>FPL WPT MOVE</b> – Flight plan waypoint moved.	The system has detected that a waypoint coordinate has changed due to a new navigation database update. Verify that stored flight plans contain correct waypoint locations.
<b>G/S1 FAIL</b> – G/S1 is inoperative.	A failure has been detected in glideslope receiver 1. The system should be serviced.
<b>G/S1 SERVICE</b> – G/S1 needs service. Return unit for repair.	A failure has been detected in glideslope receiver 1. The receiver may still be available. The system should be serviced when possible.
<b>G/S2 FAIL</b> – G/S2 is inoperative.	A failure has been detected in glideslope receiver 2. The system should be serviced.
<b>G/S2 SERVICE</b> – G/S2 needs service. Return unit for repair.	A failure has been detected in glideslope receiver 2. The receiver may still be available. The system should be serviced when possible.
<b>GDC1 MANIFEST</b> – GDC1 software mismatch, communication halted.	The ADAHRS has incorrect software installed. The system should be serviced.
<b>GDL69 CONFIG</b> – GDL 69 config error. Config service req'd.	GDL 69/69A SXM configuration settings do not match those of backup configuration memory. The system should be serviced.
<b>GDL69 FAIL</b> – GDL 69 has failed.	A failure has been detected in the GDL 69/69A or GDL 69/69A SXM. The receiver is unavailable. The system should be serviced.
<b>GDL69 MANIFEST</b> – GDL software mismatch, communication halted.	The GDL 69/69A SXM has incorrect software installed. The system should be serviced.
<b>GEA1 CONFIG</b> – GEA1 config error. Config service req'd.	The GEA1 configuration settings do not match those of backup configuration memory. The system should be serviced.
<b>GEA1 MANIFEST</b> – GEA1 software mismatch, communication halted.	The #1 GEA 71 has incorrect software installed. The system should be serviced.
<b>GEO LIMITS</b> – AHRS1 too far North/South, no magnetic compass.	The aircraft is outside geographical limits for approved ADAHRS operation. Heading is flagged as invalid.
<b>GFC MANIFEST</b> – GFC software mismatch, communication halted.	Incorrect servo software is installed, or gain settings are incorrect.
<b>GIA1 CONFIG</b> – GIA1 audio config error. Config service req'd.	The GIA1 have an error in the audio configuration. The system should be serviced.
<b>GIA1 CONFIG</b> – GIA1 config error. Config service req'd.	The GIA1 configuration settings do not match backup configuration memory. The system should be serviced.
<b>GIA1 COOLING</b> – GIA1 temperature too low.	The GIA1 and/or GIA2 temperature is too low to operate correctly. Allow units to warm up to operating temperature.

Message	Comments
<b>GIA1 COOLING</b> – GIA1 over temperature.	The GIA1 temperature is too high. If problem persists, the system should be serviced.
<b>GIA1 MANIFEST</b> – GIA1 software mismatch, communication halted.	The GIA1 1 has incorrect software installed. The system should be serviced.
<b>GIA1 SERVICE</b> – GIA1 needs service. Return the unit for repair.	The GIA1 self-test has detected a problem in the unit. The system should be serviced.
<b>GIA2 CONFIG</b> – GIA2 audio config error. Config service req'd.	The GIA2 have an error in the audio configuration. The system should be serviced.
<b>GIA2 CONFIG</b> – GIA2 config error. Config service req'd.	The GIA2 configuration settings do not match backup configuration memory. The system should be serviced.
<b>GIA2 COOLING</b> – GIA2 over temperature.	The GIA2 temperature is too high. If problem persists, the system should be serviced.
<b>GIA2 COOLING</b> – GIA2 temperature too low.	The GIA2 temperature is too low to operate correctly. Allow units to warm up to operating temperature.
<b>GIA2 MANIFEST</b> – GIA2 software mismatch, communication halted.	The GIA 2 has incorrect software installed. The system should be serviced.
<b>GIA2 SERVICE</b> – GIA2 needs service. Return the unit for repair.	The GIA2 self-test has detected a problem in the unit. The system should be serviced.
<b>GMA1 AUX MANIFEST</b> – GMA 1 AUX software mismatch, communication halted.	The digital audio controller has incorrect software installed. The system should be serviced.
<b>GMA1 CONFIG</b> – GMA1 config error. Config service req'd.	The audio panel configuration settings do not match backup configuration memory. The system should be serviced.
<b>GMA1 FAIL</b> – GMA1 is inoperative.	The audio panel self-test has detected a failure. The audio panel is unavailable. The system should be serviced.
<b>GMA1 MANIFEST</b> – GMA1 software mismatch, communication halted.	The audio panel has incorrect software installed. The system should be serviced.
<b>GMA1 SERVICE</b> – GMA1 needs service. Return unit for repair.	The audio panel self-test has detected a problem in the unit. Certain audio functions may still be available, and the audio panel may still be usable. The system should be serviced when possible.
<b>GMU1 MANIFEST</b> – GMU1 software mismatch, communication halted.	The GMU 44 has incorrect software installed. The system should be serviced.
<b>GPS NAV LOST</b> – Loss of GPS navigation. Insufficient satellites.	Loss of GPS navigation due to insufficient satellites.
<b>GPS NAV LOST</b> – Loss of GPS navigation. Position error.	Loss of GPS navigation due to position error.
<b>GPS NAV LOST</b> – Loss of GPS navigation. GPS fail.	Loss of GPS navigation due to GPS failure.

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<b>GPS2 SERVICE</b> – GPS2 needs service. Return unit for repair.	
<b>GRS1 MANIFEST</b> – GRS1 software mismatch, communication halted.	The ADAHRS has incorrect software installed. The system should be serviced.
<b>GTS CONFIG</b> – GTS config error. Config service req'd.	GTS 800 configuration settings do not match those of the GDU configuration. The system should be serviced.
<b>GTS MANIFEST</b> – GTS software mismatch, communication halted.	The GTS has incorrect software installed. The system should be serviced.
<b>GTX1 MANIFEST</b> – GTX1 software mismatch, communication halted.	The transponder has incorrect software installed. The system should be serviced.
<b>HDG FAULT</b> – AHRS1 magnetometer fault has occurred.	A fault has occurred in the #1 GMU 44. Heading is flagged as invalid. The ADAHRS uses GPS for backup mode operation. The system should be serviced.
<b>HW MISMATCH</b> – GIA hardware mismatch. GIA1 communication halted.	A GIA mismatch has been detected, where only one is SBAS capable.
<b>HW MISMATCH</b> – GIA hardware mismatch. GIA2 communication halted.	
<b>INSIDE ARSPC</b> – Inside airspace.	The aircraft is inside the airspace.
<b>INVALID ADM</b> – Invalid ADM: ATN communication halted.	Data link avionics were not configured correctly and therefore will not be able to communicate with the ground network.
<b>LOCKED FPL</b> – Cannot navigate locked flight plan.	This occurs when the pilot attempts to activate a stored flight plan that contains locked waypoint. Remove locked waypoint from flight plan. Update flight plan with current waypoint.
<b>LOI</b> – GPS integrity lost. Crosscheck with other NAVS.	GPS integrity is insufficient for the current phase of flight.
<b>LRG MAG VAR</b> – Verify all course angles.	The GDU's internal model cannot determine the exact magnetic variance for geographic locations near the magnetic poles. Displayed magnetic course angles may differ from the actual magnetic heading by more than 2°.
<b>MANIFEST</b> – MFD1 software mismatch, communication halted.	The PFD and/or MFD has incorrect software installed. The system should be serviced.
<b>MANIFEST</b> – PFD1 software mismatch, communication halted.	
<b>MFD SOFTWARE</b> – MFD mismatch, communication halted.	The specified GDU has different software versions installed. The system should be serviced.
<b>MFD TERRAIN DSP</b> – MFD Terrain awareness display unavailable.	One of the terrain or obstacle databases required for TAWS in the specified GDU is missing or invalid.

Message	Comments
<b>MFD1 BACKLIGHT CALIBRATION</b> – MFD1 calibration. Return for repair.	The specified GDU's backlight calibration cannot be found or is invalid. The system should be serviced.
<b>MFD1 CONFIG</b> – MFD1 config error. Config service req'd.	The MFD configuration settings do not match backup configuration memory. The system should be serviced.
<b>MFD1 COOLING</b> – MFD1 has poor cooling. Reducing power usage.	The MFD is overheating and is reducing power consumption by dimming the display. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 Airport Directory database error exists.	The MFD detected a failure in the Airport Directory database. Ensure that the data card is properly inserted. Replace data card. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 basemap database error exists.	The MFD detected a failure in the basemap database.
<b>MFD1 DB ERR</b> – MFD1 Chartview database error exists.	The MFD detected a failure in the ChartView database (optional feature). Ensure that the data card is properly inserted. Replace data card. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 FliteCharts database error exists.	The MFD detected a failure in the FliteCharts database (optional feature). Ensure that the data card is properly inserted. Replace data card. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 multiple database errors exists.	The MFD detected a failure in more than one database. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 navigation database error exists.	The MFD detected a failure in the navigation database. Attempt to reload the navigation database. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 obstacle database error exists.	The MFD detected a failure in the obstacle database. Ensure that the data card is properly inserted. Replace data card. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 obstacle database missing.	The obstacle database is present on another LRU, but is missing on the specified LRU.
<b>MFD1 DB ERR</b> – MFD1 Safe Taxi database error exists.	The MFD detected a failure in the Safe Taxi database. Ensure that the data card is properly inserted. Replace data card. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 terrain database error exists.	The MFD detected a failure in the terrain database. Ensure that the terrain card is properly inserted in display. Replace terrain card. If problem persists, the system should be serviced.
<b>MFD1 DB ERR</b> – MFD1 terrain database missing.	The terrain database is present on another LRU, but is missing on the specified LRU.
<b>MFD1 SERVICE</b> – MFD1 needs service. Return unit for repair.	The MFD self-test has detected a problem. The system should be serviced.
<b>MFD1 KEYSTK</b> – MFD1 [key name] is stuck.	A key is stuck on the MFD bezel. Attempt to free the stuck key by pressing it several times. The system should be serviced if the problem persists.
<b>MFD1 VOLTAGE</b> – MFD1 has low voltage. Reducing power usage	The MFD voltage is low. The system should be serviced.

Message	Comments
<b>NAV1 MANIFEST</b> – NAV1 software mismatch, communication halted.	NAV1 software mismatch. The system should be serviced.
<b>NAV1 RMT XFR</b> – NAV1 remote transfer key is stuck.	The remote NAV1 transfer switch is stuck in the enabled (or “pressed”) state. Press the transfer switch again to cycle its operation. If the problem persists, the system should be serviced.
<b>NAV1 SERVICE</b> – NAV1 needs service. Return unit for repair.	A failure has been detected in the NAV1 receiver. The receiver may still be available. The system should be serviced.
<b>NAV2 MANIFEST</b> – NAV2 software mismatch, communication halted.	NAV2 software mismatch. The system should be serviced.
<b>NAV2 RMT XFR</b> – NAV2 remote transfer key is stuck.	The remote NAV2 transfer switch is stuck in the enabled (or “pressed”) state. Press the transfer switch again to cycle its operation. If the problem persists, the system should be serviced.
<b>NAV2 SERVICE</b> – NAV2 needs service. Return unit for repair.	A failure has been detected in the NAV2 receiver. The receiver may still be available. The system should be serviced.
<b>NON-MAGNETIC UNITS</b> – Non-magnetic NAV ANGLE display units are active.	Navigation angle is not set to MAGNETIC at power-up.
<b>NON WGS84 WPT</b> – Do not use GPS for navigation to [xxxx]	The position of the selected waypoint [xxxx] is not calculated based on the WGS84 map reference datum and may be positioned in error as displayed. Do not use GPS to navigate to the selected non-WGS84 waypoint..
<b>PFD1 BACKLIGHT CALIBRATION</b> – PFD1 backlight calibration lost. Return for repair.	The PFD1 backlight calibration cannot be found or is invalid. The system should be serviced.
<b>PFD1 CONFIG</b> – PFD1 config error. Config service req'd.	The PFD configuration settings do not match backup configuration memory. The system should be serviced.
<b>PFD1 COOLING</b> – PFD1 has poor cooling. Reducing power usage.	The PFD is overheating and is reducing power consumption by dimming the display. If problem persists, the system should be serviced.
<b>PFD1 DB ERR</b> – PFD1 basemap database error exists.	The PFD detected a failure in the basemap database.
<b>PFD1 DB ERR</b> – PFD1 multiple database errors exists.	The PFD detected a failure in more than one database. If problem persists, the system should be serviced.
<b>PFD1 DB ERR</b> – PFD1 navigation database error exists.	The PFD detected a failure in the navigation database. Attempt to reload the navigation database. If problem persists, the system should be serviced.
<b>PFD1 DB ERR</b> – PFD1 obstacle database missing.	The obstacle database is present on another LRU, but is missing on the specified LRU.
<b>PFD1 DB ERR</b> – PFD1 Safe Taxi database error exists.	The PFD detected a failure in the Safe Taxi database. Ensure that the data card is properly inserted. Replace data card. If problem persists, the system should be serviced.
<b>PFD1 DB ERR</b> – PFD1 terrain database error exists.	The PFD detected a failure in the terrain database. Ensure that the terrain card is properly inserted in display. Replace terrain card. If problem persists, the system should be serviced.
<b>PFD1 DB ERR</b> – PFD1 terrain database missing.	The terrain database is present on another LRU, but is missing on the specified LRU.

Message	Comments
<b>PFD1 KEYSTK</b> – PFD1 [key name] is stuck.	A key is stuck on the PFD bezel. Attempt to free the stuck key by pressing it several times. The system should be serviced if the problem persists.
<b>[PFD1 or MFD1] CARD 1 REM</b> – Card 1 was removed. Reinsert card.	The SD card was removed from the top card slot of the specified PFD or MFD. The SD card needs to be reinserted.
<b>[PFD1 or MFD1] CARD 2 REM</b> – Card 2 was removed. Reinsert card.	The SD card was removed from the bottom card slot of the specified PFD or MFD. The SD card needs to be reinserted.
<b>[PFD1 or MFD1] CARD 1 ERR</b> – Card 1 is invalid.	The SD card in the top card slot of the specified PFD or MFD contains invalid data.
<b>[PFD1 or MFD1] CARD 2 ERR</b> – Card 2 is invalid.	The SD card in the bottom card slot of the specified PFD or MFD contains invalid data.
<b>PFD1 VOLTAGE</b> – PFD1 has low voltage. Reducing power usage	The PFD1 voltage is low. The system should be serviced.
<b>PFD1 KEYSTK</b> – PFD2 [key name] is stuck.	A key is stuck on the PFD bezel. Attempt to free the stuck key by pressing it several times. The system should be serviced if the problem persists.
<b>PFD1 SERVICE</b> – PFD1 needs service. Return unit for repair.	The PFD self-test has detected a problem. The system should be serviced.
<b>PFD1 TERRAIN DSP</b> – PFD1 Terrain awareness display unavailable.	One of the terrain or obstacle databases required for TAWS in PFD1 is missing or invalid.
<b>PFD1 VOLTAGE</b> – PFD2 has low voltage. Reducing power usage	The PFD2 voltage is low. The system should be serviced.
<b>PILOT RADIOS MUTED</b> – Pilot radios are muted.	The pilot radios are set on mute.
<b>PTK FAIL</b> – Parallel track unavailable: invalid leg type.	Invalid leg type for parallel offset.
<b>PTK FAIL</b> – Parallel track unavailable: past IAF.	IAF waypoint for parallel offset has been passed.
<b>PTK FAIL</b> – Parallel track unavailable: bad geometry.	Bad parallel track geometry.
<b>SCHEDULER [#]</b> – <message>.	Message criteria entered by the user.
<b>SLCT FREQ</b> – Select appropriate frequency for approach.	The system notifies the pilot to load the approach frequency for the appropriate NAV receiver. Select the correct frequency for the approach.
<b>SLCT MAG</b> – Select MAGNETIC NAV ANGLE display units.	The system notifies the pilot to set the Nav Angle units on the Avionics Settings Screen to Magnetic.
<b>SLCT NAV</b> – Select NAV on CDI for approach.	The system notifies the pilot to set the CDI to the correct NAV receiver. Set the CDI to the correct NAV receiver.
<b>SLCT NON-MAG</b> – Select alternate NAV ANGLE display units.	The system notifies the pilot to set the Nav Angle units on the Avionics Settings Screen to True.
<b>STEEP TURN</b> – Steep turn ahead.	A steep turn is 15 seconds ahead. Prepare to turn.
<b>STRMSCP FAIL</b> – Stormscope has failed.	Stormscope has failed. The system should be serviced.

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Message	Comments
<b>SURFACEWATCH DISABLED</b> - Too far north/south.	The SurfaceWatch system has been disabled.
<b>SURFACEWATCH FAIL</b> - Invalid audio configuration.	The SurfaceWatch system has failed due to an invalid audio configuration.
<b>SURFACEWATCH FAIL</b> - Invalid configurable alerts.	The SurfaceWatch system has failed due to invalid configurable alerts.
<b>SURFACEWATCH FAIL</b> - One or more inputs invalid.	The SurfaceWatch system has failed due to one or more invalid inputs.
<b>SURFACEWATCH INHIBITED</b> - Surfacewatch inhibited.	The SurfaceWatch system has been inhibited.
<b>SVT DISABLED</b> – Out of available terrain region.	Synthetic Vision is disabled because the aircraft is not within the boundaries of the installed terrain database.
<b>SVT DISABLED</b> – Terrain DB resolution too low.	Synthetic Vision is disabled because a terrain database of sufficient resolution (4.9 arc-second or better) is not currently installed.
<b>SW MISMATCH</b> – GDU software version mismatch. Xtalk is off.	The MFD and PFD have different software versions installed. The system should be serviced.
<b>TERRAIN AUD CFG</b> – Trn Awareness audio config error. Service req'd.	TAWS is disabled because the audio configuration is invalid. The system should be serviced.
<b>TERRAIN DISABLED</b> – Terrain Awareness DB resolution too low.	TAWS is disabled because a terrain database of sufficient resolution (4.9 arc-second or better) is not currently installed.
<b>TIMER EXPIRD</b> – Timer has expired.	The system notifies the pilot that the timer has expired.
<b>TRAFFIC FAIL</b> – Traffic device has failed.	The system is no longer receiving data from the traffic system. The traffic device should be serviced.
<b>TRN AUD FAIL</b> – Trn Awareness audio source unavailable	Terrain Awareness audio is unavailable. The system should be serviced.
<b>UNABLE V WPT</b> – Can't reach current vertical waypoint.	The current vertical waypoint can not be reached within the maximum flight path angle and vertical speed constraints. The system automatically transitions to the next vertical waypoint.
<b>VNV</b> – Unavailable. Excessive crosstrack error.	The current crosstrack exceeds the limit, causing vertical deviation to go invalid.
<b>VNV</b> – Unavailable. Excessive track angle error.	The current track angle error exceeds the limit, causing the vertical deviation to go invalid.
<b>VNV</b> – Unavailable. Parallel course selected.	A parallel course has been selected, causing the vertical deviation to go invalid.
<b>VNV</b> – Unavailable. Unsupported leg type in flight plan.	The lateral flight plan contains a procedure turn, vector, or other unsupported leg type prior to the active vertical waypoint. This prevents vertical guidance to the active vertical waypoint.

Message	Comments
<b>WPT ARRIVAL</b> – Arriving at waypoint -[xxxx]	Arriving at waypoint [xxxx], where [xxxx] is the waypoint name.
<b>XPDR1 ADS-B 1090</b> – Datalink: ADS-B 1090 receiver has failed.	A failure has been detected in the 1090 receiver.
<b>XPDR1 ADS-B FAIL</b> – Transponder: XPDR1 is unable to transmit ADS-B messages.	ADS-B is inoperative. The transponder may not be receiving a valid GPS position. Other transponder functions may be available. Service when possible.
<b>XPDR1 ADS-B NO POS</b> – Transponder: ADS-B is not transmitting position.	The transponder is not able to receive position information.
<b>XPDR1 ADS-B TRFC</b> – Transponder: ADS-B traffic has failed	The Transponder is incapable of processing traffic information.
<b>XPDR1 ADS-B UAT</b> – Datalink: ADS-B in UAT receiver has failed.	A failure has been detected in the UAT receiver.
<b>XPDR1 CONFIG</b> – XPDR1 config error. Config service req'd.	The transponder configuration settings do not match those of backup configuration memory. The system should be serviced.
<b>XPDR1 CSA FAIL</b> - Traffic: ADS-B In traffic alerting has failed.	ADS-B Conflict Situational Awareness (CSA) is unavailable.
<b>XPDR1 FAIL</b> – XPDR1 is inoperative.	There is no communication with the #1 or #2 transponder.
<b>XPDR1 FAULT</b> – Datalink: ADSB-B in has failed.	The transponder is unable to receive ADS-B information.
<b>XPDR1 FIS-B WX</b> – Datalink: FIS-B Weather has failed.	The transponder is unable to receive FIS-B weather information.
<b>XPDR1 OVER TEMP</b> - Transponder: Transponder over temp.	The system has detected an over temperature condition in XPDR1. The transmitter operates at reduced power. If the problem persists, the system should be serviced.
<b>XPDR1 PRES ALT</b> –Transponder: ADS-B no pressure altitude.	Unable to provide pressure altitude information.
<b>XPDR1 SRVC</b> – XPDR1 needs service. Return unit for repair.	The #1 transponder should be serviced when possible.
<b>XPDR1 UNDER TEMP</b> - Transponder: Transponder under temp.	The system has detected an under temperature condition in XPDR1. The transmitter operates at reduced power. If the problem persists, the system should be serviced.
<b>XTALK ERROR</b> – A flight display crosstalk error has occurred.	The MFD and PFD are not communicating with each other. The system should be serviced.

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## DATABASE MANAGEMENT

Database information is obtained from third party sources. Inaccuracies in the data may be discovered from time to time. Garmin communicates this information by issuing a Database Alert. These notifications are available on <http://fly.garmin.com>.

Garmin requests the flight crew report any observed discrepancies related to database information. These discrepancies could come in the form of an incorrect procedure; incorrectly identified terrain, obstacles and fixes; or any other displayed item used for navigation or communication in the air or on the ground. Go to <http://fly.garmin.com> and select Aviation Data Error Report.



**CAUTION:** *Never disconnect power to the system when loading a database. Power interruption during the database loading process could result in maintenance being required to reboot the system.*

The system uses Secure Digital (SD) cards to load and store various types of data. For basic flight operations, SD cards are required for database storage as well as database updates. Not all SD cards are compatible with the system.



**NOTE:** *When loading database updates, the 'DB Mismatch' message will be displayed until database synchronization is complete, followed by turning system power off, then on. Synchronization can be monitored on the Aux – Databases Page.*



**NOTE:** *Loading a database in the system prior to its effective date will result in the expiration date on the power-up screen and the effective date on the Aux – Databases Page being displayed in amber.*

### LOADING UPDATED DATABASES



**CAUTION:** *Never disconnect power to the system when loading a database. Power interruption during the database loading process could result in maintenance being required to reboot the system.*



**NOTE:** *When loading database updates, the 'DB Mismatch' system messages will be displayed until database synchronization is complete, followed by turning system power off, then on. Synchronization can be monitored on the Aux-Database Page.*

All databases are updated through a single SD card in the bottom slot of the MFD. When the card is inserted, the databases on the card will be copied to standby and synchronized across all powered, configured units. When in standby, databases are not immediately available for use, but stored to be activated at a later time.

Databases may be loaded through Garmin Pilot and Flight Stream 510. When loading databases through Garmin Pilot and the Flight Stream 510, the Flight Stream 510 must be enabled on the system and the multimedia card inserted in the bottom SD slot of the MFD.

The cycles and dates for both standby and active databases are displayed on the “Aux – Databases” page on the MFD. Any active databases with expiration dates in the past will be highlighted with amber text. When an expired active database has a standby database that is ready to become effective, a cyan double-sided arrow will be displayed between the database cycles. When this arrow is visible, it indicates that the standby and

active databases in that row will be switched on the next power cycle, activating the current standby database. Databases can also be manually selected (or deselected) by highlighting a list item and pressing the ENT key, provided a valid, verified standby database is present.

In some cases it may be necessary to obtain an unlock code from Garmin in order to make the database product functional. It may also be necessary to have the system configured by a Garmin authorized service facility in order to use some database features.

The basemap database contains data for the topography and land features, such as rivers, lakes, and towns. It is updated only periodically, with no set schedule. There is no expiration date.

The terrain database contains the terrain mapping data. These databases are updated periodically and have no expiration date.

The obstacle database contains data for obstacles, such as towers, that pose a potential hazard to aircraft. Obstacles 200 feet and higher are included in the obstacle database. It is very important to note that not all obstacles are necessarily charted and therefore may not be contained in the obstacle database. This database is updated on a 56-day cycle.



**NOTE:** *The data contained in the terrain and obstacle databases comes from government agencies. Garmin accurately processes and cross-validates the data, but cannot guarantee the accuracy and completeness of the data.*

The AOPA or AC-U-KWIK Airport Directory provides data on airports and heliports throughout the U.S. or worldwide, respectively. The AOPA Directory offers detailed information for over 5,300 U. S. airports, along with the names and phone numbers of thousands of FBOs. These databases are updated every 56 days. The AC-U-KWIK Directory offers detailed information for more than 8,000 airports with runways longer than 3,000 feet worldwide.

The SafeTaxi database contains detailed airport diagrams for selected airports. These diagrams aid in following ground control instructions by accurately displaying the aircraft position on the map in relation to taxiways, ramps, runways, terminals, and services. This database is updated on a 56-day cycle.

The FliteCharts database contains procedure charts for the United States only. This database is updated on a 28-day cycle. If not updated within 180 days of the expiration date, FliteCharts will no longer function.

The ChartView database is updated on a 14-day cycle. If the ChartView database is not updated within 70 days of the expiration date, ChartView will no longer function. The ChartView database must be purchased directly from Jeppesen, but can be updated at [www.jeppesen.com](http://www.jeppesen.com) or [www.flygarmin.com](http://www.flygarmin.com).

## UPDATING DATABASES

The Garmin database updates can be obtained by following the instructions detailed in the 'Aviation Databases' section of the Garmin website (fly.garmin.com). Once the updated files have been downloaded from the website, a PC equipped with an appropriate SD card reader is used to unpack and program the new databases onto an existing Supplemental Data Card. Equipment required to perform the update is as follows:

- Windows-compatible PC computer
- SD Card Reader: SanDisk SDDR-93, SanDisk SDDR-99, Verbatim #96504, or equivalent
- Updated database obtained from the Garmin website
- Supplemental SD Cards

In some cases it may be necessary to obtain an unlock code from Garmin in order to make the database product functional. It may also be necessary to have the system configured by a Garmin authorized service facility in order to use some database features.

In order to load databases through Garmin Pilot and the Flight Stream 510, the Flight Stream 510 must be enabled on the system and inserted in the bottom SD slot of the MFD. A mobile device with Garmin Pilot must be paired with the Flight Stream 510 over Bluetooth (refer to the Additional Features section). When there is at least one paired device available to connect, the Flight Stream 510 will automatically connect to the system's preferred mobile device. The preferred device can be selected on the Aux – Databases page from a menu list of paired devices.

Once a connection to the paired mobile device is made, Garmin Pilot makes available databases that can be transferred to the Flight Stream 510. If any of these databases is more recent than the respective standby database on the system, (or if there is no standby database on the system) those databases will be automatically selected to load. The database updates may be initiated from the Aux - Databases page, or from other pages on the MFD.

### Updating Databases:

- 1) With the system OFF, remove an SD Card from the bottom SD card slot of the MFD.
- 2) Download and install the databases on an SD card.
- 3) Put the SD Card in the bottom SD card slot of the MFD.
- 4) Turn the system ON.
- 5) Press the **ENT** Key or the right most softkey on MFD display to acknowledge the startup screen.
- 6) Turn the large **FMS** Knob to select the Aux page group on the MFD.
- 7) Turn the small **FMS** Knob to select the Database page group on the MFD.
- 8) Monitor the Sync Status on the Database page. Wait for all databases to complete syncing, indicated by 'Sync Complete' being displayed. A cyan double arrow will appear between the Standby and Active columns to show which Standby databases will be transferred to Active at the next power cycle.

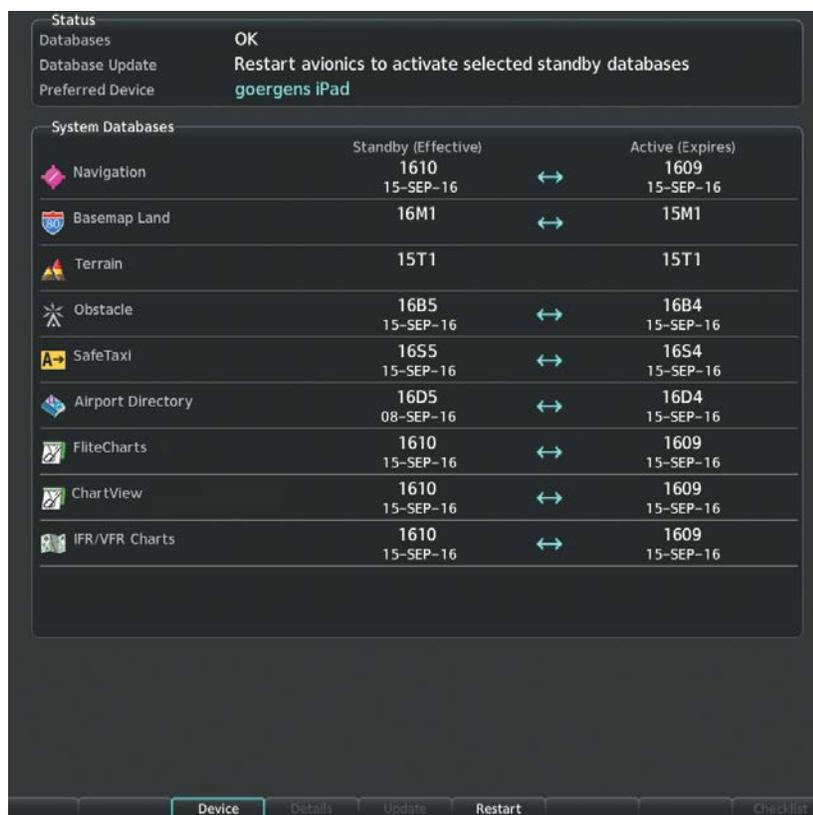


Figure B-1 Database Page before Activation of Standby Databases

- 9) Verify the correct database cycle information is shown in the Standby Database column.



**NOTE:** The **Restart** Softkey is enabled only when the aircraft is on the ground.

- 10) Press the **Restart** Softkey. A 10 second restart countdown will appear.
- 11) Press the **Restart** Button in the display window to continue with the restart of the system, or remove power from the system if the **Restart** Softkey is diminished.

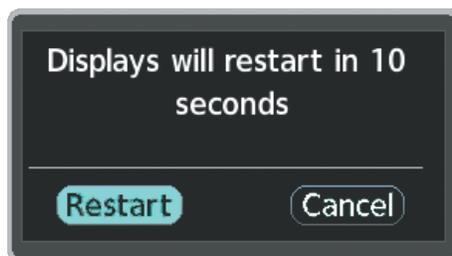


Figure B-2 Database Restart

- 12) Remove the SD card from the bottom slot of the MFD.
- 13) After restarting the system, turn the large **FMS** Knob and select the Aux page group on the MFD.
- 14) Turn the small **FMS** Knob and select the Databases page.
- 15) Verify that the standby databases transferred and are now in the active database column.



Figure B-3 Aux - Database Page - Updated Databases

- 16) To view database information for an individual display, press and then turn the **FMS** Knob to select the database, and then press the **Details** Softkey. Press the **ENT** Key or the **FMS** Knob to exit.



Figure B-4 Database Page Details

- 17) To manually activate any databases that did not transfer to the active column:
- Press the **FMS** Knob. The first database title on the screen will be selected.
  - Turn the small **FMS** Knob as necessary to select the database title.
  - Press the **ENT** Key. A cyan double-sided arrow will appear indicating that the standby database will become active.
  - Remove and reapply power to the system.
  - Verify that the standby databases transferred and are now in the active database column.
- 18) Remove power from the system.

## UPDATING DATABASES USING FLIGHT STREAM 510

Updating Databases from any MFD page (except the Aux - Databases page):

- 1) Insert the Flight Stream Multimedia Card in the bottom slot of the MFD.
- 2) Press the **Update** softkey when the Database Update screen appears.



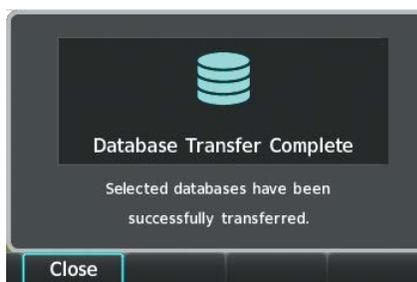
**Figure B-5 Database Update Available**

- 3) The Flight Stream 510 will enter WI-FI mode. The following screen will appear.



**Figure B-6 Starting Database Transfer**

- 4) Put the mobile device in WI-FI mode (refer to the Additional Features section).
- 5) Connect the mobile device to the Flight Stream 510 WI-FI (refer to the Additional Features section). The 'WI-FI Not Connected' screen will close when the WI-FI connection is established.
- 6) When the transfer is complete, the following screen will appear.



**Figure B-7 Database Transfer Complete**

- 7) Press the **Close** softkey.
- 8) When an existing database is expired and a new one is ready to become active, a 'Database Expired' window will appear. Continue to the next step to restart the system.

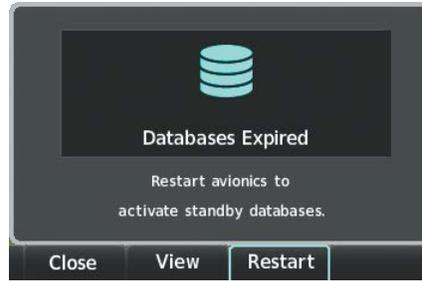


Figure B-8 Database Expired



**NOTE:** The **Restart** Softkey is enabled only when the aircraft is on the ground.

- 9) Select the **Restart** softkey to restart the system and load the updated database(s), or remove power from the system if the **Restart** Softkey is diminished .
- 10) After restarting the system, turn the large **FMS** Knob and select the Aux page group on the MFD.
- 11) Turn the small **FMS** Knob and select the Databases page.
- 12) Verify that the standby databases transferred and are now in the active database column.



Figure B-9 Database Page with Updated Databases

- 13) To view database information for an individual display, press and then turn the **FMS** Knob to select the database, and then press the **Details** Softkey. Press the **ENT** Key or the **FMS** Knob to exit.



Figure B-10 Database Page Details

- 14) To manually activate any databases that did not transfer to the active column:
  - a) Press the **FMS** Knob. The first database title on the screen will be selected.
  - b) Turn the small **FMS** Knob as necessary to select the database title.
  - c) Press the **ENT** Key. A cyan double-sided arrow will appear indicating that the standby database will become active.
  - d) Remove and reapply power to the system.
  - e) Verify that the standby databases transferred and are now in the active database column.
- 15) Remove power from the system.

#### Updating Databases from the Aux - Databases page:

- 1) With the system OFF, insert the Flight Stream Multimedia Card in the bottom slot of the MFD.
- 2) Turn the large **FMS** Knob to select the Aux page group on the MFD.
- 3) Turn the small **FMS** Knob to select the Database page group on the MFD.
- 4) Press the **Device** Softkey.
- 5) The Aux - Databases page will show the databases connected to the mobile device in place of the active databases on the system. Databases selected to load will be indicated by a cyan arrow.
- 6) Press the **Update** softkey. The Flight Stream 510 will enter WI-FI mode.
- 7) Put the mobile device in WI-FI mode (refer to the Additional Features section).
- 8) Connect the mobile device to the Flight Stream 510 WI-FI (refer to the Additional Features section).
- 9) The Database Update status will appear in the Status window at the top of the page.



**NOTE:** The **Restart** Softkey is enabled only when the aircraft is on the ground.

- 10) Select the **Restart** softkey to restart the system and load the updated database(s), or remove power from the system if the **Restart** Softkey is diminished.
- 11) After restarting the system, turn the large **FMS** Knob and select the Aux page group on the MFD.
- 12) Turn the small **FMS** Knob and select the Databases page.
- 13) Verify that the standby databases transferred and are now in the active database column.



Figure B-11 Database Page with Updated Databases

- 14) To view database information for an individual display, press and then turn the **FMS** Knob to select the database, and then press the **Details** Softkey. Press the **ENT** Key or the **FMS** Knob to exit.



Figure B-12 Database Page Details

- 15) To manually activate any databases that did not transfer to the active column:
  - a) Press the **FMS** Knob. The first database title on the screen will be selected.
  - b) Turn the small **FMS** Knob as necessary to select the database title.
  - c) Press the **ENT** Key. A cyan double-sided arrow will appear indicating that the standby database will become active.
  - d) Remove and reapply power to the system.
  - e) Verify that the standby databases transferred and are now in the active database column.
- 16) Remove power from the system.

## MAGNETIC FIELD VARIATION DATABASE UPDATE

A copy of the current magnetic field variation database (MV DB) is included with the navigation database. At startup, the system compares this version of the MV DB with that presently being used by the ADAHRS. If the system determines the MV DB needs to be updated, a prompt is displayed on the Navigation Map Page.

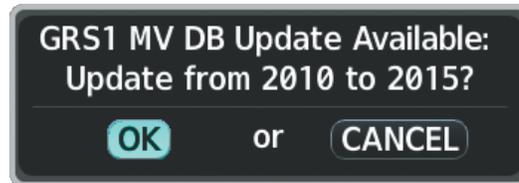


Figure B-13 Magnetic Field Variation Database Update Prompt

### Loading the magnetic field variation database update:

With 'OK' highlighted, as seen in Figure B-13, press the **ENT** Key on the MFD. A progress monitor is displayed as shown in Figure B-14. When the upload is complete, the system is ready for use.

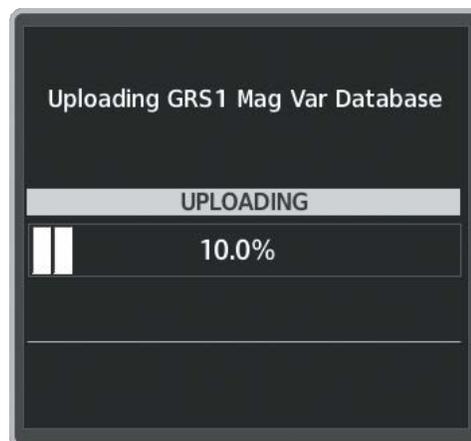


Figure B-14 Uploading Database

## GARMIN AVIATION GLOSSARY

<b>ACARS</b>	Airborne Communications Addressing and Reporting System	<b>AP DISC</b>	Autopilot Disconnect
<b>ACC</b>	Accuracy	<b>APPR, APR</b>	Approach
<b>ACT, ACTV</b>	Active, Activate, Altitude Compensated Tilt	<b>APT</b>	Airport, Aerodrome
<b>ADAHRS</b>	Air Data, Attitude and Heading Reference System	<b>APTSIGNS</b>	Airport Signs
<b>ADC</b>	Air Data Computer	<b>ARINC</b>	Aeronautical Radio Incorporated
<b>ADF</b>	Automatic Direction Finder	<b>ARSPC</b>	Airspace
<b>ADI</b>	Attitude Direction Indicator	<b>ARTCC</b>	Air Route Traffic Control Center
<b>ADIZ</b>	Air Defense Identification Zone	<b>ARV</b>	Arrival
<b>ADS-B</b>	Automatic Dependent Surveillance-Broadcast	<b>AS</b>	Airspeed
<b>ADS-R</b>	Automatic Dependent Surveillance-Rebroadcast	<b>ASB</b>	Aviation Support Branch
<b>AF</b>	Arc to Fix Leg	<b>ASOS</b>	Automated Surface Observing System
<b>AFCS</b>	Automatic Flight Control System	<b>AT</b>	Auto Throttle
<b>AFM</b>	Airplane Flight Manual	<b>ATC</b>	Air Traffic Control
<b>AFMS</b>	Airplane Flight Manual Supplement	<b>ATCRBS</b>	ATC Radar Beacon System
<b>AFRM</b>	Airframe	<b>ATIS</b>	Automatic Terminal Information Service
<b>AGL</b>	Above Ground Level	<b>ATK</b>	Along Track
<b>AHRS</b>	Attitude and Heading Reference System	<b>AUTOSEQ</b>	Automatic Sequence
<b>AIM</b>	Aeronautical Information Manual	<b>AUX</b>	Auxiliary
<b>AIRB</b>	Airborne	<b>AVG</b>	Average
<b>AIRMET</b>	Airman's Meteorological Information	<b>AVLC</b>	Aviation VHF Link Control
<b>AIRREP</b>	Air Reports	<b>AWOS</b>	Automated Weather Observing System
<b>ALRT</b>	Alert	<b>B</b>	Both Runways
<b>ALT</b>	Altitude	<b>B ALT</b>	Barometric Altitude
<b>ALT, ALTN</b>	Alternator	<b>BARO</b>	Barometer, Barometric
<b>ALTS</b>	Selected Altitude Capture Mode	<b>BATT</b>	Battery
<b>ALTV</b>	VNAV Altitude Capture Mode	<b>BC</b>	Backcourse
<b>AMPS</b>	Amperes	<b>Bearing</b>	The compass direction from the present position to a destination waypoint.
<b>ANNUNC/ANN</b>	Annunciation/Annunciator	<b>BFO</b>	Beat Frequency Oscillator
<b>ANT</b>	Antenna	<b>BKSP</b>	Backspace
<b>AOA</b>	Angle of Attack, ACARS Over AVLC	<b>Bluetooth</b>	Wireless standard for data exchange over short distances
<b>AOC</b>	Aeronautical Operational Control	<b>BOC</b>	Bottom of Climb
<b>AOG</b>	Aircraft On Ground	<b>BOD</b>	Bottom of Descent
<b>AOPA</b>	Aircraft Owners and Pilots Association	<b>BRG</b>	see also Bearing
<b>AP</b>	Autopilot	<b>°C</b>	Degrees Celsius

<b>C</b>	Center Runway	<b>Crosstrack Error</b>	The distance the aircraft is off a desired course in either direction, left or right.
<b>CA</b>	Course to Altitude Leg	<b>CRS</b>	see also Course, Course to Steer
<b>CAL</b>	Calibrated	<b>CRSR</b>	Cursor
<b>CALC</b>	Calculator	<b>CSA</b>	Conflict Situational Awareness
<b>Calibrated Airspeed</b>	Indicated airspeed corrected for installation and instrument errors.	<b>CSC</b>	Current Speed Control
<b>CAS</b>	Crew Alerting System	<b>CTA</b>	Control Area
<b>CD</b>	Course to DME Distance Leg	<b>CTR</b>	Center
<b>CDI</b>	Course Deviation Indicator	<b>CTRL</b>	Control
<b>CDU</b>	Control Display Unit	<b>Cumulative, CUM</b>	The total of all legs in a flight plan.
<b>CF</b>	Course to Fix Leg	<b>CVDR</b>	Cockpit Voice Data Recorder
<b>CG</b>	Center of Gravity	<b>CVR</b>	Cockpit Voice Recorder
<b>CH, CHNL</b>	Channel	<b>CVRG</b>	Coverage
<b>CHT</b>	Cylinder Head Temperature	<b>CWS</b>	Control Wheel Steering
<b>CHKLIST</b>	Checklist	<b>CYL</b>	Cylinder
<b>CI</b>	Course to Intercept Leg	<b>D ALT</b>	Density Altitude
<b>CLD</b>	Cloud	<b>D-ATIS</b>	Digital Automatic Terminal Info Service
<b>CLR</b>	Clear	<b>DB, DBASE</b>	Database
<b>CM</b>	Centimeter	<b>dBZ</b>	Decibels 'Z' (Radar Return)
<b>CMC</b>	Central Maintenance Computer	<b>DCL</b>	Departure Clearance
<b>CN</b>	Canada	<b>DCLTR, DECLTR</b>	Declutter
<b>CNS</b>	Communication, Navigation, & Surveillance	<b>DEC FUEL</b>	Decrease Fuel
<b>CO</b>	Carbon Monoxide	<b>DEG</b>	Degree
<b>COM</b>	Communication Radio	<b>DEIC, DEICE</b>	De-icing
<b>CONFIG</b>	Configuration	<b>DEP</b>	Departure
<b>COOL</b>	Coolant	<b>Desired Track</b>	The desired course between the active "from" and "to" waypoints.
<b>COPLT</b>	Copilot	<b>DES, DEST</b>	Destination
<b>Course</b>	The line between two points to be followed by the aircraft.	<b>DEV</b>	Deviation
<b>Course to Steer</b>	The recommended direction to steer in order to reduce course error or stay on course. Provides the most efficient heading to get back to the desired course and proceed along the flight plan.	<b>DF</b>	Direct to Fix Leg
<b>CPDLC</b>	Controller Pilot Datalink Communications	<b>DFLT</b>	Default
<b>CPL</b>	Couple	<b>DG</b>	Directional Gyro
<b>CR</b>	Course to Radial Leg	<b>DGRD</b>	Degrade
<b>CRG</b>	Cockpit Reference Guide	<b>DH</b>	Decision Height
<b>CRNT</b>	Current	<b>Dilution of Precision</b>	A measure of GPS satellite geometry quality on a scale of one to ten (lower numbers equal better geometry, where higher numbers equal poorer geometry).

<b>DIR</b>	Direction	<b>ENR</b>	Enroute; ETE to Final Destination
<b>DIS</b>	Distance	<b>Enroute Safe Altitude (ESA)</b>	Uses Grid MORAs to determine a safe altitude within ten miles left or right of the desired course on an active flight plan or direct-to.
<b>Distance</b>	The 'great circle' distance from the present position to a destination waypoint.	<b>ENT</b>	Enter
<b>DL LTNG</b>	Datalink Lightning	<b>EPE</b>	see also Estimated Position Error
<b>DLS</b>	Data Link System	<b>EPU</b>	Estimated Position Uncertainty
<b>DME</b>	Distance Measuring Equipment	<b>ERR</b>	Error
<b>DN</b>	Down	<b>ES</b>	Extended Squitter
<b>DOP</b>	see also Dilution of Precision	<b>ESA</b>	see also Enroute Safe Altitude
<b>DP</b>	Departure Procedure	<b>ESP</b>	Electronic Stability and Protection
<b>DPRT</b>	Departure	<b>Estimated Position Error (EPE)</b>	A measure of horizontal GPS position error derived by satellite geometry conditions and other factors.
<b>DR</b>	Dead Reckoning	<b>Estimated Time of Arrival (ETA)</b>	The estimated time at which the aircraft should reach the destination waypoint, based upon current speed and track.
<b>DSBL</b>	Disabled	<b>Estimated Time Enroute (ETE)</b>	The estimated time it takes to reach the destination waypoint from the present position, based upon current groundspeed.
<b>DTG</b>	Distance To Go, Remaining distance to last active FPL waypoint	<b>ETA</b>	see also Estimated Time of Arrival
<b>DTK</b>	see also Desired Track	<b>ETE</b>	see also Estimated Time Enroute
<b>DQR</b>	Data Quality Requirements	<b>EVS</b>	Enhanced Vision System
<b>E</b>	Empty, East	<b>EXPIRD</b>	Expired
<b>EAS</b>	Engine and Airframe Systems	<b>°F</b>	Degrees Fahrenheit
<b>ECU</b>	Engine Control Unit	<b>FA</b>	Course From Fix to Altitude Leg
<b>EDM</b>	Emergency Descent Mode	<b>FAA</b>	Federal Aviation Administration
<b>EFC</b>	Expected Further Clearance	<b>FADEC</b>	Full Authority Digital Engine Control
<b>Efficiency</b>	A measure of fuel consumption, expressed in distance per unit of fuel.	<b>FAF</b>	Final Approach Fix
<b>EGNOS</b>	European Geostationary Navigation Overlay Service	<b>FAIL</b>	Failure
<b>EGT</b>	Exhaust Gas Temperature	<b>FANS</b>	Future Air Navigation System
<b>EICAS</b>	Engine Indication and Crew Alerting System	<b>FBO</b>	Fixed Base Operator
<b>EIS</b>	Engine Indication System	<b>FC</b>	Course From Fix to Distance Leg
<b>ELEV</b>	Elevation, Elevator	<b>FCC</b>	Federal Communication Commission
<b>ELT</b>	Emergency Locator Transmitter	<b>FCST</b>	Forecast
<b>EMER, EMERG, EMERGCY</b>	Emergency	<b>FD</b>	Flight Director, Course From Fix to DME Distance Leg
<b>EMI</b>	Electromagnetic Interference	<b>FDE</b>	Fault Detection and Exclusion
<b>END, ENDUR</b>	Endurance	<b>FF, FFLOW</b>	see also Fuel Flow
<b>Endurance</b>	Flight endurance, or total possible flight time based on available fuel on board.	<b>FIS-B</b>	Flight Information Services-Broadcast
<b>ENG</b>	Engine		
<b>ENGD</b>	Engaged		

<b>FISDL</b>	Flight Information Service Data Link	<b>GFC</b>	Garmin Flight Control
<b>FL</b>	Flight Level	<b>GIA</b>	Garmin Integrated Avionics Unit
<b>FLC</b>	Flight Level Change	<b>GLONASS</b>	Global Orbiting Navigation Satellite Landing System
<b>FLT</b>	Flight Timer	<b>GLS</b>	Global Navigation Satellite Landing System
<b>FLTA</b>	Forward Looking Terrain Avoidance	<b>GMA</b>	Garmin Audio Panel System
<b>FM</b>	Course From Fix to Manual Termination Leg	<b>GMC</b>	Garmin Mode Controller
<b>FMS</b>	Flight Management System	<b>GMT</b>	Greenwich Mean Time
<b>FOB</b>	see also Fuel On Board	<b>GMU</b>	Garmin Magnetometer Unit
<b>FOD</b>	see also Fuel Over Destination	<b>GND</b>	Ground
<b>FPA</b>	Flight Path Angle	<b>GPH</b>	Gallons per Hour
<b>FPL</b>	Flight Plan	<b>GPN</b>	Garmin Part Number
<b>FPM</b>	Feet Per Minute, Flight Path Marker	<b>GPS</b>	Global Positioning System
<b>FREQ</b>	Frequency	<b>GPWS</b>	Ground Proximity Warning System
<b>FRMT</b>	Format	<b>Grid MORA (Minimum Off—Route Altitude)</b>	One degree latitude by one degree longitude in size and clears the highest elevation reference point in the grid by: a) 1,000 feet where the highest elevation is <5001MSL or b) 2,000 feet where the highest elevation is >5000MSL
<b>FRZ</b>	Freezing	<b>Groundspeed</b>	The velocity that the aircraft is travelling relative to a ground position.
<b>FSM</b>	Flight System Messages	<b>Ground Track</b>	See Track
<b>FSS</b>	Flight Service Station	<b>GRS</b>	Garmin Reference System
<b>FT</b>	foot/feet	<b>GS</b>	Ground Speed, Glideslope
<b>Fuel Flow</b>	The fuel flow rate, expressed in units of fuel per hour.	<b>GSA</b>	Garmin Servo Adapter
<b>Fuel On Board</b>	The total amount of usable fuel on board the aircraft.	<b>GSD</b>	Garmin Data Concentrator
<b>Fuel Over Destination</b>	The estimated fuel remaining when the aircraft reaches the destination waypoint, based upon current fuel flow.	<b>GSL</b>	Geodetic Sea Level
<b>FWD</b>	Forward	<b>GSR</b>	Garmin Satellite Radio
<b>G/S</b>	Glideslope	<b>GSU</b>	Garmin Sensor Unit
<b>GA</b>	Go-Around	<b>GTC</b>	Garmin Touchscreen Controller
<b>GAL, GL</b>	Gallon(s)	<b>GTS</b>	Garmin Traffic System
<b>GBOX</b>	Gearbox	<b>GTX</b>	Garmin Transponder
<b>GBT</b>	Ground Based Transceiver	<b>GWX</b>	Garmin Weather Radar
<b>GCU</b>	Garmin Control Unit	<b>HA</b>	Hold Terminating at Altitude Leg
<b>GCS</b>	Ground Clutter Suppression	<b>HDG</b>	see also Heading
<b>GDC</b>	Garmin Air Data Computer	<b>HDOP</b>	Horizontal Dilution of Precision
<b>GDL</b>	Garmin Satellite Data Link	<b>Heading</b>	The direction an aircraft is pointed, based upon indications from a magnetic compass or a properly set directional gyro.
<b>GDR</b>	Garmin Data Radio		
<b>GDU</b>	Garmin Display Unit		
<b>GEA</b>	Garmin Engine/Airframe Unit		
<b>GEO</b>	Geographic		

<b>HF</b>	High Frequency, Hold Terminating at Fix Leg	<b>Indicated</b>	Information provided by properly calibrated and set instrumentation on the aircraft panel.
<b>HFOM</b>	see also Horizontal Figure of Merit	<b>INFO</b>	Information
<b>Hg</b>	Mercury	<b>IN Hg</b>	Inches of Mercury
<b>HI</b>	High	<b>INS</b>	Inertial Navigation System
<b>HI SENS</b>	High Sensitivity	<b>INT</b>	Intersection(s)
<b>HM</b>	Hold with Manual Termination Leg	<b>INTEG</b>	Integrity (RAIM unavailable)
<b>HNS</b>	Hybrid Navigation System	<b>IrDA, IRDA</b>	Infrared Data Association
<b>Horizontal Figure of Merit</b>	A measure of the uncertainty in the aircraft's horizontal position.	<b>ISA</b>	International Standard Atmosphere; ISA Relative Temperature
<b>hPa</b>	Hectopascal	<b>ITT</b>	Inter-Turbine Temperature, Interstage Turbine Temperature
<b>HPL</b>	Horizontal Protection Level	<b>KEYSTK</b>	Key Stuck
<b>HR</b>	Hour	<b>KG</b>	Kilogram
<b>HRZN HDG</b>	Horizon Heading	<b>kHz</b>	Kilohertz
<b>HSDB</b>	High-Speed Data Bus	<b>KM</b>	Kilometer
<b>HSI</b>	Horizontal Situation Indicator	<b>KT</b>	Knot
<b>HT</b>	Heat	<b>L</b>	Left, Left Runway
<b>HUL</b>	Horizontal Uncertainty Level	<b>LAT</b>	Latitude
<b>Hz</b>	Hertz (cycles per second)	<b>LBL</b>	Label
<b>I</b>	Inner Marker	<b>LB</b>	Pound
<b>IAF</b>	Initial Approach Fix	<b>LCD</b>	Liquid Crystal Display
<b>IAS</b>	Indicated Air Speed	<b>LCL</b>	Local
<b>IAT</b>	Indicated Air Temperature	<b>LDA</b>	Landing Distance Available
<b>IAU</b>	Integrated Avionics Unit	<b>LDG</b>	ETA at Final Destination
<b>ICAO</b>	International Civil Aviation Organization	<b>LED</b>	Light Emitting Diode
<b>ICS</b>	Intercom System	<b>Left Over Fuel On Board</b>	The amount of fuel remaining on board after the completion of one or more legs of a flight plan or direct-to.
<b>ID</b>	Identification/Morse Code Identifier	<b>Left Over Fuel Reserve</b>	The amount of flight time remaining, based on the amount of fuel on board after the completion of one or more legs of a flight plan or direct-to, and a known consumption rate.
<b>IDENT, IDNT</b>	Identification	<b>Leg</b>	The portion of a flight plan between two waypoints.
<b>IEEE</b>	Institute of Electrical & Electronics Engineers	<b>LGND</b>	Legend
<b>IF</b>	Initial Fix	<b>LIFR</b>	Low Instrument Flight Rules
<b>IFR</b>	Instrument Flight Rules	<b>LMM</b>	Location Middle Marker
<b>IG</b>	Imperial Gallon	<b>LNAV</b>	Lateral Navigation
<b>ILS</b>	Instrument Landing System		
<b>IMC</b>	Instrument Meteorological Conditions		
<b>IN</b>	Inch		
<b>INACTV</b>	Inactive		
<b>INC FUEL</b>	Increase Fuel		
<b>IND</b>	Indicator, Indicated		

SYSTEM OVERVIEW	<b>LO</b>	Low	<b>Minimum Safe Altitude (MSA)</b>	Uses Grid MORAs to determine a safe altitude within ten miles of the aircraft present position.											
	<b>LOA</b>	Letter of Authorization		<b>MKR</b>	Marker Beacon										
	<b>LOC</b>	Localizer			<b>MOA</b>	Military Operations Area									
	<b>LOI</b>	Loss of Integrity (GPS)				<b>MON</b>	Monitor								
	<b>LOM</b>	Location Outer Marker					<b>MOV</b>	Movement							
	<b>LON</b>	Longitude						<b>MORA</b>	Minimum Off-Route Altitude						
	<b>LP</b>	Localizer Performance							<b>MPEL</b>	Maximum Permissible Exposure Level					
	<b>LPV</b>	Localizer Performance with Vertical Guidance								<b>MPM</b>	Meters per Minute				
	FLIGHT INSTRUMENTS	<b>LRU</b>									Line Replaceable Unit	<b>MSA</b>	see also Minimum Safe Altitude		
		<b>LT</b>									Left		<b>MSAS</b>	Multi-functional Satellite Augmentation System	
<b>LTNG</b>		Lightning	<b>MSG</b>								Message				
EIS		<b>LVL</b>		Level							<b>MSL</b>			Mean Sea Level	
		AUDIO PANEL & CNS		<b>M</b>	Meter, Middle Marker, Mach									<b>MT, M</b>	Meter
				<b>M<sub>MO</sub> (V<sub>MO</sub>)</b>	Maximum Speed	<b>mV</b>									Millivolt(s)
				<b>Mach Number</b>	Mach number is the ratio of the true airspeed to the speed of sound.		<b>MVFR</b>								Marginal Visual Flight Rules
				FLIGHT MANAGEMENT	<b>MAG</b>			Magnetic							<b>N</b>
					<b>MAG VAR</b>			Magnetic Variation	<b>NAV</b>						
					<b>MAHP</b>			Missed Approach Hold Point		<b>NAVAID</b>					
	<b>MAN IN</b>				Manifold Pressure (inches Hg)			<b>NDB</b>				Non-Directional Beacon			
	<b>MAN SQ</b>				Manual Squelch							<b>NEXRAD</b>	Next Generation Radar		
	<b>MANSEQ</b>		Manual Sequence		<b>NM</b>								Nautical Mile(s)		
<b>MAP</b>	Missed Approach Point		<b>NoPT</b>								No Procedure Turn Required (procedure shall not be executed without ATC clearance)				
<b>MASQ</b>	Master Avionics Squelch	<b>NOTAM</b>									Notice To Airman				
<b>MAX</b>	Maximum					<b>NRST</b>					Nearest				
<b>MAXSPD</b>	Maximum Speed (overspeed)						<b>O</b>				Outer Marker				
HAZARD AVOIDANCE	<b>MB</b>			Marker Beacon							<b>OAT</b>		Outside Air Temperature		
	<b>MDA</b>			Barometric Minimum Descent Altitude					<b>OBS</b>				Omni Bearing Selector		
	<b>MEPT</b>			Manual Electric Pitch Trim						<b>OFST</b>			Offset		
	<b>MET</b>			Manual Electric Trim				<b>OOOI</b>					Out of the gate, Off the ground, On the ground, and In the gate		
	<b>METAR</b>			Aviation Routine Weather Report								<b>OXY</b>	Oxygen		
	<b>MFD</b>			Multi Function Display	<b>P ALT</b>								Pressure Altitude		
	<b>MFW</b>		Multi Function Window	<b>PA</b>									Passenger Address, Proximity Advisory		
	<b>MGRS</b>	Military Grid Reference System	<b>PASS</b>										Passenger(s)		
	<b>MHz</b>	Megahertz													
	<b>MIC</b>	Microphone													
APPENDICES	<b>MIN</b>	Minimum													
INDEX															

<b>PC</b>	Personal Computer	<b>REV</b>	Reverse, Revision, Revise
<b>PDC</b>	Pre-Departure Clearance	<b>RF</b>	Radio Frequency, Constant Radius Turn to Fix Leg
<b>PFD</b>	Primary Flight Display	<b>RMI</b>	Radio Magnetic Indicator
<b>PG</b>	Pilot's Guide	<b>RMT</b>	Remote
<b>PI</b>	Procedure Turn to Course Intercept Leg	<b>RNAV</b>	Area Navigation
<b>PIREP</b>	Pilot Report	<b>RNG</b>	Range
<b>PIT, PTCH</b>	Pitch	<b>RNP</b>	Required Navigation Performance
<b>POA</b>	Plain Old ACARS	<b>RNWX, RWY</b>	Runway
<b>POH</b>	Pilot's Operating Handbook	<b>ROL</b>	Roll
<b>POHS</b>	Pilot's Operating Handbook Supplement	<b>ROM</b>	Read Only Memory
<b>POS, POSN</b>	Position	<b>RPM</b>	Revolutions Per Minute
<b>PPH</b>	Pounds per Hour	<b>RST FUEL</b>	Reset Fuel
<b>PPM</b>	Parts per Million	<b>RSV</b>	Reserve (fuel reserve entered by pilot)
<b>P. POS</b>	Present Position	<b>RT</b>	Right
<b>PRES, PRESS</b>	Pressure	<b>RVRSNRY</b>	Reversionary
<b>PROC</b>	Procedure(s), Procedure Turn	<b>RVSM</b>	Reduced Vertical Separation Minimums
<b>PROP</b>	Propeller	<b>RX</b>	Receive
<b>PROX</b>	Proximity		
<b>PSI</b>	Pounds per Square Inch	<b>S</b>	South
<b>PT</b>	Procedure Turn	<b>SA</b>	Selective Availability
<b>PTK</b>	Parallel Track	<b>SAR</b>	Search and Rescue
<b>PTT</b>	Push-to-Talk	<b>SAT</b>	Static Air Temperature
<b>PWR</b>	Power	<b>SBAS</b>	Satellite-Based Augmentation System
		<b>SCIT</b>	Storm Cell Identification and Tracking
<b>QFE</b>	Field Elevation Pressure	<b>SD</b>	Secure Digital
<b>QNH</b>	Sea Level Pressure	<b>SEC</b>	Second(s)
<b>QTY</b>	Quantity	<b>SEL, SLCT</b>	Select
		<b>SELCAL</b>	Selective Calling
<b>R</b>	Right, Right Runway	<b>SENS</b>	Sense
<b>RA</b>	Resolution Advisory, Radio Altimeter	<b>SFC</b>	Surface
<b>RAD</b>	Radial	<b>SIAP</b>	Standard Instrument Approach Procedures
<b>RAD ALT</b>	Radio Altimeter	<b>SID</b>	Standard Instrument Departure
<b>RAIM</b>	Receiver Autonomous Integrity Monitoring	<b>SIG/AIR</b>	SIGMET/AIRMET
<b>RAM</b>	Random Access Memory	<b>SIGMET</b>	Significant Meteorological Information
<b>RAT</b>	Ram Air Temperature	<b>SIM</b>	Simulator
<b>RCVR</b>	Receiver	<b>SLD</b>	Supercooled Large Droplet
<b>REF</b>	Reference	<b>SLP/SKD</b>	Slip/Skid
<b>REM</b>	Remaining (fuel remaining), Reminder	<b>SMBL</b>	Symbol
<b>REQ</b>	Required	<b>SMS</b>	Short Message System
<b>RES</b>	Reserve (fuel reserve entered by pilot)		

<b>SNGL</b>	Single	<b>TGT</b>	Target
<b>SPC</b>	Space	<b>T HDG</b>	True Heading
<b>SPD</b>	Speed	<b>TIS</b>	Traffic Information Service
<b>SPI</b>	Special Position Identification	<b>TIS-B</b>	Traffic Information Service-Broadcast
<b>SPKR</b>	Speaker	<b>TIT</b>	Turbine Inlet Temperature
<b>SQ</b>	Squelch	<b>TKE</b>	see also Track Angle Error
<b>SRVC, SVC</b>	Service	<b>TMA</b>	Terminal Maneuvering Area
<b>SSID</b>	Wireless Service Set Identifier	<b>TMR/REF</b>	Timer/Reference
<b>STAB</b>	Stabilization	<b>TOC</b>	Top of Climb
<b>STAL</b>	Stall	<b>TOD</b>	Top of Descent
<b>STAR</b>	Standard Terminal Arrival Route	<b>TOGA, TO/GA</b>	Take-Off, Go-Around
<b>STATS</b>	Statistics	<b>TOLD</b>	Takeoff and Landing Data
<b>STBY</b>	Standby	<b>TOPO</b>	Topographic
<b>STD</b>	Standard	<b>TORA</b>	Takeoff Run Available
<b>STRMSCP</b>	Stormscope	<b>TOT</b>	Total
<b>SUA</b>	Special Use Airspace	<b>TPA</b>	Traffic Pattern Altitude
<b>SURF</b>	Surface	<b>Track</b>	Direction of aircraft movement relative to a ground position; also 'Ground Track'.
<b>SUSP</b>	Suspend	<b>Track Angle Error</b>	The angle difference between the desired track and the current track.
<b>SVT</b>	Synthetic Vision Technology	<b>TRK</b>	see also Track
<b>SW</b>	Software	<b>TRSA</b>	Terminal Radar Service Area
<b>SYNC</b>	Synchronize	<b>TRUNC</b>	Truncated
<b>SYN TERR</b>	Synthetic Terrain	<b>TTL</b>	Total
<b>SYN VIS</b>	Synthetic Vision	<b>TURB</b>	Turbulence
<b>SYS</b>	System	<b>TURN</b>	Procedure Turn
<b>T</b>	True	<b>TWIP</b>	Terminal Weather Information for Pilots
<b>TA</b>	Traffic Advisory	<b>TX</b>	Transmit
<b>TACAN</b>	Tactical Air Navigation System	<b>UAT</b>	Universal Access Transceiver
<b>TAF</b>	Terminal Aerodrome Forecast	<b>UHF</b>	Ultra-High Frequency
<b>TAS</b>	True Airspeed, Traffic Advisory System	<b>UNAVAIL</b>	Unavailable
<b>TAT</b>	Total Air Temperature	<b>US</b>	United States
<b>TAWS</b>	Terrain Awareness and Warning System	<b>USR</b>	User
<b>TCA</b>	Terminal Control Area	<b>UTC</b>	Coordinated Universal Time
<b>TCAS</b>	Traffic Alert Collision Avoidance System	<b>UTM/UPS</b>	Universal Transverse Mercator/ Universal Polar Stereographic Grid
<b>TEL</b>	Telephone	<b>V</b>	Volts
<b>TEMP</b>	Temperature	<b>V, Vspeed</b>	Velocity (airspeed)
<b>TERM</b>	Terminal		
<b>TF</b>	Track Between Two Fixes Leg		
<b>TFR</b>	Temporary Flight Restriction		

<b>V<sub>1</sub></b>	Takeoff Decision Speed	<b>VM</b>	Heading Vector to Manual Termination Leg
<b>V<sub>2</sub></b>	Takeoff Safety Speed	<b>VMC</b>	Visual Meteorological Conditions
<b>V<sub>A</sub></b>	Maneuvering Speed	<b>VNAV, VNV</b>	Vertical Navigation
<b>V<sub>APP</sub>, V<sub>AC</sub></b>	Approach Climb Speed	<b>VOL</b>	Volume
<b>V<sub>FE</sub></b>	Maximum Flap Extended Speed	<b>VOR</b>	VHF Omnidirectional Range
<b>V<sub>LE</sub></b>	Maximum Landing Gear Extended Speed	<b>VORTAC</b>	VHF Omnidirectional Range Station and Tactical Air Navigation
<b>V<sub>LNDx</sub></b>	Approach Speed (Flaps at x°)	<b>VPATH, VPTH</b>	Vertical Path
<b>V<sub>LO</sub></b>	Maximum Landing Gear Operating Speed	<b>VPL</b>	Vertical Protection Level
<b>V<sub>MC</sub></b>	Minimum Control Speed	<b>VPROF</b>	VNAV Profile, Vertical Profile
<b>V<sub>MO</sub> (M<sub>MO</sub>)</b>	Maximum Operating Speed	<b>VR</b>	Heading Vector to Radial Leg
<b>V<sub>NE</sub></b>	Never-Exceed Speed	<b>VRP</b>	Visual Reporting Point
<b>V<sub>R</sub></b>	Takeoff Rotate Speed	<b>VS</b>	Vertical Speed
<b>V<sub>REF</sub></b>	Landing Approach Speed, Reference Landing Speed	<b>VSD</b>	Vertical Situation Display
<b>V<sub>SB</sub></b>	Maximum Speedbrake Speed	<b>VSI</b>	Vertical Speed Indicator
<b>V<sub>SR</sub></b>	Stall Speed	<b>VSR, VS REQ</b>	see also Vertical Speed Required
<b>V<sub>T</sub></b>	Takeoff Flap Retraction Speed	<b>VTF</b>	Vector to Final
<b>V<sub>TIRE</sub></b>	Maximum Tire Speed	<b>W</b>	Watt(s), West
<b>V<sub>X</sub></b>	Best Angle of Climb Speed	<b>WAAS</b>	Wide Area Augmentation System
<b>V<sub>Y</sub></b>	Best Rate of Climb Speed	<b>WARN</b>	Warning
<b>V<sub>YSE</sub></b>	Best Single-Engine Rate of Climb Speed	<b>WATCH</b>	Weather Attenuated Color Highlight
<b>V DEV</b>	Vertical Deviation	<b>WGS-84</b>	World Geodetic System - 1984
<b>VA</b>	Heading Vector to Altitude Leg	<b>WI-FI, WIFI</b>	Wireless Local Area Network based on IEEE 802.11
<b>VAC</b>	Volts Alternating Current	<b>WOG</b>	Weight on Gear
<b>VAPP</b>	VOR Approach	<b>WOW</b>	Weight on Wheels
<b>VAR</b>	Variation	<b>WPT</b>	Waypoint(s)
<b>VD</b>	Heading Vector to DME Distance Leg	<b>WT</b>	Weight
<b>VDC</b>	Volts Direct Current	<b>WW</b>	World Wide
<b>VDL</b>	VHF Datalink	<b>WX</b>	Weather
<b>VERT</b>	Vertical	<b>XFER, XFR</b>	Transfer
<b>Vertical Figure of Merit</b>	A measure of the uncertainty in the aircraft's vertical position.	<b>XM LTNG</b>	SiriusXM Lightning
<b>Vertical Speed Required</b>	The vertical speed necessary to descend/ climb from a current position and altitude to a defined target position and altitude, based upon current groundspeed.	<b>XPDR</b>	Transponder
<b>VFOM</b>	see also Vertical Figure of Merit	<b>XTALK</b>	Cross-Talk
<b>VFR</b>	Visual Flight Rules	<b>XTK</b>	Cross-Track, Crosstrack Error
<b>VHF</b>	Very High Frequency	<b>YD</b>	Yaw Damper
<b>VI</b>	Heading Vector to Intercept Leg		
<b>VLOC</b>	VOR/Localizer Receiver		

SYSTEM OVERVIEW

FLIGHT INSTRUMENTS

EIS

AUDIO PANEL & CNS

FLIGHT MANAGEMENT

HAZARD AVOIDANCE

AFCS

ADDITIONAL FEATURES

APPENDICES

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## FREQUENTLY ASKED QUESTIONS

If a particular aspect of system operational capability is not addressed by these commonly asked questions or in the index, contact Garmin (see the copyright page or back cover for contact information) or a Garmin-authorized dealer. Garmin is dedicated to supporting its products and customers.

### WHAT IS SBAS?

The Satellite Based Augmentation System (SBAS) uses a system of ground stations to correct any GPS signal errors. These ground stations correct for errors caused by ionospheric disturbances, timing, and satellite orbit errors. It also provides vital integrity information regarding the health of each GPS satellite. The signal correction is then broadcast through geostationary satellites. This correction information can then be received by any SBAS-enabled GPS receiver.

SBAS is designed to provide the additional accuracy, availability, and integrity necessary to enable users to rely on GPS for all phases of flight.

There are several SBAS systems serving different parts of the world. The Wide Area Augmentation System (WAAS) is currently available in the United States, including Alaska and Hawaii. The European Geostationary Navigation Overlay Service (EGNOS) offers coverage of Europe, parts of the middle east and northern Africa. The Multi-functional Satellite Augmentation System (MSAS) covers mainly Japan and parts of northern Australia.

### HOW DOES SBAS AFFECT APPROACH OPERATIONS?

Both LNAV/VNAV and LPV approaches use the accuracy of SBAS to include vertical (glide path) guidance capability. The additional accuracy and vertical guidance capability allows improved instrument approaches to an expanded number of airports throughout the U.S.

The implementation of LPV approaches further improves precision approach capabilities. LPV approaches are designed to make full use of the improved GPS signal from the SBAS. This approach combines the LNAV/VNAV vertical accuracy with lateral guidance similar to the typical Instrument Landing System (ILS). LPV approaches allow lower approach minimums.

### WHAT IS RAIM AND HOW DOES IT AFFECT APPROACH OPERATIONS?

RAIM is an acronym for Receiver Autonomous Integrity Monitoring. RAIM is a GPS receiver function that performs the following functions:

- Monitors and verifies integrity and geometry of tracked GPS satellites
- Notifies the pilot when satellite conditions do not provide the necessary coverage to support a certain phase of flight
- Predicts satellite coverage of a destination area to determine whether the number of available satellites is sufficient to satisfy requirements



**NOTE:** If RAIM is not predicted to be available for the final approach course, the approach does not become active, as indicated by the "RAIM not available from FAF to MAP" message and the LOI annunciation flagging on the HSI.

For RAIM to work correctly, the GPS receiver must track at least five satellites. A minimum of six satellites is required to allow RAIM to eliminate a single corrupt satellite from the navigation solution.

RAIM ensures that satellite geometry allows for a navigation solution calculation within a specified protection limit (2.0 nm for oceanic and en route, 1.0 nm for terminal, and 0.3 nm for non-precision approaches). The system monitors RAIM and issues an alert message when RAIM is not available (see Appendix A). Without RAIM, GPS position accuracy cannot be monitored. If RAIM is not available when crossing the FAF, the pilot must fly the missed approach procedure.

## WHAT IS GSL ALTITUDE?

GSL (Geodetic Sea Level) altitude is the height above Mean Sea Level (MSL), as calculated geometrically, generally using a global positioning system (GPS) as the primary data source. The calculated result may or may not include a barometric component, but the primary source is geometric.

## WHY ARE THERE NOT ANY APPROACHES AVAILABLE FOR A FLIGHT PLAN?

Approaches are available for the final destination airport in a flight plan or as a direct-to (keep in mind that some VOR/VORTAC identifiers are similar to airport identifiers). If a destination airport does not have a published approach, the system indicates “NONE” for the available procedures.

## WHAT HAPPENS WHEN AN APPROACH IS SELECTED? CAN A FLIGHT PLAN WITH AN APPROACH, A DEPARTURE, OR AN ARRIVAL BE STORED?

When an approach, departure, or arrival is loaded into the active flight plan, a set of approach, departure, or arrival waypoints is inserted into the flight plan, along with a header line showing the title of the selected instrument procedure. The original en route portion of the flight plan remains active, unless the instrument procedure is activated. This may be done either when the procedure is loaded or at a later time.

Flight plans can also be stored with an approach, a departure, or an arrival. Note that the active flight plan is erased when the system is turned off. Also, the active flight plan is overwritten when another flight plan is activated. When storing flight plans with an approach, a departure, or an arrival, the system uses the waypoint information from the current database to define the waypoints. If the database is changed or updated, the system automatically updates the information, provided the procedure has not been modified. Should an approach, departure, or arrival procedure no longer be available, the flight plan becomes locked until the procedure is deleted from the flight plan.

## CAN “SLANT GOLF” (“/G”) BE FILED USING THE G1000?

“/G” may be filed for a flight plan. The system meets the requirements of TSO-C145a Class 3 and ETSO C145 Class 3 installations. GPS approaches are not to be flown with an expired database. See the approved Pilot’s Operating Handbook (POH) as well as the Aeronautical Information Manual (AIM) for more information.

## WHAT DOES THE OBS SOFTKEY DO?

The **OBS** Softkey is used to select manual sequencing of waypoints. Activating OBS mode sets the current active-to waypoint as the primary navigation reference and prevents the system from sequencing to the next waypoint in a flight plan. When OBS mode is cancelled, automatic waypoint sequencing is continued, and the system automatically activates the next waypoint in the flight plan once the aircraft has crossed the present active waypoint.

Normal (OBS not activated)	OBS
<ul style="list-style-type: none"> <li>• Automatic sequencing of waypoints</li> </ul>	<ul style="list-style-type: none"> <li>• Manual sequencing - 'holds' on selected waypoint</li> </ul>
<ul style="list-style-type: none"> <li>• Manual course change on HSI not possible</li> </ul>	<ul style="list-style-type: none"> <li>• Manually select course to waypoint from HSI</li> </ul>
<ul style="list-style-type: none"> <li>• Always navigates 'TO' the active waypoint</li> </ul>	<ul style="list-style-type: none"> <li>• Indicates 'TO' or 'FROM' waypoint</li> </ul>
<ul style="list-style-type: none"> <li>• Must be in this mode for final approach course</li> </ul>	<ul style="list-style-type: none"> <li>• Cannot be set for final approach course or published holding patterns</li> </ul>

When OBS mode is active, the system allows the pilot to set a desired course to/from a waypoint using the **CRS/BARO** Knob and HSI (much like a VOR).

The most common application for using the **OBS** Softkey is the missed approach. The system suspends automatic waypoint sequencing (indicated by a 'SUSP' annunciation placed on the HSI) when the missed approach point (MAP) is crossed. This prevents the system from automatically sequencing to the missed approach holding point (MAHP). During this time, the **OBS** Softkey designation changes to **SUSP**. Pressing the **SUSP** Softkey reactivates automatic waypoint sequencing. The **OBS** Softkey then resumes its normal functionality.

### WHY MIGHT THE SYSTEM NOT AUTOMATICALLY SEQUENCE TO THE NEXT WAYPOINT?

The system only sequences flight plan waypoints when automatic sequencing is enabled (i.e., no 'OBS' or 'SUSP' annunciation on the HSI). For automatic sequencing to occur, the aircraft must also cross the *bisector* of the turn being navigated. The bisector is a line passing through the waypoint common to two flight plan legs at an equal angle from each leg.

### HOW CAN A WAYPOINT BE SKIPPED IN AN APPROACH, A DEPARTURE, OR AN ARRIVAL?

The system allows the pilot to manually select any approach, departure, or arrival leg as the active leg of the flight plan. This procedure is performed on the MFD from the Active Flight Plan Page by highlighting the desired waypoint and pressing the **ACT Leg** Softkey then the **ENT** Key to approve the selection. The GPS then provides navigation along the selected flight plan leg.

### WHEN DOES TURN ANTICIPATION BEGIN?

The system smooths adjacent leg transitions based on a normal 15° bank angle (with the ability to roll up to 30°) and provides three pilot cues for turn anticipation:

- A waypoint alert ('Next DTK ###° in # seconds' or 'Next HDG ###° in # seconds') appears on the PFD 10 seconds before the turn point and flashes as it counts down to zero.
- A flashing turn advisory ('Turn [right/left] to ###° in # seconds') appears on the PFD 10 seconds before the turn and flashes as it counts down to zero. 'Turn [right/left] to ###° now' or 'Next [DTK/HDG] to ###° now' is displayed when the pilot is to begin the turn and the HSI (GPS mode) automatically sequences to the next DTK or HDG value.
- The To/From indicator on the HSI flips momentarily to indicate that the midpoint of the turn has been crossed.

## WHEN DOES THE CDI SCALE CHANGE?

Once a departure is activated, the Course Deviation Indicator (CDI) full scale deflection is set to 0.3 nm. The CDI scale changes to 1.0 nm (terminal mode) then ramps up to 2.0 nm (enroute mode) at 30 nm from the departure airport. When 31 nm from the destination, the CDI scale smoothly transition from 2.0 nm back to 1.0 nm (terminal mode). At 2.0 nm before the FAF during an active approach, the CDI scale transitions down further based on the type of approach activated (LNAV, LNAV/VNAV, LPV). When a missed approach is activated, the CDI is set to 0.3 nm. See the Flight Instruments Section for more details on CDI scaling.

## WHY DOES THE HSI NOT RESPOND LIKE A VOR WHEN OBS MODE IS ACTIVE?

Unlike a VOR, the CDI scale used on GPS equipment is based on the crosstrack distance to the desired course, not on the angular relationship to the destination. Therefore, the CDI deflection on the GPS is constant regardless of the distance to the destination and does not become less sensitive when further away from the destination.

## WHAT IS THE CORRECT MISSED APPROACH PROCEDURE? HOW IS THE MISSED APPROACH HOLDING POINT SELECTED?

To comply with TSO specifications, the system does not automatically sequence past the MAP. The first waypoint in the missed approach procedure becomes the active waypoint when the **SUSP** Softkey is selected *after* crossing the MAP. All published missed approach procedures must be followed, as indicated on the approach plate.

To execute the missed approach procedure prior to the MAP (not recommended), select the Active Flight Plan Page and use the **ACT Leg** Softkey to activate the missed approach portion of the procedure.

## AFTER A MISSED APPROACH, HOW CAN THE SAME APPROACH BE RE-SELECTED? HOW CAN A NEW APPROACH BE ACTIVATED?



**NOTE:** Do not attempt to reactivate the current approach prior to crossing the missed approach point (MAP). If an attempt to do so is made, an alert message "Are you sure you want to discontinue the current approach?" appears. The system directs the pilot back to the transition waypoint and does not take into consideration any missed approach procedures, if the current approach is reactivated.

After flying the missed approach procedure, the pilot may reactivate the same approach for another attempt by pressing the **PROC** Key. Once the clearance is given for another attempt, activate the approach by highlighting 'Activate Approach' using the large **FMS** Knob and pressing the **ENT** Key. The system provides navigation along the desired course to the waypoint and rejoins the approach in sequence from that point.

To activate a new approach for the same airport, select the new procedure by pressing the **PROC** Key. Choose 'Select Approach', select the desired approach from the list shown, and press the **ENT** Key. Select the desired transition, then activate the approach using the **ENT** Key.

To activate a new approach to a different airport, press the **Direct-to** Key and select the desired airport using the **FMS** Knobs. Press the **ENT** Key to accept the selected airport, then follow the steps in the preceding paragraph to select an approach for the new airport.

# MAP SYMBOLS

## AVIATION SYMBOLS

Item	Symbol
Unknown Airport	
Non-towered, Non-serviced Airport	
Towered, Non-serviced Airport	
Non-towered, Serviced Airport	
Towered, Serviced Airport	
Restricted (Private) Airport	
Heliport	
Intersection	
LOM (compass locator at outer marker)	
NDB (non-directional radio beacon)	
VOR	
VOR/DME	
VOR/ILS	
VORTAC	
VRP	
TACAN	

## LAND SYMBOLS

Item	Symbol
User Waypoint	
Interstate Highway	
State Highway	

US Highway	
National Highway	
Large City (> 200,000)	
Medium City (> 50,000)	
Small City (> 5,000)	
State or Province Border	
International Border	
Road	
Railroad	
Latitude/Longitude	
River/Lake	
Latitude/Longitude (LAT/LON)	

## AIRSPACE SYMBOLS

Item	Symbol
Class B Airspace Altitude Label (ceiling/floor)	
Class C Airspace Altitude Label (ceiling/floor)	
Class D Airspace Altitude Label (ceiling)	
ICAO Control Area Class B Airspace	
Mode C Tower Area	
Warning Area	
Alert Area	
Caution Area	
Danger Area	
Prohibited Area	
Restricted Area	
Training Area	
Unknown Area	
Class C Terminal Radar Service Area Mode C Area	
Military Operations Area (MOA)	

MISCELLANEOUS

Item	Symbol
ARTCC Frequency or FSS Frequency	
Map Pointer (when panning)	
Elevation Pointer (on Topography Scale when panning)	
Measuring Pointer	
Wind Vector	
Overzoom Indicator	
User Waypoint	
Vertical Navigation Along Track Waypoint	
Parallel Track Waypoint	
Unanchored Flight Path Waypoint	
Top of Descent (TOD)	
Bottom of Descent (BOD)	
Navigating using Dead Reckoning	

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