

GTN 650/750 SERIES SW V5.00 UPGRADE SUPPLEMENT

The Pilot's Guides have been revised for SW Version 5.00. This supplement provides information regarding new features of software version 5.00 for GTN 6XX/7XX Series units.

- GTN 625/635/650 Pilot's Guide
(Garmin P/N 190-01004-03) Rev F
- GTN 725/750 Pilot's Guide
(Garmin P/N 190-01007-03) Rev F



NOTE: *The combination of the following documents is equivalent to the Pilot's Guide revisions listed above:*

- GTN 650/750 Series SW Version 5.00 Upgrade Supplement

and either

- GTN 625/635/650 Pilot's Guide
(Garmin P/N 190-01004-03) Rev E

or

- GTN 725/750 Pilot's Guide
(Garmin P/N 190-01007-03) Rev E

Current documents are available at www.garmin.com for free download. Printed copies may be purchased by contacting Garmin Customer Support.



NOTE: *Depending on which version of software is installed and how it is configured, the actual features and screen images may differ from what is shown. Refer to the GTN 725/750 Pilot's Guide, P/N 190-01007-03 or GTN 625/635/650 Pilot's Guide, P/N 190-01004-03, for more information regarding feature availability for specific software versions.*

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This manual reflects the operation of System Software version 5.00, or later. Some differences in operation may be observed when comparing the information in this manual to later software versions.

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GTN 7XX - Page 6-1, GTN 6XX - Page 6-1

Added the following note.

6 PROCEDURES



NOTE: *Baro-corrected altitude is not required by the GTN unit to meet the requirements of TSO-C146c; however, to take full advantage of the GTN unit's capabilities, an optional baro-corrected altitude source is recommended for automatic sequencing of altitude leg types. If no baro-corrected altitude data is provided to the GTN unit, altitude leg types must be manually sequenced.*

GTN 7XX - Page 7-2

Added the following note.

7 CHARTS



NOTE: *If two GTN 7XX units are crossfilled, then the same type (ChartView or FlightCharts) and version (cycle number and effective dates) for the chart database must be installed on both units in order for the correct chart to be overlaid on the main map page.*

GTN 7XX - Page 9-4, GTN 6XX - Page 8-3

Added the following note.

9.1.1 (8.1.1) Map Overlays



NOTE: *Map overlays for StormScope, Traffic, or Radar are prevented from being overlaid on the main map without a heading source or while User Navigation Angles are selected.*

Added additional text and notes.

9.1.1.5 Charts (Optional)

The Charts menu option allows the display of Charts overlaid on the Map page. The Charts Map Overlay option selects whether Chart data is shown on the Map page. Charts may or may not be shown depending on the other aircraft's location. The ownship icon will be shown over an available chart. See the Charts section for more detail.

A chart will be displayed on the map if all of the following are true:

- A charts database is a valid database.
- The system date is prior to the disable date of the charts database.
- The Charts Overlay Setting is active.
- The aircraft is In Air.

The chart displayed on the map will be chosen based on:

- The approach chart for the approach in the active flight plan, if an approach exists in the active flight plan.
- The airport surface chart for the nearest airport, if no approach exists in the active flight plan and an airport exists within 200NM of the aircraft's current position.



NOTE: Features that are selectable on the main map page, such as obstacles, airports, airspace, and other waypoint types that are not visible beneath the overlaid chart, remain selectable even when an approach chart is overlaid on the main map.



NOTE: Opaque charts are displayed on top of other overlays, such as NEXRAD.



NOTE: If the chart for the loaded approach procedure is not overlaid on the map page with the Chart Overlay active, ensure the correct chart is selected on the dedicated Charts page.



NOTE: If two GTN 7XX units are crossfilled, then the same type (ChartView or FlightCharts) and version (cycle number and effective dates) for the chart database must be installed on both units in order for the correct chart to be overlaid on the main map page.

Added the following table.

9.1.2.2 (8.1.2.2) Aviation

Airport Size	Size Criteria	Display Criteria
Small	Longest runway length is less than 5000 feet, unless it has a tower frequency, in which case it is a Medium Airport.	Small airports and heliports are displayed on the map when the Map Range is less than or equal to 1/4 times the Airport Range Setting.
Medium	Longest runway length is less than 8100 feet but greater than or equal to 5000 feet or less than 8100 feet and has a tower frequency.	Medium airports are displayed on the map when the Map Range is less than or equal to 1/2 times the Airport Range Setting.
Large	Longest runway length is greater than or equal to 8100 feet.	Large airports are displayed on the map when the Map Range is less than or equal to the Airport Range Setting.

Table 9-3 Airport Display Range Setting



NOTE: The Airport Range Setting of "Off" means airports are never displayed.

Heliports are displayed on the map page if the Heliport Display Setting is "On" and the Map Range is less than or equal to 1/4 times the Airport Range Setting.

Added the following notes.

10.3 (9-3) Traffic Information Service (TIS) (Optional)



NOTE: *GDL 88 equipped aircraft only: When the radio tower symbol is crossed out, the ownership is not a participant in the TIS-B system – i. e. not visible to other TIS-B clients. The GDL 88 will, however, continue to receive available TIS-B and FIS-B ground station up-links and continue to display TIS-B and FIS-B data along with available ADS-B and ADS-R data.*



NOTE: *Except for GDL 88 equipped aircraft, TIS, and Traffic Advisory System (TAS) may not both be displayed at the same time.*



NOTE: *More information is available about the GDL 88 in the “Garmin GDL 88 ADS-B Transceiver Pilot’s Guide, P/N 190-01122-03.”*

GTN 6XX - Page 10-16.

Added the following section.

10.3.8.5 Inhibiting/Enabling TAWS-B Alerting

TAWS also has an inhibit mode that deactivates the PDA/FLTA aural and visual alerts. Pilots should use discretion when inhibiting TAWS and always remember to enable the system when appropriate. Only the PDA and FLTA alerts are disabled in the inhibit mode. After cycling power, TAWS will no longer be inhibited.



Figure 10-14 TAWS-B Alerting Disabled (TAWS Inhibited) Annunciation



1. While viewing the Terrain page, touch the **Menu** key.



2. Touch the **TAWS Inhibit** key to inhibit or enable TAWS (choice dependent on current state). A green bar in the key indicates the TAWS is inhibited.

11 (10) TERRAIN

11.1 (10.1) Terrain Configurations

During power-up of the GTN 7XX, the terrain/obstacle database versions are displayed along with a disclaimer. At the same time, the Terrain system self-test begins. A failure message is issued if the terrain test fails.

Garmin provides the following terrain awareness solutions within the GTN 7XX environment:

- Terrain Proximity - This is the standard Terrain function and refers to the display of the relative terrain elevations on the moving map. No aural alerts of any type are provided by a Terrain Proximity configuration.
- TAWS-B (Optional) - A system developed to meet the terrain alerting and ground proximity requirements for Class B TAWS systems as defined in TSO-C151c. Garmin's GTN 7XX Terrain Awareness and Warning System (TAWS-B) is an optional feature and is intended to provide the flight crew with both aural and visual alerts to aid in preventing inadvertent Controlled Flight Into Terrain (CFIT).
- HTerrain Proximity - This is the standard Terrain function and refers to the display of the relative terrain elevations on the moving map. No aural alerts of any type are provided by a Terrain Proximity configuration.
- HTAWS - (HTAWS) is an optional feature to increase situational awareness and aid in reducing controlled flight into terrain. Garmin TAWS satisfies TSO-C194 requirements for certification.
- TAWS-A (Optional) - A system to increase situational awareness and aid in reducing controlled flight into terrain (CFIT) as defined in TSO-C151c. TAWS-A provides visual and aural annunciations when terrain and obstacles are within the given altitude threshold from the aircraft.



NOTE: *Obstacles are removed from the Terrain and TAWS pages at ranges greater than 10 NM.*

11.5 (10.5) TAWS-A (Optional)

11.5.1 (10.5.1) Introduction



NOTE: *TERRAIN, TAWS-A, TAWS-B, HTAWS, or HTERRAIN PROXIMITY functionality will be available via the Terrain page, depending on the installed hardware and configuration. HTAWS or HTERRAIN PROXIMITY are available in software version 4.00, or later. TAWS-A is available in software version 5.00, or later.*



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

TAWS-A (Terrain Awareness and Warning System - Class A) is an optional feature to increase situational awareness and aid in reducing controlled flight into terrain (CFIT). TAWS-A provides visual and aural annunciations when terrain and obstacles are within the given altitude threshold from the aircraft.

TAWS-A satisfies TSO-C151c Class A and TSO-92c requirements for certification.

Class A TAWS requires the following components and will not work properly without them:

- A valid terrain/obstacle/airport terrain database
- A valid 3-D GPS position solution
- Valid flap and landing gear status inputs
- A valid radar altimeter

TAWS-A uses terrain and obstacle information supplied by government sources. Terrain information is based on terrain elevation information in a database that may contain inaccuracies. Individual obstructions may be shown if available in the database. The data undergoes verification by Garmin to confirm accuracy of the content, per TSO-C151c. However, the displayed information should never be understood as being all-inclusive and data may be inaccurate.

TAWS-A uses information from the GPS receiver to provide a horizontal position and altitude, along with additional altitude input from the radar altimeter. GPS altitude is derived from satellite measurements. GPS altitude is

then converted to a height above geodetic sea level (GSL), which is the height above mean sea level (MSL) calculated geometrically. GSL altitude accuracy is affected by factors such as satellite geometry, but it is not subject to variations in pressure and temperature that normally affect pressure altitude devices. GSL altitude does not require local altimeter settings to determine MSL altitude. Therefore, GSL altitude provides a highly accurate and reliable MSL altitude source to calculate terrain and obstacle alerts.

The terrain and obstacle databases used by TAWS-A are referenced to mean sea level (MSL). Using the GPS position and GSL altitude, TAWS-A displays a 2-D picture of the surrounding terrain and obstacles relative to the position and altitude of the aircraft. Furthermore, the GPS position and GSL altitude are used to calculate and “predict” the aircraft’s flight path in relation to the surrounding terrain and obstacles. In this manner, TAWS-A can provide advanced alerts of predicted dangerous terrain conditions.

Class A TAWS incorporates radar altimeter input with the GSL altitude to provide a more accurate position reference when at lower altitudes for certain alert types, and to retain a level of ground proximity warning capability in the unlikely event of an airport, terrain or obstacle database failure.

Baro-corrected altitude (or indicated altitude) is derived by adjusting the altimeter setting for local atmospheric conditions. The most accurate baro-corrected altitude can be achieved by frequently updating the altimeter setting to the nearest reporting station along the flight path. However, because actual atmospheric conditions seldom match the standard conditions defined by the International Standard Atmosphere (ISA) model (where pressure, temperature, and lapse rates have fixed values), it is common for the baro-corrected altitude (as read from the altimeter) to differ from the GPS-MSL altitude. This variation results in the aircraft’s true altitude differing from the baro-corrected altitude.

TAWS-A provides the following alert types:

- Forward Looking Terrain Avoidance (FLTA) Alerting, which consists of:
 - Required Terrain Clearance (RTC) / Required Obstacle Clearance (ROC) Alerting
 - Imminent Terrain Impact (ITI) / Imminent Obstacle Impact (IOI) Alerting
- Premature Descent Alerting (PDA)
- Ground Proximity Warning System (GPWS) Alerting, which consists of:

- Excessive Descent Rate (EDR) Alerting
- Excessive Closure Rate (ECR) to Terrain Alerting
- Flight Into Terrain (FIT) Alerting
- Negative Climb Rate (NCR) after takeoff Alerting
- Excessive below Glideslope/Glidepath Deviation (GSD) Alerting
- Altitude Voice Call Out (VCO) Alerting

11.5.1.1 (10.5.1.1) Displaying TAWS-A Data

TAWS-A uses yellow (caution) and red (warning) to depict terrain and obstacle (with a height greater than 200 feet above ground level, AGL) alerts relative to aircraft altitude. Colors are adjusted automatically as the aircraft altitude changes. The colors and symbols in Figure 11-28 and Tables 11-11 and 11-12 are used to represent terrain, obstacles, and threat locations.

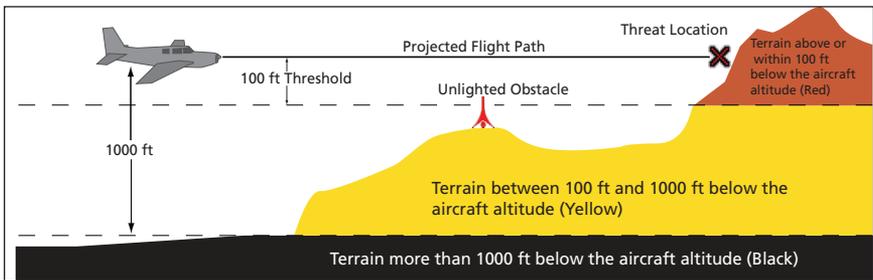


Figure 11-28 Terrain Altitude/Color Correlation for TAWS-A

Alert Level	Annunciator Text	Threat Location Indicator	Example Visual Annunciation
Warning	White text on red background		
Caution	Black text on yellow background		
Informational	Black text on white background	Not Applicable	

Table 11-11 TAWS-A Alert Colors and Symbology

Obstacle Symbol	Unlighted Obstacle		Lighted Obstacle		Threat Location Indicator	Terrain Color	Terrain/Obstacle Location	Alert Level
	< 1000 ft AGL	> 1000 ft AGL	< 1000 ft AGL	> 1000 ft AGL				
								
					Yellow	Terrain/Obstacle between 100 ft and 1000 ft below current aircraft altitude	CAUTION (Yellow)	

Table 11-12 TAWS-A Terrain/Obstacle Colors and Symbology

11.5.2 (10.5.2) TAWS-A Display

The TAWS-A Page shows terrain, obstacle, and threat location data in relation to the aircraft's current altitude, without clutter from the basemap. Aviation data (airports, VORs, and other NAVAIDs) can be displayed for reference. If an obstacle and the projected flight path of the aircraft intersect, the display automatically zooms in to the closest potential point of impact on the TAWS-A Page.

Aircraft orientation on this map is always heading up unless there is no valid heading. Two views are available relative to the position of the aircraft: the 360° default display and the radar-like ARC (120°) display. Map range is adjustable with the **In** and **Out** keys from 1 to 200 NM, as indicated by the map range rings (or arcs).

Terrain Page Title

Heading Annunciation



Aircraft GSL Value (GPS Derived)

Red Terrain Is Above Or Within 100 ft Below The Aircraft Altitude

Range Arc

Yellow Terrain Is Between 100 ft and 1000 ft Below The Aircraft Altitude

Owship Position

Terrain Scale

Terrain Menu Key

Terrain Type

Figure 11-29 TAWS-A Page with Arc View

Terrain Page Title

Heading Annunciation



Aircraft GSL Value (GPS Derived)

Red Terrain Is Above Or Within 100 ft Below The Aircraft Altitude

Owship Position

Yellow Terrain Is Between 100 ft and 1000 ft Below The Aircraft Altitude

TAWS Annunciations (all annunciations shown on Terrain page)

TAWS Annunciations (shown on all displays) (+ indicates there are more annunciations and will show each one for five seconds)

Range Arcs

Terrain Type

Figure 11-30 TAWS-A Page with 360° View



1. While viewing the Terrain page, touch the **Menu** key.
2. Selections are grouped by function: View, Layers, and TAWS.



Figure 11-31 TAWS-A Menu

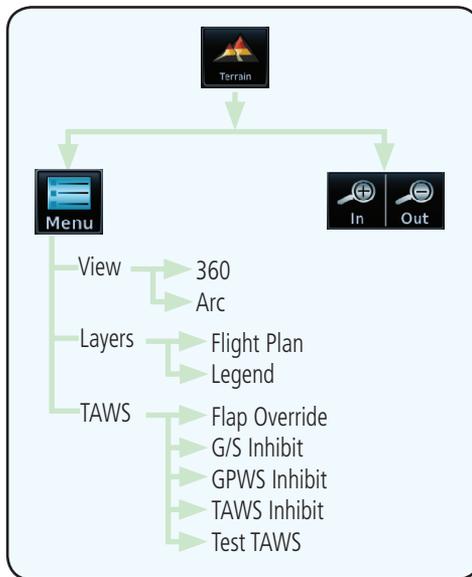


Figure 11-32 TAWS-A Page Functional Diagram

11.5.3 (10.5.3) TAWS-A Alerts

Alerts are issued when flight conditions meet parameters that are set within TAWS-A software algorithms. TAWS-A alerts employ a CAUTION or a WARNING alert severity level. When an alert is issued, visual annunciations are displayed and aural alerts are simultaneously issued. TAWS-A alert types with corresponding annunciations and aural messages are shown in Table 11-13.

When an alert is issued, annunciations appear on the display. The TAWS-A Alert Annunciation is shown on the lower left part of the display. If the TAWS-A Page is not already displayed, a pop-up alert appears while an alert is active.

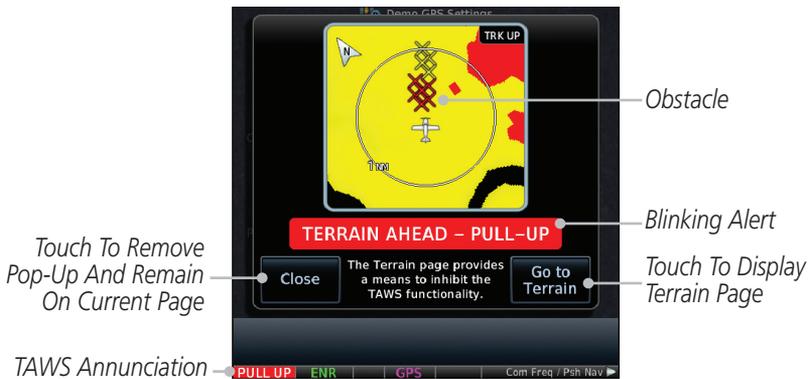


Figure 11-33 Terrain Alert Pop-Up

To acknowledge the pop-up alert:



Touch the **Close** key (returns to the currently viewed page), or



Touch the **Go to Terrain** key (accesses the TAWS-A Page)

11.5.3.1 (10.5.3.1) TAWS-A Alerts Summary

Alert Type	Alert Annunciation	Pop-Up Alert (Except TAWS-A Page)	Aural Message
Reduced Required Terrain Clearance Warning (RTC)	PULL UP	TERRAIN - PULL-UP * or TERRAIN AHEAD - PULL-UP	"Terrain, Terrain; Pull Up, Pull Up" * or "Terrain Ahead, Pull Up; Terrain Ahead, Pull Up"
Imminent Terrain Impact Warning (ITI)	PULL UP	TERRAIN - PULL-UP * or TERRAIN AHEAD - PULL-UP	"Terrain, Terrain; Pull Up, Pull Up" * or "Terrain Ahead, Pull Up; Terrain Ahead, Pull Up"
Reduced Required Obstacle Clearance Warning (ROC)	PULL UP	OBSTACLE - PULL-UP * or OBSTACLE AHEAD - PULL-UP	"Obstacle, Ob- stacle; Pull Up, Pull Up" * or "Obstacle Ahead, Pull Up; Obstacle Ahead, Pull Up"
Imminent Obstacle Impact Warning (IOI)	PULL UP	OBSTACLE - PULL-UP * or OBSTACLE AHEAD - PULL-UP	"Obstacle, Ob- stacle; Pull Up, Pull Up" * or "Obstacle Ahead, Pull Up; Obstacle Ahead, Pull Up"
Excessive Descent Rate Warning (EDR)	PULL UP	PULL-UP	"<whoop> <whoop> Pull Up"
Excessive Closure Rate Warning (ECR)	PULL UP	PULL-UP	"<whoop> <whoop> Pull Up"
Reduced Required Terrain Clearance Caution (RTC)	TERRAIN	CAUTION - TERRAIN * or TERRAIN AHEAD	"Caution, Terrain; Caution, Terrain" * or "Terrain Ahead; Terrain Ahead"

* Alerts with multiple messages are configurable. Alerts for the default configuration are indicated with asterisks.

** VCO alerts are not issued if both TAWS and GPWS systems have failed or are not available

† GSD alert will be available if a valid ILS is being used for navigation, even in no valid GPS signal is being received.

Table 11-13 TAWS-A Alerts Summary

Alert Type	Alert Annunciation	Pop-Up Alert (Except TAWS-A Page)	Aural Message
Imminent Terrain Impact Caution (ITI)	TERRAIN	CAUTION - TERRAIN * or TERRAIN AHEAD	"Caution, Terrain; Caution, Terrain" or "Terrain Ahead; Terrain Ahead"
Reduced Required Obstacle Clearance Caution (ROC)	OBSTCL	CAUTION - OBSTACLE * or OBSTACLE AHEAD	"Caution, Obstacle; Caution, Obstacle"* or "Obstacle Ahead; Obstacle Ahead"
Imminent Obstacle Impact Caution (IOI)	OBSTCL	CAUTION - OBSTACLE * or OBSTACLE AHEAD	"Obstacle Ahead; Obstacle Ahead"* or "Caution, Obstacle; Caution, Obstacle"
Premature Descent Alert Caution (PDA)	TERRAIN	TOO LOW - TERRAIN	"Too Low, Terrain"
Excessive Descent Rate Caution (EDR)	TERRAIN	SINK RATE	"Sink Rate"
Excessive Closure Rate Caution (ECR)	TERRAIN	TERRAIN	"Terrain, Terrain"
Negative Climb Rate Caution (NCR)	TERRAIN	DON'T SINK * or TOO LOW - TERRAIN	"Don't Sink" * or "Too Low, Terrain"
Flight Into Terrain High Speed Caution (FIT)	TERRAIN	TOO LOW - TERRAIN	"Too Low, Terrain"
Flight Into Terrain Gear Caution (FIT)	TERRAIN	TOO LOW - GEAR	"Too Low, Gear"
Flight Into Terrain Flaps Caution (FIT)	TERRAIN	TOO LOW - FLAPS	"Too Low, Flaps"
Flight Into Terrain Takeoff Caution (FIT)	TERRAIN	TOO LOW - TERRAIN	"Too Low, Terrain"

* Alerts with multiple messages are configurable. Alerts for the default configuration are indicated with asterisks.

** VCO alerts are not issued if both TAWS and GPWS systems have failed or are not available

† GSD alert will be available if a valid ILS is being used for navigation, even in no valid GPS signal is being received.

Table 11-13 TAWS-A Alerts Summary

Alert Type	Alert Annunciation	Pop-Up Alert (Except TAWS-A Page)	Aural Message
Glide Slope Deviation Caution (GSD)	GLIDESLOPE	GLIDESLOPE	"Glideslope"
Altitude Voice Callout (VCO)	None	None	"Five-Hundred" [*] , "Four-Hundred" [*] , "Three-Hundred" [*] , "Two-Hundred" [*] , "One-Hundred" [*]
TAWS Available	None	N/A	"TAWS Available"
TAWS System Test in Progress	TAWS TEST	N/A	None
TAWS System Test Pass	None	N/A	"TAWS System Test OK"
TAWS N/A	TAWS N/A	N/A	TAWS Not Available
TAWS Alerting is Disabled	TAWS INHB	N/A	None
TAWS System Test Fail	TAWS FAIL	N/A	"TAWS System Failure"
Incorrect TAWS configuration, invalid/missing terrain, airport, or obstacle database, or TAWS audio fault.	TAWS FAIL ^{**}	N/A	"TAWS System Failure"
No GPS position	TAWS N/A	N/A	"TAWS Not Available"

* Alerts with multiple messages are configurable. Alerts for the default configuration are indicated with asterisks.

** VCO alerts are not issued if both TAWS and GPWS systems have failed or are not available

† GSD alert will be available if a valid ILS is being used for navigation, even in no valid GPS signal is being received.

Table 11-13 TAWS-A Alerts Summary

Alert Type	Alert Annunciation	Pop-Up Alert (Except TAWS-A Page)	Aural Message
GPS position unavailable/ degraded, outside of terrain database coverage	TAWS N/A	N/A	"TAWS Not Available"
Sufficient GPS signal reception restored	None	N/A	"TAWS Available" (aural message only in flight)
Incorrect TAWS configuration, radar altimeter unavailable, GPS position unavailable/ degraded, TAWS audio fault	GPWS FAIL *	N/A	"GPWS System Failure"
GPWS Inhibit	GPWS INHB	N/A	"GPWS System Failure"
GPWS Not Available. Incorrect TAWS configuration, radar altimeter unavailable, GPS position unavailable/ degraded, TAWS audio fault.	GPWS N/A	N/A	None
Glideslope Inhibit	G/S INHB	N/A	None

* Alerts with multiple messages are configurable. Alerts for the default configuration are indicated with asterisks.

** VCO alerts are not issued if both TAWS and GPWS systems have failed or are not available

† GSD alert will be available if a valid ILS is being used for navigation, even in no valid GPS signal is being received.

Table 11-13 TAWS-A Alerts Summary

Alert Type	Alert Annunciation	Pop-Up Alert (Except TAWS-A Page)	Aural Message
FLAP Override	FLAP OVRD	N/A	None

* Alerts with multiple messages are configurable. Alerts for the default configuration are indicated with asterisks.

** VCO alerts are not issued if both TAWS and GPWS systems have failed or are not available

† GSD alert will be available if a valid ILS is being used for navigation, even in no valid GPS signal is being received.

Table 11-13 TAWS-A Alerts Summary

11.5.3.2 (10.5.3.2) Excessive Descent Rate Alert

The purpose of the **Excessive Descent Rate (EDR)** alert is to provide notification when the aircraft is determined to be descending upon terrain at an excessive rate. The parameters for the alert as defined by TSO-C151c are shown below.

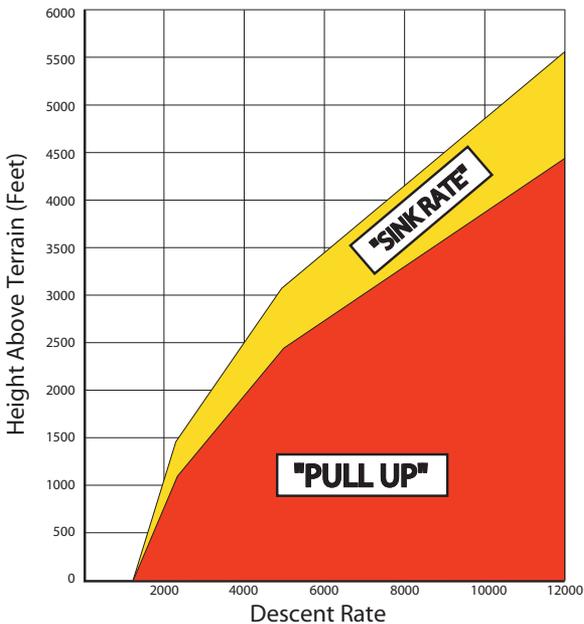


Figure 11-34 Excessive Descent Rate Alert Criteria

11.5.3.3 (10.5.3.3) Forward Looking Terrain Avoidance

Reduced Required Terrain Clearance (RTC) and **Reduced Required Obstacle Clearance (ROC)** alerts are issued when the aircraft flight path is above terrain, yet is projected to come within the minimum clearance values in the FLTA Alert Minimum Terrain and Obstacle Clearance Values table. When an RTC alert and/or a ROC is issued, a threat location indicator is displayed on the TAWS Page.

Imminent Terrain Impact (ITI) and **Imminent Obstacle Impact (IOI)** alerts are issued when the aircraft is below the elevation of a terrain or obstacle cell in the aircraft's projected path. ITI and IOI alerts are accompanied by a threat location indicator displayed on the TAWS Page. The alert is annunciated when the projected vertical flight path is calculated to come within minimum clearance altitudes in the following table.

Flight Phase	Minimum Clearance Altitude (feet)	
	Level Flight	Descending
En Route	700	500
Terminal	350	300
Approach	150	100
Departure	100	100

Table 11-14 FLTA Alert Minimum Terrain and Obstacle Clearance Values

During final approach, FLTA alerts are automatically inhibited when the aircraft is below 200 feet AGL while within 0.5 NM of the approach runway or below 125 feet AGL while within 1.0 NM of the runway threshold.

11.5.3.4 (10.5.3.4) Premature Descent Alerting

A Premature Descent Alert (PDA) is issued when the system detects that the aircraft is significantly below the normal approach path to a runway.

PDA alerting begins when the aircraft is within 15 NM of the destination airport and ends when the aircraft is either 0.5 NM from the runway threshold or is at an altitude of 125 feet AGL while within 1.0 NM of the threshold. During the final descent, algorithms set a threshold for alerting based on speed, distance, and other parameters.

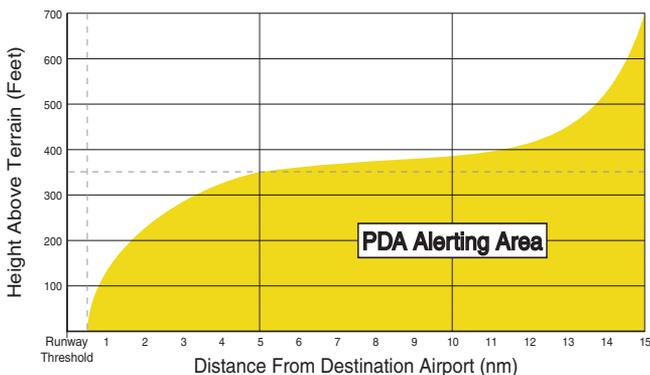


Figure 11-35 PDA Alerting Threshold

PDA and FLTA aural and visual alerts can be manually inhibited. Discretion should be used when inhibiting TAWS and the system should be enabled when appropriate. When TAWS is inhibited, the alert annunciation “TER INHB” is shown.

11.5.3.5 (10.5.3.5) Inhibiting/Enabling TAWS-A Alerting

TAWS-A also has an inhibit mode that deactivates the PDA/FLTA aural and visual alerts. Pilots should use discretion when inhibiting TAWS-A and always remember to enable the system when appropriate. Only the PDA and FLTA alerts are disabled in the inhibit mode. After cycling power, TAWS-A will no longer be inhibited.



Figure 11-36 TAWS-A Alerting Disabled (TAWS Inhibited) Annunciation



1. While viewing the Terrain page, touch the **Menu** key.



2. Touch the **TAWS Inhibit** key to inhibit or enable TAWS (choice is dependent on current state). A green bar in the key indicates the TAWS is inhibited.

11.5.4 (10.5.4) Excessive Closure Rate Alert

The **Excessive Closure Rate (ECR)** alert provides suitable notification when the aircraft is determined to be closing upon terrain at an excessive speed for a given aircraft gear and flap configuration.

The following figures show the ECR alerting criteria for flaps in the landing configuration and for all other flight phases respectively.

ECR alerts are automatically inhibited when the aircraft is 5 NM from the nearest airport, except when FLTA is not available (causing the TAWS N/A or TAWS FAIL annunciation to be displayed), in which case ECR alerting will remain active until landing.

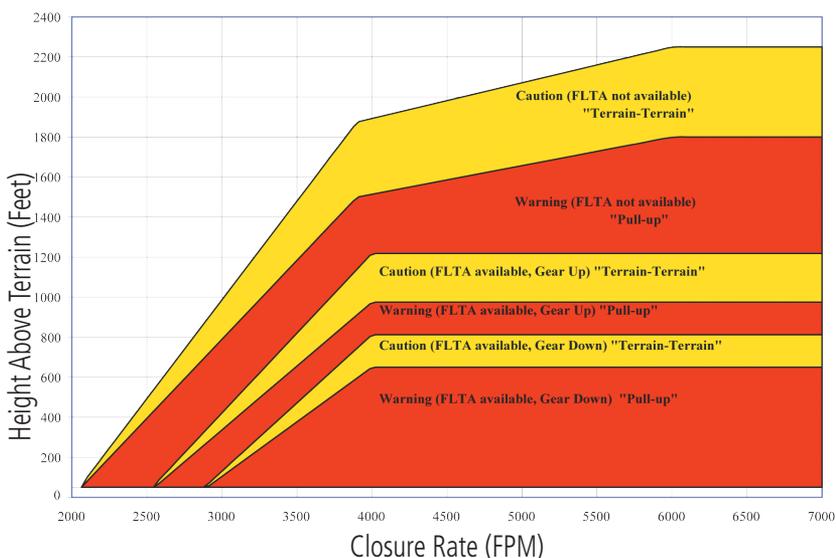


Figure 11-37 Excessive Closure Rate Alert Criteria (Flaps Up or Takeoff Configuration)

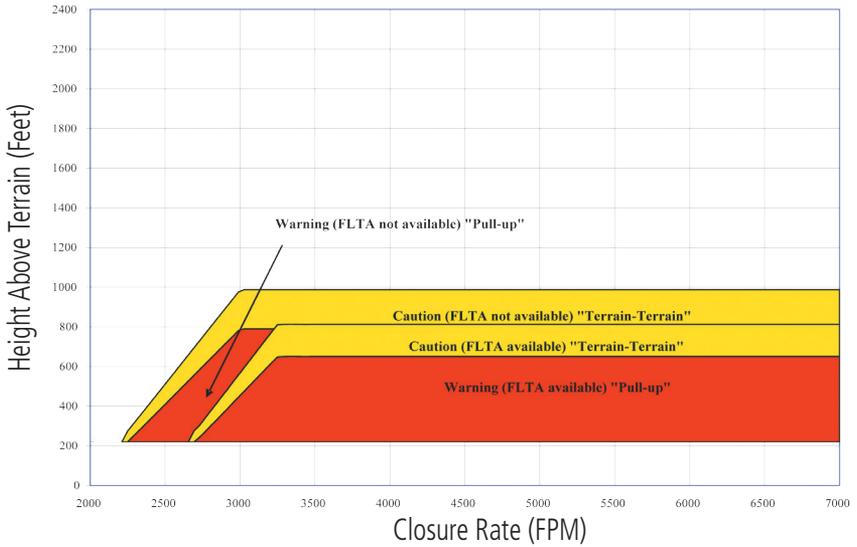
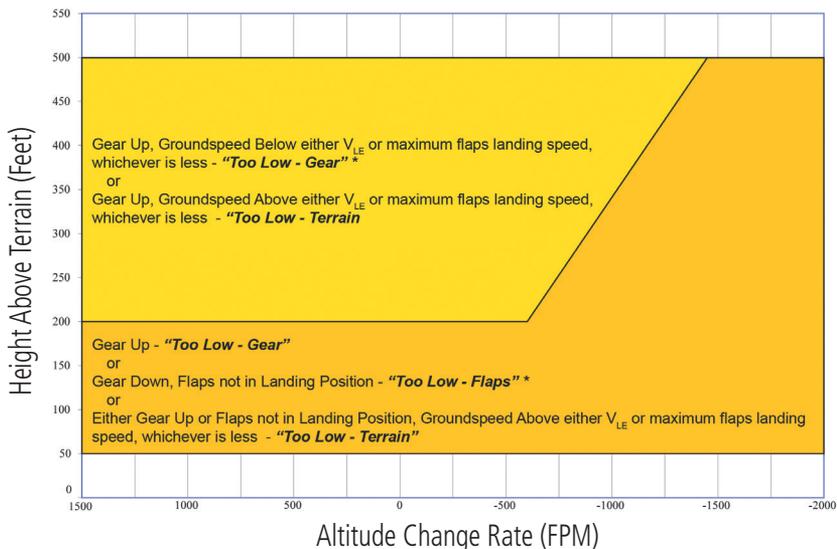


Figure 11-38 Excessive Closure Rate Alert Criteria (Flaps in Landing Configuration)

11.5.5 (10.5.5) Flight Into Terrain Alert

Flight Into Terrain (FIT) alerts occur when the aircraft is too low with respect to terrain based on landing gear status, flap position, and groundspeed. FIT caution alerts are issued when flight conditions meet the criteria shown below.



* Flap position will not trigger alert if Flap Override option is enabled; see discussion below.

Figure 11-39 Flight Into Terrain Caution Alert Criteria

To reduce nuisance FIT alerts on approaches where flap extension is not desired (or is intentionally delayed), the pilot may override FIT alerting based on the flap position, while all other FIT alerting remains in effect.



Figure 11-40 TAWS-A Page Menu and FIT Flap Override Annunciation

11.5.5.1 (10.5.5.1) Overriding Flaps-based FIT alerting



1. While viewing the TAWS-A Page, touch the **MENU** key.



2. Touch the **Flap Override** key to toggle the override state.

When the Flaps Override option is enabled, the annunciation “FLAP O/R” is annunciated on the TAWS-A Page. If GPWS alerts are also inhibited (which include FIT), the “FLAP O/R” annunciation is not shown.



NOTE: *The FLAP O/R (Flap Override) should be activated when an approach without flaps is going to be performed.*

FIT alerts also occur during takeoff or go-around if the aircraft’s height above ground level (as determined by the radar altimeter) is too close to rising terrain. TAWS-A will issue the aural message “**Too Low - Terrain**” and visual annunciations when conditions enter the caution alert area.

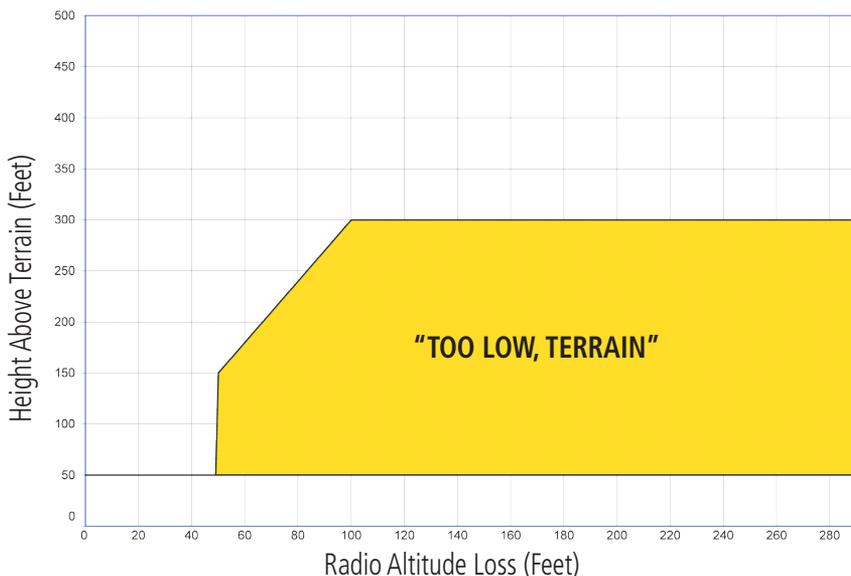


Figure 11-41 FIT Alerting After Takeoff

11.5.6 (10.5.6) Negative Climb Rate After Take-Off Alert (NCR)

The **Negative Climb Rate (NCR) After Take-Off** alert (also referred to as “Altitude Loss After Take-Off”) provides alerts when the system determines the aircraft is losing altitude (closing upon terrain) after takeoff. The aural message “Don’t Sink” is given for NCR alerts, accompanied by an annunciation and a pop-up terrain alert on the display. NCR alerting is only active when departing from an airport and when the following conditions are met:

- Height above the terrain is less than 700 feet
- Distance from the departure airport is 2 NM or less
- Heading change from the departure heading is less than 110°

The NCR alerting parameters as defined by TSO-C151c are shown below.

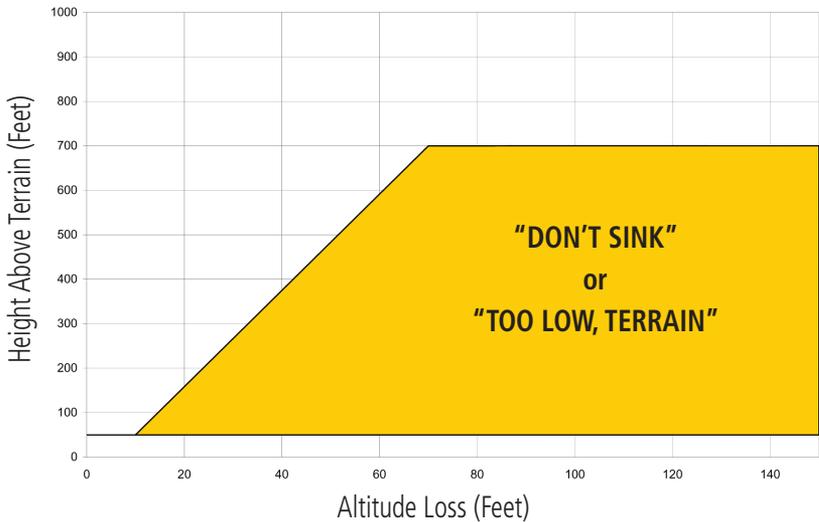


Figure 11-42 Negative Climb Rate (NCR) Altitude Loss

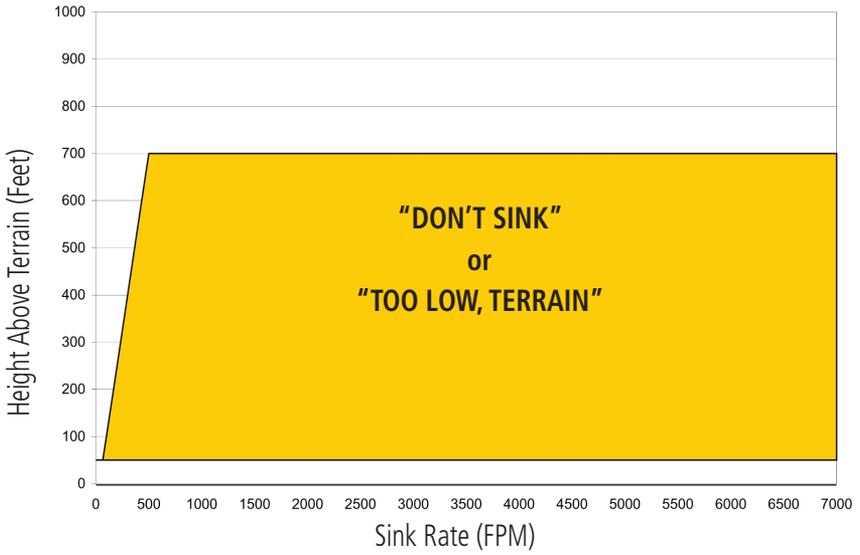


Figure 11-43 Negative Climb Rate (NCR) Sink Rate

11.5.7 (10.5.7) Inhibiting GPWS Alerts (EDR, ECR, FIT, and NCR)



NOTE: The “Inhibit GPWS” function only affects GPWS alerts (EDR, ECR, NCR, and FIT). Alerting for FLTA, PDA, and GSD is controlled independently from the GPWS alerts listed below.

EDR, ECR, FIT, and NCR aural and visual alerts can be manually inhibited as a group. Discretion should be used when inhibiting alerts and the GPWS system should be enabled when appropriate. When these alerts are inhibited, the alert annunciation “GPWS INH” is shown on the TAWS-A Page annunciation window.

11.5.7.1 (10.5.7.1) Inhibiting/enabling GPWS alerting



1. While viewing the TAWS-A Page, touch the **MENU** key.



2. Touch the **GPWS Inhibit** key to inhibit or enable GPWS alerts (choice dependent on current state).



Figure 11-44 GPWS Inhibit Annunciation

11.5.8 (10.5.8) Altitude Voice Callout (VCO)

TAWS-A provides aural advisory alerts as the aircraft descends, beginning at 500 feet above the terrain, as determined by the radar altimeter (if greater than 5 NM from the nearest airport) or 500 feet above the nearest runway threshold elevation (if less than 5 NM from the nearest airport). Upon descent to this altitude, TAWS-A issues the aural alert message “Five-hundred”.

Maintenance personnel may enable additional VCO alerts corresponding to 400, 300, 200, and 100 feet. There are no display annunciations or pop-up alerts that accompany the aural message(s). VCO alerts cannot be inhibited.

11.5.9 (10.5.9) TAWS-A System Status

During power-up, TAWS-A conducts a self-test of its aural and visual annunciations. The system test can also be manually initiated. An aural alert is issued at test completion. TAWS-A System Testing is disabled when ground speed exceeds 30 knots.

11.5.9.1 (10.5.10) Excessive Below Glideslope/Glidepath Deviation Alert

A **Glideslope Deviation** or **Glidepath Deviation (GSD)** caution alert is issued when the system detects that the aircraft is significantly below the glidepath for the selected approach.

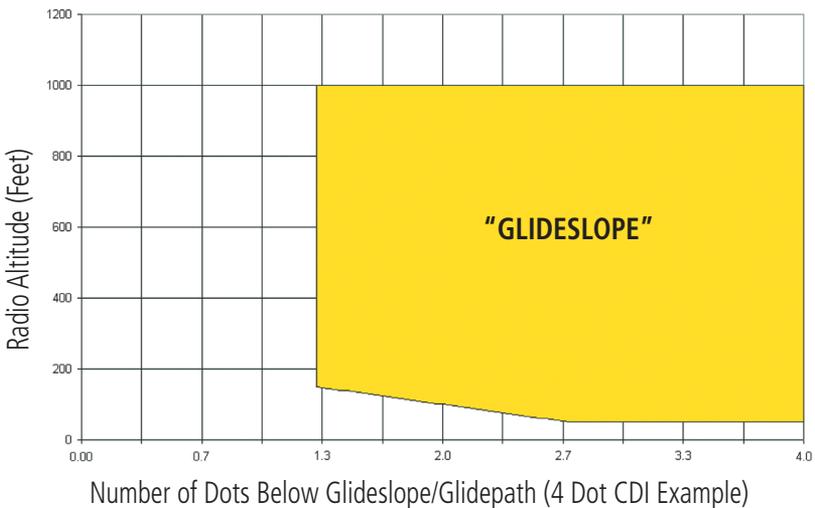


Figure 11-45 Excessive Below Glideslope/Glidepath Deviation Alert Criteria

GSD alerting is only active after departure and the following conditions are met:

- An ILS, LPV, LNAV/VNAV, or LNAV+V approach is active and vertical navigation indications are being displayed.
- Aircraft is below 1000 feet AGL.
- Gear is configured for landing.

When a GSD caution alert occurs, the aural and visual annunciation “GLIDESLOPE” is issued. If a GSD caution alert occurs on an LPV, LNAV/VNAV, or LNAV+V approach, the aural and visual annunciation “GLIDESLOPE” is issued.

11.5.9.2 (10.5.10.1) Inhibiting Glideslope Deviation (GSD) Alerts



NOTE: *The Glideslope (G/S) Inhibit function should be activated when flying a localizer backcourse approach to prevent nuisance GSD alerts. GSD alerts are inhibited independent from all other FLTA, PDA, and GPWS alerts.*



1. While viewing the TAWS-A Page, touch the **MENU** key.



2. Touch the **G/S Inhibit** key to inhibit or enable glideslope or glidepath alerts (choice dependent on current state).



NOTE: *The G/S Inhibit function will only be active for a single approach and the inhibit function will not remain active for subsequent approaches. When G/S alerts are inhibited, they are only inhibited for a single approach. To inhibit G/S alerts on the next approach, the G/S Inhibit function must be activated again between the first and second approaches.*



NOTE: *Glideslope Deviation alerts will not be available if the G/S INHB function is activated.*

11.5.10 (10.5.11) TAWS-A Abnormal Operations

TAWS-A continually monitors several system-critical items such as database validity, flap and landing gear position, radar altimeter input, and GPS status.

If the GTN does not contain Terrain, Airport Terrain, and Obstacle databases (or the databases are invalid), the aural message “*TAWS System Failure*” is generated along with the “TAWS FAIL” alert annunciation.

TAWS-A requires a 3-D GPS navigation solution along with specific vertical accuracy minimums. Should the navigation solution become degraded or if the aircraft is out of the database coverage area, the annunciation “TAWS N/A” is generated in the annunciation window and on the TAWS-A page, the aural message “*TAWS Not Available*” is generated if airborne, some TAWS-A terrain alerts will not be issued, and GPWS alerting (which are not dependent on GPS position) will continue to operate. When the GPS signal is re-established and the aircraft is within the database coverage area, the aural message “TAWS Available” is generated.

TAWS-A also requires radar altimeter input. Should the radar altimeter input fail or become degraded, the annunciation “GPWS FAIL” is generated in the annunciation window and on the TAWS-A Page. The aural message “*GPWS System Failure*” is also generated. The “GPWS FAIL” annunciation will also occur if both GPS altitude and barometric altitude are unavailable. If only the GPWS system has failed, GPWS-based alerts will not be available, while other TAWS-A alerting remains unaffected.

Multiple TAWS or GPWS annunciations cannot be displayed at the same time. When multiple annunciations exist, an asterisk will be present next to the annunciation. The display of each annunciation will alternate with each being displayed for approximately five seconds.

GTN 7XX - Page 12-70, GTN 6XX - Page 11-48

Added the following paragraph.

12.6 (11.4) FIS-B Weather

A cyan checkerboard pattern indicates that no data is available for that area, and rainfall in that area is unknown.

GTN 7XX - Page 12-74, GTN 6XX - Page 11-52

Updated the following paragraph.

12.6.2.2 (11.4.2.2) NEXRAD Limitations

Certain limitations exist regarding the NEXRAD radar displays. Some, but not all, are listed for the user's awareness:

- The Regional NEXRAD “pixels” are 1.5 minutes (1.5 nautical miles = 2.78 km) wide by 1 minute (1 nautical miles = 1.852 km) tall. The CONUS NEXRAD “pixels” are 7.5 minutes (7.5 nautical miles = 13.89 km) wide by 5 minutes (5 nautical miles = 9.26 km) wide. Above 60 degrees of latitude the Regional NEXRAD “pixels” are 3 minutes/nautical miles. CONUS NEXRAD is not available above 60 degrees of latitude. The intensity level reflected by the pixel will be the highest level sampled within the area covered by each pixel.

15 (14) UTILITIES

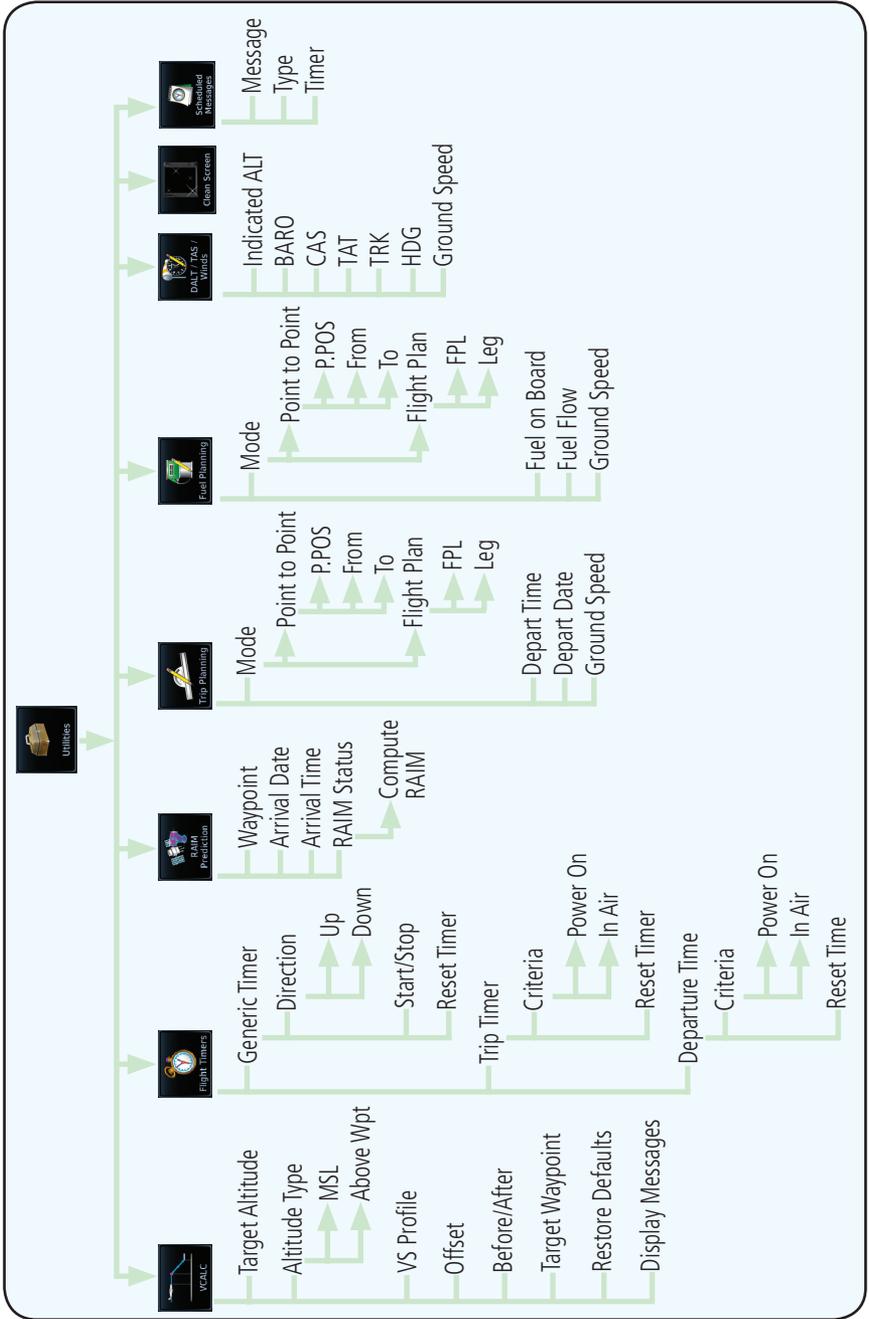


Figure 15-2 Utilities Functional Diagram

Added the following section.

15.8 (14.8) Scheduled Messages

The Scheduled Messages utility displays reminder messages (such as “Change oil”, “Switch fuel tanks”, “Overhaul”, etc.). One-time, periodic, and event-based messages are allowed. One-time messages appear once the timer expires and reappear each time the GTN-series unit is powered on, until the message is deleted. Periodic messages automatically reset to the original timer value, once the message is displayed. Event-based messages do not use a timer, but rather a specific date and time.



NOTE: *This feature is available in SW Versions 5.00, and later.*



1. While viewing the Utilities page group, touch the **Scheduled Messages** key to start the Scheduled Messages function.

Touch To Add A Scheduled Message



Figure 15-46 Scheduled Messages Page

2. Touch the **Message** selection and enter the desired message to be displayed. Touch the **Type** selection to choose the message type. Touch the **Timer** selection to set the countdown time for the message to be displayed.

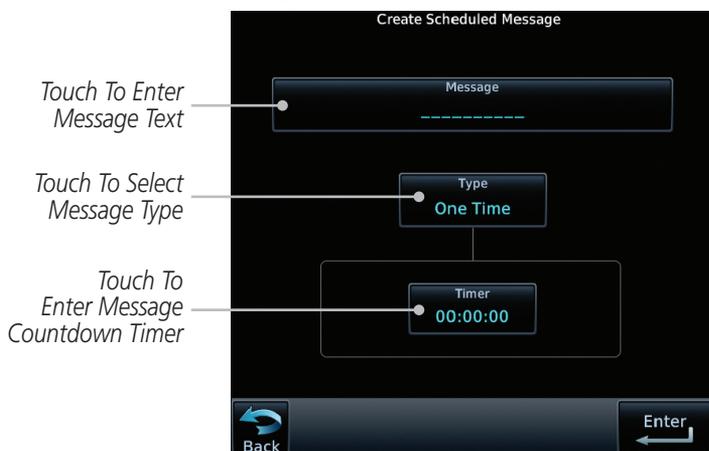


Figure 15-47 Create a Scheduled Message



2. After completing the selections, touch the **Enter** key.

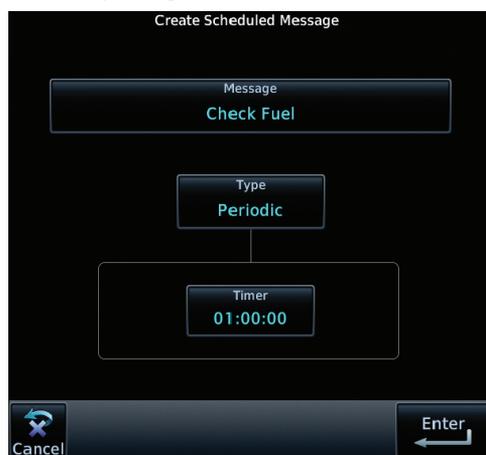


Figure 15-48 Sample Scheduled Message

GTN 7XX - Page 16-20
 Added the following note.

16.4.4 Crossfill



NOTE: *If two GTN 7XX units are crossfilled, then the same type (ChartView or FlightCharts) and version (cycle number and effective dates) for the chart database must be installed on both units in order for the correct chart to be overlaid on the main map page.*

GTN 7XX - Page 17-1, GTN 6XX - Page 16-1
 Added the following text.

17 MESSAGES

System messages are not crossfilled between GTN units. Each GTN will display messages based on data received by that unit. This may result in duplication of messages between units, however the pilot should view messages on both GTN units when more than one is installed to ensure all messages are received.

GTN 7XX - Page 18-7, GTN 6XX - Page 17-7
 Updated the following table.

18.7 (17.7) Map Tool Bar Symbols

Symbol	Description
	Terrain Proximity Enabled and Available Indicator
	Terrain Proximity Enabled and Not Available Indicator
	StormScope
	Ownship is receiving TIS-B and ADS-R services
	Possible incomplete traffic picture – ownship is not receiving one (or both) of the TIS-B or ADS-R services
	Traffic Enabled and Available Indicator
	Traffic Enabled and Not Available Indicator

Table 18-9 Map Tool Bar Symbols



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