GTN 625/635/650 SOFTWARE v6.60
PILOT'S GUIDE UPGRADE SUPPLEMENT

This supplement contains the pages revised in the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03, Rev P, regarding the new features of software v6.60. Change bars are placed adjacent to the revised information as described in the revision summary table.

This supplement, in combination with the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03, Rev. N, is equivalent to the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03, Rev. P.

Current documents are available at flyGarmin.com

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. For more information regarding feature availability for specific software versions refer to the GTN 625/635/650 Pilot's Guide, P/N 190-01004-03.*

This manual reflects the operation of system software v6.60 or later. Some differences in operation may be observed when comparing the information in this manual to later software versions.

United States radar data provided by NOAA; European radar data collected and provided by Meteo France.

For information regarding the Aviation Limited Warranty, refer to Garmin's website.

For aviation product support, visit flyGarmin.com.

GTN 625/635/650 Pilot's Guide Revision P, Change Summary

Section	Page	Description
Section 8 – Map		
8.1.2	8-9	Added "Selected ALT Range Arc" to figure 8-10.
8.1.2.1	8-11	Added "Selected ALT Range Arc" to table 8-2.
	8-21	Added "Selected ALT Range Arc" description.
Section 9 – Traffic		
9.6.2	9-25	Changed 9,000 feet to "9,900" feet, two places in paragraph.
Section 11 – Weather		
11.1.1	11-3	Updated figure 11-5, "Weather Data Link Menu."
11.1.5	11-7	Rewrote third paragraph for clarity.
	11-8	Updated key icon, figure 11-9, figure 11-10, and added note.
11.1.18	11-24	Added figure 11-43, "Icing Legend."
11.4	11-48	Updated figure 11-74, "FIS-B Weather Functional Diagram."
11.4.1	11-49	Added information about similarities between weather products and updated figure 11-76, "FIS-B Weather Data Link Menu."
11.4.2	11-50	Updated "FIS-B NEXRAD" section.
11.4.2.3	11-54	Updated figure 11-80, "FIS-B Reception Unavailable."
11.4.4	11-56	Added "Cloud Tops" section.
11.4.5	11-56	Added "Lightning."
11.4.7	11-58	Changed heading to "FIS-B SIGMETS and Textual AIRMETS."
11.4.8	11-59	Added "Graphical AIRMETS" section.
11.4.9	11-61	Added "Center Weather Advisory" section.
11.4.10	11-62	Updated "FIS-B Winds and Temperatures Aloft" section.
11.4.11	11-63	Added "Icing" section.
11.4.12	11-64	Added "Turbulence" section.
11.4.13	11-65	Added "FIS-B PIREPs" section.
Section 15 – System		
15.4.6.3	15-27	Added "GTN-G3X Crossfilling" section.
Section 16 – Messages		
16	16-10	Added two "Flight Plan Import" messages concerning the G3X.

8.1.2 Map Setup

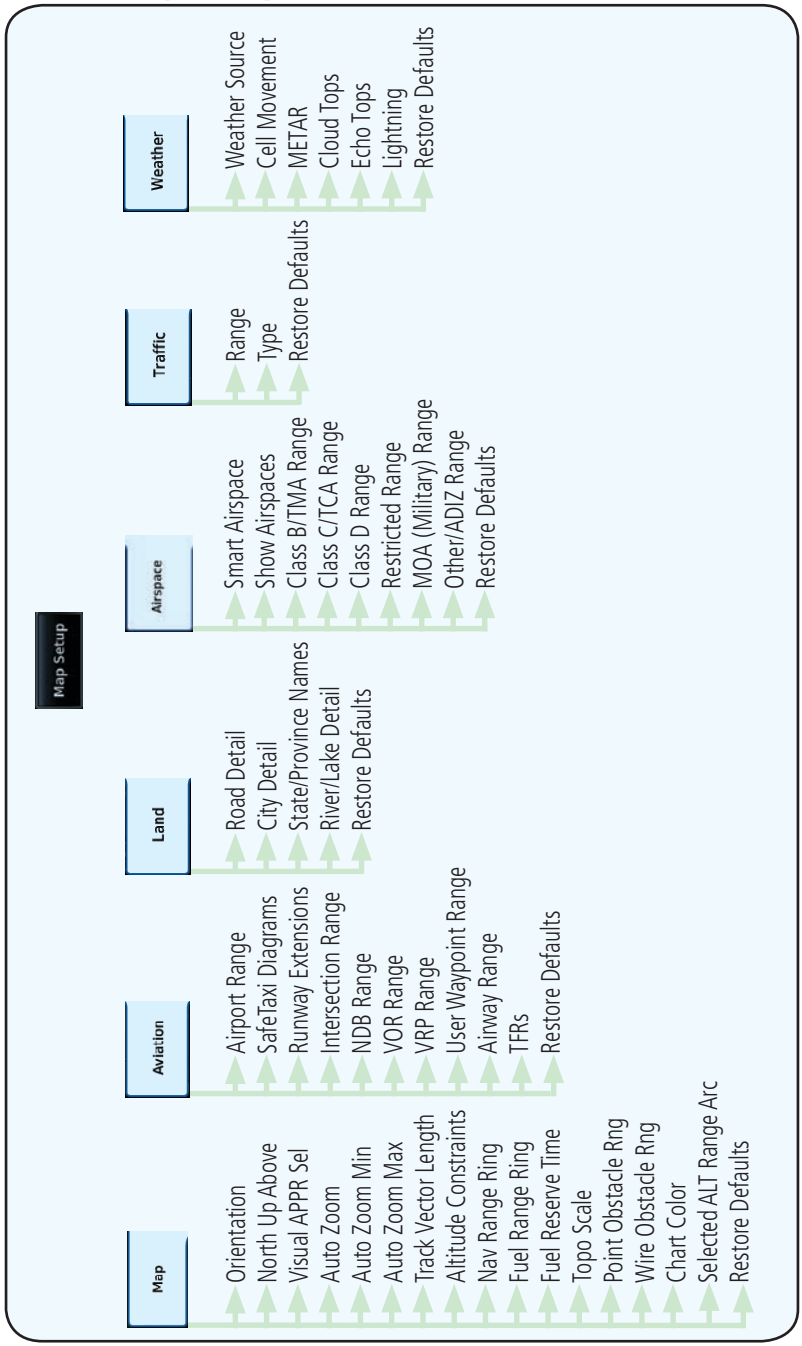


Figure 8-10 Map Setup Functional Diagram

8.1.2.1 Map

The Map option defines the behavior and display of information on the Map page such as: Orientation, North Up Above, Auto Zoom, Nav Range Ring, Topo Scale, Obstacle Range, and Restore Defaults. The default values are shown in **bold** type.

Feature	Selection
Orientation	North Up, **Track Up**, Heading Up
North Up Above	Off, 10 NM, 15 NM, 25 NM, **40 NM**, 50 NM, 75 NM, 100 NM, 150 NM, 250 NM
Visual APPR Selector	Off, 2.5 NM, 4 NM, 5 NM, 7.5 NM,**10 NM**, 15 NM,25 NM
Auto Zoom	Off, **On**
Auto Zoom Min	250 ft, 400 ft, 500 ft, 750 ft, 1000 ft, 1500 ft, 2500 ft, 0.5 NM, 0.75 NM, 1 NM, **1.5 NM**, 2.5 NM, 4 NM, 5 NM, 7.5 NM, 10 NM, 15 NM, 25 NM, 40 NM, 50 NM, 75 NM, 100 NM, 150 NM, 250 NM, 400 NM
Auto Zoom Max	250 ft, 400 ft, 500 ft, 750 ft, 1000 ft, 1500 ft, 2500 ft, 0.5 NM, 0.75 NM, 1 NM, 1.5 NM, 2.5 NM, 4 NM, 5 NM, 7.5 NM, 10 NM, 15 NM, **25 NM**, 40 NM, 50 NM, 75 NM, 100 NM, 150 NM, 250 NM, 400 NM
Track Vector Length	OFF, 30 SEC, **60 SEC**, 2 MIN, 5 MIN, 10 MIN, 20 MIN
Altitude Constraints	Off, Selected Only, **Selected & Active**, All
Nav Range Ring	Off, **On**
Fuel Range Ring	**Off**, On
Fuel Reserve Time	30 MIN, **45 MIN**, 60 MIN, 90 MIN
Topo Scale	**Off**, On
Point Obstacle Range	Off, 4 NM, **5 NM**, 7.5 NM, 10 NM, 15 NM
Wire Obstacle Range	Off, 1 NM, **1.5 NM**, 2.5 NM
Selected ALT Range Arc	Off, **On**
Restore Defaults	Returns values to original factory settings

Table 8-2 Map Setup Map Options

Selected Altitude Range Arc

NOTE: *Requires a Garmin Display Unit (GDU). This feature is available in software v6.60 and later.*

Enabling the Selected ALT Range Arc setting places a cyan arc in front of the aircraft symbol. This arc represents the location at which the aircraft is expected to reach the selected altitude.

Figure 8-27 Selected ALT Range Arc

Restore Defaults

Returns values to the original factory settings.

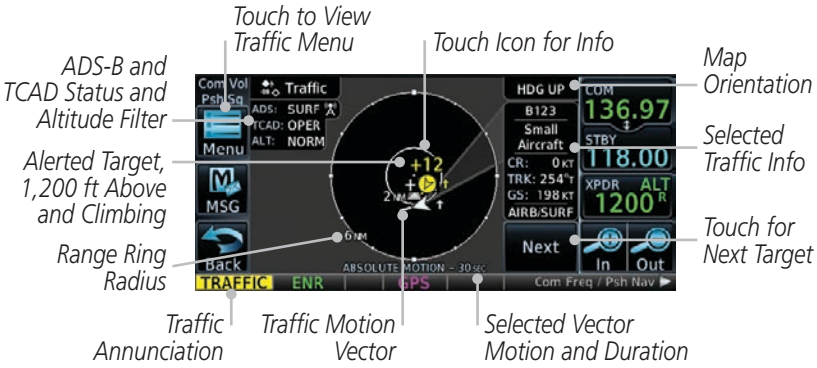


Figure 9-19 Traffic Page for Ryan TCAD with GDL 88

9.6.2 Altitude Mode

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

The selected altitude display mode is displayed in the upper left-hand corner of the Traffic page.

The Altitude Filter limits the traffic displayed to the Below, Normal, Above or Unrestricted altitude block as listed in the "Displayed Traffic Range" table. The filter altitudes are relative to ownship altitude. While viewing the Traffic page, touch the **Altitude Filter** key to change the altitude filter value. Select the desired altitude filter by touching the **BELOW**, **NORMAL**, **ABOVE**, or **UNRESTRICTED** keys. The selection is displayed in the Altitude mode field.

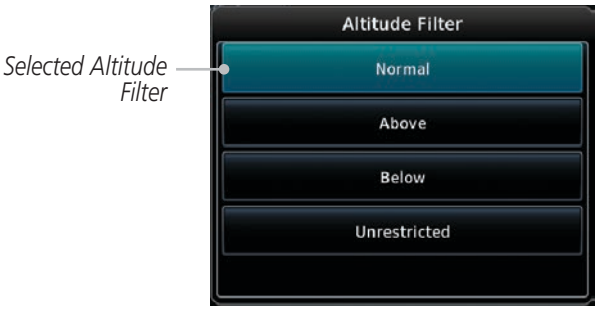


Figure 9-20 Traffic Altitude Filter Selection

11.1.1 Displaying SiriusXM Weather

To display SiriusXM weather touch the following sequence of keys starting from the Home page.

1. Touch the **Weather** key on the Home page and then touch the **Data Link** key.

Figure 11-4 SiriusXM Weather Page

2. While viewing the Data Link weather page, touch the **Menu** key to configure the Data Link Weather page.

Figure 11-5 Weather Data Link Menu

3. Once you have selected what items you want to display, touch **BACK** to return to the Data Link Weather page.

NOTE: *The unit displays valid times on the weather map in lieu of product age indications for SiriusXM Weather Icing Potential, Winds Aloft, and Turbulence weather products.*

NOTE: *The unit displays product age for SiriusXM Weather Freezing Level and Canada Winds Aloft weather products. The product age indication represents the number of minutes that have elapsed since the weather product was provided by SiriusXM Weather. The unit does not display the valid times assigned to the information within these products.*

11.1.5 NEXRAD

WSR-88D, or NEXRAD (NEXt-generation RADar), is a network of 158 high-resolution Doppler radar systems that are operated by the National Weather Service (NWS). NEXRAD data provides centralized meteorological information for the continental United States and selected overseas locations. The maximum range of a single NEXRAD radar site is 250 NM. The NEXRAD network provides important information about severe weather for air traffic safety.

NEXRAD data is not real-time. The lapsed time between collection, processing, and dissemination of NEXRAD images can be significant and may not reflect the current radar synopsis. Due to the inherent delays and the relative age of the data, it should be used for long-range planning purposes only. Never use NEXRAD data for maneuvering in, near, or around areas of hazardous weather. Instead, use it in an early-warning capacity of pre-departure and en route evaluation.

NEXRAD weather radar displays a mosaic of precipitation data, colored according to reflectivity. Composite reflectivity images depict the highest radar energy received from multiple antenna tilt angles at various altitudes. Base reflectivity images depict returns from the lowest antenna tilt angle.

NOTE: *Due to similarities in color schemes, the display of Echo Tops cannot be shown with Cloud Tops and NEXRAD.*

1. While viewing the SiriusXM Weather menu, touch the **NEXRAD** key to display the NEXRAD selections.

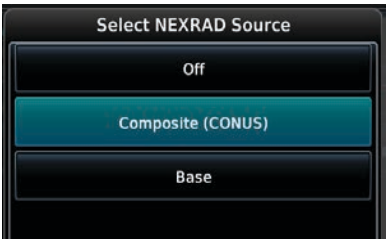
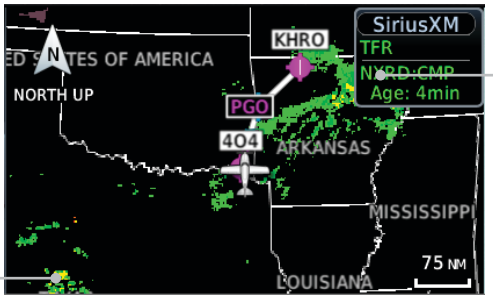


Figure 11-9 SiriusXM NEXRAD Weather Selection

NOTE: *Depending on the SXM service and installed GDL hardware, radar base reflectivity imaging may have broader coverage within North America or be limited to only Canada.*

2. Touch the desired **NEXRAD** source selection and then the **Back** key to view the weather information.



Age of Selected Weather Products

NEXRAD Weather

Figure 11-10 NEXRAD Weather

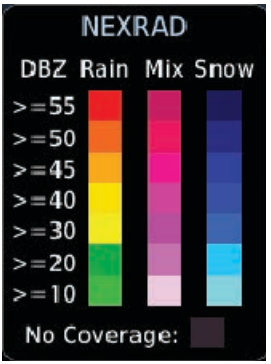
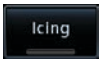


Figure 11-11 NEXRAD Weather Legend

11.1.18 Icing

The Icing product provides information about the current icing environment and where it may occur between 1,000 feet and 30,000 feet in 3,000 foot increments. Supercooled Large Droplets (SLD) Icing provides an alert to the potential for freezing rain due to the presence of large, supercooled water droplets. SLD data is shown between 1,000 feet and 30,000 feet in 3,000 foot increments.



1. While viewing the Data Link Weather menu, touch the **Icing** key.

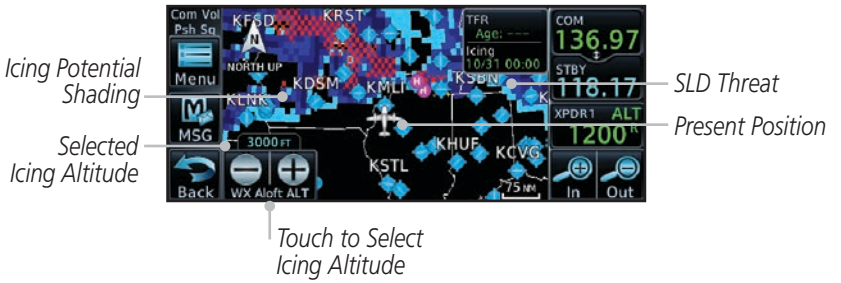
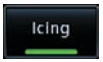


Figure 11-42 Icing

2. Touch the **WX Aloft ALT** − or + keys to increase or decrease the reporting altitude of icing in 3,000 foot increments. The selected altitude is shown in a window above the altitude keys.



3. Touch the **Icing** key again to turn it off.

G3 SiriusXM

G4 SiriusXM

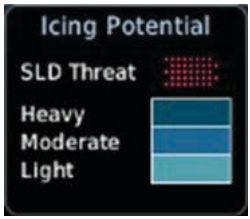


Figure 11-43 Icing Legend

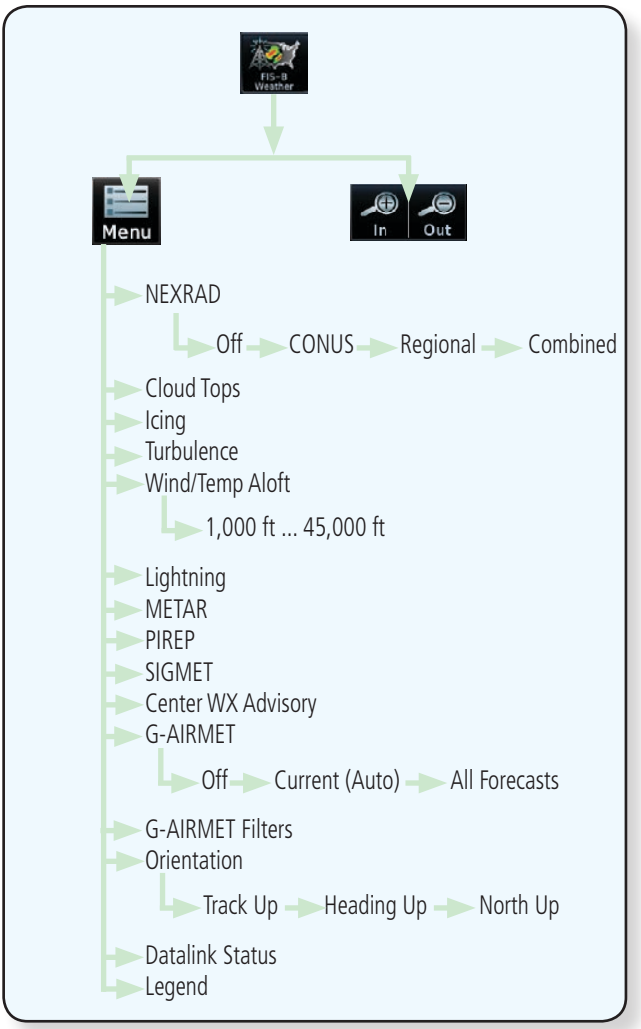


Figure 11-74 FIS-B Weather Functional Diagram

WARNING: *Do not use the indicated data link weather product age to determine the age of the weather information shown by the data link weather product. Due to time delays inherent in gathering and processing weather data for data link transmission, the weather information shown by the data link weather product may be significantly older than the indicated weather product age.*

11.4.1 FIS-B Operation

Weather data reception time is shown in the upper right corner of the screen. An indicated time shows if the aircraft is currently within reception coverage of a ground station with weather broadcast capabilities. The ground system determines the weather coverage area and extent of data that is transmitted by each ground station.

Due to similarities in depiction, the following FIS-B Weather products are mutually exclusive: NEXRAD, Cloud Tops, Icing, Turbulence, Winds and Temperatures Aloft, and Lightning.

1. From the Home page, touch the **Weather** key on the Home page and then touch the **FIS-B Weather** key (if necessary).

Figure 11-75 FIS-B Weather Page (NEXRAD Key Shown)

2. While viewing the FIS-B Weather page, touch the **Menu** key to configure the Data Link Weather page.

Figure 11-76 FIS-B Weather Data Link Menu

3. Once you selected what items you want to display, touch **BACK** to return to the FIS-B Weather page.

11.4.2 FIS-B NEXRAD

WARNING: *Never use NEXRAD weather for maneuvering in, near, or around areas of hazardous weather. NEXRAD images are snapshots of past weather data. They are not safe for use as real time depictions of nearby weather activity.*

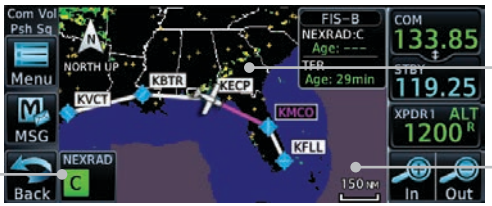


Figure 11-77 FIS-B CONUS NEXRAD

NEXRAD weather radar displays a mosaic of precipitation data, colored according to reflectivity. Composite reflectivity images depict the highest radar energy received from multiple antenna tilt angles at various altitudes. Base reflectivity images depict radar returns from the lowest antenna tilt angle. Per AC 00-63A, FIS-B CONUS and Regional NEXRAD are composite reflectivity images.

The precipitation intensity level reflected by each pixel represents the highest level of composite radar reflectivity data sampled in that location.

Figure 11-78 Regional NEXRAD

A clear understanding of ground-based Doppler weather radar capabilities will allow you to interpret the NEXRAD weather imagery in the safest way possible. The National Oceanic and Atmospheric Administration hosts a description of the technology on its website: https://www.weather.gov/jetstream/doppler_intro

11.4.2.1 Radar Data Animations

NOTE: *Animated NEXRAD functionality is available in software v6.00 and later.*

To depict trending weather movements over time, an animation function stitches the last three to six received radar images together in sequence, from oldest to newest, and replays them on a continuous loop.

Play and stop controls are active when three or more NEXRAD images are available for playback.

11.4.2.2 CONUS and Regional NEXRAD

To depict trending weather movements over time, an animation function stitches the last three to six received radar images together in sequence, from oldest to newest, and replays them on a continuous loop.

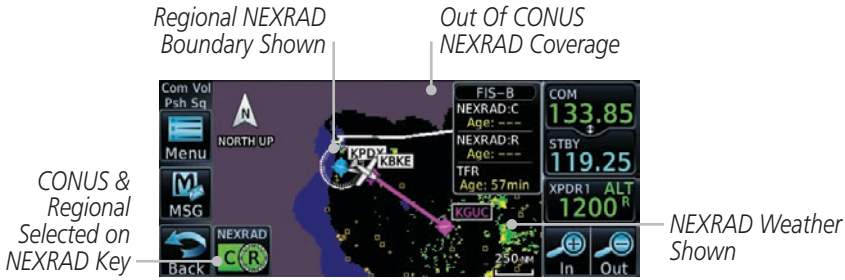


Figure 11-79 FIS-B CONUS and Regional NEXRAD Combined

Depending on the locations of received FIS-B ground stations, Regional NEXRAD coverage can extend as far as 250 nm around an aircraft's position. Aircraft flying at higher altitudes typically receive data from more ground stations than aircraft flying at low altitudes.

FIS-B NEXRAD does not differentiate between liquid and frozen precipitation types.

Source options are selectable from the weather setup menu or the NEXRAD key at the bottom left of the FIS-B Weather page. The key label changes to reflect the active source.

CONUS **Regional** **Combined**

Type	Description
CONUS	• Large, low-resolution weather image for the entire continental U.S. • Pixels are 7.5 min (7.5 nm = 13.89 km) wide by 5 min (5 nm = 9.26 km) wide
Regional	• High-resolution weather image with limited range, centered around each broadcasting ground station • Pixels are 1.5 min (1.5 nm = 2.78 km) wide by 1 min (1 nm = 1.852 km) tall • Each weather pixel varies with latitude. Above 60° latitude, pixel block width doubles to 3 min/nm for regional maps
Combined	• Both CONUS and Regional NEXRAD images display simultaneously • White hash mark indicates regional boundary • Animation functionality not available

Table 11-4 FIS-B NEXRAD Types

11.4.2.3 NEXRAD Abnormalities

There are possible abnormalities regarding displayed NEXRAD images. Some, but not all, causes of abnormal displayed information include:

- Ground Clutter
- Strobes and spurious radar data
- Sun strobes, when the radar antenna points directly at the sun
- Military aircraft deploy metallic dust which can cause alterations in radar scans
- Interference from buildings or mountains, which may cause shadows
- Scheduled maintenance may put a radar off-line

Affected Areas

Any area in the continental United States (CONUS) or Alaska where the distance from ADS-B ground stations, or the combined effect of distance and low altitude, is sufficiently great may cause poor reception. To find the latest ground station coverage, visit faa.gov.

Reception will improve in some affected areas as the FAA completes the NextGen ADS-B ground station infrastructure. However, due to line-of-sight broadcast characteristics, operators with properly installed and functioning equipment may still receive incomplete FIS-B data when signal reception is limited by the distance from ground stations combined with a low altitude.

The example below displays an area where FIS-B data is degraded due to poor reception:

The example below displays an area where FIS-B data is degraded due to poor reception:

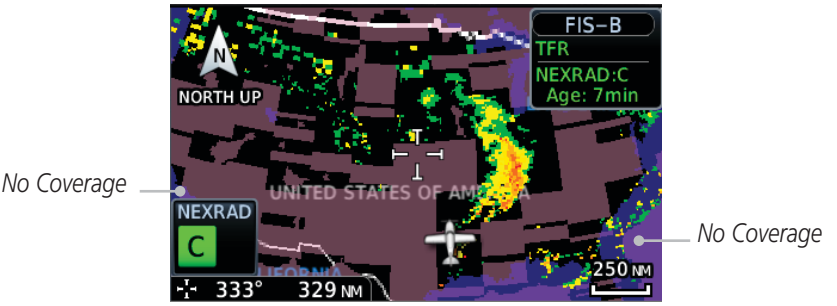


Figure 11-80 FIS-B Reception Unavailable

NOTE: *No coverage areas are semi-transparent in software v6.60 and later.*

Selecting NEXRAD in the FIS-B Weather Menu

1. While viewing the FIS-B Weather page, touch the **Menu** key to select the NEXRAD choice.
2. Touch the **NEXRAD** key to select Off, Regional, CONUS, or Combined NEXRAD.

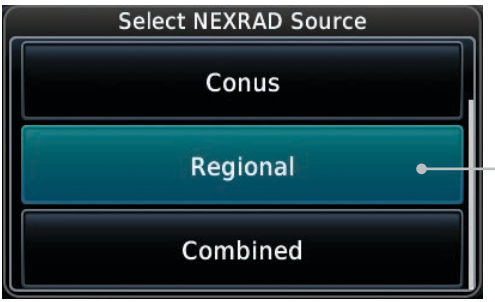


Figure 11-81 NEXRAD Source Selection

3. Touch the **Back** key to return to the FIS-B Weather Menu.

11.4.4 Cloud Tops

Cloud tops indicate the altitude of the highest visible portions of a cloud at the time of measurement.

FIS-B cloud top data is generated by a computer model and has limited accuracy compared to actual conditions.

Due to similarities in color schemes, this product is mutually exclusive with Echo Tops.

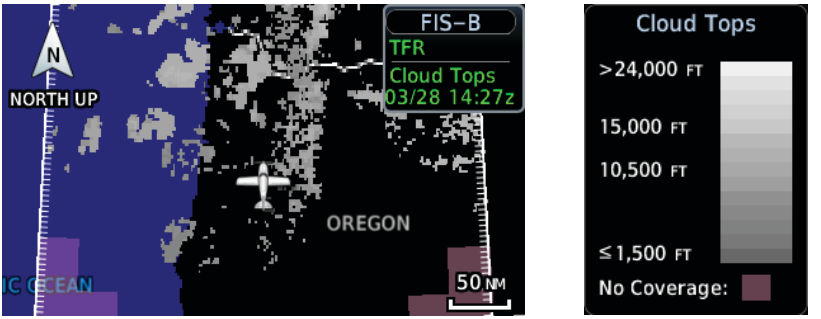


Figure 11-84 FIS-B Cloud Tops

1. While viewing the FIS-B Weather menu, touch the **Cloud Tops** key.

11.4.5 Lightning

FIS-B lightning strikes display as a lightning bolt.

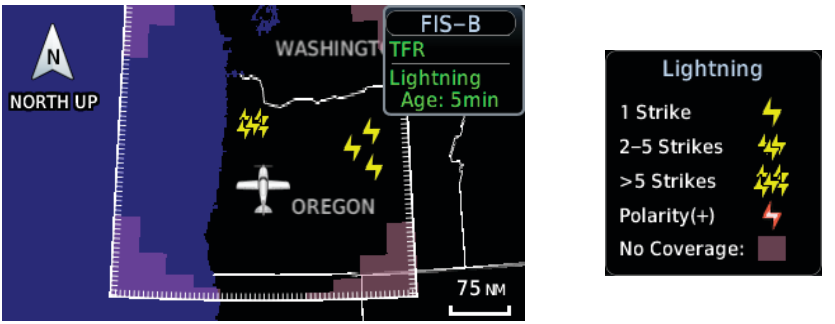


Figure 11-85 FIS-B Lightning

1. While viewing the FIS-B Weather menu, touch the **Lightning** key.

11.4.7 FIS-B SIGMETs and Textual AIRMETs

SIGMETs (SIGnificant METerological Information) and AIRMETs (AIRmen's METerological Information) are broadcast for potentially hazardous weather considered of importance to aircraft. The update rate is approximately every 20 minutes.

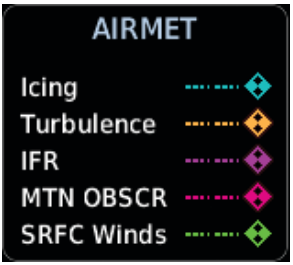


Figure 11-87 FIS-B SIGMET/AIRMET Legend

1. While viewing the FIS-B Weather menu, touch the **SIGMET AIRMET** key.

Surface Winds

Turbulence Line

Mountain Obscured

Figure 11-88 FIS-B SIGMETs and AIRMETs Map

2. Touch a SIGMET/AIRMET line to view details. Touch the **Back** key to return to the Weather display.

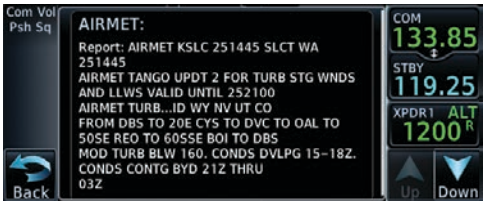


Figure 11-89 SIGMET and AIRMET Details

3. Touch the **SIGMET/AIRMET** key again to turn it off.

11.4.8 Graphical AIRMETs

Graphical AIRMETs (G-AIRMETs) display more weather phenomena than textual AIRMETs, while eliminating the need to interpret raw text. Updates occur four times daily. Filtering options allow you to mitigate page clutter.

Forecast Settings

Current (Auto): Displays active graphical records based on the current UTC. The function automatically switches from 0 hr to 3 hr forecasts.

All Forecasts: Displays the most recent, non-expired graphical records.

Off: Turns the G-AIRMETs product off.

Forecast Periods are 0 hr, 3 hr, and 6 hr.

Figure 11-90 FIS-B G-AIRMET Forecast Settings

Filter Settings

Filters include: Freezing Level, Icing, IFR, Low-level Wind Shear, Mountain Obscuration, Surface Winds, and Turbulence.

Figure 11-91 FIS-B G-AIRMET Filters

Viewing Graphical AIRMETs

1. While viewing the FIS-B Weather menu, touch the **G-AIRMET** key.

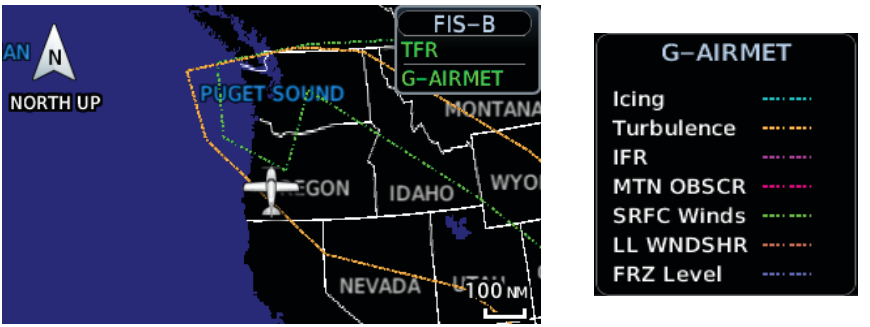


Figure 11-92 FIS-B G-AIRMETs

2. Select between Current (Auto), All Forecasts, or Off.

G–AIRMET Filters

3. Select one or more filters.

4. Touch a G-AIRMET line to view details. Touch the **Back** key to return to the Weather display.

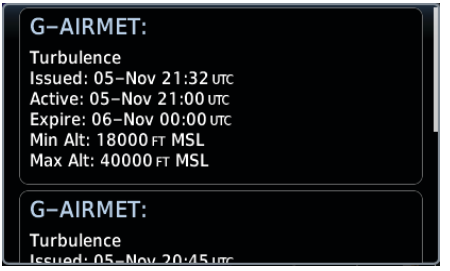


Figure 11-93 G-AIRMET Details

11.4.9 Center Weather Advisory

These advisories communicate en route and terminal weather conditions expected to occur within the next two hours.

Information is valid for up to 2 hours.

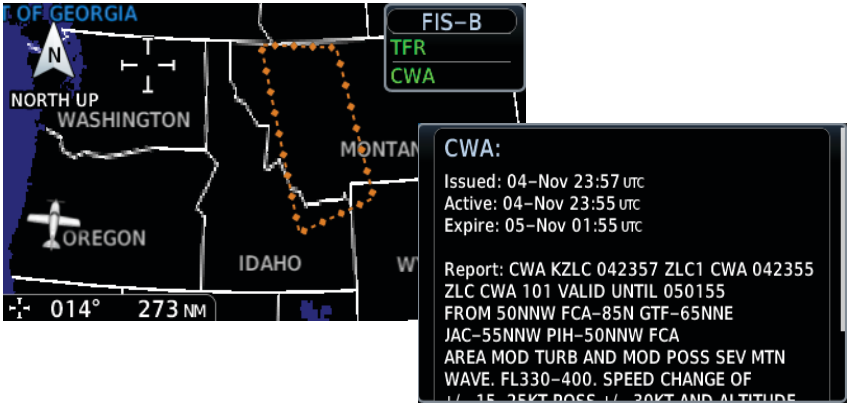


Figure 11-94 FIS-B Center Weather Advisory

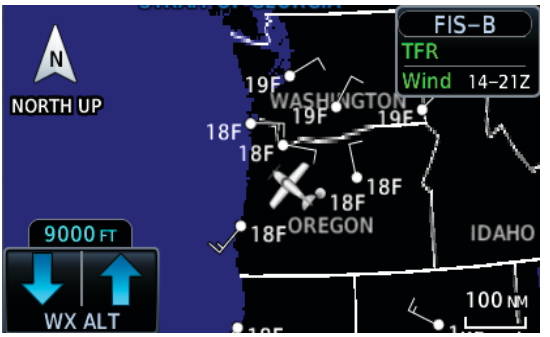
1. While viewing the FIS-B Weather menu, touch the **Center WX Advisory** key.

4. Touch a CWA line to view details. Touch the **Back** key to return to the Weather display.

11.4.10 FIS-B Winds and Temperatures Aloft

Winds and Temperatures Aloft data shows the forecast wind speed, direction, and Temperature at selected altitudes. Altitudes can be selected in increments from the 1,000 feet up to 53,000 feet. The update rate is every 12 hours.

1. While viewing the Data Link Weather menu, touch the **Wind/Temp Aloft** key.



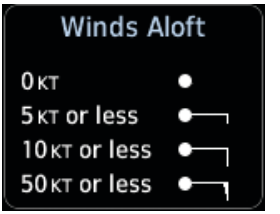


Figure 11-95 Winds Aloft

2. Touch the **WX ALT** − or + keys to increase or decrease the reporting altitude of the winds aloft in increments. The selected altitude is shown in a window above the altitude keys.

3. Touch the **Wind/Temp Aloft** key again to turn it off.

11.4.11 Icing

NOTE: *Due to the incremental and overlapping nature of the FIS broadcast, timestamps, regional coverage, and map data availability may vary with altitude for computer generated icing forecasts.*

Icing potential is not a forecast, but a presentation of icing potential at the time of analysis. For FIS-B, the icing timestamp shows the valid time in UTC.

Supercooled Large Droplet (SLD) icing conditions are characterized by the presence of relatively large, super cooled water droplets indicative of freezing drizzle and freezing rain aloft. SLD threat areas are depicted as black and pink blocks over the icing colors.

The icing potential shows a graphic view of the current icing conditions. Categories vary depending on the configured weather source. For FIS-B, they include: Trace, Light, Moderate, and Heavy.

Altitude Range: 2,000 to 24,000 ft.

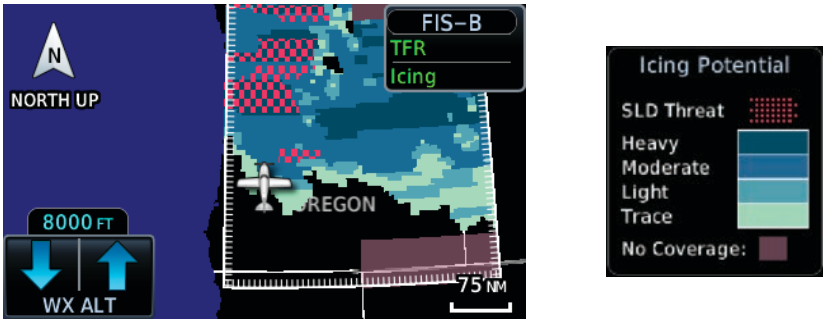
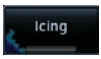


Figure 11-96 FIS-B Icing



1. While viewing the FIS-B Weather menu, touch the **Icing** key.

11.4.12 Turbulence

NOTE: *Due to the incremental and overlapping nature of the FIS broadcast, timestamps, regional coverage, and map data availability may vary with altitude for FIS-B turbulence forecasts.*

Turbulence is classified as light, moderate, severe, or extreme. Turbulence data is intended to supplement AIRMETs and SIGMETs.

For FIS-B, the turbulence timestamp shows the valid time in UTC.

Altitude Range: 2,000 to 24,000 ft (at 2,000 ft intervals).

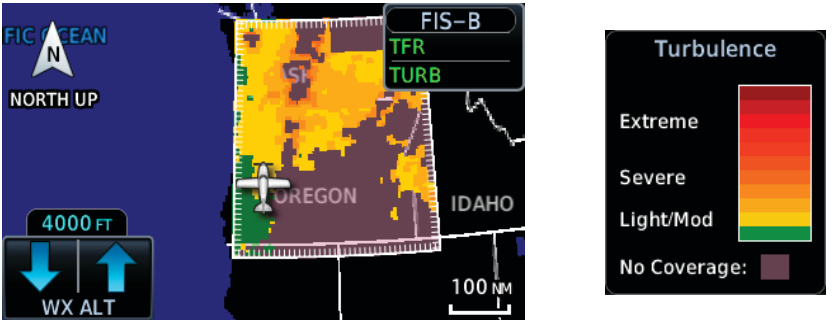


Figure 11-97 FIS-B Turbulence

1. While viewing the FIS-B Weather menu, touch the **Turbulence** key.

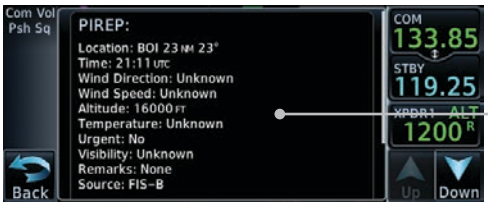
11.4.13 FIS-B PIREPs

Pilot Weather Reports (PIREPs) provide timely weather information. When significant weather conditions are reported or forecast, Air Traffic Control (ATC) facilities are required to solicit PIREPs. A PIREP may contain non-forecast adverse weather conditions, such as low in-flight visibility, icing conditions, wind shear, and turbulence. PIREPs are issued as either Routine (UA) or Urgent (UUA). The update rate is approximately every 20 minutes.

1. While viewing the FIS-B Weather page, touch the **Menu** key to select the PIREP choice.

2. Touch the **PIREP** key to toggle PIREPs on or off.
3. Touch a weather information symbol to view details for that item.

Routine PIREP Symbol (Blue). Touch for Details.



PIREP Details

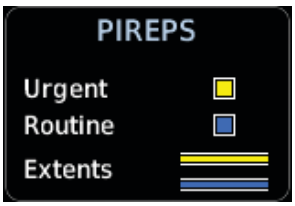


Figure 11-98 PIREP Information Detail and Legend

4. Touch the **Back** key to remove the detailed information.

5. Touch the **PIREP** key again to turn it off.

15.4.6.3 GTN-G3X Touch Crossfilling

NOTE: *Requires pilot activation on both the GTN and the G3X Touch. This feature is available in software v6.60 and later.*

When this function is enabled by the pilot, active flight plan navigation is crossfilled with the G3X Touch. It is recommended that all flight plan edits be made using the G3X Touch when this function is active.

1. While viewing the System Setup page, touch **External FPL XFILL** to toggle between Enabled and Disabled Crossfill with the G3X Touch.
2. Ensure that the crossfilling function on G3X Touch is active.

Message	Description	Action
FLIGHT PLAN IMPORT - Changes to the active route are disabled.	Unit receives a flight plan from G3X Touch, but the External FPL Crossfill function is off.	Enable the External FPL Crossfill function. Home > **System** > **Setup** > **External FPL Xfill**.
FLIGHT PLAN IMPORT - GDU disconnected. External flight plan crossfill inoperative.	Communication with the G3X Touch is lost.	Verify that the GDU is on. Contact dealer for service.
FPL WAYPOINT LOCKED - Stored flight plan waypoint is not in current navigation database.	A stored flight plan waypoint is no longer in the current navigation database.	Verify stored cataloged flight plans and procedures. Modify stored flight plans as necessary to include waypoints that are in the current navigation database.
FPL WPT MOVED - Stored flight plan waypoint has changed location.	A stored flight plan waypoint has moved by more than 0.33 arc minutes from where previously positioned.	Verify stored cataloged flight plans and procedures. Modify stored flight plans as necessary to include waypoints that are in the current navigation database.
GLIDESLOPE - Glideslope receiver has failed.	The glideslope board is not communicating property with the system.	Fly an approach that does not use the glideslope receiver (VOR, LOC, GPS). Contact dealer for service.
GLIDESLOPE - Glideslope receiver needs service.	The glideslope board is indicating that it needs service. The glideslope board may continue to function.	Verify glideslope deviation indications with another source and crosscheck final approach fix crossing altitude. If another glideslope source is not available for verification, fly a GPS based approach. Contact dealer for service.

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