

In July 2010, the FAA released Change 1 for AC 00-45G, Aviation Weather Services (which was originally released in February 2010). In Change 1, the following editorial changes were made that supersede the original release. Several illustrations were corrected, and they are printed below with the change instructions. In the text changes shown below, **yellow highlighting** indicates where an edit has occurred.

Page Number	Change Explanation
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1-3	<p><i>Section 1.1.2.5 is changed to read as follows:</i></p> <p>The mission of the National Weather Service (NWS) Office at the FAA Academy is to provide weather training for Federal Aviation Administration (FAA) Air Traffic Controllers, write reference materials, and certify non-military pilot weather briefers and tower visibility observers.</p>
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1-6	<p><i>In Section 1.3.1, change wording from “specialist” to “NWS certified pilot weather briefer”:</i></p> <p>Prior to every flight, pilots should gather all information vital to the nature of the flight. This includes an appropriate weather briefing obtained from a NWS certified pilot weather briefer at a FSS/AFSS or Direct User Access Terminal Service (DUATS).</p>
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2-1	<p><i>In Section 2.1.1, change wording from “are considered” to “pertain to”:</i></p> <p>Note: Sections 3 through 8 of this Advisory Circular pertain to Primary Weather Products.</p>
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2-2	<p><i>In Section 2.3 second paragraph, change reference from “defined in paragraph 2.3” to “defined in paragraph 2.2”:</i></p> <p>Since all three types of weather information defined in paragraph 2.2 are not available from all sources of aviation weather information, the FAA...</p>
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2-3	<p><i>In Section 2.3.2 at the end of the second paragraph, change reference from “defined in paragraph 2.2.1” to “defined in paragraph 2.1.1”:</i></p> <p>... For these approved users, the weather analyses and forecasts produced by their approved EWINS are considered primary weather products as defined in paragraph 2.1.1, Primary Weather Products.</p> <p><i>In Section 2.3.3, middle of the last paragraph, change reference from “(see paragraph 2.4.2, above)” to “(see paragraph 2.3.2, above)”:</i></p> <p>... if the commercial provider is EWINS-qualified (see paragraph 2.3.2, above)....</p>
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Page Number	Change Explanation
3-14	<i>In Section 3.1.3.9, change example wording from “cumulonimbus to 7,500” to “...cumulonimbus at 3,200”:</i> SCT018 OVC032CB Scattered layer at 1,800 feet, overcast layer (ceiling) of cumulonimbus at 3,200 feet
3-24	<i>In Section 3.1.3.13.19.4, change order of clouds to list by height (i.e., CCSL, ACSL, SCSL, rotor):</i> Cirrocumulus (CCSL), altocumulus (ACSL), stratocumulus (SCSL) , or rotor clouds are coded in the following format: the cloud type followed by the direction from the station. The cloud type and direction entries are separated by a space. For example, altocumulus standing lenticular clouds observed southwest through west of the station are coded ACSL SW-W ; an apparent rotor cloud 5 to 10 statute miles northeast of the station is coded APRNT ROTOR CLD NE ; and cirrocumulus clouds south of the station are coded CCSL S .
3-32	<i>In Section 3.2.1 in the first sentence, change figure reference to “(Figure 3-10)”:</i> A PIREP is transmitted in a prescribed format (Figure 3-10)
3-37	<i>Section 3.2.1.7, in the Example at the top of the page, change coding from “/WV” to “/WX”:</i> /WX FV01SM +DS000-TOP083/SKC /RM DURC
3-38	<i>In Section 3.2.1.10 replace the second paragraph with the following:</i> Duration (INTMT, OCNL, or CONS) is coded first (if reported by the pilot) followed by intensity (LGT, MOD, SEV, or EXTRM). Range or variation of intensity is separated with a hyphen; e.g., MOD-SEV. If turbulence was forecasted, but not encountered, NEG is entered.
3-42	<i>In Section 3.2.1.12.8, change PIREP interpretation from “flight level 310” to “flight level 370”:</i> Urgent Pilot Weather Report, 240 degrees at 75 nautical miles from Anchorage International Airport, Alaska, 2110 UTC, flight level 370 , a DC10 reported volcanic ash, remarks, volcanic eruption occurred at 2008 UTC Mount Augustine, ash 40 nautical miles south moving south-southeast.
3-45	<i>In Section 3.3.1, change figure reference to “(see figure 3-15).”</i> Reports are transmitted hourly from WSR-88D Weather Radar sites (see figure 3-15) . The SD/ROB format is presented in Figure 3-8.
3-46	<i>In Section 3.3.1.3, change figure reference to “Figure 3-12”:</i> Figure 3-12 illustrates the three configurations that can be reported in a Weather Radar Report.
3-49	<i>In Section 3.3.1.11, in the last sentence of first paragraph, change figure reference to “Figure 3-14”:</i> ... (See Figure 3-14 for an example of a digital code plotted from the Oklahoma City, Oklahoma, Weather Radar Report.)

4-10 *In Section 4.1.4.1.3.6, correct spelling error in Figure 4-11; from “propogation” to “propagation”:*

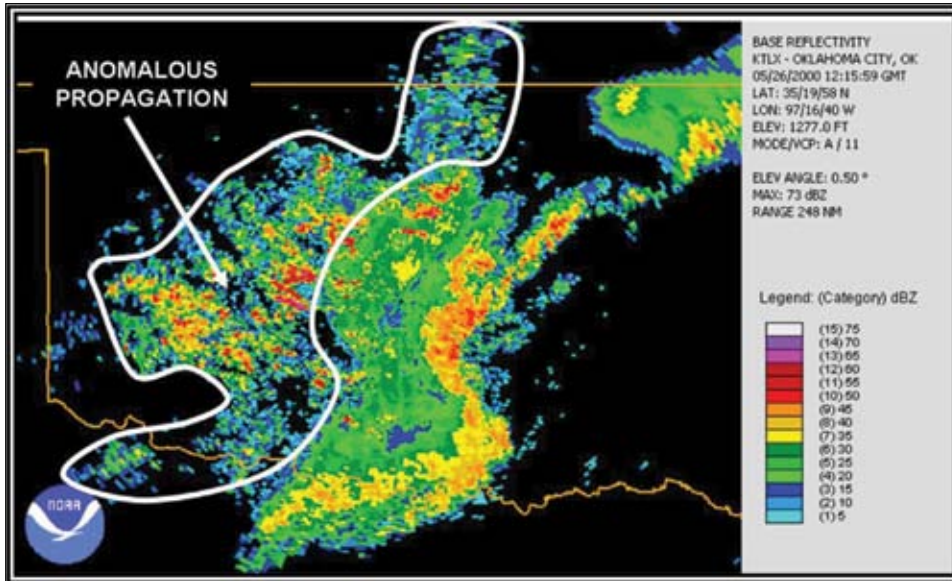


Figure 4-11. WSR-88D Weather Radar Anomalous Propagation (AP) Example

4-11 *In Section 4.1.4.2, delete long-range Composite Reflectivity since the NWS no longer provides it. Two paragraphs and Figure 4-13 are deleted.*

5-39 *Section 5.4 is removed, since the Lifted Index (LI) Analysis DIFAX Chart is no longer produced. All text on pages 5-39 through 5-41 is deleted. Figure 5-38 and Table 5-12 are removed.*

6-26 *In Section 6.2.5, correct numbering error on Figure 6-11:*

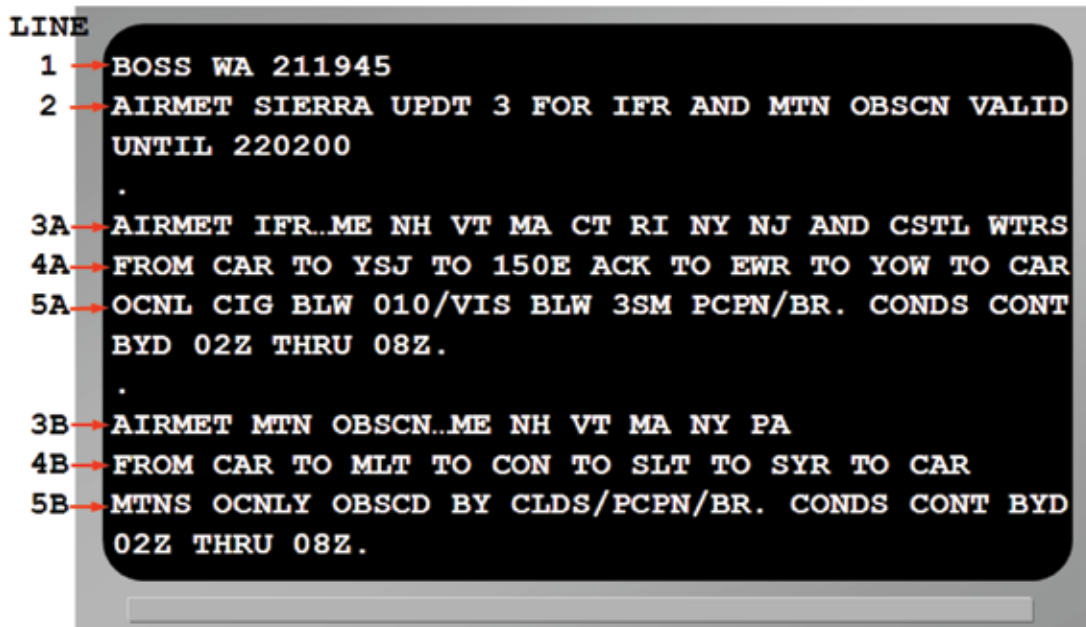


Figure 6-11. AIRMET Bulletin Decoding Example

6-31 Section 6.3: Insert new section "G-AIRMET" as new primary product, to read as follows (through Page 12 of this update):

6.3 Graphical Airman’s Meteorological Advisory (G-AIRMET)

The Graphical-AIRMET product, known as the "G-AIRMET," is a decision-making tool based on weather "snapshots" displayed at short time intervals. The G-AIRMET identifies hazardous weather in space and time more precisely than text products, enabling pilots to maintain high safety margins while flying more efficient routes.

The National Weather Service’s (NWS) goal is to maximize aviation safety and air space efficiency by providing the most accurate and timely weather information possible to enhance both pre-flight and in-flight decision making. For decades, NWS has issued text-based AIRMETs that have provided broad-scale descriptions of hazardous weather. Often referred to as a time "smear", the text-based AIRMET requires meteorologists to describe hazardous weather over large geographical areas for six-hour periods. G-AIRMET provides more precise, and informative weather hazard depictions than the text only AIRMET.

Aviation weather users have found that pictures are worth a thousand contractions. G-AIRMETs provide a better path from the aviation meteorologist to the weather user, by providing precise, interactive and easy to understand graphical displays. Meteorologists can put their energy into creating and updating G-AIRMET weather graphics, while the traditional text AIRMET is generated from G-AIRMET information.

G-AIRMETs are available for the conterminous U.S. (CONUS) and adjacent coastal waters only and can be viewed on Aviation Digital Data Service (ADDS) web site using the G-AIRMET display tools at: <http://aviationweather.gov/products/gairmet/>

6.3.1 G-AIRMET Issuance

G-AIRMETs are issued by the Aviation Weather Center (AWC) every 6 hours and updated/amended as necessary, coincident with the text AIRMET products.

	1 st Scheduled Issuance (UTC)	2 nd Scheduled Issuance (UTC)	3 rd Scheduled Issuance (UTC)	4 th Scheduled Issuance (UTC)
CONUS	0255	0855	1455	2055

Table 6-7. G-AIRMET Issuance Schedule

6.3.2 G-AIRMET Content

Graphical AIRMET Snapshots (G-AIRMET) are graphical forecasts of en-route weather hazards valid at discrete times no more than 3 hours apart for a period of up to 12 hours into the future (00, 03, 06, 09 and 12 hours). 00 hour represents the initial conditions, and the subsequent 3-hourly graphics depict the area affected by the particular hazard at that valid time. G-AIRMET snapshots may be viewed as static (single) images, combined, and looped using the tools provided on the web page.

G-AIRMET depicts the following en-route aviation weather hazards:

- Instrument flight Rule conditions (IFR)
 - Areas of cloud ceilings with bases less than 1000 feet above ground level (AGL) and/or areas of surface visibilities below 3 statute miles, including the weather causing the visibility restriction. The cause of the visibility restriction includes only PCPN, FU, HZ, BR, FG, and BLSN.

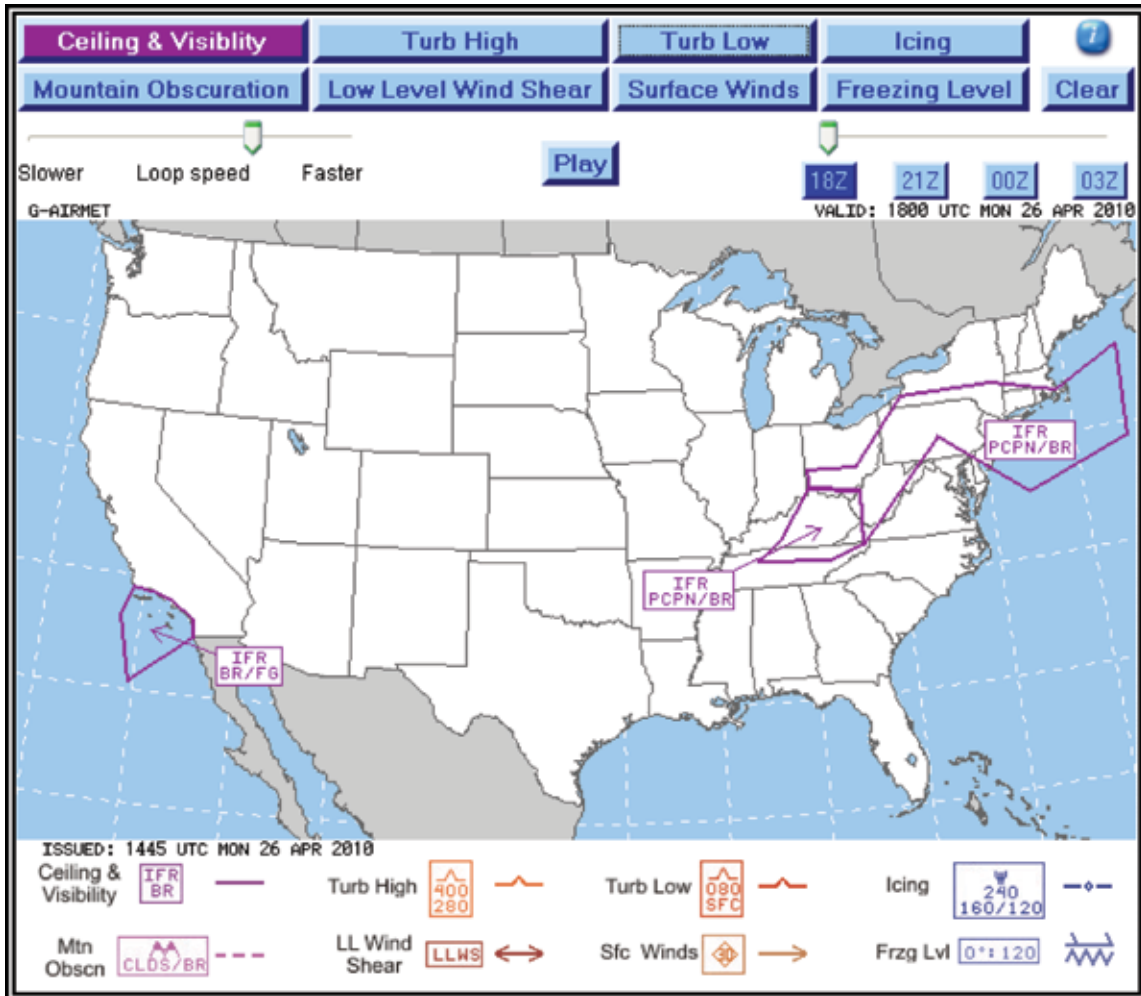
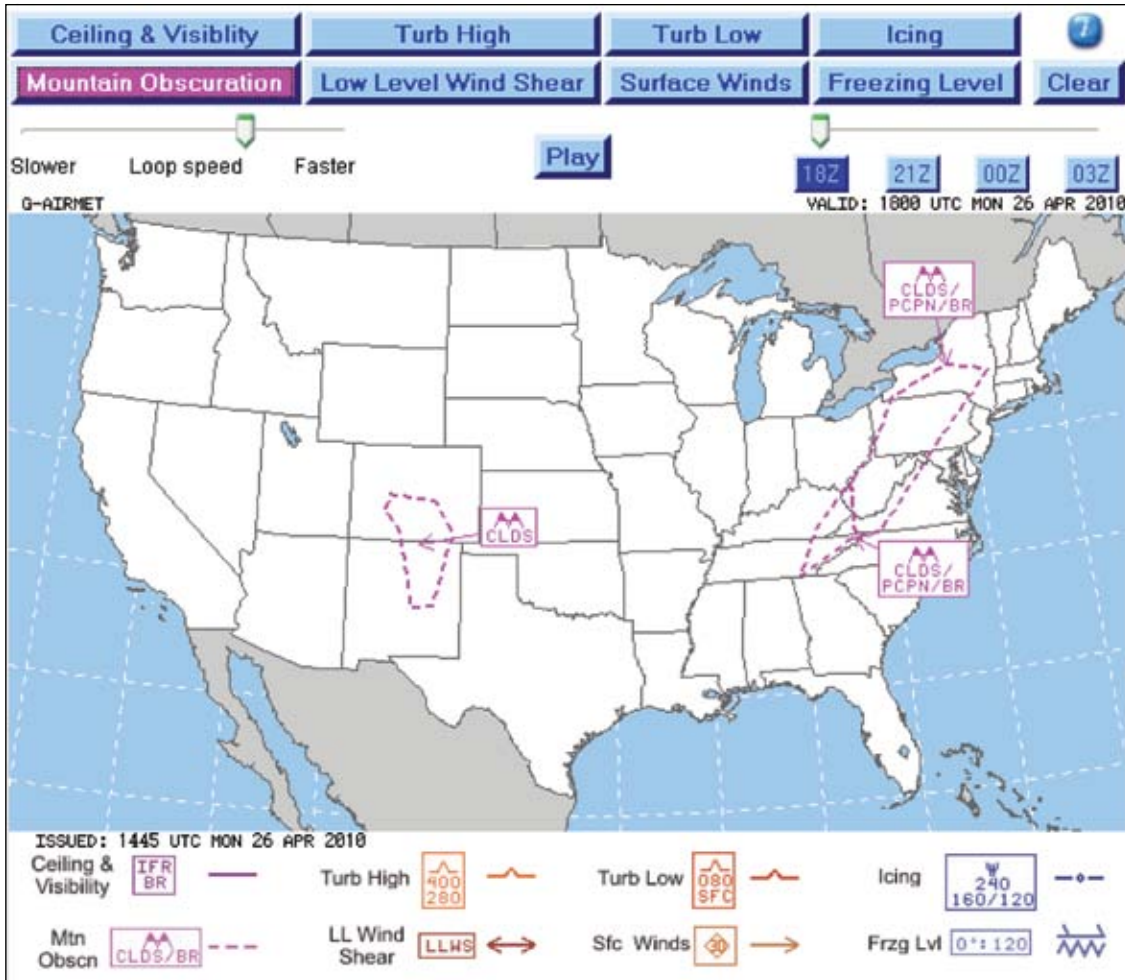


Figure 6-12. G-AIRMET–Ceiling and Visibility (IFR) Snapshot Example

Continued

- Mountain Obscuration
 - Areas of widespread mountain obscuration where Visual Meteorological Conditions (VMC) cannot be maintained, including the weather causing the obscuration. The weather causing the obscuration includes only CLDS, PCPN, FU, HZ, BR, and FG.



- Icing
 - Areas of moderate airframe icing, other than convectively induced, including the vertical extent (base and top). Altitude variations in the base of icing layers may be denoted (e.g., “080 / 060” indicates the altitude varies between 6,000 and 8,000 feet above mean seal level (AMSL)).

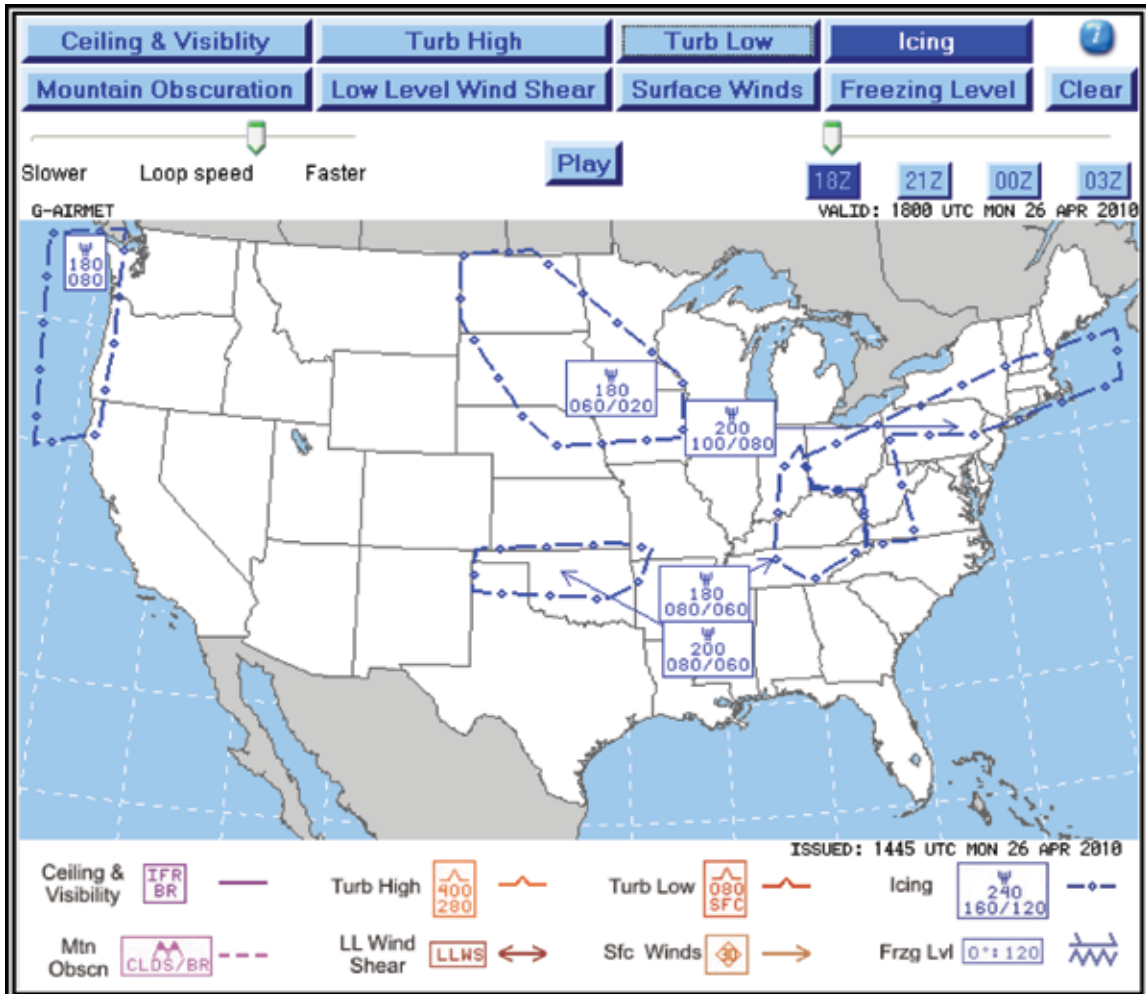


Figure 6-14. G-AIRMET – Icing Snapshot Example

Continued

- Freezing Level
 - Freezing level is defined as the lowest freezing level above the ground or at the SFC as appropriate. Freezing levels above the ground are delineated at 4000 feet intervals above mean sea level (AMSL). Areas with multiple freezing levels above the ground are delineated including the vertical extent (base and top).



- Turbulence
 - Areas of moderate turbulence, other than convectively induced, including the vertical extent (base and top).



Figure 6-16. G-AIRMET – Turbulence-High Snapshot Example

Continued

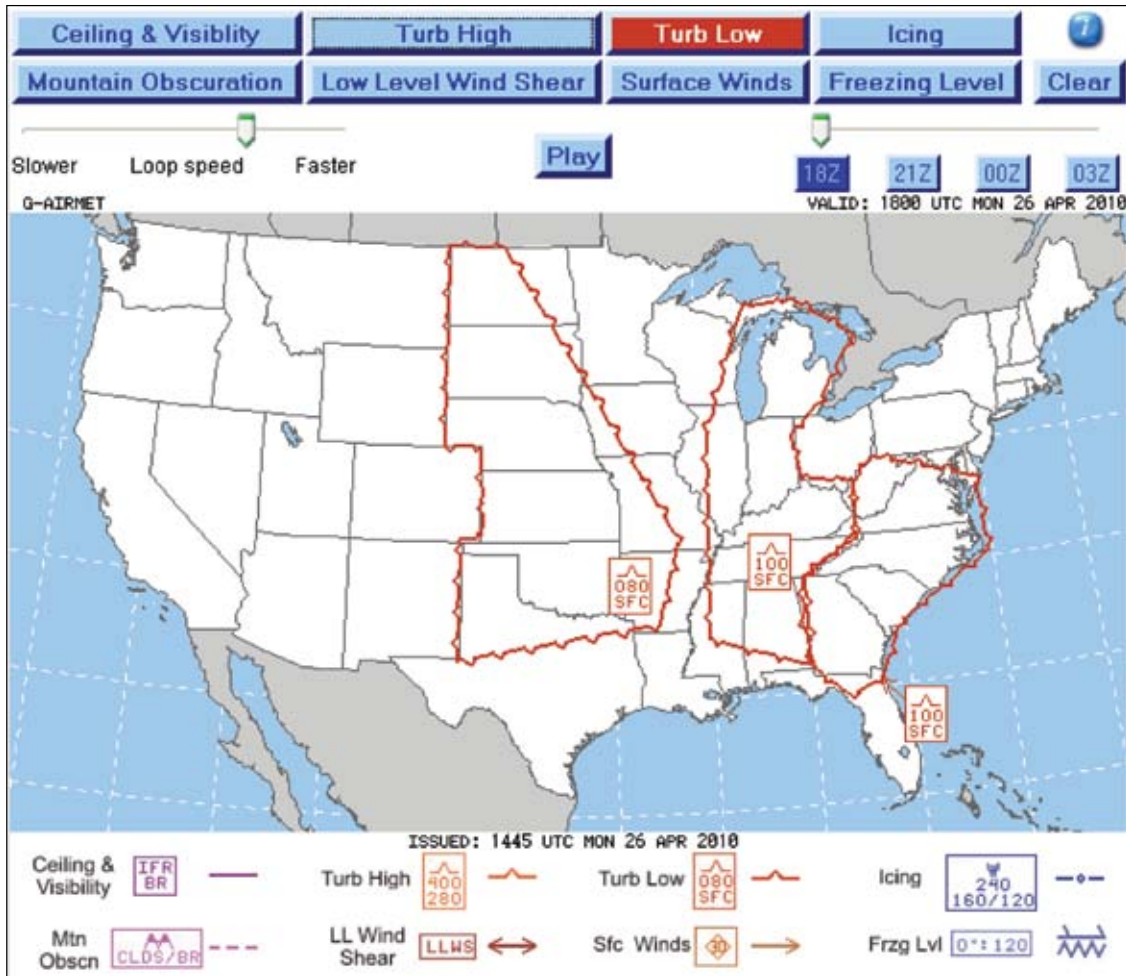


Figure 6-17. G-AIRMET-Turbulence-Low Snapshot Example

- Low Level Wind Shear (LLWS)
 - LLWS is defined as wind shear below 2000 feet AGL, other than convectively induced, exceeding 10 knots per 100 feet (vector difference between two points in space).

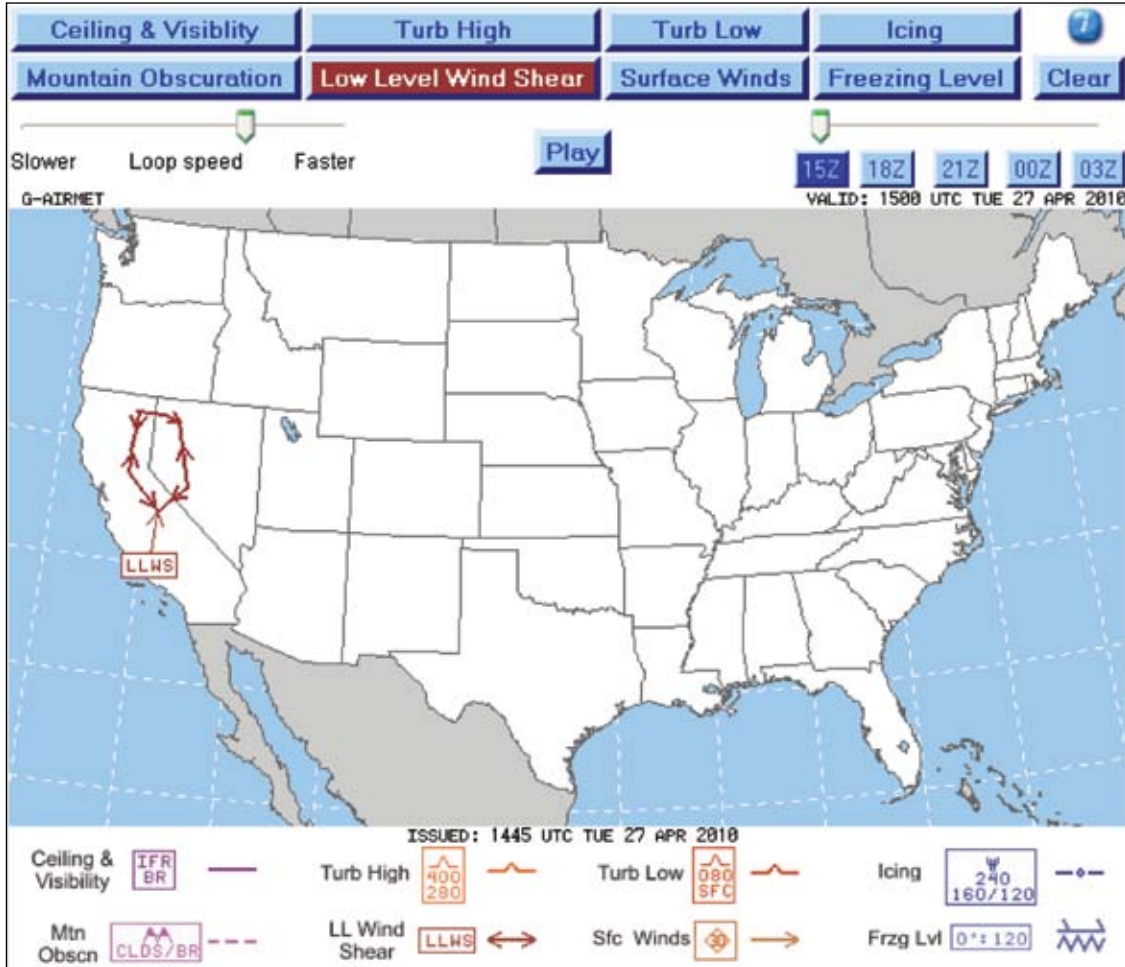


Figure 6-18. G-AIRMET – Low-Level Wind Shear (LLWS) Snapshot Example

Continued

- Strong Surface Winds
 - Areas of sustained surface winds greater than 30 knots. The direction and speed of winds are not depicted; only the area where sustained surface winds greater than 30 knots will occur.

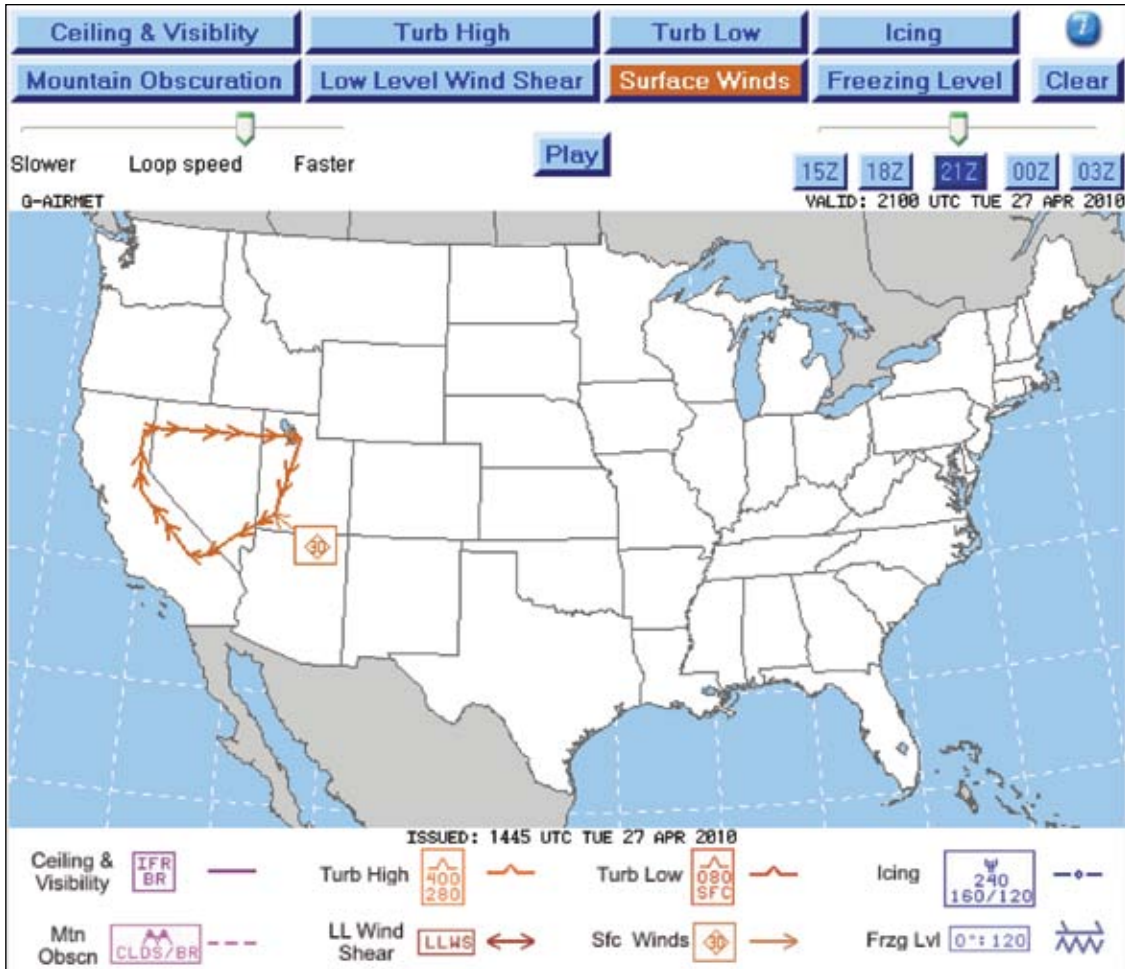


Figure 6-19. G-AIRMET – Strong Surface Winds Snapshot Example

Page Number	Change Explanation
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7-16 *In Section 7.1.10, remove mention of Alaska SIGMETs (they are no longer embedded in the Alaska Area Forecasts):*

- Clouds and Weather: a description of the clouds and weather for each geographical zone during the first 12 hours of the forecast period including the following elements:
 - AIRMET information for IFR ceiling and visibility, mountain obscuration, and strong surface winds
 - Cloud amount (SCT, BKN or OVC) with bases and tops
 - Visibilities of 6 SM or less with obstruction(s) to visibility
 - Precipitation and thunderstorms
 - Surface wind greater than 20 knots
 - Mountain pass conditions using categorical terms (for selected zones only)
 - 12- to 30-hour categorical outlook (VFR, MVFR, and IFR)
- Turbulence: a description of expected turbulence conditions including the following elements.
 - AIRMET information for turbulence or low level wind shear
 - Turbulence not meeting SIGMET or AIRMET criteria during the 6- to 12-hour period
 - If no significant turbulence is forecast, NIL SIG will be entered.
- Icing and freezing level: a description of expected icing conditions including the following elements.
 - AIRMET information for icing and freezing precipitation
 - Icing not meeting SIGMET or AIRMET criteria during the 6- to 12-hour period
 - Freezing level
 - If no significant icing is forecast, NIL SIG will be entered followed by the freezing level.

9-28 *Section 9.5 is updated from GTG to the new GTG-2, to read as follows:*

9.5 Graphical Turbulence Guidance (GTG-2)

The Graphical Turbulence Guidance (GTG-2) graphics are computer-generated four-dimensional forecasts of information related to the likelihood of encountering Clear Air Turbulence (CAT) associated with upper-level fronts and jet streams. It is not intended to predict turbulence associated with convection and thunderstorm clouds or breaking mountain waves. The product provides forecasts for the 48 contiguous United States, much of Canada and Mexico, and their respective coastal waters at flight altitudes from 10,000 MSL to FL450 only, that is, it does not provide forecasts from the surface to 10,000 ft MSL.

GTG-2 graphics may be used as a higher-resolution supplement to AIRMETs and SIGMETs, but not as a substitute for the turbulence information they provide. GTG-2 graphics are authorized for use as an unrestricted, supplementary weather product. The GTG is issued by the Aviation Weather Center (AWC) and are available through the Aviation Digital Data Service (ADDS) web site at: http://adds.aviationweather.noaa.gov/turbulence/turb_nav.php.

9.5.1 Issuance

The GTG-2 product consists of a 00, 01, 02, and 03 hour forecast, which are updated every hour, and a 06, 09, and 12 hour forecast, which are updated every three hours, starting at 00Z. GTG-2 graphics are “snapshot” graphics, intended to depict forecasted clear air turbulence conditions at the valid time (for example, at 1200Z), not for a valid time range (for example, from 1200Z to 1300Z). The GTG-2 graphics suite is automatically produced with no human modifications. Information on the graphics is determined from observational data, pilot weather reports, upper air soundings, satellite soundings, automated aircraft reports, and surface weather reports, all of which are integrated with computer model output. The GTG-2 does not have the capability to be amended.

9.5.2 Content

9.5.2.1 GTG-2 Analysis and Forecast

The GTG-2 00-hr (analysis) and forecast graphics depict the location and intensity of potential Clear Air Turbulence (CAT). Standard intensity terminology is used: The only turbulence intensities depicted are light and moderate or greater. Pilot reports (PIREPs) of turbulence are overlaid on the (00-hr (analysis). The GTG-2 output is available for 1,000 foot vertical intervals between 10,000 ft MSL and FL450. ADDS turbulence page displays every two thousand feet starting at 11,000 ft MSL. The ADDS Flight Path Tool allows access to GTG-2 turbulence data for different altitudes in 1000 foot increments, as well as vertical cross sections for a specific route, interactive overlays of additional weather data, and a closer look at specific geographic areas.

Continued

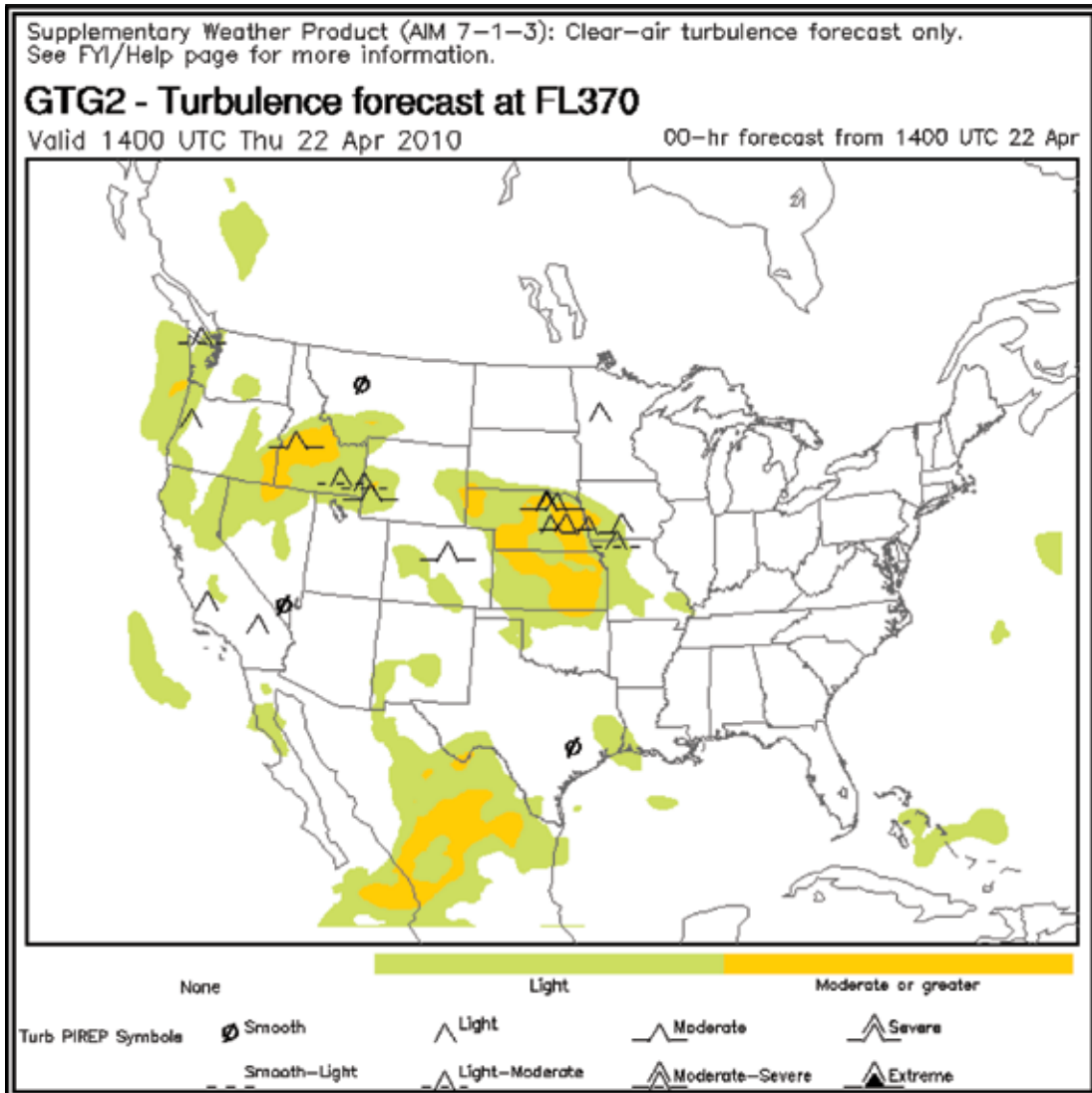


Figure 9-23. GTG Example

9.5.2.2 GTG-2 Maximum Turbulence Intensity (10000 ft. MSL to FL450)

The “GTG-2 Maximum turbulence intensity (10000 ft MSL to FL45)” analysis and forecast products display the maximum intensity of potential turbulence between 10,000 ft MSL and FL450 (Figure 9-24). In other words, at any given location, the displayed value represents the maximum potential turbulence between 10,000 ft MSL and FL450. Single altitude graphics must be examined to determine the altitude of the potential turbulence.

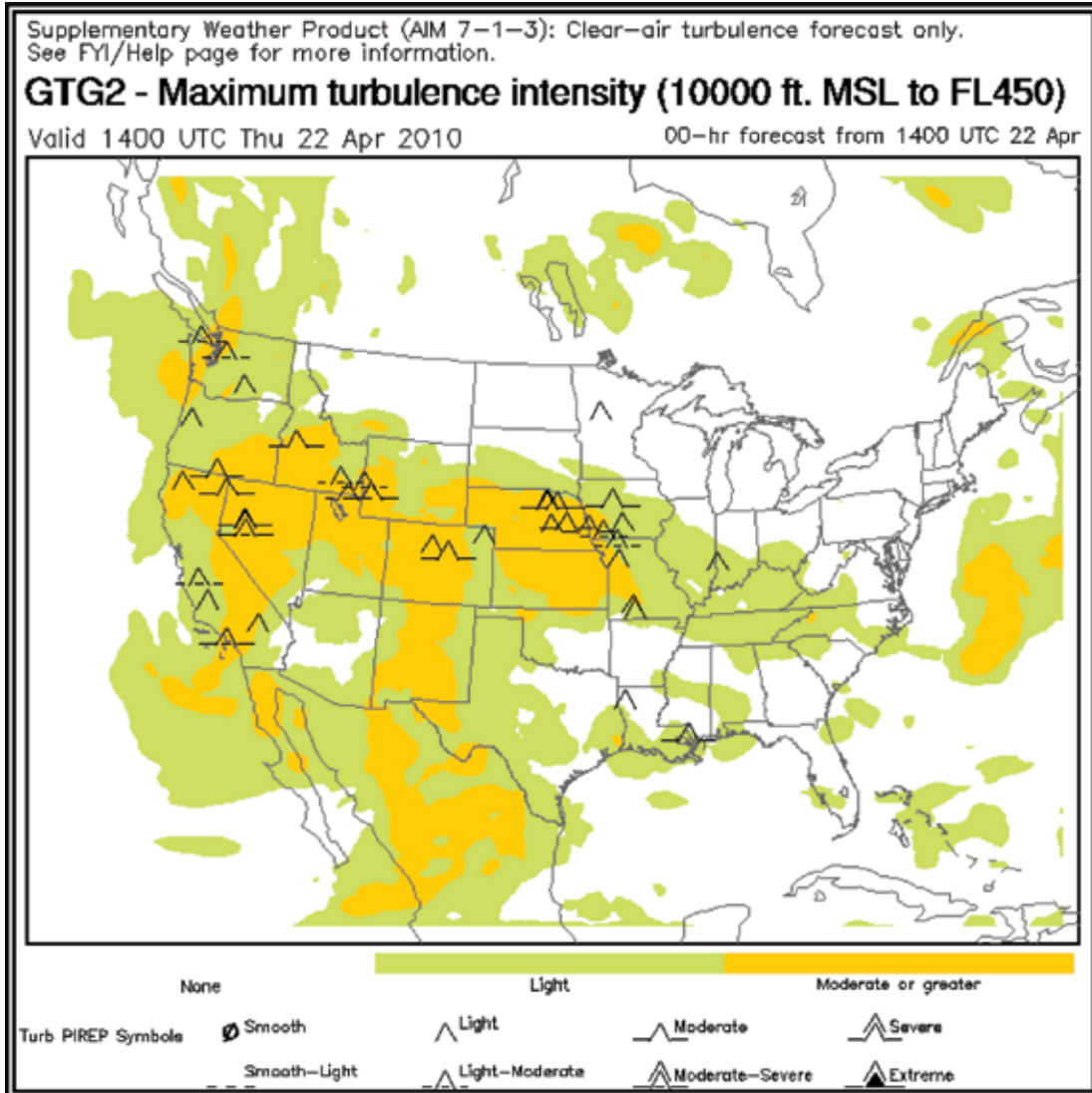


Figure 9-24. GTG Composite Example

9.5.3 Strengths and Limitations

The GTG-2 provides an hourly, high resolution analysis (00-hr) and forecast of clear-air turbulence (CAT) potential between 10,000 ft. MSL and FL450. CAT is depicted to a higher resolution than AIRMETs and SIGMETs. However, the product is only for CAT associated with upper level fronts and jet streams and is not intended to predict turbulence associated with convection and thunderstorm clouds or breaking mountains waves. Users should also be aware that turbulence is a highly dynamic phenomenon and in case of rapidly changing conditions the product may not accurately convey a significant hazard.

9.5.4 Use

The “GTG-2 Maximum turbulence intensity (10000 ft MSL to FL45)” analysis and forecast products can provide a quick method to determine what the greatest potential of clear-air turbulence (CAT) is at a given location. However, to determine the CAT potential at any given altitude, the individual altitude products must be viewed.

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