

The National FAA Safety Team Presents

Topic of the Month – August Pre-flight & In-flight Weather Resources

Presented to: **Carrabelle Flying Club (X13)**
By: **Bruce Graham FAAST Rep KAAF / X13**
Date: **17 August 2024**

Produced by:
The National FAA Safety Team (FAASTeam)



**Federal Aviation
Administration**



Welcome

- Exits
- Restrooms
- Emergency Evacuation
- Breaks - **NONE**
- Set phones & pagers to silent or off
- Thanks for making FAAST a part of the Carrabelle Flying Club Safety Focus
- **Attendance sheet with your WINGS email for credit!**



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Overview

- ***GAJSC Safety Enhancement – Weather Technology**
- **Pre-flight weather resources**
 - Not a comprehensive list
 - Sample of government resource available today
 - Many third-party resources are also available
- **In-flight weather resources**
 - Not a comprehensive list
 - Sample of resources available today

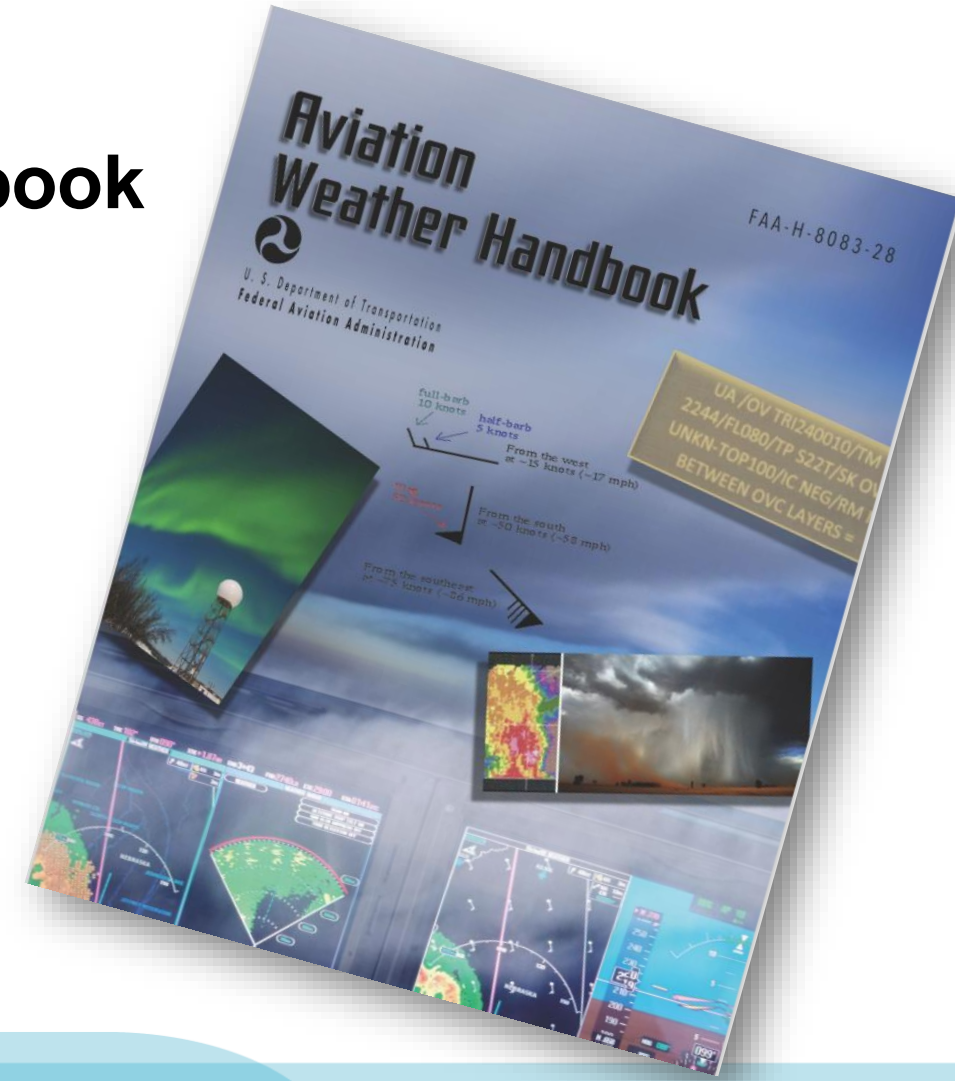


*General Aviation Joint Safety committee



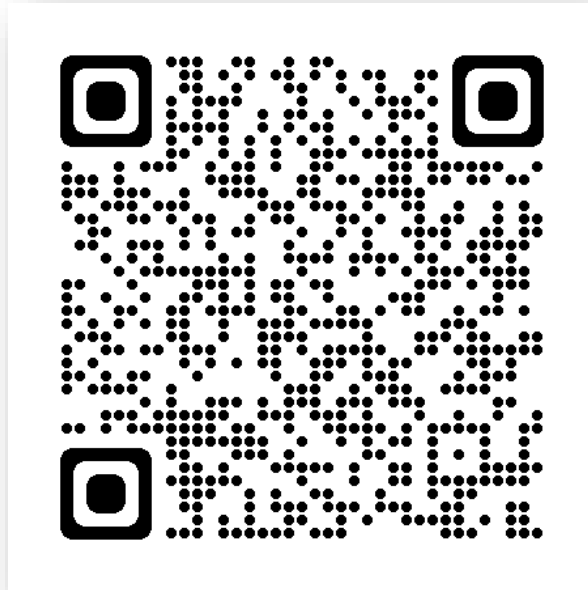
Resources

- **FAA H-8083-28 Aviation Weather Handbook**
 - Incorporates information from:
 - AC 00-6, Aviation Weather.
 - AC 00-24, Thunderstorms.
 - AC 00-30, Clear Air Turbulence Avoidance.
 - AC 00-45, Aviation Weather Services.
 - AC 00-54, Pilot Windshear Guide.
 - AC 00-57, Hazardous Mountain Winds

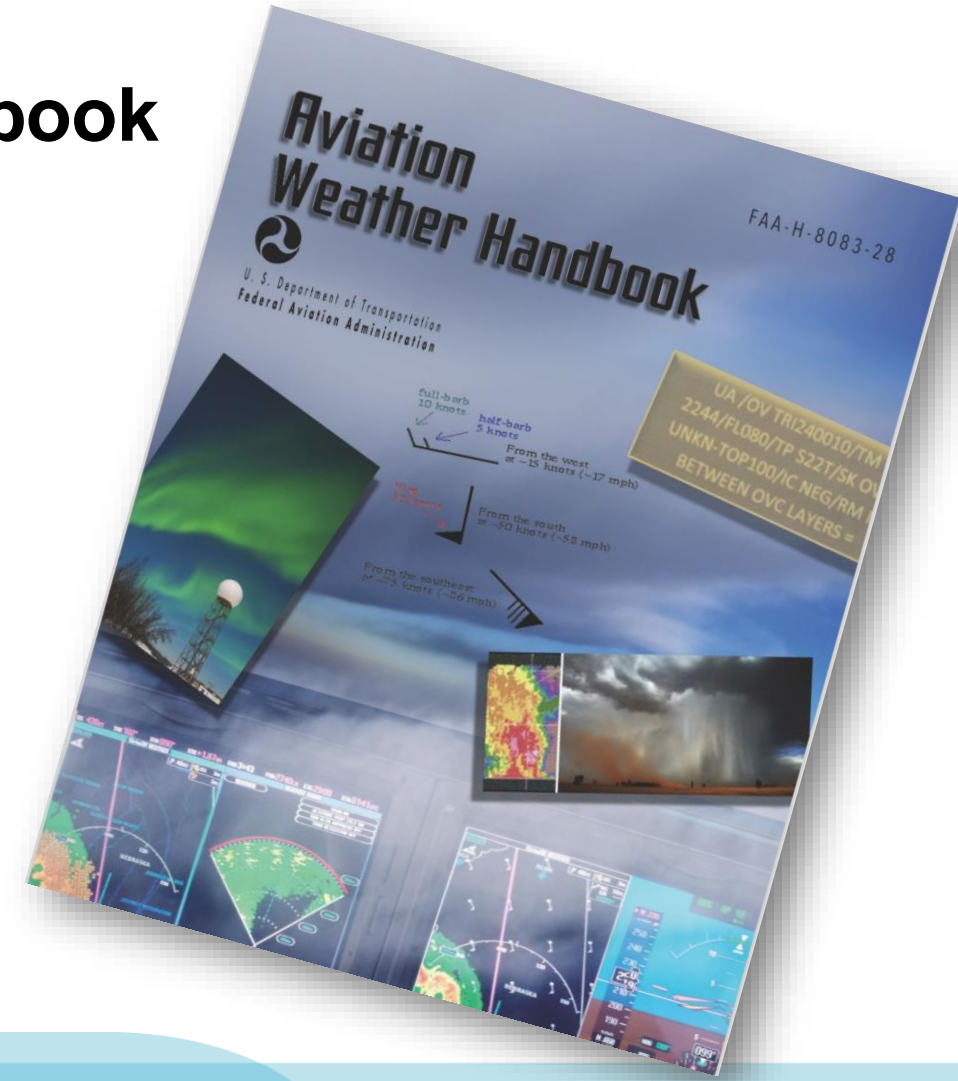


Resources

- FAA H-8083-28 Aviation Weather Handbook

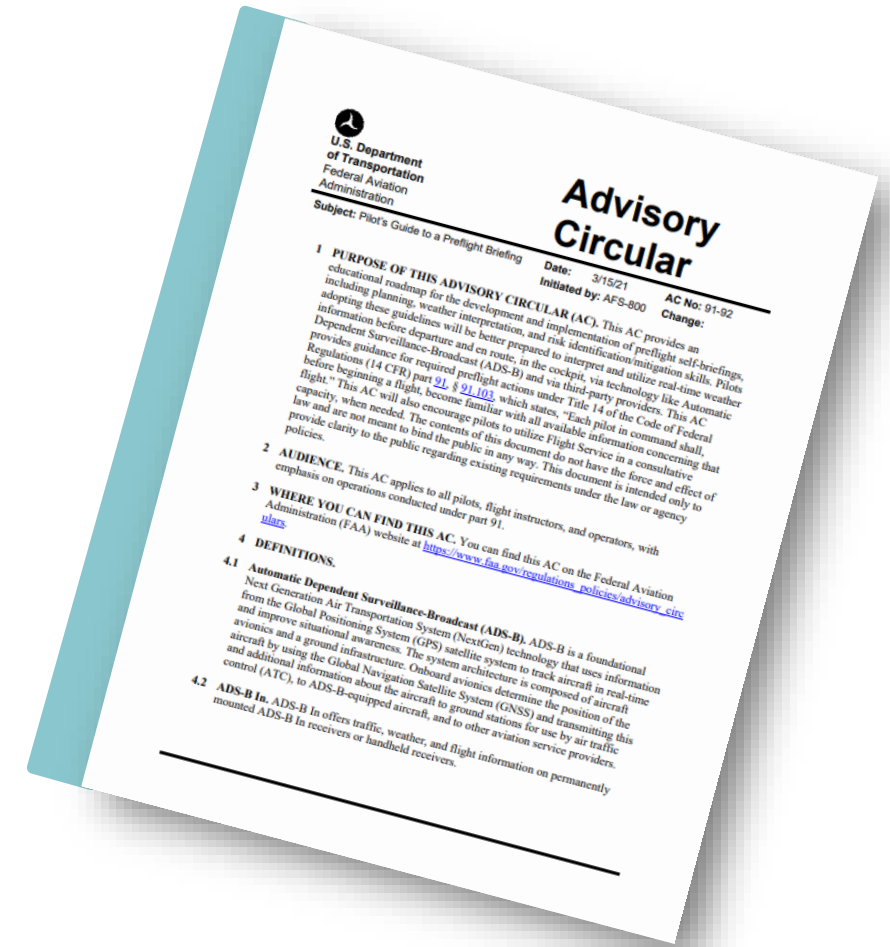


https://www.faa.gov/sites/faa.gov/files/FAA-H-8083-28_FAA_Web.pdf



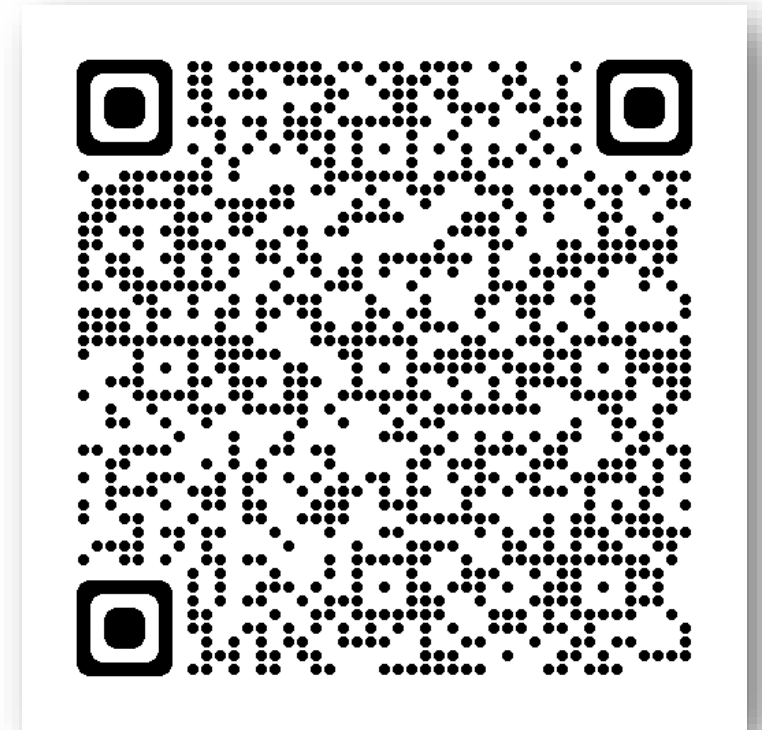
Resources

- **AC 91-92: Pilot's Guide to a Preflight Briefing**
 - Extensive ADS-B discussion
 - Flight Service Web Services
 - Self-briefing information and tips
 - Single-pilot Resource Management



More on AC 91-92

- Encourages pilots to conduct regulatory compliant preflight self-briefings
- Replaces FAA publications:
 - General Aviation Pilot's Guide to Preflight Weather Planning, Weather self-Briefings, and Weather Decision Making
 - How to Obtain a Good Weather Briefing



https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1036892

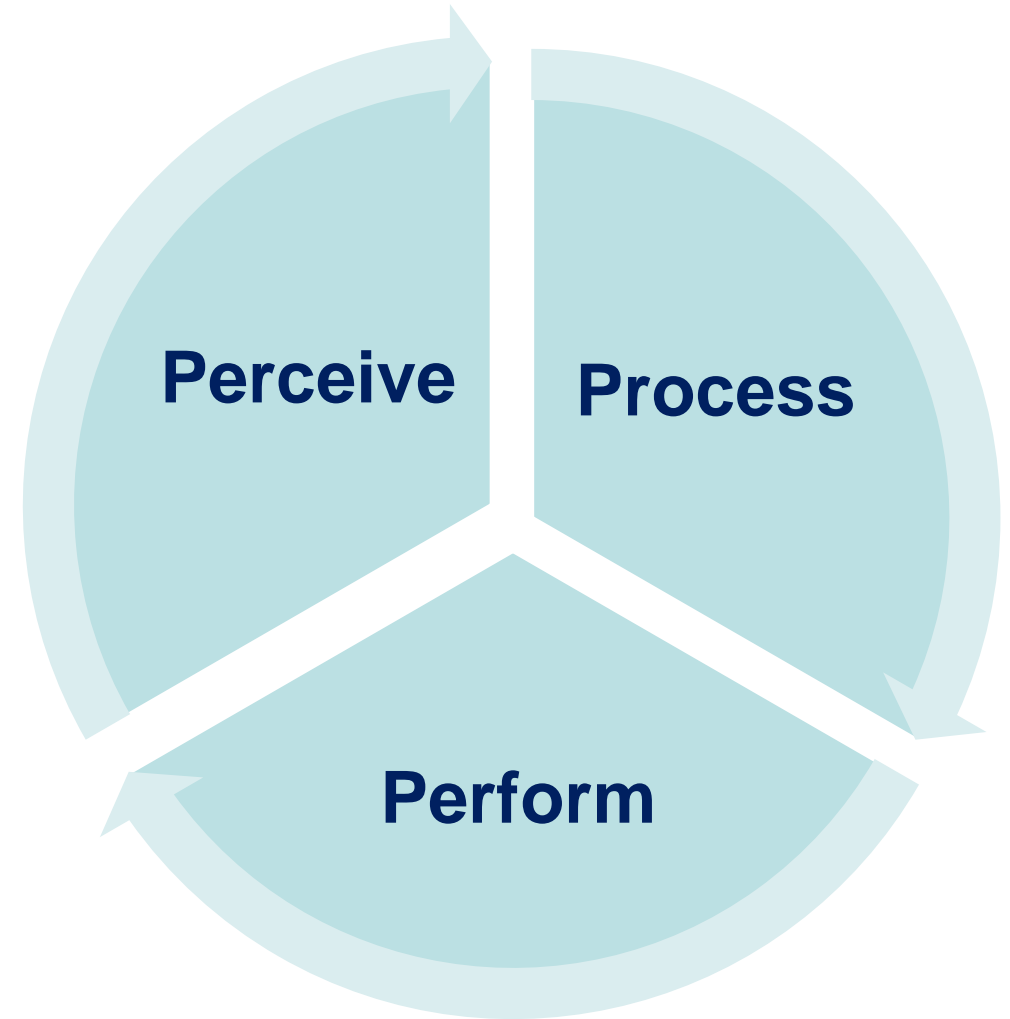


Weather analysis and decision making are big parts of our job.



Preflight to tie down

- **Perceive**
 - Gather weather information
- **Process**
 - Analyze weather information
- **Perform**
 - Make and act upon operational decisions



Pre-flight Self-Briefing

- **Prior to every flight, pilots should gather all information vital to the nature of the flight**
- **Using automated resources, pilots can conduct a regulatory compliant preflight briefing without contacting Flight Service**
- **Pilots who prefer to contact Flight Service are still encouraged to conduct a self-briefing prior to calling**
 - **Provides familiarity of meteorological and aeronautical conditions applicable to the route of flight**
 - **Promotes a better understanding of weather information**



Pre-flight Know Before You Go

1) Adverse Conditions	<ul style="list-style-type: none">• Weather advisories (SIGMETs, AIRMETs, Convective SIGMETs, Center Weather Advisories, Aviation Watch Notification Messages)• NOTAMs (airport/runway closures, TFRs, etc.)• IFR conditions, low-level windshear, thunderstorms, reported icing, frontal zones
2) Synopsis	<ul style="list-style-type: none">• Weather systems and/or air masses
3) Current Conditions	<ul style="list-style-type: none">• Current observations (e.g., METARs, PIREPs) for departure, en route, and destination• Satellite and radar imagery
4) Forecast Conditions	<ul style="list-style-type: none">• Forecast information (departure, en route, and destination)
5) Winds Aloft	<ul style="list-style-type: none">• Winds aloft forecast (interpolate between levels and stations)• Temperature at proposed altitude
6) Notices to Airmen (NOTAM)	<ul style="list-style-type: none">• Departure, en route, and destination
7) Restricted or Special Use Airspace	<ul style="list-style-type: none">• Prohibited Areas P-40, P-56, and the Special Flight Rules Area (SFRA) for Washington, DC
8) ATC Delays	<ul style="list-style-type: none">• ATC delays and/or flow control advisories



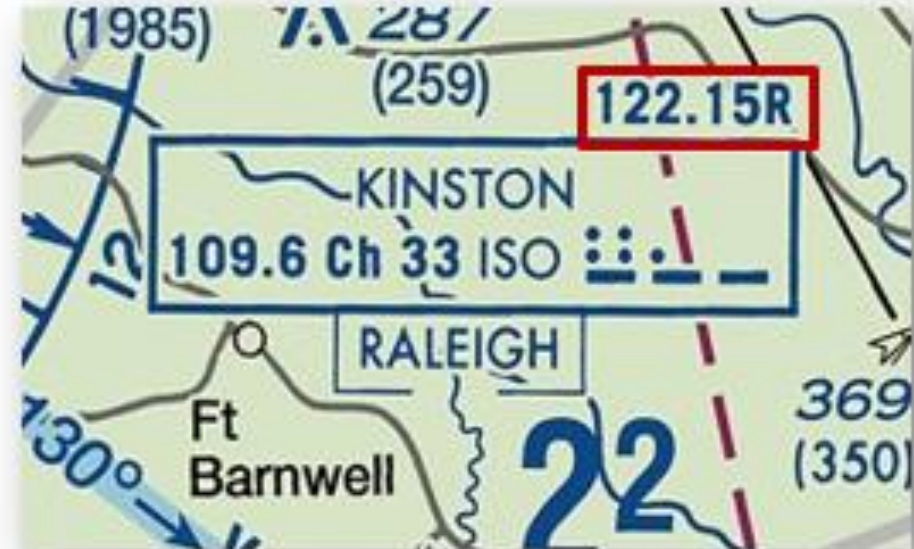
Sample Pre-flight Self-Briefing Resources

1800wxbrief.com	Leidos Flight Service – FAA Contract Vendor
avcams.faa.gov	Alaska and Canada
aviationweather.gov	NOAA/Government Web Site for aviation weather
Fly.faa.gov/flyfaa/usmap.jsp	FAA Flight Delay Information
nhc.noaa.gov	National Hurricane Center (HNC)
notams.aim.faa.gov/notamSearch	Federal NOTAM System (FNS)
spc.noaa.gov	NOAA Storm Prediction Center
ssd.noaa.gov/VAAC/vaac.html	Volcanic Ash Advisory Centers (VAAC)
sua.faa.gov	Special Use Airspace
tfr.faa.gov/tfr2/list.html	Temporary Flight Restrictions
weather.gov	National Weather Service Forecast Office
weather.gov/aawu	Alaska Aviation Weather Unit (AAWU)
weather.gov/hfo	National Weather Service Forecast Office Honolulu, HI
wpc.ncep.noaa.gov	Weather Prediction Center



In-flight Weather Sources

- Flight Service (FSS) en route weather
- Frequencies depicted on VOR data block
 - FSS transmits & receives on 122.2 (VHF) and 255.4 (UHF)
 - FSS receives on 122.15 & transmits on 109.6 (VOR)



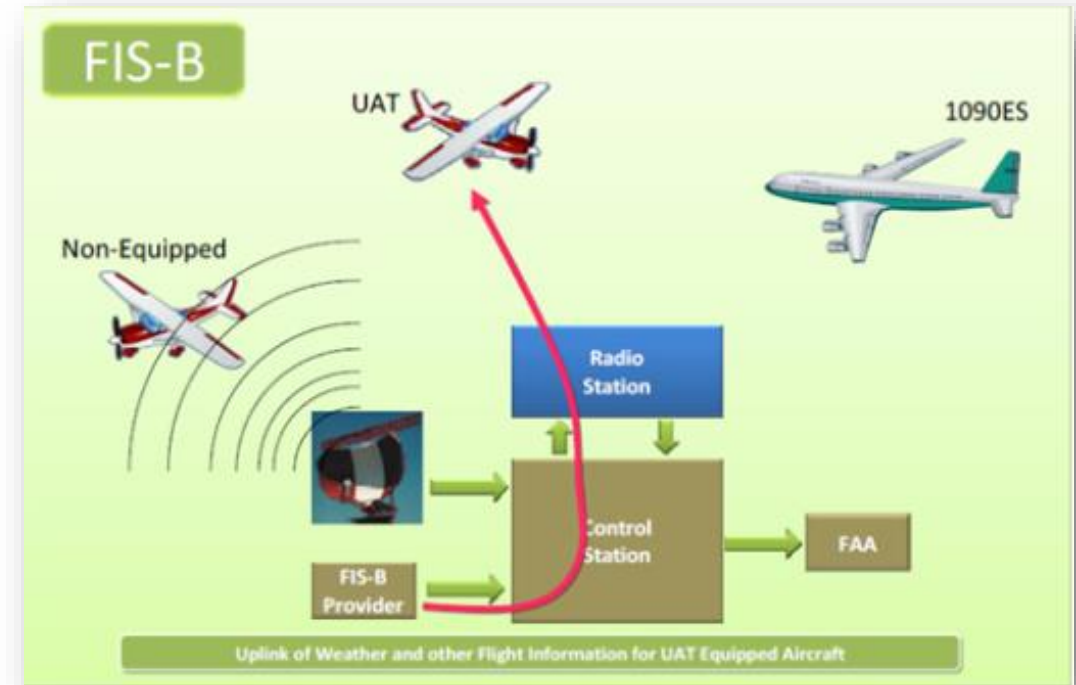
In-flight Weather Service Products – Radio or Datalink

Near Real Time or older	Forecasts old news
METARs – Surface Observations	Graphical Forecasts for Aviation (GFA)
SPECIs – Special METAR Reports	Terminal Aerodrome Forecasts - TAFs
SIGMETs (WSs) – Non-convective weather hazards to all aircraft	Winds & Temperatures Aloft
Convective SIGMETs (WSTs) – Convective weather hazards to all aircraft	
AIRMETS (WAs) – Weather hazards to light aircraft	
PIREPs - Pilot reports of flight conditions	
NOTAMs – Notices to Airmen	

Compare forecasts to real time observations to get the best weather picture.

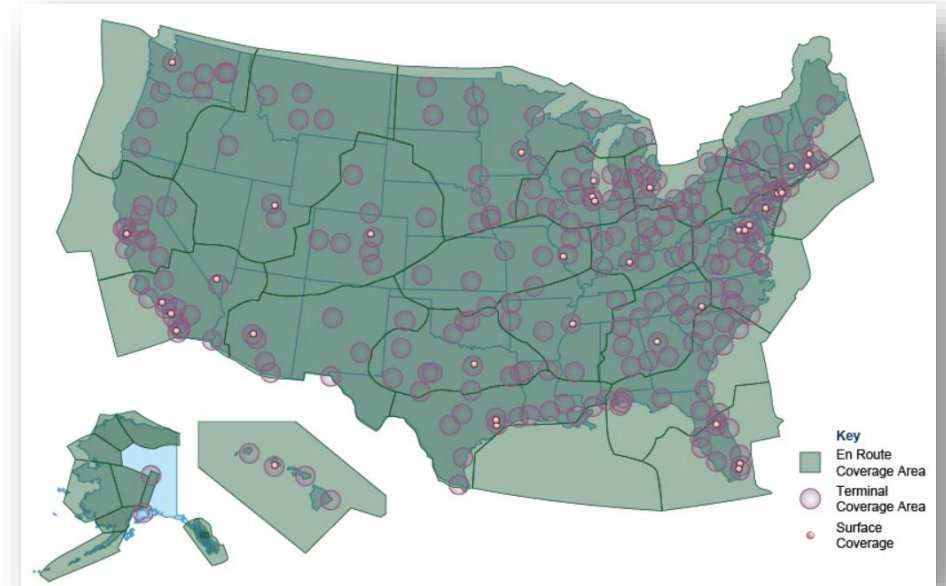


- ~~• Hazardous In-flight Weather Advisory Service (HIWAS)~~
- Flight Information Services-Broadcast (FIS-B)



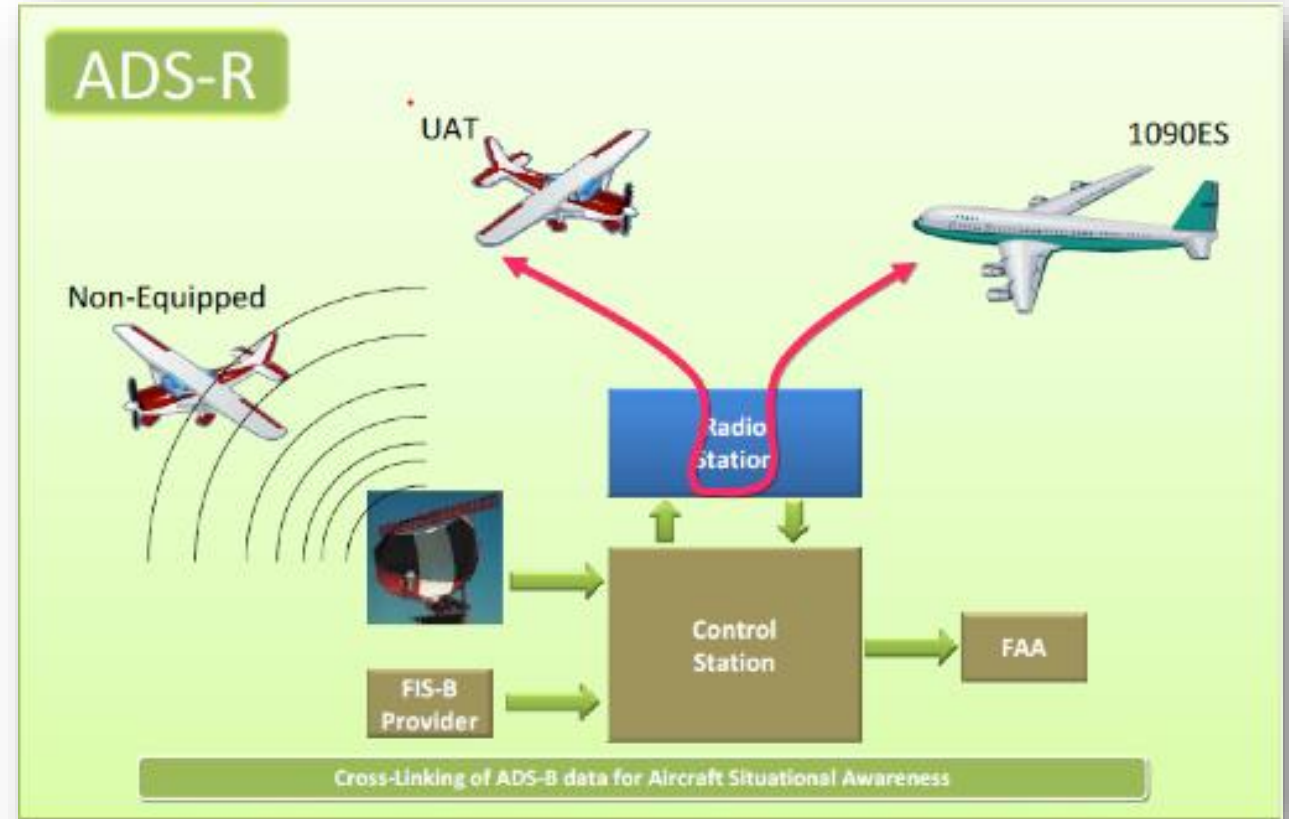
ADS-B – In Applications

- Automatic Dependent Surveillance – Rebroadcast (ADS-R)
- Traffic Information Services - Broadcast (TIS-B)
- Flight Information Services - Broadcast (FIS-B)



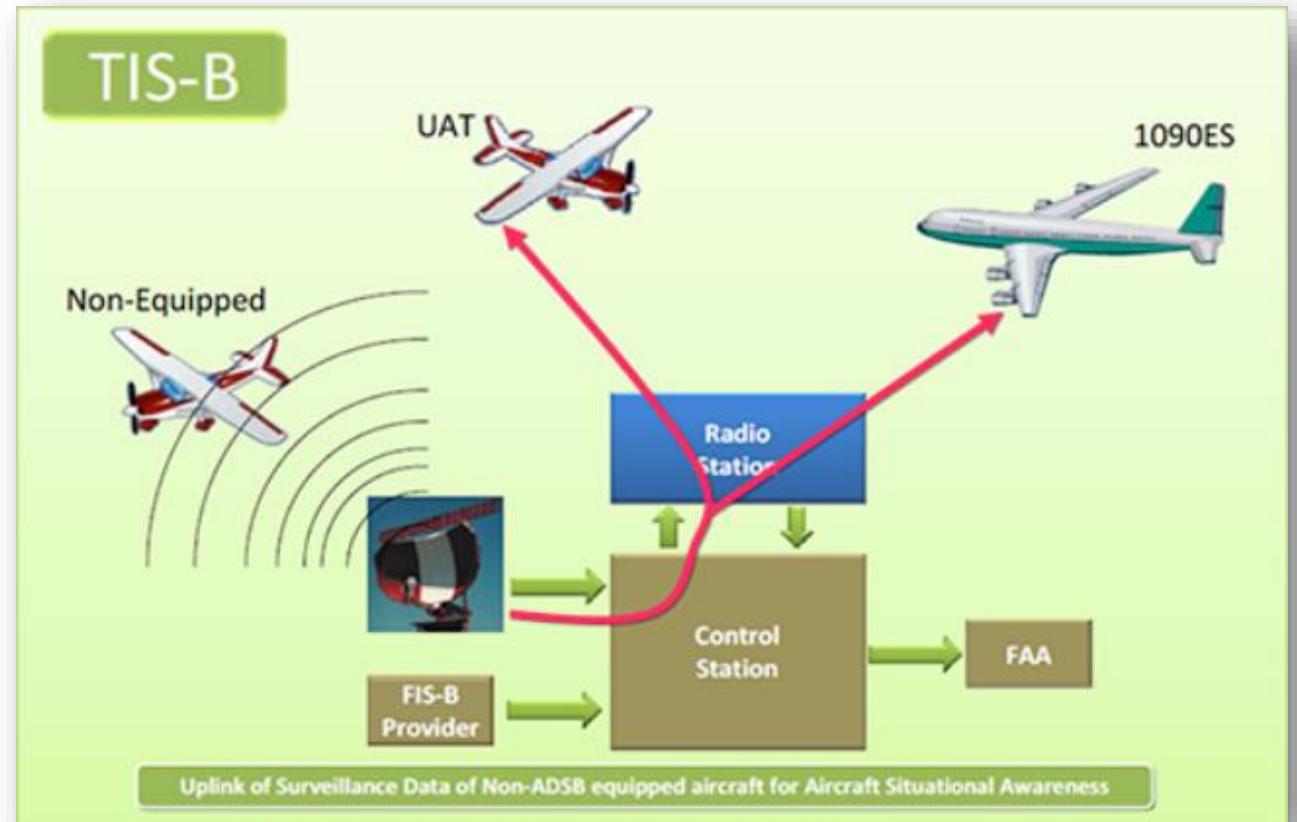
ADS-R

- UAT ADS-B In aircraft receive UAT ADS-B out traffic directly
- ADS-R relays ADS-B Out Information to ADS-B In-equipped aircraft



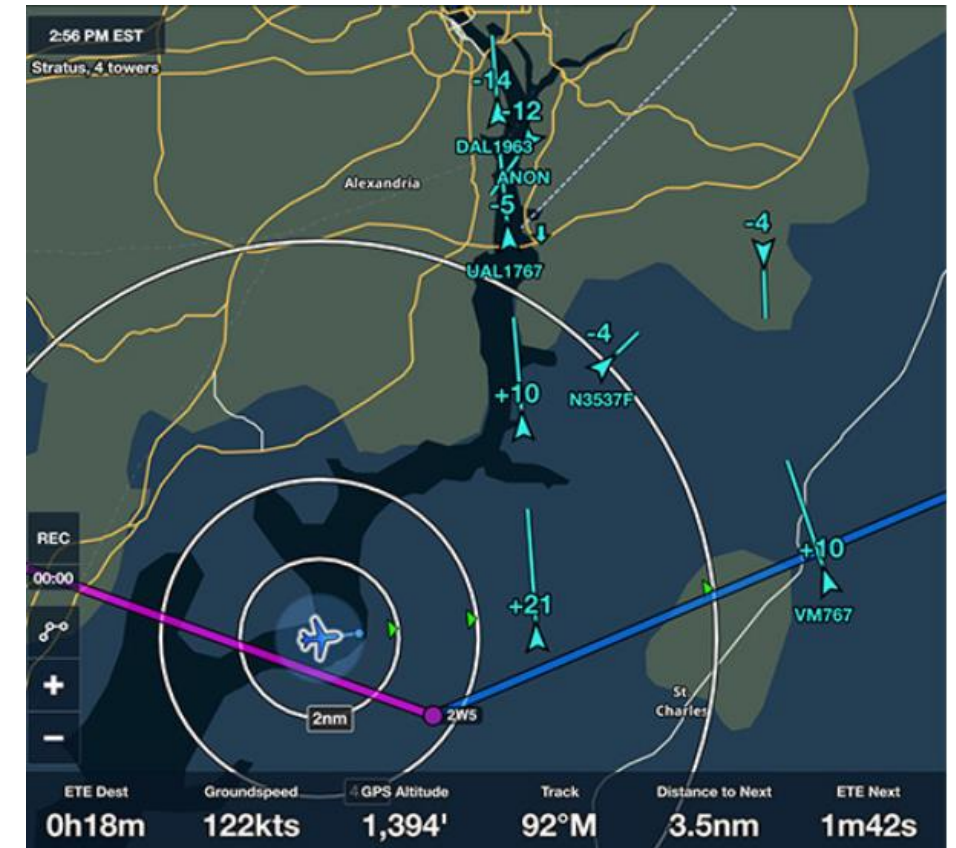
TIS-B

- Available to ADS-B In aircraft at and below 24,000 feet
- Positional data collected from all aircraft is transmitted to ADS-B In aircraft



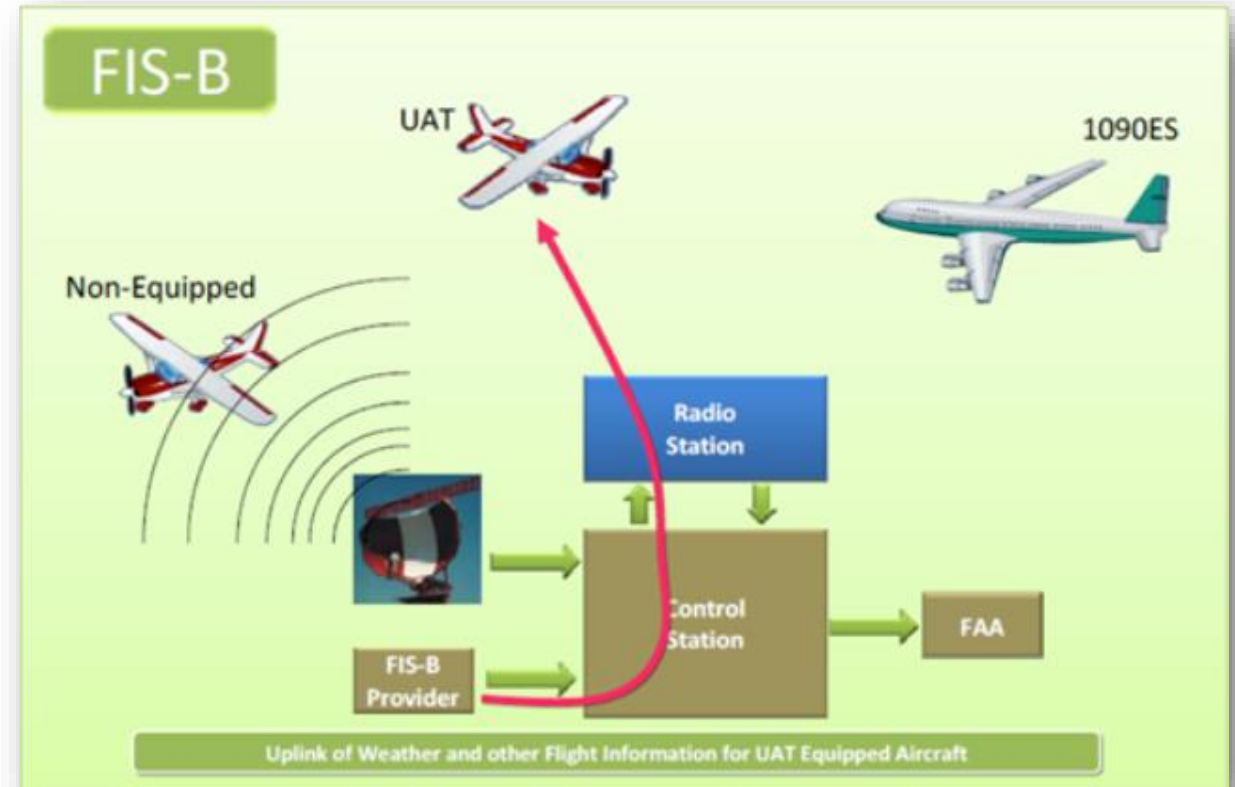
Caution

- ADS-B traffic picture may not be complete
- Good adjunct to visual scan but...
- We still need to look outside for traffic.



FIS-B

- Available to ADS-B UAT equipped aircraft
- System broadcasts aeronautical information products from the FAA and weather products from the National Weather Service



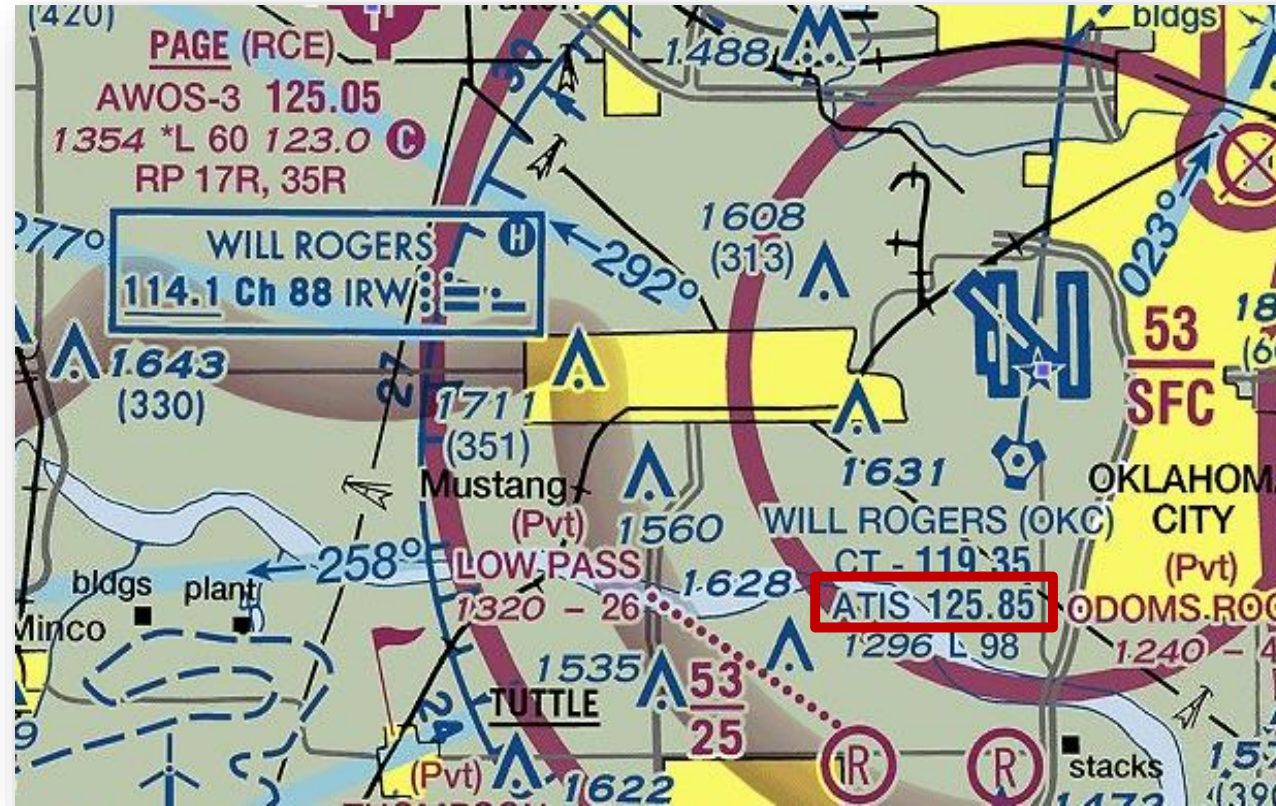
FIS-B Products

AIRMETs	TAFs
Convective SIGMETs	Amended TAFs
SIGMETs	Winds & Temperature Aloft
METARS	Lightning
SPECIs	Turbulence
National NEXRAD	Icing
Regional NEXRAD	Cloud Tops
D-NOTAMs	Graphical AIRMETs
FDC-NOTAMs	Center Weather Advisories
PIREPS	TIS-B Service Status
Special Use Airspace (SUA) Status	



In-flight Weather Sources

- Automated Terminal Information Service (ATIS)



In-flight Weather Sources

- Automated Surface Observing System (ASOS)
- Automated Weather Observing System (AWOS)



ASOS Information

METAR Element	Information Provided
Wind Direction, Speed, & Character	Tens of degrees – Knots, Gusts
Visibility	Up to & including 10 statute miles
Runway Visual Range (RVR)	At selected sites
Basic present weather	Type and intensity
Obstructions to vision	Fog, mist, haze, & freezing fog
Sky condition	Cloud height and amount to 12,000 Ft. AGL CLR, FEW, SCT, BKN, OVC
Ambient & Dew point Temperatures	Degrees Celsius
Pressure	Altimeter Setting In. Hg.
Remarks	Automated, Manual, & Plain Language – depending on service level

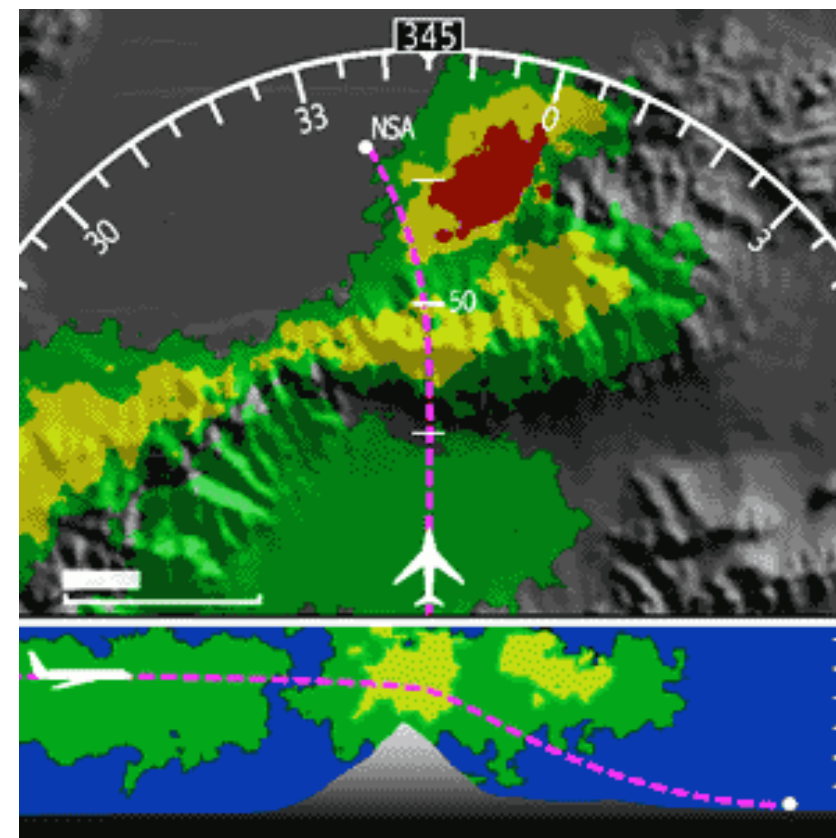


AWOS Information

AWOS Type	Information Provided
AWOS-A	Altimeter Setting
AWOS-AV	Altimeter Setting & Visibility
AWOS-1	Altimeter Setting, Wind speed & direction, Temperature, Dew Point, & Density Altitude
AWOS-2	AWOS-1 plus Visibility
AWOS-3	AWOS-2 plus Cloud & Ceiling Data
AWOS-3P	AWOS-3 plus Precipitation Discriminator
AWOS-3PT	AWOS-3P plus Thunderstorm/Lightning
AWOS-3T	AWOS-3 plus Thunderstorm/Lightning
AWOS-4	AWOS-3 plus precipitation type and accumulation, freezing, thunderstorm, & runway surface information



Airborne Weather Radar



Airborne Weather Radar

- Real Time
- May not show all precipitation
- Good for tactical avoidance
- New users should seek instruction



Strike Finder & Storm Scope

- Real Time
- Doesn't show precipitation
- Good for tactical avoidance
- Instruction recommended for new users



Portable ADS-B Receivers

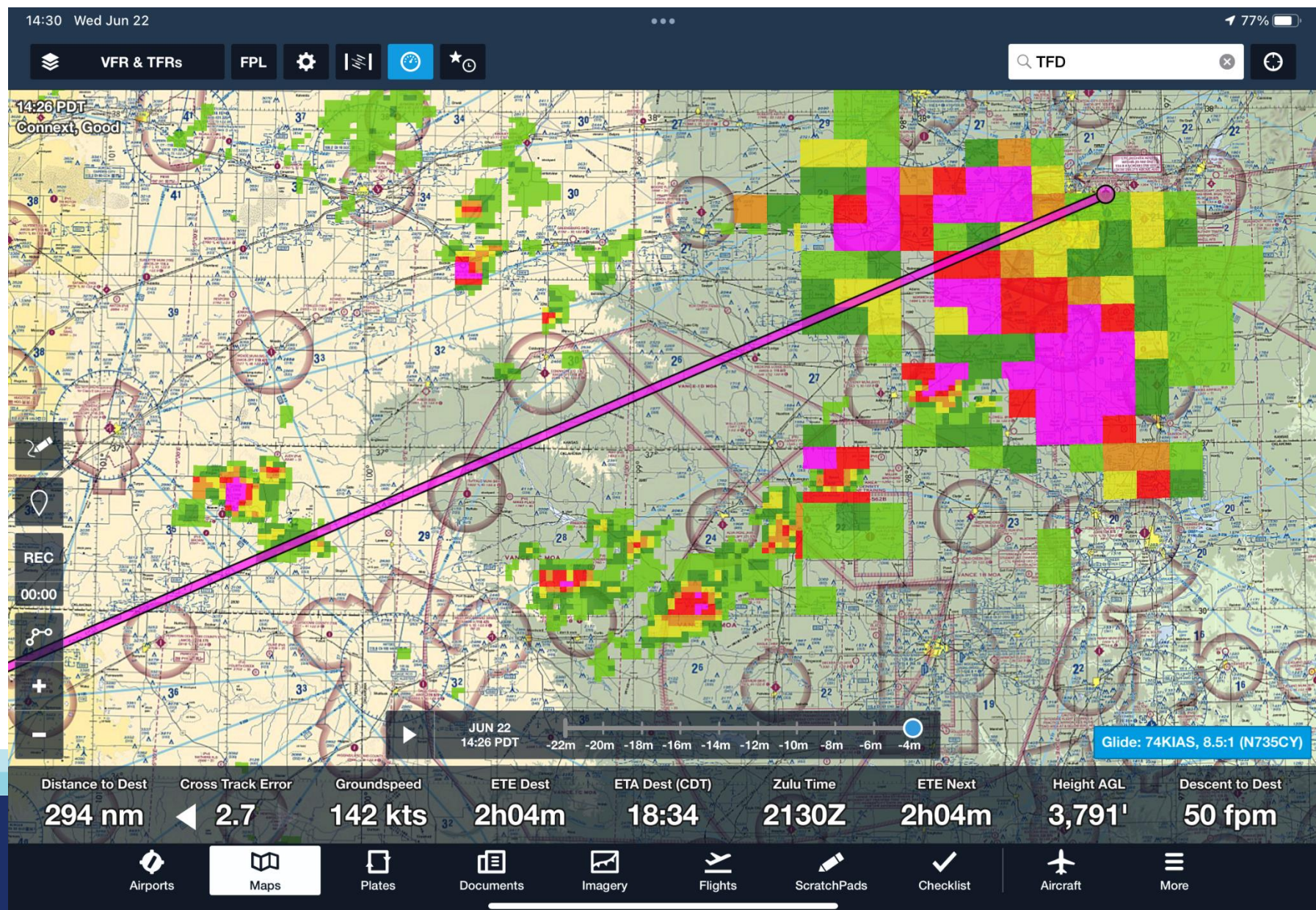


XM Weather

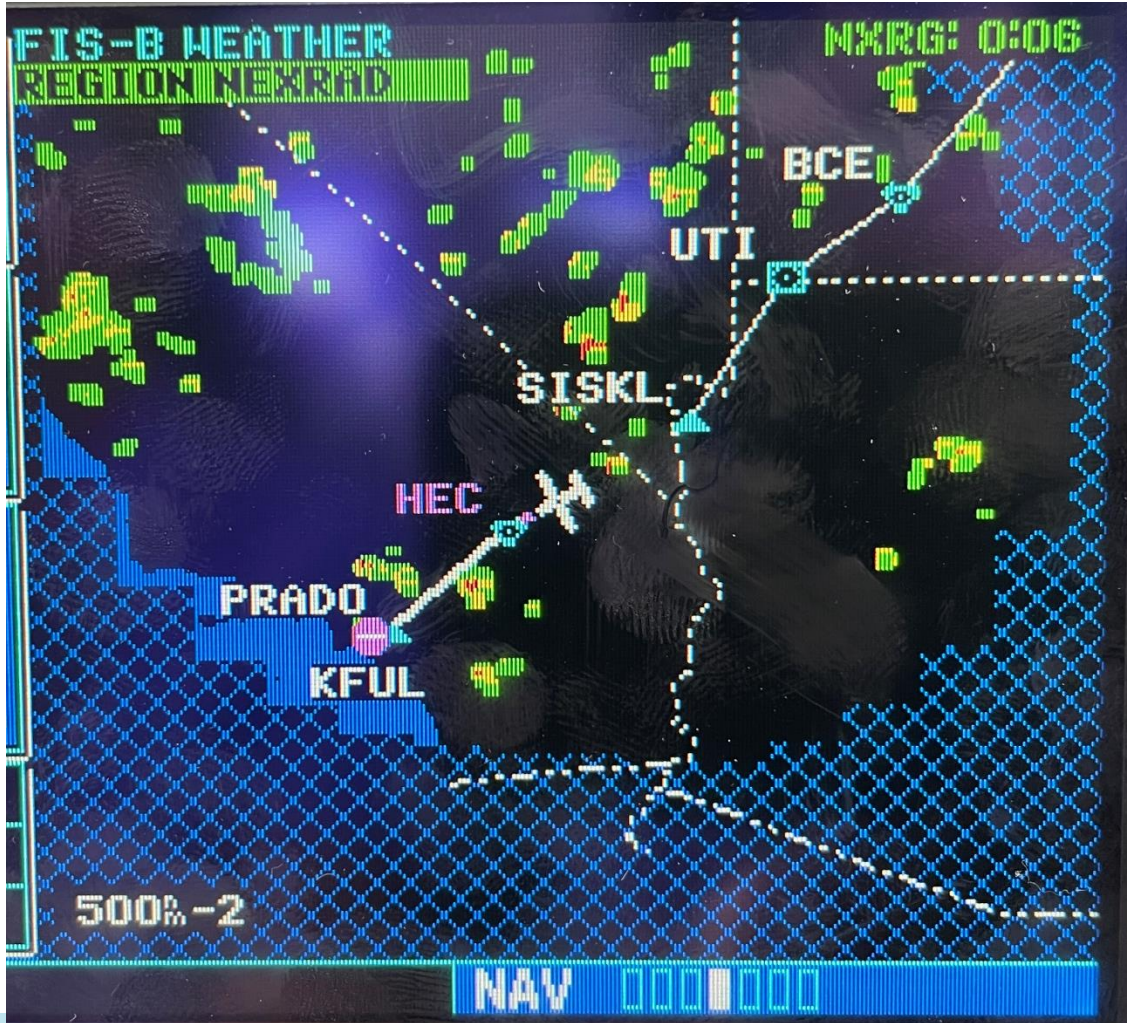
- Near Real Time
 - 2.5 Minute update
 - Look for time stamp
- Good for strategic planning



Onboard versus IRL



Onboard versus IRL



Onboard versus IRL



Onboard versus IRL

CON RX
118.900
118.900

APT KFUL Public

TEXTUAL METAR FIS-B

METAR KFUL 082353Z
19008KT 10SM CLR 28/16
A2983 RMK A02 SLP098
T02780161
10311 20222 56022=

VLOC
114.35
117.00

VOR _____
RAD _____°
DIS _____nm

ENR

GPS

HPT

CON
118.900
118.900

APT KSNA Public

TAF FIS-B

TAF KSNA 082330Z
0900/0924 22010KT P6SM
SKC
FM090400 VRB04KT P6SM
BKN015
FM091700 VRB04KT P6SM
SCT015 SCT150
FM092000 23008KT P6SM
SCT250=

VLOC
114.35
117.00

VOR _____
RAD _____°
DIS _____nm

ENR

HPT



Onboard versus IRL

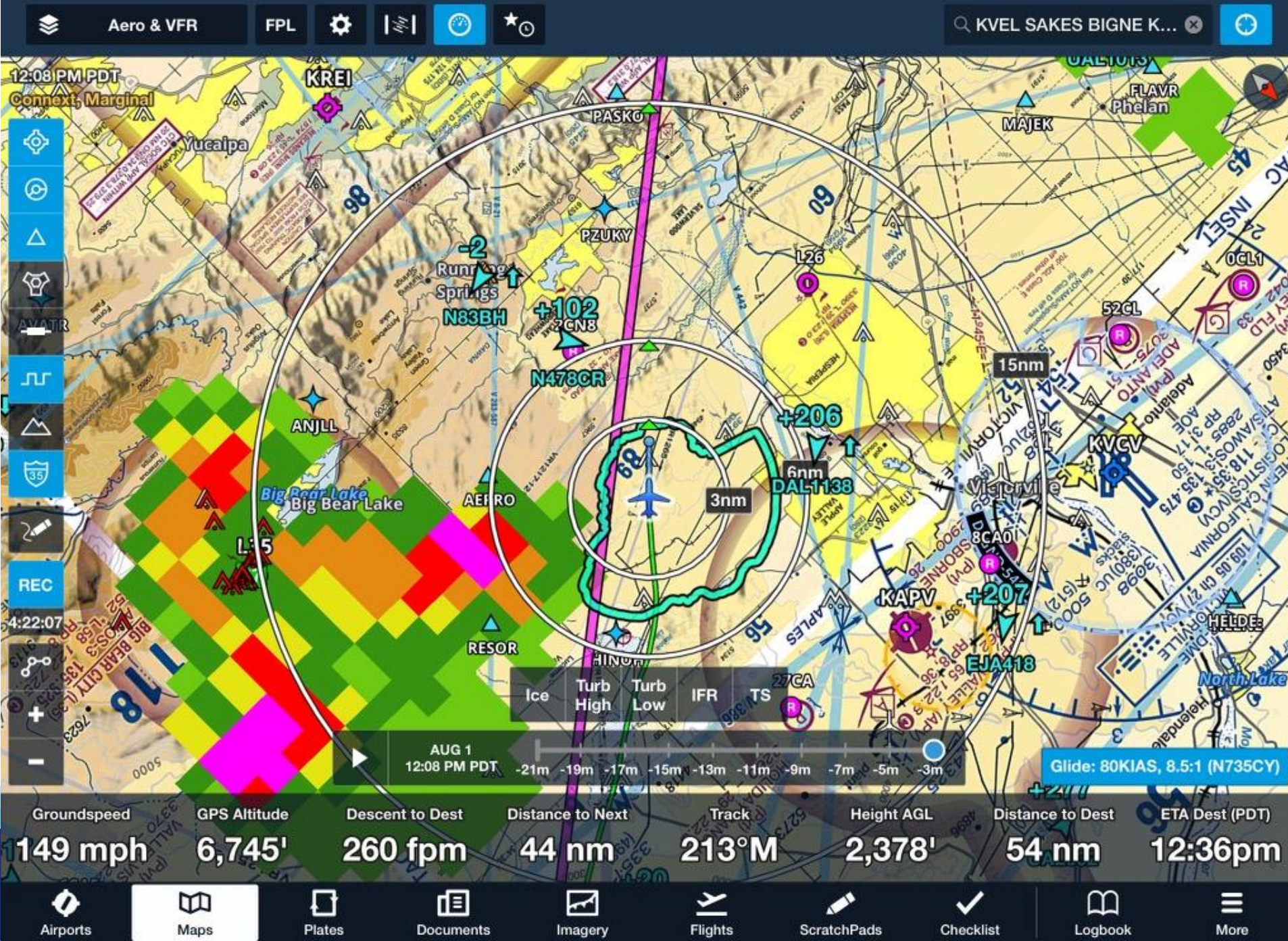


Onboard versus IRL









Onboard versus IRL





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Air Traffic Control

- Limited ability and time to forward weather information
- You can learn a lot by just listening.
- Don't wait until the last minute to make diversion requests.

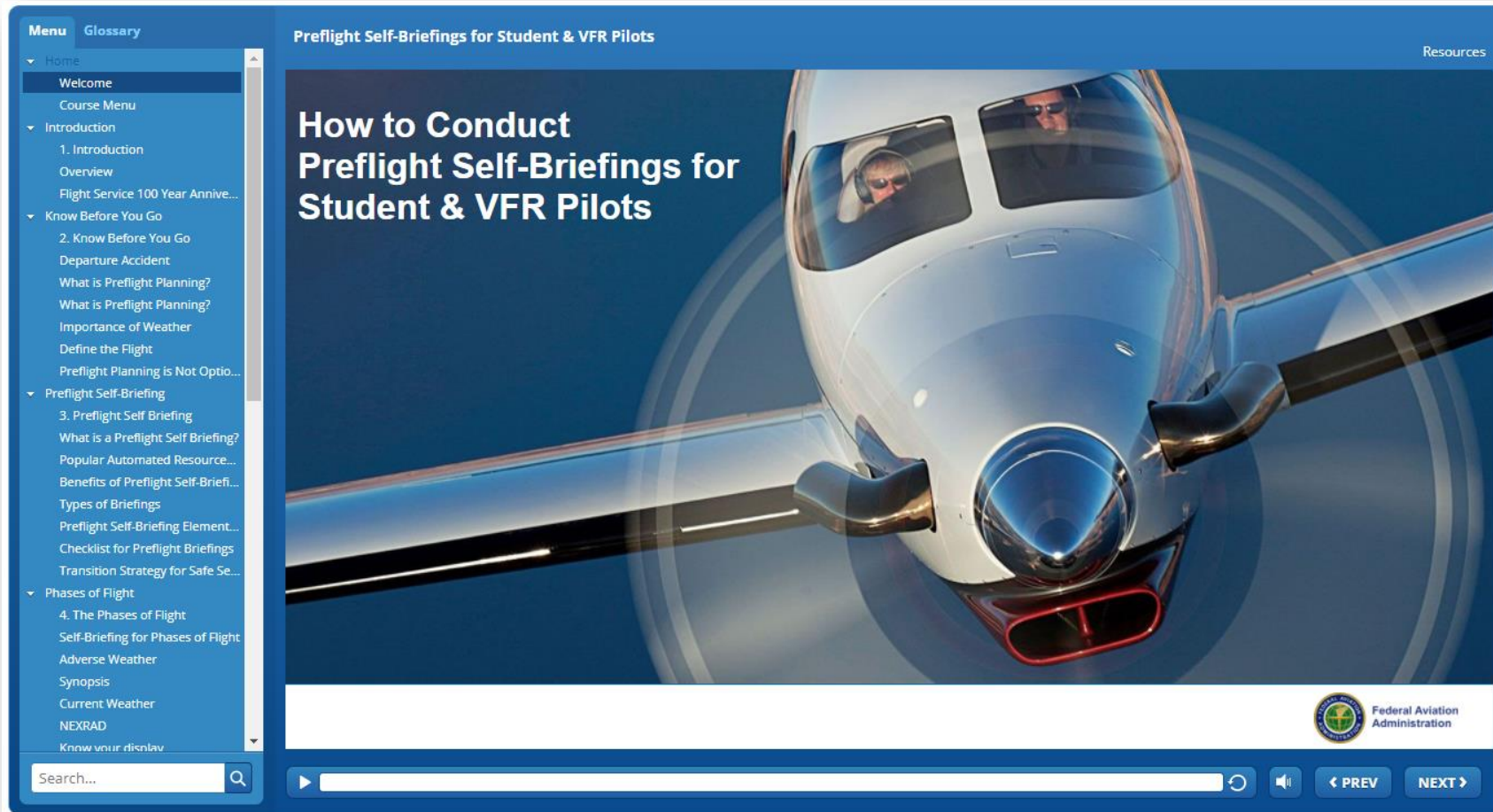


Cautions & Tips

- **Don't fixate on the equipment**
 - Cockpit displays don't tell the whole story
 - We still have to look outside
- **Understand what the displays tell you... and what they don't.**
 - You may not see all the traffic in your area
 - or all the weather ahead
- **Make weather avoidance decisions early**
 - Don't wait till you're close to choose a route
 - Refine your decisions as more information becomes available



Want to know more?



The screenshot displays the FAA website interface. On the left, a blue sidebar contains a 'Menu' and 'Glossary' section. The 'Menu' is expanded, showing a hierarchical list of topics: Home, Welcome, Course Menu, Introduction, 1. Introduction Overview, Flight Service 100 Year Annive..., Know Before You Go, 2. Know Before You Go, Departure Accident, What is Preflight Planning?, What is Preflight Planning?, Importance of Weather, Define the Flight, Preflight Planning is Not Optio..., Preflight Self-Briefing, 3. Preflight Self Briefing, What is a Preflight Self Briefing?, Popular Automated Resource..., Benefits of Preflight Self-Briefi..., Types of Briefings, Preflight Self-Briefing Element..., Checklist for Preflight Briefings, Transition Strategy for Safe Se..., Phases of Flight, 4. The Phases of Flight, Self-Briefing for Phases of Flight, Adverse Weather, Synopsis, Current Weather, NEXRAD, and Know your environm... At the bottom of the sidebar is a search bar. The main content area has a blue header with the title 'Preflight Self-Briefings for Student & VFR Pilots' and a 'Resources' link. Below the header is a large image of a cockpit with the text 'How to Conduct Preflight Self-Briefings for Student & VFR Pilots'. At the bottom of the main area is the FAA logo and the text 'Federal Aviation Administration'. A video player interface is visible at the very bottom of the screenshot.



<https://bit.ly/3tmxtrX>



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Proficiency training works!

- Sports
- Medicine
- Aviation



Proficiency Training Works

- Increases confidence
- Increases comfort
- Expands horizons
- Keeps us safe



Earning any WINGS phase qualifies for a Flight Review!



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Why *WINGS*?

- **Proficient Pilots are:**
 - Confident
 - Capable
 - Safe
- ***WINGS*** will keep you on top of your game



References

- **AC 00-63A Use of Flight Deck Displays of Digital Weather and Aeronautical Information**
 - https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_00-63A.pdf
- **AC 90-114B Automatic Dependent Surveillance-Broadcast Operations**
 - https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_90-114B.pdf
- **AC 91-92 Pilot's Guide to a Pre-flight Briefing**
 - https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1036892



References

- **Aeronautical Information Manual**

- [faa.gov/air_traffic/publications/media/aim_basic_dtd_4-20-23.pdf](https://www.faa.gov/air_traffic/publications/media/aim_basic_dtd_4-20-23.pdf)
- Chapter 7 – Safety of Flight
 - Section 1 - Meteorology

- **FAA ADS-B Information**

- <https://www.faa.gov/nextgen/equipadsb/>

- **Automated Surface Observing Systems**

- <https://www.weather.gov/asos/>
- https://www.faa.gov/air_traffic/weather/asos/



Safety Management Systems (SMS) Coming to General Aviation



<https://www.faa.gov/about/initiatives/gasafetyoutreach>



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Questions?

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Thank you for attending

- You are vital members of our GA safety community



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