



The General Aviation Perspective: Advancements in MET GA Technology and Information for GA Cockpits

Melissa McCaffrey

Senior Government Analyst

Air Traffic Services









Weather Technology in the GA Cockpit

- **In- Flight Weather**
- **Datalink**
- **ADS-B**
- **Nexrad**



In Flight Weather

- **Pilots often choose to take off and evaluate the weather as they go. At typical GA aircraft speeds, a 200-mile trip can leave a 2-3 hour weather information gap between the preflight briefing and the actual flight. In bridging that gap, in cockpit wx technologies come into play.**



Datalink and Weather Avoidance Equipment

- **Weather datalink equipment uses satellites to transmit weather data such as METARs, TAFs, and NEXRAD radar to the cockpit. Handheld devices are growing in popularity amongst the GA community.**



Datalink



- **Lightning Detectors-** Whether they're called Stormscopes or Strikefinders, lightning detection units have become popular in many complex GA aircraft. Lightning detection is considered an essential complement to traditional airborne weather radars and datalink storm depictions.

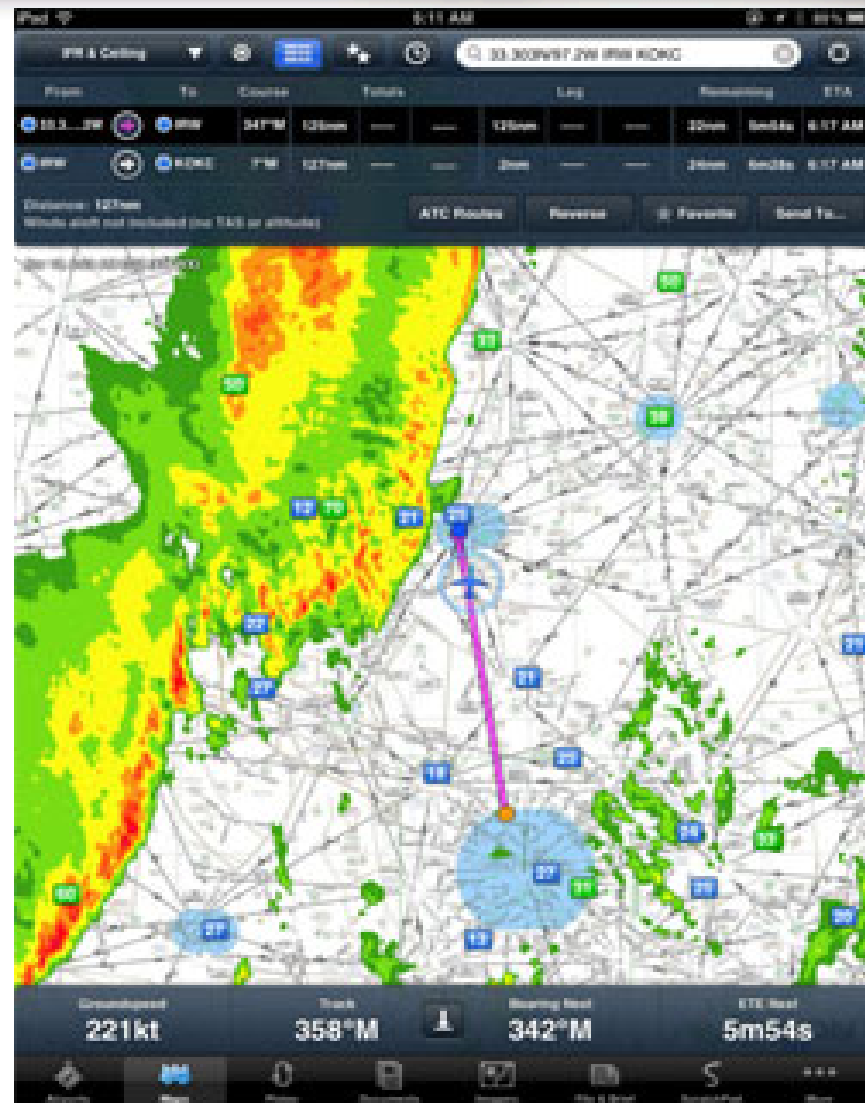
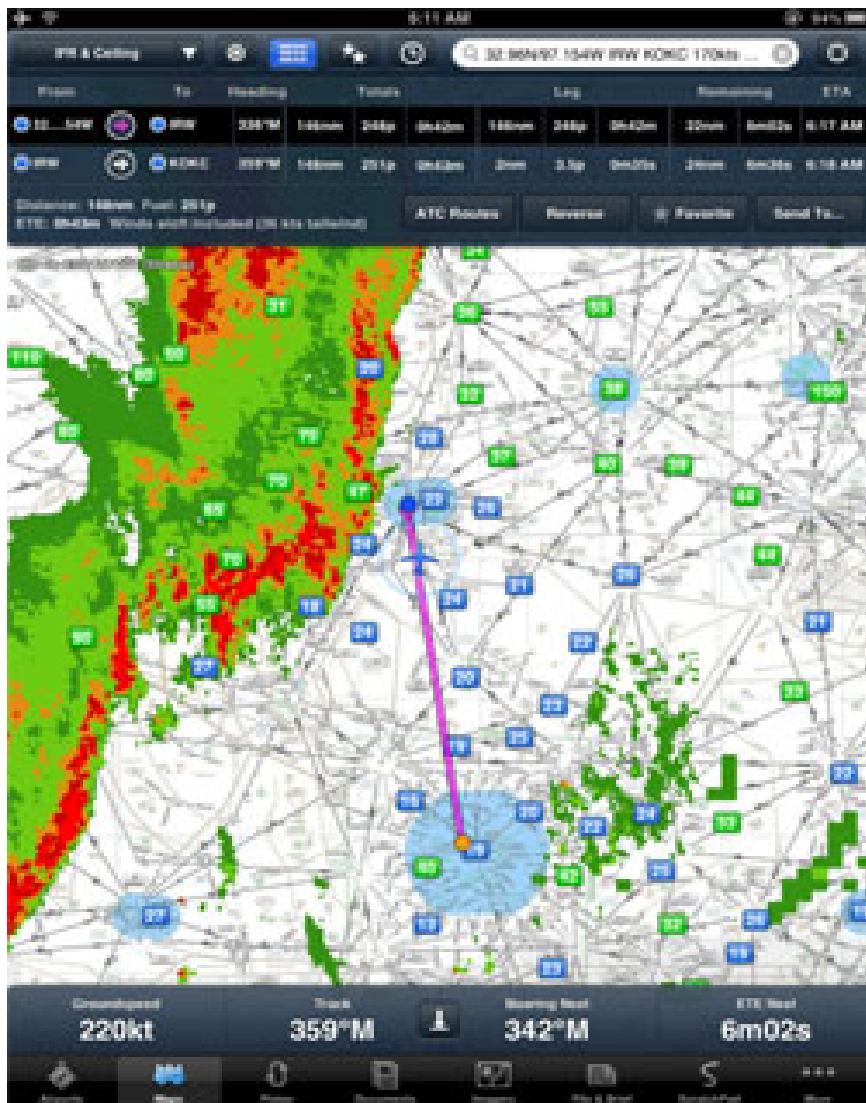


ADS-B

- **Flight information service-broadcast (FIS-B) weather information is one of three datalink elements of ADS-B**
- **FIS-B delivers Nexrad radar images, Pirep, METAR, TAF and winds aloft weather reports directly to a cockpit multifunction display**



ADS-B vs. XM Weather





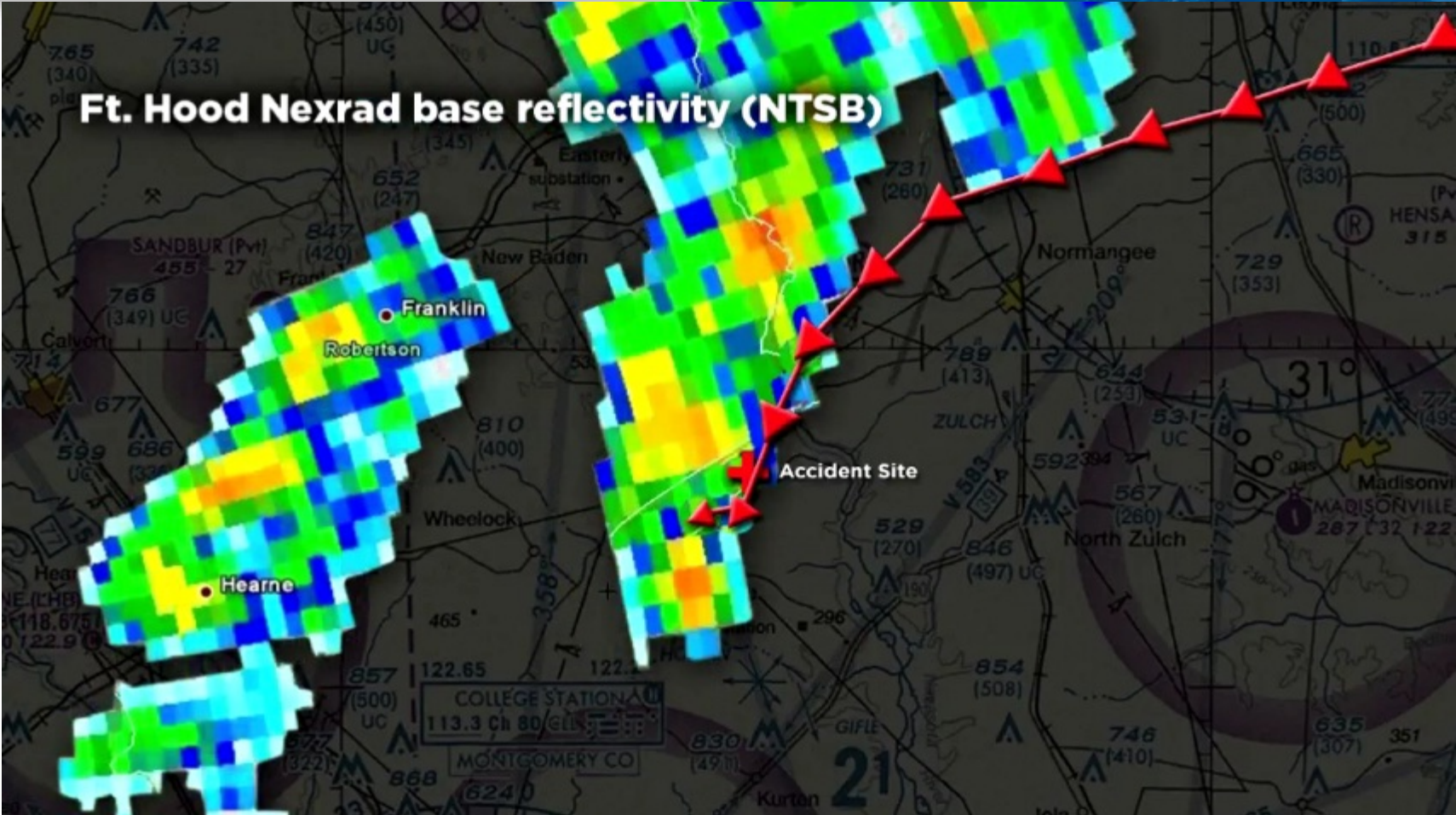
- **Radar images are transmitted via data link, and provide a vastly better picture of the weather than in the past. But the information is not in real time, it typically takes several minutes for the Nexrad ground station to complete the scans necessary to build an image and then additional time to send the image to the aircraft. In benign wx time lag is not a factor, but of course in significant wx this gap can mean the difference between life and death.**

Significant Time Lag

NTSB document

The closest matching base reflectivity image to the 2130 CST XM data²³ was the 1.4° elevation scan base reflectivity which began at 21:24:40 CST and this gives the 2130 CST XM data a time latency²⁴ of 5 minutes and 20 seconds (figure 31). There was an additional 1 minute and 4 seconds for the XM data to be created²⁵ so that it could be displayed in the cockpit and so the total approximate time latency of the 2130 CST XM data was 6 minutes and 24 seconds. The XM data age indicator in the cockpit should have indicated that the XM data was 1 minute old (the time it took for the XM data to be created and sent to the accident airplane).







Contact Information

Melissa McCaffrey
Office Phone: (301) 695-2228
Melissa.McCaffrey@aopa.org

