

Thunderstorm Separation

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Nexrad Lag Time



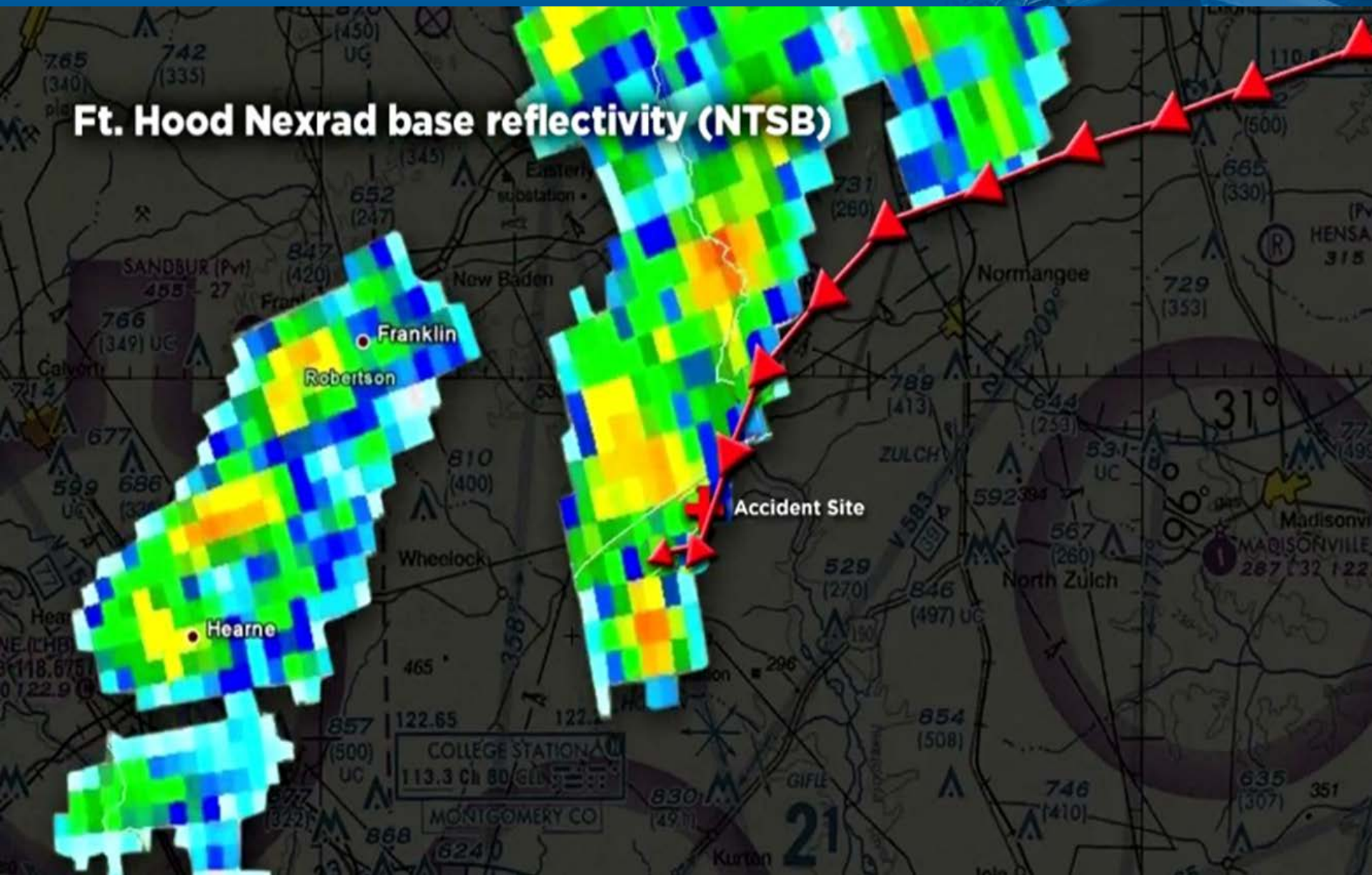
- Radar images are transmitted via data link and provide a vastly better picture of the weather than in the past
- Information is not real time
 - It typically takes several minutes for the Nexrad ground station to complete the scans necessary to build an image
 - then additional time to send the image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



NTSB Graphic



Ft. Hood Nexrad base reflectivity (NTSB)



XM Depiction



Representative XM weather (NTSB)





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).

The ATC flight track is provided for reference. Figure 32 provides the closest available 1.4° elevation scan base reflectivity from the KGRK WSR-88D, which began at 21:29:01 CST, to the 2130 CST XM data.



Not all Thunderstorms are Created Equally

■ Not all thunderstorms are created equally

- Understand the nature of the system
- Is the front fast moving?
- Where are the tops?
- What does the radar show?

■ Make safe decisions

- The burden is on the pilot in command to understand the big picture of the weather and decide when not to continue the flight
- Understand the risks



Interactive Learning



WEATHER WISE THUNDERSTORMS & ATC



✓ 1: The Basics

✓ 2

✓ 3

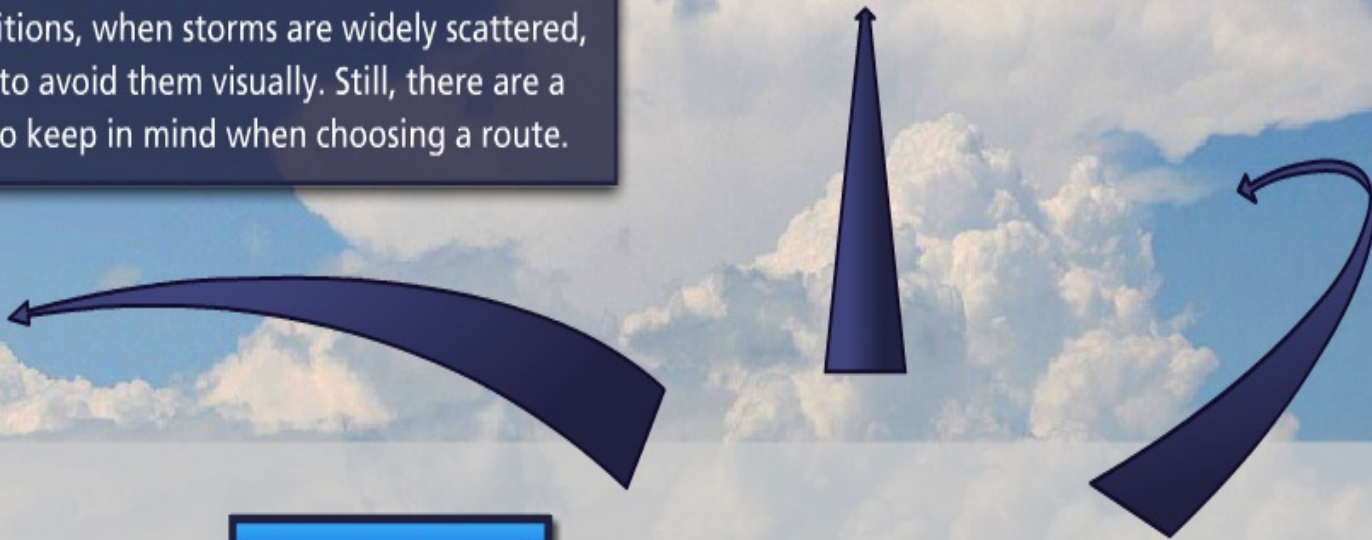
✓ 4

Quiz

[1] [2] [3] [4] [5] [1-6] [7]

Isolated Cells

In VFR conditions, when storms are widely scattered, it's possible to avoid them visually. Still, there are a few things to keep in mind when choosing a route.



Make Your Choice

Select a path to navigate around the storm.

Fly Under the Anvil

Fly Over

Fly 20nm Around

Make Your Choice



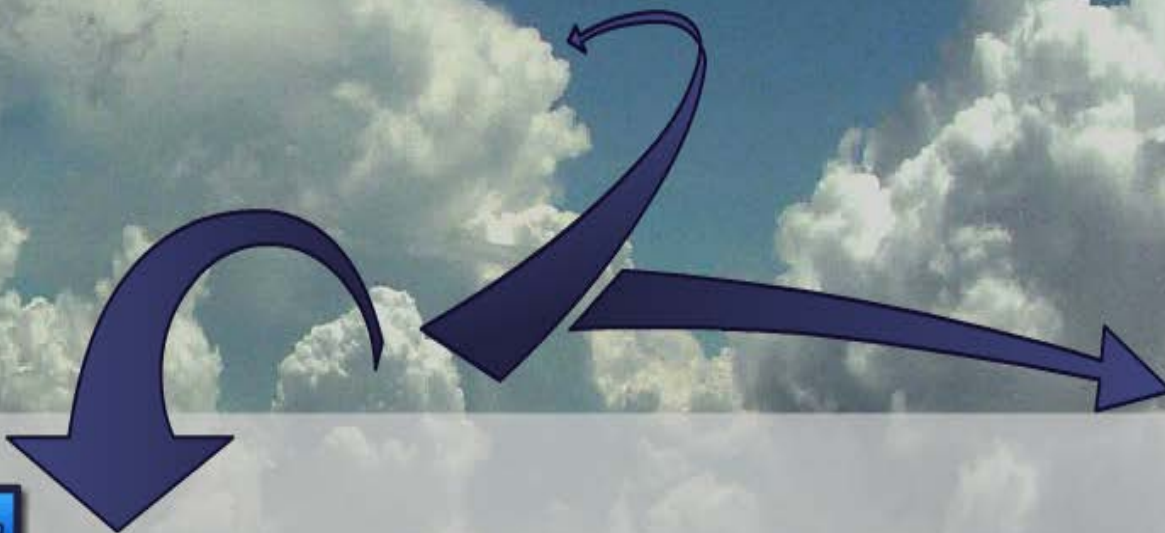
WEATHER WISE THUNDERSTORMS & ATC

- ✓ 1: The Basics
- ✓ 2
- ✓ 3
- ✓ 4
- Quiz

- [1] [2] [3] [4] [5] [6] [1-7]

The Situation Worsens

As storms grow and fill in, avoiding them becomes more difficult, and the case for diverting becomes more compelling.



Make Your Choice

Select a path to navigate around the storm.

- Fly Through the Hole*
- Fly Around*
- 180° Turn or Land*

ATC Assumptions



- ✓ 1
- ✓ 2
- ✓ 3: Communicating with ATC
- ✓ 4
- Quiz

- | 1 |
- | 2 |
- | 3-3 |
- | 4 |
- | 5 |
- | 6 |
- | 7 |
- | 8 |

ATC Assumptions

It's important for both pilots and ATC to recognize (and avoid) dangerous assumptions. Click on each example below.

Assumption:

The pilot can see and avoid thunderstorms.

The aircraft has weather detection equipment.

If told to "proceed on course *when able*," the pilot will proactively avoid hazardous weather.

If told to "*deviate as necessary*," the pilot will proactively avoid hazardous weather.

Reality:

Many light GA aircraft do **not** have weather detection equipment.

Hear what you could say to help resolve this issue



Pilot Assumptions



- ✓ 1
- ✓ 2
- ✓ 3: Communicating with ATC
- ✓ 4
- Quiz

- [1]
- [2]
- [3]
- [3-4]
- [5]
- [6]
- [7]
- [8]

Pilot Assumptions

It's important for both pilots and ATC to recognize (and avoid) dangerous assumptions. Click on each example below.

Assumption:

When I'm receiving VFR flight following, ATC will keep me out of the clouds.

ATC radar displays all hazardous weather.

When I'm handed off to a new controller, he/she will provide the same services as the previous

Since ATC cleared me on course "when able." I should turn as soon as practical.

ATC told me to "deviate as necessary." The weather can't be that bad if I can avoid it on my

Reality:

As previously discussed, ATC radar has limitations that can prevent controllers from seeing all hazardous weather.

Hear what you could say to help resolve this issue 