MAXCRAFT AVIONICS LTD

Pitt Meadows Regional Airport
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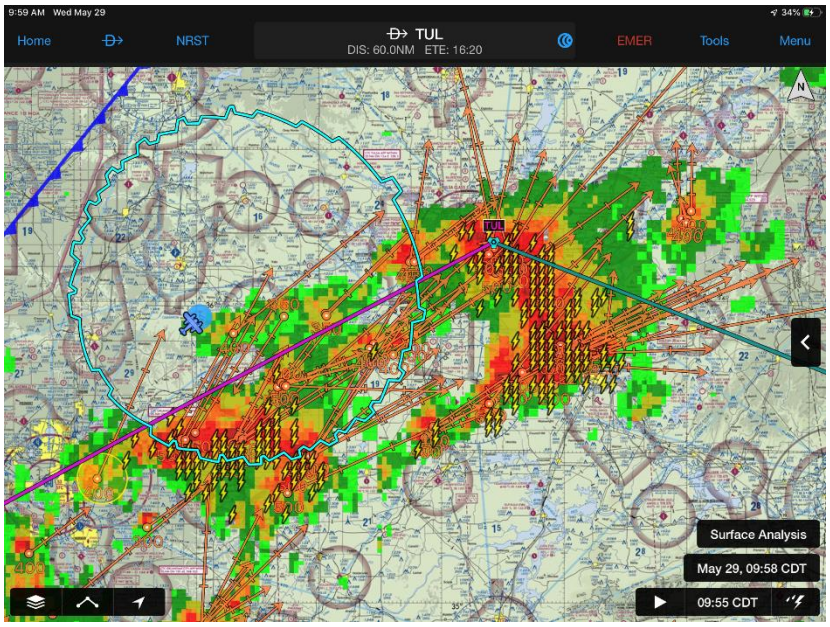
The Technical Side:
Weather in the Cockpit

We are lucky to live in the era of aviation we do and have vast amount of weather options live in the cockpit. It was considerably more difficult, and higher risk, back even 20 years ago when attempting a cross county fight. Today there many ways to get weather in the cockpit but choosing the right one can be a daunting process. Your choices will be different depending on where you fly, how fast and high you fly, your ratings, and the urgency of getting there. For example, if you are flying a corporate jet, Mr. Big in the back cabin likely has some important meetings to get to and you need the tools to reliably and safely get him there and back on schedule. On the other hand, if you are flying on a cross country with your spouse she is likely to be quite willing to stay at that resort and not push the weather to get back home!



Some nasty weather over Tulsa, OK that SXM, FIS-B, and a Stormscope helped the author deviate around

Maxcraft has been installing weather systems for many decades and as technicians and pilots we think we have some pretty good feedback to share. There is not a simple answer that can succinctly be put in an article of this size, but we will give you some guidance on the technologies and associated benefits.

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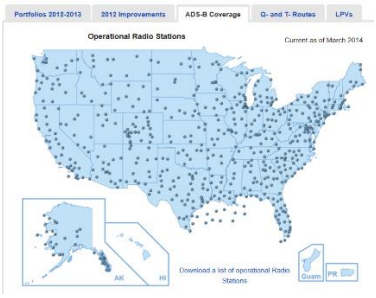
- SiriusXM Satellite Weather

  - If quality and a large selection of content is your driving factor with North American coverage, then SiriusXM is the way to go. There's no denying the satellite weather product offers a superior display to ADS-B's pixelated representation—not to mention the fact that SiriusXM has more weather products and it can be received on the ground. This product works well across North America although some of the products drop off in Northern Canada. Plans start at $30US/mth and music is an option as well.
  - There are many hardware products to receive this content and display it, from simple portable receivers that sit on the dash and display on your iPad to remote installed units with external antennas that interface to your glass panels in the aircraft. The latter can overlay on your moving map and flight plan while also showing your Stormscope and radar on the same page for much more informed picture of the weather.

- FIS-B Weather



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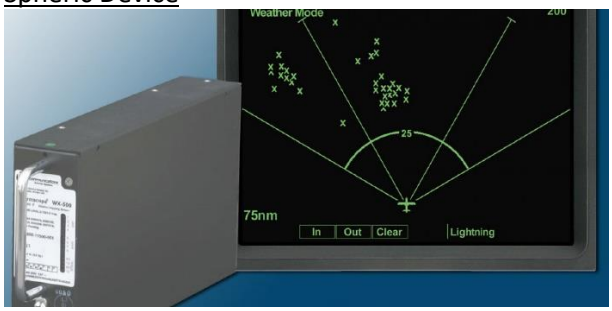
- Now let's take a closer look at FIS-B (Flight Information System-Broadcast). FIS-B weather is the ADS-B In data (in addition to traffic) that gets transmitted and received on a variety of displays, both portable and panel mounted. The list of weather products is lengthy, from aeronautical information data from the FAA to graphical weather products from the National Weather Service. There's AIRMETs, Convective SIGMETs, SIGMETs, METARs, SPECIs, national and regional NEXRAD radar, NOTAMs, PIREPs, SUA status, TAFs, amended TAFs, and winds and temps aloft. Newly added products include lightning, turbulence, icing, clouds tops, graphical AIRMETs and center weather advisories. That's a lot of data to get for "free."
- A caveat or two: Unless you're positioned within direct shot of the ADS-B ground station, you might not receive weather data until airborne. Important to note is this product is only available while flying in the U.S.

- <u>Spheric Device</u>



- Stormscope Weather Mapping Systems like the WX-500, were the first airborne instruments developed specifically to detect and map thunderstorms by analyzing the radiated signals of electrical discharges from storm cells. During the cumulus stage of a thunderstorm, storm cells are usually precipitation-free, and weather radar is unable to show activity. A Stormscope, by detecting the electrical activity already present as the storm builds, provides an accurate view of areas that should be avoided.
- The Stormscope WX500 is a remote mounted box that interfaces to many glass panels.

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- Internet weather

  - If you are lucky enough to have an onboard connectivity solution with Gogo Avance, Garmin GSR56, or similar, than this is a very good choice to get some near real time weather.
  - Some pilots report that if they are low enough, they can pick up cell-based internet but this is problematic as the reception cannot be guaranteed.

- Radar Systems

  - An onboard weather radar system detects precipitation intensity which is associated with convective activity. It will give you real time prevailing weather conditions for accurate decision making.
  - Older systems used a magnetron tube that wears out and is costly to repair.
  - Newer digital dishes are not only reliable, but they have more processing in them that removes some of the art on how to use and interpret radar images.

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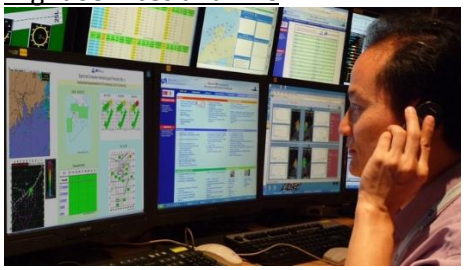
Vertical scan capabilities now allow pilots to focus on storm gradients and storm cell build-up at various altitudes. Doppler options enable turbulence detection.

- Flight Services and ATC



  - I'm surprised how often this channel is overlooked. Flight services will bend over backwards to keep you out of bad weather. If the weather is dropping, just listening on with ATC will keep you informed as they are working with other pilots all with the same challenge.

- Your Window!

  - It may seem silly to mention this but a seasoned pilot can tell plenty of what the weather trend is doing having flown the same route many times over. A good example of this is seasoned "Coast Dog" floatplane pilots who know the local weather up the west coast and how it changes.