The initial (cumulus) stage of Cb development involves updrafts only. Turbulence is light to moderate and most other Cb hazards won't have materialised, although light rain is possible during this stage.

"There is, however, one hazard that may become severe during this stage," says Greg. "And that's airframe icing due to the large super-cooled liquid water droplets being carried aloft into the cloud by the updrafts."

In the mature stage, all the hazards associated with thunderstorms may now exist. At this stage, there will be heavy precipitation at the surface and an anvil will start to form at the top of the cloud.

Once the anvil starts to become glaciated, the Cb has entered its final stage.

"At this point the updrafts cease and the hazards quickly weaken and disappear, often leaving only the anvil behind. This remaining cloud is benign," says Greg.

"Each stage lasts about half an hour, so the total life cycle of an upright, stationary Cb is around 1.5 to 2 hours. However, a thunderstorm rarely forms in isolation. There are usually others in the vicinity at different stages in their life cycles."

Don't Be Afraid to Turn Back

If you get caught en route, and can't fly around a thunderstorm, then either turn around, or land at an alternative aerodrome until the storm passes.

"And thanks to your earlier good planning, you'll have plenty of fuel to get to your alternate aerodrome," says Peter Lechner.

"If the storm is over your destination aerodrome, then hold off, or divert."

Greg Reeve adds, "While many aircraft have been successfully flown through thunderstorms in New Zealand and overseas, there is also a very large number of aircraft that have crashed during the attempt. The MetService's advice is simple: Avoid! Avoid! Avoid!"

Check the Weather

Log in free to Metflight GA to get up-to-date weather information so you can avoid thunderstorms and other weather nasties. ■

Progress on **ADS-B**

The New Southern Sky project of shifting aircraft flying in controlled airspace to ADS-B is moving quickly. Here's an update.

If you're a regular reader of *Vector*, you'll already know that New Zealand's ageing radar systems will have reached the end of their useful lives by 2021, and are to be replaced with ADS-B (Automatic Dependent Surveillance – Broadcast) technology.

ADS-B will transmit more information more often from each aircraft to air traffic controllers, allowing them a more complete picture of who is doing what in controlled airspace.

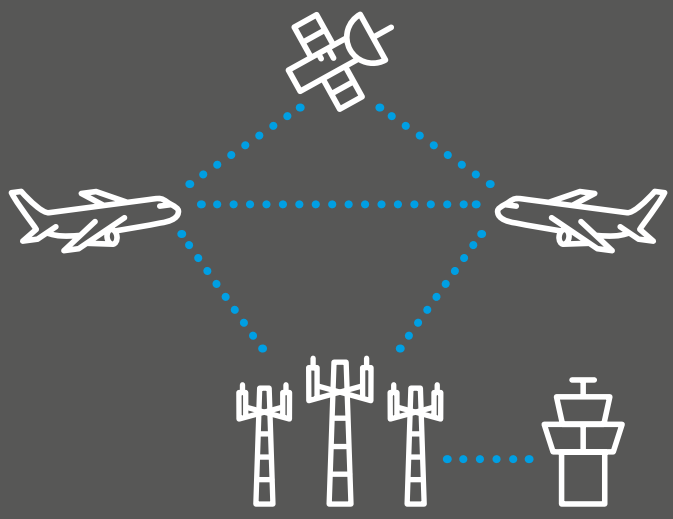
If you fly in controlled airspace, we suggest you read the new FAQs page at www.nss.govt.nz, "Guidance and Advice". It covers everything from the whats and whys of ADS-B through to installation and operational requirements, and offers advice on what to do if you want to equip now.

The CAA is developing a discussion document going out for public feedback in 2017 on the proposed ADS-B mandate for all controlled airspace below FL 245 from 31 December 2021.

The discussion document will consider options for reducing costs as much as possible for General Aviation, and examine the implications for operators with unique concerns, such as gliders, and other aircraft with size, weight, and electronic restrictions.

Airways recently signed a contract with a French company, Thales, to install ground equipment for the $12 million ADS-B network. Installation work will begin in early 2017.

Cabinet has agreed on the publication of a Notice of Proposed Rule Making (NPRM) for a rule requiring all aircraft flying above FL 245 to be equipped with operational ADS-B from 31 December 2018. If you want your say on the NPRM and associated Advisory Circular, register with our email notification service at www.caa.govt.nz/subscribe. ■



An on-board transponder broadcasts an aircraft's position, altitude, and velocity directly to air traffic control. Richer and more accurate information than that from current transponder systems means more efficient traffic management and improved safety.