ADSB

As you may or may not be aware, PGL has its first real 21st Century piece of kit – a new transponder. There are a couple of things this new one should do that the old one couldn't, the first being to correctly display altitude to ATS without a 400 ft error. The other new feature is that it is a Mode S transponder, which means ADS-B OUT.

What is ADSB?

Automatic Dependent Surveillance-Broadcast (ADSB) is a system that allows an aircraft to transmit information to ATS and other aircraft. It's basically a way of spreading surveillance services across more of the country without having to put ATC radar sites everywhere.

- Automatic – the pilot doesn't need to do anything (other than turn the equipment on);
- Dependent – on having the right equipment, which means barometric (ie. altitude) encoding and GNSS input;
- Surveillance – an enhancement to traditional radar surveillance;
- Broadcast – your information is broadcast to ATS and other suitably equipped aircraft.

Your aircraft may have ADS-B OUT and ADS-B IN, or just ADS-B OUT, which is what PGL has. ADS-B OUT means you're broadcasting your position. ADS-B IN means you have ADS-B OUT, as well as a display that will show ADS-B OUT information from other aircraft, which generally means you have a full glass cockpit.

Your ADS-B position is GNSS-based, which means the unit will know where it is anywhere in Australia. But to be of use to ATS and other aircraft, you need to be within range of an ADS-B ground station. If you are, your transponder broadcasts to the ground station network which, combined with radar, provides Australia-wide coverage above 30,000 feet, and significant coverage at the levels we fly at. The information is available to ATS and to aircraft equipped with ADS-B IN.

ADS-B transmits twice per second on 1090 MHz, which is in the UHF band. The information broadcast includes aircraft ID, position, altitude, velocity and vertical speed.

The benefits

Many of the benefits are to IFR aircraft, including:

- Position reports are not required if your aircraft is suitably equipped;
- Greater ability for ATS to approve requested routes or flight levels, which can increase efficiency and reduce fuel burn, for instance by allowing aircraft to climb to optimum cruising levels with less chance of being delayed in doing so by other traffic;
- Ability to reduce separation, which means higher volumes of traffic without a reduction in safety;
- A radar service in airspace that previously only had procedural coverage.

If you're buzzing around at 3000 ft near Northam with your transponder on, you'll show up on Melbourne Centre's screen, but with a Mode C transponder you won't show up at 3000 ft over, say, Meekatharra or Newman. The coverage of ADS-B ground stations means that with a Mode S transponder you will show up at many of those more remote locations.

On that topic, ADS-B is a big benefit up north. In recent times a lot of mining companies have decided it's practical to have airstrips at their mines. It's more convenient for a company to fly workers straight to Yandi or West Angelas than to fly them to Newman and put them on a bus for two hours to site. That increase in air traffic has meant a greater need for surveillance, and in the absence of wide radar coverage down low, ADS-B provides extra situational awareness and improved safety.

What ATS sees

If you're within primary radar coverage, ATS will have two dots for you on their screen – the primary radar paint, and the GPS position being transmitted by your transponder. If you're out of radar coverage but within range of an ADS-B ground station, your aircraft ID, GPS position and tracking will be displayed on the ATS screen just as if you were within normal radar coverage, which means ATS can provide a better service than if they were relying on position reports.

The flight identification (FLTID) is pre-programmed into the ADS-B unit, and allows a target on a display to be linked to the relevant flight plan. However, if you're entering radar-controlled CTA, you'll still be given a discrete transponder code to squawk.

What other pilots see

If an aircraft is equipped with ADS-B IN, and you're both within coverage of a ground station, you'll appear as a target on their Navigation Display, which is the same display that will show Traffic Collision and Avoidance System (TCAS) information. Because an aircraft display is smaller than an ATS radar display, to avoid cluttering up the screen, you appear just as a dot, with no aircraft ID. That means it's just as important as ever to talk to each other to increase situational awareness.

For the 737 or Fokker 100 pilot competing with you for airspace, TCAS only shows you when you're within about 50 seconds. ADS-B IN has an advantage in that it will show you sooner than that because it's based on knowing you're there, not just on whether you're a potential conflict. That enhances situational awareness for the pilots with ADS-B IN.

What you need to do

In the Surveillance section of an ICAO Flight Notification, you select:

- E-Mode S with ID, Alt and ADS-B, and
- B1-ADS-B OUT 1090 MHz.

This displays as EB1 in the notification.

And apart from putting the right code in the right spot if you're submitting a Flight Notification, all you need to do is turn the transponder on to ALT.

Happy flying, and don't forget your line-up checks include strobes, ALT on the nice new Mode S transponder, plus the other item that's missing on the checklist in PGL – your take-off safety brief. That's not the pax brief; that's the "If anything goes wrong on take-off" brief.

Note: Thanks to Dave Kerr for his expert advice on the use of ADS-B IN.