

## How Low Can You Go?

If you only fly VFR by day, your low flying rules are pretty simple – 1000 ft over houses and 500 ft anywhere else, with some exceptions such as, obviously, taking off and landing. But you don't need to go to the trouble of working out a lowest safe altitude to stay clear of obstacles, because you can see and avoid them. It's when you're planning to fly at night or in cloud that you need to think more carefully about how to avoid the cumulonimbus clouds. That means knowing your Lowest Safe Altitude, or LSALT. (Some pilots call it "Low Salt", which is a diet, not an altitude. Most of us just say Lowest Safe.)

## The area to consider

The basic idea when calculating LSALT is to define an area that allows for you being a bit off track, determine the highest thing in that area that you could hit, whether it's the ground or something tall and man-made, and plan to be at least 1000 feet above it.

AIP GEN 3.3-4 describes the area that an IFR pilot has to consider. If you have the engineering brain of a Howie Pietersie, a Dave Beech or our late friend Dave Rose, you can probably make sense of the waffle in AIP. Otherwise, have a look at the diagrams in the "VFR Guide under Night VFR – Lowest Safe Altitude". Thankfully, for night VFR pilots, the simplest option is pretty simple – 10 nm either side of your planned track.

## LSALT published on charts

IFR pilots flying on published routes have it fairly easy because all the calculating is already done for them. For instance, on the attached extract from Enroute Chart (Low) No. 8, on the route from Albany to HOODY, LSALT is 3300 ft heading east and 4700 ft heading west. They're different figures because the areas being considered are different; basically the assumption is that you can stay on track more accurately heading out of Albany via the NDB than heading east from HOODY.



## Grid LSALT

Grid LSALT is another easy option. If you're satisfied that you're somewhere in a grid that's 1° by 1° area, you can use the published figure in green in the middle of the grid. In the grid just north of Albany, it's an unusually high LSALT for WA of 5100 ft, thanks to Bluff Knoll. Grid LSALT is useful if you divert, especially on a NVFR flight test, in which failure to recalculate LSALT on a diversion is an excellent (guaranteed at RACWA) way to fail.

Speaking of unusually high, one thing IFR pilots don't have to contend with very much in WA is LSALT being above the freezing level. If you're over east and flying around the high country, your LSALT may be anything up to 8400 ft, so you're planning to be up at 9000 ft or higher. If the freezing level is, say, 4000 ft, you know that if you're in cloud you're going to ice up. So if you're flying from, say, Bankstown to Essendon on a winter night, you may plan via Albury instead of direct, because the LSALTs aren't quite as high.

## The highest ground or obstacle

The first thing to look for in your area of interest is the highest ground. For instance, if the highest contour line in your area on the WAC is 1640 ft, and the highest spot height within that contour is 2884 ft, you can assume the highest ground is 2884 ft, or you can be conservative and assume not every spot height is marked, and there could be ground almost as high as the next contour height, which is 3280 ft. Like many others, I prefer the conservative option.

Then you apply the rule buried in the arcane depths of CASR 139.365, which says that if you build a structure taller than 110 metres (360 ft) high, you have to tell CASA. What that means for LSALT is that there may be a tower 110 metres high that the builder hasn't told CASA about because he doesn't have to. So on top of the highest ground, you assume there's a structure 360 ft high, and in the above case you add 3280 ft (highest ground), plus 360 ft (highest possible unknown structure), plus 1000 ft. Your LSALT would then be 4640 ft, which you round up to 4700 ft.

So usually you'll decide what the highest terrain is, and add 1360 ft. The less common scenario is when there's an obstacle more than 360 ft above the highest terrain. For example, you've worked out that the highest possible terrain is 3280 ft. Then you see a tower marked "3800 (700)" on the chart. You know there's nothing higher than that, because any tower higher than 3800 ft would have to be at least 520 ft (3800 – 3280) above the ground, and as per CASR 139.365, CASA would know about it and it would be on the chart. In this case, you just add 1000 ft, and get a LSALT of 4800 ft.

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## NVFR: when can you fly below LSALT?

For a NVFR pilot, it's pretty easy. The only times you're allowed to be below LSALT are:

1. Climbing after departure;
2. When you're within 3 nm of your destination and you have the aerodrome in sight (At most aerodromes you see the lights first, then wait until you're within 3 nm, whereas at Northam, where the lights are about as bright as a scented candle in a New Age shop, the 3 nm is bound to come first);
3. When you're under radar control (the AIP says 'when being vectored', which is not quite the same thing: if you're radar identified and the controller tells you to track direct to the aerodrome, that's not a vector, but it's still radar control, and you can descend to whatever height he/she clears you to).

A practical thing to remember about Point 2 is that you can't descend below LSALT until within 3 nm, but that doesn't mean you can't descend. If you're up at 7500 ft and your LSALT is 3000 ft, you might start your descent more or less at the same place you'd do it by day; you just can't go below 3000 ft until you're within 3 nm.

## IFR: when can you fly below LSALT?

When can an IFR pilot fly below LSALT? Same as Points 1 and 3 above, plus when doing an instrument approach (obviously). And there's one other circumstance – VMC by day. That could happen in a scenario like this: you plan to fly IFR from Albany to Northam. You work out a LSALT of 3800 ft. You ring your mate Ashley at Northam, and he tells you he's just been flying and the cloud is overcast at 3000 ft. You know Northam doesn't have an instrument approach, so you know if you climb above LSALT and get into the cloud, you probably won't be able to get out of it over Northam. Solution: don't get into the cloud in the first place. Fly under it, and under LSALT, all the way.

So in that case, why not go VFR? Of course you can, but the benefits of staying IFR are firstly, that Flight Service is obliged to do more for you, such as giving you traffic information, and secondly, you don't have a SARTIME. Under IFR you're reporting every so often, including a departure report from Albany, and if you don't report within a couple of minutes of your expected time, they'll start looking for you straight away. So if you crash after take-off from Albany, they're trying to call you within a couple of minutes, rather than at a SARTIME which may be an hour after your ETA at Northam.

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