



Jump Flying and Spotting with a GPS

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Four years ago when I found my first gig flying a 182 jump plane, I had a fairly vague idea regarding the job and what it's all about. Get in the plane, bring these people to 12,000ft over the drop zone and let them jump out, then come back down and do it all over again. Not much to it, right? Well it turns out I was wrong. With the exception of the actual hands on flying part (which I was still learning, being a 250hr wonder) most of what I was doing was new to me... I still had a lot to learn! Hopefully this article will shed some light on a couple questions that seem to come up frequently.

An important and very handy tool at the drop zone for both pilots and jumpers are the forecast winds, which are published by the Australian Government's Bureau of Meteorology, or BOM for short. The forecast is available via fax, telephone or online and they are updated at regular intervals 24 hours a day. To get to their website, you can use this address, <http://www.bom.gov.au/aviation/forecasts/arfor/> or Google "Australian aviation weather" and click on the first link. From there you can select Aviation forecast on the left of the page, then Area Forecast (ARFOR), then select the appropriate region which applies to your drop zone. The winds are always given in the same format, in degrees true and knots (nautical miles per hour, or 1.85 km/h)

In the example below, the wind at 2,000ft would be forecast at 110 degrees true at 15 knots, at 5,000ft it would be 120 degrees true at 15 knots and at 10,000ft, 130 degrees at 15 knots, and the temperature will be plus 8 degrees Celsius (PS08, which is included in the forecast at the 10,000ft altitude and above). The forecast is surprisingly accurate and a rough jump run can usually be discussed with the DZSO prior to the first load.

On the way to height during the first load of the day, the pilot will confirm that the forecast is accurate. He/she will make a series of "S" turns or possibly a 360 degree turn or two usually at opening height, somewhere at a mid level altitude, and maybe again closer to jump altitude. During these maneuvers we note the ground speed displayed on the GPS. Reference the forecast above, at 5,000ft during a right turn from East (090 degrees) through South (180 degrees) the pilot notes their initial ground speed of 90 knots dropping to a low of 70 knots somewhere around 120 degrees, and then as the turn progresses the groundspeed starts to rise again. You can bet your last dollar that the wind is coming out of the south-east, or about 120 degrees. To get the wind speed, we need to take the difference between the highest and lowest ground speed and divide by two. In this example, they will continue the right hand

turn to a heading opposite of 120 degrees (our wind direction) producing a direct tail wind and therefore giving us our highest ground speed. If that happened to be 110 knots, we would note a difference of 40 knots, divide that by two and the answer we get, 20 knots, is our wind speed. Once the forecast has been assessed on the way to height, the pilot/load master/DZSO can decide on a spot that suits the particular load. In this case, if you happened to be in a 182 with a tandem and a 2-way, the ideal run-in direction would be close to 120 degrees and we would have the door open over the top. By the time the 2-way climbs out and exits, the plane will travel another 0.1 or 0.2 nautical miles putting the load slightly upwind of the target on deployment.

AMD OVERVIEW:

ISOLATED THUNDERSTORMS WEST OF KERIN/YCRY AFTER 00Z AND ALSO NORTH OF YHID. ISOLATED SHOWERS. ISOLATED SMOKE OVER LAND, LOCALLY THICK NEAR FIRES.

WIND:

2000	5000	7000	10000	14000	18500
110/15	120/15	120/15	130/15 PS08	140/10 PS03	180/10 MS03

REMARKS: WINDS NE OF YMBA/CARDO 10-15KT STRONGER AT AND BETWEEN 3000 AND 10000FT.

CLOUD:

ISOL CB 4000/38000 OVER LAND W OF KERIN/YCRY AFTER 00Z AND ALSO N OF YHID

BKN ST 1000/2000 IN PRECIPITATION

SCT CU 2000/10000, BASE 4000 INLAND, BKN WITH ISOL TOPS TO 20000 WITH SHRA

SCT SC 4000/10000

BKN AC AS ABOVE 10000 WITH CB.

Another item that comes up a fair bit is the GPS. I would take a guess that most of the commercial drop zones in Australia are now using it as a primary means of spotting. It allows for very accurate jump runs and gives pilots the ability to adjust the spot by 0.01 nautical miles (that's just short of 20m!). In addition, it also takes away the unpredictability of visual spotting. You can imagine trying to spot for a caravan load with seven or eight exits. An experienced jumper may get it right the very first time, however on the next load someone who has a different idea on how to spot could possibly put the load up to a mile short or past the ideal!

There are many different units and models of GPSs. With each model the pilot also has the ability to adjust the information on the display to what he/she feels necessary. Most GPS units in jump planes will indicate at least your ground speed (not to be confused with air speed), distance in nautical miles, as well as a bearing to the drop zone and the current track (aircraft heading plus or minus wind drift) you are flying. These will usually be under the headings of "GS", "DIS", "BRG" and "TRK" respectively. Fancier units will have additional information such as your distance either side of the desired track (jump run). Again, all this information may be displayed differently or not at all. Most of the time it's best to ask your pilot, especially if you are not familiar with the GPS.

In the GPS image below the aircraft is 2.38 nautical miles (4.4km) from the drop zone with a ground speed of 111 knots (205km/h). It is flying on a track of 139 degrees and the drop zone is at a bearing of 102 degrees (37 degrees to the left of our current track).



After the three-minute call, the pilot needs to get established on jump run and this is where GPS earns its keep. Everyone will have their own routine, however in general we try to keep steep turns to a minimum. Personally I like to be on jump run at about the one minute call, that way no turning is necessary when jumpers are moving about preparing to exit. In the photo above, the jump run that day was 090 degrees (which is represented on the display as the purple line) and we had the door open at 0.3 nautical miles past the dz. We will be established on jump run when the bearing (BRG) to the drop zone and the track (TRK) we are currently flying both match up with our selected jump run of 090 degrees. In this case, as

we get closer to jump run (that purple line), the bearing will reduce from 102 to 90 degrees and the track of 139 degrees will do the same assuming the pilot started their left turn in time to intercept the track.

Depending on where your drop zone is, Air Traffic Control (ATC) can play a big part in how smoothly the operation is run. Generally, the closer you are to large airports, the more input is needed by ATC to confirm acceptable levels of safety between air traffic. From the controllers' point of view, it's kind of like the game Frogger (www.frogger.net if you're not familiar with it). We need to cross 14 lanes of traffic to get back home, but this time instead of a frog sorting its way through pixilated cars and buses, ATC needs to sort out a path for us humans through lanes of jets and other general air traffic! To accomplish this, they can impose altitude restrictions or time restrictions, put us on hold, or not provide a clearance at all. It is frustrating at times, especially if you are put on hold and can't see a plane anywhere. One thing I do know for sure is that ATC doesn't just deny clearances or put us on hold for fun. There is always a reason.

You also may have noticed from time to time that your standard "Three Minutes!" call isn't really three minutes at all and may barely measure up to two minutes. More often than not the pilot has been given a clearance requiring them to be jumpers away and on descent by a certain time otherwise a lengthy hold will result. Of course, if you are not ready to jump then don't jump!

On that note, I will leave you with a few do's and don'ts that will keep your pilots happy. We all have our own pet peeves but in general:

- In smaller Cessna type aircraft such as 182s and 185s, try and keep movement to a minimum prior to the three-minute call. Every time the weight shifts in the airplane, we need to re-trim for the new weight position. After five or six loads on a hot Saturday afternoon, this gets a bit annoying.
- After the three-minute call, we get quite busy with radio calls to ATC, other aircraft operating in the vicinity of the drop zone and ground crew. Questions like "what are the winds doing", "what's the spot", and "hey are you coming to the pub after work for tea" should have been asked much earlier.
- Be very aware of the fuel selector particularly in the Cessna 185. It is easy to nudge the pointer into the "Off" position without knowing it.

- Two things you can't remind us enough about would be to hold the brakes on exit (Cessna 182s without the step) and to slow the descent rate after a no-jump to avoid all the AADs firing.
- A cold beer after a busy day is always welcome!

Hopefully this will answer a few commonly asked questions about GPS and jump flying. Most pilots are eager to offer some insight into the flying side of things, so if you are a bit curious about how things are done or why they are done a certain way, don't hesitate to ask!