

GT-2A Gravimeter Repeat Line Example

The Gravimetric Technologies GT-2A (Figure 1) is a 3-axis, inertial stabilised airborne gravimeter, and is capable of acquiring data under turbulent conditions in either a fixed elevation or a loose drape flying mode.



Figure 1. GT-2A Gravimeter installed in the survey aircraft

In mid-2021, as part of a GT-2A system performance verification, repeat line data were acquired on three separate flights in both fixed elevation and loose drape mode. The repeat line data are presented following in Figure 2, and a statistical summary of these data are presented in Table 1.

The upper frame of Figure 2 shows the processed 100 second Free-Air Anomaly profiles (normalised), and the average of all the repeat line profiles.

The lower Figure 2 frame shows the terrain profile along the repeat line, and the planned flying height for fixed elevation passes and draped elevation passes.

Root Mean Square (RMS) noise levels have been calculated using the method of Green and Lane (2003), and are presented in Table 1.

Flying conditions over the three flights ranged from generally calm to very turbulent. Consistency in the repeatability statistical analysis provides confidence in the GT-2A performance under a range of flying conditions.

An indication of the turbulence levels encountered along each flown line was generated by calculating the RMS of 2 Hz GPS-derived vertical accelerations in a 300 second moving window. The maximum RMS along each pass is reported in Table 1.

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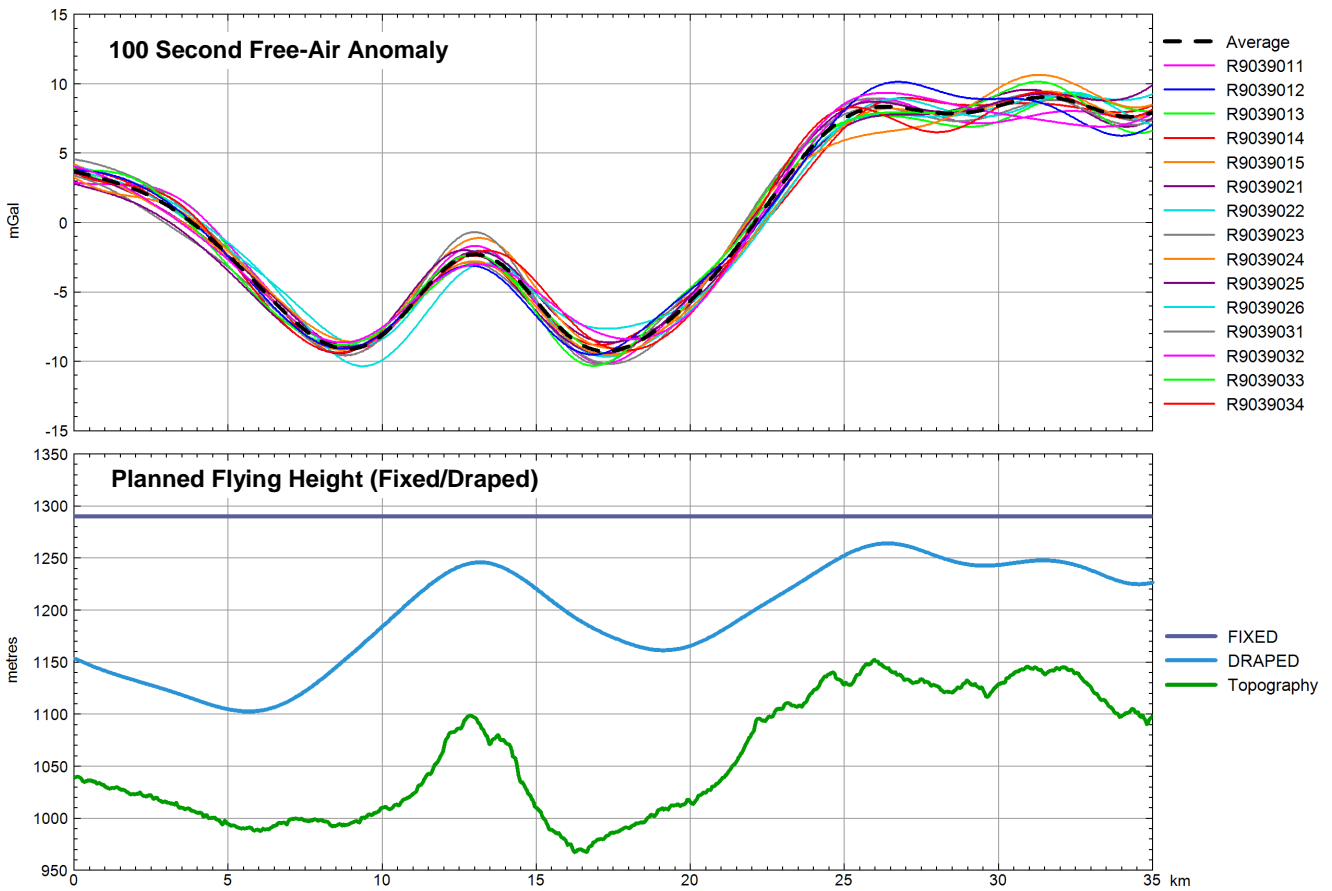


Figure 2. Free-air anomaly profiles and topography height with planned flying elevations

Line No.	Survey Height Mode Fixed/Draped	Turbulence Max. Vertical Acceleration (RMS) mGal	Repeatability Deviation from Mean (RMS) mGal
9039011	Fixed	60,598	0.74
9039012	Fixed	61,159	0.72
9039013	Fixed	86,687	0.55
9039014	Fixed	73,325	0.69
9039015	Fixed	80,446	0.82
9039021	Draped	33,727	0.71
9039022	Draped	31,611	0.90
9039023	Draped	34,282	0.73
9039024	Draped	35,495	0.56
9039025	Fixed	26,620	0.43
9039026	Fixed	37,234	0.57
9039031	Draped	25,506	0.60
9039032	Draped	28,050	0.57
9039033	Fixed	26,226	0.57
9039034	Fixed	28,031	0.50
Average RMS			0.64

Table 1. Repeat line summary statistics