

"Insight through Innovation"

GT-2A Airborne Gravimeter

The GT-2A gravimeter is an airborne gravimeter with improvements developed following seven years of operational experience with the GT-1A. All Transparent Earth Geophysics' GT-2A gravimeters also use our improved Thermal Stabilisation System, and the Mk.III(A) Shock-Mount and Restraint System (STC approved).

Improvements on the GT-1A:

- Mk.III(A) Shock-Mount and Restraint System
- Greatly improved thermal stabilisation
- 8 hours battery back-up
- Can be operated remotely
- Increased sensitivity
- Increased precision
- Wider dynamic range

Advantages:

- Reliable performance in high turbulence
- High productivity
- Aircraft-independent operations
- Fully automated recording
- Remote or in-field Quality Control
- Remote or in-field production of preliminary gravity products



TEG Shock-Mount
with battery back-up



The large dynamic range provides high precision data even in turbulent flying conditions. Data are acquired through short periods of saturation in high turbulence by the automatic application of a reduced order Kalman filter, enabling platform misalignment to be computed and hence controlled.

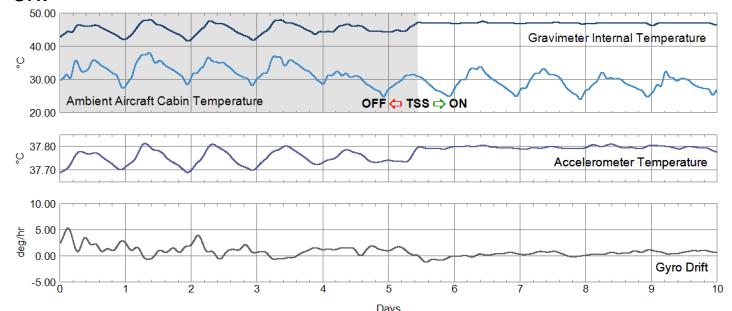
The automatic calibration program computes accelerometer scale factors and errors in perpendicularity between the accelerometer sensitive axis and the platform surface.

The GT-2A is sealed for protection when operating in environmental extremes. Short lead-ins improve survey efficiency and reduce costs. Filters depend on aircraft speed and flight conditions and provide spatial resolution typically ranging from 1.2 km to 3.5 km.

The graph on the right shows results from the first field trial of the GT-2A Thermal Stabilisation System (the GT-2A TSS). The data were collected over a 10 day period while the gravimeter was installed in an aircraft and operating 2 flights a day. The TSS was functional from day 6 onwards.

For the first 5 days with the TSS off, the Gravimeter Internal Temperature and the (external) Accelerometer Temperature both closely track the ambient temperature. The Gyro Drift does not track the ambient temperature in the same period, but it does vary quite significantly. Once the TSS is operational, the standard deviation of the Gravimeter Internal Temperature shows a dramatic stabilisation, with the standard deviation reducing from 1.54 to 0.16.

The standard deviation of the Gyro Drift reduces from 1.08, to 0.5, and the Accelerometer Temperature standard deviation reduces by a factor of 3 after the TSS is turned on.





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Specifications:

Measurement range	9.75 to 9.85 m/s ²	Sensor noise floor	< 0.2 mGal RMS
Dynamic range	> ± 1,000 Gals	RMS error in gravity anomaly estimation Repeat Line	
Drift per day (corrected)	< 0.1 mGal		0.01 Hz cut-off = 0.6 mGal (± 1 LSD*)
Attitude limits		Power	
Roll & Pitch	± 45°	Input (AC)	88 - 264 V, 44 - 66 Hz
Operating temperature (with TSS)	-10°C to +50°C	Input (DC)	22 - 30 V
Dimensions		Operating (standard)	150 W
Sensor	400 x 400 x 600 mm	Standby	50 W
Shock mount & rotation table	600 x 600 x 330 mm	Service life	30,000 hours
Installation weight (as pictured)	172.2 kg		
* Least significant digit Specifications subject to change		Gravimetric Technologies: Manufacturer of the GT-2A Canadian Micro Gravity Ltd: GT-2A exclusive distributor	

The Equipment (GT-2A and Accessories):

- Main Sensor Unit
- Uninterruptible Power Supply
- Industrial data acquisition PC for operating the gravimeter and recording the data
- Rover and Base GPS receivers and antennae
- Software to operate the gravimeter and record the data
- Software for post-processing GPS and gravimeter data
- All required cables
- Shipping cases

Survey Constraints:

RMS error in gravity anomaly estimation is under the following conditions:

- Vertical acceleration ± 1.0 g
 - Correct installation of the gravimeter and the Rover GPS antenna
 - Dual frequency GPS receivers acquiring data at 2 Hz or 10 Hz
 - Minimum 6 visible satellites
 - PDOP < 2.5, and baseline < 100 km *
- * TEG has proven survey specifications can be met with GPS base lines in excess of 500 km, depending on the satellite constellation

