

Bell Aerospace Marine Gravity Meter System BGM-3

The BGM-3 is a third generation, stabilized gravity meter whose design is based on the highly successful BGM-1 and BGM-2. Over 700,000 hours of reliable shipboard operation have been logged on the BGM-2 and over 30,000 hours on the BGM-3, attesting to the success of the second and third generation production systems.

Bell Aerospace Textron has been recognized as having advanced the state of the art in gravity measurement technology. The initial Bell Gravimeter BGM-1, proved the concept that the use of an inertial grade accelerometer could significantly improve the accuracy of shipboard gravity measurement. Other concepts that were also proven are low-cost stable platforms improves performance over gimbal systems and digital filtering with real-time readout in milligals reduces operator data reduction time.



The Bell BGM-3 Gravity System

The Bell gravity meters have been specifically designed to make precision measurements in a high motion environment. Precision gravity measurements are attained by the use of the highly accurate Bell Aerospace Model XI inertial grade accelerometer.

Gravity meter improvements in this system center around the gravity sensor subsystem, reducing the system drift, minimising the number of ovens required for temperature control and eliminating the system susceptibility to indefinite power interruption. The sensor subsystem incorporates the proven results of the in-house efforts to date.

The system is designed to be operated and maintained under adverse environmental conditions at remote locations by technician grade personnel.

Additional features which facilitate maintenance and servicing of the equipment include the following:

1. System monitors, provide a fail-safe capability, shutting down critical circuits to prevent secondary failures.
2. Self-test circuits enable the operator to determine rapidly the status of major subsystems.
3. Extensive use is made of built-in test circuits and accessible test points to isolate failures to a replaceable element.
4. Modular construction is used whenever practicable to facilitate rapid field replacement of defective elements without adjustment.
5. Highly reliable circuits and components are used throughout.

BELL BGM-3 TECHNICAL SPECIFICATIONS

SENSOR SPECIFICATIONS

RANGE: 978,000 -983,000 milligal
 DRIFT PREDICTABILITY: 1.2 milligal per month
 TEMPERATURE SETPOINT: 46 °C Nominal

STABILIZED PLATFORM SPECIFICATIONS

PLATFORM PITCH: ± 30 degrees
 PLATFORM ROLL: ± 45 degrees
 VERTICALITY: ± 0.1 milliradian

CONTROL SYSTEM SPECIFICATIONS

RECORDING RATE: 1 Hz
 DATA OUTPUT: Frequency Modulated Data Pulse Train
 ADDITIONAL I/O: 200 Hz Sync Pulse and DNV indicator

SYSTEM SPECIFICATIONS

ACCURACY AT SEA: 1.0 milligal
 ACCURACY IN DOCK: 0.3 milligal
 SENSITIVITY: 0.1 milligal

OPERATING TEMPERATURE: 15⁰C to 32⁰C
 STORAGE TEMPERATURE: 10⁰C to 35⁰C

POWER REQUIREMENTS:
 Stabilized Platform Subsystem 50 W (warm-up), 35 W (cont) at 117±10 VAC 60Hz
 Sensor Subsystem 235 W (peak),110 W (ave)

DIMENSIONS AND WEIGHTS	DEPTH	WIDTH	HEIGHT	WEIGHT
SENSOR ELECTRONICS	17.5 in 44 cm	19 in 48 cm	7 in 18 cm	44 Lbs 20 Kg
SENSOR ASSEMBLY	4.8 in 12 cm	6.8 in 17 cm	5.2 in 13 cm	6.6 Lbs 3 Kg
STABILIZED PLATFORM	17.5 in 44 cm	16 in 41 cm	17.5 in 44 cm	57 Lbs 26 Kg
CONTROL POWER SUPPLY	20 in 51 cm	19 in 48 cm	7 in 18 cm	29 Lbs 13 Kg
BATTERY PACK	9 in 23 cm	19 in 48 cm	7.5 in 19 cm	47 Lbs 21 Kg

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