

INTRODUCING THE FG5-X

The new state of the art
in absolute gravity measurement

Improved reliability
and accuracy

New extended free-fall
length chamber

Improved Electronic Control



FEATURES

NEW SLIM-LINE, TRANSPARENT CASING, DROPPING CHAMBER

- Extended free-fall length (35cm)
- New test mass design reduces decelerations caused by any external magnetic fields.
- Redesigned drive system, including:
 - Counter-weighted elevator to reduce mechanical recoil and air gap modulation
 - Improved microprocessor servo controller
 - Increased motor power for better tracking
 - Inline drive system to reduce horizontal accelerations (Coriolis) of test mass

NEW SYSTEM INTERFACE MODULE (SIM) PROVIDES SMALLER, LIGHTER, AND MORE ROBUST ELECTRONIC CONTROL:

- Reduces size of total electronics by two full rack units
 - Includes Dropper Controller
 - Includes Superspring Controller
 - Includes System A/D interface (eliminates NI A/D computer card)
 - Optional system leveling control
 - Includes Integrated, GPS-disciplined rubidium timing system
- also:**
- USB integration for communication with new **g**-software

Provides feedback from electronics to warn user if:

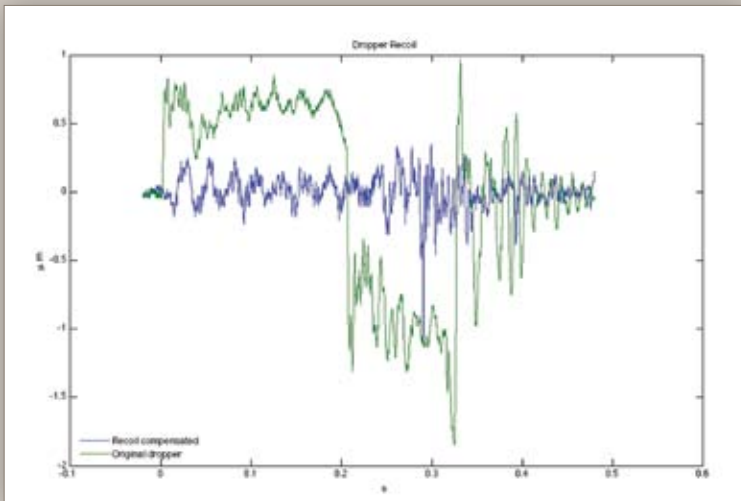
Superspring is not locked or is out of range

Dropping Chamber is not in drop mode

Remote operation of FG5-X through the internet

Upgrade path available for users of original FG5 systems!

COUNTERWEIGHTED RECOIL COMPENSATION



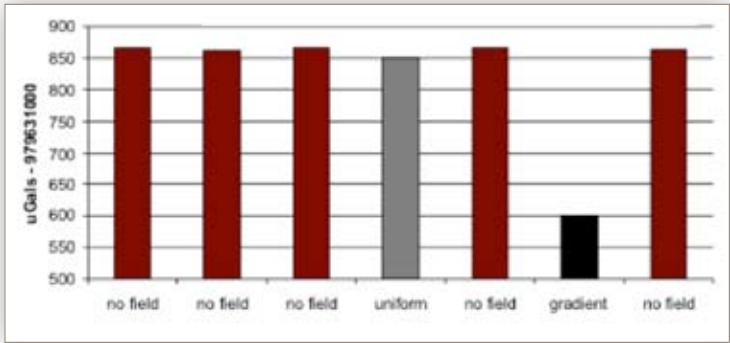
Dropping Chamber displacement as a function of time during the lift off, freefall, and deceleration of the dropped object. The green curve is plots the displacement of the original FG5 dropping chamber, and the blue curve plots that of the FG5-X system –showing a greater than 5X reduction in recoil to the system.

GREATLY REDUCED SUSCEPTIBILITY TO MAGNETIC FIELD GRADIENTS

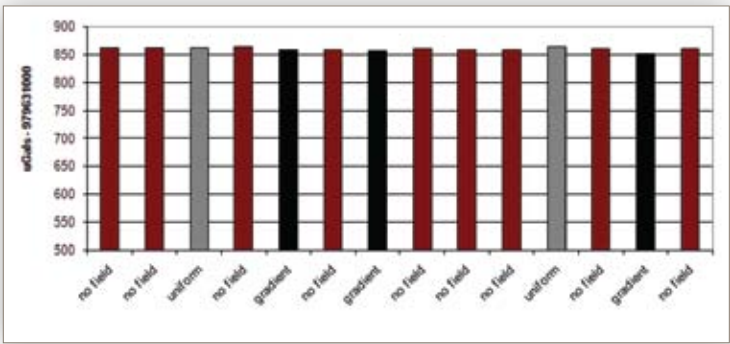
Magnetic field susceptibility test apparatus. The coil can be configured to create a magnetic field with either a uniform distribution or a large linear gradient.

A magnetic coil was used to subject the FG5(-X) test masses to varying external magnetic fields. When the applied field is non-uniform, eddy currents in the test mass of the original FG5 can cause very large offsets in the measured gravity value. The FG5-X is significantly less sensitive.

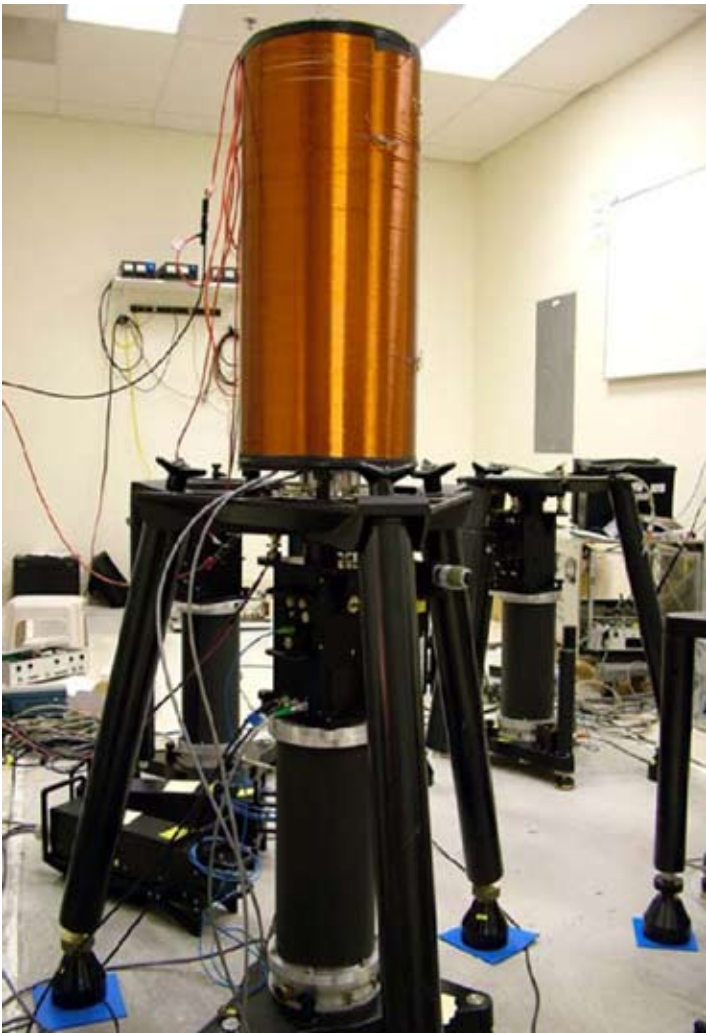
FG5 TEST MASS



FG5-X TEST MASS



MAGNETIC FIELD SUSCEPTIBILITY TEST APPARATUS



The coil can be configured to create a magnetic field with either a uniform distribution or a large linear gradient.

Extended Chamber



A view of the opened dropping chamber is shown above. The cable drive system, along with attached counter weights, is clearly visible. Note also the symmetric, on-center attachment of the cables to the cart elevator (shown here at the top of its travel). This system greatly reduces horizontal impulse to — and thus Coriolis accelerations of — the dropped object. At the lower left is the high power, robust drive motor.



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