

July 2003

## Magnetics Edition

### Special Interest Articles:

*This edition  
focuses on the  
GEM range of  
magnetometers*

- Evolutions
- Overview
- Noise Reduction
- Services
- New Mag Freeware

# Alpha Geo-News

A Newsletter produced by Alpha GeoScience Pty. Limited for customers interested in geophysical products and services

## Evolutions in Ground Magnetic Systems

Ground magnetic methods are evolving to make the survey process more efficient. The addition of [integrated GPS systems](#) for ground-based positioning speeds up surveys. One source at a major mining group indicated that they are already looking at new strategies with their ground systems. Their approach is to send in survey teams to rapidly map 25 to 50 targets on the ground, quickly interpret the results and then return to the 7 to 10 hottest prospects.

Alpha GeoInstruments not only sells GEM Magnetometer systems but also has the GEM GSM19 Overhauser system for rental. We undertake the surveys and provide training on the system by experienced qualified operators.

GEM magnetometers are a Canadian quality product that is having tremendous success all over the world. With its flexibility, ruggedness and modern design it is indeed a unique product.

## Working in Areas of 50-60 Hz Noise ? How GEM Optimises Your Results:

In magnetic surveys, sources of 50 / 60 Hz noise are derived from two sources; namely, noise picked up in the sensor coils and noise actually present in the magnetic field data. GEM users are protected from these types of noise using a measuring technique that is called "full period nullification".

The normal approach to calculating magnetic field values is to measure the number of zero crossings in the given measurement period and therefore, derive the frequency response (i.e. proportional to field). With full period nullification, GEM ensures that the measurement period includes an even number of positive and negative peaks. The net effect is that any AC noise is eliminated.

## Optically Pumped Potassium Instruments

GEM is unique as the only commercial supplier of Potassium systems -- the highest sensitivity and absolute accuracy optically pumped magnetometers available. The new GSMP-40 system extends these characteristics to the next generation of even higher performance instruments.

Major benefits of the GSMP-40 include:

- Acquisition of very high resolution and accuracy data.
- Location of very weakly magnetic objects or small-size anomalies.
- High quality results in areas with high gradients.
- Proven reliability and predictability of results.
- High sampling rates up to 20 times per second

## An overview of GEM Magnetometers:

GEM Advanced Magnetometers has been in business providing quality magnetometers and gradiometers to professionals in the earth sciences for more than 2 decades. In addition to quality products, GEM's focus lies in R&D – developing the latest Proton Precession, Overhauser and Potassium magnetic technologies for users around the world. The following provides a quick overview of GEM's major ground systems:

### Proton Precession Instruments

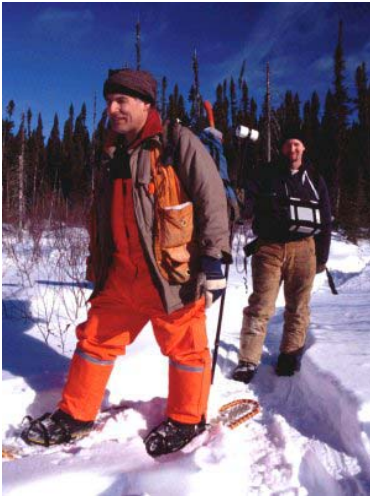
The GSM-19T also provides numerous technologies that differentiate it from other systems. For example, it is the only proton precession system with integrated GPS (optional) for high-sensitivity, accurately-positioned ground surveys. The GSM-19T also leads in sensitivity, memory, base station technology, and other key areas. A detailed list of technological enhancements is provided at:

[www.gemsys.ca/PDFDocs/Proton%20Precession%20Magnetometer.pdf](http://www.gemsys.ca/PDFDocs/Proton%20Precession%20Magnetometer.pdf)

### Overhauser Instruments

With sensitivity exceeding standard proton precession by a factor of ten and comparable to costlier optically pumped cesium units, the GSM-19 Overhauser System is a standard in many fields.

Overhauser uses radio frequency polarization to deliver high sensitivity data with no heading error. In addition to being the choice of data end-users and interpreters, the GSM-19 is also the choice of operators due to its simplicity, minimal weight & power consumption, and GPS positioning. "Clean" data, survey efficiency, and affordability will quickly confirm that you are in a class of your own for key projects and academic applications.



*"Geophysics is the art of seeing into the ground."*

## Alpha-GeoScience Rentals

Alpha Geoscience has staff and equipment available to undertake both trials and full production surveys for clients throughout Australia, New Zealand, and South-East Asia.

The equipment is the most innovative and advanced available today. The Windows processing and display software allows for ease of use, filtering, printing and data storage.

Training of staff is available and the equipment can then be rented for the project.

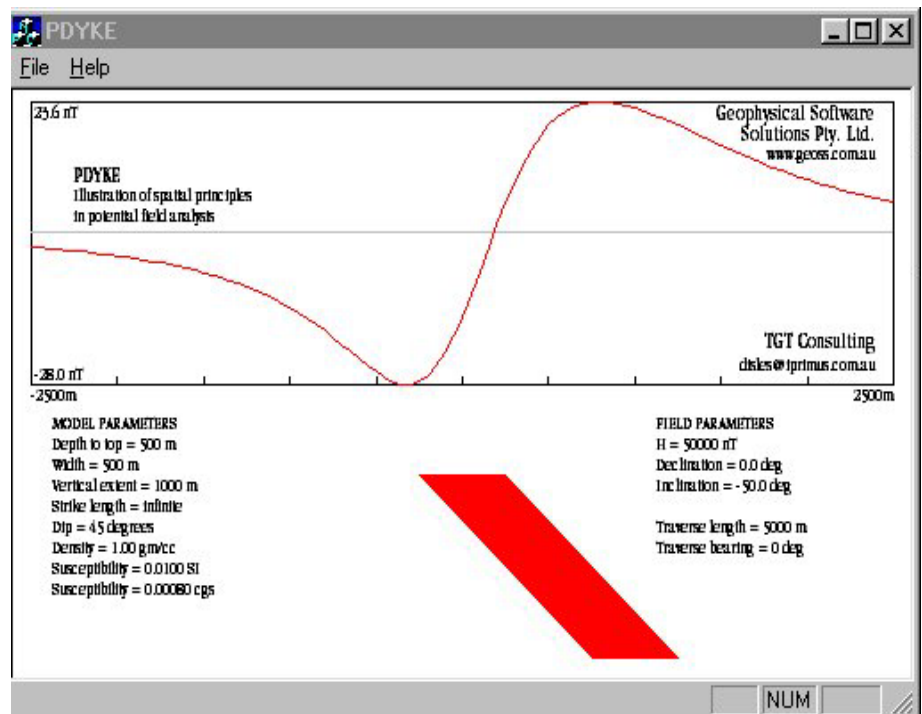
Just ask us for a competitive quote.

## New Potential Field Modeling Freeware From Geophysical Software Solutions (GSS), Canberra.

Teaching and survey professionals alike may be interested in two new handy, quick modeling software programs from [Geophysical Software Solutions](http://www.geos.com.au) of Canberra, Australia. Designed by Principal, Richard Almond and David Isles, an educationalist in Perth, the freeware includes:

- Pblock, (204 Kb) calculates the magnetic or gravity effect of a rectangular prism
- Pdyke, (204 Kb) an enhanced version that also calculates the effect of a dipping 2-D prism

In the image below, we see an example of Pdyke showing the anomaly associated with a magnetic dyke dipping at 45 degrees.



As such, **professionals** can model simple anomalies rapidly in the field as a means of checking geological hypothesis, or in the office prior to doing more detailed interpretations with other packages offered by Geophysical Software Solutions. To access your version of the freeware, click [here](#).

Both Pblock and Pdyke are bundled with GEM's magnetometer offerings as a value-added service to our clientele. They are accessible from a special "Modeling" menu in the GEMLinkW program.

Contact Alpha Geoinstruments for details on any article in this issue!

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