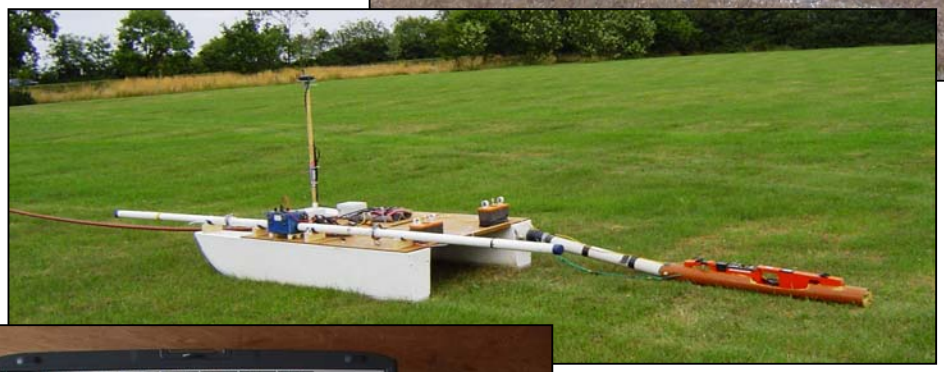
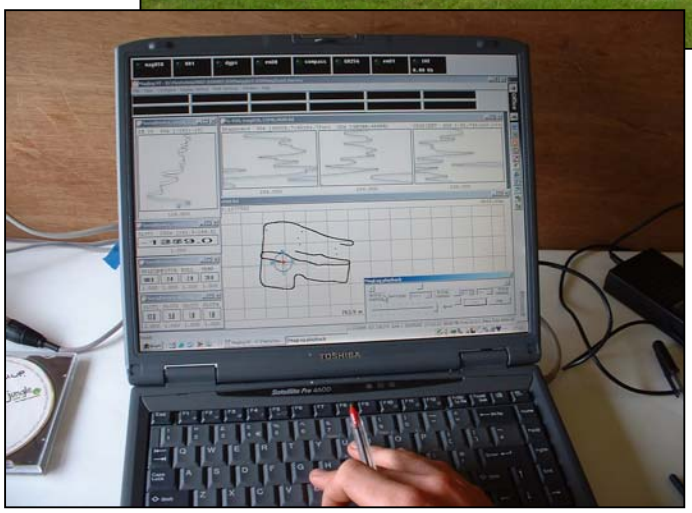
Geomatrix Earth Science Ltd.

GEEP

Geophysical Exploration Equipment Platform

The GEEP system increases the efficiency of any survey





- Multiple sensors can used simultaneously
- Data displayed to the users in real-time

- On-site data processing
- **Any** instrument that outputs serial data can be mounted
- Data output files in a simple ASCII format

- The Geophysical Exploration Equipment Platform (GEEP) provides a faster and more efficient survey method. This allows any survey to be completed in a much shorter time.

- Efficiency is achieved by allowing multiple instruments to gather data simultaneously without the need for extra surveyors. Industry-standard instruments are mounted on a mobile platform and towed around the site. Positional data is provided by a Differential GPS system and compass, both included with the GEEP. Instrument proximity to the ground and the stability of the platform allow high quality data to be collected.

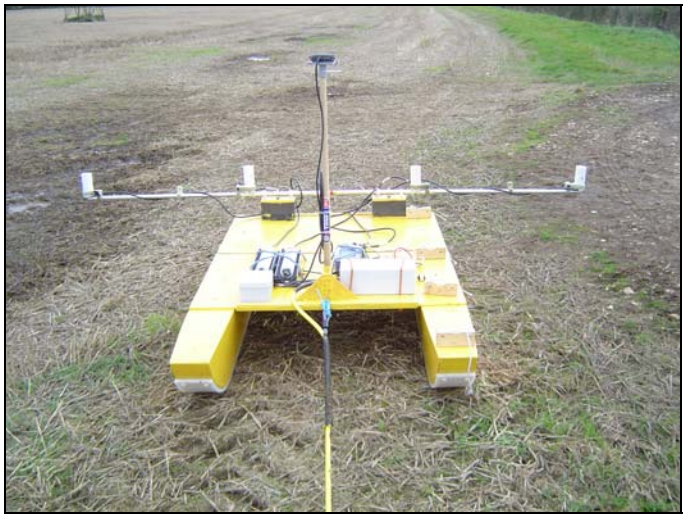
- Efficiency is further increased by the use of interchangeable 'decks', allowing the next equipment load-out to be readied for surveying whilst another survey is taking place.

- The GEEP can log **any** instrument that outputs a continuous RS232 data string. This data is displayed in real-time by GEEP logging software at a remote logging station, allowing instant analysis and quality control of the data recorded.

- The software also produces output files for each instrument, containing a time stamp, the instrument output (converted to S.I. units as appropriate) and instrument position (in local coordinates), allowing easy transfer to any data processing package.

The GEEP Geophysically Invisible Platform

Showing the system set-up with 4 magnetometers, DGPS antenna and compass



Example Data

The figures show two datasets of the total magnetic field over the same site (an old Roman City). Both systems are using Caesium vapour magnetometers.

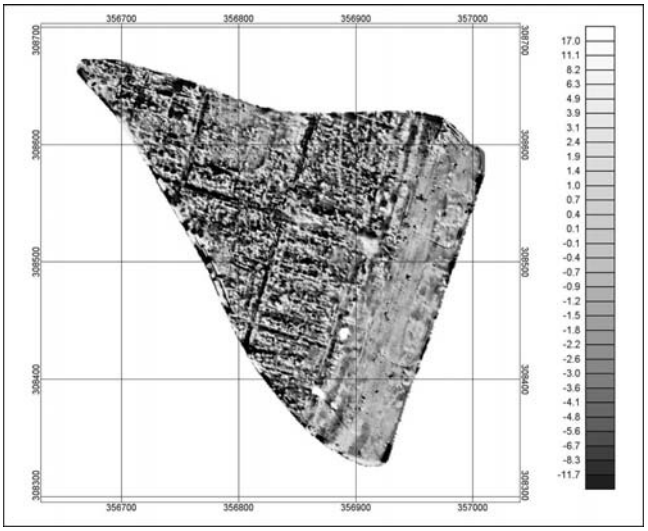
Data collection with the GEEP (top picture) took three hours, whereas the top dataset took 3 days to collect, showing the obvious efficiency of the GEEP system.

More Reasons for GEEP Efficiency:

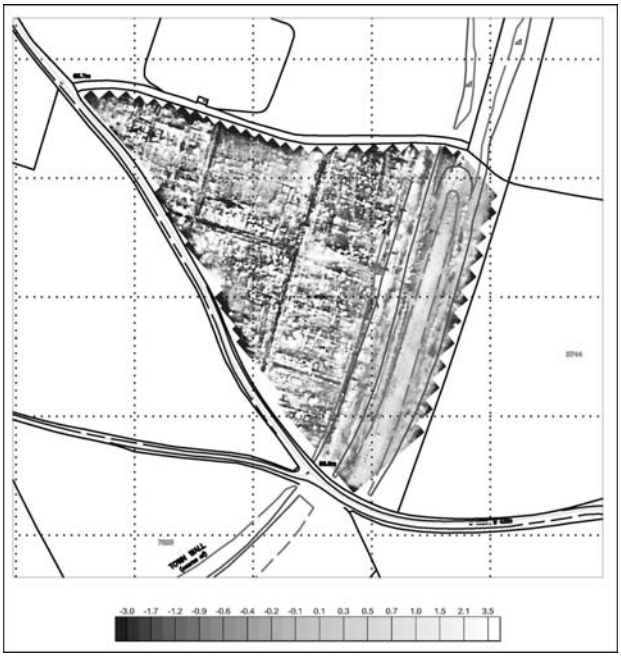
The GEEP method of surveying removes the need for a survey grid to measured and pegged out prior to each new survey. Instead the Differential GPS output provides all the positional data required.

This allows the GEEP to move from survey to neighbouring survey without stopping, and also allows the GEEP to start surveying earlier in the day and end later, maximising the time in which data can be collected

GEEP – Collection Time 3 hours



Collection time – 3 Days



Geomatrix Earth Science Ltd.

GEEP Components:

- **Instruments –** provided separately (apart from the DGPS and Compass)
  Any instrument outputting continuous RS232 strings may be used
- **2 sledges (1 subsidiary used for EM34 transmitting coil)** which can be dismantled for transport. Sledge mounted equipment includes:
  2 Seres DGPS – positional data
  1 TCM Compass Module
  1 Interface Box – receiving up to 8 RS232 inputs, and outputting 24V on six connectors
- **Tow Cable –** used to transmit RS232 and power. Hardwired into sledge electronics
- **Driver GPS Display –** tablet PC displaying the GEEP's current position.
- **Transmitting Electronics –** converts RS232 into Wi-Fi for transfer to a remote logging station and provides system power from a $12V_{DC}$ source. Tow Vehicle mounted.
- **Tow Vehicle –** Provided by user – agricultural quad suggested
- **Receiving Electronics –** converts Wi-Fi into network signal, output to a logging PC. At remote logging station
- **GEEP Log –** 1 CD containing the data logging software on the remote logging laptop. Provides GPS display on the Driver GPS Display

Specifications:

Sledge:

Weight (unloaded)	40kg
Dimensions	2000x1200x326 mm

Subsidiary Sledge (used for the EM34 Transmitting Coil):

Weight (unloaded)	30kg
Dimensions	1500x1200x326 mm

Tow Cable:

Breaking Strain	8.5kN (0.95 (US) Ton)
Cable Length	10m

Recommended Tow Vehicle:

Ideal Vehicle	Agricultural Quad
Capable of Towing	~200kg (440lbs)

Transmitting Electronics:

Voltage and Current Output to Sledge	$27V_{DC}$	10A
Wireless Connection Type and Range	802.11b (11Mbps)	1km (with clear line of sight)
Data Bandwidth	Safely supports GPS (5Hz), Compass & 6×Magnetometers (10Hz)	

GEEP Data Logging:

Number of RS232 Connections	6 (+ 1 DGPS + 1 Compass)
Real Time Display	1 Position Plot, Instrument output
Driver Display	Position plot with navigation aids
Output File Type	ASCII
Instrument Output File Format	Instrument Position {x, y, z}, Instrument output, GPS Time
Automatic Detection of Sensors	

Instruments Available for Use:

Appropriate Instrument Types	EM, Magnetometry, VLF, (resistivity)	
All instruments must output continuous RS232 data strings		
Equipment Tested on the GEEP	EM31	Ohmmapper
	EM38	EM34 (with subsidiary sledge)
	EM61	G823
	G858	GR320 (γ-Ray Spectrometer)
3 Example Combinations:	EM31, EM38 and GR320	
	Magnetometer array, EM38 and GR320	
	Magnetometer array, EM34 and GR320	

Survey Specifications:

Data Acquisition Rate	2 Hectares/hour (Archaeological magnetometer survey for 1m lines)
Standard Towing Speed	$6kmh^{-1}$

Enquiries:

For any enquiries please contact:

Paul Fuller
Geomatrix Earth Science Ltd
20 Eden Way
Leighton Buzzard
LU7 4TZ
UK

Telephone: +44 (0)1525 383438
Fax: +44 (0)1525 382200

e-mail: Paul.Fuller@georentals.co.uk

Developed through a Knowledge Transfer Partnership between Geomatrix Earth Science Ltd and The Geology Department, The University of Leicester