



GEM-3 Array

The GEM-3 Array that can be towed by or mounted in front of a vehicle. This new electromagnetic induction (EMI) array is built on a flat one-inch thick panel and, thus, light in weight and easy for packaging and shipping. The standard GEM-3 has seven receiver channels, provides a 2.4 meter swath, and produces high spatial density at a high survey speed. The system may be used for detecting unexploded ordnance (UXO), finding buried utilities, and mapping shallow geology. With proper packaging, the array can also be used for underwater investigations. It may also be used for detecting and characterizing landmines and IEDs in hostile environments under suitable concepts of operation.

The system provides 2-D data display that shows ground images in real time, including flagging potential targets on the screen. The unit comes with a GPS unit at a decimeter accuracy. This Windows-based system can merge data from other sensors and devices on the same platform using standard serial communication lines such as RS232 and RS485. Communication to the Data Logger via Ethernet or RS 485.



GEM-3 Array Specifications

Number of Channels	3, 5, 7 or 8
Swath	1m to 3.2m
Dimensions	Adjustable; typically 30 cm x 210 cm x 3 cm (H)
Coils configuration	Bucked coplanar
Transmitter current	20 amp RMS max
Transmitter moment	350 Am ² at 270 Hz (typ.)
Power supply	24 VDC
Frequency range	90 Hz to 96 kHz
No. of frequencies	Programmable Typically 10-12



GEM-3 Array Features

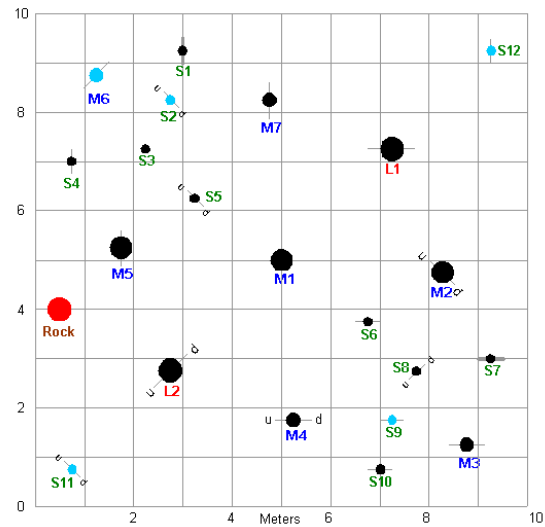
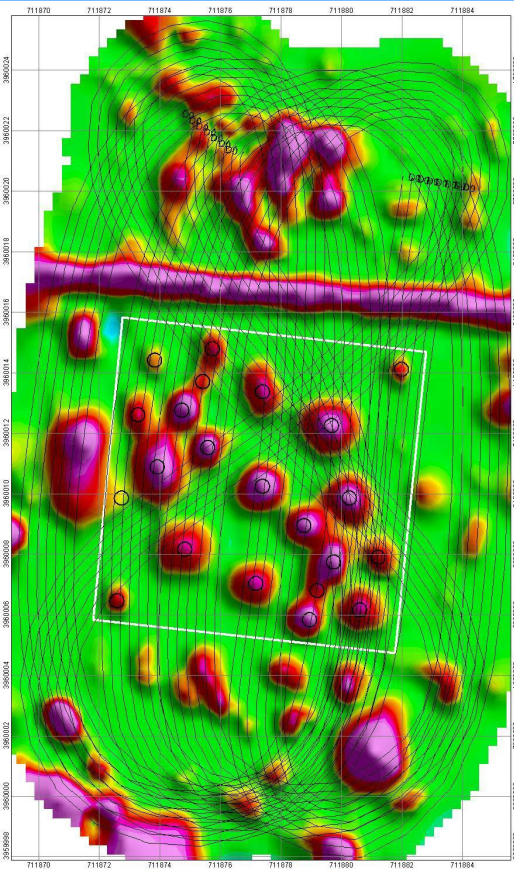
The GEM-3 Array consists of a large transmitter coil along its perimeter, a bucking transmitter and seven equally-spaced receiver coils along its center line. The array has the following advantages:

- Maximum possible transmitter moment for a given array size;
- Broadband operation, typically 10-12 frequencies between 90Hz – 96kHz;
- Seven equally-spaced receiver channels operating simultaneously;
- High-speed survey;
- high data density;
- Easy shipping owing to its flat construction.



GEM-3 Array Data Examples

An example Q-sum data (left) obtained by painting the screen over the *Geophex UXO Test Site*, a 10 m x 10 m area, indicated by the white square boundaries. The ground truth map below shows a total of 20 seeded targets of various metal pipes and one magnetic rock (red circle to the left). The seven parallel lines indicate the ground track of the array having seven receiver channels; the swath is about 2.4-m wide.



GEM-3 Array data obtained along streets in Raleigh, NC, superimposed upon an aerial photograph of the area. The survey was undertaken to detect all utility lines (water, sewer, powerline, telephone and fiber optic cables) buried under the road. Faint black lines indicate the ground track of the array.