Further information about forensic searches

New Services

ERA Technology has reorganised the production of the SPRscan ground penetrating radar equipment and the services offered using ground penetrating radar. We have introduced two new survey services, using different specialist teams. These have been formed specifically to meet the distinct needs of police investigation teams carrying out forensic searches and civil contractors mapping underground utilities. The manufacture of the SPR equipment has now been transferred to Subsurface Imaging Systems Inc.

Index and links

Forensic search services

Ground penetrating radar (GPR) is a technology that can be employed to assist police and law enforcement investigation teams in forensic searches. GPR is able to detect objects buried in the ground and also determine ground structure. Large areas can be searched quickly and non-destructively. Therefore, the use of GPR can greatly improve the efficiency of a search operation by reducing the amount of unnecessary excavation, and consequent repair, hence reducing costs and time on site.

Forensic applications of ground penetrating radar include:

- detection of buried bodies and graves
- detection of buried hides and caches
- detection of cavities both in the ground and in structures
- hostage situations (through wall radar)

The forensic service is being run by Jon Dittmer who has many years of assisting police forces both in the UK and around Europe: "Using ground radar for forensic purposes is well-established but the techniques needed to interpret the data are very different from those used for engineering and construction surveys. ERA has provided support to scene-of-crime investigators for many years and the skills and experience we have built up are second to none."

Ground penetrating radar being used in connection with the Fred West case
(photograph courtesy of the Gloucestershire Echo)

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Each survey is unique to a certain degree and is tailored to the precise requirements of the investigation and to the practicalities of the site. The team will discuss the exact requirements with the investigators in order to determine the most favourable approach to conducting the search.

The forensic survey service includes:

- attendance on site using appropriate survey methods
- real time ground marking for instant results enabling on-site decisions to be made regarding further investigations
- on-site advice and interpretation
- if required, a detailed report with plans can be provided, which may be used in evidence

Background information on ground penetrating radar

Ground penetrating radar can be applied to the detection of buried bodies, hostage situations (through wall radar) building and site surveying as well as the detection of pipes and cables. Ground penetrating radar radiates a packet of electromagnetic energy into the ground and detects the backscattered energy from the buried target. In the case of impulse radar the radiated pulse is typically a wavelet of several nanoseconds duration and in the frequency domain, covers a wide range of frequencies over the range several hundred MHz to several GHz. The power radiated per spectral line is in the order of a few nanowatts.

For close-in systems the radar antenna beam is moved in a known pattern over the surface of the ground and an image of the ground can be generated, in real time, on a display either in grey scale or in colour. The image can be a cross-section or a plan view. The radar image is not identical to an optical image because the wavelengths of the illuminating radiation are similar in dimension to the target. This results in a much lower definition in the radar image and one that is highly dependent on the propagation characteristics of the ground. In addition the beam pattern of the antenna is widely spread and this degrades the spatial resolution of the image, unless corrected. Suitable single channel radar systems are based on ERA Technology's field-proven, standard commercial impulse radar.

The high performance radar provides a state-of-the-art performance by virtue of advanced antenna and transmitter-receiver design. ERA Technology has supplied single channel systems for the following national mine research and development programmes: UK, Swedish, German, French, Swiss, Belgian and Dutch. A modified version of the radar has been used in trials in Cambodia. Designs for multi-channel radar systems are available for vehicle use. The low power, impulse radar technology offers cost effective technology and can detect metallic and minimum-metal buried mines in realistic conditions.

Applications of GPR in site surveys

- location and mapping of buried utilities including conduits and cables
- route proving
- road reinstatement checking
- reinforced concrete investigation
- void and cavity location
- forensic investigation
- building/tunnel integrity testing
- archaeological surveying

Background to using GPR for forensic searches & underground mapping

Using ground penetrating radar and other complementary non-invasive geophysical surveying methods, ERA Technology provides two specialised services for both forensic searches and the mapping of underground utilities and structures.

Different specialist teams provide these services to meet the distinct needs of police investigation teams and civil engineering contractors. Such investigations avoid unnecessary disruption and excavation, and subsequent excavations and other work can be then planned more efficiently, greatly reducing the time, effort and cost involved. Although the technology involved in both cases is similar, interpretation of the results requires different expertise and experience.

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In order to carry out investigations in different geophysical conditions, ERA offers a number of surveying methods, primarily based on ground penetrating radar system. Other geophysical methods include metal detection, cable detection and resistivity.

Accurate positioning of surveyed areas is obtained using a modern total station theodolite system. The flexibility of the service allows searches to be carried out not just on the ground, but also against other surfaces such as walls, bridges, support pillars, etc. Each survey is tailored to the precise requirements of the client and the practicalities of the site.

Ground penetrating radar can detect changes in material types, so it is able to locate any item including non-metallic objects such as plastic, ceramic and concrete pipes and buried foundations.

SPRscan transfer of business

Subsurface Imaging Systems acquires SPRscan radar technology from ERA Technology

Subsurface Imaging Systems Inc (USA) is taking over the complete manufacture and supply of the SPRscan radar product, and is also fulfilling all after-sales support, maintenance and warranty obligations on existing equipment in the field.

The radar was developed by ERA Technology in the UK and has gained the reputation of being the best GPR survey tool around. ERA will now focus on its electronics design and development services and will still be heavily involved in future enhancements to the product. ERA will also continue to undertake radar based surveys with the launch of two separate services focussed on forensic searches and the underground mapping of utilities.

SIS have been the North American distributor for SPRscan. The close relationship between SIS and ERA will be continuing, with ERA concentrating on design activities, other aspects of surface penetrating radar, such as the new services announced below.

For further information on SPRscan, please go to the SIS - US Radar website

or contact Ron LaBarca, President of SIS, direct on +1 732 566 2035

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