

# Recording World Heritage

by Paul Burrows

**CAP, the Cyrene Archaeological Project, is devoted to recording the remains of the Greco-Roman city at Cyrene in Libya and is a joint venture between Oberlin College (USA), the University of Birmingham (UK) and the Department of Antiquities (Libya). The site is part of the Green Mountain Conservation and Development Area, which was recently established by the Libyan government under "The Cyrene Declaration". CAP's aim is to record the standing structures and buried features within this UNESCO World Heritage Site in a systematic, traceable and comprehensive method using a combination of land-based, aerial and sub-surface measurement techniques – amongst them a Leica ScanStation and a Leica HDS6000 scanner.**

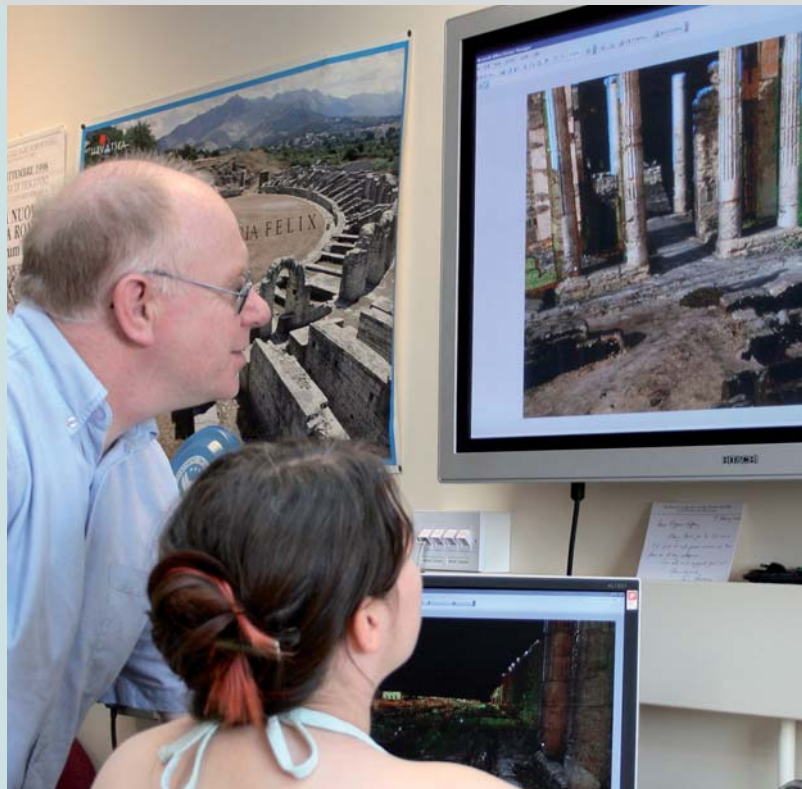
Nestled in the heart of the University of Birmingham is VISTA, the Visual and Spatial Technology Cen-

tre, part of the Institute of Archaeology and Antiquity (IAA). This archaeological group is committed to the capture, analysis and preservation of 3D data through the creation of digital environments, with data capture projects ranging from object to landscape modeling.

VISTA has been in existence since 2003 and has nurtured relationships with universities and professional institutions around the world. These global ties have supported large open-ended research projects which require dedicated teams of highly skilled experts using the latest technology to capture data – this is where Leica Geosystems High Definition Surveying™, terrestrial total stations and GPS (TPS/GPS) technology have been utilized by VISTA to achieve an accuracy of data collection thought near impossible a few years ago. "Our aim as an historical group is to capture and integrate all data types with cutting edge technology into the largest volumetric and sub-surface model ever captured for archaeological purposes," says

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### **VISTA and the CAP project**

As one of the best funded groups in Europe, VISTA was well placed to take part in the CAP project. The 2007 season was undertaken between the 17<sup>th</sup> and 28<sup>th</sup> June and the Leica HDS6000, in conjunction with an external camera solution, was used to record data from several key sites. In addition, a Foerster magnetometer array, combined with a Leica SR530 differential GPS solution, was used to carry out the vast geophysical survey.

The Leica HDS6000 was chosen as it represented the most advanced phase-based scanning technology on the market. "The unit performed excellently in unseasonably high temperatures of over 35°C whilst its relatively light construction and high battery capacity meant the unit was highly mobile – it can be worn in its transport case like a rucksack too", stated Dr. Helen Goodchild, Project Geomatics Manager.

Using both the Leica HDS6000 and the pulse based scanner Leica ScanStation, over 120 scans were carried out over the two week period and over 150 GB of data were collected, representing billions of survey points. Registration was carried out using Leica Cyclone Register and the data was geo-referenced using GPS data control-points acquired with the Leica SR530 DGPS base station and rover.

### **Full 3D surface models**

The data acquired by the Leica HDS6000 has been used to generate animated fly-throughs, 2D sections and slices of the data for interrogation. Full 3D surface models have also been generated that have helped aid the investigation and provide an irreplaceable document of the area. In addition, the data has been incorporated into the VISTA GIS software suite alongside GPS, Magnetometry, GPR and environmental survey data so it can be analyzed in context.

Birmingham Archaeology is a long standing user of Leica Geosystems survey technology, so its foray into the world of High Definition Surveying is a natural technological progression. Without the use of the Leica HDS6000 or Leica ScanStation, the CAP team would not have been able to capture the data from ancient standing structures with the same level of detail in such a short period of time.

VISTA is currently working with IBM (UK) in developing procedures for the analysis, manipulation and display of these types of datasets using Birmingham's Blue-BEAR, one of the largest University computing facilities in the UK ([www.bear.bham.ac.uk](http://www.bear.bham.ac.uk)). ■

*About the author:*

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