

OHMEX

Ltd - Manufacturer of portable equipment and computer software used in Hydrographic and Topographic Surveying

HydroLite ATS System



HydroLite in use at Kilmarnoch Reservoir.

The current trends in hydrographic surveying are toward larger, faster and dedicated data collection systems using state of the art GPS in conjunction with swathe echo sounders. This trend raises the standards and coverage for large scale surveys but the costs involved prohibit its use in small scale, low budget applications. The HydroLite system has been designed to provide a solution to meet the needs of inshore and shallow water hydrographic surveys utilizing readily available equipment. The HydroLite concept is particularly well suited to surveyors whose main activity is a mixture of topographic and small scale hydrographic work, including canals, lakes, reservoirs and inshore coastal surveying. The design philosophy used has been to provide a very small boat system that can be easily mobilized using a small craft of opportunity, an important feature being connectivity to a variety of positioning systems ranging from GPS/Robotic Total Stations to simple fix event marking. The central component within the HydroLite system is the SonarMite, a small, portable, single beam digital echo sounder which combines the functions of echo sounder and data logger.

Radial Positioning options

The HydroLite 600 variant of the system uses a Geodimeter 600 series Robotic Total Station in conjunction with the SonarLite echo sounder and the GeoTrak95 software package running on a portable PC. The tracking process used within the Geodimeter robotic total stations is their proprietary 'Remote Target' technology in which the target device in addition to providing a prism for distance measurement also provides an active infra-red source to help the instrument lock correctly and accurately onto the target. HydroLite uses the latest development of these targets,

the 'Super RMT' which has a 360 degree field of view and multiple source LEDs, thus greatly improving the tracking reliability and avoiding the problem of keeping the target pointing in the general direction of the instrument.



Geodimeter Robotic Tracking at Watchet Harbour

The GeoTrak95 tracking software used in the field to control the instrument can be either directly connected via a RS232 cable or through the integral radio telemetry system. Controlling the tracking from the instrument helps overcome the problem of power, water-proofing and screen visibility associated with using a portable PC in a boat. The computer operator can work from a vehicle or building and be linked to the instrument using the radio telemetry, in principal the operator could be in the boat but for practical purposes the system normally requires the operator to be in the vicinity of the instrument. The tracking software is designed for ease of use within Windows 95 and provides software features for)

- **Station establishment using resection**
- **3D offsets from prism to transducer**
- **Predictive tracking recovery algorithms**
- **On screen tracking over a background bitmap image.**

Developments are currently under way to incorporate the 'Laserace' hand-held range and bearing system manufactured by [MDL](#). This instrument will offer a range of positioning options including range/bearing, range/azimuth and range/range solutions. The instrument in conjunction with the [MDL](#) radio telemetry will provide the user with a variety of boat or shore based options to achieve high accuracy positioning from small portable equipment.

Field Trials - Conclusions

Initial field trials for the HydroLite system using a Geodimeter 620 were held in conjunction with Blackdown Consultants Ltd. during July 1997 at Watchet Harbour in Somerset, UK. The purpose of the trial survey was to infill hydrographic detail of small gullies and rivulets running through the mud banks in the Harbour, as part of a more comprehensive survey of the geology, sedimentation and physical characteristics of the port location. The results of the survey were excellent and the system performed well even in a strong breeze. Dr.Reg Parker of Blackdown

commented "there was virtually zero dropout from the system even when moving rapidly between lines". Several minor software refinements became obvious from the trials, in particular the need to bypass the Windows mouse interface using keyboard shortcuts, the ability to replay previously recorded data and a predictive algorithm to help the tracking system jump around obstacles. In summary the results were well within specification and the HydroLite package performed exceptionally well for a previously untried system. Where the system was measured against known physical points a typical accuracy of +/-150mm in all three dimensions was achieved at ranges up to 500m and boat speeds of up to 2m per second.

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