

### Purpose

The bathymetry software is required to control the data collection processes and to inform the operator and the helmsman during surveying. Further, it supports data storage, validation, processing and presentation. The end products are a depth chart, a data file with validated x,y,z data and, optionally a digital terrain model. Primary application is assessment of storage volume of reservoirs.

A PC controls the bathymetric data collection process. The bathymetry software assists the operator with the planning of the survey. Data are acquired from the DGPS and the echosounder, The operator and the helmsman get status and controlling information presented. All collected data are recorded on PC hard disk.

### Conditions & Requirements

- The bathymetry software shall be of such a design that it operates reliably and accurately under the prevailing working conditions on board of small craft.
- The bathymetry software shall be easy to operate and maintain.
- The bathymetry software shall be supplied with the accessories as needed for effective deployment.
- All bathymetry software and files shall be compatible with the PC hardware and MS-Windows95 (or its successor) environment.
- The bathymetry software shall be of a robust design.
- An operator's manual and system manual, related to the bathymetry software, shall be part of the delivery.
- The bathymetry software package shall be widely accepted and adequate for preparation and execution of bathymetric surveys and the processing and presentation of the collected data.
- The bathymetry software shall have a facility to generate helmsman data. These data should be shown on a dedicated display, i.e. both operator and helmsman use a separate display
  - ◊ Preferably a low power and easily readable LCD display is used, possibly of special hardware design. The helmsman display should be part of the delivery.
  - ◊ Alternatively, helmsman data may be projected on a standard (external) computer display. This alternative is not recommended as it increases power consumption considerably.
- The bathymetry software shall support data conversion to connect the collected depth data to MSL.
- The software shall support grid/projection conversion from and to the most common grids/projections. In particular, local grid, WGS84 and the common Indian projections shall be supported.
- It should be possible to operate data collection and data processing software separately, on different computers.
- The bathymetry software shall support NMEA-0183 compatible devices. The software should provide device drivers to support a wide range of echosounders, DGPS, digitizers, plotters, scanners, etc.
- The bathymetry software shall support a wide range of echo-sounders and the communication standards used by GPS equipment.
- The bathymetry software shall have tools for editing the collected files, to rectify and validate the data.

## Specifications

The **data collection** software shall support following functions:

1. run-line preparation
2. on line datum conversion
3. collecting, processing and storing of data from the DGPS positioning system and the echo-sounder
4. data storage by increments of sailed distance has a preference
5. monitoring of data acquisition related quality indicators; in particular the performance of the DGPS (HDOP, functioning of the differential mode etc.), the echo-sounder and the track keeping of the helmsman
6. accurate time stamping of collected data, i.e. better than 0.05 s
7. generation of annotation text for the echo-sounder
8. helmsman guidance by left right indication and track searching and depth display
9. presentation of process information and providing controls to the operator

The **data processing** software will be executed off-line. It shall support following functions:

1. combination of survey data from different files, sessions and formats
2. addition of shorelines and landmarks to the data sets and inclusion of the same in the produced maps/charts
3. digitising of paper based geographical data (maps, charts)
4. free zooming and panning of maps, charts and plots
5. drafting of 'sailed track' plots
6. generation of depth number charts
7. spike/outlier/error detection and editing supported by graphics
8. generation of TIN model and interpolation to rectangular grid
9. generation of depth contours plots
10. assessment of reservoir volume
11. assessment of erosion and sedimentation changes (comparison of with previous data sets).

## Remarks

- For entry of graphical data, access to a scanner and/or a digitiser is required.
- An A4 size jet type colour printer may be applied for normal reporting.
- Map production requires an A2 size or larger colour jet printer/plotter.

These devices are part of other procurement packages and are therefore not specified here.