GEDAP™
FOR WINDOWS NT

The Complete Software Solution for Physical Modelling in Hydrodynamics Laboratories

*Interaction of extreme waves
with Hibernia GBS platform*

Wave Synthesis   *Data Analysis*

Wave Generation   *Powerful Graphics*
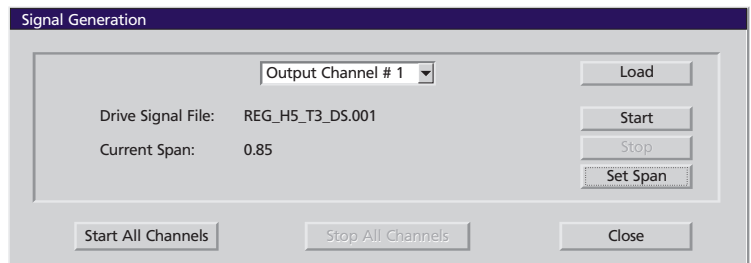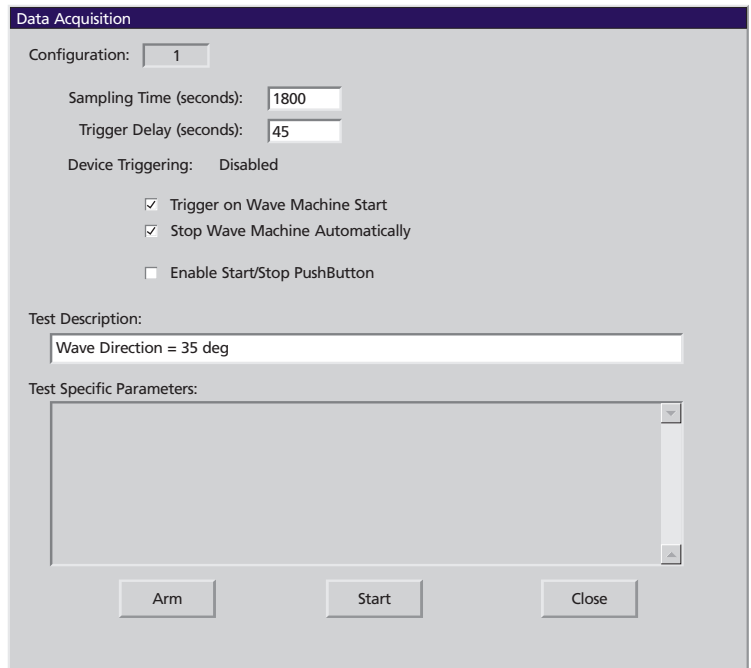
Experiment Control   *Quality Assurance*

Data Acquisition

NDAC

NDAC is a real-time data acquisition and control package for both analog and digital signals. NDAC also facilitates the calibration of wave machines and sensors such as wave probes, load cells, accelerometers, etc.
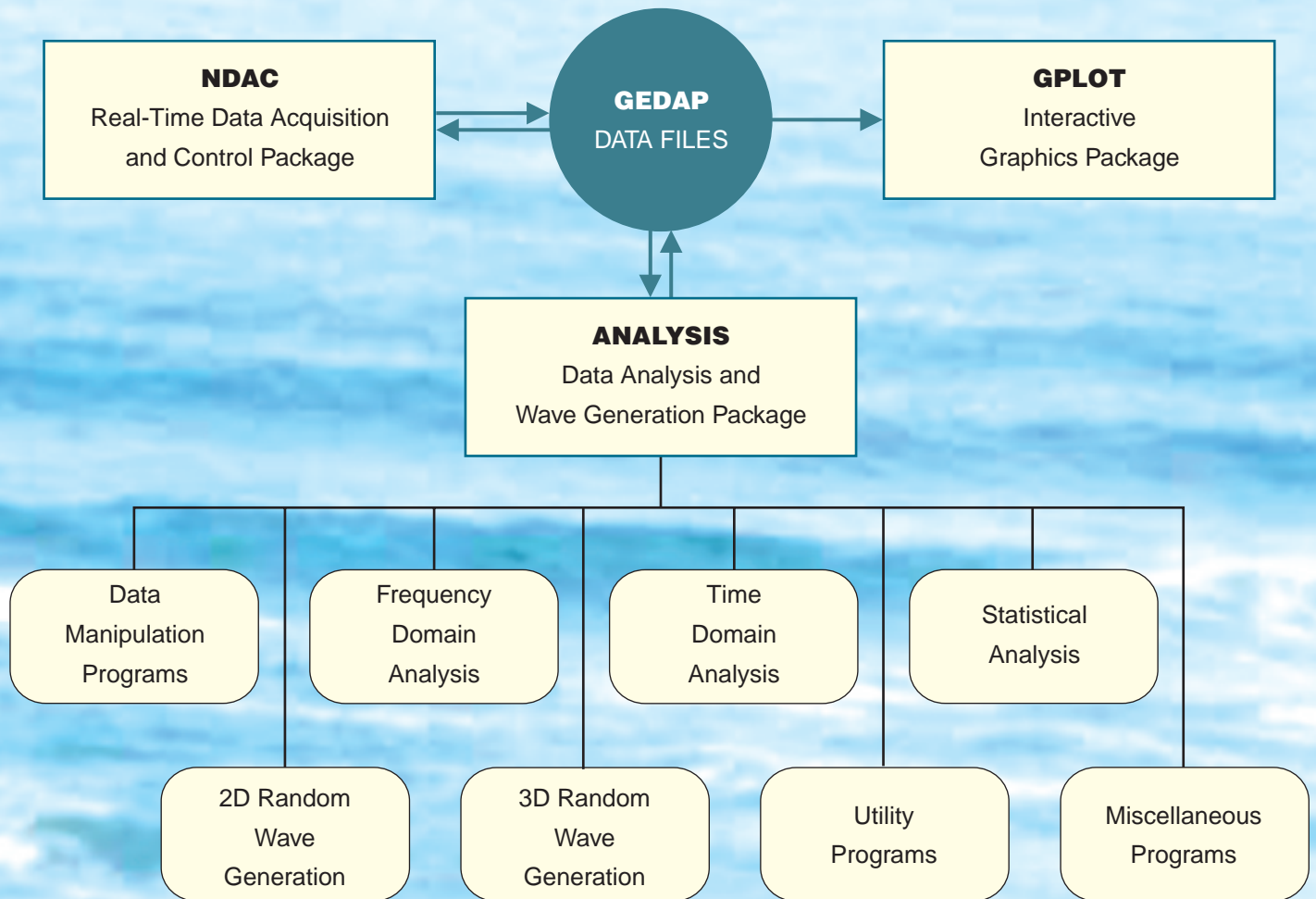
Calibration

Select Channels

Next Channel

Previous Channel

Change Sign

Delete Last

Delete All

Save

Cancel

Print

Sampling Time: 30 seconds
Polynomial Degree: 1
Programmable Gain: 1

○ Perform New Calibration
○ View Most Recent Calibration

● Model Scale   ○ Full Scale

Maximum Error = −0.613% of Calibration Range

Wave Elevation (m) vs Input Signal at A/D Converter (volts)

Exit   Start Sampling   Stop Sampling

NDAC Data Acquisition Software Version 2.2

Channel Attributes | Sensor Calibration | Data Acquisition
Test Configuration | Sensor Rezero | Signal Generation

Exit

Dialogue boxes illustrating the calibration of a wave probe, the acquisition of experimental data, and the real-time control of a wave machine.

Data Acquisition

Configuration: 1

Sampling Time (seconds):   1800
Trigger Delay (seconds):   45
Device Triggering: Disabled

☑ Trigger on Wave Machine Start
☑ Stop Wave Machine Automatically

☐ Enable Start/Stop PushButton

Test Description:
Wave Direction = 35 deg

Test Specific Parameters:

Arm   Start   Close

Signal Generation

Output Channel # 1 ▼   Load

Drive Signal File: REG_H5_T3_DS.001   Start

Current Span: 0.85   Stop

Set Span

Start All Channels   Stop All Channels   Close

GEDAP™
FOR WINDOWS NT

GEDAP contains a comprehensive set of more than 140 data analysis and wave generation programs organized into eight groups.

NDAC
Real-Time Data Acquisition and Control Package

GEDAP
DATA FILES

GPLOT
Interactive Graphics Package

ANALYSIS
Data Analysis and Wave Generation Package

Data Manipulation Programs

Frequency Domain Analysis

Time Domain Analysis

Statistical Analysis

2D Random Wave Generation

3D Random Wave Generation

Utility Programs

Miscellaneous Programs

GEDAP Subroutine Libraries

Since **GEDAP** is an open system, users can also add their own Fortran programs by taking advantage of more than 350 subroutines available in the various libraries.
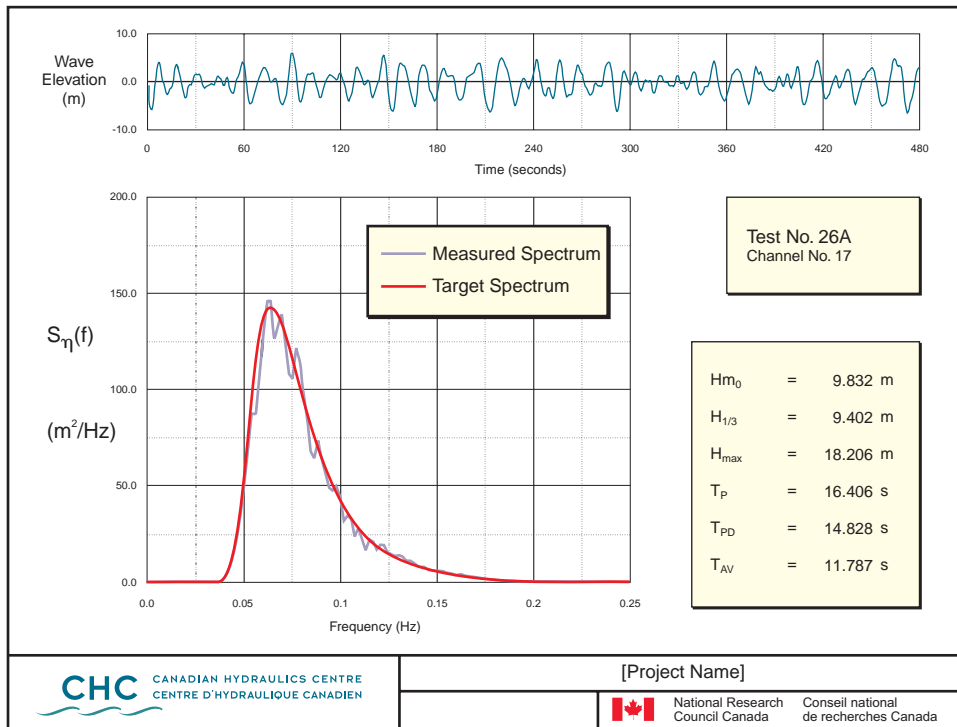
- Digital Signal Processing
- Fast Fourier Transforms
- **GEDAP** System Library
- Hydrodynamics

- Mathematical Routines
- Spline Interpolation
- Statistical Routines
- Miscellaneous

See the Canadian Hydraulics Centre **WEB SITE** for a detailed description of the entire **GEDAP** software package.

http://www.chc.nrc.ca

GPLOT

GPLOT is an extensive interactive graphics package that allows GEDAP data files to be easily examined at any stage of the analysis process.

Wave Elevation (m) — Time (seconds)

$S_\eta(f)$ (m^2/Hz) — Frequency (Hz)

Measured Spectrum
Target Spectrum

Test No. 26A
Channel No. 17

Hm_0	=	9.832 m
$H_{1/3}$	=	9.402 m
H_{max}	=	18.206 m
T_P	=	16.406 s
T_{PD}	=	14.828 s
T_{AV}	=	11.787 s

CHC CANADIAN HYDRAULICS CENTRE / CENTRE D'HYDRAULIQUE CANADIEN

[Project Name]

National Research Council Canada   Conseil national de recherches Canada

Mean Direction θ_m and Spreading Width σ_η for Test Case R
Double Amplitude, Broad Spreading (s = 6)

(a) Mean Direction θ_m, η, u, v — Target = 0 deg — Lab 1, Lab 2, Lab 4

(b) Mean Direction θ_m, 6 Probe Array — Target = 0 deg — Lab 1, Lab 2, Lab 4, Lab 5, Lab 6

(c) Spreading Width σ_η, η, u, v — Target = 29.5 deg — Lab 1, Lab 2, Lab 4

(d) Spreading Width σ_η, 6 Probe Array — Target = 29.5 deg — Lab 1, Lab 2, Lab 4, Lab 5, Lab 6

GPLOT Features

- Interactive or batch mode operation.
- Automatic generation of batch mode scripts.
- Automatic scaling and automatic axis labelling using information from the **GEDAP** data file header.
- Choice of linear, logarithmic or probability axis scales.
- Choice of line patterns, line widths and colours for plotting curves.
- Various fonts are available for labelling plots.
- Selection of symbol types, sizes and colours for plotting data points.
- Support for embedded LaTeX commands in text strings for Greek characters, math symbols, accents, subscripts, superscripts, etc.
- Dynamic objects such as text strings, boxes, arrows, etc. that can be positioned with a mouse when designing plots.
- Multiple datasets per graph and multiple graphs per page with up to 262,144 points per dataset.
- Automatic generation of plot legends to identify the various datasets in a plot.
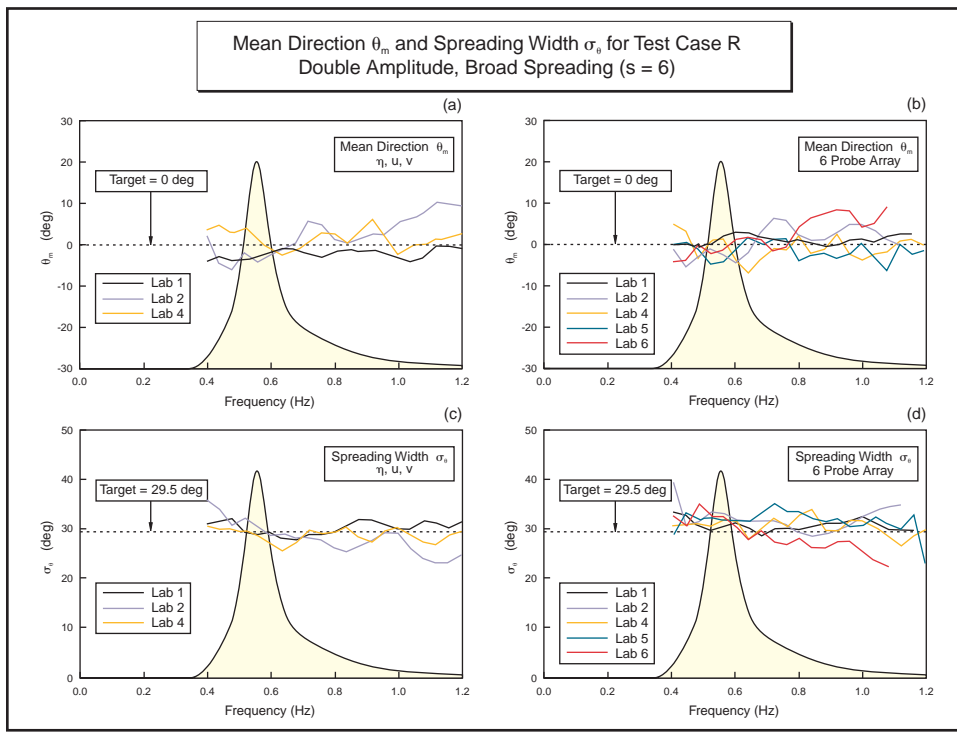
GEDAP is a general purpose software package for the analysis and management of laboratory data including real-time experiment control and data acquisition functions. **GEDAP** is a well-proven system that has been developed over many years to satisfy a broad range of real-world project requirements with particular emphasis on random wave generation and data analysis in hydrodynamics laboratories. It can also be used for other applications including the analysis of full-scale data. **GEDAP** can greatly enhance the capabilities of most existing 2D and 3D wave generators.

Study of moored ship response

Salient Features

- Fully integrated modular package using a common data file structure and a common set of support routines.

- Includes automatic data tracking tools for quality assurance systems such as ISO 9000.

- Ancillary parameters, which are automatically stored in **GEDAP** file headers during data acquisition and analysis, can be easily retrieved for use in spreadsheets or plot labels.

- **GEDAP** programs can either be run interactively or in batch mode to analyse multiple sets of input data.

- Complete on-line documentation accessed by standard Web browsers.

- Comprehensive set of programs for unidirectional (2D) and multidirectional (3D) wave generation in flumes, basins and towing tanks.

- All types of wave machines supported: piston, flapper, combinations of piston-flapper, dual-flap, etc.

- Dynamic calibration capabilities for accurate determination of wave machine response characteristics.

- Sophisticated wave machine compensation programs with extensive safety checks.

- Complete set of directional wave analysis programs.

- Reflection analysis programs for regular and random waves.

- Active absorption of waves reflected by test structures.

Stability of a breakwater head under multidirectional waves

Platforms

GEDAP is currently available for Intel Pentium personal computers running Microsoft Windows NT and for Digital Alpha workstations using either the Windows NT, VMS or UNIX operating systems. It is also available for HP and SGI UNIX workstations.

Training Courses

Training courses on **GEDAP** can be arranged either at the client's site or in Ottawa, Canada. The duration and extent of each course will depend on the client's needs.

National Research Council Canada **Conseil national de recherches Canada**

For further information on GEDAP contact:

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Web site : **http://www.chc.nrc.ca**

Canada

Some Users of **GEDAP**

- Bassin d'essais des carènes, Paris, France

- Centro de Estudios de Puertos Y Costas, Madrid, Spain

- Institute for Marine Dynamics, St. John's, Newfoundland, Canada

- Institute of Harbour and Marine Technology, Taichung, Taiwan

- Korea Research Institute of Ships and Ocean Engineering, Daejon, Korea

- Laboratoire National d'Hydraulique, Chatou, France

- Offshore Technology Research Center, Texas A&M University, College Station, Texas, USA

- Queensland Government Hydraulics Laboratory, Brisbane, Australia

- Queens University, Kingston, Ontario, Canada

- University of British Columbia, Vancouver, British Columbia, Canada

- US Army Coastal Engineering Research Center, Vicksburg, Mississippi, USA