## Quick Start: GeoDAS-LT with Single Beam Echo Sounder

## I. Setting up GeoDAS-LT for Single Beam Echo Sounder Survey

- 1. Connect your single beam echo sounder, GPS receiver and other sensors (e.g. gyro and motion sensor) to serial ports on your data acquisition PC.
- Launch GeoDAS-LT by double-clicking on the GeoDAS icon on the Desktop or select Start → Programs → GeoDAS.
- In the Setup window (File → Setup), set the Mode to Acquisition and RT Type for your single beam echo sounder. For this exercise, we set the RT Type to NMEA, to receive NMEA DBT string (Depth Below Transducer) from NMEAWiz. (Set NMEAWiz to output DBT string only.)

Secup		
System		
Mode: Acquisition	in the second se	Sensor Setup Select Files Loop
Logging HDD Dir: [D:\Data Auto Start [] Select Direct Meta-data Inputs NONE Environmental	Allas Deso EHOplus EHOplus Devolutento 320 NMERS OF EREV 4 OPE STANDARD OPE STANDARD OPE STANDARD OPE STANDARD OPE STANDARD OPE STOW/PR Simad EA 500 SportScan 881 OIC Ping UPP Ethems OIC Ping Serial	Tape 1:
KAY: Grid Type: Universe Hemisphere: North Projection: Universe		Configure Depth: Meters  Speed: M/s
Printer		Events
Port LPT1 Type	Bitmap File	Configure Enable
Display         SPEED CORF           Sampling:         GROUND RA           MEAN         TALL Sho	The defined of the defined of the	tom Track IV Pitch/Roll I Depth Mag
Bathy Color Map	SS Color Map	bottom Bottom Tracking Bathymetry
	Grey C	onfigure Configure
Gains/Processing		
TVG: AV	/G: LUT:	CGI:
Load	Save	0K Cancel

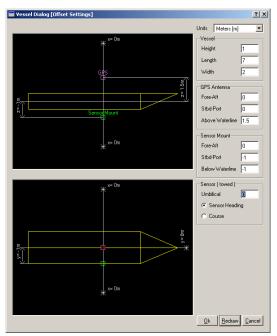
4. Click on the Sensor Setup... button. Configure the port setting for your sensor.

Sensor Setup: NMEA				
SENSOR CONTROL	Port:	Ŧ	Configure	
NMEA	Port COM2	•	Configure	
	ОК	Cancel		

- 5. In the Logging panel, choose a logging directory and click the checkbox to select Auto Start.
- 6. In the Meta-data Inputs panel of the GeoDAS Setup window, select a pre-defined configuration from the list or click "…" button to create a new configuration. Set the Vessel Nav, Course, Speed and Time formats to NMEA (i.e. GPS) and configure the port setting. Set Sensor Nav to From Vessel Nav and the Vessel and Sensor Headings to your device or From Course if you do not have a heading sensor. If your GPS does not receive ZDA strings, set the Time format to From System Time.

Data	Format	Source		Status	Data: Water Depth
Vessel Nav	NMEA	<ul> <li>COM1</li> </ul>	*	0K	Prototype:
Sensor Nav	From Vessel Nav	•	Ψ.	N/A	
Vessel Hdg.	From Course	•	Ŧ	N/A	
Sensor Hdg.	From Course	<b>T</b> (	v	N/A	Sampled
Course	NMEA.	<ul> <li>COM1</li> </ul>	•	N/A	
Speed	NMEA	COM1	Ŧ	N/A	
Attitude	NONE	-	Ŧ	N/A	Formatted:
Sensor Depth	NONE	- i	v.	N/A	
Sensor Alt	NONE	Tí 👘	v	N/A	
Water Depth	Altitude+Sensordep	₹í—	Ŧ	N/A	Filters Mirc 0 Max 10000 FIB: 0.00
Cable Out	NONE	īí—	v	N/A	- Factors
Sound Vel	NONE	Tí	Ŧ	N/A	Bias: 0.000 Vessel Layout Configuration
Magnetometry	NONE	Tí	Ŧ	N/A	Scale: 1.000 RTK Elevation Settings
Time	NMEA	<ul> <li>COM1</li> </ul>		N/A	
Events	NONE	<b>ə</b> (	×.	N/A	Time Sync 🛛 Use NDAA Pos Qual Reg 🔽 Ignore Check
USBL Offset	NONE	ī—	-	N/A	
Seabed Type	NONE	ī —	Ŧ	N/A	Zero Depth Test Port Reset Port Config

- 7. Set the Water Depth to "Altitude+Sensordepth".
- 8. Click the **Vessel Layout Configuration** button in the Survey Offsets panel. Type in the vessel and sensor mount, and GPS antenna offsets. Click **Redraw** to update the diagram.



- 9. Click **OK** when everything is set up. Make sure to save the new configuration.
- 10. In the Mapping panel, click the **Configure...** button for X/Y and set the coordinate system for your survey area.

Coordinate S	ystem		×
Grid:	Universal Transverse Mercator		
Zone:	4	•	?
Datum:	WGS 1984   W84   Global Definition II	•	?
Projection:	Universal Transverse Mercator   UTM	<b>v</b>	?
Hemisphere:	North South		
	OK Cancel Save	Delete	

11. If you do not have a sidescan sonar, uncheck the Sidescan checkbox in the Waterfall Windows panel.

- 12. Click the **Configure...** button in the bathymetry panel and press the **SS From Beam Amp** button.
  - Next, set reasonable values for minimum and maximum depth values. To have GeoDAS automatically re-scale the depth bounds to bracket the current data, select the **Auto Scale** button. The default values should be sufficient to allow the system to re-evaluate the current data and optimally set the minimum and maximum depths.

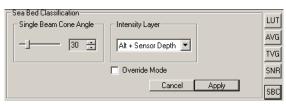
Click	Apply	or	OK
CHUK	прри	OI	UN.

Bathymetry	×
Processing Properties Slant Range Data	Display Properties Depth
Quality Flagging Colinearity Brightness Amp BD Phase BD	Min Depth(m): 10.00 Max Depth(m): 35.00
Q-Bit set : 💦 🖇 Shadow Mask Threshold 🛛 🗾	Delay (m): 0 Range (m): 0
Roll Correct Scale: 1.0 - Bias(deg): 0.000 -	Fill Bathy Auto Range Wtr. Scrolling: Sync. w/ SS 💌
Pitch Correct Scale: 1.0 😴 Bias(deg): 0.000 😴	SS From Beam Amp Amp Min: 64 Max 65535
Heave Correct Scale: 0.0 E Bias(m): 0.000 E	Ping Attitude:
Tide Draft ERTK	Hdg (deg): Roll (deg): Depth (m): Crs (deg): Pitch (deg): Heave (m):
Altitude Limits Min(m): 1.0 Max(m): 100.0	X: Y: Spd (m/s):
S. Range Limits Min(m): 0 Max(m): 0	Auto Scale Prigs: 10 Time Interval: 5 secs
B. Angle Limits Min(deg): 90 Max(deg): 90	Expand Gate: 5 % Contract Gate: 10 %
In B. Angle Limits Min(deg): Max(deg):	
Linear Fit Deviation Factor: 8 🗾	
Interferometry Latency	Apply OK Cancel

13. Save the parameter file (\*.param) and click OK to dismiss the Setup window.

## II. Data Acquisition and Real-time Mosaicking

- 1. Start GeoDAS by clicking the green button on the GeoDAS GUI or selecting File → Start System.
- Click the SBC button on the right bottom corner of GeoDAS GUI, which opens the Sea Bed Classification (SBC) panel. Change the Single Beam Cone Angle to match your sensor's beam angle and select Alt+Sensor Depth or Water Depth in the Intensity Layer panel. Click Apply.

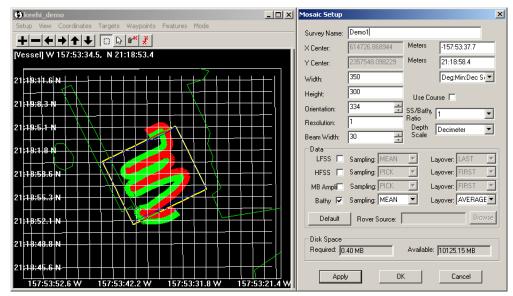


 If the auto logging is not on, begin logging by clicking the ON button in the media tool/logging control panel. Make sure the disk Used bar is in green and the ON/OFF button is pressed and showing OFF.

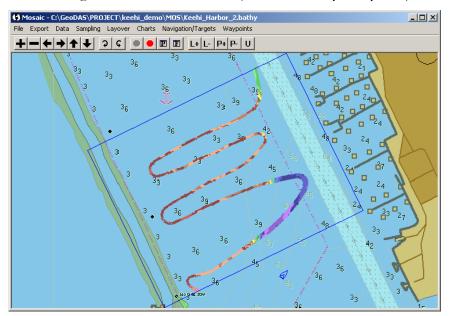
MEDIA	REMAINING	USED	ON/OFF
Disk:	28088.7 MB	46.1%	COFE:
MO:	3824.3 MB	62.6%	ON
Tape 0:		0.0%	ON
Tape 1:		0.0%	ON

4. The waterfall should now display a colored representation of your depth data in the bathymetry window. The sidescan window should be blank, and may be closed. Open your navigation window to view the current navigation track. To create a mosaic, select Mosaic → Setup. The Mosaic Setup window appear.

5. Drag a box around the survey area, as indicated by the active coverage plot, or your CO. Provide a survey name, refine the width, height and orientation as desired, and set the resolution to one or two meters, and the beam width to 30 degrees, or a value approximately equal to that of your survey echo sounder. It is probably best to leave the **Depth** scale set to **Decimeter**. Make sure that only the **Bathy** data layer is selected, and that you have selected **AVERAGE** for sampling and layover. Select **Apply**, and then **OK**.



6. GeoDAS allocates space for the mosaic, and opens a window to show you your real-time mosaic, with the option of loading BSB, S-57 DNC charts (if available on your system).



7. At the end of the survey, select the red **STOP:** button on the mosaic panel to stop the mosaicking, and then proceed to the creation of mission products.

## **III.** Creating a Mission Product

 In the Mosaic window, select Export → Mission Products, to open the Mission Products window. There are six plot types you can create: (Sidescan, Contour, Color Contour, Target, Contour & Target, 3D Color Contour). For this example, we create a contour map from the single beam echo sounder data.

Mission Products		×
Plot Type: Contour	▼ SubArea	Options Scale: Map Annotation:
Area Grid Units: Lat/Lon(It OpArea: keehi_demo Zone: 4 × Center: -157.893805	Page Size:     Letter       SubArea:     Keehi_Harbor       Orientation:     334       Width:     1154.855643	
Y Center: 21.31622222	Height 914.1251709	Target Type: Benchmark Hazard Target
Contour Interval: 0.5	Ann Factor: 2	
Smoothing 5	Ann Font: 12	Destination File: C:\GeoDAS\PR0JECT\keehi_d
Depth Units: M Surface Resolution: 3 Tension: 0.75 Relax: 1.4 Convergence: 0.006000 Iterations: 250	Use Chart         ✓ No Grid Mask         ✓ Block Median         ✓ Block Mean         ✓ Block Mean         ✓ Lose Existing Grid         Azimuth:         100         Elevation:	Format     POST       Other Source     Browse       Source File:     Browse       OK     Cancel

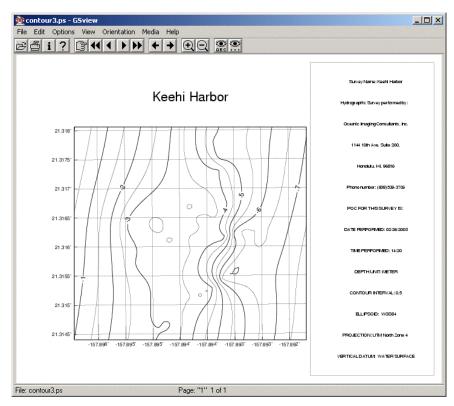
- 2. Select Contour for the Plot Type. Set the Grid Units and the Page Size in the Area panel.
- 3. In the Contour panel, specify contour properties such as contour interval and annotation factor.
- 4. Check the Surface checkbox to smooth the bathymetry data. For the first time, it is best to use the default values and change them later depending on the results. Note that the Tension level has to be between 0 and 1 and the Relax level between 1 and 2. For more details, refer to the GMT manual.
- 5. Check the **No Grid Mask** checkbox; this fills in the unsurveyed areas and draws continuous contour lines.
- 6. In the **Options** panel, set the **Scale**, **Map Annotation**, **Title** and **Target Type**.
- 7. Select the destination file name. Make sure that the Format is set to "POST". Click OK.
- 8. Click Yes when a popup message asks if you want to add marginal data.
- 9. After selecting **Yes**, a text editor pops up. Type marginal data you wish to include. Close the editor when finished.

🖉 MarginalDataUser.txt - Notepad	
File Edit Format Help	
Survey Name: Keehi Harbor	
Hydrographic Survey performed by:	
oceanic Imáging Consultants, Inc. 1144 10th Ave. Suite 200,	
Honolulu, HI, 96816	
Phone number: (808)539-3706	
POC FOR THIS SURVEY IS:	
DATE PERFORMED: 02/26/2003	
TIME PERFORMED: 14:20	
DEPTH UNIT: METER	
CONTOUR INTERVAL: 0.5	
ELLIPSOID: WGS84	
PROJECTION: UTM North Zone 4 VERTICAL DATUM: WATER SURFACE	
VERTICAL DATUM: WATER SURFACE	
	-

10. The Command Prompt window opens, and runs the GMT commands to create a plot.

🖾 C:\WINNT\system32\cmd.exe	
C:\GeoDAS\TMP>del mask.grd Could Not Find C:\GeoDAS\TMP\mask.grd	
C:\GeoDAS\TMP>del surface.grd	
C:\GeoDAS\TMP>grdimage "C:\GeoDAS\TMP\Keehi_Harbor_2bathy.grd" -R614507.86894 357345.098229/614945.868944/2357751.098229r -Jx0.013699 -C"C:\GeoDAS\TMP\temp t" -X1.500000 -Y1.094178 -K 1>"C:\GeoDAS\PROJECT\keehi_just_a_test\MOS\contou ps"	.cp
C:\GeoDA\$\TMP}grdcontour "C:\GeoDA\$\TMP\Keehi_Harbor_2bathy.grd" -C0.500000 - .013699 -A1.000000f9 -L-8.000000/-2.500000 -S5 -R614507.868944/2357345.098229. 4945.868944/235751.098229r -X0 -Y0 -K -O 1>>"C:\GeoDA\$\PR0JECT\keehi_just_a st\M0\$\contour.ps"	/61
C:\GeoDAS\TMP>psscale -D1.0i/7.205822i/2.0i/0.2ih -C"C:\GeoDAS\TMP\temp.cpt" - .00000009/9/:Meters: -U -O -K 1>>"C:\GeoDAS\PROJECT\keehi_just_a_test\MOS\conto .ps" psscale: Reading CPT file C:\GeoDAS\TMP\temp.cpt. CPT range from -8 to -2.5	
C:\GeoDAS\TMP>psbasemap -R-157.895931/21.314402/-157.891680/21.318042r -JU4/6 0000 -Ba0.000379f0.000379g0.000379:"Lon (Deg)":/:"Lat (Deg)":/:."keehi_just_a st Keehi_Harbor_2":WeSn -X0 -Y0 -O -K 1>>"C:\GeoDAS\PROJECT\keehi_just_a_tex MOS\contour.ps"	te

11. Press any key when the plot has been created to show the resulting plot in GSview (a PostScript viewer).



12. You can print out the plot from Gsview (File  $\rightarrow$  Print).