AutoChart user manual

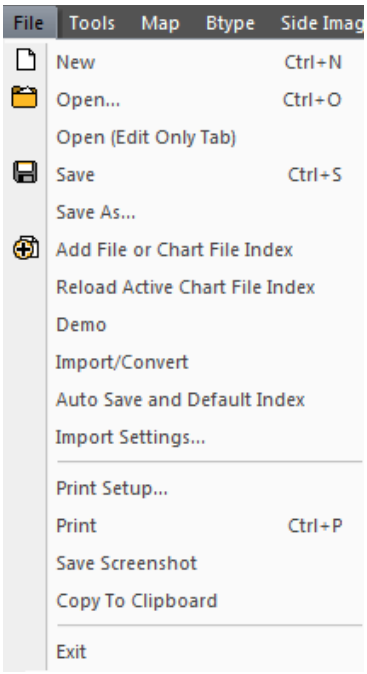
This manual provides detailed information on all features available in AutoChart. For a basic overview, for both off the water use as well as live use, and a step by step guide on how to use AutoChart for making maps, please check out the **Getting Started Guide** which you can open from the **Info** icon found on the start page in AutoChart.

Contents (AutoChart Standard and Pro versions):

AutoChart Pro version only features:

Menus

File



- **New.** Clears all loaded/displayed contents and returns to the start screen.
- **Open.** Open an .acd data file. With a live data connection established, new data that is received is added to the file when saved.
- **Open (Edit Only Tab).** Open an .acd data file in a new Edit tab. Edit tabs allow you to have several data files open for edit simultatenously. Note that all map generation must be made in the main tab, edit tabs will only display raw data.
- **Save/Save As.** Saves data to file.
- **Add File or Chart File Index.** Opens a file or Chart File Index. Data loaded with Add will be placed in a separate memory bank. Several files can be opened with **Add**, but only one Chart File Index can be used at a time.
- **Reload Active Chart File Index.** Reloads data from the active Chart File Index. Use this command if you have made external changes to a file in the Chart File Index.
- **Demo.** Opens and plays demo data. Simulates a live data connection by playing a log file with real data. (Only available with no GPS/sounder connected.)
- **Import/Convert.** With this utility you can import depth data collected in log files. AutoChart will read:
  - Humminbird sonar log files (.dat).
  - Humminbird sonar log files (.son). Select the .son file named BOO1.SON, which is the file containing the 200kHz down beam. The .acd file that will be created can after the conversion be found one level up, where the .dat file resides. Reading the B001.SON file directly would normally be your first choice, but using the '.dat route' enables you to select many records to be converted at once.
  - Humminbird track files (.ht). The format used by Humminbird units to store tracks.
  - DrDepth data files (.drd). The format used by the DrDepth mapping application.
  - Goolge Earth files (.kml). Tracks drawn in Goolge Earth to be used as custom shorelines in AutoChart.

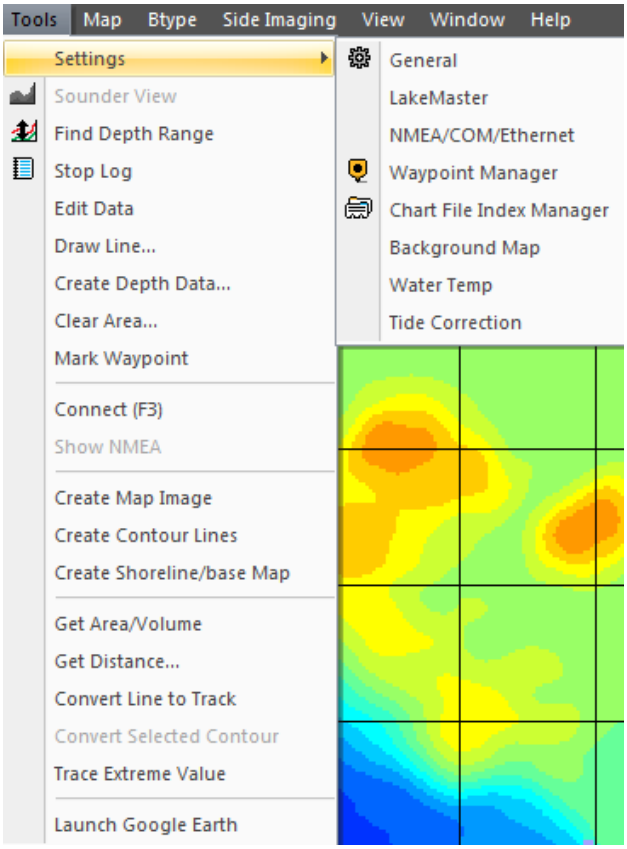
  Imported data will be converted to AutoChart binary format. The filename will be the same as the input file but with the extension .acd.

  Notes:
  - The AutoChart .acd data file created after conversion will NOT be opened automatically. If you would like to view the data, you will need to manually open the file!
  - Imported files will be added to the default Chart File Index (see the Autosave settings).
  - If you import a track to be used as shoreline data, the track should not be closed. The line will be closed automatically if you set it to 'Loop' in AutoChart.
  - If you hold down the 'Ctrl' key while using **Import/Convert** you will be given the option to directly assign shoreline parameters.
  - When you import data you will be given the option to apply corrections for transducer/antenna positions and timing. Parameters found in the 'Transducers' group in General settings will be used. More information on these parameters can be found in Parameter tuning.
  - If you want to apply tide corrections when importing data, check 'Ask for tide correction when importing data' in **Tools/Settings/Tide Correction**.

- **Auto Save...** Opens a dialog with Automatic save settings.
- **Import Settings...** Opens a dialog with Import settings.
- **Print.** Prints the map displayed in the AutoChart main window. Note: To print high quality / high resolution maps, first create the map with **Tools/Create Map Image** and then print the generated image.
- **Save Screenshot.** Save the map in the AutoChart main window to file.
- **Copy to Clipboard.** Copy the map in the AutoChart main window to the Windows clipboard - you can then directly paste the image in an email, a Word document or similar.
- **Exit.** Terminates the program.

For more information on the difference between the **Open** and **Add** commands, see Data reuse or Chart File Index manager.

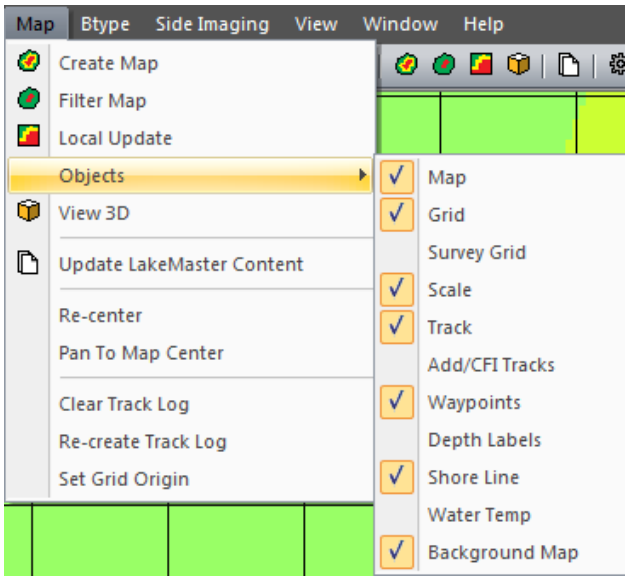
Tools



- **Settings.** Activates a sub-menu with seven ebtries: General, NMEA/COM, Waypoint Manager, Chart File Index Manager, Background Map, Water Temp and Tide Correction. 'General' opens a dialog with parameters affecting map appearance and map calculation. 'LakeMaster' opens a dialog with settings for LakeMaster map data. 'NMEA/COM' opens a dialog with communication settings. With 'Waypoint Manager' you can edit, delete and create new waypoints. 'Chart File Index Manager' is used to create and maintain the Chart File Index, managing all your data. With 'Background Map' you can load maps and imagery to be displayed in the background in AutoChart. 'Water Temp' allows you to set alarms triggered by the water temperature. 'Tide Correction' is used to take tide and water level variations into account. These dialogs are described in Settings.
- **Sounder View.** Splits the window into two parts, showing a depth profile plot in one half, with depth values taken from the sounder. The current depth is shown to the right. Note that the horizontal axis shows the distance in meters or feet along the track, and not time as a 'normal' sounder would. If a map has been calculated the sounder view also display depth values from the map as colored squares. The sounder view can give an indication if the map is accurate or needs to be updated. (Note that if the map has been filtered, the colored squares will not match the sounder depth profile, which is not compensated for the transducer.)
- **Find Depth Range.** Automatically finds the current depth interval from collected data.

- **Stop Log.** Turns of data logging, but position (track) and depth are still being displayed. For more information, see Data reuse.
- **Edit Data.** Enables data editing. For instructions, see Editing data.
- **Draw Line...** Used to draw shore and marker lines. Draw with the left mouse button, finish with right click. You will be prompted for a file name, and if you have a Chart File Index active, or have checked 'Add imported files to the CFI selected in the AutoSave settings' in Import Settings, you can directly add the new file to that Chart File Index.
- **Create Depth Data...** Used to create depth data. Set points with the left mouse button, finish with right click. You will be prompted for a file name, and if you have a database active, or have checked 'Add imported files to the CFI selected in the AutoSave settings' in Import Settings, you can directly add the new file to that Chart File Index. When you click a point you will be promted for the depth of that point. If you check **Apply to all**, all subsequent points will be given the same depth. You can then also draw by holding down the left mouse button, just as if drawing a line.
- **Clear Area...** Let's you draw a polygon to be cleared. Set points with left mouse click, finish with right click. If you hold down the Shift key when clicking 'Clear Area...' the function will be reversed, and the area outside the marked area will be cleared. If you hold down the Ctrl key when clicking 'Clear Area...' the function you can use an .acd file as area delimiter.
- **Mark Waypoint.** Creates a new waypoint at the current position, or if you have the Map Pan mode active (see Keys/Keyboard), at the center of the program window. When you pan the map with the mouse a cross will be shown for easier placement of waypoints. The waypoint is given a default name. If you would like to change it, use the Waypoint Manager.
- **Connect.** Connects to the GPS/sounder, according to the settings made in **Settings/NMEA/COM**.
- **Show NMEA.** Displays NMEA data from GPS/sounder in a separate window.
- **Create Map Image.** Exports the current map to an image file. If the program displays a 2D map a 2D image will be genereated, in 3D mode a 3D image will be generated. For 2D maps, calibration files can be generated for Fugawi (.jpr), OziExplorer (.map) and Google Earth (.kml). For details, see Creating map images.
- **Create Iso/contour Lines.** This tool can be used to:
  - Create iso/contour lines as vector/track data. First calculate the map and then use the 'Tools/Create Iso/contour lines' menu command to create/export contour line data. It is not necessary to display the map with Iso lines on screen to do this, but it is recommeded so that you can see what the output will be. Iso/contour lines can be created in GPS eXchange (.gpx) and Humminbird (.ht) formats.
  - When generating ISO/contour lines in .gpx format, an options dialog with two check boxes will be shown after the filename has been set:
    - 'Include depth labels as waypoints' - if checked, waypoints will be generated showing the depth of the contour line.
    - 'Save contours as separate trails' - if checked, contours of different depths will be placed in separate trails. Contours can then be displayed in the GPS device using different colors.
  - When generating ISO/contour lines in Humminbird .ht format, you will be asked if you want labels generated as waypoint file (.HWR) as well.
- **Create Shoreline/base Map.** This tool is used to convert all custom shoreline data from a Chart File Index to vector/track data. The supported output formats are the same as with **Create Iso/contour Lines**.
- **Get Area/Volume.** Calculates the mapped area (the non-white section of the map), the corresponding water volume and the average, max and min depth.
- **Get Distance...**Distance measurement tool. The tool works by anchoring a tape measure at one position and then pointing with the mouse at a second position. Setting the anchoring point is very similar to setting a waypoint: first drag the map so the desired point is on the center of the screen and then use the menu command 'Tools/Get Distance...'. You can also place the anchor by holding down the 'Alt' button and double clicking the desired point.
- **Wpt From Average.** Allows you to create a precision waypoint by averaging all data in the 'Main memory' (which is data received after 'New' or data opened with 'Open', not data opened with 'Add'). If you want to use the average function with just a GPS connected set 'NMEA Sentence/Sounder' in the 'Tools/Settings/NMEA/COM' dialog to (GP)GGA otherwise no data is stored. Then, make sure that 'Use X/Y/T' in the 'Tools/Settings/General' dialog is unchecked.
- **Convert Line to Track.** Convert an .acd file (for example a marker line) to a a track file in Humminbird (.ht) or iPilotLink (.hit) format.
- **Convert Selected Contour.** Save the currently selected contour (use right ctrl-double click to select) in AutoChart (.acd), Humminbird (.ht) or iPilotLink (.hit) format.
- **Trace Extreme Value.** Finds the source file of the deepest data value currently loaded from a Chart File Index (ie a Chart File Index must be active).
- **Launch Google Earth.** Start Google Earth and navigate to the area displayed in AutoChart (Google Earth must be installed on your PC).

Map



- **Create Map.** Generates a map from all loaded data. The depth in areas between sounding data is found through interpolation and extrapolation.
- **Filter Map.** Compensates the map for the effects of the transducer cone angle. In order to achieve a good result, mapping parameters need to be properly set. **Filter Map** is only available after a map has been calculated using **Create Map** or **Local Update**.
- **Local Update.** Initiates continuous map updating for use with live data. The map is calculate in the same way as using **Create Map**, but only in the local area of the current position. The map is updated as more and more data is collected.
- **Objects.** Activates a sub-menu for selection of objects to be displayed on-screen: Map, Grid, Survey Grid, (depth) Scale, Track, Add/CFI Tracks (eg. tracks from a Chart File Index), Waypoints, Depth Labels, Shore Line, Water Temp and/or Background Map.
  Depth Labels are generated along with the map. If you want to update these after a display range adjustment (without a new map calculation) use the keyboard shortcut 'l'.
- **View 3D.** Shows a three dimensional image of the bottom. The size of the map section being displayed in 3D depends on the resolution set in General settings and is shown numerically on-screen. The map section is taken from the area displayed at center of the screen. The 3D image can be rotated using the mouse or arrow Keys. North is initially up. A north indicator shows how the direction changes as you rotate the image. With live data, if the current position is on the displayed 3D-area, it will be shown on the surface. **View 3D** is only available after a map has been generated.
- **Re-center.** The program updates a map in internal memory (the size is user selectable - the Internal map size). If you move outside this area with live data, or want to view data from a different area in offline mode, you can use **Re-center** to change the location of the map: (1) pan the map so you have the desired location in the middle of the screen, (2) run **Re-center**.
- **Pan To Map Center.** Pans the map so that center of the internal map (the red box) is positioned at the center of the screen.
- **Clear Track Log.** Clears the internal track log memory. Does not affect data being saved to file.
- **Re-create Track Log.** Recreates the track log from data in the main memory bank. Used if you want to see the track in an opened file, or if you have previously cleared the track log.
- **Set Grid Origin.** Positions the grid origin where you want it (initially it is set at the first data point). The new origin is placed at the center of the screen - you place the grid in the same way as when you create/place a new waypoint.

View, Window and Help

- The **View and Window** menus have functions to change the appearance of the AutoChart application.

- The **Help** menu is used to access documentation and license management.

Right click context menu

Right clicking the mouse in the map window area will display a shortcut menu to the most frequently accessed settings and functions. The contents of this menu will vary depending if in 2D or 3D mode.

Tip: The right click context menu can also be opened by a left click at the top of the map window area, just below the Toolbar.

Tab menu

If you have more than one tab open in AutoChart (for example the Main data tab and a help docuemnt), you can split the view to display content side by side. Simply right click one of the tabs for options.

Toolbar

The toolbar provides display related functionality and also quick access to some of the most commonly used menu items. There are standard buttons for **New**, **Open**, **Save** and **Add**, and also:

- **Zoom in.**
- **Zoom out.**
- **Log on/off.** Quick access to **Stop Log** in the **Tools**-menu.
- **Sounder View on/off.** Quick access to **Sounder View** in the **Tools**-menu.
- **Move upper limit down.** Fast depth range adjustment.
- **Move upper limit up.** Fast depth range adjustment.
- **Find Depth Range.** Quick access to **Find Depth Range** in the **Tools**-menu.
- **Move lower limit down.** Fast depth range adjustment.
- **Move lower limit up.** Fast depth range adjustment.
- **Create Map.** Quick access to **Create Map** in the **Map**-menu.
- **Filter Map.** Quick access to **Filter Map** in the **Map**-menu.
- **Local Update on/off.** Quick access to **Local Update** in the **Map**-menu.
- **View 3D on/off.** Quick access to **View 3D** in the **Map**-menu.
- **Settings.** Quick access to **Settings/General** in the **Tools**-menu.
- **Waypoints.** Quick access to **Settings/Waypoint Manager** in the **Tools**-menu.
- **Chart File Index.** Quick access to the **Chart File Index Manager** in the **Tools**-menu.

The Pro version also has additional toolbar buttons for Bottom type mapping and Side Imaging mosaic. These toolbar items are decribed in the SideImaging mosaic and Bottom hardness sections.

The toolbar buttons (and their corresponding menu commands) can be combined with keyboard keys to extend the functionality:

- If you hold down the 'Shift' key while clicking the depth range adjustment Toolbar buttons the depth range will be changed in steps of five units.
- If you hold down the 'Shift' key while klicking the Chart File Index Manager button the currently active Chart File Index will be reloaded (handy if you made external changes to a file).
- If you hold down the 'Ctrl' key while opening the Chart File Index Manager the currently active Chart File Index will be viewed/opened.
- If you hold down the 'Shift' key while clicking Add, the file type selector in the following file dialog will be set to 'AutoChart Files (*.acd)'

- If you hold down the 'Ctrl' key while clicking Add, the file type selector in the following file dialog will be set to 'AutoChart Index (*.aci)'

When editing data, an additional toolbar will be displayed. It is described in Editing data.

Keyboard shortcuts

Some of the menu functions have keyboard shortcuts. There is also keys that will modify the menu functions.

A complete overview of all keyboard shortcuts is available from the help menu: **Help/Shortcuts**.

Mouse

Mouse functions

- **Map Pan.** Hold down the left mouse button and drag the map.
- **Rotate 3D map.** Hold down the left mouse button and drag the map.
- **Set 3D draw/pivot point.** Hold down the Alt key and doubleclick on the 3D surface.
- **Zoom.** Use the scroll wheel (you can flip the zoom direction in **Tools/Settings/General**).
- **Open a waypoint** in the waypoint manager by doubleclicking it on the map.
- **Create a new waypoint** at the mouse cursor: Ctrl+doubleclick.
- **Select a single contour** Right Ctrl+doubleclick.
- **Trace data points.** If you find corrupt data when having a database open you can easily trace which data file a particular data point comes from. Just hold down the Shift key and double-click the suspicious point - the file name will be displayed and you will be given options for editing. This trace function is also available on the right click context menu.
- **Select a data point** for editing in edit mode: doubleclicking the point.
- **Display context meny.** Right-click anywhere in the window will display a shortcut menu with the most frequently changed settings plus offers switching between 2D and 3D views.
- **Hovering** the mouse on the map will display depth+position at the mouse cursor.
- **Adjust depth range:**
  - Point the Min/Max-values in the depth scale and use the scroll wheel to adjust.
  - Click the middle of the depth scale to auto adjust the depth range (=Tools/Find Depth range).
- **Minimize AutoChart in Full Screen mode.** Double-click the Humminbird icon in the lower left corner.

When you pan the map using the mouse, these help lines will be displayed on screen:

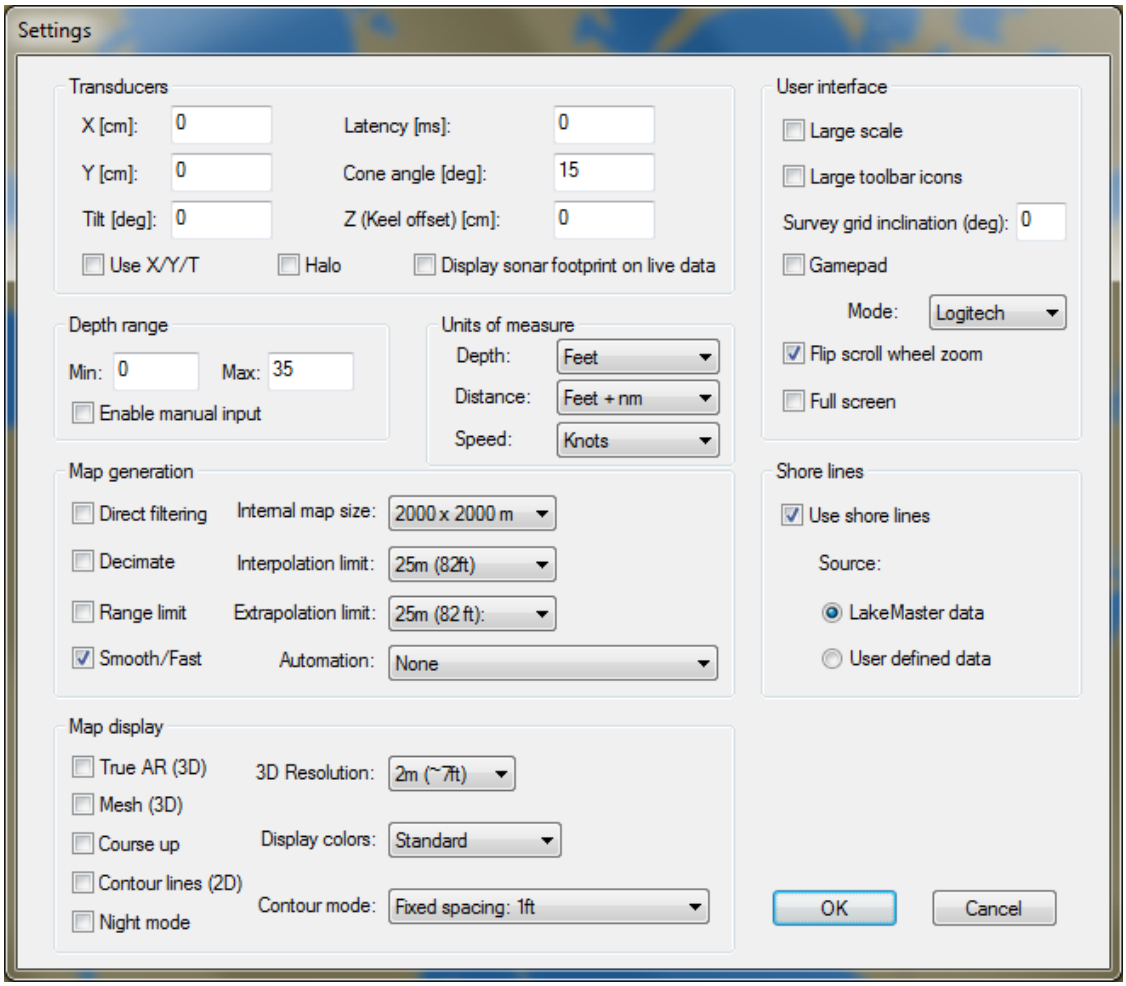
- A cross is shown to make it easier to place waypoints and grid.
- A square is shown to indicate the area that will be rendered in 3D (requires that a map is available).

Settings

- General settings
- LakeMaster map data settings
- Connection of GPS and sounder for live data
- Waypoint manager
- Chart File Index manager
- Water temperature alarms
- Tide correction
- Automatic save
- Import settings
- Background maps

General settings

Mapping parameters and user interface settings are found in **Tools/Settings/General**:



- **Transducers.** Using the settings in this group box you can for example make corrections for how you GPS and tranducer are installed in the boat. The program will use these settings to compensate both live data as well when importing logged data.
  - **X (cm).** The distance between the sounder transducer and the GPS antenna, in the boat lengthwise direction, given in *centimeters*. If the antenna is placed before the transducer, this value is positive, negative otherwise.
  - **Y (cm).** The distance between the sounder transducer and the GPS antenna, across the boat, given in *centimeters*. If the antenna is placed on the starboard side of the transducer, this value is positive, negative otherwise.
  - **Tilt (deg).** Ideally, the sounder transducer should be directed straight down towards the bottom, but in practice there will be a slight deviation in inclination as the speed of the boat varies. The Tilt value, given in *degrees*, tells how much the inclination deviates form straight down. If directed slightly forward, the value is positive. Instructions on how to find the **Tilt** value is given in Tuning of transducer parameters.
  - **Latency (ms).** Relative latency between sounder and GPS NMEA data, given in *milliseconds*. Instruments needs some time to process data before outputting NMEA. How to tune Latency is described in Tuning of transducer parameters.
  - **Cone angle (deg).** The transducer cone angle given in *degrees*. This parameter is used during map filtering. The sounder manufacturer usually states a cone angle for its instrument, use this value as an initial setting. However, results are most likely improved if this value is tuned. See Tuning of transducer parameters for instructions.
  - **Z (Keel offset) (cm).** The distance between the water surface and the transducer, given in *centimeters*. The keel offset is always a positive value.

- **Use X/Y/T.** Use the X/Y/Tilt parameters. In order for the program to be able to use these values correctly, the boat heading must be known. If you have/use an electronic compass, true heading will be used for corrections. Without a compass, position data will be used to derive heading from course, and this assumes you have a forward speed. If the boat instead drifts backwards or sideways the error will increase rather than decrease, if these parameters are used.
  Therefore (without compass) : if you have forward speed (for example during active data collection) have the **Use X/Y/T** checked. If you do not have forward speed, uncheck **Use X/Y/T**.
- **Display sonar footprint on live data.** If checked a circle will be drawn indicating what the sonar sees at the current depth (corresponding set Cone angle).
- **Halo.** If checked the current position (with live data) will be highlighted with a halo effect.

- **Depth range.** Minimum and maximum depth values on the scale. Can be input manually, or found using **Tools/Find Depth Range**.
  - **Enable manual input.** If checked, you can input depth values by clicking on the depth scale (inside the frame) using your mouse/stylus. With this function you can log depth data without access to a sounder with NMEA data.

- **Units of measure.** Selects the units to be used for depth, distance and speed.

- **Map generation.** Settings affecting the generation of the map.
  - **Direct filtering.** If checked, the map will be compensated for the effects of the transducer ('filtered') directly when using the **Calculate Map** or **Local Update** commands. The **Filter Map** command will be unavailable. See more information in Map calculation.
  - **Decimate.** If checked, data is decimated using a clever algorithm before map calculation, saving computational time.
  - **Range limit.** If checked, only data within the depth range according to the **Depth range** settings will be used during map calculation.
  - **Smooth/Fast.** If checked, maps will be calculated with different parameters in the interpolation algorithm, which gives smoother maps and also reduces the computational time. For most cases, Smooth/Fast is the setting to use. The main exception is if you are mapping features like ship wrecks and want to get as much detail as possible, then make sure that Smooth/Fast is not checked.
  - **Internal map size.** Controls the size of the internal map the program uses to render maps (the 'drawing canvas'). With a larger internal map, a larger map section can be kept up to date, without having to do a shift in the map center using the **Re-center** function. A larger internal map size also means that a larger section can be rendered in 3D.
    The choice of internal map size depends on your computer and your needs. If you have a lot of memory you can go bigger, but bigger may also mean slower map updates. In particular for live data use, there is no reason going too big.
  - **Interpolation limit.** This control determines how close a point in the map has to be to measured data to be mapped. By selecting a larger value, larger areas will be filled (interpolated). This is sometimes practical as it will reduce the time needed for collecting the data - areas with flat bottom etc will not need to be sampled as closely. Be warned though, increasing the 'Interpolation limit' may give large errors far from the data points.
  - **Extrapolation limit (PC only).** This control determines how far from data (outside the 'interior' of the data) the map will be extrapolated.
  - **Automation.** Determines if and how automatic map updating will be used. You can find more information in Covering large areas with live data.

- **Map display.** Settings affecting the appearance of the map when displayed.
  - **True AR (3D).** If checked, the map will be displayed in 3D view with the correct aspect ratio. If not checked, depth variations will be exaggerated.
  - **Mesh (3D).** If checked, a mesh will be drawn on the map in 3D mode. The mesh makes it easier to see terrain variations.
  - **Course up.** If checked, the map will be rotated such that the course direction is up.
  - **Contour lines (2D).** If checked, colored contour lines will be displayed instead of a full color map.
  - **Night mode.** If checked, colors are inverted, giving a different appearance.
  - **3D Resolution.** Sets the resolution, in meters, used in 3D mode. Selecting a large value will provide larger area coverage in 3D, but with less detail.
  - **Display colors.** Selects the display map colors to use, a change will have immediate effect. To use custom colors, see Creating custom colors.
  - **Contour mode.** Sets the spacing of contours. You can have either a fixed spacing of your choice, or you can

have the contour spacing set relative to the color range set, i.e. the Min and Max **Depth Range** settings. With the relative spacing and colored contours you will then have ten contours between Min and Max, while with black contours on a full color map you will have twenty.

- **User interface.**
  - **Large scale.** Increases the size of the depth scale.
  - **large toolbar icons.** Increases the size of toolbar buttons.
  - **Survey grid inclination (deg).** Sets the inclination (clockwise) of the survey grid.
  - **Gamepad.** Check to use a gamepad to control AutoChart and the mouse. The mode selector lets you adapt to Logitech and Saitek configurations. Functions:

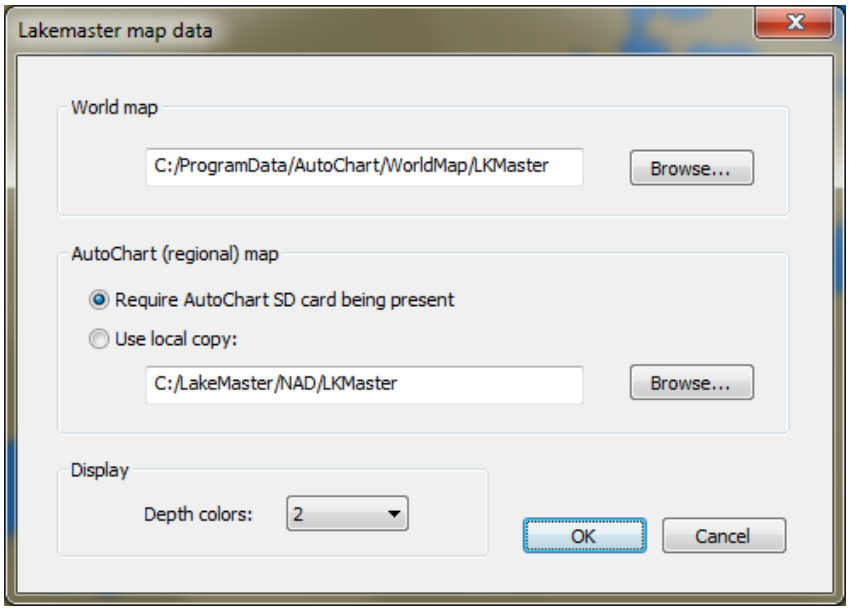
If you notice a drift in the mouse cursor, you can recalibrate the sticks by pressing and holding the four range buttons (Min range up/down + Max range up/down) simultaneously.

  - **Flip scroll wheel zoom.** Check to get the same scroll wheel zoom direction used by for example Google Earth.
  - **Full screen.** Check to turn on Full Screen display mode. While in Full Screen mode you can minimize AutoChart by double-clicking the Humminbird icon in the lower left corner.

- **Shore lines.** Determines how shorelines will sources and used
  - **Use shore lines.** If checked, shore line data will be included in the generation of the map. Shore line data is used as a constraint when maps are calculated and is also used to mask the map. (Note: this checkbox does not control if shore line data is displayed or not, that is controlled from the Map menu (Objects)).
  - **Source.** Select **LakeMaster data** to use shorelines from the AutoChart SD card. Select **User defined data** if you want to user custom shoreline data. You can find more information on shore line data in Using custom shore line data.

LakeMaster map data settings

Settings for LakeMaster map data are found in **Tools/Settings/LakeMaster**:



- **World map.** This is where your world wide base map is stored. This location will be setup first time your run AutoChart. If you want you can change the location of the world map data to anywhere on your PC, just make sure to keep the folder **LkMaster** intact when you copy/move the map data.
- **AutoChart (regional) map.** This is the regional map that is the basis for all custom maps you will create with AutoChart. It comes on the AutoChart ZeroLine SD card. You can choose if you want to use data directly from the original SD card or use a local copy:
  - **Require AutoChart SD being present.** Your AutoChart SD card must be present to display maps or create new LakeMaster map data. Using this options your custom maps will be generated directly to the card and are ready for use directly.
  - **Use local copy.** You can place a copy of the original **LkMaster** folder on your hard drive. Using this options you can work on your maps without having the SD card at hand but you **MUST** copy the custom map folders manually back to the card to use these maps on the water on your Humminbird unit.
- **Display - Depth colors.** Controls how colors are applied to a LakeMaster depth map when displayed (just like the setting with the same name on your Humminbird unit).

Tutorial map sample

The tutorial data included with AutoChart comes from a lake in Minnesota, US. If you have a different version of the AutoChart ZeroLine SD card than the North America version, there is a small regional LakeMaster map (covering the tutorial area) included with the AutoChart install on your PC, which you can use to work through the tutorial. This is how to use this map:

1. In the **AutoChart (regional) map** group box, tick **Use local copy**.
2. Use the **Browse** button to locate and select the the LkMaster map folder as follows:
   - On Windows XP, you will find the tutorial sample map below the install folder of AutoChart. On a standard install, the folder will typically be:
     C:\Program\Johnson Outdoors Inc\AutoChart\Tutorial\Map\LkMaster
   - On Windows Vista/7/8, the sample map folder is:
     C:\ProgramData\AutoChart\UserData\Tutorial\Map\LkMaster

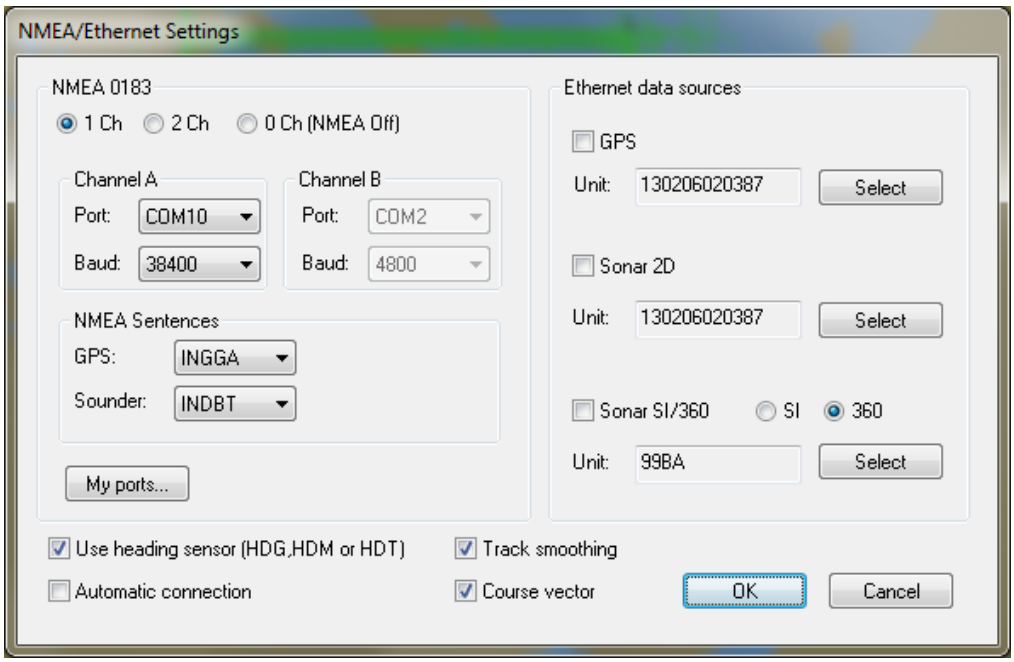
The sample map for the turorial will ONLY display in AutoChart PC, it will NOT display on Humminbird units.

Important 1: Do not change/modify any of the files inside the **LkMaster** folders. Doing so will destroy the map content and make the card useless.

Important 2: Do not place LakeMaster data in the Program Files folder on Windows Vista or newer Windows versions.

Connection of GPS and sounder

Parameters for live data connection are found in **Tools/Settings/NMEA/COM**:



- **NMEA 0183.** Options for NMEA 0183 data:
  - **1 Ch.** Position and depth data is received on the same NMEA-channel/serial port. Parameters for Channel A apply.
  - **2 Ch.** GPS and sounder use separate NMEA-channels/serial ports. Parameters for Channel A apply to the GPS, and parameters for Channel B apply to the sounder (*important!*).
  - **0 Ch (NMEA Off).** Select if you are not using NMEA 0183 and will instead use Ethernet for live data.
  - **Channel A/B.** Parameters for the serial (COM) ports which the GPS and sounder are connected to.
  - **NMEA Sentence.** The NMEA sentences that will be read/used.
    You can see what NMEA sentences your instruments transmit if you select **Show NMEA** in the **Tools**-menu (the connection must be up and running).
  - **My ports...** Displays the available COM/serial ports. Note that virtual COM port are only visible if the hardware linked to them (for example a USB to serial converter) is plugged in.

- **Ethernet.** Options for Humminbird Ethernet data:
  - **GPS.** Check to receive GPS position data on Ethernet.
  - **Sonar 2D.** Check to receive Sonar 2D 200kHz depth (and hardness) data on Ethernet.
  - **Sonar SI/360.** (Pro version only) Check to receive Sonar SI or 360 data on Ethernet.
  - **SI/360.** (Pro version only) Select if you want to use a SI or 360 data source.
  - **Select.** The Select button checks for available units providing the desired data type. Before using Select the data source must be up and running, and both your PC as well as the data source must be connected to the network. Press Select and you will be provided with a list of units supplying the desired data. Important: you must run Select for each of the data types you have checked!

- **Use heading sensor (HDG, HDM, HDT).** Check to use heading data (if available) for X/Y transducer/antenna compensation. If you run the 2 Ch. mode both channels will look for heading data.
- **Automatic connection.** If checked, the GPS and sounder will be connected when AutoChart is started.
- **Track smoothing.** If checked, the GPS data will be filtered for more stable speed and course estimates (also applicable when importing data).
- **Course vector.** If checked, a black vector showing the course will be drawn on screen. If heading data is available there will also be a red vector showing boat heading.

Firewall: When using Ethernet, either turn your (Windows) firewall off, or make sure AutoChart can access ethernet data:

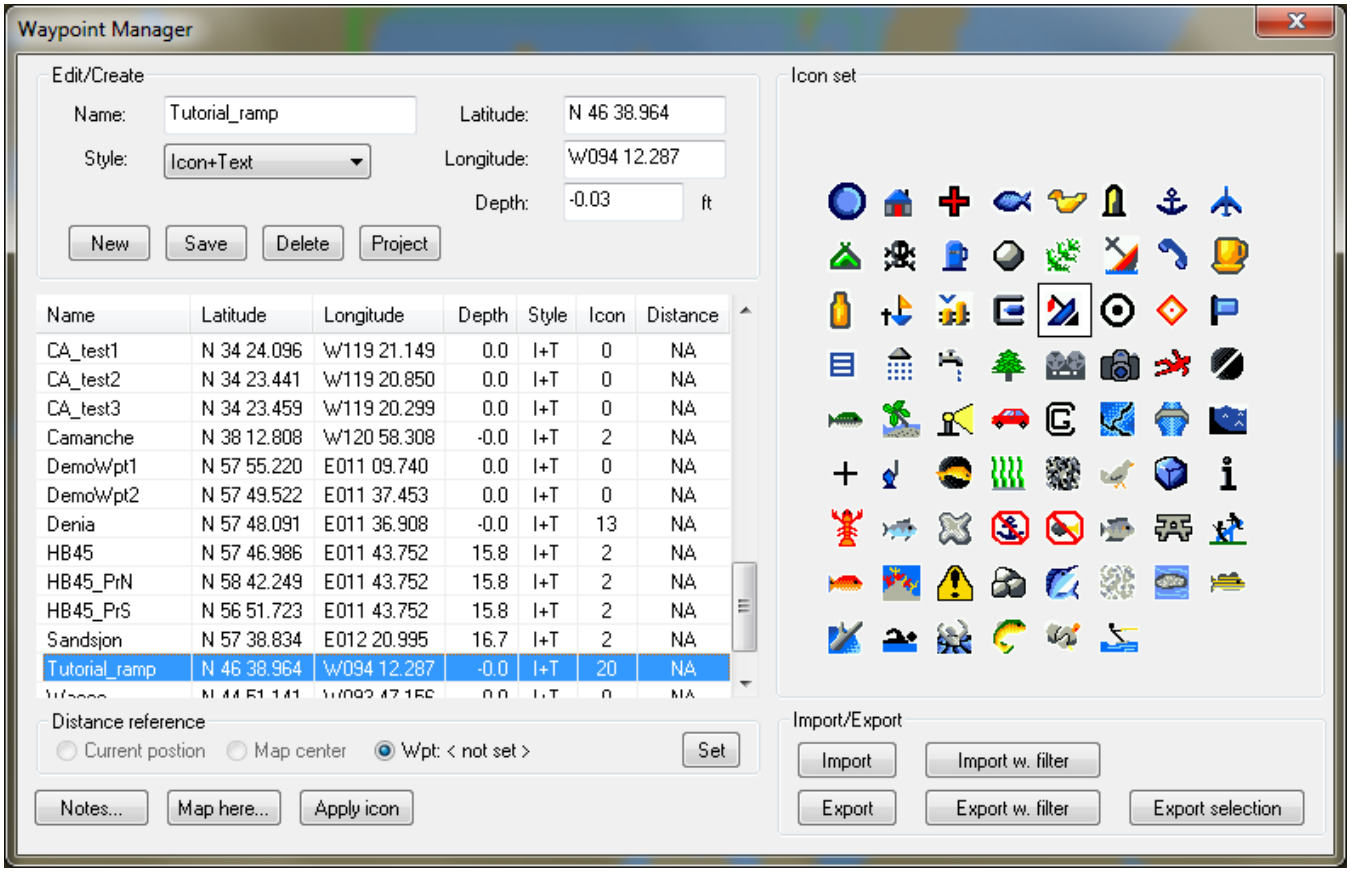
- Control Panel/Windows Firewall/Exceptions.
- Use the 'Add program' button to allow DrDepth get through.

Note 1: You can combine NMEA 0183 and Ethernet if you wish, sourcing one data type from NMEA 0183, and another from Ethernet.

Note 2: Cabling for NMEA 0183 and Ethernet is described in the Gettings started guide.

Waypoint manager

Waypoints can be edited by selecting **Tools/Settings/Waypoint Manager**:



Basic funtionality

- To edit a waypoint, double-click it in the list box. Its name, latitude, longitude and style will be shown in the respective field (the map datum/reference is WGS 84). To save, click **Save**. To delete the selected waypoint, simply press **Delete**. You can select multiple waypoints in the list and delete them at once.
- To create a new waypoint, click **New**. Edit the name, the latitude, longitude and style and then click on the **Save** button. The format for the latitude and longitude is: N/S/E/W degrees minutes.decimalminutes.
- If you would like to create a new waypoint similar to an existing one, then double-click the old one in the list before clicking on **New**. The name and coordinate fields are not cleared on **New**, and you can use the entries as a template.
- The **Project** button projects waypoints a desired distance (PC only). Mark the waypoint in the list and click Project. When you close the project waypoint dialog the name is selected for change. You must press Save to store.
- To **Sort** the waypoints, just click the column headers in the list. If you want to sort by distance, select the distance reference point in the **Distance Reference** group.
- The **Notes...** button will open a window where you can enter notes for the waypoint selected in the list. For example, the notes function lets you maintain a geographical fishing diary.
- The **Map here...** button will have different effect depending on if you have data loaded or not:

    - If you have Opened/Added data, selecting a waypoint and pressing 'Map here...' will 'Recenter' the map at that waypoint.
    - If you do not have any open data (New), selecting a waypoint and pressing 'Map here...' will set the map center locus at the waypoint and will also set all necessary parameters AutoChart needs to show data. The effect is exactly the same as if you right clicked the same position on the start screen and selected 'Map here...' from the pop up menu.

  When using 'Map here...' for offline mapping there are two ways to have a Chart File Index automatically loaded for you:
    - If you check 'Add Database on New' in 'AutoSave', that database will be opened for you. **Note:** This is the default setting/behaviour in AutoChart when runinng with standard settings!
    - If you hold down the Ctrl key when clicking 'Map here...' the most recently used Chart File Index will be loaded.
- The **Apply icon** button lets you set a waypoint icon to many waypoints in one stroke. First select the waypoint icon you want from the Icon set pane, then select the waypoints in the list you want to set this icon to. Finally press Apply icon.

Importing and exporting waypoints

AutoChart lets you keep your waypoints in sync. While moving waypoints from AutoChart to your Humminbird units and back you can maintain your prefered icon etc. If you create new waypoints on the water you can import the lot back to AutoChart - old waypoints will not be duplicated.

- With the **Import** buttons you can import waypoints in Humminbird (.HWR), GPS eXchange (.gpx), AutoChart/DrDepth (.dwp) and Lowrance user data version 2 (.usr) formats.
- With the **Export** buttons you can export waypoints in Humminbird (.HWR), GPS eXchange (.gpx) and AutoChart (.dwp) formats.
- For Humminbird: the quickest way to get your waypoints to/from your unit is to use the HWR format (it is the format the unit will store waypoints in when you export them on your unit) - you will not need to go though use Humminbird PC. To get your waypoints to your unit: place you .HWR file on a memory card, in a folder named 'MATRIX', insert the card to your unit and turn it on - the file will be read during boot.
- To export only a selected range of waypoints (ie not all), select them in the list and use the **Export selection** button.
- You can also invoke a **filter** when importing or exporting waypoints. The filter is an AutoChart .acd or Google Earth .kml file (you will be asked for this file when using the Import/Export w. filter buttons) that will be used as a spatial delimiter: waypoints inside the polygon defined by the file will be imported/exported. This way you can for example easily export waypoints from a lake by just using the (outer) shoreline file as a filter.
  You can also use the filter function if you have more waypoints than your plotter can handle. Just export waypoints for the area you will be in and load these to your plotter.

Tip: you can quickly edit a waypoint by simply double clicking it on a map display. The Waypoint manager will open with the clicked waypoint selected.

Waypoints are stored in a text file, drdwptv2.dwp, located in the install directory of AutoChart if you have Windows XP. On Windows 7/8 and Vista, the file is located in C:\ProgramData\AutoChart\UserData. If you want to (for example if you have a large number of waypoints to enter), you can edit this text file. The format to use is illustrated by the demo waypoints. Note: The format of the coordinates are different in the text file compared to the Waypoint Manager. The latitude and longitude are to be given in degrees.decimaldegrees. S/W are to be replaced by minus signs. Note: Do not edit the first or last line in drdwptv2.dwp.

Waypoint notes are stored in a file named 'acwptnotes.dnt' located in the install directory of AutoChart if you have Windows XP. On Windows 7/8 and Vista, the file is located in C:\ProgramData\AutoChart\UserData.
DO NOT edit this file.

Chart File Index manager

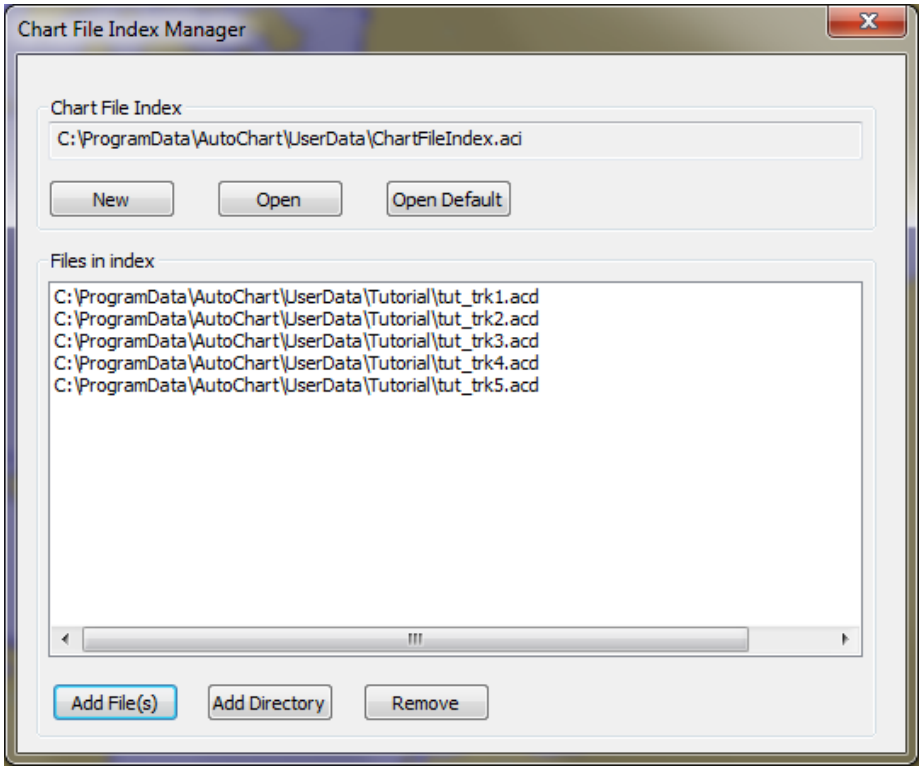
With the Chart File Index manager you can create an index of all your data files. The use of a Chart File Index is very handy when you have a lot of data files, possibly from differnt areas.

The actual Chart File Index is a header file which contains information on what is inside your data files and where.

AutoChart uses this information to retrieve the data from the particular area you are currently at. You can use significant amounts of data without filling up your computers primary memory - only the data that is nesessary for the target area will be loaded.

When you install AutoChart the first time a default Chart File Index will be created and set up for you. You do not need to do any manual configuration. When you import data files these will be added to the default Chart File Index automatically. This default Chart File Index is used to display your data content on the start screen.

To display the content of your default Chart File Index, first open the Chart File Index Manager from Tools/Settings and then click **Open Default**. If, for example, you have gone through the tutorial in the Getting started guide, the content may look like this:



Your existing .acd files are listed, and as you import more data, your new .acd files will appear hear as well automatically. If you get .acd files from external sources (for example friends using AutoChart), you can use the **Add files(s)** or **Add Directory** buttons to add these to your Chart File Index. When adding files there is an automatic check so that file entries will not be duplicated.

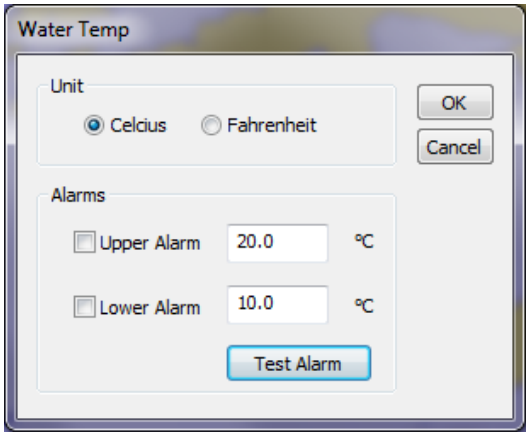
If you later want to exclude files you can use the **Remove** button. This will exclude the .acd file from the Chart File Index, but it will not delete the actual file so you can later put it back in if you wish.

Advanced use

The advanced user can create and use multiple Chart File Indexes, and select the one to load/use at run time using **File/Add File or Chart File Index**. For most users though, the default Chart File Index is all that is required.

Water temperature alarms

Parameters for water temperature alarms are found in **Tools/Settings/Water Temp**:



If your sounder transmits the MTW NMEA sentence AutoChart will display the water temperature.

- **Unit.** Sets the dispaly unit for water temperature.

There are two types of alarms that can be set:

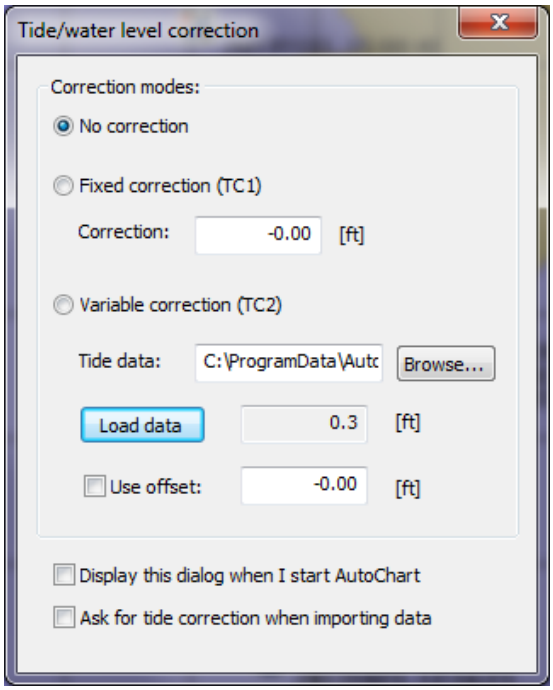
- **Upper Alarm.** Triggered by rising temperature.
- **Lower Alarm.** Triggered by falling temperature.

The threshold set for 'Upper Alarm' can be lower than the one for 'Lower Alarm'. The volume of the alarm beep is affected by settings in Windows (Volume Control), you can test with the 'Test Alarm' button.

Water temperature data can bes displayed as an overlay, see Water temperature overlay. The overlay is turned on with **Map/Objects/Water Temp**

Tide Correction

Parameters for tide and water level corrections are found in **Tools/Settings/Tide Correction**:



There are three modes for tide correction:

- No correction. The depth from the sounder and/or files will be used as is.
- Fixed correction (TC1). Compensates the data from the sounder and/or files with a fixed value.
- Variable correction (TC2). Compensates the data from the sounder and/or files with the current tide. Tide data is generated from a program called 'WXTide32'. An additional fixed offset value can also be included to take atmospheric effects (wind, pressure etc) into account. **Note:** the TC2 mode is for compensation of live NMEA data, not for 'offline' use!

With a correction on, the mode and correction value will be seen in the status bar.

When using the TC1 or TC2 modes, the idea is to have all your data files (.acd) corrected/referenced to a normal water level (0 m/ft correction), and then simply set a correction value that reflects the condition for the day. The correction is applied to the sounder data (or really subtracted) before it is saved so the data in the .acd file will be referenced to the normal zero level. When creating/updating a map, the correction is added to all loaded data so the output (the map) reflects the current condition. As the tide changes the map will follow.

Using **TC1**:
Select the 'Fixed correction (TC1)' radio button and set the 'Correction'. If the water level is higher than normal 'Correction' should be positive, if it is lower it should be negative.

Using **TC2**:
For TC2 you will need a file with tide data, which you can create using an application called WXTide32. WXTide32 is free, but due to licensing it cannot be distributed with AutoChart. Follow these simple steps to generate tide data for AutoChart:

1. Download and install WXTide32 from www.wxtide32.com.
2. Run WXTide32 and find out what the best/nearest port (location with tidal information) is to you. You can also create a custom port.
3. Once you have your port sorted out, close WXTide32, open a command window in Windows, navigate to the folder where WXTide32 is installed, and run this command:

   wxtide32.exe -textfile "actidedata.txt" -csv -nowarn -incremental 10 -numdays 365 -location "YOURPORT" -units m -utc

   where you first MUST replace YOURPORT with the name of your port, i.e., the port you selected in step 2. After running the command you will have a file "actidedata.txt" which is the file AutoChart will use. With the command above you will get a file with data for a year, but you can change the number of days if you like (AutoChart will warn if the data has expired and you have to generate a new file). You can place the file wherever you like, just use the 'Browse' button to set the path to it.

With the tide data file created and in place, press the Load button to update the current tide, which will be displayed next to the 'Load' button. Note: it is not necessary to load the tide data file manually as it will be done automatically when closing the dialog if you have selected TC2. Tide data will also be loaded on program start if TC2 is selected.

Important: when you use TC2, make sure that the clock and Time Zone is correctly set in Windows, otherwise the correction will be wrong!

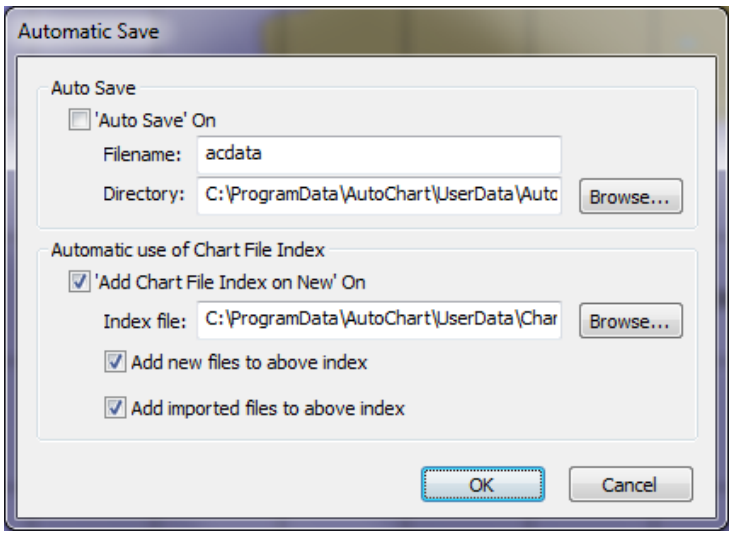
When using TC2 you can also add an extra offset to take, for example, atmospheric effects into account. Just check 'Use Offset' and set an offset correction. The offset added to the tide value (next to the 'Load' button) is the total correction.

If you use the TC1 and/or TC2 modes it is a good idea to check 'Display this dialog on start' to get a reminder to set proper values when you start AutoChart.

To apply tide corrections when **importing data**, check 'Ask for tide correction when importing data'. You will then get a similar dialog when importing your data. The settings you select for import corrections are not the same as the ones in the main tide dialog, so you can keep separate settings for data import and mapping or live use.

Automatic save

Settings for Automatic Save are found in **File/Auto Save...**. The sample settings displayed below are the original settings created on a fresh install:



Auto Save: Turning on Auto Save is recommended for live data use.

- **'Auto Save' On.** If checked, new files will be saved automatically (not files opened with 'Open'). The filename will be the name tag in the 'Filename' field (exclude .acd here!) which will be appended with date and time tags (set automatically). The file will be stored in the folder 'Directory'. Auto save will start within a few seconds after the first data is received, and the file is then saved every five minutes and when closed. You can change the name of the current file with 'Save As' if you wish, automatic save will continue with the new name.

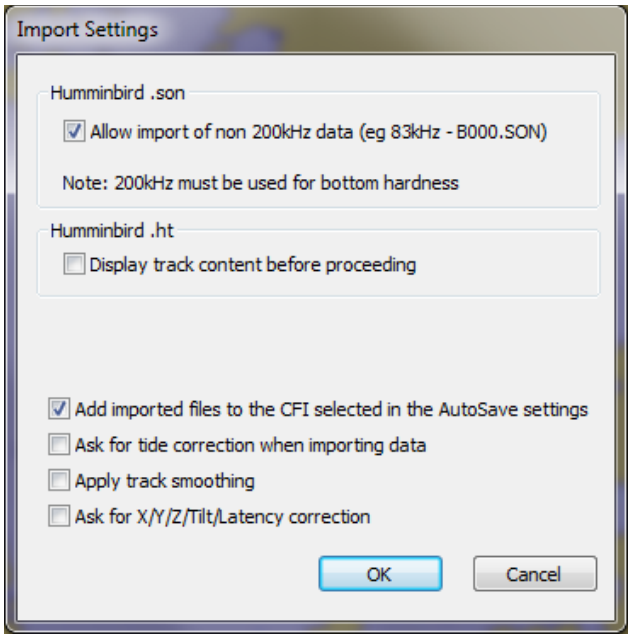
Automatic use of Chart File Index: These are the settings that makes the start screen display all your data. It sets the default Chart File Index and how it will be used.

- **'Add Chart File Index on New' On.** If checked, the Chart File Index selected under **Index file** will be loaded automatically on 'New' (or on program start which is the same as 'New'). The Chart File Index set under **Index file** will be the **Default** Chart File Index.
- **'Add new files to above index'.** If checked: When a new file is closed it will be added to the selected Chart File Index. If the Chart File Index does not exist it will be created.
- **'Add imported files to above index'.** If checked, files will be added to the selected Chart File Index on import. If the Chart File Index does not exist it will be created.

With proper selections above you do not have to worry about file management. Turn AutoChart on when you take off, turn it off when you come ashore.

Import settings

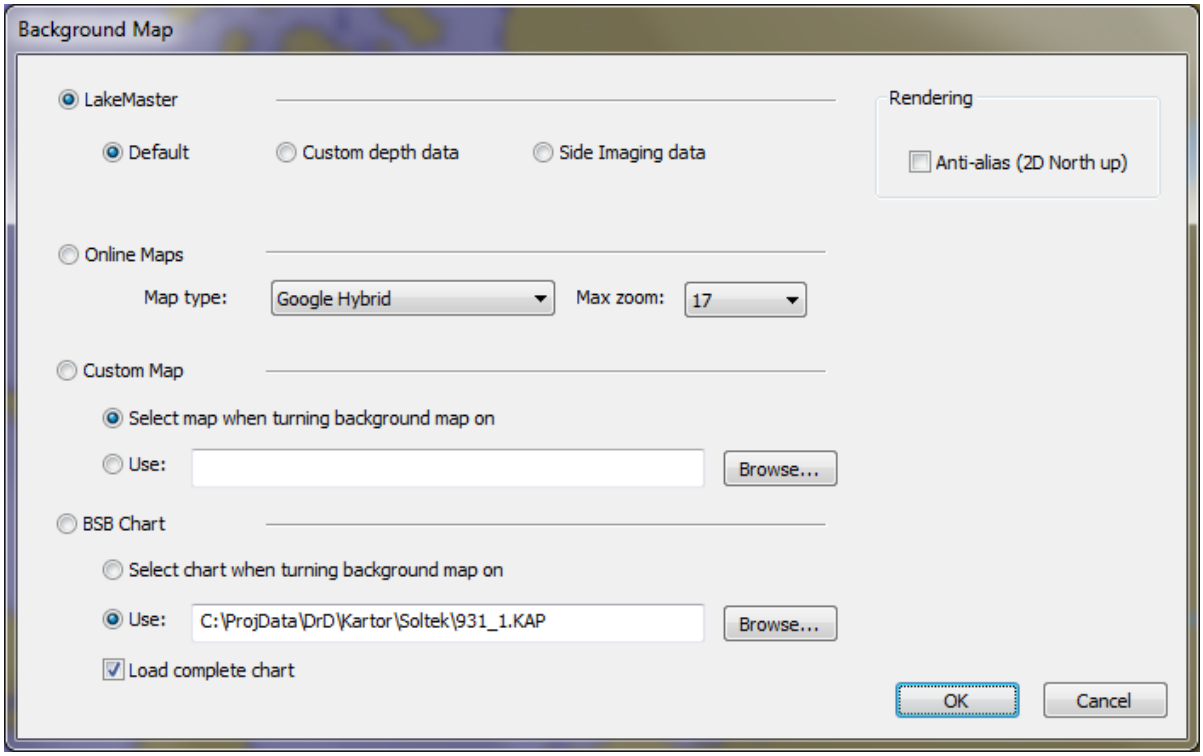
Settings for data import are found in **File/Import Settings...**



- **Humminbird .son** Check to allow import of non-200kHz Humminbird data (for example 83kHz - BOOO.SON). Note: 200kHz (BOO1.SON) is ALWAYS preferable if you have it, and is a MUST to get bottom hardness with the AutoChart Pro version.
- **Humminbird .ht** Check if you want to have the track name and time info displayed before proceeding to import.
- **Add imported files to the CFI selected in the Autosave settings** Check to add new files to your database (this is the same setting as in File/Auto Save).
- **Ask for tide correction when importing data** Checking this option will prompt for tide correction (this is the same setting as in Tools/Settings/Tide Correction).
- **Apply track smoothing** Check to filter position data.
- **Ask for X/Y/Tilt/Latency correction** Check to be prompted for transducer placement/timing corrections.

Background maps

Settings for background maps are found in **Tools/Settings/Background Map**:



The start screen in AutoChart will always use LakeMaster map data. When you leave the start screen, having loaded data and/or initiated the normal map data view, you can select to use arange of sources as background map:

- **LakeMaster** This is the map from your AutoChart ZeroLine SD card. You can select to display the default base map, or one of the custom map layers you create yourself.
- **Online Maps** A selection of various online map providers. Choose the map supplier and the type of map you want. You can also set a **Max zoom** level to load: some suppliers will return empty maps at the finer zoom levels, and you can prevent display of these empty maps by restricting the max zoom level. Setting a Max zoom level can also reduce the amount of data to download.
  Important! To be able to use an online map provider you will need to:
  - Have an internet connection.
  - Make sure AutoChart is not blocked by your Windows or network firewall.
- **Custom Map** You can use almost any map/image (png/jpeg/bmp/gif) as custom background map but you will need a calibration file for it - you can choose if you want to select the calibration file when turning the background map on, or if you want to assign a default under 'Use:'. It is assumed that the map image is nominally north up.
  The following calibration file formats are supported:
  - Google Earth .kml
  - Fugawi .jpr
  - OziExplorer .map

  AutoChart uses a polynomial based calibration model so calibration files in .map or .jpr-format can have more than (three)/four points to account for slight skew and make maps of various map projection display accurately when zooming in.

  If you do not have a calibration file for your image it is easy to make your own 'pseudo' kml file. In a text editor, create a file with this content:

  <href>mymap.png</href>
  <north>57.82643747</north>
  <south>57.82408988</south>
  <east>11.62595975</east>
  <west>11.62220977</west>

  Replace the actual values within the tags with the file name of your map and the bounding box of it (in degrees/WGS84). Save the file with .kml file extension in the same folder as the image. AutoChart will now read the

calibration data (but Google Earth will not read/understand it...).
This will work with most maps/images of up to 'moderate size', with true north up. The lat/long scaling need not be the same, but there is no compensation for skew/rotation or any other distortion.
With larger maps the datum/projection comes into play and there may be significant error.

- **BSB chart** Non-encrypted BSB charts, such as the free NOAA US charts, are supported. You can choose if you want to select the chart when turning display of it on, or if you want to use a default. You can also choose to load the entire BSB chart (rather than just the area corresponding to the internal map) but this may require a bit of memory.

If you check **Anti-alias** the image quality will typically improve (depending on the relation of the source image and screen resolutions).

The display of background maps is turned on and off with **Map/Objects/Background Map** or through the right click menu. You can also use the keyboard shortcut '**g**'.

Tip for BSB charts: If you hold down the Shift key while turning on the background map, the background map will be loaded to fit the window rather than the internal map.

Background maps are displayed both in 'North Up' (default) and in 'Course Up' mode, and you also get the background map as an underlay/backdrop in 3D.

Copyright notices:

AutoChart ZeroLine SD cards

AutoChart ZeroLine SD cards other than the North America version are based on OpenStreetMap data. OpenStreetMap is open data, licensed under the Open Data Commons Open Database License (ODbL). In accordance with the Open Street Map license, we are providing access to a derivative database that has been created for use in the Autochart product. Click the link below to download a copy of the Humminbird Open Street Map Derivative Database in shapefile format. The database includes all shorelines available from Open Street Map with the exception of the US and Canada. Please understand that this database is only readable in specific GIS software packages and consists of nothing more than the Open Street Maps shoreline information.

OpenStreetMap database link to FTP (700 mb file)

To access the FTP site, please use Username = "TBD" and Password = "TBD".

MapQuest Open Aerial Tiles

Portions Courtesy NASA/JPL-Caltech and U.S. Depart. of Agriculture, Farm Service Agency.

Examples

- Logging data
- Data reuse/memory management - Open vs Add
- More on the Chart File Index
- Editing data
- About map calculation and filtering
- Using custom shore line data
- Creating map images
- Covering large areas with live data
- Water temperature overlay
- Tuning the transducer parameters
- Creating custom colors
- Files to backup

Logging data

When using live data, a new data log file is started by selecting **New** in the **File**-menu. If you record data on a Hummninbird unit, sonar recordings are started from the **Snapshot and Recording view**. If you are using the tracklog to record data, you can start a new recording by simply starting a new track.

Important: It is ALWAYS good practice to keep data from differnt days in different files! Avoid continuing recording on a previous file/log the next day.

The optimum way to record data depends on a lot of factors - the topography, boat speed, boat setup etc. If you are using AutoChart primarily to improve your fishing, the simple advice is to just keep recording on when you are out in the boat. All data you will get is usable. You will discover new areas to map as you go, and you will quickly build on your skills to get the the data that you require for your needs. A fisherman rairly needs to map every little detail of a water. Start with your fishing spots and build from there.

If your goal is to make a complete lake map, follow these guidelines to get a good map in as short time as possible, :

- Follow a plan.
- Follow the maximum gradient of the seafloor (up or down).
- Keep a steady speed.
- Turn the boat where the bottom is flat if possible.

If you want to scan an object to map in detail, such as a shipwreck, do as follows:

- Do most of the runs across the wreck rather than alongside.
- Turn the boat where the wreck is well out of the transducer cone.
- Try to reduce the measurement time, so as to reduce the error due to possible GPS variations.

Data reuse/memory management - Open vs Add

AutoChart uses two separate memory areas to handle data:

- Main memory. Live data received directly from a GPS+Sounder goes here. If you select **New** the main memory will be cleared. If you open a file with **Open** the main memory will first be cleared, then the main memory will be filled with data from the file. New data from the instruments will be appended at the end. If you then save the file, the new data will be included.
- Background data memory. Data you open with **Add File or Chart File Index**, or data loaded by right clicking the start page and selecting **Map here...** is placed here.
  You can add as many files as you like, but only one Chart File Index at a time. Data in the background memory is displayed and is included when creating maps. If you select **New** or open a file with **Open** the background data memory is cleared.

When to use **Open** and when to use **Add**?

- Use **Open** to open an individual file to review new data or edit data. Normally you would do this when you want to check the latest file you logged, to see if the data is ok and simply reviewing your latest fishing trip.
- Use **Add** when you want to load all your data to create a new updated map.

When using data loaded with **Add File or Chart File Index**, note that it is much more memory efficient to use a Chart File Index than to add individual files. When using a Chart File Index, only data from the current map area will be loaded, while if you add individual files, all data from the files will be loaded.

Note: When you load data by right clicking the start page and selecting **Map here...**, **Add** is what you are implicitly using, and you are also using a Chart File Index!

The background data memory makes it easy to keep data collected at different times separated in different files, and variations due to GPS error and tides will not be mixed. You can use as many files as you want to create maps.

More on the Chart File Index

A **Chart File Index** is an index file of all your files. A Chart File Index will be automatically setup when you install AutoChart. All new files you import or record from live data will be added to this default Chart File Index.

AutoChart uses the content of the default Chart File Index to display file information on the start page and to load data for your target area when you select 'Map here...'. Most users will never need to go beyond the default settings and can simply use the original configuration.

Advanced users

The avanced user may want to use more than one Chart File Index. For example, a user may wish to have individual Chart File Indexes for different waters, or maintain water level references at different base levels.

- To create a new Chart File Index, go to **Tools/Settings/Chart File Index Manager**. Click **New** to create a new Chart File index, which will be a file with a .aci file type. Add content to your new index with the **Add File(s)** and **Add Directory** buttons.
- You can open an existing Chart File Index in the **Chart File Index Manager** with the **Open** button. The default Chart File Index is quickly opened with **Open Default**.
- If you want to change the Chart File Index used to display content on the start page: go to **File/AutoSave and Default Index** and modify the **Index file** setting.

To load data from a Chart File Index that is not set to be the default, use **File/Add File or Chart File Index** to select the index .aci file - but before you can do this the target map in AutoChart area must be initiated (you must have left the start screen). These are the ways to do this:

- Right click the map on the start screen and select **Map here...**.
- Open the **Waypoint Manager**, select a waypoint and click the **Map here...** button.
- Open and individual file with **File Open**.
- Receive live GPS data.

Editing data

There are two ways to open a file for edit in AutoChart:

- In the **Main** tab: use **File Open** and then use **Tools/Edit Data**.
- In an **Edit** tab: use **File Open (Edit Only Tab)**.

You can have many **Edit** tabs open at the same time but only one **Main** tab.

With data ready for editing you will get the **Edit toolbar** displayed:

This toolbar provides access to the following functions (buttons left to right):

- Delete all data before the data point you are at (earlier data).
- Move back in time (left arrow on the keyboard). The step size depends on the zoom level. With the highest zoom level, you will move one sample at each step. Hold down the Ctrl-key to jump to the first data point.
- Delete the data point you are at (keyboard shortcut arrow down or the Delete-key).
- Move forward in time (right arrow on the keyboard). Hold down the Ctrl-key to jump to the last data point.
- Delete all data after the data point you are at (later data).
- Delete a range of data: First set the cursor at one end of the data interval you want to delete (by mouse double-click or arrow keys), then press this toolbar button, and finally double-click the other end point (the order you mark the interval end points does not matter).

- Open the tool to move/shift data. You can move all points in the data set in X/Y/Z using a relative value.
- Insert a data point manually. First press the button, then click the mouse on the map where you want the new point. The new point is inserted after the data point you are at, and from which the depth value is copied.
- Edit the depth of the data point you are at or all point(s). Opens a dialog to set the (absolute) depth of a particular point (the current point) or all points (check 'Apply to all'). For shore line data, if you do not want the point to be included when calculating maps set the depth to -1. Note the difference to the 'Shift Data' tool, with which you can change the depth on all data with a relative value to compensate water level variations.
- Decimate date - reduce the amount of data. Data is reduced with the same algorithm used when calculating maps if **Decimate** in **Settings/General** is checked. The difference is that data will be removed from the file.
- 'De-anchor' - remove closely spaced points.
- Range limit - remove all data outside the set depth interval.
- Remove all points with zero depth - remove all data points with depth 0m/ft.
- Clean shoreline - remove identical points and resolve 'knots'/problematic sections in shoreline data.
- Set data type. Opens a dialog to specify if the open data set/file is standard depth data or shoreline data.
- Exit editing mode.

Tip 1: You can quickly select the current data point in edit mode by double clicking the point.

Tip 2: If you activate **Tools/Sounder View** when you edit data it will be easier to find anomalies and extreme values as you step throgh the data.

Tip 3: Have you been drifting across the same area again and again, and are now wondering exactly where you were three drifts ago when the fish were biting? Using the edit function you can follow your track back in time.

Quick edit / Tracing individual data points

Your sounder will occasionally give you errors in the data, often due to false bottom lock or turbulence. Sometimes you will not see these anomalies until you have more data from the same area. With all data on screen it can be difficult to see which file the data comes from and which file should be edited. There is a simple way for you to trace such data points:

1. Make sure AutoChart is displaying raw data. If you have a map on display, deselect it with right mouse click + Map, or from the menu, Map/Objects/Map.
2. Hold down the **Shift** key and double click the suspicious data point *or* right click the point and select **Trace Data** from the popup menu.
3. A dialog will pop up giving information about the point:
    - If the data point belongs to a file that was loaded with Open, you will have the options to directly delete the point, enter edit mode with the cursor set to the point, or Cancel.
    - If the data point belongs to a file loaded from a Chart File Index, the file name will be presented. You will be given the options to directly delete the point, Open the file in an Edit tab with the cursor set to the point, remove the file from the Chart File Index, or Cancel.

If you make changes to one of the files you have in your Chart File Index in an Edit tab, you can reload the Chart File Index content in the Main tab using **File/Reload Active Chart File Index**.

Note that tracing will only work when you 'Add' data using a Chart File Index. Individual files added one by one cannot be traced.

About map calculation and filtering

The map is calculated from the collected depth/position samples. The depth in areas between sounder data is found through interpolation. The accuracy will be best close to data samples. How close samples need to be spaced to get good results depends on the actual bottom topography. Keep in mind that the calculated map might be inaccurate!

Mapping

The **Smooth/Fast** setting in **Tools/Settings/General** affects the mapping algorithm used to transform your data points to a chart. If checked, maps will be calculated with different parameters in the interpolation algorithm, which gives smoother

maps and also reduces the computational time. For most cases, Smooth/Fast is the setting to use. The main exception is if you are mapping features like ship wrecks and want to get as much detail as possible, then make sure that Smooth/Fast is not checked.

Sometimes the sounder will give you false depth readings, for example when there is a thermo cline, a school of fish is present, or when the water flow around the transducer is disturbed (typically when going in reversed gear). If there are incorrect samples in the data, the calculated map will be affected. The faulty data can be deleted using the edit tools, but if the incorrect depth readings are all outside of the true bottom depth interval, there is a simple alternative to editing:

- Set the depth range manually in **Tools/Settings/General** such that incorrect depth values are outside this range (do not use **Tools/Find Depth Range**).
- Check **Range limit** in **Tools/Settings/General**.
- Create the map. Depth data outside the set depth range interval will not be included in the calculation.

If you have a lot of data, map calculation may take a long time. To reduce the processing time, check **Decimate** in **Tools/Settings/General/Map calculation**. This will reduce the number of data points by roughly 80% using a clever algorithm before map calculation, with little impact on the mapping results. Data saved to file is not affected.

Filtering

The filtering function compensates for the effect of the sounder and its transducer cone angle to improve results partularly in deep waters. Be aware that the compensation algorithm cannot always recreate a perfect image of reality. For example, the filter cannot resolve 'holes' in the bottom that are too small (relative to the cone) for the sounder to see any depth variation.

Depending on how you set the **Direct Filtering** checkbox in **Tools/Settings/General** you have two ways to compensate (filter) the map for the transducer response:

A. If **Direct Filtering** is not checked, the map will be compensated by after applying **Map Calculation** or **Local Update**, selecting **Filter Map**.
B. If **Direct Filtering** is checked, the map will be compensated directly by **Map Calculation** or **Local Update**.

These two alternatives are NOT identical, and will not give perfectly identical results. B does not imply that **Filter Map** will be run automatically after map calculation. Instead, a different algorithm will be applied, which compensates the data within the interpolation (map calculation) process. The methods are similar and in most cases it is simply a matter of taste which one to use. Though, there are some extreme cases where one method is preferable:

- If the boat has been rocking significantly (due to waves) during the measurement, use method A (**Direct Filtering** not checked).
- If there is sporadic interference (for example false depth readings on NMEA due to fish), use method B (**Direct Filtering** checked).
- If there are large depth variations within the area, use method B (**Direct Filtering** checked).

The saved data is not affected by what method you select to use.

Using custom shore line data

Adding shore line data to your mapping will greatly improve the result as soon as you have data close to shore. Shoreline data will not only be a line on the map. It adds to your depth data, as the shore line depth (usually 0m/ft but can be any value) is used whitin the mapping process. The shore line is also used to mask/trim the map, removing the 'dry' side for a nice clean map.

With the AutoChart SD card handling shorelines is simple, as shoreline data will be extracted from the card. You still have the option to use custom user defined shorelines though, and this is how to do so.

Preparing shore line data

You have two ways to create your own custom user defined shoreline data:

- Draw the shore line directly in AutoChart.
- Import a file with line/track data created in Google Earth.

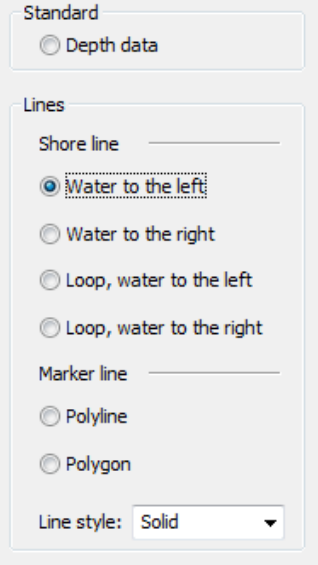
Drawing shore lines in AutoChart

To draw a line in AutoChart you must first initiate the mapped area. Right click the start screen map at your desired location and select **Map here**, or use a waypoint and the 'Map here...' button in the Waypoint manager.

To have a reference when drawing the line you probably want to turn on a background map. You can use any of the supported Background maps. Then follow these simple steps:

- Activate the drawing tool by selecting **Tools/Draw line**.
- Draw using the left mouse button. You can either click point by point or draw by holding down the left button.
- When done, right click to finish.

The following dialog will then be displayed:



This is where you set the data file to be a shore line. Check one of the following alternatives:

- Water to the left. Tells that the water is to the left as you walk the line in the order it was created.
- Water to the right. Tells that the water is to the right.
- Loop, water to the left. The loop will be closed automatically, you do not need to have identical first and last points. A loop can be a lake or an island, depending on which side the water is.
- Loop, water to the right.

You can go back later and change if needed (open the .acd file and use **Tools/Edit**).

There is also a selection for 'Line style'. It tells how the line will be drawn on screen and on a generated map image file.

When you have selected the properties you want, close the dialog. You will next be prompted for a filename. You will also be asked if you want to add the new file to the default Chart File Index - select Yes.

Tip: If you would like to add/remove points or change the depth of points you can do this by opening the file and using the editing tools. Often the depth is 0 m at the shore but if the shore is steep another value could be more meaningful. If you do not want the shoreline points to be included when generating maps set the depth to -1.

Creating shore line data with Google Earth

1. Open Google Earth and zoom in to your area.
2. On the Google Earth toolbar, press the ‘Add Path’ button.
3. A new dialog pops up. Give your path a name, but DO NOT close this dialog yet.
4. Draw your shore line path/track using your mouse, either by holding down the left button or clicking point-by-point.
5. When drawing is done, close the pop up dialog with OK.
6. In the ‘Places’ pane on the left side in Google Earth, right click your path and select ‘Save As’ and save the file making sure the file format is set to ‘.kml’,
7. Use **Import** in AutoChart to import the .kml file and convert it to the .acd format.

To use your new .acd file as a shorle line you will need to set the line type for it. Open the .acd file and go to edit mode (Tools/Edit). Use the 'D/SL' button in the edit toolbar to assign shore line properties to the file (as described above).

Tip: If you hold down the Ctrl key when clicking **Import** you will be prompted for shoreline settings directly when you import the file, so you do not need to open it afterwards to apply shore line settings.

Using your custom shore lines

Open **Tools/Settings/General**:

- Select **User defined data** in the **Shore lines** group box.
- Make sure **Use shore lines** in the **Shore lines** group box is checked.

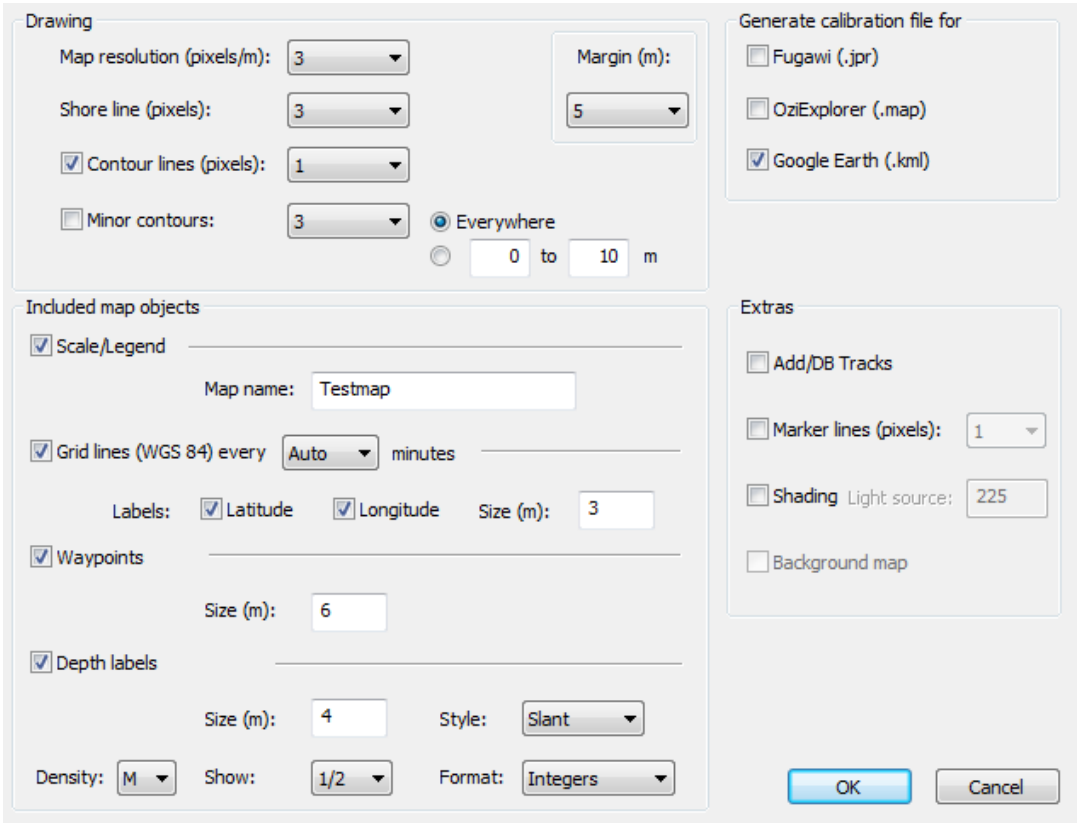
AutoChart will now use your own shorelines.

Creating map images

The **Tools/Create Map Image** menu command is used to output map images in high resolution, which you can print or use in other map application. The generated output depends on the display mode: if the program displays a 2D (3D) view the image will be in 2D (3D). If iso/contour lines are displayed, the generated map image will have them.

This is the way to create a printable 2D map image:

1. Load your data.
2. Create the map.
3. Select Tools/Create Map Image. A file dialog is shown, where you select the output image format you want (24/32b Bitmap, PNG, GIF or JPEG) and a file name.
   After closing the file dialog the following dialog pops up:



Set the map resolution and the line widths as you like and check the items you want on the map. You can also generate calibration data files for Fugawi, OziExplorer or Google Earth - with a calibration file you can use the map in these applications without doing a manual calibration. The calibration file will have the same name as the map image but with a different file extension. When the dialog is closed the map will be generated.

Minor contours are extra (thinner) contour lines that will be created between the 'major' contours, i.e. the ones you see on the map in the AutoChart main windows. These can not be assigned a label. Minor contours are useful to bring more detail to a map if for example the depth range is large and you want to use the coloring range to the whole depth range. You can set the minor contours to be displayed only in a particular depth range, for example shallow areas.

Tip: For best results in Google Earth, select the image format to be 'Bitmap (32 bit)' as this will make white transparent. To view your map in Google Earth after generation, just double click the .kml file (the calibration file) and your map will display (Google Earth must be installed).

Note: If you want to include your own custom background map you will need to turn the display of it on before starting the map generator with Tools/Create Map Image.

Note: Only custom custom background map can be included due to copyrights.

Note: The size of the image file is determined by the size of the mapped area and the map resolution.

Covering large areas with live data

AutoChart works with an internal map which is updated as new data is logged or a new map is calculated. The size of this internal map can be set by the user. The border of this map is shown as a red square as you zoom out.

If you are moving in larger areas, for example if you are trolling, you will quite soon go outside the internal map and depth information will no longer be shown on screen. The internal map can be moved manually with **Re-center** in the **Map**-menu, but to avoid having to do this every time you go outside the map, there are functions to this automatically. In

Settings/General there is a setting called **Automation**. It has the following options:

- **None.** No automation.
- **Auto Re-center.** The internal map is moved automatically whenever you come close to its border. The new map will be centered around the current position.
- **Auto Re-center + Map Calc.** As previous, plus the map will be updated according to the settings for map calculation you have made.
- **Auto Re-center + Map Calc + Auto Range.** As previous, plus the display depth range will be adjusted for the data in the new area.
- **Auto RC + Look Ahead.** The internal map is moved automatically whenever you come close to its border. The new map will be centered around a position ahead of you.
- **Auto RC + MC + Look Ahead.** As previous, plus the map will be updated according to the settings for map calculation you have made.
- **Auto RC + MC + AR +Look Ahead.** As previous, plus the display depth range will be adjusted for the data in the new area.

What option do you use? For example, if you fish at a specific spot, you would set Automation to 'None' to maintain the map at the target location. If you are drifting, set it to 'Auto Re-center(+Map Calc.)'. If you are trolling and will likely continue in a more or less straight line, set Automation to 'Auto RC+(MC)+Look Ahead'.

Note: If you are in 3D mode when a map update is triggered the map display will temporarily switch to 2D.

Water temperature overlay

If your sounder supplies the MTW sentence you can plot the water surface temperature live on the map. You turn on temp overlay from the Map menu: Objects/Water Temp. If the received data has water temperature you will now see temperature marks and a thermometer. The water temperature is stored in your .acd data files so you can open a file at a later time to review the temperature readings. However, water temperature will not be read from files opened with 'Add'.

Note that your temperature sensor may be slow to react to changes, and plotted values may be lagging.

You can use custom colors for water temperature if you like by creating a color definition file. See Creating custom colors.

Tuning the transducer parameters

To get the best possible result, the parameters in the **Tools/Settings/General/Transducers** section should be correctly set. These parameters are used to estimate the position of where the sounder signal hits the bottom. Think of the sounder as a flash light illuminating an area on the bottom. It is the center position of this illuminated area that is interesting to get the best map possible, and not the position of where the GPS receiver is located.

The **X** and **Y** parameters are found using a tape measure. The Latency and Tilt parameters are easy to tune with a simple measurement series, a tuning process you only have to do once. The Tilt value is mainly important in deeper waters. If you are mostly in shallow waters you can simply set Tilt to 0.

Follow these steps to set all these parameters using live data:

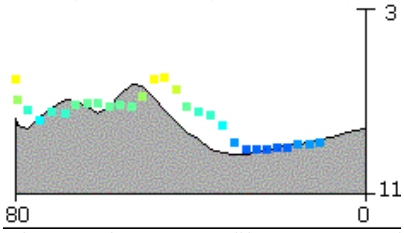
1. Use a tape measure to measure and set **X** and **Y** (how these values are defined is described in General settings).
2. Make sure **Use X/Y/T** is checked.
3. Make sure **Latency** and **Tilt** are set to 0.
4. Tune **Latency** (see below).
5. Tune **Tilt** (see below).

It is important that Latency and Tilt are optimized in the correct order: *first* Latency, *then* Tilt.

Latency

Latency is tuned by doing a simple measurement run over shallow but uneven bottom (depth 0-10m(30ft)), where the Tilt value has litte impact:

- Select **Sounder View** in the **Tools**-menu. Make sure that both Latency and Tilt are set to 0.
- Start a new measurement with **New**. When logging has begun, select **Local Update** in the **Map**-menu.
- Drive the boat in a straight line, over shallow uneven bottom, for about 100 m.
- Turn of **Local Update**, turn the boat and go back the way you came, in the exact same track.
- Once back at the start position, turn logging of with **Stop Log** in the **Tools**-menu.
- The sounder view will now look similar to this (select a zoom level such that the distance from the turning point to the end point is shown in the sounder view):



The gray bottom profile represents the way back, while the colored squares shows the bottom profile for the first half section of the measurement, before you turned (calculated by **Local Update**). If you have followed the same track going both ways, the two profiles should match. If not, adjust the Latency value in steps of 100 milliseconds and redo the measurement until the two profiles match. If the gray profile is to the left of the colored one (as in the picture above), decrease the Latency value, and if the gray profile is to the right, increase Latency.

Tilt

Tilt is tuned by doing a measurement run over deep but uneven bottom (depth >50m). The measurement is almost identical to the one you did to tune Latency:

- Select **Sounder View** in the **Tools**-menu. Make sure that Latency is set to the value you found previously, and that Tilt is set to 0.
- Start a new measurement with **New**. When logging has begun, select **Local Update** in the **Map**-menu.
- Drive the boat in a straight line, over deep uneven bottom, for about 100 m.
- Turn of **Local Update**, turn the boat and go back the way you came, in the exact same track.
- Once back at the start position, turn logging of with **Stop Log** in the **Tools**-menu.
- The sounder view will again show two depth profiles. The Tilt value should be adjusted such that the gray and the colored profiles match. Adjust Tilt in steps of 1 degree until matching is achieved. If the gray profile is to the left of the colored one, increase the Tilt value, and if the gray profile is to the right, decrease Tilt. **NOTE:** the optimum Tilt value depends on the speed of the boat. Try to tune Tilt for the speed you will use while actively collecting data!

Cone angle

The Cone angle value is used in the map filtering algorithm (transducer compensation). The transducer manufacturer usually provides the cone angle. Use this value as an initial setting, but results may be improved if this value is tuned. The best way to tune the cone angle value is to do a measurement of a known structure, for example a shipwreck of known size, and then generating maps with different cone angle settings to make comparisons. If in doubt, its better to have a cone angle value that is slightly small, than using a value being too large.

The Latency and Tilt valued are used during live data recording and it is important that these parameters are correctly set if you want top performance. On the other hand, the Cone angle value does not affect data that are saved to file and can be changed later.

Creating custom colors

You can override the built in color palettes used to display depth maps, Side Imaging mosaic or bottom hardness. Each display color selector has three entries for custom colors: 'Custom 1', 'Custom 2' and 'Custom 3'. You can also override the default color palette used for water temperature. To use these options you must first create your own color definition file, and this is how to do that:

1. Open a text editor, for example Notepad
2. Enter this sample data:

   Standard AutoChart map colors, red,green,blue
   153,0,0
   204,0,0
   255,0,0
   255,51,0
   255,102,0
   255,153,0
   255,204,0
   255,255,0
   204,255,51
   153,255,102
   102,255,153
   51,255,204
   0,255,255
   0,204,255
   0,153,255
   0,102,255
   0,51,255
   0,0,255
   0,0,204
   0,0,153
   0,0,102

3. Save the file as 'accolors1.txt'.

On Windows XP, place this color file in the AutoChart install directory. If you have Windows 7/8 or Vista, the color file should be placed in: C:\ProgramData\AutoChart\UserData .

You now have a custom color file. To use it, go to **Tools/Settings/General** and set **Display colors** to **Custom 1**.

Initially, you might not see a difference, because the file you just created implements the standard map colors. To change this, simply adjust the colors to your liking:

- The first row is just information which is not read by AutoChart.
- The following rows defines one color each, in RGB values.
- The intensities of red/green/blue should be 0 to 255.
- There must be (at least) 21 colors. Colors 1-20 are used in full color mode, colors 1,3,...,21 are used for displaying colored contours.

To create files to use with the 'Custom 2' and 'Custom 3' settings, or for SI mosaic, bottom hardness or water temperature, simply save the file with a different file name:

	Depth	SI Mosaic (Pro)	Hardness (Pro)	Water Temperature
Custom 1:	accolors1.txt	accolors1_scan.txt	accolors1_bt.txt	accolorswt.txt
Custom 2:	accolors2.txt	accolors2_scan.txt	accolors2_bt.txt	NA
Custom 3:	accolors3.txt	accolors3_scan.txt	accolors3_bt.txt	NA

Files to backup

Computers do break. While AutoChart itself is easy to reinstall after a repair/replacement, to avoid tears, make sure you keep backups of the following files:

- All AutoChart .acd data files.
- All your original recorded log files (.ht, .son).

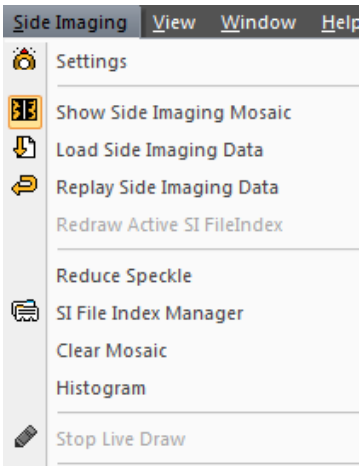
- drdwptv2.dwp (waypoint file) and acwptnotes.dnt (waypoint notes). These are located in the install directory of AutoChart if you run Windows XP. On Windows Vista and 7 they are located in C:\ProgramData\AutoChart\UserData.
- Custom color definition files (eg accolors1.txt/accolors2.txt/accolors3.txt/accolorswt.txt) if applicable.

Side Imaging mosaic (AutoChart Pro)

Contents:

Overview

The Side Imaging mosaic tools are found in the **Side Imaging** menu and the added toolbar buttons (below):



The menu adds the following functions needed to process and draw Side Imaging mosaic:

- **Settings**. Explained below.
- **Show Side Imaging Mosaic**. Used to switch between displaying a depth map or a Side Imaging mosaic.
- **Load Side Imaging Mosaic Data**. Used to open and draw mosaics from recorded Humminbird Side Imaging data.
  - A Humminbird sonar recording consists of several files. Example:

    RECORD\R00005.DAT
    RECORD\R00005\B001.IDX
    RECORD\R00005\B001.SON
    RECORD\R00005\B002.IDX
    RECORD\R00005\B002.SON
    RECORD\R00005\B003.IDX
    RECORD\R00005\B003.SON

    The actual sidescan data is in the B002.SON (port) and B003.SON (starboard) files.
    If you select the .dat file both files will be processed.

  If you wish you can select multiple files.
  If the map area is initialized (using waypoints, or if either depth or sidescan data is already open)
  you will also get the option to load a SI File Index. This works in the same way as using a Chart File Index

for depth data. More info on the SI File Index can be found here.

- **Replay Side Imaging Data**. Used to replay one file (.son or .dat to replay both sides). During replay pause/play and stop buttons will be displayed, so you can pause/play as you like. You can also drag the replay position slider to any position you like. This way you can draw specific parts of a file without other parts hiding a feature you are interested in. To be able to replay a file the map area must be initialized (using waypoints, or by loading depth or Side Imaging data).
- **Redraw Active SI File Index**. Redrawa all data from an active SI File Index.
- **Reduce Speckle**. Used to filter the mosaic image to reduce random noise.
- **SI File Index Manager**. Opens the SI File Index manager.
- **Clear Mosaic**. Used to clear the mosaic drawing surface without clearing the map initialization or loosing depth data/map.
- **Histogram**. Displays a histogram of intensities in the mosaic image. You can adjust the sensitivity/contrast curve by dragging the small handles in the histogram plot. The change will have immediate effect on the mosaic. The histogram can be used indirectly to auto tune the sensitivity/contrast: with Side Imaging data on display, hold down the control key and click **Tools/Find Depth Range**.
- **Stop Live Draw**. Temporarily suspends drawing of live (ethernet) Side Imaging data without disconnecting ethernet.

Added toolbar buttons:

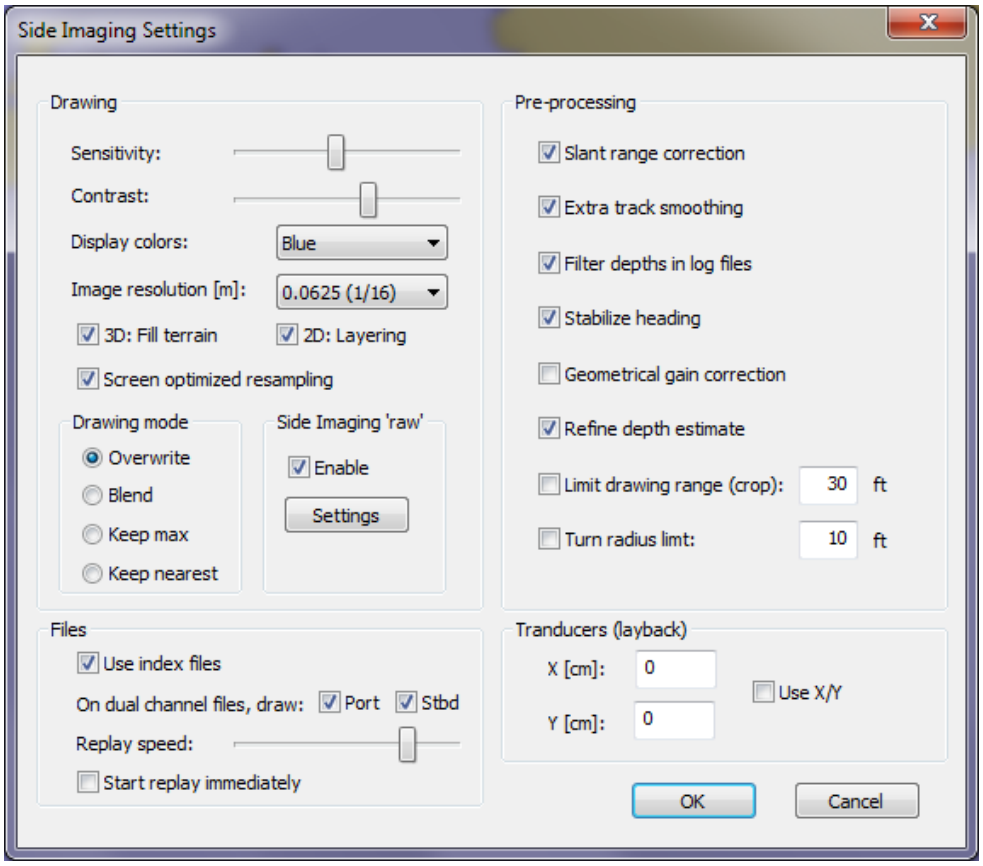
The new toolbar buttons have the same function as the **Show Scan Mosaic**, **Settings**, **SI File Index Manager**, **Replay Side Imaging Data**, **Load Side Imaging Data** and **Stop Live Draw** menu items.

Working with Side Imaging data in AutoChart is very similar to working with depth data. You can use many of the tools, such as waypoints, for Side Imaging data as well, and you can have depth and Side Imaging data open simultaneously. You can easily create/export images, for example to be used as overlays in Google Earth, with 'Tools/Create Map Image'.

If you have depth data from the same area as your Side Imaging data you can overlay depth contours on the sidescan mosaic. To do this you will need to display the depth map as contours: check 'Iso lines (2D)' in 'Tools/Settings/General', or use the mouse right click context menu.

Settings

The menu item **Side Imaging/Settings** (or its corresponding Toolbar button) opens the following dialog:



Drawing:

- **Sensitivity**. Similar to the gain/sensitivity setting on your Humminbirt unit. When a Side Imaging mosaic is on display in AutoChart, the (blue arrow) toolbar buttons normally used to adjust the display 'Max' depth range can be used to adjust sensitivity.
- **Contrast**. Used to adjust the image contrast. When a Side Imaging mosaic is on display in AutoChart, the (red arrow) toolbar buttons normally used to adjust the display 'Min' depth range can be used to adjust contrast.
- **Display colors**. Colors used for sidescan mosaic. You can use custom colors if you like in the same way you can for depth. The file names for custom color definition files should be 'accolors1_scan.txt', 'accolors2_scan.txt' or 'accolors3_scan.txt'.
- **Image resolution [m]**. The resolution used for mosaic imaging. **Important:** read this!
- **3D: Fill terrain**. Check if you want areas without Side Imaging data coverage, but with depth map coverage, filled with a base color when displaying in 3D.
- **2D: Layering**. Check to enable multilayered display, to display mosaic and depth map (if available) at the same time. If the depth map is set to full color it will be displayed beneath the mosaic, if set to contour lines it will be displayed on top of the mosaic. Each layer will have its own transparency control.
- **Screen optimized resampling**. If checked the mosaic image will be resampled when zoomed out to improve the image quality.
- **Drawing mode**. Affects how overlapping scans will be drawn:
  - **Overwrite**. New data will overwrite data already drawn.
  - **Blend**. New data will be drawn transparent such that old data will shine through (alpha-blending with alpha=0.5).
  - **Keep max**. The maximum value of new data and data already drawn.
  - **Keep nearest**. This drawing mode performs 'auto crop' on your data to draw the best pieces from overlapping runs.
- **Side Imaging 'raw'**. If checking **Enable**, you will get display of Side Imaging data both as mosaic as well as waterfall diagram when replaying data or using a live connection with Ethernet. More details and the **Settings** are explained here.

Files:

- **Use index files**. If checked AutoChart will generate an extended index file for the Side Imaging data file. This will make subsequent access to the same file faster, in particular if the file spans an area partly outside the current location of the internal map.
- **On dual channels...**. Check channels to draw from multichannel files (.dat).
- **Replay speed**. Sets the speed when replaying sidescan files.
- **Start replay immediately**. If checked replay will start immediately after selecting the file. Uncheck if you want to avoid drawing the beginning of the file.

Pre-processing:

- **Slant range correction**. Check to apply slant range correction = removal of the water column plus transformation of range distance to sideways (horizontal) distance.
- **Extra track smoothing**. Check to increase position filtering to get smoother position and heading estimates.
- **Filter depths in log files**. Check to filter the depth values. Filtering depths will make the residues of the water column (close to the boat track) less erratic.
- **Stabilize heading**. Check to apply additional smoothing to the heading estimate.
- **Geometrical gain correction**. Check to equalize the effects of the transducer response and the incident angle dependence in sonar back scatter.
- **Refine depth estimate**. Check to tune the depth estimate from sonar data (locally around the default depth estimate). Will make the central seem between port and starboard channels better when using slant range correction.
- **Limit drawing range (crop)**. Check to use a maximum drawing range for each scan line.
- **Turn radius limit**. Check to avoid drawing data from tight turns.

Transducers (layback):

- **X (cm).** The distance between the sidescan transducer and the GPS antenna, in the boat lengthwise direction, given in *centimeters*. If the antenna is placed in front of the transducer, this value is positive, negative otherwise.
- **Y (cm).** The distance between the sounder transducer and the GPS antenna, across the boat, given in *centimeters*. If the antenna is placed on the starboard side of the transducer, this value is positive, negative otherwise.
  The X and Y parameters are similar to the parameters used for the depth transducer vs GPS location (see 'Tools/Settings/General'), and are used to correct for the relative positions of the sidescan transducer and the GPS.
- **Use X/Y**. Check to apply correction for X/Y.

Important info on the resolution setting

While the Side Imaging mosaic image quality will generally improve when using a finer resolution, it takes more memory. The total amount of memory that is required will be determined by the combination of the resolution and the size of the 'Internal map' (the size of the red square you will see when zooming out in AutoChart), which you will find the setting for in **Tools/Settings/General**. There is a limit to what your computer can handle, so be prepared that you cannot use a large 'Internal map' in combination with a fine resolution.

- If you want to make an overview of you side scan data and want to be able to cover a large area, use a coarse resolution.
- If you want full detail in your side scan images, you will need to be conservative with the 'Internal map' size.

The exact limits for you will depend on how much RAM you have got and how your system can allocate it.

As a guideline, 'normal' values for the image resolution to use are 0.125m and 0.0625m. VERY few have any reason to use 0.03125m, it will only eat memory.

Viewing and managing Side Imaging data

Displaying Side Imaging data in AutoChart is many ways similar to viewing depth data:

- If your map area is initialized (either by opening depth data, using waypoint initialization etc), AutoChart is ready to draw mosaic in the area.

- If your map area is not initialized, the first Side Imaging data file you load with **Side Imaging/Load Side Imaging Data** will determine the map area (just like when opening a depth data file). Subsequent use of **Side Imaging/Load Side Imaging Data** will draw in this area. So: the first use of **Side Imaging/Load Side Imaging Data** is similar to **Open** a depth data file, and the next use of of **Side Imaging/Load Side Imaging Data** is similar to **Add** depth data. If you want to start all over, use **File/New** to clear.
- You can move/change the map area with **Map/Re-center** just like with depth data. Drag the map to where you want the mapped area and use **Map/Re-center**, or use Waypoints + **Map here...**.
- A **SI File Index** works in the same way as a **Chart File Index** for depth data files. Before you can actually load/activate a SI File Index, the map area must be initialized.
- If you have loaded a SI File Index, data from it will be automatically redrawn when using **Map/Re-center**. If you have loaded individual files you will need to redraw manually with **Side Imaging/Load Side Imaging Data**.
- When drawing data, chances are that the specific area you want to view in detail gets overwritten with other data, from the same file or from a different file. To see a particular segment of data, use the **Replay Side Imaging Data** function and stop or pause the replay when you get to your spot.
- You can use background maps/images just like you can when displaying depth data.

Some differences with Side Imaging data compared to depth (and bottom type) data are:

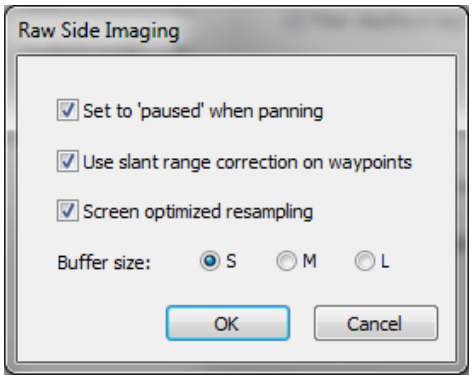
- AutoChart does not create/convert any data files with sidescan data. AutoChart will use the data in its original format (.dat/.son).
- When loading data, data is drawn directly to the map, it is not stored in raw format in internal memory.

Side Imaging raw

If you check **Enable** in the **Side Imaging 'raw'** group box in the Side Imaging settings you will get display of Side Imaging data as a waterfall diagram besides the mosaic. This works with replayed data as well as with live data using an Ethernet connection.

With sidescan raw on, the display will be split horizontally. You can resize by grabbing the range bar with you mouse and pulling up/down.

There are a couple of settings for sidescan raw:



- Set to 'paused' if panning. Check if you want a replay paused if you pan/go back in history.
- Use slant range correction on waypoints. Check if you want to apply slant range correction when placing waypoints on the waterfall diagram.
- Screen optimized resampling. Check to improve the image quality when zoomed out.
- Buffer size. Determines how much data will be kept in memory.

Basic navigation in raw Side Imaging data:

- Drag the waterfall sonogram with your mouse down/up to move in time, or left right.
- The scroll wheel will zoom at the range you point at.
- Double click will reset the display to accommodate the range in the data. Double click will also go back from a

panned view to a rolling view.

Waypoints: to create a waypoint, hold down the Ctrl key and double click in the sonogram.

Note: only waypoints created on the waterfall sonogram, in the current session, will be displayed on the waterfall.

Making measurements:

- If you let the mouse hover you will get a readout of the range distance to the center line.
- To make an arbitrary measurement, first set a reference line by holding down the **Alt** key and double clicking. You will then get the range from that line. If you point further away from the center than where the line is placed you will also get a **Height** estimate. The height provides a measure of how much an object must stick up from the bottom in order to create a shadow with length equal to the distance from the line to the mouse point.

Live data with Humminbid Ethernet

If you have a Humminbird SI unit with Ethernet port, or a Humminbird 360 system, you can connect a PC to it to get Side Imaging or 360 data live. The unit transmits the same sidescan data that goes into a .dat/.son log file on the Ethernet bus.

To use this feature your PC must have an Ethernet port. Go to the live data settings, Connection of GPS and sounder for live data, and make the appropriate settings under **Sonar SI/360**

Bottom hardness (AutoChart Pro)

Contents:

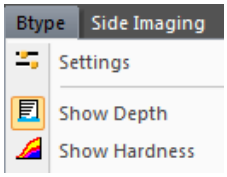
!!!!!IMPORTANT!!!!!:

- Keep a copy of all your sonar data files (.dat/.son), DO NOT delete them after you have imported data. You might want to use them for more in the future.
- For best results it is important that you understand the concepts outlined in this manual.
- To be able to get bottom hardness you MUST have 200kHz data!

!!!!!IMPORTANT!!!!!

Overview

The bottom type mapping tools are found in the Btype menu and the added toolbar buttons (below):



The new menu adds the functions needed to map bottom hardness:

- **Settings**. Explained below.
- **Show Depth** and **Show Hardness**. Used to switch between displaying a depth map or a hardness map.

Added toolbar buttons:

The new toolbar buttons have the same function as the **Show Depth**, **Show Hardness** and **Settings** menu items.

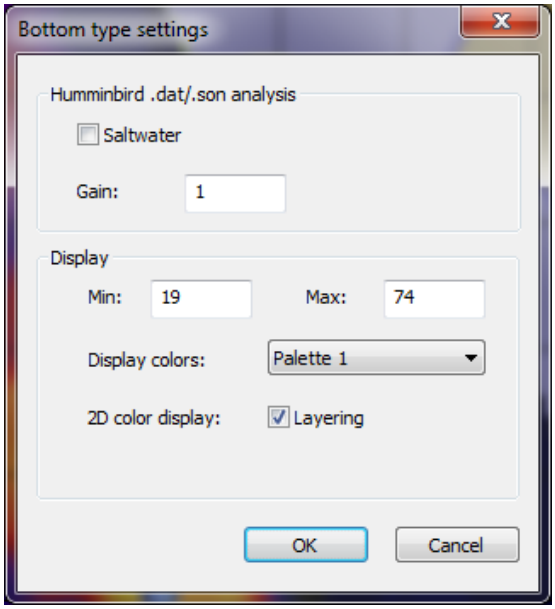
Working with hardness data is very similar to working with depth data. Once you have imported/analyzed your sonar data files you do as you would do with depth only data. If there is hardness data in your files, a hardness map will be found when you calculate the depth map (and the button/menu item to show the hardness map will be enabled). You can combine data that has depth information only with data containing both depth and hardness. In this case your hardness map may cover a smaller area than the depth map.

You set the display range with the up/down buttons as you would with a depth map. When hardness is displayed, the buttons (and entries in the settings dialog) will affect the hardness display range. You can switch between showing depth and hardness both in 2D and 3D, and you can choose to display hardness as contours in 2D.

You can create output data just as with depth maps. Basically, what you have on screen is what will be exported with the **Tools/Create Map Image** and **Tools/create Iso/contour Lines** menu items. When creating hardness maps using **Tools/Create Map Image** you will be given the option to include depth contours as an overlay.

Settings

The menu item **Btype/Settings** opens the following dialog:



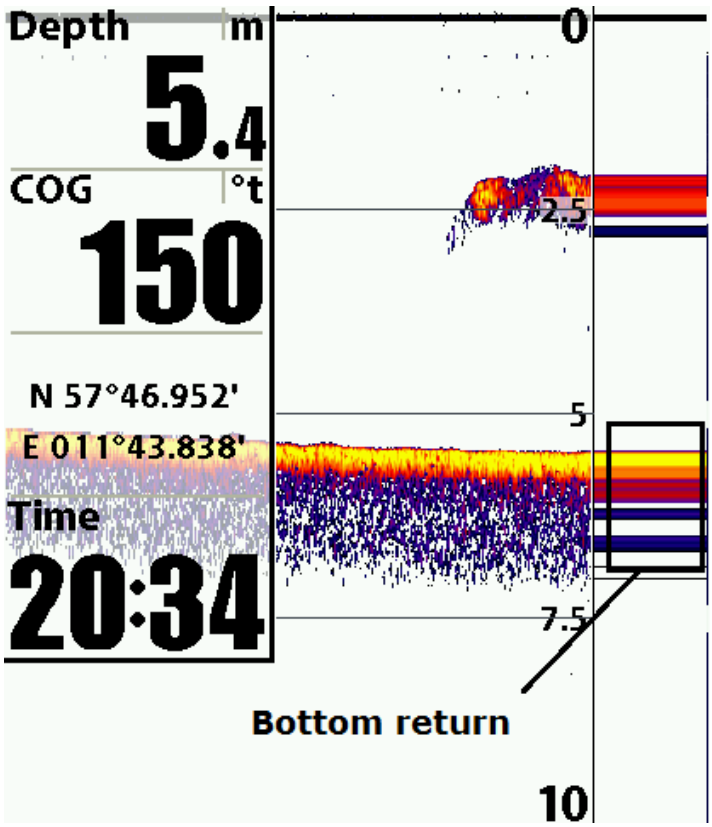
- **Humminbird .dat/.son analysis**. Parameters used when extracting the hardness information from Humminbird .dat/.son files. Explained in detail here.
- **Display**.
  - **Min** and **Max**. The display range for bottom hardness.
  - **Display colors**. Colors used for hardness. You can use custom colors if you like in the same way you can for depth. The file names for custom color definition files should be 'accolors1_bt.txt', 'accolors2_bt.txt' or 'accolors3_bt.txt'.
  - **2D color display**. Check **Layering** to enable multilayered display, to display hardness and depth map at the same time. If the depth map is set to full color it will be displayed beneath the hardness map, if set to contour

lines it will be displayed on top of the hardness map. Each layer will have its own transparency control. To be able to display the hardness map as contours, **Layering** must be unchecked.

Understanding 'hardness'

The hardness of the bottom is basically how much of the ultrasonic sonar signal that is reflected (or actually backscattered) from the bottom. A dense (hard) bottom like rock will send more signal back than a soft muddy bottom.

A common misconception is that the hardness of the bottom can be inferred by just looking at the 'amplitude of the bottom return'. It is a bit trickier as the bottom return signal is distributed in time. Below is an example of a bottom return:



The depth here is 5.4m (the distance from the transducer to the bottom), but there is actually very little signal coming there. The most signal comes a bit later, and this can be explained by the transducer cone angle. As you get off the center axis of the cone the sounder 'sees' a larger area, which gives more backscatter, which in turn arrives back at the transducer slightly later as the distance has increased. Moving even further away from the center axis the sensitivity of the transducer decreases so you will have less signal again.

What further complicates things is that the overall return signal is random in nature. You can see this on the amplitude scope as from ping to ping the return signal looks very different. In reality the variation is even bigger than what you see as the sounder displays amplitude in compressed (logarithmic) scale.

You do not need to know or master the above to benefit in your fishing from mapping bottom hardness, but for the curious, you have taken a long step by understanding that:

- Bottom properties (such as hardness) are revealed by the average behavior of the bottom return.
- Hardness has no unit, it is a relative value. It is the ratio of backscattered signal to transmitted signal.

Recording options on Humminbird

To be able to get bottom hardness from your Humminbird unit your MUST use sonar recordings. The tracklog does NOT include bottom hardness.

Importing sonar data

The sonar recordings you do on yout Humminbird units contain just what you see on you sounder screen - the complete sonar return signal. So, getting a parameter for bottom hardness is 'just' a matter of analyzing this signal. AutoChart will do it all for you. In the process, scaling is applied such that effects of depth and propagation/loss are removed.

You import sonar files using **File/Import/Convert**. Depth and hardness will be extracted along with position data, and you can apply corrections for X/Y/Tilt/Latency as well as for tide/water level.

Humminbird data. A Humminbird sonar recording consists of several files. Example:

RECORD\R00005.DAT
RECORD\R00005\B001.IDX
RECORD\R00005\B001.SON
RECORD\R00005\B002.IDX
RECORD\R00005\B002.SON
RECORD\R00005\B003.IDX
RECORD\R00005\B003.SON

The interesting data is in the B001.SON file, containing the 200kHz down beam. You can import the data by either selecting the .DAT file or selecting the BOO1.SON

Reading the B001.SON file directly would normally be your first choice, but using the .dat route enables you to select many records to be converted at once.

It is **VERY** important that you get the parameters in the Settings dialog right when importing sonar data to extract hardness:

- **Saltwater**. Check if your data is from saltwater.
- **Gain**. Parameter to scale hardness data. **IMPORTANT - read below!**

!!!---GAIN---!!! Every combination of transducer and head unit will give its own unique scaling to the signal. Even two seemingly identical transducers can have slightly different effective gains. The gain parameter is used so you can get a reading/range of hardness that is 'sensible'. As hardness is a unit less measure a sensible way to think is in terms of percent (%). It is recommended that you adjust the gain parameter such that very hard bottom will give you a reading of about 100.

- Once you have determined a value for the gain parameter you should use the very same value when importing ALL files, otherwise data from different files will not be comparable.
- If you share data with a friend, make sure to find gains for your respective setups that will make you data comparable.
- If you change the gain you will need to re-import all your data.

Be prepared to later change the gain parameter and update all your files. The 'hard' bottom you first thought was 'max' might be exceeded.

When making your first setting of the gain parameter, it is convenient to use this procedure (based on one single data file):

1. Set gain to 1, and make sure the other settings are set according to your hardware.
2. Import the file with **File/Import/Convert**, then open the file with **File/Open**.
3. Calculate the map with **Map/Create Map**, then switch to hardness view with the **Show Hardness** button.
4. Set the display range using **Tools/Find Depth Range** (which operates on hardness when displaying hardness).
5. Check the display max range that was now set. Change the gain parameter to 100/(max range). The gain value can have decimals and also be smaller than one.
6. Clear all data with **File/New**, import your file again and then open it. Create the map and display hardness.

Tools/Find Depth Range should now set the range up to 100.

This will give you a 'ball park' setting for gain. You will probably later find data that has harder values then 100. When adjusting gain for this, remember to reimport all data with the new setting.

Using Humminbird Ethernet

If you have a Humminbird unit with Ethernet port you can connect your PC to it to get bottom hardness live. The sounder transmit the same sounder data that goes into a .dat/.son log file on the Ethernet bus.

To use this feature your PC must have an Ethernet port. Go to the live data settings, Connection of GPS and sounder for live data, and make the appropriate settings under **Sonar 2D**

Getting program updates

To access the latest version of AutoChart, please register your AutoChart license at the Humminbird web site:

www.humminbird.com