

PARASOUND - AWI - PANGAEA

Data Storage and Management

Version 1.1

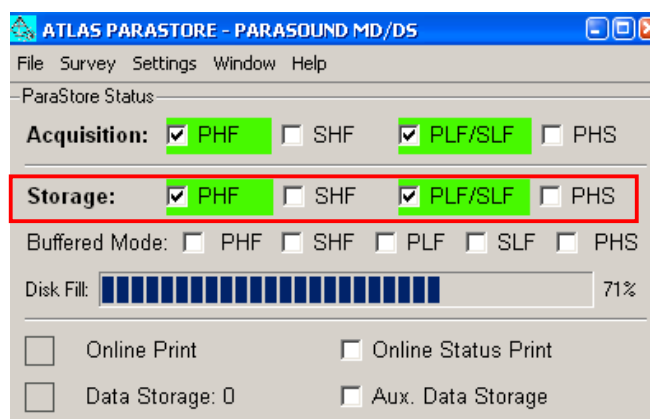
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***Polarstern, 24.8.2009
ANT-XXV/5***

1. Storage, Backup, Quality Control, Transfer

On RV „Polarstern“ different Parasound data sets are stored on the „Operator PC“ first. Via LAN the data are copied to the „Data Storage PC“ by the Parasound operator (not watch keeper). From there the data are transferred via LAN onto the Polarstern Mass Storage by the Parasound Operator (not watch keeper). A prepared folder on the Mass Storage is provided by the system manager. In addition, the data may be copied from the „Data Storage PC“ onto an external hard disc via USB port. This transfer has to be carried out on a day to day basis in order to have daily backups. At least ASD-files on the „Data Storage PC“ have to be checked (selected time ranges only) for readability using Atlas Parastore in off-line mode (replay).

Only data which have been transferred into the mass storage can be deleted on the „Operator PC“. On the „Operator PC“ keep free disc space always above 25% (Disk-Fill bar not higher than 75%).



On the „Operator PC“, „Data Storage PC“ and (optional) USB hard disc the data management is the responsibility of the Parasound Operator (not watch keeper). On the mass storage the data management is the responsibility of the System Manager of a given cruise, who will make sure the data will be transferred to the AWI Computer Group. The latter takes care to transfer the data into the SILO. A process has to be developed to extract Meta Data for PANGAEA. The data will then be available via PANGAEA or a direct network link for AWI users.

On RV „Sonne“ or „Merian“ there are no „Data Storage PC“ and/or mass storage. Here the back up will take place onto two USB hard discs (identical data sets, hardware provided by AWI for participants from AWI only), on which the readability has to be checked using the „Operator PC“ in off-line mode (e.g. on station). The Parasound Operator is responsible for transfer of hard discs back to AWI and hand them over to Frank Niessen or Gerhard Kuhn, who will transfer the data to the AWI Mass Storage.

2. Data and Directory Structure

The data structure is summarized in Table 1. On the “Operator PC” the data are ordered into a cruise folder according to frequency (PHF/SHF/SLF) and auxiliary data (navigation and system control) and then (for the frequencies only) according to data type (ASD/PS3/SEG-Y). When copied to the „Data Storage PC“ the frequency data are subdivided into folders according to day of acquisition, frequency and data type (not necessary for the auxiliary data). Here it is not necessary to create empty folders if data for a specific frequency (e.g. SHF) have not been acquired and stored. The data structure on the „Data Storage PC“ is then copied into the ship’s Mass Storage and maintained during the entire cruise. The Parasound data names are given to indicate Parasound version (e.g. PS3), frequency, year, month, day, time (HHmmss) and a sounding number. For example, for a single PHF data file:
PS3PHF_2008-02-14T225332Z_18572958.asd

| hardware | disc | folder | folder | folder | files/folders | remarks | | | |
|-------------------------|------|-----------------------------|--------------------|--|--|--|--|--|--|
| Operator PC | G: | / CRUISE / PHF | | / ASD | / PS3PHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf | 1,2,3 | | | |
| | | | | | / PS3PHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf.idx | 4 | | | |
| | | | | | / online | 5 | | | |
| | | | | | / PS3 | / PHFYMMDDHHmm.ps3 | | | |
| | | | | | / SGY | / PHFYMMDDHHmm.sgy | | | |
| | | | | | / SHF | / ASD | / PS3SHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf | | |
| | | | | | | / PS3SHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf.idx | | | |
| | | | | | | / online | 5 | | |
| | | | | | | / PS3 | / SHFYMMDDHHmm.ps3 | | |
| | | | | | | / SGY | / SHFYMMDDHHmm.sgy | | |
| | | | | | | / SLF | / ASD | / PS3SLF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf | |
| | | | | | | | / PS3SLF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf.idx | | |
| | | | | | | | / online | 5 | |
| | | | / PS3 | / SLFYMMDDHHmm.ps3 | | | | | |
| | | | / SGY | / SLFYMMDDHHmm.sgy | | | | | |
| | | / PSAUX | / | YYYYMMDD.nav | 6 | | | | |
| | | | / | YMMDD.inf | 6 | | | | |
| | | | / | YMMDD_q.inf | 6,7 | | | | |
| hardware | disc | folder | folder | files | | | | | |
| Data Storage PC | G: | / CRUISE / PHF_ASD_YYYYMMDD | / | PS3PHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf | 8,9 | | | | |
| Mass Storage | R: | / | / | PS3PHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf.idx | | | | | |
| and/or USB drive | --- | / | / PHF_PS3_YYYYMMDD | PHFYMMDDHHmm.ps3 | | | | | |
| | | | / PHF_SGY_YYYYMMDD | PHFYMMDDHHmm.sgy | | | | | |
| | | | / SHF_ASD_YYYYMMDD | PS3SHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf | | | | | |
| | | | / | PS3SHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf.idx | | | | | |
| | | | / SHF_PS3_YYYYMMDD | SHFYMMDDHHmm.ps3 | | | | | |
| | | | / SHF_SGY_YYYYMMDD | SHFYMMDDHHmm.sgy | | | | | |
| | | | / SLF_ASD_YYYYMMDD | PS3SLF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf | | | | | |
| | | | / | PS3SLF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd.acf.idx | | | | | |
| | | | / SLF_PS3_YYYYMMDD | SLFYMMDDHHmm.ps3 | | | | | |
| | | | / SLF_SGY_YYYYMMDD | SLFYMMDDHHmm.sgy | | | | | |
| | | | / PSAUX | YYYYMMDD.nav | | | | | |
| | | | / | YMMDD.inf | | | | | |
| | | | / | YMMDD_q.inf | | | | | |
| | | | / ASD_online | PS3PHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd | | | | | |
| | | | / | PS3SHF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd | | | | | |
| | | | / | PS3SLF_YYYY-MM-DDTHHmmsZ_XXXXXXX.asd | | | | | |
| | | | / DSHIP | NAV_YYYYMMDD-YYYYMMDD.txt | 10 | | | | |

Tab. 1: Parasond primary and backup structure

Remarks:

1. CRUISE: For example ANT-25-5, MSM-12-2.
2. PS3PHF, T, Z, .asd.acf are constant.
3. x: sounding ID number counted up by the system.
4. Extension .idx: Index-file which contains information about the traces packed into cabinet file with same time code (.asd.acf). Without the .idx files the .acf files are not readable by Atlas Parastore.
5. „online“ is a folder which may contain single .asd files as shown under „Data Storage PC“ in the sub-folder /ASD_online (see text)
6. Txt-files.
7. q is a number ≥ 1 , if more than one .inf files are created by the system per day.
8. G: → Access to Operator PC: G auf „Mcp1ps3“ (W:), [Polarstern only].
9. R: → Access to Mass Storage: data01 auf „fileserver (192.168.20.10)“ (R:), [Polarstern only].
10. NAV-file to be extracted from DSHIP (see text).

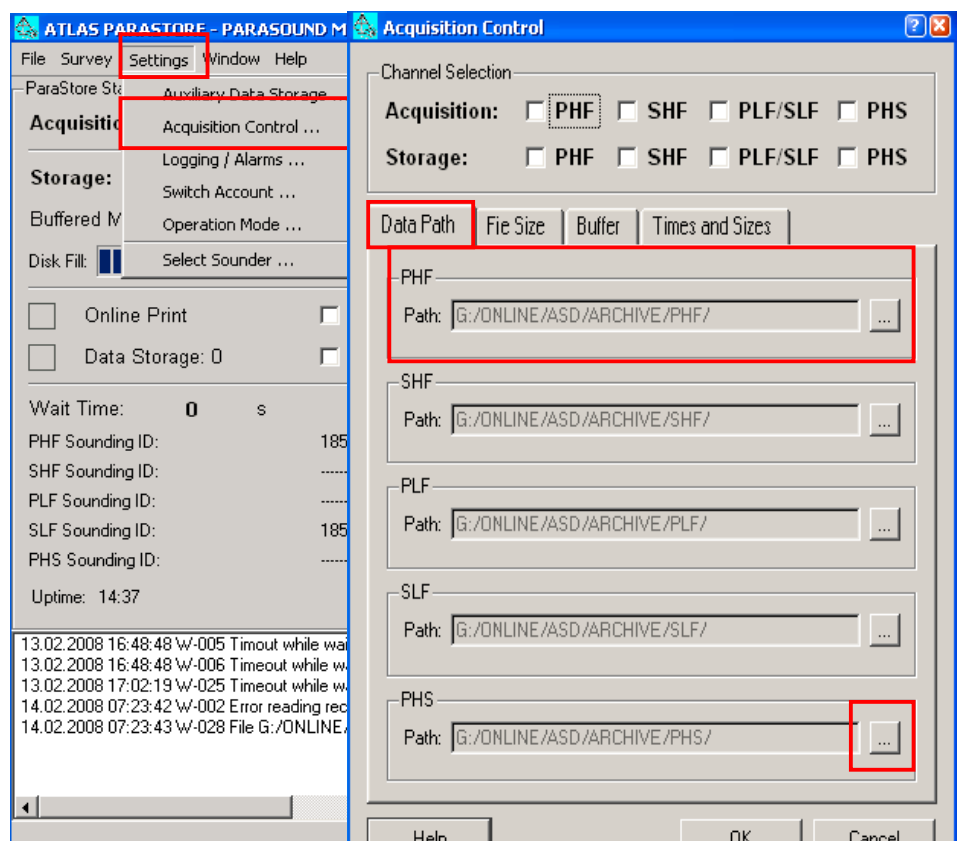
In order to reduce the number of files, .asd files are grouped together into cabinet files (asd.acf files, Tab.1), which are automatically created by the system. The size of the cabinet files can be manipulated by the Parasound Operator in Atlas Parastore (as explained below). Both single .asd files and cabinet files are created when data storage is switched on. Single .asd files are stored in the folder “online” but also being compiled to a cabinet file which grows continuously while .asd files are added. When the final size of a cabinet file has been reached and the file is complete, the single .asd files in the “online” folders are deleted by the system automatically. A new cabinet file is created and file storage is repeated as described above. At normal operation without system crashes the “online” folders are empty when data storage is switched off and only cabinet files remain as illustrated in Tab.1.

In case of system crashes the actual cabinet file being in the process of compilation cannot be finished and the .asd files in the “online” folders cannot be deleted. In such a case data remain in the storage twice, as undeleted .asd files in the “online” folders and in the unfinished cabinet files. In case of several crashes the number of .asd files in the “online” folders will grow as more and more .asd files remain undeleted. If an unfinished cabinet file is unreadable the associated single .asd files can be used to fill the data gap. Therefore the .asd files in the “online” folders must also be copied to the “Data Storage PC” into the sub-folder “ASD_online” (Tab.1) and, subsequently, into the Mass Storage. Under normal operating conditions the number of single .asd files will be relatively small. Therefore, all .asd files are copied into the “ASD_online” folder regardless of the day of acquisition and frequency, from which they were created (PHF, SHF, SLF) (Tab. 1).

3. Data Paths and Storage using software Atlas Parastore

On the „Operator PC“ the desired directories have to be created first (Tab. 1) in order to select the correct paths in Parastore. Make sure the correct paths are still selected after Atlas Parastore was switched off or crashed. A prepared parameter set may be downloaded that has the correct paths stored. To select the paths for ASD-Files open the following windows and select by using the browse function:

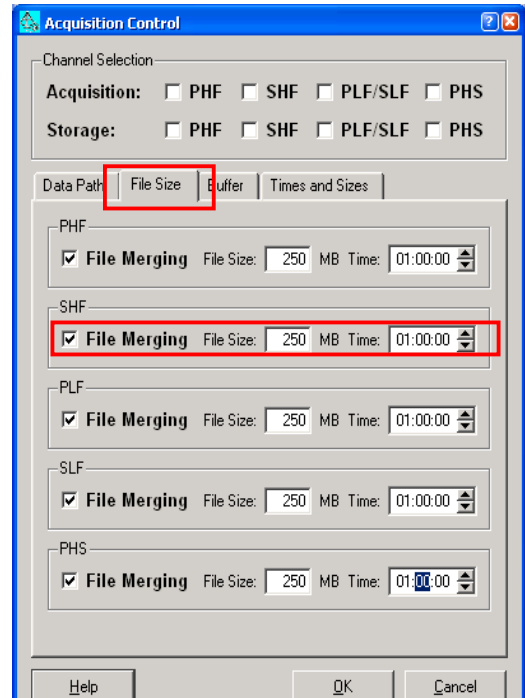
The selected paths can be stored under „File“. These Paths and sizes refer to cabinet files only. For the different frequencies the system will add “online” folders automatically (Tab. 1) where .asd files are stored. The paths of the “online folders” cannot be changed. For normal operation there will be no data storage for PLF (Primary Low Frequency) and PHS (Primary High Frequency Side Scan).



In the same sub-window go to „File Size“ and select the following settings:

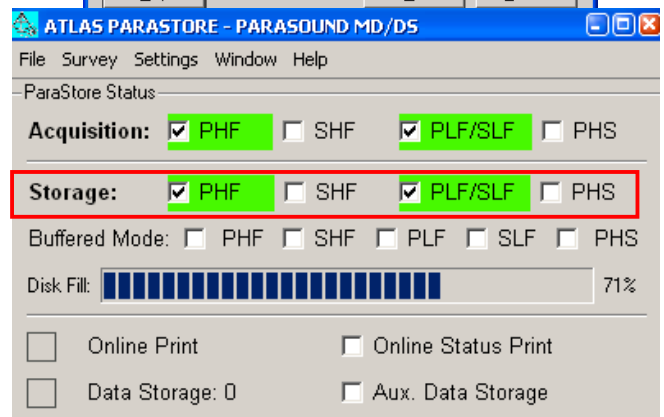
ASD-Files: 100 MB and 10 minutes (00:10:00). (Not 250 MB and 1 Hour as in the example below). In order to keep the files always in 10-minute blocks (data base requirement) the file size is set to a large size which can never be reached in 10 minutes (100 MB).

This has to be done for all frequencies of which data are stored: PHF, SHF, SLF.



Under the Atlas Parastore Starting Window activate the following storage:

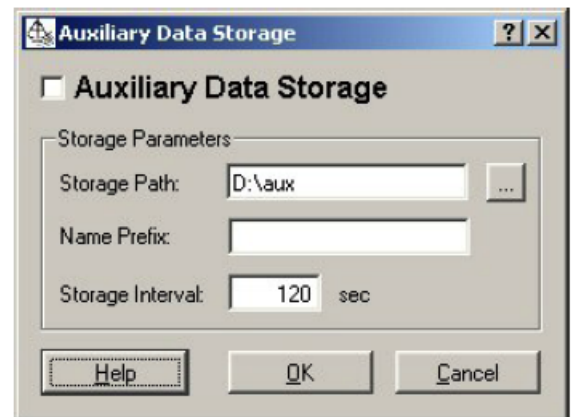
PHF, PLF/SLF and PHS if needed. Make sure these data are acquired by clicking Acquisition „on“.



By the function „Aux. Data Storage“ a table with navigation data is stored in txt format (.nav, Tab.1) . This is the same as can be printed by activation of „Online Status Print“.

To select the desired path for „Aux. Data Storage“ go to the Parastore starting window (Main Window) → Settings → Auxiliary Data Storage and use the Browser Function. Make sure the „Storage Interval“ is set to a useful length (recommended: 60 sec and NOT 120 sec as in the example shown here).

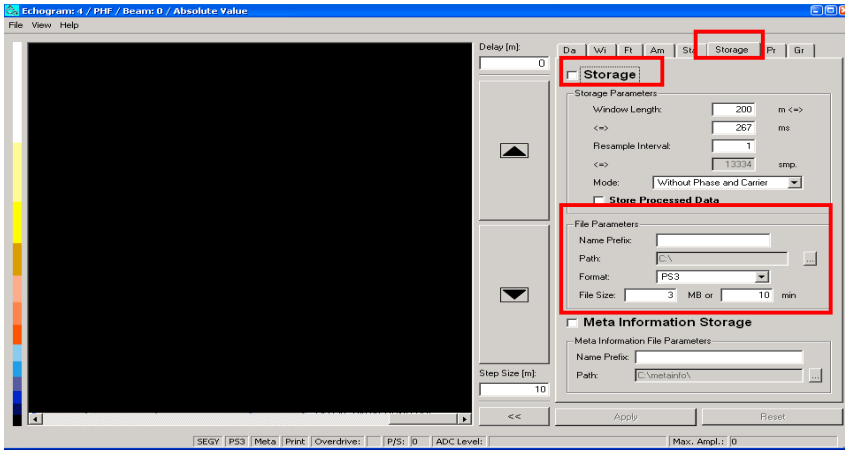
Make sure „Aux. Data Storage“ is clicked „on“.



In order to select the desired paths for PS3 and SEG-Y data open the sub-window „Storage“ in the prepared Parastore Echogram Window: Click on Storage and select the format: PS3, SEG-Y or PS3 and SEG-Y. For the selection „PS3 and SEG-Y“ these files will be stored together into one directory. Here the operator has two possibilities in order to keep within the desired data structure:

- Separation of different data types into different directories by hand under Windows.
- Open two similar Echogram Windows and use one for PS3 Storage and the other for SEG-Y Storage into different directories (recommended).

PS3 data should be stored „with phase and carrier“.



In the same window(s) set the file size to 20 MB or 10 Min (PS3 and SEGY) (NOT 3 MB and 10 min as in the example left).

In the same window(s) click on „Meta Information Storage“ and select the prepared „PSAUX“ directory. Meta Information here stands for a protocol about changes to settings

applied to Atlas Parastore during on-line operation.

Save your settings under File → Save so that the path remains set if Parastore needs to be restarted.

Subsequently, the files have to be copied onto the „Data Storage PC“ and ordered according to day of acquisition as outlined in Table 1. The “PSAUX” and “ASD_online” folders only need to be updated for new data.

4. Navigation Data

It is of major importance to select navigation data out of the ships data base (DSHIP on RVs “Polarstern”, “Sonne”, “Maria S. Merian” and “Meteor”) for a given cruise before the final transfer of data into the Mass Storage and/or on external USB hard disc is finished. Only with this information meta data for PANGAEA (not the same as meta data above) can be extracted in order to allow data base storage of and access to the cruise Parasound data.

A data set is required with navigation data (year/month/day*time, latitude and longitude) in one minute intervals for the entire period of Parasound data acquisition and storage from the first to the last Parasound file. On RV “Polarstern”, navigation data can be extracted via the Intranet by using „DSHIP“ under “Science/Wissenschaft”. Click on “data export and documentation” → “data base access”, type in your user name and mail name (e.g. “Maxwell Smart -> msmart.d”) and select a “full data set”. Submit and select “System” and submit. Select the position AND the output format “Position Deg” as in the example below and submit.

| | | | |
|--|---|---|--|
| <input checked="" type="checkbox"/> Position lat | Output format <input type="text" value="Position Deg"/> | Field width <input type="text" value="15"/> | Precision <input type="text" value="5"/> |
| <input type="checkbox"/> <u>Samples</u> <input checked="" type="checkbox"/> Spot <input type="checkbox"/> Min <input type="checkbox"/> Max | | <input type="checkbox"/> Value validity | |
| <input type="checkbox"/> Position lat (degrees) [deg] | Output format <input type="text" value="Real"/> | Field width <input type="text" value="8"/> | Precision <input type="text" value="2"/> |
| <input type="checkbox"/> <u>Samples</u> <input checked="" type="checkbox"/> Spot <input type="checkbox"/> Min <input type="checkbox"/> Max | | <input type="checkbox"/> Value validity | |
| <input checked="" type="checkbox"/> Position lon | Output format <input type="text" value="Position Deg"/> | Field width <input type="text" value="15"/> | Precision <input type="text" value="5"/> |
| <input type="checkbox"/> <u>Samples</u> <input checked="" type="checkbox"/> Spot <input type="checkbox"/> Min <input type="checkbox"/> Max | | <input type="checkbox"/> Value validity | |

Confirm your order in the list by “submit request”. Select “Time/date of export” and “File format” as follows:

| | |
|--|--|
| <p style="text-align: center;">Time/date of export</p> <p><u>Start date/time</u> 20.05.2009 15:00:00</p> <p><u>End date/time</u> 20.05.2009 16:00:00</p> <p><u>Duration [s]</u> 3600</p> <p><u>Interval</u> 60 [s] ▾</p> <p>Selected extraction takes (approx.) 5 s</p> | <p style="text-align: center;">Result</p> <p><u>File name</u> DataAAAI7aGgF</p> <p><u>User name</u> Frank Niessen</p> <p><u>Mail address</u> fniessen.d@awi-polarstern.de</p> <p><u>Get mail</u> <input type="checkbox"/></p> |
| <p style="text-align: center;">File format</p> <p><u>Separator</u> Tabulator ▾</p> <p><u>End of record marker</u> New line ▾</p> <p><u>Date / time format</u> YYYY/MM/DD*HH:mm:ss ▾ * = Separator</p> <p><u>Decimal symbol</u> . ▾</p> <p><u>Header row</u> <input checked="" type="checkbox"/></p> <p><u>Max. data file size</u> 0 MByte <input checked="" type="checkbox"/> unlimited</p> | <p style="text-align: center;">Error/invalid value pattern</p> <p><u>Error value numeric</u> 9 ▾</p> <p><u>Error value alphanumeric</u> Blank ▾</p> <p><u>Error value position</u> Blank ▾</p> <p><u>Include invalid values</u> <input type="checkbox"/></p> <p><u>Skip invalid lines</u> <input type="checkbox"/></p> <p><u>Fit to format</u> <input type="checkbox"/></p> <hr/> <p>Save order <input type="checkbox"/> as SaveDataAAAI7aGgF</p> |

The Parasound sounding operation, data acquisition and storage should be in the time window defined by “Start date/time” and “End date/time”. This time window can be larger than the Parasound data window but NEVER be smaller. The interval is 60 (s). The “File format” has to be exactly as above.

Then start extraction. Automatically a link is provided by the system, from where the data can be downloaded. Of the four files extracted only the .dat file contains the date/time and navigation data. The format is txt. Load the data into Excel or K-Graph tables and make sure the time format YYYY/MM/DD*HH:mm:ss is maintained and no commas are used (“.” only) and save as .txt file (export as tab-delimited txt in K-Graph).

This file has to be added to the Parasound Data in the Mass Storage under the directory „DSHIP “ or, for other vessels, onto the two external USB hard discs (see Tab. 1).

Parasound navigation data (.nav files) are not sufficient because data storage may not cover the entire period of sounding acquisition and data storage. Only with the navigation data as described above and being stored at the end of the cruise AWI can make Parasound data available for post-cruise users.

Example of extracted navigation data

| Date | Time | System Position lat Spot | System Position lon Spot |
|------------|----------|--------------------------------|--------------------------------|
| 2009/05/20 | 15:00:00 | 47.49949 | -6.80437 |
| 2009/05/20 | 15:01:00 | 47.5017 | -6.8024 |
| 2009/05/20 | 15:02:00 | 47.50401 | -6.80041 |
| 2009/05/20 | 15:03:00 | 47.50625 | -6.79837 |
| 2009/05/20 | 15:04:00 | 47.50844 | -6.79622 |
| 2009/05/20 | 15:05:00 | 47.51064 | -6.79408 |