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Guidelines for Supplying Data for Analysis

This document provides guidelines to customers of RMS Instruments who will be supplying data for analysis and/or post-flight compensation. In order to expedite processing please ensure your data conform to these guidelines.

Data recorded in AARC500-series[1] systems

- Data files may be compressed: 'zip' or 'rar' only.

- Aeromagnetic compensation – calibration data:

  – Provide the original 'd' file(s) for the calibration flight(s), and/or the corresponding '.x' files. If partial calibrations were required, provide all the 'd' and '.x' files involved.

    The 'd' files are critical if an in-depth analysis of the calibration/installation is required. They must be in the original format (binary or ASCII), without any modifications.

  – Provide the original 'd' file for the FOM-box flown in compensated mode immediately after the calibration.

  – Provide the 'monasc.txt' log file for the session that includes the calibration(s) and FOM box.

  – Specify system parameter settings: front end sampling rate, host sampling rate, bandwidth, trigger (host synchronization) mode, LP-filter option (enabled/disabled, cut-off frequency), number of TF mags, number of gradients, GPS type/output.

- Aeromagnetic compensation – low-level survey lines for post-flight compensation/analysis:

  – Data files for the applicable calibration(s) should be provided per the instructions in the preceding point.

  – Note that throughout survey flights, all pertinent system parameters must have remained identical to those employed for the applicable calibration flight(s).

  – Provide the original 'd' file(s) that need compensation. They must be in the original format (binary or ASCII), without any modifications.

    Each 'd' file may contain one or more lines.

- Aeromagnetic compensation – post-flight compensation output files:

  The standard output format is flat-ASCII, space-separated. The first field in each record is the fiducial number (from the original 'd' file). This is followed by compensated TFs, and compensated gradients (if applicable), all in units of [nT].

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[1]   The RMS Instruments' *AARC500-series* of products comprises the models AARC500 (Gen-1 and Gen-2), DAARC500 (Gen-1 and Gen-2), AARC510 and DAS500. The *AADCII* model is a legacy product, still widely used, predecessor of the AARC500.

- Ancillary data:

  Provide original ancillary data files, exactly as recorded by the system, together with the corresponding (magnetics/GPS) 'd' file.

  System parameter settings may be explicitly specified, as indicated below, or alternatively, supply all applicable configuration files ('xlist', 'zlist', 'tlist', 'alist', 'vlist').

  – Analog ('a' files):   Specify system parameter settings: sampling rate, ±10V or ±5V input range, and 16-differential or 32-single-ended channels.

  – Serial ('s' files):   Specify system parameter settings for each of the 8 serial channels: sampling rate, protocol, preamble (1, 2, 3), offset, length, terminator.

    Specify the format and transmission rate of all the incoming data streams.

  – Ethernet ('t' files):   Specify system parameter settings: sampling rate, and host packet data length.

    Specify the format and transmission rate of the incoming data stream.

Data recorded in non-AARC500-series systems

- Data should be supplied in file(s) in flat-ASCII format, with blank-separated fields. Lines should be terminated with a carriage-return/line-feed.

- The files may be compressed: 'zip' or 'rar' only.

- Specify the variables in each field in a header at the beginning of files, or in separate 'header files'. Where applicable, indicate the units in which each variable is encoded.

- Specify the sampling rate (i.e., $1/T$, there T is the time period between records).

- A fiducial number as the first field in each record is helpful to readily identify sections of interest. This may be inherent in the data set, or explicitly added to it.

- If the files are generated by exporting from a Geosoft database, make sure that values are exported using full precision. By default, Geosoft exports using only two decimal places.

- Aeromagnetic compensation – calibration data output by AARC500-series or AADCII device, recorded in non-AARC500-series system:

  – Complete calibration (FOM-box) with no signal loss: Supply one file for the calibration flight and one file for the FOM-box flown immediately after in compensated mode. Make sure the complete record is included, from the level-flight section before starting maneuvers, up to and including the last turn after completing the maneuvers for the final heading.

    Partial calibrations: Supply one file for each partial calibration. Make sure level-flight sections at the start and end are included. Supply also a file for the FOM-box flown in compensated mode after the partial calibrations.

  – Records should include vector magnetometer signals (Vx, Vy, Vz), raw total fields (TFs), uncompensated TFs, compensated TFs, and compensated gradients (if applicable). Note that raw TFs and uncompensated TFs are identical if the LP-filtering option was disabled in the system, but are different otherwise.

– Specify system parameter settings:

AARC500-series: front end sampling rate, host sampling rate, bandwidth, trigger (host synchronization) mode, LP-filter option (enabled/disabled, cut-off frequency), number of TF mags, number of gradients, GPS type/output.

AADCII: sampling rate (10 or 20 Hz), LP-filter option ('disabled', '0.9-Hz recursive', or 'minimum-FIR'), number of TF mags, number of gradients.

– For data from AADCII systems include the *mode code* and *error* fields, preferably at the end of each record.

– Delimiter characters marking the start of each record are acceptable (e.g., '#').

- Aeromagnetic compensation – low-level survey lines for post-flight compensation/analysis; data output by AARC500-series or AADCII device, recorded in non-AARC500-series system:

– Data files for the applicable calibration(s) should be provided per the instructions in the preceding point.

– Note that throughout survey flights, all pertinent system parameters must have remained identical to those employed for the applicable calibration flight(s).

– For the survey lines to be processed, it is preferable to have one file for each line.

If the above is problematic, we can also deal with a single file containing a series of lines; the data should be continuous, including all turns.

The least-preferable option would be a single file containing multiple lines concatenated together, excluding turns. In this case the processing will result in large transients at the discontinuities.

– For post-flight compensation only, records should include vector magnetometer signals (Vx, Vy, Vz) and raw total fields (TFs).

If further analysis is required, the following must also be included: uncompensated TFs, compensated TFs, and compensated gradients (if applicable).