INERTIAL PROCESSING WITH BACKPACK SYSTEMS

MEMS IMUs are typically used in backpack systems due to their small size and low power consumption. The following guidelines will help ensure the success of both SPAN's real time solution and Inertial Explorer's post-processed solution in these applications:

- It is important to start and finish the survey walking in an area with reasonably open views of the sky. We recommend that at least 30 to 40 seconds of data be collected while walking at a more or less constant heading. This will ensure that an initial position, velocity and heading can be determined from the GNSS data, which is required by the alignment process. Collecting stationary data is unimportant as MEMS IMU's are incapable of static alignment.
- Following this initial coarse alignment procedure, several changes in heading (left and right turns) should be observed to maximize attitude convergence prior to entering challenging GNSS conditions. Collecting stationary data during the alignment is unimportant as MEMS IMU's are incapable of static alignment.
- If an alignment can be achieved in real time, it is a good indication that post-processing will also be successful in the forward processing direction. In order to achieve an alignment in real time in a pedestrian application, it is recommended to lower the alignment velocity threshold to the minimum value of 1.15 m/s. This can be done through the SETALIGNMENTVEL command.

- Pedestrian processing profiles are presently included in Inertial Explorer 8.60 for ADIS16488, STIM300, CPT, KVH1750 and FSAS SPAN systems. If the data has been decoded in 8.60.5025 or later, Inertial Explorer will attempt to automatically detect "Pedestrian" as the processing environment and thus automatically load the appropriate pedestrian profile when accessing the tightly coupled processing dialogue.
- If you do not see a pedestrian profile for your system under the processing dialogue, please contact support@novatel.com or edit the automated alignment thresholds manually to apply a minimum velocity of 0.5 m/s and a heading SD tolerance of 45 degrees. These are currently the default alignment tolerances for all pedestrian applications within Inertial Explorer.
- To maximize solution accuracy and for quality analysis, Inertial Explorer® processes data in the forward and reverse directions. Thus achieving an alignment in the reverse direction which is equally important as the forward direction. As such, the above alignment guidelines are equally applicable to reverse processing, and the same field procedures used to start the survey should be repeated at the end.
- For best results in Inertial Explorer, process tightly coupled and choose the "multi-pass" processing direction.

For more information please contact:

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