



Multipath Assessment Tool™

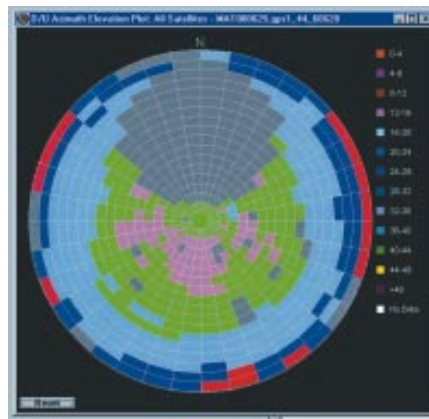
NovAtel Inc. has recently implemented a Multipath Meter (MPM) feature within the Multipath Estimation Delay Lock Loop (MEDLL) portion of Wide Area Augmentation System (WAAS) type receivers. The MPM outputs data which describes the multipath environment that an antenna is experiencing. It uses NovAtel's MEDLL technology that is able to model and remove multipath signals from the direct signal. MEDLL generates enough information to calculate residuals from the modeling process. The MPM calculates the residuals and outputs them in standard NovAtel log format, along with the amplitude, delay and phase for each satellite signal currently being tracked. This data is tracked every second.

The Multipath Assessment Tool (MAT) is PC software which allows the user to assess the multipath environment in a graphical manner. MAT automatically extracts multipath parameters from the MPM which outputs: relative multipath power, delay and phase. Other parameters which are a function of multipath are also extracted from the receiver, such as C/No, elevation and azimuth angles. These parameters are displayed by MAT in a graphic manner with various types of plots to simplify the multipath analysis. The plots are updated as the output is received from the MPM. This allows the user to view the multipath environment as the satellites are passing overhead. The capability to playback MPM data is also available during post processing for a more detailed analysis.

If you don't already have a WAAS/MEDLL receiver, one can be leased for the duration of your multipath site survey.

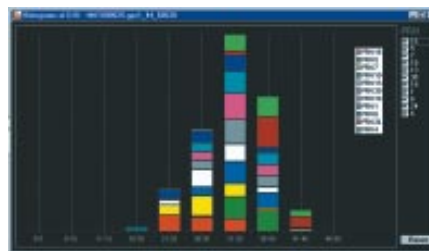
Features

- **Logging Control** - saves all the necessary data that MAT may need for analysis and file playback.
- **File Playback** - reads Multipath Meter data from a file(s) and lets the user pause, fast forward, or rewind the data stream.
- **Plot Windows**
 - **Multipath polar plot** - to view the multipath signal strength as a function of azimuth and elevation. Color coded segments represent multipath strength. Satellite signals received from directly overhead are at the center, while those at the horizon are at the outermost edge of the plot.



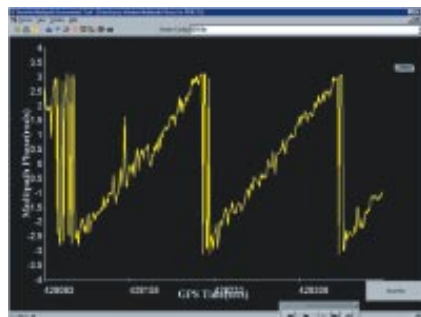
Multipath polar plot

- **Multipath histogram** - to monitor the distribution of the multipath signal strength for all or individual satellites



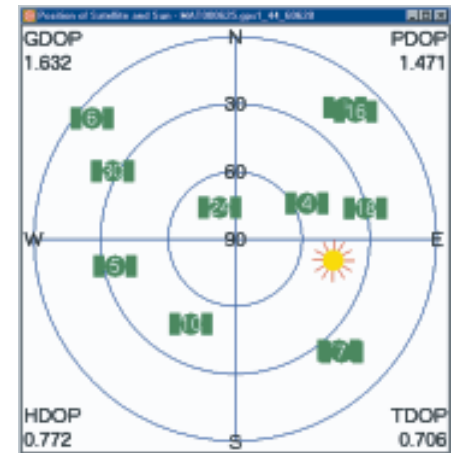
Multipath histogram

- **Time series plot** - to view any signal parameter over a period of time



Multipath phase time series plot

- **Satellite position plot** - to view the position of the satellites in the sky



Satellite position plot

- **Multipath Information Window** - in tabular format displays all the multipath parameters (D/U, phase, delay, C/No, azimuth, elevation, etc.)
- **Capture Control** - pre-set the system to take a 'snap shot(s)' of plots, at any time.

RF and Multipath

GPS signals are susceptible to reflection because of the short wavelength at L1 frequency. As GPS is a radio navigation ranging system, the direct path signal is of primary interest and the reflected signal causes biases to the ranging measurements. Multipath is the greatest source of errors to system operation in single differencing mode. Multipath errors cannot be reduced by traditional DGPS signal differencing techniques. Therefore careful site selection for a reference receiver or survey point is essential.

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For detailed product technical specifications, please call:
1-800-NovAtel

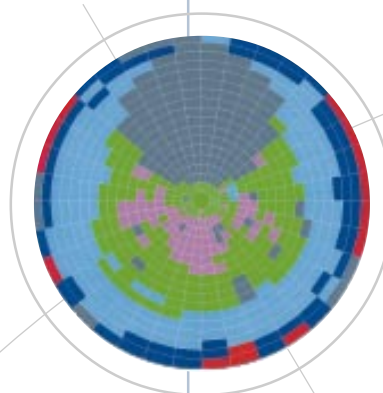
in U.S. or Canada or +1-403-295-4900
e-mail: sales@novatel.ca
internet: www.novatel.ca

NovAtel Inc.
1120 - 68th Avenue NE
Calgary, Alberta, Canada T2E 8S5



Look into NovAtel's Multipath Assessment Tool™ (MAT)

*A graphical user interface (GUI) program
designed to assess multipath effects
at reference sites. Ideal for WAAS and
LAAS reference site assessment.*



Multipath polar plot



Satellite position plot
/ multiple histogram



ADVANTAGES

- Real-time site survey tool for multipath environment assessment
- Allows real time 'quick-look' as site survey progresses
- Ideal for location of multipath sensitive GPS antennas for WAAS or LAAS
- Graphical user interface (GUI)
- Software load available for existing WAAS, MSAS or EGNOS receivers
- Derived from MEDLL - superior data set for accurate Multipath analysis
- Data can be collected and analysed real-time or post processed

MAT