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TECHNICAL BULLETIN

NOVATEL GPS POSITION LOGS

NovAtel GPS receivers offer several position logs to accommodate a wide variety of applications. Following is a brief overview of the differences between these position logs and some insight into their respective applications. The logs can be split into two primary categories to help illustrate the differences: low latency and high latency. Each type will be explained in detail.

Low Latency

These logs report the last computed position (best available) from the receiver. The time stamp on the log will virtually coincide with the actual time that the position was collected. In the case of real-time differential operations, the higher latency logs will provide a more accurate position, but at the expense of a greater log delay. The low latency logs can be further sub-divided into three groups: position information only, differential position logs, and special position logs.

Position information only logs: useful when the user simply requires the antenna position and accuracy in a relatively compact log (can be used for single point or differential positions).

> **POSA/B** **Computed Position** - best available position reported in units of latitude, longtitude, and height (MSL). The coordinates are based on whatever datum is selected using the DATUM and/or USERDATUM commands.

> **PXYA/B** **Computed Cartesian Coordinate Position** - best available position reported in Cartesian x-y-z coordinates with the center of the Earth as the origin. These coordinates are based on the WGS-84 ellipsoid regardless of the DATUM and USERDATUM settings.

> **GPGGA** **NMEA Global Position System Fix Data** – this log follows the standard format as adopted by the National Marine Electronics Association. It can be used to provide positions to other systems that recognize NMEA formats.

> **GGAB** **Global Position System Fix Data** - a binary equivalent of the NMEA GPGGA log with a NovAtel header attached.

Differential position logs: include the same type of information as the above logs plus additional data on the real time differential status.

> **PRTKA/B** **Computed Position – Best Available** - when the receiver is operating in real time differential mode, the position reported in this log will be extrapolated based on the most recently received base station observations. If base station observations are not received for the period specified with the

DGPSTIMEOUT command (or 30s for RT-2 and RT-20), the log reverts to a single point position.

P20A/B **Computed Position – Best Available** - this log has been replaced with the RTKA/B log in software loads 3.43 and 4.43 or higher for OEM/PC 2 and MiLLenium receivers respectively. A couple of new fields were added to the PRTKA/B logs that are not present here.

Special position logs: these logs are used in conjunction with other receiver functions or may have special parameters combined in the log.

MKPA/B **Mark Position** - this log format is the same as POSA/B but reflects the position when a mark impulse is detected. The position is extrapolated from the last computed position and velocity.

PAVA/B **Position Averaging Status** – this log is used in conjunction with the POSAVE command. The parameters in this log reflect the averaged position and standard deviations as it is updated by the POSAVE function. The ONCHANGED trigger is recommended for this log.

PVAA/B **XYZ Position, Velocity and Acceleration** – this log contains the latest computed position, velocity and acceleration in Cartesian Earth-Centered Earth Fixed (ECEF) coordinates. This log may be derived from an external sensor (and Inertial Navigation System, for example) and injected into the receiver to aid in satellite reacquisition.

High Latency

These logs are intended for real-time kinematic operation only. The position is updated only when the rover unit receives new reference station observations. As a result, there is no base station extrapolation error and the position reported is the most accurate. However, because the calculation requires buffered measurements, there will be a lag between when the position was gathered versus when the log is reported. In the event that the differential link is lost, these logs will continue to output unchanged position values. As a result, it is suggested that these logs be used with the ONCHANGED trigger.

RTKA/B **Computed Position – Time Matched** – virtually identical to the PRTK log except the positions are not extrapolated from earlier reference station observation data.

RT20A/B **Computed Position – Time Matched** – this log has been replaced with the RTKA/B log in software loads 3.43 and 4.43 or higher for OEM/PC 2 and MiLLenium receivers respectively. It still applies, however, for software versions 3.35 and lower. A few new fields regarding differential status and satellite visibility have been added to the RTKA/B log that are not present here.

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