

## Trimble Centerpoint RTX for POS AV and AP: Frequently Asked Questions

### 1) What is Trimble Centerpoint RTX?

*Trimble Centerpoint RTX (Real Time eXtended) is a proprietary Precise Point Positioning (PPP) technology applying a variety of innovative techniques, which combined provide users with centimeter-level real time positioning accuracy anywhere on or near the earth's surface.*

### 2) How Does RTX Work?

*The corrections containing real-time precise orbit, clock and other information are transmitted to the rover via satellite or Internet. The error sources such as satellite orbit, satellite clock, atmospheric delays are modeled at the rover location. The advanced software algorithms running on the rover receiver and satellite motion allow the position to quickly converge to an integer carrier phase solution. All broadcasted corrections are derived from global network of Trimble base stations.*

### 3) What accuracy can I achieve using RTX with POS AV and AP for airborne mapping?

*Airborne Real-time and Post-processed Position Accuracy using RTX:*

*Horizontal: <0.1m RMS*

*Vertical: <0.2m RMS*

*The real time orientation accuracy is improved using RTX for better georeferencing accuracy and smoother control of auxiliary sensors such as stabilized mounts.*

### 4) What is the price of RTX? Are there discounts for multiple systems?

*The price depends upon geographical coverage (Global/Regional) and the length of subscription. A Global coverage 1yr subscription is \$7,000. Discounts are available for multiple systems.*

### 5) What are the benefits of using RTX versus Applanix SmartBase or a Reference station in POSpac MMS?

*With RTX, the post-processed POSpac solution is not dependent on availability, coverage, geographical locations (geometry) and calibration of publically available CORS stations. There is also no base-line (distance between Rover and Reference station) restriction that limits your mapping area in order to provide consistent results.*

**6) Do I need to use Applanix SmartBase or a Reference station in POSpac MMS if I use RTX?**

*It is not required to use SmartBase or a dedicated Reference station in POSpac if the required mapping accuracy can be met with RTX alone. However it is always recommended to use SmartBase or a dedicated Reference station as a back-up for RTX if there is ever an issue with convergence.*

**7) Can I still use Applanix SmartBase or a Reference station if I use RTX?**

*Yes, POSpac supports all reference station processing options (if purchased) regardless of RTX activation.*

**8) How long does it take RTX to converge to its full accuracy?**

*Convergence to full accuracy currently takes about 30 minutes or less.*

**9) Is the convergence dependent upon where I fly or how I fly?**

*Convergence is independent of location or flying pattern as long as the GNSS antenna has an unobstructed link with the L-band satellite, and there is no interference to the GNSS signals that causes cycle slips.*

**10) Do I have to wait until RTX converges before I can take-off?**

*No, the time it takes to taxi, take off and transit to the mapping areas counts towards convergence time.*

**11) Do I have to wait until RTX converges to begin using the solution from the POS AV system for mapping?**

*Depending upon your accuracy requirements, it may not be necessary to wait until full convergence to begin using the POS AV system for georeferencing purposes.*

**12) What happens if I lose corrections or my GNSS is jammed in mid-flight? Will this cause me to lose my mission? How long does RTX take to re-converge?**

*If you lose corrections or experience significant interference that causes cycle slips in mid-flight, the system will first go to a less accurate mode, and then will automatically attempt to re-converge back to full accuracy. The user will need to decide if they should pull off line at this point or continue on. However if you have SmartBase or a Reference station as back-up then there is no need to abort the mission. The re-convergence in mid-flight is significantly faster, usually taking only a few minutes.*

**13) How do I tell in real-time how accurate my solution is using RTX and if it has fully converged or is re-converging?**

*The position accuracy can be monitored via the position RMS value estimates output by POS AV in real-time. These can be displayed using the AV POSView controller or the integrated POSTrack Flight Management System display. Full convergence is achieved*

when both of the reported horizontal RMS accuracies are consistently below 5 cm. There is a possibility to set user predefined thresholds for automatic monitoring of RMS values as a part of the real time QC. The RMS values are also available on the Ethernet and serial port.

**14) What is “Quick Start” convergence?**

The “Quick Start” is a completely automatic mode that allows the RTX solution to fully converge within 5 minutes following the start of the system. If the POS AV with a fully converge RTX solution is powered down while the aircraft is parked, the next time the system is powered up it will attempt to use the last known position to initialize the RTX solution, thus significantly reducing convergence time. The requirements for Quick Start to succeed are as follows:

- 1) RTX solution must be fully converged before the POS AV is powered off
- 2) Aircraft must be parked in open sky before the POS AV is powered off
- 3) Aircraft must not be moved after the time the POS AV is powered off
- 4) Once the POS AV is powered back on, the aircraft must remain stationary until the GNSS mode indicates RTX

**15) What is the L-Band satellite coverage for RTX?**

The RTX corrections are transmitted over the air using geostationary satellites that operate on L-Band range of frequencies. Those satellites are often referred as L-Band satellites. Although the RTX corrections are truly global their over-the-air transmission to the rover location is limited by the coverage of L-band satellites. The interactive coverage map for Trimble CenterPoint RTX via satellite with standard initialization is available on the following link:

<http://www.trimble.com/positioning-services/interactive-map/interactive-map.aspx>

The areas that are currently not covered are located on far north such as northern Canada, Alaska and parts of Russia.

**16) How do I activate RTX on my POS AV or AP system?**

RTX is activated automatically “over-the-air” once a subscription is purchased. Please contact an Applanix Customer Support representative for details on how to purchase a subscription.

<http://www.applanix.com/support/general-support/contact-support.html>

**17) Is it possible to get a demo subscription of RTX?**

Yes, demo subscriptions are available for all airborne users with qualified POS AV hardware. Please, contact an Applanix Customer Support representative.

<http://www.applanix.com/support/general-support/contact-support.html>

**18) Can I run RTX on POS AV/POSTrack V5 hardware?**



*No, V5 products cannot support RTX. It is only supported in V6 products (POS AV/POStrack V6 and AP) that integrate the latest GNSS technology. It also requires GNSS antenna capable of tracking L-Band frequencies. If you require hardware upgrade, please contact Applanix Customer Support.*

**19) Are there specific software/firmware requirements to run RTX on POS AV?**

*Yes. It is recommended to use latest production firmware.*

*Firmware Requirements:*

*POS AV firmware 8.2 or higher*

*GNSS firmware 4.9 or higher*

*POSPacMMS 6.2 Service Pack 2 (SP2) or higher.*