

Wide Area Augmentation System (WAAS)

Frequently Asked Questions and Answers

What is WAAS?

The Wide Area Augmentation System (WAAS) was created by the Federal Aviation Administration (FAA) as a free-to-air differential correction service. The system augments GPS with additional signals that increase the reliability, integrity, precision and availability of GPS signals required for the aviation industry.

What are the benefits of using WAAS?

As WAAS is broadcast from geo-stationary satellites, the signal will often be available in areas where other differential GPS (DGPS) sources such as MSK beacon or radio broadcasts are not available.

WAAS provides a useful backup to your primary DGPS source. If your primary source becomes unavailable, WAAS can automatically be used as an infill differential source to ensure continuous real-time DGPS operation.

How does WAAS work?

The WAAS network consists of 25 ground reference stations located in the United States. This network receives GPS signals from all GPS satellites in view. The GPS data is sent to a master control site, where GPS differential corrections and GPS satellite health data are transmitted to geo-stationary satellites. These satellites broadcast the information to all WAAS-capable GPS receivers, which then decode the WAAS signal to provide real-time differential corrections.

How precise are WAAS DGPS Corrections?

The published specification for WAAS accuracy is approximately 5 meters horizontally, and 7.6 meters vertically. As a comparison, the published specification of the U.S. Coast Guard beacon system is 10 meters.

How much does WAAS cost to use?

WAAS signals are broadcast *free* to all WAAS-enabled receivers.

Is WAAS operational now?

Since September 1999, a complete set of test messages has been broadcast on a continuous basis. Initial Operational Capability (IOC) has been delayed several times, and is currently undetermined. Once IOC is declared, WAAS will be available for aviation use. The WAAS test signals are available now, but there is no guarantee of the availability and reliability of the information. *(Note that the IOC date primarily affects aviation users, as they cannot get the full benefits of WAAS until the FAA declares the system operational).*

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Where is WAAS available?

WAAS is available throughout the United States (including Hawaii and southern Alaska).

Why should I upgrade my GPS receiver to use WAAS?

If you can benefit from a source of free differential corrections to improve the reliability of your differential GPS, you should upgrade your GPS receiver to support WAAS corrections. WAAS can be used as an infill DGPS source if your primary DGPS source becomes unavailable for any reason.

WAAS can also be used as your primary DGPS source if you are in an area that has no other DGPS source available.

I have already subscribed to a satellite differential service. What will I gain by upgrading my receiver for WAAS capability?

You may want to upgrade your receiver to WAAS to ensure that you have an additional source of free differential corrections in case the satellite differential signal is not available and DGPS is required. Alternatively, you may want to make WAAS your primary correction source and take advantage of the reduced cost over existing satellite differential services.

How do I use WAAS in my GPS receiver?

To use the WAAS signal, your GPS Pathfinder® Pro XR, Pro XRS, or Power receiver must have firmware version 1.50. To access the settings necessary for using the WAAS signals, you must also be running one of the following data collection software applications:

- Asset Surveyor® version 5.20 or later
- TerraSync™ version 1.20 or later

Which GPS receivers can be upgraded to use WAAS?

GPS Pathfinder Pro XR, Pro XRS, and Power receivers are now shipping with version 1.50 firmware, and thus have the ability to use WAAS as part of their standard configuration. Existing GPS Pathfinder Pro XR and Pro XRS receivers will require a firmware upgrade in order to support the WAAS functionality.

☒ Note: GPS Pathfinder Pro XR receivers purchased prior to January 1999 with part number 29654-xx cannot be upgraded to support WAAS. Trimble will offer a trade-in program for these receivers. For more information, contact your local Trimble representative.

How can I enable the WAAS option?

- From April 23 2001, all new GPS Pathfinder Pro XR, Pro XRS, and Power receivers will have the WAAS option enabled.
- A WAAS upgrade is available if you purchased a Pro XR/XRS receiver in February 2001 or later, or have a current receiver firmware support agreement. To obtain this option visit www.trimble.com/support/files/xrs.htm.
- A WAAS trade-in offer is available from April 30 2001 for GPS Pathfinder Pro XR receivers purchased prior to January 1999 (part number 29654-xx). For more information, please contact your Trimble representative.
- If you purchased a GPS Pathfinder Pro XR/XRS receiver (part numbers 33302-xx or 38073-xx), you will be able to purchase the WAAS option (part number 37262-10).

What effect will WAAS have on the utilization of GPS channels inside the receiver?

To get the precision and integrity benefits of the WAAS service, one GPS channel in the GPS receiver must be dedicated to a WAAS satellite to decode the WAAS message. The remaining channels can select GPS (and other WAAS) satellites that provide the best geometry for position calculations.

Why is the WAAS precision specification less than the satellite-based differential service providers?

WAAS is not as precise as an L-band subscription service provider, primarily because WAAS requires extra bandwidth for integrity monitoring. Satellite L-band uses this bandwidth to achieve a greater correction update rate and increase differential correction precision.

Where can I get more information about WAAS?

You can get more information on WAAS from the FAA website at www.faa.gov. This website has information on the planned implementation schedule, including any schedule changes. Technical information regarding WAAS can be found on the Stanford University website at www.stanford.edu/group/GPS/Projects/WAAS, which also provides links to other related sites.



Trimble Navigation Limited
645 North Mary Avenue
Post Office Box 3642
Sunnyvale, CA 94088-3642
1-800-827-8000
In North America
1-408-481-8000
outside North America
1-408-481-7744 Fax
<http://www.trimble.com>

