

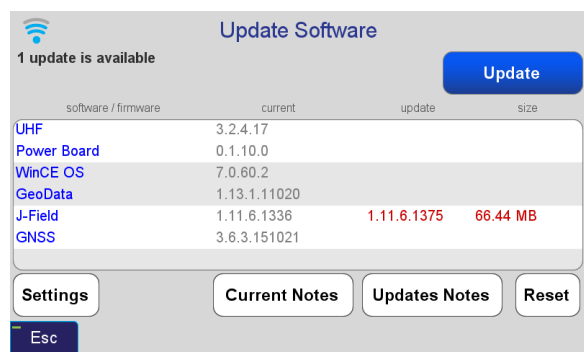
Configuring The TRIUMPH-LS to Receive 5 Hz “Beast Mode” Corrections

In a previous article titled [JAVAD GNSS 5 Hz “Beast Mode” RTK Base Station Corrections Reduce the Time to Acquire a Fix by 72 Percent](#), the benefits of RTK base station correction rates greater than 1 Hz were discussed. This article will detail how to configure a Javad base station and radio to transmit 5 Hz corrections to a [Javad TRIUMPH-LS](#). This process includes the following steps:

- Update the TRIUMPH-LS Firmware and Software
- Update the Options Authorization File (OAF) of Your Base Station
- Update the Firmware of Your UHF radio
- Configure the UHF Radio Parameters and Start the Base Station
- Turn Off Extrapolation Mode

Update the TRIUMPH-LS Firmware and Software

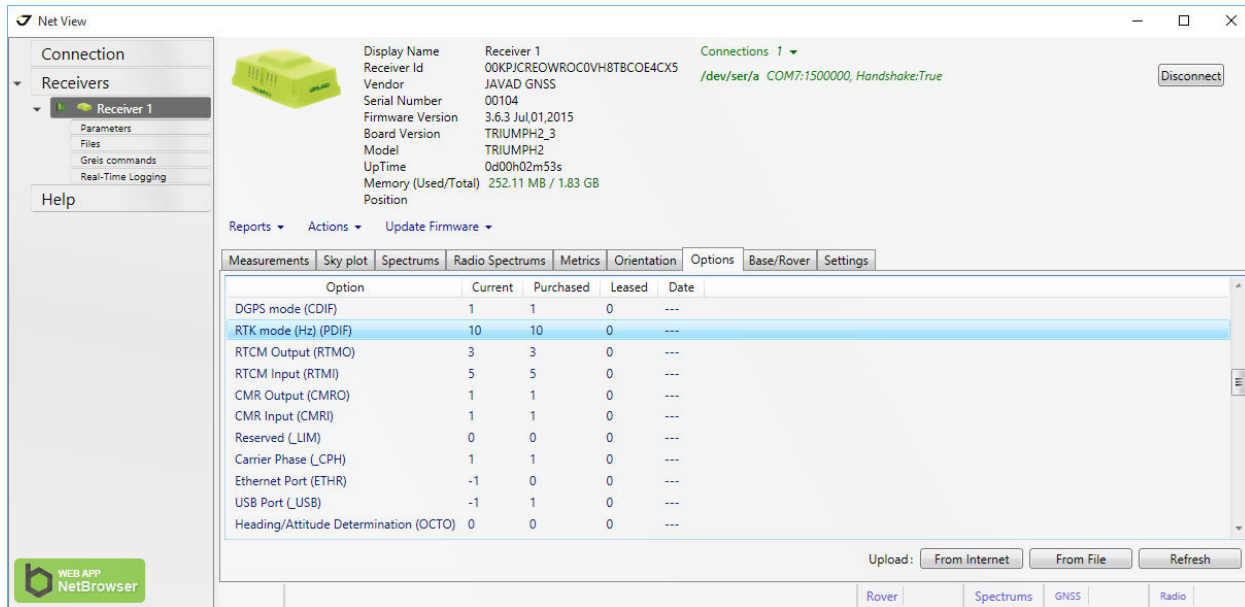
The first step is to update the TRIUMPH-LS to the latest software and firmware. Javad provides all software and firmware updates free of charge. Updates can be easily download installed when the TRIUMPH-LS is connected to the internet through WiFi or with a network LAN cable. Press the Support button found on the home screen and then choose Software Updates to search for updates. If updates are found, press Update to download and install the updates.



Update Software screen showing an update of J-Field is available.

Update the Options Authorization File (OAF) of Your Base Station

The next step is to check and update the OAF of your base station. Connect your base station to your PC with a USB cable and connect to it through [NetView](#). Navigate to the Options tab in NetView and check to see if your receiver has the “RTK mode (Hz)” option of 10.



NetView Option tab showing the RTK mode (Hz) option has a value of 10.

If you do not have this option press the Upload “From Internet” button to update your options. Javad GNSS is giving this option free of charge to all users who have purchased an RTK receiver.

Update the Firmware of Your UHF Radio

A recent update is needed for the UHF radios to work when a call sign is being broadcast with corrections rates faster than 1 Hz. Download the latest firmware from <http://javad.com/jgnss/support/update.html> and follow the instructions on this page to install this firmware. When launching [ModemVU](#) on your PC, be sure to right click on it and choose “Run as administrator”.

Configure the UHF Radio Parameters and Start the Base Station

To start the base with 5 Hz corrections the Broadcast Period must be changed to 0.2 seconds in the Base/Rover Setup. “RTCM 3.0 Min” should be chosen as the correction format. This format only broadcast the RTCM messages needed for RTK positioning and excludes information containing signal-to-noise (CNO) and full milliseconds for code observations. A modulation must be selected that has a sufficient link rate to transmit increased data rates with 5 Hz corrections. With the Channel Bandwidth set to the FCC’s limitation 12.5 kHz, the D16QAM modulation must be used. With 2 Hz corrections (0.5 second broadcast period) D8PSK modulation can also be used.

UHF Modem Link Rates (bps)

Channel Spacing	Modulation			
	DBPSK	DQPSK	D8PSK	D16QAM
6.25 kHz	2,400	4,800	7,200	9,600
12.5 kHz	4,800	9,600	14,400	19,200
20 kHz	7,200	15,000	22,500	30,000
25 kHz	9,600	19,200	28,800	38,400

Modulations with greater link rates have decreased receiver sensitivity to demodulate the signal and the downside to choosing modulations with higher link rates is that they are more subject to interference and data loss when the signal is weak. Field test have found that D16QAM modulation decreases the working range of the radio approximately 20% as compared to DQPSK modulation.

The screenshot displays the radio configuration interface. On the left, the 'UHF Configuration' menu is open, showing options: Base ID (0), UHF Configuration (selected), Format (RTCM 3.0 Min), Transmit L2C (checked), Broadcast Period (0.2 Sec), and DPOS Configuration. On the right, the 'Common Settings' and 'Base Modem' sections are visible. 'Common Settings' includes Frequency (451.80000 MHz), Modulation (D16QAM), Channel Bandwidth (12.5 KHz), Output Power (4000(36)), Call Sign (WSFL386), FEC (checked), and Scrambling (checked). 'Base Modem' shows three radio models: HPT401BT/AW401BT, HPT404BT/AW400BT, and HPT435BT/AW435BT, all with status indicators. At the bottom, there are buttons for 'Esc', 'OK', 'Cancel', and 'Apply', along with a 'Link Rate 19200 bps' indicator.

Radio settings for 5 Hz Corrections

After these setting in Base/Rover Setup have been modified press the To Base button apply them and then the Start Base button to start broadcasting with the configured setup.

Turn Off Extrapolation Mode

Extrapolation mode extrapolations corrections when they are lost between the base and the rover. This mode does work with correction rates greater than 1 Hz and needs to be turned off. It also reduces the accuracy when corrections are extrapolated. The longer they are extrapolated, the greater the decrease in the RTK position.

To turn off extrapolation mode select **Setup>Advanced>RTK/DGPS>Use data for up to** and select **None**. Warnings are shown in the action screens when extrapolation mode is enabled.