



CO-OPS Engineering Bulletin 20-002

Engineering Change: Identify and Document Locations of Trimble Bullet III GPS Antennas and Replace with Antcom 3G15A-XTR-1 GPS Antennas as Inventory Allows

Systems Affected: All CO-OPS owned systems using Satlink transmitters

Originating Team: Chesapeake and Seattle Instrument Labs

Approval Date: 07 February 2020



Background: All operational stations using a Satlink GOES transmitter require a GPS time sync to successfully transmit within their allotted transmission window. CO-OPS currently utilizes several models of GPS antenna to provide the GPS time sync to the Satlink. The Trimble Bullet III GPS antenna, which is the standard GPS antenna issued by Sutron with the Xpert platform, has been shown to have significant internal corrosion issues and a high failure rate. This is largely believed to be due to the air inside the void space in the antenna expanding and contracting with changes in temperature resulting in an exchange of air with the environment. This leads to the introduction of moisture to the internal electronics and eventual failure. This is a critical issue because without a time sync, the Satlink will not transmit. As such, a failed GPS antenna will ultimately result in no data transmissions from a station.

After exhaustive efforts working with Trimble to improve the design of the Bullet III failed, it became clear that we needed to find an alternative GPS antenna. The Antcom 3G15A-XTR-1 antenna was identified as a backwards compatible replacement and has been used operationally for approximately 5 years without any confirmed failures. The Antcom antenna is hermetically sealed, has close to zero void space, and is rated for use on aircraft operating at altitudes up to 70,000' and at temperatures between -67 F and +185 F making it suitable for our use.

Action Required: During the next regularly scheduled site visit, document the location of all Trimble Bullet III GPS antennas at CO-OPS owned / maintained stations in the Future Work section of the eSite report. If parts are available, replace all Trimble Bullet III GPS antennas with Antcom 3G15A-XTR-1 units at the earliest opportunity. Replace the GPS antenna cable along with the antenna unless the existing cable is still in excellent condition. There may not be enough replacement antennas on hand to complete all replacements in the coming field season but the goal is to have all Trimble Bullet III antennas replaced as quickly as inventory permits. Note that there are some sites which may alternately utilize a small black Trimble puck antenna inside the house. These are generally an acceptable alternative but please document the presence of any puck antennas in the Future Work section of the eSite report for reference.

Estimated Time To Complete: 15 minutes to document, 1 hour to replace

References:

CO-OPS SOP 3.2.3.5 (E1) Standing Project Instructions for Coastal and Great Lakes Water Level Stations