



Garmin eTrex 20 in a fixed location indicated by green circle with cross-hair, whose position had been determined with iG3s dual-freq GPS+GLONASS, 350 minute observation time, post-processed by CSRS-PPP with reported 95% probability error ellipse dimensions of 2.4 cm x 1.2 cm.

Gamin eTrex 20 was receiving both US GPS and Russian GLONASS satellites plus WAAS. Garmin display generally estimated 10-12 foot (3-3.6 m) error range.

blue dots: 17 readings at variable intervals between 11 AM and 10 PM (EST), May 26, 2020.

green dots: 12 readings labeled 1...12, spaced between 11 AM to 9 PM (EST) May 27, 2020

red dots: 12 averaged readings labeled 1A...12A, each taken right after the corresponding green dot reading. Garmin averaged until "100 % confidence", usually 4 to 10 minutes.

magenta lines: connecting x and xA dots to show direction of adjustment

NOTE maximum errors > 7 meters, double the Garmin estimate, and averaged location was not consistently more accurate.

yellow star: Bad Elf Surveyor, 2 hour GPS recording, CSRS Rapid (24h) post processing, error ellipse 10.8m x 8.7m

during 2 hour recording the Bad Elf app display showed gradual drift within  $\pm 20$  foot radius of last 15 min average loc.