

Sturnus Warder Range Test Using Lora Amplifier

April 15 2024

Introduction

Kairos conducted additional range testing for the Warden/Warder range safety devices. This testing included an amplifier on the Warden to increase the signal range. The objective for this testing was to quantify the additional range provided by using an amplifier. All testing was done line-of-sight to get an accurate distance measurement.

Test Setup

- Sturnus with the Warder board. Sturnus was unmodified for this testing and pulled straight from the pelican
- Warden in the Ground Control Station (GCS) variant



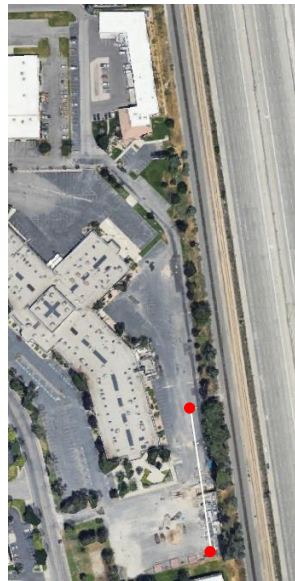
- +10db Lora Radio Transmission/Receiving Signal Amplifier



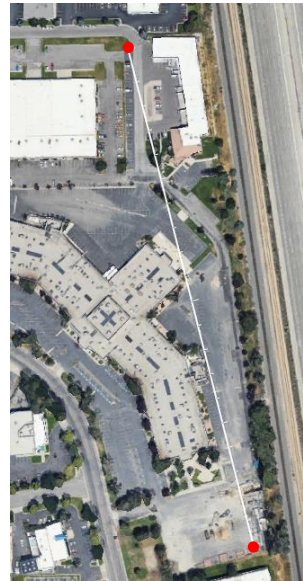
- Windows 10 Laptop
- Kairos POE Power supply

Findings

Without an amplifier on the Warden, the Sturnus/Warder loses the heartbeat messages at 100 meters and enters the auto E-Stop countdown.



Range test without amplifier (106 meters)



Range test with amplifier (409 meters)

At 409 meters the Warden, with amp, was able to receive status messages from the Warden on the Sturnus. The Warden was able to reliably E-Stop the Sturnus and Rearm at this distance.

Version History

Date and Signature	Revisions	Reasons for Revision
04/15/2024 Jack R.	Document was written. (v01.00.00)	



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