

## AI Generated Summary of DPRG RBNV – December 17, 2024

- **Tom C. presented updates on his GPS accuracy tests**, noting that he was seeing better longitude than latitude accuracy
- Tom is using an **ESP32 cam and AI** to detect a cone, using **Edge Impulse** to train his model, with the model running on the ESP32 itself.
- The **ESP32-CAM** is a low-cost option with an onboard ESP32 processor that can run AI models and is being used for object detection.
- Doug presented V-I curves for a Smraza RPi power supply, and showed voltage loss over a cable that can cause RPi low voltage alarms. He recommended using **RPi 5 supplies** for everything to eliminate the IR drop issue.
- There are issues with 5V buck converters that have USB cables & connectors vs. bare wires. Doug showed a **USB cable wire tester from AliExpress** to identify power-only vs. data cables.
- Doug demonstrated a **constant current load** useful for developing USB power supply V-I curves.
- Doug showed that sealed lead acid batteries lose capacity at current draws exceeding 0.05C.
- Ray showed an **ESP32 board powered by USB with a battery connector** to avoid USB-cable variances. Ray and Tom also showed devices that plug inline with USB-A that display volts and amps.
- Ray shared a [randomnerdtutorials.com](https://randomnerdtutorials.com) **tutorial** on using an ESP32-CAM with OpenCV to track a colored blob.
- Doug shared a link to a **5V/3A buck converter with inline fuse and wire connectors**: <https://www.amazon.com/gp/product/B0D7P819RW/>.
- **Paul's testing showed that a USB3 connection from RPi4 to hub to SSD destroyed RTK-GPS accuracy.** Replacing the **USB3 hub with a USB2 hub** resolved the issue, but slowed down boot time by 30%. He will use a Belkin four-port USB 2 hub. The USB3 noise is in the DC-5 GHz range, which interferes with the GPS signal, and USB2 has a much lower frequency noise.
- Paul introduced **Trekbot**, a new robot platform, assembled as an R/C vehicle that will be modified into a robot.

- There was a discussion of **Discord** and its use for communication. There was a link posted to join the Discord server: <https://discord.gg/sCBfa9uG> and <https://discord.gg/2jKYtpwx>.
- There was a discussion about moving away from blob detection to **AI-based object detection** such as cones. Doug has a dataset of cone images for training an AI model.
- Ray discussed the **Max Cam** which is a low cost and low power AI camera.
- Paul showed a video about using a real-time appearance-based mapping slam package that uses RGBD sensors, instead of LAR, to create a 3D map of an environment. Ponder SomeMore is looking at using the **D455** real sense camera for this purpose.
- Paul will be hosting a robot power lunch in place of the December meeting in the DFW area.