Summary Description: Testing LoRa Communication Using My TTGO LoRa ESP32 Microcontrollers, Smartphones, and the Meshtastic App

Tags: electronics; nature projects; TTGO Esp32 LoRa; Meshtastic app; smartphone; Bluetooth;

Why I did this: Wanted to experience the impressive long-range (LoRa) abilities of the TTGO esp32 LoRa technology. I figured a perfect use for pair of these is a messaging network that doesn’t use cellular nor WAN-wifi service (like if I’m hiking in deep woods); I would program the LoRa esps to each pair with separate smartphones (via wifi access points or Bluetooth), then use the LoRas to communicate with each other over long distance; The smartphones could then send messages to each other through their LoRa counterparts.

But…turns out someone already made that! The Meshtastic project is an open-source project design to build mesh communication networks using low powered devices.

(summary pic of system)

Design Walkthrough:

Parts: 2x TTGO esp32 LoRa; 2x smartphone (with Meshtastic app and Bluetooth); 2x batteries

Following the directions of the Meshtastic webpage: I installed the USB to esp32 drivers (for allowing the computer to talk to the devices), then installed the Meshtastic firmware to the microcontrollers, via computer. I then installed the android version of the Meshtastic app to both of my smartphones (via Android Play Store). Then I paired a smartphone to an esp32 device (via the app’s Bluetooth connection software) and repeated for the other esp and smartphone. After changing the settings to be on the US band (which is 915MHz; my model), and changing device recognition names, I was able to get both pairs of systems to talk to each other. Success!

(pics of system)

Lessons Learned and Future Changes:

How well does it perform? It works but I have yet to test the distance it can work from. I will need to update this article when I go climbs some mountains.

Nice compartment needed. I used an old 3d printed casing for each device, but they aren’t good enough; I need one ready for nature’s elements.

Good app, but it could be more. LoRa is known for its long-distance information transfer, but I believe it lacks in bandwidth (can only do small data packets); nevertheless, if it was programmed, I believe it could send small data voice messages instead of being limited to just text messages. Could be a good test for updating the app (or building my own app).

References:

Meshtastic project: <https://meshtastic.org/docs/introduction>

TTGO LoRa esp32 devices: https://www.aliexpress.com/item/32996759721.html?&\_t=pvid:ebbb0b93-8253-4631-9764-8743b9339dab&afTraceInfo=32996759721\_\_pc\_\_pcBridgePPC\_\_xxxxxx\_\_1688249164&spm=a2g0o.ppclist.product.mainProduct