

## Raspberry Pi for Sensorgnome – Layout & Drilling

### Materials

- Waterproof plastic case (US G.I. Heavy-duty Carry Case or Pelican Case)
- BNC to SMA bulkhead connectors (4; or more if using >4 antennas)
- BNC dust covers (4)
- SMA dust cover (1)
- 1/2" x 1/8" brass carriage bolt (1) with washer (1) and nut (1)
- 1/8" I.D., 1/4" O.D., 1/16" cross section O-ring (1)

### Tools

- 1/2" drill bit
- 5/16" drill bit
- 1/4" drill bit
- 9/64" drill bit
- Electric hand drill
- Razorblade or sharp knife
- Sharpie or pen for marking
- Ruler
- Pliers

We build our Sensorgnomes inside plastic waterproof case drill holes to accommodate coaxial connections from the antennas, power inputs, and the external GPS antenna. We have settled on a layout that puts the Funcubes and coaxial equipment inside the lid and the Raspberry Pi and electrical equipment in the base of the case as it maximizes space and makes all components easily accessible.

- 1) Remove any insulation or inserts from inside the case. Layout drilling location for coax (4 x 1/2"), electrical terminals (2 x 5/16"), GPS (1 x 1/4") and dust cover (1 x 9/64") according to Figure 1.

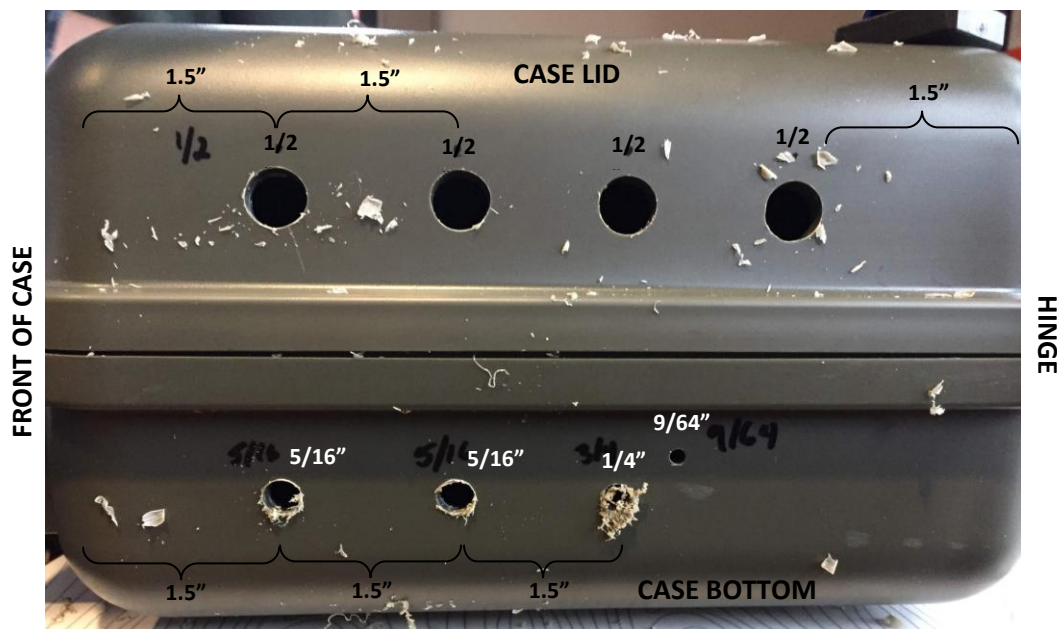


Figure 1: Space 1/2" holes evenly across one side of the lid of your case depending on how many antennas you will be using. The 1/4" hole is roughly in the center of one side of the case bottom.

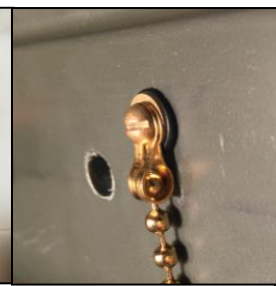
- 2) Drill all holes in case side. 1/2" holes, may need to be reamed slightly in order for bulkhead connectors to fit (test for fit and use drill bit to widen hole if necessary). Use razorblade or knife to clean edges of drilled holes.
- 3) Remove nut and washer from BNC bulkhead connectors and fit in 1/2" holes with the cable inside the case (Figure 3). Secure connectors with nut on outside of case. Place BNC dust cover on each connector (Figure 4).
- 4) Use brass carriage bolt and O-ring to secure the SMA dust cover in the 9/64" hole (Figure 5). Fit the chain, washer, and O-ring on the bolt then put bolt through the hole and secure with the nut (Figure 6).
- 5) Remove large nut and washer from red and black terminal posts and replace with O-ring (Figure 7). Fit posts through 5/8" drilled holes on lower portion of case with O-ring to the outside of the case. Replace washer and nut and tighten with pliers (Figure 8).



Figure 3: Connectors should fit in the hole snugly but go in easily. Widen the hole slightly with the drill, if necessary. Secure with nut and tighten with pliers.



Figure 4: The dust cover chains can be joined with a ring or twist tie.



Figures 5 & 6: Secure the brass bolt with a nut inside the case. An O-ring against the exterior seals the drilled hole from water getting inside the case.

