

Xiegu G90 Go-Box Build Plan (Apache 3800 Case)

1. Overview

This document describes a practical waterproof go-box build for the Xiegu G90 using the Harbor Freight Apache 3800 case. It is designed for portable use: POTA, SOTA, RV, and emergency deployment.

2. Case & Basic Dimensions (Apache 3800)

- Exterior (approx): 15" W x 11.5" D x 7" H
- Interior (approx): 13" W x 9" D x 6" H
- Lid depth (usable): ~1.75"
- Base depth (usable): ~4.25"

3. Gear List (Typical Build)

- Xiegu G90 radio body
- Xiegu G90 detachable control head
- Optional: CE-19 data interface or similar sound card interface
- 6–12 Ah LiFePO4 battery (internal) OR Anderson Powerpole input for external battery
- Anderson Powerpole bulkhead connector (panel mount)
- SO-239 bulkhead for RF output
- Optional: 3.5 mm panel jack for external speaker
- Optional: USB bulkhead connector for digital modes
- 1x HDPE cutting board or similar as a base plate
- EVA / closed-cell foam for padding and strain relief

4. Layout (Top View, Base Section)

Looking down into the bottom of the case:

[FRONT (latch side)]

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|           G90 RADIO BODY (MOUNTED)           |  
|                                     |  
| Battery Pack      | CE-19 / Speaker / etc |  
|                                     |  
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[HINGE SIDE]

Suggested placement:

- Mount the G90 body centered left-to-right, with heatsink fins aligned front-back.
- Place the battery along one side (hinge side or right side) to balance weight.
- Mount CE-19 or accessory box beside or behind the radio as space allows.

5. Lid Layout (Control Head & Storage)

- Mount the G90 control head in the lid using heavy-duty Velcro or a thin panel:
 - * Option A: Velcro the control head directly to the lid foam.
 - * Option B: Cut a thin acrylic or ABS panel, screw it to lid bosses, and cut an opening for a flush mount of the control head.
- Route the control cable along the hinge side; secure it with adhesive tie mounts.
- Use remaining lid space for: mic, short coax jumper, power cable, logbook, etc.

6. Base Plate Construction

- Remove the stock pick-and-pluck foam from the bottom section.
- Cut an HDPE cutting board to fit snugly in the base (approx 13" x 9").
- Mark and drill mounting holes for:
 - * G90 radio body (using factory mounting holes or bracket).
 - * CE-19 or accessory box.
 - * Standoffs for a second level if desired (accessory shelf).
- Secure with stainless screws and nylock nuts. Use spacers or standoffs (0.25"–0.5") under the radio to allow air circulation for cooling.

7. Panel Connectors (Side or Front)

Choose one wall of the case (usually a short side) to mount connectors:

- 1x Anderson Powerpole bulkhead: connects to internal power distribution.
- 1x SO-239 bulkhead: connects to radio RF output via short coax jumper.
- Optional: 3.5 mm jack for speaker audio to an external speaker.
- Optional: USB bulkhead for CE-19 or sound-card interface to a laptop/phone.

Basic wiring:

- Battery (or internal power bus) -> inline fuse (15–20 A) -> Powerpole bulkhead -> radio power leads (and any accessories).
- G90 RF OUT -> 1–2 ft RG-58 jumper -> SO-239 bulkhead -> external feedline.

8. Power System Details

- For internal LiFePO4:
 - * Use a 6–12 Ah pack with built-in BMS.
 - * Add an accessible Powerpole pigtail or panel-mount for charging.
 - * Inline ATC/ATO fuse: 15–20 A on positive lead close to the battery.
- For external-only power:
 - * Omit internal battery and wire Powerpole bulkhead directly to radio via fuse.

Wire gauge suggestions:

- 12 AWG for main battery to radio run (recommended).
- 14 AWG acceptable for short internal wiring if run length is small.

9. Cooling Considerations

- The G90 can get warm at 20 W, especially on digital modes.
- Provide at least 1/4" clearance under the radio and keep some open volume around the heatsink fins.
- For heavy FT8 or RTTY use:
 - * Consider adding a small 5–12 V fan inside and vent holes, or
 - * Operate with the lid cracked open in hot weather.

10. Assembly Steps (Summary)

- 1) Test fit all items in the empty case with foam removed.
- 2) Cut and drill HDPE base plate; mount radio and accessories.
- 3) Decide which wall will hold bulkhead connectors; mark and drill.
- 4) Install Powerpole, SO-239, and any other bulkheads; tighten hardware.
- 5) Wire battery, fuse, power distribution, and radio power leads.
- 6) Make short coax jumper from radio to SO-239 bulkhead.
- 7) Mount control head in lid (Velcro or panel) and route control cable.
- 8) Add foam or strap retainers in lid for mic and small accessories.

9) Label connectors and fuses for quick field troubleshooting.

11. Suggested Labels

- "RF OUT" near SO-239 bulkhead.
- "+13.8 VDC" and polarity markings near Powerpole bulkhead.
- "CHARGE" if a dedicated charging port is used.
- "DO NOT BLOCK" near any fan or vent openings.

12. Customization Ideas

- Add a small volt/amp meter on the panel to monitor current draw.
- Add a fixed-length RG-316 jumper inside to reduce bulk.
- Integrate a small external speaker in the lid for better audio.
- Add a laminated band-plan or quick reference chart in the lid.

End of Plan