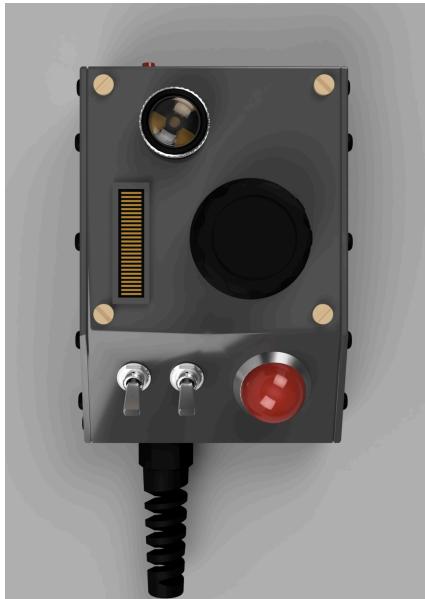


GB Pack Attenuator Shell

This is the main shell and accessories for the device commonly referred to as a “Pack Attenuator”, based on the design first shown by maker Adam Savage as part of a [one-day build for his own Ghostbusters Proton Pack](#). This was intended as a one-handed prop device with switches, a bargraph display, and of course lights so there would be visual interest on the front of the ALICE pack frame worn as part of standard equipment. This shell attempts to replicate the elements seen in the final form of his device.



The device was designed to be worn on the padded strap of an ALICE frame which is approximately 80mm wide when worn under load, and features a back plate with 4 holes allowing you to attach it to a utility belt or any other part of your uniform. The original device showcased by Adam Savage appeared to use a 1:3 ratio for the height vs. length. When worn in the expected orientation the overall dimensions are 80mm W x 115mm L x 38mm D (with back plate attached).



One notable difference from the original design is use of a more vertical space for a [Barometer BL28Z-3005SA04Y](#) 28-segment bargraph, and a bezel which prevents it from slipping through the mounting location. An additional hole at the top of the shell is meant to house a clip-in lens. This provides a light on the top of the device that serves as a status indicator for the intended electronics kit, and can be easily viewed by the operator. The cable attachment point is shifted to avoid the corner supports for the back plate which is fully removable for maintenance of the electronics inside.

Files/Options Included:

- Shell design for FDM or resin printing with 3mm wall thickness for rigidity
 - Available with 2 options for the cable connection to exit, either the top or bottom
 - Includes standard cutouts for the Frutto Technology 28-segment bargraph, 3 LEDs, toggle switches, and rotary encoder
- Back plate designed to accept 5mm screws for attaching to any desired uniform location
- Lens flange meant to work with the Carlco clear dome lens (supports the 2 registration pins)
- Lens assembly with surface diffuser for the radiation/overheat indicator
 - The lens diffuser MUST be printed using transparent filament or resin!
 - Accepts a 15mm lens as noted in the hardware section of this document
- Top control dial with multiple design options
 - A blank top option is available for adding your own logo (24mm diameter)
 - Includes 2 sample logo designs: GPStar and Zeddemore Industries "Z"
- Internal clips for mounting RGB LEDs in the provided openings

Suggested Print Settings:

Layers: 0.16mm - 0.20mm

Infill: 10-15% as desired

Supports: Yes, have some!

Suggested Exterior Hardware:

- [M3x4 Button Hex Head Screws](#) (Qty: 14) - Used for decoration on the sides of the shell
- [M4x6 Cheese Head Slotted Screws](#) (Qty: 4) - Used for decoration on the top of the shell
- [M4 Nuts](#) (Qty: 4) - May be required to secure the screws to the Attenuator shell
- [M4x8 Button Hex Head Screws](#) (Qty: 4) - Used to secure the base plate to the shell
 - [M4x6 Heat-set Inserts](#) (Qty: 4, optional) - Use with the M4 screws for a more secure fit
 - If not using the heat-set inserts, M5x8 screws may be substituted
- [5mm Chicago Screws](#) (Qty: 4) - Used for attaching the back plate to webbing, belt, etc.
- [Clip-in Lens SML_190_CTP](#) (Qty: 1) - Used for the top status & menu mode indicator
- [15mm x 5mm Convex Lens](#) (Qty: 1) - Used for the upper radiation/overheat indicator
- [Carlco Clear Dome Lens](#) (Qty: 1) - Used for the lower stream mode indicator light

Finishing Process:

- Prime and sand to remove layer lines as necessary for FDM prints
- Confirm all screws fit as expected:
 - Use a thread tap or drill out holes to help screws seat into the plastic
 - Add heat-set thread inserts into the 4 mounting holes under the shell
- Paint the shell as you desire
 - See the [ATTENUATOR FINISHING](#) guide in the GPStar project for supplies and ideas
 - If desired, watch propmaster [Ben Eadie's video covering how to repaint a PKE meter](#) for a lesson on simple but effective painting and weathering techniques
- Use any pack/wand stick-on labels you wish from any maker/source for final details

Electronics:

You may use your own electronics inside of this device, though it was meant to work with the “No-Enclosure” (aka. electronics-only) kit offered by [Frutto Technology via Etsy](#), which integrates with the full Proton Pack + Neutrona Wand electronics kit by [GPStar Technologies](#). Please note that if you opt to purchase the electronics kit you will receive components such as toggle switches, rotary encoder, RGB LEDs, 28-segment bargraph, wiring w/ connectors, PG7 strain relief boot, vibration motor, piezo buzzer, and a microcontroller (ESP-WROOM-32 dev module) with a custom PCB for connections. Alternatively, you may build your own electronics for the device by following this [DIY Guide](#) which will allow it to integrate with the same system, though you will need to purchase all components yourself including any protoboards in addition to the components mentioned in the guide. Assembly and software is outside the scope of this guide but you can find support in the [GPStar Facebook group](#).

Distribution:

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