Caveatron SV Rev C 3D Printed Parts Description

2023-02-20

Introduction

This document includes a description of the 3D printed parts for the Caveatron SV and notes on how to print them. Also included is information on how the 3D printed parts go together. Information on how to assemble all the other components is found in the Caveatron SV Assembly Instructions document.

Scaling

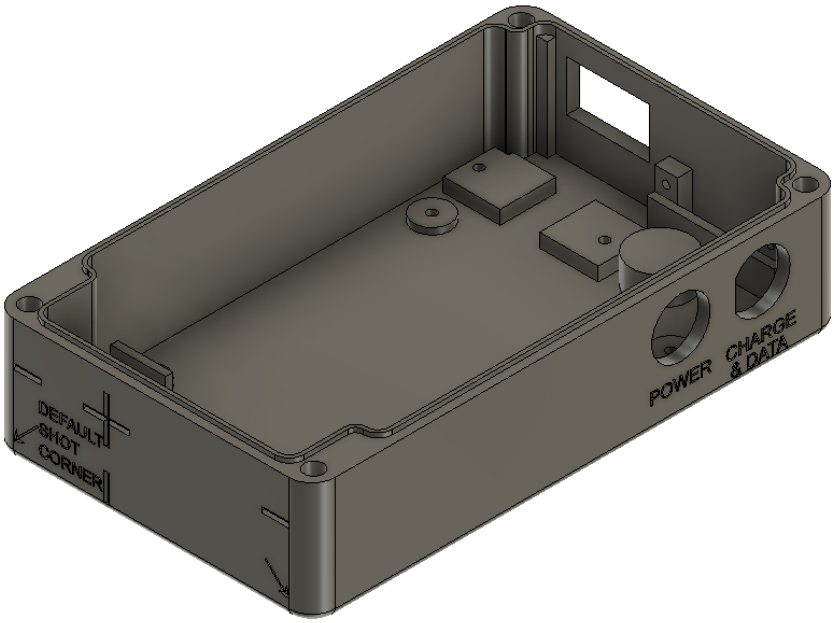
In some Slicer software, these files must be scaled by 2540% though in others, they import correctly.

General Printing Notes

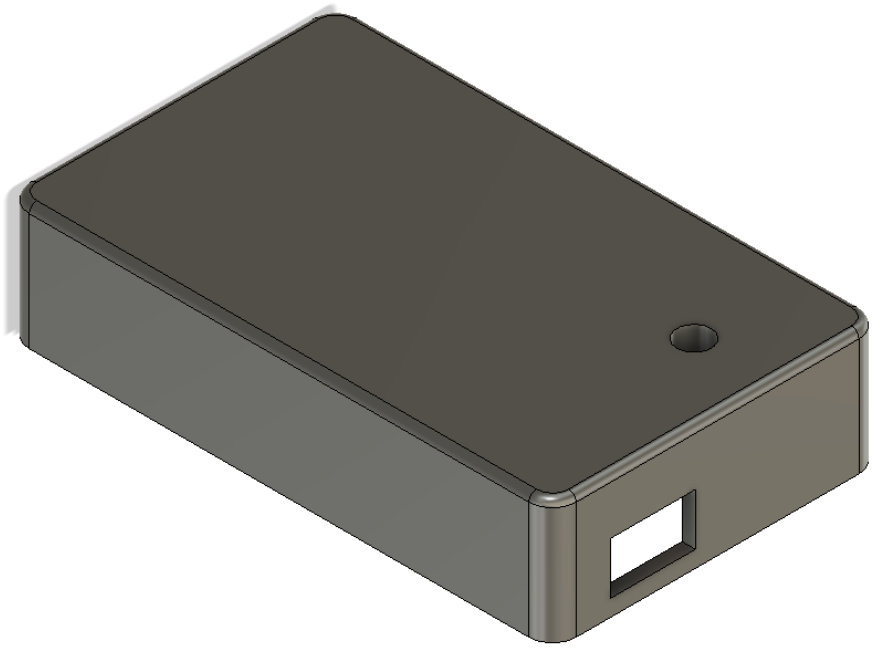
The recommended material for these parts is PETG. Print settings were 0.2 mm resolution and 20% infill. PLA is not recommended as it is not as durable. ABS may work but is more rigid and brittle so screws and inserts may not work as well. Many parts can be printed without support material. There are a few parts where support material is recommended in a few spots and if you have the ability to insert supports only in selected locations, you do not need supports everywhere.

Enclosure Base

The main portion of the enclosure containing the bulk of the components. Support material should be used across the LRF window and the center portion of the USB and power button holes on the right side. Heat-set threaded inserts are added to each of the four corner holes to attach the lid and an acrylic LRF window is glued inside the front. An optional ¼-20 heat-set threaded insert location is on the underside.

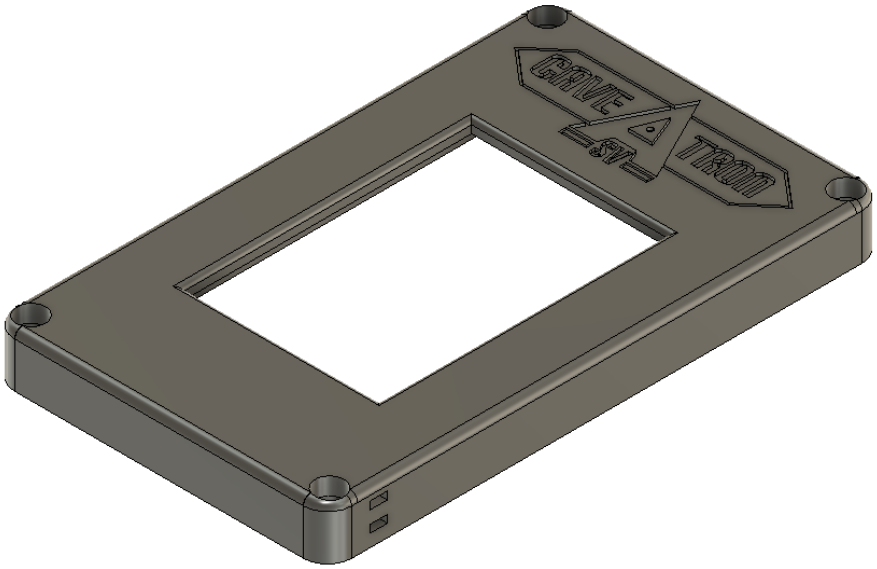


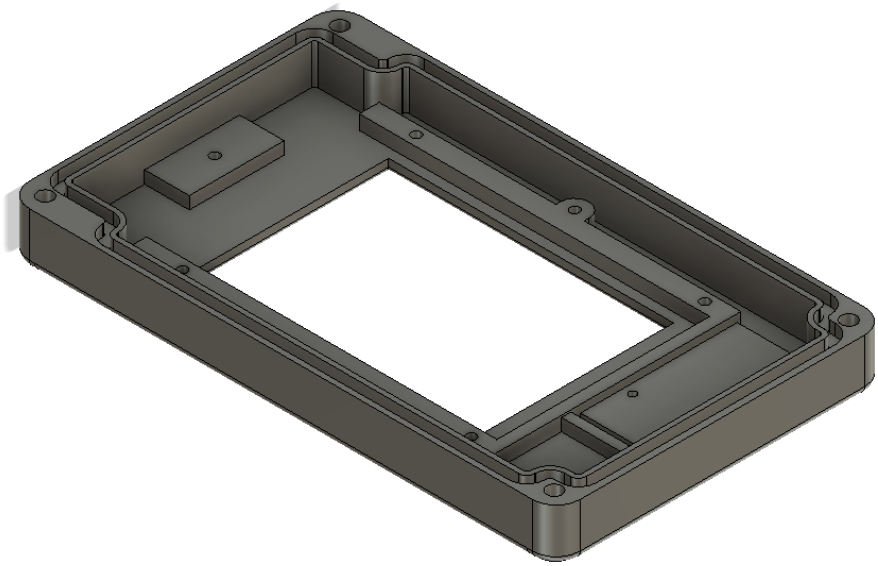
Print in this orientation



Enclosure Lid

The lid supports the LCD touchscreen, and the wrist strap. It also has a groove for the sealing O-ring. It attaches to the main enclosure base by four 6-32 flathead machine screws into the threaded inserts.

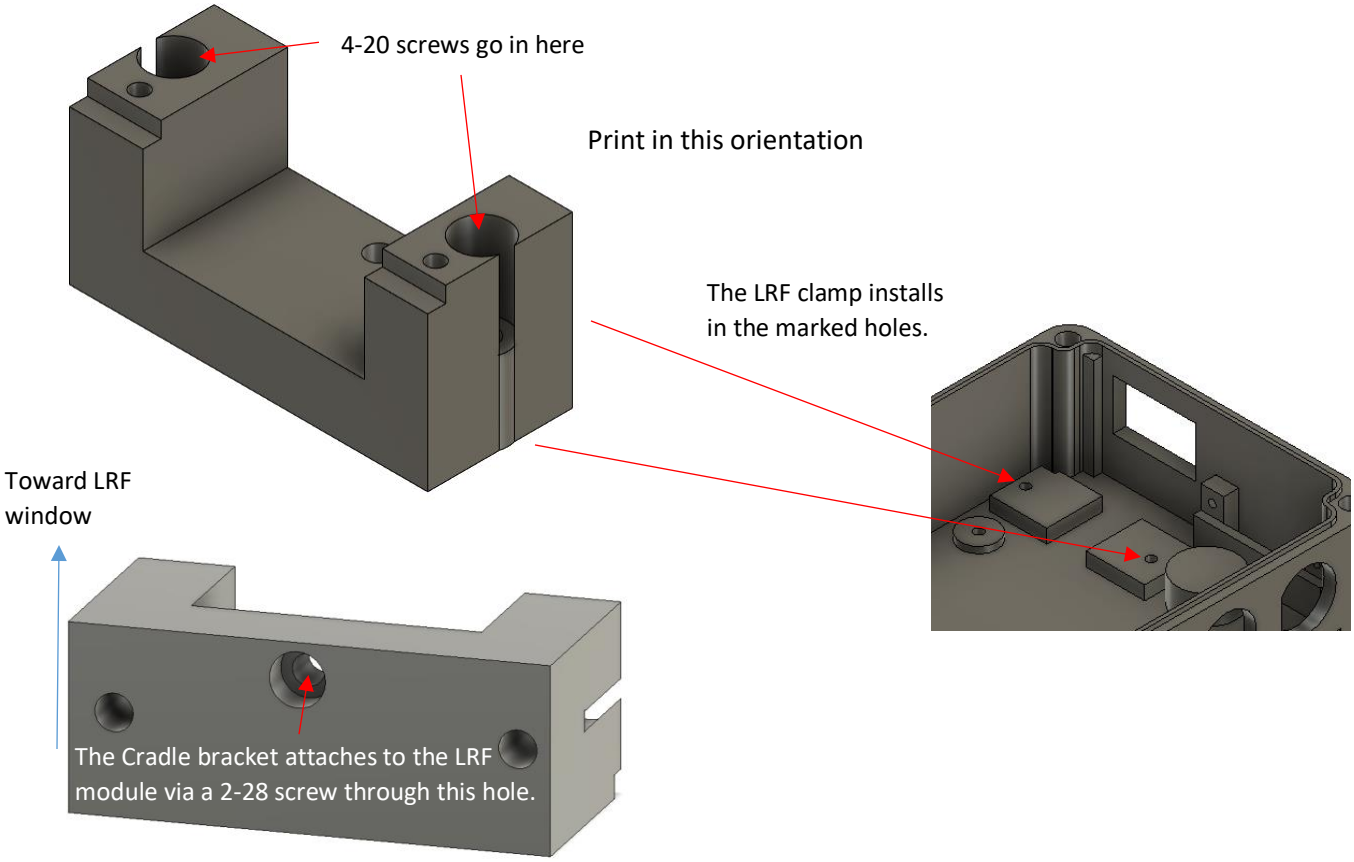




Print in this orientation

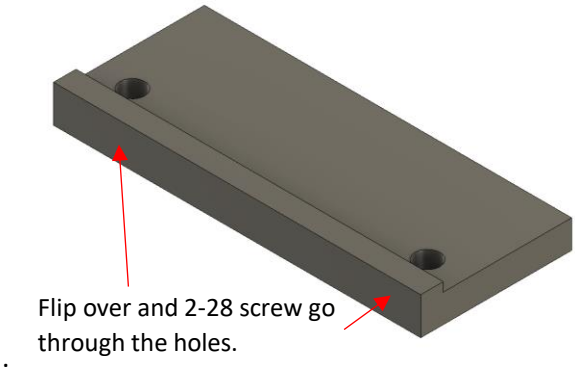
LRF Cradle Bracket

The LRF module is supported by this bracket which in turn mounts to the inside of the Main Enclosure Base. A single 2-28 thread rolling screw inserted into the countersunk bottom center hole threads into the hole on the underside of the LRF module. The part is then mounted to the Main Enclosure base with two 4-20 thread rolling screws that are inserted into the countersunk holes on either side.



LRF Clamp

Attaches to the top of the LRF bracket to fully secure the LRF module. Two 2-28 screws through the holes on either side attach to the top of the LRF bracket. The protrusion goes downward.



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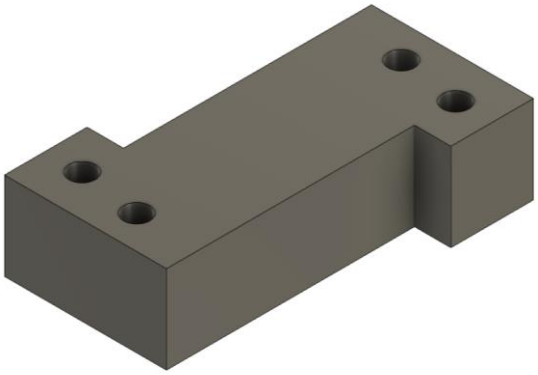
RM3100 Bracket

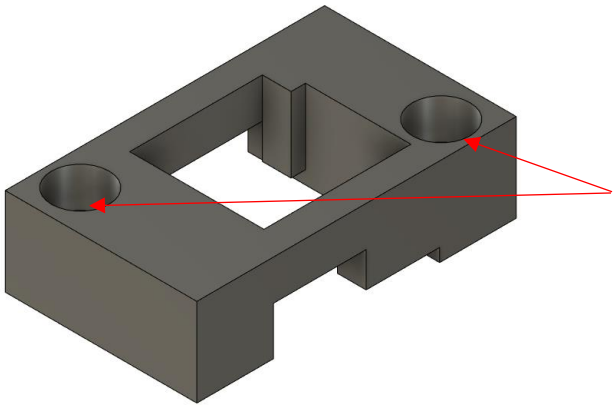
Provides support to the RM3100 magnetometer. 2-28 screws from the underside the main PCB screw into the two centermost holes in this part.



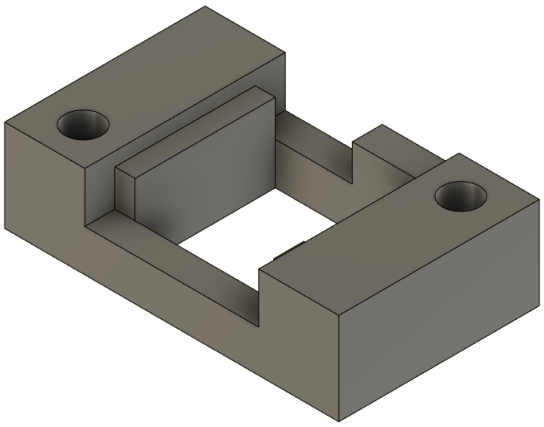
Print in this orientation

RM3100 Clamp

Hold the RM3100 magnetometer securely to the bracket to prevent movement.



2-28 screw threads
into the RM3100

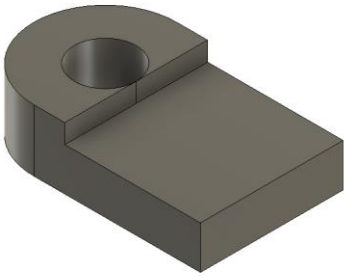


Print in this orientation

Be sure to get the orientation correct and adjust it so that it does not press on any components on the RM3100 board. The sloped corner goes toward the 40 pin connector for the touchscreen display.

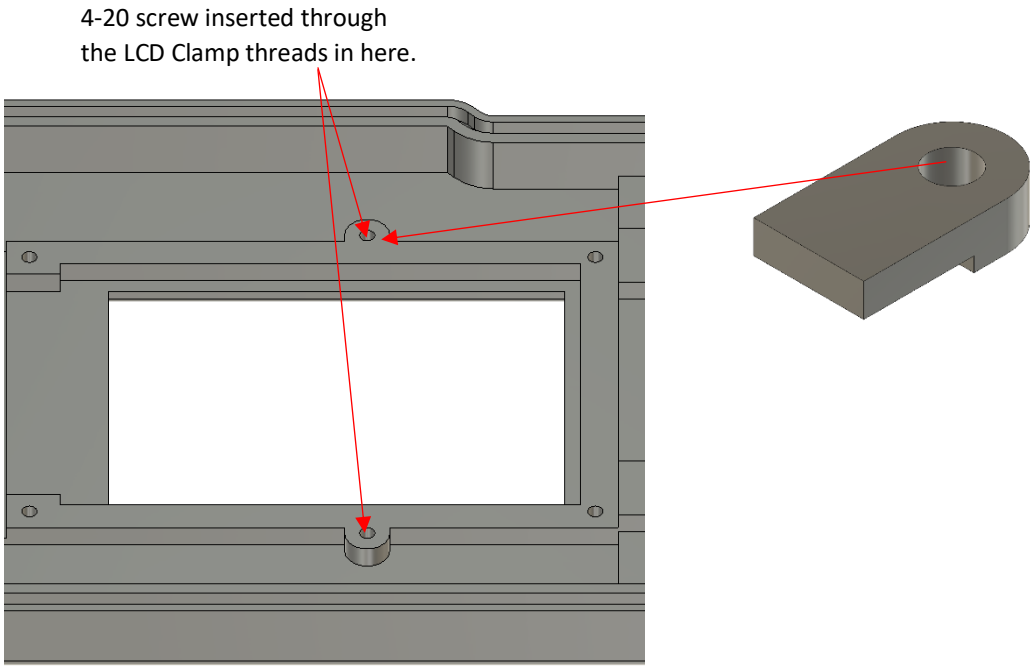
LCD Clamp

Provides additional support to the long side of the LCD modules. Two of these need to be printed.



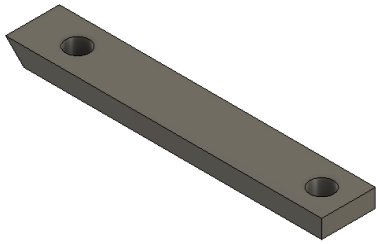
Print in this orientation

A 4-20 thread rolling screw inserts through the LCD Clamp into threads into the hole indicated. The clamp is oriented so that the recessed part is down facing the LCD.



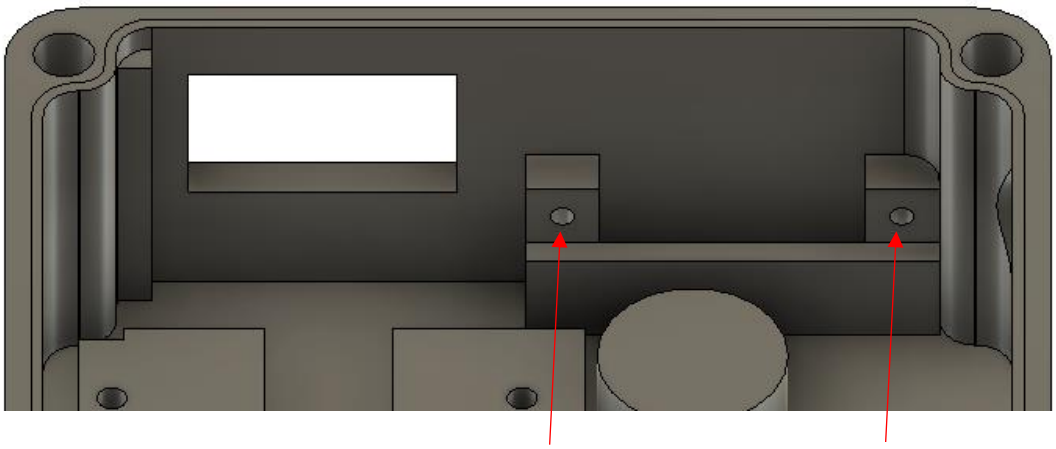
Buzzer Clamp

Secures the piezo buzzer in place.



Print in this orientation

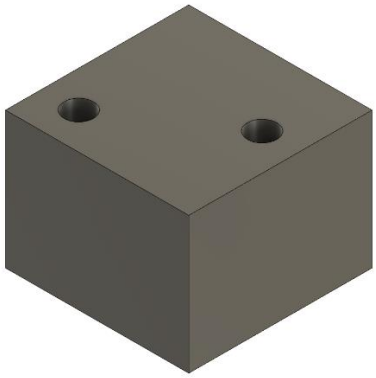
This piece presses against backside of piezo buzzer (which is inserted into a slot at the bottom of the Main Enclosure Base). The Buzzer Clamp attaches to the Main Enclosure Base via two 2-28 thread rolling screws threaded into mounting points on the front of the enclosure.



The Cradle bracket installs to the enclosure base at the marked holes.

MinIMU Bracket

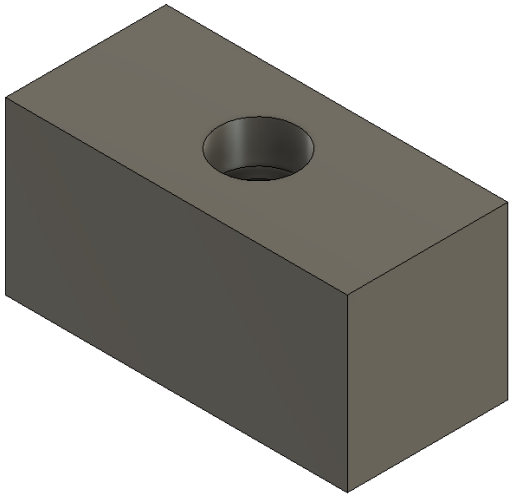
Secures the MinIMU module to the PCB.



This part does not directly attach to any other 3D part but instead attaches between MinIMU module and holes in the main PCB. Two 2-28 thread-rolling screws are inserted through the main PCB into the underside. The MinIMU attaches using one screw from the top.

Battery Clamp

Secures the battery in place. This part is attached to the underside of the Main Enclosure Lid with a single 4-20 thread rolling screw. Two small pieces of adhesive-backed foam should be attached to the side that presses down on the battery.



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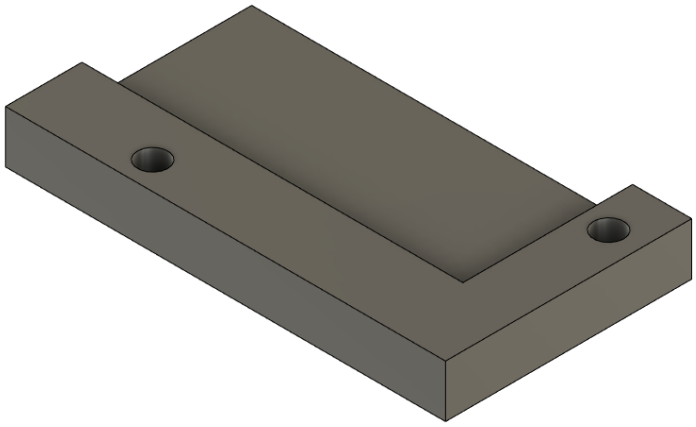
Bluetooth Module Clamp (Optional)

Secures the Bluetooth module in place on the underside of the Main Enclosure Lid.



Print in this orientation

The cutout in this part fits over the Bluetooth module and holds it to the underside of the lid. It attaches with two 2-28 thread-rolling screws.