
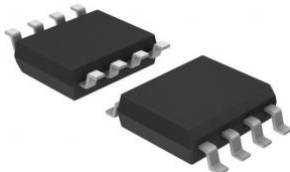

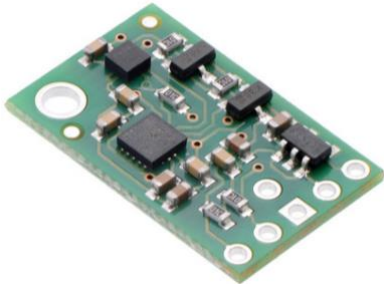






**Caveatron SV Bill of Materials**  
**Hardware Revision: C**  
**Date: 2024-01-02**

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Item	Qty	Manufacturer	Mfr. P/N	Description	Suggested Vendor Link	Photo
Laser Rangefinder  <b>OPTION 1</b>	1	JRT Meter Tech., Co, Ltd.	Unknown	40m – 60m Laser Distance Sensor Module	<a href="#">Ebay</a> <a href="#">Ebay</a> <a href="#">Ebay</a>  <a href="#">Alibaba</a> <a href="#">Alibaba</a> <a href="#">Alibaba</a>  Availability changes frequently. Sites linked above has availability as of the date of this BOM	
<b>Notes:</b> <i>Used for station distance measurements.</i> There are several variants of this module including those that use ASCII or HEX-based commands both of which are supported by the Caveatron. Based on the datasheets I have reviewed I think any variant of this style should work.						
Font/Graphics IC	1	Winbond	W25Q128JVSIM	W25Q128 SPI flash memory IC, 128 Mbit, quad 8-SOIC	Digikey and many other source	
<b>Notes:</b> <i>Contains the fonts and graphics used for the GUI.</i> You must use the 128Mbit 8-SOIC package version – other sizes may not work. It is soldered to the pad location on the underside of the Teensy 4.1 that is directly under the micro-SD slot and closest to the edge.						

Item	Qty	Manufacturer	Mfr. P/N	Description	Suggested Vendor Link	Photo
Compass Module  <b>OPTIONAL BUT HIGHLY RECOMMENED</b>	1	Witmotion	RM3100	WitMotion High-Precision RM3100 Military-grade Magnetometer Sensor	<a href="#">Amazon</a> or <a href="#">Witmotion</a>	
<p><b>Notes:</b> <i>Used to determine the azimuth angle of the Caveatron.</i> This is the best currently available low-cost magnetometer module option. This magnetometer has proven more accurate, reliable and with less drift than another other tested. It is optional since the Pololu IMU module below also includes a magnetometer but the Pololu magnetometer is much more noisy and less accurate, so it is highly recommended that you use this module.</p>						
IMU Module	1	Pololu	MinIMU-9 v5 (#2738)	MinIMU-9 v5 Gyro, Accelerometer, Compass (LSM6DS33, and LIS3MDL Carrier)	<a href="#">Pololu</a>	
<p><b>Notes:</b> <i>Used to determine orientation of the Caveatron and measure inclination.</i> Note that the AltIMU-10 v5 does not fit on the current PCB. The MinIMU-9 v3 and v4 are still supported by the code and electronics but are no longer available.</p>						

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Item	Qty	Manufacturer	Mfr. P/N	Description	Suggested Vendor Link	Photo
Battery Pack  <b>OPTION 1</b>	1	Dantona	L37A26-1-0-2WX	18650 Lithium-Ion Battery Rechargeable (Secondary) 2.6Ah	<a href="#">Digikey</a>	
<b>Notes:</b> <i>Primary system battery.</i> This version comes with a 2-pin JST connector. A similar battery is available from Tenergy (PN 30011) but is not connectorized: <a href="#">Tenergy</a>						
Battery Pack  <b>OPTION 2</b>	1	Adafruit	1781	Lithium Ion Cylindrical Battery - 3.7v 2200mAh	<a href="#">Adafruit</a>	
<b>Notes:</b> <i>Primary system battery.</i> This option is a lower capacity battery but might be an option if you are unable to obtain the higher capacity option above.						
Voltage Regulator – 5V	1	Pololu	2119	5V Step-Up/Step-Down Voltage Regulator S7V7F5	<a href="#">Pololu</a>	
<b>Notes:</b> <i>Power supply for Teensy.</i>						
LRF Voltage Regulator	1	Pololu	2118	Pololu Adjustable Step-Up/Step-Down Voltage Regulator S7V8A	<a href="#">Pololu</a>	
<b>Notes:</b> <i>Power supply for Laser Rangefinder.</i> Output needs to be set to 3.0V.						

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Item	Qty	Manufacturer	Mfr. P/N	Description	Suggested Vendor Link	Photo
Power Switch & Charging LED	1	Adafruit	3350	Rugged Metal Pushbutton - 16mm 6V RGB Momentary	<a href="#">Adafruit</a> <a href="#">Amazon</a>	
<b>Notes:</b> <i>On/Off power switch and charge indicating ring LED.</i> This one enables separate colors on the ring LED for indicating charging and charge complete. These can be found at other sources as well but if you buy from another source be sure to get the common anode version.						
USB Jack	1	GT Contact	GT114200-10 (RR-114200-10)	Mini USB-B C2 size Plastic Panel Mount	<a href="#">USBFirewire.com</a>	
<b>Notes:</b> <i>USB jack for data download, battery charging, and loading of software and calibration parameters.</i> This is the version with the solder pins on the inside. If you prefer a USB-micro connector, that is available as part number <a href="#">RR-11A200-10</a> and is an identical fit.						
Item	Qty	Manufacturer	Mfr. P/N	Description	Suggested Vendor Link	Photo
USB Cap	1	GT Contact	GT1C522122 (RR-1C522122)	Seal Cap	<a href="#">USBFirewire.com</a>	
<b>Notes:</b> <i>Waterproof cap for USB jack.</i> This cap works for either the mini or micro USB options.						



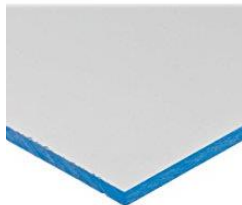






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Item	Qty	Manufacturer	Mfr. P/N	Description	Suggested Vendor Link	Photo
LRF Window Material	1	Sibe Polymers	5064981212	Clear Acrylic Plexiglass 12" x 12" - 3/32" (.090)	<a href="#">Amazon</a>	
<b>Notes:</b> Transparent acrylic sheet for LRF window on Main Body.						
Wrist Strap Lanyard	1	Hukado	N/A	Hukado Adjustable Hand Wrist Straps Lanyard, (6 Pack) 9.5 inches Nylon Lanyard	<a href="#">Amazon</a>	
<b>Notes:</b> Wrist Strap. This wrist strap works well, but other options are available in various lengths depending on your preference.						
O-Ring Seals	4 ft	The O-Ring Store	N50.103/10	0.103" (2.62mm) Buna-N 50 O-Ring Cord Stock, 10' Piece, Black	<a href="#">O-Ring Store</a>	
<b>Notes:</b> O-Ring material for seals in main enclosure and LIDAR module. This 50 durometer material is preferred over more readily available 70 durometer since it is softer and can make a tighter seal. Must cut to length and glue ends (this vendor also sells O-ring glue in small quantities.) Other vendors sell similar material.						

**Other Required Items:**

Caveatron SV Rev C Printed Circuit Board

CR1220 Battery

Single row male headers, 2.54 mm (0.1") pitch

Double row female headers 2x20 (for 40 pin LCD Connector), 2.54 mm (0.1") pitch

Soldering supplies

6-32 x 1/2" Flat Head Screws (4x)

4-20 x 1/2" thread rolling screws (3x)

4-20 x 1/4" thread rolling screws (10x)

2-28 x 1/4" thread rolling screws (15x)

PETG filament for 3D printed parts

O-Ring grease

O-Ring epoxy

Flexible waterproof epoxy sealant

Adhesive-backed foam

Tape (Kapton or cellophane)

**Notes:** *For assembly and electrical interconnections between boards.*