Power

J1 Battery
1 BAT+
2 BAT−

F1 Polyfuse

BAT+_FUSED

D1 SB560

LiPo Charger and Protection (blue module)
M2
IN+
IN−
B+
B−
OUT+
OUT−

IN=USB Voltage, not used

On/Off J2

PWR+

+VDC

R6 DNP

DC/DC voltage regulator (red module)
M3
IN+
EN
IN−
IN+
EN
IN−
OUT+
OUT−
OUT+
OUT−

+3.3V

GND
GND

* R6 should normally not be populated, but can be used when the DC/DC converter fails to start. Try a 1k value. This is not good electronic design, but it has been shown to work under certain circumstances.

ESP32

+VDC

Voltage divider for measuring battery voltage via ADC pin

R4 150k
C1 100n
R5 300k
V_MEA

GND

TRIG2
ECHO2

M1 ESP32 WROOM 30-Pin

Pin			Pin
1	EN	IO23	30	SD_CMD
2	SENSOR_VP	IO22	29	SCL
3	SENSOR_VN	TXD0	28	RX
4	IO34	RXD0	27	TX
5	IO35	IO21	26	SDA
6	IO32	IO19	25	SD_DAT0
7	IO33	IO18	24	SD_CLK
8	IO25	IO5	23	SD_CD
9	IO26	IO17	22	GPS_RX
10	IO27	IO16	21	GPS_TX
11	IO14	IO4	20	ECHO1
12	IO12	IO2	19	BUTTON
13	IO13	IO15	18	TRIG1
14	GND1	GND	17	GND
15	VIN	3V3	16	+3.3V

GND

SD Card Module

M4 SD
1 +3.3V
2 SD_CD
3 SD_CMD
4 SD_CLK
5 SD_DAT0
6 GND

GPS Module

M5 GPS
4 +3.3V
3 GPS_RX
2 GPS_TX
1 GND

Display & Button

J3 Display Cable
1 +3.3V
2 SCL
3 BUTTON
4 GND
5 SDA

Mounting

H1 H2 H3

Mounting holes

Passives

+3.3V
C2 22u
C3 22u
GND

Bulk decoupling, place near ESP32 and display cable connector

BUTTON
R3 10k
GND

pull down resistor for button

+3.3V
R2 1k2
SDA

+3.3V
R1 1k2
SCL

I2C pull up resistors

Distance Sensors

S1 Sensor 1
1 +3.3V
2 TRIG1
3 ECHO1
4 GND

S2 Sensor 2
1 +3.3V
2 TRIG2
3 ECHO2
4 GND

Add-ons

The addon port can be used for hacking the device and adding custom extensions, or while debugging. It exposes 3.3V power, the I2C bus and the RX/TX lines for serial output and communications. Test points provide solderable connections to more GPIO pins.

Add-ons
J41
1 +VDC
2 +3.3V
3 GND
4 SCL
5 SDA
6 RX
7 TX

IO35 — IO35
IO32 — IO32
IO33 — IO33
IO27 — IO27
IO14 — IO14
IO12 — IO12
IO13 — IO13