Optional IR remote sensor

U5
IRM-3636M3F45

Vs 3 +3.3V
OUT 1 — IR
GND 2

It has become difficult to find a TV remote that can be detected directly by pypilot

5V DC power supply

+5V
+ − J1

Optional transient voltage suppressor
D6 SA5.0A

A1
RPI Zero W

Pin	Signal		Signal	Pin
1	3V3[1]		5V[1]	2
3	GPIO2/SDA (SDA)		5V[2]	4
5	GPIO3/SCL (SCL)		GND[8]	6
7	GPIO4/GPCKL0 (IR)		TXD0/GPIO14	8
9	GND[1]		RXD0/GPIO15	10
11	GPIO17/GEN0 (AUTO)		GPIO18 (MODE)	12
13	GPIO27/GEN2 (−1)		GND[4]	14
15	GPIO22/GEN3 (+1)		GEN4/GPIO23 (MENU)	16
17	3V3[2] +3.3V		GEN5/GPIO24 (LCD_RESET)	18
19	GPIO10/MOSI (MOSI)		GND[5]	20
21	GPIO9/MISO		GEN/6GPIO25 (LCD_DC)	22
23	GPIO11/SCLK (SCK)		~[CE0/GPIO8 (LCD_CE)	24
25	GND[2]		~[CE1/GPIO7	26
27	ID_SD		ID_SC	28
29	GPIO5 (+10)		GND[6]	30
31	GPIO6 (−10)		GPIO12	32
33	GPIO13		GND[7]	34
35	GPIO19		GPIO16	36
37	GPIO26 (TACK)		GPIO20	38
39	GND[3]		GPIO21	40

R1 2.2k
R2 2.2k

D5 SA5.0A   D1 1N4148   D3 1N4148
D2 1N4148   D4 1N4148

To controller
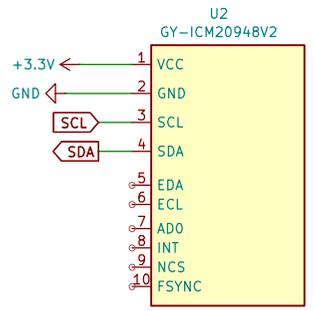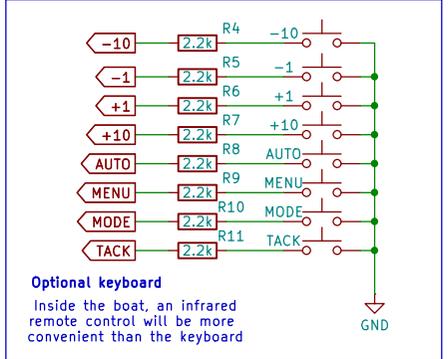1 +3.3V
2 TX (to RX)
3 RX (to TX)
4 GND
J2

GND

The Pypilot computer is powered by a +5V DC power supply connected to the Pi Zero W via a microUSB cable or better directly to the pins of the RPI Zero (+5V at 2 or 4 and GND at 6)

Optional NMEA interface

+3.3V

D7 SA5.0A   D8 1N4148   D10 1N4148
D9 1N4148   D11 1N4148

R12 2.2k
R13 2.2k

NMEA0183
1 +3.3V
2 TX (to RX)
3 RX (to TX)
4 GND
J3

GND

The NMEA interface can also be achieved via a USB/RS422 converter, preferably galvanically isolated, connected to one of the two micro-USB sockets on the Pi Zero.

U2
GY-ICM20948V2

Pin	Signal
1	VCC (+3.3V)
2	GND
3	SCL (SCL)
4	SDA (SDA)
5	EDA
6	ECL
7	AD0
8	INT
9	NCS
10	FSYNC

The IMU module must be compatible with the 3.3V I2C bus of Pi. All MPU2950 ICs are. But with the ICM20948 IC, which has a 1.65V I2C bus, the module must have an interface circuit to be able to be connected directly to a Pi. ICM20948 modules with only a few capacitors in addition to the IC cannot be connected directly to the Pi, even if the IC can be powered with 3.3V. Pi-compatible IM20948 modules have at least a few transistors in addition to the IC.

Optional keyboard

−10	R4 2.2k	−10
−1	R5 2.2k	−1
+1	R6 2.2k	+1
+10	R7 2.2k	+10
AUTO	R8 2.2k	AUTO
MENU	R9 2.2k	MENU
MODE	R10 2.2k	MODE
TACK	R11 2.2k	TACK

GND

Inside the boat, an infrared remote control will be more convenient than the keyboard

U1

Pin	Signal
1	ROM_IN
2	ROM_OUT
3	ROM_SCK
4	ROM_CS
5	LEDA
6	VSS
7	VDD
8	SLCK (SCK)
9	SDA (MOSI)
10	RS (LCD_DC)
11	RESET (LCD_RESET)
12	CS (LCD_CE)

R3 1k
GND
+3.3V

JLX12864G-086-PN

OPTIONAL LCD DISPLAY

EMC protection diodes D1 to D5 are essential whenever the UART connection to controller exceeds 0.5 meters.
TVS diode D6 is recommended only for Raspberry Pi Zero models, as it is included by the Raspberry Pi Foundation on the circuit board of other Pi models.

The SA5.0A unidirectional TVS diodes (D5, D6 and D7) can be replaced by SA5.0CA bidirectional TVS diodes, which can be mounted in either direction.

The +3.3V pins of raspberry Pi are connected together.
The +3.3V pins of the IMU, the display and the interface to the controller must be connected to a +3.3V pin of the Pi

The GND pins of raspberry Pi are connected together.
The GND pins of the IMU, the display, the keyboard and the interface to the controller must be connected to a GND pin of the Pi