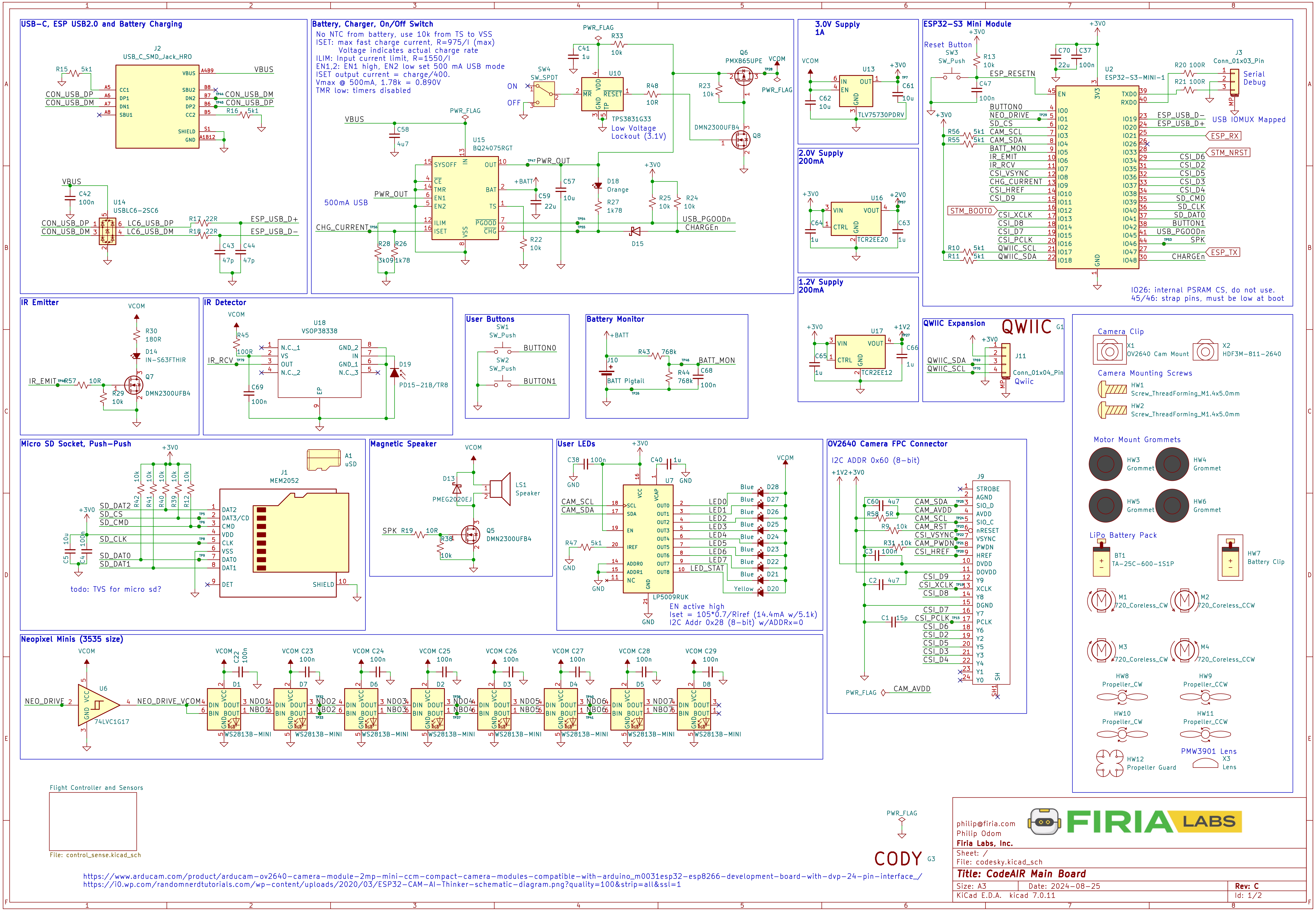
USB-C, ESP USB2.0 and Battery Charging
J2
USB_C_SMD_Jack_HRO
VBUS
CON_USB_DP
CON_USB_DM
U14
USBLC6-2SC6
ESP_USB_D+
ESP_USB_D-
Battery, Charger, On/Off Switch
No NTC from battery, use 10k from TS to VSS
ISET: max fast charge current, R=975/I (max)
Voltage indicates actual charge rate
ILIM: Input current limit, R=1550/I
EN1,2: EN1 high, EN2 low set 500 mA USB mode
ISET output current = charge/400.
Vmax @ 500mA, 1.78k = 0.890V
TMR low: timers disabled
500mA USB
U15
BQ24075RGT
PWR_OUT
CHG_CURRENT
USB_PGOODn
CHARGEn
U10
TPS3831G33
Low Voltage
Lockout (3.1V)
Q6
PMXB65UPE
Q8
DMN2300UFB4
3.0V Supply
1A
U13
TLV75730PDRV
2.0V Supply
200mA
U16
TCR2EE20
1.2V Supply
200mA
U17
TCR2EE12
ESP32-S3 Mini Module
Reset Button
U2
ESP32-S3-MINI-1
J3
Conn_01x03_Pin
Serial
Debug
USB IOMUX Mapped
ESP_RX
STM_NRST
STM_BOOT0
ESP_TX
IO26: internal PSRAM CS, do not use.
45/46: strap pins, must be low at boot
IR Emitter
D14
IN-S63FTHIR
Q7
DMN2300UFB4
IR Detector
U18
VSOP38338
D19
PD15-21B/TR8
User Buttons
BUTTON0
BUTTON1
Battery Monitor
BATT_MON
BATT Pigtail
QWIIC Expansion
QWIIC
J11
Conn_01x04_Pin
Qwiic
Camera Clip
X1
OV2640 Cam Mount
X2
HDF3M-811-2640
Camera Mounting Screws
HW1
Screw_ThreadForming_M1.4x5.0mm
HW2
Screw_ThreadForming_M1.4x5.0mm
Motor Mount Grommets
LiPo Battery Pack
BT1
TA-25C-600-1S1P
HW7
Battery Clip
M1 720_Coreless_CW
M2 720_Coreless_CCW
M3 720_Coreless_CW
M4 720_Coreless_CCW
HW8 Propeller_CW
HW9 Propeller_CCW
HW10 Propeller_CW
HW11 Propeller_CCW
HW12 Propeller Guard
PMW3901 Lens
X3
Lens
Micro SD Socket, Push-Push
J1
MEM2052
todo: TVS for micro sd?
Magnetic Speaker
LS1
Speaker
Q5
DMN2300UFB4
User LEDs
U7
LP5009RUK
EN active high
Iset = 105*0.7/Riref (14.4mA w/5.1k)
I2C Addr 0x28 (8-bit) w/ADDRx=0
OV2640 Camera FPC Connector
I2C ADDR 0x60 (8-bit)
J9
CAM_AVDD
Neopixel Minis (3535 size)
U6
74LVC1G17
NEO_DRIVE
NEO_DRIVE_VCOM
WS2813B-MINI
Flight Controller and Sensors
File: control_sense.kicad_sch
https://www.arducam.com/product/arducam-ov2640-camera-module-2mp-mini-ccm-compact-camera-modules-compatible-with-arduino_m0031esp32-esp8266-development-board-with-dvp-24-pin-interface_/
https://i0.wp.com/randomnerdtutorials.com/wp-content/uploads/2020/03/ESP32-CAM-AI-Thinker-schematic-diagram.png?quality=100&strip=all&ssl=1
CODY
philip@firia.com
Philip Odom
Firia Labs, Inc.
Sheet: /
File: codesky.kicad_sch
Title: CodeAIR Main Board
Size: A3
Date: 2024-08-25
Rev: C
KiCad E.D.A. kicad 7.0.11
Id: 1/2

6-Axis IMU (Accel/Gyro)

U3
BMI088

+3V0
C51 100n
C67 100n
PS
CSB1
CSB2
SCL/SCK
SDA/SDI
NC
VDD
VDDIO
SDO1
SDO2
INT1
INT2
INT3
INT4
GNDIO
GNDA
IMU_SCL
IMU_SDA
INT_ACC
INT_GYR

I2C Addr, Accel: SDO1=0, 0x30 (8-bit)
Gyro: SDO2=1, 0xD2 (8-bit)

STM32 Debug

J4
+3V0
VCC
GND
RESET
SWCLK
SWDIO
SWO
STM_NRST
STM_SWCLK
STM_SWIO
STM_SWO
TC2030-NL
GND

STM32 Flight Controller

STM_NRST
STM_BOOT0
C10 100n
R14 10k
TP71
GND
8Meg
Y1
C14 15p
C12 15p
R59 0R
NRST
BOOT0
PH0
PH1
PD2
VBAT
VDD
VDDA
VSS
VSSA
VCAP_1
VCAP_2
U1
STM32F405RGTx
C15 10u
C16 100n
C17 100n
C18 100n
C19 100n
C20 100n
C21 100n
PA0 INT_GYR
PA1 INT_ACC
PA2 MOTOR4 TIM2_CH3
PA3 FLOW_MOTION
PA4 FLOW_CSn
PA5 FLOW_SCLK
PA6 FLOW_MISO
PA7 FLOW_MOSI
R35 5k1
IMU_SCL
PA8
PA9 USB_ID
PA10 USB_DM
PA11 USB_DP
PA12
PA13 STM_SWIO
PA14 STM_SWCLK
PA15 TIM2_CH1
PB0
PB1
PB2
PB3 STM_SWO
PB4 RANGE_TOP_SHUT
PB5 RANGE_FRONT_SHUT
PB6 RANGE_SCL
PB7 RANGE_SDA
PB8 MOTOR1
PB9 MOTOR2 TIM4_CH4
PB10 ESP_RX
PB11 ESP_TX
PB12
PB13
PB14
PB15
R36 5k1
R37 5k1
INT_BARO
INT_COMPASS
RANGE_BOT_SHUT
MOTOR3
R34 5k1
IMU_SDA
TP1 STM_U4_TX
TP2 STM_U4_RX
C13 4u7
C14 4u7

3-Axis Magnetometer

U5
QMC5883L
+3V0
C48 100n
VDD
VDDIO
SCL
SDA
S1
GND
DRDY
SETP
SETC
C1
IMU_SCL
IMU_SDA
INT_COMPASS
C50 220n
C49 4u7

I2C ADDR 0x3C (8-bit)

Barometric Altimeter

U4
BMP390
+3V0
C45 4u7
C46 100n
CS
SCK/SCL
SDI/SDO/SDA
SDO/DNC/SAO
VDD
VDDIO
INT/DNC
VSS/GND
IMU_SCL
IMU_SDA
INT_BARO

I2C ADDR 0xEE (8-bit, SA0 high)

Motor Drivers

C6 100n +BATT
D9 PMEG2020EJ
M_DRIVE1
J5 Conn_01x02_Pin
R1 10R
MOTOR1
Q1 CSD17318Q2
R3 10k
C30 100n

C8 100n +BATT
D11 PMEG2020EJ
M_DRIVE2
J7 Conn_01x02_Pin
R5 10R
MOTOR2
Q3 CSD17318Q2
R7 10k
C34 100n

C7 100n +BATT
D10 PMEG2020EJ
M_DRIVE3
J6 Conn_01x02_Pin
R2 10R
MOTOR3
Q2 CSD17318Q2
R4 10k
C31 100n

C9 100n +BATT
D12 PMEG2020EJ
M_DRIVE4
J8 Conn_01x02_Pin
R6 10R
MOTOR4
Q4 CSD17318Q2
R8 10k
C33 100n

Optical Flow Sensor

U12
PMW3901MB
+3V0
+2V0
C52 100n
C53 100n
C54 4u7
C55 100n
C56 4u7
VDD
VDDIO
VREG
MOSI
SCLK
MISO
CSn
MOTION
RESETn
GND
FLOW_MOSI
FLOW_SCLK
FLOW_MISO
FLOW_CSn
FLOW_MOTION
R32 10k

Laser Range Sensors

+3V0
C36 4u7
C39 100n
C32 4u7
C35 100n
AVDD
AVDDVCSEL
AVSSVCSEL
GPIO1
SDA
SCL
XSHUT
GND
U9
VL53L1CXV0FY1
U8
VL53L1CXV0FY1
RANGE_SDA
RANGE_SCL
RANGE_BOT_SHUT
RANGE_TOP_SHUT
J14
Conn_01x05_Socket
RANGE_FRONT_SHUT

Default I2C Addr 0x52 (Programmable)

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FIRIA LABS

Sheet: /Flight Controller and Sensors/
File: control_sense.kicad_sch

Title: CodeAIR Main Board

Size: A3	Date: 2024-08-25	**Rev: C**
KiCad E.D.A. kicad 7.0.11		Id: 2/2