ARCA 2.0

Control system and data collection for inert flow and static hot fires of experimental hybrid engines.

Compatible Engines:
- Luna
- Proxima
- Titan II

ARCA 2.0 is a re-spin of ARCA, which is a design upgrade on "Mk 1.1"

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Subteam Lead: Amy Danjul
Avionics Engineers: Clayton Ramsey, Rosemary Lach, Justin Guilak, Riley Kuhlman, Matthew Nutt, Mitchell Hoffman, Jonah Yi, Jonathan Enrique Avecilla Torres

regulators

File: regulators.kicad_sch

Load Cell Inamps

File: lc_inamps.kicad_sch

Drivers

File: drivers.kicad_sch

Load Cell Anti-Aliasing

File: lc_anti_alias.kicad_sch

PT Amplification

File: pt_amps.kicad_sch

Thermocouples

File: thermocouples.kicad_sch

Raspberry Pi

File: pi.kicad_sch

ADCs

File: adc.kicad_sch

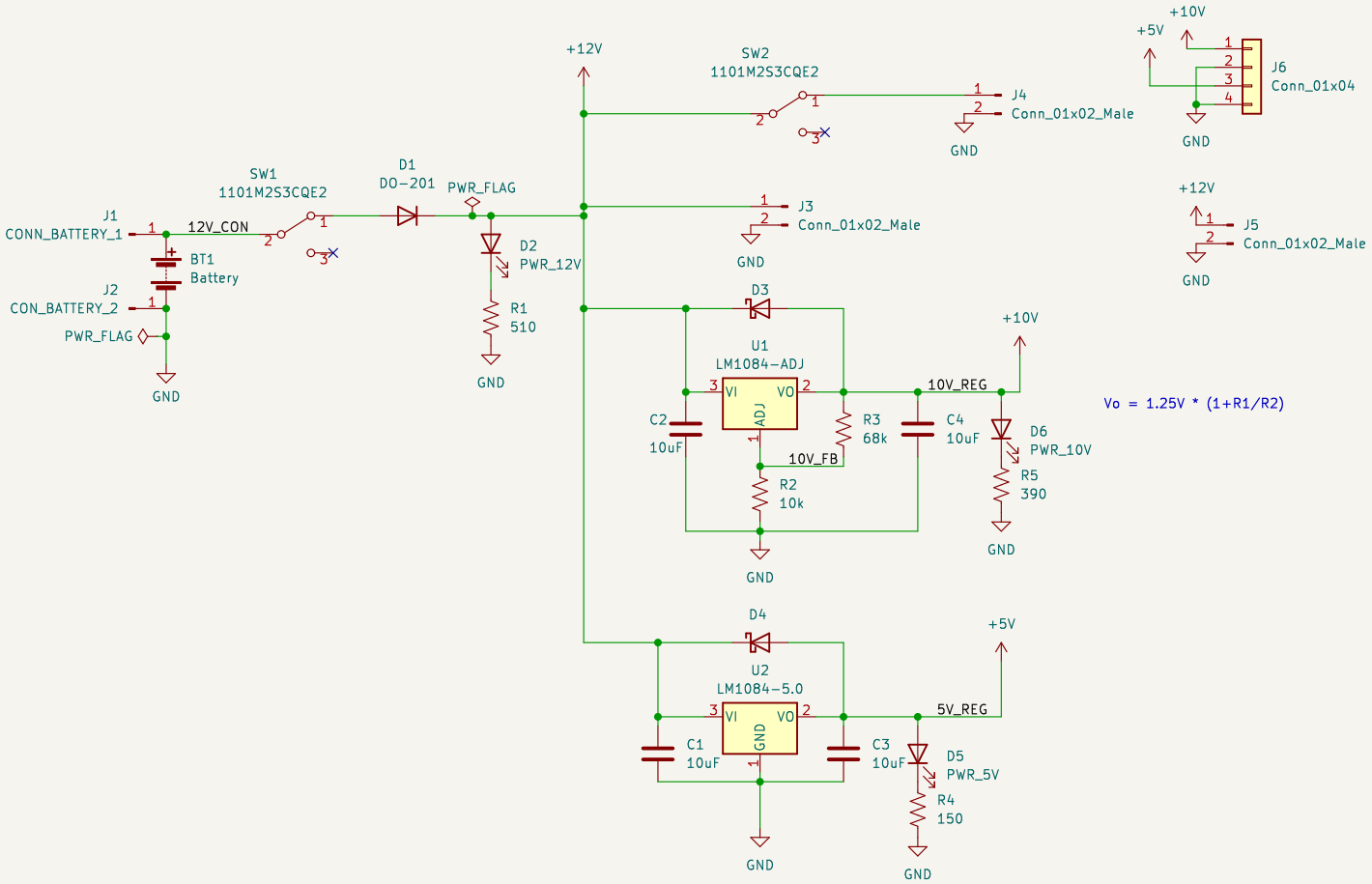
Rice Eclipse

Sheet: /
File: karca.kicad_sch

Title: ARCA 2.0

Size: A4 | Date: | Rev: 1

KiCad E.D.A. kicad (6.0.7) | Id: 1/9



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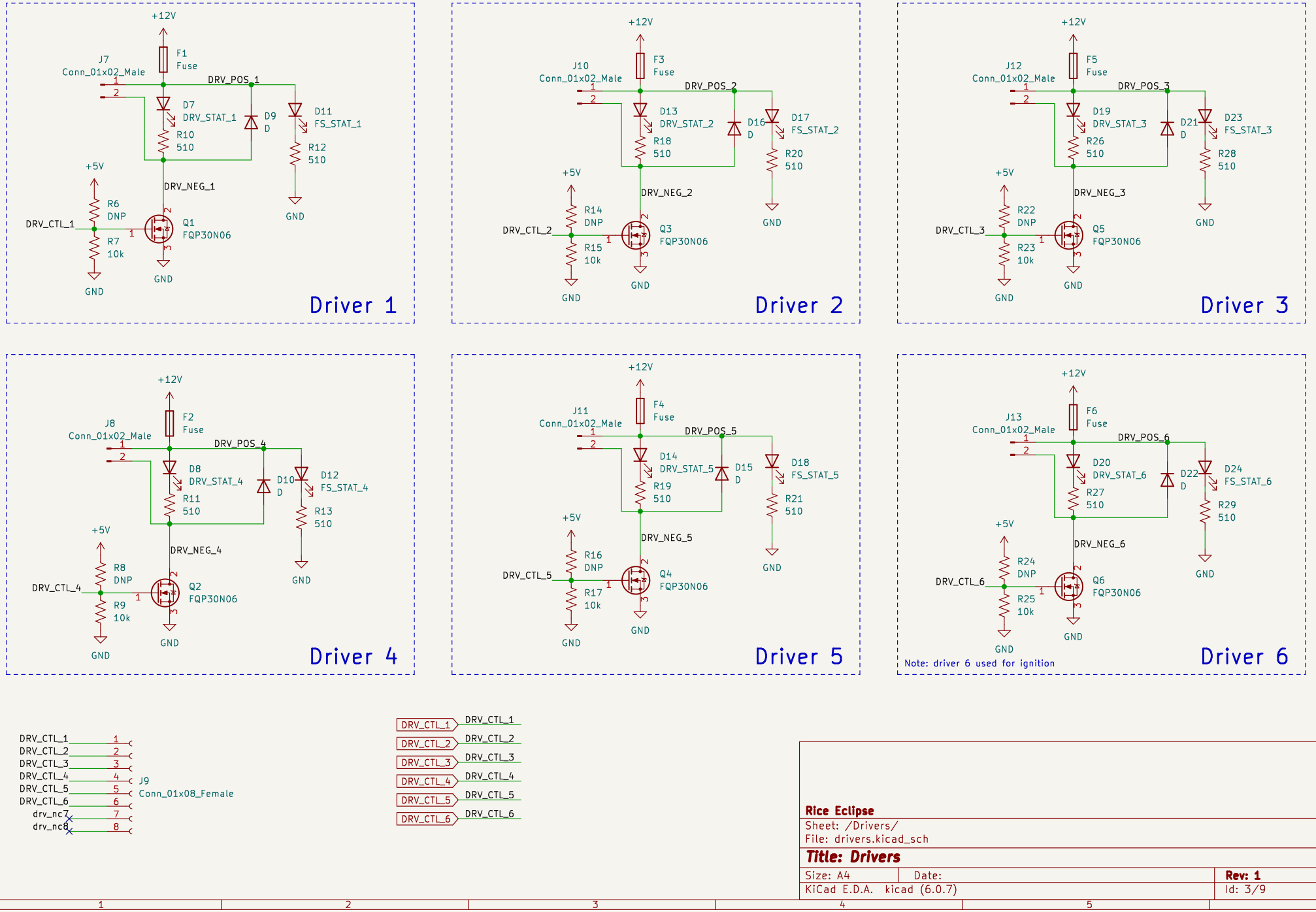
Size: A4	Date:	**Rev: 1**
KiCad E.D.A. kicad (6.0.7)		Id: 2/9


+12V
J7
Conn_01x02_Male
F1
Fuse
DRV_POS_1
D7
DRV_STAT_1
D9
D
D11
FS_STAT_1
R10
510
R12
510
+5V
DRV_NEG_1
R6
DNP
DRV_CTL_1
Q1
FQP30N06
R7
10k
GND
Driver 1
J10
Conn_01x02_Male
F3
Fuse
DRV_POS_2
D13
DRV_STAT_2
D16
D
D17
FS_STAT_2
R18
510
R20
510
DRV_NEG_2
R14
DNP
DRV_CTL_2
Q3
FQP30N06
R15
10k
Driver 2
J12
Conn_01x02_Male
F5
Fuse
DRV_POS_3
D19
DRV_STAT_3
D21
D
D23
FS_STAT_3
R26
510
R28
510
DRV_NEG_3
R22
DNP
DRV_CTL_3
Q5
FQP30N06
R23
10k
Driver 3
J8
Conn_01x02_Male
F2
Fuse
DRV_POS_4
D8
DRV_STAT_4
D10
D
D12
FS_STAT_4
R11
510
R13
510
DRV_NEG_4
R8
DNP
DRV_CTL_4
Q2
FQP30N06
R9
10k
Driver 4
J11
Conn_01x02_Male
F4
Fuse
DRV_POS_5
D14
DRV_STAT_5
D15
D
D18
FS_STAT_5
R19
510
R21
510
DRV_NEG_5
R16
DNP
DRV_CTL_5
Q4
FQP30N06
R17
10k
Driver 5
J13
Conn_01x02_Male
F6
Fuse
DRV_POS_6
D20
DRV_STAT_6
D22
D
D24
FS_STAT_6
R27
510
R29
510
DRV_NEG_6
R24
DNP
DRV_CTL_6
Q6
FQP30N06
R25
10k
Note: driver 6 used for ignition
Driver 6
DRV_CTL_1
DRV_CTL_2
DRV_CTL_3
DRV_CTL_4
DRV_CTL_5
DRV_CTL_6
drv_nc7
drv_nc8
J9
Conn_01x08_Female
Rice Eclipse
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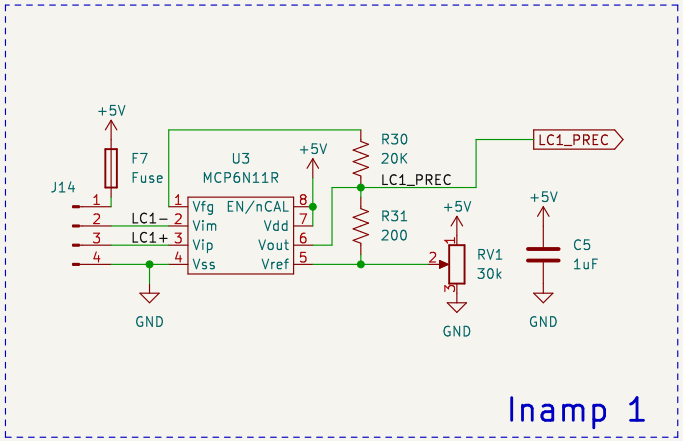
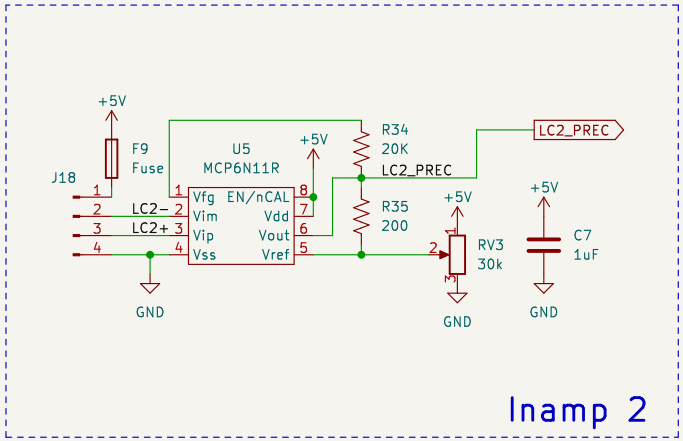
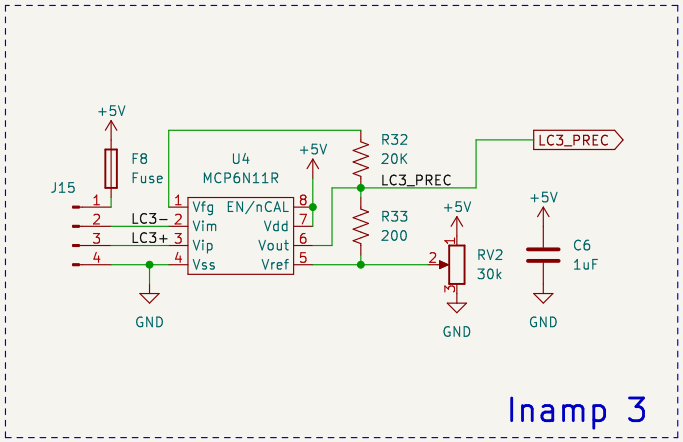
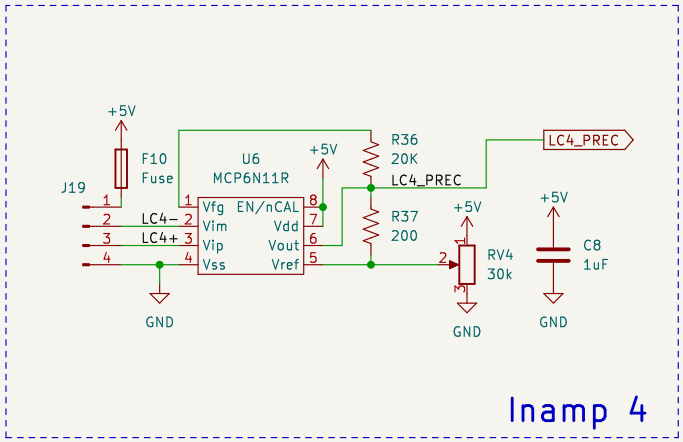
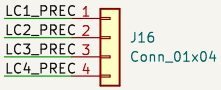
Date:
Rev: 1
KiCad E.D.A. kicad (6.0.7)
Id: 3/9

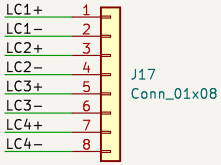










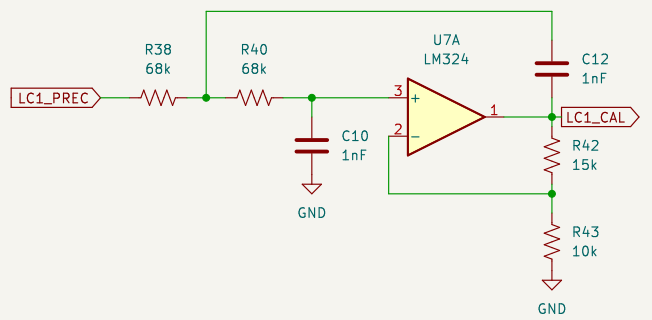


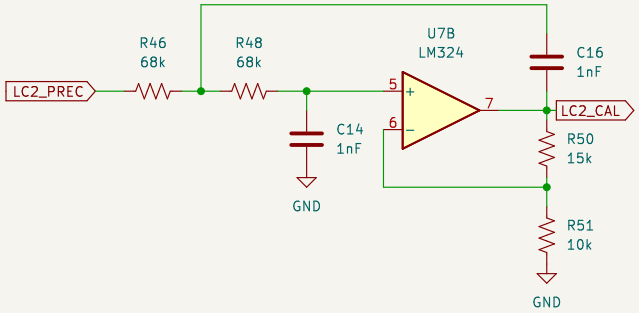
Rice Eclipse

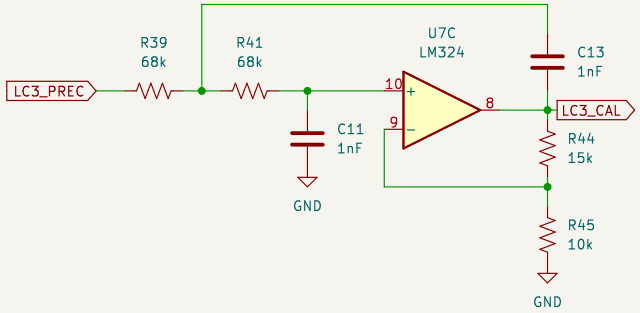
Sheet: /Load Cell Inamps/
File: lc_inamps.kicad_sch

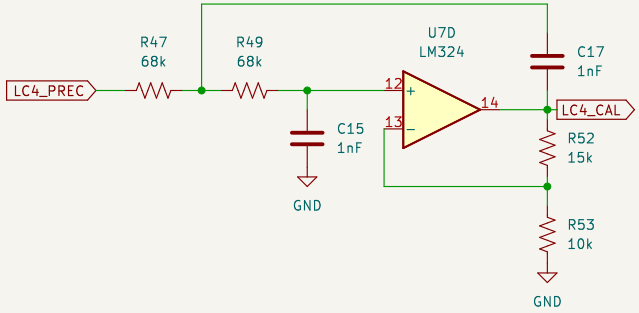
Title: Load Cell InAmps

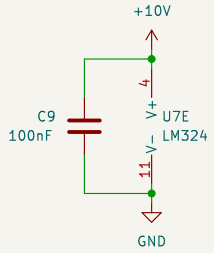
Size: A4	Date:	**Rev: 1**
KiCad E.D.A. kicad (6.0.7)		Id: 4/9









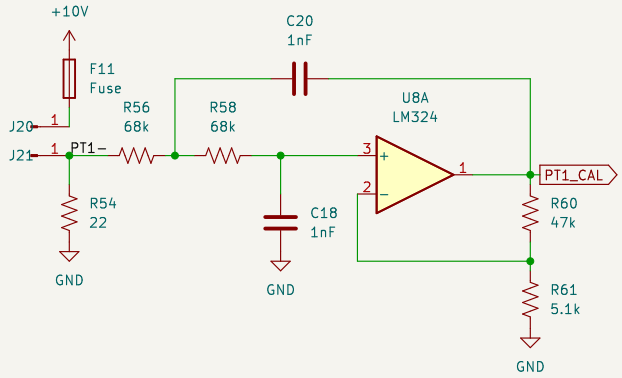


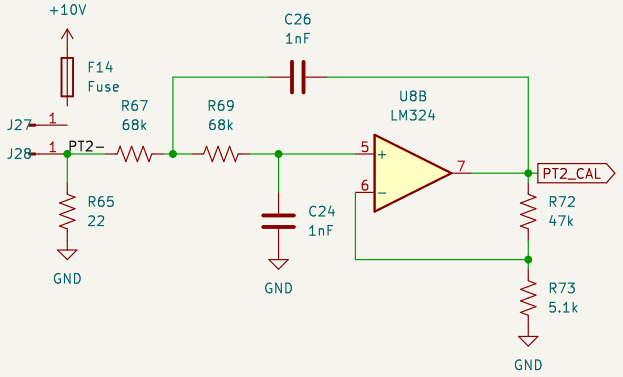
Rice Eclipse

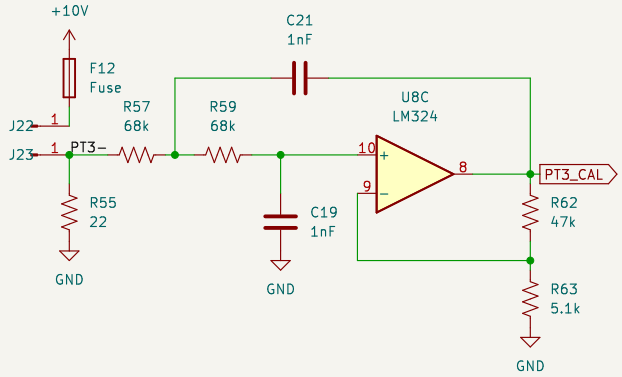
Sheet: /Load Cell Anti-Aliasing/
File: lc_anti_alias.kicad_sch

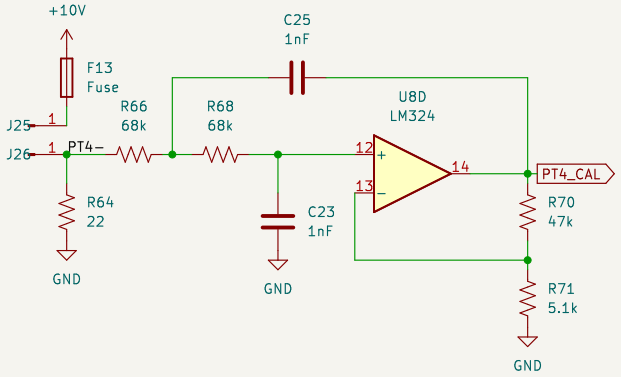
Title: Load Cell Anti-Aliasing

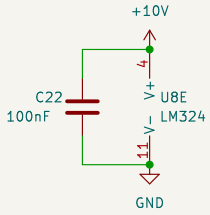
Size: A4	Date:	**Rev: 1**
KiCad E.D.A. kicad (6.0.7)		Id: 5/9











Rice Eclipse

Sheet: /PT Amplification/
File: pt_amps.kicad_sch

Title: Pressure Transducer Amplification

Size: A4	Date:	**Rev: 1**
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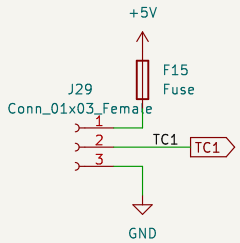
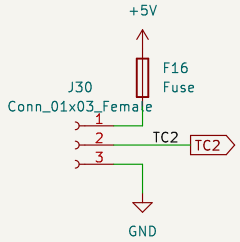
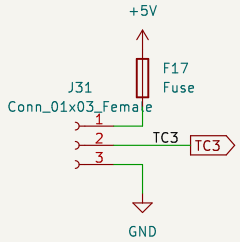
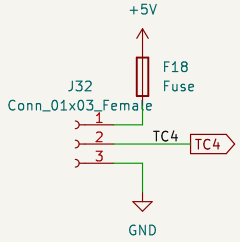






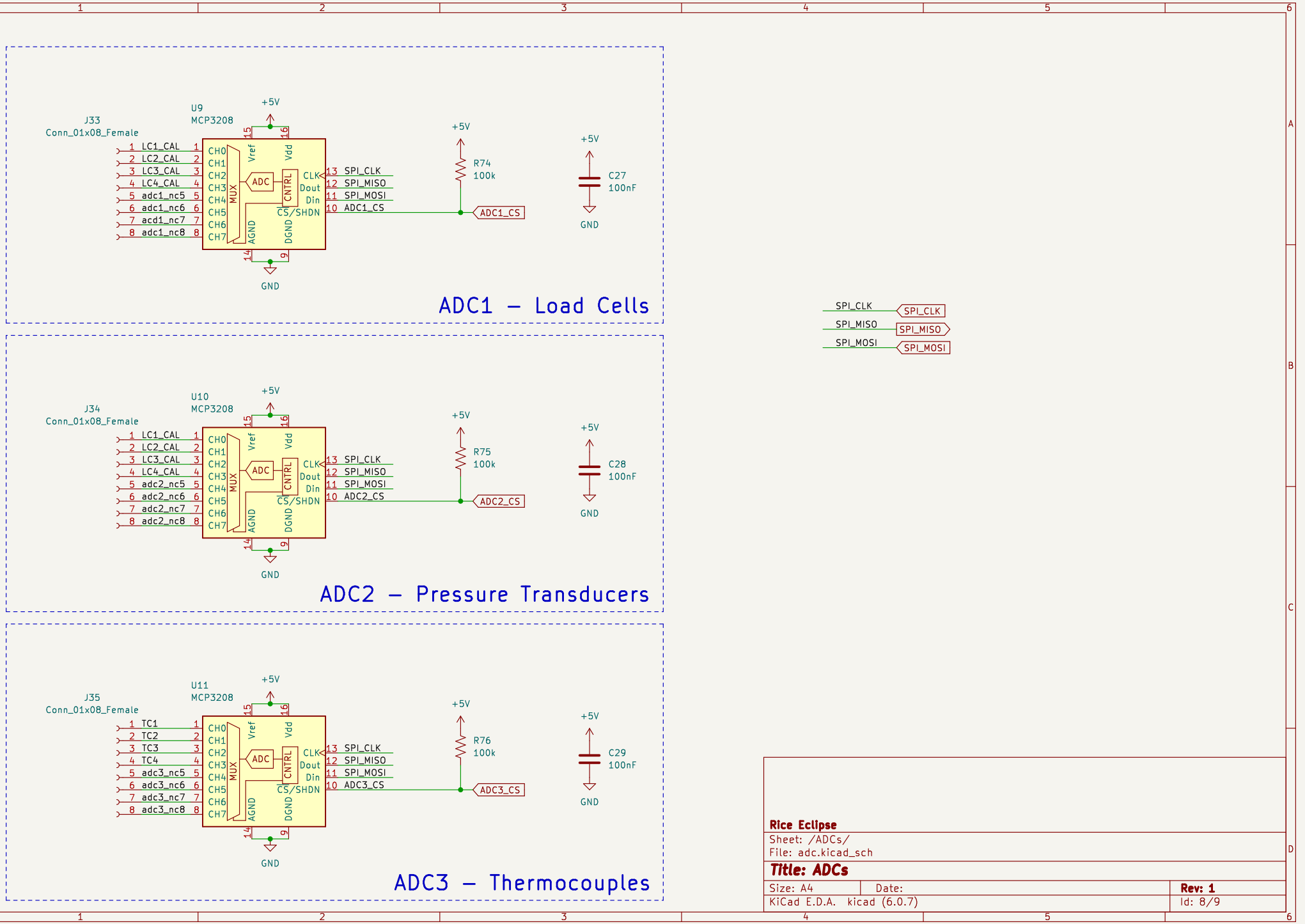


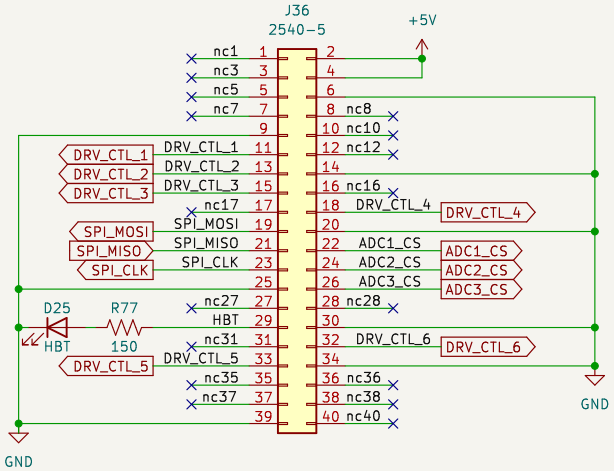
Rice Eclipse

Sheet: /Thermocouples/
File: thermocouples.kicad_sch

Title: Thermocouple Ports

Size: A4	Date:	**Rev: 1**
KiCad E.D.A. kicad (6.0.7)		Id: 7/9


J33
Conn_01x08_Female
1 LC1_CAL
2 LC2_CAL
3 LC3_CAL
4 LC4_CAL
5 adc1_nc5
6 adc1_nc6
7 acd1_nc7
8 adc1_nc8
U9
MCP3208
+5V
CH0
CH1
CH2
CH3
CH4
CH5
CH6
CH7
Vref
Vdd
ADC
MUX
CNTRL
AGND
DGND
CLK
Dout
Din
CS/SHDN
13 SPI_CLK
12 SPI_MISO
11 SPI_MOSI
10 ADC1_CS
R74
100k
C27
100nF
GND
ADC1 – Load Cells
J34
Conn_01x08_Female
1 LC1_CAL
2 LC2_CAL
3 LC3_CAL
4 LC4_CAL
5 adc2_nc5
6 adc2_nc6
7 adc2_nc7
8 adc2_nc8
U10
MCP3208
10 ADC2_CS
R75
100k
C28
100nF
ADC2 – Pressure Transducers
J35
Conn_01x08_Female
1 TC1
2 TC2
3 TC3
4 TC4
5 adc3_nc5
6 adc3_nc6
7 adc3_nc7
8 adc3_nc8
U11
MCP3208
10 ADC3_CS
R76
100k
C29
100nF
ADC3 – Thermocouples
SPI_CLK
SPI_MISO
SPI_MOSI
Rice Eclipse
Sheet: /ADCs/
File: adc.kicad_sch
Title: ADCs
Size: A4
Date:
Rev: 1
KiCad E.D.A. kicad (6.0.7)
Id: 8/9



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File: pi.kicad_sch		
Title: Raspberry Pi Interface		
Size: A4	Date:	**Rev: 1**
KiCad E.D.A. kicad (6.0.7)		Id: 9/9