

University of Sydney

PCB Assembly Manual

AERO4701: Space Engineering 3

Group C

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Section A: PCB Shelf A, Power Distribution

Component List

Component	Code	Quantity
Shelf A PCB	C-A01	1
Current Sensor	C-A02	4
Battery Management System	C-A03	1
24 V Regulator	C-A04	1
5 V Regulator	C-A05	1
3.3 V Regulator	C-A06	1
1x1 Female Header	C-A07	1
1x2 Female Header	C-A08	7
1x3 Female Header	C-A09	1
1x4 Female Header	C-A10	4
1x6 Female Header	C-A11	4
1x12 Female Header	C-A12	2
MOSFET	C-A13	1
Solenoid Resistor	C-A14	1
Thermistor	C-A15	1
Thermistor Resistor	C-A16	1
Solder Bridge	C-A17	4
Solar Panel Connection	C-A18	4
Battery Connection	C-A19	1
Kill Switch Connection	C-A20	1
Solenoid Connection	C-A21	1

Interfaces

INT-A01

Description:	1x1 Headers
Connection:	C-A01 to C-A07
Orientation:	Directionless
Relevant Designators:	J19

INT-A02

Description:	1x2 Headers
Connection:	C-A01 to C-A08
Orientation:	Directionless
Relevant Designators:	J18, J15, J13, J10, J8, J5, J4

INT-A03

Description:	1x3 Headers
Connection:	C-A01 to C-A09
Orientation:	Directionless
Relevant Designators:	J7

INT-A04

Description:	1x4 Headers
Connection:	C-A01 to C-A10
Orientation:	Directionless
Relevant Designators:	J17, J11, J14

INT-A05

Description: 1x6 Headers
 Connection: C-A01 to C-A11
 Orientation: Directionless
 Relevant Designators: J12, J3, J6, J16

INT-A06

Description: 1x12 Headers
 Connection: C-A01 to C-A02
 Orientation: Directionless
 Relevant Designators: J2, J9

INT-A07

Description: MOSFET
 Connection: C-A01 to C-A13
 Orientation: Silkscreen guided
 Relevant Designators: Q1

INT-A08

Description: Current Sensors
 Connection: C-A11 to C-A02
 Orientation: Silkscreen guided
 Relevant Designators: J3, J6, J12, J16

INT-A09

Description: Solar Panel Connections
 Connection: C-A08 to C-A18
 Orientation: Red to PIN2
 Relevant Designators: J4, J5, J8, J10

INT-A10

Description: Battery Connections
 Connection: C-A08 to C-A19
 Orientation: Red to PIN2
 Relevant Designators: J13

INT-A11

Description: Kill Switch Connections
 Connection: C-A08 to C-A20
 Orientation: Directionless
 Relevant Designators: J13

INT-A12

Description: Battery Management System
 Connection: C-A03 to C-A10
 Orientation: Silkscreen guided
 Relevant Designators: J17

INT-A13

Description: 3.3 V Regulator
 Connection: C-A06 to C-A10
 Orientation: Silkscreen guided
 Relevant Designators: J17

INT-A14

Description: 5 V Regulator
 Connection: C-A05 to C-A09
 Orientation: Silkscreen guided

	Relevant Designators:	J7
INT-A15		
	Description:	24 V Regulator
	Connection:	C-A04 to C-A10 (x2), C-A07
	Orientation:	Silkscreen guided
	Relevant Designators:	J11, J14, J19
INT-A16		
	Description:	Solenoid Connection
	Connection:	C-A08 to C-A21
	Orientation:	Directionless
	Relevant Designators:	J18
INT-A17		
	Description:	Solenoid Resistor
	Connection:	C-A14 to C-A01
	Orientation:	Directionless
	Relevant Designators:	R3
INT-A17		
	Description:	Thermistor Resistor
	Connection:	C-A16 to C-A01
	Orientation:	Directionless
	Relevant Designators:	R6
INT-A18		
	Description:	Thermistor
	Connection:	C-A15 to C-A01
	Orientation:	Directionless
	Relevant Designators:	R7
INT-A19		
	Description:	Solder bridges
	Connection:	C-A17 (solder)
	Orientation:	Directionless
	Relevant Designators:	R1, R5

Assembly

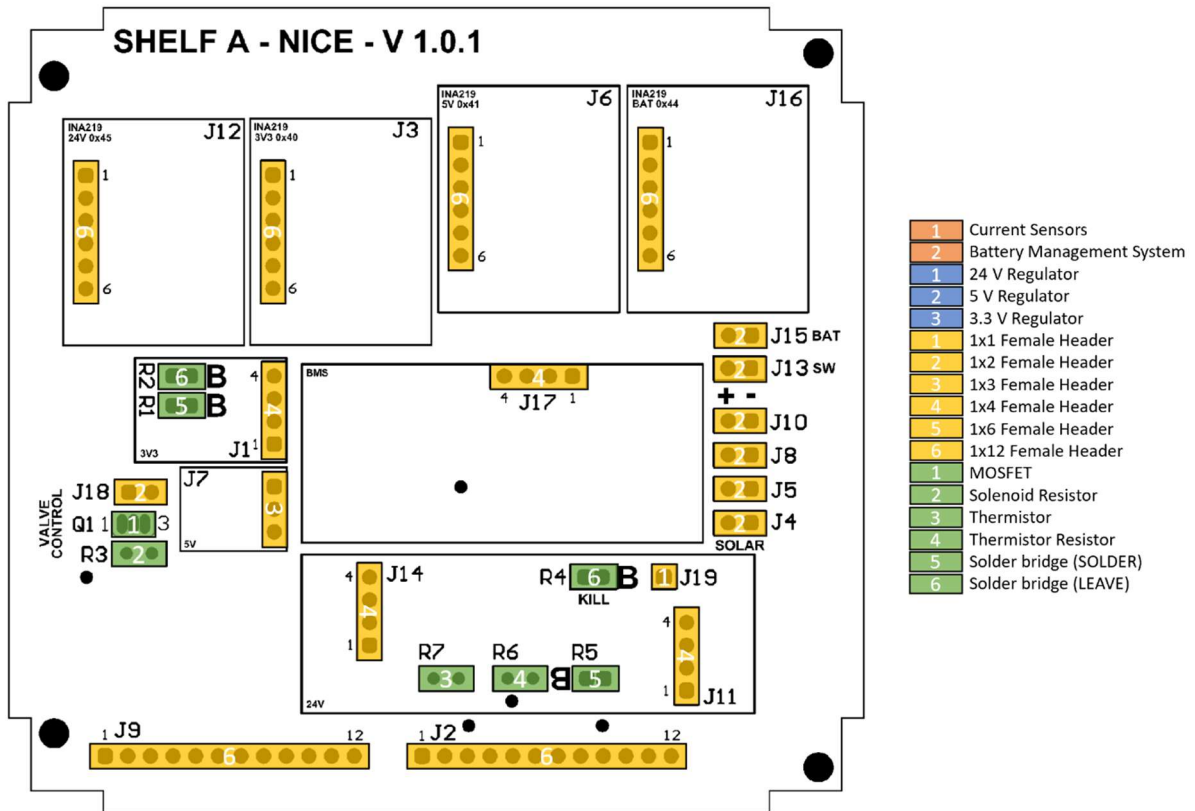


Figure 1: Shelf A First Placement

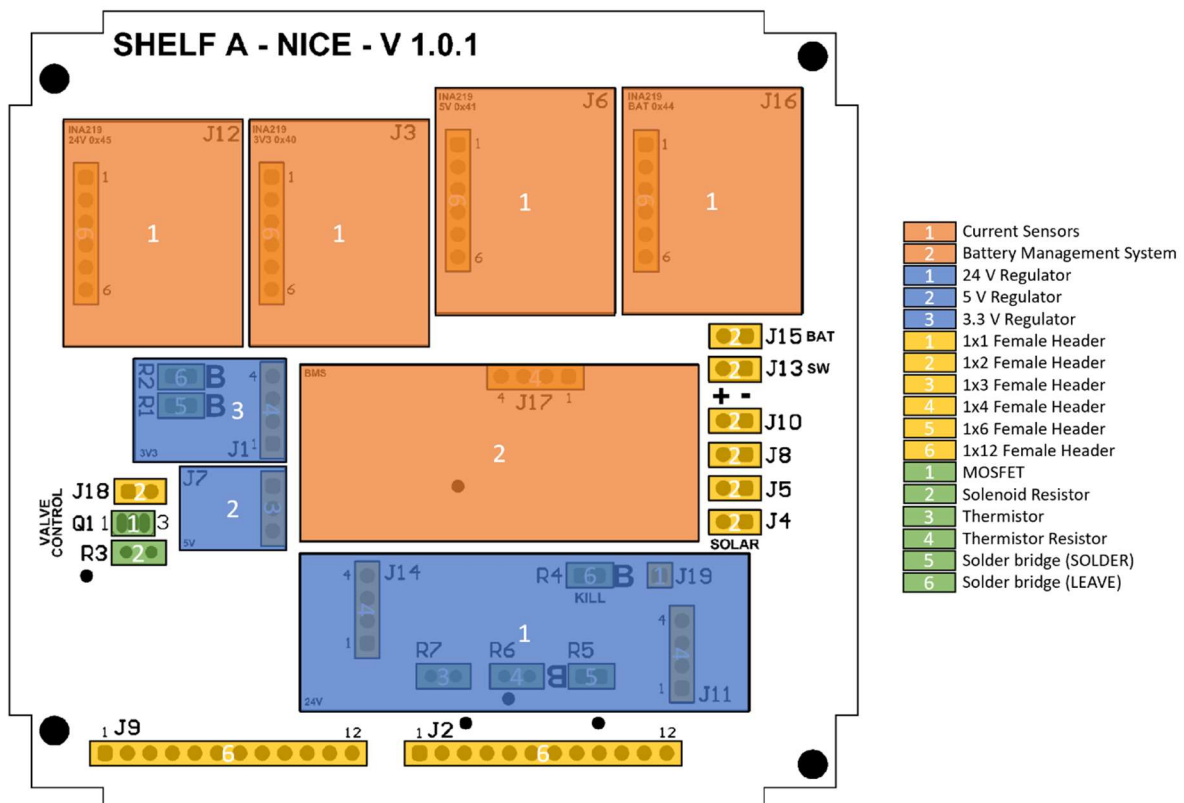


Figure 2: Shelf A Second Placement (Lower components visible)

Section B: PCB Shelf B, Sensing and Payload

Component List

Component	Code	Quantity
Shelf B PCB	C-B01	1
GPS	C-B02	4
IMU	C-B03	1
Transceiver	C-B04	1
Payload Connection	C-B05	1
ADC	C-B06	1
Photodiode Connection	C-B07	1
Magnetorquer Connection	C-B08	7
1x2 Female Header	C-B09	9
1x4 Female Header	C-B10	2
1x6 Female Header	C-B11	6
1x10 Female Header	C-B12	2
1x12 Female Header	C-B13	2
Photodiode Resistor	C-B14	6
Magnetorquer Resistor	C-B15	6
Thermistor	C-B16	1
Thermistor Resistor	C-B17	1
Solder Bridge	C-B18	1

Interfaces

INT-B01

Description:	1x2 Headers
Connection:	C-B01 to C-B09
Orientation:	Directionless
Relevant Designators:	J3, J7, J8, J11, J12, J15, J19, J20, J21

INT-B02

Description:	1x4 Headers
Connection:	C-B01 to C-B10
Orientation:	Directionless
Relevant Designators:	J18, J14

INT-B03

Description:	1x6 Headers
Connection:	C-B01 to C-B11
Orientation:	Directionless
Relevant Designators:	J1, J2, J5, J6, J9, J13

INT-B04

Description:	1x10 Headers
Connection:	C-B01 to C-B12
Orientation:	Directionless
Relevant Designators:	J17, J16

INT-B05

Description:	1x12 Headers
Connection:	C-B01 to C-B13
Orientation:	Directionless

Relevant Designators:	J4, J10
INT-B06	
Description:	Photodiode Resistors
Connection:	C-B01 to C-B14
Orientation:	Directionless
Relevant Designators:	R1, R2, R3, R4, R5, R6
INT-B07	
Description:	Magnetorquer Resistors
Connection:	C-B01 to C-B15
Orientation:	Directionless
Relevant Designators:	R10, R11, R12, R13, R14, R15
INT-B08	
Description:	Photodiode Connection
Connection:	C-B09 to CB07
Orientation:	Red to PIN2
Relevant Designators:	J3, J7, J8, J11, J12, J15
INT-B09	
Description:	Magnetorquer Connection
Connection:	C-B09 to CB08
Orientation:	Red to PIN2
Relevant Designators:	J19, J20, J21
INT-B10	
Description:	Solder bridges
Connection:	C-B18 (solder)
Orientation:	Directionless
Relevant Designators:	R7
INT-B11	
Description:	Thermistor
Connection:	C-B01 to C-B16
Orientation:	Directionless
Relevant Designators:	R9
INT-B12	
Description:	Thermistor Resistor
Connection:	C-B01 to C-B17
Orientation:	Directionless
Relevant Designators:	R8
INT-B13	
Description:	ADC
Connection:	C-B06 to C-B12
Orientation:	Silkscreen guided
Relevant Designators:	J17, J16
INT-B14	
Description:	GPS
Connection:	C-B02 to C-B11 (x2) OR C-B02 to C-B10
Orientation:	Ground to J5 PIN2 OR Silkscreen guided
Relevant Designators:	J1, J2 OR J18
INT-B15	
Description:	IMU
Connection:	C-B03 to C-B10 AND C-B03 to C-B11

Orientation: Silkscreen guided
Relevant Designators: J13, J14

INT-B16

Description: Payload Connection
Connection: C-B05 to C-B11
Orientation: Silkscreen guided
Relevant Designators: Ground (Black) to PIN6

INT-B17

Description: Transceiver
Connection: C-B04 to C-B11
Orientation: Silkscreen guided
Relevant Designators: J5, J6

Assembly

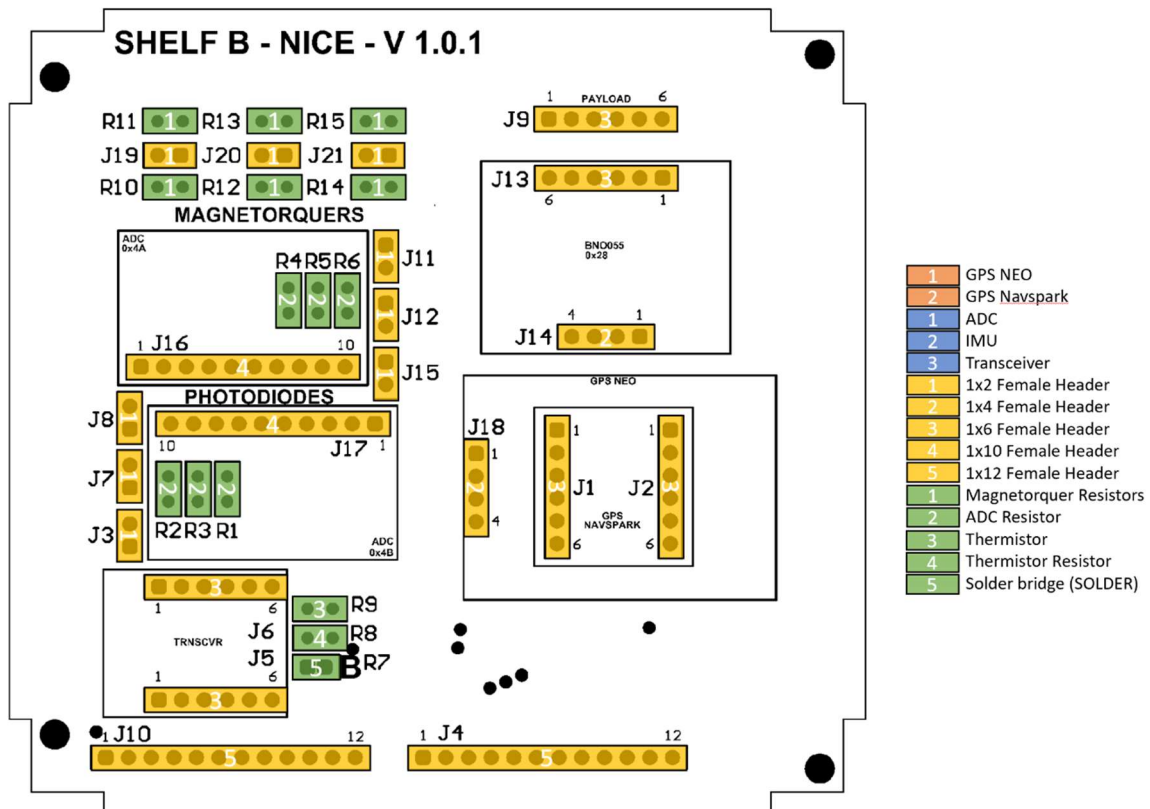


Figure 3: Shelf B First Placement

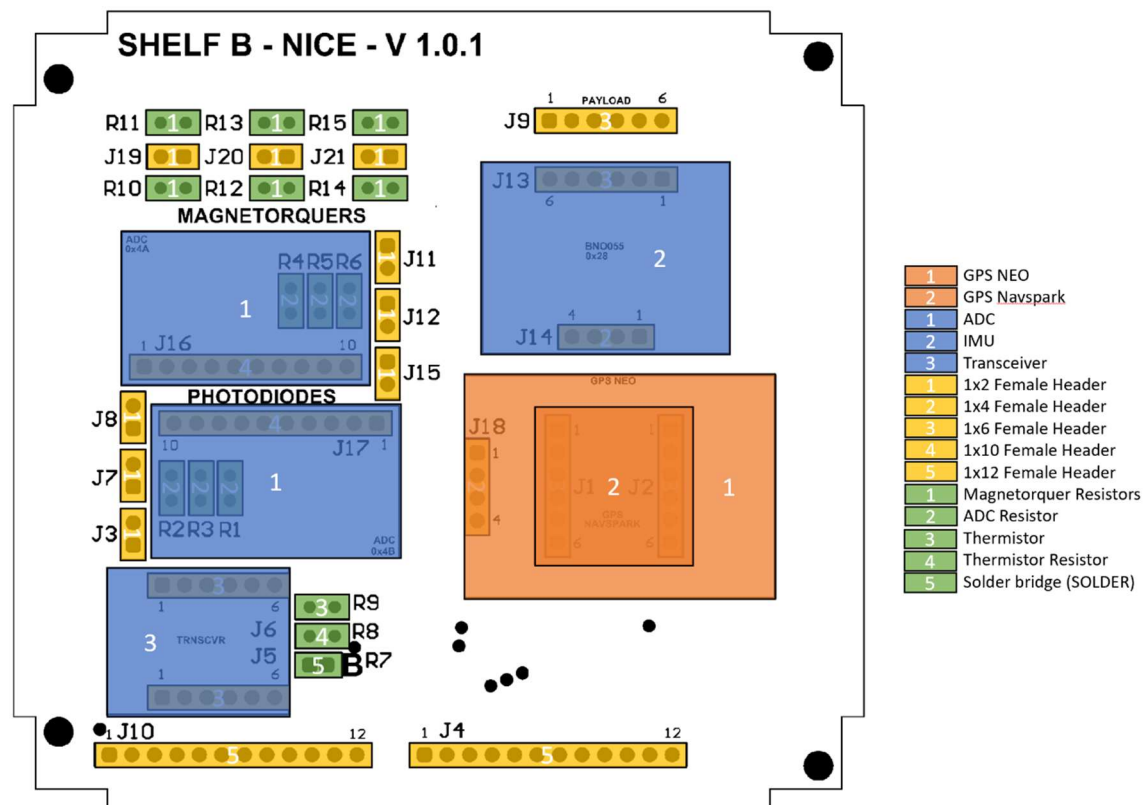


Figure 4: Shelf B Second Placement (Lower components visible)

Section C: PCB Shelf C, Computation

Component List

Component	Code	Quantity
Shelf C PCB	C-C01	1
PocketBeagle	C-C02	1
USB Connection	C-C03	1
Thermistor Connection	C-C04	1
Thermistor Resistor	C-C05	1
Solder Bridge	C-C06	1
1x2 Female Header	C-C07	1
1x7 Female Header	C-C08	1
1x12 Female Header	C-C09	2
2x18 Female Header	C-C10	2

Interfaces

INT-C01

Description: 1x2 Headers
 Connection: C-C01 to C-C07
 Orientation: Directionless
 Relevant Designators: J4

INT-C02

Description: 1x7 Headers
 Connection: C-C01 to C-C08
 Orientation: Directionless
 Relevant Designators: J3

INT-C03

Description: 1x12 Headers
 Connection: C-C01 to C-C09
 Orientation: Directionless
 Relevant Designators: J1, J2

INT-C04

Description: 2x18 Headers
 Connection: C-C01 to C-C10
 Orientation: Directionless
 Relevant Designators: U1A, U1B

INT-C05

Description: PocketBeagle
 Connection: C-C02 to C-C10
 Orientation: Silkscreen guided
 Relevant Designators: U1

INT-C06

Description: USB Connection
 Connection: C-C03 to C-C08
 Orientation: USB03 to PIN1
 Relevant Designators: J3

INT-C07

Description: Thermistor Connection

Connection: C-C04 to C-C07
Orientation: Directionless
Relevant Designators: J4

INT-C08

Description: Thermistor Resistor
Connection: C-C05 to C-C01
Orientation: Directionless
Relevant Designators: R2

INT-C09

Description: Solder bridge
Connection: C-C06 (solder)
Orientation: Directionless
Relevant Designators: R1

Assembly

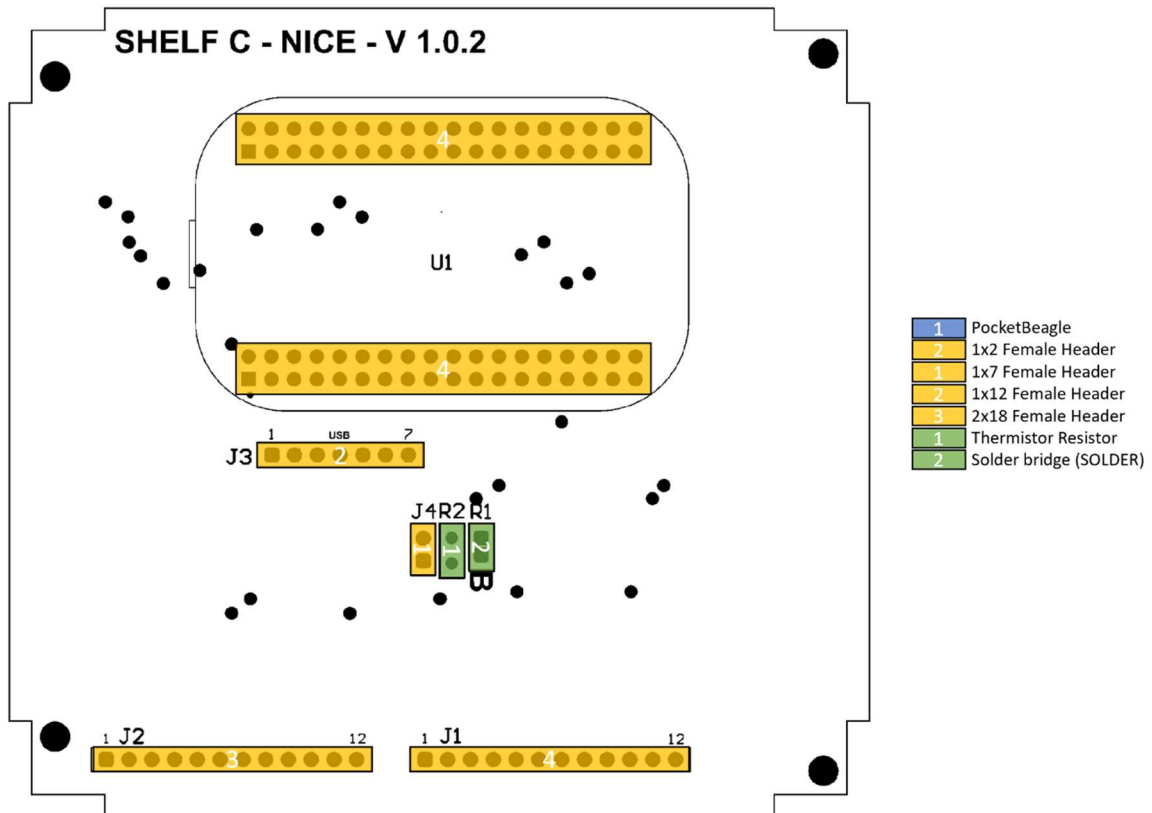


Figure 5: Shelf C First Placement

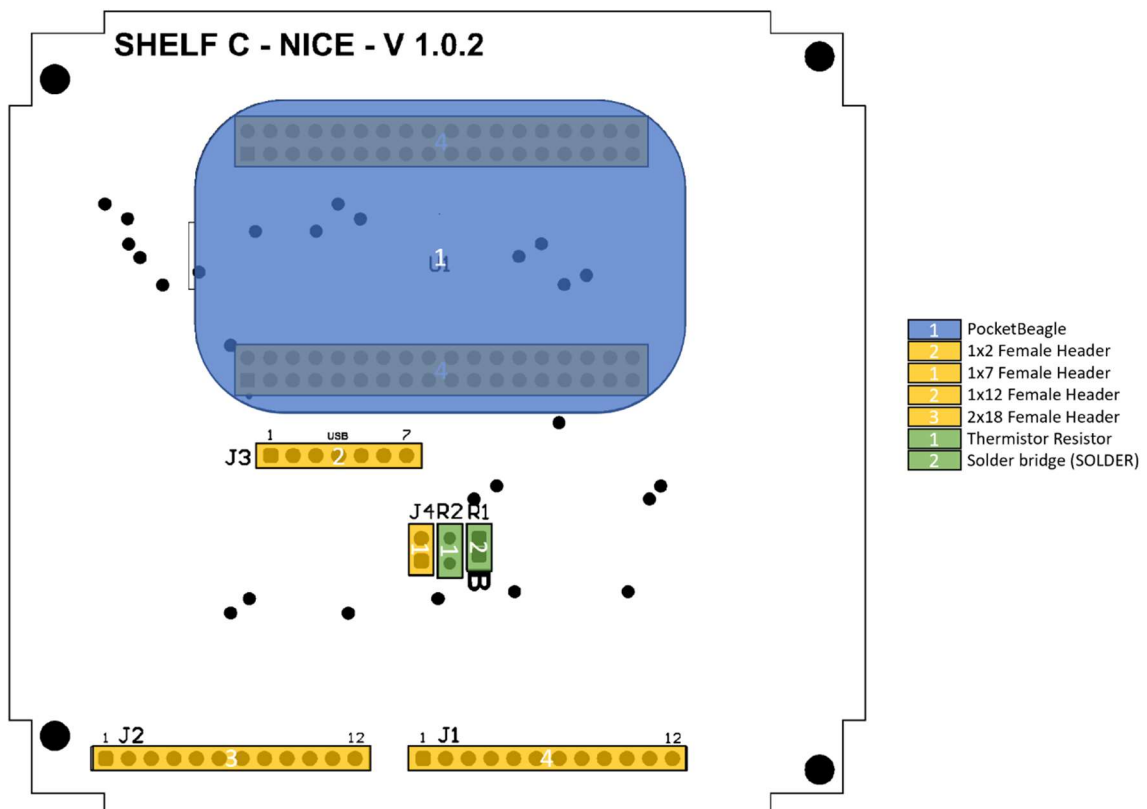


Figure 6: Shelf C Second Placement (Lower components visible)