

openQRP Xcvr Parts List By Functional Section

PC Board Rev E+ (40M Version) – STE 1/25/2024

Section 1 – AGND

R37 ___ [I8] 10K 1/8W
R38 ___ [J9] “ “
C80 ___ [J9] **6.8uF**
C79 ___ [J9] .1uF

Schematic Page 2

Resistor (Brown Black Orange)
Tantalum Capacitor
Ceramic Capacitor (104)

Section 2 - 12 V Input

J3 ___ [E11] Power Connector
D1 ___ [D11] 1N4001
C92 ___ [G8] **470uF**
C85 ___ [F10] .1uF
C56 ___ [C3] 100uF

Schematic Page 3

Power Diode
Electrolytic Capacitor
Ceramic Capacitor (104)
Electrolytic Capacitor

Section 3 - Digital 5V

VR2 ___ [F2] LM78L05
C51 ___ [F2] .1uF
C50 ___ [F3] 100uF

Schematic Page 3

5 volt Regulator (TO-220)
Ceramic Capacitor (104)
Electrolytic Capacitor

Section 4 - Analog 6V

VR3 ___ [G9] LM78L06
C91 ___ [G8] .1uF
C93 ___ [A1] “ “
C88 ___ [G9] 100uF

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6 volt Regulator (TO-92)
Ceramic Capacitor (104)
Electrolytic Capacitor

Section 5 - Analog 8V

VR1 ___ [D7] LM78L08
C31 ___ [D7] .1uF
C33 ___ [D8] “ “
C30 ___ [D8] **22uF**

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TO92 8 volt Regulator (TO-92)
Ceramic Capacitor (104)
Tantalum Capacitor

Section 6 - Arduino CPU

R3 ___ [C4] 4.7K 1/8W
R5 ___ [D4] “ “
R14 ___ [D5] “ “
R24 ___ [D6] “ “
R53 ___ [E1] “ “
R48 ___ [E3] “ “
R16 ___ [D6] 10K 1/8W
R6 ___ [D4] “ “
R29 ___ [F5] 1K 1/8W
R54 ___ [G1] 2.2K 1/8W
R55 ___ [H1] “ “
R56 ___ [I1] “ “
R57 ___ [J1] “ “
R2 ___ [C2] 22K 1/8W
C46 ___ [E4] 22pF
C47 ___ [E4] “ “

Schematic Page 8 & 9

Resistor (Yellow Violet Red)
Resistor (Brown Black Orange)
Resistor (Brown Black Red)
Resistor (Red Red Red)
Resistor (Red Red Orange)
Ceramic capacitor (blue, 22p)

C46A	___ [E3]	.1uF	Ceramic Capacitor (104)
C55	___ [D4]	" "	
C52	___ [F1]	.01uF	Ceramic Disc Capacitor (102)
C54	___ [D3]	" "	
C86	___ [F10]	" "	
C87	___ [F10]	" "	
U2S1	___ [E2]	28 pin DIP sockets	Socket for CPU (In IC package)
Y2	___ [E4]	16.384 MHz	Crystal
LED1	___ [E6]	LED	Red LED
J1	___ [C4]	2x3 Header	ICSP Connector 6 pin dual header
J4	___ [F11]	Stereo 1/8	Paddle connector
S1	___ [E1]	SPST	Pushbutton Switch
S2	___ [F1]	SPST	
S3	___ [F1]	SPST	
S4	___ [G1]	SPST	
S5	___ [H1]	SPST	
S6	___ [I1]	SPST	
U2	___ [E2]	ATmega168 CPU	28 pin DIP (In IC package)

Section 7 - LCD Display

C53	___ [E1]	.1uF
RX2	___ [D2]	10K
R1	___ [C1]	47Ω 1/2W
Q12	___ [E2]	2N7000
DP1-H	___ [A1]	ref: Assembly Guide
DP1	___ [A1]	LCD Display

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Ceramic Capacitor (104)
Trimmer Potentiometer (Contrast)
Resistor (Red Violet Black)
MOSFET transistor (TO-92)
16 pin right angle pin header
Sunlike 1602SD

Section 8 - VFO

Q9	___ [E8]	2N3904
R25	___ [E8]	47K 1/8W
R31	___ [F8]	22K 1/8W
R32	___ [F9]	2.2K 1/8W
R30	___ [E7]	1M 1/8W
C16	___ [C8]	10pF
C43	___ [F7]	.01uF
C36	___ [F9]	1000pF
C38	___ [F8]	" "
C37	___ [F9]	2700pF
C34	___ [E9]	220pF
C41	___ [F8]	" "
C35	___ [E9]	150pF
C40	___ [F8]	" "
CT3	___ [D8]	5-25pF
VC1	___ [E8]	MVAM109
L5	___ [E9]	T50-6 Toroid Core

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NPN Transistor (TO-92)
Resistor (Yellow Violet Orange)
Resistor (Red Red Orange)
Resistor (Red Red Red)
Resistor (Brown Black Blue)
Ceramic Capacitor (10)
Ceramic Capacitor (103)
Polystyrene Capacitor
Polystyrene Capacitor
Ceramic Capacitor (221)
Ceramic Capacitor (151) Blue
Green Trimmer Capacitor
Varactor Diode
6.0 uH 37 turns #28

Section 9 - VFO Buffer

R26	___ [D7]	100K 1/8W
R27	___ [D7]	" "
R15	___ [D6]	2.2K 1/8W
R28	___ [D6]	1K 1/8W

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Resistor (Brown Black Yellow)
Resistor (Red Red Red)
Resistor (Brown Black Red)

C32	___ [D7]	.01uF	Ceramic Disk Capacitor (103)
C39	___ [E8]	22pF	Ceramic Capacitor (Blue)
C42	___ [E7]	10pF	Ceramic Disk Capacitor (10)
C44	___ [E6]	10pF	Ceramic Disk Capacitor (10)
Q10	___ [E7]	2N3904	NPN Transistor (TO-92)
Q11	___ [E7]	2N3904	

Section 10 - Tune/RIT Controls

R52	___ [G3]	1.5K 1/8W	Resistor (Brown Green Red)
R47	___ [G4]	2.2K 1/8W	Resistor (Red Red Red)
R49	___ [G3]	3.9K 1/8W	Resistor (Orange White Red)
R50	___ [G2]	7.5K 1/8W	Resistor (Violet Green Red)
R51	___ [G3]	33K 1/8W	Resistor (Orange Orange Orange)
RP1	___ [na]	10K (TUNE)	10 Turn 10K Potentiometer (Control Pack)
RP2	___ [na]	10K (RIT)	10K Potentiometer (Control Pack)
C45	___ [F5]	.01uF	Ceramic Disk Cap (103) .2" spacing
U4	___ [G5]	CD4066	14 pin DIP (In IC Package)

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R52	___ [G3]	1.5K 1/8W	Resistor (Brown Green Red)
R47	___ [G4]	2.2K 1/8W	Resistor (Red Red Red)
R49	___ [G3]	3.9K 1/8W	Resistor (Orange White Red)
R50	___ [G2]	7.5K 1/8W	Resistor (Violet Green Red)
R51	___ [G3]	33K 1/8W	Resistor (Orange Orange Orange)
RP1	___ [na]	10K (TUNE)	10 Turn 10K Potentiometer (Control Pack)
RP2	___ [na]	10K (RIT)	10K Potentiometer (Control Pack)
C45	___ [F5]	.01uF	Ceramic Disk Cap (103) .2" spacing
U4	___ [G5]	CD4066	14 pin DIP (In IC Package)

Section 11 - TX Keyed 12V

R4	___ [C4]	4.7K 1/8W
R12	___ [C6]	" "
R13	___ [C6]	10K 1/8W
C3	___ [B2]	.1uF
C15	___ [C7]	2.2uF
Q3	___ [C6]	2N7000
Q4	___ [C7]	2N4403
R8	___ [A4]	150Ω 1/4W
ZD1	___ [B2]	7.5V

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R4	___ [C4]	4.7K 1/8W	Resistor (Yellow Violet Red)
R12	___ [C6]	" "	
R13	___ [C6]	10K 1/8W	Resistor (Brown Black Orange)
C3	___ [B2]	.1uF	Ceramic Capacitor (104)
C15	___ [C7]	2.2uF	Tantalum Capacitor
Q3	___ [C6]	2N7000	MOSFET transistor (TO-92)
Q4	___ [C7]	2N4403	PNP transistor (TO-92)
R8	___ [A4]	150Ω 1/4W	Resistor (Brown Green Brown)
ZD1	___ [B2]	7.5V	1N5236 Zener Diode

Section 12 - TX Mixer/1st Driver

R11	___ [A6]	100Ω 1/4W
R7	___ [A5]	150Ω 1/4W
R10	___ [B6]	5.6K 1/8W
R9	___ [B6]	10K 1/8W
C7	___ [A4]	2.2pF
C1	___ [A3]	150pF
C2	___ [A3]	47pF
C6	___ [A4]	56pF COG
C8	___ [A5]	" "
C10	___ [A6]	120pf NPO
C11	___ [A6]	220pF
C4	___ [C2]	680pF
C5	___ [C3]	.01uF
C9	___ [A5]	.1uF
CT1	___ [A2]	8-70pF
L1	___ [A3]	47uH
U1	___ [B3]	NE602A
Q1	___ [A6]	2N2222A
Y1	___ [B2]	4.9152 MHz
T1	___ [B4]	42IF123
T2	___ [B5]	" "

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R11	___ [A6]	100Ω 1/4W	Resistor (Brown Black Brown)
R7	___ [A5]	150Ω 1/4W	Resistor (Brown Green Brown)
R10	___ [B6]	5.6K 1/8W	Resistor (Green Blue Red)
R9	___ [B6]	10K 1/8W	Resistor (Brown Black Orange)
C7	___ [A4]	2.2pF	Multi-layer Ceramic Blue (2.2) bend leads
C1	___ [A3]	150pF	Multi-layer Ceramic Orange (151)
C2	___ [A3]	47pF	Ceramic Disk Capacitor (470)
C6	___ [A4]	56pF COG	Multilayer Ceramic Capacitor Blue (560)
C8	___ [A5]	" "	
C10	___ [A6]	120pf NPO	Multi-layer Ceramic Capacitor (121)
C11	___ [A6]	220pF	Ceramic Disk Capacitor (221)
C4	___ [C2]	680pF	Multi-layer Capacitor Orange (681)
C5	___ [C3]	.01uF	Ceramic Disk Capacitor (103)
C9	___ [A5]	.1uF	Ceramic Capacitor (104)
CT1	___ [A2]	8-70pF	Trimmer Capacitor
L1	___ [A3]	47uH	Inductor
U1	___ [B3]	NE602A	Mixer (DIP8) (In IC package)
Q1	___ [A6]	2N2222A	NPN Transistor (TO-18)
Y1	___ [B2]	4.9152 MHz	Crystal
T1	___ [B4]	42IF123	IF Transformer (10.7 MHz)
T2	___ [B5]	" "	

Section 13 - PSoC Controller

R45	___ [G4]	22K 1/8W
C49	___ [F3]	.1uF
C48	___ [F5]	.1uF
U3	___ [G4]	CY8C27143
U3S	___ [G4]	8 pin socket

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Resistor (Red Red Orange)
Ceramic Capacitor (104)
Mylar Capacitor (104) Brown, .2"
PSoC (DIP8) (In IC package)
DIP8 (In IC package)

Section 14 - Low Pass Filter / Rx Antenna Switch

R23	___ [C9]	22k 1/8W
C21	___ [A10]	220pF
C27	___ [B11]	" "
C20	___ [A10]	680pF
C23	___ [A10]	" "
C26	___ [B10]	" "
C24	___ [B11]	" "
C25	___ [B10]	1200pF
C29	___ [C9]	.001uF
L2	___ [A10]	T37-6
L3	___ [B11]	" "
Q7	___ [C10]	2N7000
Q8	___ [C10]	" "
Q6	___ [B10]	ZVNL110A
J2	___ [C11]	BNC RF Connector
RP3	___ [na]	5K (RF Gain)

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Resistor (Red Red Orange)
Multilayer Ceramic 200V (221)
Multilayer Ceramic 200V (681)
Multilayer Ceramic 200V (122) blue
Ceramic disc
1.2uH 17 turns #24
MOSFET transistor (TO-92)
MOSFET transistor (TO-92E)
PCB Mount (Control Pack)
5K Potentiometer (Control Pack)

Section 15 - Audio Amplifier

C94	___ [H10]	.01uF
C81	___ [J10]	2.2uF
C82	___ [I9]	.1uF
C83	___ [H9]	.1uF
C84	___ [G10]	100uF
R33	___ [G10]	2.2Ω 1/4W
R34	___ [H9]	27K 1/8W
RX3	___ [J10]	10K
J5	___ [H11]	Stereo 1/8
R58	___ [G10]	100Ω 1/4W
U8	___ [H10]	TDA7052A

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Ceramic Disk Capacitor (103)
Tantalum Capacitor (105)
Ceramic Capacitor (104)
Ceramic Capacitor (104)
Electrolytic Capacitor
Resistor (Red Red Gold)
Resistor (Red Violet Orange)
Trimmer Potentiometer (AF Gain)
Speaker connector
Resistor (Brn Blk Brn)
Audio Amp (DIP8) (In IC package)

Section 16 - Active Filter

U7	___ [I8]	TS922A
R36	___ [H8]	66.5K 1/8W
R42	___ [G7]	33.2K 1/8W
R35	___ [H8]	5.76K 1/8W
R46	___ [F4]	1M 1/8W
C89	___ [H8]	.012uF
C90	___ [G8]	" "

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Dual Op Amp (DIP8) (In IC package)
1% Resistor
1% Resistor
1% Resistor
Resistor (Brown Black Blue)
Mylar Capacitor

**Section 17 - Receiver Input Filter,
1st Rx Mixer, and Crystal Filter**

Part 1		
C60	___ [H3]	.1uF

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Ceramic Capacitor (104)

C61	___ [H4]	47pF	Ceramic Disk Capacitor (470)
C57	___ [I2]	56pF	Ceramic Capacitor (560)
C59	___ [H3]	" "	
C58	___ [I3]	2.2pF	Ceramic Capacitor (2.1)
C66	___ [H5]	39pF	Ceramic Capacitor (390)
C67	___ [I4]	220pF	Ceramic Capacitor (221)
C69	___ [J5]	" "	
C71	___ [I5]	" "	
C68	___ [J4]	150pF	Ceramic Capacitor (151)
C70	___ [J5]	" "	
L6	___ [H5]	10uH	Inductor
L7	___ [I5]	" "	
U5	___ [H4]	NE602A	Mixer (DIP8) (In IC package)
Part 2			
Y4	___ [J4]	4.9152 MHz	Crystal
Y5	___ [J4]	" "	
Y6	___ [J5]	" "	
Y7	___ [J6]	" "	
T4	___ [H3]	42IF123	IF Transformer (10.7 MHz)
T5	___ [J3]	" "	
C95	___ [H3]	.001uF	Ceramic Disc Capacitor (102)

Section 18 - 2nd Rx Mixer and Diff Amp

Don't get C77 and R41 mixed up !

R44	___ [I5]	470Ω 1/8W	Resistor (Yellow Violet Brown)
R40	___ [I7]	4.7K 1/8W	Resistor (Yellow Violet Red)
R43	___ [J6]	" "	
R39	___ [J8]	470K 1/8W	Resistor (Yellow Violet Yellow)
R41	___ [J7]	" "	
C72	___ [I6]	.01uF	Ceramic Disk Capacitor (103)
C73	___ [H6]	.01uF	Mylar Capacitor (103) Brown
C74	___ [I6]	.1uF	Mylar Capacitor (104) Brown
C75	___ [I7]	" "	
C62	___ [H5]	51pF	Silver mica Capacitor (51J)
C63	___ [H6]	220pF	Ceramic Disk Capacitor (221)
C78	___ [J8]	150pF	Multilayer Ceramic Capacitor (151)
C77	___ [J7]	" "	
C64	___ [H5]	.1uF	Ceramic Capacitor (104)
C76	___ [H7]	" "	
C65	___ [H5]	22uF	Tantalum Capacitor
CT2	___ [H7]	8-70pF	Trimmer Capacitor
D2	___ [J7]	1N4148	Silicon Diode
D3	___ [J7]	" "	
U6	___ [H6]	NE602A	Mixer (DIP8) (In IC package)
Y3	___ [G6]	4.9152 MHz	Crystal

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Section 19 - Tx 2nd Driver/Final

Q5	___ [A9]	IRF510	Power MOSFET (TO-220)
R19	___ [B7]	4.7K 1/8W	Resistor (Yellow Violet Red)
R20	___ [A4]	2.2K 1/8W	Resistor (Red Red Red)
R18	___ [B7]	1K 1/8W	Resistor (Brown Black Red)

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R21	___ [A7]	22Ω 1/4W	Resistor (Red Red Black)
R22	___ [A9]	10Ω 1/8W	Resistor (Brown Black Black)
C12	___ [B6]	.01uF	Ceramic Disk Capacitor (103)
C13	___ [A8]	.1uF	Ceramic Capacitor (104)
C18	___ [A9]	" "	
C22	___ [A10]	.1uF	Ceramic Capacitor (104)
C28	___ [B9]	" "	
C19	___ [B9]	.001uF	Ceramic Capacitor (102)
C17	___ [C9]	470uF	Electrolytic Capacitor
Q2	___ [A7]	2N2219A	NPN Transistor (TO-39)
T3	___ [B8]	FT37-43	Coupling transformer see assy guide
RX1	___ [A8]	5K	Trimmer Pot (Transmit Bias)
L4	___ [A9]	FT50-43	7 turns bifilar winding #24

Control Pack

Knob	___	Qty 3 - Tuning, RIT, RF Gain
Potentiometer	___	Qty 1 - Single turn 5K Pot
Potentiometer	___	Qty 1 - Single turn 10K Pot
Potentiometer	___	Qty 1 - 10 turn 10K Pot
BNC	___	Qty 1 - BNC Connector PCB mount

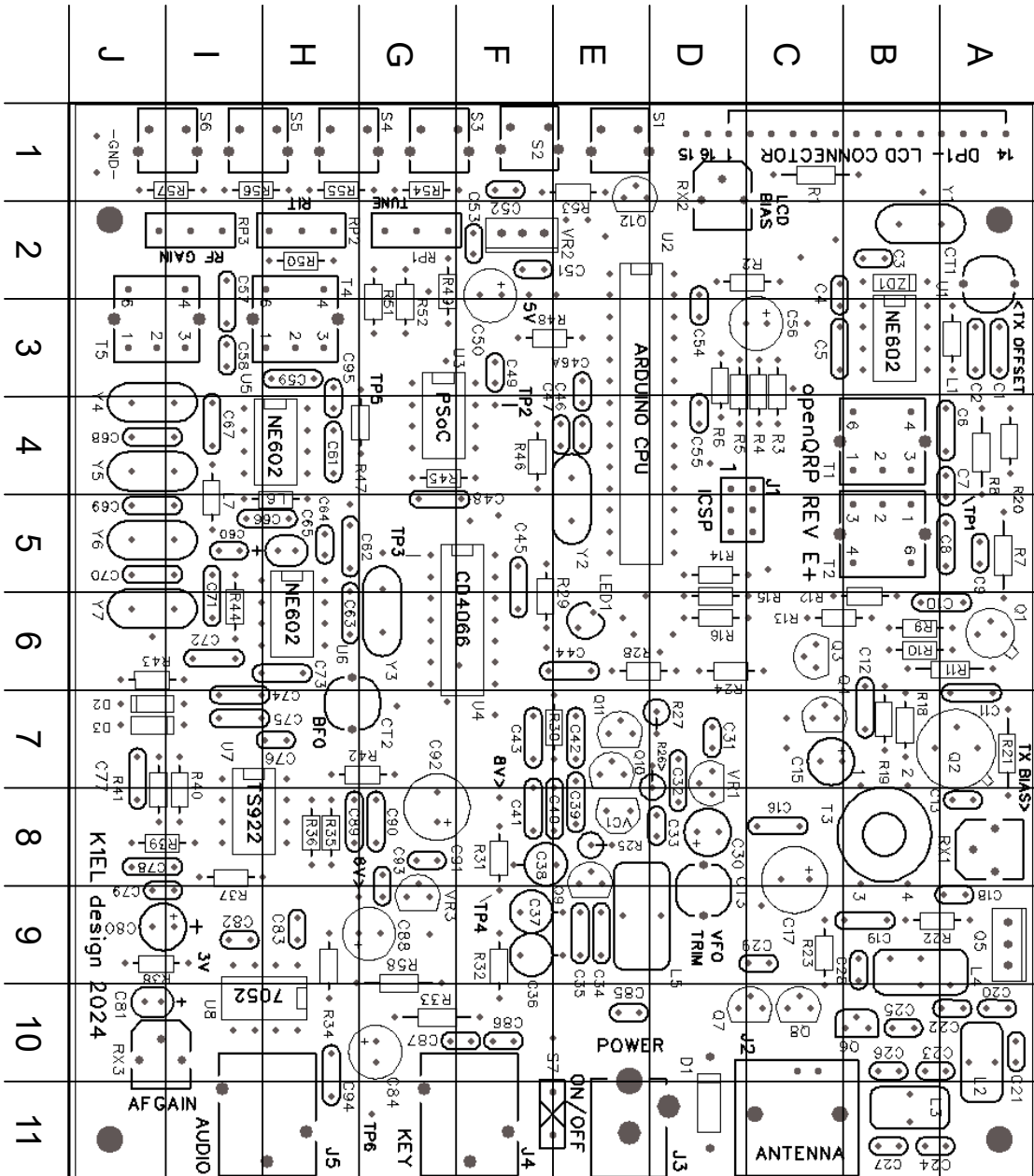
Miscellaneous

Copper Wire #24	___	33 inches Low pass filter and final toroids
Copper Wire #28	___	21 inches VFO toroid
Enclosure	___	Qty 1
Heat Sink Bracket	___	Qty 1
Rubber Feet	___	Qty 4
4-40 x 1/4 Screws Black	___	Qty 4 For enclosure cover
4-40 x 3/8 Screws	___	Qty 4 For PCB mounting
TO220 Insulator	___	Qty 1 For heat sink
TO220 Shoulder Washer	___	Qty 1 For heat sink
4-40 x 1/4 Screw	___	Qty 2 For heat sink bracket
4-40 Nut w/Lock Washer	___	Qty 1 For heat sink bracket
Insulated Wire	___	20 inches Control Wiring

IC Pack

NE602/610	___	Qty 3 8 pin DIP
TS922A	___	Qty 1 8 pin DIP
CD4066	___	Qty 1 14 pin DIP
TD7052A	___	Qty 1 8 pin DIP
Atmega68	___	Qty 1 28 pin DIP
CY8C27143 (PsoC)	___	Qty 1 8 pin DIP
14 pin socket	___	Qty 2
8 pin socket	___	Qty 1

Parts Placement Guide - Rev E+ PCB – 2/25/2024



KIEL design 2024