ControlBoard Rev 1.1 Population List

Population List
Control Board Revision 1.1

Color Key
Capacitor
Resistor
Diode

107 Total Components   [Gerbers](#)

Description	Layer	MPN	Quantity	Designator	Footprint	Comment
BOTTOM							38 components
4 Channel Differential Line Receiver	Bottom	AM26LV32EIPWR	2	U2, U3	16-TSSOP	Receiver for encoder inputs
Chip Capacitor	Bottom	Multiple	1	C32	0603	1µF
Chip Capacitor	Top, Bottom	Multiple	19	C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31	0603	0.1µF
Bidirectional 16 Pin I/O Expander over I2C	Bottom	MCP23017	1	IC4	28-SSOP	I/O Expander, for Error LEDs and switch/button inputs
Header 2X20	Bottom	DF12(3.0)-40DS-0.5V(86)	1	J17	DF12(3.0)-40DS-0.5V(86)	Motor Board Connector, VERY hard to solder. ALWAYS check for shorts between each neighboring pin once soldered!
Header 2X25	Bottom	DF12(3.0)-50DS-0.5V(86)	1	J25	DF12(3.0)-50DS-0.5V(86)	Motor Board Connector, VERY hard to solder. ALWAYS check for shorts between each neighboring pin once soldered!
LED RGB	Bottom	WS2812B	1	LED2	WS2812B	Neopixel
4-Array Resistor	Bottom		1	R19	0603-4CC	10.0kΩ, 1%
Single Chip Resistor	Bottom		1	R20	0603	68.0kΩ, 1%
8-Array Resistor	Bottom	742C163331JP	2	R21, R24	0603-8CV	330Ω
Single Chip Resistor	Bottom	Multiple	1	R22	0603	330Ω
Single Chip Resistor	Bottom		1	R26	0402	0Ω, says NP on PCB silkscreen layer...Must have for kicker to work
Header 1X4	Bottom	84981-4	2	J19, J21	84981-4	Ball Sense Emitter/Detector Connector
Header 1X8	Bottom	52852-0870	1	J27	Molex 52852-0870	Kicker Board Flex Cable Connector
N-Channel MOSFET	Bottom		1	Q1	SOT-23-3	MOSFET N-Channel, for Piezo Buzzer
Single Chip Resistor	Bottom	Multiple	1	R23	0603	0Ω, Ignore, FPGA will not configure from mbed if soldered! (it will be in JTAG mode)
4-Array Resistor	Bottom		1	R25	0603-4CV	0Ω, Ignore
TOP							59 components
8-Array Resistor	Top	742C163331JP	6	R4, R5, R7, R9, R10, R11	0603-8CV	330Ω
Single Chip Resistor	Top	Multiple	3	R8, R12, R13	0603	330Ω
Single Chip Resistor	Top	Multiple	1	R1	0603	0Ω
Single Chip Resistor	Top	RC0805FR-07150RL	1	R18	0805	150Ω
Single Chip Resistor	Top	Multiple	3	R6, R14, R16	0603	10kΩ
Single Chip Resistor	Top	Multiple	1	R17	0603	100kΩ
Single Chip Resistor	Top		2	R111, R112	0603	4.7kΩ, 5.1kΩ also OK as alternative
4-Array Resistor	Top	742C083471JP	1	R15	0603-4CC	470Ω
Single Chip Resistor	Top		1	R3	0603	5.6kΩ

Chip Capacitor	Top	Multiple	4	C2, C3, C5, C7	0603	0.1µF
Chip Capacitor	Top		3	C1, C4, C10	0603	100nF
Chip Capacitor	Top		1	C6	0603	2200pF, 50V
Chip Capacitor	Top		2	C8, C9	0603	0.047µF
Chip Capacitor	Top		1	C11	0603	0.47µF
Chip Capacitor	Top		1	C12	0603	10000pF
Light-emitting Diode	Top	APT2012SRCPRV	2	D5, D6	0805	Red, 1.2V & 2.5V Error LEDs
Light-emitting Diode	Top	APT2012SRCPRV	4	M5, M6, M12, M13	0805	Red, Motor Error LEDs
Light-emitting Diode	Top	APT2012SRCPRV	4	D1, D3, D8, D10	0805	Red, Dribbler/Radio/MPU/Ball Error LED
Light-emitting Diode	Top	APA3010YC-GX	2	D2, D4	2-SMD	Yellow, Radio TX/RX LEDs
Light-emitting Diode	Top	APA3010SGC-GX	1	D7	2-SMD	Green, Ready LED
Light-emitting Diode	Top	APA3010QBC/D-GX	1	D9	2-SMD	Blue, HasBall Status LED
Voltage Reg. LDO	Top	MCP1824T-1202E/OT	1	IC1	SOT-23-5	FPGA's 1.2V Voltage Regulator; Must also short bridge beside regulator with solder
Voltage Reg. LDO	Top	MCP1824T-2502E/OT	1	IC2	SOT-23-5	FPGA's 2.5V Voltage Regulator; Must also short bridge beside regulator with solder
Six-Axis (Gyro + Accelerometer) MEMS Device	Top	MPU-6050	1	IC3	24-QFN	Motion Processing Unit, Hot Air / Reflow ONLY
Header 2X5	Top	87409-105LF	1	J6	SMD 5X2 1.27mm	Radio Board Header, THIS IS A DIRECTIONAL COMPONENT! Side with only 1 tab inside the header area goes towards to front. Can also be a lot tricker to solder than you'd think...check for shorts with multimeter, pin 1 and the pin across from it are on the same net.
LED RGB	Top	WS2812B	1	LED1	WS2812B	Neopixel
Header 2X3	Top	43045-0610	4	M3, M4, M8, M9	Molex 43045-0610	Hall Sensor Headers
DIP Switch, 3 Position, SPST	Top	219-3MST	1	S2	219-3MST	3-way DIP switch for settings
Button	Top	KMR441NG ULC LFS	1	S3	KMR4	Self Test Button
Spartan-3E FPGA	Top	XC3S100E-4TQG144C	1	U1	TQG144_M	FPGA
Crystal Clock Oscillator	Top		1	X1	XOSC 7X5mm	FPGA's Clock, 18.432MHz
4-Array Resistor	Top	742C083471JP	±	R2	0603-4CV	470Ω, Ignore
THROUGH-HOLE						
Speaker	Top		1	LS1	PS12	Piezo Buzzer; Through-Hole; Do not solder before board wash stage
Hex Selector	Top	94HCB16T	1	S1	94HCB16T	Hex Selector for Robot's ID; Through-Hole
mbed LPC1768	Top		1	M7	mbed	mbed Headers; Through Hole
Header 2X5	Top	30310-6002HB	4	M1, M2, M10, M11	TE 1-1634688-0	Encoder Headers; "Through-Hole"; Must be very careful to not heat up pins long at all, they will EASILY melt the plastic
Header 1X6	Bottom	35363-0660	±	J18	Molex 35363-0660	JTAG Header, Through Hole, Ignore

8 components

Related Parts						
Break Beam Board Cables		686704100001	2			