

Controller

Controller Bill Of Materials

| Ref | Value |
|-----|---|
| C1 | 100 nF 50 V ceramic disc capacitor |
| C2 | 100 nF 50 V ceramic disc capacitor |
| C3 | 100 nF 50 V ceramic disc capacitor |
| C4 | 1000 uF 10 V electrolytic polarized capacitor |
| C5 | 100 nF 50 V ceramic disc capacitor |
| C6 | 100 uF 25 V electrolytic polarized capacitor |
| C7 | 100 nF 50 V ceramic disc capacitor |
| C8 | 10 nF 50 V ceramic disc capacitor |
| C9 | 10 nF 50 V ceramic disc capacitor |
| C10 | 10 nF 50 V ceramic disc capacitor |
| C11 | 10 nF 50 V ceramic disc capacitor |
| C12 | 10 nF 50 V ceramic disc capacitor |
| C13 | 10 nF 50 V ceramic disc capacitor |
| C14 | 10 nF 50 V ceramic disc capacitor |
| C15 | 100 nF 50 V ceramic disc capacitor |
| C16 | 100 nF 50 V ceramic disc capacitor |
| C17 | 100 nF 50 V ceramic disc capacitor |
| C18 | 10 nF 50 V ceramic disc capacitor |
| C19 | 100 nF 50 V ceramic disc capacitor |
| C20 | 100 nF 50 V ceramic disc capacitor |
| C21 | 100 nF 50 V ceramic disc capacitor |
| C22 | 10 nF 50 V ceramic disc capacitor |
| C23 | 10 nF 50 V ceramic disc capacitor |
| C24 | 10 nF 50 V ceramic disc capacitor |
| C25 | 100 nF 50 V ceramic disc capacitor |
| C26 | 100 nF 50 V ceramic disc capacitor |
| C27 | 10 nF 50 V ceramic disc capacitor |
| C28 | NC |
| C29 | NC |
| C30 | 100 nF 50 V ceramic disc capacitor |
| C31 | 100 nF 50 V ceramic disc capacitor |
| C32 | 100 nF 50 V ceramic disc capacitor |
| C33 | 100 nF 50 V ceramic disc capacitor |
| C34 | 100 nF 50 V ceramic disc capacitor |
| C35 | 100 nF 50 V ceramic disc capacitor |
| C36 | 100 uF 25 V electrolytic polarized capacitor |
| C37 | 100 nF 50 V ceramic disc capacitor |
| C38 | 100 nF 50 V ceramic disc capacitor |
| C39 | 100 nF 50 V ceramic disc capacitor |
| C40 | 100 nF 50 V ceramic disc capacitor |
| C41 | 100 nF 50 V ceramic disc capacitor |
| C42 | 100 nF 50 V ceramic disc capacitor |
| C43 | 10 nF 50 V ceramic disc capacitor |
| C44 | 10 nF 50 V ceramic disc capacitor |

Controller

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| C45 | 10 nF 50 V ceramic disc capacitor |
| C46 | 100 nF 50 V ceramic disc capacitor |
| D1 | 1N4004 |
| D2 | 1N4004 |
| D3 | 1N5711 or "ebay 1N60P" |
| D4 | 1N5711 or "ebay 1N60P" |
| D5 | 1N5711 or "ebay 1N60P" |
| D6 | 1N5711 or "ebay 1N60P" |
| D7 | 1N5711 or "ebay 1N60P" |
| D8 | 3 mm LED |
| D9 | 1N5711 or "ebay 1N60P" |
| D10 | 1N5711 or "ebay 1N60P" |
| D11 | 1N5711 or "ebay 1N60P" |
| D12 | 1N5819 |
| D13 | 1N4148 |
| D14 | 1N5819 |
| D15 | 1N4148 |
| D16 | 1N4148 |
| D17 | 1N5711 or "ebay 1N60P" |
| D18 | 1N4148 |
| D19 | 1N4148 |
| D20 | 1N4148 |
| D21 | 1N4729A |
| D24 | 1N5819 |
| D25 | 1N5819 |
| D27 | 1N4733A |
| D28 | 1N4733A |
| J1 | 2 rows of 5 pin headers 2.54 mm spacing |
| J2 | 2 rows of 5 pin headers 2.54 mm spacing |
| J3 | 2 rows of 5 pin headers 2.54 mm spacing |
| J4 | 2 rows of 5 pin headers 2.54 mm spacing |
| J5 | 2 rows of 5 pin headers 2.54 mm spacing |
| J6 | 2 position 5.08 mm screw terminal block |
| J7 | 2 rows of 5 pin headers 2.54 mm spacing |
| J8 | 1 rows of 6 pin headers 2.54 mm spacing |
| J9 | 2 position 5.08 mm screw terminal block or right-angle BNC isolated PCB receptacle |
| J10 | 1 rows of 5 pin headers 2.54 mm spacing |
| J11 | 2 position 5.08 mm screw terminal block or right-angle BNC isolated PCB receptacle |
| J13 | 2 position 5.08 mm screw terminal block or right-angle BNC isolated PCB receptacle |
| J15 | 2 position 5.08 mm screw terminal block |
| J16 | JST 2.54 mm male pin socket, 7 pins, 2.54 mm spacing |
| JP1 | 1 rows of 3 pin headers 2.54 mm spacing |
| Q1 | 2N3904 |
| Q2 | 2N3904 |
| Q3 | 2N3904 |
| Q4 | 2N3904 |
| Q5 | 2N3904 |
| Q6 | 2N3904 |
| Q7 | 2N3904 |

Controller

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| Q8 | 2N3904 |
| Q9 | 2N7000 |
| Q10 | 2N7000 |
| Q11 | 2N7000 |
| Q12 | 2N7000 |
| R1 | 10k $\frac{1}{4}$ watt resistor |
| R2 | 10k $\frac{1}{4}$ watt resistor |
| R3 | 1k $\frac{1}{4}$ watt resistor |
| R4 | 330R $\frac{1}{4}$ watt resistor |
| R5 | 470R $\frac{1}{4}$ watt resistor |
| R6 | 10k $\frac{1}{4}$ watt resistor |
| R7 | 51R $\frac{1}{4}$ watt resistor |
| R8 | 10k $\frac{1}{4}$ watt resistor |
| R9 | 10k $\frac{1}{4}$ watt resistor |
| R10 | 1k $\frac{1}{4}$ watt resistor |
| R11 | 330R $\frac{1}{4}$ watt resistor |
| R12 | 1k $\frac{1}{4}$ watt resistor |
| R13 | 330R $\frac{1}{4}$ watt resistor |
| R14 | 10k $\frac{1}{4}$ watt resistor |
| R15 | 1k $\frac{1}{4}$ watt resistor |
| R16 | NC |
| R17 | NC |
| R18 | 10k $\frac{1}{4}$ watt resistor |
| R19 | 100R $\frac{1}{4}$ watt resistor |
| R20 | 22k $\frac{1}{4}$ watt resistor |
| R21 | 220R $\frac{1}{4}$ watt resistor |
| R22 | 220R $\frac{1}{4}$ watt resistor |
| R23 | 51R $\frac{1}{4}$ watt resistor |
| R24 | 1k $\frac{1}{4}$ watt resistor |
| R25 | 1k $\frac{1}{4}$ watt resistor |
| R26 | 1k $\frac{1}{4}$ watt resistor |
| R27 | 51R $\frac{1}{4}$ watt resistor |
| R28 | 220R $\frac{1}{4}$ watt resistor |
| R29 | 1k $\frac{1}{4}$ watt resistor |
| R30 | 1k $\frac{1}{4}$ watt resistor |
| R31 | 1k $\frac{1}{4}$ watt resistor |
| R32 | 100R $\frac{1}{4}$ watt resistor |
| R33 | 1k $\frac{1}{4}$ watt resistor |
| R34 | NC |
| R35 | 10k $\frac{1}{4}$ watt resistor |
| R36 | 1k $\frac{1}{4}$ watt resistor |
| R37 | 1.5k $\frac{1}{4}$ watt resistor |
| R38 | 1.5k $\frac{1}{4}$ watt resistor |
| R39 | 1k $\frac{1}{4}$ watt resistor |
| R40 | 1k $\frac{1}{4}$ watt resistor |
| R41 | 220R $\frac{1}{4}$ watt resistor |
| R42 | 100R $\frac{1}{4}$ watt resistor |
| R43 | 1.5k $\frac{1}{4}$ watt resistor |
| R44 | 1.5k $\frac{1}{4}$ watt resistor |

Controller

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| R45 | 56R 1 watt resistor |
| R46 | 1k $\frac{1}{4}$ watt resistor |
| R47 | 22k $\frac{1}{4}$ watt resistor |
| R48 | 100R $\frac{1}{4}$ watt resistor |
| R49 | 220R $\frac{1}{4}$ watt resistor |
| R50 | short circuit wire |
| R51 | 22k $\frac{1}{4}$ watt resistor |
| R52 | 220R $\frac{1}{4}$ watt resistor |
| R53 | short circuit wire |
| R54 | 10k $\frac{1}{4}$ watt resistor |
| R55 | short circuit wire |
| R56 | 1k $\frac{1}{4}$ watt resistor |
| R57 | 1k $\frac{1}{4}$ watt resistor |
| R58 | 1k $\frac{1}{4}$ watt resistor |
| R59 | 1.5k $\frac{1}{4}$ watt resistor |
| R60 | 1.5k $\frac{1}{4}$ watt resistor |
| R61 | 1.5k $\frac{1}{4}$ watt resistor |
| R62 | 220R $\frac{1}{4}$ watt resistor |
| R63 | 10k $\frac{1}{4}$ watt resistor |
| R64 | 56R 1 watt |
| R65 | 56R 1 watt |
| R66 | 10k $\frac{1}{4}$ watt resistor |
| R67 | 10k $\frac{1}{4}$ watt resistor |
| R68 | 10k $\frac{1}{4}$ watt resistor |
| R69 | 10k $\frac{1}{4}$ watt resistor |
| R70 | 10k $\frac{1}{4}$ watt resistor |
| R71 | 10k $\frac{1}{4}$ watt resistor |
| R72 | 10k $\frac{1}{4}$ watt resistor |
| R73 | 10k $\frac{1}{4}$ watt resistor |
| U1 | 74HC393 DIP-14 |
| U2 | 74HC14 DIP-14 |
| U3 | 74HC86 DIP-14 |
| U4 | LM350 TO-220 |
| UB1 | BLUEPILL: solder two 20 pin header sockets into board and 20 pin headers on Bluepill, slot into the sockets. |