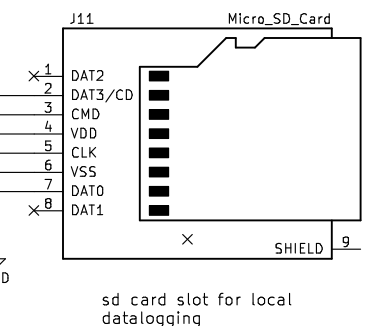
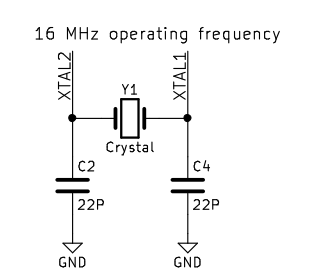
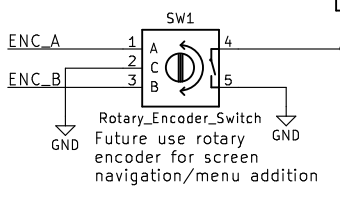
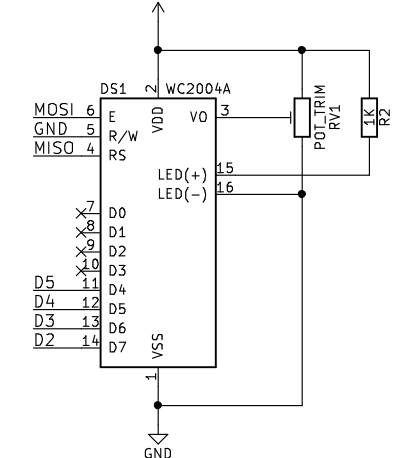


Test input for blown fuse detection. If test input does not match the voltage feedback plus or minus 50 counts, then output enable is disabled and display indicates blown fuse.

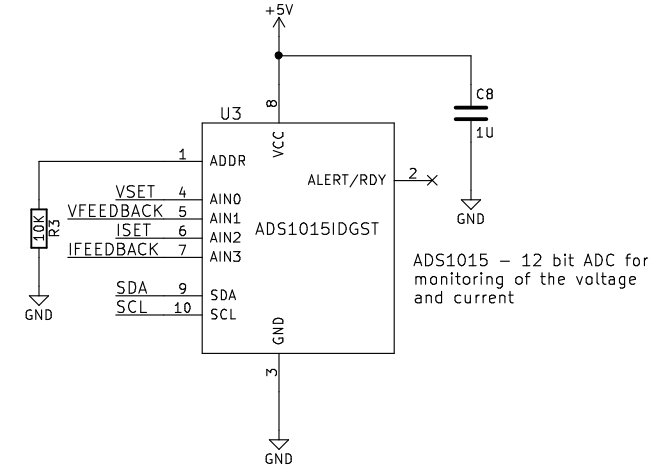


sd card slot for local datalogging

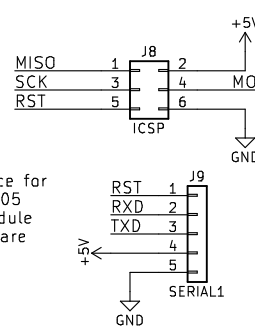
8-Bit microcontroller with Arduino Bootloader, data logging with SD card or sent to computer via serial port.



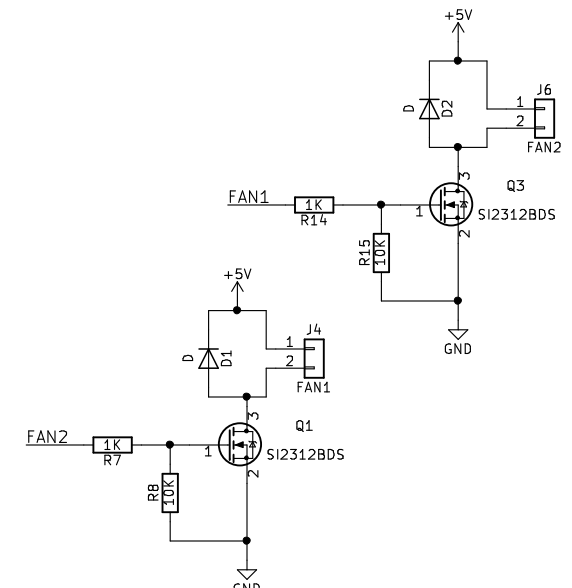
Rotary_Encoder_Switch Future use rotary encoder for screen navigation/menu addition



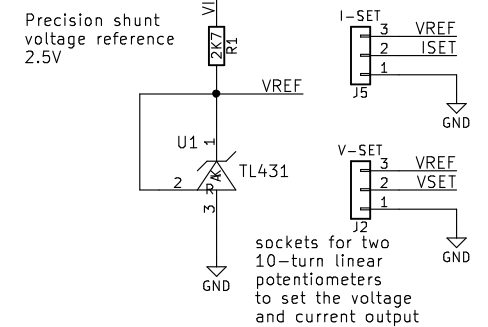
ADS1015 - 12 bit ADC for monitoring of the voltage and current



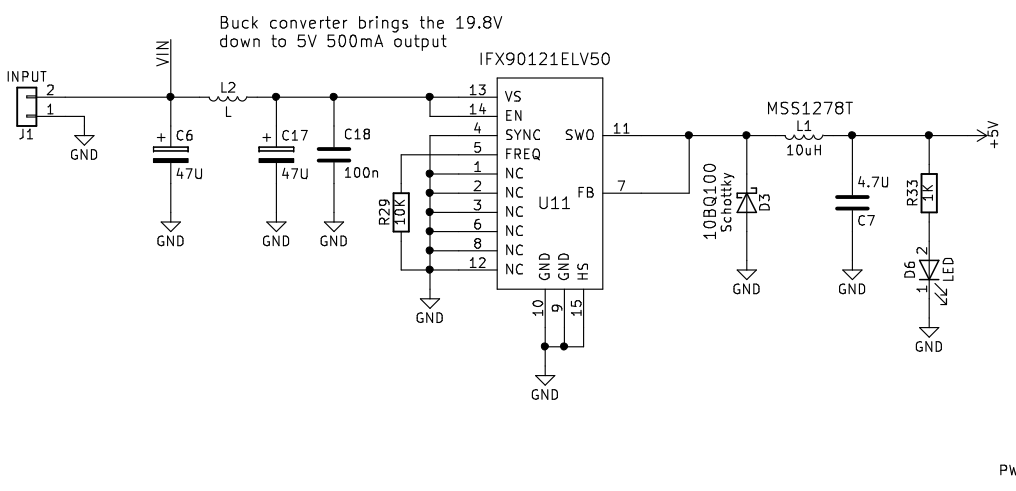
Serial interface for use with HC-05 Bluetooth module and for firmware programming



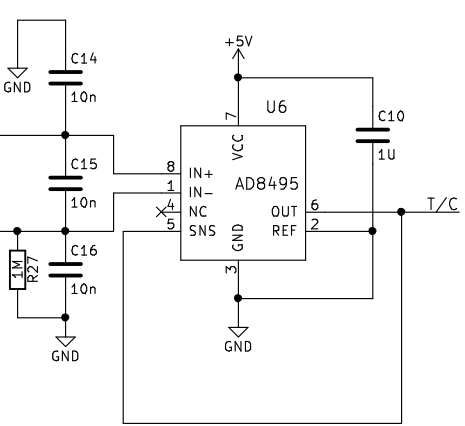
Fans for heatsink and main board active cooling. Each fan 170mA at full speed.



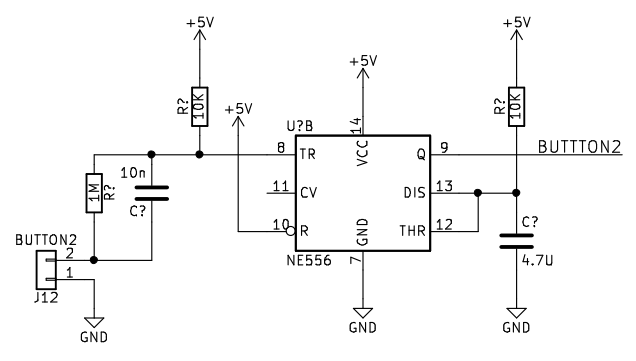
Precision shunt voltage reference 2.5V sockets for two 10-turn linear potentiometers to set the voltage and current output



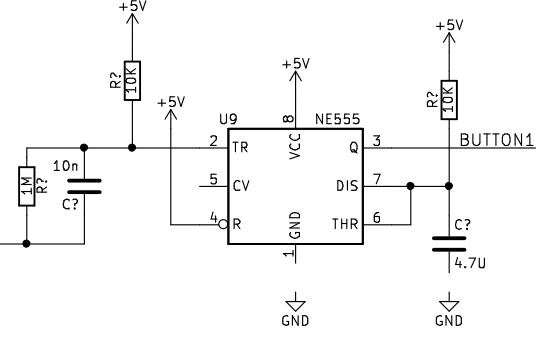
Buck converter brings the 19.8V down to 5V 500mA output



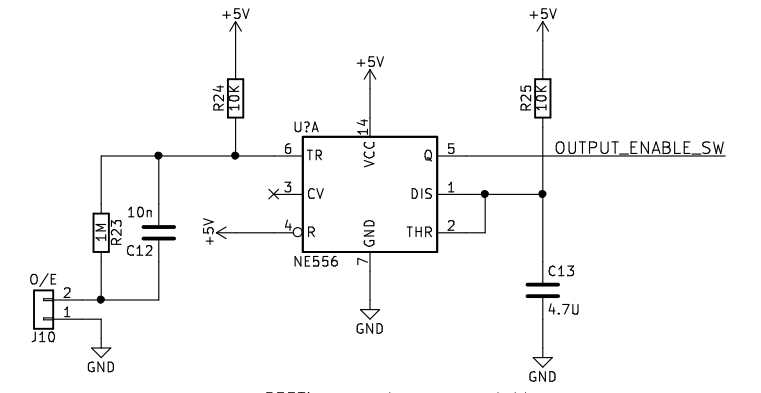
Thermocouple amplifier K type thermocouple to measure heatsink on main pass transistor. T(C) = (Vout - 1.25V) / 5mV per degrees C



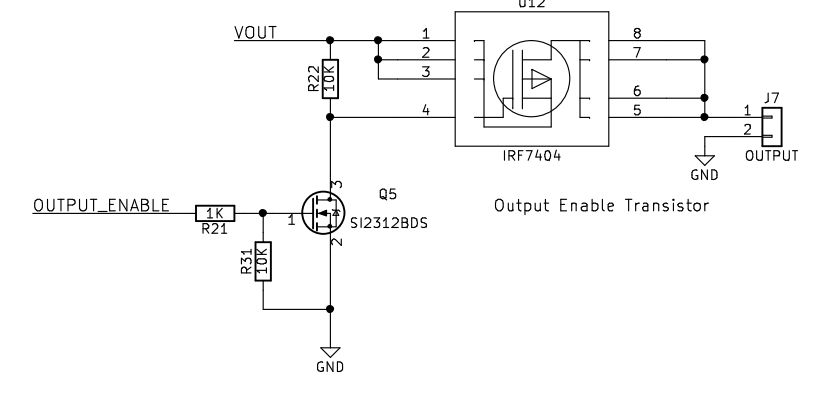
555Timer used a monostable multivibrator in a non retriggrable one shot configuration.



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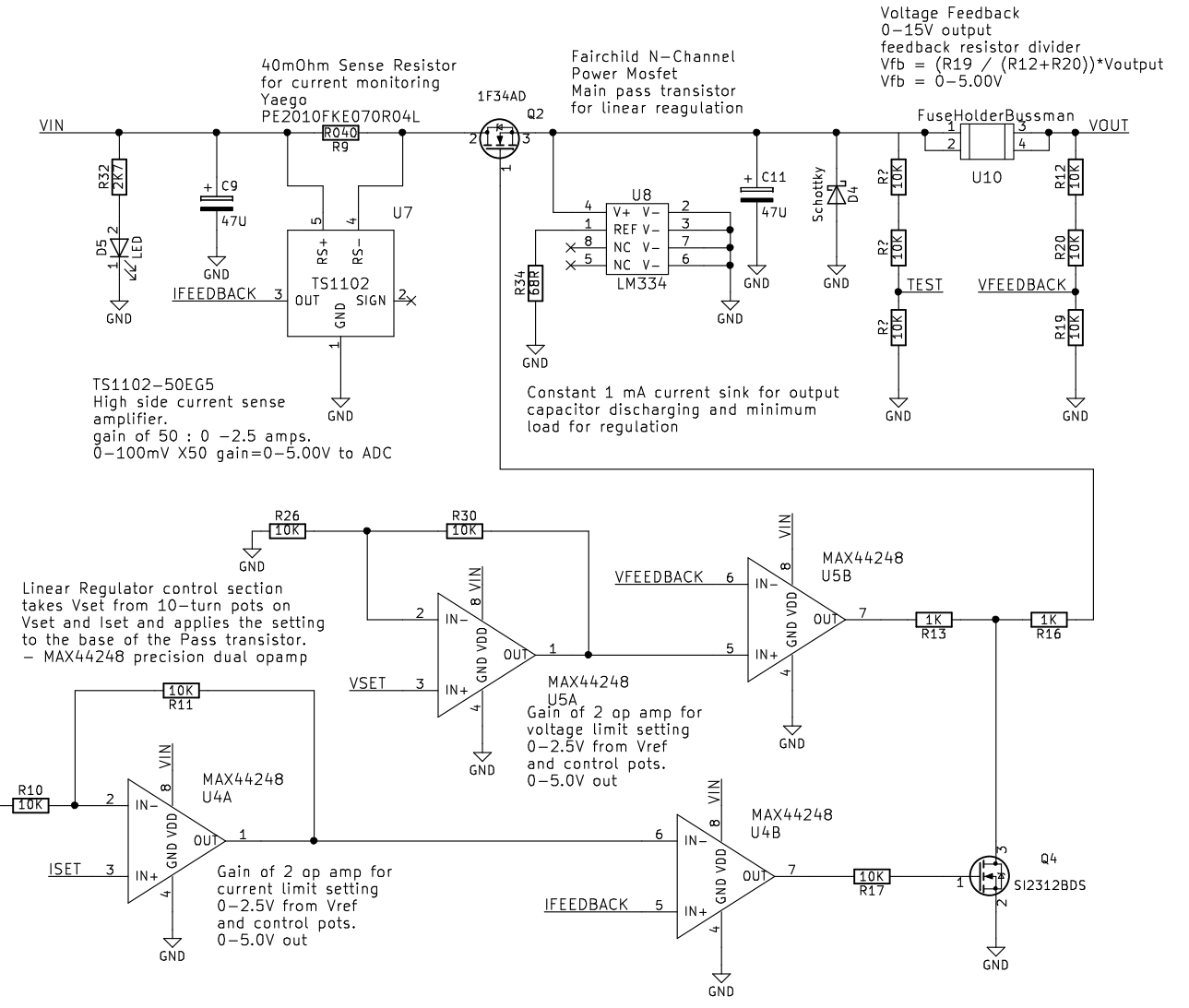


Output Enable Transistor

Linear Power Section : This section of the Schematic takes the 19.8V from the external power supply (old computer power supply) and regulates its output to match the desired set voltage based on two 10-turn potentiometers. The current limit setpoint is based off of the 2.5V from the voltage reference and buffered with a X2 amplifier to compare the 0-5V from the output of the current sense amplifier. The voltage limit setpoint is base off of the 2.5V from the voltage reference and is buffered by a X2 amplifier to compare the output voltage at the source of the pass transistor and through the voltage divider.

The Test output is used by the microcontroller to sense a blown fuse and announce an alarm on the LCD.

The LM334 is used to discharge the output capacitor under no load conditions and to provide minimum sink current of 1mA for regulation.



40mOhm Sense Resistor for current monitoring Yaego PE2010FKE070R04L
Fairchild N-Channel Power Mosfet Main pass transistor for linear regulation
1F34AD
TS1102-50EG5 High side current sense amplifier. gain of 50 : 0 -2.5 amps. 0-100mV X50 gain=0-5.00V to ADC
LM334 Constant 1 mA current sink for output capacitor discharging and minimum load for regulation

Linear Regulator control section takes Vset and Iset and applies the setting to the base of the Pass transistor. - MAX44248 precision dual opamp
MAX44248 U4A Gain of 2 op amp for voltage limit setting 0-2.5V from Vref and control pots. 0-5.0V out
MAX44248 U4B Gain of 2 op amp for current limit setting 0-2.5V from Vref and control pots. 0-5.0V out

Voltage Feedback 0-15V output feedback resistor divider $Vfb = (R19 / (R12+R20)) * Voutput$
 $Vfb = 0-5.00V$

Primary Signal Electronics
2018
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