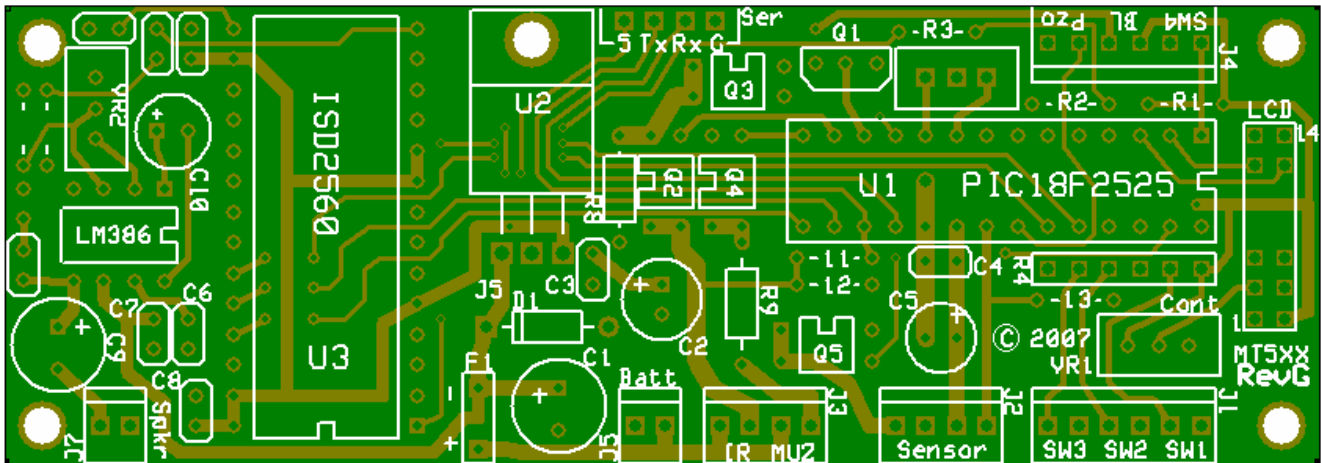
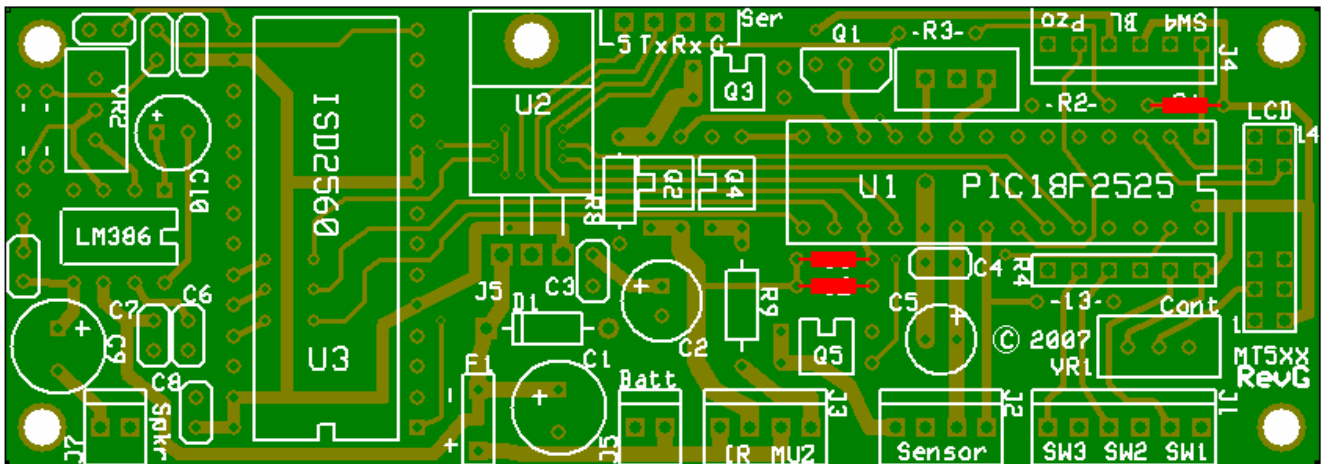


5.XX Rev G Assembly Reference



1. Install 10K resistors (x 3).

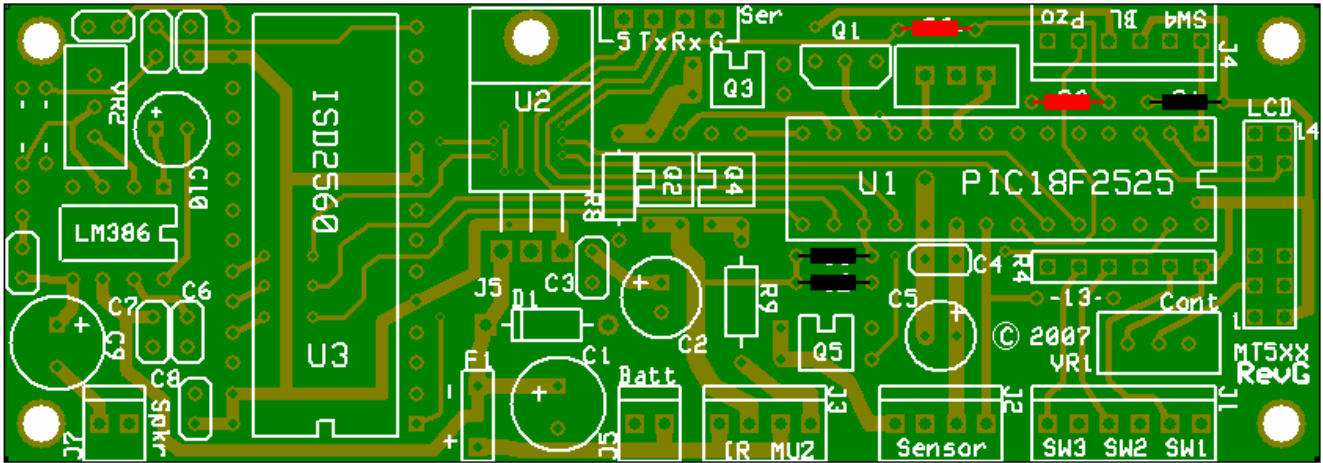
R1 is a pull-up resistor for SW4. **R11** and **R12** form the fail detection circuit for the infrared LED.



Resistor, 10K, 1/8 Watt

2. Install 1.65K resistors (x 2).

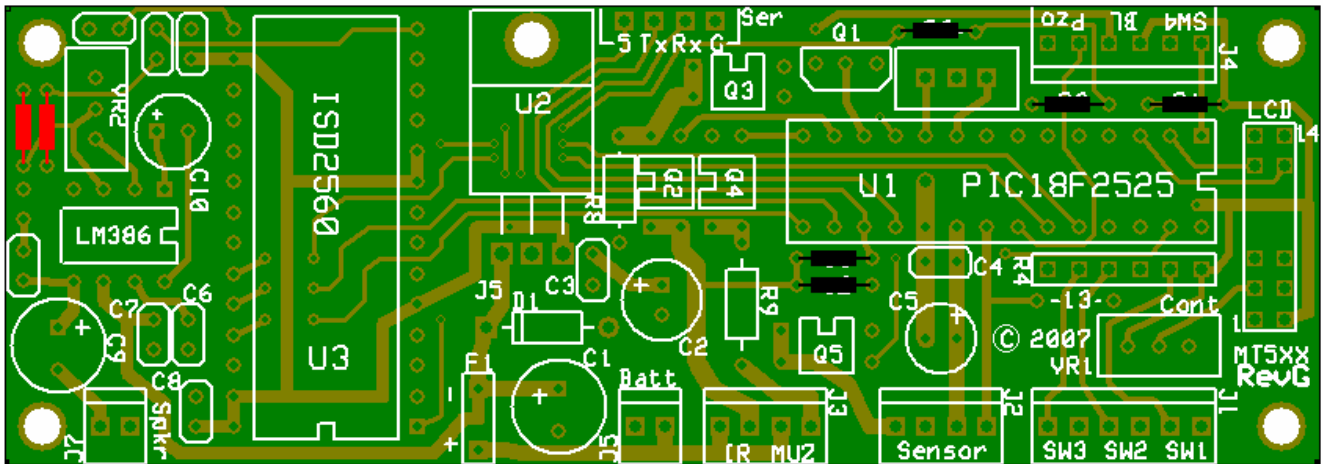
R2 and R3 form a voltage divider to monitor battery voltage. The output of this voltage divider feeds the analog-to-digital (A/D) converter input on U1.



Resistor, 1.65K, 1%, 1/8 Watt

3. Install 680K resistors (x 2).

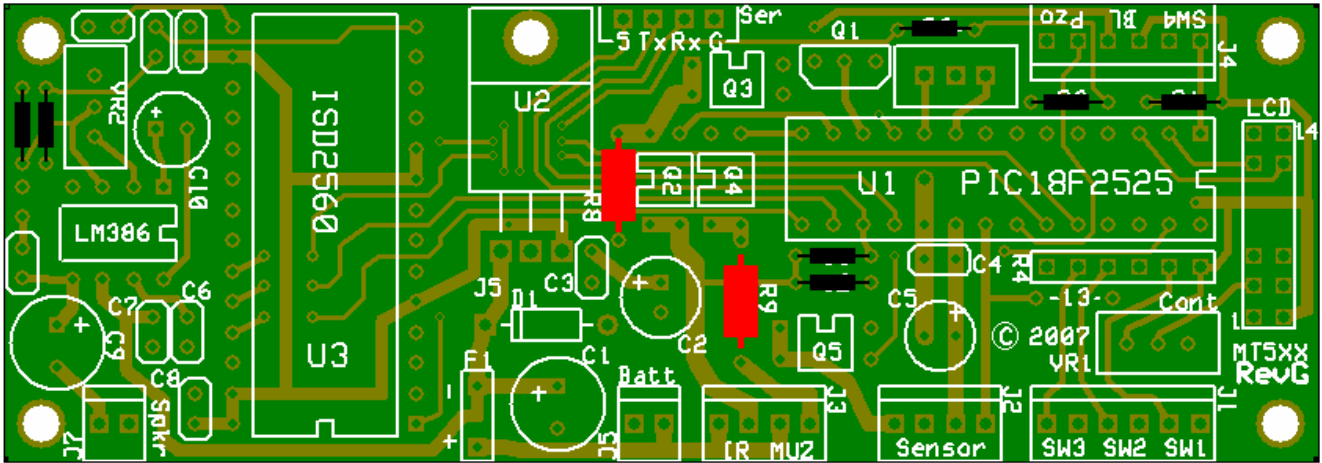
These resistors are part of the audio amplifier circuit. They are required to reduce the signal level from the ISD2560 output pins to a level suitable for input to the the LM386 amplifier IC.



Resistor, 680K, 1/8 Watt

4. Install 51 ohm resistors (x 2).

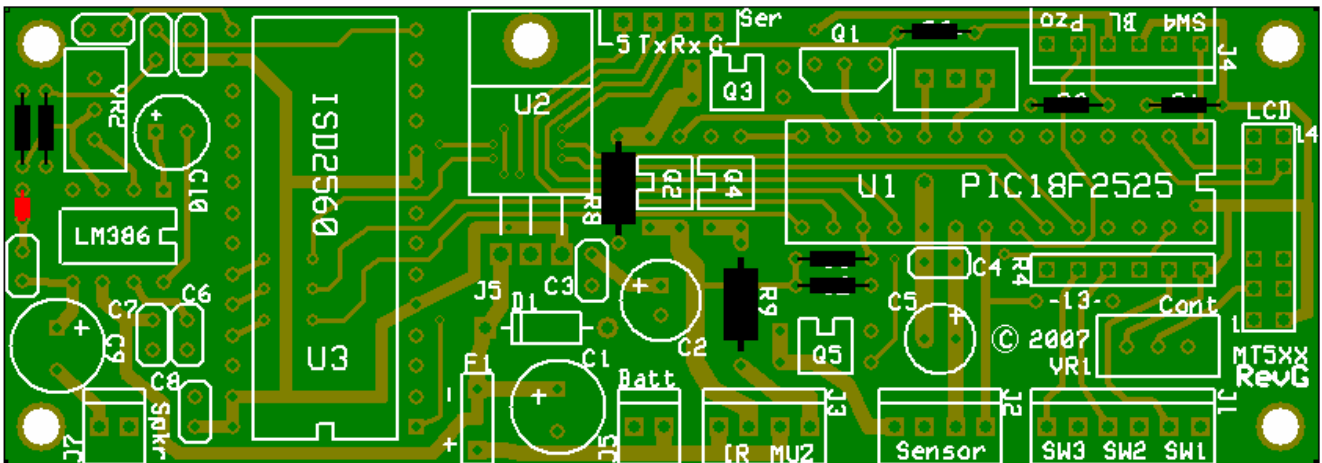
R8 is the current limiter for the infrared LED during “low power” transmit. **R9** is the current limiter for the muzzle flash LED. The 51 ohm resistor value corresponds to approximately 100mA drive current.



Resistor, 51ohm, 1/4 Watt

5. Install 10 ohm resistor (x 1).

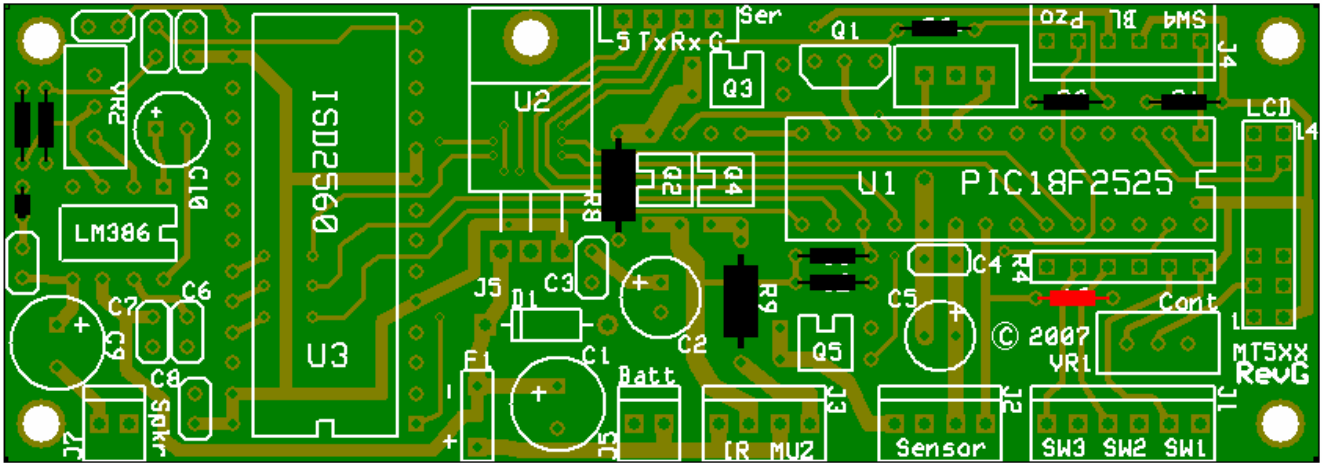
This resistor is part of the LM386 audio amplifier circuit.



Resistor, 10ohm, 1/8 Watt

6. Install 200K resistor (x 1).

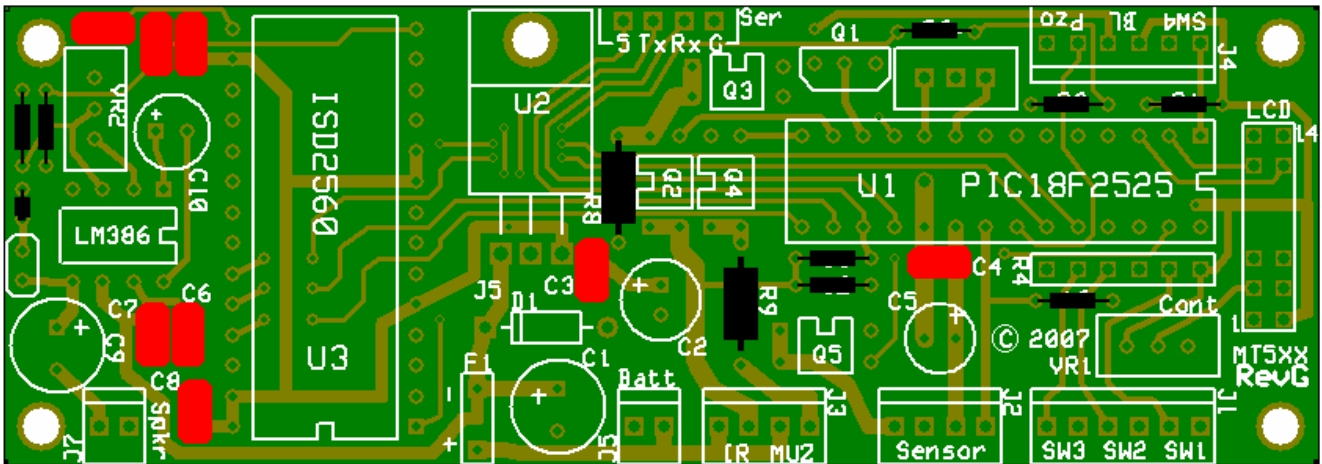
R13 provides a weak pull-down for the sensor input to the microcontroller. It allows the microcontroller to detect when the sensor circuitry fails or is disconnected.



Resistor, 200K, 1/8 Watt

7. Install 0.1uF capacitors (x 8).

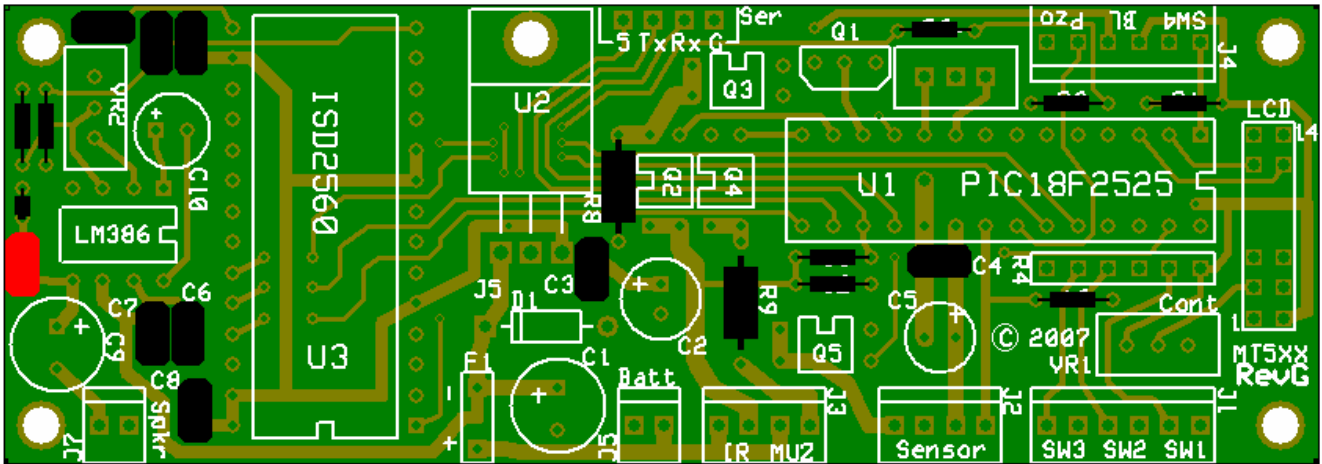
These capacitors are used for decoupling power supply noise (EMI) at U1, U2 and U3. Also for audio coupling in the LM386 audio amplifier circuit.



Capacitor, .1uF

8. Install 0.047uF capacitor (x 1).

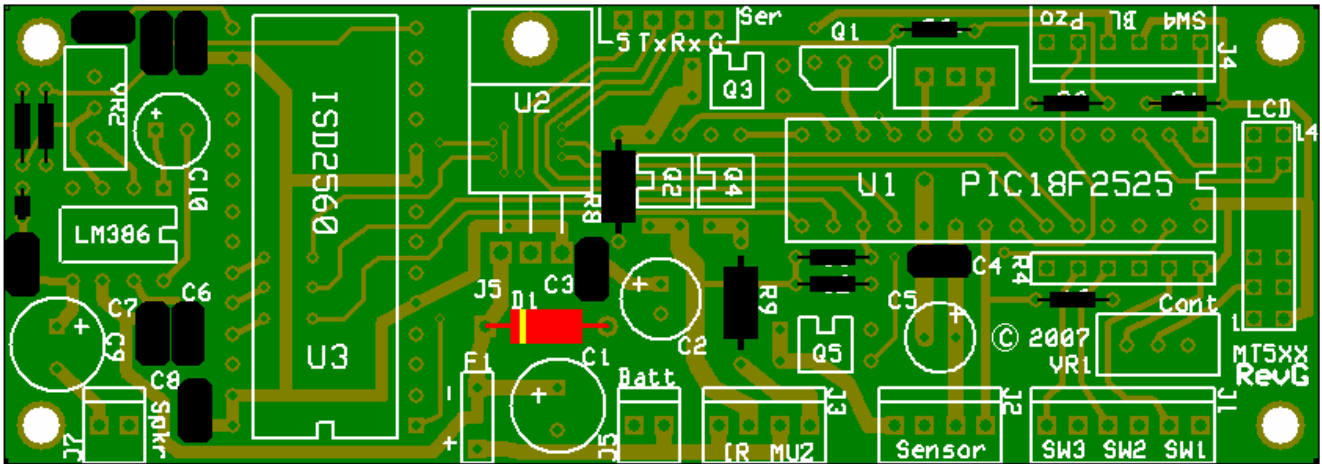
This capacitor is part of the LM386 audio amplifier circuit.



Capacitor, .047uF

9. Install 1N4001 rectifier diode (x 1).

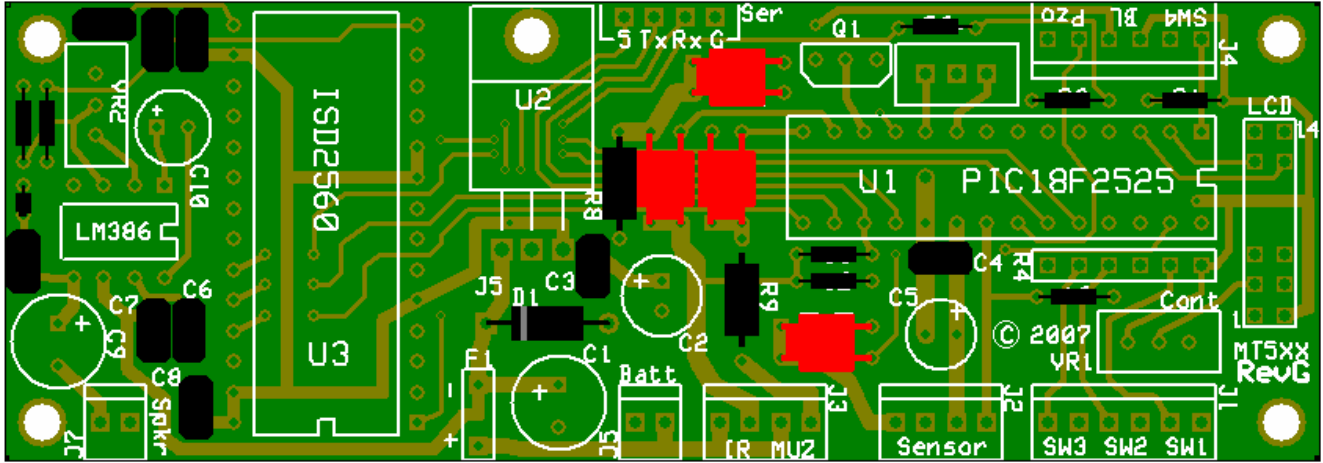
OBSERVE COMPONENT ORIENTATION. D1 acts as a protection device in the event of reverse battery polarity. Primarily this will protect the battery pack more so than the circuitry. If a reverse voltage is applied at the battery input connector (J5), D1 will be forward-biased causing a high current to flow through the fuse F1. This will cause the fuse to open, preventing further current flow through the circuit.



Diode, 1N4001 (check polarity)

10. Install HEXFETs (x 4).

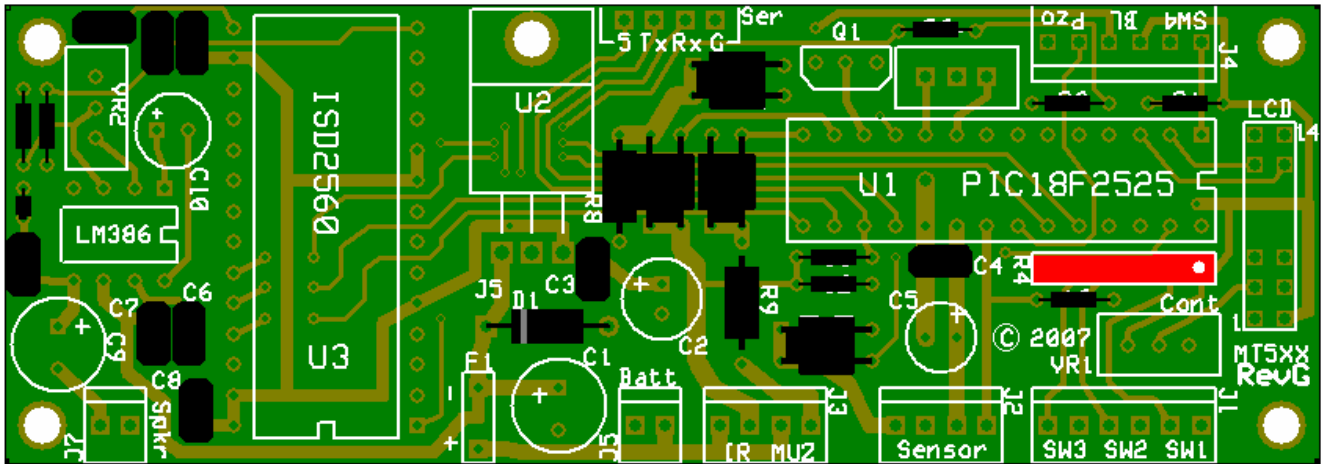
OBSERVE COMPONENT ORIENTATION. Q2 is used to modulate the infrared LED. Q3 controls the current applied to the infrared LED (On=High, Off=Low). Q4 controls the muzzle flash LED. Q5 controls the Hit LEDs in the head sensor.



FET, IRLD110

11. Install 10K SIP resistor (x 1).

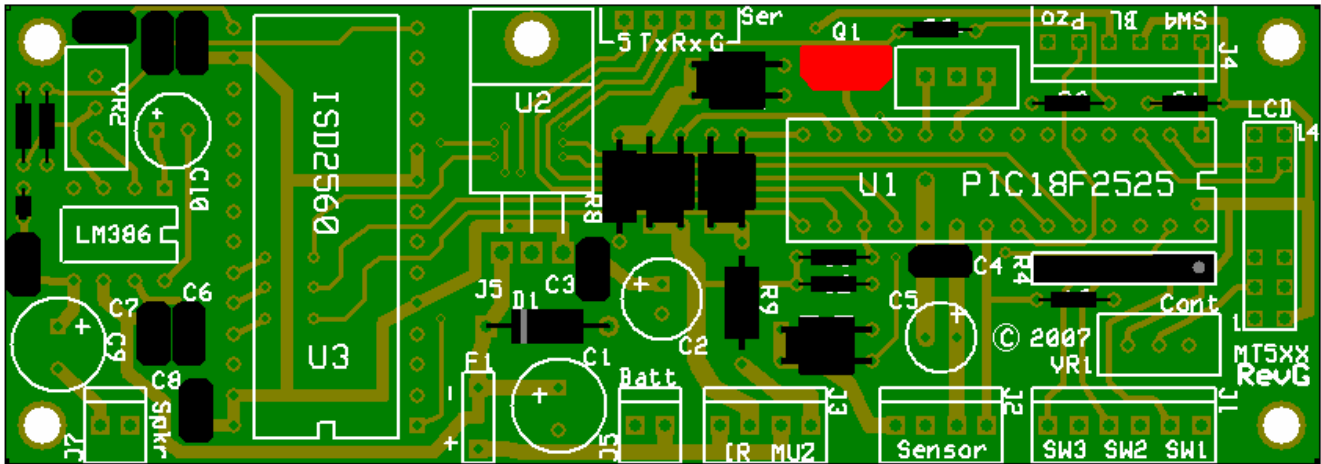
OBSERVE COMPONENT ORIENTATION. R4 resistor array provides the pull up function for SW1, SW2 and SW3 inputs to the microcontroller.



Resistor, SIP, 10K (Check Orientation)

12. Install 2N7000 transistor (x 1).

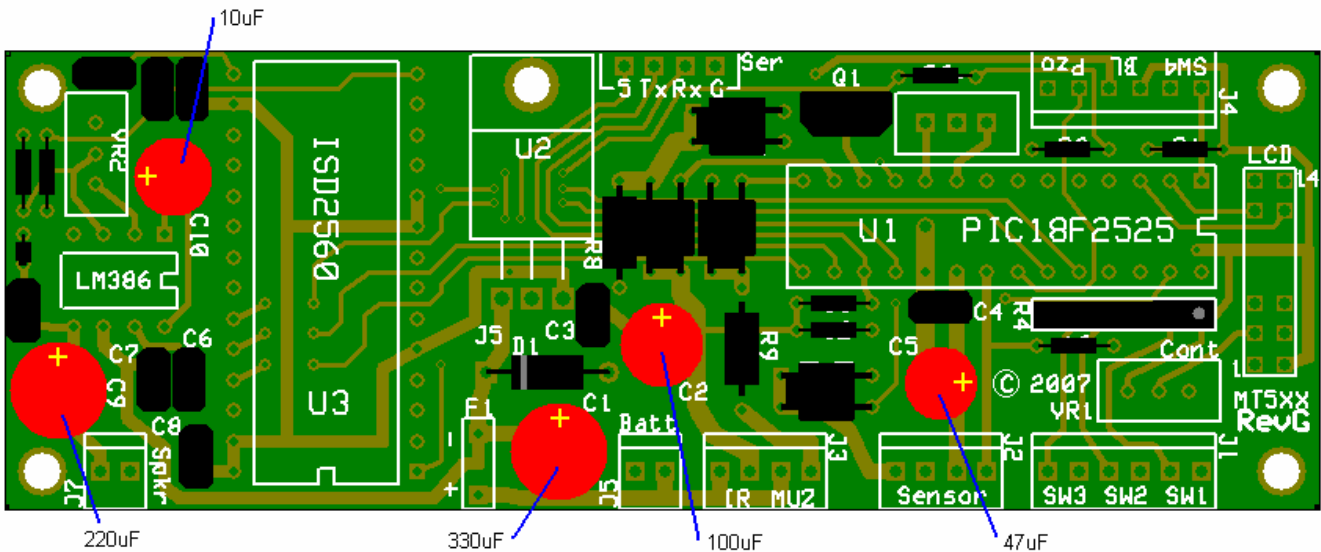
OBSERVE COMPONENT ORIENTATION. Q1 controls the LCD backlight.



FET, 2N7000 (Check Orientation)

13. Install electrolytic capacitors (x 5).

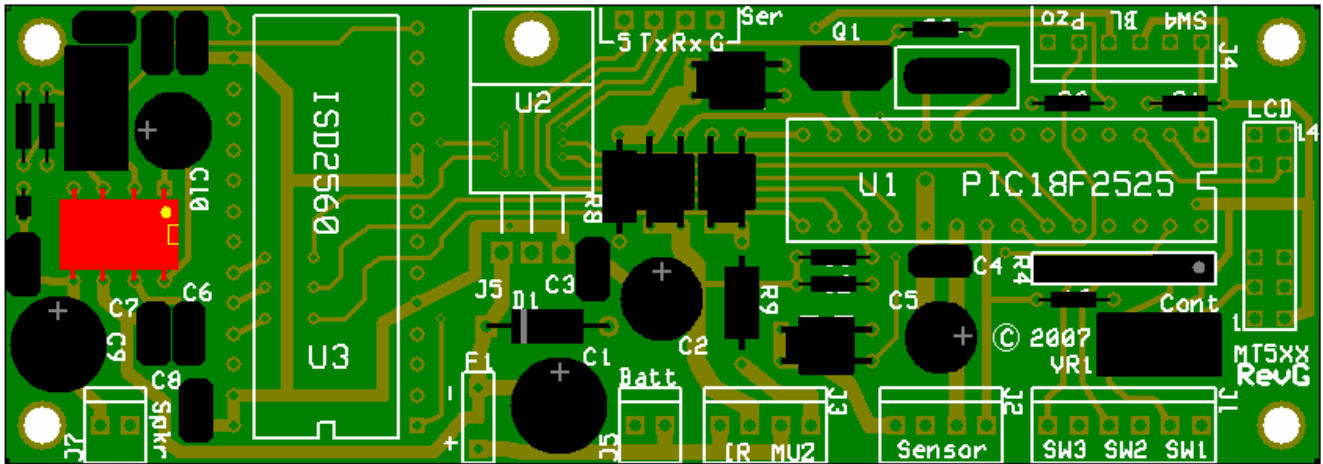
OBSERVE COMPONENT ORIENTATION. C1 is the input power filter for U2. C2 is the output power filter for U2. C5 is the sensor power filter. C9 is used to couple the output pin of the LM386 to the speaker. C10 sets the gain of the audio amplifier.



Capacitors, Electrolytic (Check Polarity)

16. Install LM386 audio amplifier IC (x 1).

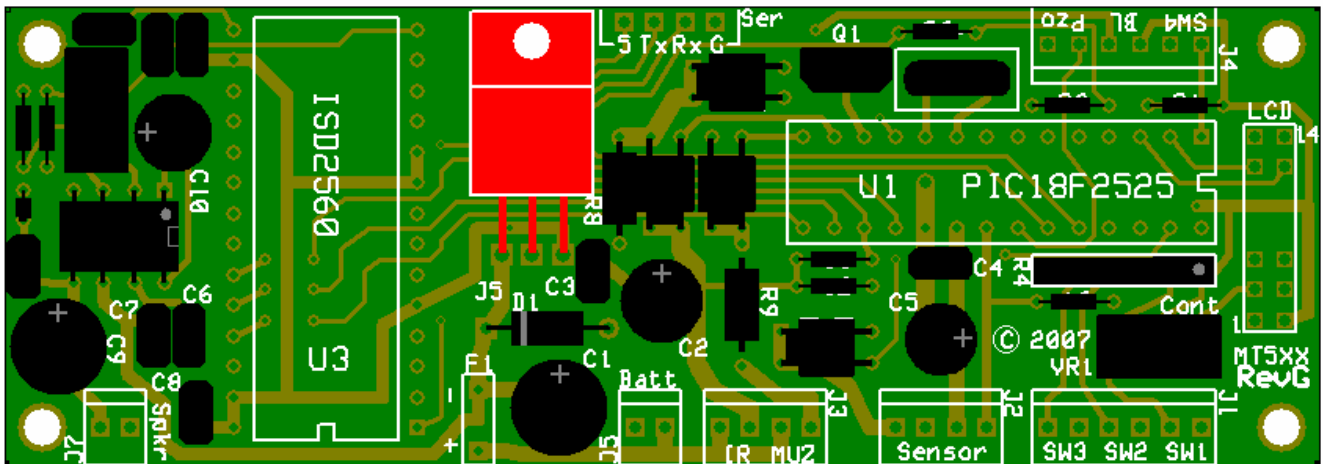
OBSERVE COMPONENT ORIENTATION. Optionally install a socket to allow easier replacement of the LM386.



IC, Audio Amplifier, LM386

17. Install L4941 low-dropout voltage regulator (x 1).

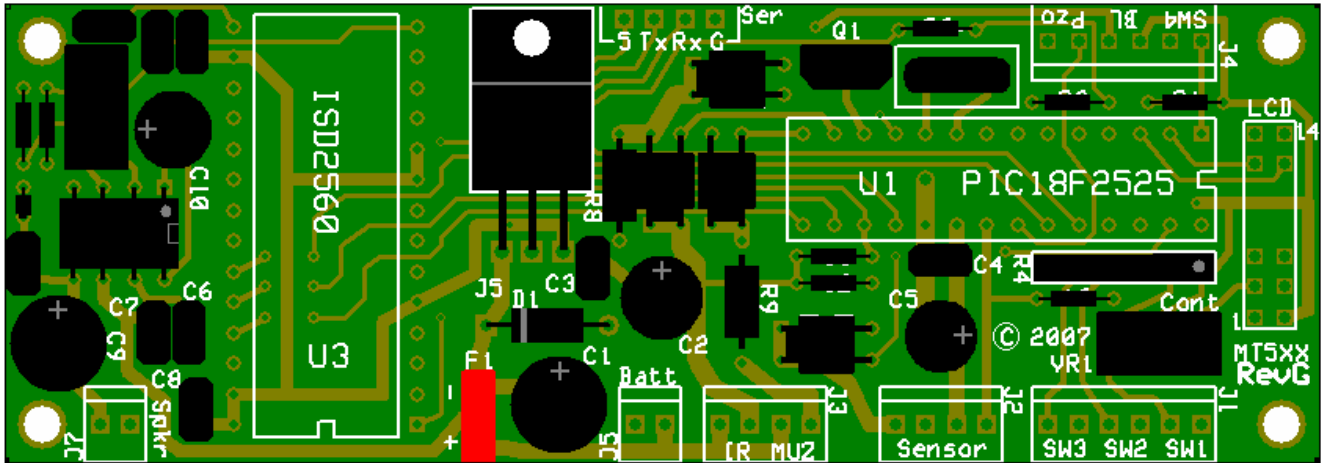
OBSERVE COMPONENT ORIENTATION. U2 provides a stable 5V DC output to power the circuit, with input voltages as low as 5.5V DC. The casing tab should be bolted to the PCB using a TO-220 insulator.



IC, Voltage Regulator, 5V, L4941

18. **Install self-resetting fuse (x 1).**

F1 is a self-resetting fuse that protects the battery pack from excess current draw in the event of a short or reverse voltage on the PCB.



Fuse, Self-Resetting

19. **Install U1 socket.** 28-pin, .3 spacing.
20. **Install U3 socket.** 28-pin, .6 spacing.
21. **Install Molex locking headers.**
22. **Install LCD cable headers.** Standard dual-row headers: 2x2, 2x3.
23. **Optionally install header for Serial port.** Standard header.
24. **Perform voltage tests.**
25. **Install preprogrammed PIC18F2525 microcontroller.**
26. **Install preprogrammed ISD2560 sound chip.**