

Reland Sun DIY Metal Detector Module Kit

Reland Sun DIY Metal Detector Module Kit User Manual

This manual provides instructions for assembling, operating, and troubleshooting the Reland Sun DIY Metal Detector Module Kit.

PRODUCT OVERVIEW

The Reland Sun DIY Metal Detector Module Kit is an electronic soldering practice kit designed to build a non-contact metal detector. It operates on a DC 3-5V power supply and features a printed circuit board (PCB) with an integrated copper wire coil for inductance. This kit is suitable for educational purposes, hobbyists, and security checks for metallic objects.

Key Features

- Operating Voltage: DC 3-5V
- Maximum Detection Range: 5 cm
- Double-sided 1.6mm fiberglass PCB
- Integrated coil design
- Adjustable sensitivity via potentiometer

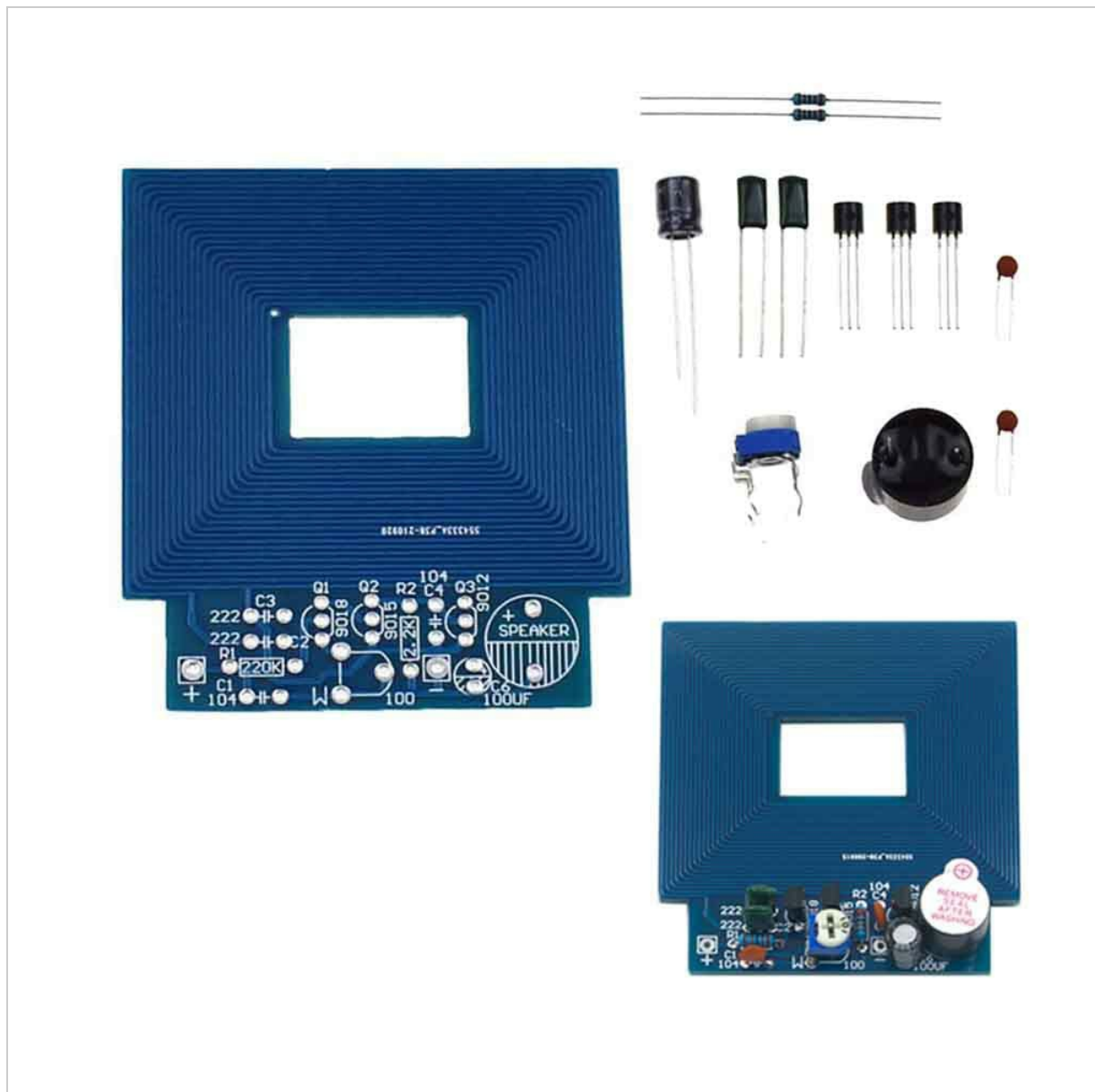


Figure 1: Overview of the Reland Sun DIY Metal Detector Module Kit, showing various electronic components and the main printed circuit board with its integrated coil.

ASSEMBLY INSTRUCTIONS

This kit requires soldering. Ensure you have the necessary tools (soldering iron, solder, wire cutters, safety glasses) and basic soldering skills before proceeding.

1. **Identify Components:** Carefully identify all components provided in the kit. Refer to the PCB markings for component placement.
2. **Solder Resistors:** Solder all resistors (e.g., R1, R2, R3, R4) into their designated positions on the PCB. Pay attention to resistance values.
3. **Solder Capacitors:** Solder the capacitors (e.g., C1, C2, C3, C4) into place. Ensure electrolytic capacitors (like C1) are oriented correctly with their polarity (+/-) matching the PCB markings.
4. **Solder Transistors:** Solder the transistors (e.g., Q1, Q2, Q3) into their respective positions. Ensure the flat side of the transistor matches the outline on the PCB.
5. **Solder Potentiometer:** Solder the potentiometer into its designated spot.
6. **Solder Speaker:** Connect and solder the small speaker to the designated speaker terminals on the PCB.

7. **Solder Power Connections:** Solder wires for the DC 3-5V power supply to the '+' and '-' terminals on the PCB.

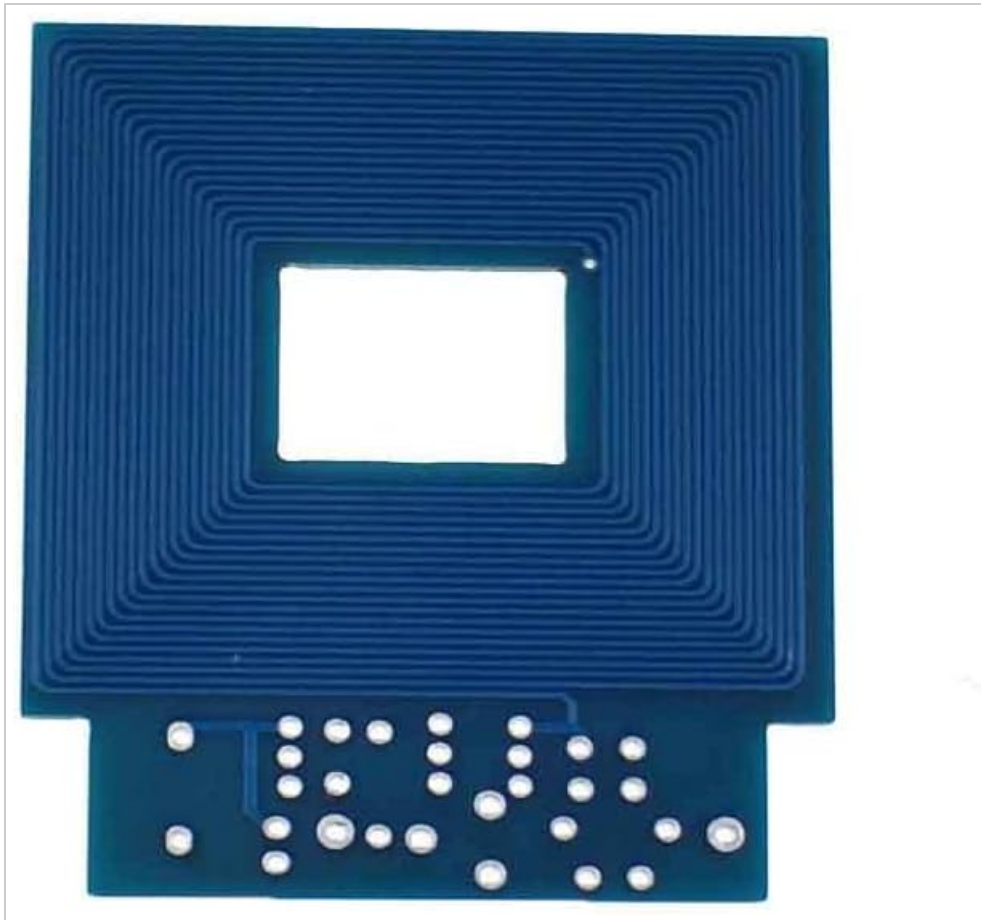


Figure 2: Close-up of the metal detector module's printed circuit board, showing the integrated coil and component pads.

Post-Soldering Debugging

The L1 and L2 inductances are formed by copper traces on the PCB, eliminating the need for separate coil winding. After assembly, the circuit should function with correct installation.

OPERATING INSTRUCTIONS

1. **Connect Power:** Connect a DC 3-5V power supply to the '+' and '-' terminals of the assembled module.
2. **Initial Adjustment:** Adjust the potentiometer until no sound is emitted from the speaker when no metal is near the PCB antenna.
3. **Detection Test:** Bring a metallic object close to the PCB antenna. The speaker should emit a sound.
4. **Sensitivity Adjustment:** Move the metallic object away. The sound should stop. If the sound does not stop when the metal is removed, turn the potentiometer slightly counter-clockwise and re-test until the desired response is achieved.

Detection Range and Sensitivity

The effective detection diameter of the integrated coil is approximately 5 cm. For longer detection distances and higher sensitivity, you may construct your own detection coil.

- **Coil Diameter:** A larger detection coil diameter generally results in a longer detection distance.
- **Coil Q-value:** A higher Q-value for the detection coil improves resolution for small metallic objects.
- **General Rule:** The maximum effective detection distance is approximately equal to the diameter of the

detection coil.

TROUBLESHOOTING

Common Issues

- **Continuous Sound After Power-On:** If the speaker emits a continuous sound immediately after power-on, it indicates that the front oscillatory stage is not vibrating correctly.
 - **Possible Causes:**
 - Incorrectly installed resistors, transistors, or other components.
 - Short circuit or open circuit within the PCB coil traces.
 - Transistor Q2's gain is too low to properly switch Q3.
 - **Solution:** Carefully inspect all soldered connections and component orientations using a magnifying glass. Verify component values.
- **No Sound or Weak Detection:**
 - **Possible Causes:**
 - Incorrect power supply voltage (should be DC 3-5V).
 - Potentiometer not adjusted correctly.
 - Faulty speaker or connections.
 - **Solution:** Check power supply. Re-adjust the potentiometer. Verify speaker connections and functionality.

SPECIFICATIONS

Feature	Specification
Operating Voltage	DC 3-5V
Maximum Detection Range	5 cm (approximate, with integrated coil)
PCB Material	1.6mm Double-sided Fiberglass
Manufacturer	RELAND SUN
ASIN	B09VDDH1ML
UPC	708310930078

MAINTENANCE

The Reland Sun DIY Metal Detector Module Kit requires minimal maintenance once assembled correctly.

- **Cleaning:** Keep the PCB clean and free from dust and debris. Use a soft, dry brush or compressed air if necessary.
- **Storage:** Store the module in a dry environment, away from extreme temperatures and humidity, to prevent corrosion or damage to components.
- **Power Supply:** Always use a stable DC 3-5V power supply. Incorrect voltage can damage the components.

WARRANTY AND SUPPORT

Information regarding specific warranty terms for this DIY kit is not provided. As a DIY kit, successful operation largely depends on the assembler's soldering skills and adherence to instructions.

For technical support or inquiries, please refer to the vendor or retailer from whom the kit was purchased.