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Zerone Forty-9er

Zerone Forty-9er 3W CW Shortwave Radio Kit Instruction Manual

Model: Forty-9er | Brand: Zerone

1. INTRODUCTION

This document provides instructions for the assembly, operation, and maintenance of the Zerone Forty-9er 3W CW Shortwave Radio Kit. This kit is designed for amateur radio enthusiasts interested in building their own 3W Continuous Wave (CW) shortwave transmitter and receiver. The assembled unit offers 3W output power for effective remote communication and includes a side tone circuit for monitoring keying during transmission.

The kit consists of an unsoldered circuit board and various electronic components that require careful assembly. Please read all instructions thoroughly before beginning the assembly process.

2. PACKAGE CONTENTS

Before starting assembly, verify that all components listed below are present in your kit. Refer to the provided circuit diagram for component identification.

- 1 x Unsoldered Circuit Board (Forty-9er V1.0 PCB)
- 1 x Scattered Components Kit (Resistors, Capacitors, Diodes, Transistors, Integrated Circuits, Inductors, Connectors, etc.)
- 1 x Circuit Diagram
- Associated wiring

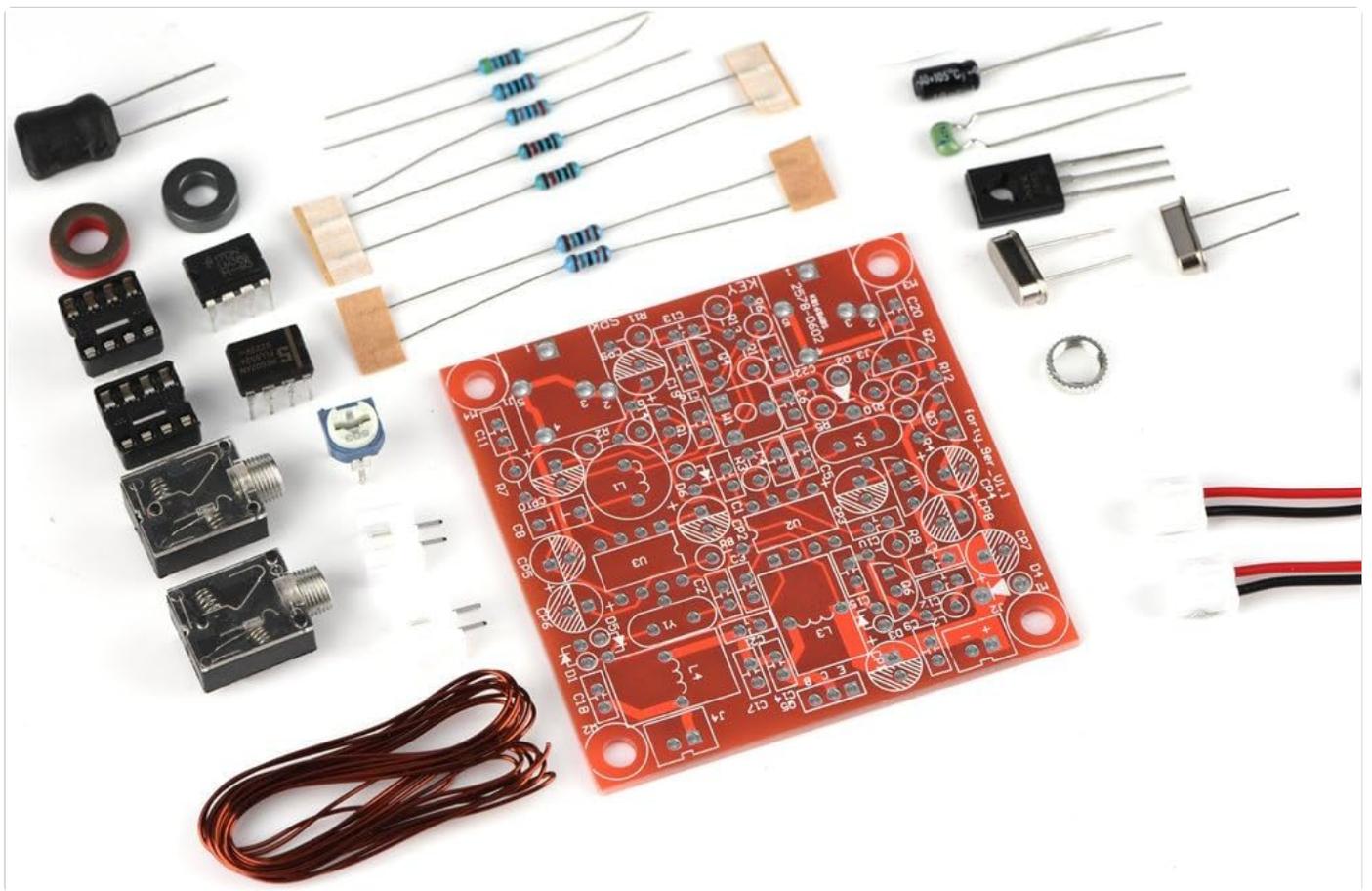


Figure 2.1: Overview of the scattered components included in the kit.

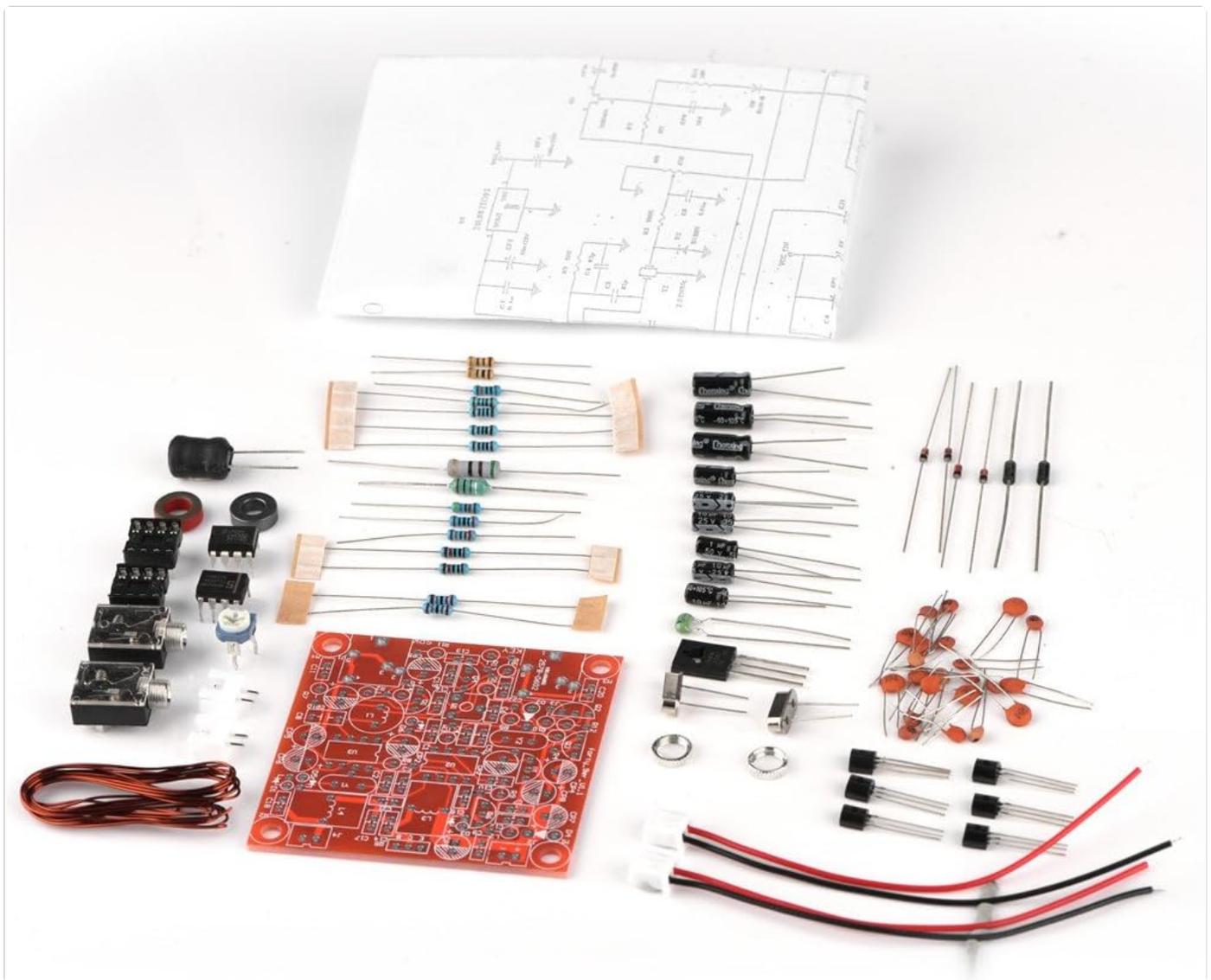


Figure 2.2: The kit components alongside the provided circuit diagram.

3. ASSEMBLY INSTRUCTIONS

Assembly of this kit requires basic soldering skills and familiarity with electronic components. It is highly recommended to have a multimeter for testing and verification during the process. Due to the nature of DIY kits, careful attention to detail is crucial.

3.1. Tools Required

- Soldering Iron with fine tip
- Solder wire (rosin core recommended)
- Desoldering pump or braid
- Small pliers and wire cutters
- Multimeter
- Magnifying glass (optional, but recommended for small components)
- Safety glasses

3.2. Component Identification and Placement

1. **Familiarize with the Circuit Diagram:** Carefully study the provided circuit diagram (Figure 3.1) to understand the circuit layout and component values. Note that the legibility of the diagram may vary, and external online resources or community forums may offer clearer versions or supplementary guides.

- **Antenna:** Connect a suitable 50 Ohm shortwave antenna to the antenna terminal (ANT).
- **Key:** Connect a CW telegraph key to the KEY jack.
- **Headphones/Speaker:** Connect headphones or a small speaker to the SPK jack for audio output.

4.2. Basic Operation

1. **Power On:** Apply 12V DC power.
2. **Reception:** The radio will be in receive mode when the key is not pressed. Adjust the variable resistor (potentiometer) on the board for fine-tuning the receiver.
3. **Transmission:** Pressing the CW key will switch the radio to transmit mode. The integrated side tone circuit allows you to hear your keying in the headphones/speaker during transmission.
4. **Tuning:** The Forty-9er is typically designed for a specific frequency band (e.g., 40 meters). Fine-tuning within this band is achieved via the variable capacitor or potentiometer.

5. MAINTENANCE

To ensure the longevity and optimal performance of your Forty-9er radio kit, follow these maintenance guidelines:

- **Keep Clean:** Regularly clean the circuit board and components with a soft, dry brush to remove dust and debris. Avoid using liquids directly on the board.
- **Inspect Connections:** Periodically check all soldered connections for signs of corrosion or loosening. Re-solder any questionable joints.
- **Proper Storage:** Store the radio in a dry, cool environment, away from direct sunlight and extreme temperatures. If not housed in a protective enclosure, consider placing it in an anti-static bag.
- **Power Supply:** Always use a stable and correctly rated 12V DC power supply. Avoid using power supplies with excessive ripple or incorrect voltage.

6. TROUBLESHOOTING

If you encounter issues with your assembled Forty-9er kit, refer to the following troubleshooting steps:

6.1. No Power / No Indicators

- **Check Power Supply:** Ensure the 12V DC power supply is connected correctly and providing the specified voltage.
- **Verify Power Polarity:** Double-check the polarity of the power connection at J4. Incorrect polarity can damage components.
- **Inspect Solder Joints:** Examine solder joints around the power input and voltage regulator for cold joints or shorts.

6.2. No Reception / Weak Reception

- **Antenna Connection:** Ensure the antenna is properly connected and suitable for the operating frequency.
- **Headphones/Speaker:** Verify that headphones or a speaker are connected and functioning.
- **IC Orientation:** Confirm that the NE602AN and LM386 ICs are inserted with the correct orientation. As noted in assembly, the NE602AN marking on the PCB might be reversed.
- **Component Values:** Double-check the values and placement of resistors and capacitors in the receiver section.

6.3. No Transmission / Weak Output

- **Key Connection:** Ensure the CW key is properly connected and making good contact.
- **Power Amplifier Section:** Inspect components in the power amplifier stage (transistors, inductors) for correct placement and soldering.
- **Inductor Windings:** Verify the number of turns on inductors L3 and L4, as incorrect windings can significantly affect

performance.

6.4. Sidetone Not Working

- **Component Check:** Examine the components associated with the sidetone oscillator circuit for correct values and placement.
- **Solder Joints:** Inspect solder joints in the sidetone circuit for any issues.

7. SPECIFICATIONS

Feature	Specification
Model	Forty-9er
Brand	Zerone
Type	CW Shortwave Transmitter Receiver DIY Kit
Output Power	3W
Board Size	6cm x 6cm (2.36in x 2.36in)
Weight (Kit)	Approximately 56g
Antenna Impedance	50 Ohms
Number of Channels	1
Power Supply	12V DC (external)

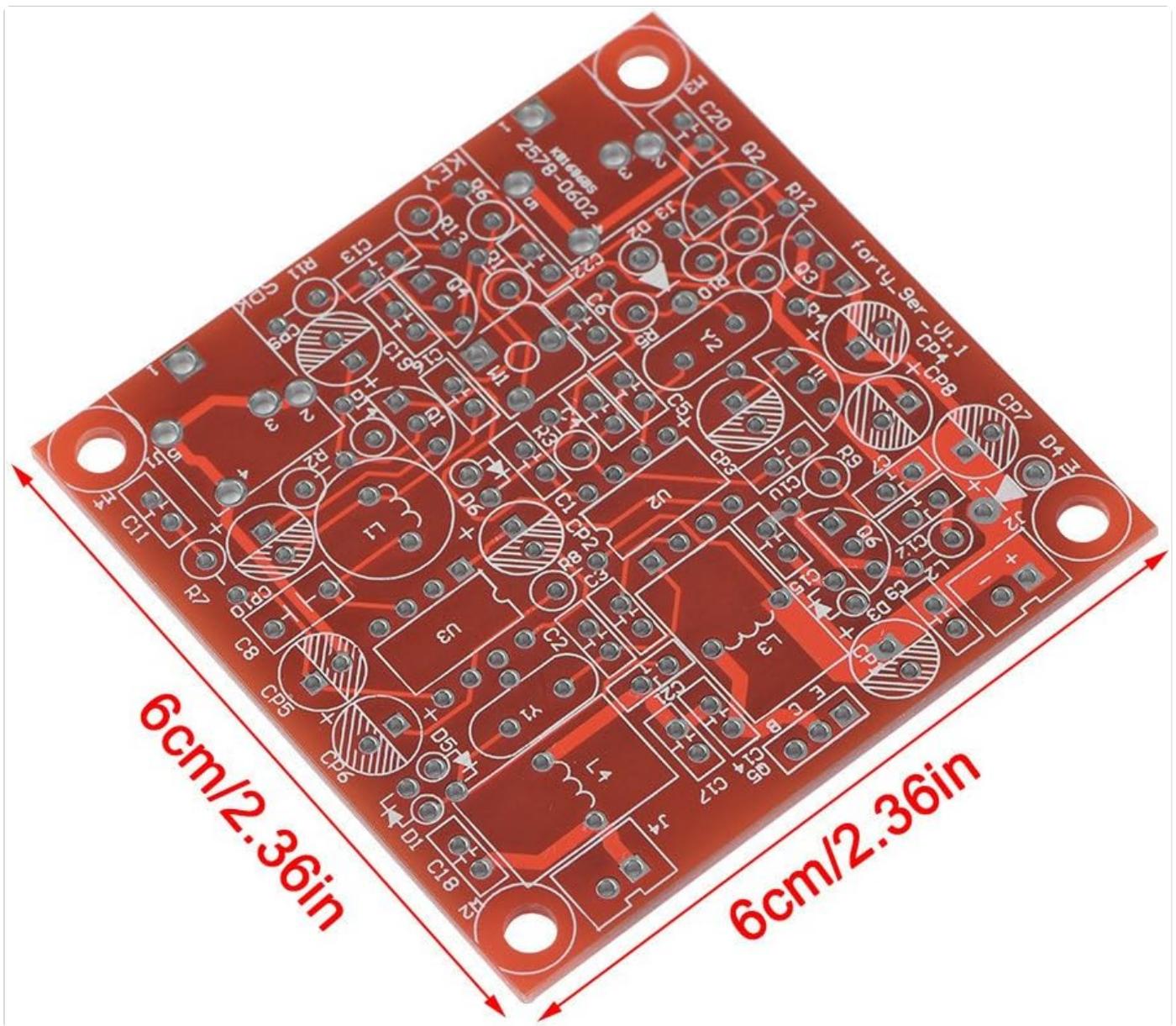


Figure 7.1: Dimensions of the Forty-9er circuit board.

8. WARRANTY AND SUPPORT

As a DIY kit, the warranty typically covers manufacturing defects of individual components rather than issues arising from assembly errors. For specific warranty details or technical support, please contact the manufacturer, Zerone, or the retailer from whom the kit was purchased. Online amateur radio communities and forums can also be valuable resources for assembly tips and troubleshooting for this type of kit.