

Gikfun EK2163

Gikfun FM Radio Soldering Kit EK2163 Instruction Manual

Model: EK2163

1. INTRODUCTION

This instruction manual provides detailed guidance for assembling, operating, and maintaining your Gikfun FM Radio Soldering Kit, Model EK2163. This kit is designed as a DIY electronics project, suitable for students and hobbyists interested in STEM learning. Upon successful assembly, you will have a functional FM radio capable of receiving frequencies between 87-108MHz, powered by either USB or batteries.

2. SAFETY INFORMATION

Please read and understand all safety instructions before beginning assembly. Failure to follow these instructions may result in injury or damage to the product.

- **Soldering Safety:** Always use a soldering iron in a well-ventilated area. Wear safety glasses to protect your eyes from solder splatter. Avoid touching the hot tip of the soldering iron. Use a heat-resistant mat to protect your work surface.
- **Electrical Safety:** Ensure the power supply is disconnected before handling components or making connections. Do not exceed the specified operating voltage (DC 3/5V).
- **Component Handling:** Some electronic components can be sensitive to static electricity. Handle components by their edges and avoid touching pins directly.
- **Small Parts:** This kit contains small parts that could be a choking hazard. Keep out of reach of small children.

3. PACKAGE CONTENTS

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- Printed Circuit Board (PCB)
- Clear Acrylic Case (top and bottom panels, screws)
- Digital Display Module
- Telescopic Antenna
- Speaker
- Integrated Circuits (ICs)
- Resistors (various values)
- Capacitors (electrolytic and ceramic, various values)
- Diodes and LEDs
- Push Buttons
- Potentiometers (for tuning and volume)

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- 3.5mm Audio Jack
- USB Power Cable
- Battery Case (for AA batteries, batteries not included)
- Power Switch

4. SETUP AND ASSEMBLY INSTRUCTIONS

This section outlines the general steps for assembling your FM radio kit. Refer to the provided circuit diagram and component layout for precise placement. Soldering skills are required.

4.1 Tools Required (Not Included)

- Soldering Iron (fine tip recommended)
- Solder Wire (rosin core)
- Solder Wick or Solder Pump (for desoldering errors)
- Wire Cutters/Strippers
- Small Pliers/Tweezers
- Multimeter (optional, for testing connections)
- Small Screwdriver (for case assembly and adjustments)

4.2 Assembly Steps

1. **Component Identification:** Carefully identify all components. Pay attention to resistor color codes, capacitor values, and IC part numbers.
2. **Solder Smallest Components First:** Begin by soldering the smallest components to the PCB, such as resistors, diodes, and ceramic capacitors. Ensure correct polarity for diodes (band indicates cathode).
3. **Install IC Sockets (if applicable):** If your kit includes IC sockets, solder these to the PCB first. This protects the ICs from heat during soldering.
4. **Solder Larger Components:** Proceed with larger components like electrolytic capacitors (observe polarity: longer lead is positive), transistors, and ICs (if not using sockets, align notch/dot with PCB marking).
5. **Solder Connectors and Controls:** Solder the push buttons, potentiometers, 3.5mm audio jack, power switch, and power input connector.
6. **Solder Digital Display:** Carefully solder the digital display module to its designated pins on the PCB.
7. **Connect Speaker and Antenna:** Solder the speaker wires and the telescopic antenna to their respective points on the PCB.
8. **Initial Power-On and Testing:** Before fully enclosing the unit, connect a power source (USB or batteries). Power on the radio and perform an initial test. Adjust the tuning potentiometer to check for FM reception.



Power on and tune before securing the housing;
Adjust with a screwdriver if not clear.

Image: Adjusting the tuning potentiometer on the circuit board before securing the housing. Use a small screwdriver for precise adjustments if the display is unclear.

9. **Assemble the Acrylic Case:** Once satisfied with the functionality, carefully mount the assembled PCB into the clear acrylic case using the provided screws and standoffs. Ensure all buttons, jacks, and the antenna are properly aligned with the case openings.



Image: The fully assembled Gikfun FM Radio Soldering Kit with its clear acrylic case, antenna extended, and digital display showing.

5. OPERATING INSTRUCTIONS

Once assembled, your Gikfun FM Radio is ready for use.

5.1 Powering On

The radio supports two power modes:

- **USB Power:** Connect the provided USB cable to the radio's USB port and to a 5V USB power adapter or computer USB port.
- **Battery Power:** Insert 3 AA batteries (not included) into the battery case and connect the battery case to the designated power input on the radio.

Flip the power switch to the 'ON' position. The digital display should illuminate.



Image: The Gikfun FM Radio powered via its USB cable, demonstrating one of the dual power modes.

5.2 Controls and Functions

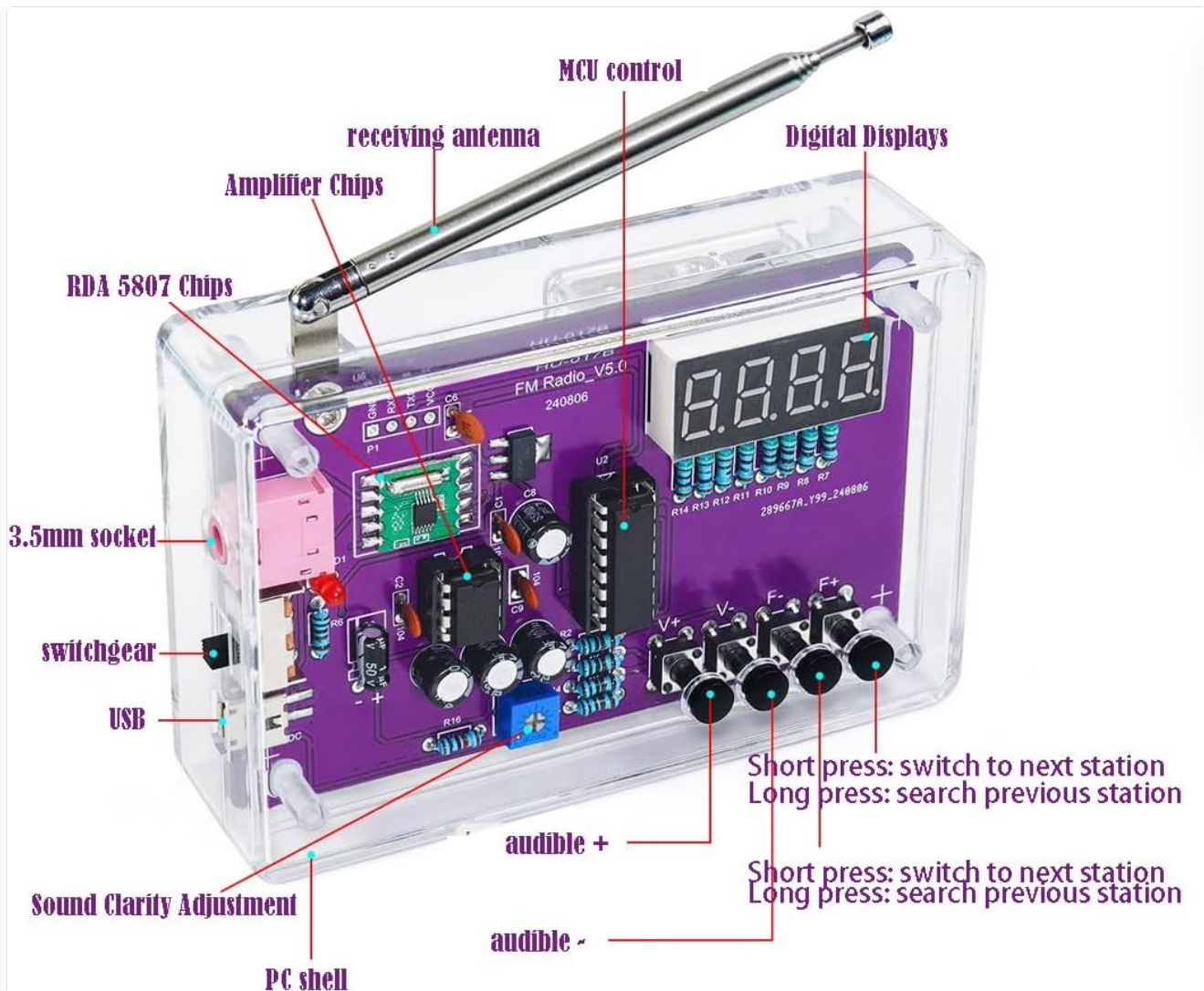


Image: Detailed diagram labeling key components and controls of the FM radio, including the antenna, digital display, 3.5mm socket, USB port, switchgear, sound clarity adjustment, and station/volume buttons.

- **Digital Display:** Shows the current FM frequency (87-108MHz).
- **Telescopic Antenna:** Extend the antenna for optimal signal reception. Adjust its position for better clarity.
- **Frequency Adjustment Buttons (F- / F+):**
 - Short press: Switch to the next/previous station.
 - Long press: Search for the next/previous available station.
- **Volume Adjustment Buttons (V- / V+):** Adjust the audio output volume.
- **3.5mm Audio Jack:** Connect headphones or external speakers for a personalized listening experience.

3.5mm Audio Jack

Supports connecting headphones or speakers

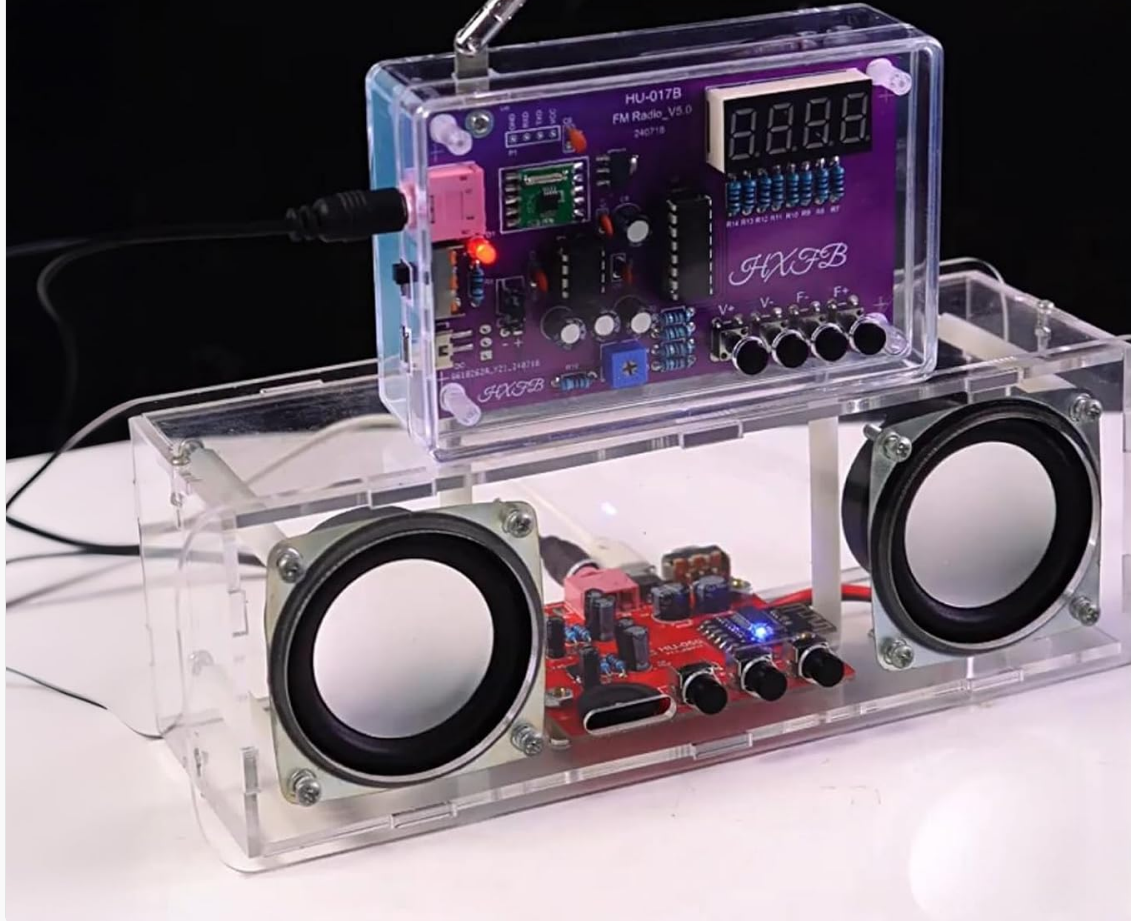


Image: The FM radio connected to an external speaker system using its 3.5mm audio jack, demonstrating its versatility for audio output.

- **Sound Clarity Adjustment:** A small potentiometer on the PCB (often labeled 'Sound Clarity' or similar) can be fine-tuned with a screwdriver to optimize audio output quality.

6. MAINTENANCE

Proper maintenance ensures the longevity and optimal performance of your FM radio kit.

- **Cleaning:** Use a soft, dry cloth to clean the acrylic case. Avoid abrasive cleaners or solvents that may damage the plastic. For the PCB, use a soft brush to remove dust.
- **Storage:** Store the radio in a cool, dry place away from direct sunlight and extreme temperatures. If using batteries, remove them during long periods of non-use to prevent leakage.
- **Component Inspection:** Periodically inspect soldered joints for any signs of corrosion or damage. Re-solder any loose connections if necessary.

7. TROUBLESHOOTING

If you encounter issues with your FM radio, refer to the following troubleshooting guide:

- **No Power/Display Off:**
 - Check power source: Ensure USB cable is securely connected or batteries are correctly inserted and charged.
 - Verify power switch is in the 'ON' position.
 - Inspect power connections on the PCB for cold solder joints or shorts.
- **No Sound/Low Volume:**
 - Ensure volume is turned up using the V+ button.
 - Check speaker connections for proper soldering.
 - If using headphones/external speakers, ensure they are fully plugged into the 3.5mm jack and functional.
 - Inspect amplifier chip connections.
- **Poor Reception/Static:**
 - Extend the telescopic antenna fully and adjust its orientation.
 - Move the radio to a different location, away from potential interference sources (e.g., computers, large metal objects).
 - Fine-tune the frequency using the F- / F+ buttons or the tuning potentiometer.
 - Check antenna connection on the PCB.
- **Incorrect Frequency Display:**
 - Ensure the digital display module is correctly soldered and connected.
 - Verify the main IC (e.g., RDA5807) is correctly installed and soldered.
- **Components Getting Hot:**
 - Immediately disconnect power.
 - Check for short circuits on the PCB, especially around power lines or ICs.
 - Verify correct polarity of electrolytic capacitors and diodes.

8. SPECIFICATIONS

Feature	Detail
Model Number	EK2163
Brand	Gikfun

FM Frequency Range	87-108MHz
Operating Voltage	DC 3/5V
Display Type	Digital
Power Modes	USB (5V) or 3x AA Batteries (3V)
Audio Output	Integrated Speaker, 3.5mm Headphone Jack
Included Components	Capacitor, Resistor, PCBs, Digital Display, Antenna, Speaker, USB Cable, Battery Case, etc.

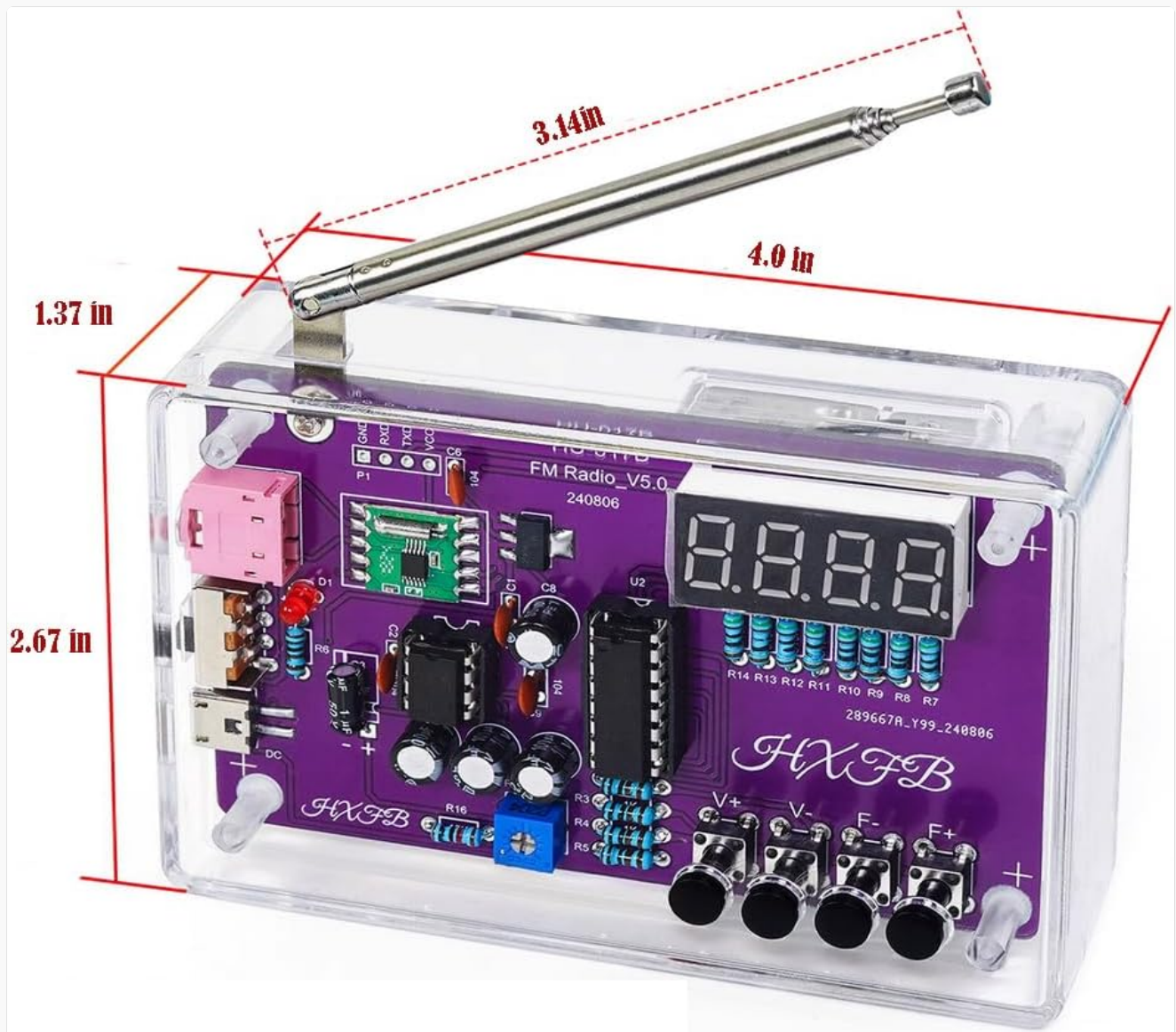


Image: Dimensions of the assembled FM radio, showing approximate measurements of 4.0 inches in length, 2.67 inches in height, and 1.37 inches in depth, with an antenna length of 3.14 inches.

9. WARRANTY INFORMATION

Specific warranty details for the Gikfun FM Radio Soldering Kit EK2163 are typically provided by the seller at the time of purchase. Please refer to your purchase documentation or contact the retailer/manufacturer directly for information regarding warranty coverage and terms.

10. SUPPORT

For technical assistance, missing parts, or further inquiries regarding your Gikfun FM Radio Soldering Kit EK2163, please contact the seller or manufacturer through the platform where the product was purchased. Provide your order number and a detailed description of the issue for efficient support.

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ASK A QUESTION ABOUT THIS MANUAL

Ask about setup, troubleshooting, compatibility, parts, safety, or missing instructions. Manuals+ will review the question and use this page’s manual context to help answer it.

Name

Anonymous

Email

you@example.com

After a successful submission, we securely hash the supplied account or form email before sending it to Microsoft Advertising for conversion attribution. [Privacy details](#).

Question

Example: How do I reset this device or fix this error?

Details

Model number, symptoms, what you tried, or the section of the manual you are using.

Submit question