

MUXWELL HU017B

MUXWELL DIY FM Radio Kit Instruction Manual

Model: HU017B

1. INTRODUCTION

The MUXWELL DIY FM Radio Kit offers an engaging and educational experience for beginners and electronics enthusiasts. This kit allows you to assemble a functional FM radio receiver, providing hands-on soldering practice and insight into circuit design and radio wave principles. The completed radio features a clear acrylic case, showcasing the intricate internal components.



Figure 1: Assembled MUXWELL DIY FM Radio Kit.

This manual provides detailed instructions for assembling, operating, and maintaining your FM Radio Kit. Please read all

instructions carefully before beginning assembly.

2. WHAT'S INCLUDED

Your MUXWELL DIY FM Radio Kit includes all necessary components for assembly:

- Printed Circuit Board (PCB)
- LED Display
- Speaker
- Audio Amplifier (AMP)
- 16P Socket
- CPU
- 8P Socket
- Antenna
- Ear Jack (3.5mm)
- FM Module
- LDO (Low-Dropout Regulator)
- Various Capacitors (0.1uF, 100uF, 1uF)
- LED
- USB Socket
- Buttons (6*6*12.5 key)
- Resistors (1k, 510, 10k)
- Switch
- Potentiometer (200k)
- Key Caps
- M2 Screws & Nuts
- Power Cable (USB to Micro USB)
- Plastic Case components
- Instruction Manual (this document)

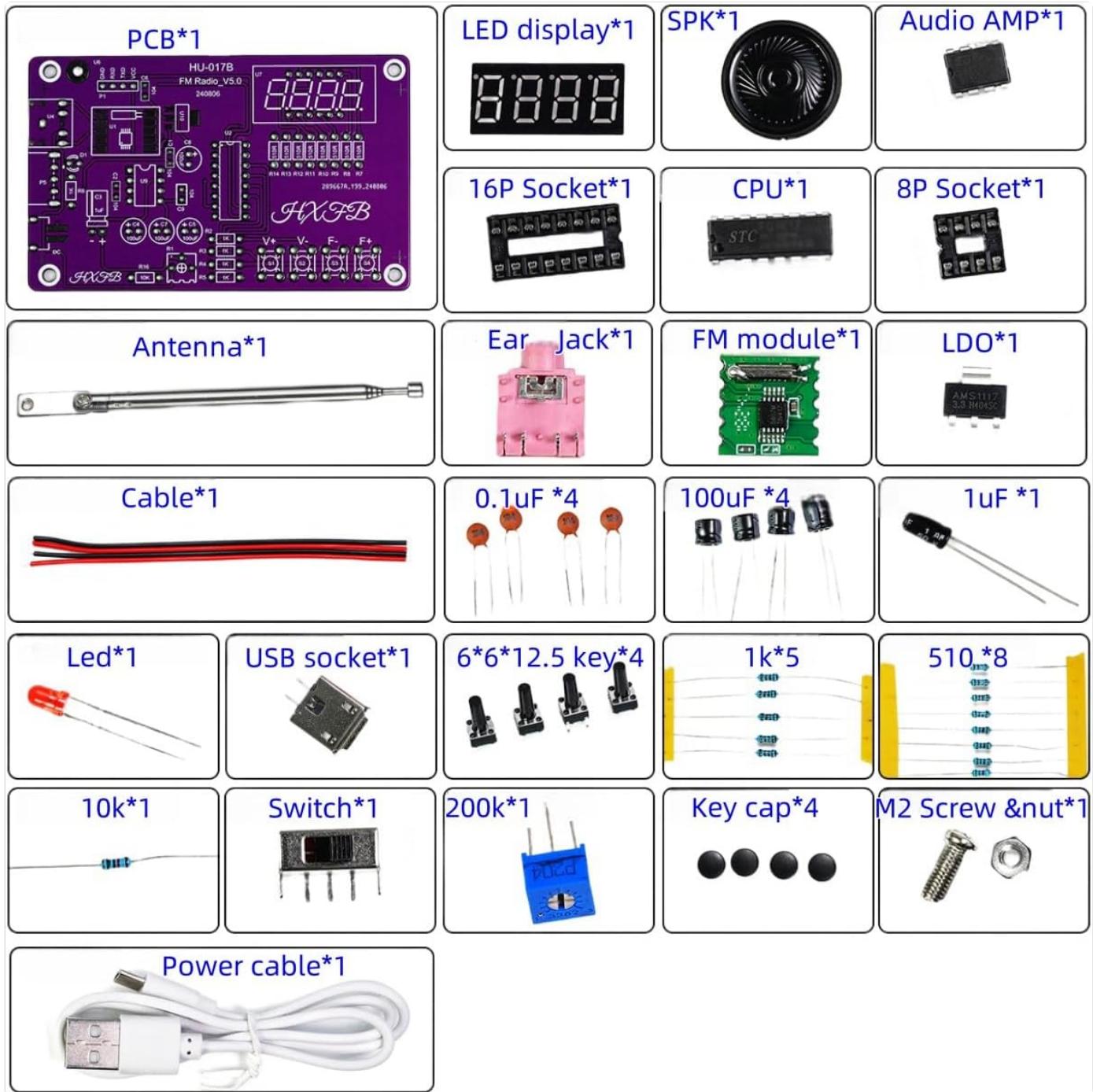


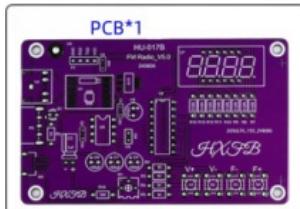
Figure 2: Kit Components Overview.

3. SETUP AND ASSEMBLY

Assembly of the MUXWELL DIY FM Radio Kit requires basic soldering skills. Ensure you have a soldering iron, solder, and safety glasses before beginning. Follow the steps below for proper assembly.

3.1 Soldering Instructions

Carefully identify each component using the provided Bill of Materials (BOM) and the PCB layout. Solder components onto the PCB according to the markings and the assembly steps. Pay close attention to component polarity where indicated (e.g., LEDs, electrolytic capacitors, diodes, integrated circuits).



Item	Description	Reference designator	Quantity	Remarks
1	LED Segment Display	U7	1	/
2	Resistor 10K	R16	1	/
3	Resistor 1K	R2, R3, R4, R5, R6	5	/
4	Resistor 510Ω	R7, R8, R9, R10, R11, R12, R13, R14	8	/
5	Switch	P5	1	/
6	USB socket	DC	1	/
7	Radio antenna	U6	1	/
8	Screw M2	/	1	/
9	Nut M2	/	1	/
10	3.5mm Audio jack	U4	1	/
11	6*6*12.5mm key	S1, S2, S3, S4	4	/
12	Key cap	S1, S2, S3, S4	4	/
13	CPU STC86K17	U2	1	/
14	Audio Amplifier TDA2822	U9	1	/
15	Electrolytic capacitor 100uF	C4, C5, C7, C8	4	/
16	Electrolytic capacitor 1uF	C3	1	/
17	Speaker	U8	1	/
18	FM module RDA5807	U1	1	/
19	Potentiometer 200K	R1	1	/
20	Ceramic capacitor 104 (0.1uF)	C1, C2, C6, C9	4	/
21	Red LED	D1	1	/
22	Line regulator AMS1117-3.3V	U10	1	/
23	8P IC socket	U9	1	/
24	16P IC socket	U2	1	/
25	red/black wires	/	4	/
26	Battery spring sets	/	1	/
27	USB to Micro USB Power line	/	1	/
28	PCB	/	1	/
29	Instruction	/	1	/
30	Plastic case	/	1	/
31	Screw pack	/	1	/

Figure 3: Bill of Materials (BOM).

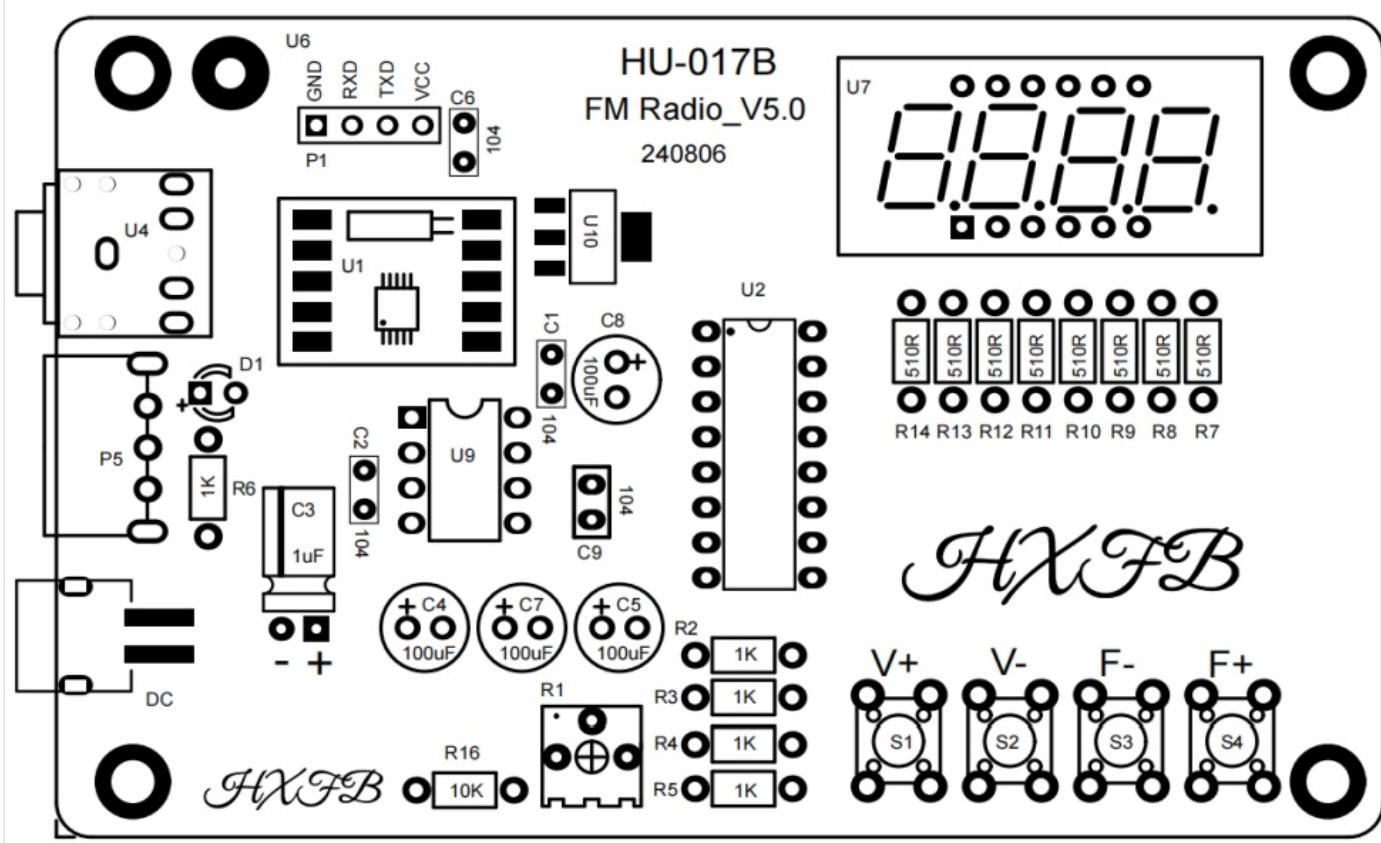


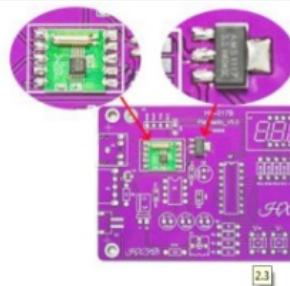
Figure 4: PCB Layout.

3.2 Assembly Steps

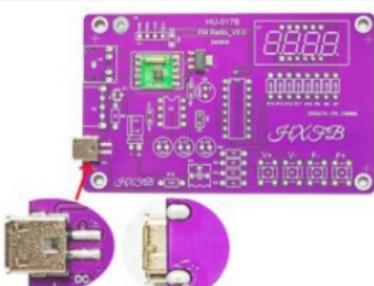
Follow the visual guide for the main soldering and case assembly steps. Ensure all connections are secure and free of solder bridges.

Detail Instruction Easy to Follow

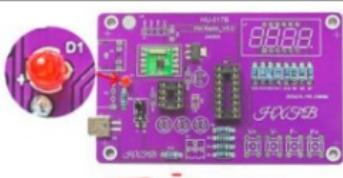
3. Soldering & Case Assembly Steps:



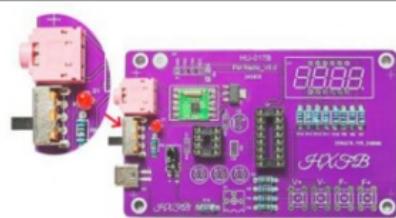
1. Solder AM1117 chip and RDA5807 radio module.



2. Solder USB socket.



6. Solder red led. (Long pin is positive and Short pin is negative)



7. Solder the toggle switch and audio jack.

Figure 5: Soldering and Case Assembly Steps.

For a detailed visual guide on the assembly process, please refer to the official product video:

Video 1: MUXWELL FM Radio DIY Kit Assembly Guide. This video provides a comprehensive walkthrough of the assembly process, from component identification to final case enclosure.

4. OPERATING INSTRUCTIONS

Once assembled, your MUXWELL FM Radio Kit is ready for operation. Familiarize yourself with the controls and functions:

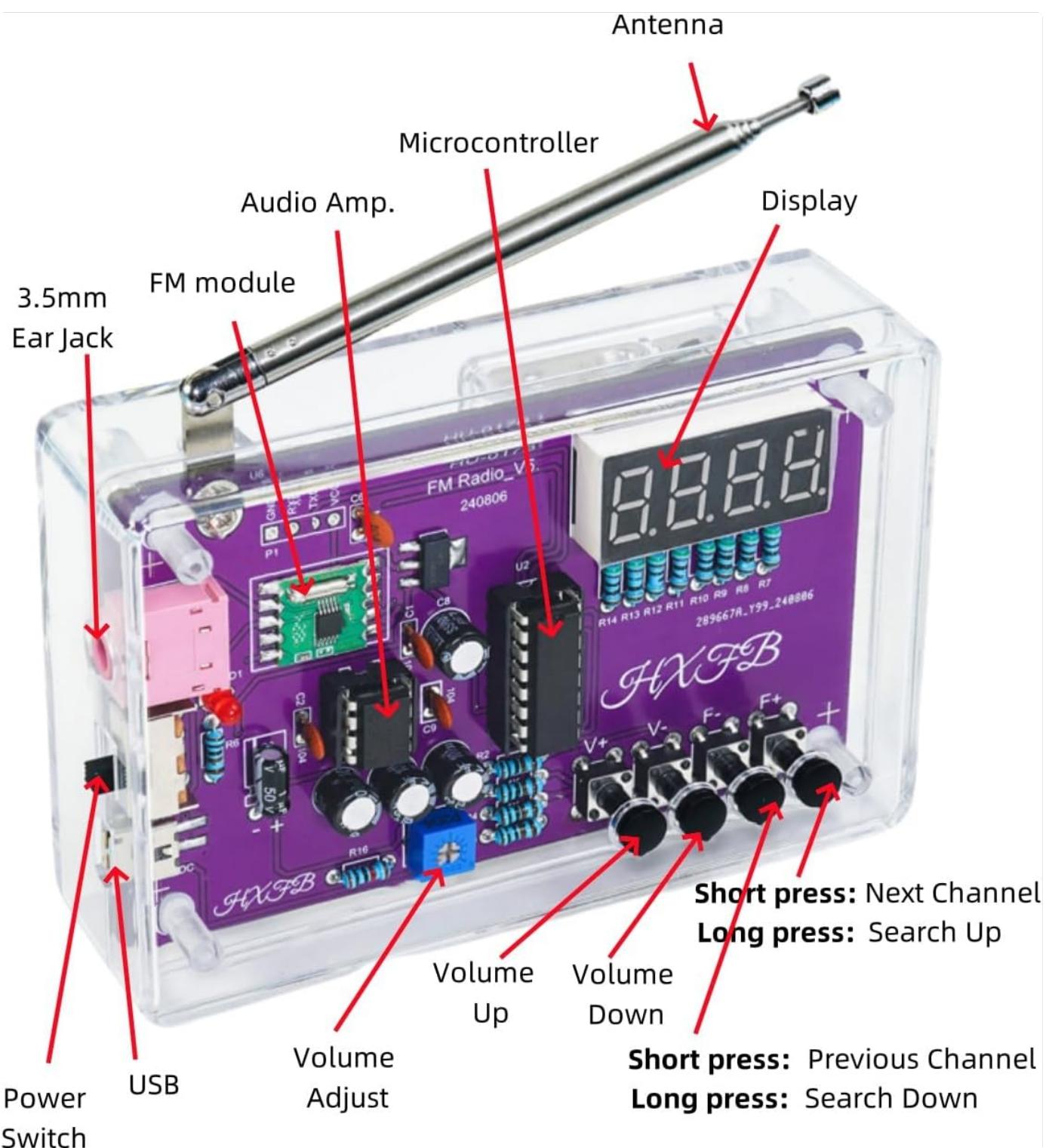


Figure 6: Front Panel Controls and Interfaces.

Battery
AAA*3

Speaker
8Ω, 0.5W



Figure 7: Back Panel Features.

4.1 Powering On/Off

- Extend the antenna fully for optimal reception.
- Locate the power switch (refer to Figure 6) and slide it to the 'ON' position. The power indicator LED will illuminate.
- **Important:** Do not connect both USB power and internal batteries simultaneously, as this may damage the radio.

4.2 Initial Scan and Channel Saving

- Upon first power-on, if no channels are saved, the radio will automatically scan and save available FM channels. This process may take a few moments.
- The radio can save a maximum of 30 channels.

4.3 Volume Control

- **Increase Volume:** Short press the 'V+' button.
- **Decrease Volume:** Short press the 'V-' button.
- The volume can also be adjusted using the volume adjustment part (potentiometer) on the PCB.

4.4 Channel Navigation and Scanning

- **Next Channel:** Short press the 'F+' button.
- **Previous Channel:** Short press the 'F-' button.
- **Scan Up (Temporary):** Long press the 'F+' button. The scanned channel will not be automatically saved.

- **Scan Down (Temporary):** Long press the 'F-' button. The scanned channel will not be automatically saved.

4.5 Signal Threshold Adjustment

- **Enter Setting Mode:** Long press both 'V+' and 'V-' buttons simultaneously. The display will show 'Sn' followed by a number (default 04). This is the signal threshold adjust mode.
- **Adjust Threshold:** The range is 0-15. Short press 'V+' to increase the threshold, and 'V-' to decrease it.
- **Effect:** A smaller value allows more poor signal channels to be scanned. A higher value results in fewer poor signal channels being received.
- **Exit Setting:** Short press 'F-' or 'F+' to move to the next setting or exit.

4.6 Power Saving Mode

- **Enter Power Saving Setting:** From the signal threshold adjustment mode, short press 'F-' or 'F+' to enter the next setting. The display will show 'Po'. This is the power saving setting mode.
- **Toggle Power Saving:** Short press 'V+' or 'V-' to toggle the power saving mode (0 to turn off, 1 to turn on). The default value is 0 (off).
- **Function:** When power saving mode is on, the display will turn off after approximately 13 seconds of inactivity. Pressing any button will light the display again.
- **Exit Setting:** Short press 'F-' or 'F+' to move to the next setting or exit.

4.7 Signal Level Display

- **Enter Signal Level Display Setting:** From the power saving setting mode, short press 'F-' or 'F+' to enter the next setting. The display will show 'dP'. This is the signal level display setting mode.
- **Toggle Display:** Short press 'V+' or 'V-' to toggle the signal level display (0 to turn off, 1 to turn on). The default value is 0 (off).
- **Function:** If the signal level display mode is on, the signal frequency and level will be displayed alternately.
- **Exit Setting:** Short press 'F-' or 'F+' to return to the main menu.

4.8 Channel List Management

- **Enter List Management Mode:** From the main menu, long press both 'F-' and 'F+' buttons simultaneously. The segment display will continue to flash.
- **Add Frequency to List:** While in list management mode, short press 'V+' to increase the frequency. Long press 'V+' to save the currently scanned channel to the channel list.
- **Decrease Frequency:** Short press 'V-' to decrease the frequency.
- **Remove Frequency from List:** Long press 'V-' to remove unwanted frequencies from the list.
- **Switch Saved Channels:** Short press 'F-' to switch to the previous saved channel. Short press 'F+' to switch to the next saved channel.
- **Exit List Management Mode:** Long press both 'F-' and 'F+' again to exit list management mode.

5. SPECIFICATIONS

Feature	Detail
Receive Frequency	87-107MHz
Power Supply	3 x AAA batteries or USB (Micro USB cable included)
Working Current	250mA max. (at maximum audio tuning)
Case Size	103 x 68 x 30.5 mm (4.06 x 2.68 x 1.2 inches)

Weight	136 g (5.6 ounces)
Special Feature	Portable
Connectivity Technology	Auxiliary, USB
Tuner Technology	FM
Color	Purple

FM RADIO KIT

Power Supply: AAA Bat.*3 or USB(Either Option)
Working Current: Max 250mA (Max audio tuning)
PCB size: 95.5x 59 mm
Total Weight: 136g

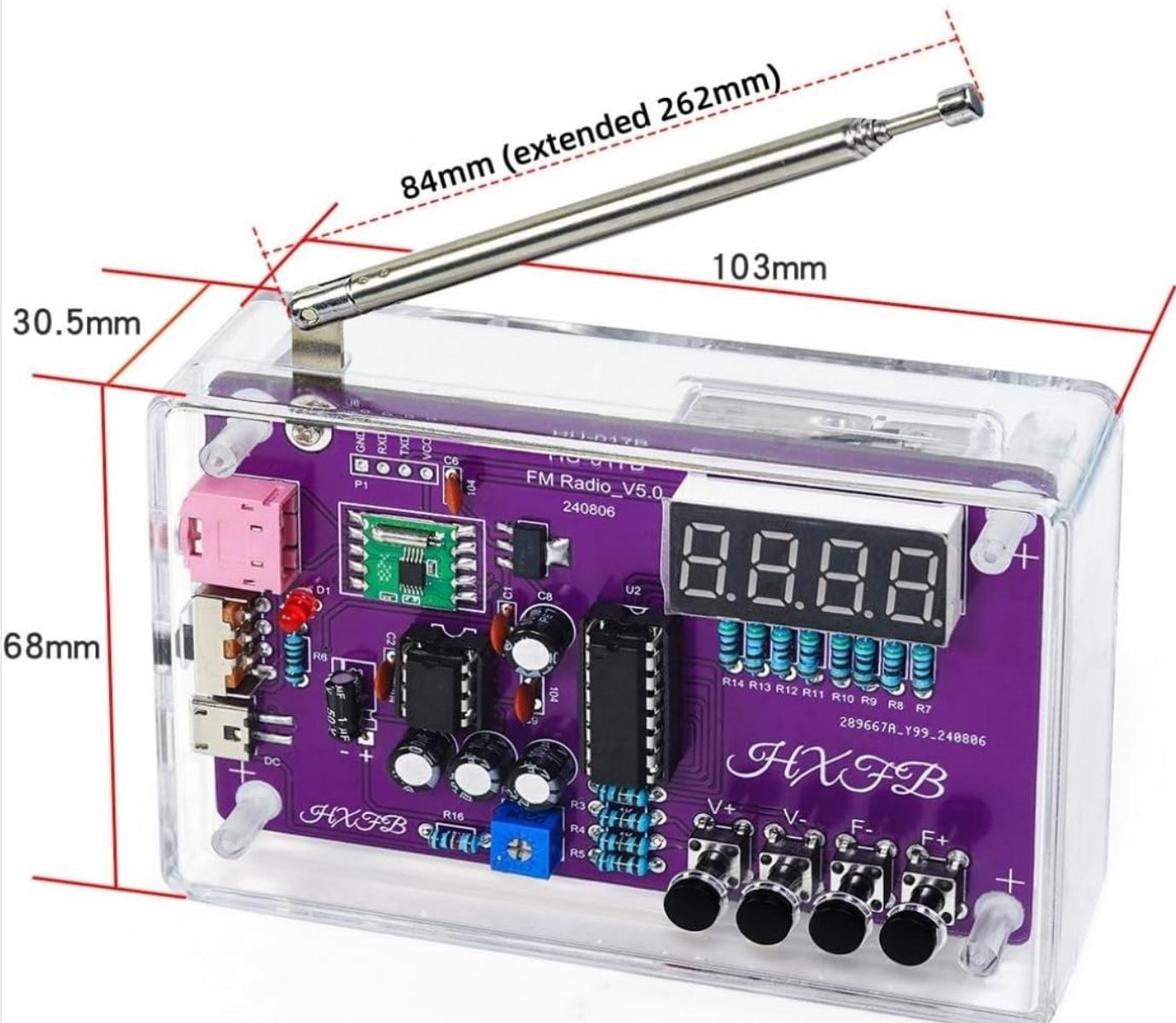


Figure 8: Product Dimensions and Specifications.

6. MAINTENANCE

- **Cleaning:** Use a soft, dry cloth to clean the exterior of the radio. Avoid using harsh chemicals or abrasive materials.
- **Battery Replacement:** If using AAA batteries, replace all three batteries when the power indicator dims or the radio

performance degrades. Ensure correct polarity when inserting new batteries.

- **Storage:** Store the radio in a cool, dry place away from direct sunlight and extreme temperatures. If storing for extended periods, remove the batteries to prevent leakage.

7. TROUBLESHOOTING

- **Radio does not power on:**

- Check battery installation and ensure batteries are not depleted.
- Verify the power switch is in the 'ON' position.
- If using USB power, ensure the cable is securely connected and the power source is active. Remember not to use USB power if batteries are installed.
- Inspect all soldered connections on the PCB for any cold joints or solder bridges.

- **No sound or poor sound quality:**

- Ensure the antenna is fully extended.
- Adjust the volume using the 'V+' button or the potentiometer.
- Check the speaker connection to the PCB.
- If using earphones, ensure they are properly plugged into the 3.5mm jack.
- Try rescanning channels (long press V+ and F+ simultaneously) to find stronger signals.
- Adjust the signal threshold setting (refer to Section 4.5) to allow for weaker signals if necessary.

- **Display is off:**

- Press any button to reactivate the display. The power saving mode might be active (refer to Section 4.6).
- Check the display's soldered connections to the PCB.

- **Cannot save channels:**

- Ensure you are in the correct channel list management mode and using the long press 'V+' function to save (refer to Section 4.8).
- The radio has a limit of 30 saved channels. If full, you may need to remove existing channels before saving new ones.

8. WARRANTY AND SUPPORT

For warranty information, technical support, or assistance with your MUXWELL DIY FM Radio Kit, please contact MUXWELL customer service through the platform where you purchased the product. Please have your model number (HU017B) and purchase details ready when contacting support.