

**Youkits HB-1A MK2 Manual**  
**Edited and revised by K9MA**  
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**HB-1A MK2 2014**



**Two band CW QRP transceiver Manual**

The HB-1A MK2 covers the 20 and 40 meter amateur bands. (30 meters with modification.) It can receive between 5 and 16 MHz. The IF bandwidth can be adjusted from 400 Hz to 3 kHz, allowing reception of CW, SSB, and AM signals. It can be powered either by an internal Lithium-Ion battery or an external power source.

The LCD display shows the following:

- Frequency
- Operating Mode
- Supply Voltage
- Signal strength
- Receiver Incremental Tuning (RIT)
- Forward and Reflected Power

The 20 frequency storage memories can be used to change frequency and band. The tuning steps can be set to 10 Hz, 100 Hz, 1 kHz, and 100 kHz for the amateur bands. Outside the amateur bands, tuning steps can be set to 10 Hz, 100 Hz, 5 kHz, and 100 kHz. RIT tuning steps can be set to 10 Hz and 100 Hz.

## Specifications

Size: 132 x 85 x 35 mm (not including knobs, etc.)  
Weight: About 380 g (not including battery pack)  
Supply Voltage: 9-14 VDC  
Receive Supply Current: 80-90 mA  
Transmit Supply Current: 950 mA at 12 V  
Receive Frequencies: 5-16 MHz, continuous  
Transmit Frequencies: 7.0-7.3 MHz, 14.0-14.35 MHz (10.1-10.15 MHz with modification)  
VFO: DDS circuit with 50 MHz reference  
Display: 1602 LCD  
Output Power: 4-5 W at 12 V  
Sidetone Frequency: About 700 Hz  
IF Bandwidth: 400 Hz to 3 kHz, adjustable  
**Audio Output: 0.1 W into 8 Ohms, stereo connector required**

## Connections

### Built In 18650 Battery Pack

Remove two screws on the back of the HB1A. Install the battery pack and connect to the circuit board. Carefully locate the battery pack so the back cover can be replaced, and secure battery with the adhesive strips.

### **Important Note:**

**Only the charger may be plugged into the “CHARGE” jack. Do NOT plug any other power supply into this jack.**

### External Power Supply

Any 9-14 V DC power supply or battery may be connected to the power jack. Reverse-polarity protection is provided. **Be very careful to plug the power supply into the “9-14V” jack, NOT the “CHARGE” jack.**

### Antenna

Any well-matched (50 Ohm) antenna may be connected to the ANT jack BNC connector. An external antenna tuner is required for antennas which are not matched to 50 Ohms.

### Headphones

A stereo headset can be connected to the PHONE jack. Impedance should be 8-32 Ohms

## Key/Paddle



3.5mm stereo plug

Connect to dot paddle or straight key contact

Connect to paddle dash or straight key ground\*

Connect to paddle or straight key ground\*

\* Both must be connected to ground for use with a straight key.  
A monaural plug may also be used with a straight key.

## **Operation**

When power is turned on with a paddle connected, the letter “A” will be heard (International Morse Code). The letter “M” will be heard if a straight key is connected. (“A” will also be heard if no key is connected.)

## V/M/SAV Button



Pressing this key will alternate between Memory mode (MEM) and VFO mode. The display will show MEM-## or VFO-##. (## represents the numbers 01-20.) In Memory mode, the Tuning knob is used to change memory locations. In VFO Mode, the Tuning knob is used to change the frequency.

Pressing the V/M/SAV key for two seconds will cause SAVE to be displayed and the current frequency and mode will be stored in the memory location selected.

## RIT/MOD Button

### RIT Mode:

Press this key to enter or exit the RIT function. A dash (-) will be displayed to the right of the frequency as shown above. In the RIT mode, the Tuning knob controls the offset of the received frequency from the transmit frequency. The transmit frequency is unchanged. The dash (-) indicates that the received frequency is the same as the transmit frequency (zero offset). Turning the Tuning knob clockwise raises the received frequency, as indicated by the up arrow. Turning the Tuning knob counter-clockwise lowers the frequency, as shown by the down arrow. In each case, the displayed frequency is the received frequency. After exiting the RIT mode, the receiver offset returns to zero.



### CW/USB/LSB Mode Changes:

To change mode, press and hold RIT/MOD for two seconds. Press and hold RIT/MOD for two seconds for each change.

### ATT/IF Key



#### Attenuator:

Press the ATT/IF key briefly to turn the receiver attenuator (ATT) on or off. The “S” in the display will change to “A” when the attenuator is ON.



#### QSK Setup:

To change the QSK mode, press and hold ATT/IF for two seconds. Pressing ATT/IF briefly will then cycle through Full (QSK), 250 ms, 500 ms, and 800ms. (The last three are semi-QSK modes.) Press and hold ATT/IF again for two seconds to exit. Exit will automatically occur if no operations happen for 8 seconds.

### Changing the Frequency Tuning Steps

Pressing the Tuning knob will change the tuning step. In the amateur bands, the steps are 10 Hz, 100 Hz, 1 kHz. Outside the amateur bands, the steps are 10 Hz, 100 Hz, and 5 kHz. In the RIT mode, steps of 10 Hz and 100 Hz may be selected.

Press and hold the Tuning knob for two seconds to set the tuning step to 100 kHz.

### IF Filter Bandwidth Adjustment

Rotate IF FILT to change the IF filter bandwidth. Fully counter-clockwise selects the 400 Hz bandwidth.

## Frequency Lock



To lock the frequency, simultaneously press V/M/SAV and RIT/MOD for about one second. Repeat to unlock. In the locked mode, the symbol “#” will be displayed next to the frequency, and rotation of the Tuning knob will not change the frequency.

## CW Keyer

### Changing Speed:

Press and hold CQ/SET for approximately one second, until the letter “S” is heard, and release. Within 8 seconds, press the DOT paddle to increase the keyer speed, or the DASH to decrease. When complete, press CQ/SET briefly to exit. (The letter “E” will be heard.)

### Entering Your Callsign:

Press and hold CQ/SET until the letter “S” is heard, then continue to hold CQ/SET until you hear the letter “T”, then release. Send your callsign with the paddle as usual. When complete, press CQ/SET briefly to exit. (The letter “E” will be heard.) Automatic exit will occur after 8 seconds.

### Automatic CQ

Press CQ/SET briefly so send “CQ CQ CQ DE (your callsign three times) K” To cancel the CQ, press and hold CQ/SET for 1 second.

## Tune Function

This function is to transmit continuously for antenna tuning, etc.

If a straight key is connected, simply close the key to transmit.

If a keyer paddle is connected, press CQ/SET and hold for two seconds, until the letter “S” is heard, continue to hold until the letter “I” is heard, then continue to hold until the letter “T” is heard. Then release CQ/SET. Press the DOT paddle to transmit a carrier, the DASH paddle to stop transmitting. When complete, press CQ/SET briefly to exit.

## Transmitting



When transmitting within the amateur bands, the display will show the approximate power output. The letter “S” is replaced with “F” followed by a series of vertical bars. Each 3 bars represent approximately one watt of output power. This is the forward power. Above in the display, the letter “R” is followed by a similar series of bars representing reflected power.

When tuning an antenna or antenna tuner, reflected power should be minimized.



If an attempt is made to transmit on a frequency outside the amateur bands, the HB-1A will not transmit, and the display will show “TX ERROR” flashing.

## DDS Calibration

This operation will reset the 20 frequency memories to their original default values and allow calibration of the DDS frequency.

Turn off power. Simultaneously press V/M/SAV and RIT/MOD, turn on power, and hold down the two keys until the display appears as shown below then release the keys.

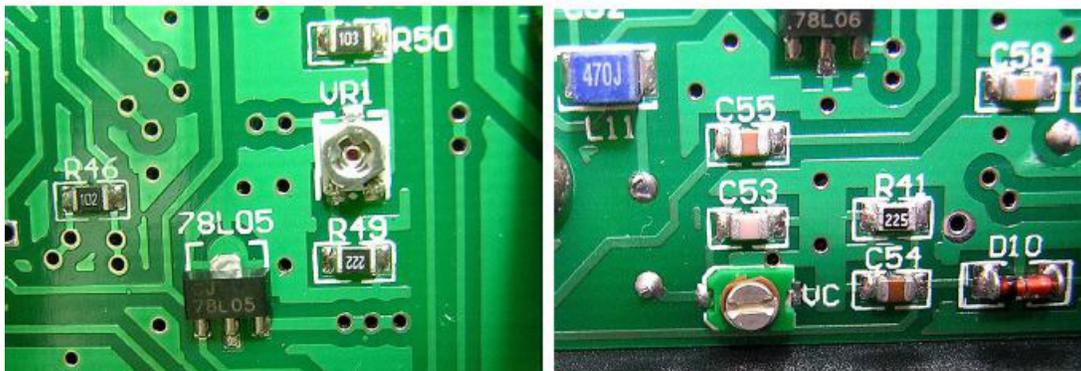


After a few seconds, the HB-1A will enter the DDS calibration mod and the display will appear as below.



With a frequency counter connected to the DDS test point, turn the Tuning knob until the counter reads the same as the HB-1A display. Press RIT/MOD to exit, then V/M/SAV to finish.

## Voltmeter Calibration and Sidetone Adjustment



Adjust VR1 so that the voltage displayed is the same as that measured with an accurate external voltmeter.

Adjust VC to set the sidetone frequency to 700 Hz.