



SW-6B six-band CW QRP transceiver instruction manual





The SW-6B is a six-band CW QRP transceiver with simple and practical features and straightforward operation, making it the best choice for field setups, outings and other activities.

* Two version available,one is with **metal enclosure**,the other is with **plastic enclosure**,while all the hardware and functionalities are same. *

Specifications:

Case size: Approx. 160mm by 110mm by 55mm / 6.3 in by 4.3 in by 2.2 in. (Metal case)

Approx. 170mm by 120mm by 72mm / 6.7 in by 4.7 in by 2.8 in. (Plastic case)

Weight: Approx. 520g / 1.14 lbs, (approx. 660g / 1.45 lbs) when the 3-cell 18650 Li-ion battery is installed) (Metal case)

Approx. 480g / 1.05 lbs, (approx. 620g / 1.37 lbs) when the 3-cell 18650 Li-ion battery is installed) (Plastic case)

Operating voltage: 10-14VDC, reverse polarity protected.

Current consumption:

Receive - ~70mA (internal speaker off) or about 100mA (internal speaker on)

NOTE - Current draw varies with volume setting.

Transmit: 0.7 to 0.8A (@ 12VDC)

Frequency Range:

Receive:

(1) 3-5MHz, (2) 5-6MHz, (3) 6-8MHz, (4) 8-16MHz, (5) 16-22MHz.

(receive sensitivity peaks at 80m, 60m only)

Transmit:

(1) 3.5-3.8 MHz/80M, (2) 5.35-5.368 MHz/60M, (3) 7.0-7.2 MHz/40M, (4) 14.0-14.35 MHz/20M. (5) 18.068-18.168 MHz/17M, 21.0-21.45 MHz/15M (shared 17M & 15M).

Filter: CW/CWR, SSB in two steps with automatic switching.

CW filter bandwidth ~400Hz, SSB bandwidth ~2KHz.

RIT/XIT Adjustment:

RIT: -9KHz to +9KHz in 10HZ steps.

XIT: -30KHz to +30KHz in 100HZ steps.

Output power: ~5W (@ 12VDC input)

Side tone 600Hz

Keyer: Built-in keyer speed is adjustable from front panel with a control.

Memory: There are 8 memories for each band, and the frequency and operating mode set by the user

NOTE - 17m and 15m share a common band/memory location.

Receive modes

CW, CWR, USB, LSB.

NOTE - You may transmit CW signals when in SSB mode, thus enabling CW/SSB cross-mode operation.

AGC: Audio derived AGC

S meter shows the relative strength of the signal for *reference only*.

Connections

External power supply and internal battery connectors:

Any stable, clean 10-14VDC source may be used via the 5.5mm x 2.1 mm power connector.

There is space for an internal battery, a three-cell 18650 lithium battery pack (voltage 11-12.6V).

If the internal battery is installed, you may still use an external power supply. The voltage of the external power supply must be *higher* than the voltage of the built-in battery.

If the external supply voltage is lower than the voltage of the built-in battery, the radio will use the built-in battery power supply, even though external power is supplied. .

CHARGE:

The CHARGE connector is for charging the internal battery. , please use the lithium battery charger for the built-in battery charging (if you don't have a built-in battery installed in the interface can be used as an external power supply interface). The CHARGE connector is for charging the built-in battery.)

Antenna:

Any resonant / well-matched (50 Ohm) antenna may be connected to the ANT jack BNC connector. An external antenna tuner is required for antennas that are not resonant at the selected frequency. The radio does **not** provide for any adjustments other than audio /RF gain and VFO.

High SWR will likely damage the radio over time. Use care when tuning any antenna. It is strongly suggested to use a series of 'dits' to reduce the chance of damage to the final amplifier while tuning. See the manual for your antenna tuner for instructions on how to match an antenna to the SW-6B radio set.

Headphones

A stereo headset may be connected to the PHONE jack. Impedance should be 8-32 Ohms. A *stereo* connector **must** be used. A MONO headphone plug will SHORT the output!

A 90° connector on the headphone"s, to reduce strain to the jack, is recommend .

Setting the switch to **SPK** will activate the internal speaker.

Key/Paddle

If using a stereo plug for a **straight key**, both ring and sleeve must be connected together for use. A monaural plug may also be used with a straight key. The radio is set to detect the type of key used. With paddles and a stereo plug, the internal keyer is automatically enabled on power up and annunciated with the Morse letter "A".



3.5mm stereo plug

TIP. Connects to DOT paddle or one side of straight key contact

RING. Connects to DASH paddle or straight key ground

SLEEVE. Connects to paddle or straight key ground

Keyer Operation

When power is applied with a paddle connected or **no** key is present, the letter "A" will be heard in the headphones upon power up.

The letter "M" is heard if a straight key is connected on power up. Connect the key *prior to power up* to ensure the radio senses the type of key in use.

AF GAIN

Used to set volume of received signal. Turn control clockwise to increase volume. Exercise caution if using "earbuds".

RF GAIN

Provides variable attenuation of incoming (RF) signal to the first mixer. This is useful in noisy band conditions.

Radio operation

ON/OFF – Push up to turn on the SW-6B radio set.

Band switch **BAND**

The switch labeled **BAND** on the right side of the panel is a band selector switch. Switch positions 1, 2, 3, 4 and 5 correspond to 80m, 60m, 40m, 20m, 17m/15m bands respectively (17m and 15m share a common band).

M/V/S button

Pressing this button alternates the display between Memory mode (**M**) and VFO (**V**) mode. The display will show M-# or V-#. # represents the numbers 1 thru 8.

In **Memory mode**, the Tune knob is used to change memory locations.

In **VFO Mode**, the Tune knob is used to change the displayed frequency.

Pressing and then holding the **M/V/S** key for more than two seconds will display **SAVE** and the current frequency and mode will be stored in the memory # location displayed.



The last stored frequency and operating mode will be entered each time the unit is turned on.

RIT/M button

RIT / XIT use:

Press the **RIT/M** button *briefly* to enter the RIT/XIT (offset) function.

- To switch *between* RIT and XIT, *momentarily* press down on the **Tune** (VFO) knob.
- Moving the VFO knob changes the *amount* of offset in *both* RIT and XIT.
 - Turning the VFO knob *clockwise*, increases the offset, turning the VFO knob *anticlockwise* decreases the offset.

The function, when active, shows on the screen on the right side of the top display line.

This also shows the *direction* of offset (+ or -) from the displayed VFO frequency and the *amount* of offset. The carrot (triangle) indicates *steps* selected for offset tuning. RIT changes will be in 10 Hz/step and XIT changes will be in 100 Hz/step.



RIT



XIT

Pressing the **RIT/M** button for more than 1 second will change the operating mode, and every time the button is pressed for 2 seconds the operating mode will change in the order of: CW, CWR, USB, LSB.

Frequency / Frequency Step change

The frequency of the VFO is changed by the **large knob** to the left of the display. This **VFO** control is used for several functions.



The frequency change **steps** are 100KHz, 1KHz, 100Hz and 10Hz. Note the **carrot** (triangle) *above* the listed frequency shows the steps in use.



By briefly pressing down the **VFO** control, the carrot moves to the next digit to the right.

NOTE - The frequency steps will change to the opposite direction (R to L) if the VFO control is pressed for *more* than 1 second.

NOTE - If the **VFO** control is pressed down while in MEM mode, the radio set will enter the VFO mode.

Screen brightness settings:



Press and hold the *M/V/S* button and *RIT/M* button at the same time to enter the screen brightness setting mode. Once in this mode, *rotate* the **VFO** control to change the screen brightness. The brightness of the display has 5 levels, Level 1 is the darkest and Levels 5 is the brightest.

Press and hold the *M/V/S* button and *RIT/M* button again at the same time to **Exit** the screen brightness setting state.

Transmit indicators:



The permitted transmitting frequencies are: 3.5-3.8MHz, 5.35-5.368MHz, 7.0-7.2MHz, 14-14.35MHz, 18.068-18.168MHz, and 21.0-21.45MHz.

When transmitting *within* the listed frequency ranges, the display will show the word **TX**, and the S-meter under the LCD is changed to show the transmitting power with a **P**.

There are 3 pips▲ on the (P) bar graph on the transmit power scale in addition to the 0 scale, the first pip is roughly 1 Watt of RF power, the second pip is roughly 3 Watts of RF, and the final pip to the far right of the bar graph, is roughly 5 Watts of RF.

NOTE - The radio detects the RF voltage output to the antenna port, the power displayed is accurate only when the standing wave is close to 1:1 (ie matched or resonant antenna).

The OP red indicator light at the top right of the panel flashes when the radio set transmits.

Out of Band Operation:

When attempting to transmit outside of these frequency ranges, the display will show the word ERR *The radio will not transmit*, but, the sidetone can still be heard. You can take advantage of this feature to use as a code practice device or to load the message memories.



OP/TUNE Tuning Switch for SWR indicator:

This switch is used to employ the Tayloe type SWR indicator.

When the switch is in the **TUNE** position, a 50 ohm bridge is placed in line with the antenna connector.

Following your antenna tuner instructions, tune for maximum noise in receive.. When transmitting (a series of „dits“ is recommended) the LED above the switch will glow if there is not a correct match. Making fine adjustments of the tuner will cause the LED to fully extinguish or grow very dim.

When the LED is fully extinguished, or very dim, you have a good match between the SW-6B radio set and the antenna.

If a fully resonant antenna is employed, the LED will remain dim or dark.

When you have completed the tuning process, place the switch back into the **OP** position.

(see the web for more information about this unique circuit)

NOTE – If you wish to operate at lower power levels, you may leave the switch in the TUNE position or reduce the input voltage.

Keyer settings:

Speed adjustment knob - SPEED

The **SPEED** knob near the bottom left of the panel controls the keyer speed. It increases in by turning clockwise and slower by turning counterclockwise.

M1, M2 buttons

M1 and M2 are two auto-call buttons, two auto-call messages can be pre-stored respectively. Briefly press the M1 or M2 button, then release immediately to automatically start the stored content.

The memory characters are manually input by the user, as described below.

To cancel the auto-call during the auto-call process, briefly press the M1 or M2 button and then release it.

Entering memory characters:

This operation is not available when using the straight keys, you must use paddles..

Press and Hold the M1 or M2 button for about 2 seconds.

After hearing the Morse code letter I, release the M1 or M2 button.

Enter your message string (~20 characters)

Quickly press the CQ button hear the Morse code letter E to **Exit**.

M1 and M2 can be pre-stored independently.

In the state of call sign input, the display will show the word TX but the SW-6B radio set *will not* transmit, this is normal.

Storage capacity for automatic messages:

The automatic call storage capacity in the radio can probably store about 20 characters, because the length of each character's code is different, so the number of characters that the memory can store is also different, if the number of characters entered exceeds the content that the memory can hold the radio will not be able to store it, at this time the radio will be emptied of the contents of the memory.

Sidetone volume level adjustment:

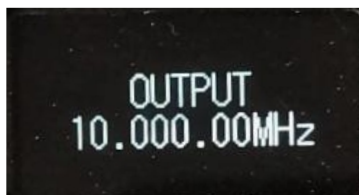
To the left of the **SPEED** knob, there is a **ST adjustment hole**. this is to adjust the volume of the side volume when transmitting. Use a small, flat blade screwdriver for adjustment. Turn it clockwise to increase the volume, turn it counterclockwise to decrease the volume.

Frequency Calibration

1. DDS frequency calibration

If the transmit frequency of the machine is off, it can be calibrated as follows:

Turn off the power, press and hold the M/V/S button and RIT/M button at the same time and then turn on the power, keep holding the two buttons for about 3 seconds and then release the two buttons when the display shows the following:



At this time, use a **calibrated frequency meter** to detect the frequency of the TEST point on the PCB board (near pin 1 of IC7), rotate the large knob to adjust the frequency to the frequency meter display 10.000.00MHz, and after that, lightly press the M/V/S button to exit and enter the IF frequency calibration.

2. IF frequency calibration

The display shows the following after exiting from DDS frequency calibration:

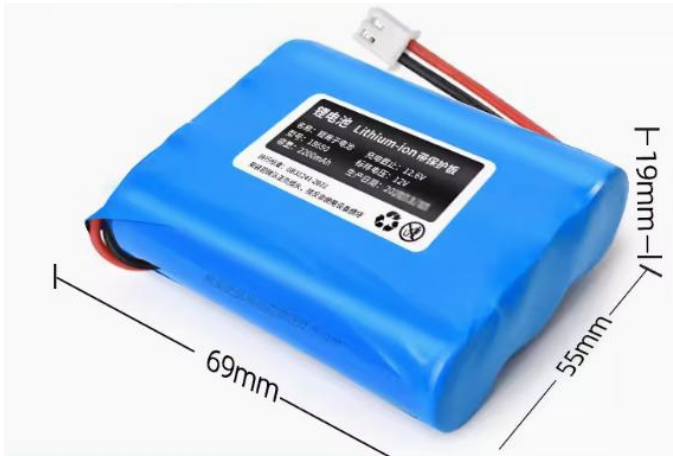


At this time, access the signal source at the antenna end of the machine, adjust the frequency to 7.023MHz, rotate the large knob to adjust the IF frequency to the maximum strength of the received signal.

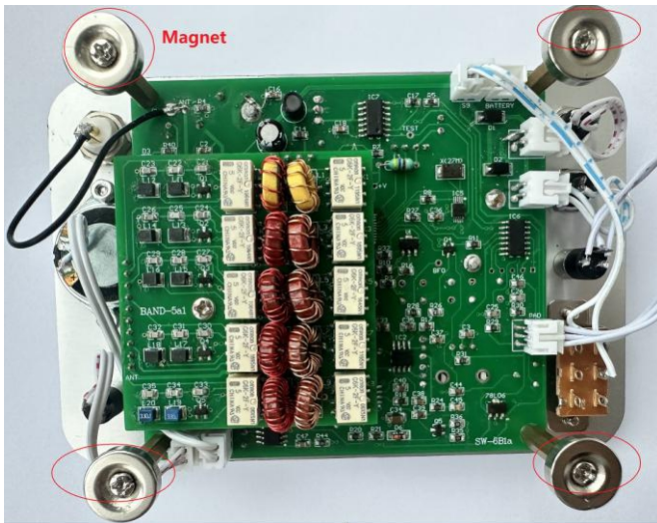
Tap the M/V/S button to exit the frequency calibration state.

Installation of built-in battery pack – For metal enclosure

There is a built-in battery space inside the radio, you can install a three-cell 18650 lithium battery pack as shown in the picture below (the size is about 69*55*19mm), the battery pack's lead plug specification is XH2.54mm, positive and negative positions please keep the same as the picture.



The assembled PCB is in the metal case by the 4 magnets underneath, just pull out the antenna holder by clamping it with pliers. Refer to the picture below to put a nylon tie through the small hole on the PCB, first install the filter board, then install the battery, plug it into the BATT position and pull the nylon tie tightly. Turn on the unit and try it without any problem, then you can put the panel back into the case.

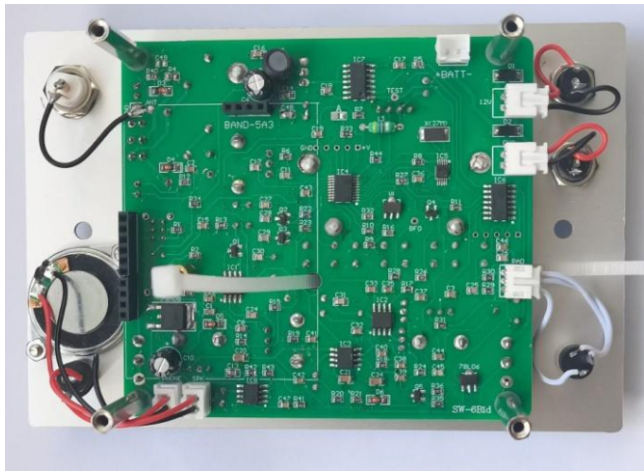


Installation of built-in battery pack – For plastic enclosure

There is a built-in battery space inside the radio, you can install a three-cell 18650 lithium battery pack as shown in the picture below (the size is about 69*55*19mm), the battery pack's lead plug specification is XH2.54mm, positive and negative positions please keep the same as the picture.



Remove the two screws on the panel of the radio (marked in the picture above) and then you can take out of the case, first remove the filter board, refer to the picture below to put a nylon tie through the small hole on the PCB, first install the filter board, then install the battery, plug it into the BATT position and pull the nylon tie tightly. Turn on the unit and try it without any problem, then you can put the panel back into the case.



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