Youkits TJ5A SSB CW HF TRANSCEIVER

IMPORTANT!

Never try the long key at the full power output. This would overheat the power transistors.Always use half or lower power to tune the tuner.Use the matched high efficient antenna such as the dipole, V-dipole, Yagi, long wire with a tuner. Low efficient antenna, such as small loop, short whip, the shortened wire of a few meters, etc. are not recommended, which would degrade the sensitivity of TJ5A, and lower audio output.

OPERATION GUIDE

TJ5A is a high-performance portable multi-band SSB/CW transceiver, used with DDS as LO, offering wide frequency coverage and fine tuning rate. The Doubly Balanced Diode Ring Mixer makes strong signal handling capability possible.

Features:

Removable Battery Pack
Low RX current Drain
High-Performance AGC
40 Memories
Dual VFO
Memory-VFO Transfer

Operating Frequency:

Wide Band RX
2.500000 - 29.999990

TX / Ham Band RX
7.000000 – 7.300000
14.000000 – 14.350000
18.068000 – 18.168000
21.000000 – 21.450000

Mode:
LSB, USB, CW
Tuning Rate: 100Hz, 1kHz, 10kHz, 100kHz, 1MHz
IF: 9 MHz
Sensitivity: 0.3uV
Operating Power: 10.5 – 12.5V
Current Drain:

MODE	CURRENT
RX	260 mA
TX	4 A

Output Power:

MODE	OUTPUT
SSB	0.1 – 20W
CW	40m, 20m, 17m: 0.1 – 10W; 15m: 0.1 – 5W

1. Face Panel

Knobs
VOL - Volume control. Turn clockwise to increase volume.
TUNE – The big knob on the right side is Frequency tuning knob/Tuning rate selector. Rotate clockwise is frequency up, counter-clockwise frequency down. Press the knob to select the tuning rate. The sequence is 10Hz, 100Hz, 1kHz, 10kHz, and 100kHz.
PWR – Transmission power control. Turn clockwise to increase the drive. TX power can be adjusted from 0.1 – 10W (CW), 0.1 – 20W (SSB).
RIT – RX increment tuning. Variable range: +260 Hz / -150Hz

Keys
MOD - Mode switch. Press to select LSB, USB and CW. In CW mode, the displayed frequency is exactly the sender's frequency. In CW mode MIC is disabled.

A / B - VFO selecting / Memory clearing. Press to select VFO A or VFO B. In MEM state, hold the button until all the memories are cleared.

V / M - VFO/MEM switching. Press to switch between VFO and MEM. Turn TUNE to select the memory number.

MEM - Frequency saving / MEM to VFO transfer. Press to save the frequency to the memory. Press MEM, the memory number appears. The dashes indicate the blank state of the memory. Turn TUNE to select the MEM position you want to store the frequency to. MEM00 - MEM39 can be used to store the frequency. Frequency saving can be canceled by pressing MOD or STEP.

In the following case, MEM01 is not vacant. A frequency 14.200.000 is saved in this position. You can rotate TUNE knob to find a vacant position.

How to transfer the frequency in MEM to VFO A or B? First, press V/M to enter MEM state. Second, press MEM to find the VFO's. Now VFO A or B appears on the left corner on LCD. (A or B depends on which VFO is in use before pressing V/M. Third, press A/B button or rotate TUNE knob to select the VFO you want to transfer the memory to (either A or B). Fourth, press MEM to transfer the frequency in the memory to the VFO you have selected. Finally, press V/M button to enter the VFO to which you have transferred the frequency.

Let us study the following example:

Transfer MEM00 (18.068) to the VFO B.

Press MEM, and the following data is displayed:

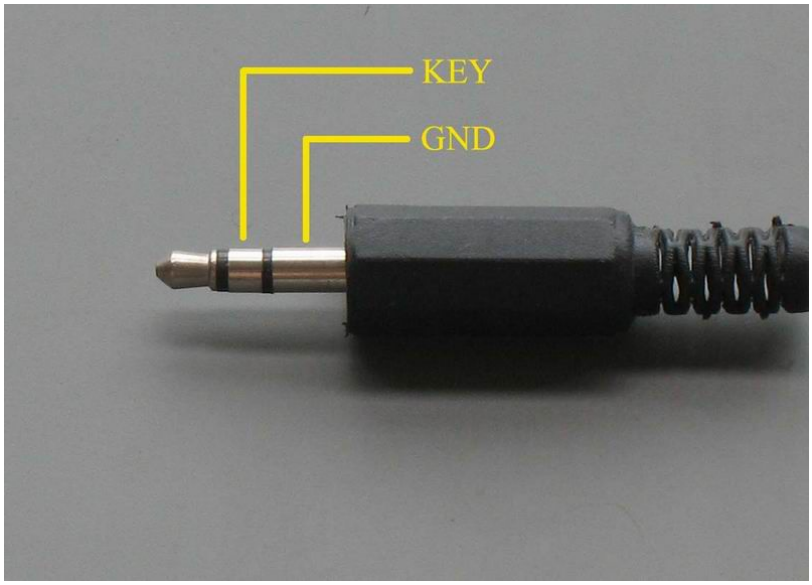
Select VFO B by pressing A/B button or rotating TUNE knob.

Press MEM to transfer MEM 00. The following is displayed:

Press V/M to enter VFO B.

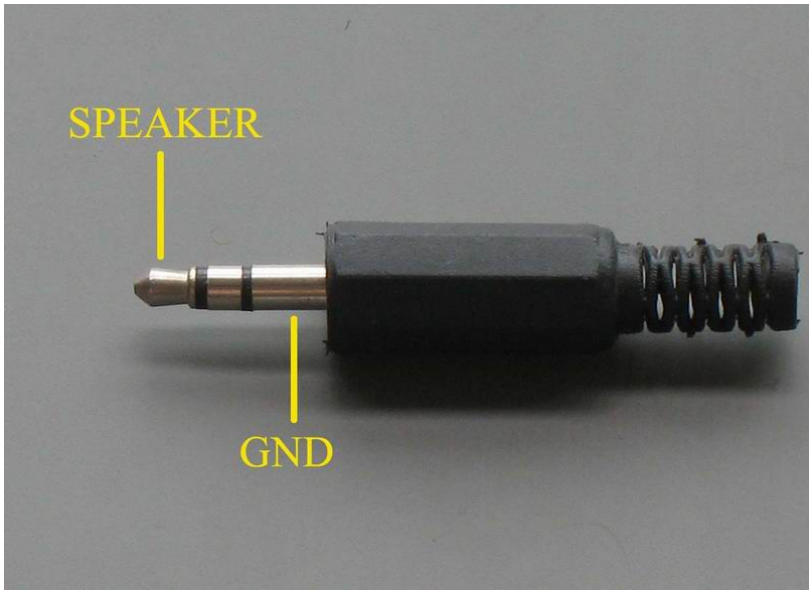
Sockets

KEY – CW key socket. Use 3.5mm stereo plug. The ring is KEY; the sleeve is GND. The tip has no connection.



PH - Earphone/speaker 3.5 mm socket. Either earphones or speaker can be used. When the earphone or speaker is plugged in, the speaker in MIC is disconnected. The tip and ring are in parallel. The sleeve is GND. The stereo earphones can be used. Never use the 3.5mm mono type plug. The long plug sleeve short-circuits the ring connection.

The speaker can be connected to either the tip or the ring, since tip and ring are in parallel. Never use the 3.5mm mono type plug. The long plug sleeve short-circuits the ring connection.



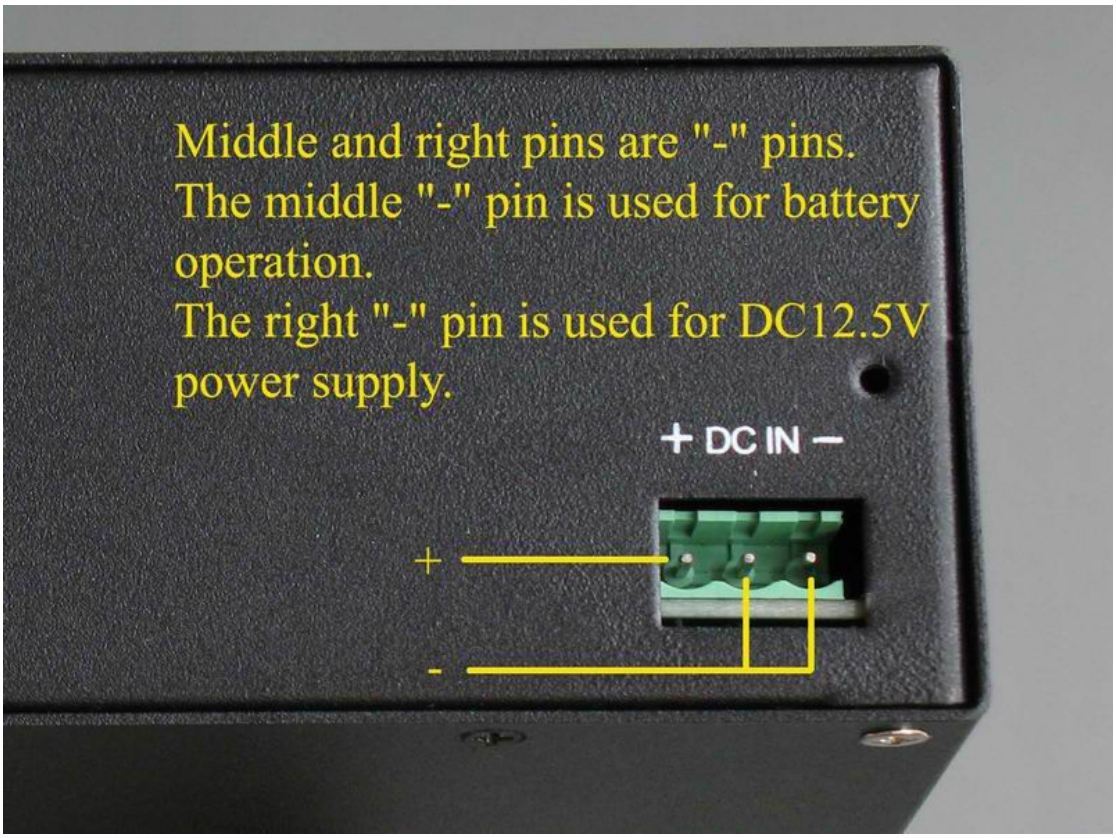
Do not connect the speaker with the amplifier to PH socket with an ordinary cable. In this case a cable with attenuating network is required.

2. Switch and Socket on Right Side

MIC - External MIC/PTT/SPK socket. The supplied speaker mic is also used as the speaker. When the front PH socket is used, the MIC speaker is disconnected.
ON - When the switch is set at this position, the power is switched on, and the rig works.
OFF - When the switch is set at this position, the power is off. The rig stops working.
ANT Socket – The M16 socket on the right side is the antenna socket. Connect 50 ohm antenna to this connector.

3. Socket on Back

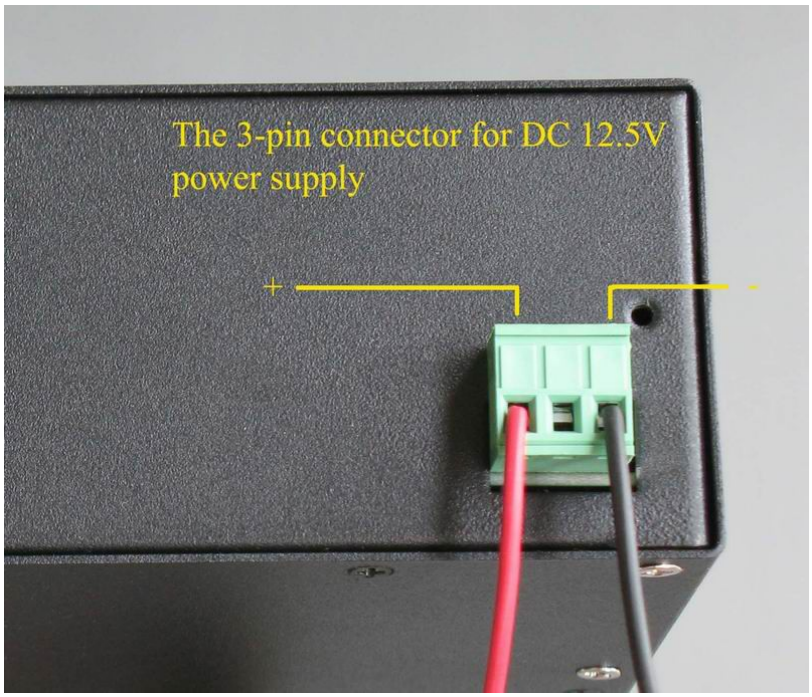
DC IN - External power supply and battery socket



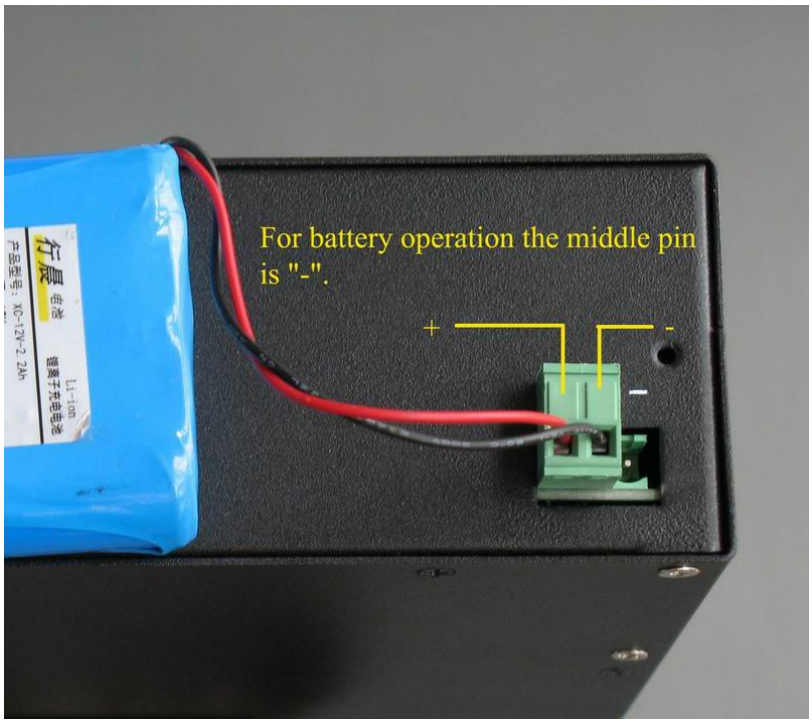
IMPORTANT!

The power supply socket on the back (**DC IN**) has three pins: the “+” pin (left) and “-”pin (right). **The pin in the middle is also “-” pin which is for battery operation**.

For DC12.5V external power supply operation, use the 3-pin connector. The left pin is “+”, and the right pin is “-”.



For battery operation, use the 2-pin connector. The connector should be connected to the left pin (+), and middle pin (-). **NEVER use the middle pin as "+"!**



4. Operation

If you do not have the battery pack, use a DC 12.5 V power supply (The battery pack is optional. Not included in the rig).

Warming-up time

It takes about 5 -10 minutes for the TJ5A to stabilize. A drift of 10 – 20 Hz might be noticed during the warming-up period.

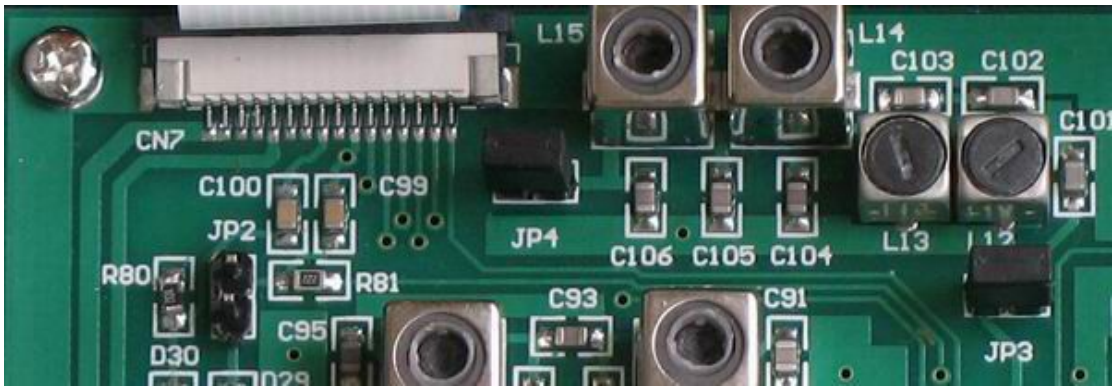
To receive signal

Connect the antenna and turn on the power. Signals or noise can be heard. Rotate the TUNE knob to the frequency you want. For compactness, TJ5A has no band switch. Therefore, use fast tuning rate (For example, 100 kHz or 1 MHz) as the band switch to get to the meter band so as to save time, and then use the fine tuning rate (100 Hz, 1 kHz) to search signals or tune accurately. Rotating RIT facilitates +260 Hz/-150Hz frequency shift. However, RIT does not affect transmitting frequency. In transmission the shift is canceled automatically. RIT is usually set in the middle position.

TJ5A is pre-set to broadband receiving, covering from 2.500000 – 29.999900 MHz. However, ham-band receiving only is possible by re-arranging the jumper caps on the main board. Open the upper cover of TJ5A, the jumper caps are easy to find. Remove the caps from JP3 and JP4. Place the caps on JP1 and JP2 to select ham band receiving. In this case, TJ5A operates in 4 ham bands only: 40, 20, 17, and 15 meter segments.

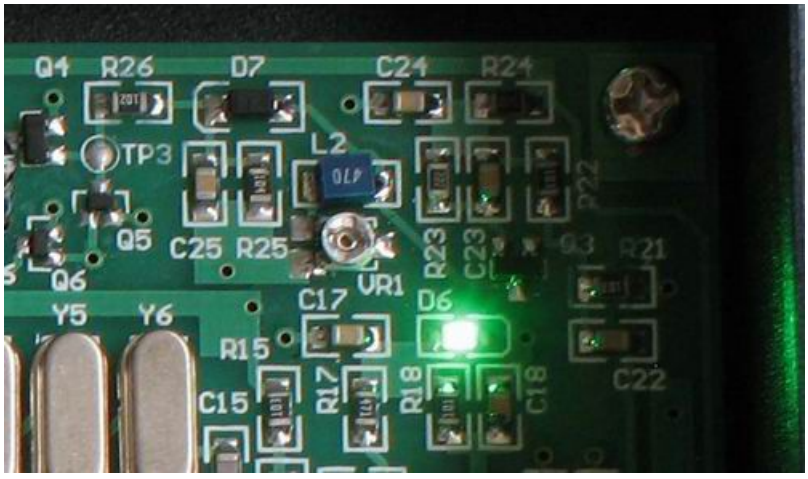
Meter Band	**Frequency Range**
40m	7.000000 – 7.300000
20m	14.000000 – 14.350000
17m	18.068000 – 18.168000
15m	21.000000 – 21.450000

Note: The jumpers cannot change the frequency coverage. The LCD display will be the same with the jumpers in narrow band position. The jumpers cut off the broadband band-pass filter and switch in the 500kHz narrow band-pass filter, and the possible unwanted noise is blocked.



This picture indicating the caps in broadband receiving position

The LED at the right corner of the main board indicates the IF working state. It flashes at very strong signals because of the AGC function.



To transmit signal

TJ5A transmits in the following frequency range:

Meter Band	Frequency Range
40m	7.000000 – 7.300000
20m	14.000000 – 14.350000
17m	18.068000 – 18.168000
10m	21.000000 – 21.450000

Note: The frequency range is controlled by the MCU. Therefore no signal is transmitted outside the above frequency range.

SSB operation

In LSB or USB mode, press PTT to enter transmission mode. Speak to the speaker mic and your voice is transmitted. The output power can be adjusted through **PWR** knob. Do not operate CW key in LSB or USB mode, because the side tone from the speaker goes into MIC, causing a strange CW signal, the combination of 950 Hz and the carrier.

Note: The speaker mic is simple and convenient. However, the hiss sound from the speaker can be picked up by the condenser microphone located close to the speaker, affecting the speech quality in SSB transmission. For high-performance SSB transmission it is suggested to use earphones or the external speaker. In this case, the speaker in the speaker mic is cut off, the condenser microphone is isolated from the speaker, and the hiss contamination is completely eliminated.

CW operation

In CW mode MIC is disabled. Press the CW key and the CW signal is transmitted. A 950 Hz side tone can be heard from the speaker. The side tone level is not controlled by **VOL**.

It is pre-set to a certain level. The level can be adjusted to meet the personal desire. If the level does not suit you, trim VR3 on the main board to obtain your desired level. Open the upper cover the TJ5A. Find VR3. Set the power level to the lowest. Press KEY and trim VR3 until the desired side tone level is obtained.

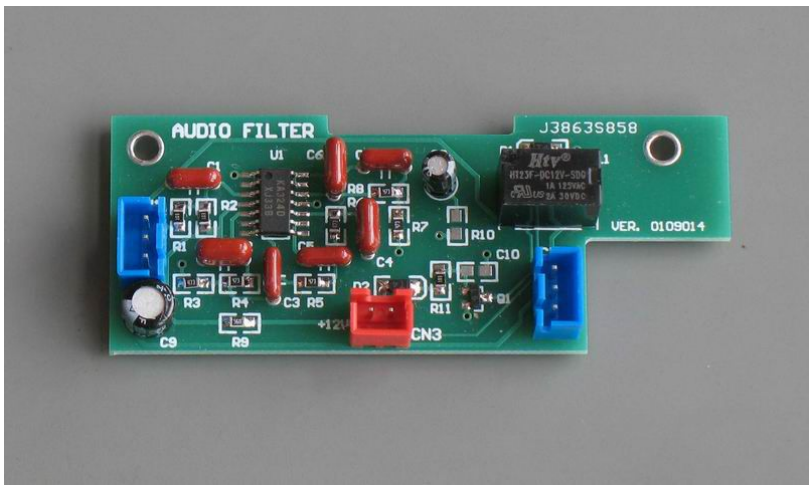
IMPORTANT!

Never try the long key at the full power output. This would overheat the power transistors. Always use half or lower power to tune the tuner.

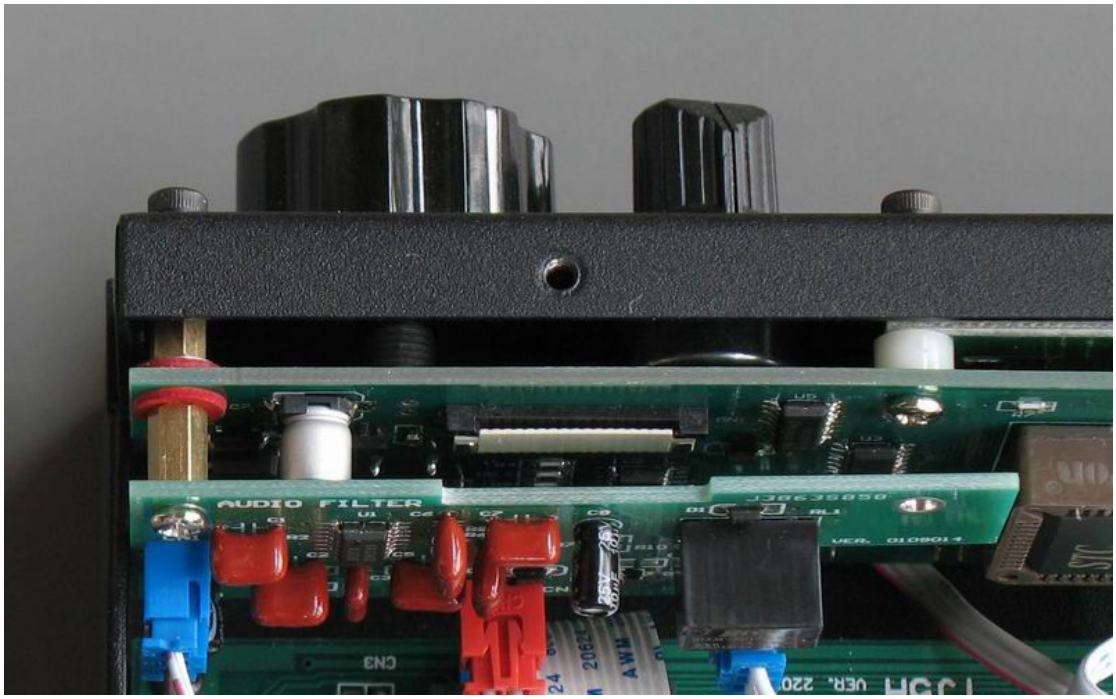
Use the matched high efficient antenna such as the dipole, V-dipole, Yagi, long wire with a tuner. Low efficient antenna, such the small diameter loop, short whip, the shortened wire of a few meters, etc. are not recommended, which would degrade the sensitivity of TJ5A, and lower audio output.

5. CW Filter

The optional auto-switched-in CW filter is made up of 300 Hz high-pass and 720 Hz low-pass filters, which greatly improves the selectivity during CW reception. The filter is switched out in SSB operation.



The filter is fastened on the back of the DDS board by means of a brass stand-off.



Youkits
12/12