Baofeng UV-5R

The (Chinese) Radio Documentation Project

http://radiodoc.github.com/

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Chapter 1. Safety Information

The following safety precautions should always be observed during operation, service and repair of this equipment.

- This equipment shall be serviced by qualified technicians only.
- Do not modify the radio for any reason.
- Use only BAOFENG supplied or approved batteries and chargers.
- Do not use any portable radio that has a damaged antenna. If a damaged antenna comes into contact with your skin, a minor burn can result.
- Turn off your radio prior to entering any area with explosive and flammable materials.
- Do not charge your battery in a location with explosive and flammable materials.
- To avoid electromagnetic interference and/or compatibility conflicts, turn off your radio in any area where posted notices instruct you to do so.
- Turn off your radio before boarding an aircraft, Any use of a radio must be in accordance with airline regulations or crew instructions.
- Turn off your radio before entering a blasting area.
- For vehicles with an air bag, do not place a radio in the area over an air bag or in the air bag deployment area.
- Do not expose the radio to direct sunlight over a long time, nor place it close to heating source.
- When transmitting with a portable radio, hold the radio in a vertical position with the microphone 3/4 centimeters away from your lips. Keep antenna at least 2.5 centimeters away from your body when transmitting.

Warning

WARNING: If you wear a radio on your body, ensure the radio and its antenna are at least 2.5 centimeters away from your body when transmitting.

Chapter 2. Features and functions.

- Dual-band handheld transceiver with display function menu on the display LCD.
- DTMF encoded.
- High Capacity Lithium-Ion battery
- Broadcast FM radio receiver 65-108 MHz
- 50 CTCSS tones and 105 DCS codes.
- VOX (voice activated transmit).
- Alarm function.
- Up to 128 named memory channels.
- FCC part 90 Narrowband compliance.
- High and low power, selectable.
- Display illumination and programmable keyboard.
- function beep on the keyboard.
- Dual watch / Dual reception.
- Frequency step, selectable between 2.5 / 5 / 6.25 / 10 / 12.5 / 25 (kHz).
- Programmable repeater offset.
- battery saving function
- Transmission time-out timer.
- selecting the scan mode
- function busy channel lock
- built in CTCSS/DCS scan
- LED flashlight.
- PC programmable.
- Ten (10) levels of Squelch adjustment.
- Crossband reception.
- End of transmission tone, aka "Roger Beep".
- ANI
- keylock

Chapter 3. Unboxing and Setup

What's in the box

This transceiver comes shipped with the following items in the box:

- Radio body
- Lithium-Ion battery pack
- Antenna
- Desk charger (With accompanying wall-wart)
- Optional belt clip
- Optional wrist-strap

Note

Items included may vary depending on country of purchase. For further information please contact your local vendor or dealer.

Assembly

Before the radio is ready for use we need to attach the antenna and battery pack, as well as charge the battery.

Antenna

This transceiver is fitted with a Male SMA connector. To mount your antenna (Female SMA connector), align the two connectors and turn clockwise until it stops.

Note

- Do not over-tighten your antenna to avoid damage to the connectors.
- When installing the antenna, don't grip it by the top. Grip by the base and turn.
- If you use an external antenna, make sure the *SWR* is about 1.5:1 or lower to avoid damage to the transceiver.
- Do not hold the antenna with your hand or wrap the outside of it to avoid bad operation of the transceiver.
- Never transmit without an antenna.

Belt clip

At the back of the radio there are two parallel screws mounted above the battery, remove these and thread them through the holes on the belt clip as you screw them back into the radio body.

Caution

Do not use any form of glue to fix the screws on the battery clip. The solvents in the glue may cause damage to the battery casing.

Battery

Before attaching or removing the battery make sure your radio is turned off by turning the power/volume knob all the way counter-clockwise.

Installation

Make sure the battery is aligned in parallel with the radio body with the lower edge of the battery about 1-2cm below the edge of the radio.

Once aligned with the guide-rails, slide the battery upward until you hear a click as the battery locks in place.

Removal

To remove the battery, press the battery release above the battery pack, as you slide the battery downward.

Charging and battery maintenance

Charging

Follow these steps to hook up and use the charger:

1. Plug the DC connector of the power adaptor into the charger base.
2. Plug the AC connector of the power adaptor into a mains wall socket.
3. Place the radio in the charging slot on the charger.
4. Make sure the radio is making contact with the charger. When the the red LED comes on steady, your radio is charging.
5. The radio is fully charged once the charger's green status LED goes steady. Please remove the radio at that time to avoid over-charging your battery.

Table 3.1. Charger LED codes

Red LED	Green LED	Status
flashing	steady	Standby (charger empty) Error (charger with radio)
steady	off	Charging
off	steady	Charge complete.

Tip

The charger and battery are fitted with matching notches so that you can charge your battery on its own! Practical if you have two batteries. That way you can charge one battery while still using your radio.

Battery Maintenance

The battery for your radio comes uncharged from the factory, please let it charge for at least four to five hours before you start using your radio.

Warning

- Use only batteries approved by the original manufacturer.
- Never attempt to disassemble your battery pack.
- Do not expose your batteries to fire or intense heat.
- Dispose of batteries in accordance with local recycling regulations. Batteries do not belong in your trash can!

Prolonging the life of your battery

- Only charge batteries in normal room temperatures.
- When charging a battery attached to the radio, turn the radio off for a faster charge.
- Do not unplug the power to the charger or remove the battery and/or radio before it's finished charging.
- Never charge a wet battery.
- Batteries wear out over time. If you notice a considerably shorter operating time with your radio, please consider purchasing a new battery.
- Battery performance will be reduced in temperatures below freezing. When working in cold environments, keep a spare battery on you. Preferably inside your jacket or in a similar location in order to keep the battery warm.
- Dust can interfere with the contacts on the battery. If necessary wipe the contacts with a clean cloth to ensure proper contact with radio and charger.

Tip

If your battery has become wet, remove it from the radio, wipe it dry with a towel and put it in a plastic bag with a handful of dry rice. Tie the bag up and let it sit over night. The rice will absorb any remaining moisture in the battery.

This method is only effective against minor splashes (light rain for instance). A soaked radio may very well be beyond repair.

Storage

Fully charge your battery before long time storage in order to prevent damage from over-discharge.

To avoid severe capacity degradation of your battery while in long time storage, please cycle the battery at least every six(6) months.

Store your batteries in a cool and dry place, never above normal room temperatures.

Chapter 4. Basic Operation

Getting to know your radio

Your radio is made out of unicorns.

Power and volume

Before we turn the power on, make sure you have attached the battery and antenna as described in chapter 3.

Turning the unit on

To turn the unit on, simply rotate the volume/power knob clockwise until you hear a "click". The backlight and display should now have come on.

Turning the unit off

Turn the volume/power knob counter-clock wise all the way until you hear a "click". The unit is now off.

Adjusting the volume

To turn up the volume, turn the volume/power knob clock-wise.

To turn the volume down, turn the volume/power knob counter-clock-wise. Be careful not to turn it too far, as you may inadvertently turn your radio off.

Tip

By using the monitor function, enabled from the [moni] key below the PTT, you can more easily adjust your volume by adjusting it to the un-squelched static.

Channel selection.

Use the [up] and [down] keys to navigate between channels.

Making a call

Press and hold the PTT button on the side of the radio body to transmit. While transmitting, speak approximately 3-5cm from the microphone. When you release the PTT your transceiver will go back to receive mode.

Chapter 5. Advanced operation

Appendix A. Menu definitions

0 SQL - Squelch Level

Selects the squelch noise threshold.

Table A.1. Menu item: Squelch level

Values	Notes	Default value
0-9		

1 STEP - Frequency Step

Selects the step in frequency when using the [up] and [down] keys. This is also the interval the scanner will run at.

Table A.2. Menu item: Frequency step

Values (kHz)	Notes	Default value
2.5 5 6.25 10 12.5 25		

This does only affect the radio when in Frequency (VFO) Mode.

2 TXP - Transmit Power

Transmit power is only settable in Frequency(VFO) Mode. In Memory(MR) Mode transmit power will be set to the level programmed in memory for any given channel.

Table A.3. Menu item: Transmit power

Values	Notes	Default value
High Low		

3 SAVE - Battery Save

Sampling ratio of the Receiver to acknowledge a signal

Table A.4. Menu item: Battery save

Values	Notes	Default value
OFF / 1 - 4		

4 VOX - Voice Operated TX

Adjusts the sensitivity of the VOX feature, if enabled.

Table A.5. Menu item: VOX

Values	Notes	Default value
OFF / 1 - 10		

The lower the setting, the louder your voice have to be in order to engage the transmitter.

5 W/N - Wideband / Narrowband

Sets maximum band deviation.

Table A.6. Menu item: Bandwidth selection

Values	Notes	Default value
WIDE NARR	5kHz 2.5kHz	

In the USA, FCC part 90 radios are mandated to switch over to Narrowband communication by January 1st 2013. Meaning all commercial users. This does not affect Amateur Radio operators.

6 ABR - Display Illumination Time

Time-out for the LCD back-light.

Table A.7. Menu item: Back-light time-out

Values (seconds)	Notes	Default value
OFF / 1 - 5		

7 TDR - Dual Watch

When enabled it allows you to monitor two frequencies simultaneously.

Table A.8. Menu item: Dual watch

Values	Notes	Default value
OFF / ON		

It should be noted that this radio does not possess a dual VFO, meaning that the Dual Watch feature is a time sharing operation. Your radio will flip-flop between A and B channels at a fixed rate. This will not allow you to receive two frequencies in paralell.

8 BEEP - Keypad Beep

When enabled your radio will emit an audible tone at every key press.

Table A.9. Menu item: Keypad beep

Values	Notes	Default value
OFF / ON		

9 TOT - Transmission Time-out-Timer

Transmission times out after set time

Table A.10. Menu item: Transmission time-out-timer

Values (seconds)	Notes	Default value
15 / 30 / 45 - 600		

Radio will alert you when your time is up.

10 R-DCS - Receiver DCS

Digital-Coded Squelch(DCS) will block out any signal that isn't sent with a matching DCS code.

Table A.11. Menu item: Receiver DCS

Values	Notes	Default value
OFF / D023N - D754I		

11 R-CTS - Receiver CTCSS

Continuous Tone-Coded Squelch System(CTCSS) will block out any signal that isn't sent with a matching CTCSS sub-tone.

Table A.12. Menu item: Receiver CTCSS

Values (Hz)	Notes	Default value
OFF / 67.0 - 254.1		

12 T-DCS - Transmitter DCS

Sets the Digital-Coded Squelch(DCS) code for the transmitter.

Table A.13. Menu item: Transmitter DCS

Values	Notes	Default value
OFF / D023N - D754I		

13 T-CTC - Transmitter CTCSS

Sets the Continuous Tone-Coded Squelch System(CTCSS) sub-tone for the transmitter.

Table A.14. Menu item: Transmitter CTCSS

Values	Notes	Default value
OFF / 67.0 - 254.1		

14 VOICE - Voice Prompt

When enabled your radio will "talk back" to you, meaning audible confirmation when pressing keys and working the menu system.

Table A.15. Menu item: Voice prompt

Values	Notes	Default value
ENG CHI OFF	English Chinese	

15 ANI - Automatic Number ID

This can only be set via Computer Linked programming.

Table A.16. Menu item: Automatic number ID

Values	Notes	Default value

16 DTMFST - DTMF tone of transmit code

Table A.17. Menu item: DTMF transmit code

Values	Notes	Default value
DT-ST ANI-ST DT-ANI OFF		

17 S-CODE - Signal Code

Table A.18. Menu item: Signal code

Values	Notes	Default value
1 - 15		

18 SC-REV - Scanner Resume Method

Sets the behaviour of the scanner upon finding active frequencies.

Table A.19. Menu item: Scanner resume method

Values	Notes	Default value
TO CO SE	Time Operation Carrier Operation Search Operation	

- Time Operation: The scanner will resume after a pre set time.
- Carrier Operation: The scanner will resume once the signal disappears.
- Search Operation: The scanner holds on the frequency with detected activity.

19 PTT-ID - When to send the PTT-ID

Sets when to send the PTT-ID (ANI) code.

Table A.20. Menu item: PTT-ID

Values	Notes	Default value
BOT EOT BOTH OFF	Beginning Of Transmit End Of Transmit Both BOT and EOT	

20 PTT-LT - Signal code sending delay.

Delay before sending the PTT-ID.

Table A.21. Menu item: Signal code delay

Values (ms)	Notes	Default value
0 - 30		

21 MDF-A - Channel Mode A Display

Sets the display mode for the upper display.

Table A.22. Menu item: Channel mode, A display

Values	Notes	Default value
FREQ CHAN	Frequency Channel number	

Values	Notes	Default value
NAME	Channel name	

Channel name can only be set via Computer.

22 MDF-B - Channel Mode B Display

Sets the display mode for the lower display.

Table A.23. Menu item: Channel mode, B display

Values	Notes	Default value
FREQ CHAN NAME	Frequency Channel number Channel name	

Channel name can only be set via Computer.

23 BCL - Busy Channel Lock-out

If enabled your radio will prevent you from transmitting on active frequencies.

Table A.24. Menu item: Busy channel lock-out

Values	Notes	Default value
OFF / ON		

24 AUTOLK - Automatic Keypad Lock

If enabled keypad will automatically lock after eight(8) seconds of inactivity.

Table A.25. Menu item: Keypad lock

Values	Notes	Default value
OFF / ON		

25 SFT-D - Frequency Shift Direction

Sets the direction of the transmit offset relative receive frequency.

Table A.26. Menu item: Frequency shift direction

Values	Notes	Default value
+ - OFF	TX frequency = RX + OFFSET TX frequency = RX - OFFSET	

26 OFFSET - Frequency shift amount

Sets the amount of offset on the transmit frequency relative the receive frequency.

Table A.27. Menu item: Frequency shift

Values (MHz)	Notes	Default value
00.000 - 69.990		

27 MEMCH - Store a Memory Channel

Stores current settings in memory to the specified channel number.

Table A.28. Menu item: Save channel

Values	Notes	Default value
000 - 127		

28 DELCH - Delete a memory channel

Deletes a memory channel at the specified channel number.

Table A.29. Menu item: Delete channel

Values	Notes	Default value
0 - 127		

29 WT-LED - Display back-light colour, Stand-by

Sets the back-light colour in standby.

Table A.30. Menu item: Standby back-light colour

Values	Notes	Default value
BLUE ORANGE PURPLE OFF		

30 RX-LED - Display back-light colour, Receive

Sets the back-light colour while receiving a signal.

Table A.31. Menu item: Receive back-light colour

Values	Notes	Default value
BLUE ORANGE PURPLE OFF		

31 TX-LED - Display back-light colour, Transmit

Sets the back-light colour while transmitting a signal.

Table A.32. Menu item: Transmit back-light colour

Values	Notes	Default value
BLUE ORANGE PURPLE OFF		

32 AL-MOD - Alarm Mode

Table A.33. Menu item: Alarm mode

Values	Notes	Default value
SITE TONE CODE	Radio speaker only Cycling tone over the air Transmit 5s tone followed by Morse	

33 BAND - Band Selection

Sets the current operating band.

Table A.34. Menu item: Band selection

Values	Notes	Default value
VHF / UHF		

34 TX-AB - Transmit selection while in Dual Watch mode

If enabled, this will force the radio to transmit on the selected frequency when in Dual Watch mode.

Table A.35. Menu item: Transmit selection in DW mode

Values	Notes	Default value
A B OFF	Upper display Lower display	

35 STE - Squelch Tail Elimination

Table A.36. Menu item: Squelch tail elimination

Values	Notes	Default value
OFF / ON		

36 RP_STE - Squelch Tail Elimination through a repeater

Table A.37. Menu item: Repeater STE

Values	Notes	Default value
OFF / 1 - 10		

37 RPT_RL - Delay the squelch tail of repeater

Table A.38. Menu item: Repeater STE delay

Values	Notes	Default value
OFF / 1 - 10		

38 PONMGS - Power On Message

When enabled it displays a 2 line message on the display. Message can only be set via computer.

Table A.39. Menu item: Power on message

Values	Notes	Default value
FULL MSG	Flash entire LCD Displays a 2 line welcome message	

39 ROGER - Roger Beep

Transmits an audible tone after you release the PTT.

Table A.40. Menu item: Roger beep

Values	Notes	Default value
OFF / ON		

40 RESET - Restore defaults

Resets the radio to factory defaults, with some exceptions.

Table A.41. Menu item: Reset

Values	Notes	Default value
VFO ALL	VFO settings only Total reset*	

* RESET>ALL resets everything with the exception of:

The Power On Message
The [6] key Power On Message
The VIP software band limits
On some firmware it may reset language to Chinese

Glossary

VFO	Variable-frequency oscillator
Squelch	A circuit used to cut out noise.
PTT	Push-To-Talk. The button used to make a call.
ANI	Automatic Number Identification. A system used in dispatch environments to let dispatch know which field radio was keyed.
PTT-ID	See ANI.
CTCSS	Continuous Tone-Coded Squelch System. Also known as "Private Line" (a Motorola trademark).
DCS	Digital-Coded Squelch. Also known as "Digital Private Line" (a Motorola trademark).
DTMF	Dual-Tone Multiple-Frequencies.
Standing Wave Ratio.	Standing Wave Ratio.

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