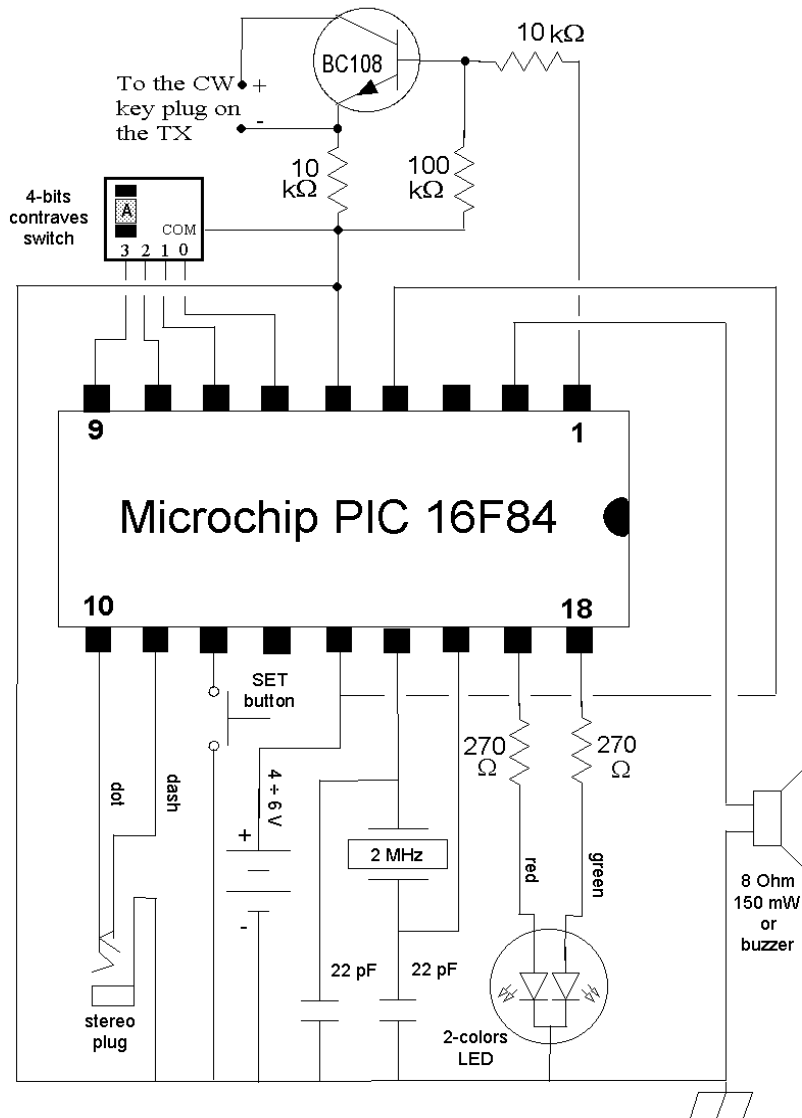


## IK0WRB Keyer

Old version 2.1

### The circuit

What follows is the scheme of the IK0WRB Keyer version 2.1



IK0WRB Keyer version 2.1

As you can see, it is quite similar to the version 2.0. The only difference is that a **4-bit switch** is used in place of the 3-ways 8-positions switch. Please note that the switch may be replaced by a 4-ways 16-positions switch, but it will be much larger than the one I suggest.

## The components list

- a Microchip PIC 16F84, in the 18 pins PDIP package
- a 2 MHz quartz crystal, parallel resonance
- 2 capacitors of 22 pF, 15 VL
- 2 resistors of 270 Ohm, 1/4 Watt
- a resistor of 100 kOhm, 1/4 W
- 2 resistors of 10 kOhm, 1/4 W
- a 2-colors LED, common cathod, red and green
- a button, normally open
- 2 jack plugs, 3 poles (stereo)
- a loudspeaker, 4 - 8 Ohm 150 mW, or a buzzer
- a BC108 transistor, or similar
- a 4-bits contraves switch (or a 4-ways 16-positions switch)

## The program

You can download here the hex module you need to program the Microchip PIC 16F84 chip you need for the keyer. This is the software for **version 2.1** of the keyer. New versions of the circuit (and related software) may be released in the future.

The code is in the file keyer21.hex

The zip archive contains the circuit scheme, this page and the hex module.

## How to use the keyer

The use of the keyer is basically identical to version 2.0 of the keyer, but setting parameters and moving to the different states is a bit more intuitive. You get also two new states, one useful for transport (continuous sleep mode) and another to emulate a vertical key (perhaps useful also to tune the transmitter or amplifier). The following table shows how to operate the keyer version 2.1.

Using version 2.1 of the IK0WRB Keyer

Switch position	Status	LED color	Left paddle	Right paddle	SET button
0	Sleep	Off	No effect	No effect	No effect
1	Ready	Green while rx. Red while tx. Yellow if tx local.	Dot	Dash	Send single CQ message
2	Speed	Yellow	Decrease speed	Increase speed	Sound current speed (Snn)
3	Weighting	Yellow	Decrease weight	Increase weight	Sound current weight (Wn or Wn.5)
4	TX	Green if disabled. Yellow if enabled.	Enable transmitter	Disable transmitter, enable speaker	Sound status (TY or TN)
5 - 9	Sleep	Off	No effect	No effect	No effect

<b>A</b>	Audio	Green if disabled. Yellow if enabled.	Enable audio monitor	Disable audio monitor	Sound status (AY or AN)
<b>B</b>	Beacon	Green if message present. Off if no message.	Starts Beacon sequence. During carrier: immediate call.	During call: go to carrier. During carrier: more carrier.	Starts Beacon sequence. During tx or pause: stops Beacon sequence.
			Autostart beacon sequence at power on		
<b>C</b>	CQ	Green if message present. Off if no message.	Starts CQ sequence. During pause: immediate CQ.	During CQ: go to pause. During pause: more pause.	Starts CQ sequence. During CQ or pause: stops sequence
<b>D</b>	Direct	Green	Carrier while pressed	Carrier while pressed	No effect
<b>E</b>	Enter	Green	Store a dot	Store a dash	Single pressure: insert inter-word space.
			Store an inter-character space when pausing 0.25 sec.		2 consecutive pressures: delete last char.
<b>F</b>	Sleep	Off	No effect	No effect	No effect

## Notes

Changes from version 2.0 to 2.1 are **in bold**.

- **Speed** can be changed with a 1 wpm step, from 1 to 50 wpm.
- **Weighting** can be set from 2 to 5, with a step of 0.5
- **CQ message** stored in the memory can be 236 *symbols* long, where a symbol can be a dot, a dash or an inter-character space. Inter-word space is coded as two consecutive inter-character spaces. If the memory is full while storing, the keyer stops storing, retaining the message stored up to that point. The message is in the EEPROM, so it's never lost, unless you decide to store another one.
- **CQ mode**: you can send a single CQ by pressing the SET button in the Ready state or start a continuous CQ sequence by pressing left paddle or SET button in the CQ mode. RX period is fixed at 10 seconds, but you can momentarily reduce or prolongue it buy using the paddle keys. See table for details.
- **Beacon mode** works as CQ mode, but with a 20 seconds pause with carrier ON. You can modify the pause periode as in CQ mode.
- **There is no on/off switch**, because the keyer goes into sleep mode after about 33 seconds of inactivity. A pression of one of the paddles or the SET button, awakes the chip and the keyer continues its activity, as if it had been always on.  
In sleep mode the circuit drains less than 10 microamperes, comparable to the auto-discharge of batteries.
- **Sleep mode locks all commands and is thus useful when carrying the keyer or to avoid unwanted transmissions while setting up the rig etc.**
- **Direct mode emulates a vertical key (and you can actually connect one of them to the keyer, either on dot or dash contact), useful also for tuning the transmitter.**

## **Future releases**

No further releases are planned at the moment, since I used all the 1024 program memory words of the 16F84! In fact, I had to work a bit to fit the chip size...

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IK0WRB