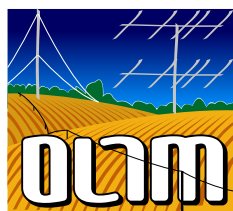




Assembly Manual

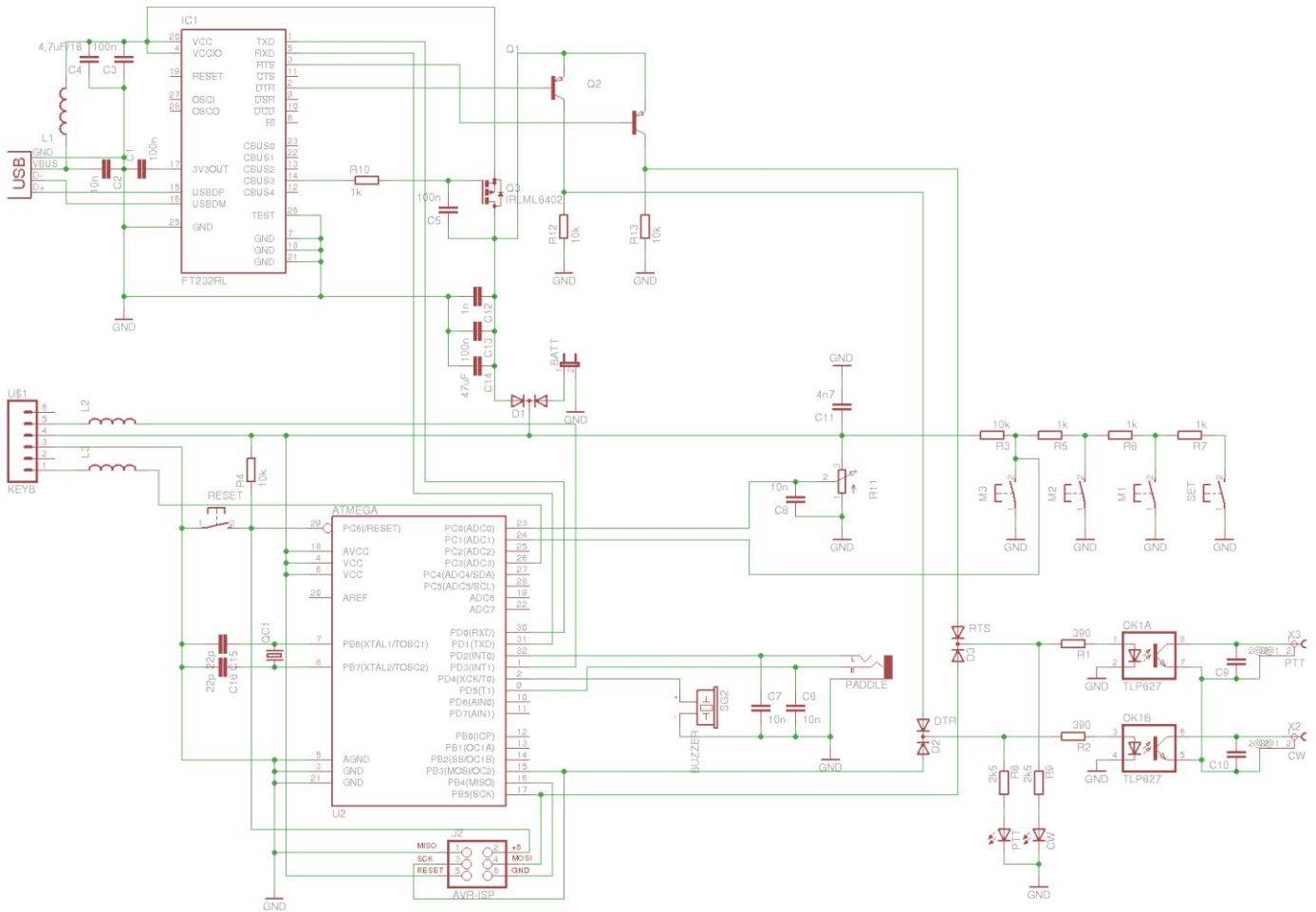
K3NG open source Arduino CW keyer with WinKey support



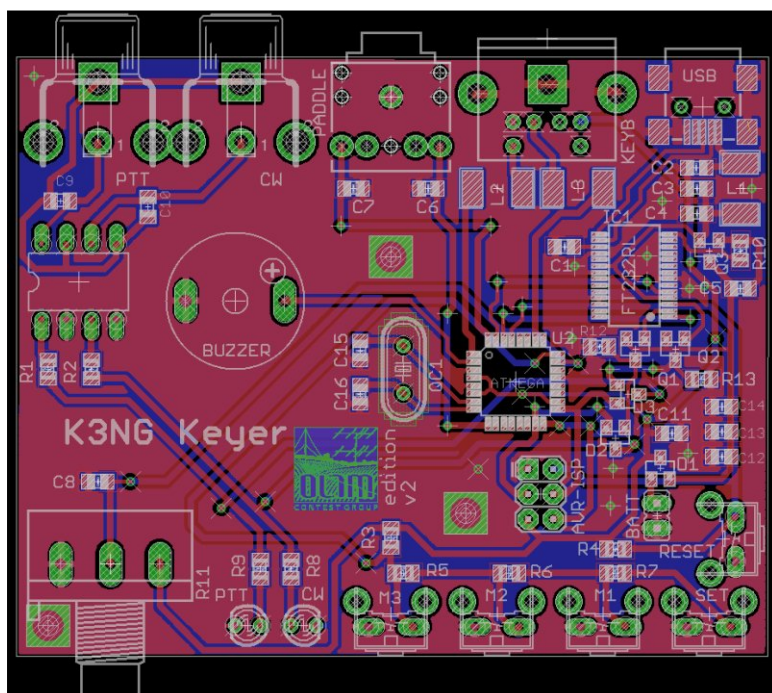
CONTEST GROUP edition | v. 1.0 October 2012 by OK1HRA | available at www.hamshop.cz

Features

- CW speed adjustable from **1 to 999 WPM**
- Programming and interfacing via **USB port** (“command line interface”)
- **PS2 Keyboard** Interface for CW keyboard operation without a computer
- **PTT outputs** with configurable lead, tail, and hang times
- **3 memories** with macros
- **Serial numbers**
- CW keyboard (via a terminal server program like Putty or the Arduino Serial program)
- Speed **potentiometer** (speed also adjustable with commands)
- QRSS and HSCW
- Beacon / Fox mode
- Iambic A and B
- Straight key mode
- Ultimatic mode
- Bug mode
- Paddle reverse
- Hellschreiber mode (keyboard sending, memory macro, beacon)
- Farnsworth Timing
- Adjustable frequency **sidetone**
- Sidetone disable
- **Command mode** for using the paddle to change settings, program memories, etc.
- Keying Compensation
- Dah to Dit **Ratio** adjustment
- Weighting
- Callsign receive practice
- Send practice
- Memory stacking
- Logging and Contest Program Interfacing via **K1EL Winkey** 1.0 and 2.0 **interface protocol emulation**
- “Dead Operator **Watchdog**”
- Autospace
- **Wordspace** Adjustment
- Pre-configured and Custom Prosigns
- Non-volatile storage of most settings
- Modular code design allowing selection of features and easy code modification
- Non-English Character Support
- **Battery include** (four AAA type)



Schematic diagram

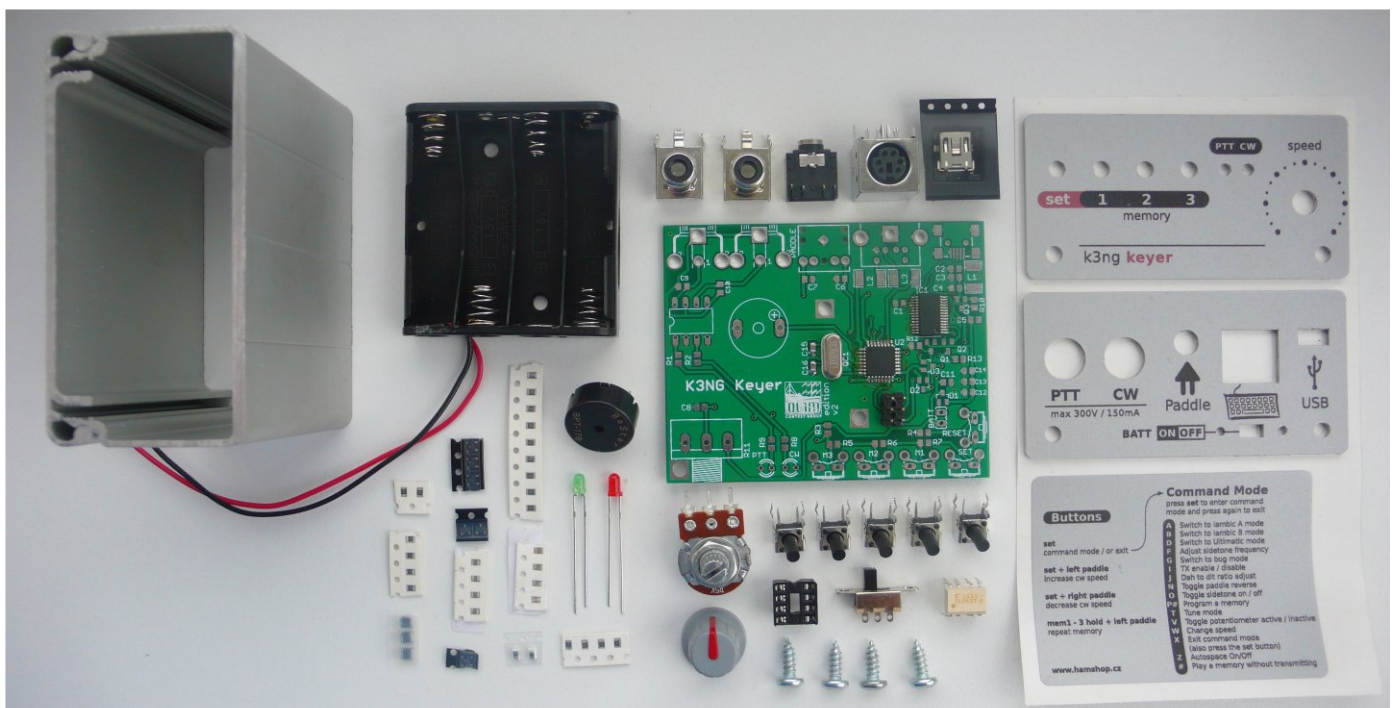


PCB

List of parts

□	C1	100nF	□	PTT	LED
□	C2	10nF	□	Q1	BC857
□	C3	100nF	□	Q2	BC857
□	C4	4,7uF/16	□	Q3	IRLML6402
□	C5	100nF	□	QC1	16MHz
□	C6	10nF	□	R1	330R
□	C7	10nF	□	R2	330R
□	C8	10nF	□	R3	10k
□	C9	10nF	□	R4	10k
□	C10	10nF	□	R5	1k
□	C11	4n7	□	R6	1k
□	C12	1nF	□	R7	1k
□	C13	100nF	□	R8	2k2
□	C14	4,7uF/16	□	R9	2k2
■	C15	22pF	□	R10	1k
■	C16	22pF	□	R11	5k Pot
□	CW	LED	□	R12	10k
□	D1	BAV70	□	R13	10k
□	D2	BAV70	□	RESET	Tact button
□	D3	BAV70	□	SET	Tact button
■	IC1	FT232RL	□	SG2	BUZZER
■	J2	AVR-ISP	□	X4	MINI DIN6
□	L1	Ferrite bead	■	U2	ATMEGA328P
□	L2	Ferrite bead	□	X1	mini USB
□	L3	Ferrite bead	□	X2	RCA
□	M1	Tact button	□	X3	RCA
□	M2	Tact button			
□	M3	Tact button			
□	OK1	TLP627			

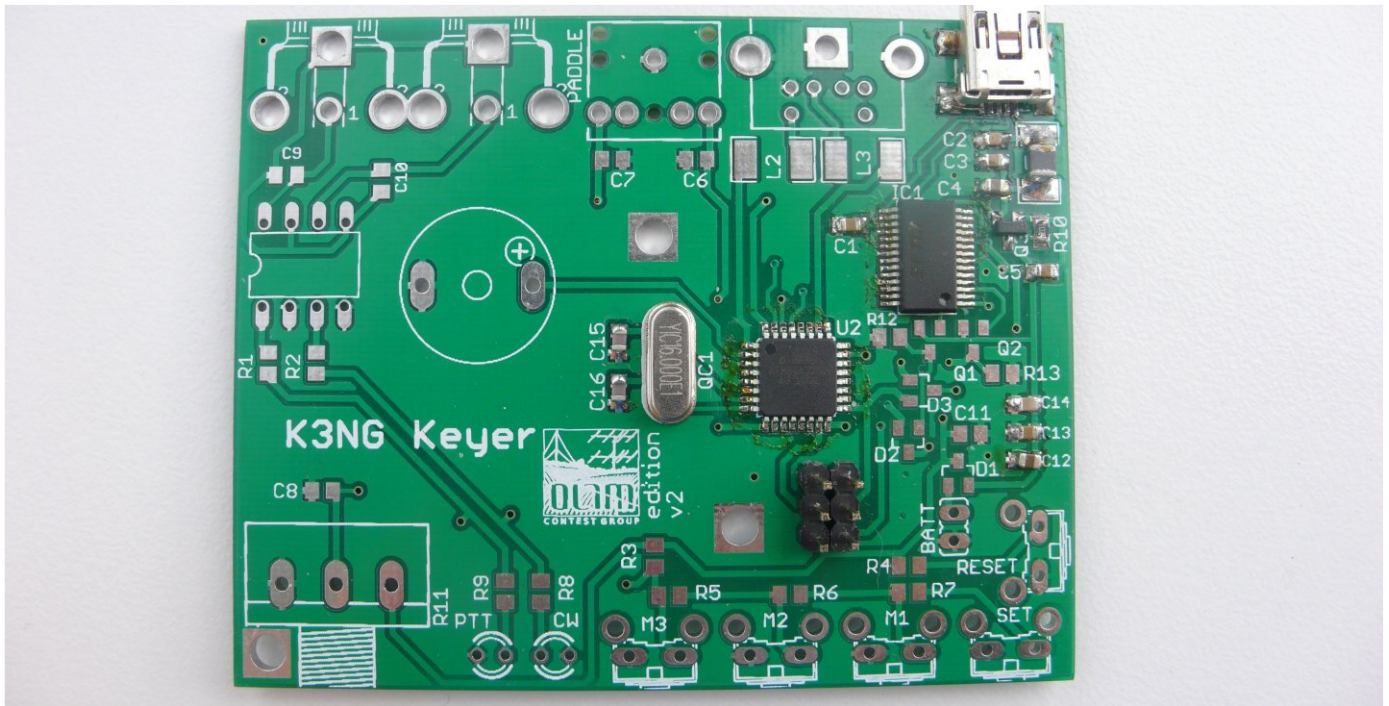
■ Presoldered on the PCB



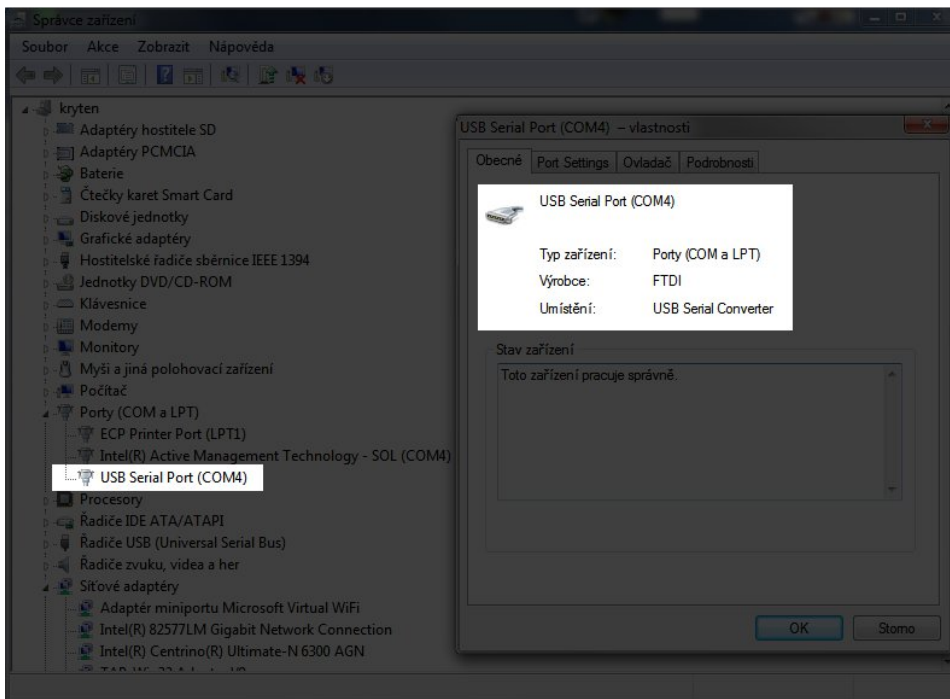
Components

1. Connecting usb interface

- solder usb connector and components around FT232
- L1, R10, C1, C2, C3, C4, C5, C12, C13, C14, Q3



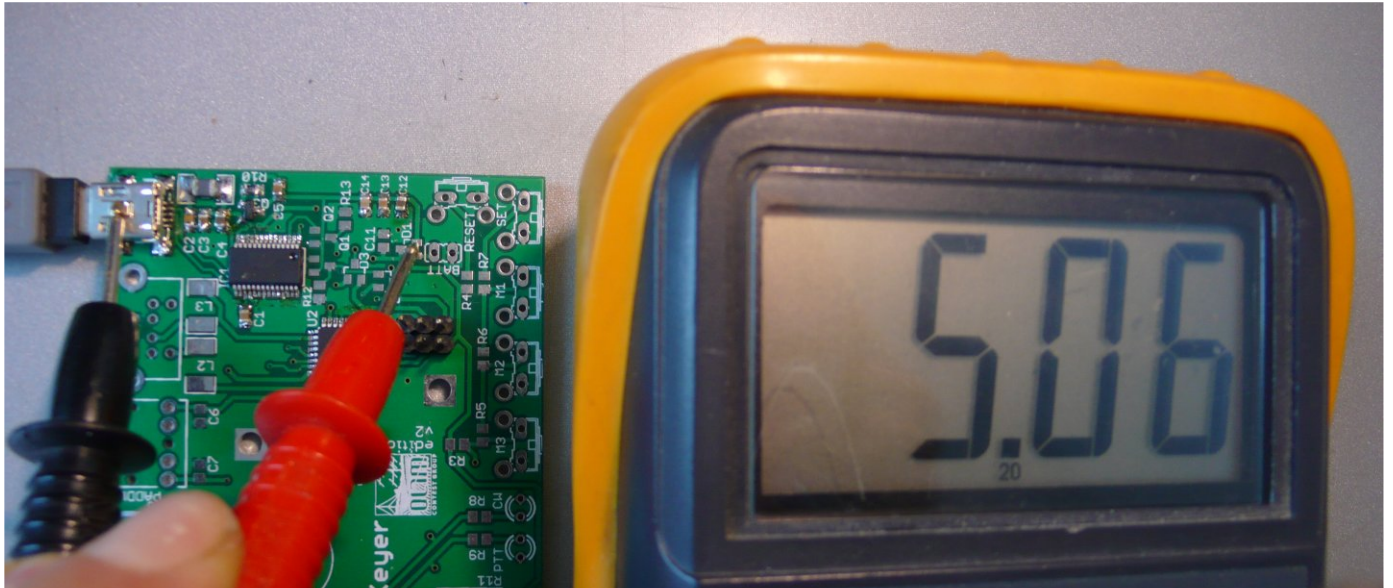
- connect to PC with usb cable and check load FTDI driver



Windows driver loaded

```
dan@nx7300:~$ dmesg | grep FTDI | tail -n 1
[195443.238248] usb 4-1: FTDI USB Serial Device converter now attached to ttyUSB0
dan@nx7300:~$ lsusb | grep FT232
Bus 004 Device 016: ID 0403:6001 Future Technology Devices International, Ltd FT232 USB-Serial (UART) IC
```

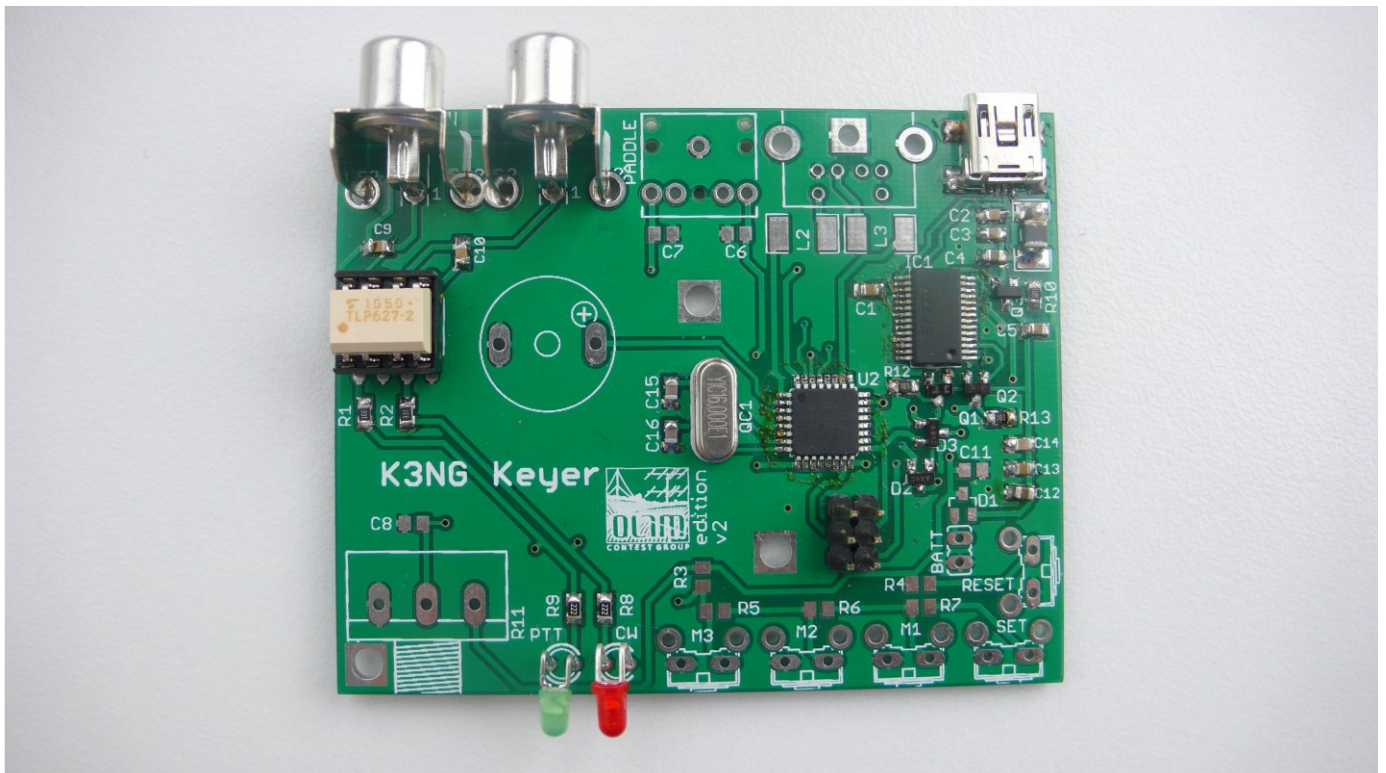
Linux modul loaded



- ❑ check 5V on PCB (see photo)
- ❑ if check is ok, pass next step

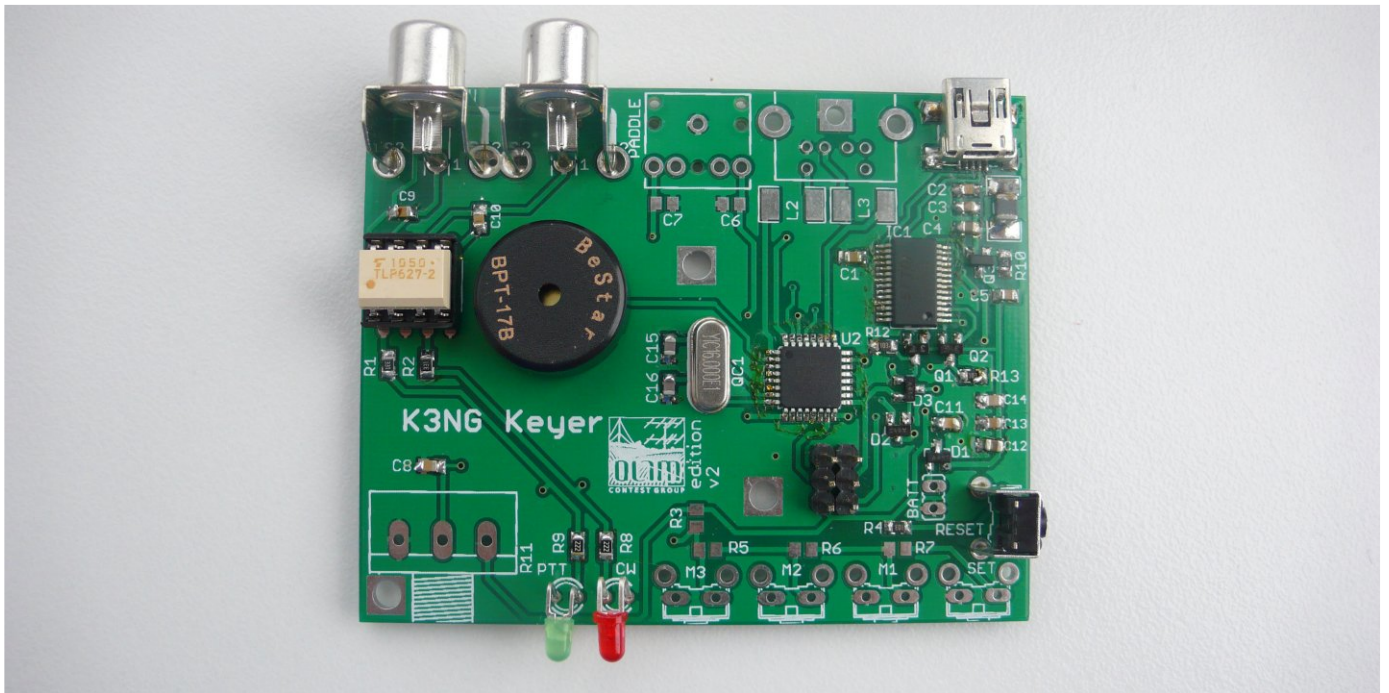
2. CW/PTT output via DTR/RTS signal from FT232

- ❑ solder Q1, Q2, R12, R13, D2, D3, R8, R9 and CW/PTT LED diode
- ❑ connect usb cable and check light LED with keying via DTR/RTS with you preferred software (alternatively with <http://tucnak.nagano.cz>)
- ❑ if LED lighting, solder R1, R2, DIL8, C9, C10 and CW/PTT cinch



3. Connecting Arduino

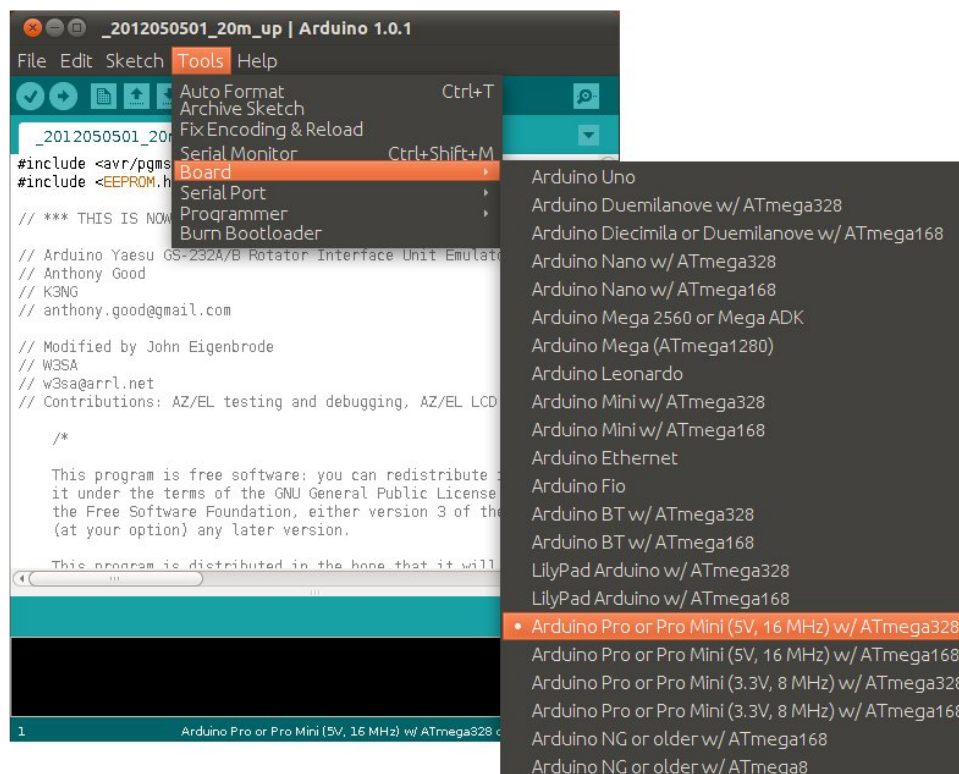
- solder D1, R4, RESET switch (first shorten), C11, buzzer SG2



- connect usb cable to pc

Install arduino software (download from <http://arduino.cc/en/Main/Software>)

Set serial port and board type from menu Tools



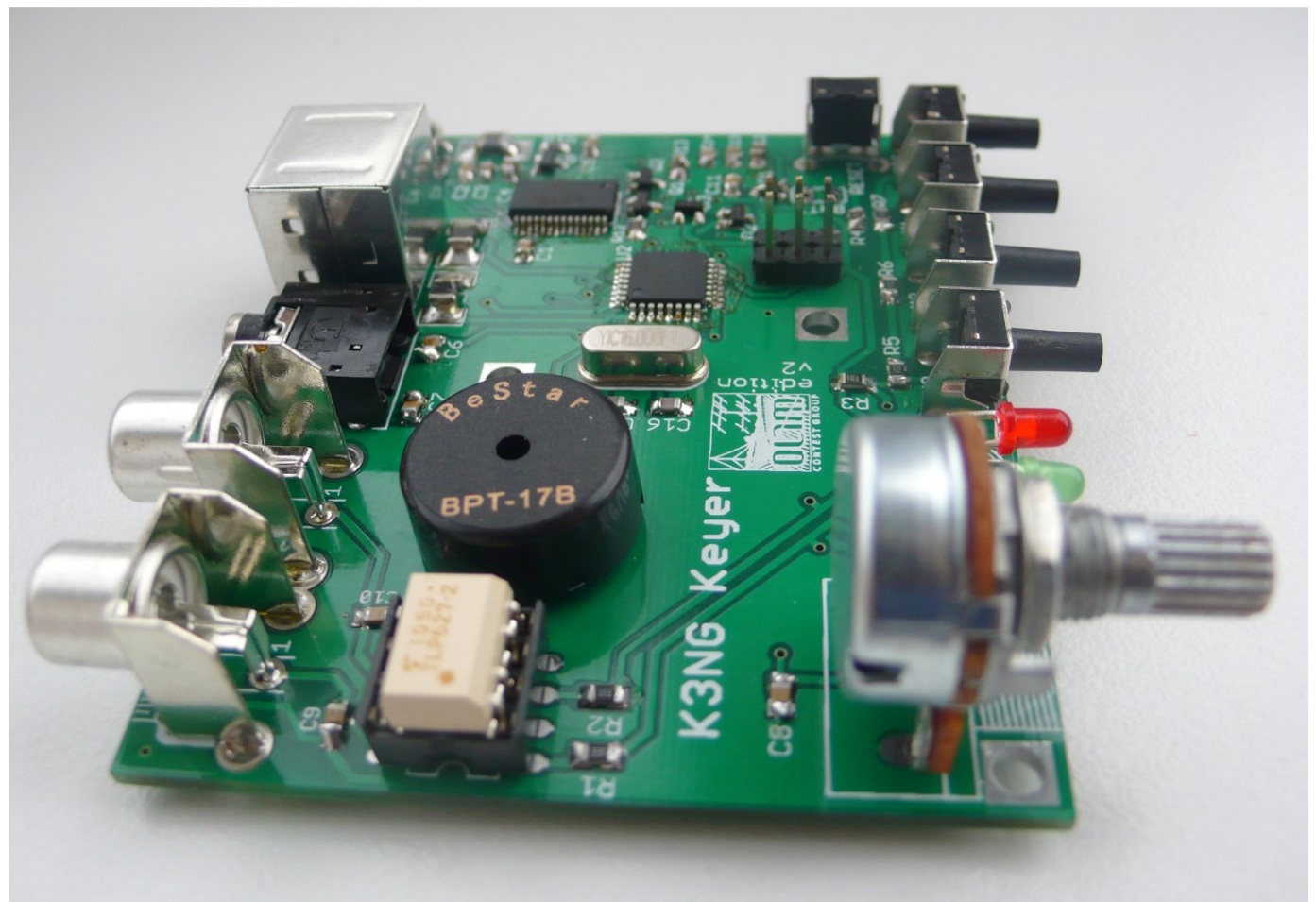
Download preset firmware from http://ok1hra.nagano.cz/2012_k3ng_keyer_2012070101.ino or original from here <http://radioartisan.wordpress.com/arduino-cw-keyer/>

Open Sketch in arduino software. Short press reset switch and upload firmware.

- if uploading is done without errors, communication interface work well

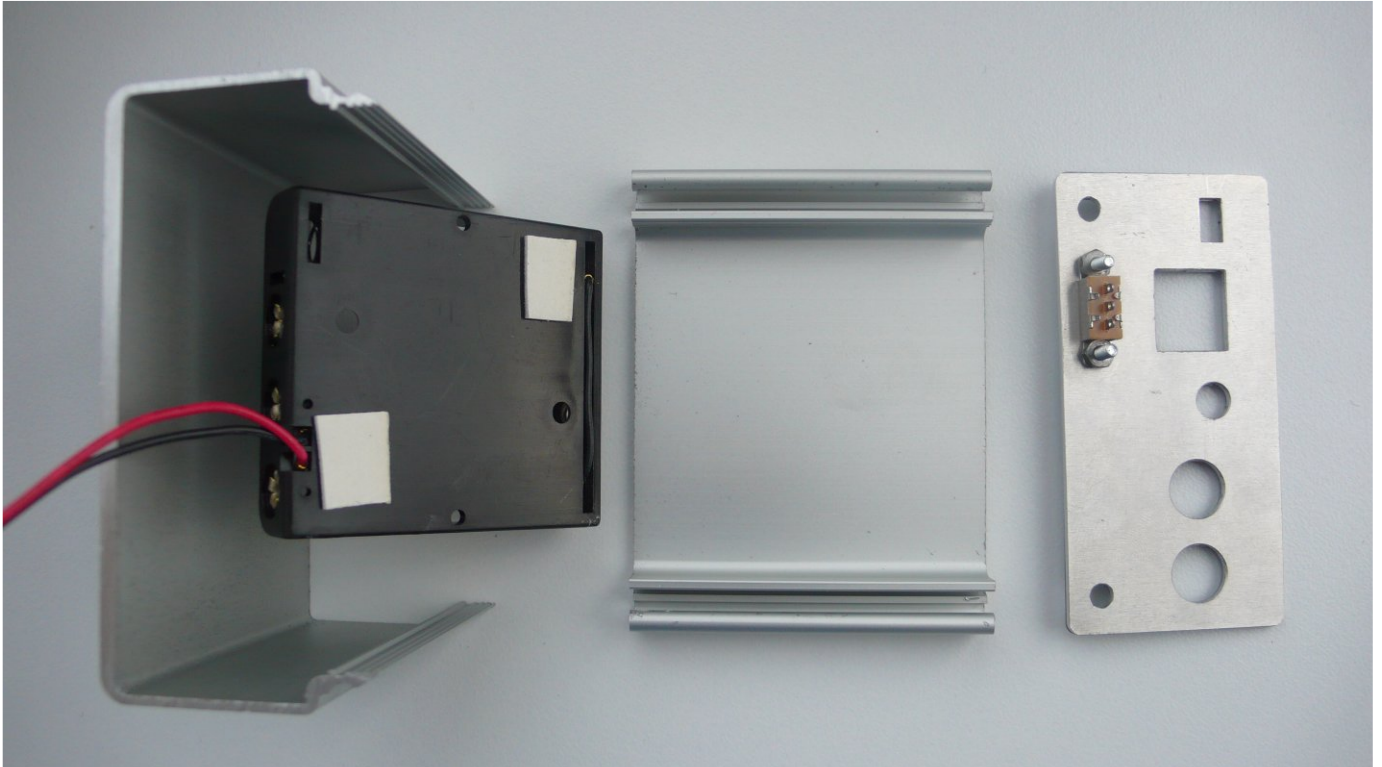
4. Finalize

- solder all remaining components
- C6, C7, C8, L2, L3, R3, R5, R6, R7, R11, jack and PS2 connector

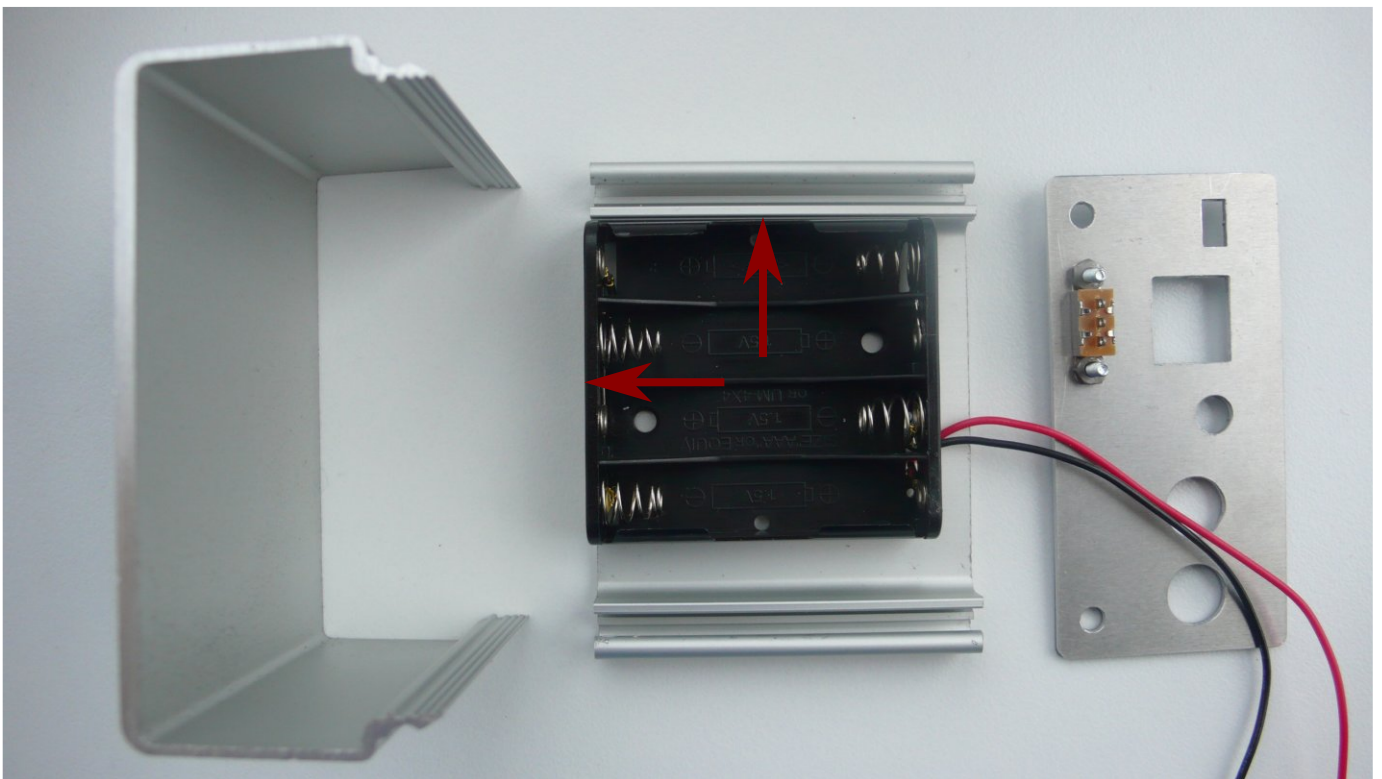


5. Mechanical assembly

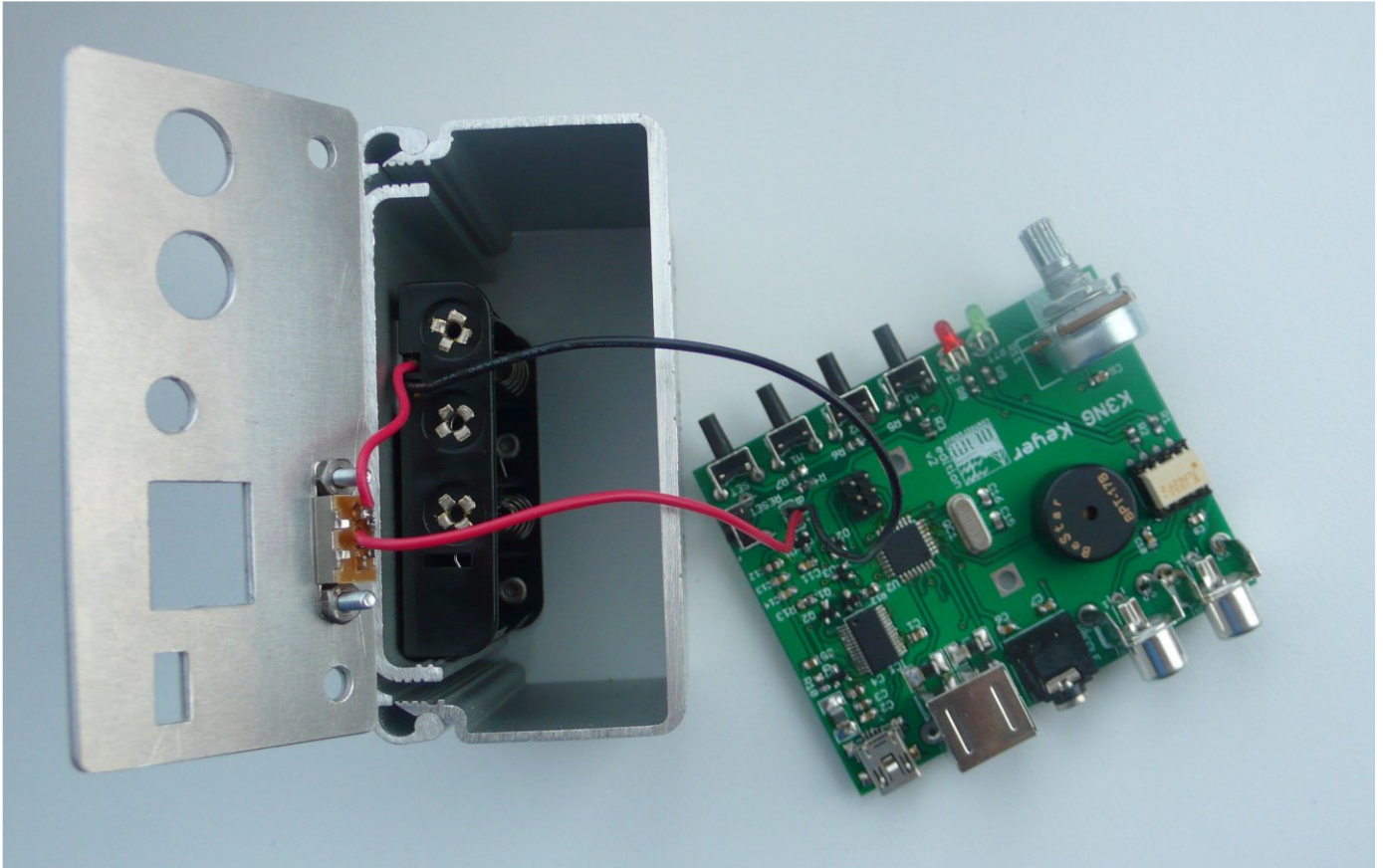
- insert double-sided tape to battery holder



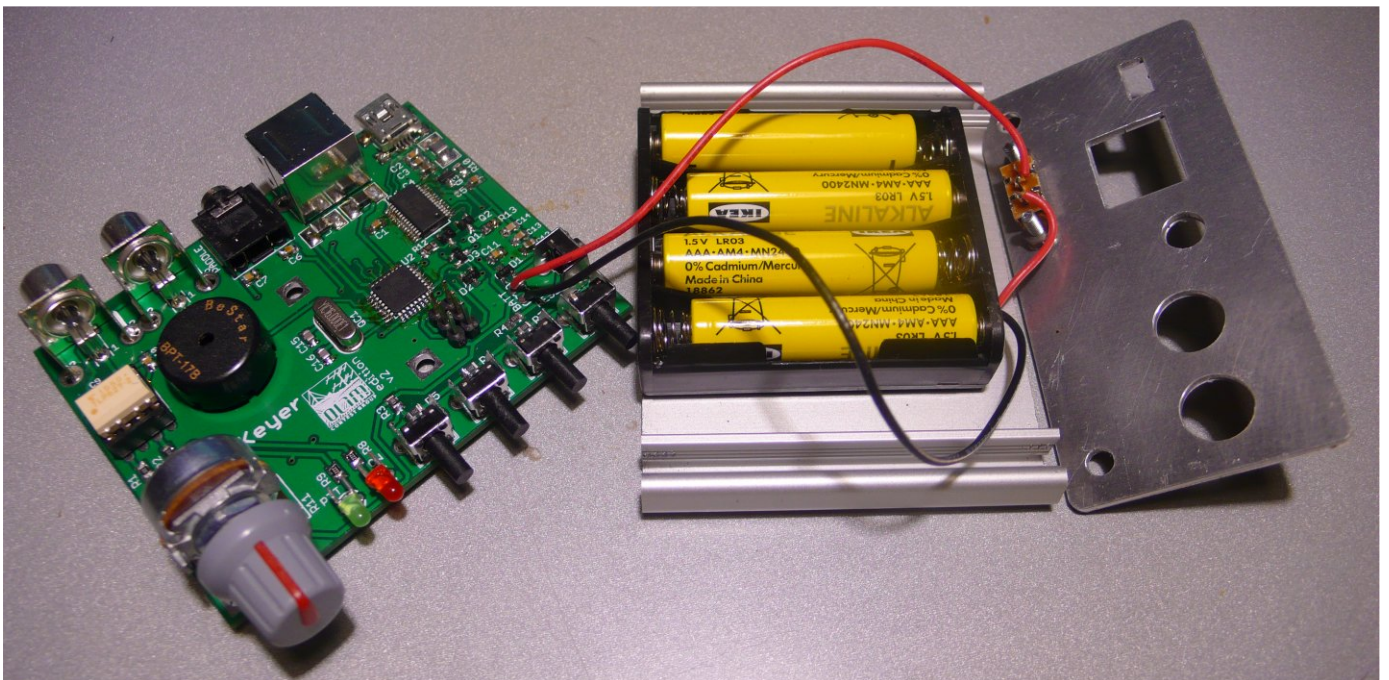
- insert the battery holder on bottom of case - position left/top



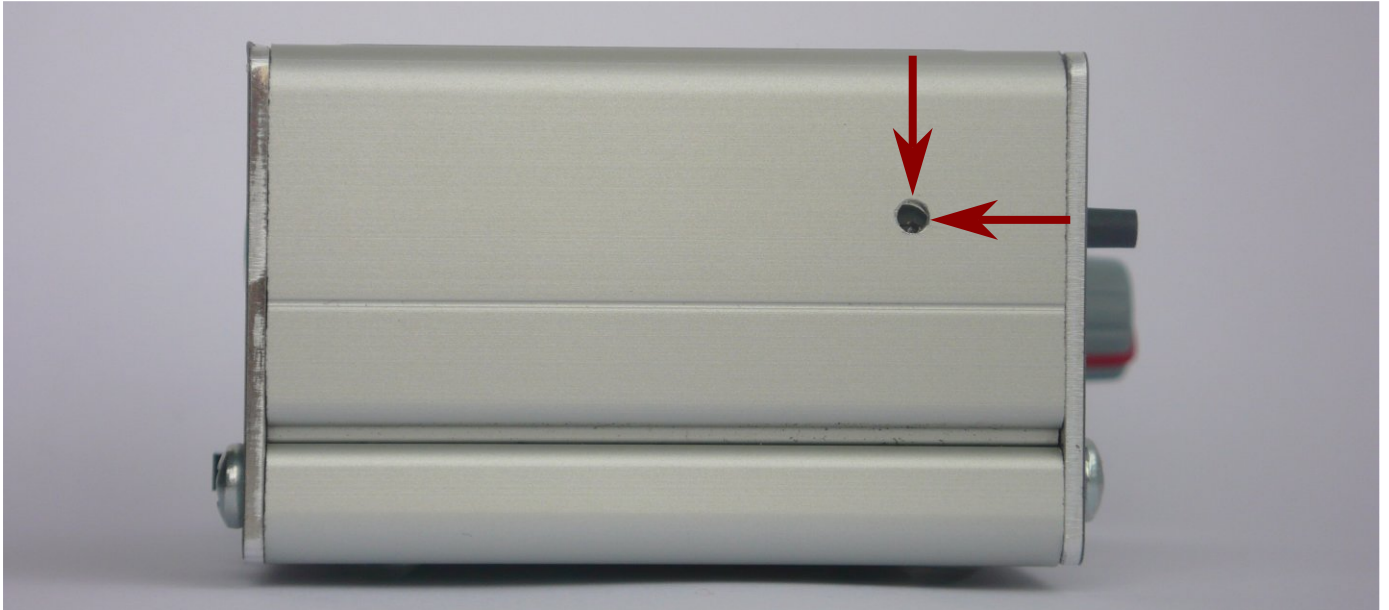
- solder wire from battery holder to board with switch on RED wire
Attention to the polarity! RED is positive, BLACK negative



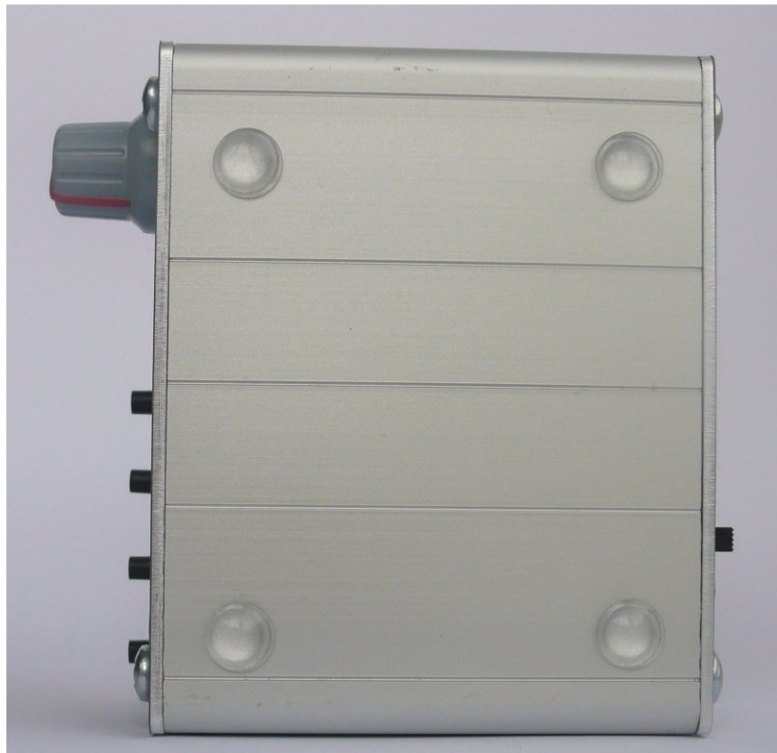
- now you can test the functionality with the battery



- OPTIONS: if you want to have easy access to the reset button after assembly case, drill a hole for the reset, with a diameter of about 2,5 mm (0.1 inch). Center the hole is 14 mm (5.51 inch) from top and 12 mm (4.72 inch) from front on left side the case.



- now you can stick four feet



- case is complete tighten the front and rear panel using the four screw
- last step is stick sticker to use keys on top of the case
- Have fun!

6. Options

- you can customize open source firmware.
Individually handle function is activated directly in the source code.
Description this function is also included.



Assembly Manual
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edition | v. 1.0 October 2012 by OK1HRA | available at www.hamshop.cz