VOICE KEYER KIT ASSEMBLY INSTRUCTIONS v2

Revision History

27 May 2022	Rewrite of original supplier's instructions
15 Aug 2022	Added link to supplier's original instructions
27 Feb 2023	Added note about trimmer function, based on circuit diagram in original instructions
6 Sept 2023	EMI filter is no longer supplied or needed

This document V2 is for Voice keyers supplied after 1st September 2023

For earlier versions see version 1

https://www.sotabeams.co.uk/content/Voice_keyer_Kit_InstructionsV1.pdf

Packing List

It's a good idea to check that you have all the parts before you get started: If anything is missing, just get in touch for help.

Parts list

Designators	Quantity	Values	Description and notes
PCB	1		pre-assembled
C2	1	1 nF	Surface mounted (brown) (direct on the rear mic pads)*
R7	1	470 ohm	Surface mounted (black) (only for Icom radios)*
C8	1	4.7 µF	Electrolytic capacitor
C1, C9, C12, C13, C18	5	10 µF	Electrolytic capacitor
RP1	1	trimmer 500 k	
VT1	1	transistor SF828	TO-92, npn
IC2	1	PIC	IC controller, programmed
IC2	1	IC socket, 8 pin	
Mic	1	electret mic MCE101	with shielded cable
S1	1	PTT switch	
S2-S4	3	switch push button	
Bu1	1	RJ45 jack, 8 pole	
Bu2, Bu3	2	socket, 1 x 8, (female)	
	2	screw M2 x 10	for attaching S1
	2	nut M2	for attaching S1
	2	washer M2 (nylon)	for attaching S1*
	1	bare wire, ø 0,5 mm	approx. 15 cm
	1	sleeving	approx. 10 cm
	1	insulated wire, solid core	approx. 15 cm

* in separate envelope

Spotted a mistake or need help?

Please let us know if you need help! Email support@sotabeams.co.uk

Voice Keyer Kit by DH8BQA (BX-184)

The manufacturer's original instructions (English) are here :-
https://www.sotabeams.co.uk/content/VoicekeyerV2.pdf
This document is a rearranged and expanded version of those original instructions.

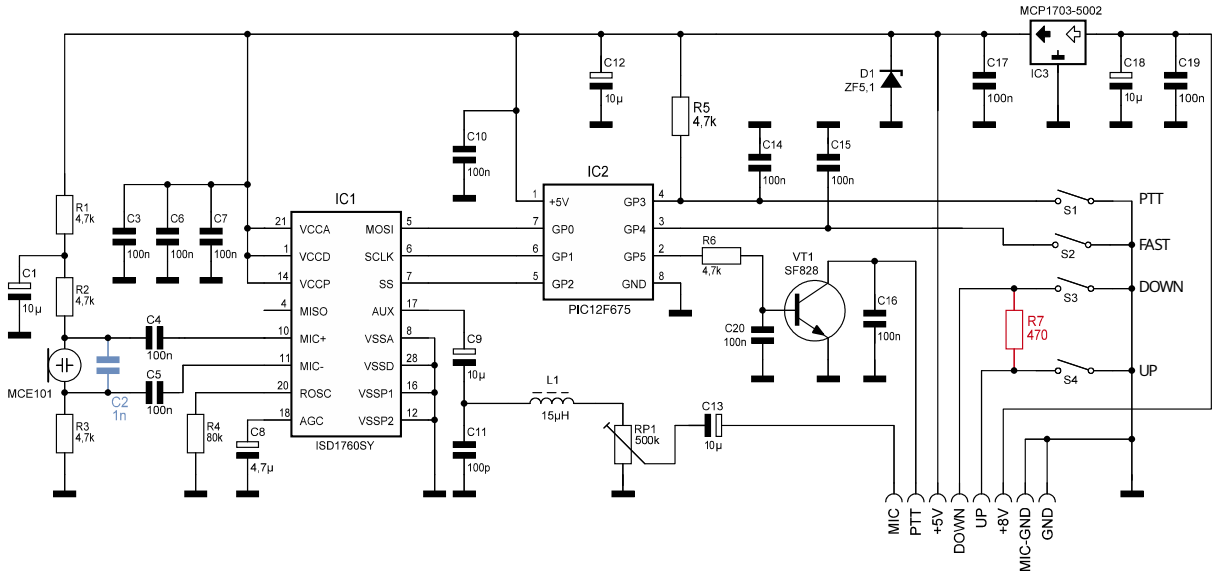
Tools needed

- Soldering iron and solder
- Small screwdriver
- Small spanner for the M2 nut or Long nosed pliers
- Wire cutters

Reference information

Circuit Diagram

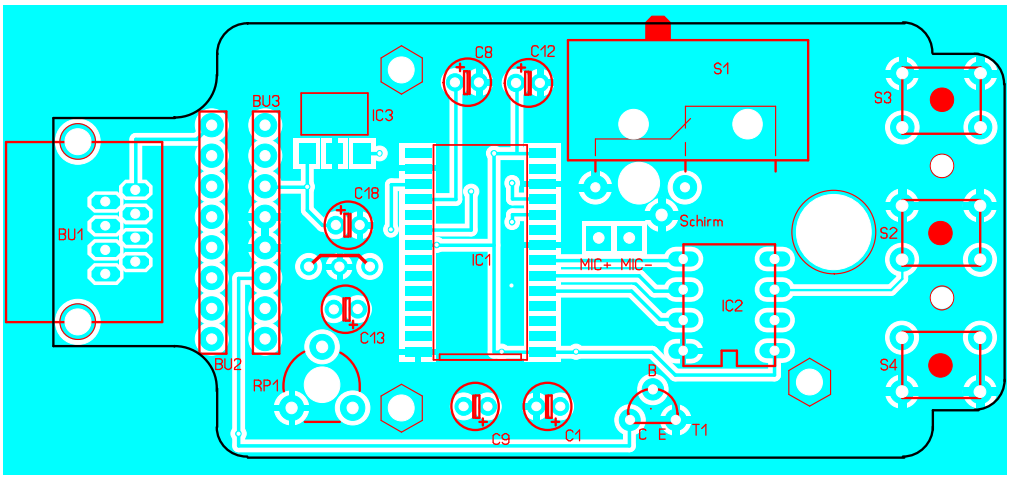
Notes: **C2 (1nF SMD)** needs to be fitted directly on the back of the electret mic. **R7** is only required for ICOM radios.



PCB Layout

User fitted components shown in Red

Note: the wire link below C18 is pre-fitted.



Assembly instructions

3 push switches (S2, S3 and S4):

Install and solder the three switches so that they are flat against the board.

Trimmer RP1:

Install and solder the trimmer. Trim all 3 pins after they are soldered.

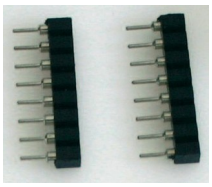
IC socket for IC2 (controller), 8 pin

Pay attention to the notch and make sure to have it in the correct orientation. Solder all pins.

2 header sockets (1 x 8 pin, female) Optional

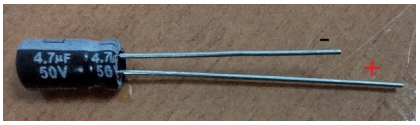
Link wires are used to configure the mic for use with Yaesu or Icom transceivers.

If you intend swapping the mic between transceivers fit the 2 sockets.
If you do not intend to swap between transceivers we recommend you omit fitting the header sockets and solder the links to the PCB in a later step. This gives a more reliable connection.



Electrolytic capacitor (4.7 µF: C8)

Install and solder the capacitor C8 (4.7 µF). Check the values before soldering as there are 2 similar looking capacitors. Ensure the capacitors are correctly oriented - see the small +-symbol on the PCBs silkscreen. The negative lead is usually marked on the capacitor and the long lead is positive.

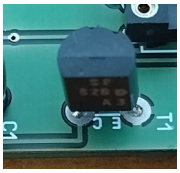


Electrolytic capacitors (10 µF: C1, C9, C12, C13 and C18)

Install and solder the 5 capacitors. Check the values before soldering. Ensure the capacitors are correctly oriented - see the small +-symbol on the PCBs silkscreen The negative lead is usually marked on the capacitor and the long lead is positive.

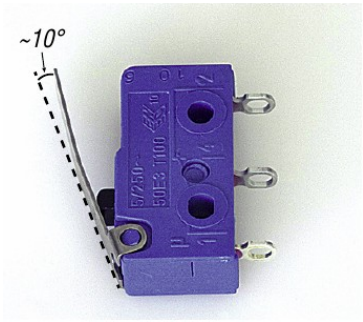
Transistor VT1 (SF828, npn):

Ensure correct orientation, see silkscreen shape. Solder and trim legs.

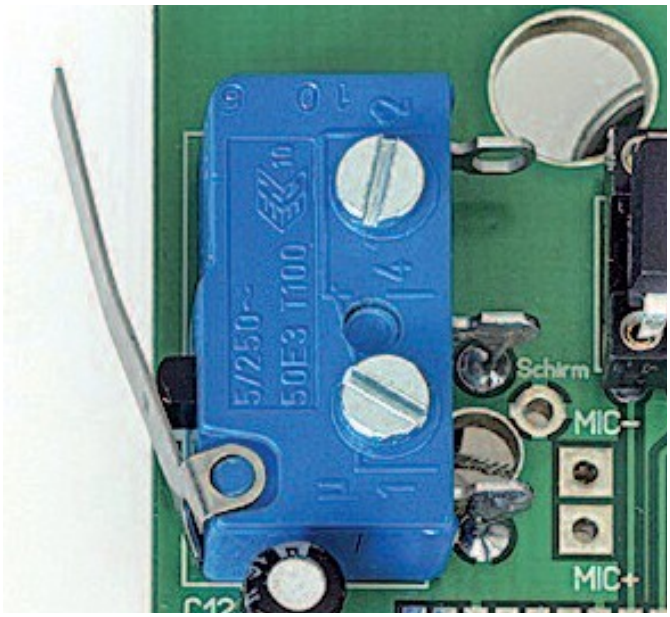


PTT switch (S1):

First bend the metal plate slightly (approx. 10 degrees) as shown below.



Use the 2 screws (M2 x 10 mm) and nuts with plastic washers to mount the switch on the PCB.
Note the washers are in the bag with the surface mounted capacitor and resistor and are hard to spot.



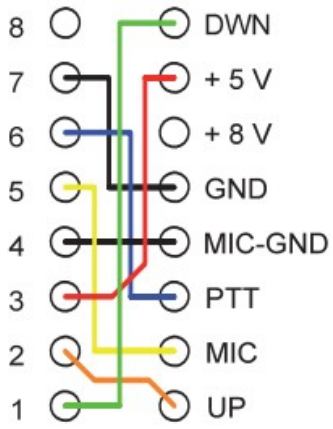
Solder the 2 contacts using short bare wires to the appropriate pads on the PCB, as shown.

Configure links for Transceiver

The original instructions use the tinned wire and sleeving. We have supplied additional PVC solid core wire and recommend using this instead, as in our opinion it is a bit easier to use.
If you have not installed the header sockets, solder the links to the PCB.
If you have used the headers, make suitable length links, stripping 4mm at the end of each link. Push the link firmly into the socket.
See below for Yaesu, Kenwood and Icom transceivers wiring. Note Icom transceivers require an additional resistor.

Yaesu transceivers

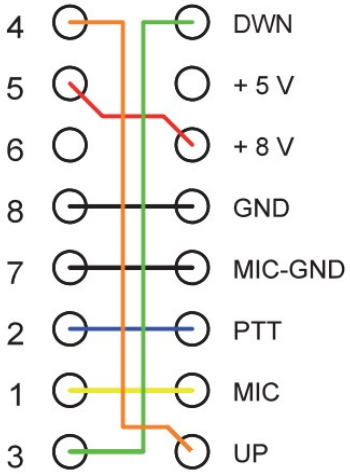
For use with the FT-817, 857, 897 or 950 there are 7 wire connections needed as shown below



FT-817 857, 897

Kenwood transceivers

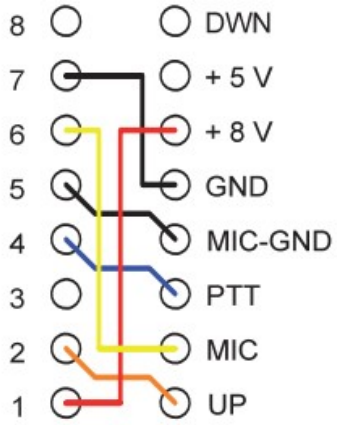
For use with the TR-751 or TR-851 there are 7 wire connections needed as shown below



MH-31 **B8** an TR-751, TR-851

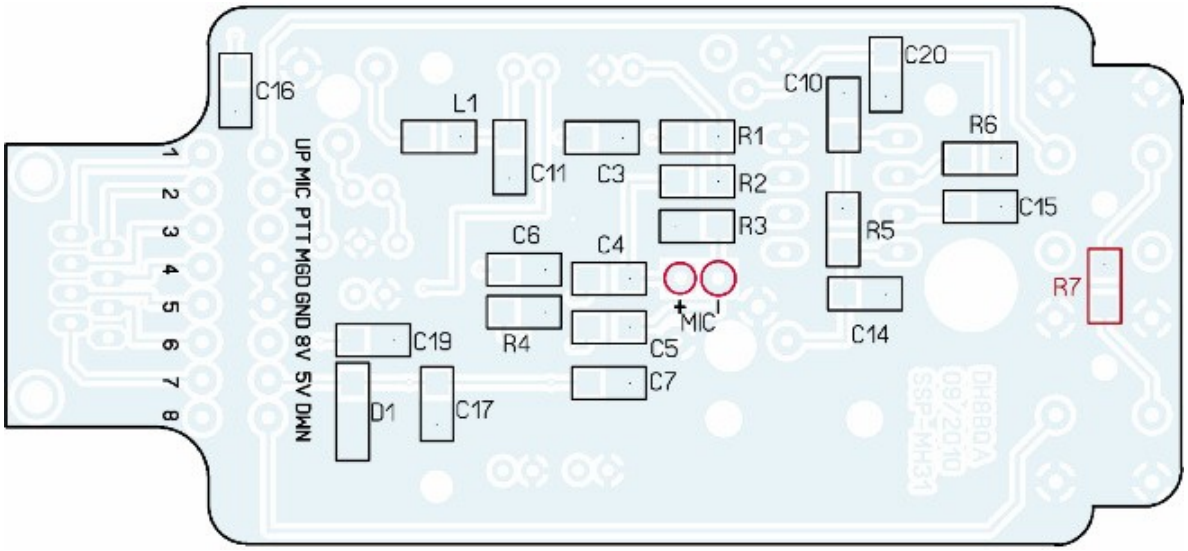
Icom transceivers

For use with Icom radios IC-7000 and IC- 706xx make connections as shown.



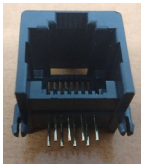
IC-7000, IC-706MkIIG

For Icom transceivers *an extra resistor needs to be fitted on the PCB.*
Fit the black 470 Ohm Surface mounted resistor to R7 to the bottom of the PCB



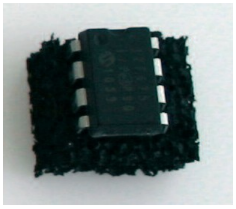
RJ45 jack (BU1):

Fit to PCB and solder



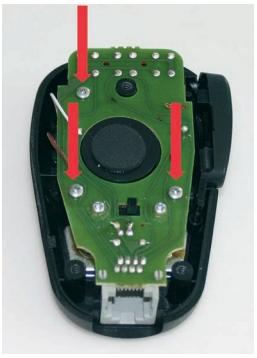
Install Controller (PIC)

Insert the programmed 8-pin PIC in its socket and make sure it is correctly aligned. The chip notch should match the notch on the socket.



Installing the new PCB into the microphone case

Remove the 3 screws from the rear side of the microphone and pull the case apart. Unscrew the indicated 3 screws inside, then remove the original PCB and the original dynamic microphone.

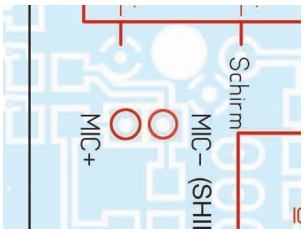



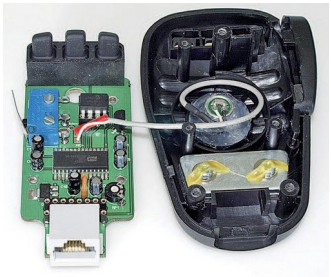
Solder the surface mount capacitor C2 (1 nF) directly to the back side of the electret mic. The capacitor is brown with no markings and is in white packaging. It is small, so be careful you do not lose it.


To prevent any electrical short circuit, use a 15 mm long piece of the supplied sleeving **or** trim both leads of the mic cable to approx 6 mm.

Use a hot glue gun to fix the electret microphone in the centre of the microphone place. Fill the hole completely for the best sound.

Solder both microphone leads to the pads on the upper side of the PCB. The shield must be connected with “MIC–“ and the inner wire with “MIC+“.





Insert the PCB into the microphone case and secure with the 3 small screws removed earlier.

Ensure that the plastic PTT button is correctly seated inside the case, and check that that it operates the PTT switch S1 okay (should click when pressed and when released). You may need to correct the angle of the metal plate slightly.

Replace the back cover of the case, and secure it with the 3 case screws removed earlier.

Operating the Voice Keyer

All 3 operating modes (record, single playback and loop playback) are controlled by the FST key. In addition there is a simple set mode for selecting the duration of monitoring interrupt.

Record

Push and hold the FST key for 3 seconds (minimum) to enter the record mode.

Push and hold the PTT key and speak into the microphone with normal voice level.

At the end of your call release the PTT. Your message is now stored.

Single playback

Push the FST key briefly (less than 0.5 sec.). The transceiver transmits your call one time and switches back to receive.

Pressing the PTT key cancels the transmission.

Loop playback

Hold down the FST key for 1 second (0.5 to 1 sec.) to start the playback.

Setting the monitoring time for loop playback operation

Pause time for monitoring is set to 3 seconds initially. While holding the PTT key down press FST for 0.5 seconds. This changes pause to 6 seconds. Pressing PTT and FST together again will change from 6 to 10 seconds. Doing it all again will change from 10 back to 3 seconds. Selection is cyclic.

Output gain

If you need to adjust the gain for the audio signal that is sent to the radio (not always necessary to do), you can do that using the trimmer on the voice keyer board.