EKEY16

Mini CW electronic Keyer

Assembly manual

Last review: February 1, 2018

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Latest updates and news: www.ea3gcy.com.

Thanks for purchasing the "EKEY16" kit

Enjoy building !   73 Javier Solans, ea3gcy

PLEASE READ THOROUGHLY ALL THE MANUAL AT LEAST ONCE BEFORE ANY WORK IS DONE.

SPECIFICATIONS

- Speed range: 5-50 WPM
- QRSS Speed LOWFER
- Messages: 236 letters/12 slots
- Modes: Bug, Iambic A or B and Ultimatic keyer
- Inter – letters space adjust
- Auto-space
- Weight adjustment
- Keying compensation
- Serial number with auto-increment
- Command for reversing blades
- Sidetone output
- Adjustable Sidetone frequency
- Quick change of the speed by paddles.
- Power supply: 3 to 5V
- KIT includes: PCB and all parts + Speaker for Sidetone + 3V battery and socket
- No included: enclosure, switches or connectors
- PCB Size: 30 x 40mm

PARTS LIST

Parts List					
	Quanty	Referenc	Value	Part type	Ident.
	2	R1 y R5	100 Ω	resistors 100 Ω	brown-black-brown
	2	R2 y R3	4K7	resistors 4K7	yellow-violet-red
	1	R4	10K	resistor 10K	brown-black-orange
	4	R6 a R9	1K 1%	Resistor de 1K 1%	brown-black-black-brown-brown
	6	C1, C2, C4, C5, C6, C7	100n	Capacitors 100n	104 o 0.1
	1	C3	10n	Capacitor 10n	103 o 0.01
	1	C8	10n	Capacitor 10n 5% **blue color**	**Blue color** 103 o 0.01
	1	Q1	BC547	Transistor NPN BC547	BC547
	1	D1	1N4148	Diode 1N4148	1N4148
	1	IC1	K16 chip	Chip microcontroller K16	--
	1	Socket 8p		Socket for IC1	--
	2	Spacers	--	Spacers + screws + nuts M3	--
	16	Male pins	--	16 Pin strip male	--
	1	Speaker	--	Speaker-buzzer for Sidetone	--
	1	Battery	--	Battery 3V CR2032	--
	1	Battery socket	--	CR2032 socket battery	--
	1	PCB	--	PCB 40 x 30mm	--

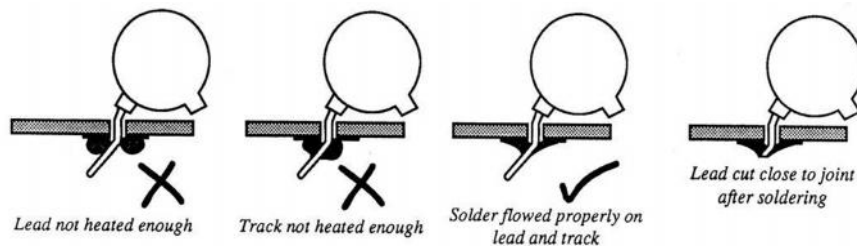# TIPS FOR FIRST TIME BUILDERS

Tools required:
- Small tipped soldering iron of about 25-30 W rating, small side cutters, wire strippers, pliers, long nosed pliers, sharp hobby knife, and screw driver for the M3 bolt.
- You will also need good lighting and a magnifying glass to read the fine print on some parts.

Instrumentation required:
- Multimeter. Frequency Counter or calibrated HF receiver.

Soldering:
There are two important things which need to be done to ensure the successful operation of a kit: one is to put the right part into the proper place on the board; the other is good soldering.

Lead not heated enough · Track not heated enough · Solder flowed properly on lead and track · Lead cut close to joint after soldering

To properly solder you must use the correct type of iron and the right quality of solder. Use a small tipped soldering iron whose bit is short and pointed at the end. The iron should be about 25-30 W (if it is not thermostatically controlled). Only use multicored solder for electronics. NEVER use any extra flux. You should hold the hot iron in contact with both the board and the part lead for about two seconds to heat them up. Then, keeping the iron in place, touch the solder onto the junction of lead and track and wait about two seconds or so until the solder flows along the lead and track to form a good joint. Now remove the iron. The iron should have been in contact with the part and circuit track for a total time of about 4 seconds. It is a good idea to drag the tip of the iron up the component lead as you remove it from the joint, this helps to pull any excess solder up with it and enables good flow along the component lead.

Finding the right part:
IC's
The board outline for ICs has a "U" notch on one end. This indicates the pin 1 end of the IC. There is also a notch on one end of the sockets. This end goes over the "U" notch outline on the board. ICs have usually pin 1 marked with a round dimple or dot. This end of IC will go towards the notch on the socket or "U" on the outline.

Electrolytic capacitors:
These must be installed with the correct polarity. The positive (+) lead is always the long lead. The negative (-) lead is marked by a stripe on the body of the capacitor can. Make sure the plus end of the cap goes toward the hole labeled with the (+).

Transistors and diodes:
The transistors have the silhouette printed on the board. The diodes must be placed in the correct polarity position, they have a color band on their body that must match the printed drawing on the board.

RECOMMENDED ASSEMBLY SEQUENCE

I strongly recommend that you install the parts in the following order:

1. Following the list of components, solder all resistors R1 to R9. All resistors are placed in vertical position. R6 to R9 are 1K and are marked only with the numbers from 6 to 9 (without the R), these resistors are 1% tolerance and are a little different.

2. Then install and solder all capacitors in place. There are two 10n capacitors (103), **C8 is 5% tolerance and it is blue.**

3. Place the socket for IC1 and insert the integrated circuit K16. Pay attention to placing them in their correct position. The socket and the integrated circuit have a mark that must match the silhouette printed on the board.

3. Place transistor Q1 and diode D1. The diode is placed in a vertical position and the dark band on its body must match that of the silhouette printed on the board.

**4**. Place "KOUT", "3-5V", "AF-SPK" and "CM-S" terminals pin.
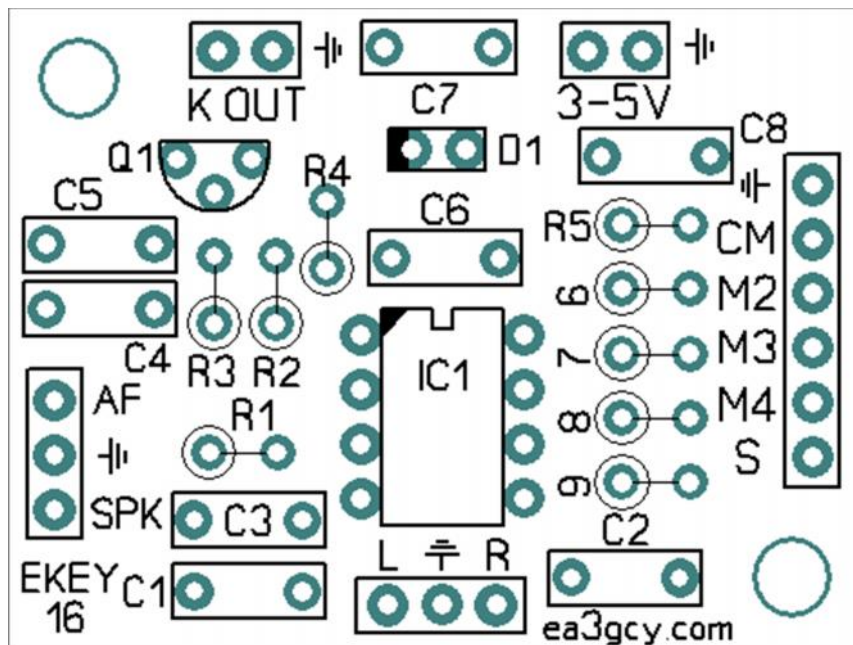
TERMINAL "S"

Use of potentiometer for speed adjustment

Normally, the "S" terminal is not used and this terminal is connected to GND through a small track on the PCB (see the following image). The speed adjustment is easily done through the K16 commands and it is not necessary to install the potentiometer.
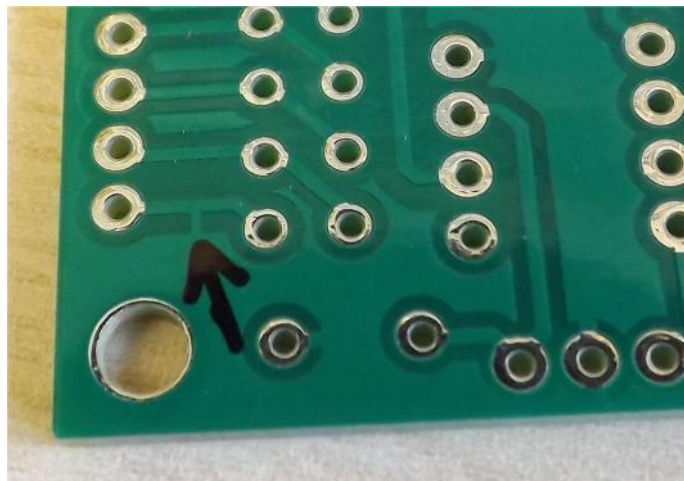
If you wish to use the speed adjustment potentiometer you must connect a 10K potentiometer to the "S" terminal and **MUST cut the circuit board track** that connects the pin with GND.
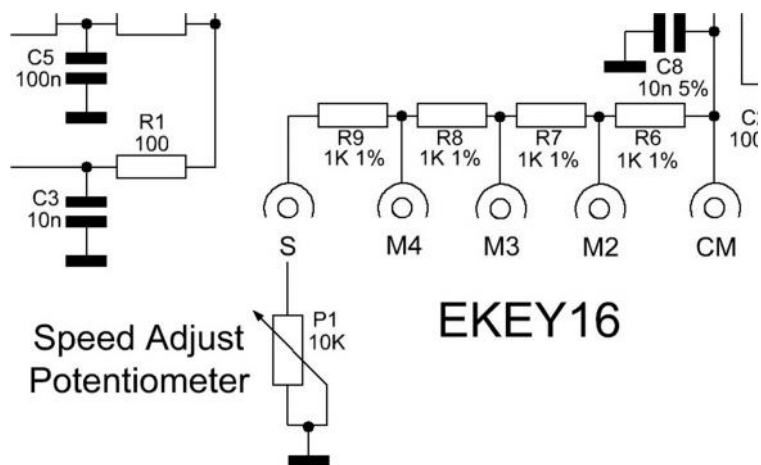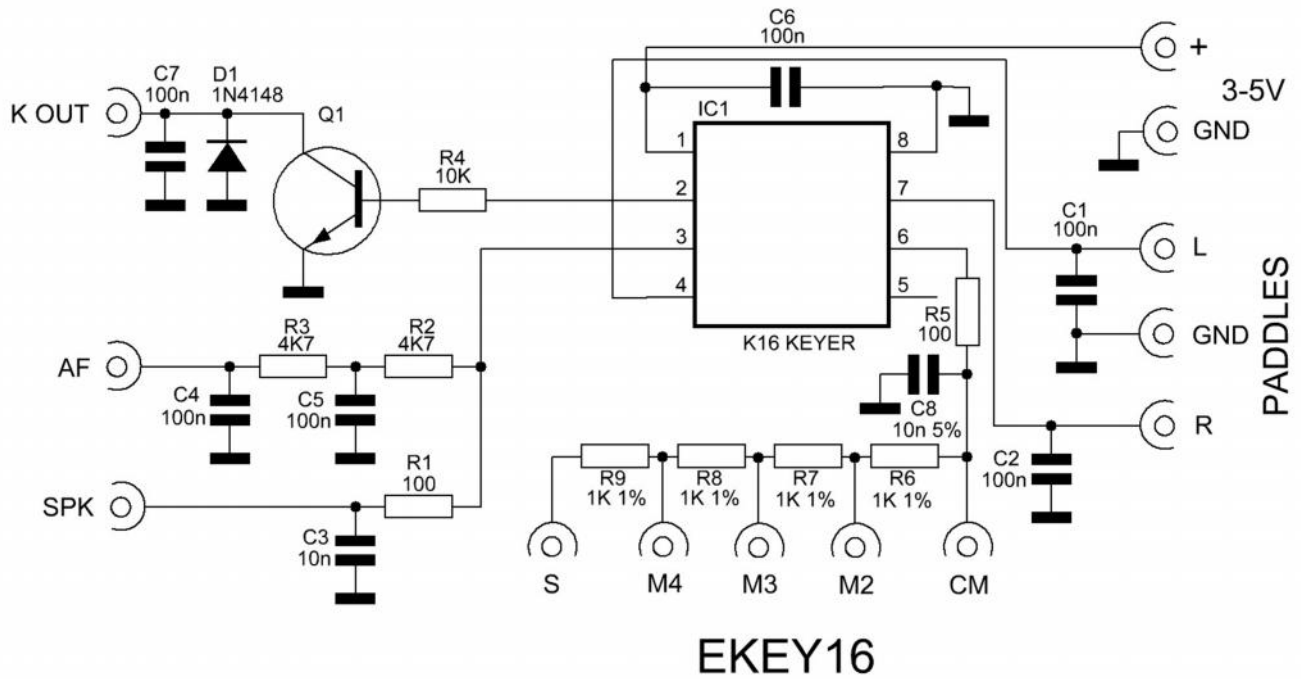
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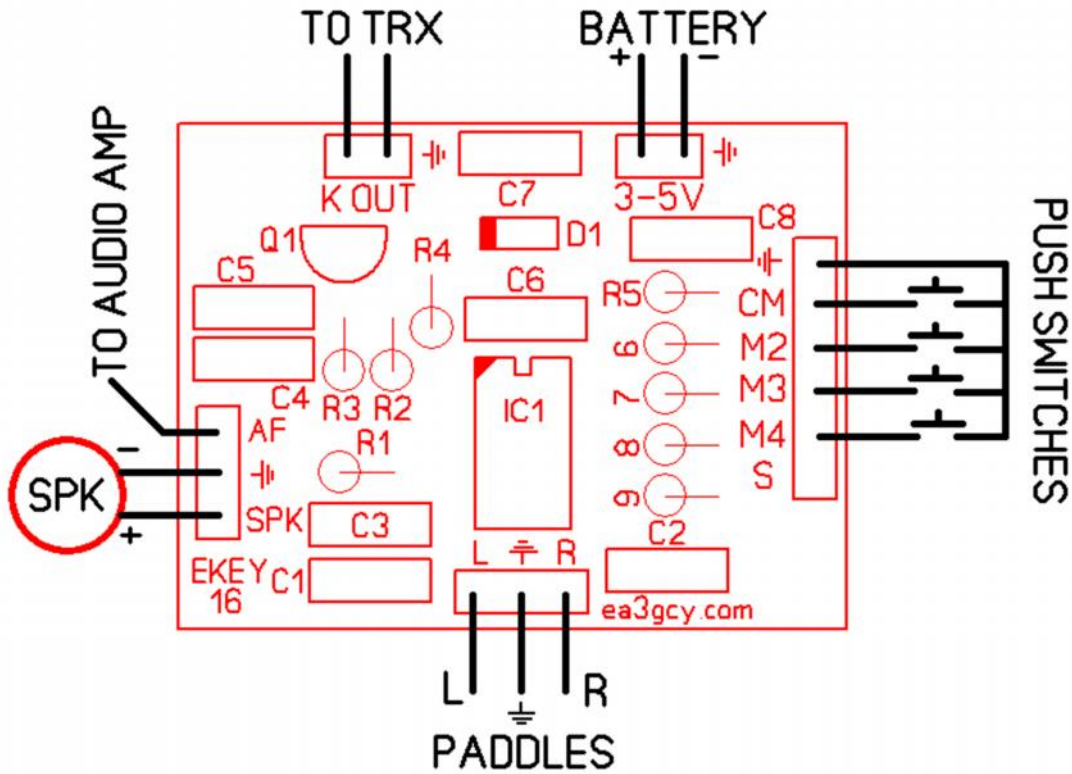
EKEY16 USE

The basic use of the K16 electronic keyer is very simple, however if you want to use all its functions you should read carefully the K16 user guide where you can see all the programming commands and functions.
You can download it from here:

www.ea3gcy.com   www.qrphamradiokits.com

SCHEMATIC

EKEY16

LIMITED WARRANTY

Please read carefully PRIOR to do any work with your kit.

All parts provided with this kit are guaranteed against any fabrication defect for one year after the sale. The buyer has the option to examine the kit and the instruction manual for 10 days. If during this period he or she decided not to build the kit, it will be possible to send the kit back, with all shipping charges payed by the customer. The seller shipping charges and all other costs involved (Ebay or Paypal charges) will not be reimbursed.

If you plan to ship it back, PLEASE CONSULT how to do it to ea3gcy@gmail.com

Javier Solans, ea3gcy, guarantees that when the kit is built and adjusted following the information enclosed in this manual, and it is used according to the advices mentioned, it will work according to its specifications.

It is your duty to follow the advices and recommendations of this manual, correctly identify the parts, use good working procedures and have access and correctly use the tools and instruments requirede for the assembly and adjustment of the kit.

In case you think any part for the kit is missing, please make an inventory of all parts with the parts list included on the manual. Please revise all bags, envelopes or boxes carefully. If something is missing, please send me an email and I will mail you the part right away. Even if you don't want to bother with a common part you may have on your junk-box or a local store, please let me know so I can help other customers with a similar problem.

I can also provide a part that you have broken, dammaged or lost by accident.

In case you find any errata or mistake on this manual, or you like to make a comment, please get in touch with me at ea3gcy@gmail.com

Enjoy building EA3GCY Kits !

73 Javier Solans, ea3gcy