

# A-PLOP

**ANTI-PLOP removes RX to TX and TX to RX switching noise**

## Assembly manual

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Updates and news at: [www.ea3gcy.com](http://www.ea3gcy.com)



Thanks for building the **A-PLOP** kit

Have fun assembling it and enjoy QRP! 73, Javier Solans, ea3gcy

# PLEASE READ ALL OF THE ASSEMBLY INSTRUCTIONS COMPLETELY AT LEAST ONCE BEFORE BEGINNING.

## WHAT ANTI-PLOP DOES

Some old equipment, many kits and amateur built transceivers usually generate some noises or "plops" at the moment of switching from RX to TX and back from TX to RX. Usually these "plops" and "cracs" are not very annoying when using loudspeakers, but they are almost unbearable when working with headphones.

The A-PLOP kit is a very versatile circuit that totally eliminates these switching noises (RX to TX and TX to RX) from any transceiver equipment.

The A-PLOP is a simple circuit that can be built and put into service in less than 1 hour. Even with its simplicity, the heart of the A-PLOP is a PIC16F683 microcontroller that is in charge of governing the sequence of the PTT and relay switching. Delay times can be set by the user in 50ms intervals from 0 to 750ms in 16 steps.

Essentially, what "A-PLOP" does is to prevent the switching noises generated by the transceiver from being heard on the speaker. Relay RL1 is responsible for sending the transceiver speaker output to a load resistor (R4) at the times when noises can occur.

### **The "A-PLOP" controls the PTT and speaker of transceiver**

When the transceiver goes from RX to TX the following occurs:

- 1) The relay disconnects the speaker and instead connects the load R4
- 2) A delay is generated
- 3) The PTT is then activated and the transceiver switches to transmission.

When turning from TX to RX the following occurs:

- 1) The PTT on the transceiver is deactivated and returns to reception (the speaker is still disconnected)
- 2) A delay is generated
- 3) The relay then reconnects the speaker to the transceiver.

## SPECIFICATIONS

- Switching the speaker to a 10 ohms dummy load (by relay)
- Electronic PTT switching. 100mA maximum
- Delay times programmable independently from RX to TX and TX to RX
- Delay time setting: from 0 to 750ms in 16 steps
- Power supply: 9 -14V
- Circuit board dimensions: 42 x 25 mm.

# TIPS FOR FIRST TIME BUILDERS

## **Tools required:**

- A fine-tipped 30W soldering iron, good-quality electronic-type solder, small diagonal wire cutters, needle-nose pliers, and tweezers to hold the SMD component.
- You will need good lighting and a magnifying glass to see the fine print on the components and other assembly details.

## **Soldering:**

There are two important things which need to be done to ensure successful operation of a kit. The first is to put the component into the proper place on the circuit board; the second is good soldering.

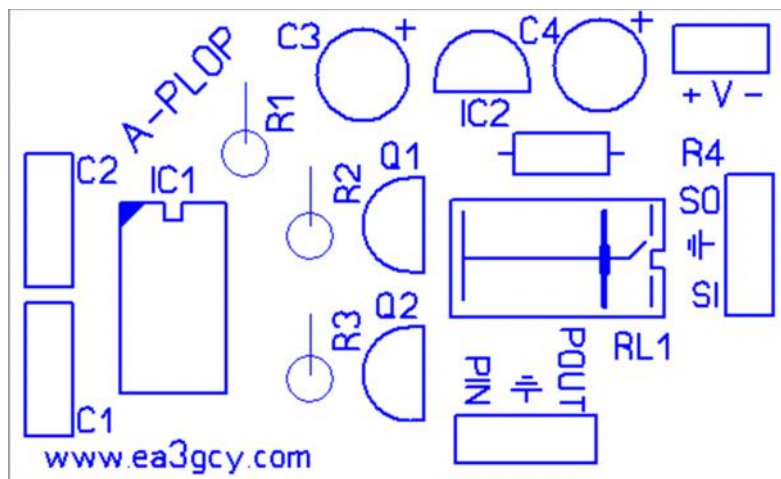
To solder properly, you must use an electronic-type solder of the highest quality possible and the correct type of iron.

Use a quality-brand soldering iron with a short, fine-pointed tip. For this kit, the soldering iron should be about 30-35 Watts (if it is not thermostatically controlled). Use only high-quality electronic-type solder. NEVER use any extra flux. You should hold the hot soldering iron in contact with both the circuit board and the component lead for about two seconds to heat them up. Then, keeping the soldering iron in place, touch the solder at the junction of the lead and trace and wait about two seconds or so until the solder flows between the lead and the trace to form a good joint. Now remove the soldering iron. The soldering iron should have been in contact with the work piece for a total time of about 4 seconds. When soldering leads that connect to large trace surfaces, you will need to preheat the junction for a little longer so that the solder flows correctly.

You should clean the soldering tip before soldering each joint. This prevents accumulating solder on the tip and mixing in residues from previous soldering operations with the next one.

# PARTS LIST

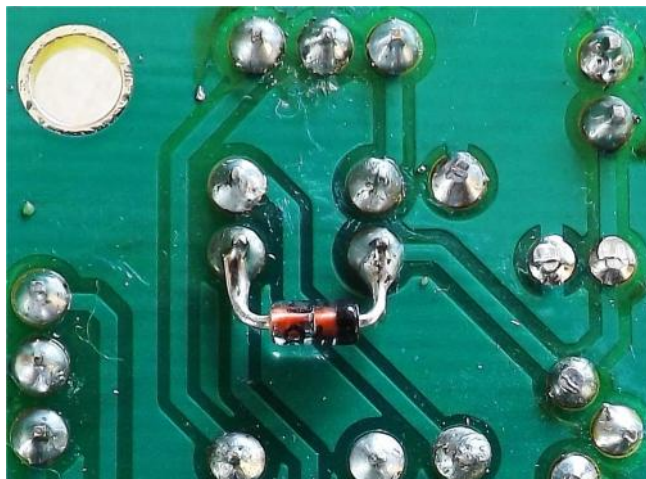
	Reference	Value	Component type	Identification
	R1, R2, R3	10K	10K Resistors	brown-black-orange
	R4	10	10 ohms <b>1/2W</b> resistor	brown-black-black
	C1, C2	100n	100n Capacitor	104 o 0.1
	C3, C4	100uF	100uF Electrolytic capacitor	100uF
	Q1, Q2	BC547	Transistor NPN BC547	BC547
	IC1	PIC12F683	PIC12F683 Microcontroller	PIC12F683
	IC2	78L05	5V Regulator	78L05
	RL1	Relay 12V	Omron Relay G5V-1 12V	G5V-1 12V
	8 pins	--	3+3+2 pins	--
	Socket	--	8 pin socket for IC1	--



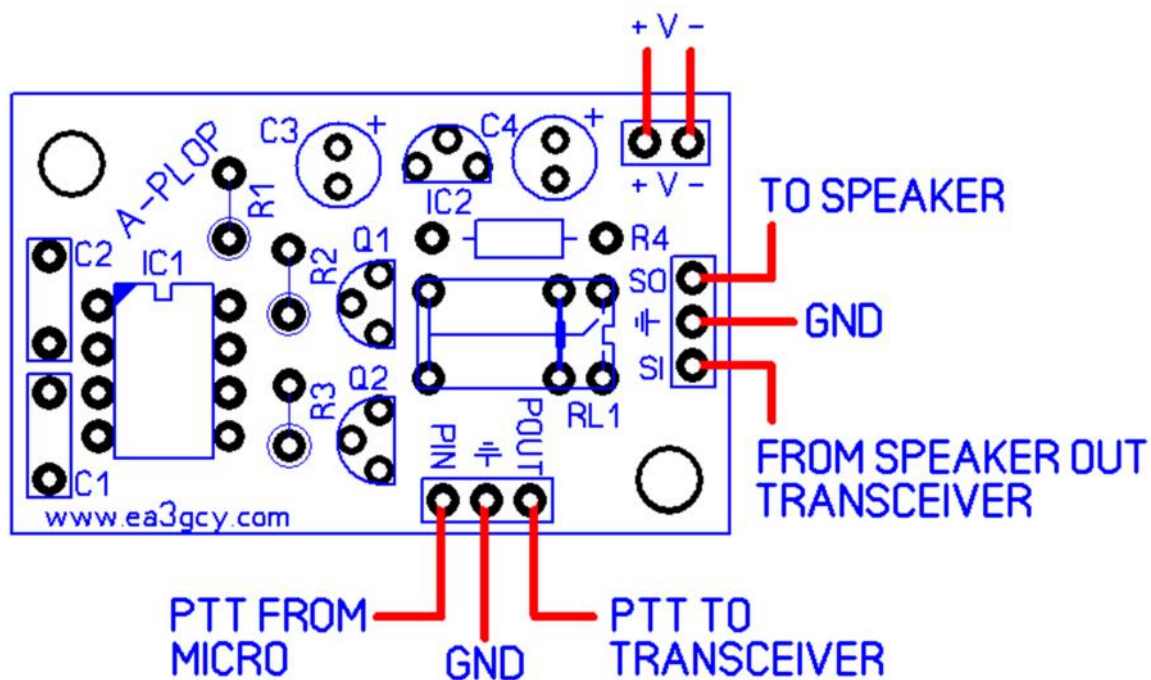
## RECOMMENDED ASSEMBLY SEQUENCE

It is recommended to assemble the kit in the following order:

1. Following the parts list, solder the R1, R2 and R3 resistors that are placed in vertical position. Solder R4 (10 ohms of 1 / 2W) that is placed in horizontal position.
2. Next install and solder C1 to C4 capacitors. The C3 and C4 capacitors are electrolytic type and must be placed with their longest terminal to "+" sign printed on the board.
3. Install and solder the IC1 socket. Note that it has a mark that should match the drawing printed on the board. Insert the IC1 PIC12F683 into the socket.
4. Install the 5V IC2 regulator. Install and solder the Q1 and Q2 transistors BC547
5. Place relay RL1.
6. Install the terminal pins. Two strips of three (3) and one strip of two (2)
7. Place and **solder underneath the board** a 1N4148 diode between the relay terminals as shown in the picture. The cathode (the diode end that carries a dark colored band) owes the pad to the + V track.



## WIRING



**"PTT FROM MICRO"** The microphone PTT cable connects here and disconnects from the transceiver.

**"PTT TO TRANSCEIVER"** Connects to the PTT transceiver input.

**"FROM SPEAKER OUT TRANSCEIVER"** From the speaker output of the transceiver and disconnected from the speaker.

**"TO SPEAKER"** The speaker is connected here.

**"+ - V"** Connect power supply 9-14V.

**"GND"** Connect the negative (ground) of the signals here.

## PROGRAMMING RX to TX and TX to RX delays

The programming of the delay times from RX to TX and from TX to RX is done by sending pulses from the PTT (push and release) and listening the activation-deactivation pulses of the relay "clic-clac".

In a sequence you can only program one of the delays, to program the other delay, you must repeat a new programming sequence.

You can also program a RESET so the delays will be set to factory values.

### Program menu flow:

- 1) Press and hold PTT (PIN to GND) + Turn on power
- 2) 2 seconds pause
- 3) the relay is activated-deactivated 2 times
- 4) 2 seconds pause
- 5) the relay is activated-deactivated 4 times
- 6) 2 seconds pause
- 7) The relay is activated-deactivated 8 times
- 8) 2 seconds pause
- 9) return to step 3

Keep the PTT pressed and turn on the power.

If we release after step 3, we then set **the delay from RX to TX**.

If we release after step 5, we then set **the delay from TX to RX**.

If we release after step 7, then we activate **the RESET**.

To finish we will have to disconnect the power supply.

### Programming RX to TX delay

Press and hold the PTT (pin "PIN" to ground GND) and then connect the power to the circuit.

Wait until you hear two (2) "click-clack", "click-clack" relay activation-deactivation pulses, and then release the PTT. Then press and release the PTT (pulses) as many times as you want to set the delay time according to the time table.

Then disconnect the power to the circuit. You are done programming.

### Programming TX to RX delay

Press and hold the PTT (pin "PIN" to ground GND) and then connect the power to the circuit.

Wait until you hear four (4) "click-clack", "click-clack" relay activation-deactivation pulses, and then release the PTT. Then press and release the PTT (pulses) as many times as you want to set the delay time according to the time table.

Then disconnect the power to the circuit. You are done programming.



## Programming RESET (Factory values)

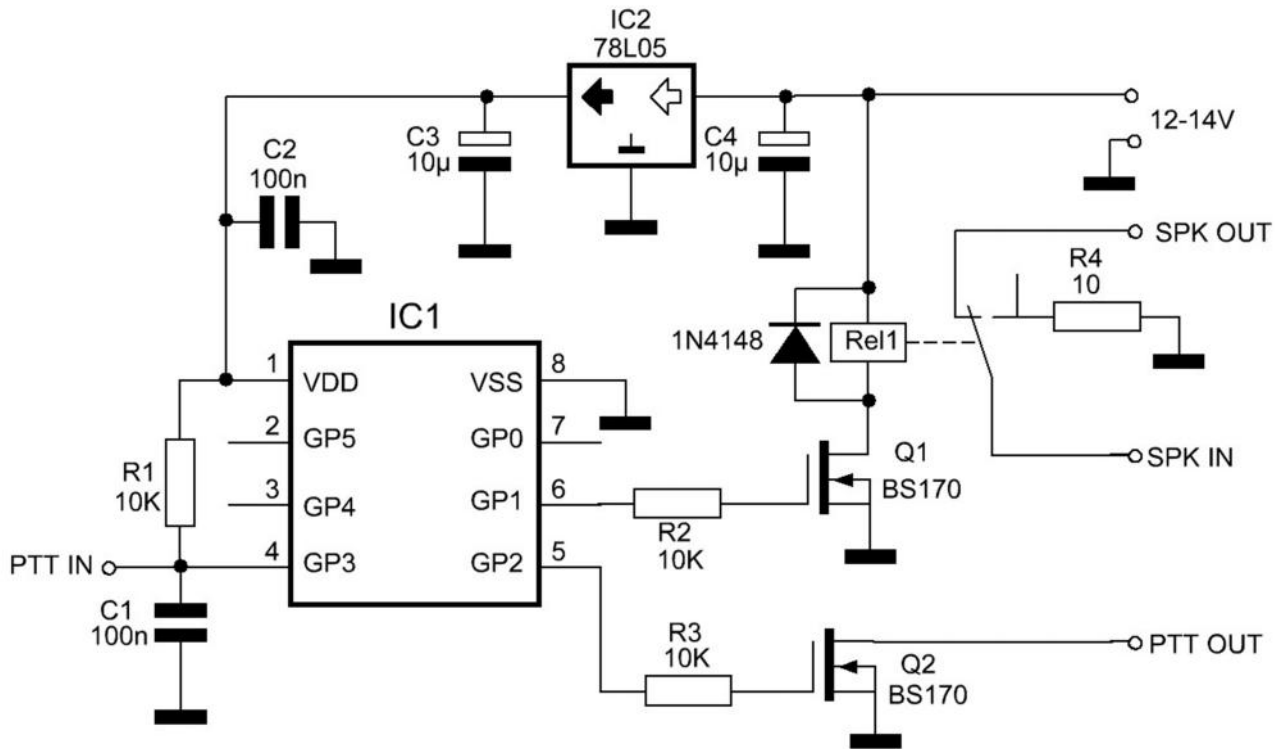
Press and hold the PTT (pin "PIN" to ground GND) and then connect the power to the circuit. Wait until you hear eight (8) relay activation-deactivation pulses ("click-clack" 8 times) and then release the PTT. You can now turn off the power. Reset has been completed.

*The factory settings are: 50ms for the RX to TX delay and 300ms for the TX to RX delay*

Delay Time Programming Table:

PULSES	PERIOD in milliseconds
1	(no delay) 0
2	50
3	100
4	150
5	200
6	250
7	300
8	350
9	400
10	450
11	500
12	550
13	600
14	650
15	700
16	750

# SCHEMATIC





# LIMITED WARRANTY

## Please read carefully BEFORE building your kit

All electronic components and hardware supplied with the kit are under warranty in case of any manufacturing defect for the period of one year after purchase. The warranty does not include the transmitter final amplifier transistor.

The original purchaser has the option of examining the kit and manual for 10 days. If within this period, the buyer decides not to build the kit, he/she may return the entire unassembled kit, shipping expenses however at their own expense. The shipping expenses and sales commissions (i.e. bank, Ebay, and Paypal commissions) included in the purchase price will not be returned.

Please, BEFORE returning a product, request instructions by email at: [ea3gcy@gmail.com](mailto:ea3gcy@gmail.com).

Javier Solans, EA3GCY, warrants this device to function according to the specifications, provided that it is assembled and adjusted as described in this documentation, and used correctly according to all provided instructions.

It is your responsibility to follow all the instructions in the manual, to identify all the components correctly, and to use good workmanship and proper tools and instruments in the construction and adjustment of this kit.

REMEMBER: This kit will not work as a commercially manufactured product; however, in some situations, it can give very similar results.

If you believe that there is a missing component for the kit, please do a thorough inventory of all parts using the parts list in the manual. Check all bags, envelopes and boxes carefully. If needed, you may email me and I will replace any component that you are missing. Even if you can find the exact part locally, please let me know so that we are aware of the problem to help other customers.

I can also supply any part that you have lost, damaged or broken accidentally.

If you find any errors in this manual or would like to make a comment, please do not hesitate to contact me at: [ea3gcy@gmail.com](mailto:ea3gcy@gmail.com)

THANKS for building the **A-PLOP** kit.

Enjoy QRP!

73 Javier Solans, ea3gcy