# ESPE01 INSTALLATION INSTRUCTIONS

First of all, installing the ESPE01 module in your theremin is **at your own risk!** If you do not have adequate soldering skills, please find someone who does to do the installation for you.

The ESPE01 module is soldered onto the solder pads on the back of the Etherwave circuit board, providing ground (GND), -12V and +12V, and the audio signal (AUDIO). It is then connected between two 15pF capacitors (marked C2 and C6) via the two wires that are already soldered onto the module.

The images to the right show the fully installed module on a Moog Etherwave Standard edition theremin and on a Moog Etherwave PLUS edition theremin.
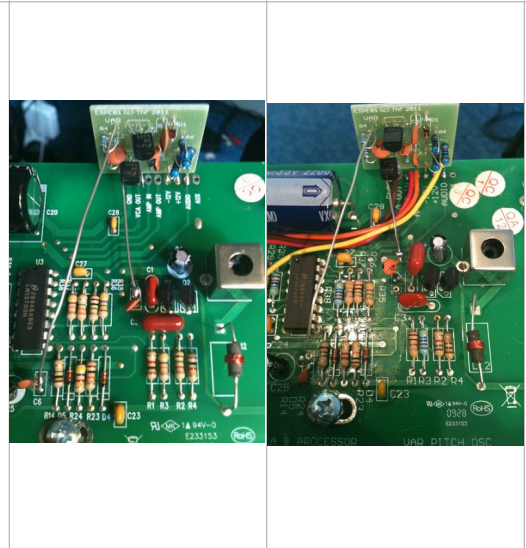
(scroll down for extra information on module

Please follow either the description on the left when installing the module in an Etherwave Standard, or the one on the right for installation in a PLUS.

Etherwave Standard edition	Etherwave PLUS edition
Start by unscrewing and removing the cover from the Etherwave. Unplug the connector to the front pannel, unsolder the wires to the antennas from there solder lugs, and remove the 5 screws that hold down the circuitboard. (There is a washer under the screw closest to the power connector.) On the bottom side of the circuitboard there may be a black diode soldered between the Etherwave solder pads GND and +12V. This diode may be removed, and does not need to be replaced after the module has been installed. Desolder both C2 and C6. This is the trickiest bit, so be very careful when doing this. As the original capacitors C2 and C6	Start by unscrewing and removing the cover from the Etherwave. Unplug both the 10 wire connector and the 4 wire connector. Unsolder the wires to the antennas from there solder lugs. Unscrew the black ground wire from the rectangular ground shield, and remove the 5 screws that hold down the circuitboard. (There is a washer under the screw closest to the power connector.) Carefully lift the circuitboard from its position. Desolder the yellow wire from the solderpad 'Audio'. Leave the other 3 wires in place. Open up the solderpad holes 'GND' and '+12V'. You will find small snippets of metal in there. Desolder both C2 and C6. This is the trickiest bit, so be very careful when doing this.
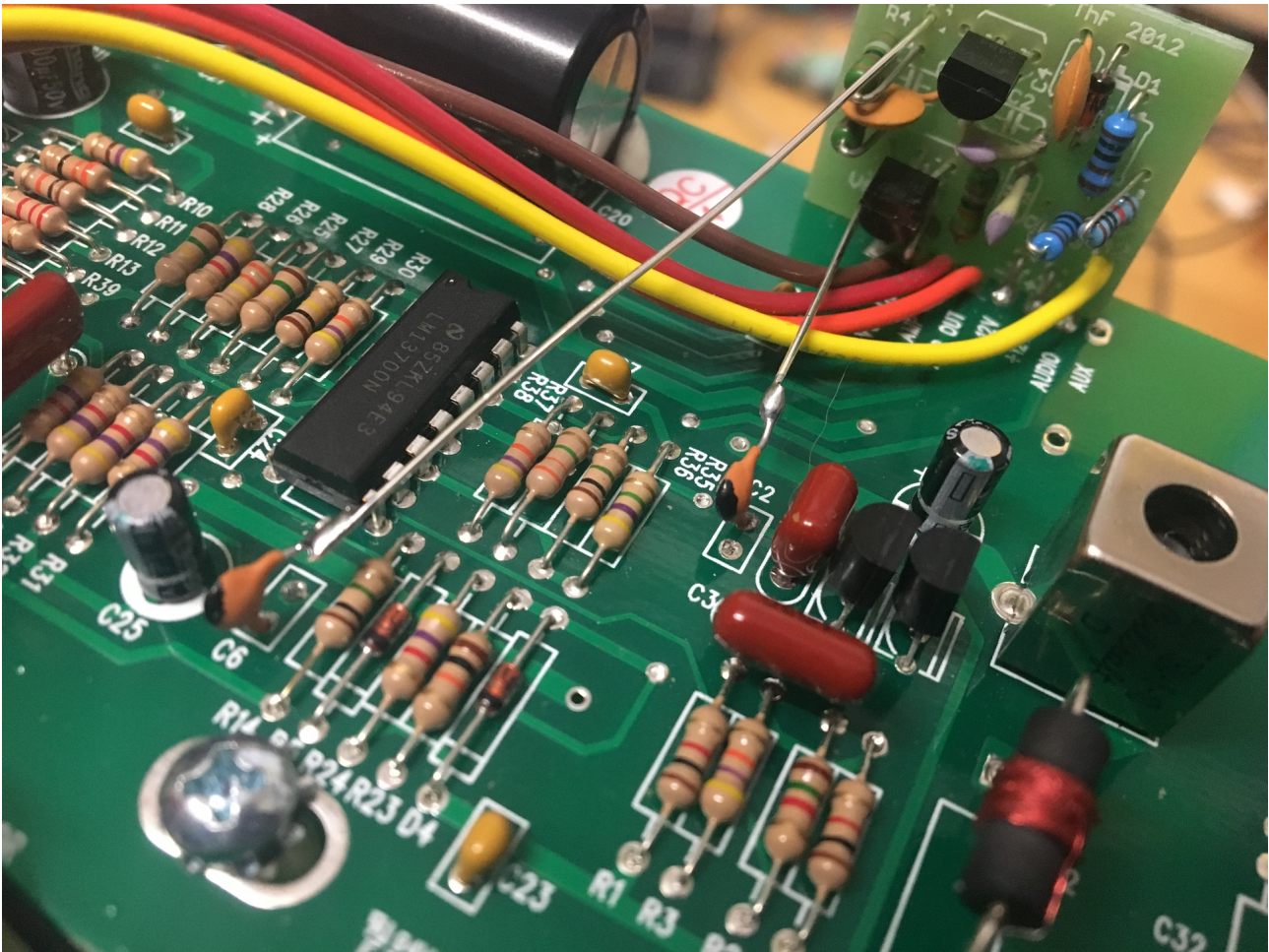
(The following steps are identical for both the Standard edition and he PLUS edition.)

Capacitor C2 is soldered in the one hole that is closest to the back of the Etherwave circuit board and the solderpads. Aim the other leg towards the solder pads. Capacitor C6 is soldered with one leg into the solderpoint which is closest to the front of the Etherwave circuit board. Aim the free leg towards the back.

Insert the module into the solderpad holes on the back of the Etherwave circuit board. The row of three legs should go to -12V, +12V and AUDIO, and the one free leg should go to GND. Try and position the ESPE01 module to the Etherwave board as close as you can. Solder the four legs and cut the exces wires that stick out.

Now continuing separate steps for the Standard and PLUS editions.

Etherwave Standard edition	Etherwave PLUS edition

The module has 2 wires, of different length, already soldered to it. The shortest wire, connected to te solderpoint labeled 'var' on the module, should be soldered to the free leg of capacitor C2. The longest wire should be soldered onto the free leg of capacitor C6. Make sure the wires go straight to their goal, without touching any other parts of the circuitry. Cut them a bit shorter if needed.

This concludes the ESPE01 installation steps.

Place the circuitboard back onto the Etherwave bottom, screw it back in to place with the 5 screws, and don't forget the extra washer. Solder the antenna wires back to their lugs, and reconnect the

The ESPE01 module has a free solderpad marked A2, positioned right above its pin that now ocupies the Audio solderpad on the Etherwave circuitboard. Solder the yellow wire from the PLUS connector to the A2 pad on the ESPE01 module.

Lead the four PLUS wires to he left, underneath the 2 bare wires that come from the module. The shortest wire, connected to te solderpoint labeled 'var' on the module, should now be soldered to the free leg of capacitor C2. The longest wire should be soldered onto the free leg of capacitor C6. Make sure the wires go straight to their goal, without touching any other parts of the circuitry. Cut them a bit shorter if needed.

This concludes the ESPE01 installation

After installing the module in either an Etherwave Standard or a Plus, the theremin may need a small retune. First assemble it fully and place the cover, without screwing it tight, and make the power and audio connection. Then switch it on, wait for the EM fields to stabalise and check the pitch field. In some cases, tuning is not needed, as zero beat can still be reached at about an arms length from the pitch antenna, while the pitch knob on the front panel is set to around 12 o'clock. If this isn't the case, use the red tuning tool that came with your theremin to adjust tuning coil L6, which controls the fixed pitch oscillator. Always turn the tuning coils very carefully, as they are quite sensitive, and very hard to replace. Even a very small turn, 1/16th of a turn or less, can be enough to bring the pitch back into reach. Take you time and repeat, or reverse, if necessary.

(Please note that in the video I mix up L6 with L5. L5 controls the high end of the pitch range, which is easily over-adjusted. Do not adjust L5, unless you wish to change the high end of the pitch range. When set too high, the oscillator circuit will overload and cause unwanted effects. As with installing the module, tuning the Etherwave is done at your own risk!)
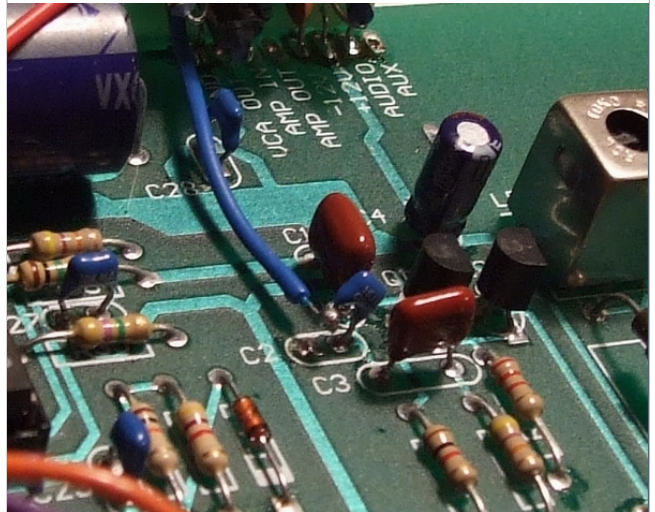
Older Etherwaves
If you have an older Big Briar Etherwave theremin, it is possible that with your theremin C2 and C6 are positioned differently or even located elsewhere on the circuit board.
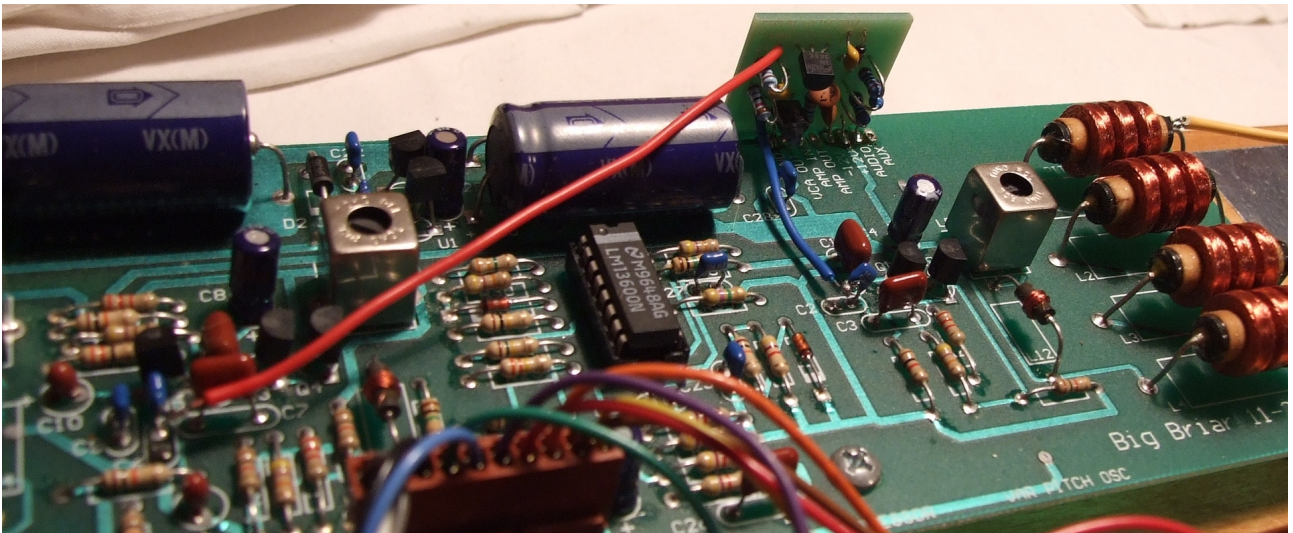
C2 is aimed differently. The 'var' wire is connected to the leg that is closest to the centre of the etherwave circuitboard.

C6 is located all the way to the lefthand side of the circuitboard. The bare wire connected to the 'fix' position on the module is not long enough. It needs to be replaced with a longer, coated wire. It should be coated as it will touch the large ELCO on its way to C6.
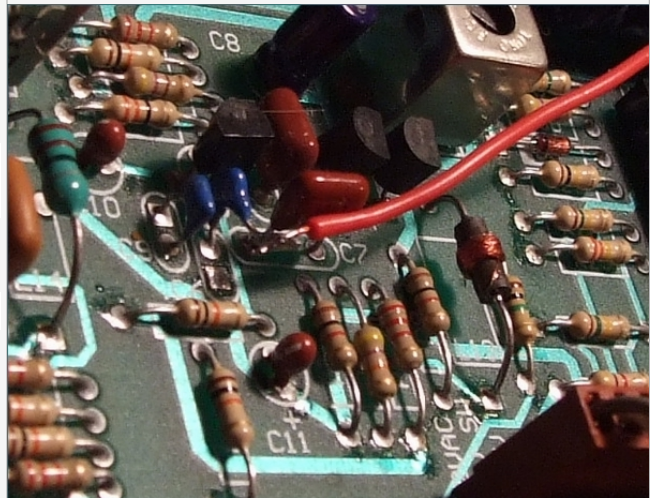
There is an alternative way to connect to C6, using the traces of the Etherwave itself. Following the image below, make a bridge between resistor R23 and diode D4. Solder the fix wire to either of the freed up holes.