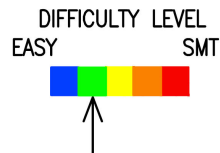
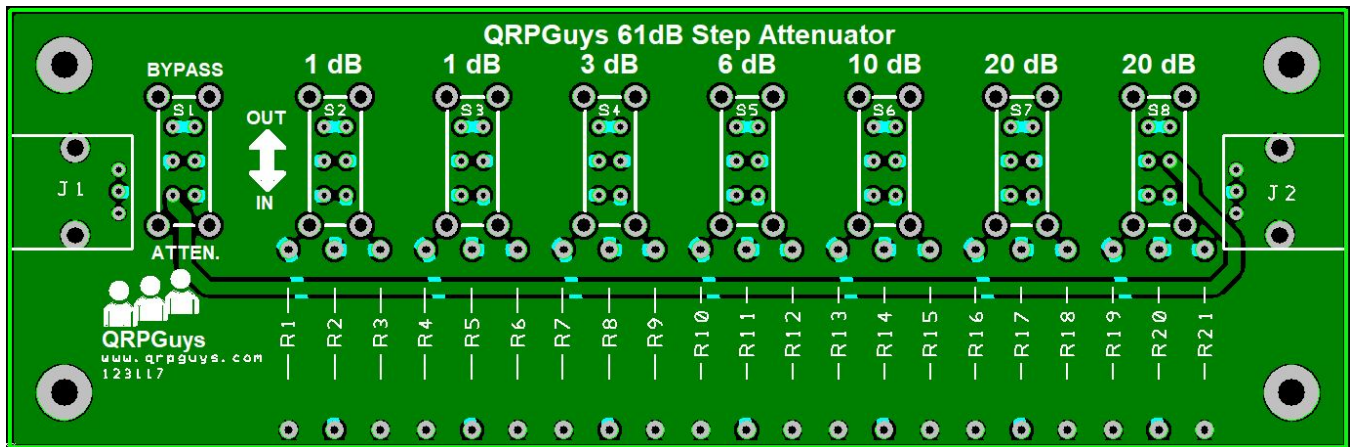


## QRPGuys 61 dB Step Attenuator



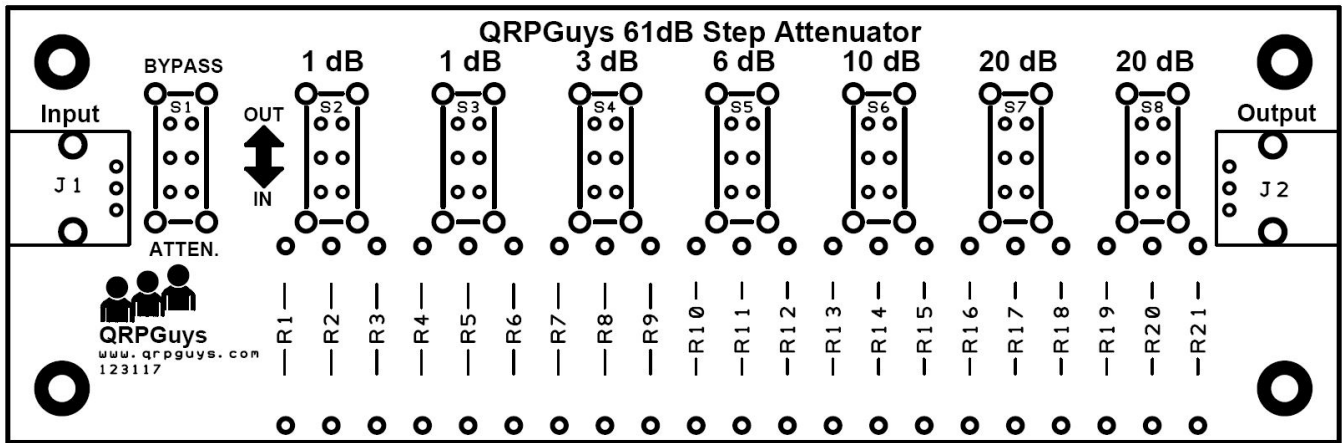
First, familiarize yourself with the parts and check for all the components. If a part is missing, please contact us at [qrpguys.parts@gmail.com](mailto:qrpguys.parts@gmail.com) and we will send you one.

*Please read all the instructions before starting to assemble the receiver.*

### Parts List

- 1 – Attenuator pcb
- 8 – S1,2,3,4,5,6,7,8, DPDT slide switch
- 2 – J1,2, female pcb bnc connector
- 4 – R1,3,4,6, 910 ohm resistor (white-brown-brown-gold)
- 2 – R2,5, 5.6 ohm resistor (green-blue-gold-gold)
- 2 – R7,9, 300 ohm resistor (orange-black-brown-gold)
- 1 – R8, 18 ohm resistor (brown-gray-black-gold)
- 2 – R10,12, 150 ohm resistor (brown-green-brown-gold)
- 1 – R11, 39 ohm resistor (orange-white-black-gold)
- 2 – R13,15, 100 ohm resistor (brown-black-brown-gold)
- 2 – R14, 68 ohm resistor (blue-gray-black-gold)
- 4 – R16,18,19,21, 62 ohm (blue-red-black-gold)
- 2 – R17,20, 240 ohm (red-yellow-brown-gold)
- 4 – self adhesive rubber foot

Refer to the graphic below for parts placement.



All the components mount of the top side of the board, except the rubber feet, *unless you are planning to mount the device in a chassis. In that case, only mount the switches on the top side, and the bnc connectors and resistors on the back side.*

When mounting the resistors, *do not mount them flush*. Keep the diameter of the resistor 1/16" off the surface of the pcb to allow for airflow. You can use a thin slat of wood like a popsicle stick or tongue depressor to space them off the board, and remove after soldering. Don't press the resistors tight against the stick or it will be difficult to remove.

- [ ] Install R1,3,4,6, 910 ohm resistor (white-brown-brown-gold)
- [ ] Install R2,5, 5.6 ohm resistor (green-blue-gold-gold)
- [ ] Install R7,9, 300 ohm resistor (orange-black-brown-gold)
- [ ] Install R8, 18 ohm resistor (brown-gray-black-gold)
- [ ] Install R10,12, 150 ohm resistor (brown-green-brown-gold)
- [ ] Install R11, 39 ohm resistor (orange-white-black-gold)
- [ ] Install R13,15, 100 ohm resistor (brown-black-brown-gold)
- [ ] Install R14, 68 ohm resistor (blue-gray-black-gold)
- [ ] Install R16,18,19,21, 62 ohm (blue-red-black-gold)
- [ ] Install R17,20, 240 ohm (red-yellow-brown-gold)
- [ ] Install S1,2,3,4,5,6,7,8, DPDT slide switch, solder all 10 pads.
- [ ] Install J1,2, female pcb bnc connector. The center hole on the board is signal and you use the outside hole for ground no matter which side you mount the BNC's on.
- [ ] Install the four self adhesive rubber feet where shown on the back side

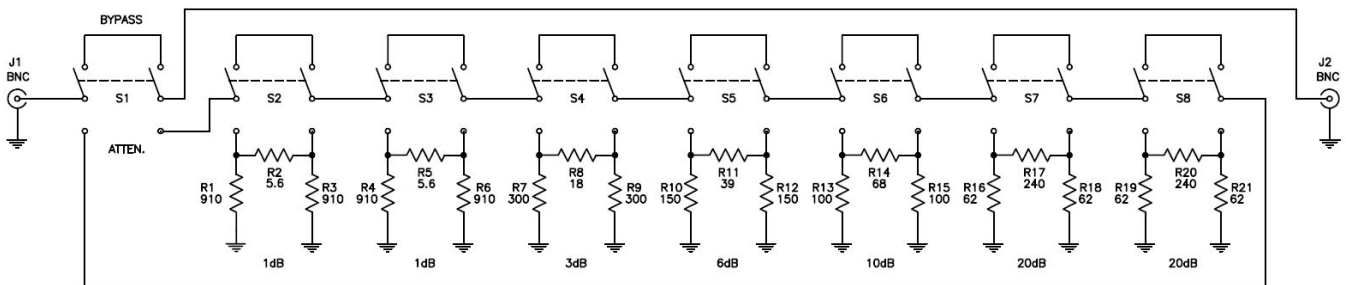
This completes the assembly

## Usage:

With all the switches in the “Out” or “Bypass” position the signals can pass through virtually without loss. With all the switches thrown to the “in” position, a 61dB reduction of signal can be achieved. Depending on how the switches are configured you can have 1 dB steps up to the full 61dB. When using the step attenuator with a transceiver, if you do not want to attenuate your received signal, move the “Bypass/Atten.” switch to “Bypass”, that way you can retain your pre-set attenuation switch settings for transmitting. We have used 3W resistors throughout, figuring a duty cycle of 50%, you can expect no problems with 5W cw use. For other modes or slightly higher power levels, monitor the resistor temperature to keep it  $\leq 70^{\circ}\text{C}/158^{\circ}\text{F}$ .

For example, 1W input, with 10dB of attenuation, yields 100mW output. 1W input, with 20dB of attenuation, yields 1mW output. 1W input, with 60dB of attenuation, yields 1uW output, you get the idea.

Remember that “voltage” and “power” attenuation are two different formulas. As an example, 1V in with a -10dB setting is .3162V out, and 1W in with a -10dB setting is .1W out. A very handy url to calculate your desires can be found at <http://www.sengpielaudio.com/calculator-amplification.htm>



## Notes:

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