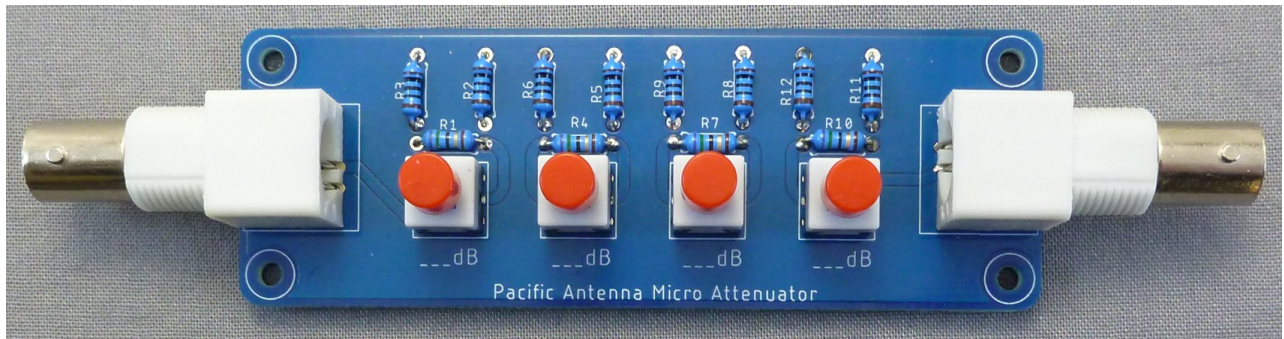


Pacific Antenna Micro Attenuator



Features

Provides variable attenuation of input signals by up to 40dB in 4 steps of 10dB.

A great first time kit to learn soldering and assembly.

Great for hidden transmitter foxhunting to control received signal strength.

Generate low level signals from sources including signal generators, oscillators and transmitters.

Can be used with a signal source to check S meter and receiver response.

Handles 0.5W continuous and up to 2W for intermittent signals.

Bidirectional, either end can be an input or output.

Usable from DC to over 200MHz.

Size: 1.3 x3.8 inches.

[Pacific Antenna](http://www.qrpkits.com)
www.qrpkits.com

Recommended Tools

- ❑ Temperature Controlled Soldering Station with small tip
- ❑ Solder, 60/40 or 63/37 Tin-Lead recommended
- ❑ Small Diagonal Cutters
- ❑ Small Needle Nose Pliers
- ❑ Pencil, Pen, and/or Highlighter
- ❑ BRIGHT work light with magnifier
- ❑ Meter to measure current and resistance (typical DMM will be ok)

Optional

- ❑ Solder Sucker or Solder Wick
- ❑ Knife or Wire Stripper
- ❑ Cookie Sheet to build in and keep parts from jumping onto the floor.
- ❑ Circuit board stand

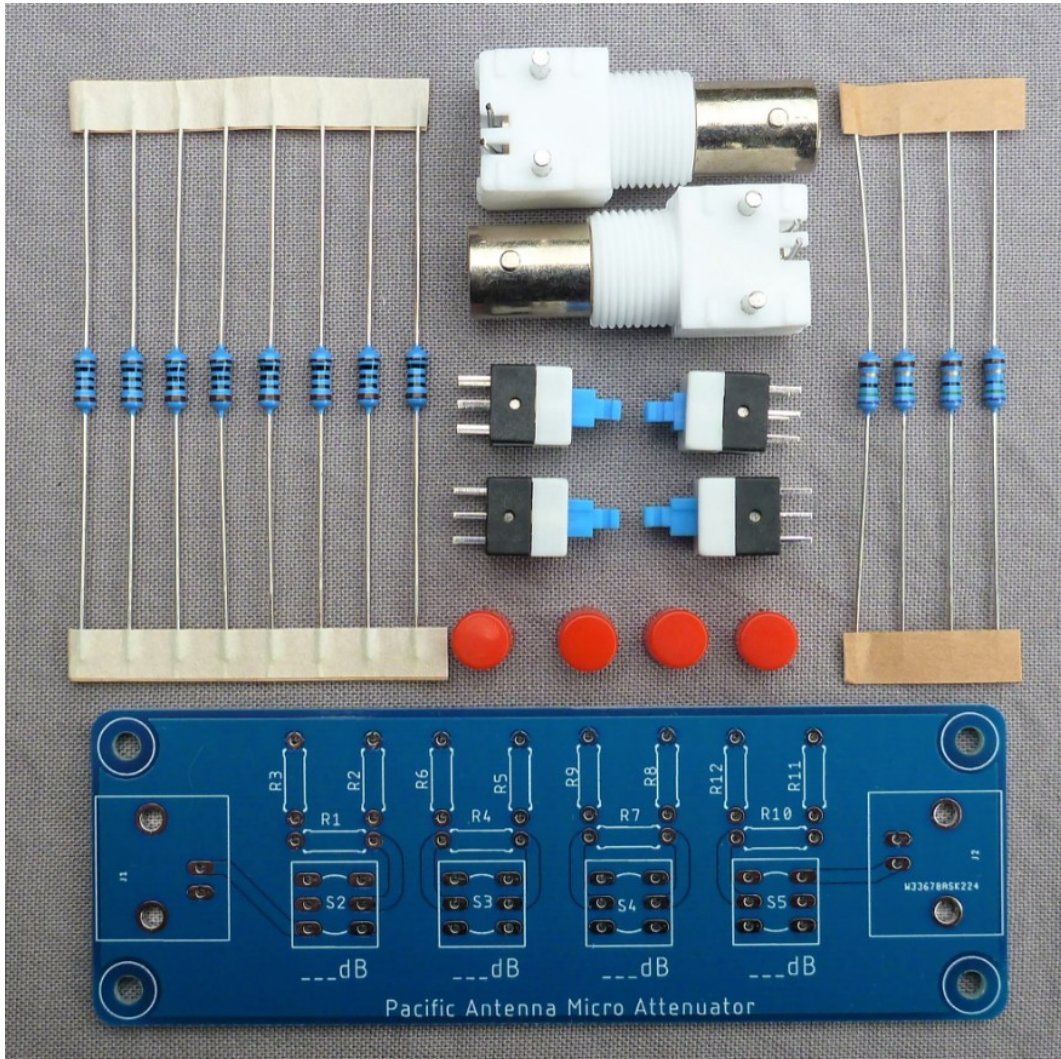
Construction Techniques

- ❑ During the build you may find it helpful to print the manual for reference.
- ❑ The Parts List has columns for inventory and construction.
 - Use the first column to check the parts as you inventory them.
 - Use the second column to check the parts as you install them.
- ❑ Please take time to inventory the parts before starting. Report any shortages to QRPKITS.com for a replacement.
- ❑ Pre-sorting and identifying components will speed up the assembly and reduce mistakes.
- ❑ If you are a beginner, new to soldering, there are a number of resources on the web to help you get on the right track soldering like a pro. Google Soldering Techniques.
- ❑ Use a Temperature Controlled Soldering Station with small tip. Conical or very small screw driver tips are best.
- ❑ You can insert several parts at a time onto the board. When you insert a part bend the leads slightly to hold the part in place until it is soldered
- ❑ Double check that the parts are in the correct locations then flip the board over and solder all at the same time.
- ❑ After soldering, clip the leads close to the board
- ❑ Most parts should be mounted as close to the board as possible. Transistors should be mounted about 1/8" above the board.
- ❑ Solder one lead on multipin packages such as ICs, IC sockets, switches, etc and then check to make sure the component is seated and flush then solder a lead on the opposite end and recheck before soldering the remaining leads.
[If the package is not seated on the board, apply gentle pressure and heat the lead on the end\(s\) not seated to the board](#)

Parts Inventory

Check	Installed	Quantity	Part	Value and Description
		4	R1, R4, R7, R10	75 ohm, 1/4W, 1% resistor: VIO-GRN-BLK-GLD-BRN
		8	R2, R3, R5, R6, R8, R9, R11, R12	100 ohm, 1/4W, 1% resistor: BRN-BLK-BLK-BLK-BRN
		4	8x8 Switches	DPDT pushbutton switches, square, blue & white
		4	Button Tops	Press on push button covers
		2	BNC	BNC female board mount connectors
		1	PCB	Micro Attenuator Circuit Board V1 or later
		4	Feet	Rubber feet, black or clear

Typical Parts



Assembly:

First, familiarize yourself with the parts and check that all components are in the kit.

Begin by locating and installing resistors R1, R4, R7 and R10.

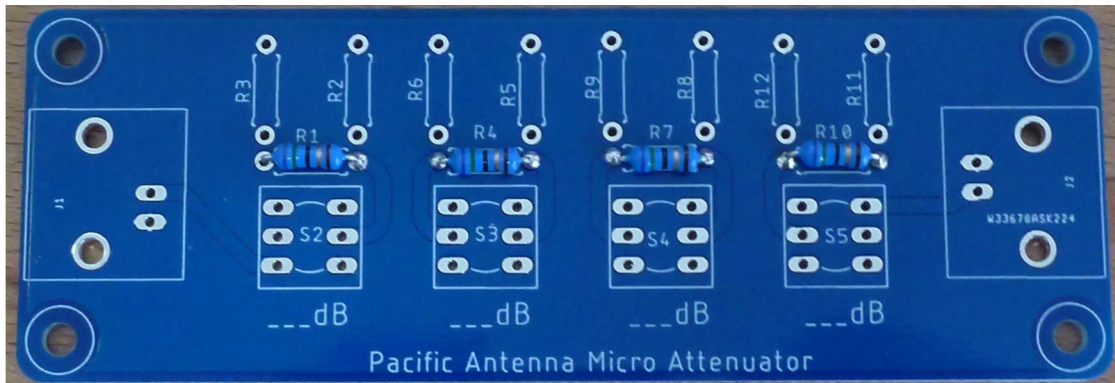
These are the 75 Ohm, 1% resistors with color codes: Violet-Green-Black-Gold-Brown

Refer to the parts list for color codes for each resistor.

Note: The color codes on these 1% resistors are sometimes difficult to read, due the texture and color of the resistor.

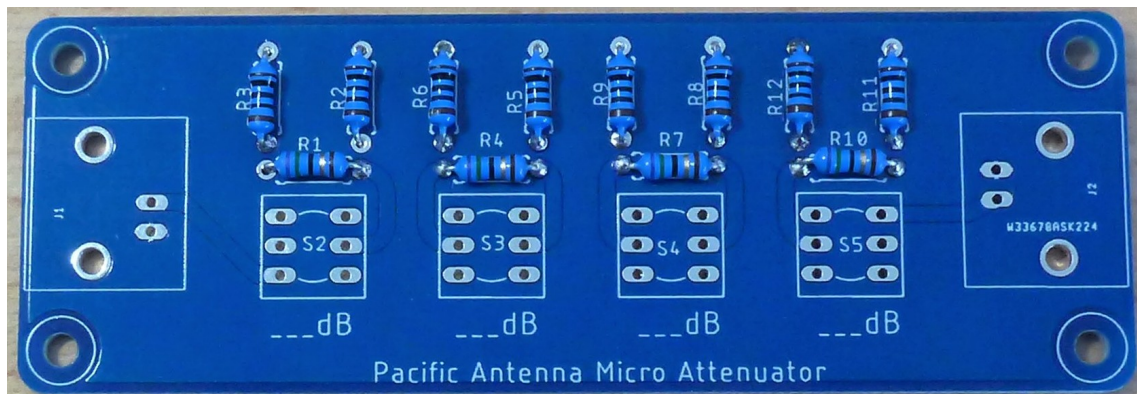
Note: There is a wider, brown band on one end. Start reading the color codes from the opposite end.

If you are not sure of the value, double check the value with a multi-meter before installing and soldering.

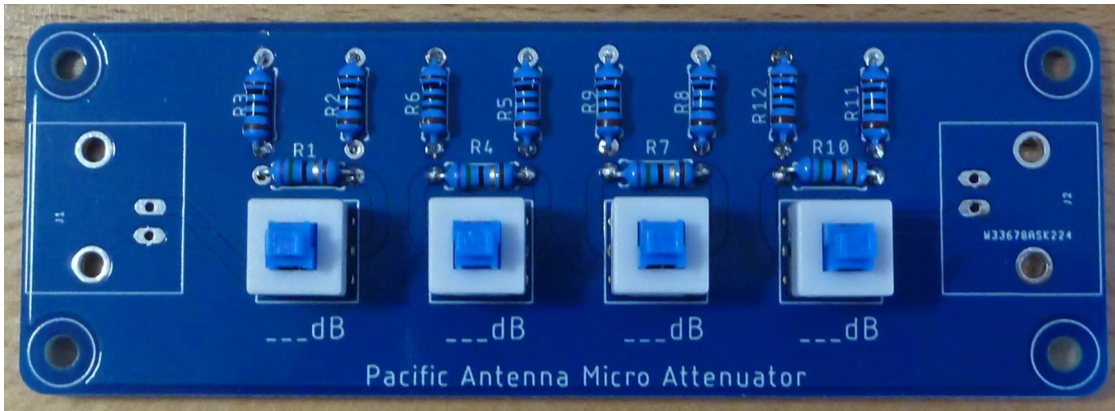


Next, install Resistor pairs R2 and R3, R5 and R6, R8 and R9, and R11 and R12.

These are 100 Ohm, 1% resistors with color codes: Brown-Black-Black-Black-Brown

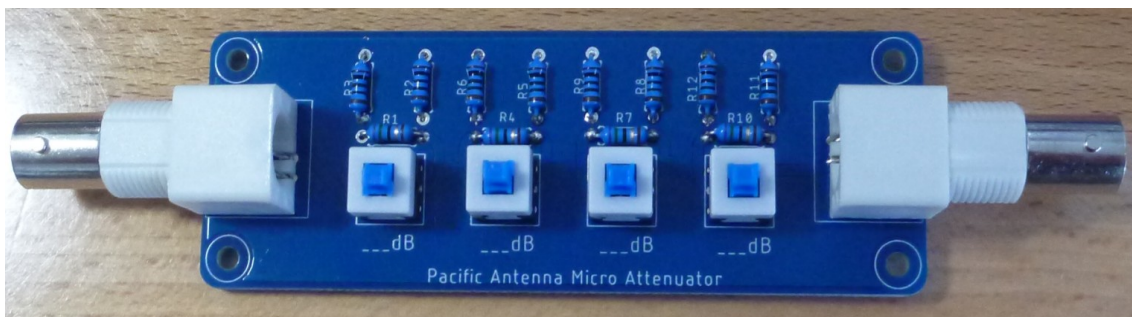


Next, install the DPDT pushbutton switches, S2 thru S5.



Install BNC connectors by first soldering one leg and checking to see that the connector is seated fully on the board.

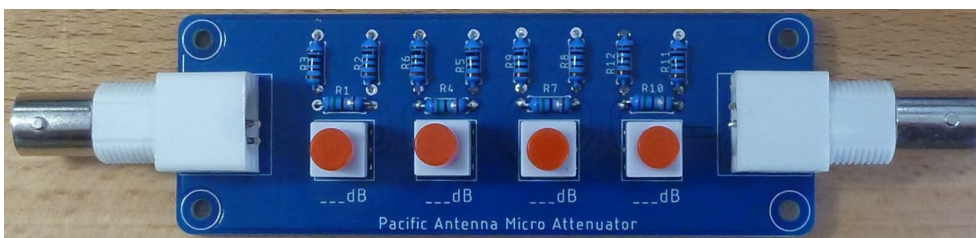
If not, reheat that connection and press the BNC into the board.



Completing the Attenuator

To finish the assembly, install the caps provided on each switch

Press gently to seat the cover on the shaft of each switch.



Congratulations, your Micro Attenuator kit is now complete!

Testing:

Now that the board is complete the next step is to check the resistance for each section of the attenuator.

If you put the resistors in the proper position, you should get similar values to what is listed below.

Connect an ohm meter to either end of the attenuator BNC connector and ground

Then, press the switch for each section of the attenuator and note if the readings are similar to those below

Press each switch again to release after the measurement before moving on to the next one.

Typical values measured for each section of the attenuator:

10 dB -	64	ohms	for switch S2 pressed
20 dB -	54	ohms	for switch S3 pressed
30 dB -	53	ohms	for switch S4 pressed
40 dB -	52	ohms	for switch S5 pressed

Some variation around these values is normal due to resistor tolerance but the values should be close unless a resistor was accidentally swapped.

Using your micro Step Rf Attenuator

The attenuator is bidirectional, either end can be an input or output.

If the button is down, that section will be in attenuation mode.

When the button is up, that section is bypassed.

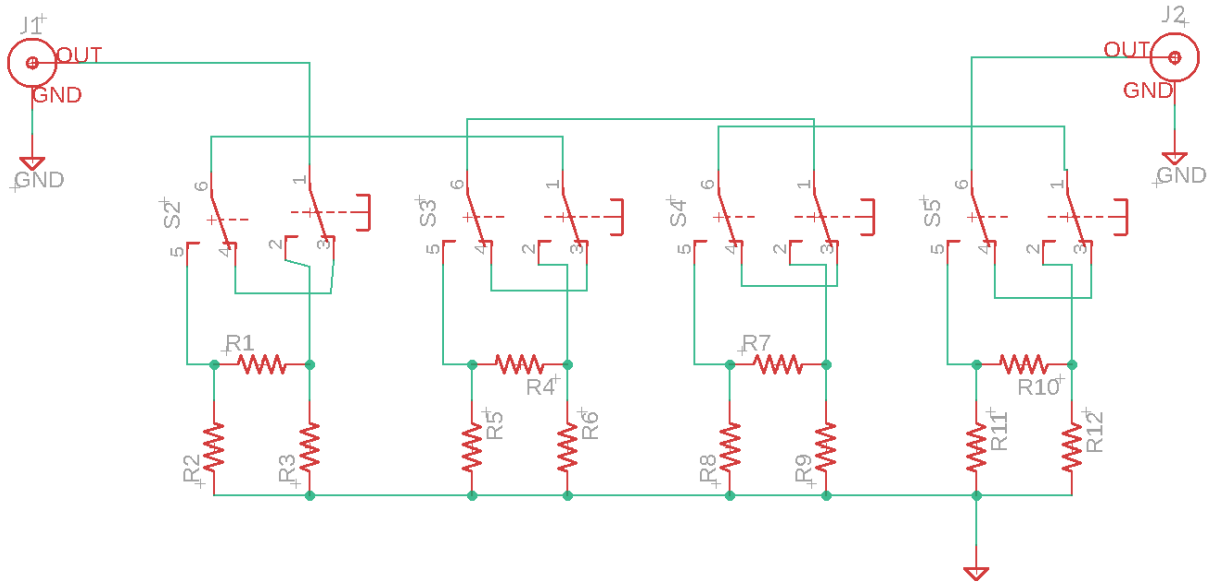
All buttons up gives 0dB attenuation.

All buttons down gives approximately 40dB total attenuation.

The resulting effect on output signal is shown here

dB Setting	Percent of Signal	Output W with 1 Watt Input
-10	10.0	0.1000 (100 mW)
-20	1.00	0.0100 (10 mW)
-30	0.10	0.0010 (1 mW)
-40	0.01	0.0001 (100 uW)

Schematic:



Board Layout

