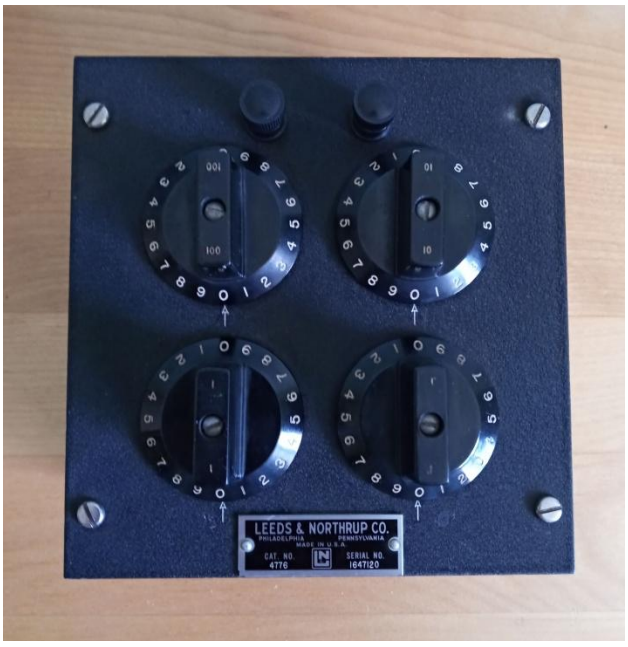
Decade Resistance Box

Here is another project that I have completed where a real requirement for it was not there but I had all the parts and wanted to build something. I did use it however to optimize a transistor stage in a vintage guitar pedal project I was building.

The construction is very simple. It consists of nine 1 kΩ, nine 10 kΩ and nine 100 kΩ resistors switched in series resulting in a switchable range from 1000 Ω to 999,000 Ω. The resistors used are ½ Watt carbon composite because that's what I had and were selected for best accuracy and the accuracy overall should be better than 1%.

The case was from an old Motorola AC voltmeter that was good only for parts. The banana jacks were installed using the standard ¾" spacing to be compatible with other connectors and adaptors that I have.

As a supplement to the above resistance box I also have this Leeds & Northrup decade resistance box. Its range is to 999.9 Ω and has good advertised accuracy. The lowest resistance range is in 0.1 Ω steps. Advertised accuracy I believe is 0.1% + 0.01 Ω. The overall range that now can be covered is from 0.1 Ω to 999999.9 Ω using the two boxes. The resolution is 0.1 Ω.



Decade resistance boxes are available on Amazon and other suppliers at real cheap prices. Things like accuracy and resistor Wattages are not generally given. Also, most of them look cheaply made with switch contact pads part of an etched PCB and surface mount resistors are used.

I don't expect the resistance box to get a lot of use but its available if needed.

April 12, 2025

UPDATE:

I made a small revision to the resistance box I built by adding a ground terminal. The output terminals still conform to the standard ¾" spacing for dual banana plugs. I was looking to help in reducing any noise pick-up through the test leads. New test leads were constructed using two conductor shielded cable.

The resistance box is getting a little more use than I thought mainly in optimizing guitar pedals. It also was used in a way to determine the full scale deflection current of some unmarked analogue meters.

October 5, 2025