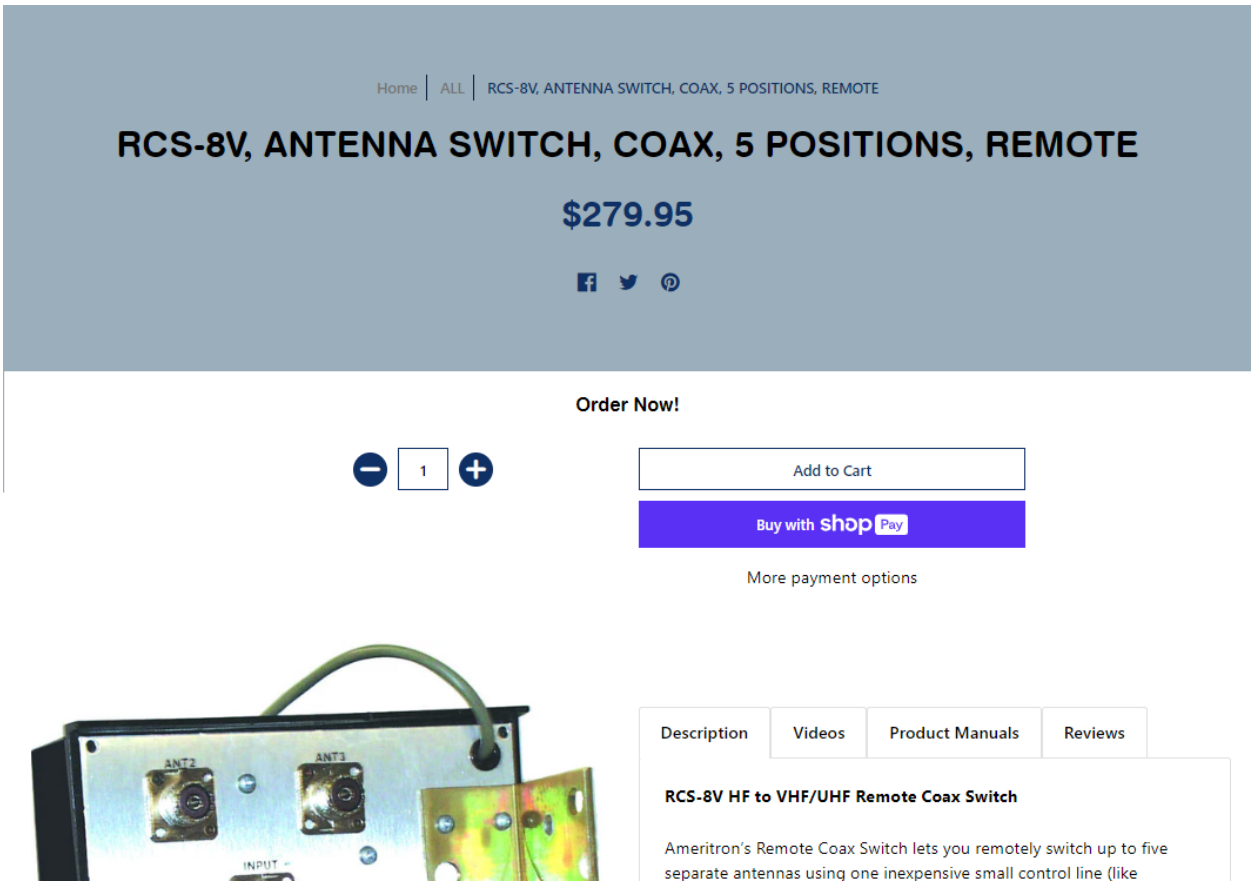
Woody's Remote Antenna Switch

This project started due to a need to replace the worn-out relays in an Ameritron RCS-8V Remote Antenna Switch.



https://mfjenterprises.com/products/rcs-8v

***SPECIAL NOTE*: The RCS-6V does NOT come with the control line. Their specification sheets say; "Use any 6-conductor control line (not supplied) and allows safe operation with 14V control voltage."**

I my case I will use the line I already have installed but you will need the same. Check out:

DEKIEVALE 20 Gauge 6 Conductor Electrical Wire, 10FT 20AWG Black PVC Stranded Tinned Copper 6 Wire Cable, 20/6 Cord Extension Cable: $11.98

https://www.amazon.com/DEKIEVALE-Conductor-Electrical-Stranded-Extension/dp/B0BX8QCKDP/

Not wanting to buy a new unit, and realizing I only need to replace the relays and not the remote switch box, I looked for alternatives and discovered these:

Price on Amazon: $15.87

https://www.amazon.com/gp/product/B017VDI0GY/

Since these are intended for automotive use they operate on 12V and are pretty heavy duty at 30/40 amps. So it occurred to me these should be able to handle the 500-600 watts of RF that I send out to my antennas. The other plus for me was that I would be able to have the unselected antennas grounded.

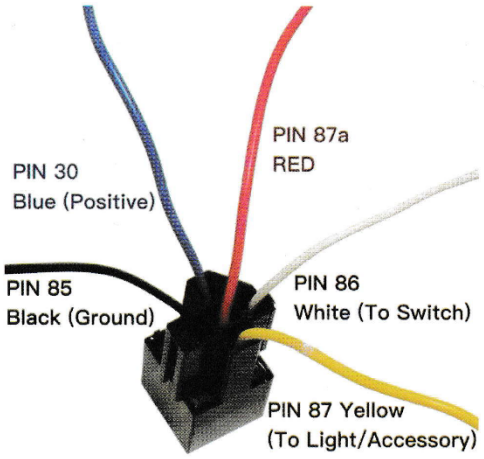
30/40 AMP
Relay Harness Spdt 12V Bosch Style

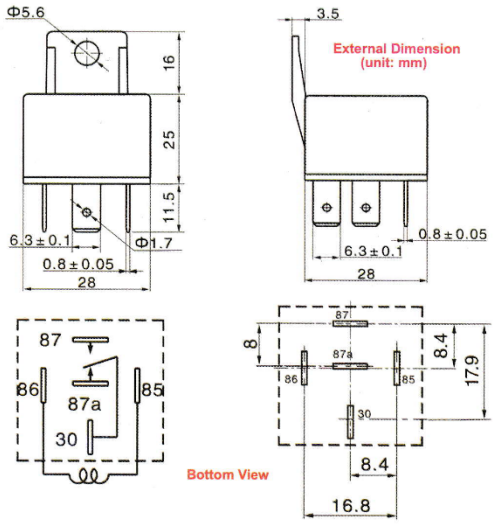
Contact Capacity

Nominal switching capacity (res. Load)	NO: 40A 14VDC NC: 30A 14VDC
Max. switching current	40A
Max. switching voltage	30VDC
Max. switching power	560W

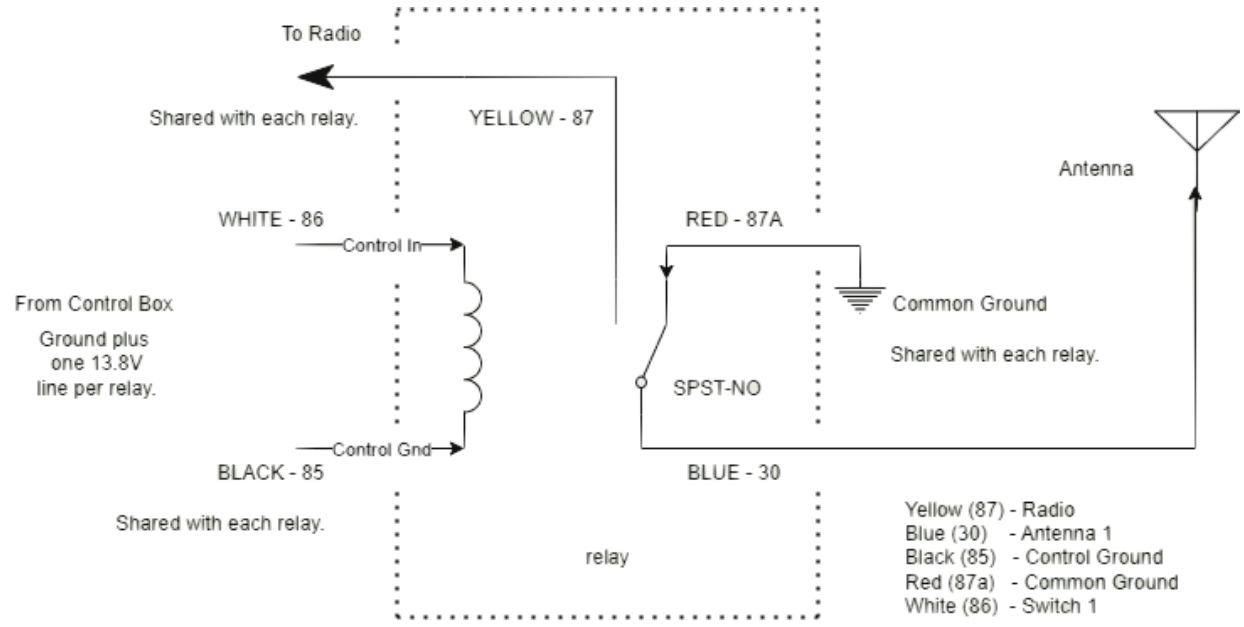
Characteristic Data

Initial contact resistance (at 6VDC 1A)	50mΩ Max.
Operate time (at nominal volt.)	10 msec. Max.
Release time (at nominal volt.)	5 msec Max.
Initial insulation resistance	100 MΩ Min.(DC500V)
Initial dielectric strength	Between open contacts: AC500V, 50/60 Hz 1Min.
	Between coil and contact: AC500V, 50/60 Hz 1Min.
Vibration resistance	Functional: 10 ~ 55Hz at double amplitude of 1.5 mm
	Destructive: 10 ~ 55Hz at double amplitude of 1.5 mm
Shock resistance	Functional: 20G Min.
	Destructive: 100G Min.
Endurance (operations)	Mechanical (at 7,200 ops./h): 10,000,000
	Electrical (at 600 ops./h): 100,000
Ambient Temperature	-40°C ~ +125°C (no condensation)





The next thing I had to do was create a schematic of the connections to make sure these would actually work.



By connecting the YELLOW (87) wires together at the TRANSCEIVER SO-239 connector, I could have as many relays as necessary (in my case 5).

The other shared connections would be the BLACK (85) Control Ground's together and the RED (87A) Common Grounds would be connected to the metal back plate that everything was mounted on.

In my case I wanted to replace the guts of the remote relay switches but keep the box they were in. You could use any project box you have, metal, plastic, whatever, that suits your particular needs.

So, what am I replacing?

So, I need 6 SO-239 solderable connectors, a 6-terminal strip, a metal backing plate, and the relays. Note that because the relays come with pre-wired sockets, and the leads on the wires are about 7 inches, I did not need to buy any wire. Also, in my case the existing box was too small to allow me to use the sockets that came with the relays so I opted to solder slip on connectors to the wires and not use the supplied sockets. All this would be even easier in a larger box using the sockets!

5 Automotive Relays: $15.87
https://www.amazon.com/gp/product/B017VDI0GY/

Terminal Block,2 Pack 6 Circuits 20-30A 200v-450v Dual Row Screw Terminals Strip +24 PCS Heat Shrink Wire Connectors: $8.99
https://www.amazon.com/gp/product/B09VSYYD66/

SO-239 Chassis Mount Connector SO239 Solder Connector UHF Female 4 Holes Panel Chassis Mount Flange Solder Cup Connector SO239 Bulkhead Connector 3pcs X 2: ($9.90 each) X 2 = $19.80
https://www.amazon.com/gp/product/B089ZZZZDS/

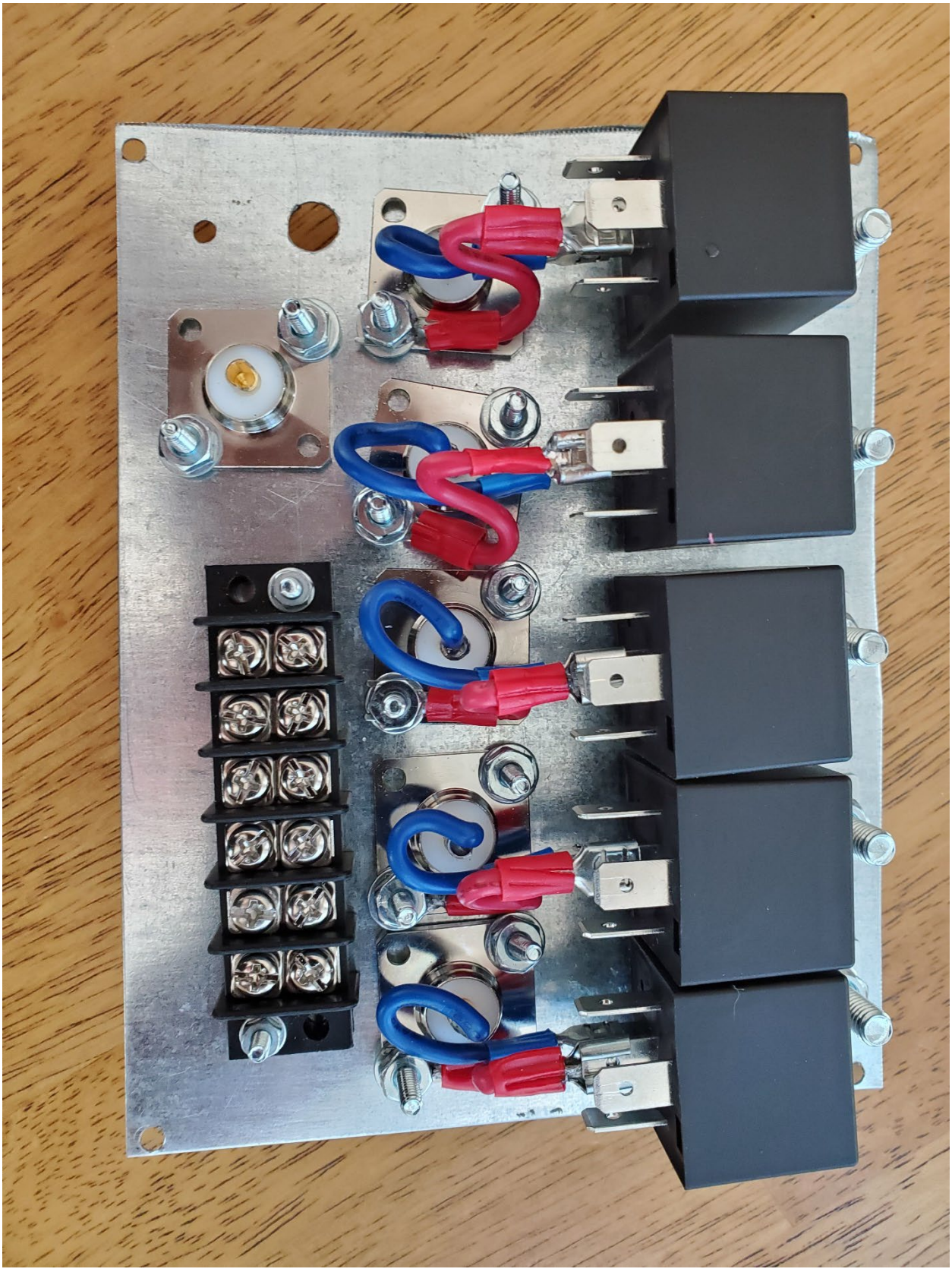
12 in. x 12 in. 28-Gauge Galvanized Sheet: $10.47
https://www.homedepot.com/p/M-D-Building-Products-12-in-x-12-in-28-Gauge-Galvanized-Sheet-56032/100287204

Total (without project box): $55.13 + $11.98 for control wire specified above: $67.11

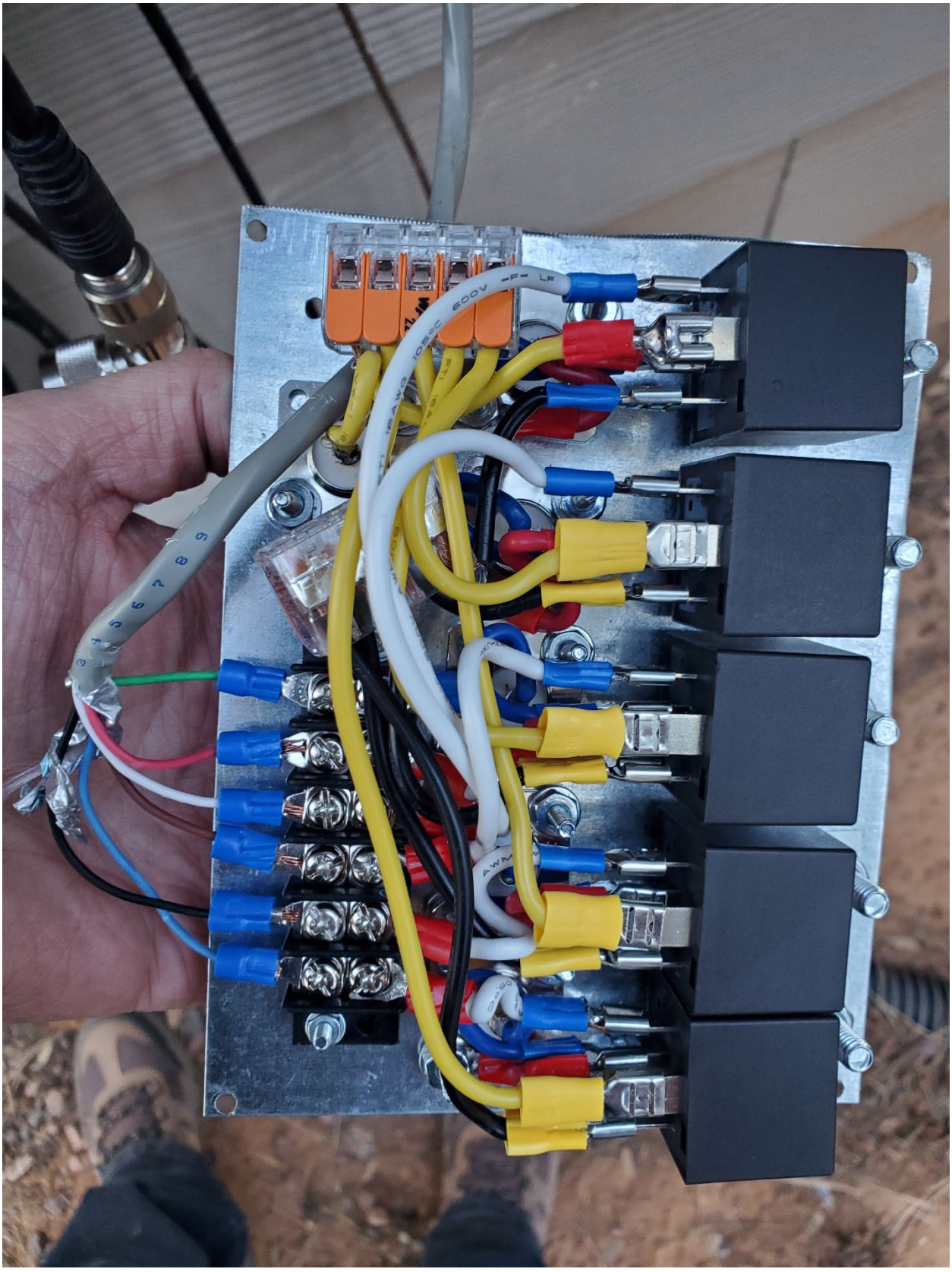
So MY cost was only $55.13!!!

Let's get started!

Partially Assembled:



All wired up and ready to test:



In Use: (1 connection is reserved for testing various antenna ptojects)

Shematic for replacing the switch box with a simple rotary type switch for 4 antennas: