

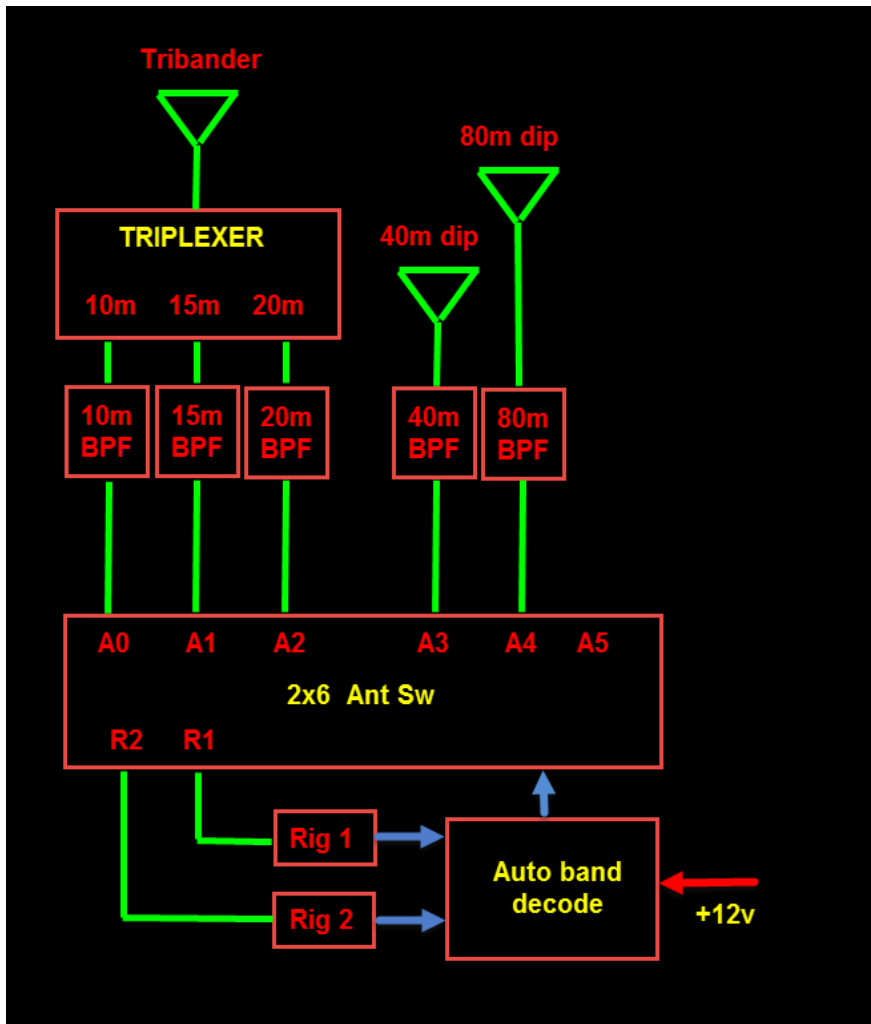
SHACK AUTOMATION - FIELD DAY STYLE

Jeff - ACØC

Objectives

- Share antennas between two rigs
 - Tribander + 40m dipole + 80m dipole
- Allow simultaneous use of tribander on 20/15/10
- Automatic switching – slaved to the rig
- Hardware lockout—prevent same band @ same time use
- Filtering – prevent RF damage / kill harmonics

Topology & Features



Ease of Use

- 3 antennas shared by 2 rigs
- Fully automatic operation

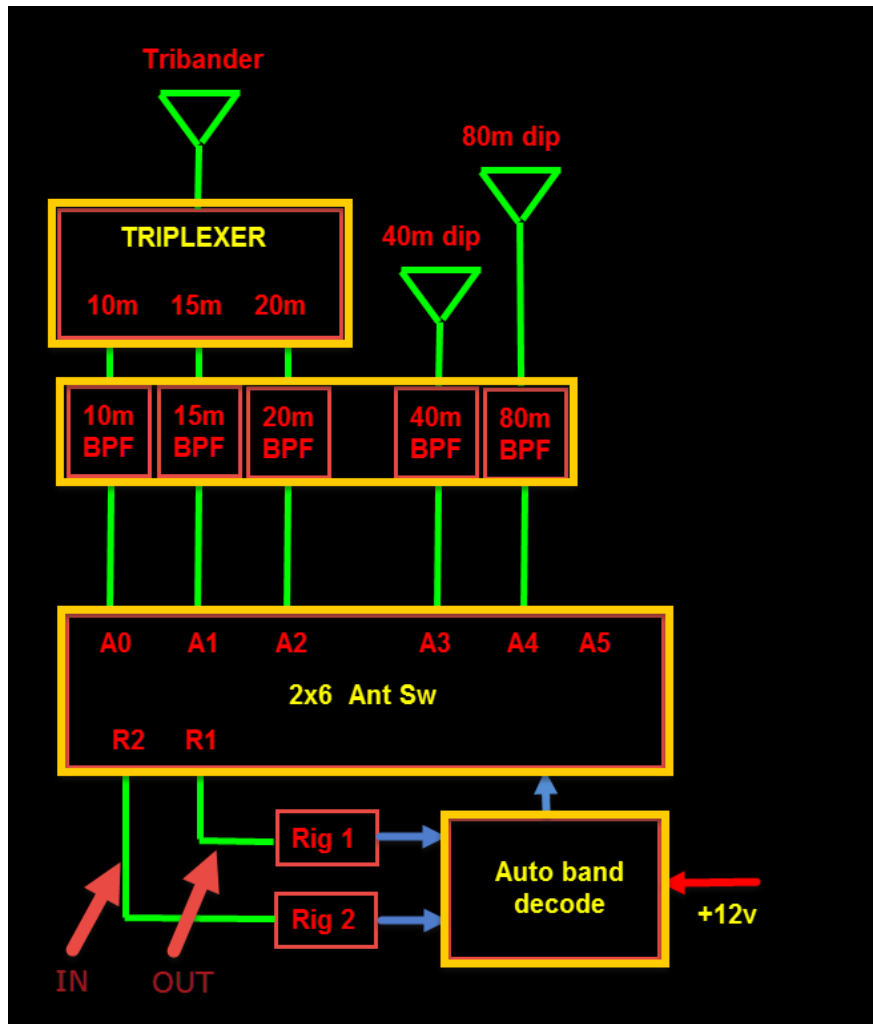
Rig Safety

- Same-band hardware lockout
- Isolation between rigs

Operator Serenity

- Harmonics hammered

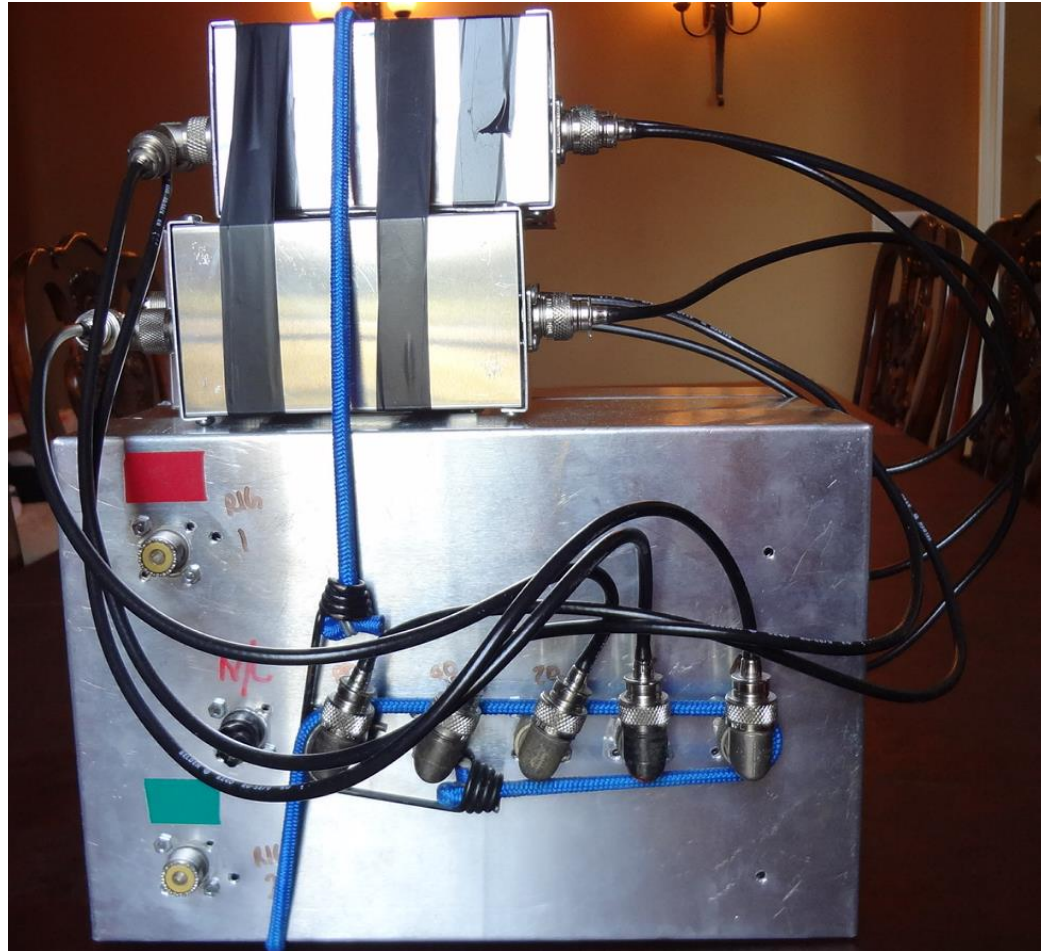
Construction



Modules

1. Triplexer
2. 5x BPF
3. 2x6 Ant Sw
4. Decoder/Driver

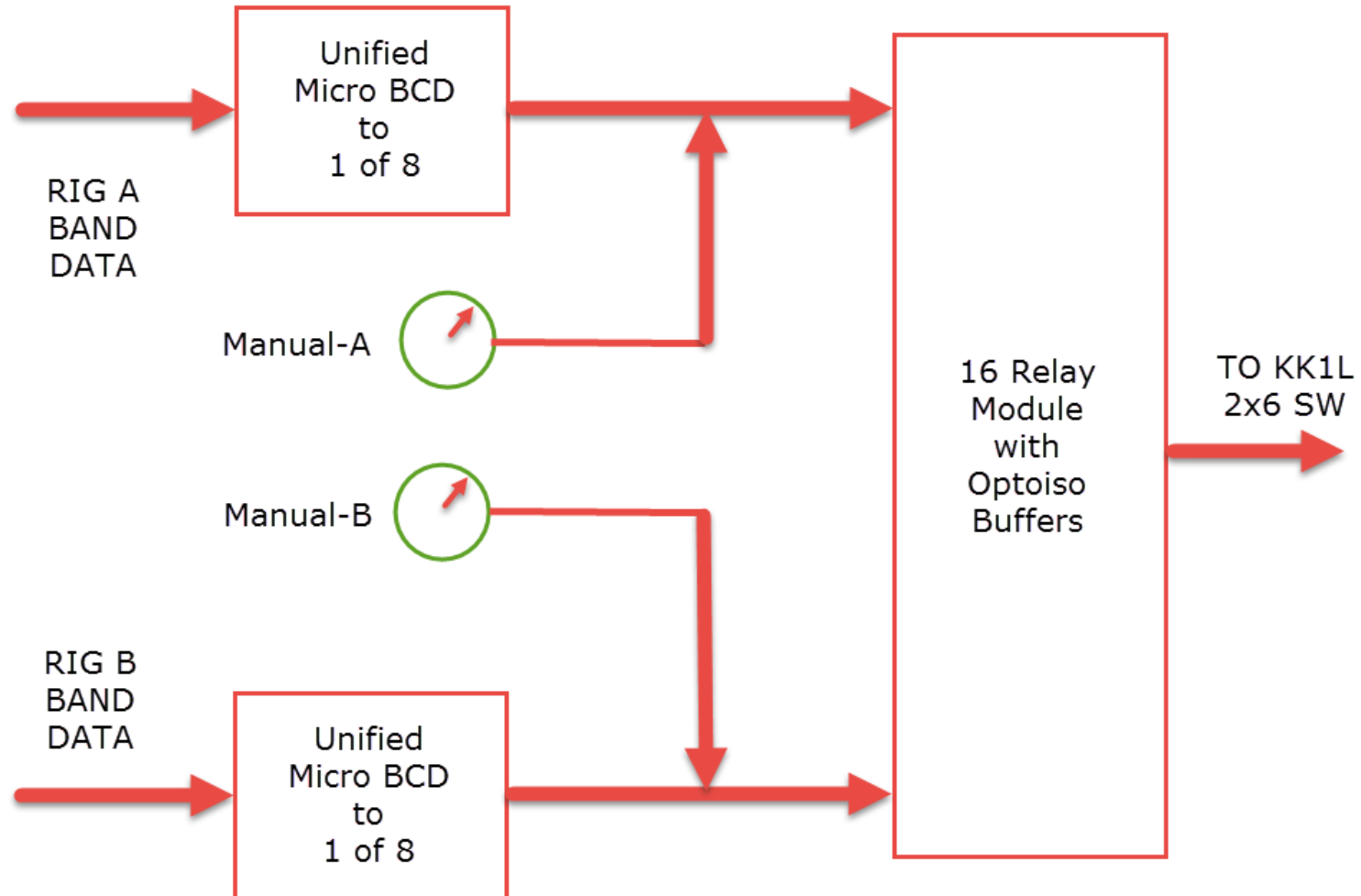
Construction



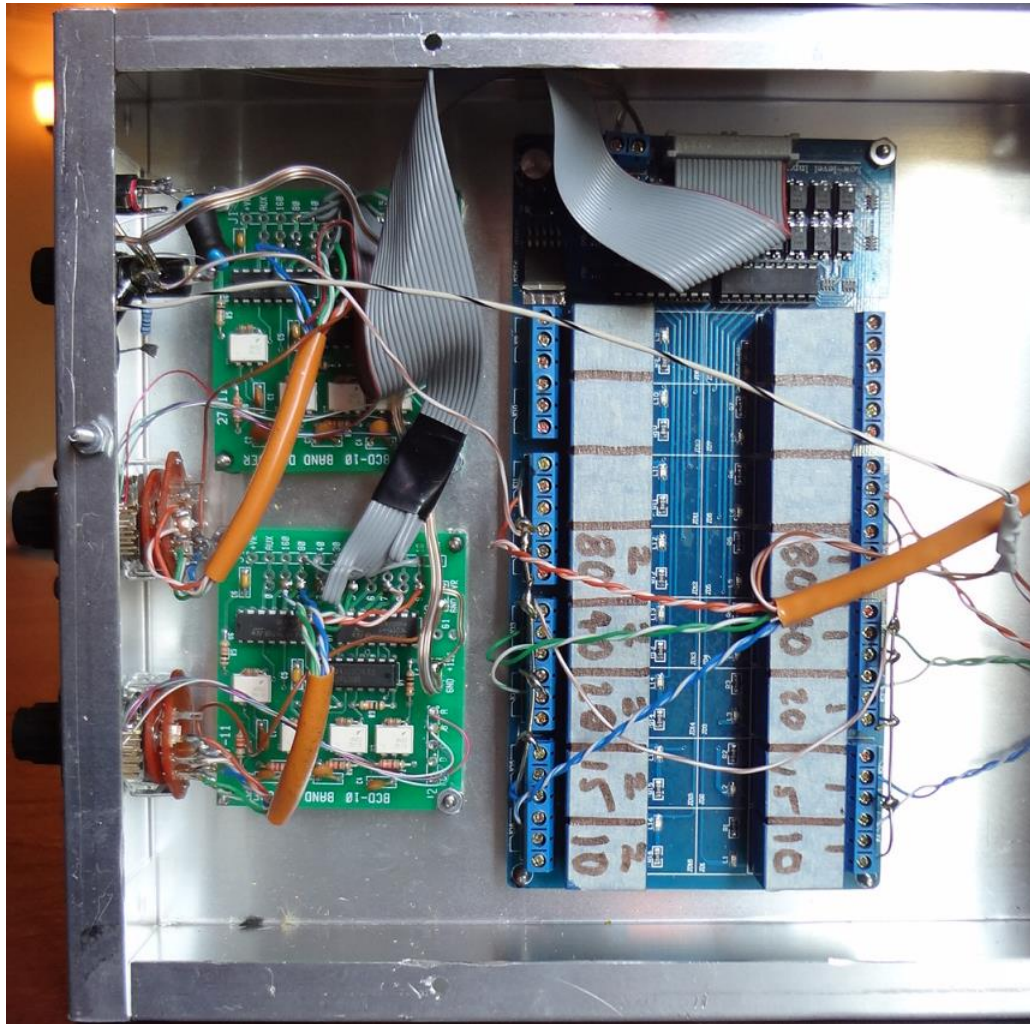
Construction



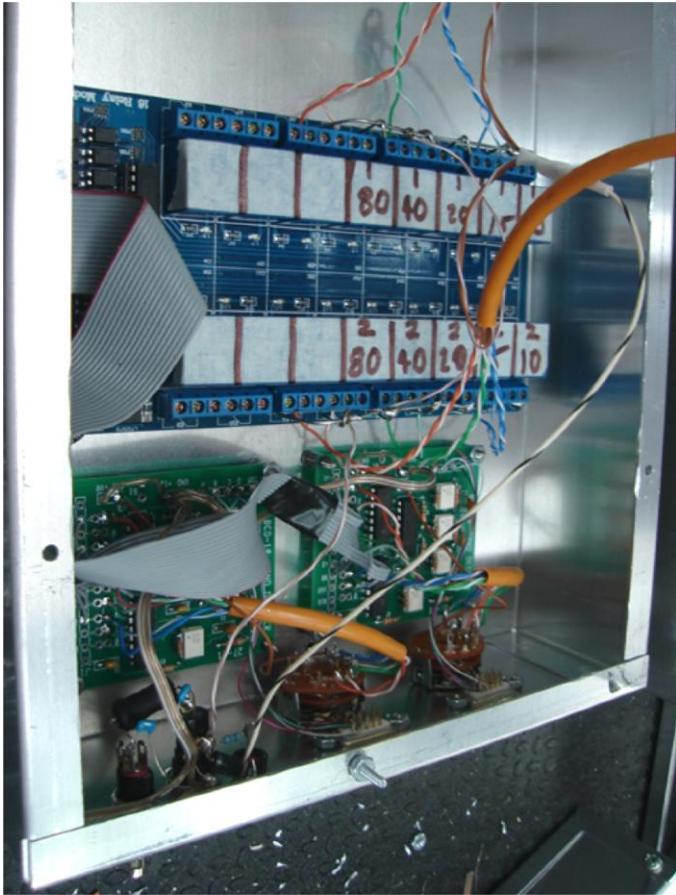
Auto Band Decode Switch Driver



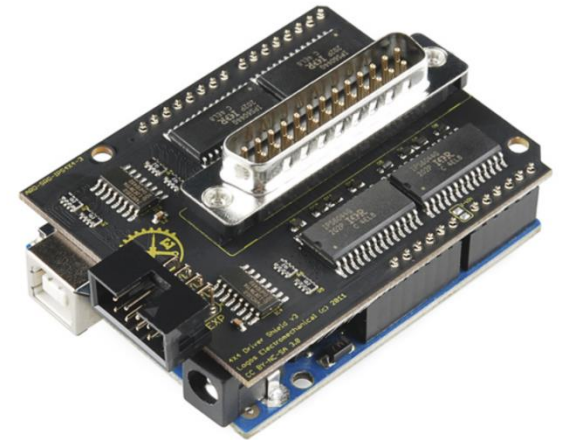
Auto Band Decode + Switch Driver



Auto Band Decode + Switch Driver

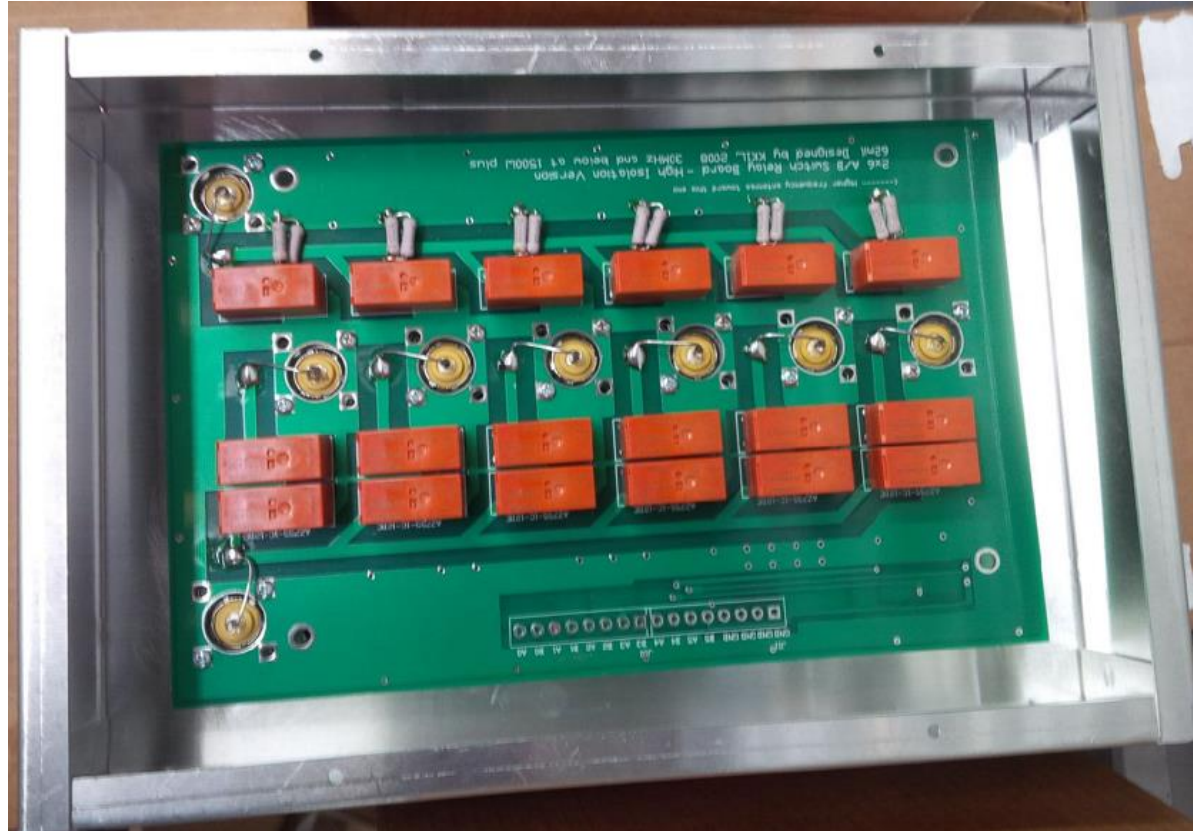


Brute force method



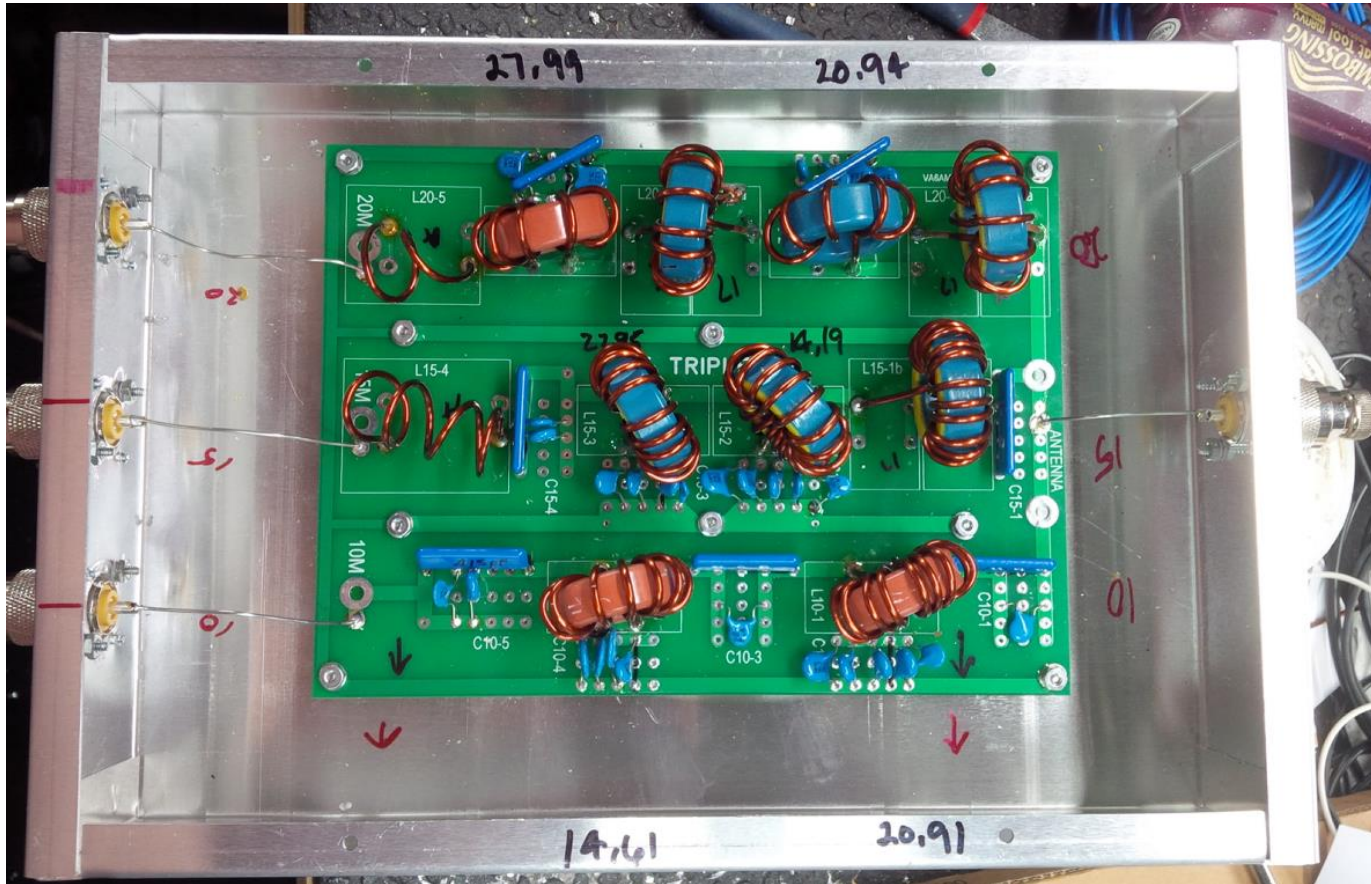
Arduino + 16-port FET shield

KK1L 2x6 Antenna Switch



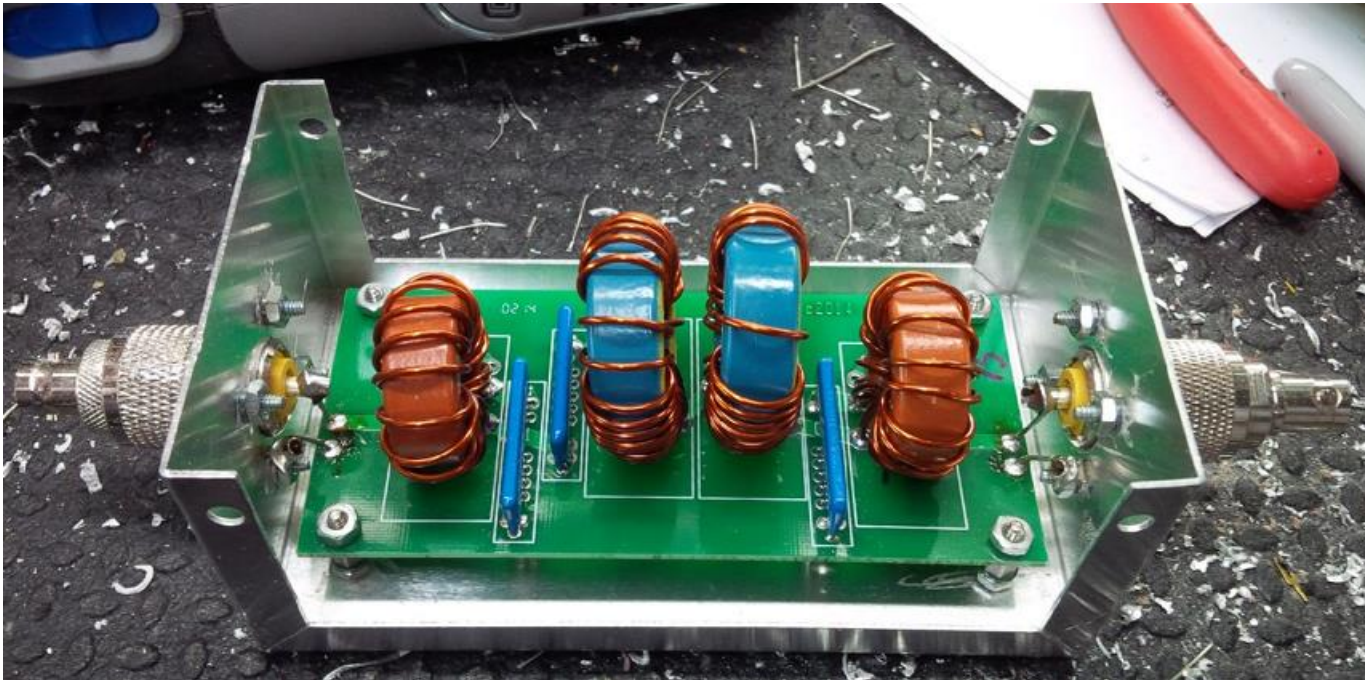
KW-rated switch, Amphenol connectors, same-band hardware lockout
Unused antenna jacks are loaded with 50 ohms – important for triplexer

VA6AM Triplexer



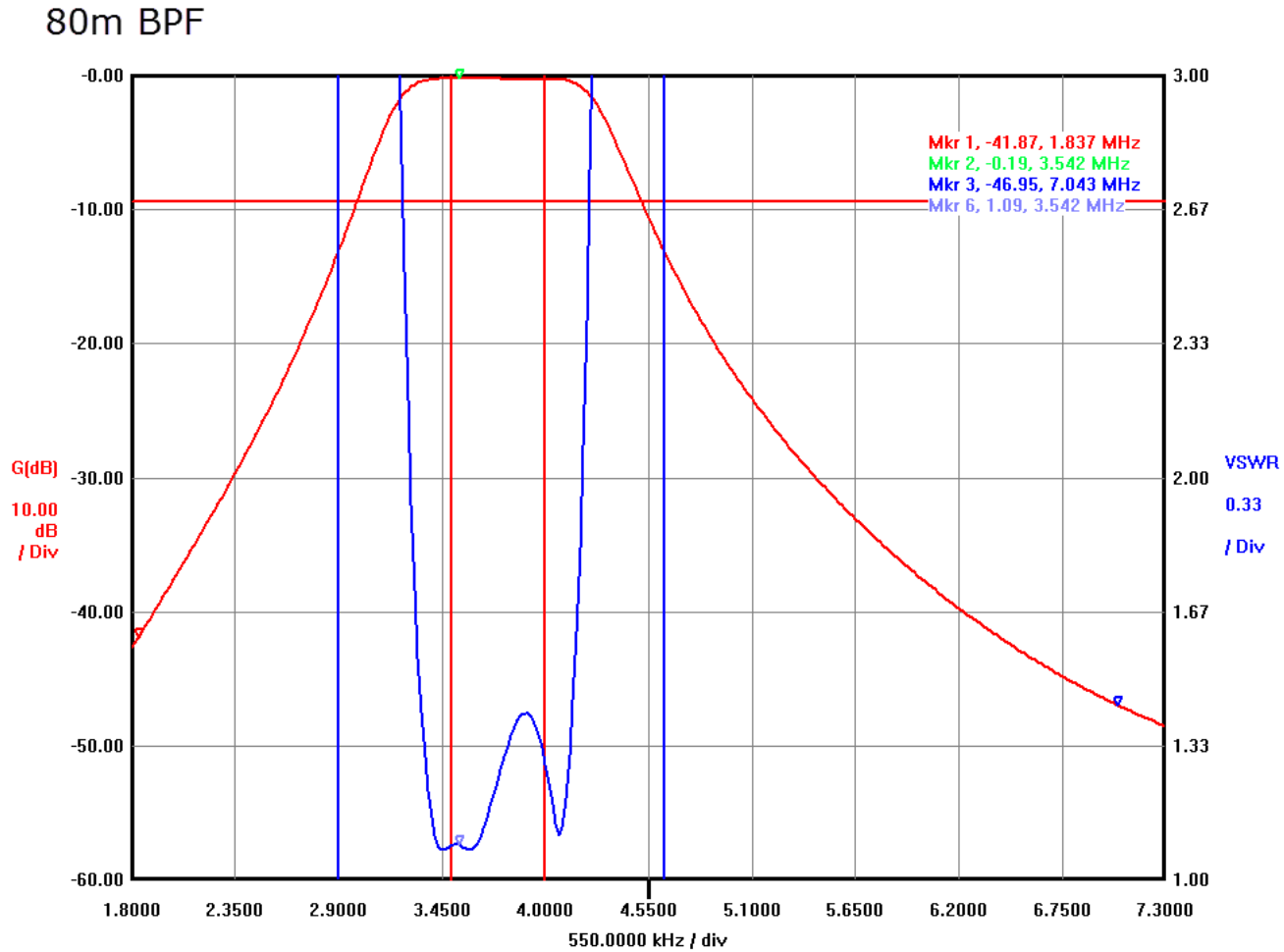
30-55 db band-to-band isolation
Alignment is critical – cap values trimmed in 1-pF steps

5B4AGN W3NQN-type BPF

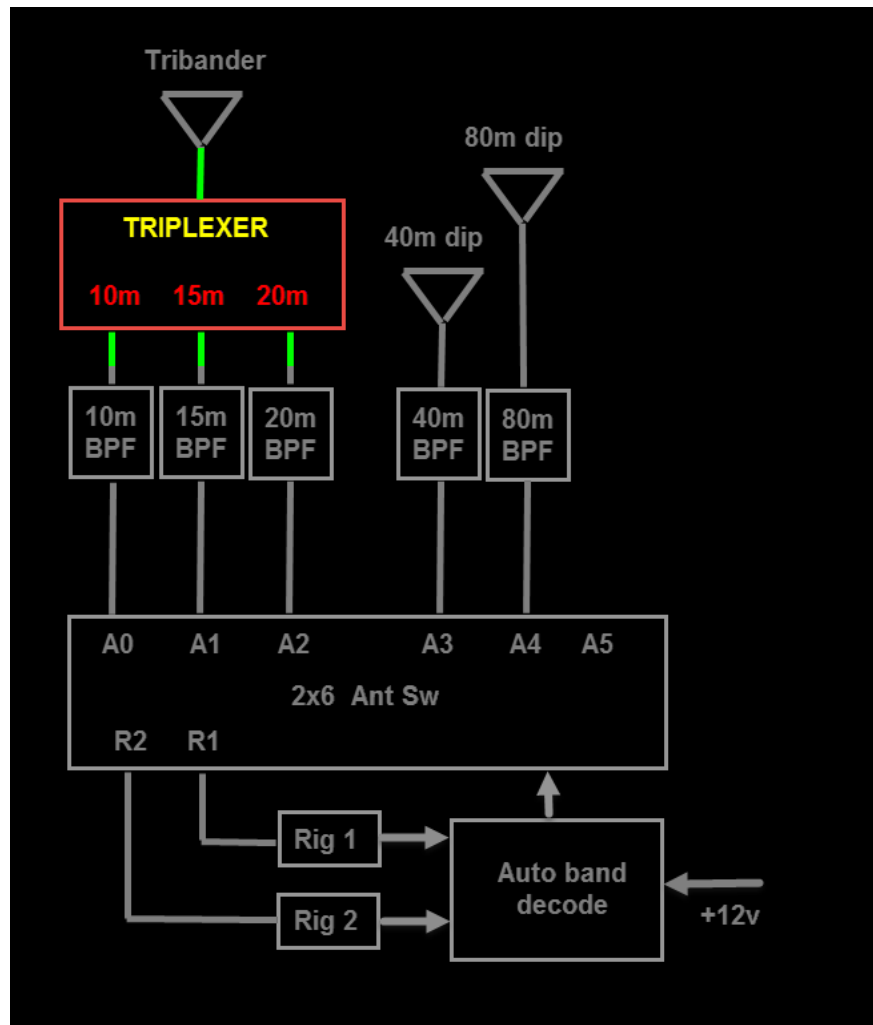


T130-17 cores, #12 200C wire, custom value RF-spec TAB mica caps
Provides 25-45 dB adjacent band attenuation

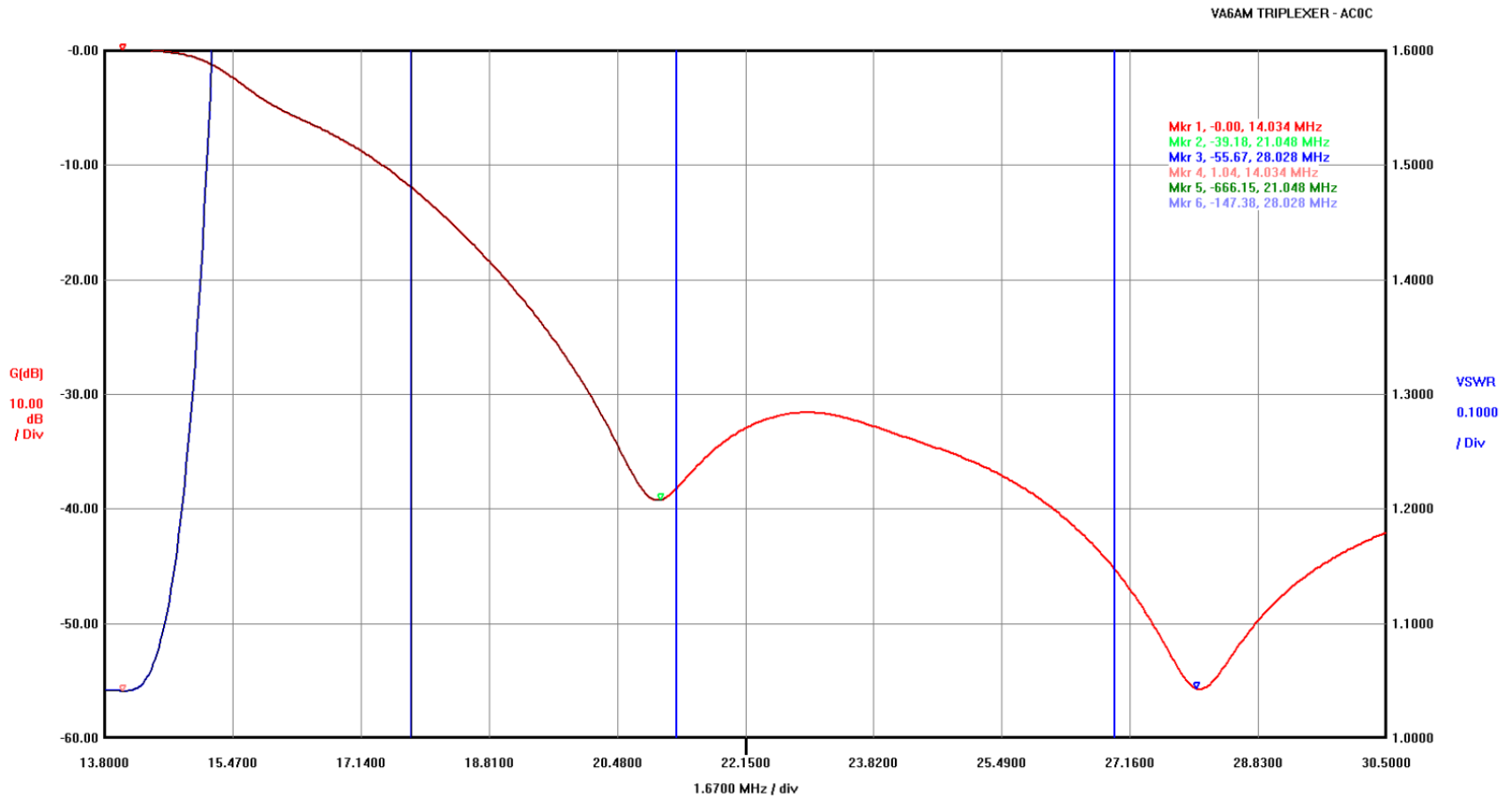
5B4AGN W3NQN-type BPF



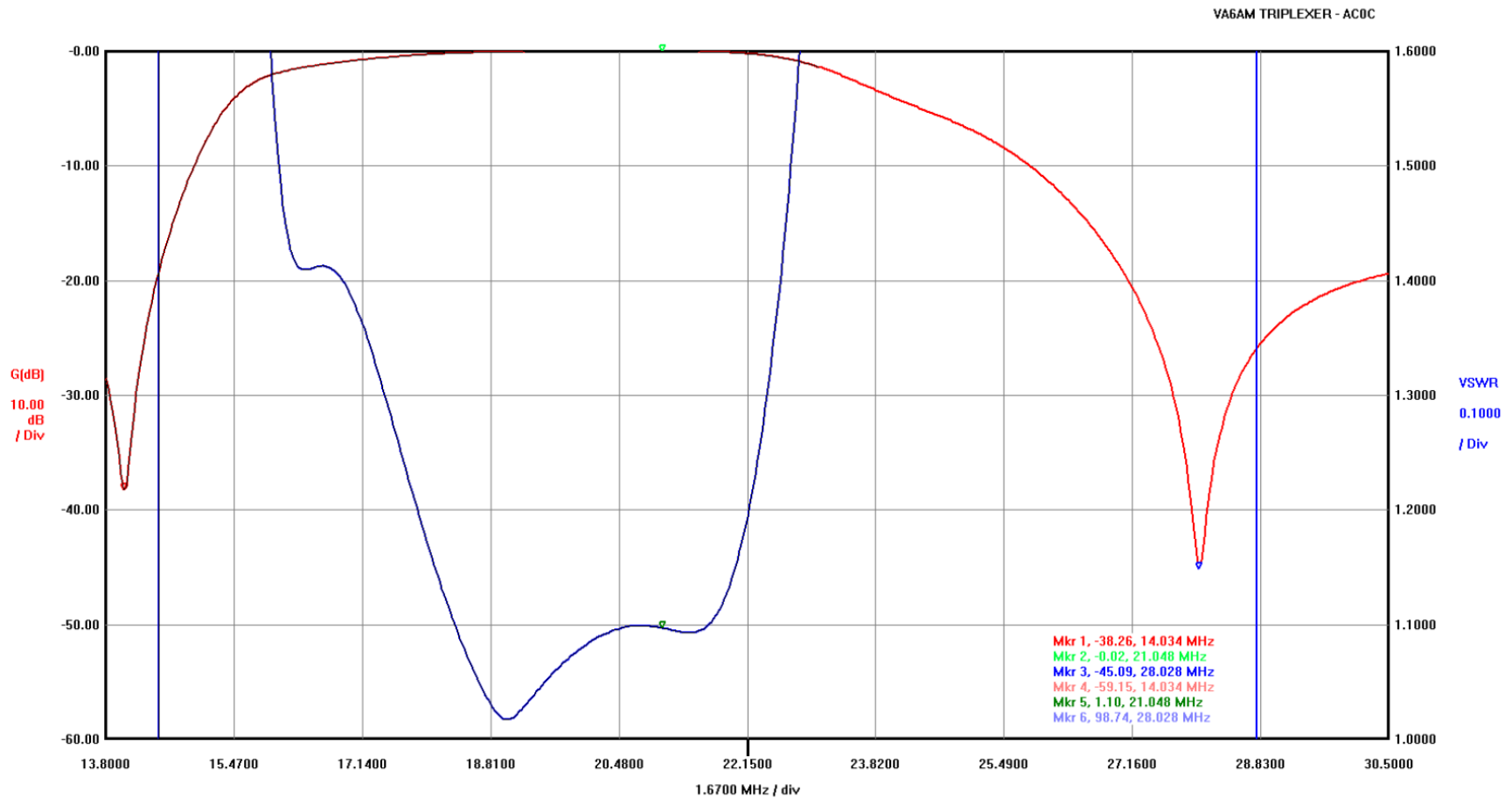
System Performance: Triplexer



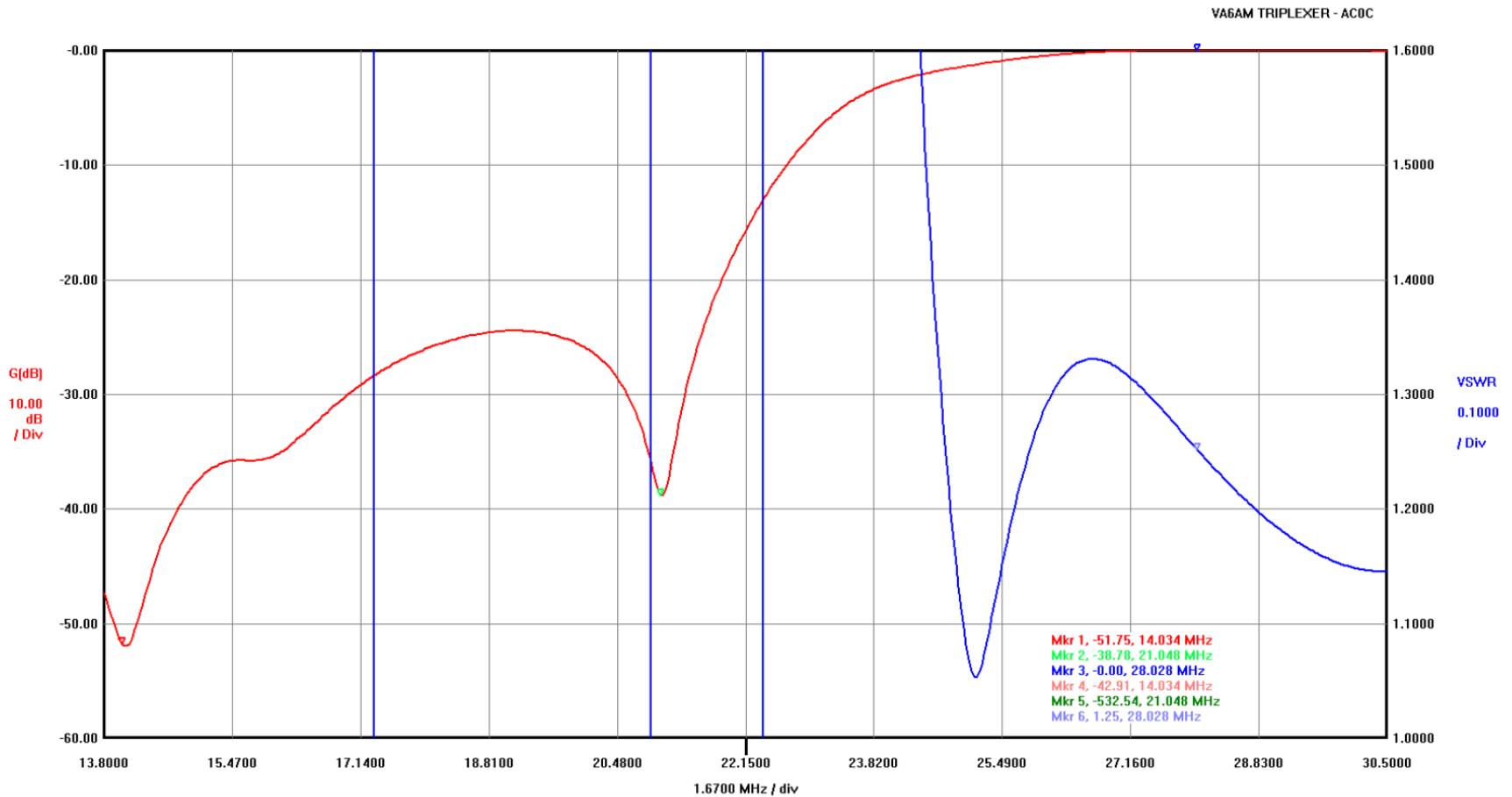
System Performance: Triplexer 20m



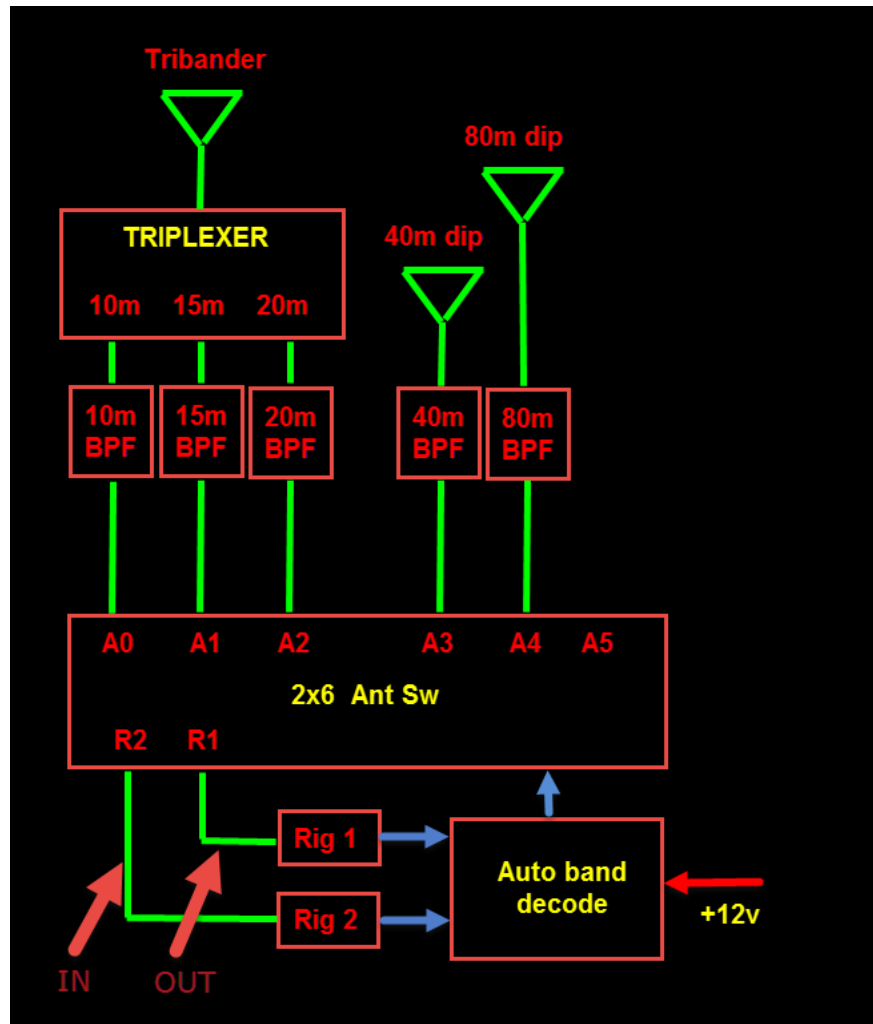
System Performance: Triplexer 15m



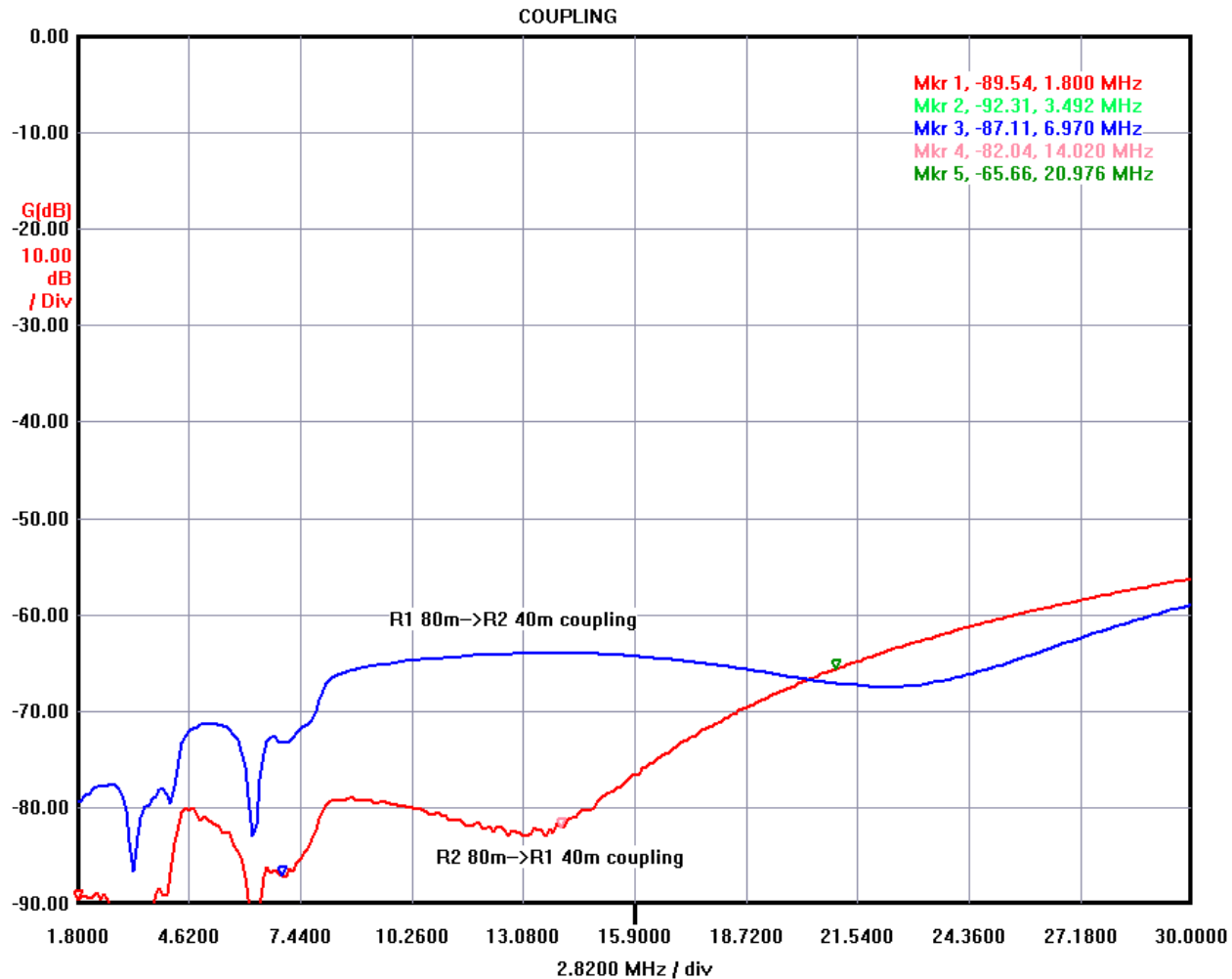
System Performance: Triplexer 10m



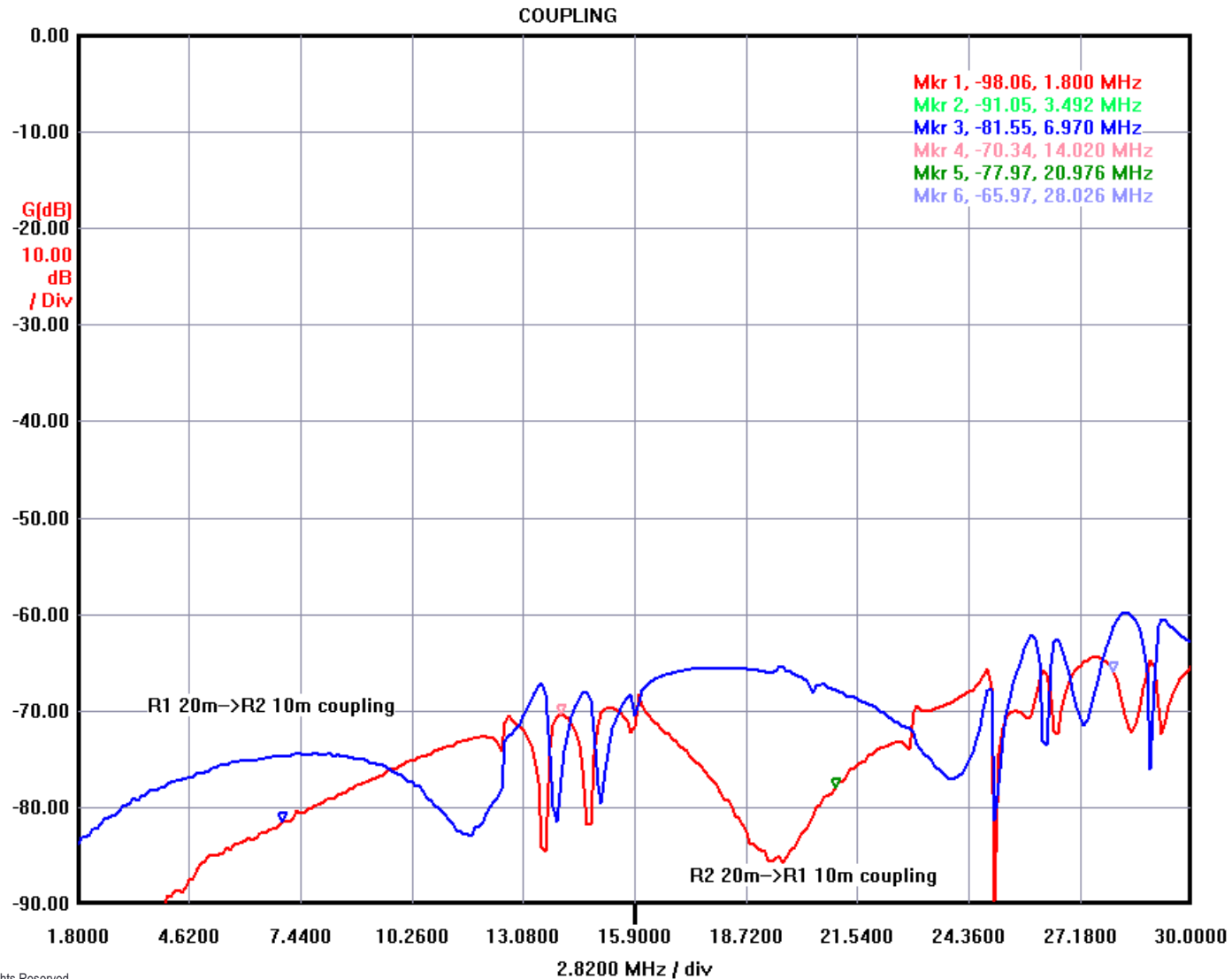
System Performance: Rig-to-Rig



System Performance: Rig-to-Rig 80m \leftrightarrow 40m



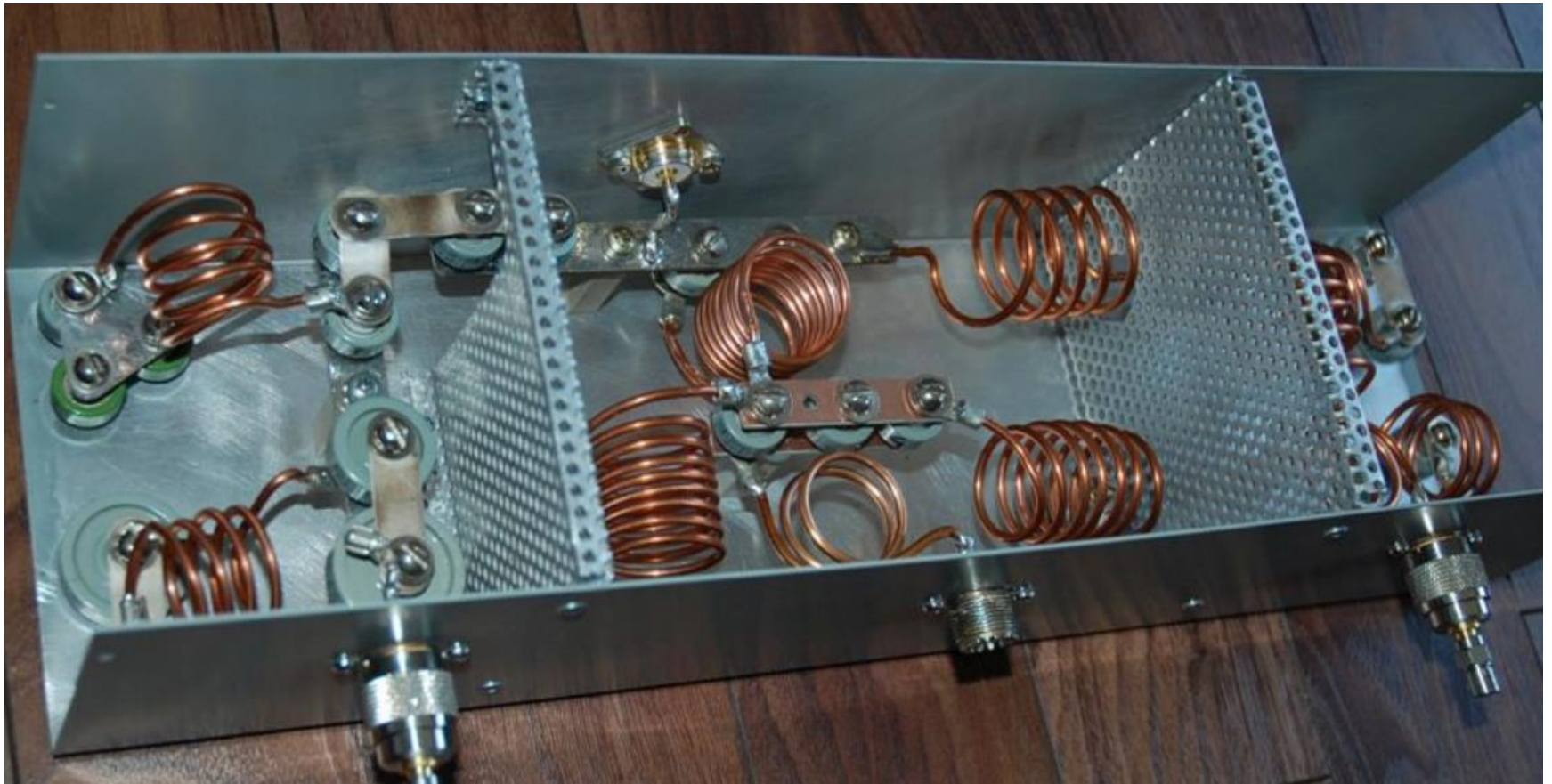
System Performance: Rig-to-Rig 20m \leftrightarrow 10m



FD 2015 - Triplexer In Action



VA6AM QRO Triplexer Prototype



Measured 0.1 dB IL \rightarrow ~ 35W dissipation (heat) @ 1500W input