CONSIDERATIONS FOR CONSTRUCTION OF LNA / RELAY COMBINATIONS FOR EME

PRESENTED
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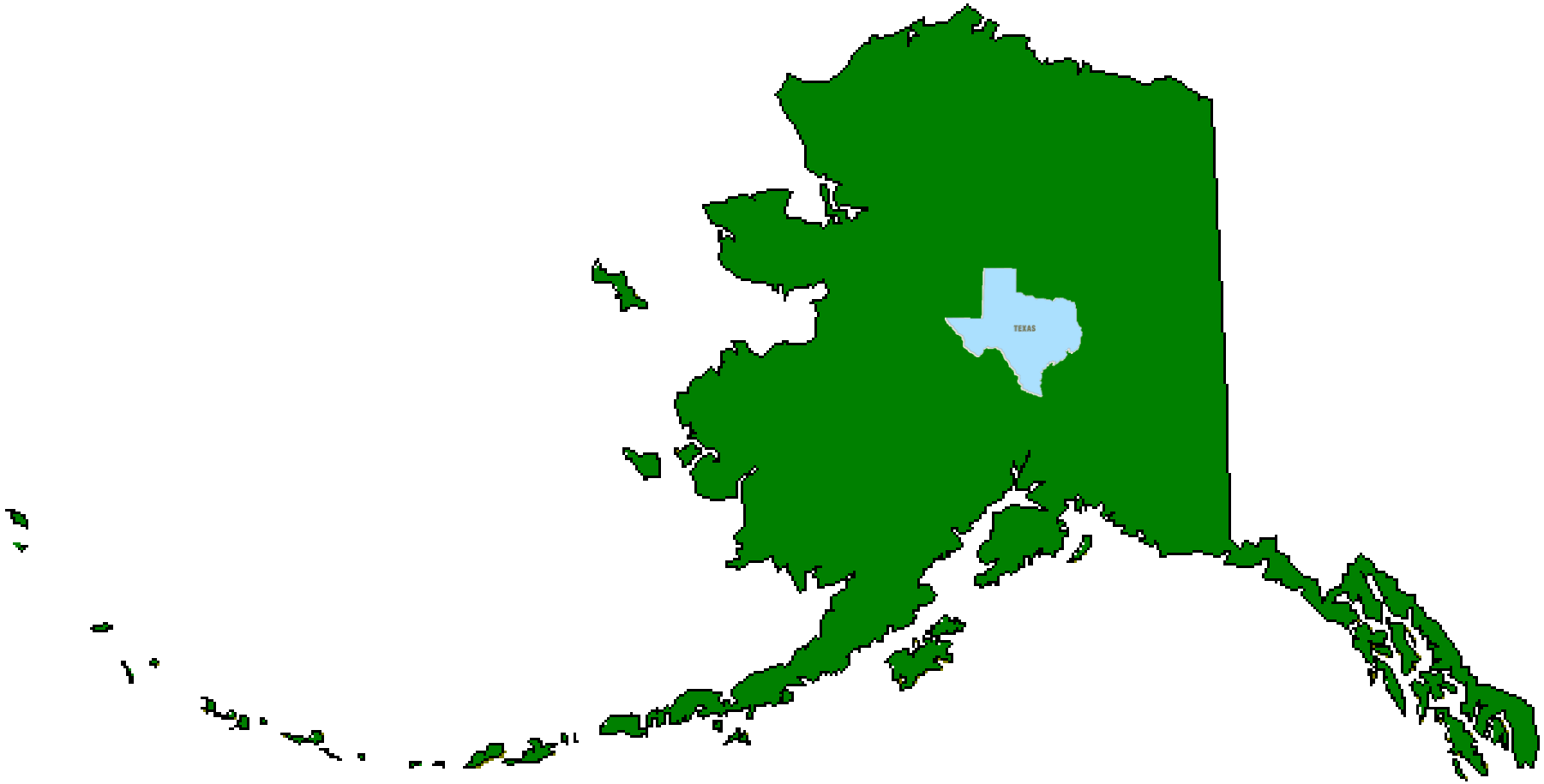
EME-2010 DALLAS, TX

THANKS FOR HAVING US



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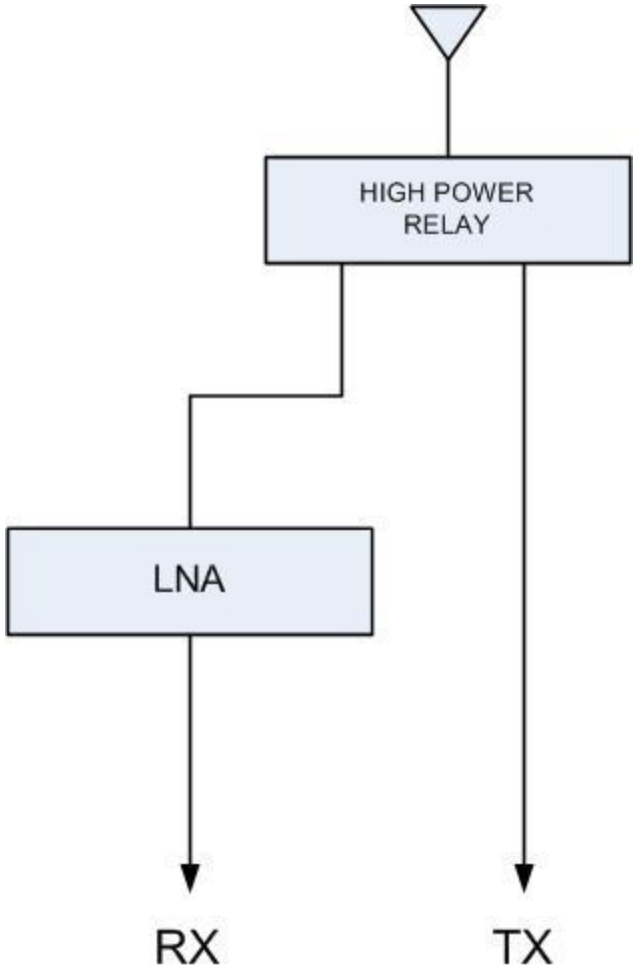
CONFIGURATIONS (#1)

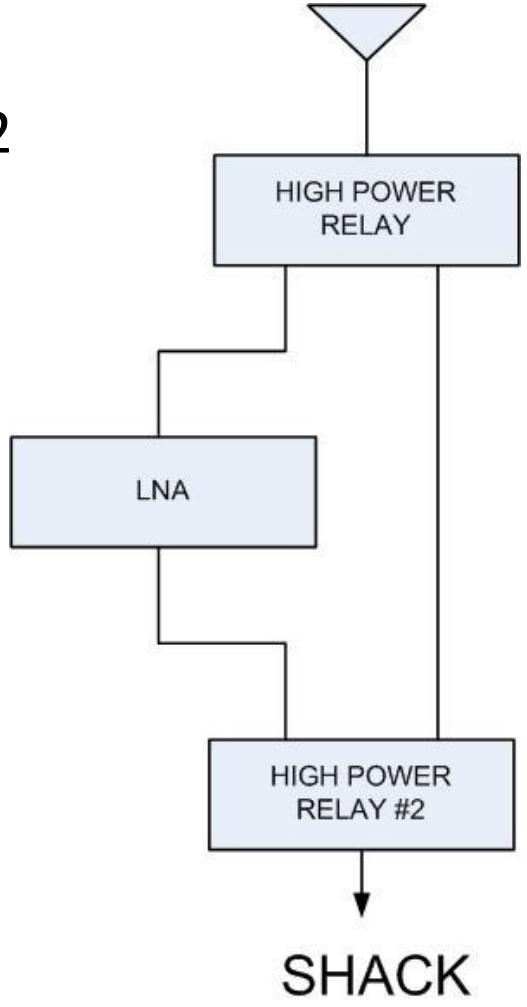
#1



- RELAY SPECS ARE CRITICAL IN THIS CONFIG
  - POWER HANDLING
  - PRIMARILY ISOLATION
    - ASSUME MAX LNA = 0dBm
    - ASSUME 1KW (60dBm)
- DRAWBACKS
  - TWO FEEDLINES
  - NO TERMINATION FOR LNA

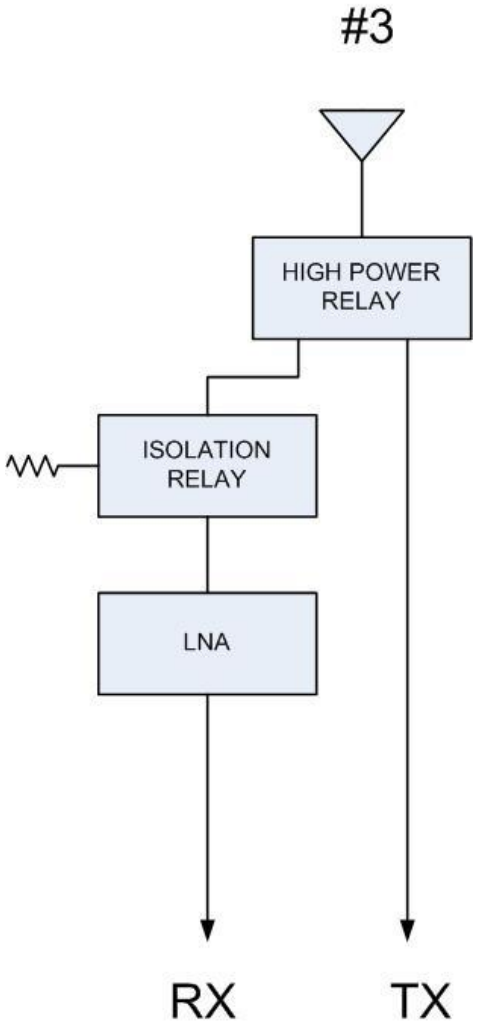
CONFIGURATIONS (#2)

#2



- SAME ISSUES AS #1
- ADDS ADDITIONAL RELAY
- DELETES ONE FEEDLINE
- RELAY #2 ISOLATION PROTECTS OUTPUT OF LNA
- REQUIRES ANOTHER RELAY IN THE SHACK

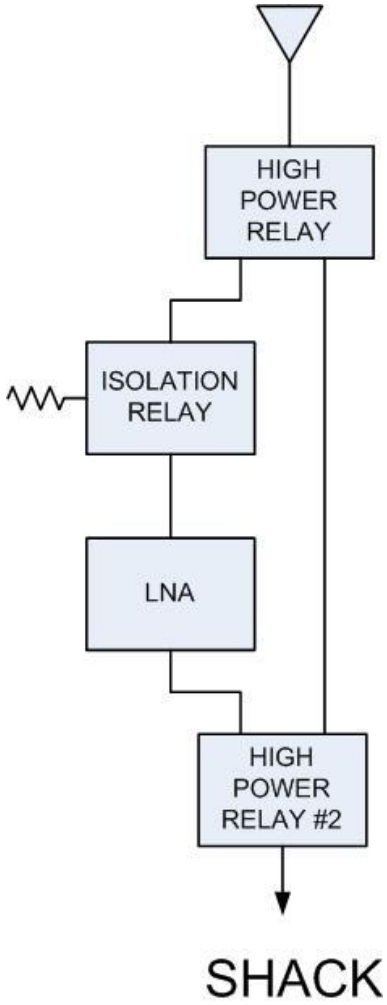
CONFIGURATIONS (#3)



- This config is failsafe
- Provides LNA input termination
- Drawbacks
  - Two feedlines
  - Additional loss ahead of LNA
- Trade-off = safety vs performance

CONFIGURATIONS (#4)

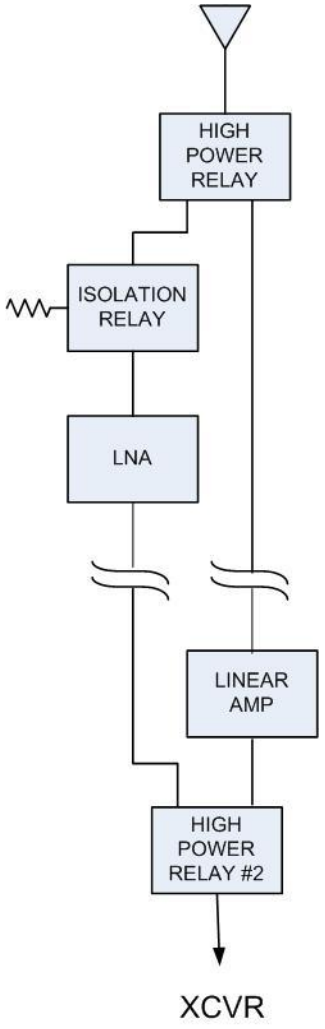
#4



- Variation of #3
- Adds additional high power relay at the antenna
- This relay needs to have high isolation
- Drawback is the need for additional relay in the shack

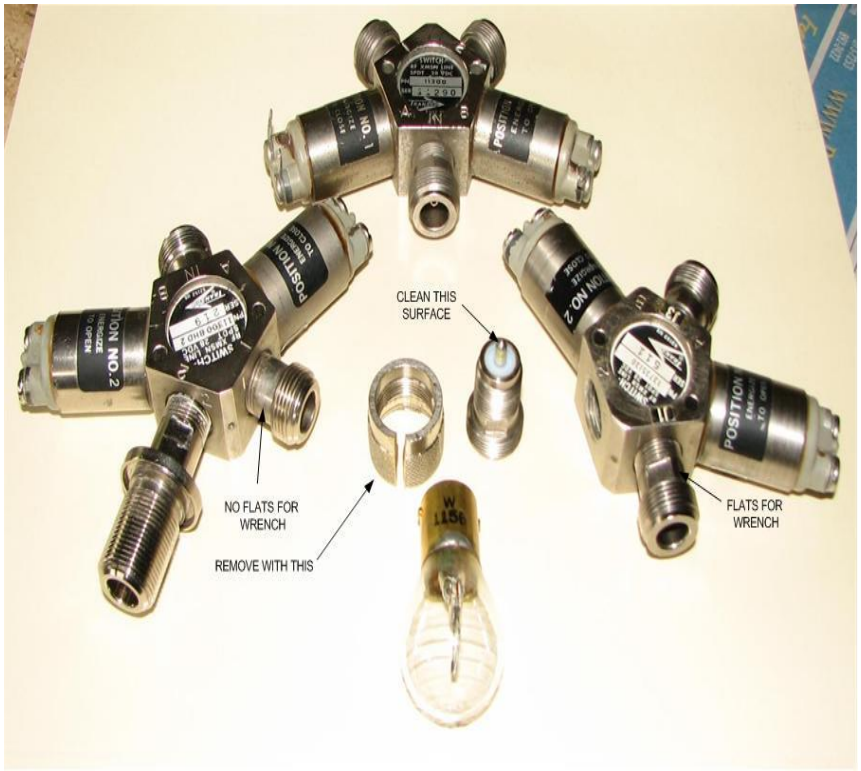
CONFIGURATIONS (#5)

#5



- YET ANOTHER VARIATION
- Same basic features as #3
- Two feedlines
- Relay #2 needs less isolation

RELAYS



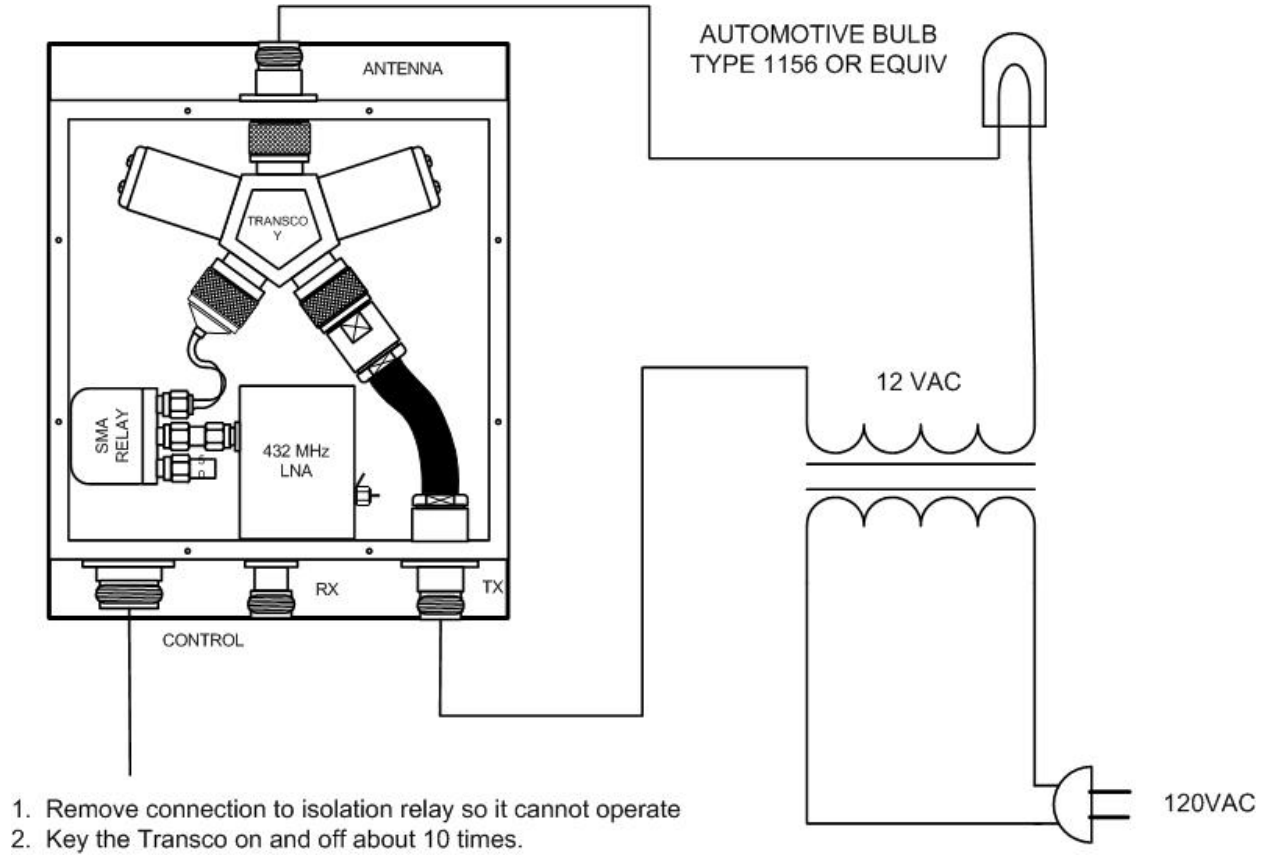
- Transco-Y
  - Designed in 1950's
  - Available
  - Low loss (0.05dB)
  - High Isolation (60dB)
  - High Power Capability (>KW)

RELAYS

- More about the Transco-Y
  - Check ‘em…they are old!
  - DC resistance of contacts < 0.2 Ohms
  - Intermittent or > 0.2 Ohms = Service!
    - Remove connectors and clean contacts
    - Solvent and steel wool
    - N-C coils - Energize coil to reassemble
  - Coil replacement may require heating of set screws

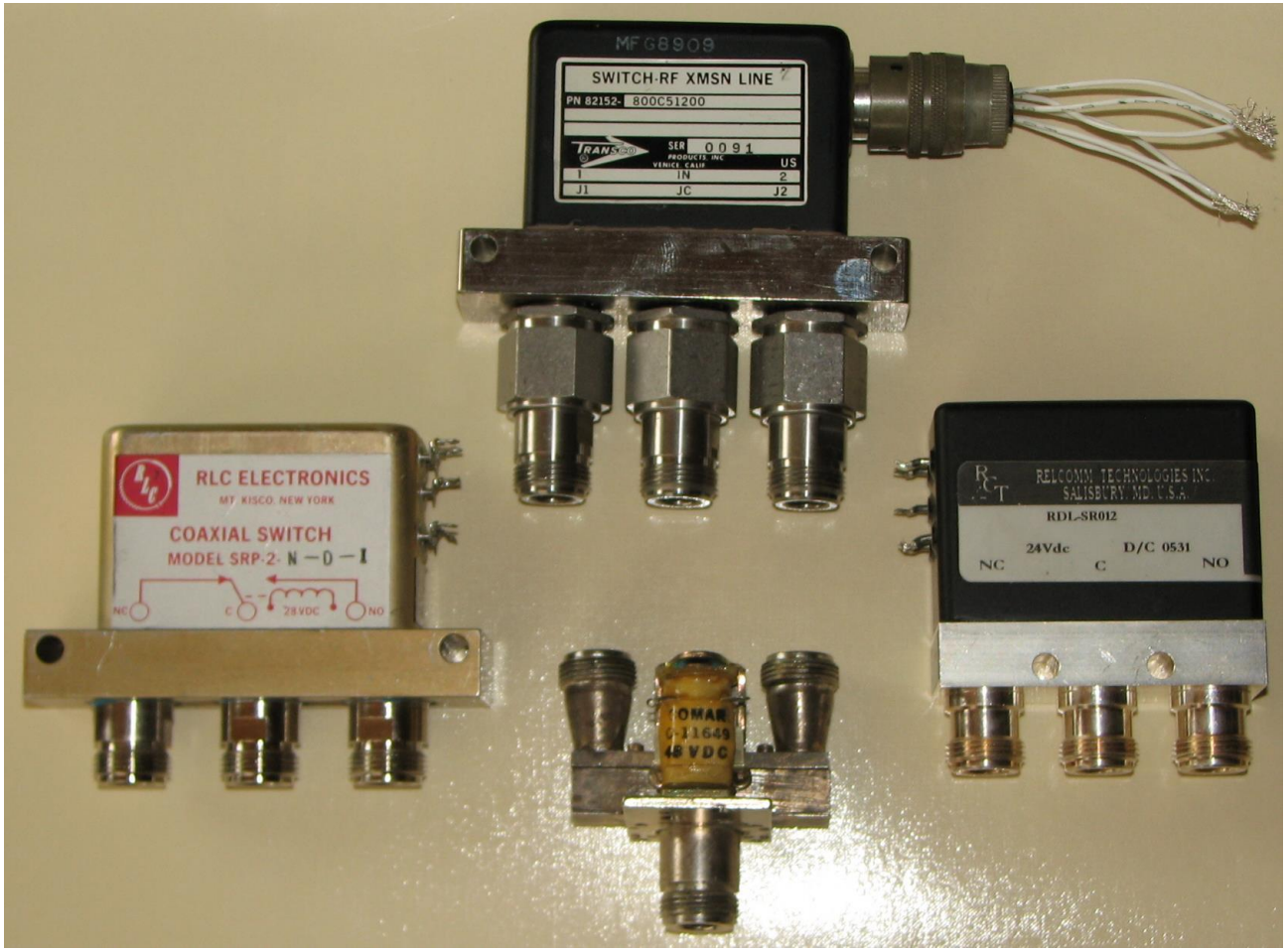
RELAYS

- Electric Burnishing of Contacts

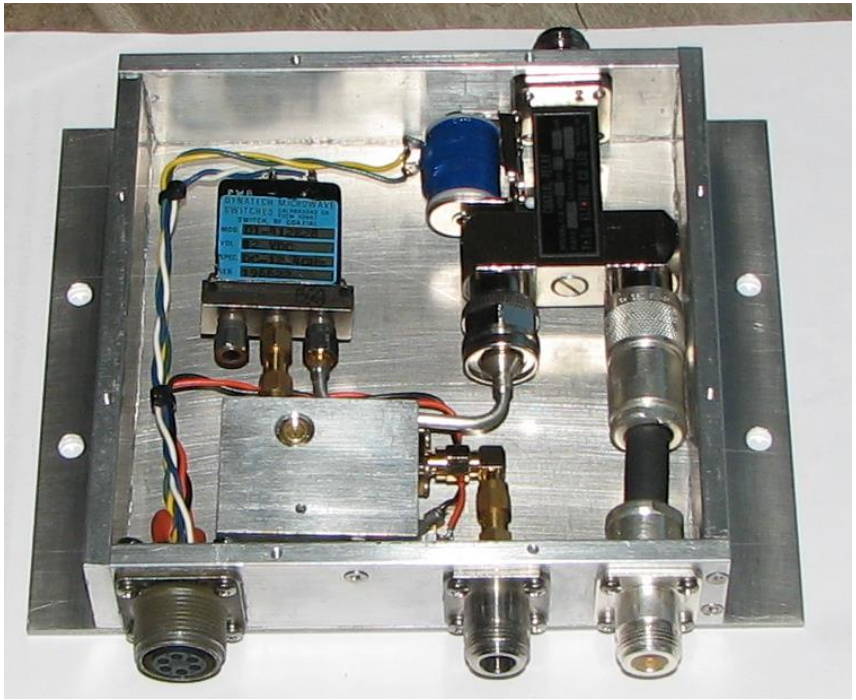


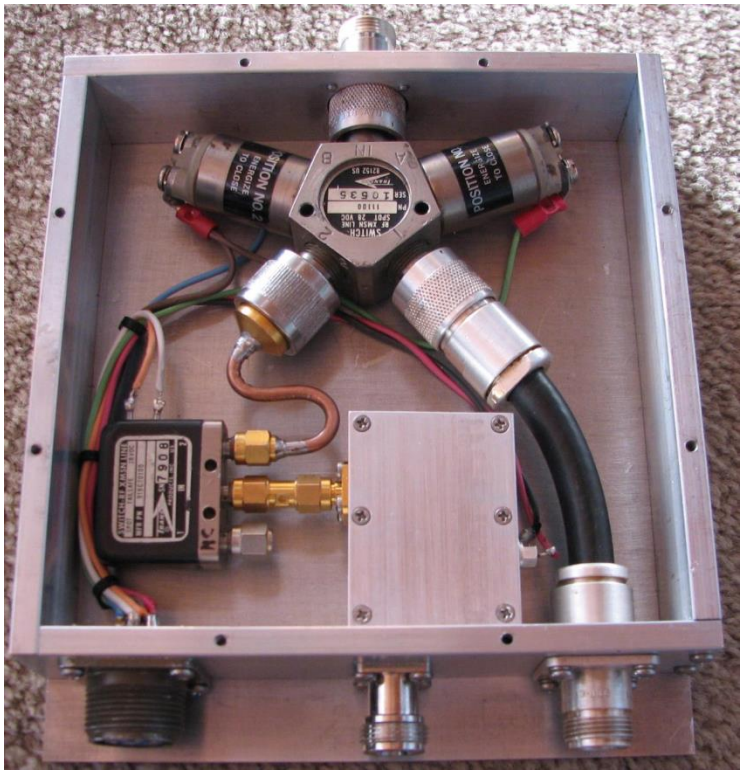
1. Remove connection to isolation relay so it cannot operate
2. Key the Transco on and off about 10 times.

More Relays


MFG8909
SWITCH-RF XMSN LINE
PN 82152- 800C51200
SER 0091
PRODUCTS, INC
VENICE, CALIF
US
J1
IN
J2
JC
RLC ELECTRONICS
MT. KISCO, NEW YORK
COAXIAL SWITCH
MODEL SRP-2
N-O-I
NC
C
28VDC
NO
RELCOMM TECHNOLOGIES INC.
SALISBURY, MD. U.S.A.
RDL-SR012
24Vdc
D/C 0531
NC
C
NO
48 VDC

ENCLOSURES



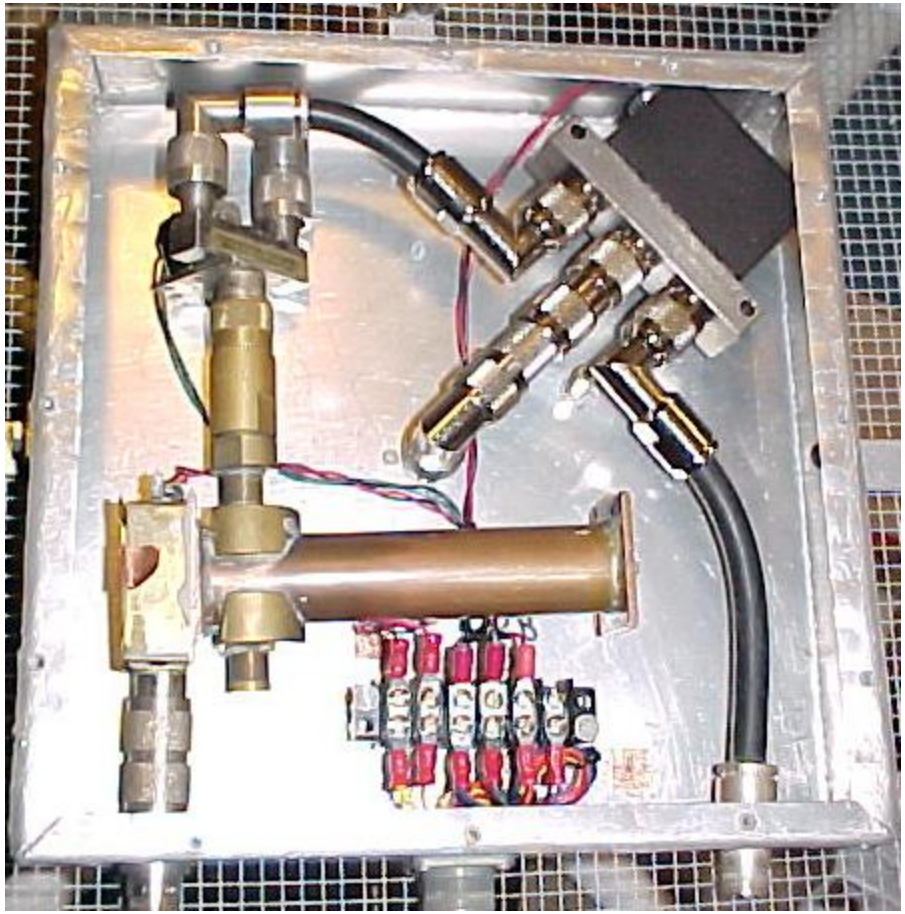


ENCLOSURES

- FOCUS
  - ACHIEVE LOWEST LOSS AHEAD OF LNA AS POSSIBLE (ALTHOUGH I CHOOSE TO USE AN ISOLATION RELAY)
  - MINIMIZE SIZE AND WEIGHT
  - MAXIMIZE WEATHER RESISTANCE
    - Weep holes?
    - Silicone sealer

ENCLOSURES

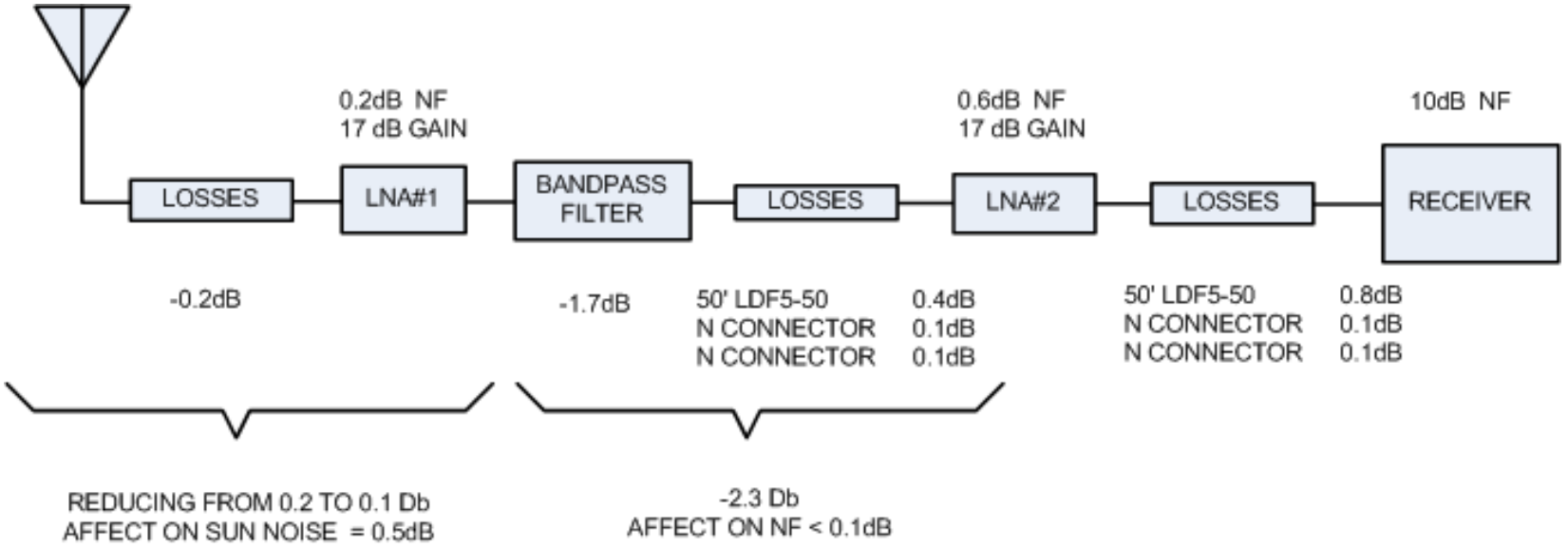
- MY 432 MHz System



LNA NOISE FIGURE = 0.17dB

OVERALL NOISE FIGURE = 0.37dB

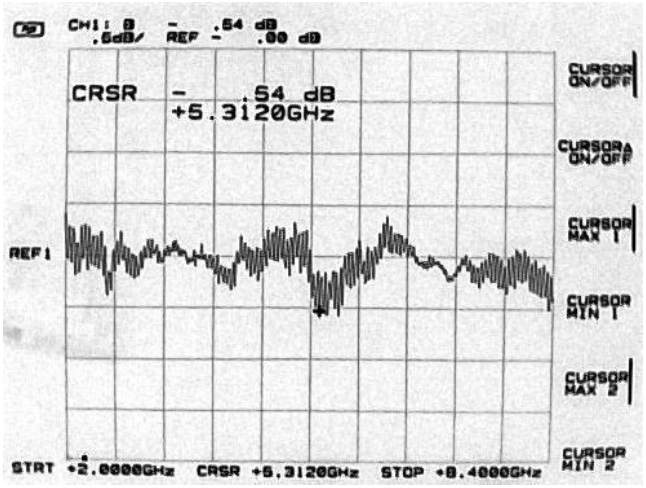
NOISE FIGURE
(OF MY SYSTEM)



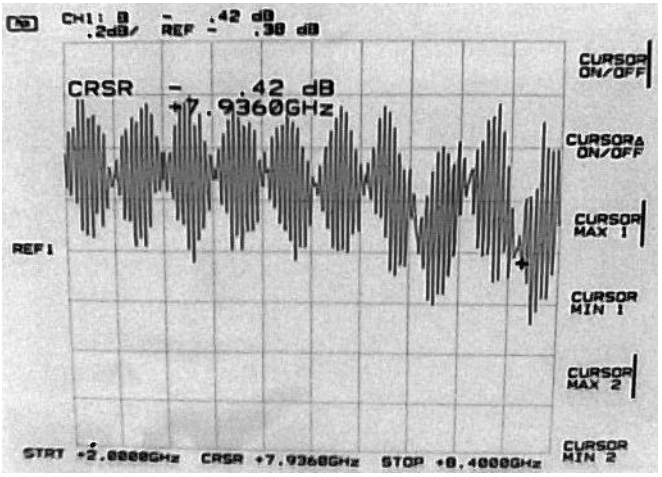
CONNECTORS

CONNECTORS

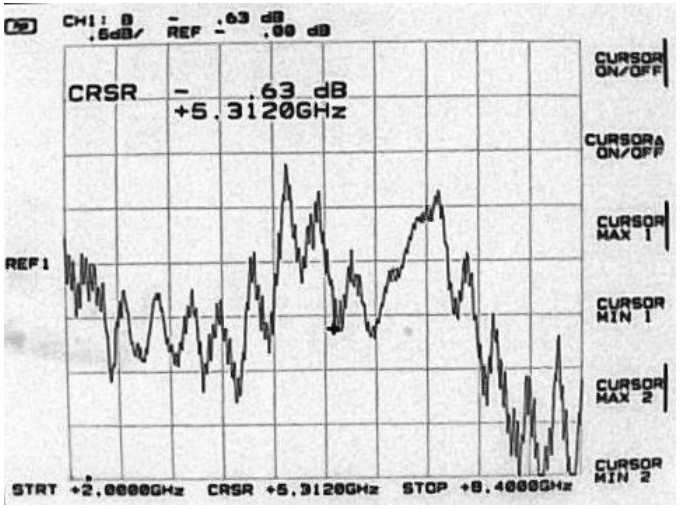
#3



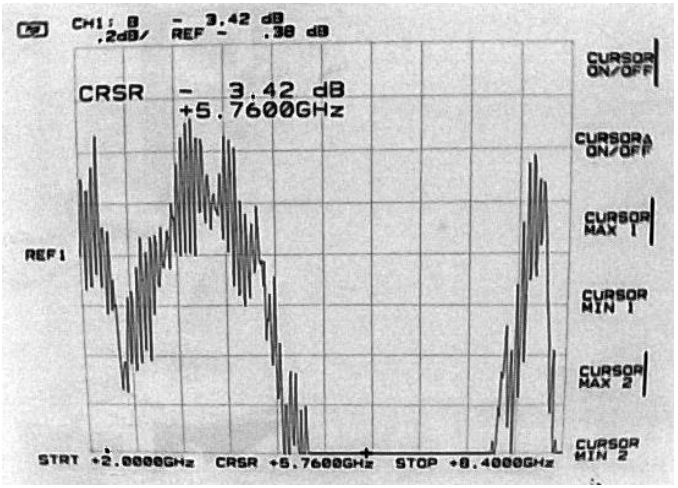
#5



#4



#6

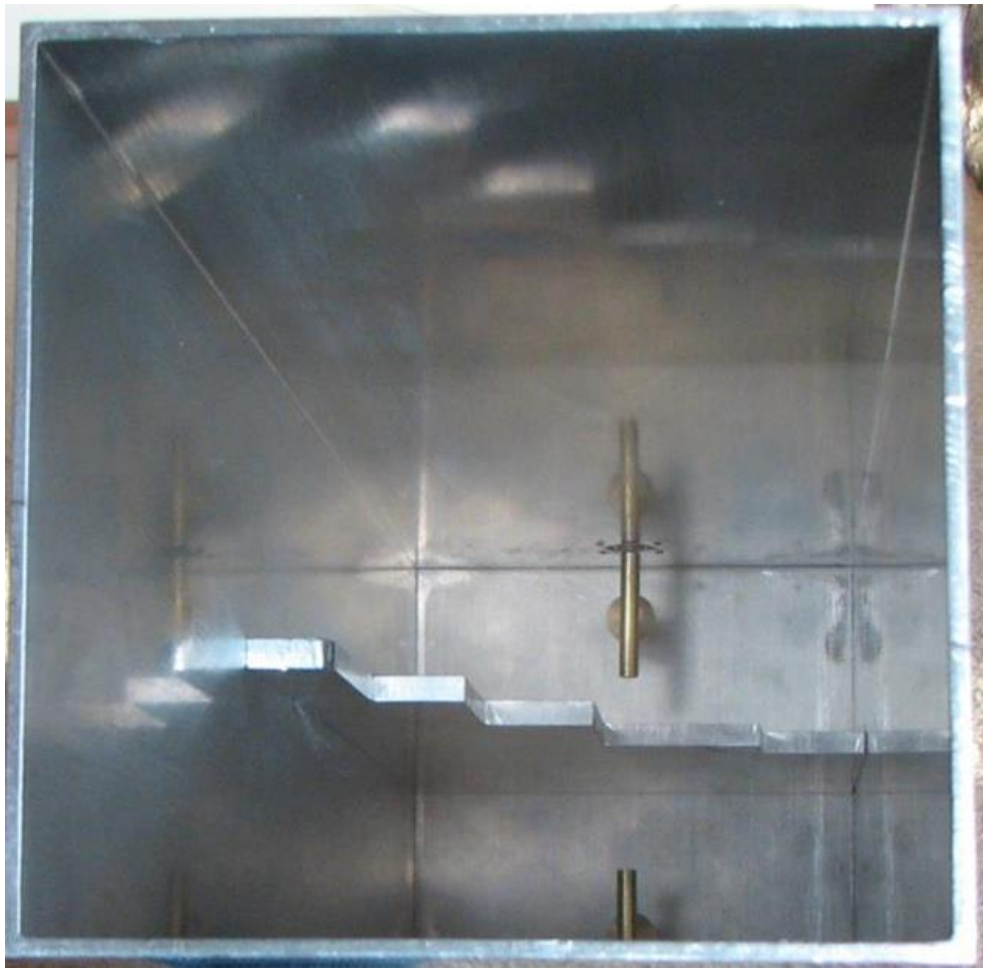


CONCLUSION

- This has been a collection of my experiences.
- I hope it has been of some benefit to you.

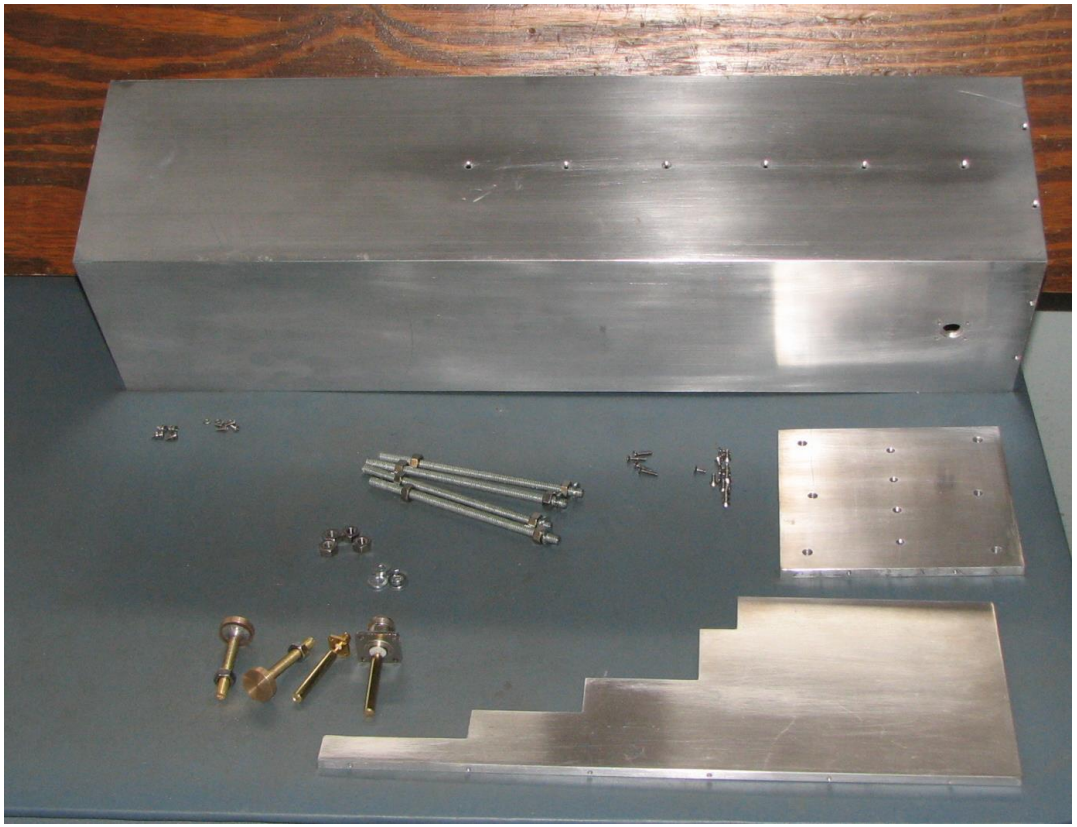
- Questions?

A NEW TECHNIQUE FOR CONSTRUCTION OF 23CM SEPTUM FEED



COMPONENTS

Key component is 6” square tubing from On-Line Metals
(see link at http://ptt-ak.com)



MOUNTING

CLOSE UP

COMPARISON

- Easier to construct than sheet metal square septum feed or VE4MA feed
- Easy to tune by adjusting both probes for best VSWR
- Good circularity with no adjustments (versus labor intensive polarizer screws)
- When scalar ring is added, and the feed is compared with a VE4MA feed on a 22 ft. dish, only 0.3dB less sun noise (W5LUA & K5GW, August 2005).
- Material cost less than $75 (Less than $100 with shipping)

CONCLUSIONS

- See for yourself
- I brought one with me
- Detailed construction instructions in the proceedings