



# **RAMBO ROVING FOR MICROWAVES**

**MICROWAVE UPDATE  
OCT 3 - 5, 2019  
DALLAS, TX**

**By: Ben Lowe, K4QF/K4VOW**

# ROVER SYSTEM REQUIREMENTS

- **5 to 25 watts of R.F. power**
- **Operates from both 13 volts d.c. and 120 volt a.c., easy to switch**
- **Easy to cool**
- **Readily attachable to tower**
- **Does not consume excessive battery power**
- **Portability**
- **Doesn't leak water or bugs**

## VARIOUS WEATHER TIGHT CASES

- **1<sup>ST</sup> Option – mail boxes; kept the water out but not the bugs, i.e. lady bugs and spiders**
- **2<sup>nd</sup> Option - homebrew p.c. boards soldered together to form a box; same problem with lady bugs and spiders**
- **3<sup>rd</sup> Option – New (or used) ammo case**

## WHY RAMBO?

**MICROWAVE TRANVERTER CONFIGURED IN USED OR NEW AMMO CASE;**

- **HEAVY DUTY**
- **AVAILABLE AT GUN STORE OR HARBOR FREIGHT**



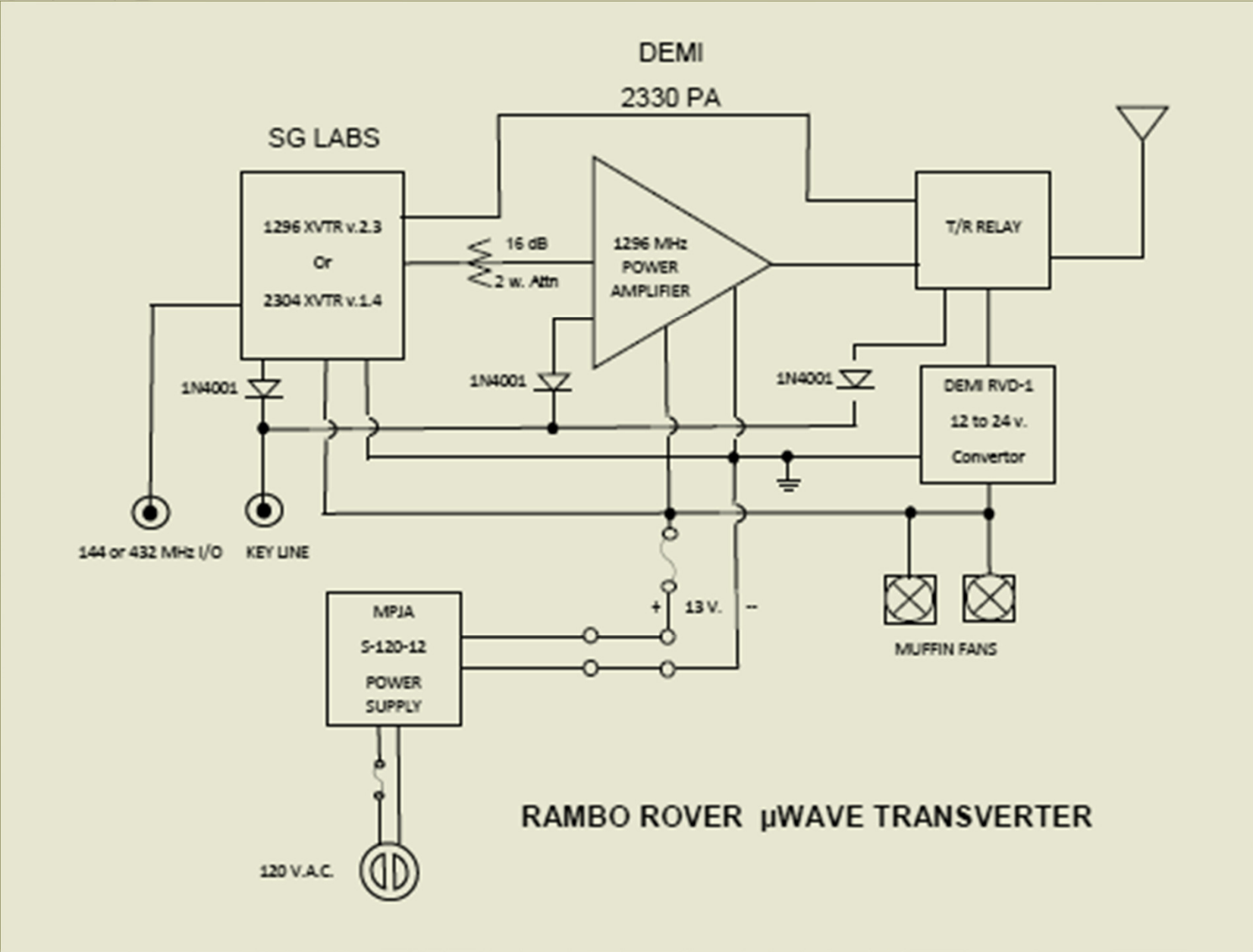
## ADVANTAGES OF AMMO CASE

- **Readily available**
- **Rugged, water tight top**
- **Inexpensive**
- **Paints easily**
- **Easy to store or attach to tower**
- **Ideal size for single band transverters**
- **I/O connections enter from bottom**

# COMPONENTS OF THE SYSTEM

- **RF generation and reception**
- **A.C. power supply**
- **T/R switching**
- **Cooling fans**

# BLOCK DIAGRAM OF TRANSVERTER



RAMBO ROVER  $\mu$ WAVE TRANSVERTER



# RF GENERATION AND RECEPTION

## SG LABS 1296 TRANSVERTER



**Modes: SSB, AM, CW , FM**  
**2W output power**  
**Low noise figure GaAs HEMT input stage**  
**High stability TCXO**  
**Internal Tx/Rx switch**



# RF GENERATION AND RECEPTION (con't)

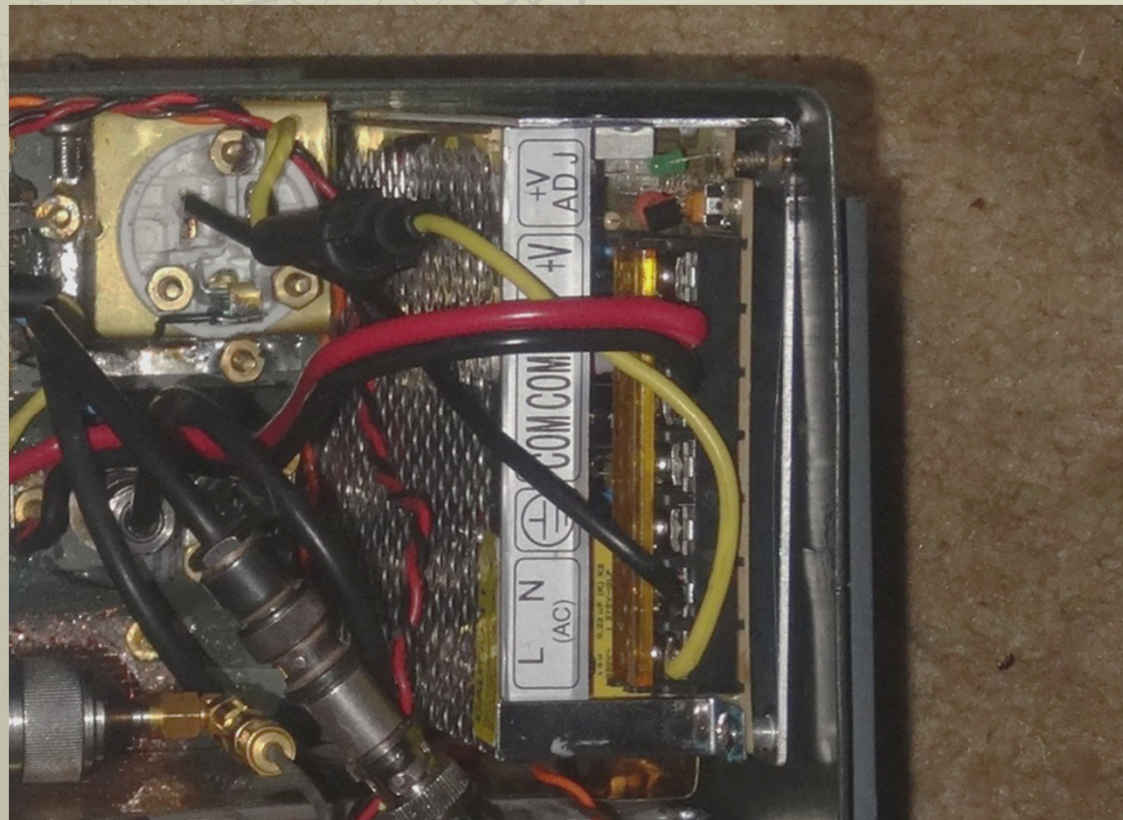
## DOWN EAST MICROWAVE 23 CM PA



**Frequency range: 1270 to 1300 MHz. Power Out (linear): 30  
Watts Input for rated power out: 50 mW typical  
Power requirements: 13.5 volts dc @ 10.0 amperes MAX.  
Size with connectors: 5.5" L x 5.5" W x 4.2" H**

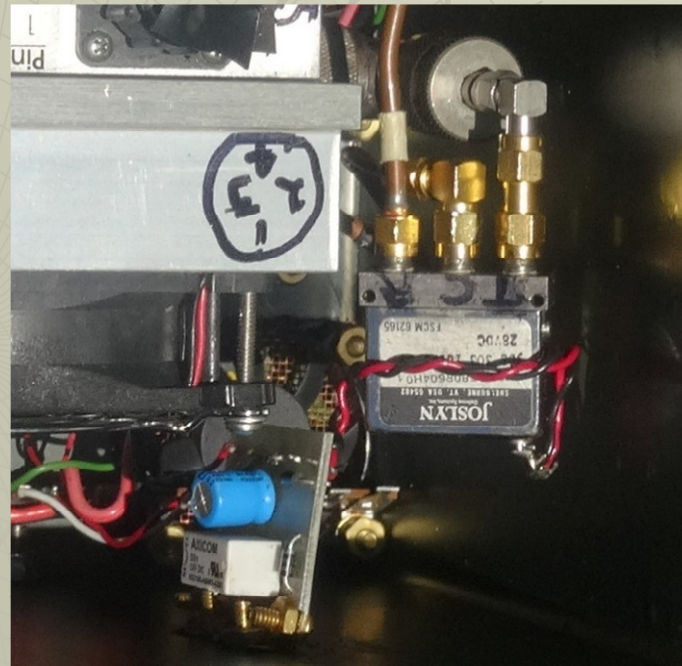
## A.C. POWER SUPPLY

- **MPJA SWITCHING SUPPLY, 13.5 V. @ 10 A.  
(~ \$14)**



# T/R SWITCHING

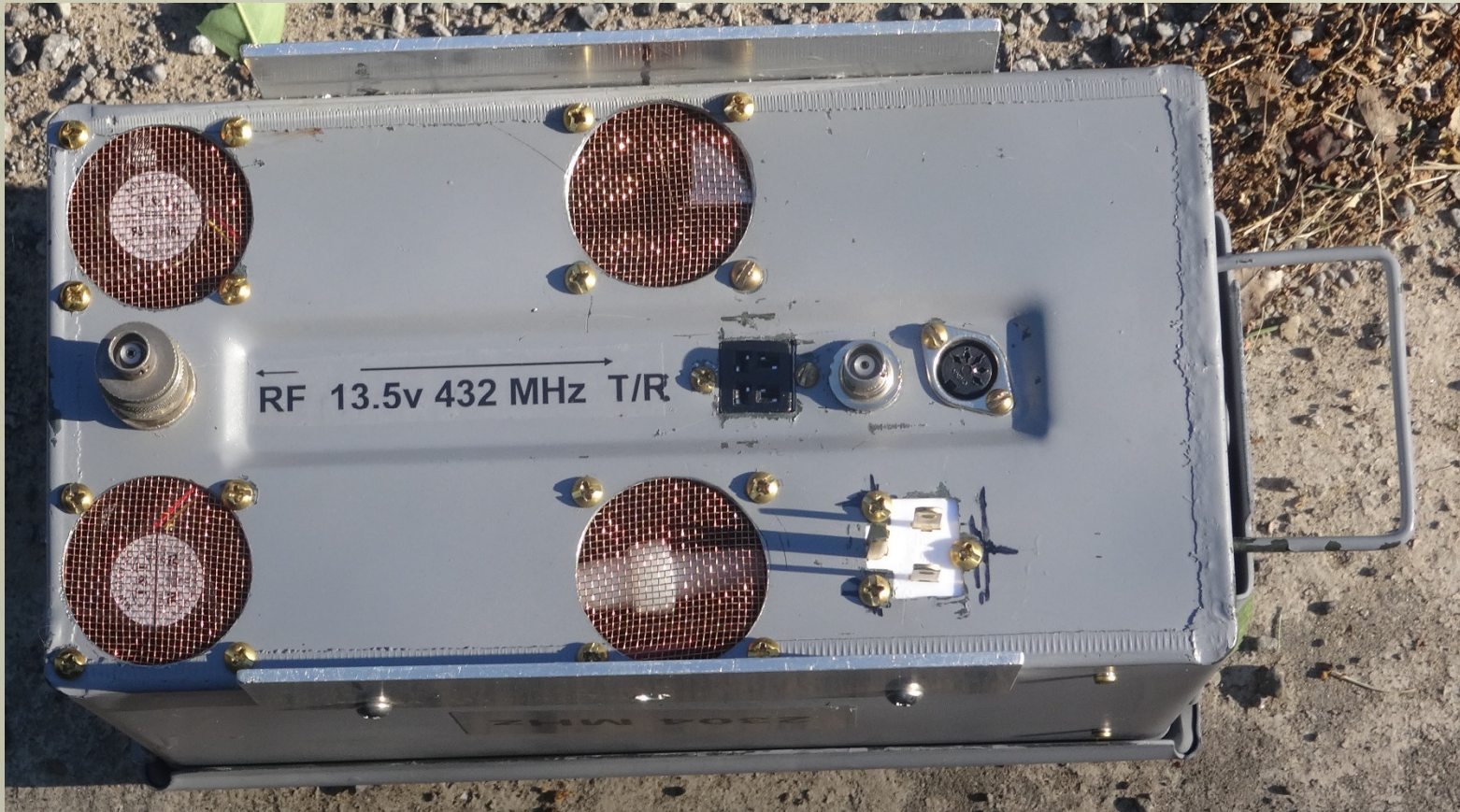
- **DEMI RVD-1, relay voltage doubler to key**
- **24 volt relay from 13 volts**
- **28 volt surplus relay**





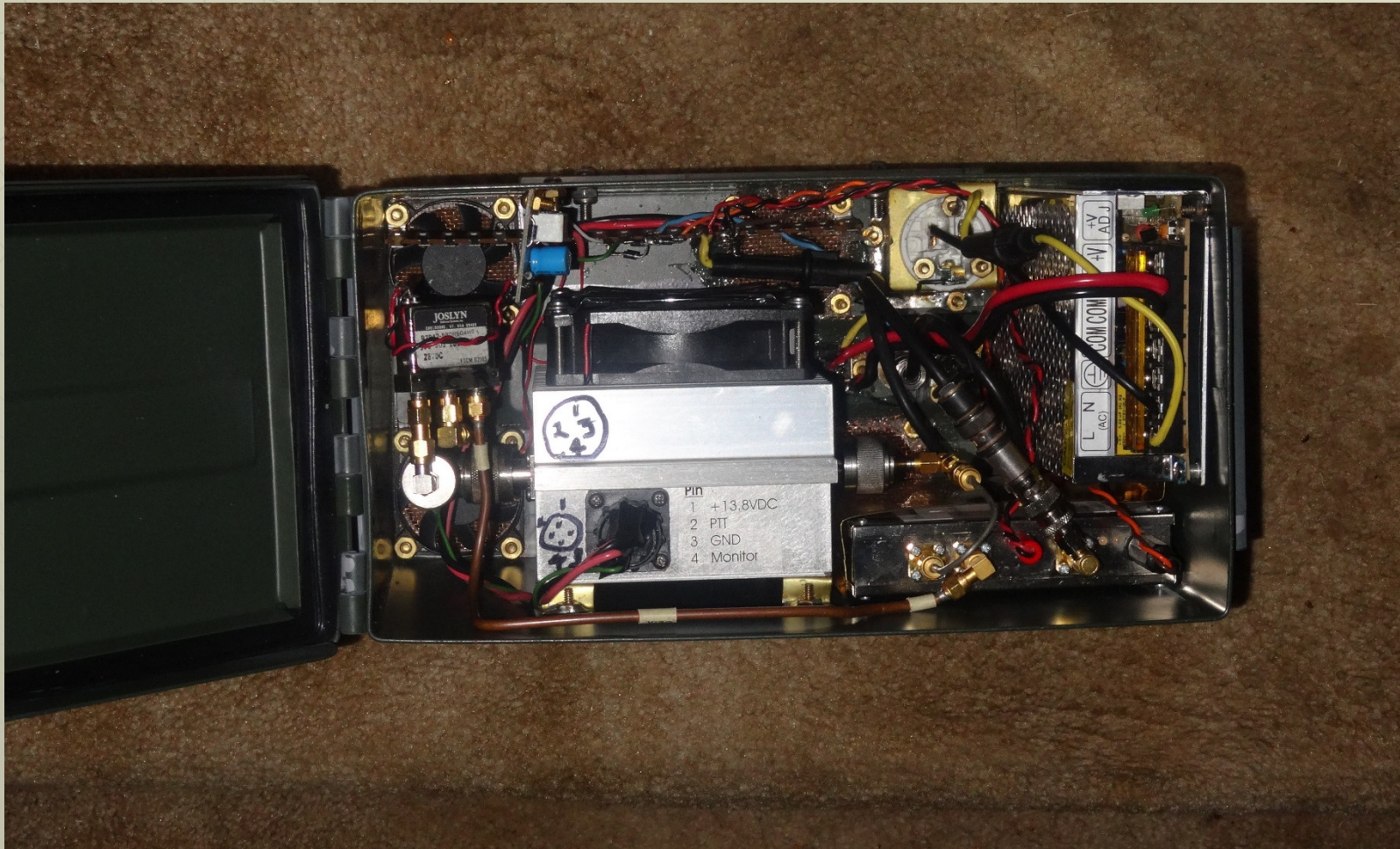
# COOLING

- **Two, 2 ¾ inch muffin fans**
- **Matching holes for intake air**

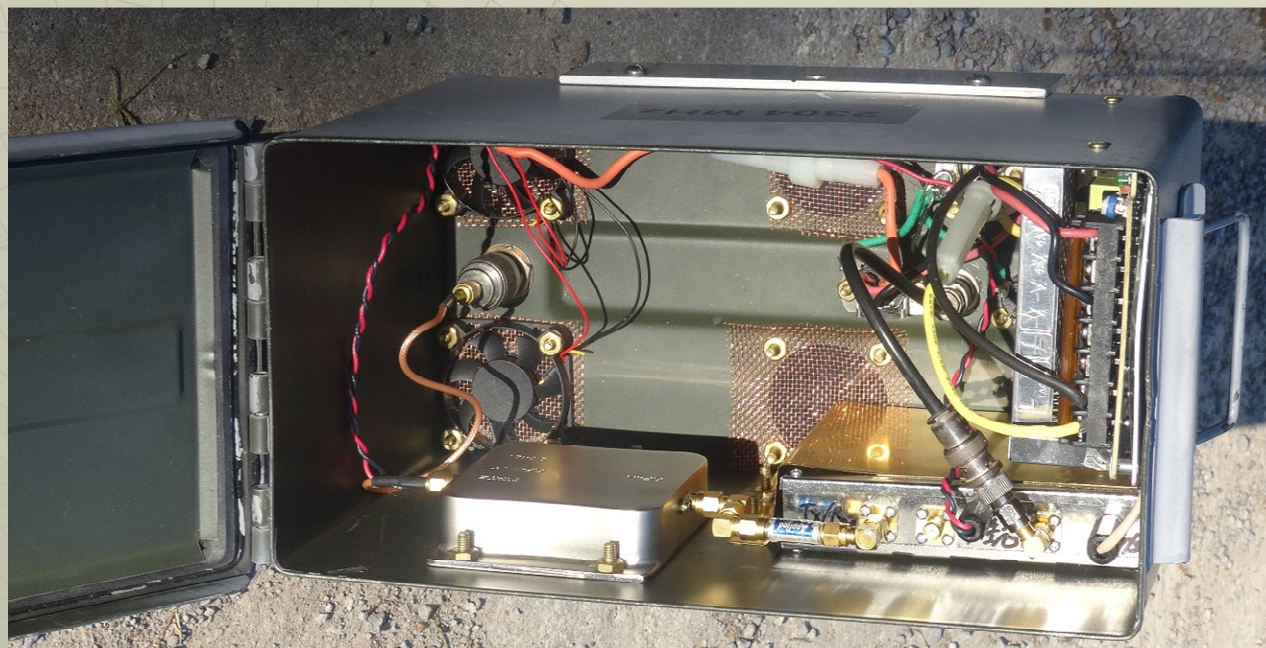




# COMPLETE 1296 MHz TRANSVERTER



# 2304 MHz TRANSVERTER

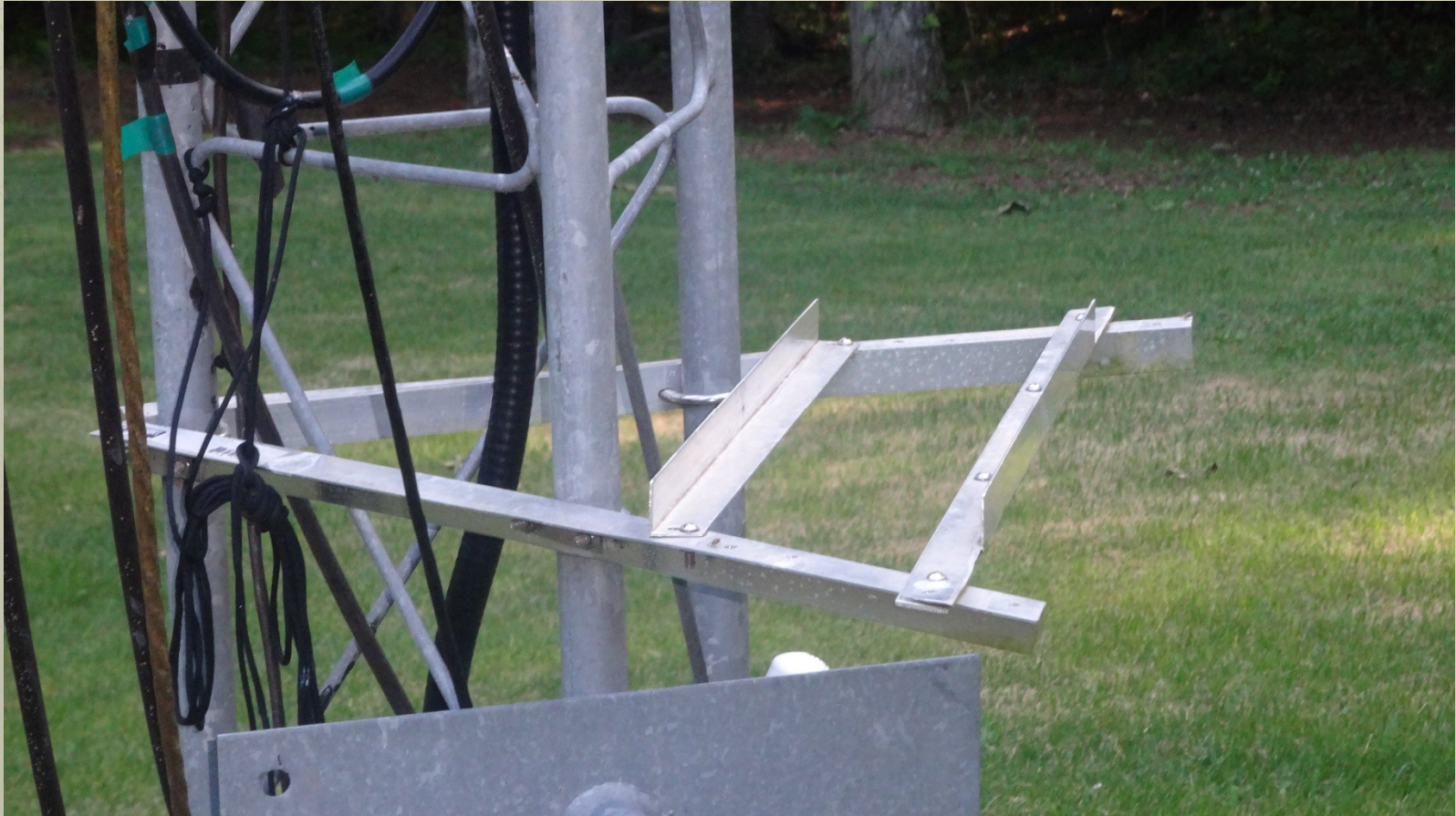




# TOWER MOUNTING (1)



## TOWER MOUNTING (2)



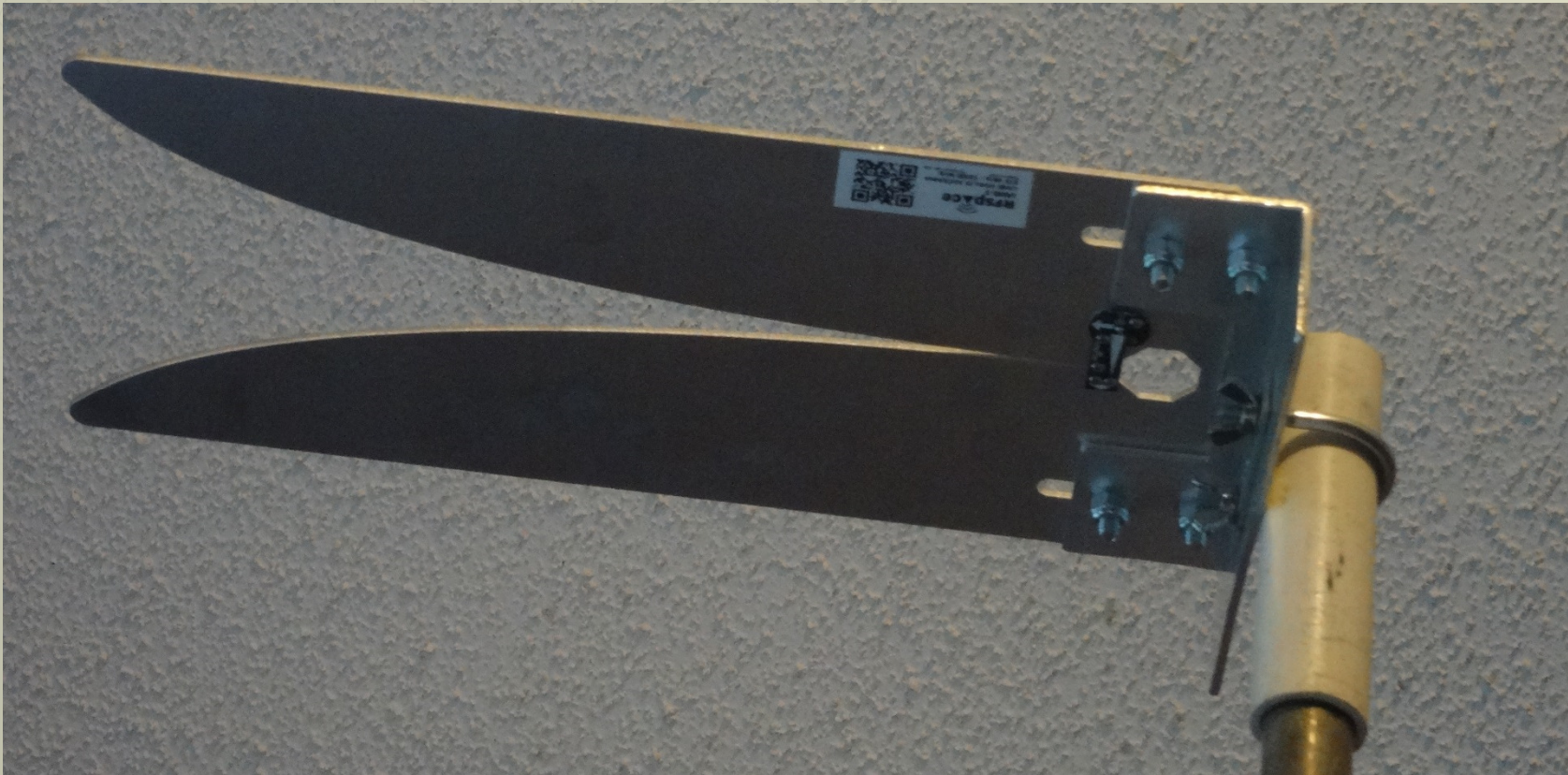


## TOWER MOUNTING (3)



# VIVALDI ROVER ANTENNA

**RF SPACE, 675 MHz TO 12 GHz,  
50 watts, 9 to 11 dBi gain**





## TO POWER IT ALL

- 13 volts, 18 amp-hours, 300 amps peak, ~ 3 lbs.
- Separate output set to 12 v. for 10 MHz Ref. source, separate USB outputs



# MY FAVORITE ROVING BAND – 10 GHz (50 MHz IS NOT THE ONLY MAGIC BAND!)





FOR ROVING, WHEN SECONDS COUNT,  
THE POLICE ARE ONLY MINUTES AWAY!



ANY QUESTIONS?

