The World Above 50 MHz

VHF, UHF and Microwave Weak Signal

Weak-Signal (not FM)

- CW, SSB, JT-65
- Horizontal Polarization
- Bands: 50, 144, 222, 432, 902, 1296, 2304, 3456, 5760, 10368, 24192, 47088, and above .....

Why the Interest

- It's fun
  - New bands
  - Experimentation
  - Homebrewing opportunities
- Interesting propagation modes
  - Tropo ducting
  - Sporadic E
  - Meteor scatter
  - Aurora scatter
  - Rain scatter
  - Airplane scatter
  - Satellites
  - EME
- New contesting opportunities – including grid roving
- “Use It or Lose It”

Contest Rovers

Microwave Portable

Some History

- Post WW-II
  - Radar technology and klystron tubes lead to the first ham use of 10 GHz
  - UHF “acorn” tubes and Nuvistors lead to VHF and UHF AM operation
  - Early receivers were “super-regen”
  - Superhets and growing SSB technology leads to modern architectures and operation
- Clegg and Gonset donimate early AM market
- 1946 first 10 GHz QSO (2 miles; 7 miles in 1947 !)
- 2012 record 10 GHz 1609 miles (W5LUA: *Allen,TX* to *Miami, FL* !)
- 1956 Japan to Argentina on 50 MHz (TE, 12,000 miles !)
- 1957 California to Hawaii on 144 MHz (Tropo 2,554 miles !)

1950's & EARLY 60's COMMERCIAL GEAR

Transceivers

	50 MHz	144 MHz	222 MHz	432 MHz	902 MHz	1296 MHz	> 1296 MHz	AVAILABLE ??
HF TRANSCEIVERS	Often	Occasionally	NO	Rarely	NO	NO	NO	YES
FT-991 'HF'	YES	YES	NO	YES	NO	NO	NO	YES
TS-2000 'HF'	YES	YES	NO	YES	NO	Option	NO	YES
IC-9100 'HF'	YES	YES	NO	YES	NO	Option	NO	YES
IC-375	NO	NO	YES	NO	NO	NO	NO	USED
IC-820	NO	YES	NO	YES	NO	NO	NO	USED
IC-970	NO	YES	NO	YES	NO	Option	NO	USED
IC-1271	NO	NO	NO	NO	NO	YES	NO	USED
TS-790	NO	YES	NO	YES	NO	Option	NO	USED
FT-736	YES	YES	Option	YES	NO	Option	NO	USED

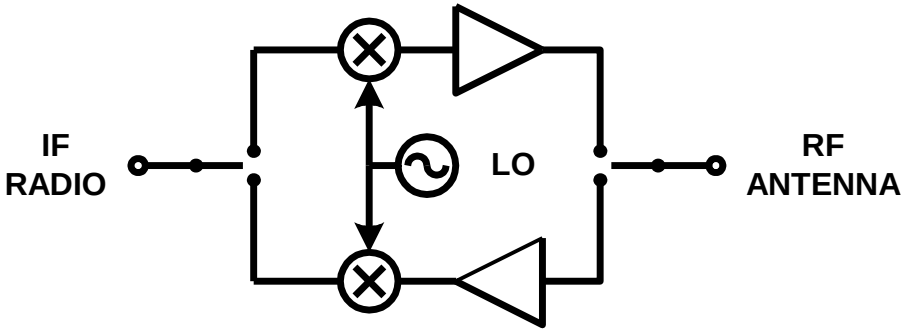
PROBLEM:

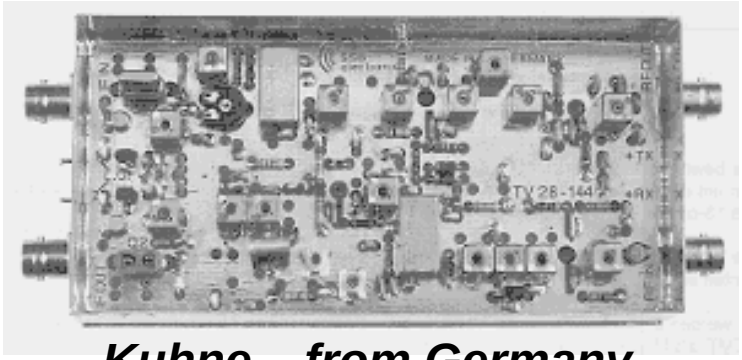
AVAILABLE RADIOS DON'T COVER MANY OF THE BANDS OF INTEREST.

QUESTION:

HOW DO YOU GET ON BANDS THAT DON'T HAVE AVAILABLE RADIOS ??

Transverters





Kuhne – from Germany

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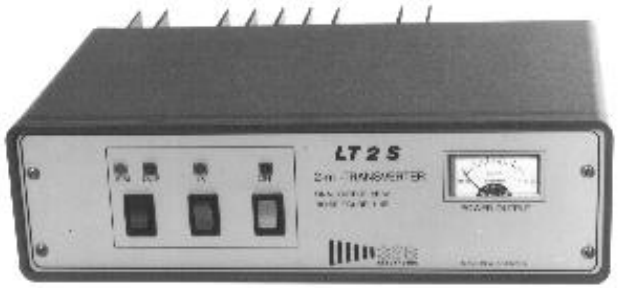


SSB Electronics

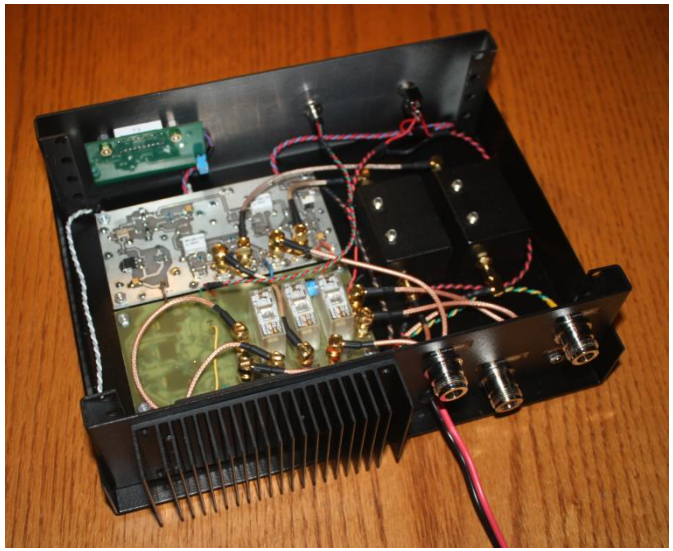
Down East Microwave

Kuhne – from Germany

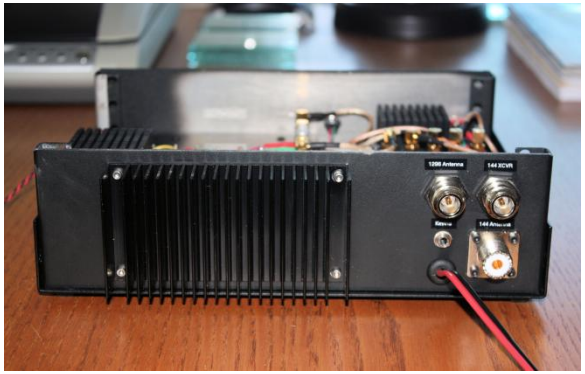
SSB Electronics

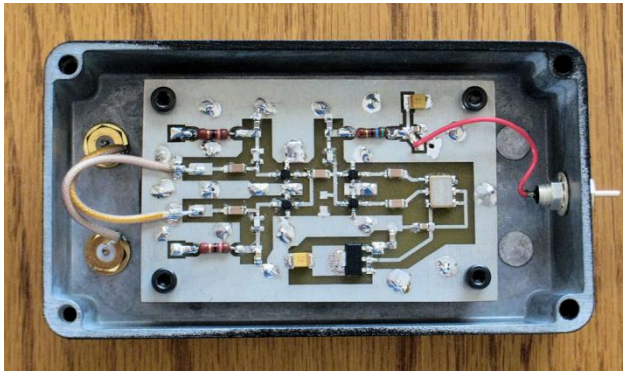
Elecraft

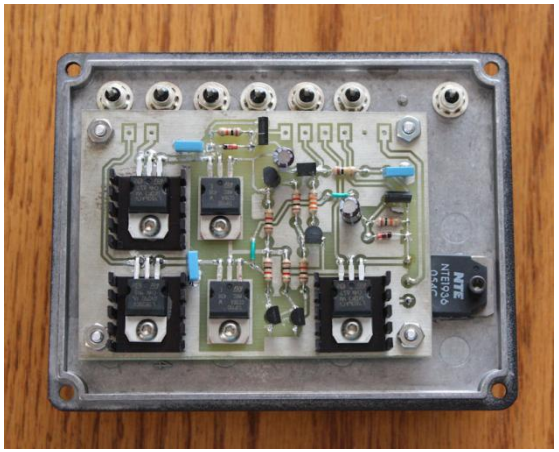
Homebrew 222 MHz Transverter

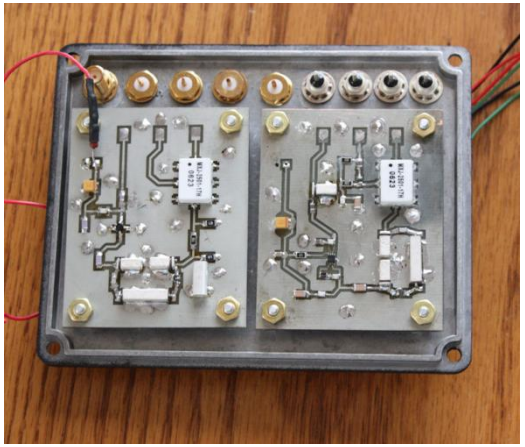


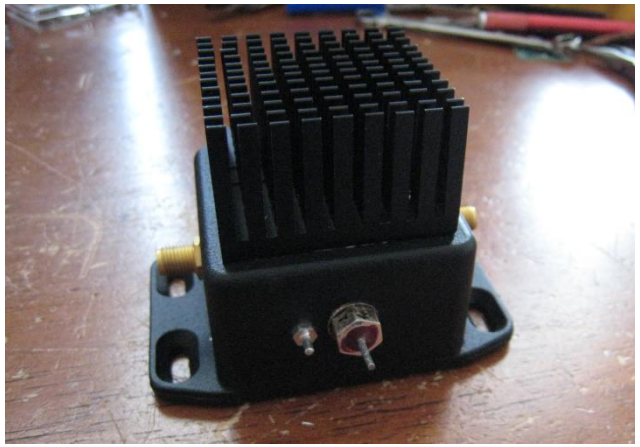
Homebrew 1296 MHz Transverter











Transverter Vendors

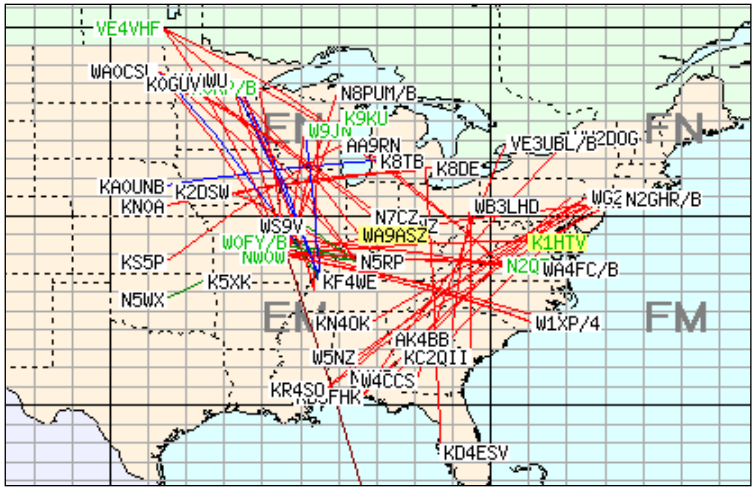
- Down East Microwave (assembled, kits, parts): http://www.downeastmicrowave.com/
- Elecraft (assembled & kits): http://http://www.elecraft.com/
- Kuhne Microwave Components (assembled & kits): http://www.kuhne-electronic.de/en/home.html
- SSB Electronic (assembled & modules): http://www.ssbusa.com/index.html
- W1GHZ (PC boards): http://www.w1ghz.org/

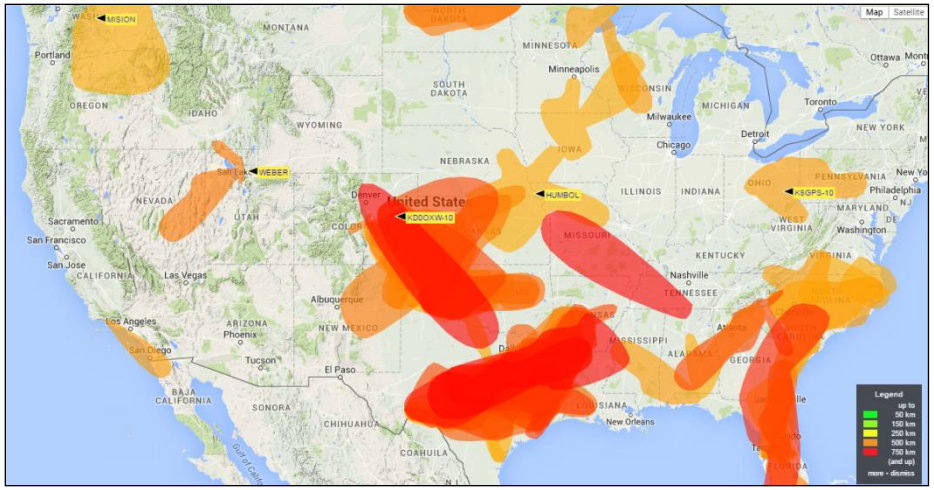
Antennas

Antenna Vendors

- VHF & UHF Yagi's: http://www.m2inc.com/
- Loop Yagi's: http://directivesystems.com/
- LFA Yagi's: http://www.force12inc.com/
- Dish Feeds: http://www.w1ghz.org/

Propagation Alerts





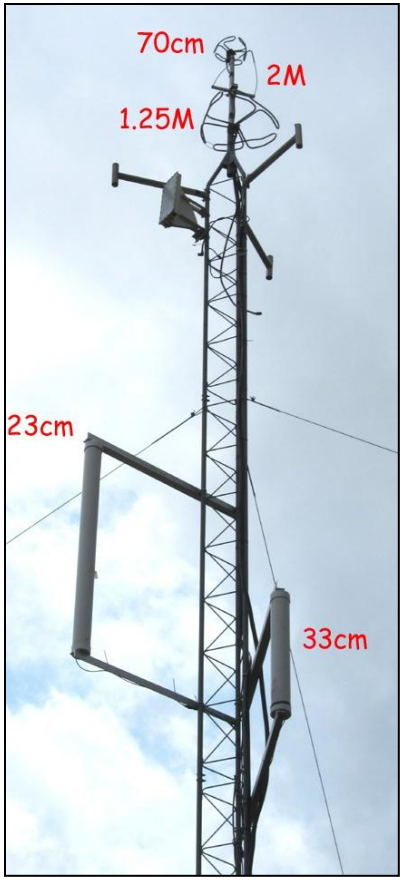
http://www.dxmaps.com/spots/map.php?Map=NA

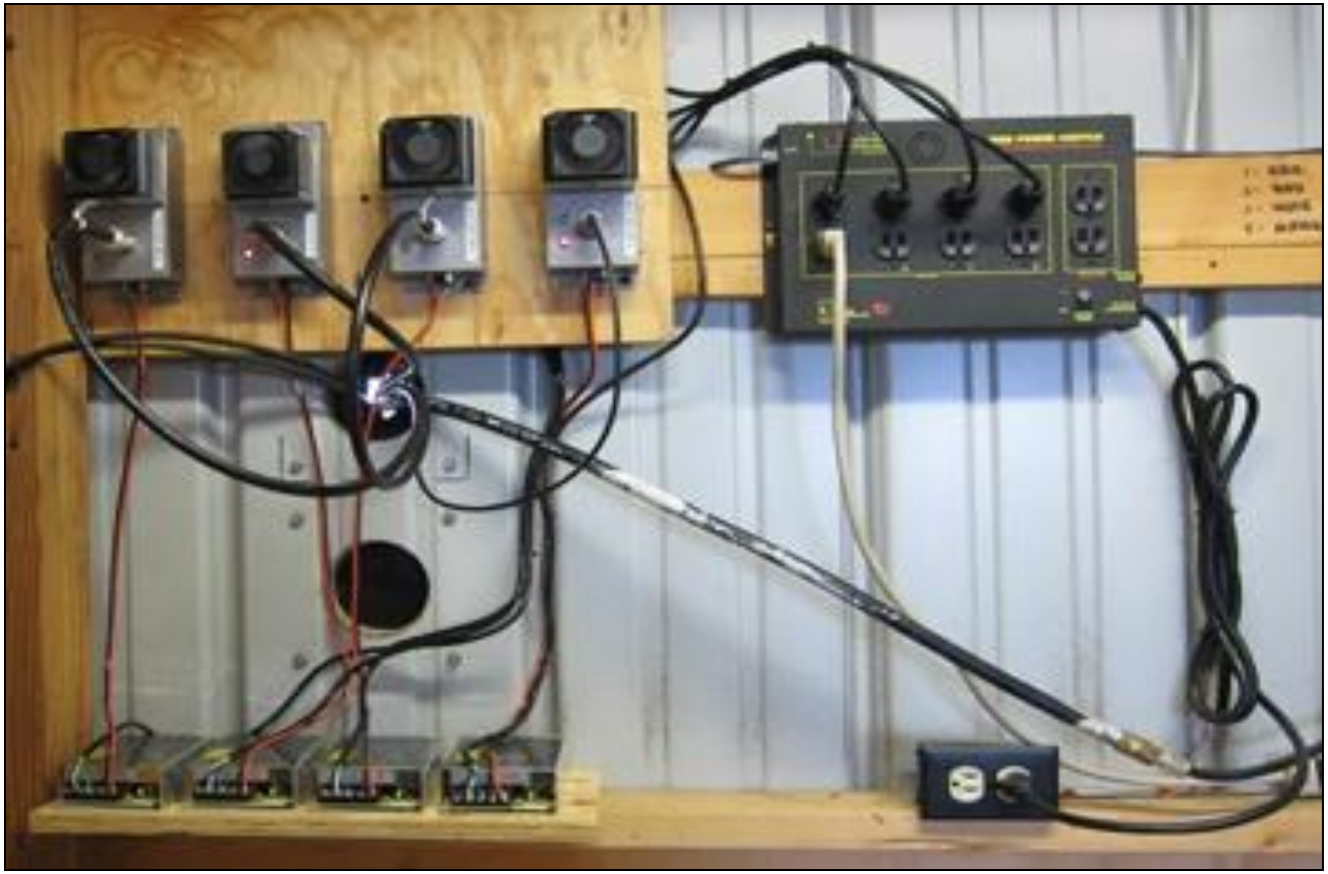
http://aprs.mountainlake.k12.mn.us/

DX MAPS for 6M PROPAGATION

VHF PROPAGATION MAP (APRS INFO)

Propagation Beacons





Local Beacons

- 50.060 Goldwaite, TX "K5AB“ 20W
- 50.072 Blanco, TX "KF5KOI" 20W (3 steps)
- 144.295 Austin, TX "K5RMG" 10W (3 steps)
- 222.060 Austin, TX "K5TRA“ 10W (3 steps)
- 432.345 Austin, TX "K5RMG" 10W (3 steps)
- 902.350 Austin, TX "K5RMG" 10W (3 steps)
- 1296.400 Austin, TX "WA6UFQ“ 15W (3 steps)
- 10368.215 Austin, TX "NO5K“ 2W

Local Clubs

- Roadrunners Microwave Group: http://k5rmg.com/
- North Texas Microwave Society http://www.ntms.org/
- HAMster Weak Signal Group http://www.144200.net/

Other WEB Resources

- San Bernardino Microwave society: http://www.ham-radio.com/sbms/
- W1GHZ projects http://www.w1ghz.org/
- VHF Packrat Technical Info http://packratvhf.com/techinal.htm
- K5TRA Technical Library http://k5tra.net/tech%20library.html

Conclusion

- Weak signal has much to offer
- Transverters are often needed since many bands are not covered by available radios
- Homebrew is a common solution
- Antennas are smaller with more gain than in HF bands
- Many propagation modes add to the interest
- Resources and local clubs discussed