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 !)
**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 ??

<table>
<thead>
<tr>
<th>HF TRANSCEIVERS</th>
<th>50 MHz</th>
<th>144 MHz</th>
<th>222 MHz</th>
<th>432 MHz</th>
<th>902 MHz</th>
<th>1296 MHz</th>
<th>&gt; 1296 MHz</th>
<th>AVAILABLE ??</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-991 'HF'</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>Rarely</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
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<tr>
<td>TS-2000 'HF'</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>Option</td>
<td>NO</td>
<td>YES</td>
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<tr>
<td>IC-9100 'HF'</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>Option</td>
<td>NO</td>
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<tr>
<td>IC-375</td>
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<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
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<tr>
<td>IC-820</td>
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<tr>
<td>IC-970</td>
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<tr>
<td>IC-1271</td>
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<td>NO</td>
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<td>YES</td>
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<tr>
<td>TS-790</td>
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<td>YES</td>
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<tr>
<td>FT-736</td>
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<td>YES</td>
<td>Option</td>
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<td>NO</td>
<td>Option</td>
<td>NO</td>
<td>USED</td>
</tr>
</tbody>
</table>

**K5TRA**

T.Apel
Homebrew 222 MHz Transverter
Homebrew 1296 MHz Transverter
Transverter Vendors

- W1GHZ (PC boards): [http://www.w1ghz.org/](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


DX MAPS for 6M PROPAGATION

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

VHF PROPAGATION MAP (APRS INFO)
Propagation Beacons

K5TRA

T.Apel
Local Beacons

- 50.060  Goldwaite, TX  "K5AB"  20W
- 50.072  Blanco, TX  "KF5KOL"  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/technical.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