

# Albuquerque Duke City Hamfest and Convention



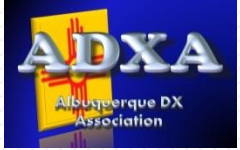
"It's a HamFiesta!"



High Frequency University  
the Senior Year 4.0

## 2-HF Antennas

A pdf of this presentation will be posted on [www.dukecityhamfest.org](http://www.dukecityhamfest.org)  
shortly after the Hamfest is over.



W5UR

# RADIO COMMUNICATIONS



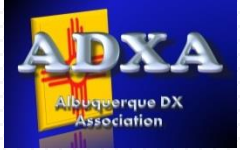
**ARRL** The national association for  
AMATEUR RADIO®  
[www.arrl.org](http://www.arrl.org)

**SKILL • SERVICE • DISCOVERY**



# HF Antennas

- Location, Location, Location
- The Best Antenna
- Chokes, BALUNs, Transformers
- Size Does Matter
- It WORKs!
- Two Are Always Better



# ~~Location, Location, Location~~

## Antennas, Antennas, Antennas

- With Propagation  
The Most Talked About  
The Least Understood Subject
- More Lore/Anecdotes than Facts
- Don't Believe Most of What You Hear or Watch (Except Here)

# Antennas, Antennas, Antennas

- Most Important Part of Station (After Your Brain)
- Least Investment in Most Stations
- Best ROI (Return on Investment)
- Most Challenging to Accomplish
- Always Have at Least Two!



# What We Want

VY2TT



# Begin with the Best

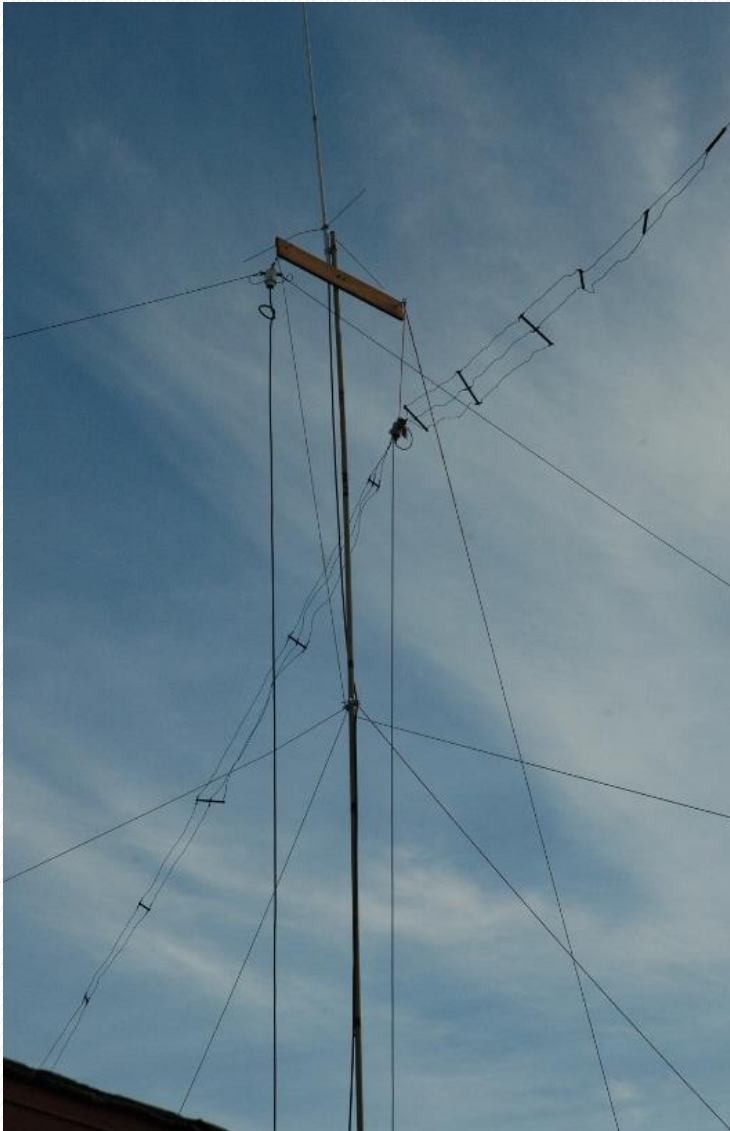
- The Best You Can Afford
  - The Best for Which You Have Room
  - The Best for the Money
- Choose Wisely and Not Shiny  
Skip the Hype  
Go By the Science

# Begin with the Best

- Half Wave Dipole
- Multiple Dipoles per Feedline
- As High as is Possible
- Avoid the OCF/EF Half Wave Craze
- Properly Installed



# What We Have



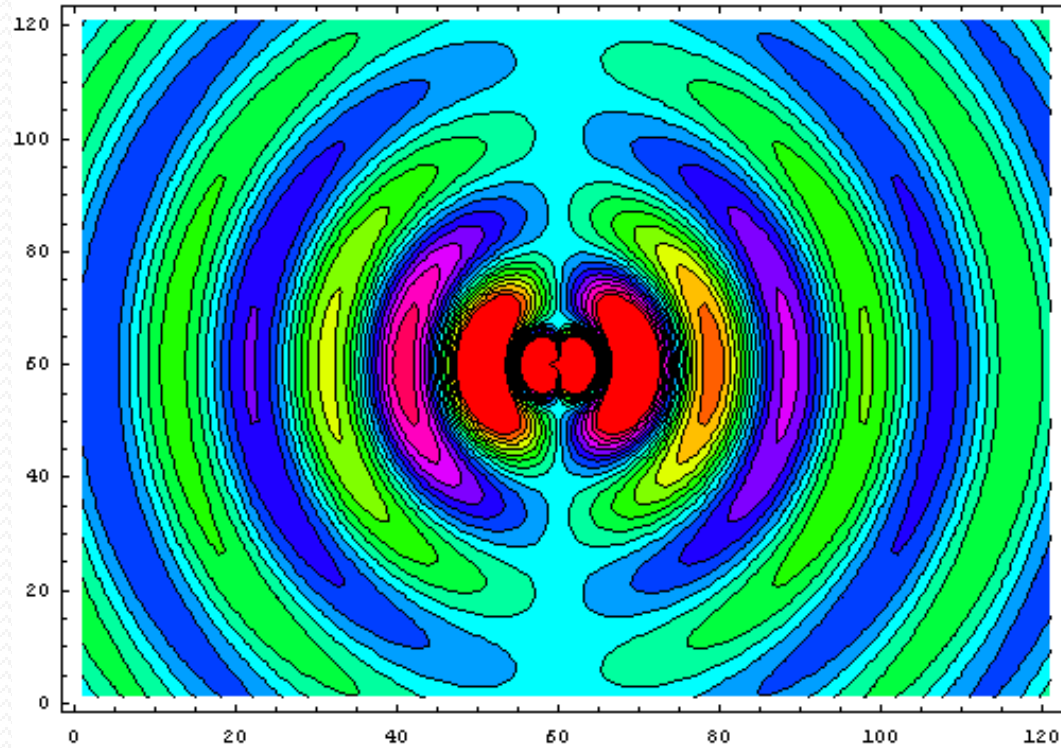
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# The Dipole

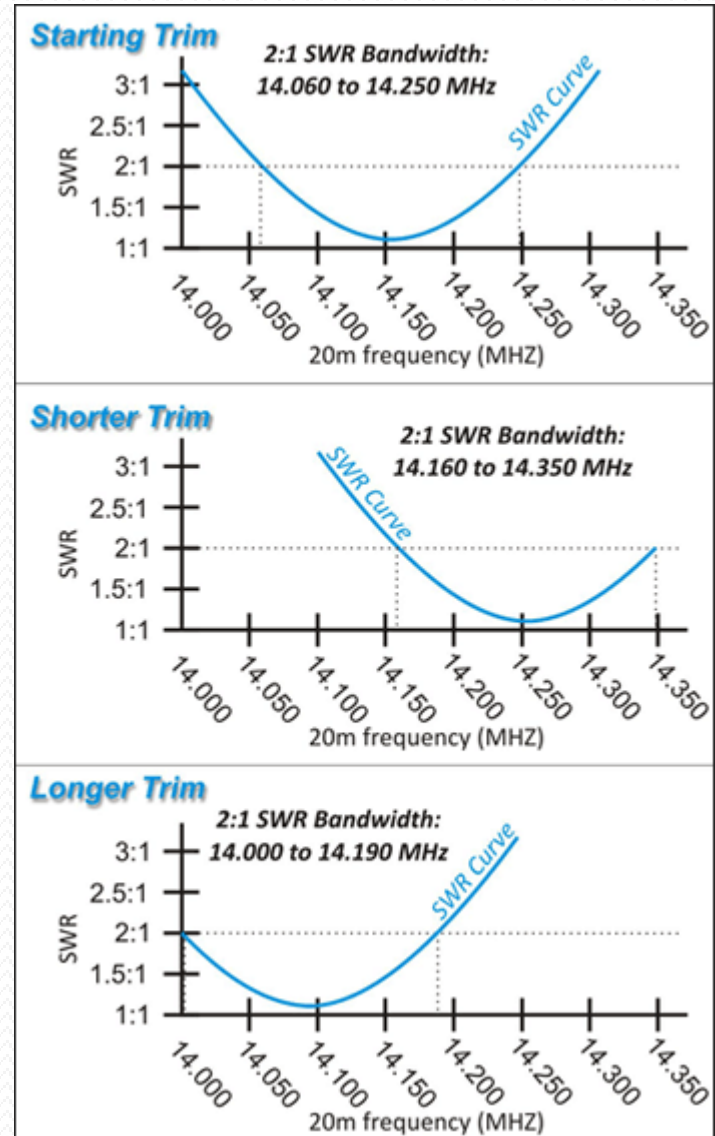
- Tune for Resonance  
NOT VSWR  
VSWR Changes with Height
- Use an Antenna Analyzer
- Fix/Ignore VSWR Later
- Single Feed for Multiples OK

# The Dipole



# The Dipole

- Only VSWR on First Results Page
- No Mention of  $X_C$  or  $X_L$
- VSWR Bridges are Cheap
- Antenna Analyzers More
- VNAs are Cheap Today
- Buy and Learn
- Holy Grail is Resonance!
- Best Antennas is the One In The Air! N0AX

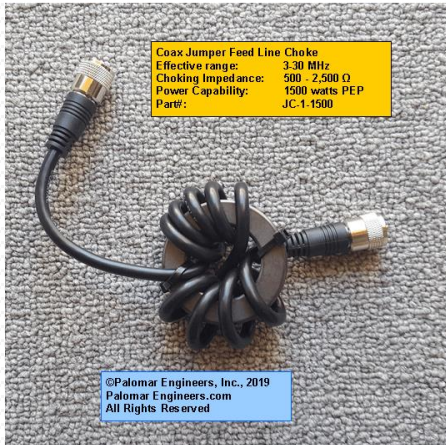


# Chokes

- Unbalance Antennas Radiate from Antenna & Coax
- Bad on BOTH TX & RX
- Known as Common Mode Current
- Install Choke At Feedpoint  
Sometimes at Shack Entrance Too



# Chokes



# Chokes

- Review K9YC.com Cookbook
- Disregard Sales Hype
- Disregard “Choke/Balun”
- Always Buy/Build Current Chokes
- Always Install on Dipoles/Verticals
- Always Install on Beams

# BALUNs

- BALanced to Unbalanced
- Match a Dipole to Coax
- Prevents Pattern Distortion
- Helps Prevent Coax Radiation
- Combine with Current Choke for Best Performance

# Transformers

- Match Antenna Impedance to Coax
  - Folded Dipole 300 Ohms
  - OCF Dipole 200-300 Ohms
- 25% is Better Than 33% Feedpoint  
Don't Use an UN-UN!  
Very Difficult to Choke!!  
High Noise Pick-Up/Coax Radiation

# Caveat Emptor

- Ham Radio Secrets Wrong on:
- Snap-on Ferrites Efficacy
- Counterpoise Inappropriate
- Don't Worry About 1 dB (most cases)
- Place Chokes Closest to Feedpoint
- Too Many Others to Mention!

# HF Antennas—Size

- Reduced Size is a Compromise
- Physical Length is Helpful
- Short and Shiny is Pretty
- Shiny Race Cars Aren't Better
- Added Coils Reduce Efficiency
- Don't Be a Crow!





# HF Antennas—Size

- Life is a Compromise
- Short But Higher is Better
- Place as High as Possible (Size)
- Use Appropriate Coax  
Consider Coax Loss
- Protect Coax Connections!
- Consider Ladder Line



# HF Antennas—More

- Use Scotch 88 Tape to Seal
- Tighten Connectors with Pliers
- Avoid Sunlight if Possible
- Keep Analyzer Screenshots
- Save VSWR Measurements
- Review Annually for Degradation

# My Antennas WORK

- “WithOut Real Knowledge”  
Alan Applegate, KØBG
- “I Contacted...” So What?
- “The VSWR Was...” So What?
- “This is the Best I Have Ever...”
- SO WHAT?

# My Antennas WORK

- Compare Against a Standard
- Keep/Erect a Dipole for Comparison
- Try to Have at Least 2 Antennas
- Take Care with Interactions
- Use WSPR Over Multiple Days
- Add the RBN or FT8  
But Test at the Same Time

# Numbers, Numbers, Numbers

12/15/2023 00:22	K8TE	DM65	AA7NM	14.097204	-28	
12/15/2023 00:24	W5UR	DM65	AA7NM	14.097079	-21	<b>7</b>
12/15/2023 00:58	K8TE	DM65	AA7NM	14.09718	-19	
12/15/2023 01:04	W5UR	DM65	AA7NM	14.097171	-25	<b>6</b>
12/15/2023 01:10	K8TE	DM65	AA7NM	14.097066	-17	
12/15/2023 01:12	W5UR	DM65	AA7NM	14.097141	-21	<b>5</b>



Average 6 dB Down in Olympia WA

# References

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- w8ji.com