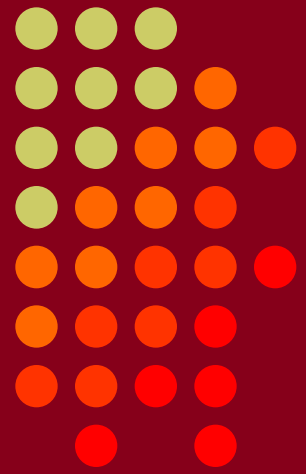
Ten Ways to Improve Your Contest Score

Doug Grant, K1DG



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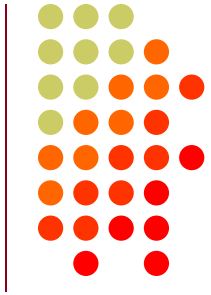
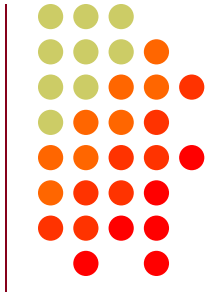


10. New radio
9. Amplifier
8. New antennas
7. Move
6. Second radio
5. Join a club
4. Go to a multiop
3. Use the Cluster
2. Go to Dayton/CTU
1. THE BIG SECRET

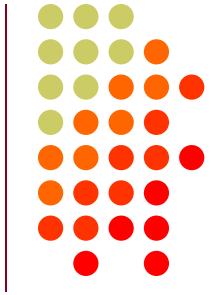
First cluster of improvements



- Tangible improvements
  10. New radio
  9. Amplifier
  8. New/better/more antennas
  7. New QTH

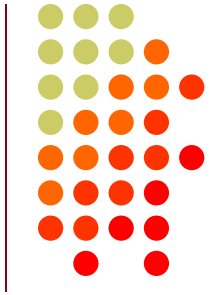
- All of these are ways to increase your score, but maybe not the way you think

10. New Radio



- IMHO, this is the least useful improvement
- Most $1000+ radios from the past 10 years provide adequate performance and features
  - IMD DR >70 dB SSB, >80dB CW sufficient (NCØB)
- Benefits of a new radio
  - It gets you more interested & on the air more
  - You enjoy it more & get on the air more

9. Amplifier 8. Antennas 7. QTH

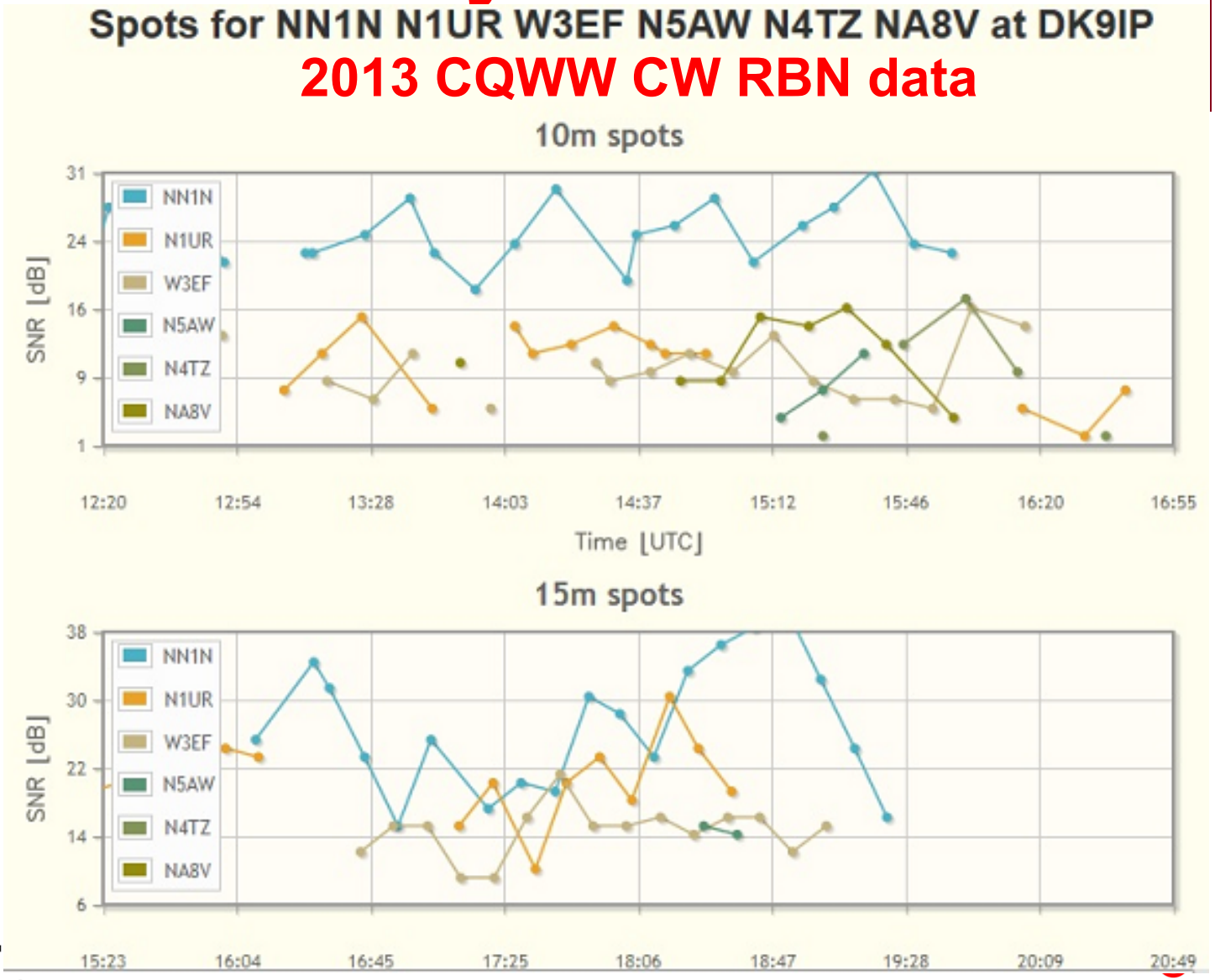


- All are ways to “add dB”
- How much is 1 dB worth in score?
- How much does a dB cost?
  - Amplifier dB
  - Antenna dB
  - QTH dB
- If the goal is increasing score, where do you spend the money?

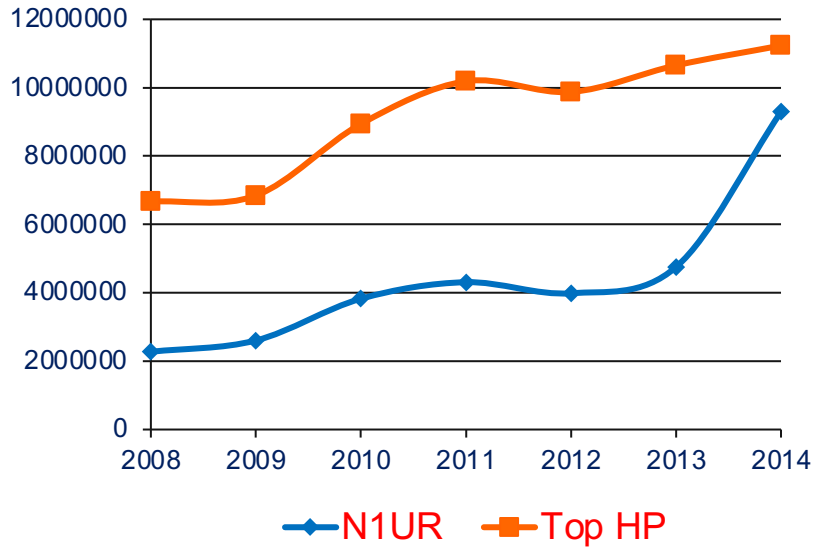
Score increase vs. dB

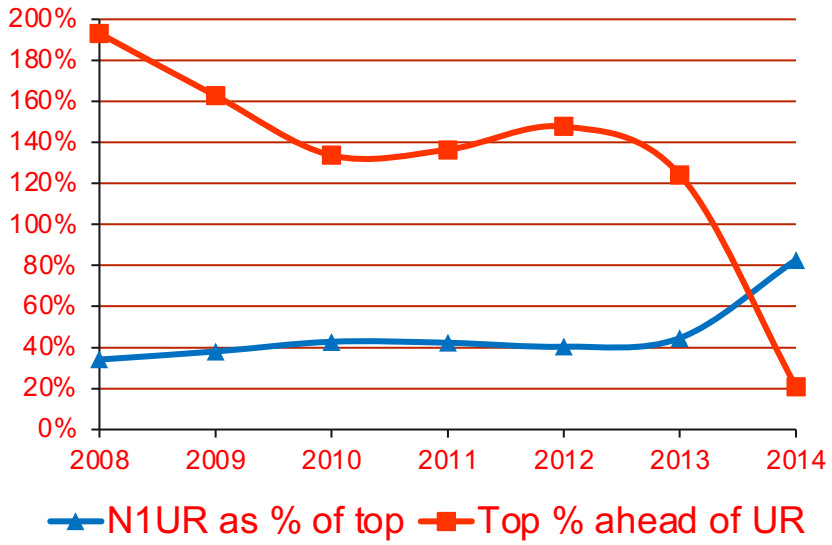
- Prior to 2014, N1UR always operated LP
- Good antennas, hillside W1 QTH
- Switched to HP in 2014
- Did it help his score?

Is N1UR Really LP?



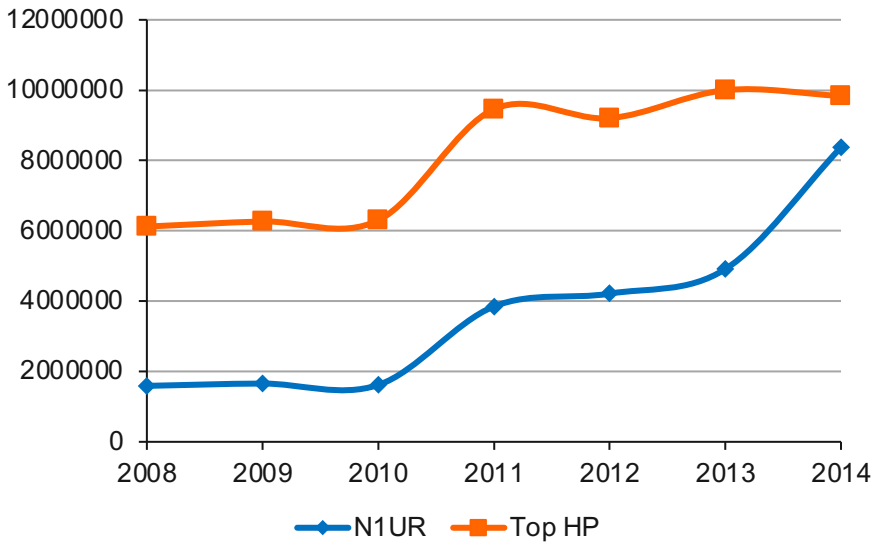
N1UR SOLP vs the Top SOHP, CW

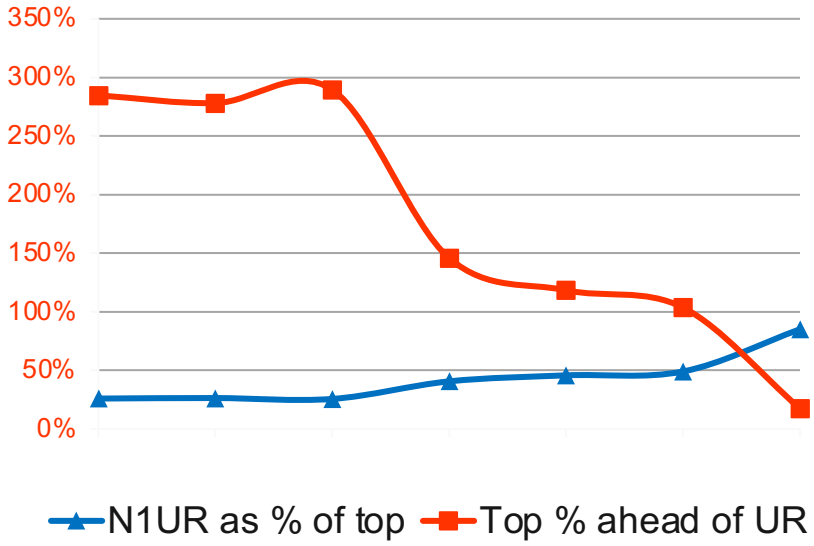




When N1UR added an amplifier (12 dB), he picked up 120 of those percentage points!

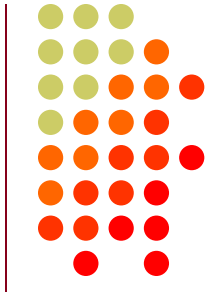
N1UR SOLP vs Top SOHP, SSB





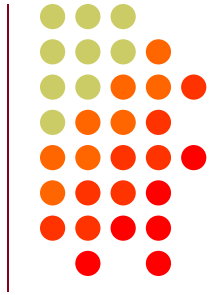
Normalized score increase was 73% 6%/dB

Does it hold for other LP-HP comparisons?



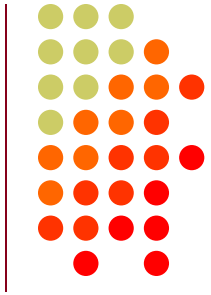
- Compared Top 5 QRP, LP vs top 5 HP
- Calculate % score increase vs. dB
  - For CW, ~12% per dB (range: 10.3-15.1)
  - For SSB, ~15% per dB (range: 11.3-17.7)
- May be closer to the 6%/dB figure, since many LP stations have lesser antennas than HP

From QRP to LP to HP…



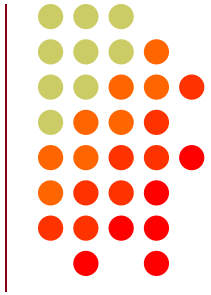
- No RBN data (QRP guys don't call CQ!)
  - 5 spots total in DL for top 5 QRPs, all bands)
- HP scores typically 1000% (CW) to 1500% (SSB) higher than QRP
- 1500W is ~25dB above 5W
- Most QRP guys do not have big antennas…another 10dB of QRPness maybe?
- If linear, 30%(CW) to 40%(SSB) per dB increase

9. Add an amplifier (LP guys only)



- Cost:
  - Used SB220 $500
  - $10k for auto-everything
  - Use $2500
- 100W to 1500W is 11.6 dB
  - Cost per dB: $200 (only $43 with SB220)
- Score improvement should be ~80%; $31 /%
- KPA500 vs. 1500W: 4.77 dB; ~30% score increase

For HP entrants…



- More than 1500 W is ***against the rules***
- Adding 10 dB is very expensive…
  - Tubes >$1000
  - Electrical service to the shack is expensive
  - Coax, connectors, filters… all get complicated
  - **Damage to reputation**
- ***Don't do it!***

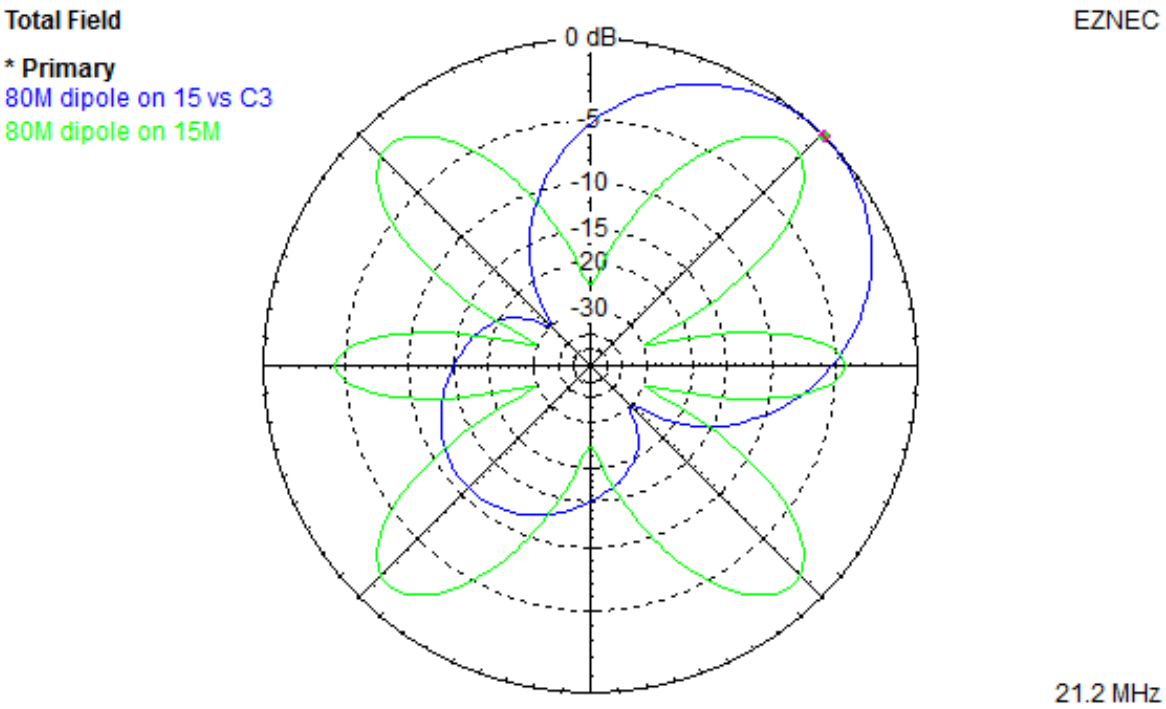
8. Antennas

- A very mixed bag of bang-for-buck
  - Gain is expensive after a while
    - ¼-wave vertical: 1.77 dBi FS, 5.15 dBi over perfect ground, 0 dBi over average ground
    - 40M dipole used on 15M: 2.8 dBi
    - 80M dipole used on 15M: 4.7 dBi
    - 3 element 15M beam: 7.44 dBi, $500, 2.7m boom, 12 lb
    - 4 el: 9.01 dBi $750, 5.4 m, 20 lb
    - 5 el: 9.1 dBi $900, 6.2m, 25 lb
    - 5 el: long boom 10.1 dBi $1050, 8.5m, 28 lb
    - 6 el: 10.9 dB $1500, 11.3m, 51 lb
    - 7 el: 12 dBi $2300, 17.6m, 78 lb

The K1AR Story

- Excellent scores with “just a dipole”
- AR is one of the best operators ever
- NH QTH
- 1500W output

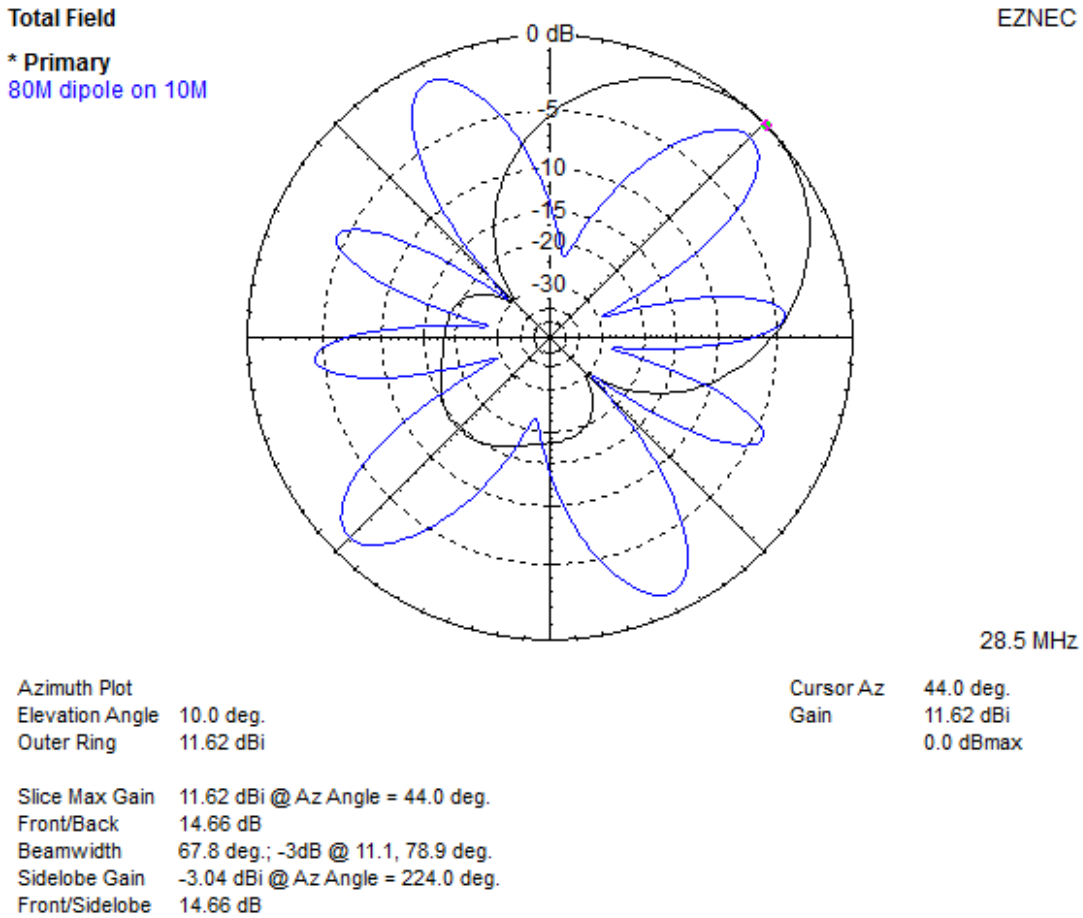
80M Dipole vs. Tribander (15M)



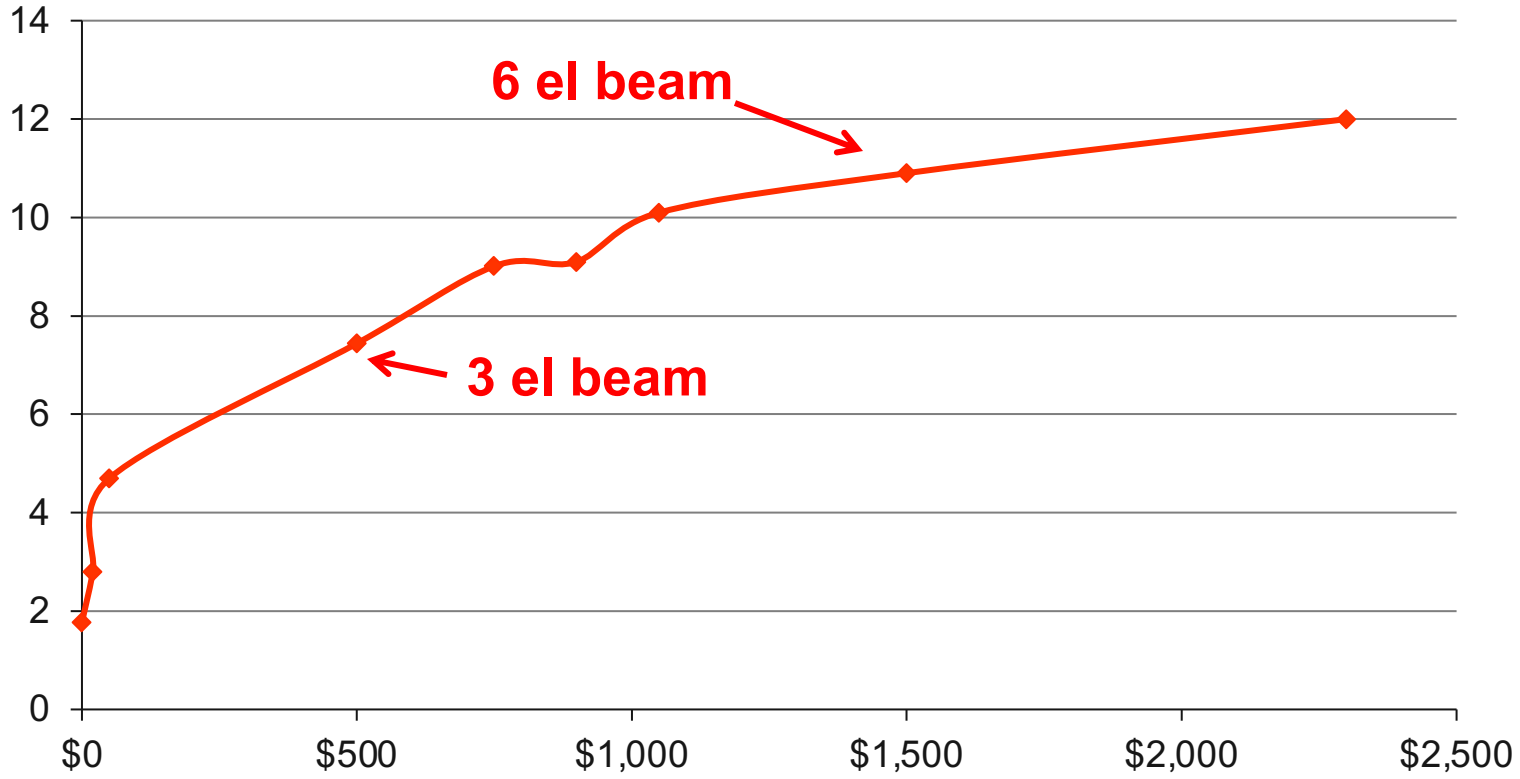
Azimuth Plot	
Elevation Angle	10.0 deg.
Outer Ring	11.57 dBi
Cursor Az	44.0 deg.
Gain	11.57 dBi
	0.0 dBmax

Slice Max Gain	11.57 dBi @ Az Angle = 44.0 deg.
Front/Back	10.97 dB
Beamwidth	69.0 deg.; -3dB @ 10.5, 79.5 deg.
Sidelobe Gain	0.6 dBi @ Az Angle = 224.0 deg.
Front/Sidelobe	10.97 dB

80M Dipole vs. Tribander (10M)



Antenna dB/$



If you already have a beam…

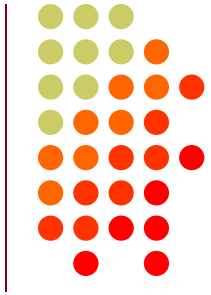
- Assume starting point of 40-foot tower with 3-element tribander
- Move to 80-foot tower, stack two 4-element beams
- Cost, comparison of patterns, gain

Low band improvements are hard

- 40M
  - Start with inverted Vee at 60 feet
    - (1.6 dBi FS, 6 dB over real ground but very high angle)
  - Move to 2-el shorty beam at 60 feet
    - ($1000 + rotator, gives 5-6 dBi gain in FS, 9-10 over real ground)
  - 4 dB for $1000 = $250/dB; 25% increase in score
    - Probably much better due to lower angles
  - Vertical or sloper array

- 80M/160M
  - Start with inverted Vee at 60 feet
  - Consider half-sloper or vertical array
    - Verticals need lots of radials
    - Arrays need phasing boxes, build or buy
  - Adding a Beverage to receive better is <$50

Feedline improvement



- Assume a tribander at 60 feet, 140 feet from the shack, fed with RG8X
  - Loss of 200’ of RG8X on 10M: 4 dB
  - Replace with 200’ LMR400, loss: 1.6 dB
    - Gain 2.4 dB for $180 = $75/dB
    - Equivalent to raising power by 1.7x AND helps on receive
    - 24% score increase
  - Replace with surplus ¾” CATV line, loss of 0.4 dB
  - Gain 3.6 dB for $?
  - Equal to raising power by 2.2x OR…

Getting 3.6 dB additional gain on 10M

- 3-el 10M yagi: 7 ft boom, $300, 7.5 dBi
- 6-el 10M yagi: 28 ft boom, $1000, 11.1 dBi

- Spend $180 (or scrounge) better coax or spend $700 on a bigger beam

- If you already have a 6-element yagi, the next 3 dB will cost a lot more!

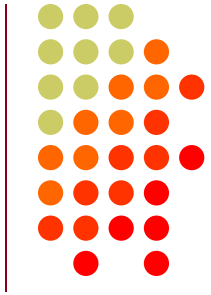
7. Move

- Complicated and expensive
- Can be effective
- Hilltop or oceanfront vs valley
- W1 vs. Black Hole
  - (NM/WTX/KP4 vs W1 for SS)

7a. “Virtual Move”

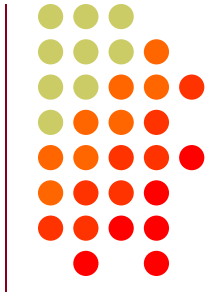
- Remote station
- This is now practical
- RHR, others…
- Roll your own

6. Add a Second Radio



- “Don’t try SO2R until you are really good at SO1R…please!” - K5ZD
- “SO2R station construction is harder than Multi-Multi” - KL7RA
- Adding a second radio only adds ~10% to a DX contest QSO total, maybe 20-30% to score
- It allows you to know what is happening on the other bands

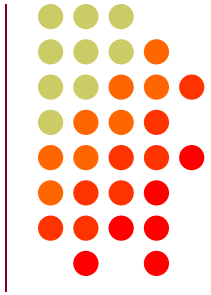
5. Join a Club



- Chose the right club…or start one!
- Learn from the other guys
- Exchange rate sheets
- “Do for others and let others do for you”

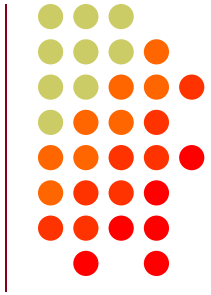
  – B. Dylan

4. Go to a Multiop



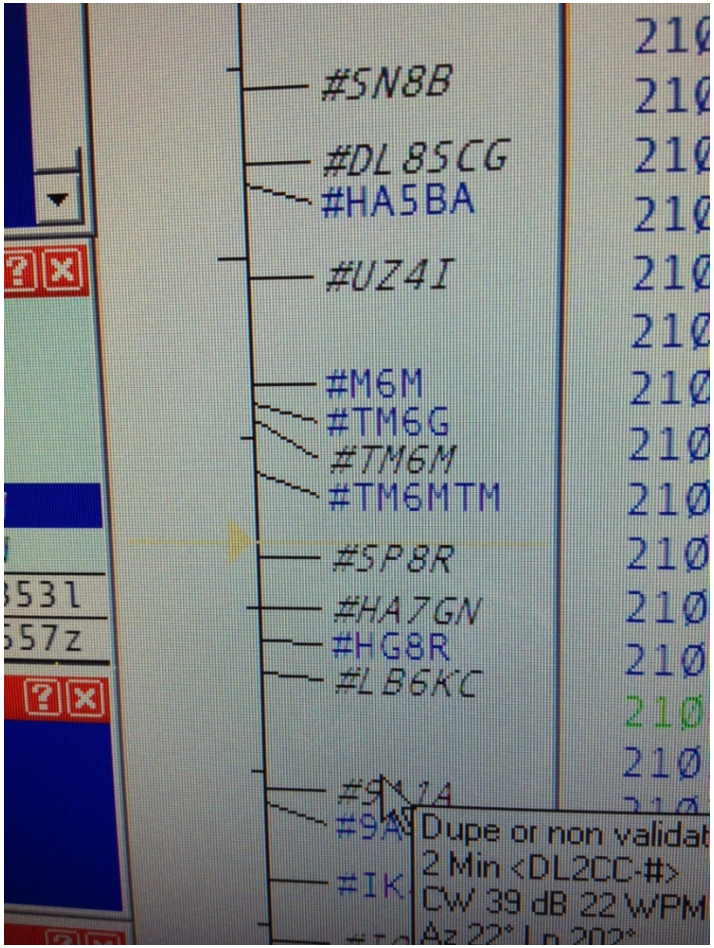
- Most multiops are well-equipped
- See what it is like to use the “Big Iron”
- See how other ops play the game
- Learn some best practices in station design and construction

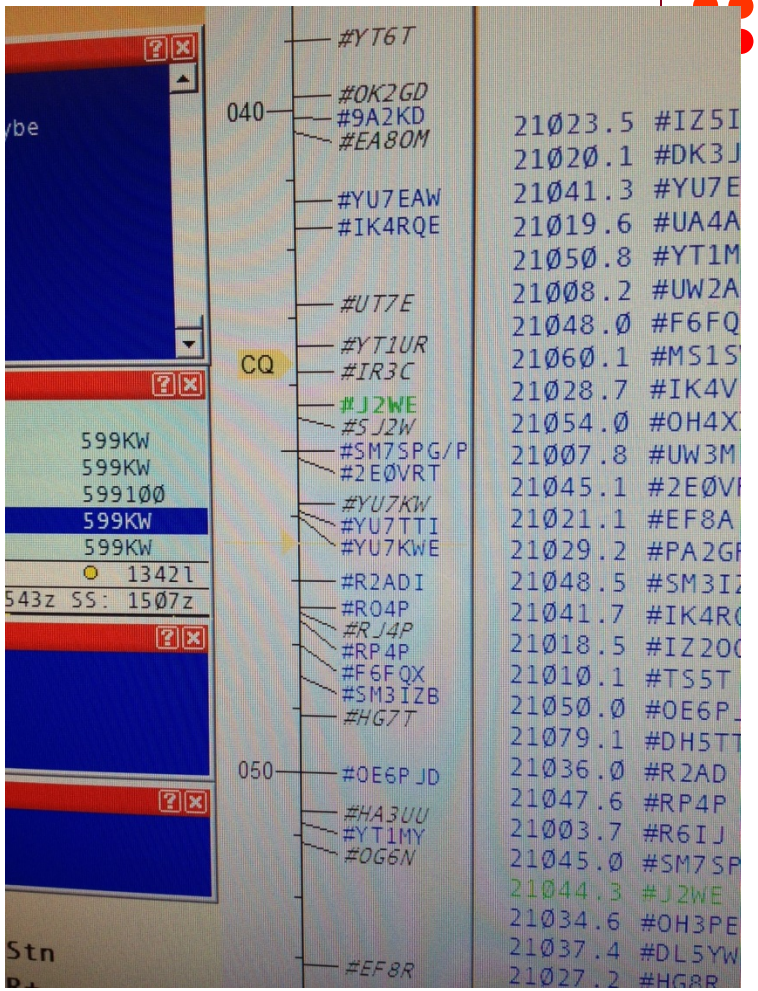
3. Use the Cluster (sigh)



- It will add 20-30% to your score…BUT…
- You will not learn anything if the Cluster does the work for you
- Don't let the Cluster distract you
- Don't believe all the spots…it can make your score go DOWN

The Cluster Makes Mistakes!





If you worked all the calls on these screens you would have a negative score!

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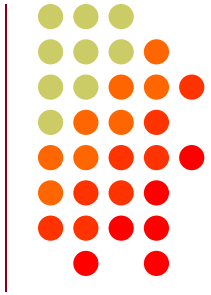
2. Go to Dayton (and CTU)

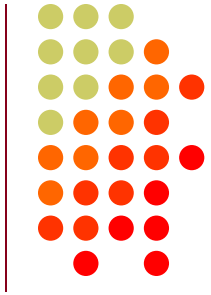


- Meet people
- Learn from the pros
- Ask questions
- Pay attention

AND THE NUMBER ONE WAY TO IMPROVE YOUR CONTEST SCORE…

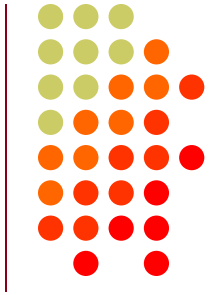
>>>> THE BIG SECRET <<<<

1. There is no secret!



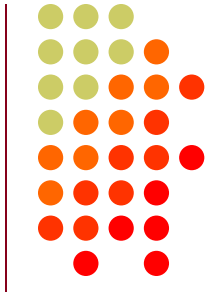
- Get on the air a lot
- Learn the bands and your station capability
- Practice calling in pileups to hone your timing
- LISTEN!
- Run any time you can…get familiar with callsigns (improve your “vocabulary”)

The Big Myth



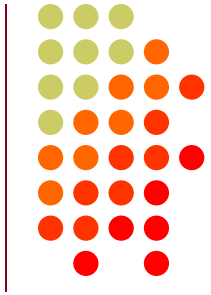
- “I yam what I yam, and that’s all what I yam”
  - – Popeye the Sailor
- “Can’t run, can’t jump.”
  - – scouting report on Larry Bird
- "Can't sing. Can't act. Balding. Can dance a little.”
  - – RKO screen test of Fred Astaire

“Outliers” (Malcolm Gladwell book)



- Cites Ericssons’ “10,000 hour rule”
  - Beatles (1200 live performances in Hamburg 1960-64),
  - Bill Gates (had access to a computer at age 13)
- 10,000 hours of “deliberate practice” required for mastery
  - “Deliberate practice is not always enjoyable”
- The top contest operators don’t have bigger or more sensitive ears, springier fingers, …

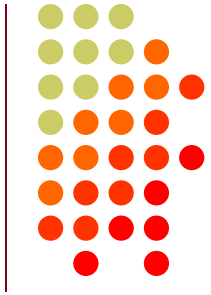
How did the top operators get there?



- “Giftedness researchers have long debated whether there is empirical evidence to support a distinction between giftedness and attained level of achievement. With the exception of fixed genetic factors determining body size and height, we were unable to find evidence for innate constraints to the attainment of elite achievement for healthy individuals. “

K. A. Ericsson et al, “Giftedness and evidence for reproducibly superior performance: an account based on the expert performance framework”, *High Ability Studies Vol. 18, No. 1, June 2007, pp. 3–56,*

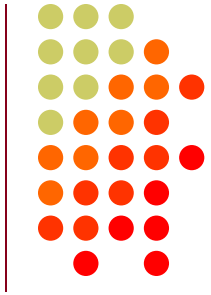
Two more factors, from recent research



- Starting young
  - All other factors being equal, those who started younger were higher achievers *at the elite level*
  - Probably related to development of working memory capacity, the ability to remember a set of objects while engaged in another task

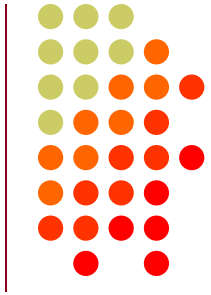
- "Grit"
  - The unique blend of IQ and EI that results in persistence
  - "The desire and passion to get better drives the willingness to spend so many hours practicing a skill."

However…



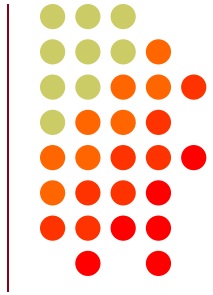
- The 10,000 hour rule applies to the **World-class top performers**
- You can get “pretty good” in 20 hours
- Josh Kaufman’s rules for learning:
  1. Deconstruct the skill into smaller parts
  2. Learn enough to self-correct
  3. Remove barriers to practice
  4. Put in the full 20 hours…overcome the initial frustration barrier

Contesting is a personal endeavor



- Some do it to compete
  - Build station
  - Improve station
  - Operate a lot
- Some do it just for fun
  - Part-time operation
  - Pick up new countries, etc.
  - Take what they can get

Some do it for both



- Most games are more fun when you develop a high level of skill

- Whatever your goal, have fun!