



# Introduction to VHF Contesting

Bob Witte, KØNR  
bob@k0nr.com

## Why VHF Radio Contesting?

- ▶ Competition
- ▶ Challenge
- ▶ Concentrates activity
- ▶ Have Fun!



## Contest Format

- ▶ Use all amateur bands above 50 MHz
- ▶ 50 MHz, 144 MHz and 432 MHz are most popular
- ▶ Work everyone you can on every band
- ▶ Score = QSO points x Total Grids Worked



50 MHz (6 meters)	1296 MHz (23 cm)
144 MHz (2 meters)	2304 MHz (13 cm)
222 MHz (1¼ meters)	3456 MHz (9 cm)
432 MHz (70 cm)	5760 MHz (5 cm)
903 MHz (33 cm)	10 GHz (3 cm)

KØNR VHF Contesting 5 Nov 2011

3

## Contest Calendar

- ▶ **ARRL January VHF Sweepstakes**  
Third or fourth weekend in January
- ▶ **ARRL June VHF QSO Party**  
Second full weekend in June
- ▶ **CQ Worldwide VHF Contest**  
Third full weekend in July  
6 Meters and 2 Meters only
- ▶ **September VHF QSO Party**  
Second full weekend in September



KØNR VHF Contesting 5 Nov 2011

4

# Types of Operation



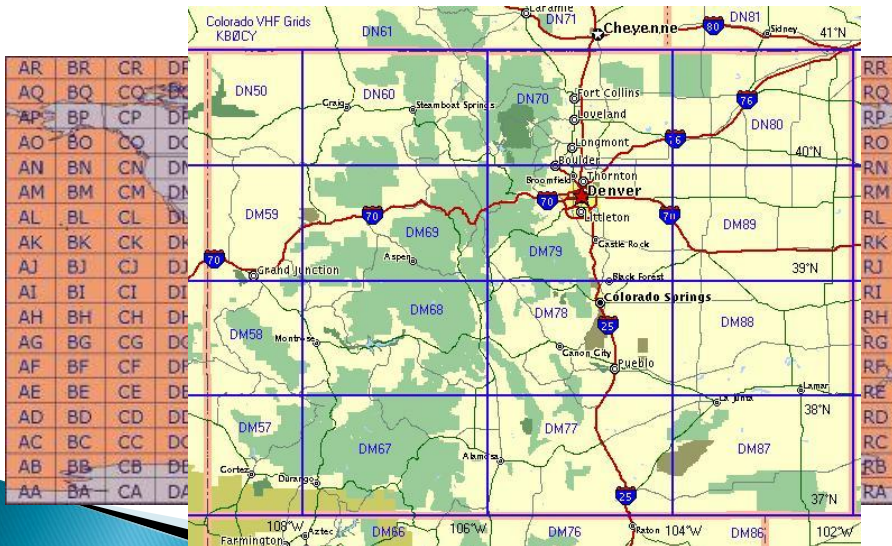
- ▶ Single Operator
  - One radio operator
- ▶ Single Operator Portable
  - One radio operator, portable power source, RF Power **10 Watts maximum**
- ▶ Multiop
  - Multiple operators, operate multiple bands simultaneously
- ▶ Rover
  - Operates from more than one grid during the contest, usually 1 or 2 radio operators

*Actually, there are subcategories of operation, so read the contest rules*

KØNR VHF Contesting 5 Nov 2011

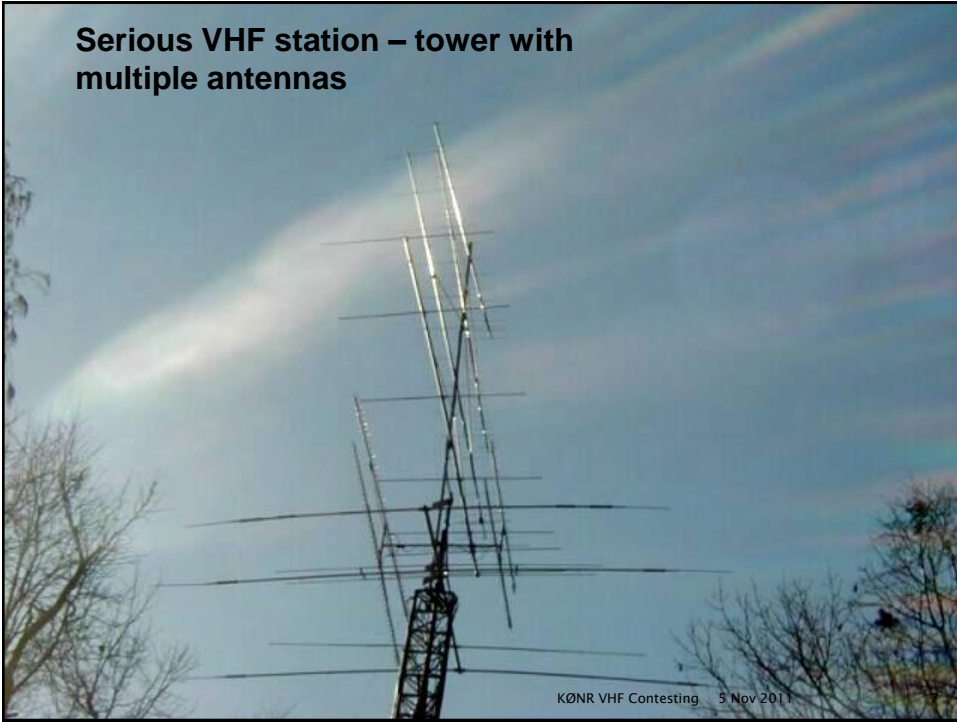
5

To make a contact, you need to exchange call sign and grid locator with the other station



6

**Serious VHF station – tower with multiple antennas**



KØNR VHF Contesting 5 Nov 2011

**The WØEEA Radio Barn  
Multioperator station  
Eastern Colorado near Kiowa**



DM79vh

KØNR VHF Contesting 5 Nov 2011

8

# KB0HH Antenna Farm

Multiop Contest Station in Byron, Oklahoma





**KØNR and WA6TTY  
Cordova Pass  
June VHF QSO Party 2007**



**Rover Station  
Eric KRØVER**



**Rove Route – Jun 12-13, 2010**



- 1 – DN71, Panorama Pt., NE
- 2 – DN70/DN71 Line and DN70 ops to DEN (PM), CO
- 3 – DN71/DN61 Line, NE
- 4 – DN61 CR-19 Ops to Denver, NE
- 4 (again) – DN60/DN61 Line
- 5 – DN61 More ops to DEN (PM)
- 6 – Night in Fort Morgan
- 7 – DN70/DN60 Line
- 8 – DN61 Microwave Twr. More ops to DEN (AM)
- 9 – DN70 More ops to DEN (AM)
- 10 – DM79/DN70 Line
- 11 – Placeholder to force route onto Rector-Leader Rd.
- 12 – DM89, Cedar Pt. Ops to Denver
- 13 – DM88/DM89 Line
- 14 – DM79/DM89 Line
- 15 – DM78/DM79 Line

Possible Additions: a) DN60/DM89 & b) DM78/DM88 lines  
 a – Four mi. round trip down CR-11 south for microwave tower  
 b – Five mi. round trip down Rt 149 just south of Pt. 14  
 Pt. 1 to Pt. 14 distance is 238 miles



Northern Colorado Rover Gathering



**KØNR  
CQ WW VHF 2006  
Mount Evans**

# The 6 Meter Kilowatt Rover

Patrick - WX7M

*50 foot Mil Surplus Tower  
5 element M2 Yagi Antenna  
KQ Loop*



KØNR VHF Contesting 5 Nov 2011

# Transceivers

Typical multimode  
transceivers capable of  
SSB and CW operation



KØNR VHF Contesting 5 Nov 2011



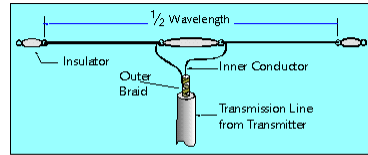
# Antennas

## ▶ 6 Meters

- Wire dipole antenna
- Horizontally polarized
- Yagi antenna

## ▶ 2 Meters and up

- Usually going to use a beam antenna  
Typically: Yagi
- Horizontally polarized for SSB weak signal work



dipole antenna



KØNR VHF Contesting 5 Nov 2011

17

## 2 Meter Antenna on mast

M<sup>2</sup> 2M9SSB Yagi  
12.0 dBd gain  
9 elements  
14.5 feet boom length



KØNR VHF Contesting 5 Nov 2011

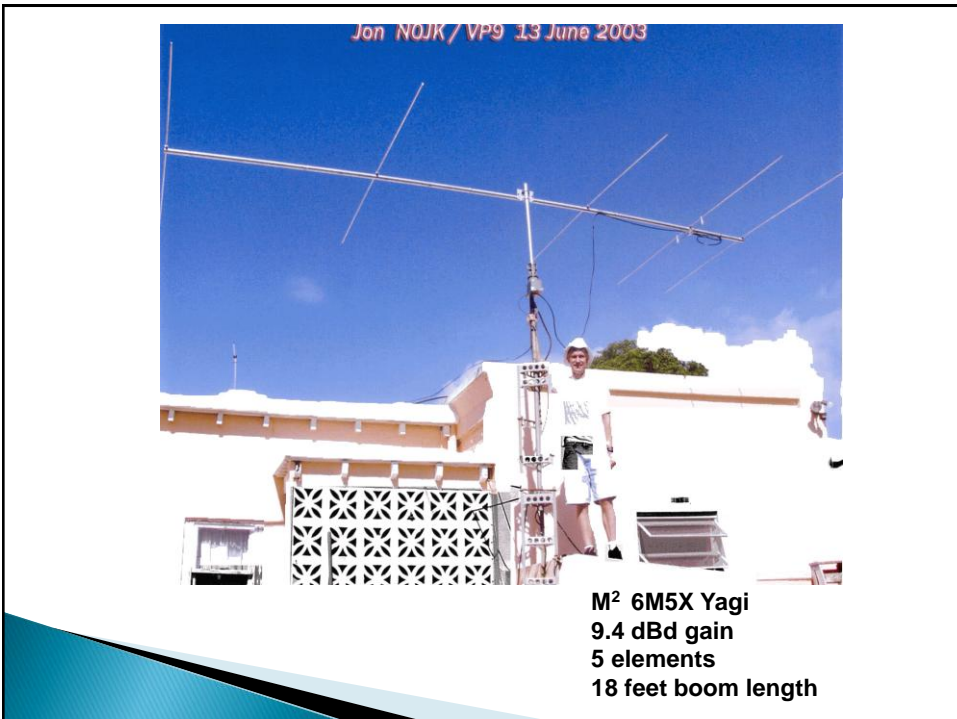
18



# M<sup>2</sup> 2M9SSB

KØNR VHF Contesting 5 Nov 2011

19

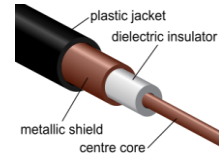


Jon NØJK / VP9 13 June 2003

M<sup>2</sup> 6M5X Yagi  
9.4 dBd gain  
5 elements  
18 feet boom length

## Transmission Lines

- ▶ Transmission line losses increase with frequency
- ▶ Pay attention to line loss at VHF and higher frequencies



### Loss per 100 Feet

Coax Cable	50 MHz	100 MHz	200 MHz	400 MHz
RG-58	3.3 dB	4.9 dB	7.3 dB	11.2 dB
RG-8X	2.5 dB	3.6 dB	5.4 dB	7.9 dB
RG-213	1.6 dB	2.2 dB	3.3 dB	4.8 dB
9913 Flex	1.1 dB	1.5 dB	2.0 dB	2.9 dB

Source: <http://www.radio-ware.com/products/techinfo/coaxloss.htm>

## Let's Make A Contact

*Keep watch on  
6 Meters*

- ▶ Call CQ on calling frequency
- ▶ Exchange: Callsign and Grid Locator
- ▶ Check for other bands

Band	Calling Frequency
6 Meters	50.125 MHz USB
2 Meters	144.200 MHz USB
1.25 Meters	222.100 MHz USB
70 cm	432.100 MHz USB

## 6 Meters – The Magic Band

- ▶ Propagation is normally similar to 2 Meters
- ▶ When sporadic-e (“e skip”) occurs, the band comes alive
  - Sporadic-e openings allow contacts across North America
  - Sporadic-e is very common in June and July
  - Keep listening to the 50.125 MHz USB
  - Move up in frequency as the band gets busy
  - 50.110 to 50.125 MHz is the DX Window, use it only for contacts to other countries

# 50 MHz

## Logging



- ▶ Keep a log of all contacts
- ▶ Date/Time in UTC
- ▶ Frequency (just the band)
- ▶ Call sign and grid of each station worked
  
- ▶ Paper log is OK
- ▶ Electronic log is better
  - Shareware software: N1MM logger, W3KM VHF Logger



## What About FM?

- ▶ Most contest activity will be on SSB, some CW when the signals are weak
- ▶ Contacts using FM are OK, too  
(2M FM Calling Frequency 146.52 MHz is not allowed)
- ▶ Colorado FM Sprint  
(during the Sept VHF contest)
  - Contest within a contest
  - 5 hours on Saturday
  - FM only
  - Same format as the September VHF QSO Party

## What About Digital?

- ▶ “Sound Card” Modes Using PC
- ▶ WSJT Software
  - FSK441 for meteor scatter
  - JT6M for ionospheric scatter
  - JT65 for EME at VHF/UHF
- ▶ EME (Moonbounce)
- ▶ Meteor Scatter (50 MHz & 144 MHz)



# Scoring (ARRL Contests)

$$\text{Total score} = \frac{\text{Total number of QSO points} \times \text{Total number of grids worked}}{\text{Total number of grids worked}}$$

## QSO Points

- 50 MHz, 144 MHz - 1 point per contact
- 222 MHz, 432 MHz - 2 points per contact
- 902 MHz, 1296 MHz - 3 points per contact
- 2300 MHz and higher - 4 points per contact

### Example:

50 MHz	10 contacts x 1 pt	6 grids
144 MHz	20 contacts x 1 pts	10 grids
432 MHz	15 contacts x 2 pts	8 grids

Total QSO points = 60 pts      Total Grids = 24  
**Total Score = 60 x 24 = 1440 points**

# Example: KØNR June QSO Party

Single Operator from my cabin near Trout Creek Pass

Set up portable station - west side of DM78

Excellent 50 MHz propagation

Lots of rover stations

50 MHz: Yaesu FT-950 100W to M<sup>2</sup> 6M5X Antenna

144 MHz: Yaesu FT-847 with 160W Amp to M<sup>2</sup> 2M9SSB Antenna

### Some 144 MHz Contacts:

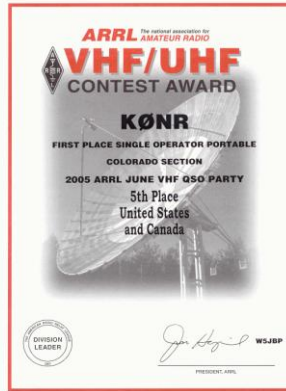
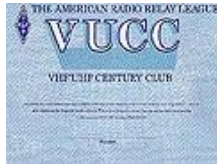
WA7KYM	DN71	Cheyenne, WY
KCØVFO	DM87	Lamar, CO
KB0HH	EM06	Byron, OK
KCØTW/R	DN61	???????, WY

**Best 50 MHz DX:**  
**C6ANX The Bahamas**

Band	QSOs	X pt =	QSO pts.	X Grids =	Points
50	500	1	500	170	85000
144	28	1	28	13	364
<b>TOTALS</b>	<b>528</b>		<b>528</b>	<b>183</b>	<b>96624</b>

# Awards

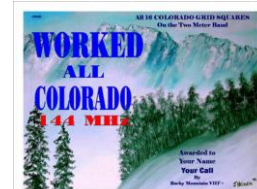
## VUCC



## Contest Certificates



Worked All Colorado – 16 grids  
Worked Colorado - 6 grids



KØNR VHF Contesting 5 Nov 2011

29

# Resources

- ▶ Read the contest rules
  - [www.arrl.org/contests](http://www.arrl.org/contests)
  - [www.cqww-vhf.com](http://www.cqww-vhf.com)
- ▶ Rocky Mountain VHF Plus Group
  - [www.rmvhf.org](http://www.rmvhf.org)
  - Web site and email reflector
  - 2M SSB Net – Monday 8 PM Local 144.220 MHz
  - Sponsor of Worked All Colorado Award
- ▶ Grand Mesa Contesters of Colorado
  - HF and VHF contesting club
  - <http://www.k8fc.com/gmcc/>

KØNR VHF Contesting 5 Nov 2011

30

## Summary



- ▶ VHF Contesting is Fun
- ▶ Most of the activity is on SSB  
Some CW and FM  
Digital modes for meteor scatter and EME
- ▶ Know your grid (for the contest exchange)
- ▶ There are lots of ways to participate:  
Single Op, Multiop, Portable, Rover
- ▶ 6 Meters is the *Magic Band!*
- ▶ Give it a try: From home, portable, rover

## Questions?

