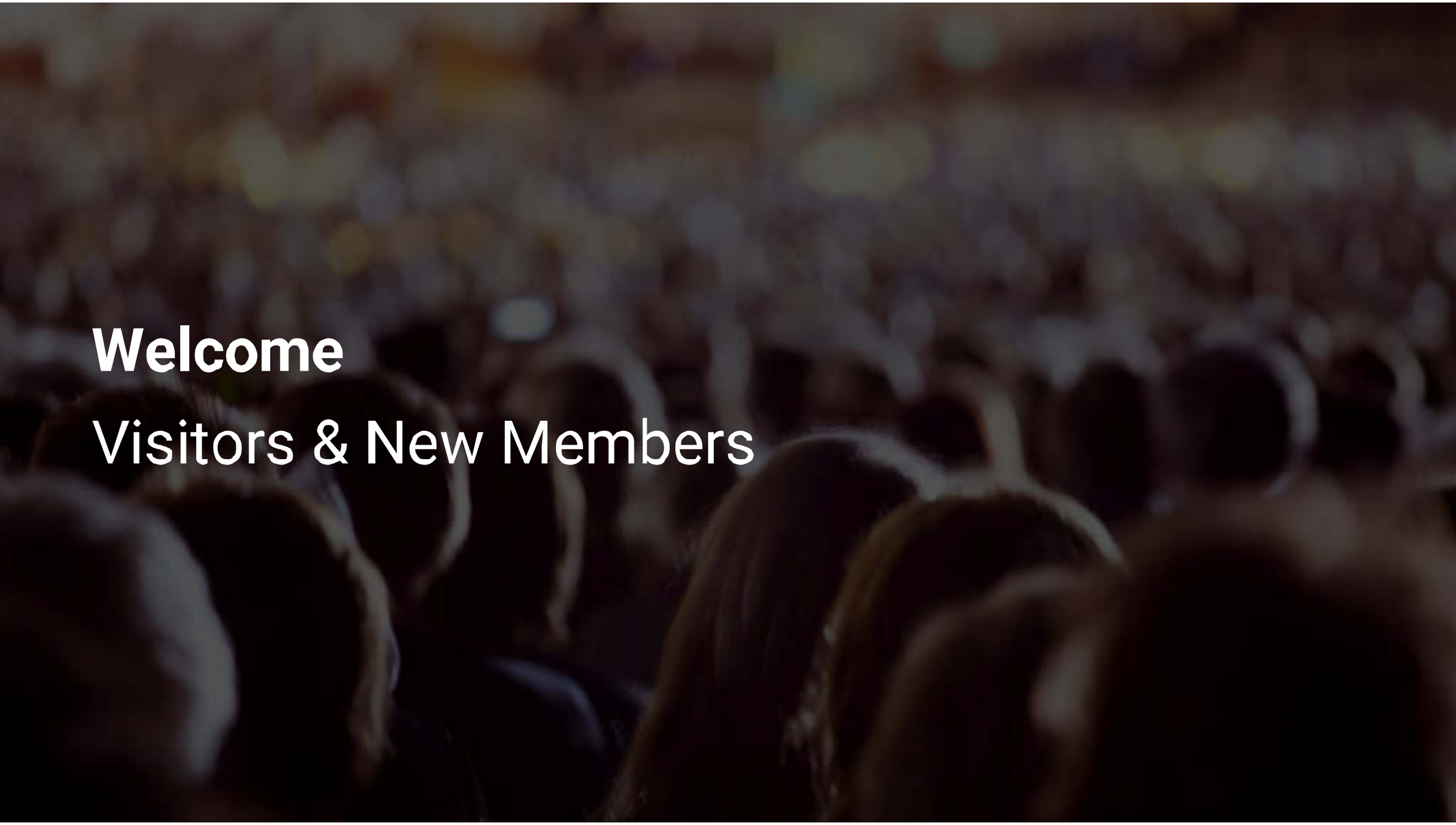
Rolla Regional Amateur Radio Society

General Meeting - May 1, 2017


Welcome
Visitors & New Members

Agenda

Welcome

New/Old Business

Tech Discussion

Upcoming Events

March Test Session Results

Barry Preston (KC0YDZ)

Upgrade to Extra

Matthew Healy

New Technician

Kyle Robertson (KE0JZF)

Upgrade to General

Jason Richardson

New Technician

March Test Session Results

Arul Chandran (KE0MLK)

Upgrade to Extra

Nicholas Maye

New Technician

Austin Range (KD9HIX)

Upgrade to Extra

Benjamin Hume (KF7ILL)

Upgrade to General

April 29th Test Session Results

Daniel Lane

New Technician

Thanks to the Volunteer Examiners:
Aaron (AA0RN), Gary (KF0TW), Dave (KF0XQ), Joe (K0OG)

Old Business

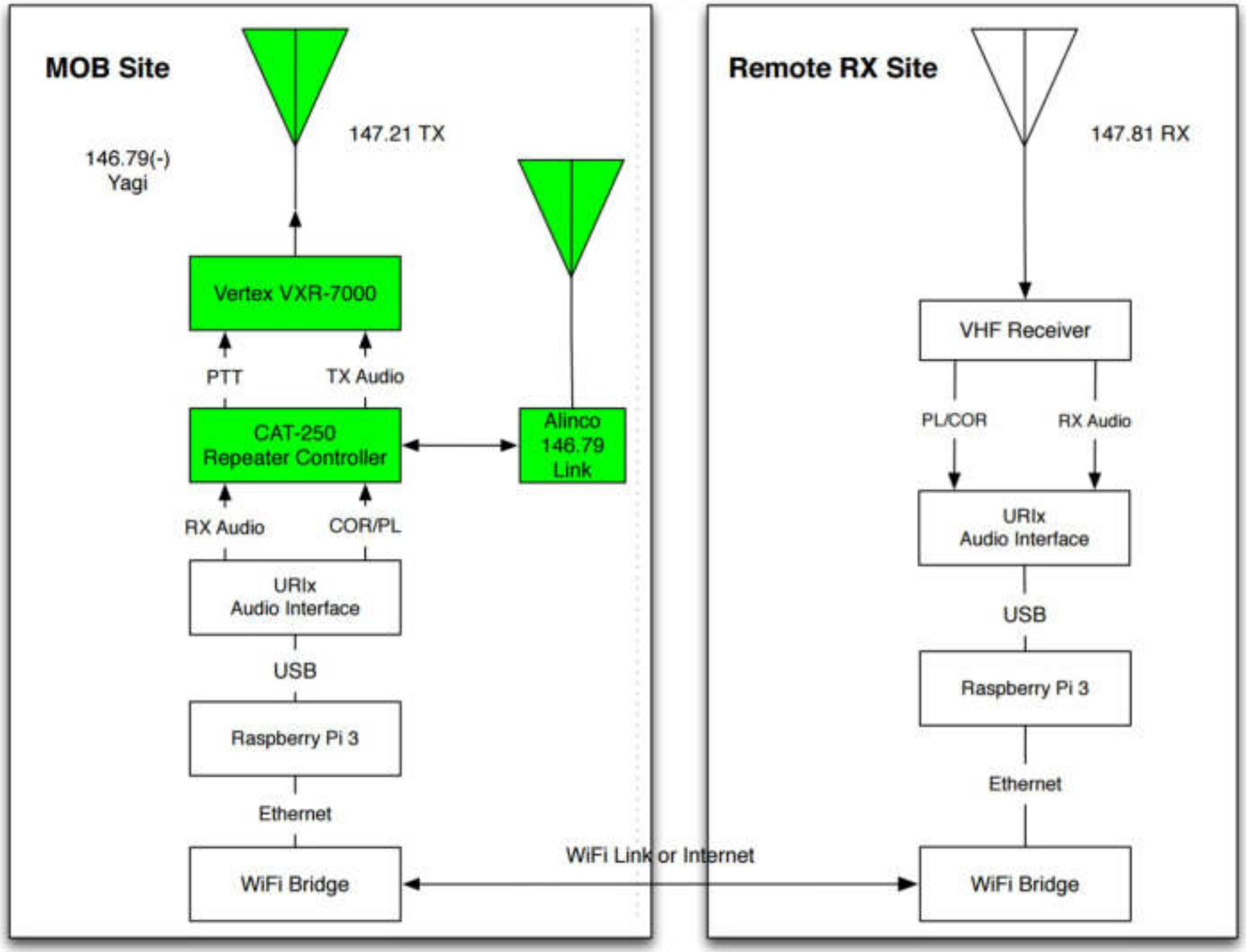
Repeater Linking - Perhaps this is a moot point now since 146.955 MHz repeater at the Lake of the Ozarks is now linked directly to the Springfield Skywarn N0NWS repeater at 145.490 MHz for Skywarn & other nets.

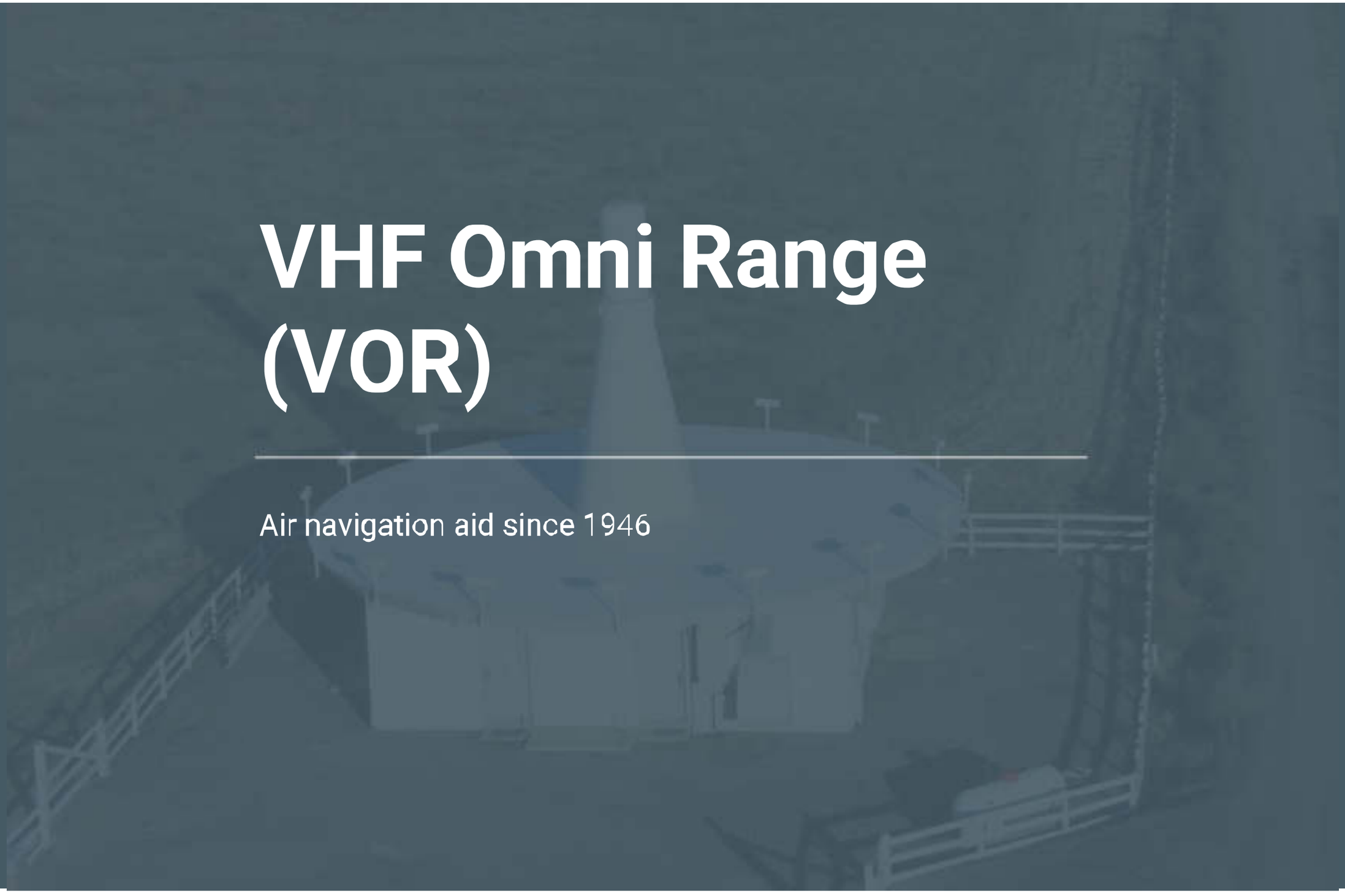
Field Day - Need chairperson to organize volunteers and station stewards

New Business

Remote RX for 147.210: Club passed a motion to proceed with a design & budget proposal, with Ron (NA0Q) as committee chairman with Steve (N6RHQ), Joe (K0OG), and Sergii (KE0MLS) as volunteers to serve on the committee.

Remote RX Diagram





VHF Omni Range (VOR)

Air navigation aid since 1946

Various Designs and Sizes

VOR - Theory of Operation

Frequencies 108 to 118 MHz, 25-100 watts (50 watts nominal)

- Azimuth (Sideband, +/- 480 Hz at 30% power, 30 Hz FM deviation)
- CW ID (AM at 5% power)
- Voice Weather / Airport info (AM at 30% power)

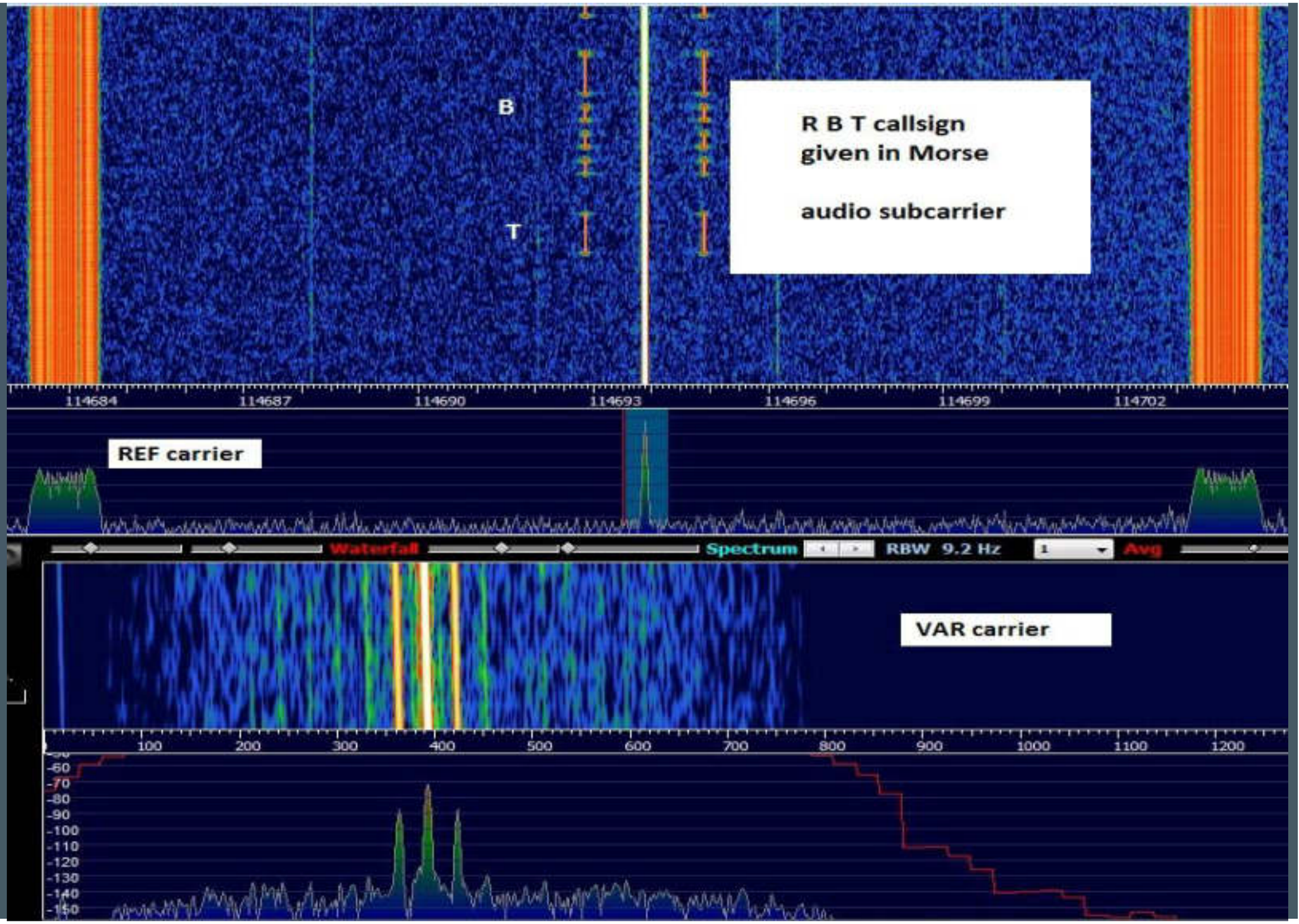
Sidebands are added / subtracted from carrier signal (SB2 lags SB1 by 90°)

- Results in Space Modulation
- Electronic simulation of antenna rotation

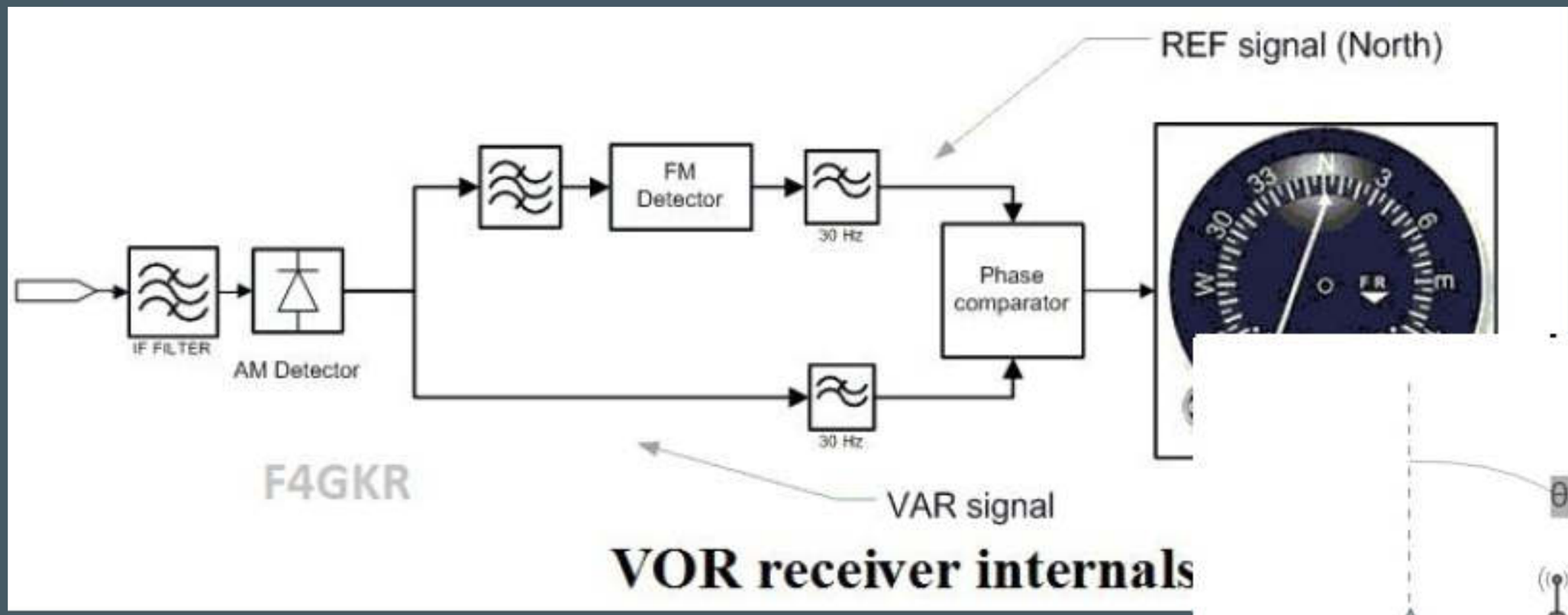
Continuous Self Monitoring to ensure accuracy / reliability

40 nm usable range

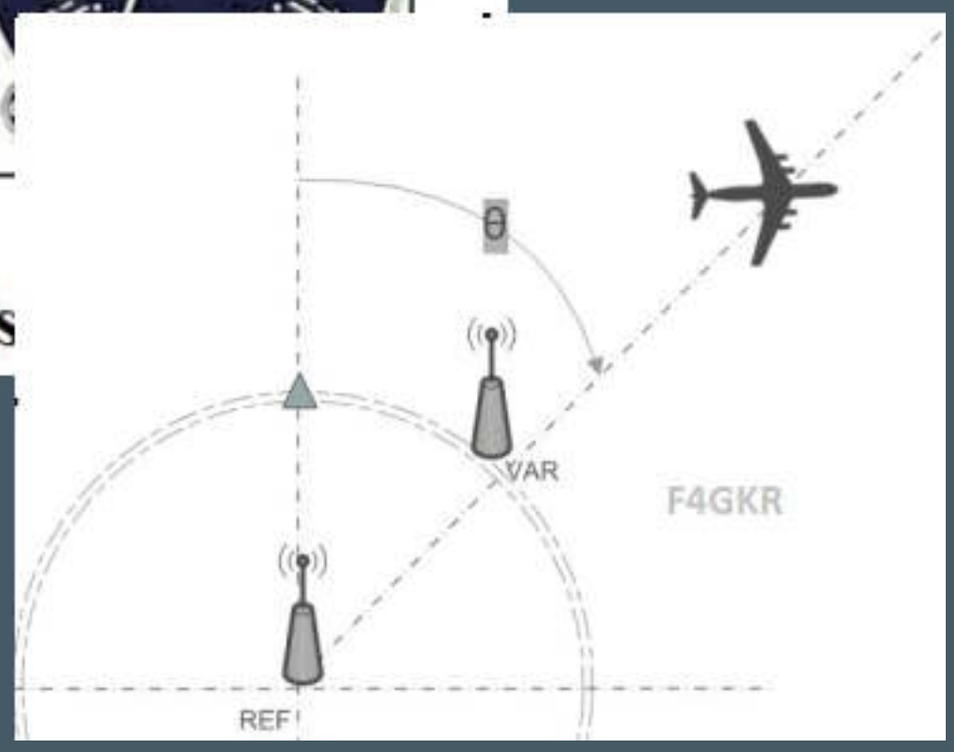
Pretty Picture



Receiver



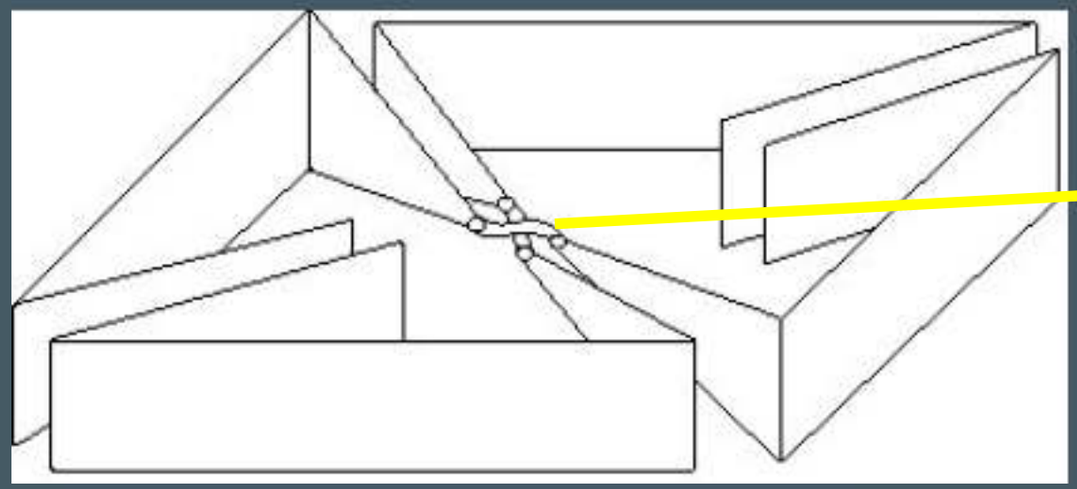
VOR receiver internals



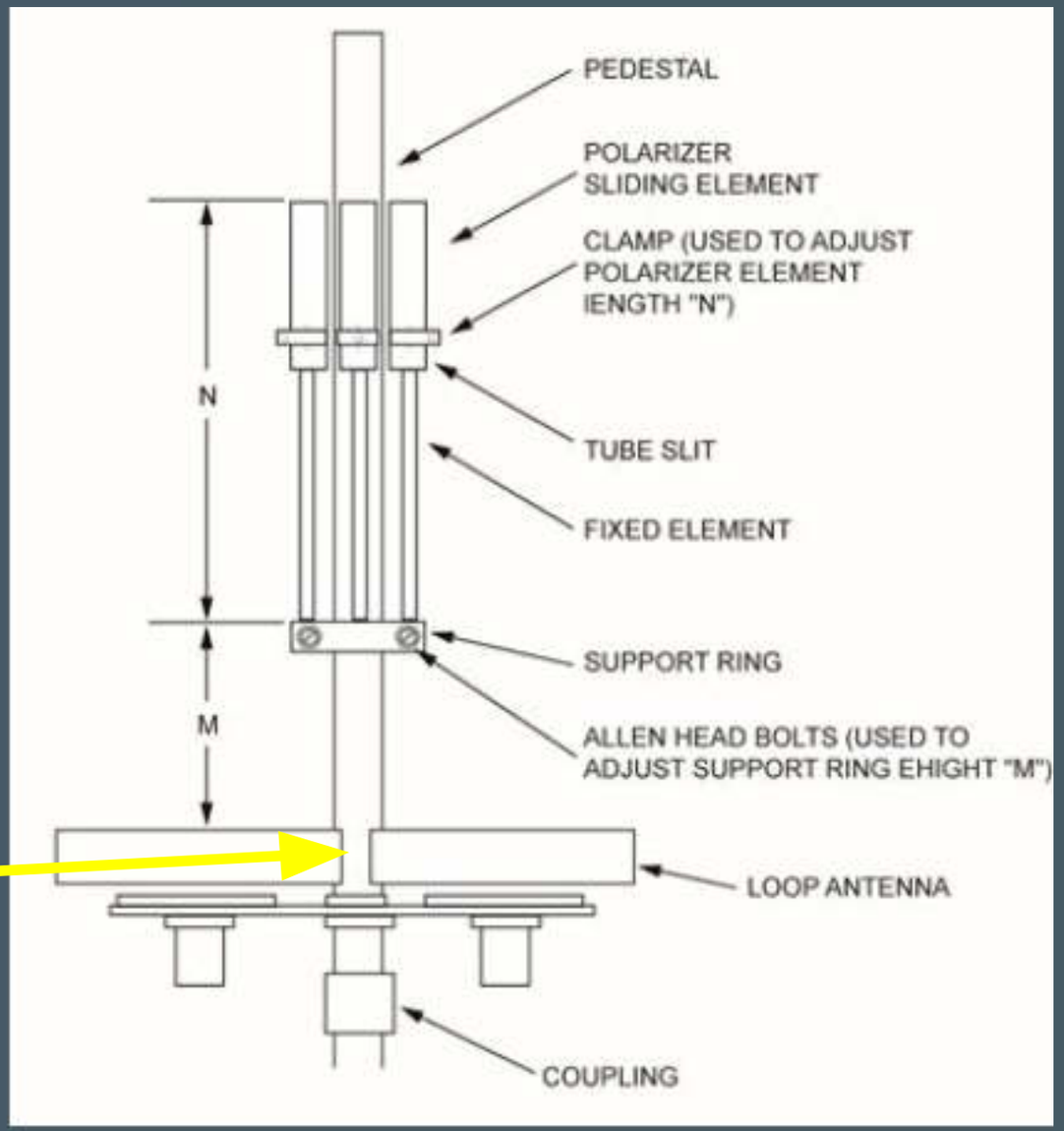
Antenna

Horizontally Polarized
with Vertically Polarized
parasitic element

Alford Loop



(10 MHz Bandwidth)



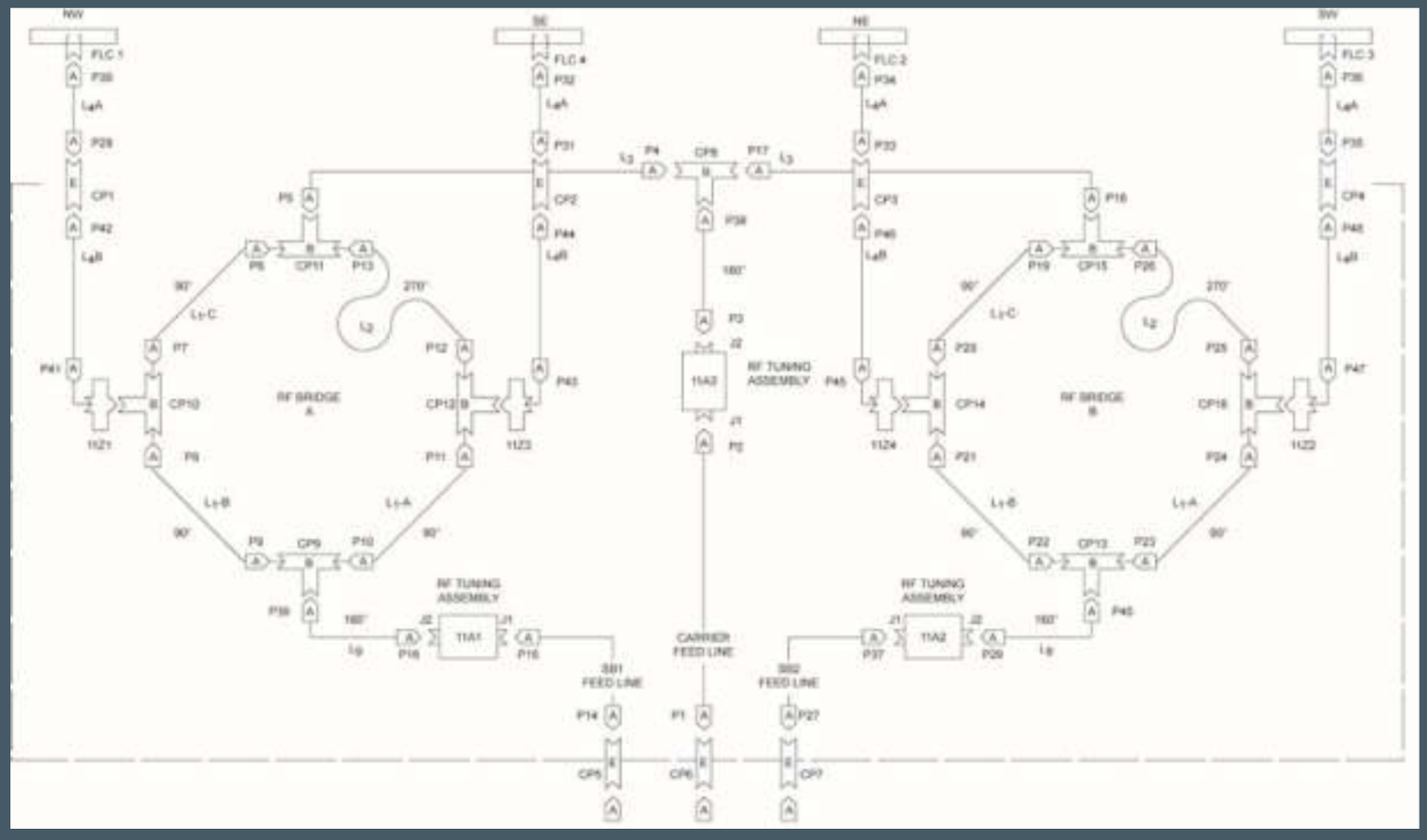
Phasing Hardware

Sideband 1 is fed in phase to Northwest and Southeast antenna pair

Sideband 2 is fed in phase to Northeast and Southwest antenna pair

Carrier signal is fed to all four antennas

Coax crossovers set the phasing for the signals, much like tuned cans for repeaters



Phasing Hardware

Like circular interference pattern...

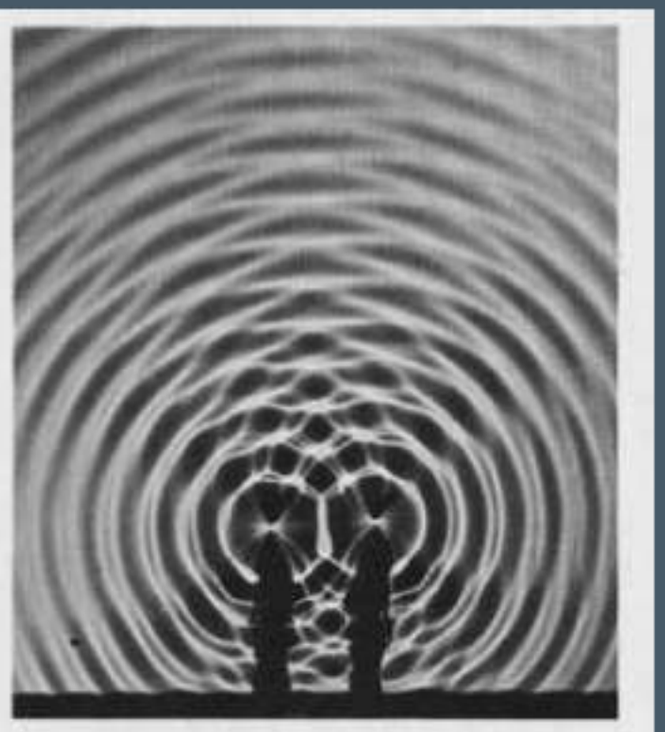
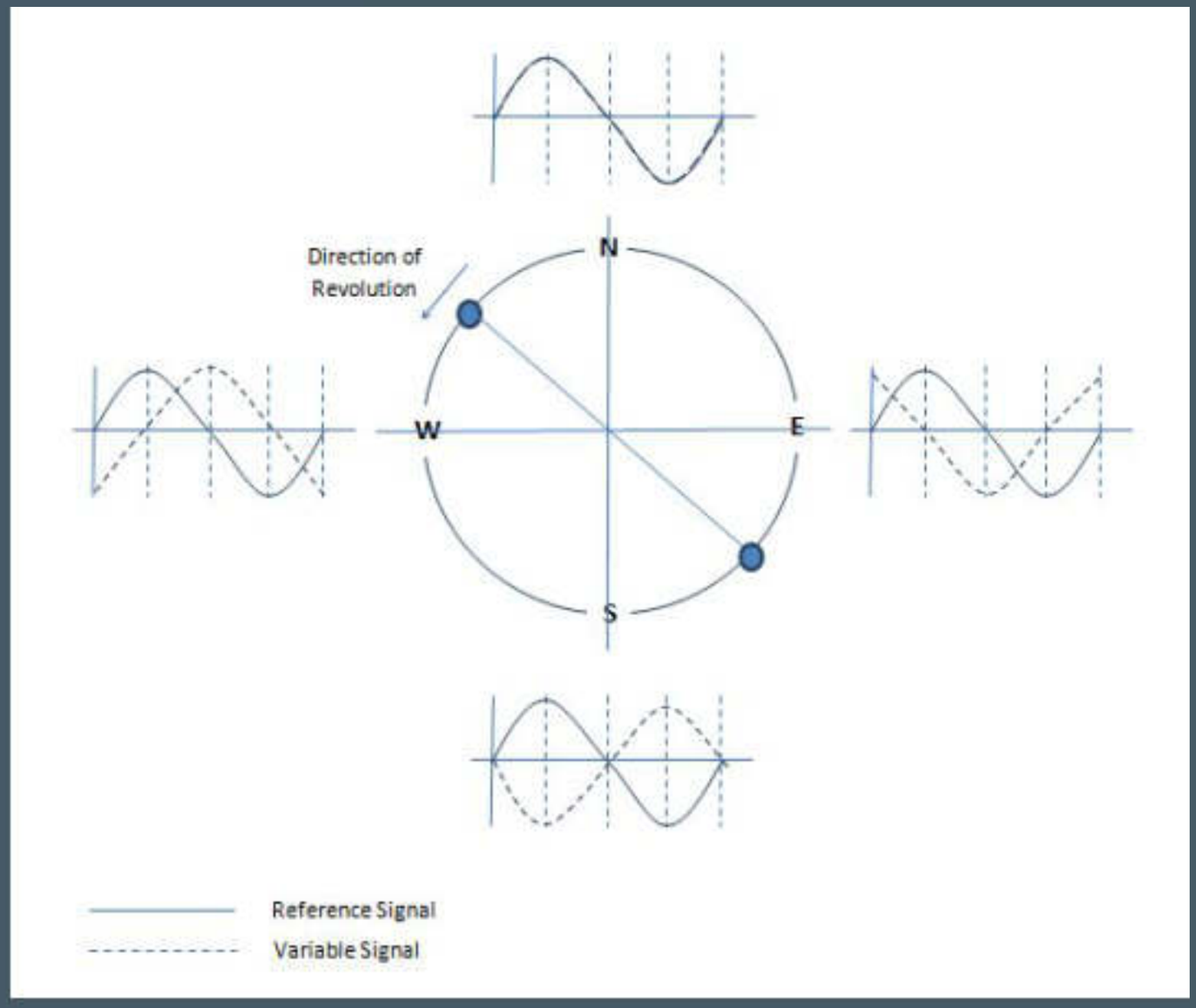


Figure 10-27. A photograph of the interference pattern of water waves from two point sources. Locate the nodal and antinodal regions.



References & Links

VOR + SDR + Matlab -
http://www.f4gkr.org/tag/signal-processing/

Theory of Operation -
https://sites.google.com/site/logancte/home

Image Sources -
http://static.panoramio.com/photos/large/5305781.jpg

https://forums.radioreference.com/aircraft-monitoring-forum/121539-vor-transmit-power.html

http://www.aeroexpo.online/prod/thales/product-170727-7270.html

http://air-nav-srf.blogspot.com/2012/05/vhf-omni-directional-radio-range-vor.html

http://boomeria.org/physicstextbook/ch10.html

Upcoming Events

6/24 Test Session

Test session at Field Day

??

Fox Hunt?

June | July | Aug | Sept

6/24 Field Day

Need a chairperson

??


Next Meeting
June 5th