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SIGNALS

Rockwell Collins Amateur Radio Club

Monthly Newsletter of the

Volume 36 Issue 2 **Web Site** http://www.w5rok.us **November 2014**

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RCARC
Membership Meeting

Tuesday 25 November 2014
1700 Social 1730 Meeting
1800 Program

Methodist Richardson Medical Center
At Bush/Renner/Shiloh Intersection
Second Floor Conference Room 200

Subject:
Buddipole—Deluxe, a First Time Look
By Joe Wolf N5UIC

Local Club News

Meeting Notice

Joe Wolf N5UIC will be presenting the program at the November meeting. Joe provided the following: I have not had this antenna system very long, however, I will be going over what is contained in this package. I also have purchased a couple of other items that are not part of the standard package. I have learned a lot after a couple of setups and can see there is a lot more to learn about setting up this antenna system under different configurations. This system is designed to work bands from 40 to 2 Meters, both in a vertical and a horizontal dipole configuration and some angles in between.

RCARC Community Service Activities

Siren Testing Dennis Cobb WA8ZBT, Chris Havenridge KF5GUN, John McFadden K5TIP and Jim Skinner WB0UNI participated in the Richardson emergency siren testing on 5 November 2014. The testing was cancelled shortly before noon, reportedly due to cloudy weather. The siren testing is performed on the first Wednesday of each month. The sirens are monitored by amateur radio operators and reports made using the Richardson Wireless Klub (RWK) repeater at 147.120 MHz.

Crime Watch Patrol Jim Skinner WB0UNI participated in Richardson Duck Creek Crime Watch Patrol (CWP) each Tuesday of October. CWP members, after successful completion of mandatory Crime Watch Patrol Training, conducted by the Richardson Police Department, volunteer their time and vehicles to patrol their neighborhoods and report all suspicious activities to the Police Department. Many members also patrol on foot or bicycle. This program is to observe and report activity only.

Understanding Antennas For The Non-Technical Ham - Part 3

Each month for the next year or so, we are including in ***SIGNALS*** *excerpts of a book by Jim Abercrombie – N4JA (SK) on antenna design. This book is available online for free and can be located at http:// www.hamuniverse.com/basicantennas.pdf. Now, part 3...*

Understanding Antennas for the Non-Technical Ham

A Book By Jim Abercrombie, N4JA (SK)

Illustrations by Frank Wamsley, K4EFW

Edited by Judy Haynes, KC4NOR

Copyright July 2005. Second Edition

Edited for the web , N4UJW

V. THE IONOSPHERE AND MODES OF HF PROPAGATION

Ground-Wave Propagation

Ground wave works only with vertical polarization. One side of the antenna is the metal vertical radiator and the other side of the antenna is the earth ground. The surface wave in the air travels faster than the part of the wave flowing through the ground. The surface of the earth is curved like the curved part of a racetrack. On the curved track, a car on the outside of the track has to travel faster than the car on the inside lane to stay even, and the two cars travel in a curved path. *(Continued on page 3)*

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VE SESSIONS

Dallas tests are held 4th Sat of each month at 1000 hrs. 13350 Floyd Rd. (Old Credit Union) Contact Bob West, WA8YCD 972.917.6362

Irving tests are held 3rd Sat of each month at 0900. Fifth and Main St. Contact Bill Revis, KF5BL 252-8015

McKinney VE test sessions are held at the Heard Museum the first Sunday of the month. The address is 1 Nature Place, McKinney TX. The time of the testing is 1430, ending no later than 1645. ***Note: no tests given on holiday weekends.***

Garland testing is held on the fourth Thursday of each month, excluding November, and begins at 1930 sharp. Location is Freeman Heights Baptist. Church, 1120 N Garland Ave, Garland (between W Walnut and Buckingham Rd). Enter via the north driveway. A HUGE parking lot is located behind the church. Both the parking lot and the Fellowship Hall are located on the east side of the church building, with big signs by the entrance door. Contact Janet Crenshaw, WB9ZPH at 972.302.9992.

Plano testing is on the third Saturday of each month, 1300 hrs at Williams High School, 1717 17th St. East Plano. Check Repeater 147.180+ for announcements.

Greenville testing is on the Saturday after 3rd Thursday, 1000 hrs at site TBA, contact N5KA, 903.364.5306. Sponsor is Sabine Valley ARA. Repeater 146.780(-) with 118.8 tone.

Richardson The Richardson Wireless Klub (RWK) VE team hold license testing on the third Thursday of each month at St. Barnabas Presbyterian Church, 1220 West Beltline Rd. Testing begins at 1900 hrs in room 12. Enter through the Northern most door on the east side of the church building. For further information contact Dave Russell W2DMR, at 972.690.9894 or E-mail warhog4@tx,rr.com.

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President's Message

THIS SPACE RESERVED FOR PRESIDENT'S AND/OR VICE-PRESIDENT'S MESSAGE

Secretary's Report

28 October 2014

The meeting was called to order by Vice President Mike Schmit WA9WCC at 1744.

The following members were present at the meeting:

Jim Brown	AF5MA
John McFadden	K5TIP
Mike Schmit	WA9WCC
Jim Skinner	WB0UNI
Joe Wolf	N5UIC

Officers and Committee Reports:
President's Report: There was no formal President's Report.

Vice-President's Report: There was no formal Vice President's Report.

Secretary's Report: The Secretary's Report is in this newsletter.

Treasurer's Report: There was no formal Treasurer's Report.

Website Manager's Report: There was no Website Manager's Report.

Station Trustee's Report: There was no Station Trustee's Report.

Database Manager's Report: There was no Database Manager's Report.

Old Business:
There was no old business.

New Business:
Jim Skinner WB0UNI requested inputs from members for the club newsletter, including articles and descriptions of club and member accomplishments.

Adjournment:
The meeting was adjourned at 1754.

The next meeting will be at 1730 on Tuesday, 25 November 2014.

Understanding Antennas For The Non-Technical Ham - Part 3 *(Continued from page 1)*

Although the wave in the air travels faster than the wave on the ground, the two parts of the wave cannot be separated. Because of this, the radio wave also travels in a curved path that follows the curvature of the earth.

The AM broadcast stations use ground wave propagation during the day and skywave propagation at night. Since radio waves at lower frequencies conduct better through the ground, an AM broadcast station on 540 kHz will be many dB stronger than a station on 1600 kHz, if both run the same power. This fact is important in understanding why ground mounted verticals do not work as well at high frequencies as they do on the broadcast band.

Direct Wave or Line of Sight Propagation
Antennas located on high structures can "look" over the horizon and "see" the receiving antennas. Because refraction is involved, direct waves travel 20% farther than light waves due to scattering of radio waves by the environment. Trees and other foliage are invisible to HF radio waves. Direct wave propagation is possible at all frequencies, but this mode of propagation is seldom used on our high frequency bands, but it is the usual propagation mode used by repeaters and others on VHF and UHF. If you watch TV on an outside antenna or on a "rabbit ears antenna," you are receiving the signal by direct wave propagation.

Propagation by Refraction
Refraction occurs when the lower part of a wave travels slower than the top part of the wave because the wave is passing through two media. These media can be two layers of air at different temperatures or they can be air and a solid. One form of refraction is caused by a radio wave passing over a hill or ridge being bent as it passes over the obstruction. This is known as "knife edge refraction." Another form of refraction occurs when layers of air of different temperatures bend the radio waves around the horizon.

This is called tropospheric ducting. This mode of propagation makes long distance contacts possible at VHF frequencies. Tropospheric ducting does occur on 10 meters and lower frequencies and is noticeable when other forms of propagation are absent. On high frequency bands, many hams mistakenly call tropospheric ducting and direct wave "ground wave."

Skywave Propagation
Skywave propagation occurs when radio waves are reflected from the ionosphere. Practically all HF communication is done by skywave. In the ionosphere, the waves are really refracted twice, and they just appear to be reflected. The reflections are frequency sensitive, meaning each ham band reflects differently from the others. Low frequencies, such as 80 meters, reflect mainly from the lower levels of the ionosphere and the reflected signal comes nearly straight back down. This causes 80 meters to propagate to points from local out to more than a few hundred miles in the daytime. At night, when the D layer and E layer are absent, signals striking the ionosphere at lower angles may propagate many thousands of miles on 80 meters. On the bands from 20 to 10 meters, high angle signals pass straight through the ionosphere and do not reflect back down to the nearby stations. The low angle signals on these higher bands reflect from the ionosphere near the horizon and return to the Earth some miles away. The in-between region cannot hear the transmitted signals nor can you hear signals coming from this region. The in-between region is called the "skip zone." Only when the

ionosphere is weakly ionized do you have a skip zone on 80 meters.

Another interesting type of skywave propagation seen on the higher HF bands is called chordal hop propagation seen frequently in trans-equatorial (TE) propagation, which is propagation crossing the equator. When this occurs, signals entering the ionosphere are trapped inside the F2 layer then they are finally refracted back to earth across the equator thousands of miles away. There is no propagation between the signal entry point and the exit point. This is skip in the extreme. On many occasions, we have worked stations far away across the equator in the southern part of South America and stations in between could not be heard. We have frequently worked VQ9LA in the Chagos Archipelago located in the Indian Ocean. The path to The Chagos Archipelago is across Europe and the Middle East and finally across the equator to his location in the Indian Ocean. One time when he was working Europe and North America at the same time, we could not hear the European stations because our path to him was via chordal hop propagation. Another way of describing chordal hop propagation is to call it ionospheric ducting.

Skywave propagation sometimes produces an effect called "backscatter." What happens is the radio waves that strike the ionosphere, instead of only reflecting father away from the transmitting station, part of the signal reflects backwards toward the transmitting station. Stations that are too close to hear each other by direct wave can communicate by the backward reflecting waves. Both stations that communicate by backscatter must point their directional beam antennas in the same direction although their direction toward each other may be at some other azimuth. Backscatter will confuse front-to-back measurements of directional beam antennas. This is because, when you turn the back of the antenna toward the station you are hearing, you may be able to hear him on backscatter from a direction opposite from him. You will be hearing him from the ionized atmospheric cloud in the opposite direction. During intense solar magnetic storms, when aurora occurs at high latitudes, stations are able to communicate by backscatter on VHF and UHF by both stations pointing their directional beams toward the aurora. This will be due north for stations in the Northern Hemisphere and due south for stations in the Southern Hemisphere. Audio from aurora backscatter will have a "wispy" sound.

Greyline Propagation

Greyline propagation occurs when the sun is low in the sky near dawn or dusk, although we have seen greyline propagation occur as early as two hours before sunset or as late as two hours after sunrise. It is often used to work stations on the other side of the world on 160 and 80 meters. For example, at certain times of the year when it is approaching sunset here in the States, the sun will have just risen in Asia or Australia and vice-versa. At that time, radio waves propagate along the semidarkness path that encircles the Earth called the greyline. Both locations must be in the greyline in order to make 2-way contacts. The tilt of the Earth makes the position of the greyline change as the seasons change. Greyline propagation occurs between any two locations for a brief period of a few weeks. Afterwards, different places fall into the greyline. For several weeks in the fall of the year, an interesting example of greyline propagation occurs in the southeastern part of the U.S. On 3915 kHz, the BBC outlet in Singapore can be heard for about an hour before sunset coming in by greyline propagation. Stations to the east hear it before we do. Stations farther to the west can hear the fading signals after it fades out here because the greyline moves as the earth rotates. For those hearing it, the signal fades in, it peaks, and it slowly fades out.

Long Path Propagation

Long path propagation occurs when signals propagate the long way around the world. It can occur on any band. It usually occurs from stations on the opposite side of the world from you. We have worked South Africa via long path by beaming northwest early in the morning on 20 meters. When this happens, we are working him long path through the nighttime side of the earth. Since at all times half the Earth has daytime and half the Earth has night, long path propagation is determined by whether the signal is propagated through the nighttime path or daylight path. Sometimes the daylight path will bring in stations by long path propagation and at other times the darkness path provides long path propagation. One night on 20 meters, we heard a station in India coming in short path and long path simultaneously, but the short path was stronger. At the same time, California was working India by long path and they could not hear him short path. They were working him through the daylight path, and he was stronger here on the East Coast via the nighttime path.

160-Meter (1.8-2.0 MHz) Propagation

Each amateur band propagates signals differently. The 160-meter band is our only MW band and it acts similar to the broadcast band. It is primarily a nighttime and wintertime band as it suffers from high summertime static (QRN). Most hams that use this band for nearby contacts use horizontal dipoles or inverted-V antennas. Some hams use vertical antennas on this band to work distant stations (DX). These DX contacts are made in the fall and wintertime at night via F layer or greyline propagation when the static levels are low. Dipoles and inverted-V antennas do not work well for DX on this band.

Eighty-Meter (3.5 4.0 MHz) Propagation

The CW part of this band is called the 80-meter band and the voice part of the band is known as 75 meters. Like 160 meters, eighty meters suffers from the same QRN in the summertime. Working DX on this band is a popular avocation during the fall and winter. However, 80 meters is used primarily for working nets and ragchewing. Eighty meters is primarily a nighttime band. This band can vary from being open most of the day in years with low sunspot numbers to being closed during the middle of the day in years with

many sunspots. Many DX contacts have been made using dipoles and inverted-V antennas, but a vertical with many ground radials will be better.

Forty-Meter (7.0-7.3 MHz) Propagation

The forty-meter band has propagation that can act like either 80 meters or 20 meters. It just depends on the stage of the sunspot cycle. During the years with high sunspot numbers, nearby contacts are possible all day. At night, the skip lengthens making contacts possible to those parts of the world where it is still dark. Working DX on 40 meters is a nighttime or greyline event. When the sunspots are low, forty meters may have long skip during the day, and nearby contacts may be impossible or they may be very weak. During the time when we suffer from low sunspot numbers, many DX contacts are made during early morning, late afternoon, and at night.

If your primary interest on forty meters is SSB, our 40-meter voice band is a broadcast band in Regions 1 and 3. Region 1 is Europe, North Asia, and Africa and Region 3 is the Pacific, Southern Asia, and Australia. The top part of 40 meters is a voice band in Region 2, which is North and South America. To work SSB on forty meters at night, you will have to find a frequency between broadcast stations. Strong broadcast stations heard at night begin to fade out slowly as the morning sun rises and moves higher in the sky. As the suns angle declines in the afternoon, the broadcast stations begin to break through the noise becoming stronger as the sun begins to set. It is only in the middle of the day when no broadcast stations are heard on forty meters.

Since DX stations in region 1 and most of region 3 can only transmit below 7100 kHz, working DX on 40 meter SSB is still possible. Stations in those regions will have to transmit below 7100 kHz. (Australian and New Zealand amateurs can operate up to 7200 kHz.) They call CQ and announce where they are listening in our voice band above 7150 kHz. This is what is called "working split."

Thirty-Meter (10.1-10.15) Propagation

This band has such a narrow frequency that the only modes allowed here are CW and digital modes. That means no SSB. Propagation here is much like 40 and 20 meters. Unlike 20 meters, this band stays open longer at night during years with low sunspot numbers. During the daylight hours, it has much shorter skip than 20 meters. In the United States, we are allowed only 250 Watts.

Upcoming Events

DECEMBER

5-7	**160 Meter Contest** Objective: For Amateurs worldwide to exchange information with W/VE amateurs on 160-meter CW. DX-to-DX QSOs do not count. Stations located in overseas and non-contiguous U.S. Territories may be worked by DX stations. This includes Alaska KL7, Caribbean US possessions KP1-KP5, and all Pacific Ocean territories KH0-KH9, including Hawaii KH6. These stations can work BOTH domestic stations (US and VE) and DX stations around the world. Contest Period: 2200 UTC Friday through 1600 UTC Sunday. Details at http://www.arrl.org/160-meter.
6-7	**EME—50 to 1296 MHz** Objective: To work as many amateur stations as possible via the earth-moon-earth path on any authorized amateur frequency above 50 MHz. Contest Period: 0000 UTC on Saturday through 2359 UTC Sunday. Details at http://www.arrl.org/eme-contest.
13-14	**10 Meter Contest** Objective: For Amateurs worldwide to exchange QSO information with as many stations as possible on the 10 meter band. Contest Period: Starts 0000 UTC Saturday; runs through 2359 UTC Sunday (December 13-14, 2014). Details at http://www.arrl.org/10-meter.
21	**Rookie Roundup—CW** Mission: To encourage newly-licensed operators ("Rookies") in North America (including territories and possessions) to operate on the HF bands and experience competitive Amateur Radio operating. Experienced operators ("Non-Rookies") are strongly encouraged to participate and help new operators – either on the air or in person. Objective: Rookies exchange information with as many other stations as possible on the 80, 40, 20, 15, and 10 meter HF bands. Rookie entrants are encouraged to read "***HF Contesting – Good Practices, Interpretations and Suggestions***." At http://www.arrl.org/hf-operating-guidelines. Contest Period: from 1800 UTC through 2359 UTC. Details at http://www.arrl.org/rookie-roundup.

REGULAR ACTIVITIES

Daily	DFW Early Traffic Net (NTS) at 6:30pm 146.88 – PL 110.9Hz
Daily	DFW Late Traffic Net (NTS) at 10:30pm 146.72 – PL 110.9Hz
Daily	Texas CW Traffic Net (NTS) at 7:00pm and at 10pm on 3541 KHz www.k6jt.com
1st Wednesday	Richardson Emergency Siren Test. At noon using the Richardson Wireless Klub (RWK) repeater at 147.120 MHz.
2nd Wednesday	ARES North Texas HF Net Every month—3860 KHz at 830 pm—930pm

Rockwell-Collins

Amateur Radio Club

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TO:

CLUB STATIONS
(972) 705-1349

W5ROK REPEATER
441.875 MHz +5 MHz Input
131.8 Hz PL - RX and TX

W5ROK-1 PACKET BBS ROK Node
145.05 MHz

W5ROK-N1, W5ROK-N2 & W5ROK-N3 HSMM-MESHNET Nodes 2.4 GHz

Tuesday 25 November 2014

1700 Social 1730 Meeting

Methodist Richardson Medical Ctr
At Bush/Renner/Shiloh Intersection

Second Floor Conference Room 200

NEXT SIGNALS INPUTS DEADLINE:
➔➔➔ 12 December 2014 ➔➔➔