
SIGNALS

Rockwell Collins Amateur Radio Club

Volume 31 Issue 12

Web Site <http://www.w5rok.us>

September 2010

RCARC Membership Meeting

Thursday, 23 September 2010
1700 Social 1730 Meeting
Methodist Richardson Medical Center
At Bush/Renner/Shiloh Intersection
Second Floor Conference Room 200

Subject: Come and See—Also Election and End of Year Annual Report

assisting the National Weather Service in visually tracking storm paths and characteristics during the recent tornado outbreaks in the Dallas area on Tuesday and Wednesday.

On Tuesday afternoon, sirens in McKinney were activated and the Skywarn net was established for tracking a cell through that area. RCARC members, Ross Terry (K5SRT) and Dennis Cobb (WA8ZBT) monitored the net in order to provide information to Rockwell Collins security about the incident.

The next day at 12:25, the Collin County ARES activated their Skywarn Weather Net on the WD5ERD repeater. Immediately ham operators, including Michael Ketchum (K5MDK), took up positions to track the storm and report characteristics, such as rainfall amounts, wind speed and direction. The first net lasted 1:20 to track a cell through Eastern Collin County .

A few hours later, at 17:29, another net alert was sent on the WD5ERD repeater as another line of thunderstorms raged through Collin County . In Dallas County, RACES member Randall Dunning (KC5QHH) participated in their Weather net as Ross Terry (K5SRT), Bob Diepenbrock (KC4UAI) and Michael Ketchum (K5MDK) answered the call for Collin County ARES. In Collin County , a total of three storms were tracked. The first had developed a wall cloud with slight rotation as it tracked along Preston Road North to Celina.

A few minutes later, a second cell tracked along Eastern Collin County , producing rain. Shortly after it was started, a new cell that had generated several tornadoes was tracking from Rockwall County .

All of the storms passed without incident as proper and accurate warnings were sent out by the National Weather Service, thanks to the observations of storm spotters on the ground. Radar can provide wonderful information to storm forecasters. However, it is storm spotters that provide valuable details of the character of the storm that the NWS uses to warn municipalities and the public of pending danger.

The Rockwell Collins facility in Richardson was not in danger from these storms this time. However, a report was given to Michael Kertis about the activities of our club members. He provided the following response: "I greatly appreciate the updates and warnings I receive from the RCARC. Most of the time it is in advance of any electronic warnings or notifications I receive otherwise. You are a valuable Early Warning resource for the onset of possible severe weather. Many times I have received (*Cont on page 3*)

Local Club News

Meeting Notice. This month's program was not finalized at the time of the newsletter's publication. But don't let that stop you from coming to see what the program is. It's always good! At a minimum, we will have the FY2011 Officers election.

Club Meeting Talk-In. Each month, on the night of the membership meeting we have a Talk-In on the club repeater. The Talk-In this month is 1630 to 1700 hours, prior to the meeting.

FY 2011 RCARC Officers Election. Our officers are asking all members to consider placing their names in nomination for the 2011 Officer Slate. The current officers would like to see more involvement of others in the leadership, and some can not serve another year. Current and some past officers have taken on other duties in addition to their officer roles for the RCARC. Some have served multiple terms. So—here is your chance to make a difference: candidates are especially needed for President, Vice President and Activities Chair. You are guaranteed to get help from the past officers and other members active in the Club.

Make your interest known to the leadership now and help your club. There is plenty of lead time until the election this fall. When the nomination committee members call on you, respond—positively, please.

September 8, 2010 - Collin County , Texas Ham operators from the Rockwell Collins Amateur Radio Club participated in protecting life and property for the general public while

RCARC OFFICERS

PRESIDENT Mike Schmit WA9WCC wa9wcc@arrl.net	VICE-PRESIDENT Bob Kirby 319.360.0500 k3nt@arrl.net K3NT
SECRETARY Open	TREASURER Bob Diepenbrock 972.705.1461 Kc4uai@gmail.com KC4UAI
ACTIVITIES CHAIRMAN Open	WEBSITE MANAGER Wayne Hughes 972.705.1406 wa0tgh@arrl.net WA0TGH 461-258
STATION TRUSTEE Steve Phillips 972.517.3332 k6jt@arrl.net K6JT	NEWSLETTER EDITOR Jim Skinner 214.535.5264 wb0uni@arrl.net WB0UNI
CLUB STATION 972.705.1349	W5ROK 461-290

VE SESSIONS

Dallas tests are held 4th Sat of each month at 10:00. 13350 Floyd Rd. (Old Credit Union) Contact Bob West, WA8YCD (972) 917-6362

Irving tests are held 3rd Sat. of each month at 09:00. 5th 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 14:30, ending no later than 16:45. **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 Bill Reynolds, K8DNE, 972-475-3854.

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.

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President's Message



There is no President's Message this month. Please watch this spot for a word from our president next month..

Mike Schmit, WA9WCC
wa9wcc@arrl.net

Vice-President's Message

Your RCARC Vote – A big 'Thank You' & a tip of the hat to those who have volunteered to run as FY2011 RCARC officers. Please remember to vote. Ballots are due by September 20, 2010.

Modeling Your Back Yard Antenna, by Loney Duncan, W0GZV – Our August program was well received and generated a large number of comments and questions from those in attendance. As a bonus, antenna modeling programs and examples have been placed in the FMO area of our website. Great job Loney!

Richardson Siren Tests — In preparation of our annual report to the company, we noted the increasing community support of the RCARC. Members are to be commended for the increasing support.

Local Weather Nets — RCARC members have been noted monitoring the local weather nets, checking in, and reporting weather. This past month, we have had two activations of W5ROK due to severe weather. Our company has indicated they would like our help in acquiring an on-site weather station. We are in the process of finalizing the proposed requirements to facilities management. W5ROK's activities have also been noted in the SEC report to the ARRL. As the RCARC has an MOU with the company concerning our support in such areas it will be good for us to all become familiar with the issues raised by the ARRL NERPC report. The RCARC needs to be prepared to support others in need and to certainly be prepared to help our fellow RC colleagues.

RCARC New Members — Are you aware of someone that you work with that is an amateur radio operator or has expressed an interest in amateur radio? If so I hope that you will take a moment and let them know about the RCARC. Invite them to a meeting, take them down to the station and show them our web site. With the influx of new employees this should be an opportunity for us to grow the active employee membership base of the RCARC.

Well, it is now time for me to say 73,
k3nt@arrl.net
<http://w5rok.us>

Secretary's Report

Mike Schmit, WA9WCC, opened the meeting at 1735 on 26 August 2010, in the Methodist Richardson Medical Center Conference Room with the Pledge of Allegiance. Present at the meeting were:

Bob Ashby	K5JHR	Charles Beis	K5UWD
Ira Blum	K5IRA	Don Bowen	K5LHO
Loney Duncan	W0GZV	Kenny Keese	KD5EVW
Michael Ketchum	K5MDK	Bob Kirby	K3NT
Steve Phillips	K6JT	Steve Phillips Sr	
Dave Russell	W2DMR	Chuck Samuel	K7NWM
Michael Schmit	WA9WCC	Jim Skinner	WB0UNI
Carl Spurgers		Ross Terry	K5SRT
Paul Veenstra	KC0TEG	Joseph Wolf	N5UIC

1. Officer Reports

- President's Report:** Mike Schmit, WA9WCC, started the meeting by welcoming all attendees and setting the agenda for the meeting. He then reported that the FY2011 election slate had candidates for Secretary and Treasurer, but not for the other offices.
- Vice-President's Report:** There was no Vice-President's report.
- Secretary's Report:** The Secretary's report is in the newsletter.
- Treasurers Report:** There was no Treasurers report.
- Station Trustee's Report:** The repeater is working well.
- Activities Chairman Report:** There was no Activities Chairman report.

2. Old Business

- There was no old business items addressed.

3. New Business

- Disposition of stored supplies:** Storage space in Wire Room for RCARC materials pallets has been eliminated by Facilities. The material consists of various types of coax, 2M diplexer, heliax, etc. A decision is needed as to how to disposition it. Many suggestions were made, including storing in the penthouse until it can be dispositioned. The most probable approach would be to inventory it and sell each item to the highest bidder (members only). It was suggested that Dennis Cobb, WA8ZBT, be involved, since he has the best knowledge of the pallet contents and their usefulness. After inventory, the list will be placed in Signals with a minimum bid price for each item.

The business meeting adjourned at 1815 and Loney Duncan, W0GZV, presented his fascinating program, **Modeling Your Back Yard Antenna**. Loney covered a lot of information, including the history of computer based analysis over the period from the 1950s into the 21st century. It brought back memories of the IBM 360 (and earlier models), punch cards, batch files, and of course, the PET. Many names of fellow Collins Radio employees from the past were brought back to our memories. Loney dispelled several myths about RF/antennas, feedlines, VSWR and the "468/f" rule. Loney also demonstrated the use of the TLW (Transmission Line for Windows) program by Dean Straw, N6BV.

Plano Balloon Festival Volunteers Needed

This weekend, Amateur Radio Operators are needed for the Plano Balloon Festival at Oak Point Park, across from Collin County Community College on Spring Creek. If you are available to help in a morning, afternoon or evening shift either Friday, Saturday or Sunday, please consider helping out. There is a need for 50 or more radio operators. Currently, I've only seen 20 show up for the training, so there is a great need. The festival runs Friday, September 17th through Sunday, September 19th.

More information about the festival, including signup, training and so on, please go to this web link: <http://www.w5adc.com/PBF/PBF.html>

To sign up to volunteer for any shifts, please use this link: <https://spreadsheets.google.com/viewform?formkey=dFFJVDZETEpzYV9TQmVuTFhwZnNpbIE6MQ>

Training materials are provided for both FIELD and RECOVERY positions. Shifts schedules are on the web site, but in brief there are morning and evening shifts with an afternoon talk-in shift. There will be shuttle service for radio operator volunteers during shift change hours so you can easily get in and out of the park without the hassle or the expense for parking and entry. But you may need to bring cash for food, which may be pricey. We are expecting over 50 balloons this year along with thousands of visitors. Volunteers get to choose what position they wish to volunteer for. The nets will be directed nets on various frequencies. Information about required equipment is on the web site.

Got questions? Contact Tony at tony@w5adc.com. Look for me on the field or chasing balloons in recovery on Friday and Saturday. (Article by Michael Ketchum, K5MDK)

September 8, 2010 - Collin County , Texas

(Cont from page 1) reports from RCARC about impending weather still several counties away, allowing me to also monitor the situation in advance of its onset here. I appreciate your working with me to protect the people at Rockwell."

Michael Kertis
Sr. Facilities Engineer, ES&H
Rockwell Collins - Richardson , TX "

To find out more about storm spotting, Skywarn and the National Weather Service, please visit the following web sites:

National Weather Service:
<http://www.srh.noaa.gov/fwd>

NWS - Skywarn:
<http://www.weather.gov/skywarn>

Collin County ARES :
<http://www.collinares.net>

Dallas County RACES :
<http://www.dallasraces.org>
(Article by Michael Ketchum, K5MDK)

Where Does 468 Come From? (from Ward Silver, N0AX)

We've all seen this number over and over again – the "magic number" that gives us the length of a half-wavelength dipole in feet from the dipole's resonant frequency: $L = 468/f$. In free-space the wavelength in feet is $492/f$, but a practical half-wavelength antenna is shorter so the constant is smaller. The number 468 is on the license exams and in the literature. It's been there ever since I started reading about ham radio in the mid-1960s. It's a pillar of amateur antenna theory. Every ham is expected to memorize it. And it's wrong.

It would be more accurate to say that it's rarely correct. There are certain instances where it's close, but using it often leads to wasted wire. The usual instructions to a new ham are, "Calculate

how much wire you need using $468/f$ and then add a couple of feet." What that really means is the value 468 is too small and we compensate for the error by "adding a couple of feet". If 468 isn't right, why do we use it? Answering that question requires a trip along the paths of history.

Recently, I had the opportunity to spend a few days at ARRL Headquarters to plan upcoming writing and editing projects. The ARRL has a great Technical Library with every edition of ARRL publications and technical publications going back decades. (If you ever get close to Connecticut, it's well worth dropping in on the ARRL for a tour!) I had some time one afternoon and decided to find out when and how the number 468 first appeared in the ham literature.

My first stop was the *ARRL Antenna Book's* initial edition in 1939. Sure enough, on page 13 in the chapter on "Antenna Properties", the familiar formula $468/f$ appears. The *Antenna Book* states that the "end effect" due to the attachment of insulators at the ends of the antenna results in the approximately 5% reduction in length from the free-space $492/f$ to $468/f$. The text goes on to state that the percentage "varies slightly with different installations", but doesn't say how, nor is a citation provided to identify how the value of 468 was obtained.

Since it is unlikely that the value of 468 appeared in the *Antenna Book* without any "prior art", I next turned to the *ARRL Handbook's* first edition in 1926. That turned out to be a dry hole – no formula for antenna length and nothing in 1927 or 1928 either. Then, in the 1929 edition's "Antennas" chapter on page 128, I hit pay dirt! The text defines natural wavelength as the highest wavelength

(the lowest frequency) at which the Hertz antenna (a half-wavelength dipole) will resonate. It is stated that "The natural wavelength of the wire...will be its length in meters multiplied by 2.1" Hmmm...2.1 is 5% longer than would be the free-space value of 2. (Remember, the text is discussing wavelength, not frequency.) Farther down the page I saw, "Speaking in terms of feet, the natural wavelength of the antenna will

be its length in feet divided by 1.56." That equation translates to $L = (300 \times 1.56)/f$ and 300×1.56 is 468! Here were the headwaters of the mighty River 468!

Still, no background for the correction was given. Where does the use of a correction factor originate? Back to the stacks! Did I really want to go through all of the *QST* magazines until I found my answer? Well, not really, but inspiration struck in the form of the online *QST* archives. I logged into the ARRL Web site,



brought up the *QST* archive search page, and...hit another roadblock. I couldn't very well search for "468" because it was unlikely to be a keyword. "Dipole" would return hundreds of hits. Then I realized that in the early days, a half-wavelength dipole would have been referred to as a "Hertz antenna" or "Hertzian antenna". I entered the former and scrolled down to the very earliest entries. The oldest article on Hertz antennas was in the July 1925 issue by 9BXQ and titled "The Hertz Antenna at 20 and 40 Meters" but it didn't discuss a formula for length. The next oldest article, October 1926's "The Length of the Hertz Antenna" by G. William Lang, turned out to be what I was looking for. In the article, Lang (who was apparently not a ham, but worked in the Dept of Radio Operations for Radio Station WBZ in Boston) set up some Hertz antennas at amateur station 1KA and also measured antennas at station 1CK and 1KF. He used an oscillator and a wavemeter to determine the frequency at which the antenna resonated then measured the entire antenna - tip-to-tip, including the counterpoise. A table of correction values was derived, with the free-space wavelength in meters multiplied by an average value of 1.46 to get the antenna's resonant wavelength in feet. This corresponds to an equation of $L = 438/f$. This is the first suggestion that the actual resonant length of a practical amateur antenna can be predicted by using a correction factor to a free-space wavelength.

The early experiments of 1925 and 1926 took place on or near 40 meters. In those days, CW operation on what we now call the "low bands" of 80 and 40 meters was the norm. At these wavelengths, a half-wavelength dipole was of a reasonable length. It could be made of ordinary copper wire, probably #8 to #14 AWG, and installed in the back yard at heights of 20 to 40 feet. For these antennas, $1/8^{\text{th}}$ to $1/4^{\text{th}}$ wavelengths above ground, a value of 468 is about right, resulting in the equation printed in the *ARRL Handbook* in 1929.

In truth, many variables affect the resonant frequency of a half-wavelength dipole, the two primary factors being the length-to-diameter ratio of the antenna conductor and most strongly, the antenna's height above ground. These can combine to change the actual correction factor quite a bit! (Insulation can also affect an antenna's electrical length.) In my November 2009 *QST* column, "Hands-On Radio: Antenna Height", I modeled a typical 20 meter dipole made of #12 AWG un-insulated wire at heights from $1/8^{\text{th}}$ to 2 wavelengths over realistic ground and calculated the correction factor at each height. It varied from 466 to 481 over that range! Clearly, using $468/f$ would lead to an antenna being too short most of the time.

If 468 is too small and rarely correct, what should you do? Realistically, you should expect to trim your dipole to get the resonant frequency you want. Instead of being frustrated that the calculations aren't exact, learn to adjust the antenna's length efficiently by using an instrument such as an antenna analyzer. Start with an estimated value based on a more realistic formula such as $490/f$ that results in a small amount of extra wire for attaching insulators. During tuning, twist the wire connections together or use clamps, then raise the antenna into position and measure. When it's right, only then solder and weatherproof the connections. Recognize that every antenna's circumstances are slightly different – height, ground conductivity, thickness of wire, nearby conductors, and so forth.

Another lesson to learn from this exploration is to realize that "magic numbers" in formulas have often been determined through

experimentation under specific circumstances. As such, they likely depend on a variety of factors that you may not be able to replicate. They will only approximate what you actually encounter. If the assumptions behind the value are given – you can use that information by comparing it to your situation. If the assumptions are not known – you should allow for variations or try to find a more accurate model representative of your own circumstances.

I hope you've enjoyed reading about this journey as much as I enjoyed taking it, opening the covers of books nearly 80 years old and mapping the stream of knowledge back to its sources - finding there the footprints of wireless pioneers that set ham radio on the course we travel today. (Reprint courtesy eHam.net)

Events and Public Service Ops

17-19 September 2010—Plano Balloon Fest.

The Plano Amateur Radio Klub invites you to come out this September 18, 19 and 20 for the Plano Balloon Festival. PARK and other amateurs from the area have been providing communication support for this event for over 20 years. The primary reason for this support is to provide support to the balloonists and organizers of this event. With this event spanning three days it requires a rather significant effort to coordinate and administer. Operators are required in two general categories. Field operations and recovery. We also provide weather monitoring support and liaison to many of the Public Safety agencies supporting the event. In the past we have also used this event to deploy new technology and techniques to validate their operational capabilities. Information: www.w5adc.com/PBF/PBF.html Those wishing to sign-up to work the PBF need to Sign up at: Plano Balloon Festival Volunteer Also include your T-Shirt size and ask to join the Yahoo group if you are not a member. Check the Plano Amateur Radio Klub for additional info.

18-19 September 2010—10 GHz and Up Contest (round 2).

The object of this event is for North American amateurs to work as many amateur stations in as many different locations as possible in North America on bands from 10-GHz through Light. Amateurs are encouraged to operate from more than one location during this event. See the detailed rules for more information and restrictions at <http://www.arrl.org/10-ghz-up>.

25 September 2010—JDRF Walk for a Cure.

Collin County Granite Park. I need your help with an annual event: JDRF Walk for a Cure. Get credit for a public service event; your time is dedicated for a great cause and you will actually have some fun doing it. Even if you have never worked an event; and have a Hand held radio you can work this event. I can show you what you need to know.

- When: Saturday, September 25th
- Time: 7:00 - 12:00 noon 5K event
- Location: Dallas American Airline Center

There is also an event in Plano for those of you who can't make the Dallas location. Need: 11 operators (10 CRF-S and 1 CRF-B) If you have that morning available and would like to help. The JDRF team and I would love to have you join us. Please contact me with any questions. N5ROS@arrl.net or 214-289-1841.

2-3 October 2010—EME Contest, 50-1296 MHz (round 1).

The object of this event is to work as many amateur stations in as many different 2 degrees x 1 degree grid squares as possible via the earth-moon-earth path on any authorized amateur frequency above 50 MHz. See the detailed rules for more information at <http://www.arrl.org/eme-contest>.

9 October 2010—Wish100. (Supporting Make-A-Wish Foundation) at Frito-Lay in Plano.

23 October 2010—CoCo Best. - Robotic games

The Paris Texas Hamfest #6

It's a Ham Radio Event Like No Other!!!

Friday and Saturday October 8 and 9, 2010
RED RIVER VALLEY FAIRGROUNDS 570 EAST CENTER ST. PARIS, TX

VE TESTING, COMMERCIAL VENDORS, INDOOR FLEA MARKET, LIVE MUSIC, ONE OF THE LARGEST OUTSIDE TAILGATE SECTIONS AROUND, FOOD, DRINKS, AND FUN

TALK IN FREQUENCY 146.760+ PL 203.5 *ADMISSION \$2, * FLEA MARKET TABLES \$15 EACH, * TAILGATE \$10.00 FOR UNLIMITED SPACE *ELECTRICITY IS AVAILABLE*

RV CAMPING AVAILABLE, HOOK-UPS AVAILABLE \$20 per night , TENT CAMPING IS OK TOO!!

DEALER SETUP AT NOON ON FRIDAY AND 6:00 AM SAT MORNING. DOORS OPEN @ 5:00 PM FRIDAY NIGHT AND CLOSE AT 9:00 PM. DOORS OPEN AGAIN AT 8:00 AM SATURDAY MORNING

DOOR PRIZES !!

SPECIAL GUESTS.. AUSTIN AMATEUR RADIO SUPPLY, CLEAR SIGNAL PRODUCTS, AND MORE !!!

CHECK OUT THE WEBSITE FOR THE LATEST INFO www.paristexasradio.com/hamfest

OR CONTACT FOR MORE INFO

RICHARD KI5DX OR CHRISTY LENOIR N5RDJ

903-783-0968, 903-737-0773, 903-517-4483

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Amateur Radio Club
Mail Station 461-290
P.O. Box 833807
Richardson, TX 75083-3807

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

145.01 MHz

Thursday 23 September 2010

1730

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

NEXT SIGNALS DEADLINE:

→→→ 17 October 2010 ←←←