
SIGNALS

Rockwell
Collins **Amateur Radio Club**

Monthly Newsletter of the

Volume 35 Issue 12

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

September 2014

RCARC Membership Meeting

Tuesday 23 September 2014
1700 Social 1730 Meeting
1800 Program

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

Subject:
The Why and How of CW Operating
by Dave Jaksa WOVX

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 has resumed participation in Richardson Duck Creek Crime Watch Patrol (CWP). 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.

EXCITING NEWS: Two New Amateur Radio Sources in the Area! See pages 6 and 7 for details

REMINDER: CAF World War II Air Expo at Dallas Executive Airport—3-5 October 2014

Local Club News

Meeting Notice

The September meeting will be dedicated to officer elections, followed by a special program by Dave Jaksa, WOVX on CW operating. Many of us learned enough code to get the General ticket and then stopped operating CW. Have you ever wondered why hams are still operating CW using Morse code? Come to the meeting to find out. Learn about the many advantages and some disadvantages of CW. Discover an easy way to learn Morse code or increase your speed. Find out about some fun on-air activities to boost your CW comfort level and operating proficiency. So see you on the 23rd.

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 3 September 2014. The testing was performed on schedule, and with the exception of a few problems, the sirens performed correctly. The siren testing is performed



The CAF is bringing "hands on" history to Dallas this October 3 through 5 when the world's only flying B-29 Superfortress, *FIFI*, the famous P-51C *Tuskegee Airmen* and over a dozen other World War II military aircraft take center stage.

The event will bring the sights, smells and sounds of World War II aviation history to south Dallas. Attractions include the CAF's RISE ABOVE Traveling Exhibit – a 160 degree panoramic theater in which visitors watch a video highlighting the courage and determination of the Tuskegee Airmen during World War II. Participants will tour the bomber cockpits, watch the airplanes fly and can even purchase rides in many of the aircraft.

RCARC OFFICERS

PRESIDENT Dennis Cobb WA8ZBT 972.705.1464 ddcobb@rockwellcollins.com	VICE-PRESIDENT Bob Kirby K3NT 319.360.0500 k3nt@arrl.net
SECRETARY Jim Brown AF5MA 972.495.2209 jhksbrown@verizon.net	TREASURER Mike Montgomery WD5TX 972.705.1498 dmmontgo@rockwellcollins.com
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STATION TRUSTEE Steve Phillips K6JT 972.517.3332 k6jt@arrl.net	NEWSLETTER EDITOR Jim Skinner WB0UNI 214.535.5264 wb0uni@arrl.net
DATABASE MGR Joe Wolf N5UIC 972.705.1388 n5uic@arrl.net	W5ROK CLUB STATION 972.705.1349 461-290

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.

SIGNALS is the monthly newsletter of the Rockwell Collins Amateur Radio Club, published by and for its members. The entire contents of this newsletter are copyright © 2014 by the Rockwell Collins Amateur Radio Club. Permission is hereby granted to any not-for-profit amateur radio publication to reprint any portion of this newsletter provided both the author and Rockwell Collins Amateur Radio Club are credited.

President's Message

Here we are at the end of another year for the Radio Club. Just to look back on the year: The radio club added the Elecraft KPA-500, 500 watt linear amplifier along with the matching tuner. A digital wattmeter was added and Pixel receiving antenna. We also added a card inside the Elecraft P3 so you can look at the display on a monitor. New speakers were bought for the K3 as well. The Weather station now has a display that will soon be on the wall outside the radio room. Three new computers were added as Rockwell Collins went to Windows 7. A DVD player is also now available. Kids day and Field Day were both successes.

It is election time, time to step up and run for an office. We have a great speaker this month, Dave Jaksa (W0VX) talking about CW. I hope you will join us.

See you there. 73,

Dennis Cobb
WA8ZBT
RCARC President

Secretary's Report

26 August 2014

The meeting was called to order by President Dennis Cobb WA8ZBT at 1745.

The following members and guests were present at the meeting:

Dennis Cobb	WA8ZBT
Kathy Cobb	
Bob Kirby	K3NT
John McFadden	K5TIP
Mike Schmit	WA9WCC
Jim Skinner	WB0UNI
Joe Wolf	N5UIC

Officers and Committee Reports:

President's Report: See under Old Business and New Business below.

Vice-President's Report: There was no VP report.

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

Treasurer's Report: In the absence of the Treasurer, President Dennis Cobb reported the RCARC treasury balance. The figure as reported was accepted by a vote of members present.

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:

President Dennis Cobb WA8ZBT announced a number of actions:

- As reported last month, the Weather Picture wall display is up and running in the RCARC radio shack. A maintenance request has been generated for the mounting of the display on the wall outside the shack, and is awaiting a supervisor's signature.
- Relative to the Cushcraft D3W rotatable antenna to facilitate operation on the 12, 17 and 30 meter bands, Dennis reported that Cushcraft has been sold to MFJ. He also reported that several negative comments on eHam.net indicate that the loading coils come apart after the antenna is mounted. Ensuing discussion pointed out that 17 meters is most important and wire antennas are cheaper and very available, but installing more wire antennas on the roof is problematic. Dennis will research further and report at the next meeting.
- The K-3 status is unchanged. If not resolved my next meeting, it will be shipped back to Elecraft for repairs.

New Business:

- Election of club officers is next month. Candidates for all offices are needed. All club members are encouraged to volunteer for offices. It is still a requirement that the President and Vice-President be current Rockwell Collins employees.
- All club members were encouraged to obtain program speakers as well as present programs themselves.

Adjournment:

The meeting was adjourned at 1810.

The next meeting will be at 1730 on Tuesday, 23 September 2014. Adjournment was followed by various show-n-tell "mini-programs" by all of the members present.

Joe is on the Air!

Joe Wolf N5UIC made his 1st SSB 10 meter contact with his new ICOM 7000 radio last week. The contact was to a station in South America. Joe is now building a 10 meter dipole and planning some portable HF operation from Missouri.

Fall ESD Tutorial

Here's a contribution from the Austin ARC SwapNet Newsletter of September 14, 2014

Now that we've had our first Fall cold snap, it's time for MNW's Fall ESD tutorial.

ALWAYS ground/neutralize yourselves BEFORE exchanging any electronic device: fist-bump first.

It makes the appearance that you're cool, anyway...

If you've got a significant other that sparks more than just your fancy when you kiss, fist-bump first.

As you slide in/out of your vehicle, Hold on to your Car chassis for support and charge carrier dismissal.

Touch the metal of car key as you push it into the keyslot. Some use a key as a snubber, too.

Install ~20Meg Ohm resistor "touch points" on nearby grounds as ESD snubbers: Place on 3-wire AC-operated Chassis, at end of metal ceiling fan pullchains, etc.

Lori and I have several of these around the house with Neon indicators.

Maybe even carry around a 20Meg resistor and snub zaps that way.

Notice when zaps happen & what you just did to charge up (push a cart, slide, remove sweater, etc).

Try to find a grounded place to touch & dump the charge as it happens, i.e., Slide out of chair w/hand on grounded item, chassis, etc

Almost all exposed metal on AC powered items are grounded. Use that!

Many of you may have other suggestions/methods. I'd like to hear them!

Email me at n5mnw@arrl.net --- Jeff Schmidt, N5MNW

(Contributed by Frank Krizan KR1ZAN)

Understanding Antennas For The Non-Technical Ham - Part 1

*Each month for the next year or so, we will be including in **SIGNALS** excerpts of a book by Jim Abercrombie – N4JA (SK) on antenna design. This series is being published in the **Majors Field Amateur Radio Club newsletter**, “*Airwaves*,” by our ham radio brother, Michael Ketchum, K5MDK. We will follow his lead. The book is available online for free and can be located at <http://www.hamuniverse.com/basicantennas.pdf>. Now, part 1...*

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

PREFACE

One reason for writing this book is to educate you so you can make an informed choice concerning the best antenna for you. Another reason is to dispel the many antenna myths that circulate in the amateur community. The third reason is a desire to teach basic antenna theory to the average ham. Therefore, to achieve that goal, you should read this book from cover to cover. It was written primarily for the newcomer and the non-technical old-timer.

This book is about common medium wave and high frequency (short wave) antennas, but the theory presented here relates to antennas of any frequency. It is in a condensed form and the antenna theory is explained so most hams can understand it. Realizing many hams are mathematically challenged, only simple mathematics procedures are used. If you can add, subtract, and divide using a calculator, you will not have trouble with this book.

A few principles in here are based on conclusions drawn from the Laws of Physics. Everything else in this book can be found scattered through The A.R.R.L. Antenna Book and nothing in here contradicts what is written there.

I. WHY ALL THE FUSS ABOUT ANTENNAS

Definition: An antenna is a piece of metal, a conductor of electricity, to which you connect the radio. It radiates your signal and receives the signals you want to hear.

Definition: An antenna system consists of the antenna, the feed-line, and any matching unit. Most antennas are made of copper or aluminum, while most mobile antennas

are made of stainless steel. A feed-line consists of two conductors that carry the signal to and from the radio and to and from the antenna. A matching unit can be an antenna tuner, a series matching section, or one of several different kinds of matching circuits at the feed-point.

Does the type of antenna make much difference? Here is an example: Once in 1959 two of us were involved in testing two antennas on 15 meters. The late R. Lynn Kalmbach, W4IW, using one antenna received a 30-dB better signal report on his antenna from a station in England than we did on our antenna. (Decibel or dB will be explained later). Thirty dB means his signal appeared that he was running 1000 times more transmitter power than we were. At that time, we didn't live that far apart so we couldn't blame it on propagation. We both were running about equal power. Both antennas were at 50 feet. The comparison proved that a good antenna could make a difference. Lynn used a home-built G4 ZU mini-beam; we were using a 15- meter 2-element Mosely Mini-Beam, which had short loaded elements. Evidently, it had a lot of loss.

Another example: Today we hear people breaking in to our ragchews with signals almost level with the noise. Why is that? The reason is they are using the wrong antennas. Their signals are twenty to thirty decibels below everyone else's. They are making contacts, but just barely. The first question our group asks, "What kind of antenna are you using?" Experienced amateurs know the antenna can make all the difference. The guy with the poor signal sometimes will blame his bad signal report on band conditions or his lack of a linear amplifier. He is just sticking his head in the sand.

What we are trying to prove is next to your radio, the most important part of your station is the antenna. Many years ago, an old-timer said, "For every dollar you spend on a radio, you should spend two dollars on your antenna." That is also true today. You can do more to improve your signal strength with antennas than you can ever do by increasing your power. Having the ability to make contacts on a particular antenna doesn't mean it works well! Any antenna will make contacts, but your signals will be stronger on some antennas than on others. In addition, some antennas hear better than others.

II. HOW ANTENNAS WORK.

First of all to work properly the antenna system must be matched to the transmitter. That is, all modern transmitters have an output impedance of 50 ohms. Antenna systems range in impedance of a few ohms to several thousand ohms. There are several ways to match them: pruning the length of the antenna, using an antenna tuner, matching the antenna with a length of transmission line called a matching section, or the use one of several matching systems at the antenna feed-point. Antenna matching is beyond the scope of the material found in this book and it is suggested you consult a more comprehensive antenna manual. Simple half-wave dipoles eliminate the need for a

matching system because a resonant half-wave dipole has an impedance near 50-ohms.

You must understand electromagnetism to understand how antennas work. If you attach the two poles of a direct current (DC) voltage source to the two ends of a coil of wire, current will flow through the coil of wire and it will become magnetized. The magnetized coil is known as an electromagnet. Its magnetism will extend out to infinity becoming weaker with distance. Remove the voltage and the magnetic field collapses back into the coil. If an alternating current (AC) is connected to the coil, the magnetism moves out and collapses into the coil in step with the frequency of the alternating current source. The north and south poles of the electromagnet reverse on each half-cycle of the AC voltage.

If voltage and current can cause a coil to become magnetized, the reverse is true: A magnetic field can produce a voltage and a current in a coil. This is known as Faraday's Principle of Magnetic Induction. A voltage will be produced at the ends of the coil of wire as you move any permanent magnet close to and parallel to the coil. The difference in this case is the magnet must be kept moving. Move the magnet in one direction, and current will flow in one direction. Reverse the direction the magnet is moving and the current will flow in the opposite direction. Moving the magnet back and forth produces alternating current. An AC generator spins a coil of wire between the two poles of a magnetic field. It doesn't matter which one is moving. The coil or the magnet can be moving. Any moving magnetic field can induce current in another coil. It doesn't have to be a piece of metal we call a magnet. Imagine a moving magnetic field produced by AC circulating in and out of a coil. If that moving magnetic field passes through a second nearby coil, it will induce an alternating current in the second coil. A transformer uses this method to work. Transformers have a continuous iron core running from the inside of one coil through the inside of the second coil to confine the magnetism inside the iron core. This makes the transformer nearly 100% efficient since only a little of the magnetic energy escapes.

A straight wire that has an AC current flowing through it also has a magnetic field surrounding it. But it is a weaker field than is produced by a coil. The magnetic field from the wire radiates out into space and becomes weaker with distance. The radiating magnetic field from a wire is known as "electromagnetic radiation" and a radio wave is one type of it. The wire that radiates becomes the transmitting antenna. Some distance away, a second wire in the path of these waves has current induced into it by the passing electromagnetic waves. This second wire will be the receiving antenna. The voltage in the receiving antenna is many times weaker than the voltage in the transmitting antenna. It may be as weak as one millionth of a volt or less and still be useful. The receiving antenna feeds that voltage to the amplifiers in the receiver front-end where it is amplified many thousands or millions of times.

Two interesting Daily 40 Meter HF Nets

Central States Traffic Net 7.253.5 MHz 12:30 PM local. Pre-Net starts at noon.

TX Traffic Net Daily 7.290 MHz 10AM-12 Noon local & 1 PM to 2PM local. <http://www.7290trafficnet.org/>

Bikes, Blues and BBQ—26-27 Sept 2014

This is the 15th annual Bikes, Blues & BBQ Rally. The celebration will be operating HF bands, 80-10 meters, SSB & CW from historic Drake Field, Fayetteville AR. Details are available at <http://grz.com/db/N5A>

QSL Cards QSL card can be obtained by sending a SASE #10 business envelope to:

Joe Dunn
167 Ireland Street
Springdale, Arkansas 72762
(Contributed by Bob Kirby K3NT)

"Last Man Standing" Special Event Set for September 28

A Hollywood-style Amateur Radio special event is set for later this month from the so-called "Seinfeld Stage" on the CBS Studio Center lot in Studio City, California. The K6H "Hollywood Hamnado" special event station will be on HF and D-STAR, September 28, from 1400 until 2200 UTC. Hosts for the event will be Amateur Radio crew members of the ABC television series "Last Man Standing." On the show, actor Tim Allen plays Mike Baxter, KA0XTT. The show's producer is John Amodeo, NN6JA

The Southern California-based PAPA Repeater System, in association with the Broadcast Employees Amateur Radio Society (BEARS) and Disney Emergency Amateur Radio Service (DEARS) are sponsoring the special event.

Operation will take place on 10, 20, and 40 meters on HF and D-STAR reflector 12A. Rob Antonacci, AA6RA, said K6H is planning to run three SSB stations, operating on or around 28.420, 14.250, and 7.260 MHz. The PAPA website, the W5KUB chat room, and the Mike Baxter KA0XTT Facebook page will provide up-to-the-minute updates.

K6H also will use the Disney Amateur Radio Interconnect to link the WB6AJE repeater in Los Angeles to Disney/ABC-sponsored repeaters in Manhattan-Bristol, Connecticut; Washington, DC, and Orlando, Florida. Various IRLP and EchoLink nodes will be available. Those contacting K6H will receive a limited-edition QSL card.

Tom Medlin, W5KUB, will be on Stage 9 to interview the participants and report on the special event activity. The PAPA website will stream video directly from the operating stations. So far, 26 members of the "Last Man Standing" crew have been inspired by the show's Amateur Radio component to get licensed. — Thanks to Rob Antonacci, AA6RA

(Reprinted courtesy of <http://www.arrl.org/news/last-man-standing-special-event-set-for-september-28>)

HRO Corporate News and Announcements

Read all the latest news and announcements about Ham Radio Outlet.

PRESS RELEASE
FOR IMMEDIATE RELEASE

Contact: Steve Gilmore
Office: 800-444-4799
Email: sgilmore@hro.net

Ham Radio Outlet, the worlds largest Amateur Radio product and accessories retailer, announced a new retail Super Store in Plano, TX. This new store will include a multi-thousand foot retail floor plan, which will stock and have on display a vast selection of amateur radio products and accessories. Included within the facility will be a large demonstration area, which will have many of the current amateur radio products connected to antennas for use and display.

"We believe the Dallas / Fort Worth area has been under served for some time," said National Sales Manager, Steve Gilmore. "With this new super store in Plano Texas, we will have a retail and shipping facility to allow customers in the Dallas / Fort Worth area a place to shop for amateur radio products and accessories. This allows for our Company to better serve surrounding areas by being able to ship products often within one (1) day to Oklahoma, most of Texas, and parts of Kansas, Arkansas and Louisiana."

"We have a plan, we have a manager, and we have a facility. We are ready to go," said National Operations Manager, Chuck Wyrick, "It's a big job to open a store, but in this case, it is absolutely necessary and important to serve Texas. Participating in amateur events, such as Hamfests, within the Texas and Oklahoma areas will now be far easier."

"It's an exciting time for us at HRO," indicated President, Robert Ferrero. "We are extremely proud to have the opportunity to move into Texas and provide a place for Hams to be able to come in and shop. So much is mail order today, however that does not provide the hands on experience. Our new store in Plano will be a new retail model, vast in size, with significant on-hand inventory. If our customer wants an amateur product, I expect to have it in Plano in 2015."

Ham Radio Outlet expects the opening of its new facility at 701 E. Plano Parkway, Suite 406, Plano, Texas 75074 in the first quarter of 2015.

HRO, Inc. (dba Ham Radio Outlet) is a family owned business with twelve (12) stores located throughout the United States as well as the largest amateur radio E Commerce website, making it the largest Ham Radio dealership in the world. Ham Radio Outlet is headquartered in Danville, California and has been serving the amateur community both nationally and internationally since 1971.

Upcoming Events

SEPTEMBER

- 19-21** Plano Balloon Festival. Oak Point Park, Plano Texas. Volunteers for Field and Recovery positions needed! <https://sites.google.com/site/pbfcommssupp/volunteering>
- 20-21** 10 GHz & Up Contest—Round 2: Objective is for North American amateurs to work amateur stations in as many different locations as possible in North America on bands from 10-GHz through Light. <http://www.arrl.org/10-ghz-up>
- 26-27** Special Event Station N5A. Operation from Drake Field Air & Military Museum on HF and VHF/UHF. SASE for N5A QSL. See article above. See <http://qrz.com/db/N5A>.
- 27-28** Texas QSO Party. Saturday 9AM-9PM Texas time, and 9AM-3PM Sunday <http://www.txqp.net/>
- 27-28** Maine QSO Party. Saturday 7 AM Texas time to 7 AM Sunday Texas time. (who knows, you might work KR1ZAN while he's in Maine!) http://www.qsl.net/ws1sm/Maine_QSO_Party.html

October

- 3-4** Belton Hamfest. Admission \$5 (Includes a \$2 Raffle Ticket) Talk-in 146.82(-)PL 123.0 www.tarc.org/hamexpo & www.beltonhamexpo.org
- 11-12** EME – 2.3 GHz and up. Objective is to work as many amateur stations as possible via earth-moon-earth path on amateur frequencies 2.3 GHz and up. <http://www.arrl.org/eme-contest>

REGULAR ACTIVITIES

- Daily** DFW Early Traffic Net (NTS) at 6:30pm 146.88 – PL 110.9Hz
- Daily** DFW Late Traffic Net (NTS) at 8:30pm 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
- Thursday** Sabine Valley Amateur Radio Association Net Every Thursday night at 7:00pm on the K5GVL/R 146.780 MHz (+) PL 114.8Hz

GRAPEVINE Amateur Radio

EST. 2014

Greetings Fellow Amateurs!

My name is Jason - KC5HWB, and I run the website at www.GrapevineAmateurRadio.com for Amateur Radio and Equipment sales.

We Have a New Storefront Location!

I'd like to inform and invite you, as a local DFW Ham Radio club, over to our new storefront location at 1901 Central Drive Suite 603, Bedford TX 76021. We have recently acquired a small office space that we are using for a retail storefront for radio and equipment sales. It is located at the Northwest corner of Central Dr and Highway 183 in Bedford.

Our website has been up since March 2014, but we just opened this storefront location and we are attempting to get the word out. Our business hours will be limited to evenings and weekends at first, as we let the business grow. The space is small for now, but we have lots of inventory from the website available for show at the storefront. We'd like to invite you to come pay us a visit, and request that you inform your club members that they are welcome to visit us also.

Do you offer VE testing or Amateur Radio classes for people wanting to become Hams? I offer **discount pricing on first radio purchases** for anyone who has recently passed their Ham Radio Exam. I have several radios available, both HT and Mobile, and I am adding new products constantly, so just contact me to find the latest deals and specials I can offer. Also let me know when your next testing session is, and I can bring some example radios over for direct purchase – anywhere in DFW!

Also, do you have a Newsletter? Do you sell advertising space on it? Or perhaps on your website? I would be interested in talking to someone in your organization about adding a link from your website to mine, or placing an ad in your Newsletter (especially if it is online).

Thank you for the opportunity to assist your club. I hope you can stop by the new shop soon and we can meet in person.

73
Jason - KC5HWB
www.GrapevineAmateurRadio.com

1901 Central Dr. Suite 603, Bedford, TX 76021
817.601.7228 ph. sales@grapevinehamradio.com
www.GrapevineAmateurRadio.com

Rockwell-Collins

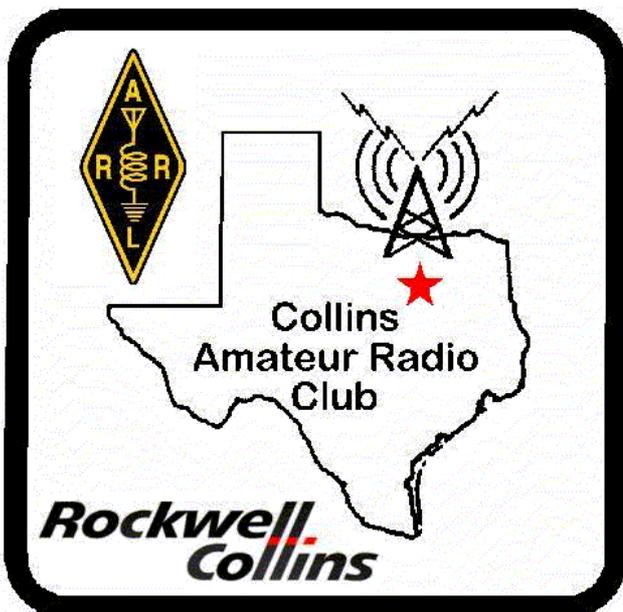
Amateur Radio Club

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

145.05 MHz

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

Tuesday 23 September 2014

1700 Social 1730 Meeting

Methodist Richardson Medical Ctr
At Bush/Renner/Shiloh Intersection

Second Floor Conference Room 200

NEXT SIGNALS INPUTS DEADLINE:

→→→ 17 October 2014 ←←←