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# SIGNALS

Rockwell Collins Amateur Radio Club

Monthly Newsletter of the

Volume 33 Issue 10

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

July 2012

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## RCARC Membership Meeting

Thursday, 26 July 2012  
1700 Social      1730 Meeting  
1800 Program

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

Subject:  
TBA—Come and See!

## RCARC participated in Bring your Child to Work Event



Paul Veenstra, KC0TEG) at Bring-your Child to Work Day.

## Local Club News

**Meeting Notice** Our Activities Chair was still working on the finalization of the program for the July meeting at *Signals* publication time, but as always, it will certainly be interesting and informative. So you are encouraged to attend this month's meeting.

### RCARC Members thanked for Siren Testing

Despite it being the Independence Day holiday, the Richardson siren test was performed as usual on Wednesday, 4 July. RCARC members Dennis Cobb WA8ZBT, John McFadden K5TIP, Andrew Robinson K5VRA and James Skinner WB0UNI were on station to observe the functionality of four of the city's twenty-two sirens. The following note of appreciation was received by email from the City of Richardson, "Thank you to all of you. We know you do NOT have to do this on a holiday but we certainly appreciate you! Happy 4th of July!"

Mistie Gardner  
EMC  
City of Richardson

This year's Bring your Child to Work Day was again a big success. About 50 employee's children and grandchildren engaged in several activities, including tours of their parents' work areas. Among their favorite activities was touring the club's Radio Room, where Paul Veenstra, KC0TEG, explained Ham Radio and demonstrated the operation of some of the club's radios.

### My All Time Worst TVI Case

Dennis Kippa (N5DPK) on June 8, 2012

My Ham radio interest started with my Uncle Elmer who repaired radios and TVs back in the day. He let me play with some of his old short wave radios and it was no time before I had the bug.

I took Novice license classes at the old Allied radio store in Glendale Wisconsin. That was a great store with a basement full of ham and ham related items.

A year later I upgraded to General and became the proud owner of a NC 183 and a Heathkit DX 100. Man, I was in tall cotton. I was operating mostly (Continued on page 4).

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### VE SESSIONS

**Dallas** tests are held 4<sup>th</sup> Sat of each month at 10:00. 13350 Floyd Rd. (Old Credit Union) Contact Bob West, WA8YCD 972.917.6362

**Irving** tests are held 3<sup>rd</sup> Sat. of each month at 09:00. 5<sup>th</sup> 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 Janet Crenshaw, WB9ZPH, 972.302.9992.

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

**Greenville** testing is on the Saturday after 3<sup>rd</sup> 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

Greetings to everyone,

Well, it has been quiet on the club front this month. I hope you're staying cool in all of this heat. There has been some club participation in the FiFi B-29 special committee as a recent radio dedication ceremony was held at the old Collins hangar in Addison, to help honor the veterans who flew in the B-29 during their service. There was a good number in attendance, I understand, and the club will be voting to help cover some of the costs for this dedication. Also, be on the look out for FiFi on the air, as she is traveling to Cedar Rapids and to Oshkosh. Operators from our club will be on board making QSOs. Thanks to Bob Kirby – K3NT and Loney Duncan – W0GZV for their efforts during the flight.

This weekend, I'm writing this from the Corpus Christi area. I've set up mobile operations along the beach in Port Aransas and have made a few QSOs today. It's been fun and challenging, since I left all of my tools at home. No prob – Hams just have to improvise. And I'm thankful for bringing a roll of Masking Tape. What a resource! So, without a soldering iron and all of the tools, I was able to setup an inverted V. See the picture below for more details.



Well, back to the beach. Please consider coming to the club meeting this next week. I would like to ask what we can do, as a club, to make our meetings more meaningful for you and to also see what kinds of activities you all want to do as a club.

73,  
Michael Ketchum  
K5MDK  
RCARC President

## Secretary's Report

28 June 2012

The meeting was called to order by President Michael Ketchum K5MDK at 1730 with the Pledge of Allegiance.

The following attendees were present at the meeting:

Larry Creech	KC5LOP
Michael Ketchum	K5MDK
John McFadden	K5TIP
Steve Phillips	K6JT
Mike Schmit	WA9WCC
Jim Skinner	WB0UNI
Bill Swan	K5MWC
Joe Wolf	N5UIC

### Officers and Committee Reports:

*President's Report:* The President's report is in the news-letter.

*Vice-President's Report:* There was no Vice-President's report

*Secretary's Report:* The Secretary's Report is in the news-letter.

*Treasurer's Report:* There was no Treasurer's report.

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

*Station Trustee's Report:* Steve Phillips K6JT reported successful station operation for field day. Steve reports that the BBS signal level is low. The repeater power project still needs batteries and labor to install.

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

*CAF Restoration:* B29 ART 13 / BC 348 radio position dedication will be June 30 at Addison Airport.

### Old Business:

*Projects:* 220 VAC drop complete, different plug required.

*Field Day:* There were 559 QSO's resulting in 800 points. Joe Wolf N5UIC reported that facilities turned off the noisy air handlers which greatly improved Field Day operation.

### New Business:

Steve Phillips reports a new antenna is required for the packet station. A great deal of message traffic is passed through the packet station.

Michael Ketchum K5MDK discussed how to renew ARRL membership through the club so that the club receives a portion of the fee.

### Adjournment:

The meeting closed at 1756.

### Program:

There was no program this month.

## Radio Merit Badge "Doubleheader":

by Allan R. Batteiger, WB5QNG on June 21, 2012

Preparedness was the theme of the day as over 212 Boy Scouts from three states came together this month for the annual Radio Merit Badge program at Ham-Com 2012 (June 8-9), the state's largest Amateur Radio convention in Plano, Texas.



Group Photo is courtesy of Paul White.

Scouts learned new skills and got a close look at the latest Amateur Radio gear during the day-long event at the Plano Convention Center.

This popular Radio Merit Badge program strives to cover all of the badge requirements in a fun and interactive way, and to highlight the importance of Amateur Radio as an emergency preparedness tool. Scouts at this year's event enjoyed special speakers, class participation activities and actual on-air contacts with radio "hams" around the world.

Citing the need to "plant seeds for the future," Ham-Com began sponsoring the program a decade ago at their annual Amateur Radio convention by offering free admission and meals to Scouts in uniform. Their goal was to inspire Scouts to pursue Amateur Radio as an avocation, or to perhaps put their newly-learned radio skills to use during times of disaster when normal communications systems are knocked out.

Richard Phillips and James Alderman have been conducting the day-long program at Ham-Com for the past eight years and have seen attendance levels steadily increase. They estimate close to a thousand boys have been through their program so far.

As the Radio Merit Badge program has gained popularity in the Scouting community, Ham-Com's support has grown also. Now Scouts can take their Amateur Radio license exam at no charge during the event.

Allan Batteiger teaches Amateur Radio license classes in the local community and heads up the exam team for the event. This year two lucky Scouts who passed their license exams were each presented with a special bonus—a brand new ICOM V80 handheld radio and matching antenna courtesy of Ham-Com and Diamond Antenna Corporation.

Event organizers faced a unique, although daunting challenge this year when a computer glitch failed to shut down the online class registration system once all available seats were filled. By the time the error was discovered, almost 600 boys had signed up for the Radio Merit Badge program—three times more than the classroom would seat!

Phillips and Alderman decided to try and accommodate overflow crowds by making this year's program a "double-header"—two Radio Merit Badge programs back-to-back in a single day.



*In the Awards Photo from Left to Right: Bill Nelson AB5QZ, Dee Miller N5UJG, Allan Batteiger WB5QNG, Fred Varian WD5ERD, Venture Scout Aaron \*\*, Boy Scout Caleb \*\*, Jim McClellan N5MIJ. Photo is courtesy of Jerry Karlovich.*

Even with two packed sessions, scores of boys who had pre-registered had to be turned away. But stay tuned! Another Radio Merit Badge class is being planned for later this summer.

\*\* Scouts under the age of 18 only first names given per BSA policy. Photo Releases are on file.  
(Article courtesy of eham.net)

**My All Time Worst TVI Case** (Continued from page 1) on 80 and 40 and was very proud of myself as I had no TVI of any kind with any of our neighbors, except for getting into the phone system at the house. Good old Ma Bell took care of that problem.

Of course that is when the problem started. Mom came home one day from shopping at Bay Shore shopping center just 200 yards from my 80 meter dipole and announced that she could understand every thing I said on the 40 TVs that were turned on at the Sears and Roebuck store. I knew this was going to be a problem.

Later that afternoon I got on my bike and rode over to the store to try and fix the problem before it got out of hand. I asked to talk to the manager of the TV department and was introduced to a gentleman named Mr. Miller. I explained to Mr. Miller that my Mother had heard me as she walked by the store display and I was there to help cure HIS TVI problem. Now to say he did not take what I said well, from a 13 year-old wise-a\*\* is putting it gently. He told me he was going to put a stop to my interference and the FCC was going to take my ticket away.

War was the first thing that came to mind but I bit my tongue and asked if it would be OK if a few members of the Milwaukee Radio Club could help identify where the problem might be.

That question was answered with a loud HELL NO and things went downhill from there. So I left the store and jumped on my bike and back to the house I went. I fired up that DX 100 and gave them hell. Called CQ in the middle of the day on 80 until I thought they had enough, I got back on my bike and rode by the store windows in front of the TV department and all the TV's were off. Sometimes I was a bad boy!!!

Well, a week later while I was at school a Ham from the Milwaukee Radio Club called my Mom and he explained that Sears had called them for help after the Sears technicians could not solve the problem much less find it. The club did a site survey and found all the TV's were feeding off one Yagi antenna through an amplifier and twin lead to each TV. Sears would not change a thing until the FCC was called and my station inspected.

It took the FCC Chicago about 2 weeks to show up with a few of the Ham's from the Milwaukee club. They came down into the basement and looked everything over real good. I made sure every thing was right with grounding, coax fittings tight, Hi pass and low pass filters on my parents TV and the DX 100. I had double ground's on everything. They found everything up to snuff. I was clean! The news for Sears was not so good. I later found out the FCC mobile unit could take out all the TVs, radios and the intercom system at the Sears store with less than 10 watts.

Sears finally got rid of the TVI with filters on everything, coax instead of twin lead and a new roof mounted antenna that pointed at the TV towers instead of my dipole. Yes the antenna was pointed the wrong way.

The whole episode did teach me to stick to my guns if I thought the fight was worth it, but make damn sure everything is right on my end.

To this day every time I pass a Sears store I think of those day's and the TVI from hell. (Courtesy eHam.net)

## Proper Choking Motor Leads of Remotely-Tuned Antennas

By Alan Applegate, KØBG,  
<http://www.k0bg.com>

This subject has been covered by yours truly, several times previously, so it's redundant for many. However, for the newcomers to mobile operation, it is of paramount importance. It is also important for those living in restricted areas who use mobile antennas to escape the HOA patrol.

To set the pace as it were, let's look at the basic reasons behind the need for the choke.

Remotely-tuned HF mobile antennas come in a variety of styles, lengths, and layouts to fit just about any situation and/or budget. Some are more efficient than others, some are light-weight, and others are truly heavy. Their color, fit, and finish all vary too. Depending on the manufacturer, the methodology used to change the resonance (tune the antenna in common parlance) may be different. However, one item they all have in common, is a DC motor! The polarity of the power fed to the motor determines the direction the motor turns. The motor then moves some part of the antenna back and forth, up and down, or in and out, to achieve resonance.

Another commonality is the fact the DC motor is mounted inside the mast portion of the antenna. Exactly where it is mounted (distance from the mounting base) depends on the manufacturer. This fact means there will be RF current flowing on the motor leads. The level of current is dependent on several factors, which we'll explore as we go. It should be noted that this current flow is *referred to* as common mode current.

In order to tame the common mode, we simply use an adequately-designed choke. This choke should be installed as close to the base of the antenna as possible, and on the outside of the vehicle. It's important to remember, that any portion of the motor leads before the choke are part of the antenna system. If you mount the choke inside the vehicle, you're essentially placing part of the antenna inside the vehicle. There is a hidden factor here which needs to be mentioned; if the RF can get out, it can also get in! Since the inside of a modern vehicle contains most of the electronics, it's almost as RF noisy as the underside of the hood! Thus, both ingress and egress RFI become very troublesome.

**Digressing.** *Aside from the aforementioned RFI issues, inadequate choking will play havoc with computerized controllers, no matter who made them. This is especially true of those controllers which utilize a turns-counting reed switch, whether automatic or manual. There are a few who will argue about the need for any choke, or for the ones described herein, especially when a manual controller is used. If you're in this camp, reread the last paragraph.*

Purists often challenge rules of thumb, and rightly so in some cases. However, in this case it's hard to argue the logic, and when it comes to motor lead chokes. So, here's a well-established rule of thumb, you can't go wrong with. The impedance of the choke in question should be at least two magnitudes greater than the impedance of the circuit we're trying to choke in the first place. Assuming the impedance is 50 Ohms (a nominal number for a properly-matched HF mobile antenna), the requisite choke needs to be at least 5k Ohms. There are cases where even this amount of impedance is inadequate, and those need to be mentioned.

Every HF mobile antenna installation will exhibit some amount of ground loss. Popular references state the loss to be from 2 to 10 Ohms (10 meters through 80 meters), but the truth is, it can be several times these assumptions. Poor mounting location, poor mounting style, and poor antenna design add to the losses encountered. The higher the ground losses, the higher the common mode current, and the higher the choke's requisite impedance has to be.

**Digressing again.** *The level of common mode flowing on the coax cable is also dependent on the ground losses. If the antenna in question is properly mounted, the level will be somewhat less than that flowing on the motor leads. Nonetheless, the choke needs to be on the outside of the vehicle for the exact reasons mentioned above. The only difference then, is the requisite impedance, which will be less.*

Ferrite split beads may be used for both motor lead, and coax chokes. The correct mix (ferrite material formulation) is 31, and for our exercise, the 3/4 inch ID units are the ones of choice. You could use mix 31 toroids, but they are harder to wind, and are somewhat more expensive. These specific split beads maybe ordered from [AES](#), [DX Engineering](#), [HRO](#), [MFJ](#), and most established amateur radio dealers. Avoid surplus ferrites, and those sold by Radio Shack as they are inadequate for the task at hand.

The photo below shows a completed motor lead choke wound on a mix 31, 3/4 inch ID split bead. The white tape is 3M #27 glass tape. Other types may be used, but in any case *do not* cover the complete choke. Contrary to popular belief, they're weather resistance. Enclosing them will allow accumulated moisture to freeze with predictable results.



The other photo below is that a coax choke with 6 turns of RG8X through the bead, and provides approximately 2,500 Ohms of impedance.



If your remotely-tuned HF mobile antenna is equipped with a turns counting reed switch which isn't being used, its leads should be hard-wired to the antenna's mast, and not left hanging or worse, grounded! If they are needed by the controller in use, a separate choke should be wound for these leads. Winding both switch leads and motor leads together in one split bead, will result in an inadequate amount of choke impedance for both sets of leads.

***Digressing once again.*** A 3/4 inch ID, mix 31, will have a single turn impedance of 69 Ohms (+0%, -20%) at 10 MHz. Since the amount of reactance is to the square of the turns, the six turn coax choke shown has an impedance of 2,484 Ohms (6 x 6 x 69). However, there will be some stray capacitance between turns, so on average the choke will have 2,100 Ohms of impedance.

*The motor lead choke shown, has 13 turns, for a total of 11,661 Ohms. Here too, there is some stray capacitance, so the average of a correctly wound choke will vary between 9 and 10 k Ohms. The key words here are correctly wound, and that's what the rest of the article is about.*

### **The How To Section**

You will need three things. Quite obviously, you'll need a Mix 31, 3/4 inch, ID split bead. Again, you need Mix 31! Not Mix 43! Not Mix 67! Nor any other, but Mix 31! *Period!*

You will need a length of stranded wire, and certainly not solid wire! The recommend wire is [Carol Cable Division](#)<sup>®</sup>, E10325.18.10 or equivalent. This wire is 18x2, 7x32 strand, with a conductor diameter including the insulation

of .068 inches. It is enclosed in a gray (sometimes brown) vinyl outer sheath with a fiberglass pull wire enclosed. It is commonly called *security wire*, but may be labeled *speaker wire* in some retail stores. [Home Depot](#), [Lowe's](#), and others carry this exact wire.



You'll need about 60 inches of wire. It really takes just 50 inches to wind the choke, but the extra length aids in the winding process. While you're at it, buy enough to run from whatever controller you're using, all the way to the antenna. The outer sheath is tough stuff, and just what you need in a mobile installation.

You'll need some tape. As mentioned above, the tape shown is [3M](#), #27, fiberglass tape, 1/2 inch wide. It is available from a variety of sources, including [Amidon](#), and most Ace hardware stores. You can use electrical tape in a pinch, but #27 has many other uses around the shack as the Amidon web site attests to. This includes winding baluns, and ununs. It's self-vulcanizing, and once the sun gets to it, it becomes very difficult to remove. It is also waterproof.

The first thing is to remove the outer sheath from the cable. This is easy to do if you cut back a few inches of the sheath. Note the fiberglass pull string in the photo. Just grab the pull string and strip off the outer sheath from the conductors, and discard the sheath and pull string

Untwist the conductors, and lay them out parallel. Take out any kinks, and make them as straight as possible. If you have a vice, you can clamp the wires on one end, and pull them through a shop rag. Again, make sure they are straight, and parallel.

Cut off 5 or 6 pieces of #27 tape, 1/2 inches long, and apply them to the straightened wires, about every 12 inches

or so. This helps maintain the parallelism of the conductors, assuring they remain untwisted; an *absolute requirement* when winding the choke. Also note the tape covering the ends of the wires. This aids in stringing the wire through the split bead.



Look closely at the photo below. Note the ends of the wires are taped to the split bead. This holds it in place as the winding is started. At this point, there are two sides covered; one with two turns, one with three turns *through the core*, not the outside!



If you've gotten this far, recheck your windings. Make sure none are over-lapped, or twisted. Again, it is *very* important that the wires are not overlapped or twisted. Continue threading the wires through the split bead. You should have three turns on each side once you're done.

This is a total of 13 turns through the completed choke (12 turns outside, 13 turns inside).

When you get back to the starting point, carefully cut the tape holding the starting end, and finish winding the last turn (number 13). If you didn't get 13 untwisted, non-overlapped, turns; *start over!* If you only got 5 to 8 turns, it probably means you used the wrong wire (too large of an OD).

Two lengths of #27 tape wound around the choke as shown in the right photo, will assure the wires stay in place. It is not necessary, *or advisable*, to cover the whole choke with tape. About all that does is hold in any collected moisture. Contrary to popular belief, nothing short of encasing the choke in a block of ice will damage it. It should be secured in some fashion (a single TyRap® will suffice) to keep it mechanically stable.



The photo above shows the completed choke with a Molex connector attached (also note the TyRap®). Some may scoff at using a Molex connector for connections exposed to the weather, but the truth lies elsewhere. Far too many rubber enclosed connectors allow water to seep in, where it stays put, and corrodes the contacts. Molex connectors get wet too, but they dry out very quickly. In any case, some form of quick disconnect is in order for obvious reasons.

One thing you don't want to do, in case you missed the point alluded to above, is cover the connection with tape, or coax seal. If the connection gets wet, let it get wet. If you put tape around it, water will still seep in, and there it will stay with predictable results.

There you have it. Motor and/or reed switch lead chokes are easy to wind if you follow the directions, and use the correct material. To reiterate: Mix 31 bead; .068 OD stranded wire; 13 turns; not twisted; and not overlapped. Anything less, start over!

(Reprinted by permission from Alan Applegate, KØBG)

# 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

145.01 MHz

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

Thursday, 26 July 2012

1700 Social

1730 Meeting

Methodist Richardson Medical Ctr  
At Bush/Renner/Shiloh Intersection

*Second Floor Conference Room 200*

**NEXT SIGNALS INPUTS DEADLINE:**

**→→→ 12 August 2012 ←←←**