



# The Repeater

## Next Club Meeting

Thursday,  
June 6, 2013, 7:00 PM  
Note different location:

102 McDonough Rd.,  
Gold Hill OR 97525 (see map this  
issue).

Program: Lud's Radio &  
Vacuum Tube Museum

Volume 2013, Issue 6

June 2013

Jeff Statchwick	W7KNX	(541) 951-0488	<a href="mailto:w7knx@arrl.net">w7knx@arrl.net</a>	President
Scott Cummings	KD7EHB	(541) 282-9776		Vice President
Lud Sibley	KB2EVN	(541) 855-5207		Treasurer
Allan Taylor	K7GT	(541) 855-2054	<a href="mailto:k7gt@charter.net">k7gt@charter.net</a>	Secretary
Tom McDermott	N5EG	(541) 734-4675	<a href="mailto:n5eg@tapr.org">n5eg@tapr.org</a>	Newsletter & Membership
Dave Basden	W7OQ		<a href="mailto:dave@basden.us">dave@basden.us</a>	Webmaster
Joe Gunderson	AF7GN	(541) 941-7186	<a href="mailto:RVARC.PIO@gmail.com">RVARC.PIO@gmail.com</a>	Public Info Officer
Club Web Page:			<a href="http://www.qsl.net/w7dta">http://www.qsl.net/w7dta</a>	

### President's Letter

As we make final preparations for Field Day 2013 I would like to encourage everyone in the club to get involved. There are opportunities to help set up and/or tear down, operate, assist operators, help welcome visitors or simply come by and socialize. There is something for everyone at Field Day. We will begin setting up on Friday, June 21<sup>st</sup> around 12 noon at Table Rock Park. I Hope to see you there!

Our club treasurer Lud Sibley, KB2EVN, is the President of the Tube Collectors Association (<http://www.tubecollectors.org/>), dedicated to preserving electron tube history.

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*The Repeater* is the official newsletter of the Rogue Valley Amateur Radio Club, Inc. It is published 10 times a year—once per month excluding July and August.

### Secretary's Report

May 2013 RVARC meeting held May 2, 2013 at Red Cross building, Medford OR

Meeting brought to order at 1700 PDT.

Visitors: N0TOT Don Miller  
N7QDB Larry Winebrenner  
Don Christian

Treasurer's report: current balance of \$4096.01

Old business: Field Day for 2013 was discussed. Tom reported on the FD planning committee meeting held earlier in the month. The present and future FD efforts need an available tower. In the discussion, Vern Hajek, K6UGS offered his 40 foot aluminum tower as a possibility for this year.

*(Continued on page 2)*

## President's Report, Cont'd.

*(Continued from page 1)*

Lud has beautifully restored the old Sam's Valley Schoolhouse and has a stunning collection of electron tubes and vintage radio equipment on display.

Lud and his wife, Marilyn have graciously invited our club to hold our June meeting at their residence and tour the beautifully restored facility and enjoy the vintage displays.

We will be meeting at the normal time, 7pm on June 6<sup>th</sup>. The address is 102 McDonough Rd., Gold Hill, Or. The presentation will be a tour of the schoolhouse and vintage electron tubes. You don't want to miss it!

I hope to see you all there,

Jeff W7KNX

## Ham License Classes

The General License Class will commence Sunday, June 9th, 3:00 pm to 6:00 pm at the Smullin Center, located at 2825 E Barnett Rd, Medford, OR 97504, adjacent to Rogue Regional Medical Center. To make the reservation for this class please contact me via the following:

(541) 941-7186 or email at

[RVARC.PIO@gmail.com](mailto:RVARC.PIO@gmail.com)

Space will be limited and I have commitments from 10 people from the Tech Class that will be Hams on this coming Sunday. Space is limited so the earlier people reserve the better or they might not get in.

73 - Joe AF7GN

## Secretary's Report, Cont'd.

*(Continued from page 1)*

New business: AB7GN, club PIO, asked for a dispersement from club funds to fund a set of General class license books. \$22.46 ea. Was voted on, passed.

Jeff, W7KNX, mentioned 7QP and the efforts of him, Scott, and others combined with a similar group from the Grants Pass club. They will be on 'all' bands from King Mountain, hopefully on a triple-county boundary.

Bill, W7QMU asked the club membership for help installing an antenna for a local ham. Bill also had some historical items to donate (old club QSLs, etc.)

Presentation: By Jeff, W7KNX, was on Field Day 2012. Presentation complete with appropriate pictures.

Next meeting: June 6 at Lud's place in Sams Valley. Maps will be available in the newsletter.

Submitted by Allan Taylor, K7GT

**Amateur Radio for Now and the Future  
Joe Gunderson AF7GN, PIO**

Now that the Tech Class has ended, things are settling to a dull roar for the instructors. We had a class of 10 + 2 techs auditing the course. After the test we will have 2 sessions where the hams will learn and build a couple of antennas to introduce them to the wonderful world of building your own stuff on the cheap. This should prove to be a positive addition to the course. Also a note of interest they're 5 females (41.7% while there are only 15% hams are female nationwide) in the class and 2 young adults. The results of the testing are as follows; We had 7 take the test and now have 7 brand new Techs. The 3 students that didn't take the test had Mother's Day commitments and will take the test Friday in Grants Pass.

We welcome Bill Shrader, W7QMU as another instructor for our club, he will bring a lot of experience and expertise to our program. We are currently working on power point presentation for the General Class license, as there are no current presentation available to fit our needs. The first General Class will be June 9<sup>th</sup>, Sunday at the Smullin Center for 8 to 12 weeks. I already have 11 people pre-registered for this class, so if you are interested in upgrading, you need to be quick to grab a slot. The reason for the variation time is we will be accessing the class

and curriculum as we go.

There will be a new Tech Class starting September 8<sup>th</sup> and we already have 2 people signed up. The classes are being listed on ARRL website and radio and TV bulletin boards. I am also trying to bring some seminars for different aspects of the Extra Class License, I am even toying with putting together a class for Extra Class, but I need a lot of help.



**Meet our newest hams!**

From left to right, Troy Masterson (now KG7DNM), KC7WWJ Jackie Wobbe (audited the course), Vicki Carlson (now KG7DNH), Haily Fox (now KG7DNI), Rebecca Fox (now KG7DNK), Josh Fox (now KG7DNJ), Trevor Fox (now KG7DNL) and Mike Benton (now KG7DNG). A hearty congratulations to all! Haily is 10 and Trevor is 12.

I am looking for individuals to volunteer to be instructors for the duration of one class or possibly more, if someone is interested please contact me as I would like to rotate instructors to keep the class fresh and the instructors sane (it is to late for me, plus I love the rubber room).

We are also working on making this the best

*(Continued on page 5)*

**K7LIX—7QP Multi Op / Multi Transmitter LP County Expedition  
Scott Cummings, KD7EHB**

It all started when Ron KF7IBN mentioned to Rob W7GH that sometime they should do something to combine camping and ham radio. Just over a month ago, Rob said why not a Field-Day-style county expedition effort in 7QP? The idea snowballed with sudden speed, and a week later we had six people on board from two ham clubs, Southern Oregon ARC in Grants Pass and Rogue Valley ARC in Medford. Two more people signed on the week of the contest. None of us were hard-core contesters, but we decided to do as serious an effort as we could manage on short notice.

Originally we considered a Forest Service campground, until Carl W7BRO casually mentioned that there is a three-county point on King Mountain where Josephine, Jackson, and Douglas counties meet. Wonder of wonders, the three-county site at 5,100' (1,550 m) actually turned out to be suitable, with reasonably level ground and plenty of natural antenna supports (some people call them trees). We also had good luck regarding weather: the last of the snow was rapidly melting on contest weekend, although the wind tore through the trees most of the time. Most of the contest we had two radios going in two popup tent trailers. For a while we had a third radio on 6m, until SOARC's venerable TS-850S went kaput.

We had a tribander yagi on a 30' (9 m) alu-

minum tower that worked very well, given the drop off to the east. We had plenty of wire antennas. We didn't have any first-rate contesters along with us, and we all had a great time learning as we went along. Rob W7GH and Steve K7KO, our CW guys, had never really run stations before. The first time felt like drinking from a fire hose apparently, but somehow they got it together and felt reasonably comfortable doing it by the end of the contest, although the grins on their faces took quite a while to subside. The SSB effort



was ably led by Scott KD7EHB and Jeff W7KNX. The rest of the crew, Dan KF7IBL, Ron KF7IBN, Carl W7BRO, and Joe AA7JS, learned very quickly and were soon running stations themselves.

All in all, it was a fantastic fun time that none of us will soon forget. Several of us were introduced to serious contesting for the first time (Field Day doesn't count). Everyone pulled together admirably, and everyone

*(Continued on page 5)*

## 7QP County Expedition, Cont'd.

*(Continued from page 4)*

made vital contributions to the effort. Ron, Steve, and Joe served up some fantastic food. What a wonderful weekend. We're already talking about next year!

Club: Southern Oregon Rogue Contesters  
Call: K7LIX  
Operator(s): K7KO KD7EHB KF7IBL  
KF7IBN W7BRO W7GH W7KNX

### Summary

Band CW\_Qs Ph\_Qs Dig\_Qs

160:

80: 201

40: 394 240

20: 333 337

15: 156 554

10:

6: 3

2:

Total: 1084 1134 0 Mults 67

Total Score 369,840

All Canadian provinces and 49 states worked, all ten DX multipliers worked. Three county line, Josephine, Jackson and Douglas

## Amateur Radio for Now and the Future Cont'd.

*(Continued from page 3)*

Field Day ever, in-fact we have garnered the help of this ending Tech class in this endeavor, but we could always use more help. It would be fantastic if the whole membership came down to field day to mingle, converse and see what is going on. Your support would be greatly appreciated, and we need the points so please sign in at the information booth. This year due to the lack of operators we are operating as a class 2A event.

For those wanting to know what happened with getting a booth for the Fair, well, simply put they wanted us to pay for space. It seems that the fair is strapped for cash in this economy, and there may not be a fair next year because of it. So coupled with cost and lack of actual volunteers ( had a total of 3 including me) we won't be having a booth there unfortunately.

Also, on a personal note, is someone in our club a welder? I need some welding done for an antenna mount on a hitch. If some could help me out I would appreciate it.

Amateur Radio Fun Trivia: **K2GL Hazard E Reese** - Invented the Stereophonic Sound System used with Cinerama which first was introduced in the early 1950's with a wide-screen to compete with early TV. He was also an avid radio contester being #1 on "CQ' Magazine Contest Hall of Fame" SK 23 December 1986.

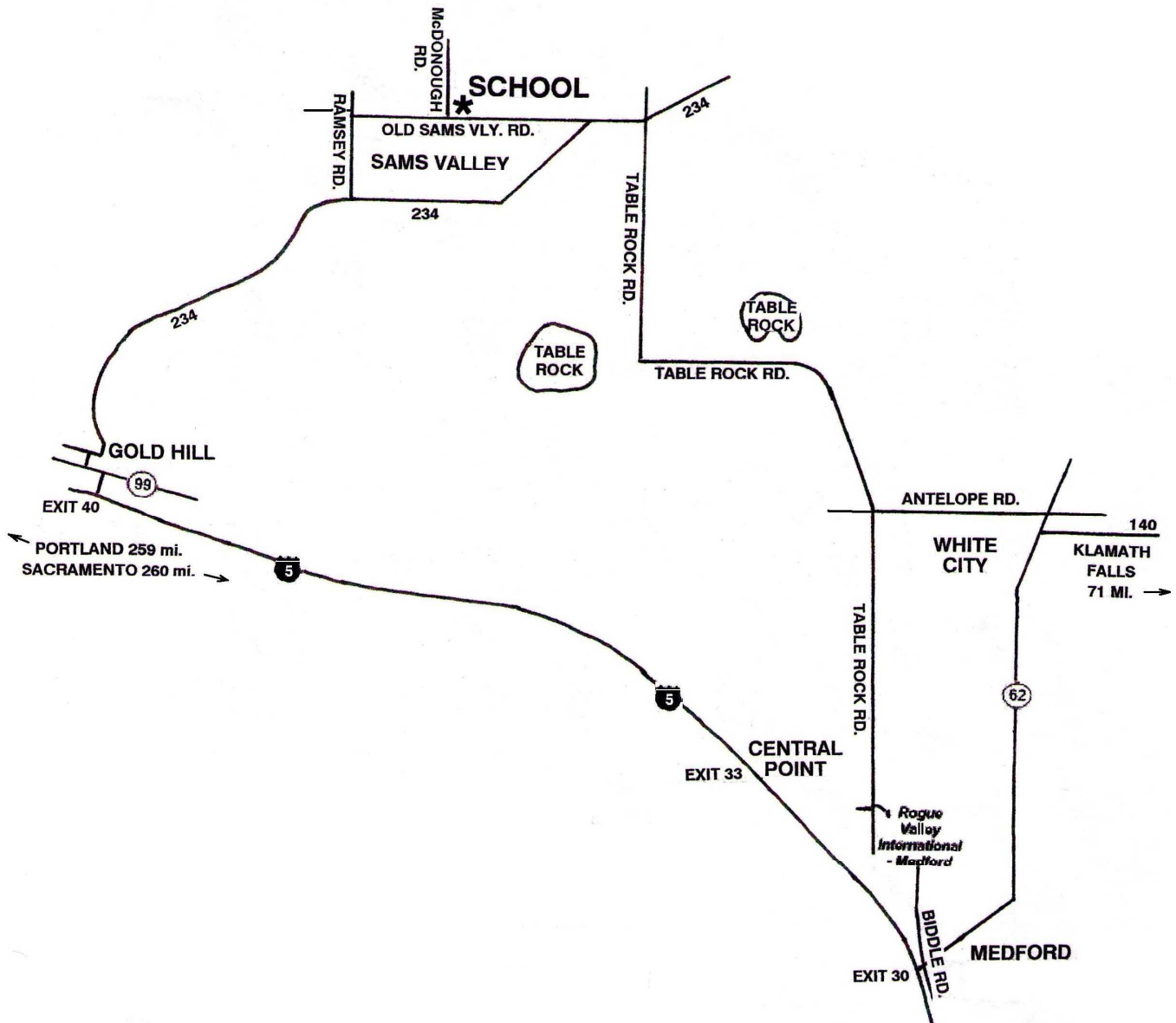
## Directions to June 2013 RVARC Meeting

102 McDonough Rd., Gold Hill, OR 97525

**GPS:** North 42d 29m 30s / West 122d 58m 27s (42.49167, -122.97425 )

### From Interstate 5, from South or North

- Take Exit 40 toward Gold Hill.
- Go ca. ¼ mi., turn left at “T” onto Hwy. 99.
- Cross bridge into Gold Hill.
- Take first right turn onto “Scenic Route 234.”
- Immediately cross RR tracks, then turn right at stop sign.
- Go east about 5 mi. on 234.
- Just after “7-mile” marker, turn left at “T” onto Ramsey Rd. / Sams Valley. Junction has large gray barn on left.
- Go 0.8 mi.
- Road turns to right and becomes Old Sams Valley Rd.
- Go 0.8 mi. Yellow two-story school visible on left.
- Turn left onto McDonough Rd. and immediately enter schoolgrounds.



## Radio Frequency Interference (RFI) and Suppression with Ferrites

Normal operation of an amateur HF station can sometimes lead to interference to home consumer electronic (CE) devices. This is sometimes due to consumer devices that do not meet FCC part 15 requirements for susceptibility, and sometimes due to large RF fields when consumer electronic equipment is operated in the near vicinity of an HF antenna.

Often the prescription “put ferrite RF chokes on the cables” of the consumer electronic equipment. This article will attempt to provide some answers to the following questions:

1. Will moving or changing my antenna have an effect?
2. Does it matter what type of ferrite choke is used?
3. Does it matter how many turns are wrapped around the choke?
4. Does it matter which leads are choked and which are not?
5. Are there other mitigation practices that can help?

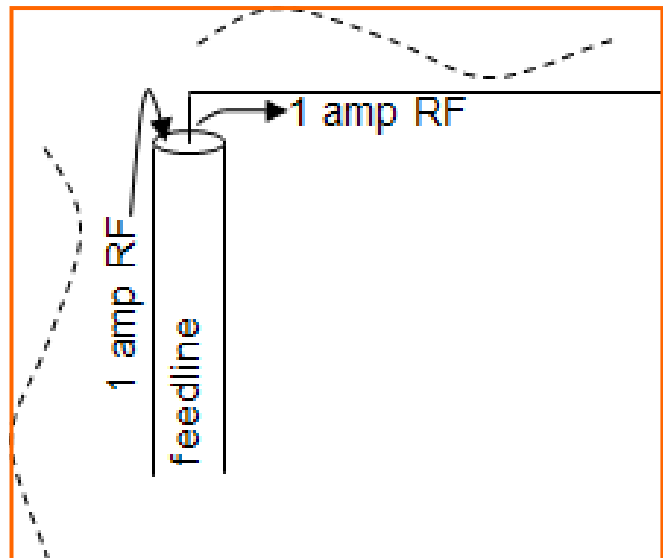
1. Will moving or changing my antenna have an effect?

Almost always, moving the antenna further away from the impacted CE equipment will help. This is because the strong fields around an antenna fall off quickly, generally as the square of the distance (i.e. doubling the distance cuts the field by a factor of 4).

Some types of antenna configuration can be extremely difficult to deal with—these many times fall into the category of an antenna that is missing a significant part of its normal radiating structure. The most common case is a long-wire antenna, another is the end-fed half-wave antenna. End fed antennas operate by current flowing into the an-

tenna element, and the same current flowing into the other part of the antenna. There's always that other part of the antenna present — even if we don't provide it. For example, if there is no ground present on a long-wire antenna, then the only place the matching current can flow is the outside of the feedline. The outside of the feedline is operating as half of the antenna, and it radiates just like the antenna itself. If such a feedline is brought into the house or shack, you are basically bringing one half of the antenna right into your shack, and you will have large RF fields right where you don't want them. If that feedline is 1/4 wave (or odd multiple) long, then the end nearest the transmitter will try to be a high-voltage point for RF. A long wire antenna must operate against ground, and a good ground it should be.

Similarly, an end-fed half wave antenna (of which a J-pole is one type [additionally containing an open wire feedline as part of the antenna] ) similarly must have an equal current on the feedline as is in the antenna structure. It's a very straightforward property



**Net current always sums to zero inside the coax. The inside of the coax does not radiate**

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## Radio Frequency Interference (RFI) and Suppression with Ferrites

*(Continued from page 7)*

of circuits—current has to flow into and out of the two source terminals equally (the source in this case being the end of the feedline). Again, the outside braid of the feedline becomes half of the antenna, and if it is routed anywhere near CE equipment, strong RFI is likely to result. An end-fed antenna is an anachronism, and planning for the other half of the antenna is much more successful than not planning for it.

At this point one sometimes hears advice “put an RF choke on the feedline”. In this particular case it may be a terrible idea. The reason is that the choke is forced to either handle a large current (which means it cannot do the job of choking current that is intended and it dissipates a large amount of power), or if the choke does reduce the current (by presenting a high impedance) then it is likely to arc over. Mother nature requires that second half of the antenna to be present. The best place for such a choke would be a quarter wavelength away from the antenna, thus allowing the 1/4 wave of feedline between the choke and the antenna feed point to act like an antenna. Note that this quarter wave is not reduced by the velocity factor of the coax because the antenna current is flowing on the outside of the coax, not the inside. The presence of nearby objects will however impact the radiation and length of the outside of the feedline (even coax) and thus determining the actual effective 1/4 wave length may be difficult indeed.

**Recommendation:** If the antenna is a bad design (end fed) then fix the antenna. An RF choke will be difficult or impossible to make work well. If the antenna is a proper design (center-fed, or fed against a good ground) then choking the feedline currents becomes a simpler task as there is an actual antenna to handle the currents. In this case a ferrite RF choke can be used to reduce the feedline

current (as the current now has someplace else to go—namely the antenna).

2. Does it matter what type of ferrite choke is used?
3. Does it matter how many turns are wrapped around the choke?

Yes—the type of ferrite used matters a lot. Older cores (orange, red, yellow, etc.) are usually powdered iron. Powdered iron has a low permeability (low  $\mu$ ) and thus it's difficult to wind enough turns of feedline around it to prove effective.

Most ferrites however have a much higher permeability and just a few turns of cable can provide an adequate amount of inductance against common mode currents. Ferrite has another property: some formulations have high resistive losses as well as inductance. In the case of common mode chokes, resistive loss is a good thing because it de-Qs the circuit, helping to avoid choke resonances that might compromise choking impedance at some frequencies. In general for HF, Mix 31 ferrite is a good choice. It has sufficient  $\mu$  that it can form a good choke throughout the HF range.

Multiple turns of cable through ferrite results in inductance that goes up as the square of the number of turns. Thus, three turns will have nine times the inductance of just a single turn choke. Additionally multiple cores can be stacked. Stacking the cores increases the inductance as the number of cores, thus 3 cores will have 3 times the inductance of a single core.

Increasing the number of cores increases the power dissipation that can be handled by the choke. More cores spreads the heat load across the cores, and thus can handle more power loss in the choke. The loss in the choke is due to its resistive losses and cur-



## Radio Frequency Interference (RFI) and Suppression with Ferrites

(Continued from page 8)

rent flowing through the core (which is what the choke is trying to prevent). When using cores to choke victim consumer equipment (CE), power dissipation is normally not much of a concern, so cores need not be stacked except for some unusual cases (at low frequencies).

Mix 61 is generally more effective at higher frequency ranges than Mix 31—so it may be a good choice at VHF.

**Recommendation:** four turns of coax through a stack of five 2.4 inch Mix 31 cores will provide an effective transmit choke that works even on 160 meters. It will be effective at 80m and above up through about 10 meters and will handle a large amount of power dissipation for use in high-power transmitting applications up to the full legal limit of 1.5 kilowatts

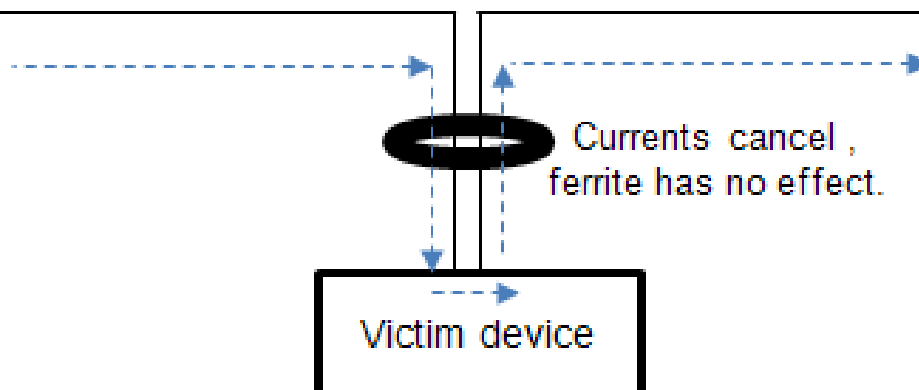
### 4. Does it matter which leads are choked and which are not?

Yes—it matters very much which leads on the victim CE equipment are wrapped around ferrite chokes. When there are multiple cables connecting to a piece of CE equipment, the leads can sometimes form a sort of dipole antenna. In that case, it is not effective to pass both leads that from the di-

pole through the same core. If this were done, then the (+) and (-) currents would cause opposing magnetic fields in the core that cancel each other out, and there would be little or no effective choking. In that case a separate ferrite choke is needed on each lead so that each core has a unique magnetic field.

Sometimes however the victim CE device has currents on the cables that are in-phase with one another with the exception of one cable (power supply usually). In that case wrapping the power supply cable through the ferrite and leaving the other cables untreated may prove effective while consuming only

Dipole-like differential currents are not suppressed with one ferrite core choke. Two are needed – one on each lead.



one ferrite core. Experimentation is required to determine if this is the case with any particular victim CE device and cable configuration.

Another particularly difficult situation occurs when the victim CE device (such as a TV set) uses an ungrounded power cable (a 2-wire cord) and the chassis of the TV set is fully insulated in a plastic case (this describes any TV set I've ever seen!). In this situation the victim antenna may prove to be

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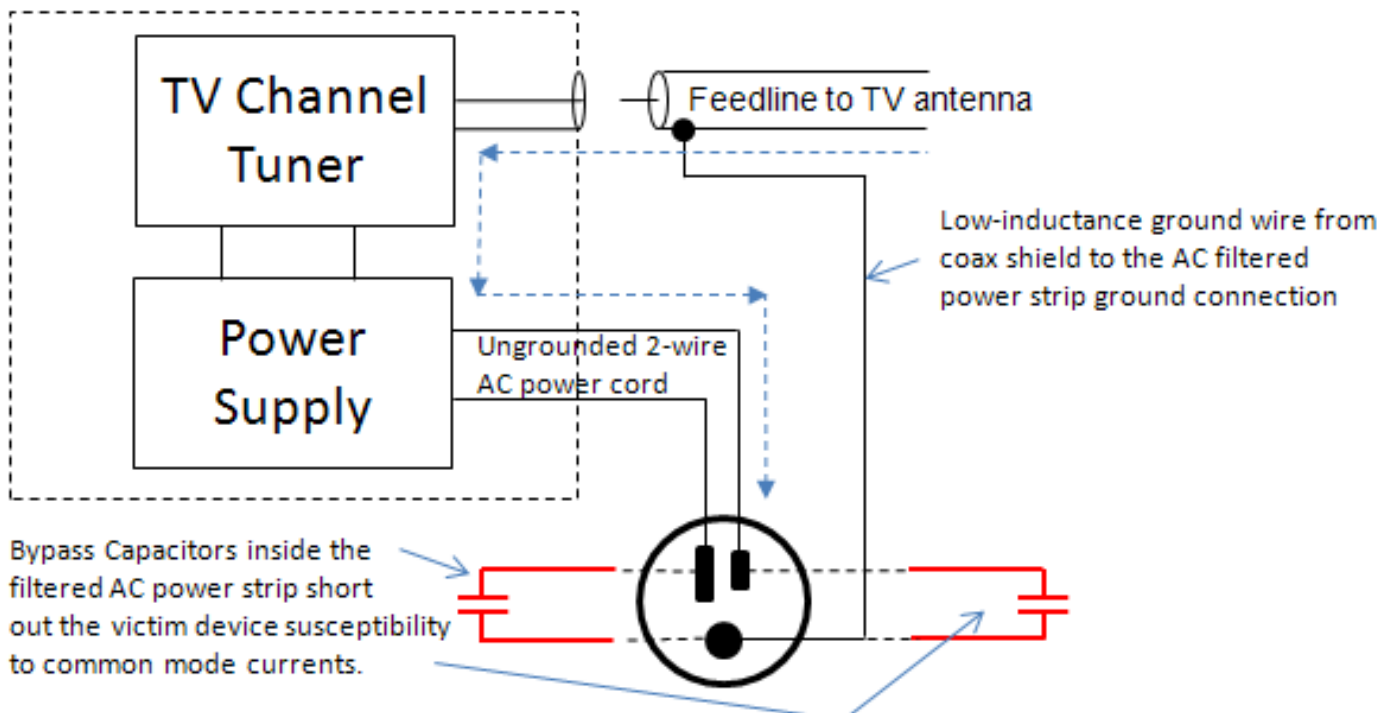
## Radio Frequency Interference (RFI) and Suppression with Ferrites

(Continued from page 9)

the shield of the antenna lead-in coax on one side, and the AC power cable and house wiring on the other side. The TV set and its internal power supply sit at the center of this dipole. The complication arises in that the dipole is not the ground wire of the power cable, but rather is spread across the two AC wires in-phase. Thus grounding the antenna lead in block doesn't really help much, and a ferrite choke doesn't help

use a filtered AC power strip with a grounding connection. The filter capacitors in the strip serve to bypass the AC lines to the ground terminal in the strip at radio frequency (RF). Then the lead-in coaxial cable is directly bonded to the ground connection on the AC power strip. This shorts out the victim device against common-mode RF antenna currents on the shield of the lead-in coaxial cable. Once the common-mode impedance of the victim device is lowered using the fil-

### Insulated Case



much. This is because the victim device, while having a 75 ohm differential-mode impedance, may have a much higher common mode RF impedance and it is just impossible to build enough choking impedance to do any good.

In this case one approach that is helpful is to short out the parasitic dipole antenna with a low impedance resulting in minimal voltage being induced across the victim (the internals of the TV set). One way to do this is to

tered power strip, an ferrite common mode choke in the feedline can be effective (it may or may not be needed after fixing the grounding problem).

**Recommendation:** provide an effective common mode RF bypass for insulated victim devices. Be careful to choke leads with differential current separately, rather than grouping them all in one choke.

(Continued on page 11)

## Review: Celestron Handheld Digital Microscope by Joe Gunderson AF7GN

I know what you're thinking what does a microscope have to do with Amateur Radio? A lot, I use mine for examining circuit boards for bad solder joints, cracks, suspect components, identifying components or anything else that these tired eyes have trouble seeing. I originally obtained this to work on HO model train cars, but saw the value in using it for electronics.



This microscope is powered by an USB2 port has 6 white LED's for illumination and a 2 megapixel camera. It will magnify 10 to 40X's on a normal screen, on a 19" screen a 150X's. It weighs 4 oz, measures 4.25" x 1.25". It comes with a sturdy stand, which can easily be removed to access larger items.

The software is easy to load, and the microscope is even easier to use. The Windows software provides image capture and measurement with a claimed accuracy of 1/100 millimeter (10 microns).

You can take pictures of problem areas so you have a reference when repairing and no room for the scope at the same time. This a must have for the serious ham projecteer.

I obtained mine from CCrane Company at <http://www.ccrane.com> for \$69.95 plus S&H, and received it 2 days later.

### RFI Suppression, Cont'd

*(Continued from page 10)*

5. Are there other mitigation practices that can help?

One thing to remember is that ferrite cores can easily be saturated by not only RF current but also DC current. The effective permeability of the core will be reduced by any net DC current flowing in the wires wrapped around the core. Thus, be sure to take care that the sum of all the DC currents in the core adds up to zero. For example if choking a DC power supply output, be sure to run both the (+) and (-) leads through the core the exact same number of turns and in the same direction. Make sure that the (-) lead does not have a sneak current path through ground that bypasses the (-) lead current through the core resulting in a difference in DC currents through the core.

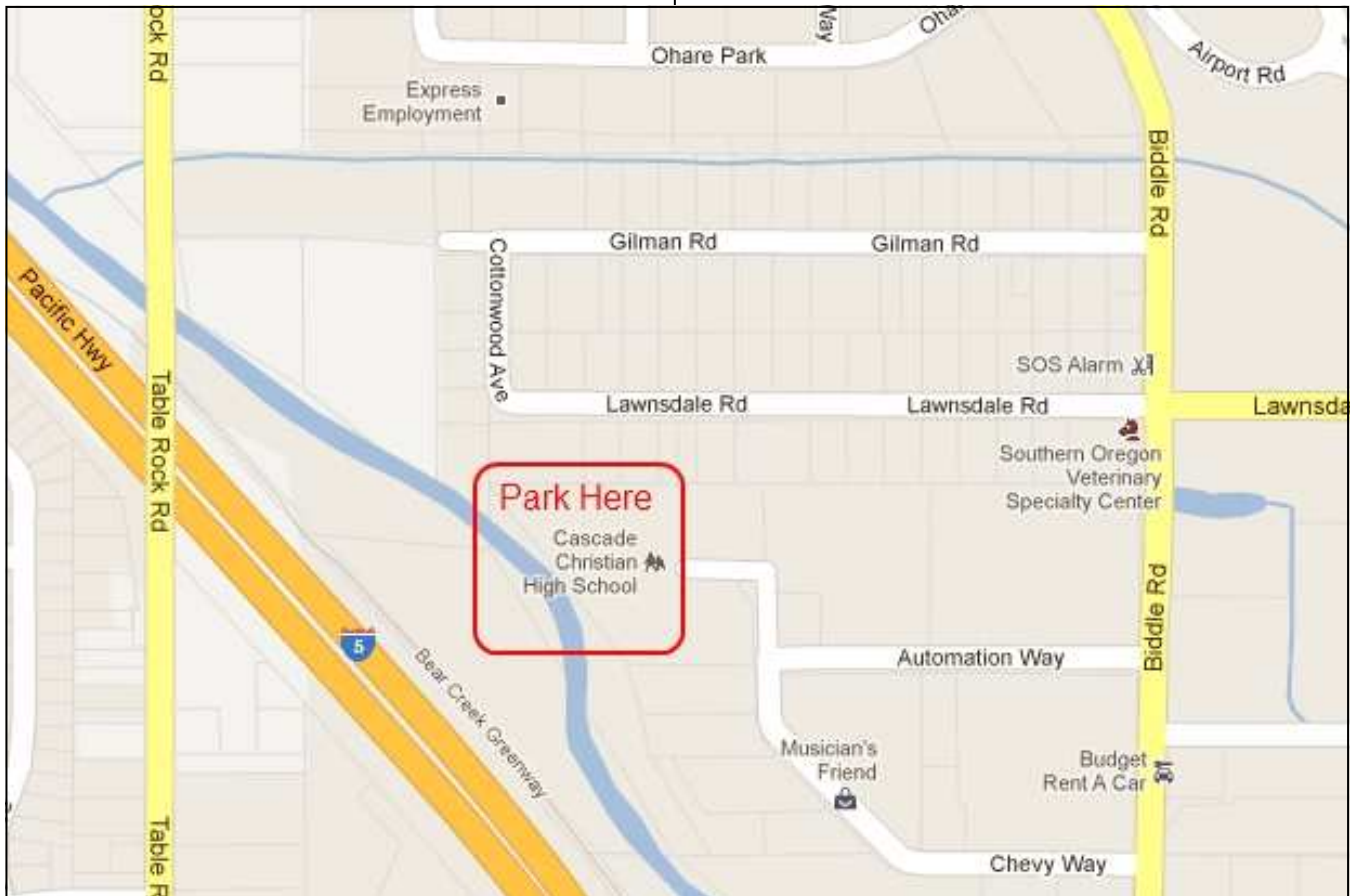
**Field Day is June 22, 23, 2013  
Table Rock Park, Medford, OR**

Field day runs from 11:00 AM Saturday, June 22 through 11:00 AM, Sunday, June 23, 2013. Our club will start setup on Friday afternoon at Table Rock Park.

Please park in the Cascade Christian High School parking lot (we have permission) as shown in the map below. It's just west off Biddle road near the Medford airport. Note

3. VHF/UHF station.
4. GOTA station. 4BTV vertical. Callsign will be **K7TFC**. We will also try to make some digital contacts, and may combine this with the GOTA station.

The GOTA station is specifically to help new hams, prospective hams, and anyone who is a little rusty to get on the air, try a new mode,



that there is no access to the park from Table Rock Rd.

Plans for Field Day include operating **W7DTA** as **2A Oregon**.

1. CW station / TH5 tribander / crank up tower.
2. Phone station. We're trying to get a tribander and tower. Otherwise dipoles.

and just have some fun.

We will have dinner Friday night after setup, and Saturday night. There will also be coffee Sunday morning (when it's desperately needed by some of us).

See you there.

## RVARC Dues are Due

RVARC membership dues run from January 1 through December 31. Please bring cash or a check payable to RVARC to a club meeting, or mail (checks only) to:

RVARC Membership  
c/o 102 McDonough Rd.  
Gold Hill, OR 97525-9626

Regular Member:	\$20.00
Senior Member (62 and over):	\$15.00
Family Member:	\$20.00
Student Member:	\$10.00

Summer vacation for the editor.

Please note that the next edition of the Repeater will be the September 2013 issue.

## Amateur Radio Examinations

In the Rogue Valley, amateur radio exams are provided by the RVARC and the SOARC. New exam participants need to provide identification, while upgrading amateurs need to **provide a copy of their current license** as well as show identification. The exam fee for 2013 remains \$15.00. All license candidates must provide a picture ID. Upgrading amateurs must also provide a photocopy of their current license to send in with their application. To search for other exam locations, see:

<http://www.arrl.org/arrlvec/examsearch.phtml>

### **Medford—Phoenix, OR**

**Time:** Saturdays, 8:30 AM. Exam session starts at 9:00 AM. Walk-ins welcome.

**Location:** Fire District 5 HQ. 5811 South Pacific Highway, Phoenix, Oregon 97535

**Dates 2013:** June 29 Oct 26

**Contact:** Don Bennett, Email: [kg7bp@rfwarrior.com](mailto:kg7bp@rfwarrior.com) Phone: (541) 973-3625

### **Grants Pass**

**Time:** Arrive 6:00 PM. Exam session starts at 6:30 PM. Walk-ins welcome.

**Location:** Fruitdale Grange. 1440 Parkdale Dr., Grants Pass OR 97527-5288

**Dates 2013:** May 17 Aug 23 Nov 15

**Contact:** John Stubbe, K7VSU, email: [K7VSU@arrl.net](mailto:K7VSU@arrl.net), Phone: (541) 218-2244

### ***Next Club Meeting***

**June 6, 2013, 7:00 PM**

**Note different location: 102 McDonough Rd., Gold Hill OR 97525 (see map this issue).**

**Program: Lud's Radio & Vacuum Tube Museum**