



May 2009

ROUNDTABLE

The Denver Radio Club Newsletter

Since 1917

PRESIDENT'S MESSAGE

By Gerry Villhauer-W0GV

Hello DRC Members,

The late snows we have had recently have sure been a welcome site. Better weather is on the horizon for all those outside antenna projects. Thanks to all who participated in the April 16th flood exercise in Boulder. The report from Mike, KB0PVD, from The Salvation Army, declared it a great success. Bob, KB0BZZ, did a great job of coordinating the communication activities and listed several suggestions for improvement. Again, thanks guys for another great job! Our next field activity will be June 6th for the Charity Run in Golden Gate Canyon. I know some have signed up for this but we can always use more help. Come volunteer, you will get a lot of personal gratification helping a good cause and some great radio practice. Please contact Oscar, K0SSE, to sign up. And please don't forget Hamcon Colorado 2009 at Estes Park on May 29, 30 and 31. This is the ARRL Regional Convention. Please check the website at hamconcolorado.org or click on the blue link on our own DRC web page at w0tx.org for information on all the activities, presentations, sponsors and vendors. I promise this will be the best Hamcon Colorado ever! Thanks to Barry Wilson, KB0BBQ for last months presentation on D*STAR digital voice and data communication. We had some technical problems with the projector but Barry recovered and did a great presentation.

I feel I need to make this statement do to the ongoing Swine Flu situation. We would like to see every DRC member at every meeting and activity, but, if you are sick or suspect you may have flu, cold or other similar ailment... Please do not expose our membership. This is the time you should not attend. Thanks for your understanding.

I would like to welcome new DRC members: Aleksey Grachev, KD0HHE, Wayne Mathis, KD0GQN and Dick William, K8ZTT. Please come to the meetings and activities and be an active member.

This month's program will be on May 20th and presented by our own Oscar Hall, K0SSE. Oscar will be doing a preparation program for the upcoming Field Day Exercise on June 27 & 28. He will be going over the rules, computer logging, station and antenna setup and lots of need to know information for a successful and fun filled Field Day. Oscar has also proposed a presidential challenge to attempt to beat myself and V.P. Dave, WG0N, on points. Think you can beat us? If you're not at FD you can't!

See you all at the meeting May 20th at the St. Joseph's Episcopal Church, 11202 West Jewell Ave., Lakewood, CO. That is about two blocks West of Kipling on West Jewell. And remember to check our website, w0tx.org, for lots of important information about the DRC. The Elmer Session and Tech Meeting start at 6:30 pm. followed by the Regular Meeting and Program at 7:30 pm.

Gerry, W0GV
President



**The DRC & ARRL
are a TEAM!
Now is the time
Join The TEAM!**



INSIDE THE ROUND TABLE

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APRIL MEETING - WHAT'D I MISS

By Bill - W6OAV

There were 57 attendees at this month's meeting! W0GV began the business meeting with introductions. KB0PVD then gave an overview of the upcoming Boulder Salvation Army exercise. KB0BZZ described the communications plans for that exercise. K0SSE then described the plans being developed for Field Day. K0TOR followed with the results of the annual Lakewood siren test held on April 8th. The meeting was then turned over to the guest speaker, Berry, KA0BBQ. The title of his presentation was "Inside D-Star Digital



Radio". The presentation included 1) The benefits and advantages of the D-Star system compared to analog systems, 2) Various hardware configurations, 3) The configuration of the Colorado D-Star Association's system, and 4) How to program and use D-Star radios and the worldwide D-Star network. The meeting ended with a couple of lucky attendees winning door prizes.

TECHNICAL COMMITTEE REPORT

By Bill - W6OAV

This report provides an overview of items discussed during the April Technical Committee meeting. Due to the fact that three committee members were not able to attend, only the following items were discussed.

The SA Battery Backup Project

Goal: Automate the DRC station battery backup system:

- KB0A will purchase of two West Mountain Radio PowerGate modules with a 1 amp charger and a spool of appropriate power wire.

Field Day

Goal: Develop Field Day plans:

- K0SSE chaired the process of adding more detail to the draft Field Day plans.

NVIS Winlink access at the Salvation Army DRC station

Goal: Establish NVIS Winlink access at the SA:

- K0QBA gave a presentation with handouts detailing a system he put together which will achieve this goal. The system ties several applications together which allows HF stations using packet to communicate with Winlink VHF RMS servers via packet gateways, such as the DRC packet gateway. The new HF user has a relatively easy learning curve as the interface is very much like the Microsoft Outlook.

SIREN SYSTEM TEST

By Bill - W6OAV

In the April issue of the "Roundtable", K0TOR detailed the Lakewood Police Department's annual siren test and the DRC's involvement in that test. On April 9th, 27 members of the Denver Radio Club took part in the siren test. K0TOR, K0SSE and KC0WWW coordinated the operation from the Lakewood EOC. The remaining DRC members checked the condition of, and observed the operation of, 25 siren sites. As a result of the DRC's assistance, five siren sites were found to have problems, some rather serious. This finding confirms the value provided by the DRC participation.



After the siren test, the participants were invited for a pizza lunch at the Lakewood Public Safety Center. During the lunch, Brian Nielsen/Manager of Environmental Services expressed Lakewood's gratitude for the DRC's help. Unfortunately, all the participants were not able to make the pizza lunch. Those that did are shown in the photo above. A big THANK YOU to all the participants.

(Continued on page 3)

(Continued from page 2)

DRC Now Has A T2FD ANTENNA

By Bill – W6OAV

On April 11, 2009 several DRC members installed an HF T2FD (Terminated. 2 conductor, **F**olded **D**ipole) antenna at the Salvation Army Building on 14th and Pennsylvania. The T2FD, developed by the US Navy in 1940, is a little known antenna. Compact in size compared to a half wave dipole, the T2FD provides signal gain, wide frequency coverage, and exceptionally low noise characteristics. Photo below shows the installation team and the T2FD on the roof of the Salvation Army building. The purpose of the T2FD is to provide good HF coverage to Salvation Army locations in Long Beach and Chicago.



N1ETV designed and built the T2FD. K0HTX built the 80 pound anchor bucket assemblies. N4ATA built the rig which allowed the conveying of the heavy equipment to the roof. The following installed the antenna and feed lines: K0HTX, N4ATA, KB0BZZ, N0LAJ, W6OAV, WG0N, W0GV and N3PQ. Thank you everyone!

DAYTON HAMVENTION STREAMING VIDEO

Can't make it to Dayton Hamvention this year then this may be of interest to you.

For the 7th year now, W5KUB.COM will be broadcasting live streaming video and audio of the 2009 Dayton Hamvention. New this year, we have lots of prizes to give some lucky viewers. We will go live Wednesday May 13 at 1300GMT and broadcast our 500 mile drive. We will continue broadcasting on Thursday as we set up in the flea market, possibly tour the Air Force Museum, and then for the entire Hamvention. The broadcast will end once we get back home to Memphis, TN on Sunday night. In addition to the video, the site has a

chat room where you can chat with other hams around the world. We have viewers on in over 150 countries. The site is up 24 x 7 x 365 days per year with recorded ham videos when not in the live mode. The site is <http://wa5kub.com> or <http://w5kub.com>. You can also check out the prizes at <http://tmedlin.com/2009prizes.html>

Hope to see you in Dayton or on the web.

73,

Tom – W5KUB

THE KB0MPX DUAL BAND J POLE

By Bill – W6OAV

The March 2007 QST contained an article describing a very efficient VHF/UHF J Pole antenna designed by WB6IQN. See Figure 1. KB0MPX and I built the antenna. My J Pole was for portable and indoor use. KB0MPX built his for outside use. The antenna is a very good performer.

This article has two purposes:

- Detail how Dan, KB0MPX, designed and built an outside version of the WB6IQN antenna. Dan used a very unique method to build and tune a PVC version of the antenna.
- Describe how to design antennas for insertion into a PVC tube which will radically change the natural resonance of an antenna.

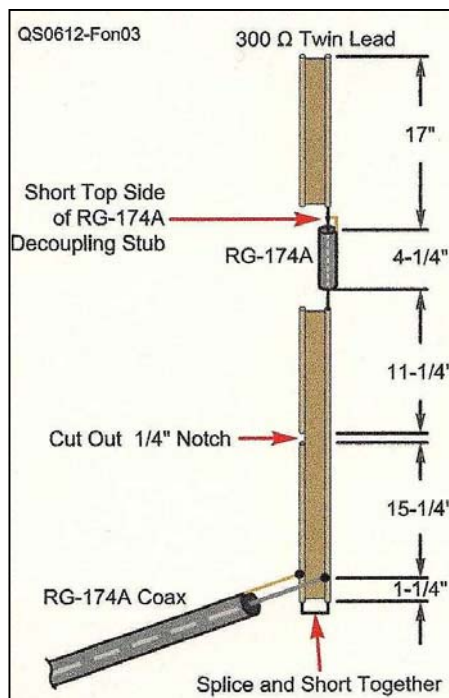


Figure 1

(Continued on page 4)

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Dan's Design

Dan's design included adding a 1:1 decoupling balun to WB6IQN's design and enclosing the J Pole in $\frac{3}{4}$ " PVC tube. See Figure 2. The J Pole is in the vertical section above the first PVC "T" section. The choke balun is wound around the first horizontal support tube. The coax from the choke balun runs down inside the PVC tube to the radio room. Note that the PVC's color matches the house!



Figure 2

Enclosing an antenna in PVC tubing makes the design a little more complicated. The problem is that when an antenna is inserted into a PVC tube, the PVC's dielectric constant significantly lowers the velocity factor of the antenna by about 15% to 20%. (Velocity factor is the speed at which an electrical radio signal pass through a medium. The lower the velocity factor of the medium, the slower the signal travels). This means that an antenna enclosed in PVC will normally need to have its physical length reduced because of the reduced velocity factor. Dan used the following procedure to resonate the antenna to its PVC environment.

Dan constructed the antenna using the measurements provided in WB6IQN's article. He then wound a decoupling balun on a short piece of PVC tube into which he had drilled holes to pass the coax to the inside of the PVC tube. See Figure 3. The balun consisted of 8 turns of RG58. Dan soldered a 4' RG58 pigtail terminated in a PL239 connector to station side of the balun which he would later connect to the coax going into the station. He then soldered a short RG58 pigtail from the balun to the feed point of

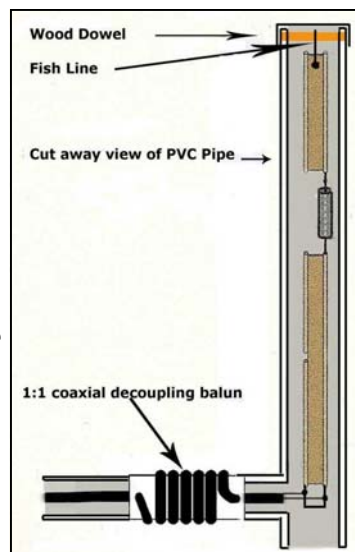


Figure 3

the J Pole. Dan pulled the J Pole into the vertical tube using a piece of fish line attached to the top of the J Pole. As the J Pole neared the top of the tube, the horizontal tube containing the balun was fitted into the PVC "T". The fish line was then tied around a wood dowel previously slid through two holes drilled in the tube. A PVC cap was slid onto the vertical tube preventing the dowel from sliding out of the holes.

Tuning the J Pole

Dan hung the PVC antenna from a tree branch and used an Analyst Model RF5 analyzer to determine the resonant frequencies. (Note: Dan first tried to tune up the antenna in his basement. This did not work as there was too much coupling to the environment). As expected, the resonant frequencies were below the theoretical values due to the dielectric constant of the PVC as mentioned above. Based on the actual resonant frequencies, Dan calculated the new velocity factor caused by the PVC. He recalculated the new antenna lengths required to bring the antenna to the desired frequencies. A description of this process is discussed later in this article.

Once the antenna was resonant, Dan assembled the support structure as shown in Figure 4. He dropped RG213, equipped with PL259s at each end, down the tube which he had earlier mounted to the side of the house. The antenna end of the RG213 was connected to the RG58 pigtail coming from the balun. The support assembly was then mounted to the vertical tube. See Figure 2. The antenna has withstood winds of up to 50 miles an hour. It also performs very well on both bands.

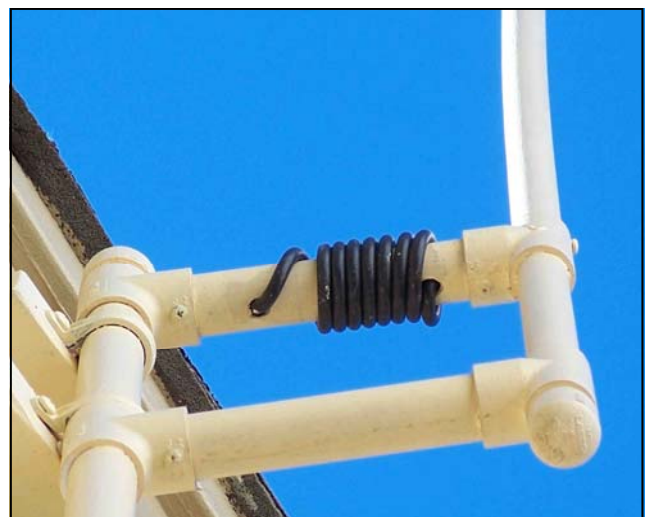


Figure 4

(Continued on page 5)

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Calculating Antenna Lengths for Insertion into A PVC Tube

As mentioned earlier, inserting an antenna into PVC will always cause its resonant frequency to decrease. There are several ways of recalculating the length required to maintain resonance at the desired frequency. I prefer the one Dan used.

The following example shows how to calculate the antenna length required for a 146 MHz TV Twin Lead J Pole which is to be inserted in a PVC tube.

- Use references to determine the theoretical velocity factor (VF) of the twin lead. In this example, let VF = 0.77 which is the most common value.
- Calculate the ½ wavelength for the twin lead radiator:
 - Formula: $L = (468 * VF) / F$:
Where L = ft, VF = velocity factor and F = MHz.
 - At 146 MHz: $L = (468 * 0.77) / 146 = 2.47 \text{ feet} = 29.61 \text{ inches}$.
- Insert the twin lead into the PVC and measure the resonant frequency. Assume it measured 142 MHz.
- Calculate the new VF based on new resonant frequency of 142 MHz:
 - Formula: $VF = (L * F) / 468$.
 - At 142 MHz: $VF = (29.61 * 142) / 468 = 0.749$.
- Calculate the length required with the new VF:
 - $L = (468 * VF) / F = (468 * 0.749) / 146 = 2.40 \text{ feet} = 28.8 \text{ inches}$

Repeat the same process for the ¼ wavelength matching section, dividing the results by 2.

PERSONAL LIGHTNING SAFETY TIPS

1. **PLAN** in advance your evacuation and safety measures. When you first see lightning or hear thunder, activate your emergency plan. Now is the time to go to a building or a vehicle. Lightning often precedes rain, so don't wait for the rain to begin before suspending activities.

2. **IF OUTDOORS...** Avoid water. Avoid the high ground. Avoid open spaces. Avoid all metal objects including electric wires, fences, machinery, motors, power tools, etc. Unsafe places include underneath canopies, small picnic or rain shelters, or near trees. Where possible, find shelter in a substantial building or in a fully enclosed metal vehicle such as a car, truck or a van with the windows completely shut. If lightning is striking nearby when you are outside, you should:

A. **Crouch down.** Put feet together. Place hands over ears to minimize hearing damage from thunder.

B. **Avoid proximity** (minimum of 15 ft.) to other people.

3. **IF INDOORS...** Avoid water. Stay away from doors and windows. Do not use the telephone. Take off head sets. Turn off, unplug, and stay away from appliances, computers, power tools, & TV sets. Lightning may strike exterior electric and phone lines, inducing shocks to inside equipment.

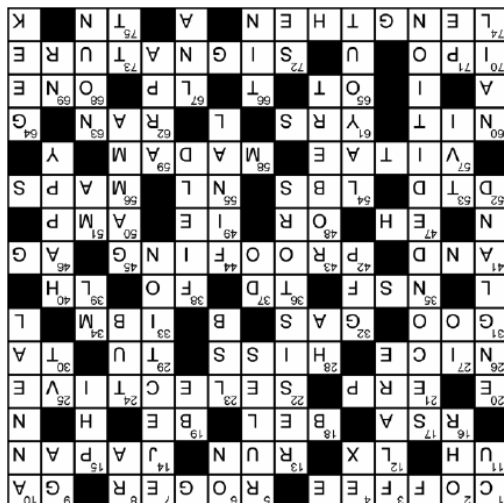
4. **SUSPEND ACTIVITIES** for 30 minutes after the last observed lightning or thunder.

5. **INJURED PERSONS** do not carry an electrical charge and can be handled safely. Apply First Aid procedures to a lightning victim if you are qualified to do so. Call 911 or send for help immediately.

6. KNOW YOUR EMERGENCY TELEPHONE NUMBERS.

Excerpted From National Lightning Safety Institute

"If you can see it, flee it; if you can hear it, clear it."



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UP COMING EVENTS

15-17 May – ARRL NATIONAL CONVENTION (DAYTON HAMVENTION)
 Dayton ARA
<http://www.hamvention.org>

27-28 JUNE – FIELD DAY
 Watch for more information in the June issue of your RoundTables.

HAMCON COLORADO 2009
MAY 29, 30 & 31ST











The 2009 HamCon Colorado convention will feature both new and time-tested technologies. Although the technical sessions have not been finalized, topics you can expect will include D-Star, Satellite Operations, and a presentation on the Mars Phoenix Lander, ARES and the popular ARRL Forum.

Go to www.hamconcolorado.org for more information and current information.

18 JULY – PPRAA MEGAFEST
 Pikes Peak Amateur Radio Association
<http://www.ppraa.org/swapfest09.php>

16 AUGUST – DENVER RADIO CLUB SWAPFEST
<http://www.w0tx.org>
 Contact: Bryan Steinberg, KBOA
 1011 South Foothill Drive
 Lakewood, CO 80228-3404
 Phone: 303-987-9596
 Email: drcfest@w0tx.org

MAY 2009							<i>DRC Net Sunday 8:30pm Local</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
					1 May Day 	2	
3	4	5	6 <i>Learning Net</i> 7pm	7	8 	9 	
10 <i>Happy Mother's Day</i> 	11	12	13 <i>Learning Net</i> 7pm	14	15	16 <i>Armed Forces Day</i>	
17 	18	19	20 <i>DRC Meeting</i> Elmer 6:30pm General 7:30pm	21	22	23	
24/31 HAMCON Last Day 	25  MEMORIAL DAY	26	27 <i>Learning Net</i> 7pm	28	29 HAMCON Colorado Starts Today	30 HAMCON 	

DRC BOARD OF DIRECTORS

President	W0GV	Gerry Villhauer	303-467-0223	W0GV@hotmail.com
Vice-President	WG0N	Dave Baysinger	303-987-0246	WG0N@arrl.net
Secretary	WA9TVH	Orlen Wolf	303-279-1328	owolf@mines.edu
Treasurer	K0TOR	Jim Beall	303-798-2351	K0TOR@arrl.net
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DRC STAFF AND VOLUNTEERS

Trustee	WA9TVH	Orlen Wolf	303-279-1328	owolf@mines.edu
Net Control	K0TOR	Jim Beall	303-798-2351	K0TOR@arrl.net
Emergency Coordinator	K0SSE	Oscar Hall	303-375-0627	oscarh1934@aol.com
Membership	KC0OUQ	Bob Proctor	303-986-0612	KC0OUQ@att.net
Club Librarian	WG0N	Dave Baysinger	303-987-0246	WG0N@arrl.net
VE Team	AC0T K0MEL	Wally Gamble Mel Minnick	303-202-0339 303-761-3456	wallygamble@comcast.net k0mel@msn.com
Swapfest Mgr	KB0A	Bryan Steinberg	303-987-9596	drcfest@comcast.net
Field Day	K0SSE	Oscar Hall	303-375-0627	oscarh1934@aol.com
Tech. Committee Chair	W6OAV	Bill Rinker	303-741-2537	W6OAV@arrl.net
APRS Chair	KB0MQQ	Lloyd Plush	303-277-0785	LloydPlush@aol.com
Benevolent		Carolyn Wolf	303-279-1328	
RT Editor	AG0S	George McCray	303-751-7246	AG0S@arrl.net
Education	AJ0C	Robert Rude	303-841-6443	AJ0C@comcast.net

DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
10m	29.620mHz (-100kHz) FM	Not In Service
6m	53.090mHz (-1mHz)	
Packet	145.05mHz<>14.105mHz	
2m	145.490mHz (-) 100Hz PL	Linked to the 70cm - 448.625mHz machine.
2m	147.330mHz (-) 100Hz PL	Local Area, Members Auto-Patch
2m	147.330mHz (-) 131.8Hz PL	NE Area Remote
1.25m	224.380mHz (-) 100Hz PL	
70cm	448.625mHz (-) 100Hz PL	Linked to the 2m - 145.490mHz machine.
70cm	449.350mHz (-) 100Hz PL	Wide area coverage with Echolink Node # 4140.

EDITOR'S NOTE

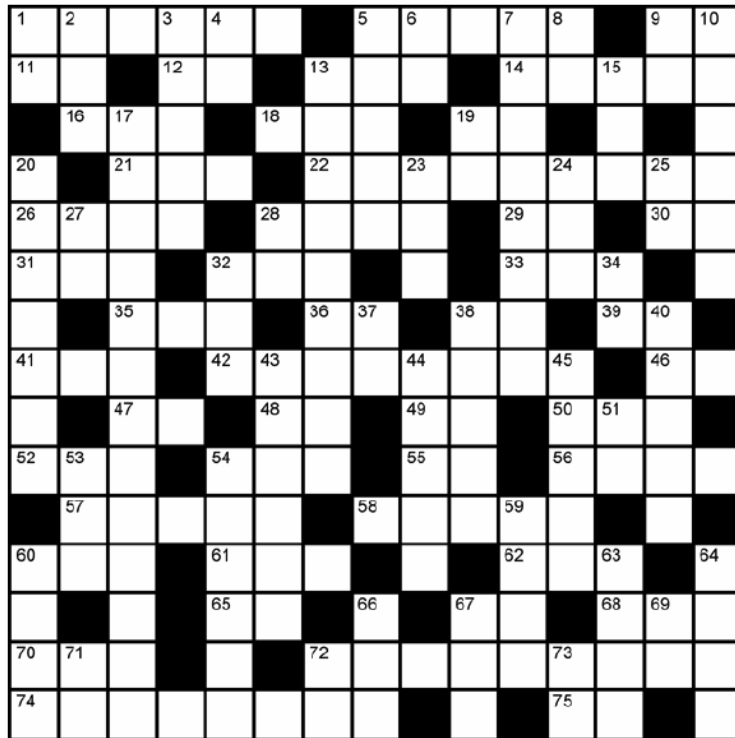
*DRC members - this is your newsletter. If there is something which is club or amateur radio related that you'd like to see as a regular feature, email suggestions to the editor. Members are the heart and sole of The Denver Radio Club, if you have an expertise or an interest in a particular segment of ham radio that you'd like to write about, you may email your submissions to DRC_RT@comcast.net. Submission deadline is the 25th of the May. **Editor***

Electric Electric # 8

Here's a plethora of perplexion, with pithy pointers to persuade pencil-pushers. Perhaps you will prevail over pitfalls to positively pop with pizzazz? Don't procrastinate! Perambulate to the puzzle, post-haste!

By H. Ward Silver, NOAX

NOTE: Puzzle solution is located on page 5.



Across

1. Keeps you awake at night
5. Means "received"
9. Wire thickness (abbr)
11. Cousin to "um"
12. Prefix for Luxembourg
13. Contact one station after another
14. 7J and 8J stations are from this country
16. Encryption standard (abbr)
18. 1/10th of this makes a dB
19. Add "O" to make a highly conductive, but toxic, insulator
21. You can only use 50 W of this on 60 meters
22. A receiver that can reject nearby signals
26. Polite or friendly
28. Output of a receiver with no signal present
29. Thanks! (CW abbreviation)
30. What you eat on Thanksgiving (prefix)
31. Sticky stuff
32. Excessive power
33. Company that invented the disk drive
35. Gov't agency that funds science (abbr)
36. Time delay (abbr)
38. Center frequency (abbr)
39. Opposite of RH (abbr)
41. Logical complement to 48 Across
42. Checking for accuracy before publishing
46. Common connector plating metal (chemical symbol)
47. The two fields that make up a radio wave
48. Logical complement to 41 Across
49. Abbreviation that indicates an explanation
50. Unit of current
52. Document that defines XML objects
54. Weight (abbr)
55. Postal code for VO1 stations
56. Graphical description of a route or region
57. With curriculum, describes your history
58. Formal address for a YL
60. Often picked
61. Comes after months (abbrs)
62. Conducted
65. Long-time ham (CW abbr)
67. Between QRP and HP
68. Number of elements in a rubber duck
70. First sale of stock to the public (abbr)
72. The last element of a radiogram
74. To lower an antenna's resonant frequency, do this to it
75. Both a fourth-district postal code and a rare African prefix

Down

1. Most common material in wires
2. Creates the "woodpecker signal" (abbr)
3. One of these on the sun wipes out HF
4. Prefix meaning "no longer"
5. Contest constraints
6. Powered up
7. The E in CME
8. Egyptian name for heavenly body that affects radio communications
9. Fourth call district state (postal code)
10. Heating and cooling process that reduce brittleness in metals
13. Type of electronic component
15. Greek letter used as a symbol for angle
17. A book that has been edited and reprinted (two words)
19. What Hamlet is trying to decide
20. G, M, and 2 stations are from this country
23. Opposite of USB
24. Vat of water
25. Between NY and NH (postal code)
27. Bidirectional data interface
28. Neighbor to S5, YO, and SP (prefix)
32. Safety component that detects imbalances in ground current (abbr)
34. Equal to one cc (abbr)
37. Prefix for leaded diode packages
38. An antenna has both a near and a far
40. What a DXer is after working a New One
43. Whose rules of order run meetings
44. Last transmission
45. Follows UV and X rays
51. Small unit of current (abbr)
53. Abbreviation for television interference
54. Arrangement of components
59. Gov't agency that funded early Internet development
60. Pointed fastener
63. Word that refers to a thing or place
64. Slang for a technically-inclined person
66. Coat with solder
67. Microwave receiving amplifier (abbr)
69. Number (abbr)
71. Has to stamp tower plans (abbr)
72. Internet domain abbreviation for Sweden
73. That (CW abbr)