



ROUND TABLE

The Denver Radio Club Newsletter

March 2008

Since 1917

PRESIDENT'S MESSAGE

By Gerry Villhauer-W0GV

Greetings DRC Members,

Spring is coming! I know this by all the projects that are starting to line up. The following is VERY IMPORTANT. Please read it a couple times so you understand it fully. Our 145.490 and 448.625 repeaters will be shut down on Wednesday morning, February 27th. This is necessary do to construction work at the repeater site. This should be temporary. How long is temporary? I can't answer that right now. I am negotiating to put the equipment at another temporary mountain top site. It looks promising but is not final as of today, although, it could happen as early as this coming weekend. All that being said here is our alternative plan. The Wednesday Learning Net and our Regular Sunday Evening Net will be moved to the 147.330 repeater. (Remember that is a + frequency split) Does it have the same coverage as the .490 repeater? No it will probably not be as good for some of you. Why did we NOT choose to use the 449.350 repeater? Because some members do not have UHF radios. We plan to have members with good base stations listen on the reverse pair and relay check-in and comments to the net control stations. Please be patient and use you communication skills during this situation.

This was another banner month for membership; I would like to welcome new DRC members Bill Busch, K0IKP, David Feurt, KD0CJU, Henry Graham (no call given) Charles Hutchinson, KB0UZI, Paul Meenach, KD0CXX, Dale Schmidt, KC0UCX, Sean Schmidt, KC0UBB, Danny Smith, K9DS and Bob Zimprich, KB0BZZ. Thank you for choosing the Denver Radio Club as your club. Please come to the meetings and activities and be an active member.

Last month's program on NVIS propagation was very well attended. Thanks for coming out and participating. Thanks to Ron Hranac, N0IVN and Bill, W6OAV for a very informative presentation. Virgil Leenerts, W0INK, will present this month's program. Virgil is a retired EE from HP/Agilent Technologies and still does some contract work from his home electronics lab. He mainly concentrates on the analog world of electronics. His program is titled Switch Mode Power. It will be an overview of linear and switching power supplies. If you have a ham radio station at home, you more than likely use one of these for your D.C. power.

See you all at the meeting March 19th at the St. Joseph's Episcopal Church, 11202 West Jewell Ave., Lakewood. That is about two blocks West of Kipling on South 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 p.m. followed by the Regular Meeting and Program at 7:30 p.m.

73,
Gerry, W0GV
President

Happy
St. Patrick's
Day!!



Inside The Round Table

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FEBRUARY MEETING - WHAT'D I MISS

By Bill-W6OAV

This month's meeting had a great turnout. 53 people were in attendance. Photo 1. A short business meeting with introductions was followed by the feature presentation.



Ron, N0IVN--one of the ARRL's Colorado Section Technical Specialists --explained how NVIS propagation works. He described the various types of NVIS antennas and their pros and cons. Ron then discussed his portable NVIS antenna which he had brought to the meeting. Photo 2.



Once Ron had familiarized the audience with NVIS, several club members covered the history of NVIS, the DRC's role in NVIS and several club members' roles in NVIS. Bill, W6OAV, covered the history of NVIS. He described how the German's developed and used

NVIS in WW2. He showed several video clips from old German newsreels which contained German tanks and command cars equipped with NVIS antennas. Bill also showed how the Army is presently using NVIS. Using projected slides, Lance, N1ETV, described the NVIS antenna that he designed, and coordinated the installation of, at the downtown Salvation Army radio location. Rob, AJ0C, described his mobile NVIS configuration. W6OAV then described AG0S's mobile NVIS configuration.

There were a lot of good questions during the presentation. Many audience members commented that they had learned a lot. As is customary, door prizes were handed out at the end of the meeting.

ELMER SESSION

By Rob-AJ0C

The following activities took place during the February Elmer Session before the regular monthly club meeting:

- We demonstrated use of field-strength meter to evaluate antenna performance.
- After a demonstrating how to construct a dual-band "tigertail" for 2-meters and 70-centimeters Mike-KONGA constructed a "tigertail."
- We discussed how improved performance may allow us to reduce power to achieve same communications results and prolonging battery power of an HT.
- We then used the field strength meter to evaluate and compare performance of standard OEM "rubber duck" antenna, a Diamond RH77CA, "rubber duck" without the tigertail" and then the Diamond with a "tigertail". In each case an improvement in the performance was observed.
- We also used field strength meter to demonstrate how changing the orientation of the antennas could impact the effective energy being transferred between transmitting antenna and receiving antenna.
- March Elmer topic is X-Band Repeat by Mike-KONGA.

TECHNICAL COMMITTEE REPORT

By Bill-W6OAV

This report provides an overview of items discussed during the February Technical Committee meeting.

147.33 REPEATER PROJECT

The project to install a second 147.33 repeater at Hudson with a different PL is still in motion:

- WA9TVH will tune up the duplexers for the new repeater. Once he has tuned the duplexers, we will install them, the Icom crystal units and the 131.8 Hz PL units in the repeater station at Hudson.

220 REPEATER

The 220 repeater is down for upgrading with an IDer:

- KC0CUA hopes to have the repeater wired by the end of February.

145.49 RELOCATION/LAKEWOOD EOC

The Lakewood EOC is moving to new quarters. They've asked DRC assistance with configuring the new quarters:

- Several of the board members will be meeting on Feb 25 with the Lakewood Environment Manager to discuss these two issues. (*See President's Message*)

(Continued on page 3)

(Continued from page 2)

- WA9TVH will develop a "bullet" list of equipment configurations that will reduce our "footprint" at the 145.49 location.

FIRE STATION POWER LINE NOISE

Excessive power line noise is affecting all systems at the Station 4 site:

- WA9TVH will contact the PUC. Appeals to the ARRL result in referrals to the FCC and visa versa. Xcel has-n't responded to earlier letters.

WATERTON ARC

The DRC has offered the Wateron ARC the Harris which the DRC doesn't need:

- K0TOR indicated that the group is becoming more interested in the Harris. It appears that they will be able to get Internet for access to control the Harris.

FIELD DAY

Plans must begin for the next DRC field day:

- K0SSE suggested doing a combination DRC/SA field day using the SA comm van at one of several sites. The combination field day would make operators familiar with the equipment and wring out any bugs or procedure problems with the comm van.
- Should the club and the SA decide to do a combined field day, then we should have a practice session before field day.
- K0SSE will chair a field day committee. Members right now are K0HTX and W6OAV. Any more volunteers?

VOTER SYSTEM

Preplanning must begin for the voter system:

- WA9TVH gave the voter system manuals to W6OAV. He will look them over and discuss with WA9TVH. The idea is to get the project started since, hopefully, the Hudson site will be soon operational.

THE SA STATION

- Swap the TS940 with the TS430. The TS430 is a more "user friendly". Also, the TS430 operates on 12 v. This configuration provides a station which completely operates on backed up 12 volts.
- W6OAV gave the TS430 to N1ETV. N1ETV will install Anderson PowerPole connectors on the 12 volt power leads for use in the SA ham station.

PACKET GATEWAY

Improve the operation of the packet station and develop a more efficient local packet network:

- The TS940 and the KAM-XL are operational at Station

4. The system is working fairly well in spite of the S9+40 impulse noise level.

- The DRC KAM-XL is the heart of the new local K-Net system which interconnects the world wide AMPRNET and the 14.105 MHz emergency packet system.

MEMBERS ESTABLISH K-NET PACKET NETWORK

By Bill-W6OAV

Several DRC members have been very busy this month configuring their packet Terminal Node Controllers (TNC) to provide a local K-Net packet network. These members are WK0C, N4ATA, KB0MQQ, AJ0C, AG0S and W6OAV. W6OAV installed and configured the DRC's TNC which is the heart of the K-Net network.

So, what is a K-Net packet network? In a nutshell, a K-Net network, unlike other packet networks, provides automatic routing of connections throughout the network. The user does not have to know how to setup a connection to a remote destination. For example, let's say that a Denver packet user wants to keyboard with another packet user in Australia. The Denver user connects to the network and types the connect command "C VK6AD-7" which is a packet node in Australia. The network will then automatically establish a connection via different intermediate packet nodes to node VK6AD-7. From there the Denver user establishes a connection from VK6AD-7 to a packet user in Australia. Just like with the long distance phone network, the routing is totally transparent to the user. Another advantage of the K-Net network is that it has higher data thru-put than non K-Net networks.

The Denver K-Net network interconnects the worldwide AMPRNET packet network with the worldwide 14.105 MHz packet network. The former consists of internet, satellite and radio links. The latter is an emergency 20 meter packet network known as NET105. The K-Net interconnection allows packet users on any of these networks to connect with users on any of the other networks.



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TIPS AND TRICKS

Keeping Track of Solar Activity

By Bryan-KC0CUA

As many of you may be aware we have started into the new solar cycle with the appearance of a number of sun-spots. As the cycle leaves the minimum and improves there will be increasing opportunities for HF DXing. I am not going to explain the mechanics or details of the solar cycle, see George's (AG0S) article Solar Update in this newsletter for more of that, but I did want to make you aware of a quick way to keep track of the activity.

If you are using **Firefox** as your browser you may be aware that it provides capabilities for add-ons. Firefox is a free, high function browser that supports the open source model. It can be downloaded at <http://www.firefox.com>. One of the add-ons for Firefox is called **Propfire** which was written by Patrick Rundall, N0HR. Propfire is a Fox-fire extension that provides HF propagation conditions on the web browser status bar. For more information and to download the add-on go to his website at <http://www.n0hr.com/Propfire.htm>.

Correction from Bryan-KC0CUA
*In my article, **Observing Band Edges...** in the February issue of the RoundTable I had an error in the third paragraph. It should have read: The same thing applies if you operate on 40 Meters, The lower edge of a General's SSB privileges on this band start at 7,175 KHz. On this band the convention is to use the lower sideband. So, you should not set your radio to a frequency lower than 7,178 KHz. (7,175 + 3 = 7,178)*

70CM BAND SLIM JIM ANTENNA

By Paulo-CT1EHO

Searching for a simple and inexpensive unobtrusive antenna for the higher bands? Search no more... why not try the Slim Jim Antenna?

Without going to much into the intricate theory of this radiator, I must say the design provides very good results! Whether you're looking for a portable travel antenna or a base station antenna, this design will provide you enough "bang" to hit those medium to far distant repeaters.

The Slim Jim antenna is not a new design. Some British hams used them frequently in the 50's 60's, when the higher bands started to be popular.

Technically the Slim Jim is a vertically polarized omni-directional end-fed antenna. In a sense the Slim Jim is



Figure 1

not more than a J-Pole whose radiator length is bent and stretched until it forms a gap with the 1/4 wave element. (See Figure 1) It seems the name came from the type of matching device (J-type matching stub) and the fact that the antenna is a beautiful and slim setup without the ground plane elements sticking out. Once finished the assembly can be inserted in a PVC tube and weather sealed tight for outdoor installation.

The main narrow angle lobe radiates around 8° to the horizon, which in turn behaves much better than the classical 1/4 wave ground plane antennas. The average gain over the 1/4 wave ground plane is about 3dB. This means the signals will have twice the radiated power.

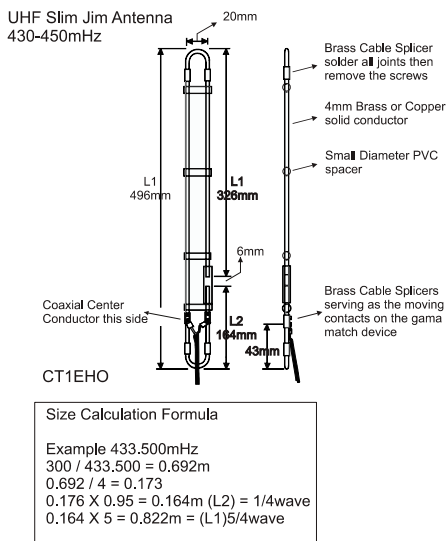


Figure 2

design is not critical although is best to keep the measurements as accurate as possible within the mm scale. (See Figure 2) A good idea is to draw on a piece of card board a ruler with all the lengths marked. Physically the round bends look better but they can be done squarely. I opted to cut the two pieces of rod and bend the corners of the antenna. I bent them on a round metal slug form I had around the workshop. After trimming all the parts I used the four cable wire brass screw splices to unite the parts and solder them all. Afterwards I removed the screws for a better finishing. (See Figure 3)



Figure 3

The antenna matching section is done with the aid of two more cable

(Continued on page 5)

(Continued from page 4)

splices with their screws. (See Figure 4) They will allow you to tight or loosen and slide the setup up or down in order to tune the antenna. The coax cable used can be the RG-58 for better flexibility, but one can opt to make a "pig-tail" adaptation using appropriate RF connectors for a larger low loss coaxial cable. An important note on the gamma match section is that the coaxial center conductor will have to be connected to the longer part of the radiator. The coax can be attached to the splices with some bolts and cable round.



Figure 4

The antenna tuning procedure is best preformed in an outdoor clear and open space to avoid reflected standing waves from the closer objects. If the intention is to protect the antenna assembly inside an appropriate PVC tube, you will have to carefully re-tune the system as the PVC does alter the tuning settings a little. Luckily I have access to a whole set of lab type devices, so I tuned my antenna with the aid of an Antenna Analyzer Anritsu Site Master S-331A. (See Figure 5) Now on to the practical results. Since I live in a condomin-

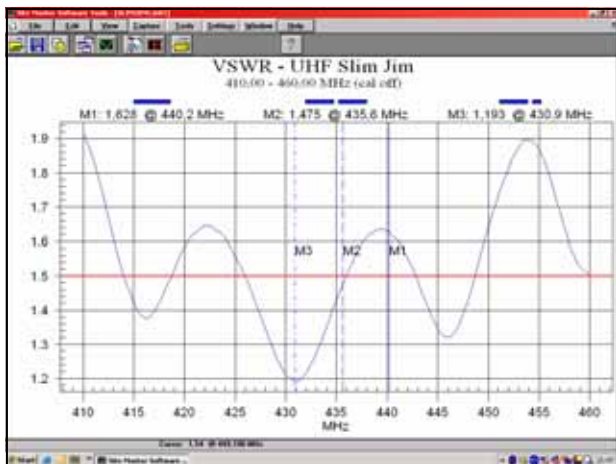


Figure 5

ium with antenna restrictions I'm still able to talk to my local ham friends and even work the local UHF repeater (17 miles away) with good signals! One night I even had a QSO through a repeater 50 miles away with the full 5 watts from the good old Alinco DJ-580. All this with the Slim Jim hanging inside my living room behind the window curtains and around 6.5m of RG-58 coax cable. My wife doesn't see the antenna, so she is happy!

Meet the Author



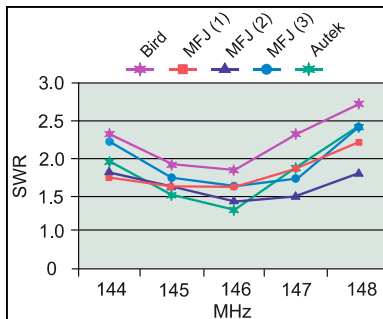
I was born in 1968, in Aveiro Portugal. I got my ham license back in 1991. The passion for the radio technology came early and brought me to my present job as BTS technician (Base Transceiver System). I've worked for the cellular company Vodafone-Portugal for the last 15 years. I feel myself privileged for having the chance to keep in touch with the latest evolutions in the cellular phone business. And, much like ham radio, this is another form of communications supported by wireless technology. Presently I live and work in Portimão (South Portugal), I'm married with Teresa and we have a beautiful 8 year old girl named Susana.

ANALYZING ANTENNA ANALYZERS

By Bill-W6OAV

The MFJ-259 and the Autek RF-5 antenna analyzers are very popular with the ham community. Yet, I have not found any specifications on the accuracy of these units. So, I decided to perform two not too scientific tests. I compared reading from the MFJ and Autek analyzers to those from the very accurate Bird Model 43 Wattmeter. The published accuracy of the Model 43 is +/- 5%. The Bird wattmeter is considered to be a commercial grade unit whereas the MFJ and Autek analyzers are considered to be consumer grade units.

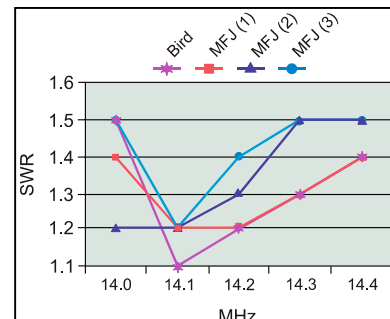
The first test was done at VHF. The second test was done at HF. The VHF test consisted of comparing three MFJ-259s and one Autek RF-5 against the Model 43. The HF test consisted of comparing the three MFJ-259s against the Model 43.



The chart to the left shows the test results on VHF. The chart below shows the test results on HF. In light of the results, I feel that the MFJ and the Autek analyzers are accurate enough for most amateur work. They are certainly cheaper than a Bird Wattmeter.

Thanks to KB0MPX for the loan of his Autek and to W0QL for the loan of his MFJ, Bird and the use of his station for the tests.

Support your hobby!
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UP COMING EVENTS

MARCH PRESENTATION

Topic

Switch Mode Power. This presentation gives an overview of linear and switching power supply regulators. It will compare the features of each type with emphases on how the basic switching buck regulator topology works.

Meet the Presenter

Virgil Leenerts, WØINK, is a retired BSEE electrical engineer from HP/Agilent Technologies and has been a licensed amateur since 1953. Currently he is active as an ARRL Technical Specialist for the Colorado Section and a part time engineering consultant. Virgil has an electronics lab at home, which serves his interests in electronics as a hobby and vocation. Virgil's interest spans the analog world from DC to Light including power supplies, audio, RF, and antennas.

There's still time to get into the
General License Class ...
Contact Jim-KOTOR TODAY!

LAST MINUTE ADDITIONS

SATERN COMMUNICATIONS GROUP


Eleven HAMS met on the 23rd to set up the new Alpha Delta DX-LB+ antenna. One of the operators made a few contacts including a check-in on the High New Noon Net. Others were tasked with work around the garage and warehouse.

**Next meeting is 4th Saturday of March.
Talk-in frequency DRC 145.490(-) PL100.**



March 2008

DRC Net Sunday 8:30pm Local

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 ARRL Int'l DX Contest (Phone) Starts 0000U
2 ARRL Int'l DX Contest (Phone) Ends 2400U	3	4	5 Learning Net 7pm	6	7  New Moon	8
9  DAYLIGHT SAVINGS TIME	10	11	12 Learning Net 7pm	13	14	15
16	17 ST. PATRICK'S DAY 	18	19 DRC Meeting Elmer 6:30pm General 7:30pm	20 FIRST DAY OF SPRING 	21  Full Moon	22
23/30 Easter Sunday 	24/31	25	26 Learning Net 7pm	27	28	29  Last Quarter

Check www.ARRL.org for More Contests & Rules!

DRC Board of Directors

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DRC Repeaters

BAND	Freq / Shift / PL Tone	Additional Information
10m	29.620mHz (-100kHz) FM	Temporarily OFF The Air
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	Members Auto-Patch
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. **Editor**

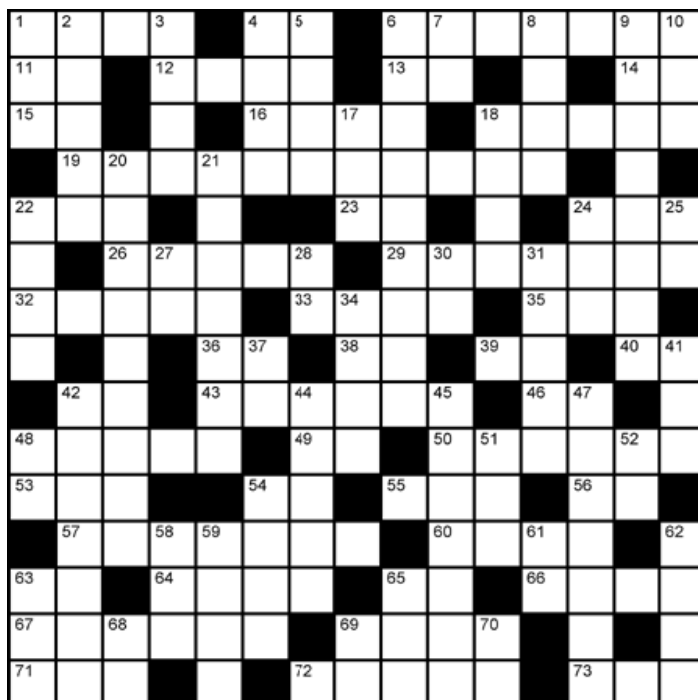
Puzzle Page

One of the most enjoyable ham radio experiences comes from operating as a team - perhaps in a contest or while supporting a public event or even responding to a disaster. The ability of a single operator is multiplied when many join together with a common aim. If you haven't tried team operating, give it a try. It will even allow you to solve this puzzle faster!

NOTE: Answer key and words used in this puzzle are located on page 6.

Across

1. Prefix meaning a small version of something
4. One of the three power categories (abbr.)
6. The reason we enter contests
11. As opposed to out
12. Set as an objective
13. The shortwaves (abbr.)
14. Prefix meaning to do again
15. Sibling prefix to 6D
16. What covers the ground near KH6 volcanoes
18. To act furtively
19. What can clash on teams
22. An ARRL section in the fifth district's largest state
23. Section abbreviation for VO
24. Skyhook (abbr.)
26. Alert or vigorous
29. An inconsistent operator
32. Nodding off
33. Only one signal at a time is allowed here
35. A joke that makes you groan
36. A long-time operator (CW abbr.)
38. In a condition between G and E (abbr.)
39. Smaller version of the TA-33
40. A wish for a fortunate future (CW abbr.)
42. That (CW abbr.)
43. The operator that takes over a position
46. Chip (abbr.)
48. Amount of time allocated to an operator
49. One who performs 60 Across (abbr.)
50. These are used to switch the RF path
53. New name for the Soviet Union (abbr.)
54. State that gets its own call district (postal abbr.)
55. Not hers
56. Transmitted energy (abbr.)
57. The data path between stations
60. To correct or change
63. Largest state (postal abbr.)
64. Showing signs of use
65. Long, narrow state with its own contest club (postal abbr.)
66. Beginning of contest season
67. The highest score ever
69. First weekend of Sweepstakes
71. Computer display device
72. Contest category
73. Short stump or stub



Down

1. Combine
2. A poor operator
3. Frankenstein's assistant
4. Round, omni-directional antenna
5. Think ahead
6. Dare a competing group to beat you
7. Grouchy elderly operator (abbr.)
8. A weak signal
9. Practice session
10. Sharp exclamation of alarm
17. Vehicle used to haul equipment
18. An exceptionally good member of the team
20. Valued knowledge
21. Provide assistance to
22. Talk back
24. Impedance matching unit (abbr.)
25. Amount of change with temperature (abbr.)
27. Designer of electronic equipment (abbr.)
28. Large island nation (prefix)
30. Read (abbr.)
31. Foolish month
34. Keenly interested or enthusiastic operator
37. Cross-equatorial propagation (abbr.)
41. Range of what you can see (abbr.)
42. The team's smartest operator
44. Live and you will do this
45. The best teams are full of these
47. Team leader
48. Least populous of the fourth district states (postal abbr.)
51. A spark (abbr.)
52. One is an antenna program, two are a toy
54. Brings power to the equipment
58. Multi-op category between MS and MM
59. Make a contact
61. Receiver stage with all the gain
62. A formalized team or group
63. Common abbreviation for 62 Down
65. The angle at which your signal leaves the antenna
68. State that's home to ARRL HQ (postal abbr.)
69. Shut down (CW abbr.)
70. And (CW abbr.)