



ROUNDTABLE

The Denver Radio Club Newsletter

January 2009

Since 1917

PRESIDENT'S MESSAGE

By Gerry Villhauer-W0GV

Hello DRC Members,

I hope you all had a very joyful holiday season. Our DRC Holiday Party was a great success! We had about 70 members and guests in attendance. Great turnout—Thank You All for coming! The food was good, and the facility was in good condition. Congratulations to the many door prize winners. Thanks to Dave, WG0N for a wonderful program on the DRC repeater sites and the history of Squaw Mountain. I continue to hear great comments from the membership about the program. It takes a lot of effort to keep the club moving in a forward direction. Dave's program sure emphasized this and gave an opportunity to recognize many of our outstanding member's efforts. We have plans to encompass Dave's program and more into a video presentation. More on that later.

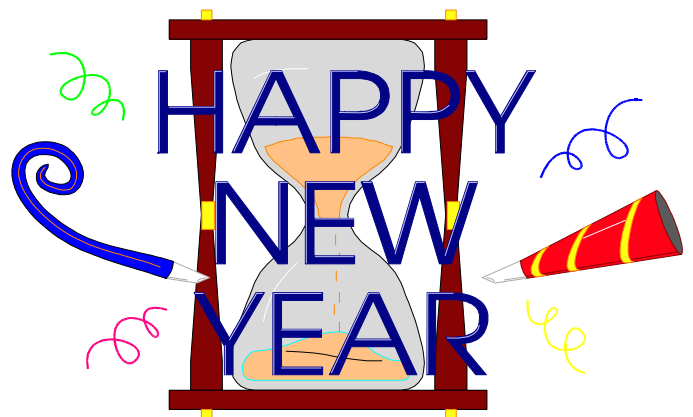
I would like to again remind the membership that the new 147.330 repeater is operational from our Hudson site. The frequency is 147.330 on your receiver and the standard 600 kHz up with a CTCSS (PL) tone of 131.8 Hz. Remember our Lakewood repeater is on the same frequency pair with 100.0 Hz. tone. Make sure you do not put any tone decode (PL) on your receiver for either repeater. Please make a point to give it a try.

Are you interested in learning about a VHF or UHF beam that is more efficient than a Yagi or a Quad,

extremely easy to build and tune, will out perform the equivalent Yagi, and is CHEAP! If so, plan to attend the January DRC club meeting. Bill, W6OAV, will give a presentation which will cover the QUAGI antenna. You will see more on his presentation elsewhere in this issue.

See you all at the meeting January 21st 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.

73
Gerry, W0GV
President



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DECEMBER MEETING - WHAT'D I MISS

By Bill - W6OAV

DRC HOLIDAY DINNER A HUGE SUCCESS

This year's holiday dinner was a fun and very successful event.

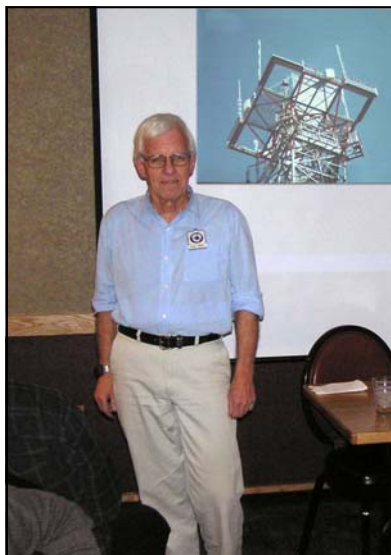


There were around 70 folks in attendance! The photo shows only part of the group. Most of the folks arrived early and had plenty of time to visit. The food was plentiful and great as always.

Gerry, W0GV, began the dinner meeting by having the attendees introduce themselves. After the introductions, Gerry introduced our guest speaker, Dave, WG0N. Dave gave a very interesting slide show and video presentation.

He started with a slide show detailing the work that was done to establish the Station 4, Centennial and Hudson sites. He then showed this year's DRC Field Day activities at Hudson. Dave rounded out the presentation with a slide show and movie detailing the history of the Squaw Mountain.

The slide show covered the present day Squaw Mountain facilities and what it used to be when Bob, W0WYX, lived at and maintained the site. The movie was an interview



with Bob just before he moved from Squaw Mountain. Bob described the history of the site, how it came to be, and his experiences while he and his wife lived there. The movie interview had been made by Dave's wife, Rita, N0UEW, when she worked for a local TV station in 1983.

The meeting ended with the door prize drawings. The main prize of an HRO \$50 gift certificate went to Dave, WG0N. Congratulations Dave!



A special THANK YOU goes to all who coordinated this year's dinner. Gerry, W0GV, arranged the venue, Bryan, KB0A, obtained the door prizes and Jim, K0TOR, setup the cash prizes.

TECHNICAL COMMITTEE REPORT

There was no Technical Committee meeting this month due to the Holiday Party. Meeting information from the January meeting will be reported in the February Round-Table.



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WORK DX VIA SPORADIC E

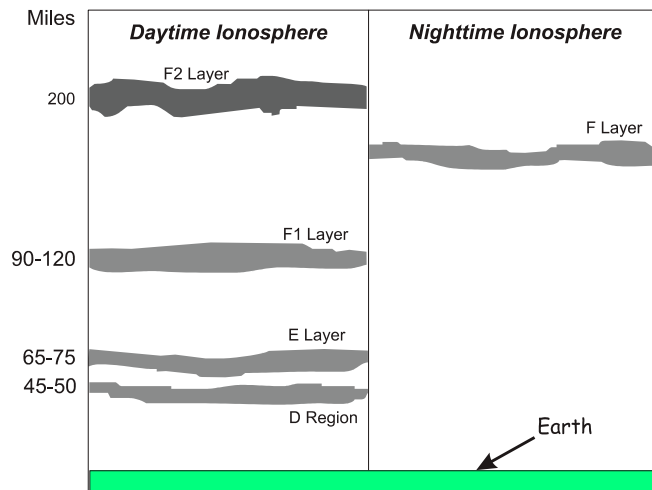
Part 1

By Bill – W6OAV

If you do not operate on the HF (3 through 30 MHz) bands, but wish to work distant stations, Sporadic E (Es) may be for you. So, what is Es, how does one find it, and how does one utilize it? This multipart article will attempt to answer these questions. This article discusses Es occurrences on 10 through 2 meters. By definition, 10 meters is considered as HF. However, relative to Es, 10 meters has the characteristics of VHF.

Overview of the Ionosphere

To understand Es, a review of the ionosphere is in order. The graphic below shows the configuration of the ionosphere during day time and night time.



The following is a brief description of the Ionosphere layers:

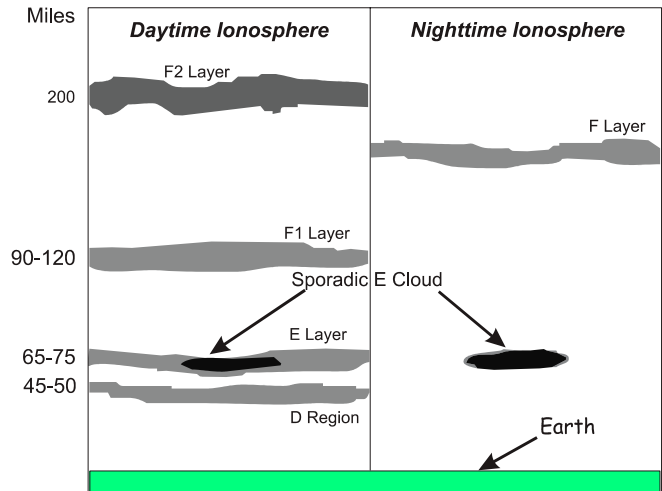
F layer -The F layer is the primary medium which supports long distance HF communications. HF signals reflect off this layer out to 2500 miles. During the day the F layer consists of two layers, the F1 and F2 layers. The F1 layer is not an important propagation layer. The F2 layer does all the work. At night the F1 and F2 layers combine into one layer.

E layer - The E layer reflects signals between 300 kHz and 3000 kHz. The E layer is strongest at noon. However, signals in the 300 kHz to 3000 kHz range from the earth are blocked by the lower D layer. At night, the E layer disappears.

D layer - The D layer absorbs all signals below 10 MHz, thus blocking the signals between 300 kHz and 3000 kHz from reaching the E layer. At night, the D layer disappears.

What is Sporadic E?

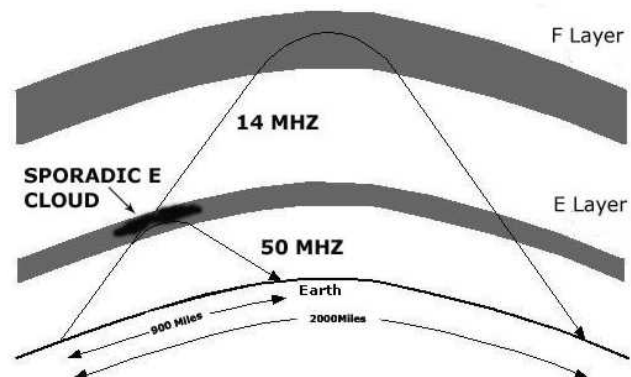
Referring to the following graphic, Es is characterized by small “clouds” of intense ionization within the E layer area. (Here after in this article, these “clouds” will be



referred to as “Es clouds”). These Es clouds, which can appear during the day or during the night, support radio wave reflections back to earth between 25 and 225 MHz. These reflections can extend out to 1500 miles for single hop and twice that distance for rarer double hops. To be of any use, the Es cloud must be approximately at the mid point between the transmitter and the receiver, far beyond the visible horizon. This fact will be important when we discuss some of the causes of Es.

A typical example of Es in action is shown below.

SINGLE HOP VHF Es

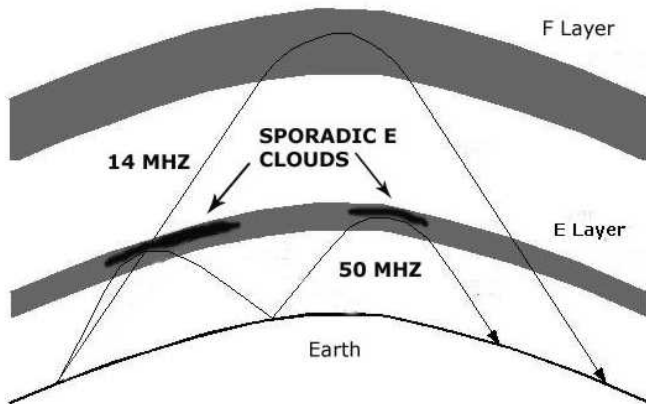


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The 20 meter signal penetrates the Es cloud and reflects back to earth via the F layer. The 6 meter signal reflects back to earth via the Es cloud. The rare double Es bounce is depicted in the graphic below.

DOUBLE HOP VHF Es



Part 2 of this article will discuss the characteristics of Es, the causes of Es and the equipment required to work Es.

JANUARY MEETING TOPIC

This is a must see event

THE QUAGI

By Bill, W6OAV

Interested in learning about a VHF or UHF beam that is more efficient than a Yagi or a Quad, extremely easy to build and tune, will out perform the equivalent Yagi, and is CHEAP! If so, plan to attend the January DRC club meeting. I will give a presentation which will cover the Quagi. The presentation will:

- Contrast the advantages and disadvantages of the Yagi and the Quad.
- Discuss how the Quagi utilizes the advantages of the Yagi and Quad and none of their disadvantages.
- Show how to easily build and tune the Quagi.
- Present the history on how and why the Quagi was developed.

Additionally, I will have my homebrew 8 element Quagi for you to see, that I built in 2 hours for \$9.

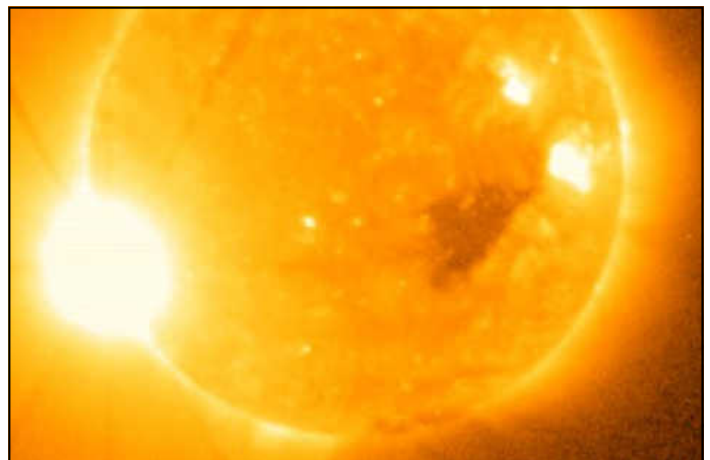
SOLAR UPDATE SOLAR FLARE SURPRISE

BY DR. TONY PHILLIPS, SCIENCE@NASA

Solar flares are the most powerful explosions in the solar system. Packing a punch equal to a hundred million hydrogen bombs, they obliterate everything in their immediate vicinity. Not a single atom should remain intact.

At least that's how it's supposed to work.

"We've detected a stream of perfectly intact hydrogen atoms shooting out of an X-class solar flare," says Richard Mewaldt of Caltech. "What a surprise! These atoms could be telling us something new about what happens inside flares."



Above: The X9-class solar flare of Dec. 5, 2006, observed by the Solar X-Ray Imager aboard NOAA's GOES-13 satellite.

The event occurred on Dec. 5, 2006. A large sunspot rounded the sun's eastern limb and with little warning it exploded. On the "Richter scale" of flares, which ranks X1 as a big event, the blast registered X9, making it one of the strongest flares of the past 30 years.

NASA managers braced themselves. Such a ferocious blast usually produces a blizzard of high-energy particles dangerous to both satellites and astronauts. Indeed, moments after the explosion, radio emissions from a shock wave in the sun's atmosphere signaled that a swarm of particles was on its way.

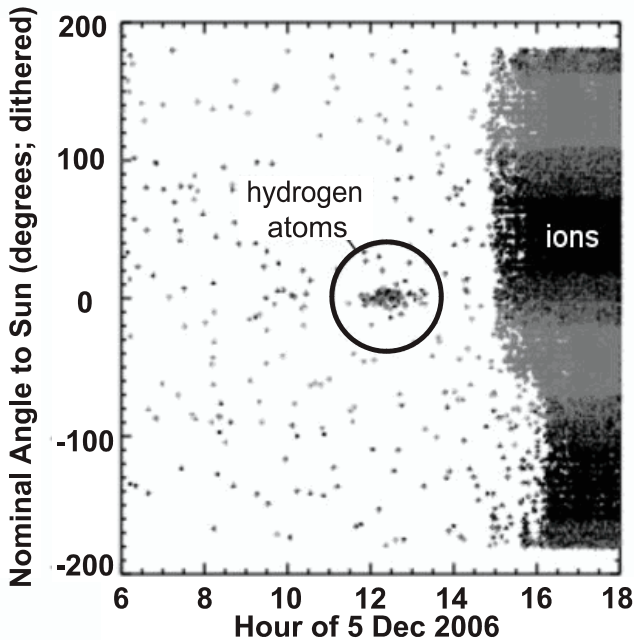
An hour later they arrived. But they were not the particles researchers expected.

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NASA's twin STEREO spacecraft made the discovery: "It was a burst of hydrogen atoms," says Mewaldt. "No other elements were present, not even helium (the sun's second most abundant atomic species). Pure hydrogen streamed past the spacecraft for a full 90 minutes."

Next came more than 30 minutes of quiet. The burst subsided and STEREO's particle counters returned to low levels. The event seemed to be over when a second wave of particles enveloped the spacecraft. These were the "broken atoms" that flares are supposed to produce—protons and heavier ions such as helium, oxygen and iron. "Better late than never," he says.



Above: STEREO particle counts on Dec. 5, 2006. The vertical axis measures the angle to the sun. Note how the initial hydrogen burst arrived from a narrow angle while the ions that followed swarmed in from all directions. The "swarming action" is a result of deflections by the sun's magnetic field—a force not felt by the neutral hydrogen.

At first, this unprecedented sequence of events baffled scientists, but now Mewaldt and colleagues believe they're getting to the bottom of the mystery.

First, how did the hydrogen atoms resist destruction? "They didn't," says Mewaldt. "We believe they began their journey to Earth in pieces, as protons and elec-

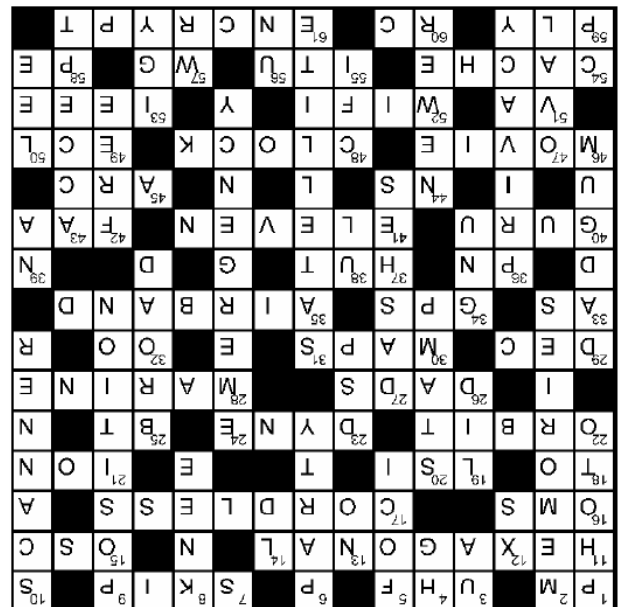
trons. Before they escaped the sun's atmosphere, however, some of the protons recaptured an electron, forming intact hydrogen atoms. The atoms left the sun in a fast, straight shot before they could be broken apart again." (For experts: The team believes the electrons were recaptured by some combination of radiative recombination and charge exchange.)

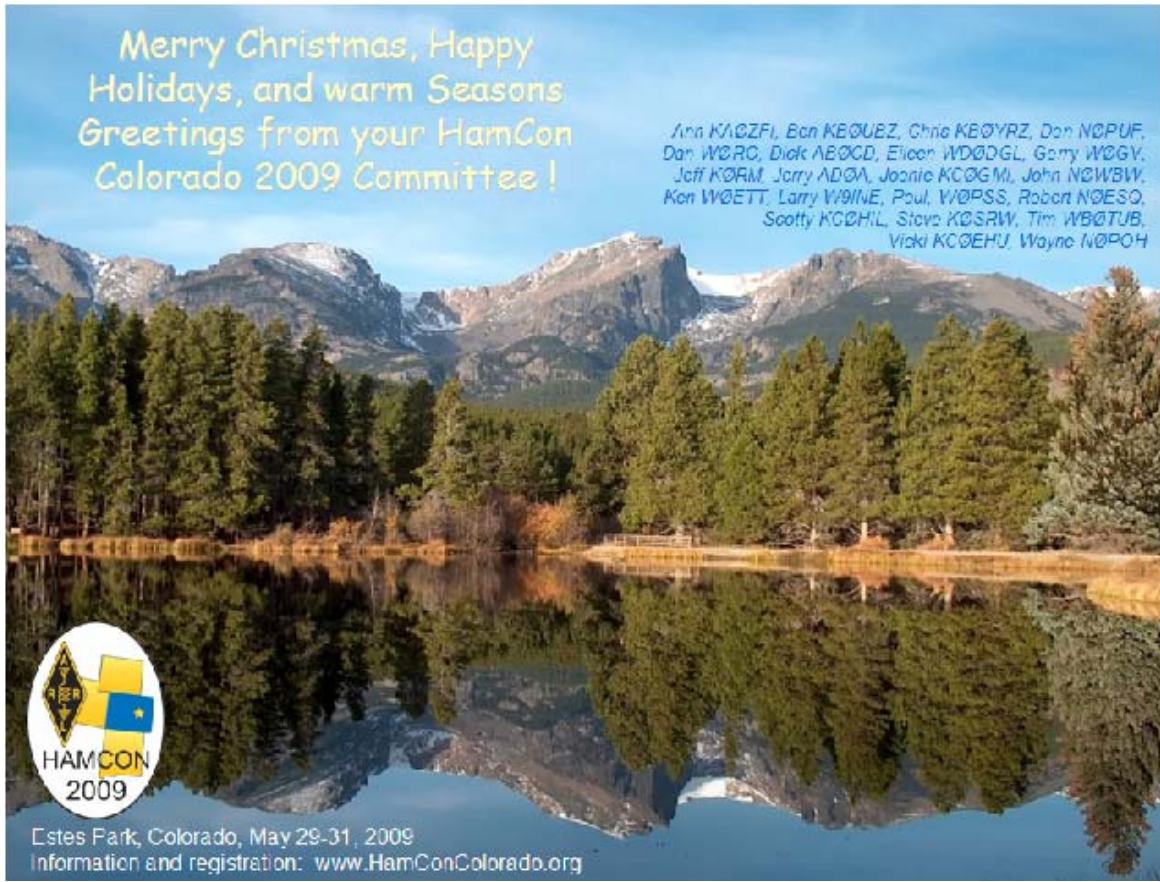
Second, what delayed the ions? "Simple," says Mewaldt. "Ions are electrically charged and they feel the sun's magnetic field. Solar magnetism deflects ions and slows their progress to Earth. Hydrogen atoms, on the other hand, are electrically neutral. They can shoot straight out of the sun without magnetic interference."

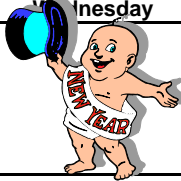





Imagine two runners dashing for the finish line. One (the ion) is forced to run in a zigzag pattern with zigs and zags as wide as the orbit of Mars. The other (the hydrogen atom) runs in a straight line. Who's going to win?" The hydrogen atoms reached Earth two hours before the ions," says Mewaldt.

Mewaldt believes that all strong flares might emit hydrogen bursts, but they simply haven't been noticed before. He's looking forward to more X-flares now that the two STEREO spacecraft are widely separated on nearly opposite sides of the Sun. (In 2006 they were still together near Earth.) STEREO-A and -B may be able to triangulate future bursts and pinpoint the source of the hydrogen. This would allow the team to test their ideas about the surprising phenomenon.

"All we need now," he says, "is some solar activity."





JANUARY 2009							<i>DRC Net Sunday 8:30pm Local</i>
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
				1 ARRL Straight Key Night	2	3 ARRL RTTY Round-Up Begins 1800U ARRL Kid's Day	
4 ARRL RTTY Round-Up Ends 2400U 	5	6	7 Learning Net 7pm	8	9	10 	
11	12	13	14 Learning Net 7pm	15	16	17 ARRL Januray VHF Sweeps Begins 1900U 	
18 ARRL Januray VHF Sweeps Ends 0359U <i>Monday</i>	19 Martin Luther King Day 	20	21 DRC Meeting Elmer 6:30pm General 7:30pm	22	23	24	
25	26 	27	28 Learning Net 7pm	29	30	31	

Check www.ARRL.org for Contests and Rules!

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DRC REPEATERS

BAND	Freq / Shift / PL Tone	Additional Information
10m	29.620mHz (-100kHz) FM	
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

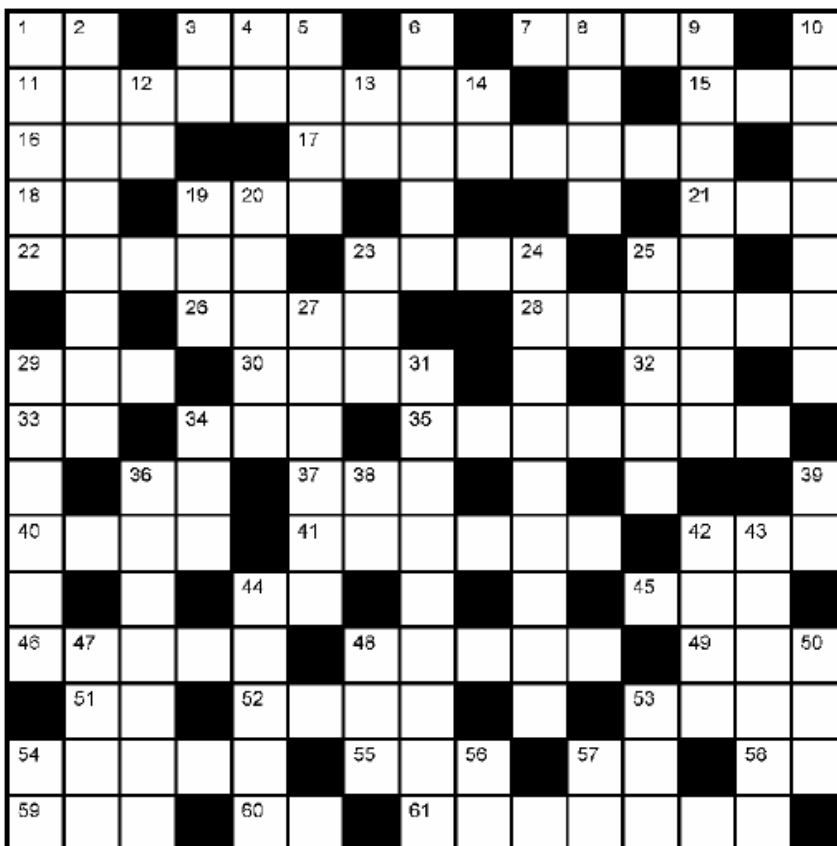
DRC members - this is your newsletter. If there is something which is club or amateur radio related that you'd like to see as a regular feature, email suggestions to the editor. Members are the heart and sole of The Denver Radio Club, if you have an expertise or an interest in a particular segment of 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 January. **Editor**

Puzzle Page

Who says radio is dead? There are more radios out there than ever before! Every cellular phone is a radio--and sometimes a two or three-bander. You can't get through a hardware store checkout line without seeing FRS and GMRS handheld radios hanging on a display. GPS receivers are built into watches--Dick Tracy was right! The theme of this puzzle is all of the "other" wireless services whose signals are right there next to ours on the bands "from dc to daylight."

By H. Ward Silver, N0AX

Puzzle solution on page 5.



Across

- 1. Cousin to FM
- 3. Frequency range for 40 Across
- 7. Propagation off the ionosphere
- 11. Shape of mobile phone cells
- 15. Generates a sine wave (abbr)
- 16. The chairman of WRTC-2006
- 17. Phone without wires
- 18. Transistor package outline prefix
- 19. One step prior to VLSI (abbr)
- 21. Atom missing an electron
- 22. Path around an astronomical body
- 23. Add "hetero-" to mix frequencies
- 25. CW dash
- 26. Slang for fathers
- 28. Radio on the water
- 29. Between OCT and HEX
- 30. Drawings of landforms
- 32. Ham band monitoring station
- 33. CW prosign for "Stand by"
- 34. Wireless satellite navigation system
- 35. Where pilots communicate
- 36. Semiconductor junction
- 37. Another word for "shack"
- 40. Expert
- 41. Wavelength in meters of CB allocation
- 42. Agency with tower height rules
- 44. How a compass needle aligns itself
- 45. Sustained spark
- 46. One use of streaming video
- 48. Regular time signal
- 49. High-speed logic family using negative voltage
- 51. Across the Potomac from MD (postal code)
- 52. Popular wireless network standard
- 53. Organization that controls the standard for 52 Across
- 54. Stash of goods or supplies
- 55. Organization that allocates prefixes
- 57. Feed line for microwaves (abbr)
- 58. Person that reviews building plans
- 59. One of several layers
- 60. Wireless control of models
- 61. Obscure the meaning with a code

Down

- 1. Voltaics and cells
- 2. Where channel contents are stored
- 3. Prefix for hosts of WRTC-2010
- 4. Used in thermometers (chemical symbol)
- 5. Where elliptical dishes concentrate energy (plural)
- 6. A shared telephone line
- 8. An abrupt change in a graph or curve
- 9. What a navigation system provides
- 10. Receiver designed to monitor many channels
- 12. Series reactance (abbr)
- 13. Opposite of Normally Closed (abbr)
- 14. Load (abbr)
- 19. Poor operator
- 20. Need one to mail QSLs
- 23. Filtering by computation
- 24. Like a disaster
- 25. Wide bandwidth or beamwidth
- 27. Partner to dots
- 29. Mildly exasperated rural expletive (two words)
- 31. A bird in space
- 34. Animal for whom the free-source movement is named
- 36. Codes used on FRS and GMRS radios
- 38. Safety lab
- 39. Does not apply (abbr)
- 42. Available at no charge
- 43. To take or receive
- 44. More recent
- 47. Shape of the aurora from space
- 48. Person qualified to teach flying
- 50. Sheltered from the wind
- 53. International scientific cooperation in 1959
- 54. Prefix for landlocked South American country
- 56. Partner to "bal"
- 57. Prefix for types of 57 Across