

Northern Colorado Amateur Radio Club

P.O. Box 272956

Fort Collins, CO 80527-2956

The Tribander

The monthly Newsletter of the Northern Colorado Amateur Radio Club

**Club Meetings are held on the 3rd Saturday of each month
At the Golden Corral, 901 E. Harmony Rd, Fort Collins, CO.**

All are welcome and encouraged to attend.

**Bring yourself and your appetite at 8:00 am.
The Meeting begins at 9:00 am.**

NCARC Club Information

Club Officers

President	Steve Henry	N7GN	(970)226-2817	n7gn@arri.net
Vice President	Eric Slutz	N0EAS	(970)282-3752	eric@redginger.com
Secretary	Dave Langenberg	KC9FOO	(773)612-8435	dave@thelangenbergs.com
Treasurer Membership Chair	Willis Whatley	WA5VRL	(970)407-6599	whatley@frii.com
Interference Coordinator	Mike Bates	N7DQ	(970)219-3225	n7dq@comcast.net
Newsletter	Willis Whatley	WA5VRL	(970)407-6599	whatley@frii.com
Technical Chair	George Salzmann	AB0SF	(303)961-0841	ab0sf@yahoo.com
Hamfest Chair	Michael Robinson	N7MR	(970)225-7501	michael@frii.com

NCARC Repeaters

W0UPS: 145.115 MHz – (144.515 MHz Input) 100 Hz CTCSS Subtone (1* on, 0* off) Autopatch (40-32.926N, 105-11.898W, 7229 ft) Horsetooth Mountain, west of Fort Collins, CO
W0UPS: 447.275 MHz – (442.275 MHz input) 100 Hz CTCSS Subtone Autopatch (40-32.926N, 105-11.898W, 7230 ft) Horsetooth Mountain, west of Fort Collins, CO
W0UPS: 146.625 MHz – (146.025 MHz Input) 100 Hz CTCSS Subtone (40-50.266N, 105-3.017W, 5600 ft) SW of the Rawhide Power Plant, 17.5 miles north of Fort Collins, CO
W0UPS: 146.850 MHz – (146.250 MHz Input) 100 Hz CTCSS Subtone (1* on, 0* off) (40-25.341N, 104-44.182 W) Greeley, CO
W0UPS-5: 144.390 MHz – APRS Digital Repeater (40-32.926N, 105-11.898W, about 7229 ft) Horsetooth Mountain, west of Fort Collins, CO

Nets

ARES District 10 Information Net	Wednesday	9:00 pm	145.115 MHz
ARES Statewide Net	Sunday	8:30 pm	145.310 MHz
Central Colorado Traffic Net	Daily	7:30 pm	145.310 MHz
Tech Net	Tuesday	7:00 pm	145.115 MHz

Web Page

<http://www.ncarc.net>

TECH NET Announcement!

This is a reminder that the 145.115 TECH NET is held Tuesday evening 07:00 PM.
It is hosted by N0WIQ, Kerry. All amateur radio operators (with 2M privileges) are welcome to check in. It is an open forum net with Questions, Answers and Topics of interest.

If the 145.115 repeater is not available, the net will be held on the 447.275 repeater

CW Practice Session!

This is a reminder that the 145.115 CW Practice Session is held Friday evening 06:00 PM.
It is hosted by WOEP, Chris. All amateur radio operators (with 2M privileges) are welcome to check in or listen.

NCARC Winter Superfest

Saturday, January 20, 2007

Lincoln Center's Canyon West Room: 8am - 2pm

Vendor setup begins at 6am.

Tables \$5 includes 1 admission

Doors open at 8am

Admission \$5

VE Testing in the Ludlow Room begins at 9:30am

**Lincoln Center
417 W. Magnolia St.
Fort Collins, CO 80521**

Prizes to be announced

Flyer and more information on the Webpage:

www.ncarc.us

www.ncarc.net

**Contact Michael, N7MR
970-225-7501
970-282-1167
michael@frii.com**

**The Rat Race
The 2nd Saturday in August
Ault, Colorado**

**10K run 5K run/walk, 2K fun run, mini kids run. Race begins at 7:30 a.m.
Radio operators usually need to arrive by 6:30 a.m.**

**This is an early morning event that is completed well before noon.
Contact K0OJ at (970) 353-7094.**

Some Other Upcoming Swapmeets

Denver Radio Club Hamfest

08/20/2006

Jefferson County Fairgrounds in Golden 8:30 AM - 2 PM

Table Cost: \$10.00 Admission: \$5.00

Note Table price DOES NOT include admission

For more info: <http://www.qsl.net/w0tx>

Mountain Amateur Radio Club MARC Campfest

08/25/2006

8649 Main Street (Not Hwy 24) Lake George, Colorado

For more info: <http://www.qsl.net/nx0g> or contact Paul Moraine at 719-638-0273

BARC Fest

09/24/2006

Vendor Setup beginning at 6:00 AM

Doors Open to all at 8:00 AM

Boulder County Fairgrounds

9595 Nelson Road (corner of Nelson and Hover Roads), Longmont

Talk-in on 146.700 (-) Repeater

Admission \$5

Door Prizes Drawn Every Hour!

Breakfast & Lunch by Papa Carr BBQ Catering

Boulder VE Team – License Exam Testing Held at 10AM Sharp!

For More Information Contact: BARC70@arrl.net

Local Area Swaplists:

For those who can not wait or can not attend the area swapmeets, below are the websites for some of the regional swaplists found on the internet. These are updated weekly.

Aurora Repeater Assn. Swaplist: <http://www.qsl.net/n0ara/swaplist.html>

Colorado Repeater Assn. Swaplist: <http://www.w0cra.org/swap/craswaplist.htm>

Wyoming Swap Shop: <http://www.hfradio.org/wb4uic/Wyo%20Swap%20Shop%20I.doc>

New Mexico Swaplist: <http://bc-ares.org/swapnet/listings.html>

Wyoming, Idaho, Montana and Utah (WIMU) 2006 Convention

August 4, 5 and 6

Commercial Vendors Include Rad-Comm and Kartronics (not Kantronics)

**Featured Guest Joel Harrison, W5ZN, ARRL President
ARRL Forum Participant and Banquet Keynote Speaker**

Program Updated

The WIMU 2006 forum program has been updated to reflect the most current information. It includes: Reception, Raffle, Flea Market, Fox Hunt, ARRL Forum, Emergency Comms Forum, APRS Forum, Satellite Forum, IRLP/VOIP Forum, Fox Hunt Forum, Phased Vertical Array Antenna Forum, Quad Antenna Forum, DX Forum, Dxpediton Forum, Home Brew Forum, **Fly Fishing Forum, Astronomy Forum, Teton/Yellowstone Geology Forum**, VE Testing, Card Checking, Banquet / Keynote Speaker Breakfast Presentation.

Advance Tickets \$8 (under 12 free)

Door Tickets \$10 (under 12 free)

Swap Table \$10

Banquet Dinner on Aug. 5 \$26 (under 12 is \$13)

Breakfast on Aug. 6 \$10 (under 12 is \$5)

Questions / Suggestions / Volunteers / Contributions: wimu2006@redgiant.org

New and renewing members for July:

KI0IO – Rob KC0WZV – Wayne K2CSU – Mark K0BYU – Alan K0UYE - Elmer

The NCARC thanks you for your support.

RADIO OPERATORS NEEDED !!!

Wild West MS Walkabout

August 25-27, 2006

**This event will have participants walking “50 miles in 3 days” and is being held in Fort Collins
From about 8 AM to 4 PM each day**

Contact Steve Henry at 226-2817 soon if you can assist with communication for this event.

ADA Tour de Cure Colorado

August 26, 2006

**The Tour de Cure is not a competitive race. It's a ride
to prevent and cure diabetes and to improve the lives of all people affected by diabetes**

The riders will select from four different courses, the earliest check-in is at 5:30 AM and there will be 12 rest stops.
The new Start/Finish is at the Boulder County Fairgrounds in Longmont

Contact Michael Robinson at 225-7501 soon if you can assist with communications for this event.

A Vacuum Tube Quiz:

Originally published in the Anchorage Amateur Radio Club Newsletter

1. Rank the following in order of increasing size: A.) 5894 B.) 832A C.) 829B
What kind of tubes are these?
2. Rank the following in order of performance: A.) 417A B.) 6AK5 C.) 416B
What kind of tubes are these and who manufactured all three?
3. Fill in the blanks: 12BE6, _____, 12AV6, _____, 35W4
What was the common name for this set of tubes and why can they be used in an AC or DC powered radio?
4. Which one of these is not a type of vacuum tube? Loctal, Compactron, Acorn, Dymaxion, Nuvistor, Lighthouse.
Who was the creator of the one that is not a vacuum tube?
5. Rank the following in order of increasing size: A.) 813 B.) 5763 C.) 6146B D.) 2E26 E.) 811A
What kind of tubes are these?
6. What can you see on the front of a Heathkit Signal Tracer or a Gonset II (but you will not see on the front of a Gonset III)?
7. Some tubes have a silvery material deposited near the location where the air was removed or inside the top of the glass envelope.
Some tubes have a white material in the same place.
What is this material called and what is the difference between the silver and white material?
8. Portable tube type radios require a variety of batteries depending on the tube compliment used.
Which of the following are not standard “B” battery voltages? 22.5 V, 33 V, 45 V, 78 V, 90 V
Is there a common theme among the wrong answer(s)?
9. Which of the following was not a source of high voltage for vacuum tubes in various applications?
Vibrator, Flyback, Dynamometer, Inverter, Dynamotor.

§97.101 General standards.

- (a) In all respects not specifically covered by FCC Rules each amateur station must be operated in accordance with good engineering and good amateur practice.
- (b) Each station licensee and each control operator must cooperate in selecting transmitting channels and in making the most effective use of the amateur service frequencies. No frequency will be assigned for the exclusive use of any station.
- (c) At all times and on all frequencies, each control operator must give priority to stations providing emergency communications, except to stations transmitting communications for training drills and tests in RACES.
- (d) No amateur operator shall willfully or maliciously interfere with or cause interference to any radio communication or signal.

Amateur or Ham?

Well, there is certainly no shortage of guesses about the origin of the term “Ham” as it is applied to Amateur Radio. Just a few are listed below. The real origin has been lost in time; therefore we should take all explanations of the term “Ham Radio” or “Ham Radio Operator” that we might hear with a grain of salt.

1. The term “ham” came about in the early days of radio, when high voltage sparks would jump out at operators. It was said that a person "with a fist as big as a ham" was needed to take the shock from the big blue spark, so it is possible that the expression “ham radio operator” stuck.
2. The term “ham” meant "a poor operator." That's the definition of the word given in *The Telegraph Instructor*, by G. M. Dodge, even before radio began. The first “wireless” operators were landline telegraphers who left their offices to go to sea or to man the coastal stations. They brought with them their language and much of the tradition of their older profession. In those early days, spark transmitters were king and every station occupied the same wavelength. Or more accurately perhaps, every station occupied the whole spectrum with its broad spark signal. Two amateurs, working across town, could effectively jam all the other operators in the area. When this happened, the frustrated commercial operators would call the ship whose weaker signals had been blotted out by the Amateurs and say “SRI OM THOSE #&\$!@ HAMS ARE JAMMING YOU.” Amateurs, possibly unfamiliar with the real meaning of the term, picked it up and applied it to themselves.
3. The three letters (H.A.M.) possibly refer, in homage, to the initials of the last names of three great radio experimenters; Hertz, who demonstrated the existence of electromagnetic waves in 1888; Armstrong, who developed a resonant oscillator circuit for radio frequency work; and Marconi, the 1909 Nobel laureate in Physics, who in the year 1901 established the first trans-Atlantic radio contact.
4. It is the combination of the initials of the last names of three Harvard students who supposedly had an amateur station in the early 1900s. Their names were supposedly Hyman, Almay and Murray. They operated a little Amateur radio station using the call sign of “HAM”. (In the early days of radio, the government did not assign callsigns.) However, an investigation of written records throughout the period did not reveal any reference to such a radio station.
5. The early 20th century was filled with magazines catering to the experimenter. (Everyone at the end of the Victorian age apparently viewed themselves as a closet inventor.) One of these magazines was called *Home Amateur Mechanic*, and it featured many simple radio sets a person could build. It is likely that when asked what kind of radio an operator was using, he might send back “RIG HR ES HAM”, meaning that it was one of the circuits shown in *Home Amateur Mechanic* magazine. Since telegraphers tend to abbreviate everything, due to the low throughput of Morse, this is plausible, and *Home Amateur Mechanic* magazine certainly did exist in the correct era. So it could have been those HAM radios that started the use of “ham” in amateur radio.
6. There is also the concern that radio operators in our craft do not want the general public viewing us as “Amateurs” of any kind because of the stigma that could be affixed to that term. Although a large portion of the general public recognizes our service as “Ham Radio”, the actual title is the Amateur Radio Service. While our ranks are filled with persons that comprise a fairly complete cross section of the general public, most operators who have been involved with our service for more than a few years are anything but “amateurs”. Amateur Radio Operators enjoy many privileges, one of which is being allowed to design, build and modify our own equipment. Most all other services under the jurisdiction of the FCC are required to use equipment that is “type certified” by the FCC. The Amateur Radio Service also has the largest selection of frequencies on which to operate, with the exception of the U.S. Military. The public service communications provided by the Amateur Radio Operators throughout the 20th century are one of the primary reasons for the granting and continuation of these privileges. These privileges come with equal levels of responsibility and the Amateur Radio Service has the highest level of self-governance of any communications service.

Do not shy away from identifying our service by its actual title. If someone makes any comment that seems to indicate that they view our service as “amateur” in a negative light, just remind them that “amateurs” built the Ark, “professionals” built the Titanic. Who would you want on your team when the going gets rough?

73,

WA5VRL

Future Flux, the shape of things to come.

Even if you are a newly licensed Amateur Radio Operator, you are probably aware that the propagation on the radio frequencies known as the HF bands has not been all that great recently. You have also probably heard of the 11-year sunspot cycle and how it impacts communications on the Amateur as well as most other frequency bands.

Well, it's official: The Solar minimum has arrived. Welcome to Ham Radio... Sunspots have all but vanished. Solar flares are nonexistent. The sun is utterly quiet. Like the quiet before a storm.

And a storm is coming: possibly the most intense solar maximum in fifty years. The next sunspot cycle will be 30-50% stronger than the last one and begin as much as a year late. This prediction comes from a team at the National Center for Atmospheric Research (NCAR).

This breakthrough-forecast prediction was made using a using a computer model of solar dynamics developed by scientists at NCAR. The scientists have confidence in the forecast because, in a series of test runs, the newly developed computer model simulated the strength of the past eight solar cycles with more than 98% accuracy. The forecasts are generated, in part, by tracking the subsurface movements of the sunspot remnants of the previous two solar cycles.

The "Predictive Flux-transport Dynamo Model" is enabling NCAR scientists to predict that the next solar cycle, known as Cycle 24, will produce sunspots across an area slightly larger than 2.5% of the visible surface of the Sun. The scientists expect the cycle to begin in late 2007 or early 2008, which is about 6 to 12 months later than a cycle would normally start. Cycle 24 is likely to reach its peak about 2012.

If correct, the years ahead could produce a burst of solar activity second only to the historic Solar Max of 1958. That was a solar maximum. The Space Age was just beginning: Sputnik was launched in Oct. 1957 and Explorer 1 (the first US satellite) in Jan. 1958. In 1958 you couldn't tell that a solar storm was underway by looking at the bars on your cell phone; they didn't exist. Even so, people knew something big was happening when Northern Lights were sighted three times in Mexico! A similar maximum now would be noticed by its effect on cell phones, GPS, weather satellites and many other modern technologies.

In nearly two centuries since the 11-year sunspot cycle was discovered, scientists have struggled to predict the size of future maxima, and failed. Solar maxima can be intense, as in 1958, or barely detectable, as in 1805, obeying no obvious pattern.

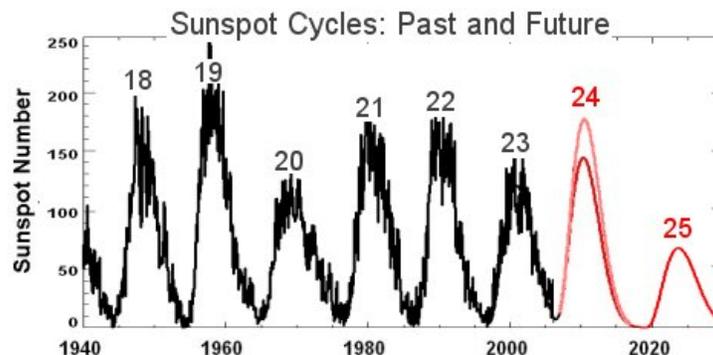
The key to the mystery was discovered several years ago. It is a "conveyor belt" on the sun. The sun's conveyor belt is a current of electrically conductive gas. It flows in a loop from the sun's equator to the poles and back again. Just as the Great Ocean Conveyor Belt controls weather on Earth, this solar conveyor belt controls weather on the sun. Specifically, it controls the sunspot cycle.

The top of this conveyor belt skims the surface of the sun, sweeping up the magnetic fields of old, dead sunspots. The 'corpses' are dragged down at the poles of the sun to a depth of 200,000 km where the sun's magnetic dynamo can amplify them. Once the corpses (magnetic knots) are reincarnated (amplified), they become buoyant and float back to the surface. Presto—new sunspots!

But all of this happens with massive slowness. It takes about 40 years for the belt to complete one loop. The speed varies anywhere from a 50-year pace (slow) to a 30-year pace (fast). When the belt is turning "fast," it means that lots of magnetic fields are being swept up, and that a future sunspot cycle is going to be intense. This is the basis for the forecasts. The belt was turning fast in 1986-1996. Old magnetic fields swept up then should re-appear as big sunspots in 2010-2011.

At this time, the Sun's Great Conveyor Belt has slowed to a record-low crawl, according to research by NASA. It's "off the bottom of the charts" and this has important repercussions for future solar activity. The slowdown being observed now means that Solar Cycle 25, peaking around the year 2022, could be one of the weakest in centuries.

So get ready and enjoy the coming Cycle 24 because, if the new prediction system is correct, you may have to wait till 2033 or longer for another cycle with a really good maxima.



Quiz Answers:

1. B, C, A. These are dual tetrode transmitting tubes commonly used in VHF homebrew and commercial FM transmitters. Having a pair of tetrodes in the same glass envelope provided advantages such as cost reduction and space savings.
2. B, A, C. These are low noise figure receiving tubes used in the front end of VHF and UHF receivers. The Western Electric Company manufactured all of these tubes for use in commercial communications circuits. Like many other tubes, they are getting hard to find.
3. 12BA6 and 50C5. This tube set is known as the All American Five. This particular set is comprised of seven pin miniature tubes but there was an earlier version of this that used octal tubes. The equipment in which these were used had no power transformer. The tube filaments were all wired in series and were connected directly to the wall outlet. The rectified B+ was also derived directly from the connection to the wall outlet, so the receiver could be operated from a 120 V AC or a 120 V DC source.
4. The Dymaxion is a streamlined car designed by Buckminster Fuller, the same guy that created the geodesic dome. An original Dymaxion can be seen at the Harrah's Auto Museum in Reno, Nevada.
5. B, D, C, E, A. These are tetrode power amplifier tubes used singly or in groups, ranging in power from just a few watts to over a kilowatt. When triodes were first used in radio transmitters and receivers, it was found that they were often unstable and had a tendency to oscillate due to parasitic anode to grid capacitance. Many complex circuits were developed to reduce this problem, but they proved to be unsatisfactory over wide ranges of frequencies. It was discovered that the addition of a second grid, located between the control grid and the plate (called a screen grid) could solve these problems. A positive voltage slightly lower than the plate voltage was applied to it, and the screen grid was usually bypassed (for high frequencies) to ground with a capacitor. This arrangement decoupled the anode and the first grid, completely eliminating the oscillation problem. These tubes having four active elements are referred to as tetrodes.
6. The Heathkit Signal Tracer and Gonset II used a "Magic Eye" tube as a tuning indicator or meter. Because of their fast reaction time compared to a panel meter, they were preferred for audio measurements and modulation indicators. RCA registered their first electron ray (Magic Eye) tube, the 6E5, on June 27, 1935. Within two years of RCA's introduction of the 6E5, several variants appeared for use in consumer radio. Most of these tubes were developed and licensed by RCA. These variants differed in size or shape of bulb, display, or electrical characteristics. These were 6G5, 6H5, 6N5 and 6T5. The 6G5, quickly replaced by the 6U5/6G5, having a tubular (T9) glass envelope, became the most popular type used in radio sets. The 6N5 was electrically similar to the 6U5_6G5 but featured a lower heater current and plate voltage for use in 6-volt farm (battery powered) sets.
7. The most common name is "getter" because it is supposed to "get" the last remaining atmospheric molecules from the vacuum inside the tube. It is built into the tube to prevent any gases that are left inside from remaining in a free state. The getter is usually a small, circular trough filled with metals that oxidize quickly, barium being the most common. Once the tube envelope is evacuated and sealed, the getter is heated to a high temperature (usually by means of RF induction heating) causing the material to evaporate. As it absorbs and reacts with any residual gases, it leaves a silver-colored metallic deposit on the inside of the envelope of the tube. The getter continues to absorb any gas molecules that leak into the tube during its working life. If a tube develops a crack in the envelope, this deposit turns a white color when it reacts with atmospheric oxygen.
8. 33 and 78. These numbers (and also 45) are the approximate RPM values at which phonograph record turntable platters were able to operate.
9. The Dynamometer is a device for measuring horsepower of car engines. The other devices listed are usually used to convert a low DC supply voltage to the higher DC voltage used in vacuum tube circuits. The Synchronous (or self-rectifying) Vibrator and Dynamotors both produce high voltage DC that is used as B+ for vacuum tube circuits. The Non-Synchronous (or interrupter) Vibrator requires the use of a rectifier tube in the circuit to produce the B+ for the other tube circuits. The Flyback is a special type of high voltage transformer whose output is rectified to get the B+ used in the tube circuits. The Inverter, like the other sources described above, uses an interrupted DC source that is transformed to a higher voltage level and then rectified to produce the B+ used in the vacuum tube circuits.

Worthy of consideration if you have moved recently:

§97.23 Mailing address.

Each license grant must show the grantee's correct name and mailing address. The mailing address must be in an area where the amateur service is regulated by the FCC and where the grantee can receive mail delivery by the United States Postal Service. Revocation of the station license or suspension of the operator license may result when correspondence from the FCC is returned as undeliverable because the grantee failed to provide the correct mailing address.

