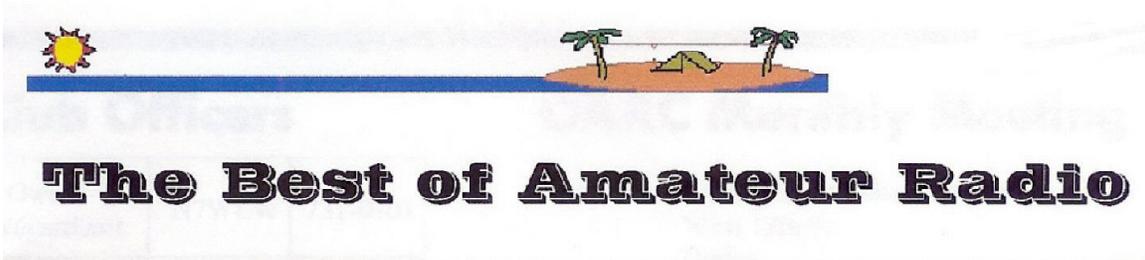




# WATTS NEWS



**The Best of Amateur Radio**

*Welcome to the OARC e-Magazine*

[www.OgdenArc.org](http://www.OgdenArc.org)

**JULY 2008**

Next Club Meeting

**3rd Saturday July 19, 2008**

**Topic: "T"-Hunt meeting & activity**

**Note: Club officers nomination meeting**



**Kent Gardner WA7AHY**  
President



**Kim Owen KO7U**  
Vice President



**Maggi Campbell N7HCP**  
Secretary



**Jeff Anderson KD7PAW**  
Treasurer



**Mike Webster N9NZ**  
Director #1



**Stan Sjol W0KP**  
Director #2



**Mike Fullmer KZ7O**  
Past Pres/Advisor



**Val Campbell K7HCP**  
Webmaster/Editor

# PREVIOUS CLUB MEETING

3rd Saturday June 21, 2008

The club meeting in June was devoted toward OARC's ARRL Field Day planning and preparation. Field day was held the following weekend which ran from noon Saturday till noon Sunday. It was held at the WOKP ranch (Stan Sjol's) in Hooper. Thanks to Stan for his hospitality in hosting this event at his place.

## OARC Field Day 2008 Results

Call Used: W7SU      GOTA Station Call: (none)      ARRL/RAC Section: UT  
Class: 2A

Participants: 32      Club/Group Name: Ogden Amateur Radio Club (OARC)

Power Source(s): Generator

Power Multiplier: 2X

Bonus Points:

100% Emergency power	200
Media Publicity	100
Information Booth	100
Site Visit by invited served agency official	100
Youth participation	20
Youth operators=1	
Youth participants=1	
Submitted via the Web	50

**Total Bonus Points**

**570 Additional Bonus Points**

Score Summary:

	CW	Digital	Phone	Total	
<b>Total QSOs</b>	<b>0</b>	<b>0</b>	<b>443</b>		
<b>Total Points</b>	<b>0</b>	<b>0</b>	<b>443 x 2 pts/qso</b>		<b>886 Claimed QSO Score</b>

Band/Mode QSO Breakdown:

	CW		Digital		Phone	
	QSOs	Pwr (W)	QSOs	Pwr (W)	QSOs	Pwr (W)
160m						
80m					41	150
40m					202	150
20m					161	150
15m					37	150
10m					2	150
6m						
2m						
1.25						
Other						
Satellite						
GOTA						
<b>TOTAL</b>	<b>0</b>		<b>0</b>		<b>443</b>	<b>Contacts</b>



## NEXT CLUB MEETING

**When:** 3rd Saturday July 19, 2008  
**Time:** 9:00 AM  
**Location:** Riverdale Fire Station (see web site for map)  
**Talk-in:** -146.90 (pl=123)  
**Topic:** "T"-Hunt meeting & activity  
**Note:** Club officers nomination meeting

Hone your skills at tracking down the location of the hidden transmitter. It will require a bit of skill and will require driving, so bring a designated driver to assist you with the challenging activity. There will be a prize for the first contestant to locate the hidden transmitter.

You can hunt the fox with your HT and a paper clip. Hold the unit down close to your chest and pirouette around and find the direction where the signal sounds the weakest. If the signal is full quieting, de-tune the radio 5 or 10 kHz until some noise is heard with the signal.

When you have found the direction of weakest-sounding signal, the signal is coming from behind you. This is the direction from which your body provides the most attenuation.

## CLUB OFFICER NOMINATIONS

Come to this meeting prepared to nominate your favorite Ham, or volunteer yourself, to an office of your choosing to support you and your club for the next club year. We will elect new officers at the following meeting, the August Steak Fry and elections meeting.

## FROM THE PRESIDENTS SHACK



Kent Gardner WA7AHY

From the President's Shack  
July 2008

Thanks to our Club Director #2, Stan Sjol and others for doing such a great job in putting our Field Day Emergency Exercise together. Stan's llamas were curious about us and we were curious about them. The two stations using his great array of antennas were both productive. The radios, food and company was fun. Thanks also to all who participated, ate and enjoyed themselves. We logged 443 contacts and earned 886 Qso points plus 570 bonus points. This exceeded last years achievements, however slightly.

Next up, is our meeting at 9:00 AM on Saturday 19 Jul 08. We intend on having a video showing a fox-hunt East coast style.. We will then have the mobile transmitter hunt at the end of the meeting with all participants vying for the nice coaxial switch that is being given as the one prize. There will not be a walking hunt in the nearby park this year because of the limited time after the meeting.

The steak fry and elections are coming in August. Those of you who would like to run for an office please let us know. Our club secretary, Maggie Campbell, is heading up the nominations effort. Also, if any of you are musically inclined or do comedy we are looking for several numbers to be performed at the steak fry.

TNX

Kent, WA7AHY

## CLUB NEWS

**Congratulations: To the following who successfully tested at the Weber County VE Test Session June 6th during the ECOMM Hamfest:**

**Remember: You saw it here first**

- |                     |        |             |
|---------------------|--------|-------------|
| • Emroy W. Byington | KE7ULQ | Tech Class  |
| • Shane K. Hunt     | KE7ULO | Tech Class  |
| • Howard J. Lythgoe | KE7ULN | Tech Class  |
| • Paul A. Mock      | KE7ULR | Tech Class  |
| • Bret L. Saxey     | KE7ULP | Tech Class  |
| • Michael E. White  | KE7ULS | Tech Class  |
| • Gary D. Hudman    | KB7FMS | Extra Class |
| • Brian P. Meisman  | KB0VSK | Extra Class |

**The following VEs assisted with the session:**

- Mary Hazard, W7UE
- Kenneth R. Wilson, N7OG
- Melvin T. Parkes, NM7P
- Larry L. Griffin, AD7GL
- Raymond F. White, K7RFW

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## AR HOBBY NEWS

### What's Happening?

- [Utah Hamfest 2008](#) (Brice Canyon - Ruby Inn)  
July 11-13 (even numbered years only)
- **No WIMU 2008** (odd numbered year only)  
"Wyoming-Idaho-Montana-Utah" Hamfest (Jackson Hole Wyoming)

## NEWS ARTICLES



### FCC RULES ENFORCER RILEY HOLLINGSWORTH RETIRES

The man who took ham radio out of the hands of trouble makers and made it family friendly once again has retired from public service. Riley Hollingsworth, K4ZDH, who held the title of Special Counsel for the Spectrum Enforcement Division of the FCC's Enforcement Bureau officially retired from the agency on July 3<sup>rd</sup>.

### RADIO SHACK AND CPSC RECALL TWO MODELS OF POPULAR POWER SUPPLIES

The U.S. Consumer Product Safety Commission, in cooperation with Radio Shack Corporation issued a recall notice on July 2<sup>nd</sup>. This, concerning two models of power supplies that the CPSC says places owners at risk of electrocution while also presenting a fire hazard.

The units recalled are 13.8V DC Power Supplies identified as Radio Shack catalog items 22-507 and 22-508. They were sold at Radio Shack stores nationwide from October 2004 through January 2008 for between \$50 and \$85. The units affected carry date codes from 08A04 through 01A08. Both the catalog number and date code are located on the back of the power supply.

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## Attention All Amateurs...



### E-mails Asking for Personal Information Are Not from ARRL (Jul 14, 2008)

We have received several reports from ARRL members with **arrrl.net** e-mail accounts who have recently been contacted via e-mail asking for personal information, such as user names and passwords. Please be assured that these e-mails are fraudulent attempts at "[phishing](#)" and did not originate from ARRL.

According to ARRL Information Technology Manager Don Durand, "This is a very crude attempt at phishing, using an easily determined spoof of the originating/return address. There is never a time when we would ask via mass e-mail for user names and passwords of **arrrl.net** users. There is simply no need to ever do so." If you receive an e-mail asking for personal information and it looks like it originated from ARRL, please do not respond, just delete it.

### Kansas Ham, Son, Electrocuted While Erecting Antennas – (Jul 14, 2008)

While putting up backyard antennas on the afternoon of Sunday, July 13, Edward Thomas, KC0TIG, of Kansas City, Kansas, and his son were electrocuted. The elder Thomas, 65, was pronounced dead at the scene. His son, 27, was rushed to the hospital but died later that day. Initial reports suggest that the antenna they were installing came in contact with 7620 V power lines. Neighbors reported a "loud popping sound" and the electricity went out on the block.

## 468/Frequency in MHz = Length in Feet

This is the first time I am writing a column in response to a reader's request, but it's a good topic—and he is my editor. The topic is 468 divided by the frequency in MHz. I'll bet you had to memorize the formula for calculating a dipole antenna for your first license exam. So where did that 468 come from?

Let's start with a 40-meter dipole and cut it for the SSB portion of the band. The formula for 7.2 MHz comes out 468/7.2, or 65.0 feet. However, if I use the formula using the speed of light, 186,272,000 miles per second/7,200,000 Hz, the length of the wave is 136.6 feet. Of course, I want a 1/2-wave antenna, so divide that by two and I get 68.3 feet. A bit long! This, though, is the length of the radio wave as it travels through free space.

Here's where the difference comes in: When the signal goes down a wire, even a straight wire, the wire has a little bit of inductance and slows down the speed of the wave. A commonly used factor for this inductance is .95, so  $68.3 \times .95$ , or 64.9 feet. Wow, that's about as close as I can do with a yardstick. However, let's look a little closer at that .95 fudge—umm . . . compensation—factor.

That inductance of a straight wire depends on the diameter of the wire. If I want to make some kind of hidden or invisible antenna out of #38-gauge wire, the best SWR for a 65-foot dipole would be at 7.35 MHz. It's moved up in resonant frequency by 150 kHz. Now let's say I have some 6-inch irrigation pipe that I want to use; the resonant frequency is 7.05 MHz. We've gone down 150 kHz. *Conclusion:* The diameter of the dipole makes quite a difference in the final tuned frequency.

### Bare or Insulated?

When light passes through plastic, it travels more slowly than through air. This change in speed, or refraction, is used when a lens is designed. When radio waves travel through plastic, they also slow down. Yes, insulated wire *does* change the electrical characteristics of your antenna. If I take my 7.2-MHz dipole using .1-inch diameter wire, and this time use enameled wire, the new resonant frequency is 7.165 MHz. That's not much difference,

\*1626 Vineyard, Grand Prairie, TX 75052  
e-mail: <wa5vjb@cq-amateur-radio.com>

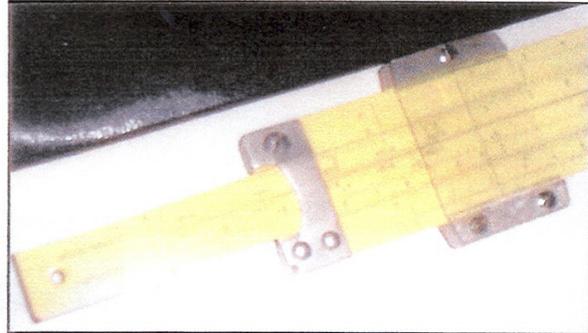


Photo A— The proper way to calculate the length of a dipole.

but that thin layer of enamel paint does change the antenna's resonant frequency. Now if something thicker is used, such as the insulation on household 120-volt wiring, the frequency comes out to 6.95 MHz, a *big* change. Just by changing from bare copper wire to the typical household insulated wire, the antenna changes frequency about 3.5%!

### Distance to Ground

For my Cheap Yagis, I use the distance between the driven element and the other elements to tune the antenna. The height an antenna is mounted above ground also changes the resonant frequency of the antenna. Up to now, I have been assuming that the 40-meter antenna is in free space—that is, far enough above ground that the ground effects are negligible. However, let's make that 7.200-MHz dipole out of .1-inch wire and mount it at 30 feet. The new resonant frequency is 7.05 MHz. The loaded effects of the soil have moved my antenna down in frequency. Put the same antenna at 50 feet, though, and the resonant frequency is now 7.25 MHz. The resonant frequency has gone up because of impedance changes caused by the reflected wave from the ground (see fig. 1).

Now let's take the two extremes for a 40-meter dipole and back-calculate that fudge factor. The formula for a 7.2-MHz dipole made out of 6-inch diameter tubing mounted at 25 feet would be  $434/\text{Frequency in MHz}$ , or about 60.3 feet.

The formula for a 7.2-MHz dipole made out of #38-gauge wire mounted at 55 feet would be  $473/\text{Frequency in MHz}$ , or about 65.7 feet.

In short, the 468 factor is for a typical wire, mounted at a typical height, over a typical ground with average soil conductivity. It's a good starting point, but I suggest making the dipole a bit longer and trimming it to your favorite frequency (see photo A).

(For those of you who like to take your favorite net frequency, say 3.818 MHz, and calculate your new dipole as 122.5773 feet, I need to take away your calculator and whap ya on the knuckles with my pocket slide rule. Your 468 factor just ain't that accurate!)

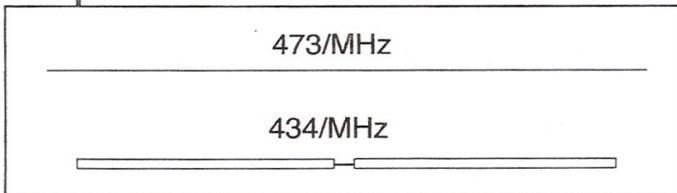


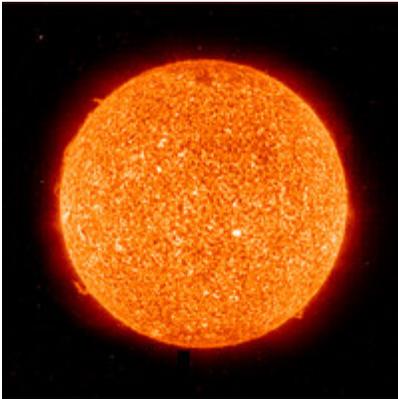
Fig. 1— Lengths of dipoles at different heights with different diameters.

# FEATURE ARTICLE

## Sun is having trouble finding its spots

*June 10, 2008*

The sun has been laying low for the past couple of years, producing no sunspots and giving a break to satellites.



That's good news for people who scramble when space weather interferes with their technology, but it became a point of discussion for the scientists who attended an international solar conference at Montana State Univ. Approximately 100 scientists from Europe, Asia, Latin America, Africa and North America gathered June 1-6 to talk about "Solar Variability, Earth's Climate and the Space Environment."

The scientists said periods of inactivity are normal for the sun, but this period has gone on longer than usual.

"It continues to be dead," said Saku Tsuneta with the National Astronomical Observatory of Japan, program manager for the Hinode solar mission. "That's a small concern, a very small concern."

The Hinode satellite is a Japanese mission with the U.S. and UK as partners. The satellite carries three telescopes that together show how changes on the sun's surface spread through the solar atmosphere. MSU researchers are among those operating the x-ray telescope. The satellite orbits 431 miles above ground, crossing both poles and making one lap every 95 minutes, giving Hinode an uninterrupted view of the sun for several months out of the year.

Dana Longcope, a solar physicist at MSU, said the sun usually operates on an 11-year cycle with maximum activity occurring in the middle of the cycle. Minimum activity generally occurs as the cycles change. Solar activity refers to phenomena like sunspots, solar flares and solar eruptions. Together, they create the weather that can disrupt satellites in space and technology on earth.

The last cycle reached its peak in 2001 and is believed to be just ending now, Longcope said. The next cycle is just beginning and is expected to reach its peak sometime around 2012. Today's sun, however, is as inactive as it was two years ago, and scientists aren't sure why.

"It's a dead face," Tsuneta said of the sun's appearance.

Tsuneta said solar physicists aren't like weather forecasters; they can't predict the future. They do have the ability to observe, however, and they have observed a longer-than-normal period of solar inactivity. In the past, they observed that the sun once went 50 years without producing sunspots. That period coincided with a little ice age on Earth that lasted from 1650 to 1700.

Tsuneta said he doesn't know how long the sun will continue to be inactive, but scientists associated with the Hinode mission are ready for it to resume maximum activity. They have added extra ground

stations to pick up signals from Hinode in case solar activity interferes with instruments at other stations around the world. The new stations, ready to start operating this summer, are located in India, Norway, Alaska and the South Pole.

Establishing those stations, as well as the Hinode mission, required international cooperation, Tsuneta said. No one country had the resources to carry out those projects by itself.

Four countries, three space agencies and 11 organizations worked together on Hinode which was launched in September 2006, Tsuneta said. Among the collaborators was Loren Acton, a research professor of physics at MSU. Tsuneta and Acton worked together closely from 1986-2002 and were reunited at the MSU conference.

"His leadership was immense, superb," Tsuneta said about Acton.

Acton, 72, said he is still enthused by solar physics and the new questions being raised. In fact, he wished he could knock 22 years off his age and extend his career even longer.

"It's too much fun," he said. "There's so much exciting stuff come up, I would like to be part of it."

A related article on the Hinode mission is located at <http://www.montana.edu/cpa/news/nwview.php?article=4902>

Evelyn Boswell, (406) 994-5135 or [evelynb@montana.edu](mailto:evelynb@montana.edu)

Hi-Resolution Image or PDF Available:

<http://www.montana.edu/cpa/news/nwview.php?article=5982&log>

SOURCE: Montana State Univ.

Submitted to OARC by Mike Fullmer KZ7O

# ANNOUNCEMENTS

## Next Club Meeting:

**3rd Saturday July 19, 2008**

- The Ogden Amateur Radio Club meetings are usually held on the **3<sup>rd</sup> Saturday** of each month.
- **Time: 9:00 AM**
- **Location: Riverdale Fire Station**

**Topic: "T"- Hunt meeting + activity**

**Note: Club officers nomination meeting**

- **Talk-in: -146.90 (pl 123.0)**

Check OARC web site for details

[www.ogdenarc.org](http://www.ogdenarc.org)

- Please invite a friend to join you. You do not have to be a member of the club to participate in our club meetings or activities. We invite all to join us.
- If anyone is interested in doing a presentation on something or just have something unique to show at the meetings.
  - Please get a hold of any of the officers and let us know.

## Next Weber Co VE Test Session:

**1st Wed Oct 01, 2008**

- Exam sessions are held in Ogden every few months, *usually* the first Wednesday in February, June, and October.

**Time: 05:00 PM** *Walk-ins allowed*

**Location:**

**WEBER CENTER**  
**2380 Washington Blvd,**  
**Room # 112**  
**OGDEN, UT 84401**

**Contact: VE Liaison:**

**Mary Hazard** [w7ue@arrl.net](mailto:w7ue@arrl.net) (801-430-0306)

**Cost: \$14.00**

Two forms of **ID**, one of which must be a **picture ID**.

For "Upgrades" bring current **license** and a **copy** of current license, and any **CSCE's**

Most **calculators** allowed. Calculator memories must be cleared before use.

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## Club Web Site

Be sure to visit our club web site.

- [www.OgdenARC.org](http://www.OgdenARC.org)

Club membership is open to anyone interested in Amateur Radio. You do not need an amateur license to join us. Dues are used to operate the club, field day activities, and repeater equipment maintenance.

You do not need to join the club to participate with us.

## Club Call Sign

Listen to the club repeaters for this very familiar CW ID. You do know Morse Code don't you?

- **W7SU**

ARRL Field Day is held on the last full weekend of June every year.

Location may vary each year so watch this notice for details as time draws near.

See you there.

OARC REPEATERS			
FREQ	CLUB	TONE	LOCATION
146.820-	OARC	123.0	Mt Ogden
448.600-	OARC	123.0	Mt Ogden
146.900-	OARC "Talk-in"	123.0	Little Mtn (w/auto patch)
448.575-	OARC	100.0	Little Mtn (w/auto patch)

OTHER AREA REPEATERS			
FREQ	CLUB	TONE	LOCATION
146.620-	UARC	none	Farnsworth Pk
147.120+	UARC	100.0	Farnsworth Pk
449.100-	UARC	146.2	Farnsworth Pk
449.500-	UARC	100.0	Farnsworth Pk
ATV	UARC	Ch-58	Farnsworth Pk
147.040+	DCARC	123.0	Antelope Isl
447.200-	DCARC	127.3	Antelope Isl
449.925-	DCARC	100.0	No Salt Lake
145.290-	UBET	123.0	Brigham City
145.430-	UBET	123.0	Thiokol
448.300-	UBET	123.0	Thiokol
146.640-	BARC	none	Logan
146.720-	BARC	103.5	Mt Logan
147.260+	BARC	103.5	Promontory Pt
449.625-	BARC	103.5	Mt Logan
145.250-	WSU	123.0	* coming soon
449.250-	WSU	123.0	* coming soon
145.490-	K7HEN	123.0	Promontory Pt
146.920-	N7TOP	123.0	Promontory Pt
449.775-	N7TOP	123.0	Promontory Pt
448.825-	IRLP/Echo	123.0	Clearfield City
449.950-	IRLP	123.0	Clearfield City
449.425-	IRLP	100.0	Nelson Peak
147.360+	Summit County	100.0	Lewis Peak

## AREA CLUB MEETINGS & WEB SITES

CLUB	WEB SITE	DATE/TIME	LOCATION
Ogden ARC	<a href="http://ogdenarc.org">ogdenarc.org</a>	3 <sup>rd</sup> Saturday 09:00 am	Check OARC web site ...
WC ARES	<a href="http://ogdenarc.org/join.html#ares">ogdenarc.org/join.html#ares</a>	2 <sup>nd</sup> Thursday 06:30 pm	Weber Co. Library Ogden Utah
WC Sheriff Comm-O		1 <sup>st</sup> Saturday 09:00 am	Weber Co. Sheriff Complex West 12 <sup>th</sup> Street Ogden Utah
Barc	<a href="http://barconline.org">barconline.org</a>	2 <sup>nd</sup> Saturday 10:00 am	Cache Co. Sheriffs Complex 200 North 1400 West Logan Ut
CSERG	<a href="http://dcarc.net/ares.htm/">dcarc.net/ares.htm/</a>	Last Wednesday 8:30pm	Clearfield City Hall Clearfield Utah
Dcarc	<a href="http://dcarc.net">dcarc.net</a>	2 <sup>nd</sup> Saturday 10:00 am	Davis Co. Sheriff Complex Farmington Utah
NU Ares	<a href="http://home.comcast.net/~noutares/">home.comcast.net/~noutares/</a>	3 <sup>rd</sup> Wednesday 7:00 pm	Cache Co. Sheriff Office Logan Utah
Uarc	<a href="http://xmission.com/~uarc/">xmission.com/~uarc/</a>	1 <sup>st</sup> Thursday 7:30 pm	UofU EMC Bldg Room 101 Salt Lake City Utah
Ubet	<a href="http://27meg.com/~k7ub/">27meg.com/~k7ub/</a>	4th Thursday 6:30 pm	BE-Thiokol: 24 East 100 South Brigham City Utah
Utah DX Association	<a href="http://udxa.org">udxa.org</a>	3 <sup>rd</sup> Wednesday check web page for details	check web page for details Salt Lake City area
UvhfS	<a href="http://ussc.com/~uvhfs/">ussc.com/~uvhfs/</a>	Each Tuesday 8:00 pm (refer to web site)	Weekly 2 meter net (no eye ball meetings)
WD Arc	<a href="http://westdesertarc.org/">westdesertarc.org/</a>	1 <sup>st</sup> Tuesday 7:00 pm	Tooele County Courthouse Tooele Utah
WsuArc	<a href="http://arcweber.edu">arcweber.edu</a>	3 <sup>rd</sup> Thursday 5:30 pm	WSU Blding #4 Room ? Ogden Utah

## LOCAL AREA NETS

DATE	CLUB	FREQ
Daily @ 12:30 PM mt	Utah Beehive net HF	7.272 Mhz <b>HF LSB</b>
Daily @ 07:30 PM mt	Utah Code net HF	3.570 Mhz <b>HF CW</b>
Daily @ 02:00 UTC	Utah Farm net HF	3.937 Mhz <b>HF LSB</b>
Sunday @ 8:45 AM	Ogden Old Timers HF net	7.193 Mhz <b>HF LSB</b>
Sunday @ 7:30 PM	UBET ARC	145.430 - 123.0 (training net)
Sunday @ 8:30 PM	SATERN Net	145.900 - 123.0
Sunday @ 9:00 PM	Morgan Co Net	147.060 = simplex
Sunday @ 9:00 PM	UARC Info net	146.620- no PL tone required
Monday @ 9:00 PM	2-meter SSB net	144.250 Mhz <b>2-meter USB</b>
<b>Tuesday @ 8:00 PM</b>	<b>Weber ARES</b>	<b>448.600 - 123.0</b>
Tuesday @ 8:00 PM	VHF Society Swap	147.120 + 100.0
Tuesday @ 9:00 PM	Bridgerland ARC	147.260 + 103.5
Wednesday @ 8:00 PM	UBET ARC	145.290-, 145.430-, 448.300- (all 123.0)
Wednesday @ 8:30 PM	CSERG	145.770 simplex
Wednesday @ 9:00 PM	No. Utah 10m HF net	28.313 Mhz <b>HF USB</b>
Wednesday @ 9:00 PM	6-meter SSB net	50.125 Mhz <b>6-meter USB</b>
Thursday @ 6:30 PM	Davis Co Elmers Net	147.040 + 123.0 <b>New Hams</b>
Thursday @ 7:00 PM	Davis ARES	147.420 = simplex
Thursday @ 8:00 PM	Weber State ARC	146.820 - 123.0 (coming soon)
Thursday @ 8:00PM	RACES State VHF	145.490 - 123.0, 146.680 - 123.0 3 <sup>rd</sup> Thursday - even months only
Thursday @ 9:00PM	Wasatch Back Net	147.360 + 100.0
Saturday @ 8:00AM mst	RACES State HF	3.920 Mhz <b>HF LSB</b> 3 <sup>rd</sup> Saturday – odd months only
Saturday @ 11:00AM mst	QCWA net HF	7.272 Mhz <b>HF LSB</b>

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*OARC OFFICERS*

President: Kent Gardner WA7AHY  
Vice Pres: Kim Owen KO7U  
Secretary: Maggi Campbell N7HCP  
Treasurer: Jeff Anderson KD7PAW

Director #1: Mike Webster N9NZ  
Director #2: Stan Sjol WOKP

*"WATTS NEWS" e-Magazine*

Editor: Val Campbell K7HCP

*OTHER CLUB FUNCTIONS*

Webmaster: Val Campbell K7HCP  
VE Liaison: Mary Hazard W7UE  
Repeater Engr: Mike Fullmer KZ7O  
Past President - Advisor:  
Mike Fullmer KZ7O

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**73 es cul de W7SU**

[www.OgdenArc.org](http://www.OgdenArc.org)