WATTS NEWS

The Best of Amateur Radio

Welcome to the OARC e-Magazine

www.OgdenArc.org

JANUARY 2010

Next Club Meeting

3rd Saturday 16 January 2010

Topic: Inventor's Project - by Ross Mann "Inventor"

Inventions, Gizmos and Micro Controllers

Kim Owen KO7U
President

James Clarke KD7SWL
Vice President

Larry Griffin AD7GL
Secretary

Jeff Anderson KD7PAW
Treasurer

Justin Doxford KE7ROQ
Program Director

Tom Harrington AF7J
Activity Director

Val Campbell K7HCP
Webmaster/NL Editor

PREVIOUS CLUB MEETINGS

3rd Saturday 19 December 2009

OARC Family Dinner

The OARC annual 2009 family dinner was held at the ABC Mandarin in Roy this year. Several dozen members and family attended. The food was good and so was the entertainment. The owner/manager of ABC Mandarin, Jonathan, surprised all in attendance when he played his "new-chin" oriental musical instrument.

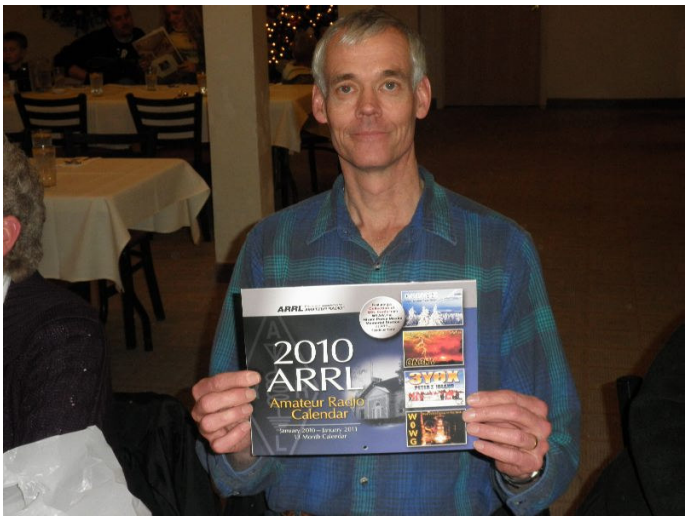
Lukas Chan W7XYB won the grand door prize. After which he re-donated it back to the general membership drawing. The lucky winner then became Kim Clarke. Congratulations Kim.

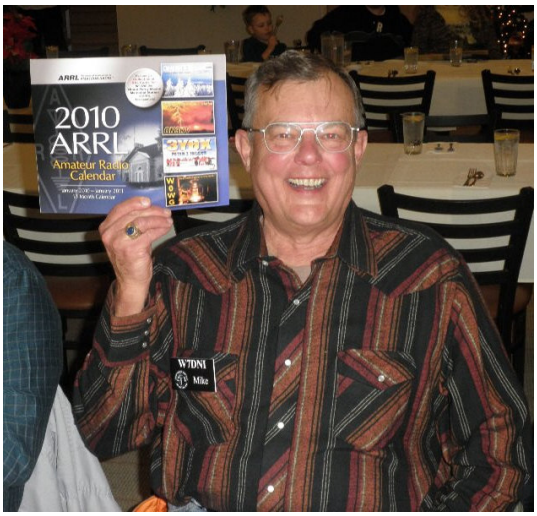
Hope to see you all there next year.


BUZZ ALDRIN EDITION


GRUNDIG

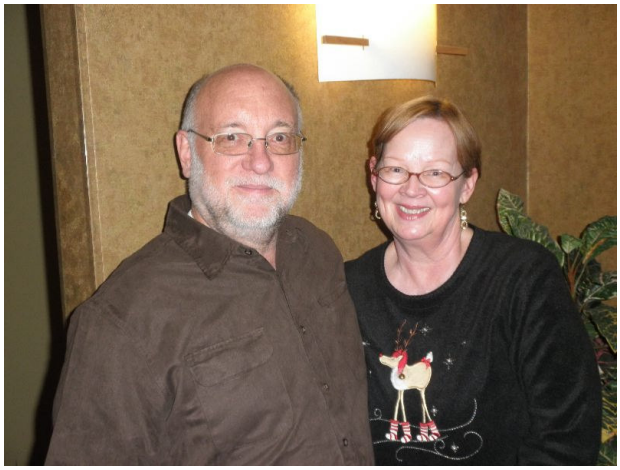

HANDBOOK
2010


ARRL
2010
ARRL
Amateur Radio
Calendar


ARRL
2010
ARRL
Amateur Radio
Calendar
W7DNI
Mike


EXIT


K7RFW
Ray
Deluxe
Assortment



W7DNH
Carol
W7DNI
Mike
Beijing



NEXT CLUB MEETING

When: 3rd Saturday 16 January 2010
Time: 9:00 AM

Location: Riverdale Fire Station
Topic: Inventor's Project - by Ross Mann "Inventor"
Inventions, Gizmos and Micro Controllers

Next Weber Co VE Test Session

(1st Wednesday) 03 February 2010

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

Time: 05:00 pm *Walkin's allowed*

Location:

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

Contact: VE Liaison:
Mary Hazard 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.

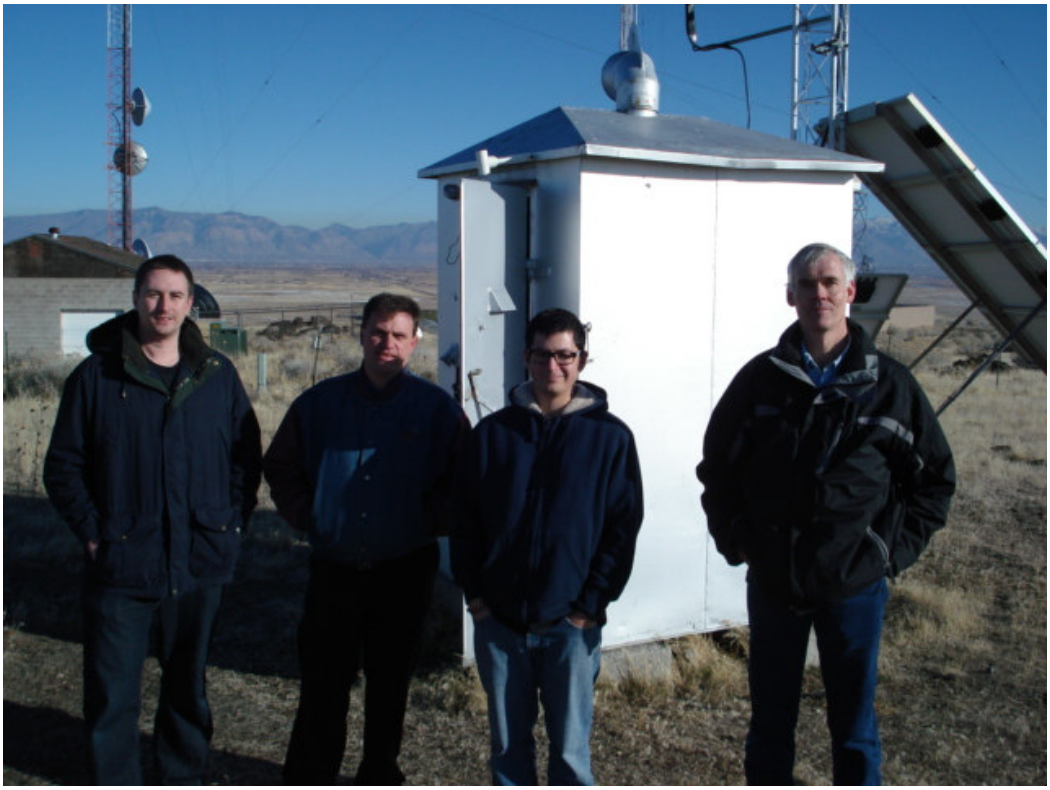
Little Mountain Repeater Site Tour with Weber State Physics Department

Ogden Amateur Radio Club's (OARC) Repeater Engineer, Mike Fullmer, KZ7O was host to several Weber State University (WSU) physics students Friday 4 December 2009 for an orientation tour of the Little Mountain repeater site.

The students, all amateur radio operators, are on the HARBOR Project Team at WSU. **T**he **H**igh **A**ltitude **R**econnaissance **B**alloon for **O**utreach and **R**esearch is a real-world science experiment sponsored by the Physics and Computer Electronics Engineering Technology (CEET) departments.

Amateur radio is used to not only support the team for communications while in the field during launch and recovery, but is a part of the payload that uses Automatic Packet Reporting System (APRS) technology to track the balloon and payload while in flight. The balloon reaches heights up to about 100,000 feet. An on-board camera (Nikon Coolpix) can snap pictures that show the actual curvature of the earth. To see an actual breathtaking panoramic earth view go to the following address. Copy, cut and paste it into your URL window.

http://spaceweather.com/submissions/large_image_popup.php?image_name=John-Sohl-harborPan02a-2k_1260148128.png



Physics students Rob Eckel, KF7EWY, left, James Child, KD7SXM and John Metcalf, KE7VVT, are shown here with repeater engineer and tour leader Mike Fullmer, KZ7O. Club member Kent Gardner, WA7AHY who was along for the ride took the picture. Other WSU faculty and students were scheduled to take the tour, but were called away to department meetings and were unable to attend.

The small building on Little Mountain contains three repeaters.

FREQ	TONE	NOTES	ACCESS
146.900 MHz - 600	123.0	(w/auto patch)	Open
448.575 MHz - 600	100.0	(w/auto patch)	Open
145.090 used by Weber County EOC		Packet digipeater	Open to all

The entire setup is powered by three large solar panels feeding a bank of storage batteries. The bottom panel is shown in the picture.

The group was treated to a closeup view of a herd of about a dozen deer while driving up. A stone monument and plaque telling about the explorer John C. Fremont with Kit Carson as the guide is only a few feet from the repeater building.

TNX Kent Gardner, WA7AHY

MORE CLUB BUSINESS

"SALE" or "WANTED" ITEMS NEEDED

OARC's O-bay (On-Line Swap-Meet) sale/wanted items needed for the web site...

Visit http://www.ogdenarc.org/ then click on **Swap-Meet**

FROM KIM'S SHACK

Kim Owen KO7U

CQ ALL Members and Friends of OARC


From Kim's Shack.....

I hope everyone enjoyed the holidays. We did at my house!
I want to thank Tom and everyone who made the Christmas dinner happen. We had good attendance. We had a short musical concert by Jonathan the owner/manager of ABC Mandarin. Lukas Chan/W7XYB won the big prize. After a photo shoot, he graciously donated his prize for a general drawing. Kim Clarke took home the prize.
We started an Extra Class study group Wednesday, January 6. We had about a dozen looking to upgrade their license. This was Jim's/KD7SWL brain child. It looks like a good group. I am humbled by the Amateur Radio presence of those attending that are upgrading. We will meet each Wednesday at 6:30 PM at the Weber County Main Library in preparation of a test session in February. Kudos to Jim for making it happen!
I hope to see everyone at club meeting on the 16th. The Gizmo Guy is going to talk about some of his inventions, Ross Mann (a.k.a. The Gizmo Guy) has a lot of energy and a creative mind. I have known him for several years. Our introductions were launched when several ICRB (Inter Cubical Rubber Band) landed on my head. He was a cheer leader at the University of Utah and did back flips the entire length of the football field. He graduated from the U in EE. He works at Hill AFB. Currently he and his son who recently graduated from the U also in EE are doing development work for various projects from their home in Fruit Heights. I hope everyone will come out hear him speak. I am sure he can stimulate the realization of some homebrew projects of everyone.

For now, 73 de Kim/KO7U

GUEST ARTICLE

In case you missed it....there was an article on the bottom of page one in the Sunday January 3rd Standard-Examiner entitled "Radio lingo not quite over and out". It was about how the old 10-codes are being phased out in favor of plain speech.

The 9-11 attack caused much confusion when all the different agencies (police, fire etc) tried to respond in a coordinated manner. The Hurricane Katrina also caused the same kind of confusion. The Federal Government is asking all agencies to begin using plain speech instead of the 10-codes. Many 10-codes vary from each other so could create problems.

Most top of Utah agencies are using varying amounts of 10-codes with increasing amount of plain language. In heavy traffic control centers 10-codes are still used extensively, but with the in car data links to laptops more plain language is being used from car-to-car etc.

TNX Kent

ANTENNA ENVY

HAM RADIO ENVY

NEWS ARTICLES

Cell phone mania forces scramble for more airwaves

By JOELLE TESSLER The Associated Press

WASHINGTON — Wireless devices such as Apple's iPhone are transforming the way we go online, making it possible to look up driving directions, find the nearest coffee shop and update Facebook on the go. All this has a price — in airwaves.

As mobile phones become more sophisticated, they transmit and receive more data over the airwaves. But the spectrum of wireless frequencies is finite — and devices like the iPhone are allowed to use only so much of it. TV and radio broadcasts, Wi-Fi networks and other communications services also use the airwaves. Each transmits on certain frequencies to avoid interference with others.

Now wireless phone companies fear they're in danger of running out of room, leaving congested networks that frustrate users and slow innovation. So the wireless companies want the government to give them bigger slices of airwaves — even if other users have to give up rights to theirs.

"Spectrum is the equivalent of our highways," says Christopher Guttman-McCabe, vice president of regulatory affairs for CTIA-The Wireless Association, an industry trade group. "That's how we move our traffic. And the volume of that traffic is increasing so dramatically that we need more lanes. We need more highways."

That won't happen without a fight. Wireless companies are eyeing some frequencies used by TV broadcasters, satellite communications companies and federal agencies such as the Pentagon. Already, some of those groups are pushing back.

That means tough choices are ahead. But one way or another, Washington will keep up with the exploding growth of the wireless market, insists Rep. Rick Boucher, D-Va. He is sponsoring a bill that would mandate a government inventory of the airwaves to identify unused or underused bands that could be reallocated.

"It's not a question of whether we can find more spectrum," says Boucher, chairman of the House Commerce Subcommittee on Communications, Technology and the Internet. "We have to find more spectrum."

CTIA, the industry group, is asking the government to make an additional 800 megahertz of the airwaves available for wireless companies to license over the next six years.

That would be a huge expansion from the industry's current slice of roughly 500 megahertz.

The Federal Communications Commission is preparing to make more frequencies available for commercial use, but has just 50 megahertz in the pipeline.

ARLB037 Amateur Radio Bill Passes Senate, Moves to the House

QST de W1AW --- ARRL Bulletin 37 ARLB037 --- From ARRL Headquarters --- Newington CT December 16, 2009

To all radio amateurs

On Monday, December 14, S 1755 -- The Amateur Radio Emergency Communications Enhancement Act of 2009 -- passed the Senate by unanimous consent; the bill now goes to the House of Representatives for consideration. Sponsored by Senator Joe Lieberman (ID-CT), and Senator Susan Collins (R-ME), S 1755, if passed, would direct the Department of Homeland Security (DHS) to undertake a study on emergency communications.

S 1755 points out that "There is a strong Federal interest in the effective performance of Amateur Radio Service stations, and that performance must be given -- (A) support at all levels of government; and (B) protection against unreasonable regulation and impediments to the provision of the valuable communications provided by such stations."

Members of the Senate Homeland Security and Governmental Affairs Committee considered S 1755 on December 10. After it passed through Committee, it was placed on the Senate's calendar to be voted on.
"We are grateful to Committee Chairman Lieberman and Ranking Member Collins for sponsoring the bill and arranging for its swift consideration and passage by the Senate," said ARRL Chief Executive Officer David Sumner, K1ZZ.

The bill also pointed out that Section 1805(c) of the Homeland Security Act of 2002 (6 U.S.C. 757(c)) directs the Regional Emergency Communications Coordinating Working Group of the Department of Homeland Security to coordinate their activities with ham and Amateur Radio operators among the 11 other emergency organizations, such as ambulance services, law enforcement and others.

SPECIAL ARTICLE

Did You Ever Wonder Why 80 and 40 Meters Use LSB and 20, 15 and 10 Meters Use USB?

80 Meters	40 Meters	20 Meters	15 Meters	10 Meters
LSB	**LSB**	**USB**	**USB**	**USB**

Years ago, when single sideband (SSB) made its debut onto the ham radio scene, I was told why, but have long since forgotten the details.

The question did come up every now and then, especially while teaching Technician licensing classes. I made vague answers about it being a characteristic of phasing sideband generators, but I never was sure.

Finally ***The Doctor is In*** column by Joel R. Hallis, W1ZR in the December issue of the QST magazine finally brought it to light. It is in the form of a Question and Answer beginning on page 45. Reprinted with permission, December 2009 QST; copyright ARRL."

Q Robert, KB5QN, asks: In amateur single sideband (SSB) voice operation, why is the upper sideband (USB) used on 20 meters and higher frequency bands while lower sideband (LSB) is used on the lower bands (except the 60 meter channels)?

A This goes back to the early days of SSB. At the time, the early 1950s, there was no 40 meter phone band (it was opened to voice on February 20, 1953), so the majority of SSB activity was on 75 and 20 meters. One common design configuration used on an SSB generator that produced an upper sideband SSB signal at 9 MHz using a filter or phasing SSB generator. The 9 MHz signal was then heterodyned with a VFO covering 5 to 5.5 MHz, often made from a (then) $5 WWII surplus ARC-5 transmitter.

The additive (9 + 5 = 14, 9 + 5.5 = 14.5) translation to 20 meters maintained the upper sideband. The subtractive translation (9 – 5 = 4, 9 – 5.5 = 3.5) reversed the frequency relations (and the VFO tuning direction) to result in lower sideband. By just using those sidebands, they did not need to buy a second carrier oscillator crystal and worry about sideband filter symmetry, or put switching into their phasing rigs. It could have just as easily gone the other way, I guess.

It just went on from there. 40 meters went LSB and the upper bands went USB. The US military appears to have settled on USB on all HF frequencies, so the “green radio” guys with SSB-capable military surplus use USB, especially on 40 meters. Compatibility with the government protocol explains why we are required to use USB on the five 60 meter channels that we share with government users. Other than that requirement, there is no regulation specifying which sideband be used on any band.

Typical Arc 5 Transmitter

It was not, in itself, a SSB unit, but its Variable Frequency Oscillator (VFO) was used in a separate SSB transmitter.

I didn’t realize that voice was added to the 40 meter band in 1953. My knowledge only starts in the early 60’s when I got my Novice and General licenses. It would seem that to promote sideband, why not make it easier and less expensive to get on the air with this new mode.

Not having to buy a second carrier oscillator crystal or putting in extra circuitry for sideband filter symmetry or having to add switching to change sidebands seemed sensible, especially when some hams built their own.

This conjures up some complications though and has to do with what has been termed “good engineering practices”. With sideband having shown it’s capabilities, why use Amplitude Modulation (AM) anymore?

My second transmitter after my Heathkit AT-1 was a Globe Scout with AM and CW. Someone showed me another Globe Transmitter that did double-sideband,

DSB 100 Double-sideband transmitter. It put out 50 watts on CW, 40 on AM and 100 on DSB no carrier.

It was a poor boy's kind of SSB. Others would tune you in as if it were sideband. Today the DSB signal would look like an AM signal because you were transmitting both sidebands which probably would raise some eyebrows of the purist sidebander.

So here was another example of manufacturing an inexpensive sideband rig that would get the job done, but would probably not be the best engineering practice, but then again it wouldn't have been as much fun to write about.

Thinking about all this however, gives me no qualms about tuning in a sideband signal with a beat frequency oscillator instead of buying another receiver with a product detector.

As another side note, USB is the accepted one to use with digital transmissions like PSK-31.

TNX Kent Gardner, WA7AHY

Technical review by
Mike Fullmer, KZ70

Follow up:

In the Feedback column on page 31 of the January 2010 issue of QST there is additional information.

In "The Doctor Is In" [Dec 2009, pp61-62], the answer to the question from Robert, KB5QN, was not quite correct. In order to have the sideband inversion occur as the bands are changed, the modulation has to be associated with the signal that adds or subtracts. Thus if USB modulation were applied to the variable signal at 5 to 5.5 MHz and the signal were heterodyned with a 9 MHz unmodulated signal, it would result on USB on 14 MHz (9 + 5) and LSB on 4 MHz (9-5 MHz).

Thanks to David Sumner, K1ZZ, in the corner office, for catching this one!

FEATURE ARTICLE

What Should Every Ham Know How to Do?

By Dan Romanchik, KB6NU

On the HamRadioHelpGroup mailing list, there was recently a discussion about using modulated CW on 2m. One fellow pointed out that MFJ sold a unit that would do this. When I pointed out that this box cost $100 and that they could do exactly the same thing with the $18 PicoKeyer from HamGadgets.Com, I got some flack that the PicoKeyer was a kit, and that some people might not be able to build it.

I pointed out that a couple of years ago our club held a construction night, and that several people who had never soldered before successfully completed the kit. I also pointed out that even if the ham didn't have the proper tools, he or she could purchase a soldering iron, needle-nose pliers, and diagonal cutters, in addition to the kit, for less than $100.

I don't know if that convinced him, but it got me thinking about what a ham should be able to do. This is the list I've come up with so far:

1. Solder. Every ham should know how to solder a connection, and by extension, build small kits and cables. Over the course of one's ham career, this skill will save you a ton of time and money.

2. Build a dipole antenna. The dipole is the simplest and most versatile antenna. Knowing how to build one and use one is an essential skill.

3. Check into a net. Net operation is one of the most basic operating skills.

4. Use a multimeter to measure voltage, current, and resistance and know what those measurements mean. This is the most basic skill used in troubleshooting, and at some point or another, you're going to have to troubleshoot something.

This list does, of course, imply that a ham is physically capable of doing them. I would not expect hams that are physically disabled to be able to do everything on this list.

After I posted this to my blog (www.kb6nu.com), I got several good responses. Jeff said, "I believe hams should know how to install RF connectors, particularly the three most used in our hobby, the PL-259, the BNC, and the N connector." Blair, WB3AWI, replied, "Another thing that hams should know how to do is to measure the SWR of an antenna."

So, now I ask you, What do you think every ham should know how to do? Feel free to post a comment to my blog or e-mail me at cwgeek@kb6nu.com.

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When not analyzing the abilities of amateurs, KB6NU pounds brass on nearly all the HF bands and teaches various ham radio classes in Ann Arbor, MI. You can read his other musings on our fine hobby at www.kb6nu.com.

ANNOUNCEMENTS

Next Club Meeting:
3rd Saturday 16 January 2010

- The Ogden Amateur Radio Club meetings are usually held on the **3rd Saturday** of each month.

- **Time:** 9:00 AM

- **Location: Riverdale Fire Station**

- **Topic: Inventor's Project**
  by Ross Mann "Inventor"

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

Check OARC web site for details
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 Wednesday 03 February 2010

- 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 (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.

Club Web Site

Be sure to visit our club web site.

- 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	ogdenarc.org	3rd Saturday 09:00 am	Check OARC web site …
WC ARES	ogdenarc.org/ join.html#ares	2nd Thursday 06:30 pm	Weber Co. Library Ogden Utah
WC Sheriff Comm-O		1st Saturday 09:00 am	Weber Co. Sheriff Complex West 12th Street Ogden Utah
Barc	barconline.org	2nd Saturday 10:00 am	Cache Co. Sheriffs Complex 200 North 1400 West Logan Ut
CSERG	dcarc.net /ares.htm/	Last Wednesday 8:30pm	Clearfield City Hall Clearfield Utah
Dcarc	dcarc.net	2nd Saturday 10:00 am	Davis Co. Sheriff Complex Farmington Utah
NU Ares	home.comcast. net/~noutares/	3rd Wednesday 7:00 pm	Cache Co. Sheriff Office Logan Utah
Uarc	xmission.com /~uarc/	1st Thursday 7:30 pm	UofU EMC Bldg Room 101 Salt Lake City Utah
Ubet	27meg.com /~k7ub/	4th Thursday 6:30 pm	BE-Thiokol: 24 East 100 South Brigham City Utah
Utah DX Association	udxa.org	3rd Wednesday check web page for details	check web page for details Salt Lake City area
UvhfS	ussc.com /~uvhfs/	Each Tuesday 8:00 pm (refer to web site)	Weekly 2 meter net (no eye ball meetings)
WD Arc	westdesertarc. org/	1st Tuesday 7:00 pm	Tooele County Courthouse Tooele Utah
WsuArc	arcweber.edu	3rd 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 HF LSB
Daily @ 07:30 PM mt	Utah Code net HF	3.570 Mhz HF CW
Daily @ 02:00 UTC	Utah Farm net HF	3.937 Mhz HF LSB
Sunday @ 8:45 AM	Ogden Old Timers HF net	7.193 Mhz HF LSB
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 2-meter USB
Tuesday @ 8:00 PM	Weber ARES	448.600 - 123.0
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 HF USB
Wednesday @ 9:00 PM	6-meter SSB net	50.125 Mhz 6-meter USB
Thursday @ 6:30 PM	Davis Co Elmers Net	147.040 + 123.0 New Hams
Thursday @ 8:00 PM	Weber State ARC	146.820 - 123.0 (coming soon)
Thursday @ 8:00PM	State RACES VHF/IRLP	145.490 - 123.0, 146.680 - 123.0 3rd Thursday - even months only
Thursday @ 8:30 PM	Davis ARES	147.420 = simplex
Thursday @ 9:00PM	Wasatch Back Net	147.360 + 100.0
Saturday @ 8:00AM mst	RACES State HF	3.920 Mhz HF LSB 3rd Saturday – odd months only
Saturday @ 11:00AM mst	QCWA net HF	7.272 Mhz HF LSB

OARC OFFICERS

President: Kim Owen KO7U

Vice Pres: James Clarke KD7SWL

Secretary: Larry Griffin AD7GL

Treasurer: Jeff Anderson KD7PAW

Program Director:
Justin Doxford KE7ROQ

Activity Director:
Tom Harrington AF7J

"WATTS NEWS" e-Magazine

NL Editor: Val Campbell K7HCP

OTHER CLUB APPOINTMENTS

Webmaster: Val Campbell K7HCP

Past Pres Advisor:
Kent Gardner WA7AHY

Board Advisor: Stan Sjol W0KP

Repeater Engineer: Mike Fullmer KZ7O

VE Liaison: Mary Hazard W7UE

73 es cul de W7SU

www.OgdenArc.org