THE HELLGATE STATIC

May 2010

Dave McGinnis K7UXO and Ed Nesselroad N0AUB Present April Program

Dave McGinnis, an 18 year veteran with the Missoula County Sheriff's Office is responsible for managing the county communications and contingency communications. Dave is the APCO frequency coordinator for Montana from 2001 through 2009 and is currently State Army MARS director for Montana, North Dakota, and South Dakota. Ed is a member of the HARC is also actively involved with the Montana Traffic Net and involved with Army MARS.

Dave and Ed, with the help of some of the HARC members, set up a mast with a t2fd antenna that was connected to various gear in Dave's truck. A wireless link was then established with computers set up in the meeting room. This demonstration showed the value of how Winlink would assist during emergency or contingency communications operations. It was pointed out that the local government's communication system should be robust enough to survive the likely and expected destructive events, and have capacity to handle common extra-ordinary events.

Dave explained Missoula County has a modern VHF system with good capacity, a high level of coverage and overlapping coverage from sites. The system has both battery and generator backup. The system is supported by a looped microwave system. The system is built to the most stringent modern technical standards for physical survivability and technical performance. The county also has HF equipment, and is a licensed participator in both the FEMA SHARES HF system, and the US Army MARS system. It also has HF email capability and has an email server connected to the HF email system that can be assessed on a wireless LAN throughout the entire courthouse campus.

Dave and Ed then demonstrated how the Winlink system operated, and gave various members attending the opportunity to operate the system as well. They showed how there are various sites throughout the world that operate 24/7 and are always available to serve as connection to the Winlink system, where you can send emails dealing with contingency communications through HF radios. Dave and Ed did a good job in explaining a rather complex operating system in terms that most in attendance could understand.

Army MARS is designed for contingency communications and is regulated by NITA and not the FCC. As Dave explained, MARS has dedicated frequencies that allow unattended operation and high speed data on HF focused on speed and interoperability. The application of technology is mission specific. It was pointed out that MARS has three parts: military, volunteers, and civil agencies. Volunteers exist to support the military and civil agencies and must be invited to assist when their help is needed.

If local club members are interested in assisting with Missoula County contingency communications, when invited, they should become a member of Army MARS, become fully NIMS trained, and complete any other requirements. If interested it would be good to contact either Dave or ED.

Congratulations License Examinees!

Congratulations to Andrew, KF7JCP who tested for his Technician license on April 12th.

Congratulations to the following people whom upgraded their licenses on April 12th.

Dean, N7DLP - General
Sandra, KF7GZR - General
John KF7JIO - General

Thanks to the following VE's for participating in the test session for the club:

Liz, WG7E
Jerry, N7GE
Paul, N7PAS
Michael, AE7MH

The next VE exam session will be held at 5:30 pm May 10th before the meeting.

Hellgate Amateur Radio Club is a 501(c)3 not for profit organization. Information concerning tax deductible donations of funds or equipment, or donations of any other kind, should be addressed to:
Hellgate Amateur Radio Club
PO Box 3811
Missoula, MT 59808-3811

Meetings held 2nd Monday of each month, 7:00 pm at Missoula Fire Station #4, 3011 Latimer off of West Broadway near Quality Supply. HARC members have a chance to win the Door Prize. *You must be present to win!*

Visit our web site at http://www.w7px.org/

Club Officers & Volunteers

Elmer, WG7P ..... elmerm@hughes.net
President

Eric, NZ7S .....nz7s@msn.com
Vice President

Michael, AE7MH..... ae7mh@arrl.net
Secretary

Jerry, N7GE ..... n7ge@bresnan.net
Treasurer

Liz, WG7E ..... lizm@montana.com
Membership

Bob, N7MSU ..... n7msu@arrl.net
Awards

Vick, K7VK ..... k7vk@arrl.net
Exams VE Contact

Mike, AE7MH..... ae7mh@arrl.net
May Newsletter *(rotates monthly)*

Mike, KE7IZG..... mleary2001@yahoo.com
Webmaster

Repeater Committee

Paul, N7PAS (2010).....n7pas@bresnan.net
Byron, NN8A (2010)...arl3051@wildblue.net
Donnie, W7XY (2010-2011) fort@montana.com
Kevin, KE7WR (2010-2011)..kgoffe1@msn.com

Events Calendar

May 1st	7QP Contest
May 10th	**HARC monthly meeting at 7:00 pm, VEC testing starts at 5:30 pm.**
May 22nd & 23rd	TOSRV - Tour of Swan Valley - Volunteers contact Bob, N7MSU
June 14th	**HARC monthly meeting at 7:00 pm, VEC testing starts at 5:30 pm.**
June 26th & 27th	Field Day - Fort Missoula, meet for breakfast at Paradise Falls restaurant, then setup starts at 9:00 am
July 4th	Special Event Station at Fort Missoula
July 11th	4th Annual Missoula Marathon - volunteers needed, please contact Lewis, AC7UZ
July 12th	**HARC monthly meeting at 7:00 pm, VEC testing starts at 5:30 pm.**
July 16th - 18th	76th Annual Glacier-Waterton International Peace Park Hamfest
July 31st	Blackfoot River Cleanup - Date NOT confirmed yet.
1st & 3rd Sundays	Montana Races Net, 3.947 MHz at 8:00 am http://www.mtraces.org/
Saturday	Montana QCWA net, 3.935 MHz at 8:30 am
Daily	Montana Traffic Net, 3910 kHz at 6:30 pm MDT (00:30 GMT) http://montanatrafficnet.com/
Every Sunday	ARRL Montana Section HF Information Net, 3880 kHz at 8:00 am
Every Tuesday	Coffee at Arby's South, 2:00 pm, give a shout on 147.04 MHz to see if we are meeting.
Every Wednesday	HARC VHF Net meets at 147.04 MHz (+offset) at 9 pm
Every Saturday	"Ham" breakfast, Paradise Falls Restaurant, 7:00 am

Congratulations to Marty, N7VGY who won the mini screw driver set at the HARC April 12th meeting

Your assistance is needed!

The ***Hellgate Static Newsletter*** needs an editor for June and July. Please contact Elmer WG7P or Michael AE7MH if you can help for these months.

How and why I became a Ham

by Bill, W4YMA

Betsy and I were talking about how to reach new hams now a days, the age that is 'golden' to catch them...for me it was like this:

I was fortunate to have been raised in an area where during WWII the school I was attending was used by the military to teach GI's the skills needed in the war.

We had a 6,000 foot dirt airstrip along side of the county school on which were parked military planes the likes of which were being used in the war at that time. P-38, P-47, P-51, P-39, T-6, Lockheed Hudson bomber, and a DC-2, all of which flew into and landed at this strip.

There were a number of fuselages that had been cannibalized for the war effort and this had become a "bone-yard" with them strewn over an acre at the far west end of the strip.

There were two aircraft engine test stands out in the open. No OSHA, no cages around the props or anything! All sorts of test props, "clubs" they were called. Shop facilities were: the aircraft engine overhaul, airframe overhaul, paint shop, and the Radio and electrical shop. This shop is the one I ended up in at the 7th grade and I was happy as a clam at high tide.

We had a link trainer, a radar set up, all sorts of aircraft radios, and one beautiful ham radio station up on the roof of the building in a 'shack' that was truly a 'shack'. There was room for maybe four people to stand around the rig as it was being operated. The rig was a US Navy BC-610 (huge "boat anchor" that put out about 800 watts of the most beautiful sounding AM signal you've ever heard. A beam antenna beside the shack helped put our signal out to where we wanted to talk, and since this was 1946 –, the sunspot cycle gave us DX as clear as the Point 6 repeater signal is today.

Full quieting and little to no QRM since the wartime ban on hams had just been lifted and few people were on the air. Oh we had QRN with the thunderstorms down south, but we learned to listen 'through the noise to dig out a CW signal'. Oh yeah, we had a choice:... CW or Phone.

To get a license you had to have code as well as be able to know schematics and how to build a transmitter, receiver and a power supply. Maybe you didn't build a set for the FCC Examiner but you had to draw a schematic for one of those three items.

We got permission to move the ham station down to the main floor when the war was over and the military training command pulled out and turned over to the county school system all this 'stuff'.

This when we got to make "ladder line" as antennae feed three stories up to the beam. We got to sit on the tower and make adjustments to the beam as the ladder-line hooked up to it.

For a 7th grader this was "heady" stuff listening to the world wide hams in QSO day and night. Getting to sit at the desk and control the station W4HZB and call CQ with a voice that was in process of changing from soprano/tenor to bass/baritone. The receiver was a Hallicrafters SX-28, the top of the line then.

The all night ham meetings on the weekends were a treat. I got acquainted with coffee then to be able to stay up and get my chance at the mic from time to time. Watching the tubes in the final amplifier section glowing cherry red when full power was being put out. A pair of 450-TH glass tubes the size each of Cuainti bottles [without the straw covering ;-)]

When the transmitter was fully-loaded, the two rectifier tubes (866A's) were glowing a bright blue as the 2500 Volts were being held in the genie's bottle to do their work going through the 'filter' system. Yes we had to be able to draw a filter system, choke or capacitor input varieties.

A room full of kids on a ham all-nighter, plus all the heat put out by the transmitter, receiver, and power supply, we never had to turn on the 'building heat'.

Memories are flooding out as I write this and remember how the good old days were and the fun and challenges is building our own rigs, putting them on the air and tuning for smoke!

Things started to get complicated as we went from "simple" to "state of the art". From homemade open wire feeder to the driven element on the beam to COAX and a gamma match or Delta match; neither of which made sense since they looked like a dead short at the element…how could THAT work?

About that time '47 '48 a new mode of putting out a signal came around. It was called SSB or Single Side Band and sounded like Donald Duck or worse. Our Beautiful Studio quality AM was no longer used. SSB could accommodate the many more hams who were now getting on the air.

They are talking about changing the way call sign were formulated. There are some new hams who had call signs starting with "N" instead of "W". I guess I got my "ticket" close to the end of the line for the 'W's' W4YMA.

THIS was not ham radio any more! What has happened? SSB, COAX, call sign changes. What's all this coming to?

Glacier-Waterton Hamfest Volunteers?

by Marty, N7VGY

I would like to ask any members that are planning to attend this years Glacier-Waterton International Peace Parks Hamfest if you would be willing to personally, or as a group, make coffee each of the four mornings during hamfest?

The GW Hamfest is July15, 16, 17, 18, 2010. The hamfest supplies coffee, cookies, cups, sugar etc. Volunteers must have coffee ready by 7:00 am and usually is over by 9-9:30 am. They don't have to stick around, just make sure that the first pot is done on time and then comeback once in a while to make sure new batches are brewed.

Biggest advantage to participating is you get the coffee made the way you like it and you get the first cup. ;)

I hope to be at the next meeting if there are any questions, or you can email me at n7vgy@yahoo.com

Thank you and 73's
Marty

W1AW News: W1AW Offers Code Practice, Bulletins via EchoLink

Audio from W1AW's CW code practices and CW/digital bulletins is now available using EchoLink via the W1AW Conference Server "W1AWBDCT." The 9:45 PM ET phone bulletin is currently unavailable via W1AWBDCT. The audio is sent in real-time and runs concurrently with W1AW's regular transmission schedule. According to W1AW Station Manager Joe Carcia, NJ1Q, this server is currently at an experimental stage: "Since the server is located at ARRL -- and uses the ARRL's Internet connection -- there may be an issue as to how many users can connect to W1AWBDCT via EchoLink. The current number of connections is set to 350. If the current system can properly handle these connections without adversely affecting the performance of the conference server, this number will be bumped up higher." All users who connect to the conference server are muted. Please note that any questions or comments should not be sent via the "Text" window in EchoLink. Please send any questions or comments via e-mail at w1aw@arrl.org

Help TOSRV Celebrate its 40th!

By Bob, N7MSU

On May 22 & 23 TOSRV will celebrate its 40th anniversary. Bicyclists for all over the USA are expected to be coming to Missoula to ride the Tour of the Swan River Valley, one of the nation's oldest cycling, road rallies. HARC has been with TOSRV the whole way, and you can help again.

Start planning now. Mark your calendars. Check out your radios and antennas. Contact N7MSU for details. Thanks and CU there.

Grizzly Man Adventure Race

by Bill, W4YMA

Drill, prepare, rehearse, and finally the shot gun start for the event at Paws Up Wilderness Outpost and the second GrizManAdventure is running on a beautiful morning . First, run to the river where radio outposts manned by K7VK and K7PX kept all informed as to Race progress as Racers put into the Blackfoot to paddle to the exit point and mount up on bikes.
Out on the bike course Racers have to be certain to remember the check points and punch-in. Maps and compass have to be kept handy to find to trail to the next check point in the race course within the Lubrecht State Experimental Forest . Watchful radio spotters Mike KE7IZG, Larry K7GIS, and Andrew KE7JCP kept a steady voice stream of information to Joshua via base station W4YMA as to progress or needs encountered . Some check points have snacks for the runners/boaters/bikers during the 10 hours long marathon.

Search and rescue are standing by at all times to assist in locating Adventurers who have lost their way and a few did wander off course for one reason or another. Consider the 99 people running the race and the number of miles involved, no one was lost and everyone finished the race under the allotted 10 hours. A spaghetti diner topped the day followed by distribution of many prizes given to the racers.

Great organization by Joshua Phillips and smooth coordination all coupled with good weather gave race day perfection.

An Introduction To Packet Radio and Digital Communications

by Wilmajean, KD7HP

It was on 4.12.2010 after the club meeting, I was ask by Michael (AE7MH) if I would write/compile an article for the news letter on Packet Radio and Digital Communications. I agreed and said you know this is a very broad subject, very broad! So with that said lets move on, I hope I can keep this interesting and informative.

It was once upon a time long ago, to some, far, far away, there was a form of asynchronous digital communications which required a trained operator to send data over wire (and later radio). This mode went on for years, many of you know it by "Morse", and it was the first form of data communications. Many of you in our club auction bought the Morse sounders used to send and receive this continental code over wire. A CQ would have looked like .. . .._. or the sound would be click click (short blank space) click followed by a time interval and click click (sounder locks down) and a click. Just a wee bit different than the International code we use for radio today where we hear tones as dits and dahs.

Well as already stated, all this required a trained operator! Yes, well, we seem have that problem today too don't we! CW although a form of asynchronous data communications requires a trained operator, and we are always looking for a way around that, we want that free lunch so to speak.

Keep in mind while all the above was going on this was the early 1800's… I am speaking here of the electromagnetic telegraph by Gauss, and Weber. It seems the physical problems, long runs (lengths) of wire, batteries, inductive kickback from the coils on the sounders, we could deal with. The simple need for a repeater every 20 miles or so, was understood… the repeater could be a electromagnetic device or a trained operator at a central point/switching station. But, we always needed the trained operator! Always!

The next big event occurred when ***Jean-Maurice-Émile Baudot*** (September 11, 1845 – March 28, 1903), a French Telegraph engineer and inventor of the first means. Inventor of digital communication Baudot Code, and the key person was one of the first pioneers of telecommunications invented a *teleprinter*.

His device later became known as the teletype, and it was to replace the telegraph operator! As the telegraph required training, and anyone could type on a keyboard to send and receive a messages. Not much has changed today, with that regard has it, we are still seeking untrained operators…

Émile Baudot device was not without its share of problems either. It too was subject to I squared R loss (i.e. Over all resistance of the wire over the total distance.) You needed a synchronous motor at both end (both teleprinters) devices. The "Bias of the selector magnets" needed to be constantly adjusted to compensate for the signal distortion over the wire. No Free Lunch is there! Again a trained operator!

Moving from wire, to radio, the original radio-teletype system is based almost invariably on the Baudot Code (a five bit code) also known as the ITA-2 5 bit alphabet. The link is based on character asynchronous transmission with 1 start bit and ***1, 1.5 or 2 stop bits***. Transmitter modulation is ***FSK*** (F1B). This Five Bit Code with One Start Bit and One, One and a half, or two Stop Bits, gives the operator 32 characters lower keyboard set and 32 characters using the shift key (generally not considered upper case upper keyboard set) for a total of 64 characters in the set. Different alphabets required a different keyboard and basket to be changed in the machine in order to implement this change at both ends of the system.

Over radio standard transmission speeds are 45.45, 50, 75, 100, 150 and 300 baud. Common carrier shifts are 85 Hz (used on LF and VLF frequencies), 170 Hz, 425 Hz, 450 Hz and 850 Hz, although some stations use non-standard shifts. There are variations of the standard Baudot alphabet, using special techniques to cover languages written in Cyrillic, Arabic, Greek, etc.

So how does the TOR and SCD modes differ from Packet?

TOR stands for ***Teletype over Radio***, it is known as a ***SCD Mode*** or ***Single Channel Digital Mode***.

First, ***Radioteletype (RTTY)*** is a telecommunications system consisting originally of two or more electromechanical teleprinters. More recently they have been replaced by "Glass Teletypes or Teleprinters" or if you prefer personal computers running a special program or software to emulate the operations of a teleprinter connected by radio rather than a wired link.

Either the entire family of systems connecting these teleprinters, over radio, regardless of the alphabet, link system or modulation, or specifically the original radioteletype system, sometimes described as "Baudot". Which means to us today, it has a limited character set (64 characters). Simply, it is a "five bit code!"

Amateur radio transmissions For RTTY(Radio Teletype) are almost always 45.45 baud - 170 Hz shift. But again this statement is not cast in stone, so please don't say but BJ you said... Because, I said "almost always 45.45 baud - 170 Hz shift, and this not cast in stone.

Packet radio is a form of packet switching technology used to transmit digital data over radio.

So as the name ***Packet*** implies, this mode of transmission splits the data to be sent up into a series of packets which can be sent one at a time. As messages are usually much longer than the amount of data which can be sent in one packet, it takes several packets to complete the message. More on Packet later…

Are there other TOR Modes? "Teletype Over Radio"

There is: ***AMTOR, Amateur Teleprinting Over Radio***. AMTOR uses a seven bit code and it is usually a 100 baud transmission with what we call FEC, Forward Error Correction to overcome the limits of RTTY.

SITOR-Simplex Telex Over radio, this was developed primarily for maritime mobile use in the 1970s. As a point of interest AMTOR was developed around the SITOR protocol in the early 1980s and is used by Amateur Radio operators around the world…

G-Tor, Golay-Teleprinting Over Radio - First off I should say, "G-TOR" is a trademark of Kantronics, Inc. Make no mistake here! And it is likely to stay that way… Also for what it is worth, it can be viewed, in part, as a variant of the Automatic Link Establishment (ALE) protocol, outlined in MIL-STD-188-141A. G-TOR combines the error correcting properties of ALE, including Forward Error Correction (FEC) coding and full-frame interleaving, the Automatic Repeat re-quest (ARQ) cycle of Packet and a new application of the inevitability of the Golay code, to produce a faster new mode.

Pactor is a radio transmission protocol used by Amateur Radio operators, marine radio stations, and radio stations in isolated areas to send and receive digital information via radio. PACTOR is one of the fastest, most accurate, and most efficient ways to send digital data by radio. A robust network of stations that use PACTOR has been established to relay data by radio to and from the Internet, extending Internet access to sea based and other isolated users PACTOR is an evolution of both AMTOR and Packet Radio, hence the name PACTOR. It was developed in order to improve the reception of digital data when the received signal was weak or noisy. PACTOR combines the bandwidth efficiency of packet radio with the error-correction (CRC) and automatic repeat request (ARQ) of AMTOR. Currently, PACTOR I is open technology.

There are two enhanced PACTOR modes, PACTOR II and PACTOR III, which are much faster but have been kept proprietary by their German company, SCS, that developed them.

Other SCD Modes

There are other Single Channel Digital modes, yes, many use sound card technology. Too many to mention here in fact, the point is they are all "Single Channel Digital"! That is to say, only one person can use the channel at any given time to handle traffic, where Packet is a multi user system.

Continued on page 9

DX Predictions

MAY 2010

Maximum usable frequency from West Coast, Central U.S. and East Coast (courtesy of Engineering Systems Inc., Box 1934, Middleburg, VA 20118). The numbers listed in each section are the average maximum usable frequencies (MUF) in MHz for contacting five major areas of the world centered on Africa-Kenya/Nairobi, Asia-Japan/Toyko, Oceania-Australia/Melbourne, Europe-Germany/Frankfurt, and South America-Brazil/Rio de Janerio. Smoothed sunspot number = 9.

*Chance of contact as determined by path loss is indicated as bold ***MUF** for good, plain MUF for fair, and in (parenthesis) for poor. UTC is hours.*

WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
10	(13)	***13**	***15**	(11)	***16**
12	(18)	10	***14**	15	(14)
14	21	***13**	***13**	18	20
16	23	13	(12)	19	***24**
18	***24**	16	(12)	18	***26**
20	***23**	***19**	23	16	***28**
22	19	***20**	28	(12)	***28**
24	17	***20**	***29**	(10)	***25**
2	15	***20**	***29**	(9)	***21**
4	***16**	***19**	***28**	***14**	***17**
6	19	***18**	***25**	15	***15**
8	16	***16**	***18**	13	***14**

CENTRAL U.S.A.

UTC	AFRI	ASIA	OCEA	EURO	SA
8	(13)	13	***16**	(11)	***13**
10	(16)	***11**	***15**	15	***14**
12	19	***15**	***13**	***17**	***20**
14	22	14	***12**	***19**	***23**
16	23	12	(12)	***20**	***26**
18	***24**	(11)	(12)	***19**	***28**
20	***23**	15	23	***18**	***29**
22	19	18	28	15	***29**
24	17	19	***30**	13	***23**
2	***15**	19	29	***11**	***19**
4	***16**	17	28	***13**	***17**
6	16	16	***24**	***13**	***15**

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SA
7	17	13	***19**	(11)	***14**
9	18	(11)	***15**	14	***14**
11	23	15	***13**	***17**	***19**
13	***26**	16	(13)	***19**	***23**
15	***28**	13	(12)	***20**	***26**
17	***28**	(11)	(12)	***19**	***28**
19	***26**	(14)	(18)	***19**	***29**
21	***21**	17	26	***17**	***29**
23	18	19	29	15	***26**
1	***15**	19	29	***13**	***22**
3	***13**	17	***28**	***11**	***18**
5	***18**	15	23	***13**	***16**

HELLGATE AMATEUR RADIO CLUB
Meeting Minutes for April 12, 2010
Fire House #4, Missoula

MEETING Called to order by Elmer, WG7P at 7pm
INTRODUCTIONS were made with 25 attendees
SECRETARIES REPORT— Mike, AE7MH **Motion Betsy, KF7ECS 2nd Mike, KE7IZG** to approve meeting minutes for March 8th, 2010, as published and amended by Elmer, WG7P for net operator on March 31st as being Paul, N7PAS. **Motion passed**
TREASURERS REPORT— Jerry, N7GE **Motion Donnie, W7XY 2nd Mike, KE7IZG** to approve Treasurers Report as presented. **Motion passed**

2009 Treasurer's Books – Ruth, N7FMW – Ruth unable to attend meeting, however she has review books and is satisfied that there are no issues. All club tax papers for 501c3 status and yearly federal tax reports filed.

2010 Memberships are due, please update your membership.

COMMITTEE REPORTS
Membership — Liz, WG7E Membership applications are available, please see Liz if you need to update your information.
Repeater — Eric, NZ7S We have some repeaters better than others, 147.04 is working intermittently at best.
Net Operators — 4/21 **Mike, AE7MH** 4/28 **Sandra, KF7GZS** 5/5 **Eric, NZ7S** 5/12 **Elmer, WG7P**
OLD BUSINESS

Static — Monthly Editor, May Michael, AE7MH Thanks Michael for April – Newsletter editors are needed for June & July "Getting to Know" article for May – No volunteers, Thank you to Donna KE5WRA sharing for April.

Name badges are still available, Please get with Elmer, WG7P

Field Day 2010 — Signup sheets passed for Potluck and for Operators for this years event.

Trailer – Lewis, AC7UZ – unable to attend meeting, no report

Grizzly Triathlon on April 10 – Jerry, N7GE – 425 participants, 8 volunteers, went smoothly after switching to 146.90 repeater from the 147.04 repeater.

Grizzly Man Adventure Race April 17th – Bill, W4YMA – Everyone will meet at Paws Up Wilderness Outpost by 7 am, you need to have your own food and water, spare batteries for your handy talkies

YMCA Riverbank Run April 24th – Jerry, N7GE – Signup sheet circulated for volunteers, participants need to be on station no later than 8 am, races will start with the longest course first ending with the shortest event last.

License Class – Mike, AE7MH – Five people regularly attending classes, 2 of which passed their General class license this evening, Dean, N7DLP and Sandra KF7GZS, Congratulations to both of these people. This session of the General Class will run through May 4th, pending no other conflicts, Marty N7VGY asked if an Extra Class session would be held, nothing has been scheduled at this point.

Other Items - None

NEW BUSINESS

TOSRV – Bob, N7MSU – was unable to attend, however sign up sheets were circulated for volunteers

Purchase of coax for antenna trailer – Eric, NZ7S **Motion Craig, KE7NO 2nd Jerry, N7GE** to purchase (2) 75' lengths of RG-213 coax or equivalent for approximately $150. **Motion Passed**

Other Items

Missoula Marathon – looking for someone to Chair event, Andy KF7CBY will not be able to chair event this year. Lewis, AC7UZ has laid the groundwork for the event, so event setup should be in good shape.

National Weather Service – Donnie, W7XY was contacted for the wind event on April 8th. Communications with the weather service had a few miscommunications; however this was later followed up with praise and thanks to the efforts of Donnie and the amateur radio community. Reports given from this area allowed the NWS to more accurately forecast the event and its possible effects to the Great Falls community. Skywarn was not activated for this event.

PROGRAM – David, K7UXO with assistance of Ed, N0AUB presented a program on Winlink 2000 and emergency communications within the amateur radio and Army Mars system. Special thanks to those whom assisted with the raising of the antennas for the demonstration.

ANNOUNCEMENTS

Reimbursements for expenses – Elmer, WG7P – Remember that the club will only reimburse you for expenses with an accompanying receipt.

Donnie, W7XY along with others attended the wedding anniversary for Argus, W8QMD and his wife on Saturday, April 10th, and was enjoyed by all.

BUY OR SELL? - Nothing mentioned
GOOD of the Order - No money was set aside for the YMCA Triathlon volunteers, Motion by Jerry, N7GE 2nd Donnie, W7XY to approve up to $80 to be spent on food after the event. Motion passed
DOOR PRIZE DRAWING – 10 piece mini precision screwdrivers won by Marty N7VGY
MOTION TO ADJOURN - Motion Betsy, KF7ECS 2nd Paul, N7PAS- Motion passed

Looking Back and Ahead: An Update On Solar Cycle 24

By Carl Luetzelschwab, K9LA

In May 2009, the Solar Cycle 24 Prediction Panel (a group of solar scientists organized and chaired by NOAA and funded by NASA) made two predictions: that solar minimum between Cycle 23 and Cycle 24 occurred in December 2008, and that the maximum smoothed sunspot number of Cycle 24 would be around 90 in early 2013.

This month's column assesses these predictions – did solar minimum occur in December 2008, and is Cycle 24 ascending per the prediction?

Figure 1 shows the monthly mean Brussels sunspot number for January 2006 through January 2010.

The red vertical bars are the monthly mean sunspot numbers for Cycle 23 sunspots and the blue vertical bars are the monthly mean sunspot numbers for Cycle 24.

Note that Cycle 23 and Cycle 24 sunspots overlapped for 16 months (January 2008 through April 2009). This overlap is a common characteristic of a solar minimum period.

More importantly, visually the data of Figure 1 suggests that solar minimum occurred around the end of 2008 or in early 2009. To better see what happened, Figure 2 plots the recent smoothed sunspot numbers (the smoothed values being the official measure of a solar cycle).

Figure 2 indicates that in December 2008 the smoothed sunspot number mathematically minimized. This actual data nicely supports the prediction. Thus we appear to have good news – that the solar minimum prediction is a good one, and solar minimum is behind us.

I should point out that a minimum smoothed sunspot number does not necessarily define "official" solar minimum. The month and year of "official" solar minimum will be determined by solar scientists, and will include consideration of other issues.

For example, one such issue could be how the number of Cycle 23 and Cycle 24 sunspots is distributed about the mathematical minimum. This was a problem for determining solar minimum between Cycle 22 and 23 – although the mathematical minimum was in early 1996, there weren't any new Cycle 23 sunspots yet. Thus the "official" solar minimum was declared to be later in 1996 when Cycle 23 sunspots were seen.

If you go back to Figure 1, an eyeball estimate indicates approximately the same number of Cycle 24 sunspots before December 2008 as the number of Cycle 23 sunspots after December 2008. This

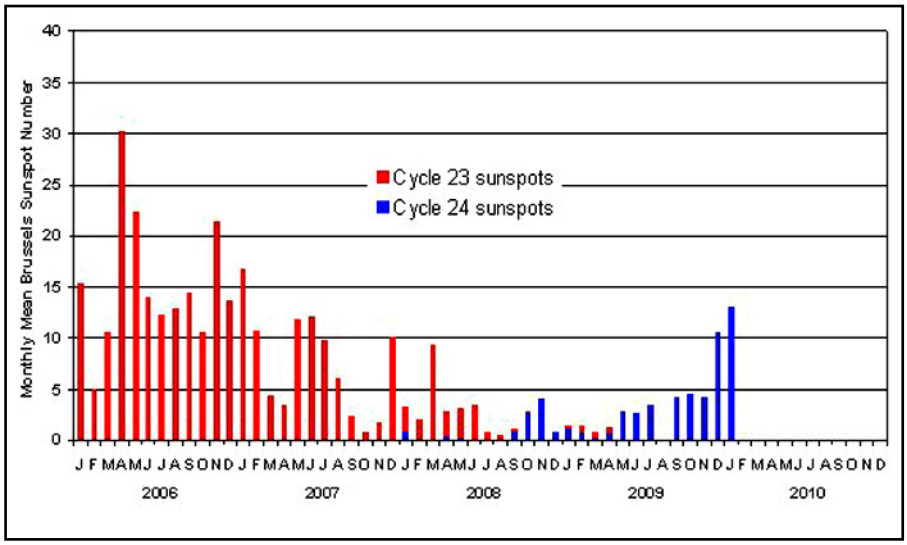

Figure 1 – Solar Minimum Between Cycle 23 and Cycle 24

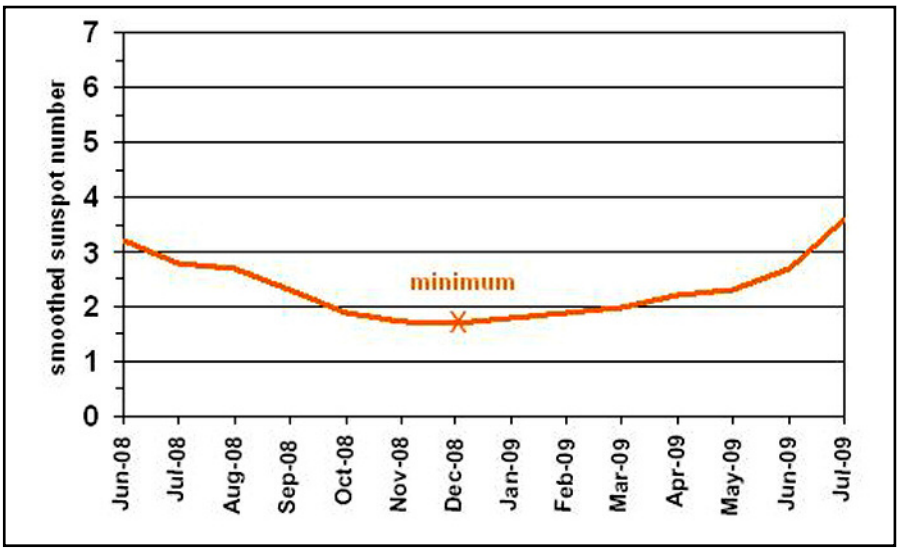

Figure 2 – Recent Smoothed Sunspot Numbers

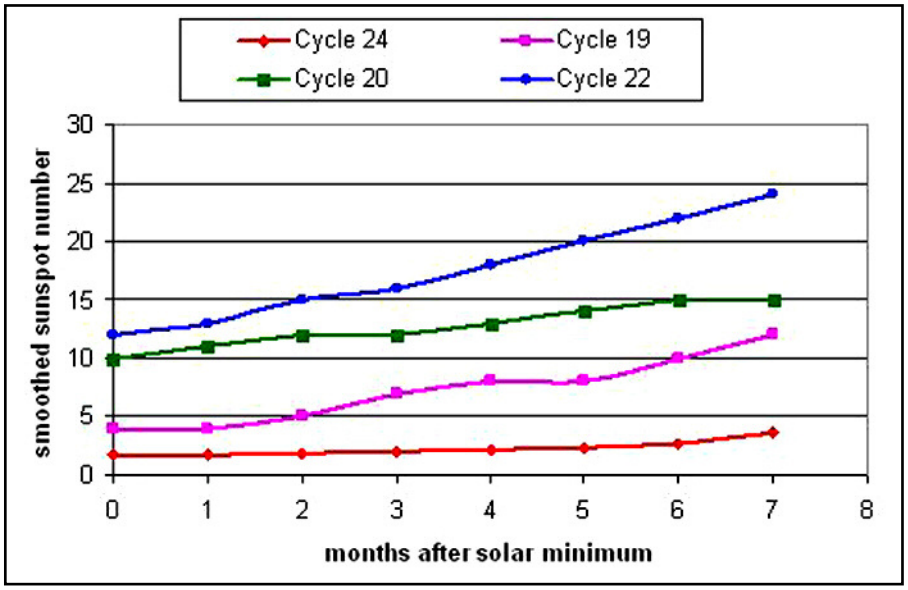

Figure 3 – Cycle 24 Ascent Compared To Other Solar Cycles

cycle	percent increase after 7 months	maximum smoothed sunspot number
19	200	201
24	112	TBA
22	100	158
20	50	111

Table 1 – Percent Increases

will be a strong case for December 2008 as the official minimum.

Now let's look at the prediction for a slightly-below-average maximum smoothed sunspot number of 90. We'll do this by comparing the ascent of Cycle 24 so far to the ascent of previous solar cycles. For the record, the average maximum smoothed sunspot number of all 23 cycles is 113.5.

The solar cycles to which we'll compare Cycle 24 are Cycle 20 (maximum smoothed sunspot number of 111 – about average), Cycle 19 (maximum smoothed sunspot number of 201 – the largest we've recorded), and Cycle 22 (maximum smoothed sunspot number of 158 – the last big one). Figure 3 shows this data.

The most obvious observation from the Figure 3 data is that Cycle 24 is starting from the lowest smoothed sunspot number of those four cycles. But that apparently doesn't mean much, as Cycle 19 started lower than Cycle 20 and Cycle 22, but eventually surpassed both of them for the highest smoothed sunspot number in recorded history.

Since we got nowhere looking at how low a cycle started, let's look at the rate of ascent of these four cycles. There is some precedence for this in that a bigger cycle generally rises more quickly than a smaller cycle. Let's use the Figure 3 data to compare the percent increase after 7 months. Admittedly we have a limited amount of data so far, but Table 1 summarizes this percent increase.

Indeed, a faster rate of ascent appears to suggest a bigger cycle. So far Cycle 24 is rising faster than Cycle 20 (which was about average), and in fact is on par with Cycle 22 (the last big one).

Does this mean Cycle 24 may rival Cycle 22's maximum smoothed sunspot number of 158? Not necessarily, but it sure bears watching as it ascends.

In summary, solar minimum is likely behind us. Additionally, it's too early to tell where Cycle 24 is headed – hopefully we'll have a clearer picture by the end of the year.

Continued from page 6

Introduction to Packet Radio and Digital Communications

Moving on to Packet Radio again!

The key advantage of packet radio is that one channel can be used by several amateur radio stations at the same time (a shared channel). This means that when sending data any/other stations has to wait until the channel is clear.

Once the frequency is free the first packet can be sent, and the receiving station will return an acknowledgement to say that all the data has been received correctly.

If this acknowledgement is not received the transmitting station waits for the frequency to clear and re-sends the data.

This process is repeated until the data has been correctly received.

Once the first packet has been transferred, the second, and subsequent ones are all transmitted in the same way.

As the receiving radio station checks for errors and the transmitter repeats the data until it has been correctly received the system is very resilient and gives very high levels of accuracy.

The other advantage is that the approach of waiting until the frequency is clear before transmitting allows many stations to use the same frequency, providing an efficient utilization of the available channel or bandwidth.

You could say this is "Packet Radio in a Nut-Shell"

The original article that I submitted to Michael, AE7MH has many more pages of information. Michael, in the interest of keeping the newsletter a manageable size has kept the rest of my article for future parts to be published in future issues of the Static Newsletter. Please feel free to let us know how interested you are in learning more about digital modes and more specifically packet radio. Thank you in advance for your feedback..

22nd Annual Grizzly Triathlon

From Jerry, N7GE
Just a short note to recap the 22nd annual Grizzly Triathlon that took place on April 10,2010. HARC was contacted by Giles Thelan, the co-director of the event to assist with communications.

The weather was fairly co-operative throughout the day although rather brisk in the morning as usually happens in April in Montana. There was a small breeze out on the course throughout the day and even with the sun shining down, the temperature was cool.

I had assistance from 9 other volunteers, David KB1BED, Steve K7PX, Mike KE7IZG, Larry K7GIS, Michael AE7MH, Kody KL0RN and Eric NZ7S and many thanks are extended to them for helping. We went to the 5 Guys Grill after the event, visited about the event and had a good lunch meal.

There were 420 entrants for the triathlon this year and there were 15 events. The race is announced by the university in January and usually is full within a couple weeks so it is a popular venue for people around the area.

We did not have any real emergencies happen this year that we are thankful for that but there were a couple of near misses due to drivers entering or leaving the course by the shopping center off East Broadway. Contact between a car or truck and a bicycle would leave only one outcome and we all know who would come up short.

We started out using the 147.040 repeater and in a short time noticed a problem with the repeater. The decision was made to move over to the 146.900 repeater and with Eric's help to set the repeater up the way we needed, we continued on without a hitch. Well, one little hitch maybe. One of the HARC volunteers had an issue with a failing vehicle battery and had to get a jump start to be able to go home but didn't miss a beat with assistance on the event. Improvise right?

Again a special thanks to the volunteers that were able to participate this year and we received a tee shirt from the triathlon folks for helping. They were appreciative of our ability to be located through out the course in case one of the entrants had problems or questions.

Thanks again.

Jerry

Programs for Remainder of 2010

We have had many informative and interesting programs since January, and the programs for the remainder of the year will prove the same. The programs we have planned are as follows:

	May 10th	Dr. Jeff Crews	Google Earth and other mapping
	June 14th	Larry K7GIS and Eric NZ7S	Setup Emergency Station Outside
	July 12th	Jerry N7GE and Steve KK7UV	Setup Emergency Station Outside
	August 9th	Eric NZ7A	Dummy Loads
	September 13th	Bob N7MSU and Frank W7PAQ	PSK31
	October 11tt	Bob, Reid, Missoula County Director of Emergency Services	Overview of County Emergency Services
	November 8th	Lance W7GJ	6 Meter EME Dxpedition to 3D2
	December 13th	Dr. Steven Running, Nobel Prize	Global Warming / How info Obtained

These programs should be on interest and perhaps will have new information and ideas that one might include in their daily radio operations. As you can see, Dr Steven Running a Nobel Prize winner from the University of Montana will be our presenter at our December/Christmas Party and his presentation should be of interest to all in attendance. If you Google Dr Running's name, you will be able to see some of his many accomplishments.

YMCA Riverbank Run

by Jerry, N7GE

The 2010 annual River Bank Run was held this weekend April 24th and the Hellgate Amateur Radio Club, once again, helped with communications during the event. I was joined on the top of the Wilma building by Michael Henry AE7MH along with Kelly of the YMCA. We set up a portable station and used the 146.900 repeater for our communications. The equipment worked very well and we were able to copy all stations throughout the event without a glitch.

We had 12 volunteers involved besides Michael AE7MH and myself N7GE. Mike Leary KE7IZG, Larry Stipe K7GIS, Kody Moore KL0RN, Steve Schlang K7PX, Bob Black K7BA, Eric Sedgwick NZ7S, Bill Farrell W4YMA, Vick Applegate K7VK, Greg Lee NL7WB and Liz Myers WG7E were on the race course to assist in the event of an emergency. Marty Merwin N7VGY of the ski patrol monitored our frequency in case medical assistance was needed so he could announce to the other ski patrol folks to get help to the location right away. I am happy to share there were no medical emergencies that we were involved with or notified of.

According to the YMCA folks, they expected over 3200 people to be registered to participate in the event. This is billed as the largest event to take place in Missoula so as always, our help was greatly appreciated.

After the event, a few of the volunteers met at Tower Pizza for a few laughs and some food and refreshments. We also went over some ideas to share with the YMCA that may help them in their future events.

I would like to extend my appreciation for the volunteers that were able to donate four hours of their Saturday to assist in the event.

Thanks again.

Jerry

Is amateur Radio important to you? Do you know the threats to our hobby?
JOIN and SUPPORT the ARRL, our greatest advocate for amateur radio.
Become a member today, for more information visit http://www.arrl.org

Hellgate Amateur Radio Club
PO Box 3811
Missoula, MT 59806-3811