CQ CHATTER

VOLUME B9 • Issue #12 WOOD COUNTY AMATEUR RADIO CLUB January 2009
P.O. BOX 534, Bowling Green, OH http://wcarc.bgsu.edu

President/Vice President	K8OVO/K8NEA	Don Buehrer/Duane Ashbaucher
Secretary	N1RB	Bob Boughton
Treasurer	WD8JWJ	Bill Wilkins

Kick-off Banquet Planned

The annual WCARC kick-off banquet will be held January 12, 2009, at Ben's Table restaurant, 1021 S. Main St. in Bowling Green. The menu is Margaret's Chicken, homemade mashed potatoes & gravy, peas or carrots, coleslaw, fresh baked rolls and butter. Coffee, hot tea, iced tea or soft drink included. A vegetarian chef's salad will be available as an alternate to chicken. The cost is $15.00 per person in advance, which includes tax and gratuity. Please make reservations and payment to Bill Wilkins, WD8JWJ, [telephone **(419) 353-9165,** e-mail: **wd8jwj@wcnet.org**] by January 7, 2009. The restaurant will be closed to the public. Doors open at 6:00 pm with dinner at 6:30. Thanks to Bob, WB8NQW, for making the arrangements. Plan to come and renew acquaintances with a few eyeball QSOs. ■

WCARC Weekly Net:
Tuesdays at 2030 EST
(0130 Z Wed year-round)
147.18 MHz 67 Hz PL

Next Meeting
Annual Banquet
MONDAY, JANUARY 12th
TIME: 6:30 pm/6:00 pm eyeball
PLACE: Ben's Table,
1021 S. Main St., Bowling Green

FREQUENCY CHANGE FOR CHU

from ARRL Letter

After 70 years of broadcasting Canada's official time, the National Research Council's shortwave station CHU
http://inms-ienm.nrc-cnrc.gc.ca/time_services/shortwave_broadcasts_e.html
will move the transmission frequency for the 7335 kHz transmitter to 7850 kHz. The change goes into effect at 0000 UTC on January 1, 2009.

Broadcasting 24 hours a day, CHU is a part of NRC's system for disseminating official time throughout Canada. Listeners hear tones to mark the seconds, a voice to announce the time in French and English and digital data to set computers. The atomic clocks at CHU are part of the ensemble of clocks in the time and frequency research laboratories at the National Research Council Canada in Ottawa. The NRC clocks are used in conjunction with clocks in the time laboratories of other countries to construct the internationally accepted scale of time, UTC (Coordinated Universal Time)..Time transmissions on 3330 and 14670

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Net Check Ins

Dec 16

N8QMV (NC)
WB8NQW
WD8ICP
WD8JWJ
N1RB
K8BBK
WB8VUL
K8OVO
K8JU
KD8BIN/John (10)

Dec 23

WB8NQW (NC)
WD8ICP
N8QMV
KC8ZJW
K8BBK
WB8VUL
KG8FH
K8OVO
N1RB (9)
2 msgs from WD8ICP handled by K8OVO

Dec 30

N1RB (NC)
W8TER/M- Steve
N8QMV
KC8ZJW
N8RIM
WB8NQW
WD8ICP
WB8VUL
K8BBK
WD8PIC
K8OVO
WA8VQP (12)

WCARC

2 m Net Control Roster

Net meets every Tuesday at 2030 EST

Dec	**30**	**N1RB**
Jan	**6**	**K8OVO**
Jan	**13**	**WD8ICP**
Jan	**20**	**N8QMV**
Jan	**27**	**WB8NQW**
Feb	**3**	**N1RB**
Feb	**10**	**K8OVO**

Brain Teasers

1. When selecting an SSB transmitting frequency, what minimum separation from a contact in progress should you allow (between carriers) to minimize interference?

a.) 150 to 500 Hz
b.) about 3 KHz
c.) about 6 KHz
d.) about 10 KHz

2. When selecting a CW transmitting frequency, what minimum separation from a contact in progress should you allow to minimize interference?

a.) 5 to 50 Hz
b.) 150 to 500 Hz
c.) 1 to 3 KHz
d.) 3 to 6 KHz

3. Why isn't FM phone used below 29.5 MHz?

a.) the transmitter efficiency for this mode is too low
b.) harmonics would not be attenuated to practical levels
c.) the bandwidth would exceed FCC limits
d.) the frequency stability would not be adequate

January Contests

The contest lineup for the month of January is given below. Please note that the WARC bands (60, 30, 17 and 12 m) are never open to contesting.

Jan 1	*0000 to 2400 Z*	160 m to 10 m
ARRL Straight Key Night		**CW**
Jan 3-4	*1800 to 2400 Z*	160 m to 10 m
ARRL RTTY Roundup		**RTTY**
Jan 10	*0000 to 2400 Z*	80 m to 10 m
070 PSK Fest		**PSK 31**
Jan 10-11	*1800 to 0600 Z*	160 m to 10 m
North American QSO Party		**CW**
Jan 17-18	*1200 to 1200 Z*	160 m to 10 m
Hungarian (HA) DX 'test		**all modes**
Jan 17-18	*1800 to 0600 Z*	160 m to 10 m
North American QSO Party		**SSB**
Jan 17-19	*1900 to 0400 Z*	6 m on up
ARRL January VHF Sweepstakes		**all modes**
Jan 23-25	*2200 to 2200 Z*	160 m
CQ WW 160 m 'test		**CW**
Jan 24-25	*0600 to 1800 Z*	80 m to 10 m
REF (France) DX 'test		**CW**
Jan 24-25	*1300 to 1300 Z*	80 m to 10 m
UBA (Belgium) DX 'test		**SSB**

Brain Teaser answers: 1-b, 2-b, 3-c

DON'T FORGET!

10 meter informal net meets each Sunday at 2030 EST

on 28.335 MHz

January Hamfests

Jan 10 Dial Radio Club. SW Ohio Digital and Technical Symposium. Miami University-Middletown, Middletown, OH. Contact Jay, K4ZLE, (513) 934-0235. k4zle@embarqmail.com http://www.swohdigi.org

Jan 18 Hazel Park ARC annual hamfest Hazel Park, MI, High School. Contact Mike (248) 399-7970. wd8s@comcast.net http://www.hparc.org

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kHz are not affected and will continue as before.

In April 2007, the ITU reallocated the 7300-7350 kHz band from the fixed service to the broadcasting service. Since then, the NRC said there has been a lot of interference on the 7335 kHz frequency from many information broadcasters around the world. "CHU listeners in Canada and around the world who have for so long considered the 7335 kHz frequency exclusively for time signals, are very vocal about this interference," said Raymond Pelletier, Technical Officer at the NRC-Institute for National Measurement Standards, who oversees the CHU facility. "We have heard from Amateur Radio operators, watchmakers, astronomers and navigators who use the tones and voice signals. We also received comments from those who use the carrier as a calibration source at a distance for their equipment."

Pelletier noted that a leap second will be added at the end of December 2008; this will be indicated in the digital code until the time of the leap second. DUT1 will go from -0.6 to +0.4 seconds and will be indicated by double tones near the start of the minute and in the broadcast code http://inms-ienm.nrc-cnrc.gc.ca/time_services/chu_e.html. ■

RADIO IN SPACE: SATELLITE CONFIRMS CRACKS IN EARTH'S MAGNETIC SHIELD

from Amateur Radio Newsline

Recent satellite observations have revealed the largest breach yet seen in the magnetic field receded to date. Scientists have long known that the Earth's magnetic field is similar to a drafty old house that sometimes lets in charged particles from the sun. These breaches cause the brilliant auroras but can also disrupt satellite and ground communications.

The discovery was made last summer by a fleet of five small NASA satellites known as Themis. Their observations showed the Earth's magnetic field occasionally develops

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two cracks that allows a stream of charged particles spewing from the sun to penetrate the Earth's upper atmosphere. Last summer, Themis calculated a layer of solar particles to be at least 4,000 miles thick in the outermost part of the Earth's magnetosphere. This is the largest tear of the planets protective shield found so far. ■

Ham Magazine Changes Hands and Format

The popular amateur magazine, *World Radio*, has been purchased by CQ Communications, Inc., publisher of *CQ Magazine* and *Popular Communications*. *WorldRadio*, which has been published as a low-cost newsprint type of magazine, will continue to be published as an on line-only journal. The intention is to make it an open access publication with no subscription fee. The publishers announced that starting with the February, 2009 issue, paid subscriptions to *WorldRadio* will be fulfilled by replacing *WorldRadio* by the equivalent subscription to *CQ Magazine*. Many hams have continued to be thoroughly entertained by several *WorldRadio* columnists, including the antenna specialist, Kurt N. Sterba. ■

Rewind---The Russian Woodpecker

The Russian Woodpecker was a notorious Soviet signal that was heard on the shortwave radio bands worldwide between July 1976 and December 1989. It sounded like a sharp, repetitive tapping noise, at 10 Hz, giving rise to the "Woodpecker" name. The random frequency hops disrupted legitimate broadcast, amateur radio, and utility transmissions and resulted in thousands of complaints by many countries worldwide. The signal was long believed to be that of an over-the-horizon radar (OTH) system. This theory was publicly confirmed after the fall of the Soviet Union, and is now known to be the Duga-3 system, part of the Soviet ABM early-warning network.

The Soviets had been working on early warning radars for their anti-ballistic missile systems through the 1960s, but most of these had been line-of-sight systems that were useful for raid analysis and interception only. None of these systems had the capability to provide early-warning of a launch, which would give the defenses time to study the attack and plan a response. At the time the Soviet early-warning satellite network was not well developed, so work started on over-the-horizon radar systems for this associated role in the late 1960s.

The first experimental system, Duga-1, was built outside Mykolaiv in the Ukraine, successfully detecting rocket launches from Baikonur Cosmodrome at 2,500 kilometers. This was followed by the prototype Duga-2, built on the same site, which was able to track launches from the far east and submarines in the Pacific Ocean as the missiles flew towards Novaya Zemlya. Both of these radars were aimed east and were fairly low power, but with the concept proven work began on an operational system. The new Duga-3 systems used a transmitter and receiver separated by about 60 km.

Starting in 1976 a new and powerful radio signal was detected worldwide, and quickly dubbed the Woodpecker by radio amateurs. Transmission power on some woodpecker transmitters was estimated to be as high as 10 MW EIRP. As well as disrupting shortwave amateur radio and broadcasting it could sometimes be heard over telephone circuits due to the strength of the signals. This led to a thriving industry of "Woodpecker filters" and noise blankers. One idea radio amateurs had to combat this interference was to

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attempt to "jam" the signal by transmitting synchronized unmodulated continuous wave signals, at the same pulse rate as the offending signal. This idea was considered, but abandoned as impractical. Simple CW pulses didn't appear to have any effect. However, playing back recordings of the woodpecker transmissions sometimes caused the woodpecker transmissions to shift frequency leading to speculation that the receiving stations were able to differentiate between the "signature" waveform of the woodpecker transmissions and a simple pulsed carrier.

Triangulation quickly revealed the signals to come from Ukraine. Confusion due to small differences in the reports being made from various military sources led to the site being alternatively located near Kiev, Minsk, Chernobyl, Gomel or Chernihiv. All of these reports were describing the same deployment, with the transmitter only a few kilometers southwest of Chernobyl (south of Minsk, northwest of Kiev) and the receiver about 50 km northwest of Chernobyl (just west of Chernihiv, south of Gomel). Unknown to most observers, NATO was well aware of the new radar installation, which they referred to as Steel Yard.

Even from the earliest reports, it was suspected they were tests of an over-the-horizon radar and this remained the most popular theory during the cold war. Several other theories were floated as well, including everything from jamming western broadcasts to submarine communications. The broadcast jamming theory was debunked early on when a monitoring survey showed that Radio Moscow and other pro-Soviet stations were just as badly affected by woodpecker interference as Western stations. More speculative explanations were also offered, claiming it was a system for weather control or even an attempt at mass subconscious mind control.

As more information about the signal became available, its purpose as a radar signal became increasingly obvious. In particular, its signal contained a clearly recognizable structure in each pulse, which was eventually identified as a 31-bit pseudo-random binary sequence, with a bit-width of 100 /s resulting in a 3.1 ms pulse. This sequence is usable for a 100 s chirped pulse amplification system, giving a resolution of 15 km (10 mi) (the distance light travels in 50 s). When a second Woodpecker appeared, this one located in eastern Russia but also pointed toward the US and covering blank spots in the first system's pattern, this conclusion became inescapable.

In 1988, the Federal Communications Commission conducted a study on the Woodpecker signal. Data analysis showed an interpulse period of about 90 ms, a frequency range of 7 to 19 MHz, a bandwidth of 0.02 to 0.8 MHz, and typical transmission time of 7 minutes.

Starting in the late 1980s, even as the FCC was publishing studies of the signal, the signals became less frequent, and in 1989 disappeared altogether. Today Google Map photography of the area shows that the antenna has been removed. The original Duga-3 site lies within the 30 kilometer Zone of Alienation around the Chernobyl power plant. It appears to have been permanently deactivated, since their continued maintenance did not figure in the negotiations between Russia and Ukraine over the active early warning radars at Mukachevo and Sevastopol. The antenna still stands, however, and has been reported to have been used by amateurs as a transmission tower (using their own antennas) and has been extensively photographed. ■

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