

SQUAKBOX

Issaquah Amateur Radio Club

Volume 41, No. 9

Issaquah, Washington

September 2019

ARRL Board Pledges to Oppose French 144 -146 MHz Proposal

At its July meeting, the ARRL Board of Directors resolved that "at the appropriate time" ARRL will oppose a proposal by France to include 144 - 146 MHz among spectrum to study for non-safety Aeronautical Mobile Service applications with an eye toward sharing the spectrum with the Amateur Services. The action came as the Board met July 19 - 20 in Windsor, Connecticut for its second meeting of 2019.

The Board pointed out that 144 - 146 MHz is a primary global Amateur Radio allocation and the

band enjoys widespread use for emergency communication. It also noted the investment by radio amateurs of money and effort to build repeaters, beacons, space infrastructure, and propagation research systems that have global reach. The AMSAT and ARISS communities would be severely affected, the Board observed.

ARRL International Affairs Vice President Jay Bellows, K0QB, ad-

(Continued on page 2)

CEPT Proposal

The final European Conference of Postal and Telecommunications Administrations (CEPT) Conference Preparatory Group (CPG) meeting prior to World Radiocommunication Conference 2019 (WRC-19) gets under way on August 26. Action at that gathering will determine whether a French proposal to have WRC-23 study the sharing of 144 - 146 MHz with the Aeronautical Mobile Service (AMS) will be adopted as a CEPT WRC-19 position. International Amateur Radio Union (IARU) experts will be present at the CPG to explain the IARU position on this and other topics. The French proposal, raised on short notice at a CEPT meeting in June, has riled the Amateur Radio community worldwide and prompted petitions to prevent its passage. The proposed 144 - 146 MHz segment would be part of a broader consideration of spectrum allocated to the Aeronautical Mobile Service.

IARU has asked its member-societies to explain the Amateur Service's concerns over the French proposal to their telecommunications regulators, and it has submitted a basic technical analysis showing the impracticality of such

(Continued on page 3)

September Program

Antenna Optimization

Dr. Quentin Caudron K7DRQ will describe Antenna Optimization with Genetic Algorithms. Should be interesting.

Future programs are as follows:
Oct - Open
Nov - open

Contact Joe KF7BMD 425-985-1562 to volunteer.

Also . . .

Last Meeting	2
Contest Rules	2
FT4	3
147.435 MHz	4
Wireless Security	5
New Logic Switch	6
8-Meter Band	6
RYRYRY	7
HPM 150 B-Day	8
Coming Events	8

At the last meeting . . .

August 7th, 2019

The meeting was called to order by President Lara Flores at 7:00PM. A number of twenty four members and guests were present at the meeting.

No minutes for the July month meeting due to the summer events. Treasure Report - given.

Old Business

Membership: The roster was circulated and filled with new names.

Reimbursement: HAM classes were paid.

Field Day reimbursement motion was moved, seconded and approved with unanimous vote

APRS Gathering: Between 6-8th of September the Valley Camp will hold the APRS Gathering. Everybody is invited to attend. No agenda was presented as not yet released.

New Business

Field Day: Lara summarized the event had a good location, people felt welcomed and there were a lot of activities. The Mayor visited the site and did GOTA contacts. Other people commented and approved the conclusion the location was very good chosen, the feeling about everything was good. Conclusion was to have as much as possible the same location next summer.

Senior Center: John spread the papers to submit for the membership and cards.

For the good of the club: Rod brought cables and antennas for sharing and auction to the club.

(Continued on page 4)

E-Mail Elmer

Got a HAM radio question and can't find an Elmer to talk to? Just send your question by E-Mail to our E-Mail Elmer at:

Elmer@w7bi.com - Ed. - S

2019 IARC Officers

President

Lara Flores (WA7LNF) - (Issaquah)

Vice President

Joe Decuir (KF7BMD) - (425) 985-1562 (Issaquah)

Secretary

Mihai Manolache (W4MHI) - (425) 647-7030 (Issaquah)

Treasurer

Don Stewart (KI7TTX) - (206) 450-1222 (Issaquah)

W7BI Trustee

Rod Johnson (WE7X) - (425) 392-8497 (Issaquah)

ARRL Contest and DXCC Rules Now Prohibit Automated Contacts

ARRL has incorporated changes to the rules for all ARRL-sponsored contests and DXCC, prohibiting automated contacts and requiring that an actual operator is initiating and carrying out a contact. These changes also apply to Worked All States (including Triple Play and 5-Band WAS), Fred Fish W5FF Memorial, and VUCC awards. The changes are effective immediately and affect the rules for both HF contests, and VHF/UHF contests as well as DXCC.

A resolution at the July ARRL Board of Directors meeting pointed to "growing concern over fully automated contacts being made and claimed" for contest and for DXCC credit. The rules now require that each claimed contact include contemporaneous direct initiation by the operator on both sides of the contact. Initiation of a contact may either be local or remote. - ARRL Letter, 8/22/2019 - S

French Proposal Cont.

vised that if it is added as an agenda item for study for WRC 2023, the Board should consider action. - ARRL Letter, 8/15/2019 - S

New FT4 Beta Release "Leaps and Bounds" Better than Earlier Iterations

The WSJT-X Development Group released yet another new beta version of the FT4 protocol this week, and WSJT-X 2.1.0-rc7 is now available for testing. Developers point out that the FT4 included in this "release candidate 7" version is not compatible with any previous releases. A short mock contest session to wring out the contesting features of FT4 took place on June 4.

"Thanks to all who participated in yesterday's FT4 mock-contest practice session -- and especially to those who provided useful feedback. It is much appreciated!" said developer Joe Taylor, K1JT. "Everyone likes the 7.5-second T/R sequences, which provide operators with significantly more human interaction time than in previous revisions of FT4. Users also appreciated the sensitivity improvements and a larger range of acceptable time offsets (DT)." DT represents the combined clock difference for the transmitting and receiving computers, he explained.

Based on data compiled by Steve Franke, K9AN, Taylor said that it appears developers have the WSJT-X timing behavior under good control on all supported platforms, and the range of measured signal-to-noise values extended down to -21 dB.

"I operated for about 3 hours using 100 W and a dipole," Taylor recounted. "I copied transmissions from 263 unique call signs and made 143 QSOs in 29 states, 5 Canadian provinces, and 15

DXCCs."

Taylor said the developers anticipate addressing all remaining issues they're aware of. "I believe we are on a good path toward a General Availability (GA) release of WSJT-X 2.1.0 by mid-July," he said.



Steve Franke, K9AN, of the

CEPT Cont.

a proposal. IARU has said much more appropriate parts of the spectrum are available to study for non-safety AMS applications.

Another issue addressed during the June CEPT meeting concerned the sharing of the Amateur Radio 1240 - 1300 MHz band with Europe's Galileo GPS system. IARU has asked its member-societies to discuss with regulators the best way to resolve concerns regarding a few cases of Amateur Radio interference to the Galileo navigation system specific to its E6 subband at 1260 - 1300 MHz.

Documents for the CEPT Conference Preparatory Group meeting are available via the CEPT website. – ARRL Letter, 8/22/2019 - S

WSJT-X Development Group spent most of his time observing during the mock contest on June 4, decoding some 25,300 FT4 transmissions. This chart represents signal-to-noise ratios reported.

"This new version of FT4 is leaps and bounds better than before," said Mike Black, W9MDB, in a June 4 post to the Yahoo WSJT Meteor Scatter and Weak Signal Group. "I worked almost everybody I could see without any repeats. Seems like we have a winner here."

Changes, improvements, and bug fixes that have been made since WSJT-X 2.1.0-rc5 include: T/R sequence length increased from 6.0 to 7.5 seconds. Signal bandwidth decreased from 90 Hz to 80 Hz.

Improved sensitivity: Threshold S/N is now -17.5 dB.

Release candidate WSJT-X 2.1.0-rc7 will be available for beta-testing through July 21, and it will permanently cease to function after that date. It will not be usable during the ARRL June VHF Contest or during ARRL Field Day. Taylor advised using WSJT-X 2.0.1 and FT8 for these events.

Downloadable installation packages for WSJT-X 2.1.0-rc7 under Windows, Linux, and macOS are available on the WSJT-X web page. – ARRL Letter 6/6/2019 - S

147.435 repeater (Southern California)

(Underground Radio (UGR))

This article has two subjects; the 147.435 repeater and Underground Radio. This is due to the way these subjects are interrelated.

The '435 repeater' is an amateur radio repeater located at Mt. Lukens as of February 2011. It was formerly on Santiago Peak during 2010 and prior to that it was located at Contractors Point.

Many users of the 435 repeater have a well known reputation for operating practices which are considered by fellow amateurs to be questionable or illegal.

Courtesy of Bill WA6ITF:

The rules violations began back in 1978 on the .435 repeater (when it was still reversed channel from today) with the formation of the now long defunct ham radio political movement known as "Underground Radio." The stated purpose of "UGR" as it called itself was: "...to free repeater users from the totalitarian rules imposed by repeater owner operators using any means at its disposal..."

Since there were few rules on the .435 repeater nobody ever figured out why it began there -- but it did. And from a small central core of a dozen or so whose calls are long forgotten -- there began an all-out war against every 2 meter repeater within the LA - San Diego RF corridor that lasted close to 4 years.

UGR formed "attack squads" that would show up on repeaters, jam out QSO's with high power mobile or remote base radios and leave as suddenly as they ap-

peared.

One repeater -- the old K6MYK machine owned by the late Art Gentry (W6MEP) -- the person generally credited with inventing the first practical ham radio repeater -- converted his machine from a repeater to a 24 / 7 code practice channel. Others fought back in kind by invading .435 and jamming the stations who had jammed their repeaters.

By '82 many of us had simply abandoned 2 meter FM -- going to 222 or 440. 222 was of little interest to UGR and they seemed to be scared to try to tangle with those on 440. In that day and age a ham did not dare to show up on a 440 repeater without a specific invitation to use the band as issued by its then inhabitants. In fact, the local retailers were quite reticent to sell the average ham a 70cm radio for fear of reprisal from the 440 community. Actually, its a lot more complex than that -- but it would take pages to go into full detail.

So UGR stayed on 2 meters and harassed any group it pleased. But one day they made the mistake of taking on the '76'ers -- the group that had for decades kept repeaters off of 146.76 MHz simplex-only and considered it their own private channel. When the UGR folks showed up on .76 they were literally met with what one could equate as an organized military response. UGR never again showed up on 146.76 -- likely in fear of their personal safety. (.76 was a closed community detailed in "The Chronicles of .76" as au-

thored by the late Kendal Webster Sessions, K6MVH. It had its own society, its own rules and even its own police force known as the Seven Six Secret Service or SSSS.)

But the real downfall of the UGR movement was when it went up against the DX Club repeater. A group of very wealthy doctors, lawyers, bankers, film industry executives and the like who had the "connections" to force the issue. It also had a hard-bitten attorney, the late Joseph Merdler, N6AHU, who had personal contacts at the level of the U.S. Congress. Within weeks of UGR's assault on the DX Club repeater, Merdler made a trip to Washington to meet with Rep, Jim Corman. Within a month of that meeting the local LA FCC office had begun targeting hams breaking the rules -- especially those identified as members of UGR. I still recall being at the ARRL SW Division Banquet in 1980 when the then

(Continued on page 7)

Minutes Cont.

Presentation: John presented the HF Portable Antenna HFpVertical and Fox Delta Analyzer. The presentation was very well received and the demonstration about how the antenna can be tuned with the analyzer was very interesting.

The meeting was adjourned at 8:30PM.

- Mihai Manolache, W4MHI,
IARC Secretary - S

Origin of Wireless Security: The Marconi Radio Hack of 1903



Nevil Maskelyne, circa 1903. From the Royal Institution.

The place is the historic lecture theater of the Royal Institution in London. The date is the 4th of June 1903, and the inventor, Guglielmo Marconi, is about to demonstrate his new wireless system, which he claims can securely send messages over a long distance, without interference by tuning the signal.

The inventor himself was over 300 miles away in Cornwall, preparing to send the messages to his colleague Professor Fleming in the theater. Towards the end of Professor Fleming's lecture, the receiver sparks into life, and the morse code printer started printing out one word repeatedly: "Rats". It then spelled out an insulting limerick: "There was a young man from Italy, who diddled the public quite prettily". Marconi's supposedly secure system had been hacked.

The person behind this hack was Nevil Maskelyne, an inventor, magician, and general troublemaker who was a long-time rival of Marconi. He was the manager of a rival wireless company and had been involved in a number of disputes with Marconi over the patents that covered wireless telegra-

phy systems. He decided that the most effective way to show that Marconi's claims were hollow was a practical demonstration.

In the trade journal *The Electrician* (the *Hackaday* of its time) he detailed how he hacked the system. One of the fundamental claims of Marconi was that because his system used a tuned signal, other signals would not interfere unless they were tuned to the same frequency. This, however, had not been proven to the satisfaction of Maskelyne, and he didn't accept that the system was really secure. So, he set out to demonstrate this. But how could you prove this? In his account in *The Electrician*, he wrote that:

"When, however, it was pointed out to me that the practical demonstrations accompanying the lecture rendered independent tests possible, I at once grasped the fact that the opportunity was too good to be missed...The only hope, then, was to interpolate messages calculated to anger and "draw" somebody at the receiving end. If that could be done, there would be proof positive."

His plan involved setting up a

transmitter not far from the lecture (supposedly in the theater that his father, a famous stage magician, owned) that would overwhelm the signals from Cornwall. His transmitter, he claimed, was not run at full power: while it was capable of outputting 8 or 9 Amps, he turned it down to 2.5 Amps. He didn't simply block the signal, but instead transmitted his own morse signal for a short time, claiming that he "studiously refrained from all unnecessary interference".



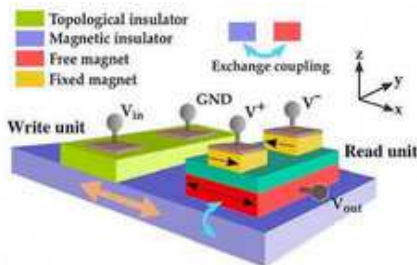
Scientific Identity, Portrait of Guglielmo Marconi. Smithsonian Institution

His plan worked. Towards the end of the lecture, Maskelyne's signals were picked up by the receiver, decoded and noted by Fleming, who wrote to the *Times* complaining of "Scientific Hooliganism". A slew of letters to and fro in the *Times* followed, where Maskelyne and Fleming argued over if the interference was caused

(Continued on page 6)

Logic Switch Uses No Electric Current

The Smart2.0 Newsletter for May 13 reported on a logic switch that uses no electric current. According to the article, researchers at New York University say the new method of controlling magnetic circuits is energy efficient, promising lower heat and energy costs in applications such as large server farms or in the artificial intelligence arena, which requires massive amounts of memory.



[Image courtesy of Smart2.0 Newsletter]

"The method uses a voltage-controlled topological spin switch (VTOPSS) that requires only electric fields, rather than currents, to switch between two Boolean logic states, greatly reducing the heat generated and energy used," the article explains. "Spin can be transported without a charge with the use of a topological insulator -- a material whose interior is insulating but that can support the flow of electrons on its surface."

Compared with existing spin-based devices, researchers claim the VTOPSS offers 10 to 70 times lower energy dissipation and 70 to 1,700 times lower energy-delay product. The VTOPSS technology, the researchers add, "offers

competitive metrics compared with existing CMOS technology, and interconnect issues that dominate the performance in CMOS logic are relatively less significant for the VTOPSS, enabling it to switch between two states more effectively."

"Imagine if you were preparing a recipe and had to go into a different room anytime you needed an ingredient before returning to the kitchen to add it," says NYU Tandon School of Engineering Assistant Professor Shaloo Rakheja, the principal author of an academic paper on VTOPSS. "It's just as inefficient when the portions of computing hardware needed to do a calculation and the portions needed to store it are not well integrated."

The article noted that VTOPSS can reduce reliance on cloud memory, potentially making computing safer, because it would be harder for to gain access to a system's hardware. – ARRL Letter, 8/15/2019 - S

8-Meter Amateur Band

The FCC has put on public notice for comment a Petition for Rulemaking (RM-11843) that seeks the creation of a new 8-meter Amateur Radio allocation on a secondary basis. The Petition suggests the new band could be centered on an industrial-scientific

Wireless Security Cont.

by Maskelyne or other phenomena, such as ground loops or the electrical lighting in the theater.

In the end, it was discovered that the receiver that Fleming had been using was not, in the phrasing of the time, syntonic. It wasn't tuned to a specific frequency, excluding all others, because a syntonic receiver would have been too large to use in the demo. In effect, Marconi was being at least a little deceptive. Maskelyne ended his account with the latin phrase "Qui vult decipi, decipatur", a legal phrase that translates as "Let him be deceived who wishes to be deceived."

In the end, the hack did little to dent Marconi's reputation. Just the year before, he had sent the first wireless signal across the Atlantic and started a commercial transatlantic service a few years later in 1907. That same year he was awarded the Nobel Prize with Karl Ferdinand Braun "in recognition of their contributions to the development of wireless telegraphy". When he died in 1937, the BBC observed two minutes of silence in respect, and asked all radio transmitters to do the same.

What the hack did, however, was to reframe the discussion on wireless security. Rather than accept Marconi's assertion that these signals were secure and could not be interfered with, researchers afterward started looking into ways that these could be monitored, jammed and otherwise manipulated. The ease with which Maske-

147.435 Cont.

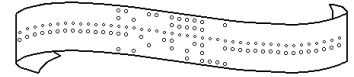
ARRL Division Director introduced two Federal agents who in turn announced the arrest earlier that day of one of the most blatant violators. By late 1982 UGR was gone but the toll it took on 2 meter FM operation likely will never be accurately assessed.

But the remnants of UGR hung around on .435 but as long as they stayed there nobody cared. Just as long as they stayed off everyone else's repeater -- all was well in the world. Those there now -- whomever they are -- are there because they cannot operate elsewhere in the unorthodox style -- the same as their predecessors. To out of town'ers who hear it on the Internet and to newcomers who hear it for the first time -- live -- it tends to be upsetting. But once people understand the "unofficial

8-Meter Cont.

-medical (ISM) segment somewhere between 40.51 and 40.70 MHz. The spectrum between 40 and 41 MHz is currently allocated to the Federal Government and, as such, within the purview of the National Telecommunications and Information Administration (NTIA). ARRL member Michelle Bradley, KU3N, of Maryland, filed the Petition in May on behalf of REC Networks, which she founded and described in the Petition as "a leading advocate for a citizen's access to spectrum," including Amateur Radio spectrum.

"REC feels that the time is right

RYRYRYRY...

DE KA7TTY

The young kids are back in school so the morning and afternoon traffic will be heavy again (one of the nice things about Summer). School buses to get trapped behind.

Yup. The BEARS Repeater (and the Intertie and Echolink) are still down for tower painting by the owner. They will be back as soon as the owner turns the power back on.

Seafair is mostly over. Did anyone help with the parades? Officially, Salmon Days is a Seafair event, but so far removed from the rest it hardly counts and is a good end for the Summer events.

I hope you were able to get your antenna projects taken care of and are ready for the coming Winter weather. I didn't change anything so I hope all will be good for another season.

It's time to start lining up Winter projects for the long dark evenings to come. Things where you can stay inside warm and dry.

OK. Take care and I'll see you at the meeting. John KA7TTY

truce" that exists, it just becomes a way of life. – from Bruce KG7OI, 8/19/2019 –*Interesting bit of history. And we think we have had problems on our repeaters up here. Ed. - S*

for the Commission to open a Notice of Inquiry and eventually a Notice of Proposed Rulemaking, and in cooperation with the NTIA, this new band opportunity can be realized to spark the next generation of 'makers' in the fields of science, technology, education, and math (STEM), especially women and girls," Bradley told the FCC in the Petition. "The more opportunities we give to make things, the more opportunities we have to build a pool of experts in STEM, right here at home."

The Petition said the objective of a new band would be "an effort to foster experimentation into the propagation characteristics of this band midway between the 10- and

Wireless Security Cont.

lyne could monitor the signals was also an eye-opener for governments and lead to the development of wireless encryption systems that were used in World War I, II and beyond.

Nevil Maskelyne died in 1924, and is best known for his other career as a magician. He wrote "Our Magic: the art in magic, the theory in magic, the practice in magic", a magic textbook that is still in use. His son Jasper Maskelyne applied these magical skills in World War II, where he was involved in the development of the fake munitions, tanks, and other trickery that helped mislead the Nazis in the lead up to D-Day, and taught soldiers how to hide escape tools in everyday items. – Hackaday, 3/2/2017, Submitted by Roger Weiss, K9RJW, 6/17/2019 -

(Continued on page 8) S

SQUAKBOX

This newsletter is published monthly for the members of the Issaquah ARC W7BI. Items for publication must be received by the 15th day of the month preceding publication. Send items to:

SQUAKBOX Editor
John MacDuff, KA7TTY
 620 S.E. Bush St.
 Issaquah, WA 98027-3909

Material may also be sent via E-Mail at editor@w7bi.com.

The IARC is affiliated with the American Radio Relay League (ARRL). Visit our WEB page at: <http://www.w7bi.com>

Membership is open to anyone regardless of age, sex, race, national origin, religion, or amateur radio license status. Dues are \$15 per year for a family membership, free for those under 19 years of age.

A two-month courtesy mailing of this newsletter will be made to meeting visitors and others upon request.

Original material may be quoted without prior permission provided ISSAQUAH ARC SQUAKBOX is credited.

- Coming Events -

- **September 4** - Monthly Issaquah ARC meeting at the Issaquah Senior Citizens Center, 75 NE Creek Way, Issaquah. Doors open at 6:45 PM, the meeting begins promptly at 7:00 PM and the program begins at 8:00 PM. Refreshments are provided.
- **September 6-8** - 20th Northwest APRS/Digital Summer Gathering. Valley Camp, North Bend, WA. <https://wa7vc.org/sumnergathering/2019>
- **September 21** - N7YRC Tailgate Swap and Shop. Yakima County EOC parking lot, 2403 S 18th Street, Union Gap, WA. Contact: Rod Rath, KC7VQR: rrath@charter.net
- **September 22** - Issaquah Communications and Support Team meeting, Issaquah Public Works, Issaquah, talk-in 146.56 MHz at 6:45 PM, Meeting at 7:00 PM.
- **September 28** - Washington State Convention, Spokane, WA. Jake McCarty, KI7QPJ, Treasurer@VHFclub.org

8-Meter Cont.

6-meter bands." An allocation in the 8-meter band is available to radio amateurs in Ireland, where the Irish Radio Transmitters Society has developed a band plan for 40 - 41 MHz.

"REC perceives this spectrum can be used for weak signal experimentation and eventually general amateur use, especially along transatlantic paths using CW, SSB, digital modes such as FT8 and digital voice," the Petition said. "As no radios are mass-produced for this band at this time, this opens up new opportunities for 'makers' to construct transmitters, receivers, and antenna systems that can be used in this spectrum."

REC anticipates "very low" usage of the new band, "with peak usage around sporadic-E episodes, operating events such as ARRL Field Day, and VHF contests, as

well as during the peak of sunspot cycles," Bradley told the Commission. "[W]e feel that the sharing of 40 MHz can be accomplished in a manner that serves the needs of the Amateur Radio Service while meeting the organizational missions of Federal Government

agencies that utilize this spectrum."

Interested parties may file short comments on RM-11843 via the FCC's Electronic Comment Filing Service (Express). – ARRL Letter, 6/27/2019 - S

HPM Birthday Event

Sat. Aug. 31 to Mon. Sept. 8

The 9-day operating event commemorates the 150th anniversary of the birth of ARRL cofounder and first president Hiram Percy Maxim, W1AW (born on September 2, 1869) and is open to all amateurs. The objective is to work as many participating stations as possible. W1AW and all ARRL members will append "/150" to their call signs during this event (DX operators who are ARRL members may operate as <call sign>/150, if permitted by their

country of license.) Stations will exchange a signal report and ARRL/RAC Section. DX stations will send a signal report and "DX." All Amateur Radio bands except 60, 30, 17, and 12 meters are available. Contacts may be made on CW, phone, and digital modes. Logs will be scored, and downloadable certificates will be available. An announcement and complete rules appear in the September issue of QST, p. 86. – ARRL Letter, 8/22/2019 - S