2022-08-23 Hamlet Net

Announcements:

- Sessions
    - Next scheduled test session is this Saturday, August 27th at 10am at 350 Terry Street
        - ARRL VE session, so $15 fee to test
    - To test before this (or online), go to hamstudy.org -> Find a Session (make sure you search for online sessions!

- The Colorado state QSO party is coming up September 3rd. For more info, go to: https://ppraa.org/coqp (papa-papa-romeo-alpha-alpha-dot-org-slash-charlie-oscar-quebec-papa)

- If there are any newly-licensed hams listening, QRZ and GigaParts have announced a New Ham Jumpstart program, which will provide new hams with a welcome package containing a dual-band HT and programming cable.

  If you obtained your first license within the last 30 days, then you are eligible! The program runs through October 31st. To sign up, go to www.qrz.com/jumpstart, that's www-dot-quebec-romeo-zulu-dot-com-slash-jumpstart

- All club activities are open to anyone - members and non-members. ~~If you have questions, ask them on a net or~~ **send email to elmer@w0eno.org**

- Club breakfast Saturday mornings at 8am at the Hidden Cafe in Longmont

    - Come meet other Club members and discuss amateur radio

Misc:

- Hawaii, Kansas and Ohio state QSO parties this weekend

Presenter: Bryan, AF0W

Topic: Space Radio

- One area of amateur radio that I find very interesting is communications involving objects in space

- This is probably due to watching too much Star Trek when growing up - no matter where they were, they could whip out a communicator and get in contact with the ship

- Seems pretty boring today, but those were the days of wired, landline telephones, so the closest thing I had was a Radio Shack walkie-talkie, which was huge and would barely work down the block, much less up into space!

- Today, amateur radio provides numerous opportunities for such communications, all of which are accessible to license holders as soon as they get their Technician license

ISS

- The first item I wanted to mention tonight is that the ISS now has two next-generation radio systems based around modified Kenwood D710GA dual band radios in operation

- This means that they can now simultaneously support both voice repeater and APRS packet operations

- The space station is using two call signs:

    a. NA1SS is used by the radio in the US Columbus Module, and is currently running in cross-band FM voice repeater mode. It is capable of supporting scheduled US educational voice contacts, packet and voice repeater operations.

    b. RS0ISS is used by the radio in the Russian Service Module, and is operating in packet mode. This radio is capable of supporting scheduled Russian educational contacts, SSTV, packet and voice repeater operations.

- It is interesting that the US radio is not listed as supporting SSTV operations - hopefully this is something that is being worked on.

- ISS astronauts are also able to use the voice repeater to make contacts with stations on Earth - in fact, American astronaut Kjell (Kyel) Lindgren, KO5MOS (kilo-oscar-5-mike-oscar-sierra) has been on the air quite a bit lately.

- If you'd like to try to utilize these systems, go to the Amateur Radio on the ISS (or ARISS) web site at ariss.org (), and select "Current Status of ISS Stations" under the "General Contacts" menu to see the current status and modes of the radio systems.

- Note that they are disabled during space walks and docking/undocking operations.

- The voice repeater is on 145.990 MHz uplink with a PL tone of 67 Hz, and 437.800 MHz downlink, while the packet system operates on 145.825 MHz up and down.

- You can also view status reports on the ISS radio systems (along with other amateur radio satellites) on the AMSAT Live OSCAR status page at amsat.org/status (that's alpha-mike-sierra-alpha-tango-dot-org-slash-status)

Earth-Moon-Earth

- The second topic I wanted to touch on is bouncing radio signals off the surface of the moon - called moonbounce, earth-moon-earth, or simply EME
- There is an EME contest going on this weekend, with the objective of working as many amateur stations as possible via an earth-moon-earth path
- There are four contest periods per year, with two sets of allowable frequencies. The contest this weekend only allows contacts to be made using 2.3 GHz and up, but the sessions in October and November are for 50 to 1296 MHz, which means you may be able to receive signals using standard amateur radios
- Any combination of CW, phone, or digital modes may be used for the contest
- The distance from the Earth to the moon varies, but is around 240,000 miles, resulting in a two-way path distance of around a half a million miles
- Calculating the free space path loss over this distance results in average path losses in the range of 243 to 294 dB, depending on the frequency
- As if these losses were not enough, the surface of the moon only reflects around 6% of the signal
- Signals take around 2.5 seconds to make this round-trip journey, so it is possible to receive your own signal
- Of course, both the Earth and Moon are moving relative to each other, so your antenna will need to be pointed in the right direction, and you also have to worry about signal polarization, which may shift during the contact
- The signals will undergo a Doppler frequency shift
- These challenges are what make EME communications interesting for some amateurs
- The digital mode JT65 was developed specifically for EME
- Its transmission time of 47 seconds seems absolutely glacial to the 15 seconds used by FT8, but the protocol includes error-correcting features that make it very robust, even with weak signals
- It is decodable down to -27 dB relative to the noise floor - this is too weak to be audible
- I used to use this mode a lot for terrestrial contacts when I was first licensed. It has a very distinctive, musical quality to it, and there were many times where I could not hear the incoming signal, but the software was able to decode it just fine.
- For comparison, CW is copyable down to around -12 dB for a very practiced operator with good ears.

- If you do much research on amateur EME stations, you will see a lot of huge antenna arrays and high-power amplifiers, which may lead you to believe that it is outside your grasp, but that may not be the case.
- An ARRL contest document mentioned that you may be able to make a JT65 digital moonbounce contact on 2 meters or 70 centimeters with as little as 50 watts and a modest-sized single Yagi beam
- This is because there are several large stations with plenty of power and antenna gain that can make up for the path losses involved and your weaker station
- Note that SSB is used for JT65, so you won't be able to hear it with a standard HT, but you could try using a USB SDR stick, or maybe a portable HF QRP radio capable of single sideband reception.
- So while not everyone's cup of tea, there are certainly some amazing things you can do with amateur radio that were literally the science fiction of the past.

Questions:

- **Since most hams probably aren't considering earth-moon-earth communications, (but if you are, please say so!) the question for this week is what is your most favorite aspect of amateur radio?**
- **In my case, I like the hands-on, technical aspect of amateur radio. Getting to research and set up new equipment or devices, getting things like CAT control working on an old radio, or setting up an HT-based satellite station. I find that I actually get more enjoyment out of that part of the hobby than actually talking to people on the radio!**

Notes:

- If you have ideas for net topics or general meeting topics / presenters, please let us know! Tell us on a net, or send email to k0itp@w0eno.org

Email to elmer@w0eno.org

Steve, KM6SJA - Are we recording these nets?

Indian Peaks radio club has their new repeater up and running. Chuck was able to pick it up just west of I-25 448.550/443.550 -5 offset 141.3 PL

KC0CT - Joe - NCS - Learning new things, long-range DX with low power

K0ITP - Chuck - Integrates so much other technology. Integrate old technology into new technology and make it usable

KF0EAJ - Steve - So new still, so everything still fascinating. Enjoy looking at antennas and trying to build them - wire antennas. Entire concept of being able to listen and send messages great distances with low power (20-100 watts).

WA7EM - Ed - Chasing DX on CW. Is relatively new to him, as hasn't used it since he got his license. Down at low end of 20m chasing DX. 100 countries confirmed by end of year is his goal. 2 states short of WAS. POTA QRP with his QCX 5w transceiver

AE0DO - John - Antennas, social aspect - breakfast with club on Saturdays

KV0N - Raman - Experimentation aspect. Also reading about the history of experimenting with amateur radio and how far we've come.

N0ZFV - Bob in Broomfield - It's about 1000 hobbies in one. He wants to try a little bit about everything. Primary is emergency communications, trying to build and maintain an off-grid radio station, and social - hamfest, breakfast, field days

KE0VT - Dick - Rag chewing, chasing DX, public service, VEing

KE0RWD/V/B - Hands-on part, dealing with old equipment and building. Also the learning.

KM6SJA - Steve -