

Reception of SAQ Transmissions at Cohoe Radio Observatory on 30 June 2019

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1. Introduction

The 2019 annual commemorative transmissions on 17.2 kHz from station SAQ in Sweden took place on *Alexanderson Day*, 30 June {[SAQ](#)}. These transmissions use the historical call sign SAQ and are sponsored by the Alexander Association, a group of dedicated historical radio enthusiasts. The station transmits only a couple times per year on special occasions: Alexanderson Day on a Sunday at the end of June or beginning of July and on Christmas Day 25 December. I successfully received SAQ's transmissions at Cohoe Radio Observatory on 1 July 2018 as reported in {[Reeve18](#)} and was successful again this year.

2. Stations

Only a brief summary is provided here. For complete details of the transmitting and receiving stations including the antennas used, see {[Reeve18](#)}. The great circle propagation path from station SAQ to Cohoe Radio Observatory is about 6870 km and over the North Pole. The estimated radiated power from the rotary transmitter and huge antenna system in Sweden is estimated to be around 8 kW. Cohoe Radio Observatory uses a relatively small square loop antenna with 1.2 m diagonal and a software defined radio (SDR) receiver. The loop plane was oriented north-south, very closely in line with the path.

The only change at Cohoe Radio Observatory from the previous year was the replacement in spring 2019 of the SDRPlay RSP2Pro with the RSPduo SDR receiver. I used the latest version of SDRuno software that was available at the time (v1.31) and setup the receiver remotely from Anchorage using TeamViewer software.

3. Transmission and Reception

Two SAQ transmission sessions were scheduled for Sunday, 30 June UTC {[SAQSched](#)}. The sessions were broadcasted and also recorded on {[YouTube](#)}. All messaging used Morse code:

- ⚙ 1st session tuning startup at 0830 UTC with message transmission at 0900;
- ⚙ 2nd session tuning startup at 1130 with message transmission at 1200;

Because of the time difference between the SAQ station in Sweden and Cohoe Radio Observatory in Alaska, I made no attempt to listen to the transmissions live. Instead, I setup the SDRuno software recording schedule a few days before and activated the automatic timer.

The SDRuno recorder scheduler has limited capability, so I recorded a continuous 3.5 h stretch from 0859 to 1230. This resulted in seven WAV files of about 2 GB each, or about 14 GB total. This was far too much to upload using the 4G internet connection at CRO, so I had to wait for the next trip to Cohoe to retrieve the data. The data was placed on a USB stick drive and brought to Anchorage on 7 July, one week after the event.

Playback and analysis of the recorded Wave files in SDRuno clearly showed a weak but easily recognizable signal in the spectrum display and waterfall (figure 1). I could hear the Morse code messages but they were too weak with respect to the background noise and too fast for me to decode from the audio. I did not attempt to enhance the audio with post signal processing.

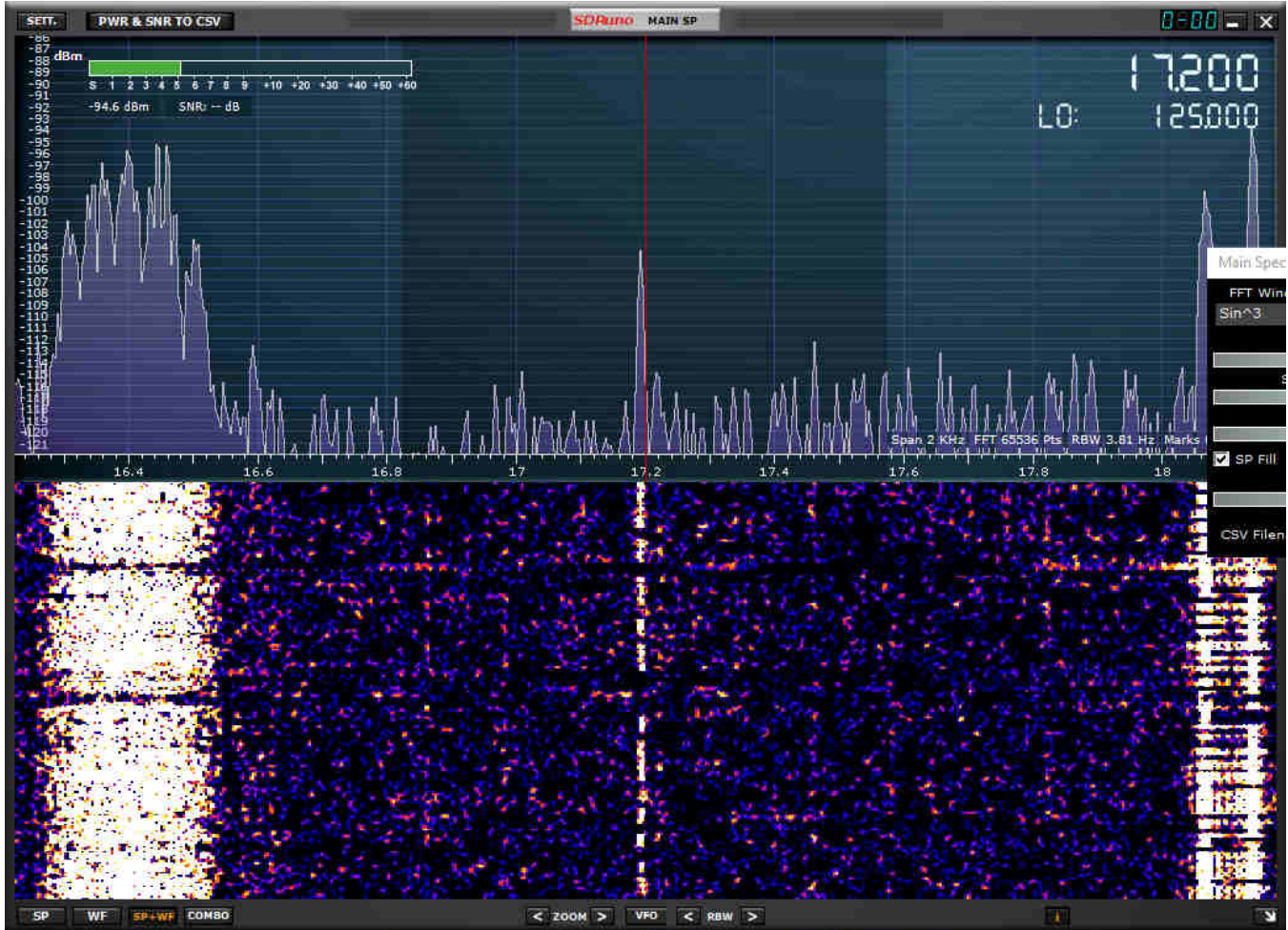


Figure 1 ~ Screenshot of SDRuno received spectrum and waterfall recorded at Cohoe Radio Observatory in the frequency range 16.2 to 18.2 kHz with tick marks at 20 Hz intervals. The receiver is tuned to 17.200 kHz which places a red vertical cursor at that frequency. In the screenshot shown here, the SAQ signal is about 20 Hz low. The strong signals seen near the left and right edges of the displayed spectrum are VLF transmitters for submarine communications, JXN in Norway at 16.4 kHz and a Russian station at 18.1 kHz.

I started the recording at 0859 UTC to include the last minute of the transmitter tune-up for the first session. I could hear the transmissions throughout that last minute and for another 8 minutes until 0908, when the message ended. Since the SDRuno recorder already was running, the entire tune-up session for the second session was recorded. I first detected the SAQ signal at 1141:49 and it continued until 1159:49 with a few short gaps. During this time period the received carrier frequency started about 20 Hz low with respect to the receiver frequency of 17.2 kHz and slowly increased to about 7 Hz low at the end. When the message for the second session was transmitted, I could hear the signal from 1200 to about 1207 UTC, when it stopped. At the start of the message, the frequency was about 8 Hz low and increased slowly to about 5 Hz low at the end of the

message. It is possible that part of the frequency error was due to the receiver – I have not yet checked its frequency accuracy after installation at CRO.

I filed an online reception report on the Alexander Association website on 7 July and learned on 18 July that the association will send out QSL card acknowledgements. This article will be updated with an image of the card after I receive it.

4. References and Weblinks

- {Reeve18} Reeve, W., Reception of SAQ Transmissions at Cohoe Radio Observatory in Alaska USA on 1 July 2018, 2018, available at: http://www.reeve.com/Documents/Articles%20Papers/Reeve_SAQ-Jul2018.pdf
- {SAQ} <http://alexander.n.se/?lang=en>
- {SAQSched} <https://alexander.n.se/valkommen-till-alexandersondagen-2-juli-2017-2-2/?lang=en>
- {YouTube} https://www.youtube.com/channel/UC-83S-I9JKD1iuhsXx3XQ3g?sub_confirmation=1
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