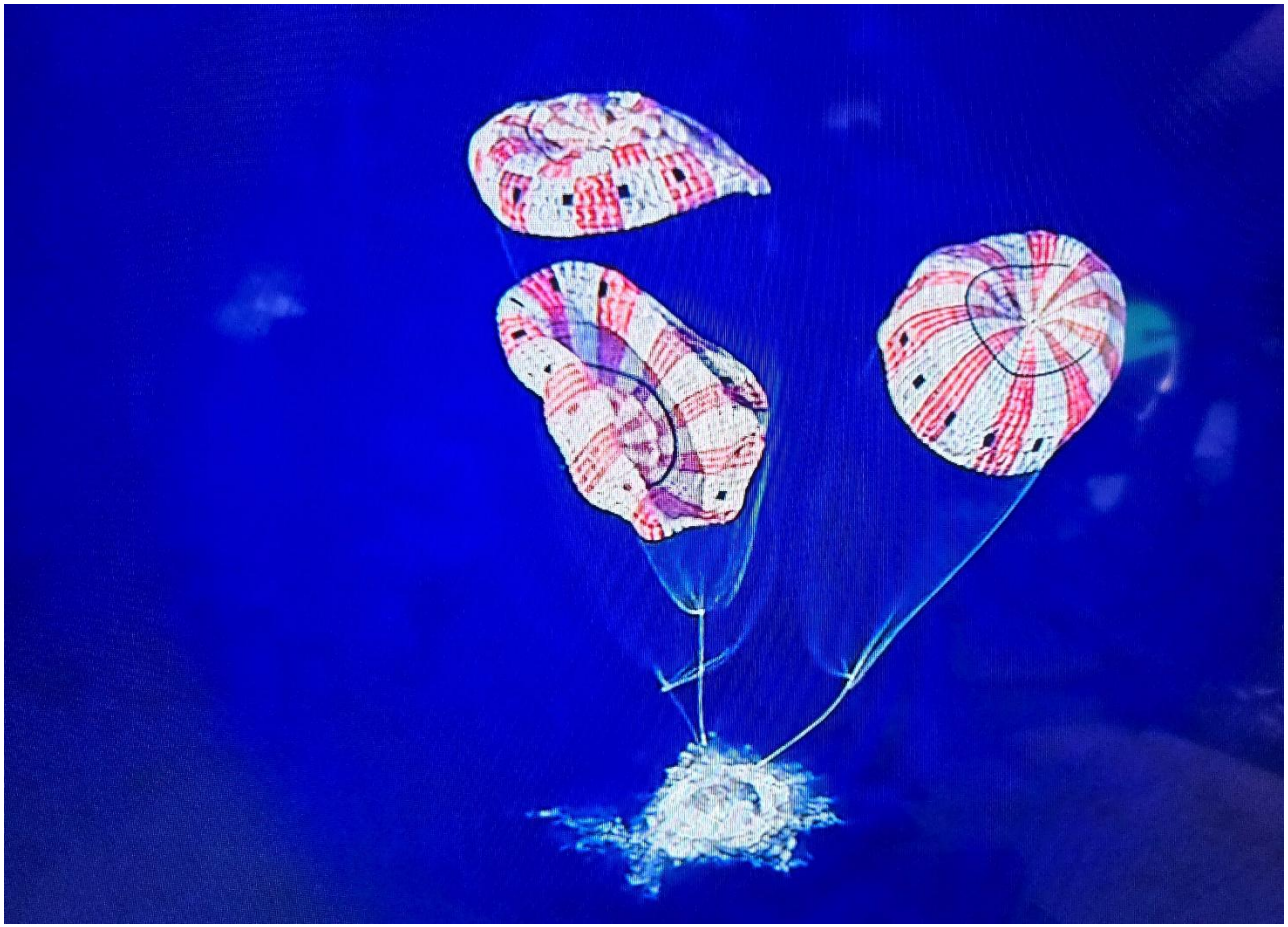
North Texas NTMS Microwave Society

Successful Artemis II Splashdown!



North Texas NTMS Microwave Society

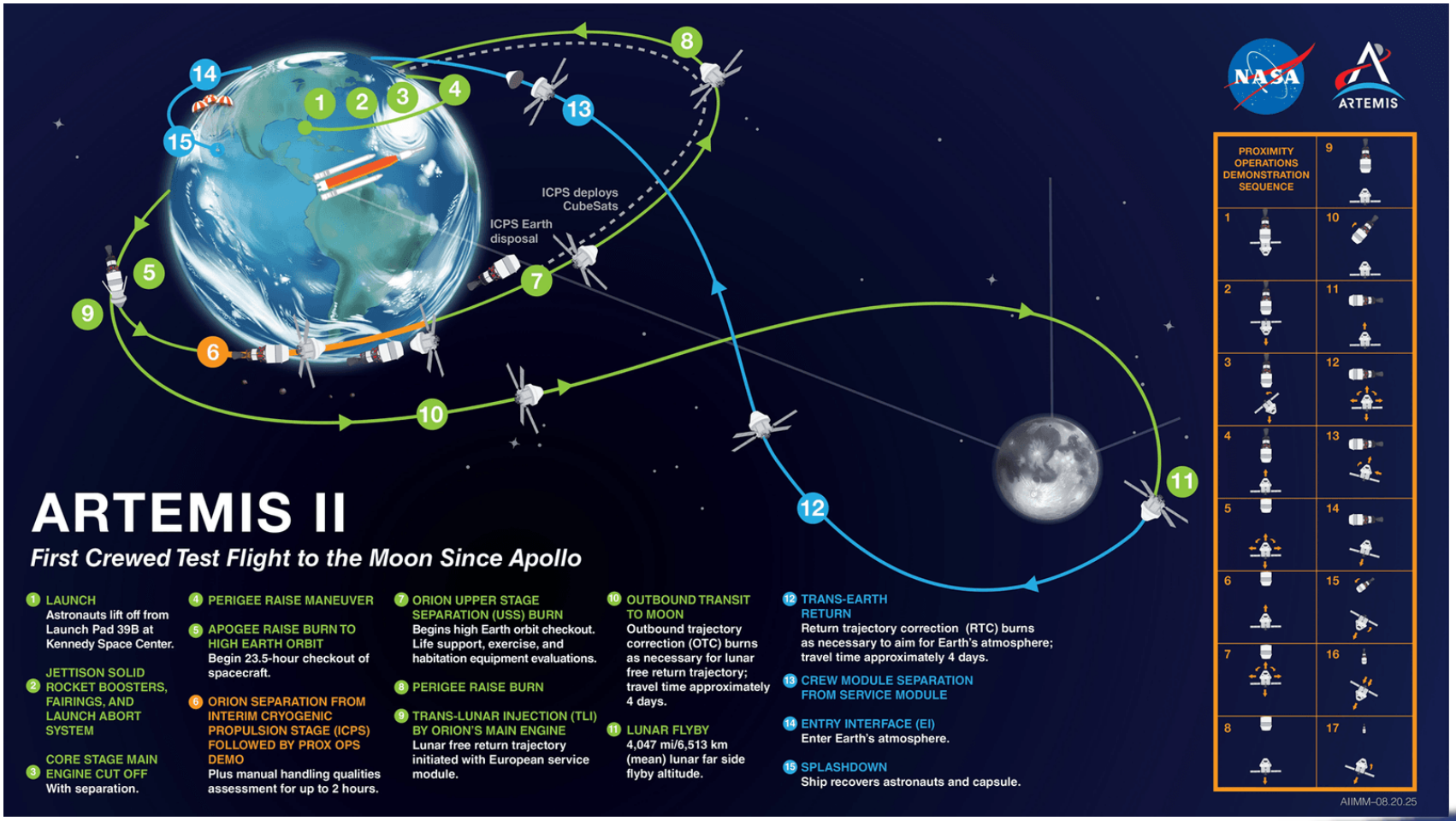
Artemis II Reception

Al Ward
W5LUA

April 11, 2026

Artemis II

North Texas NTMS Microwave Society



Amateurs Tracking Artemis

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- K0PRT DSES 60 ft (18.2m) dish in Colorado
- N0OY EM18 KS with 28 ft Dish.
- AMSAT DL 20m Bochum Dish
- VE4MA EN19 2.4m
- CT1BYM
- Several others as well.
- I thought I might give it a shot with my 5m dish which was set up for EME on 2304 MHz

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W5LUA 5m Dish

Previously

- In early 1998, I had copied the Lunar Prospector on 2273 MHz
- In Nov 2007, I copied the Japanese Lunar Orbiter on 2263 MHz
- So why not give Artemis a shot?

Communications with Artemis II

- Optical Communications system using LASER
- Deep Space Network managed by JPL using X and Ka bands
- Near Space Network for launch, re-entry, and LEO using X and Ka bands
- S Band Radio – reliable, traditional system for telemetry, voice and data. Used by previous NASA programs.
  Artemis II will use 2216.5 MHz

www.n2yo.com

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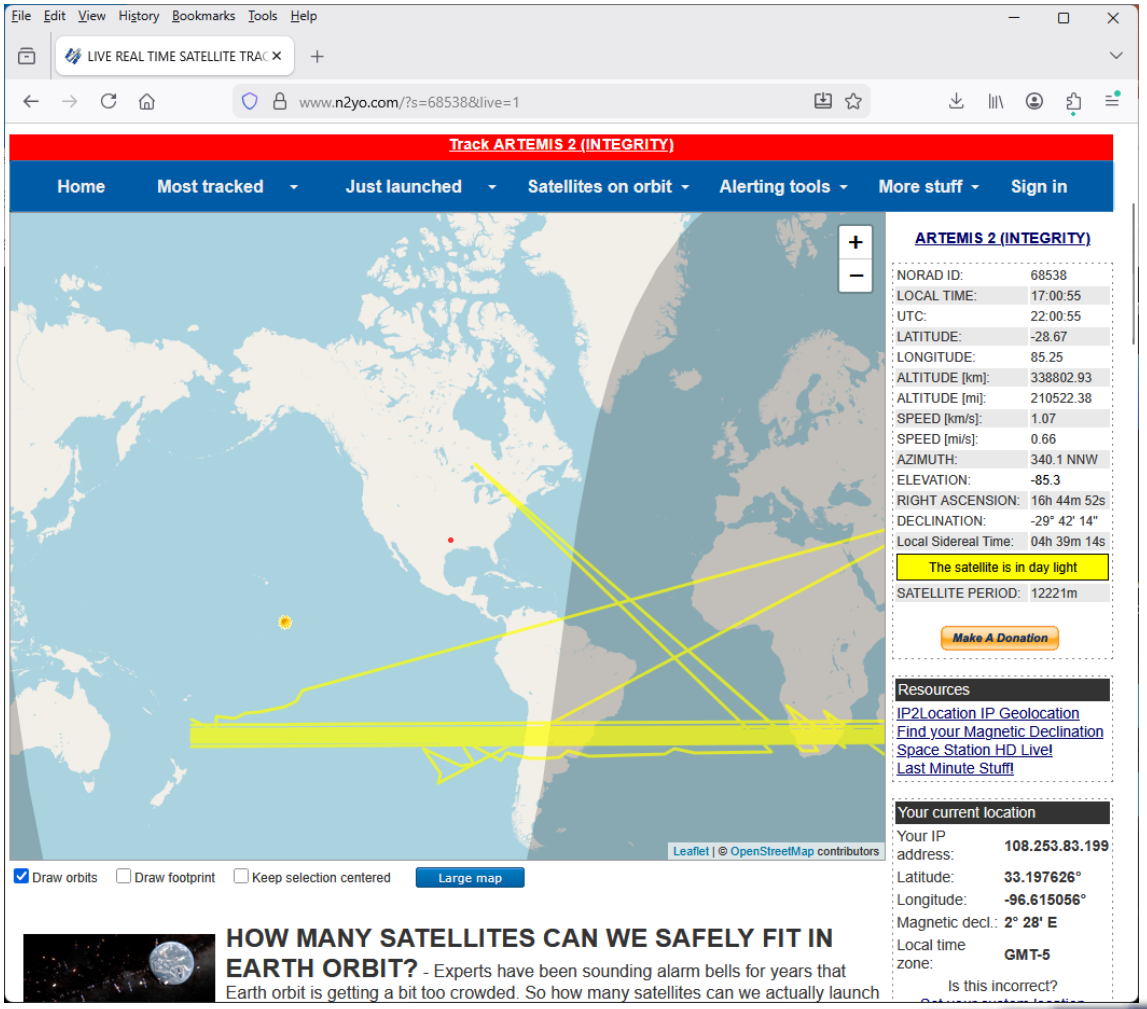

https://science.unistellar.com/ephemeris/

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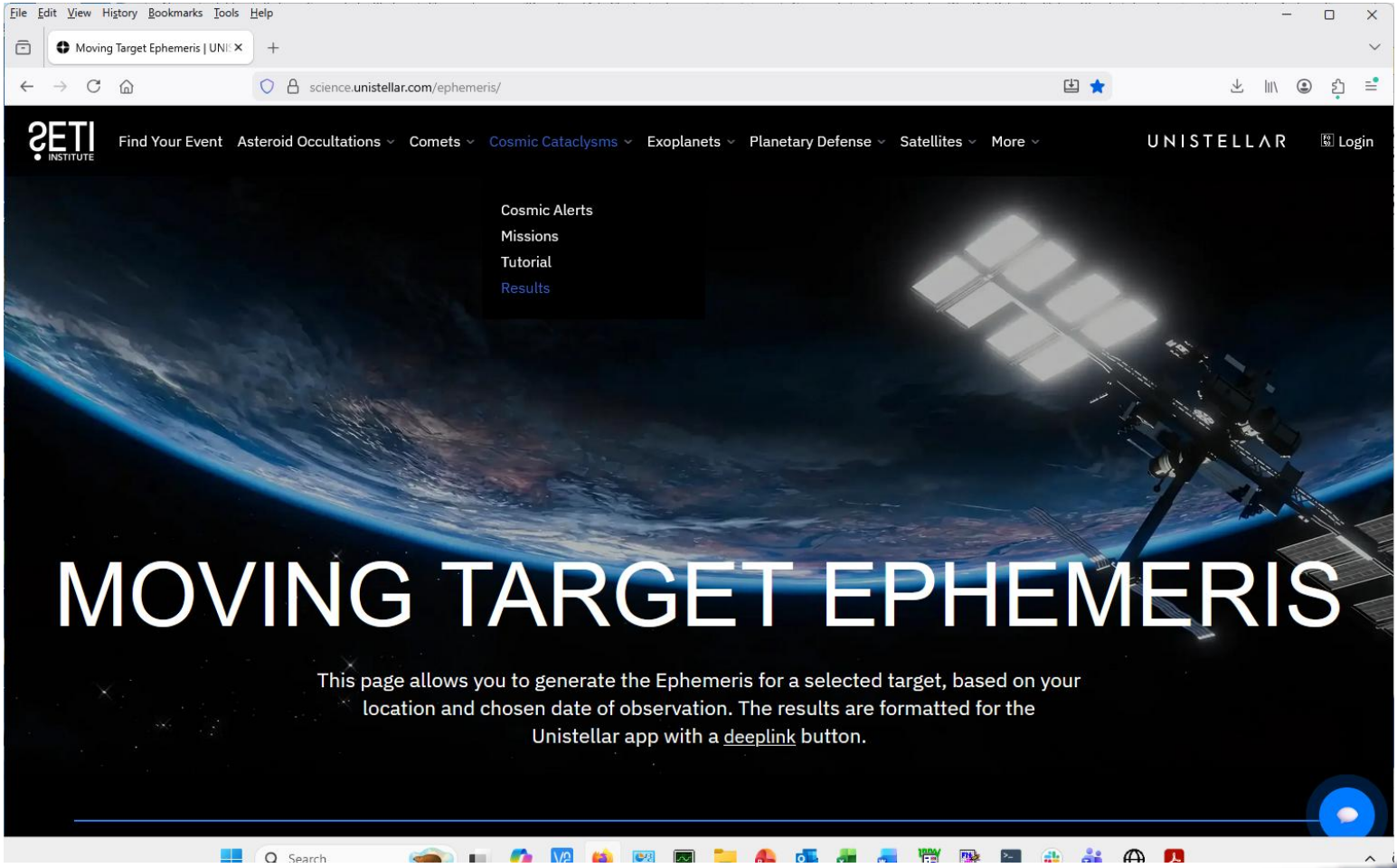

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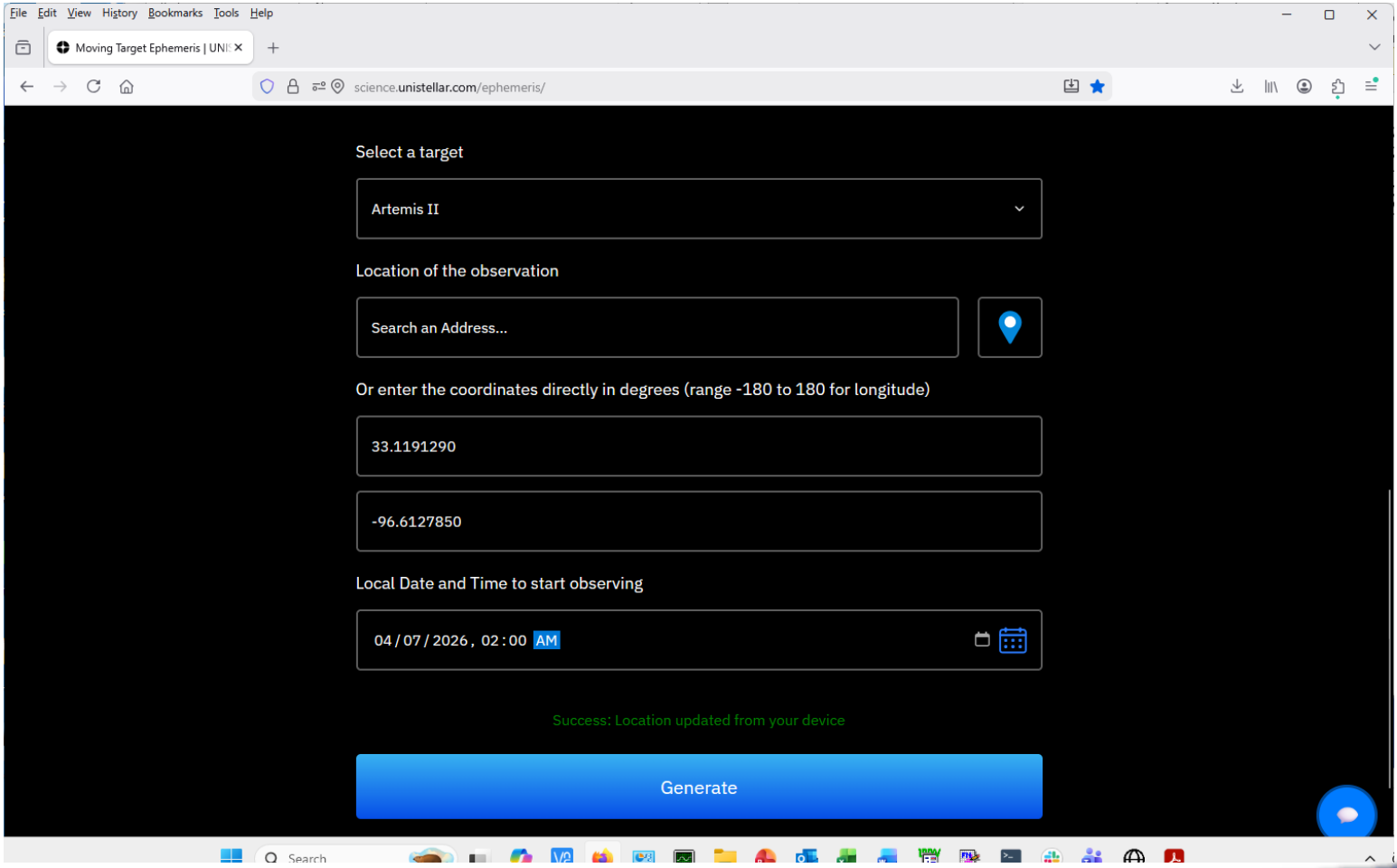

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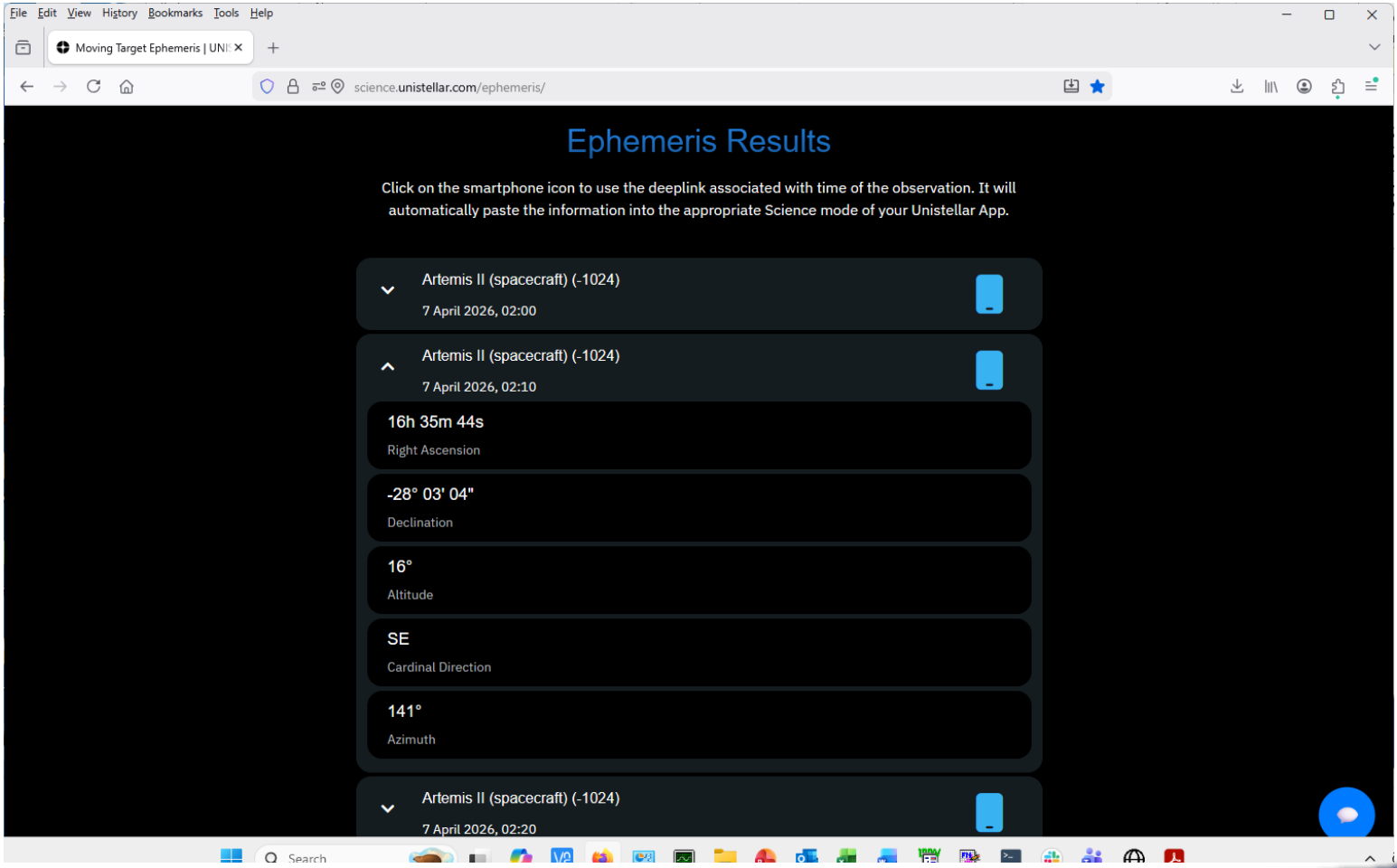

K0PRT Reception on April 3rd

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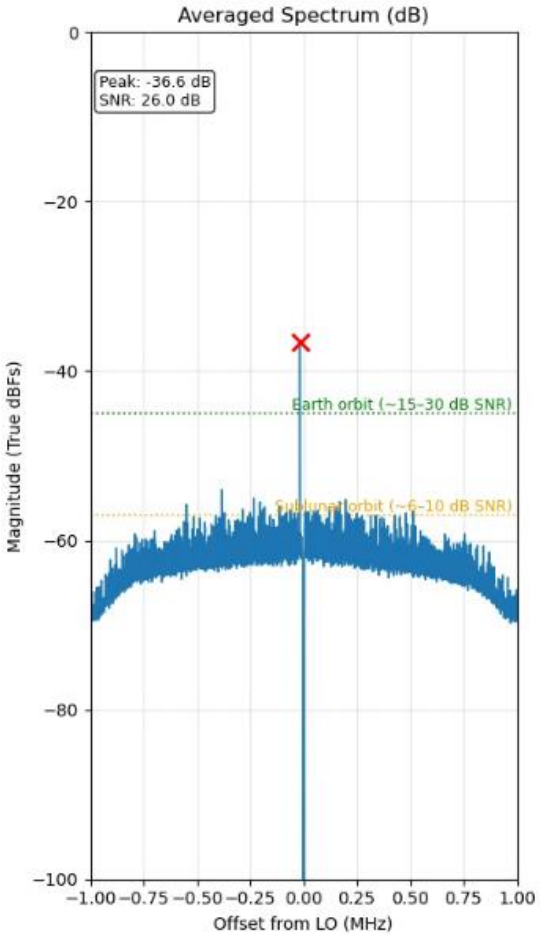

60 ft Dish

CT1BYM Reception on April 4th

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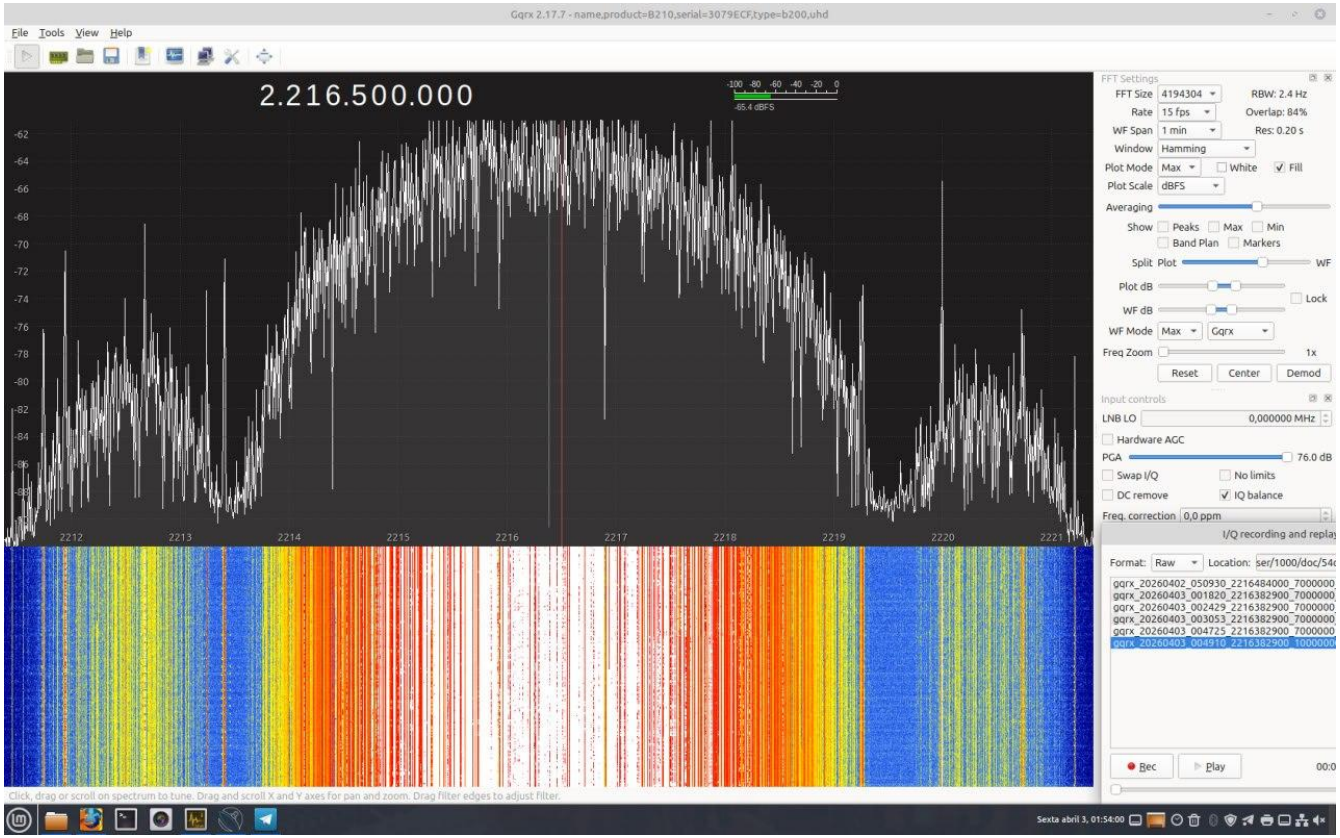

Dish Size Unknown

April 5th

- I realized after the first day of no success that I was reverse polarized w.r.t CP.
- EME operation is RHCP on xmit and LHCP on receive
- I did not care to swap the LNA over to the RHCP port.
- I decided to just disconnect the Klystron in the shack and attach a downconverter capable of reception at 2216.5 MHz.
- I did not have an SDR capable of receiving 2216 MHz so I decided to build a converter so I could copy the primary frequency and down-convert to 10m on my Flex 6600.

Band Pass Filter

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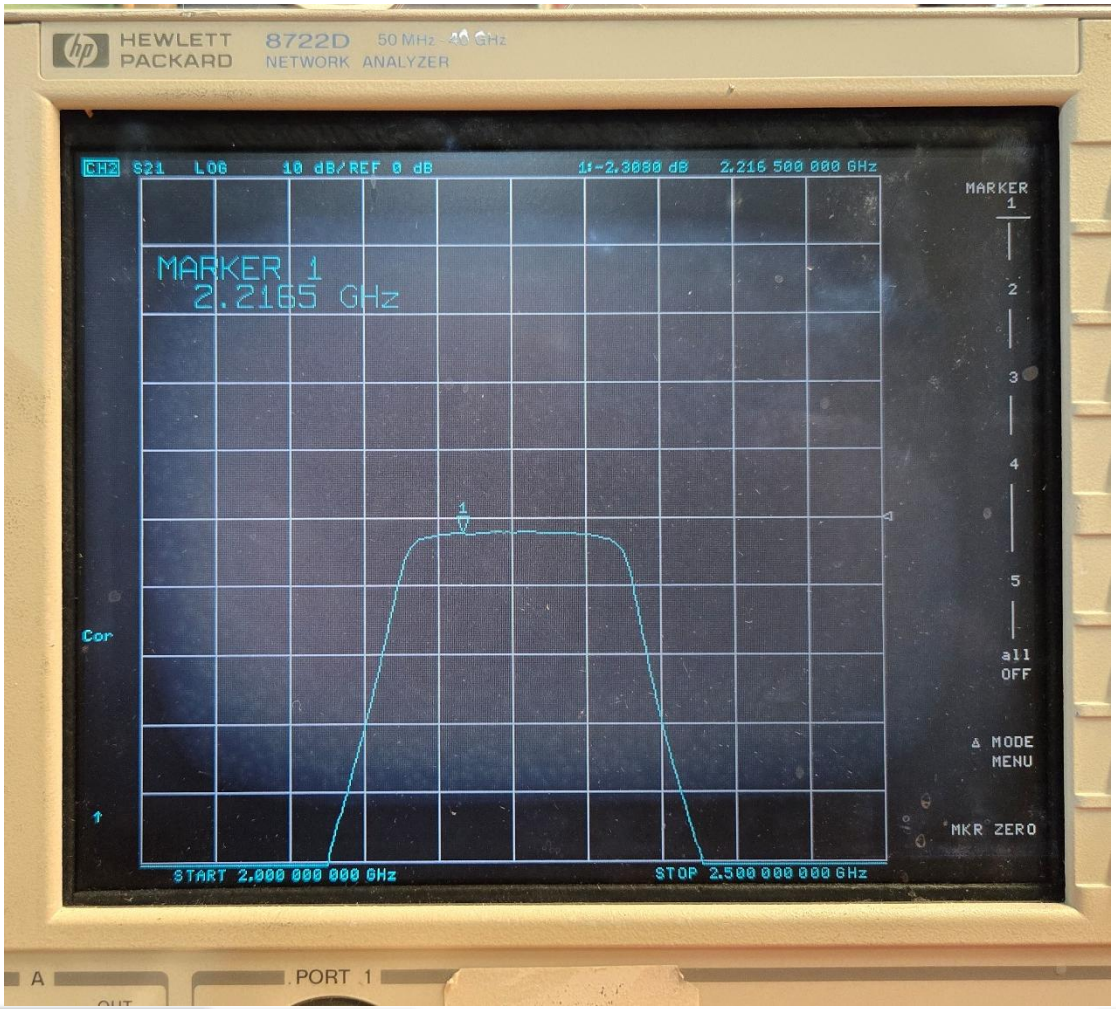

K+L Microwave
8B120-2250/U100-0/0

Filter covers approximately 2180 MHz to 2320 MHz

Provides adequate image rejection at 1928 MHz and >50 dB of LO rejection at 2072 MHz

Thanks Kent WA5VJB for providing the filter

Simple 2216 MHz Receive Converter

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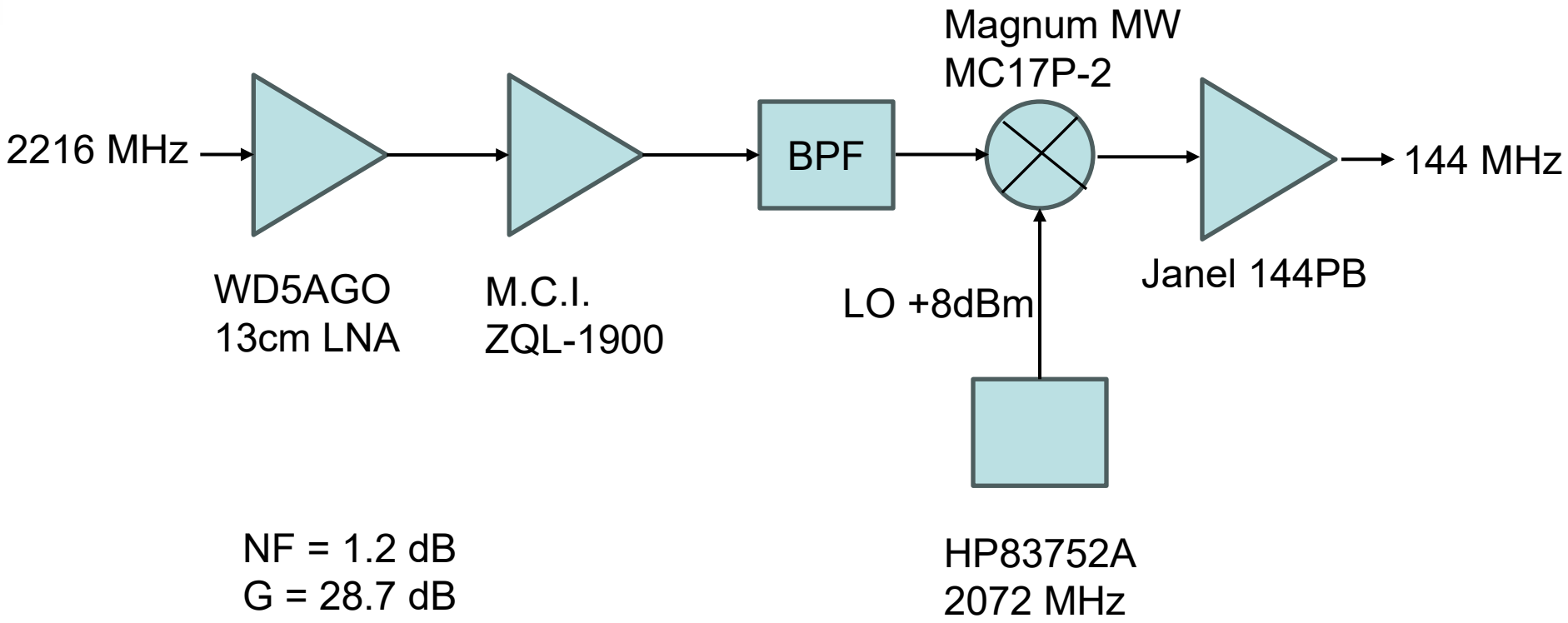

April 6

- Morning of the day Artemis II circled around the moon.
- I saw a CW signal just before it disappeared at 08:22 z. N0OY confirmed time
- I tracked Artemis II for the next few hours with varying success

April 6, 10:15z

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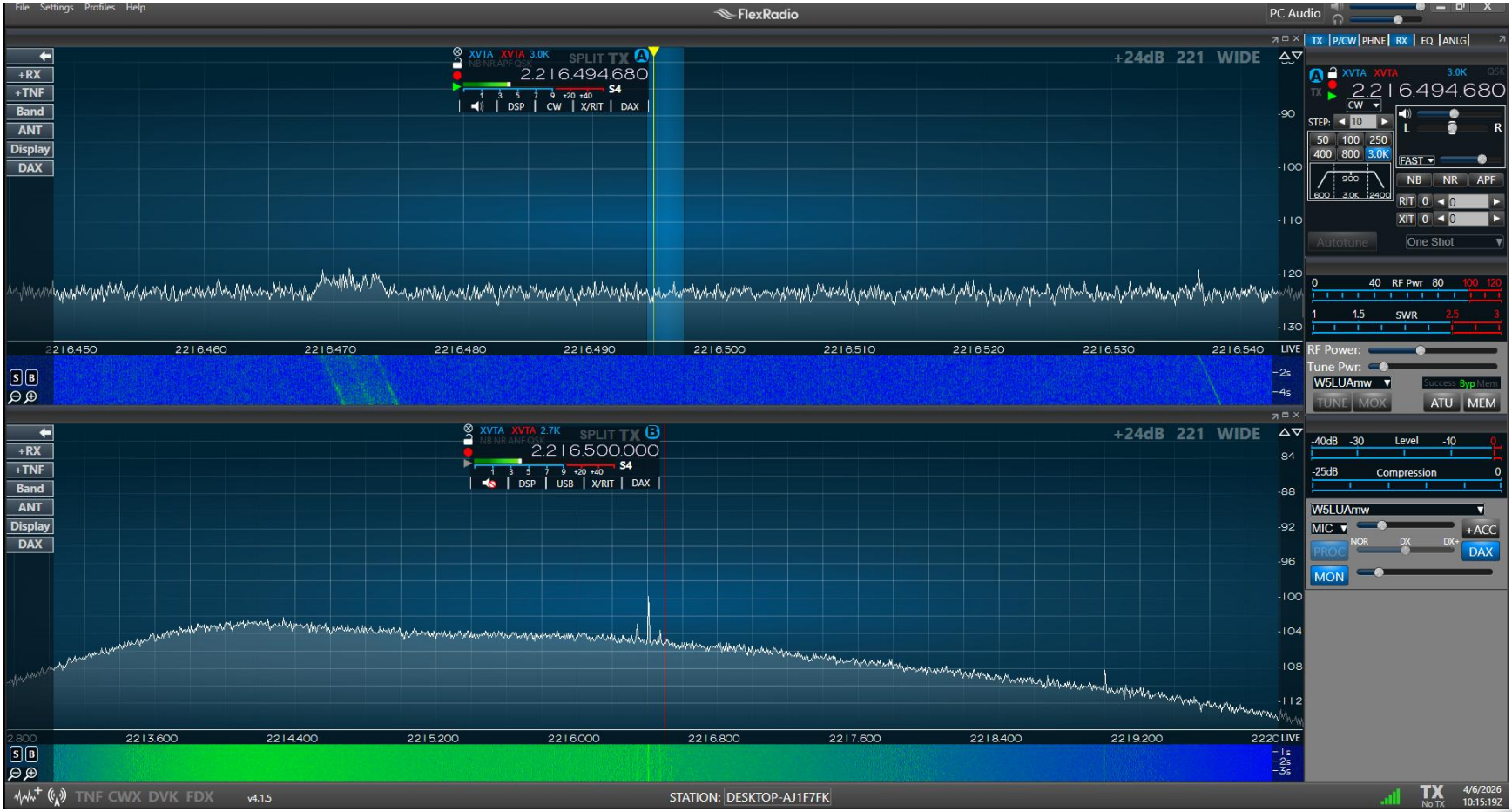
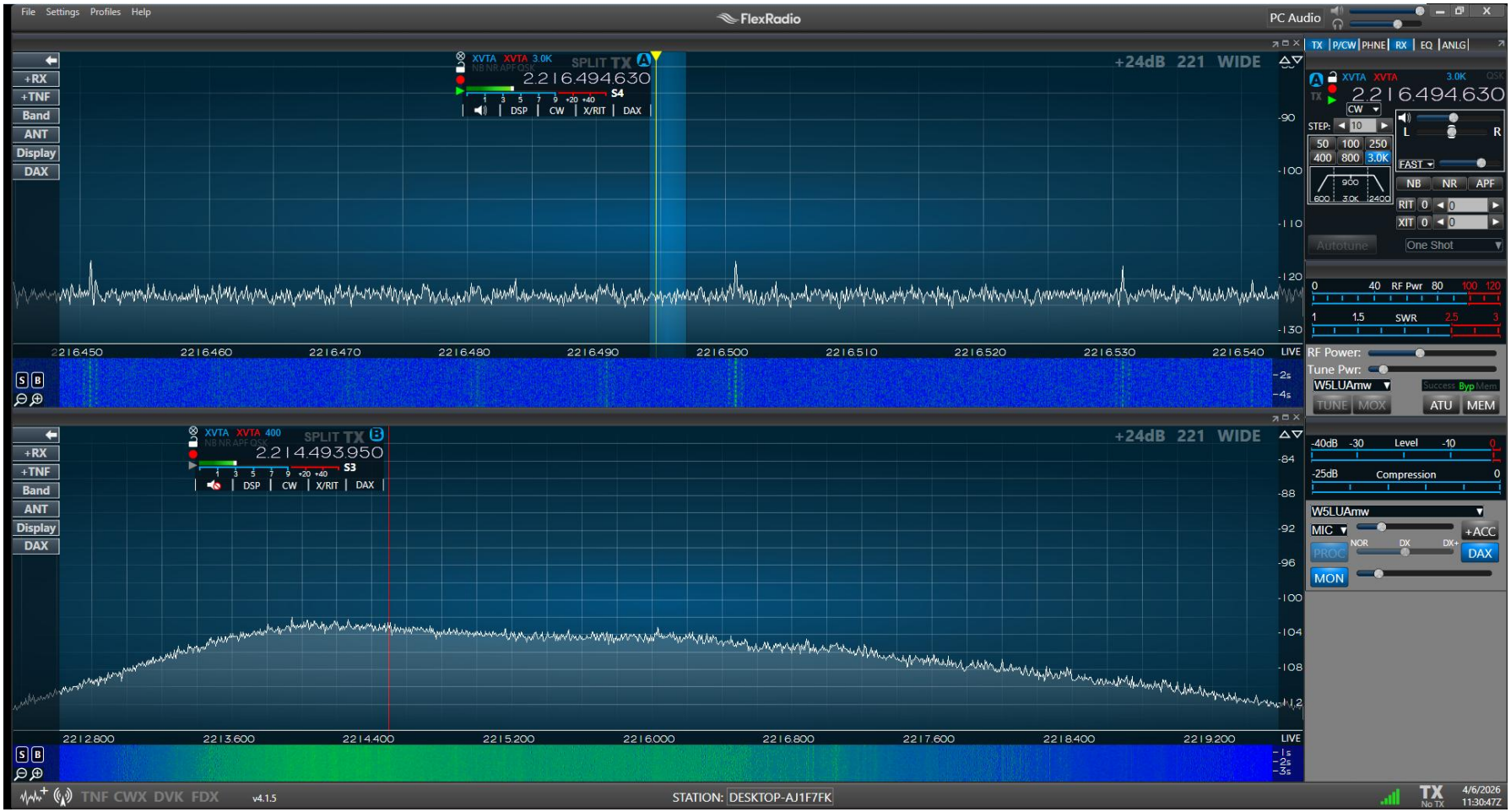


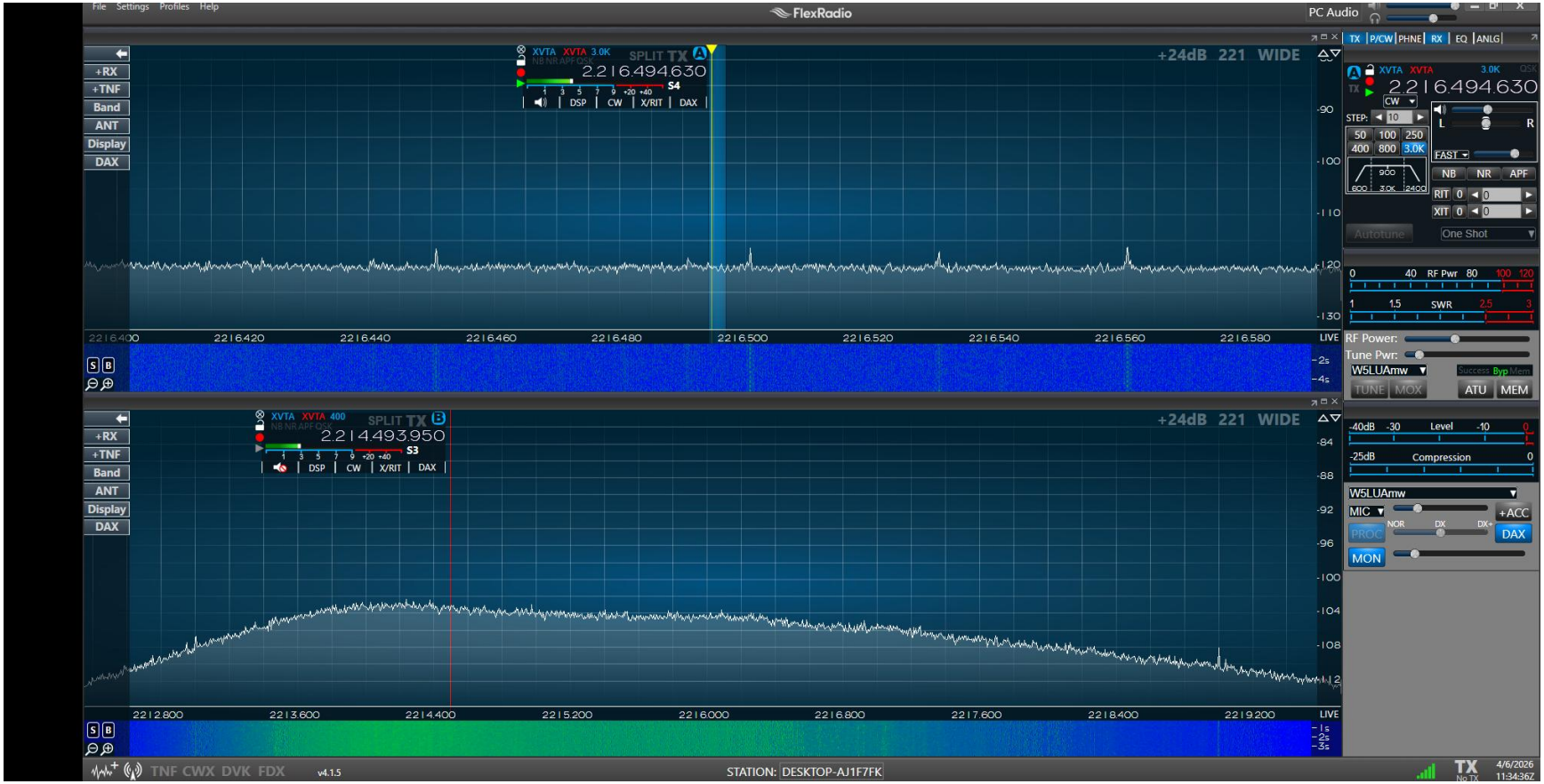
April 6, 11:30z

North Texas NTMS Microwave Society



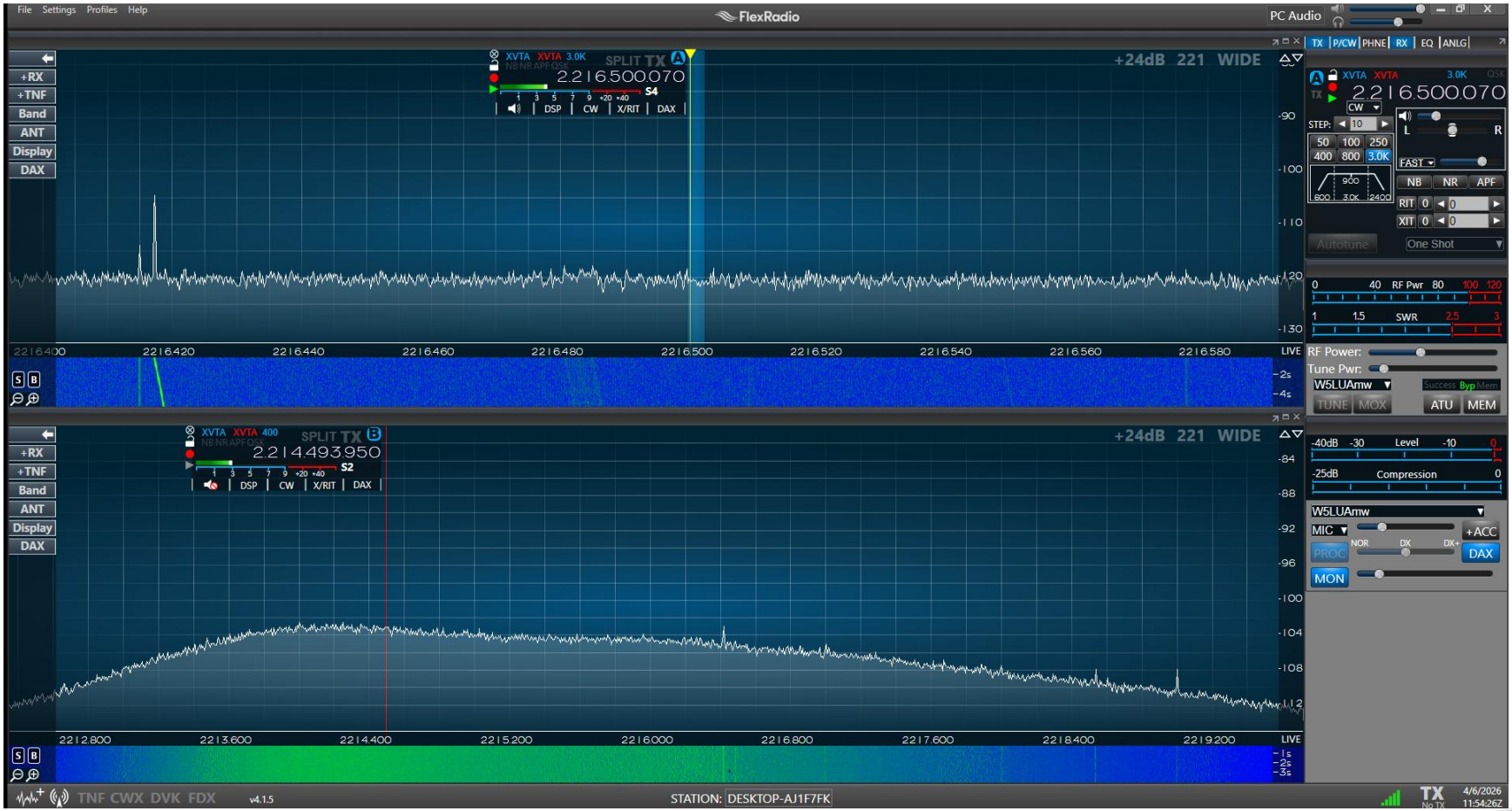
April 6, 11:34z

North Texas NTMS Microwave Society



April 6, 11:54z

North Texas NTMS Microwave Society



April 7th

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- Artemis II travelling back towards earth
- Doppler is now positive
- Distance approximately 200,000 miles
- Slides show the primary beacon signal at 2216.5 MHz plus doppler and various other artifacts.

April 7, 08:13z

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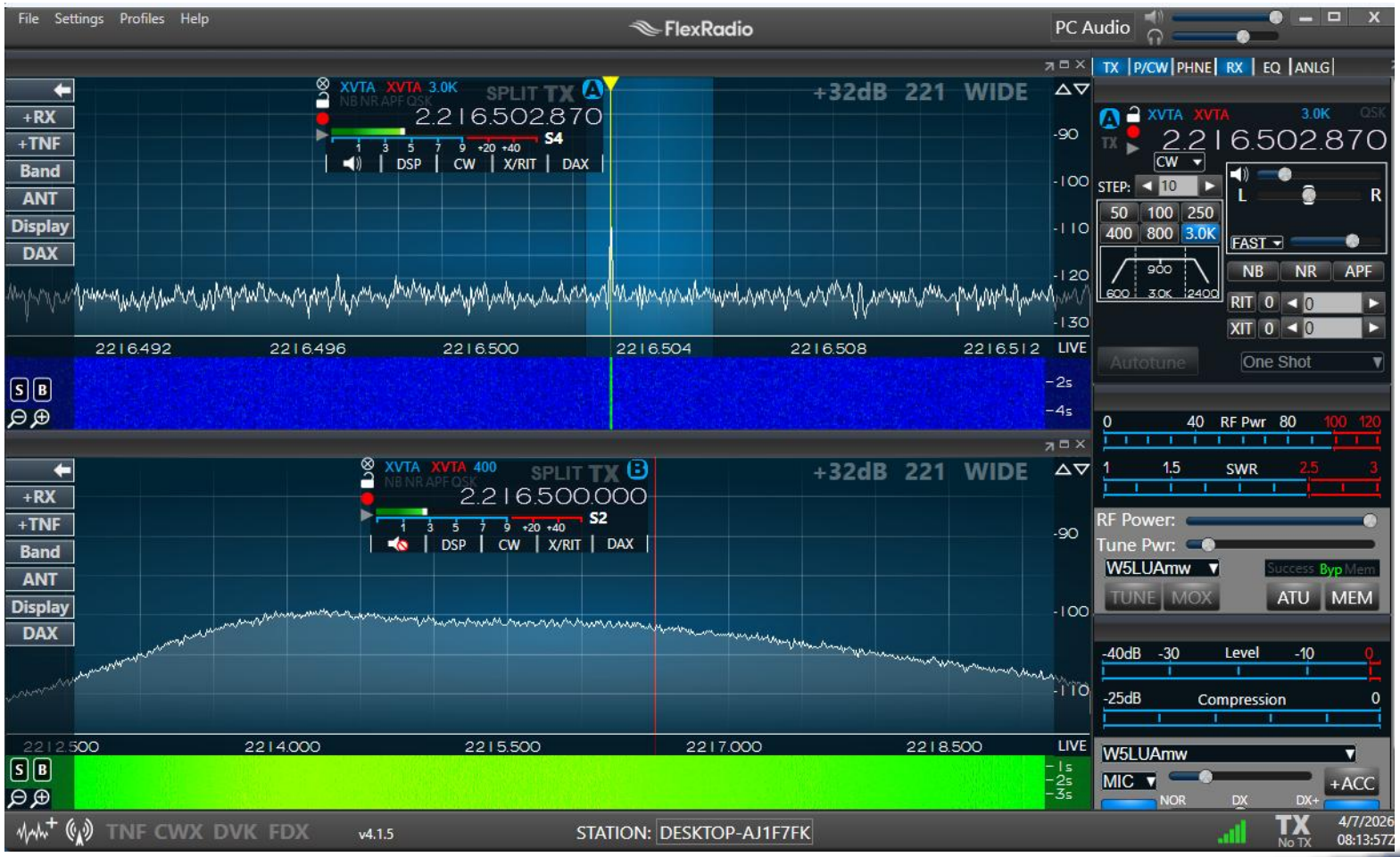
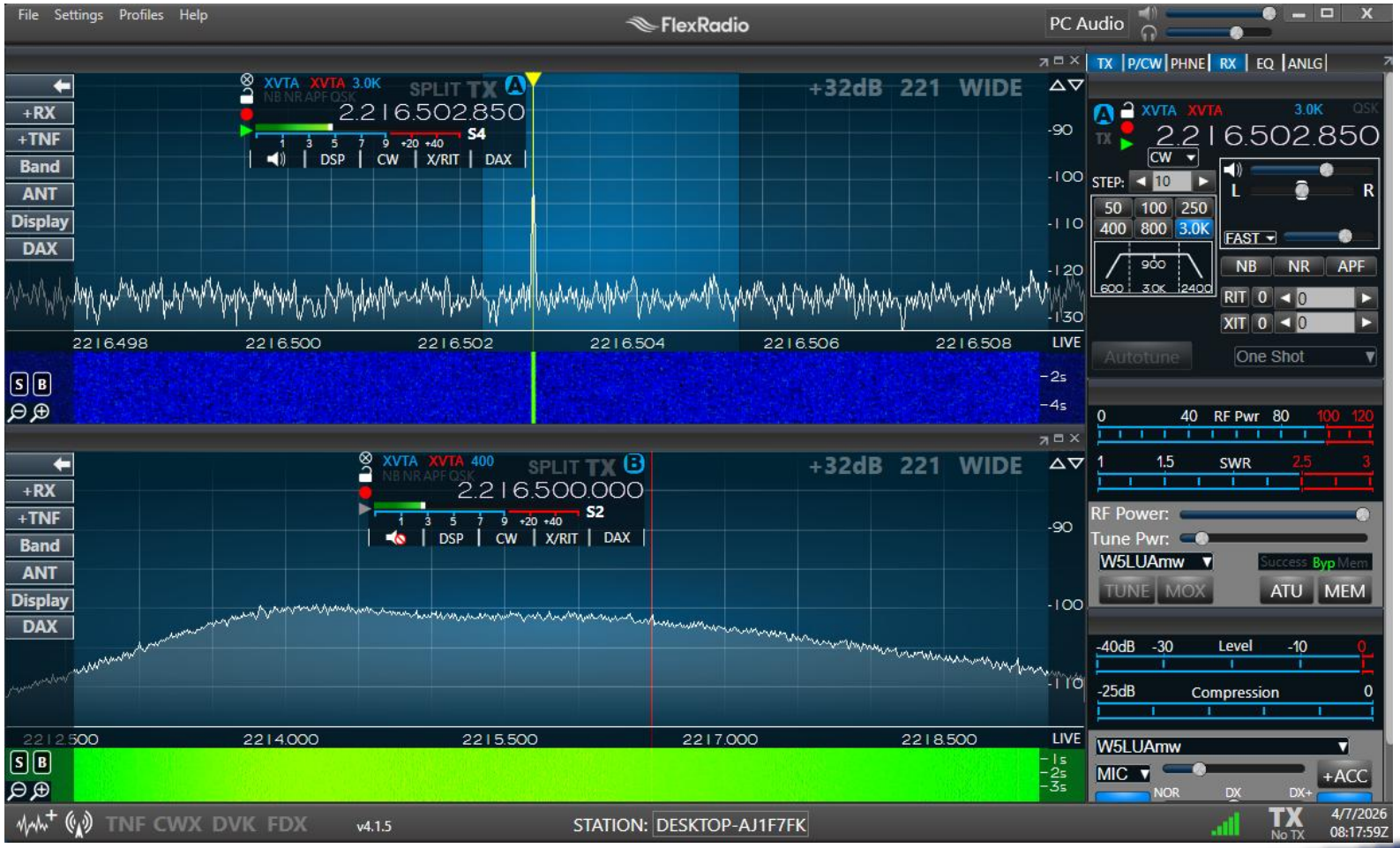


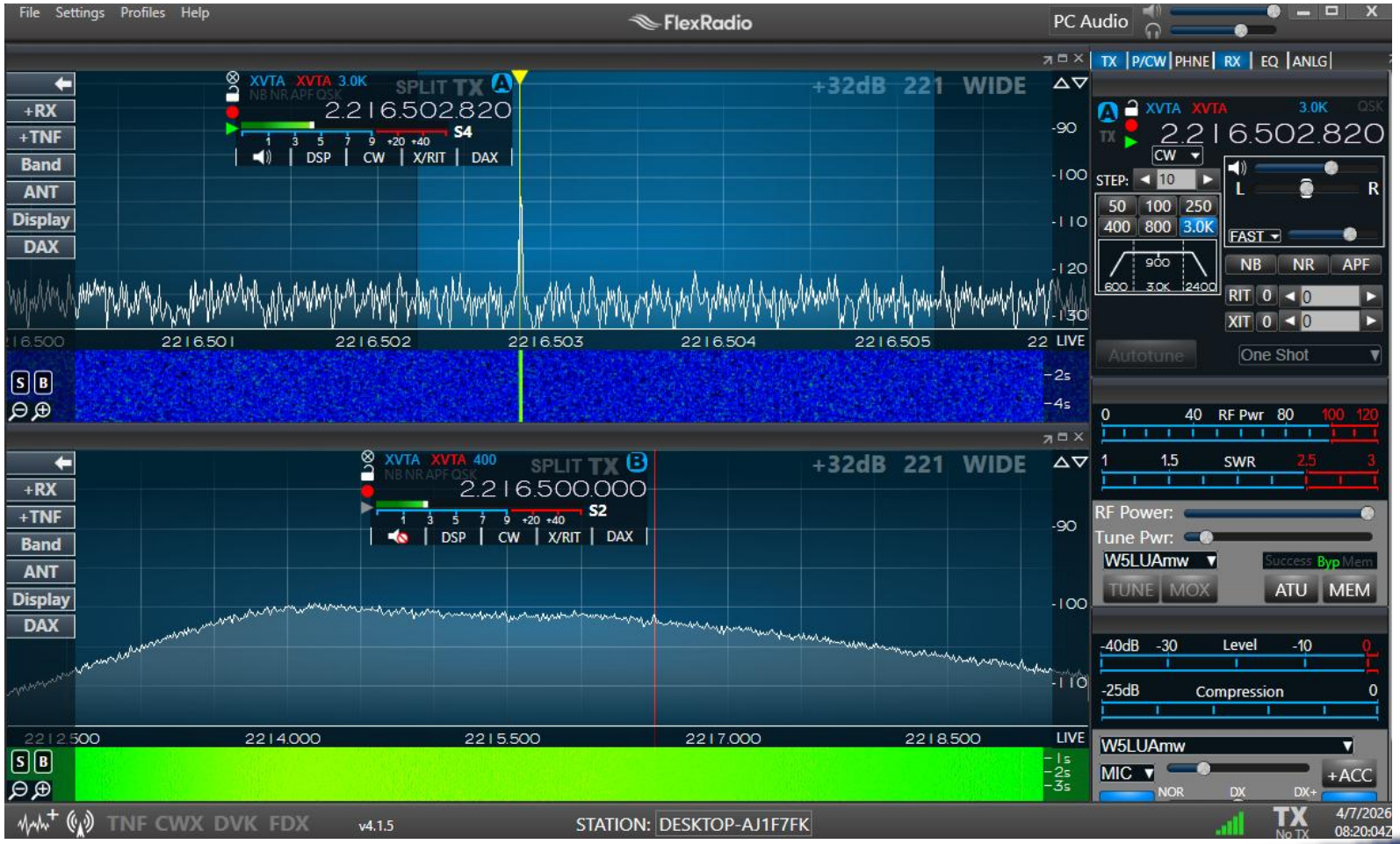
April 7 08:17z

North Texas NTMS Microwave Society



April 7 08:20z

North Texas NTMS Microwave Society



April 7 08:21z

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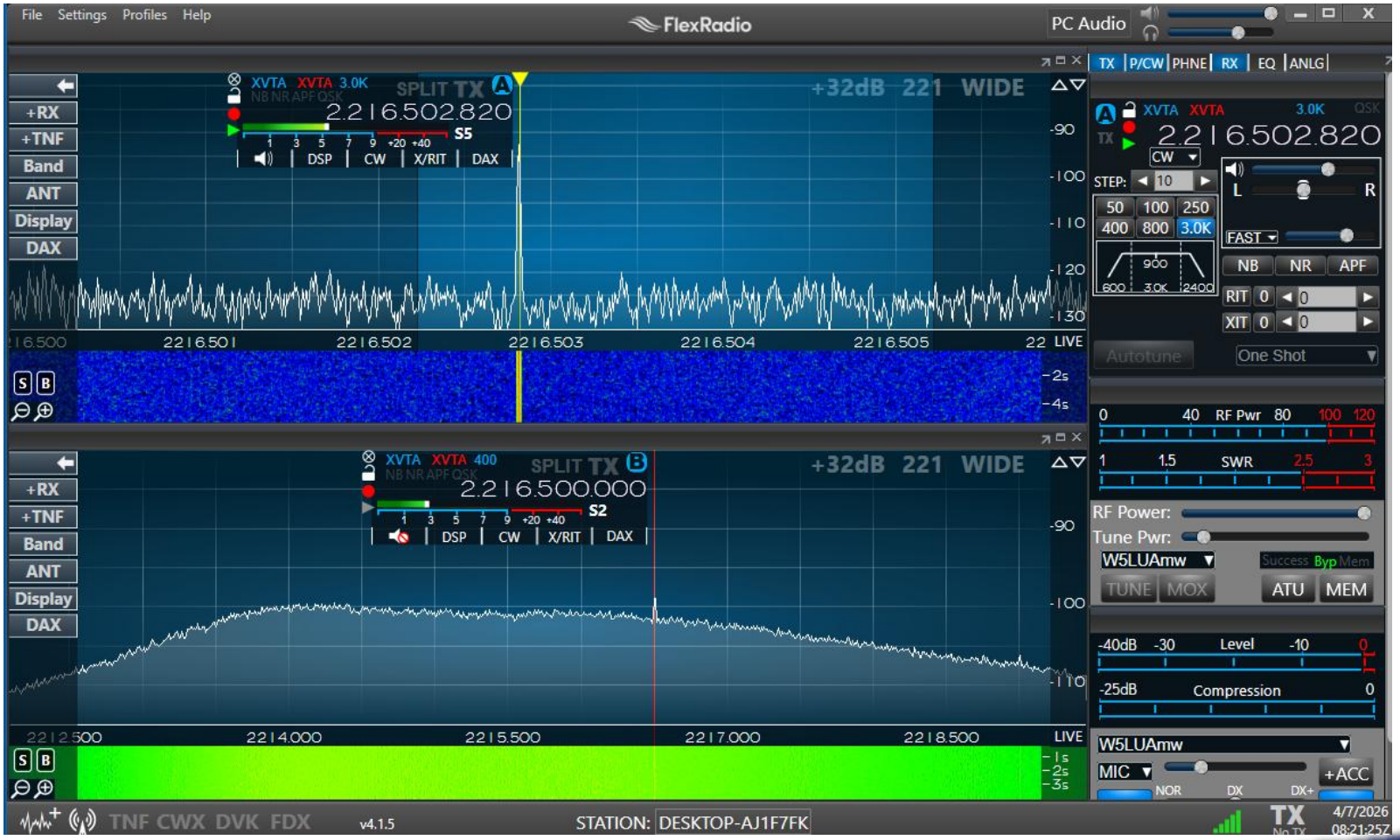

April 7 08:28z

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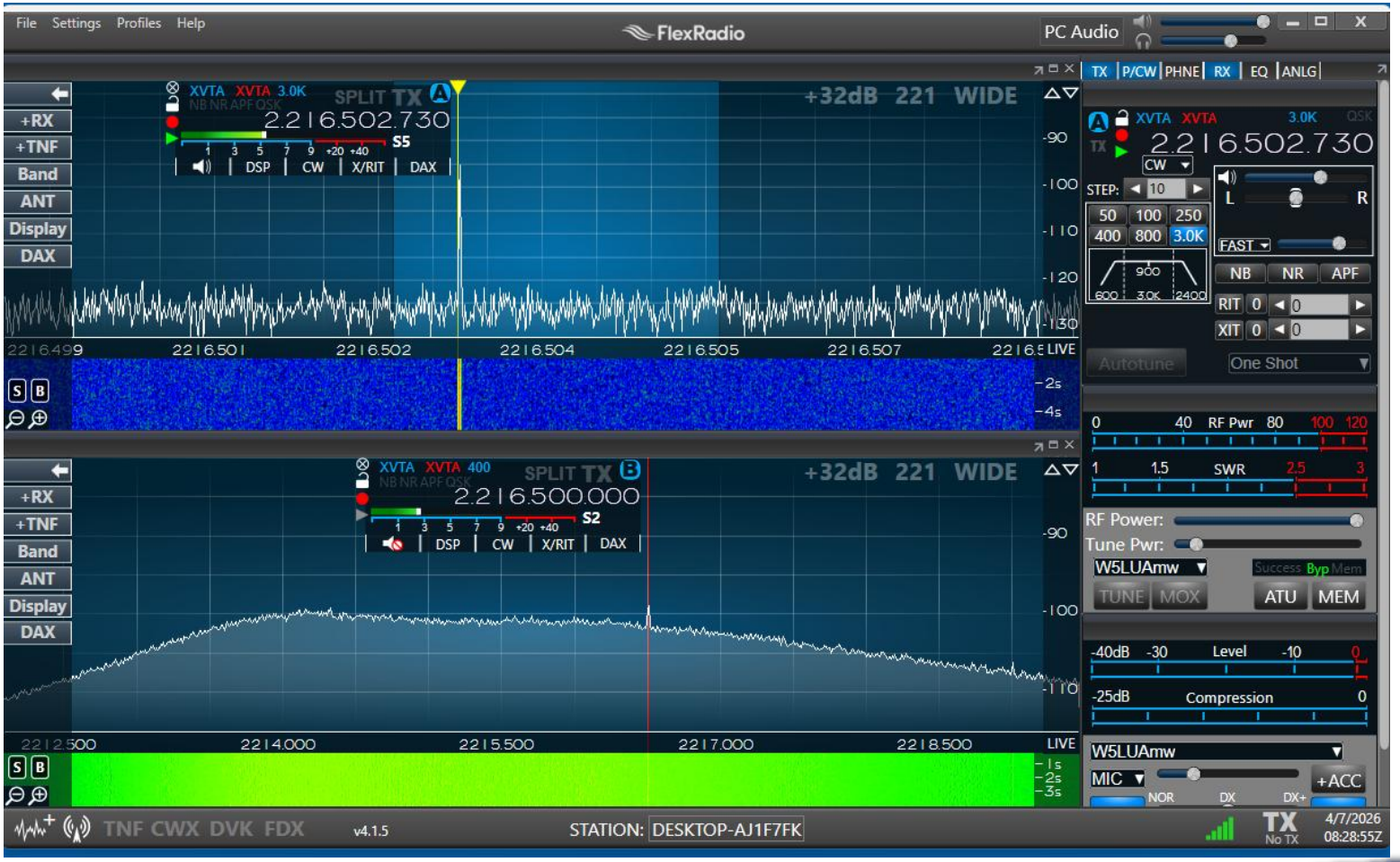

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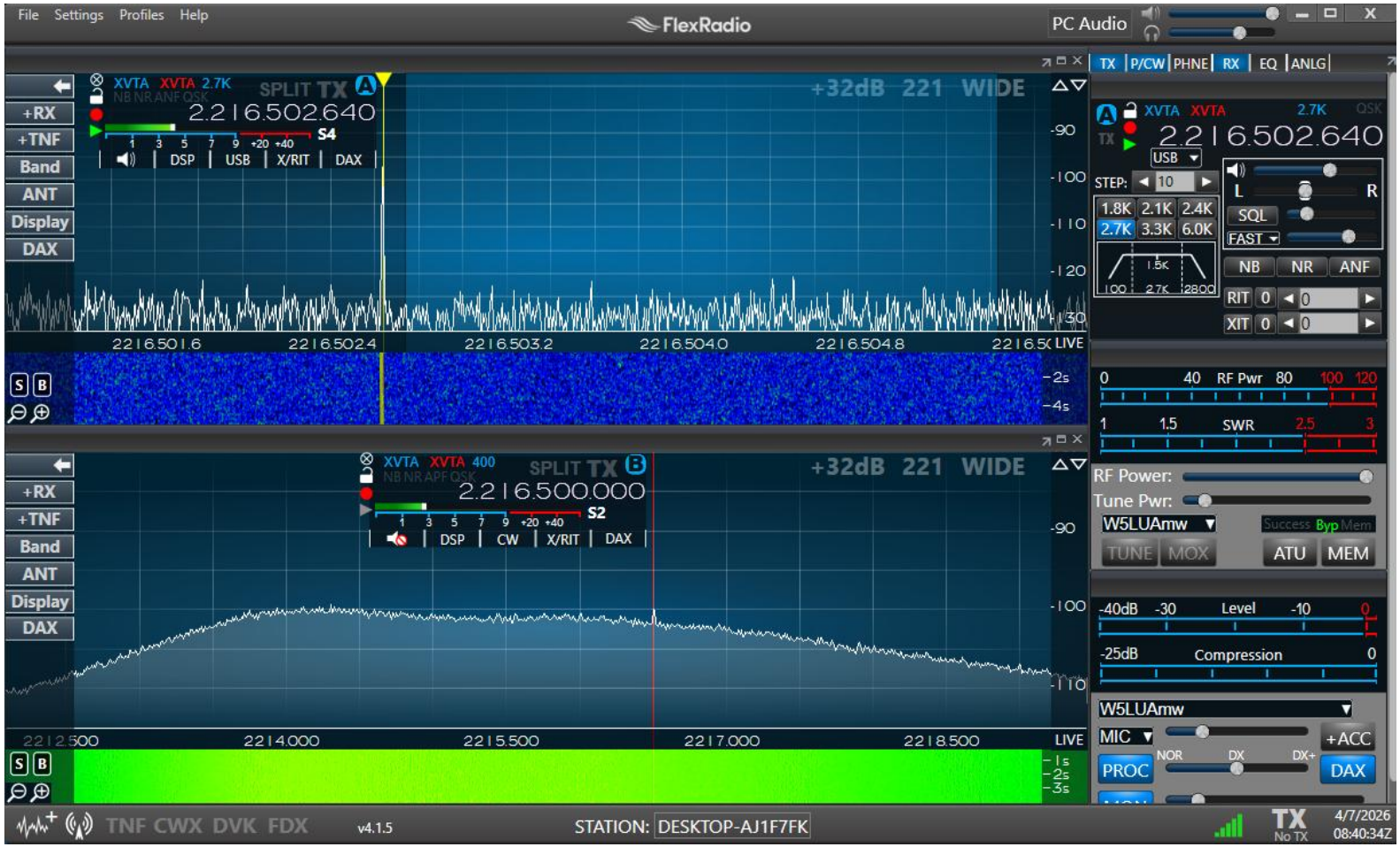
April 7 08:40z



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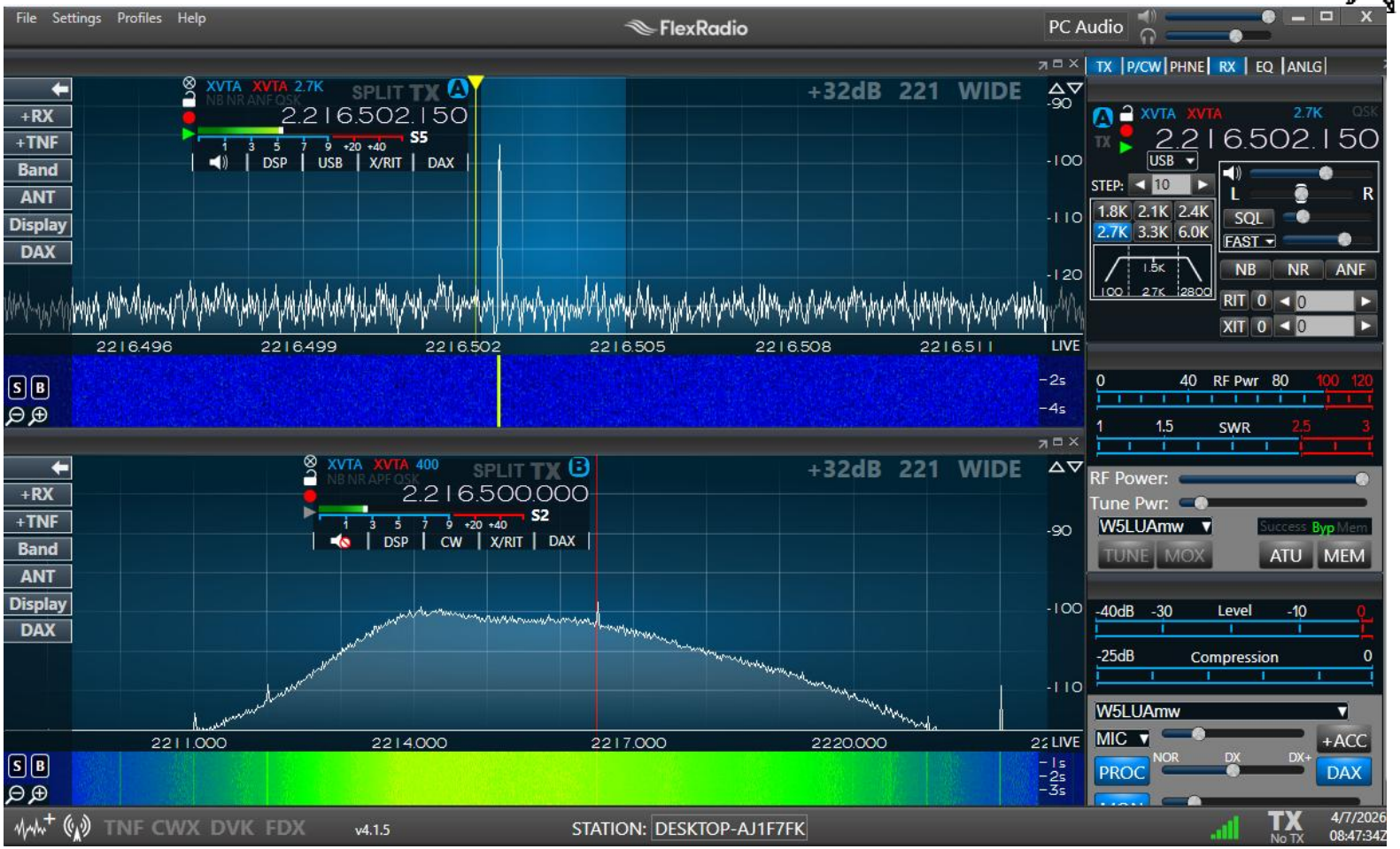
April 7 08:47z



The signals at the edge of the broadband plot are spurs in the IF

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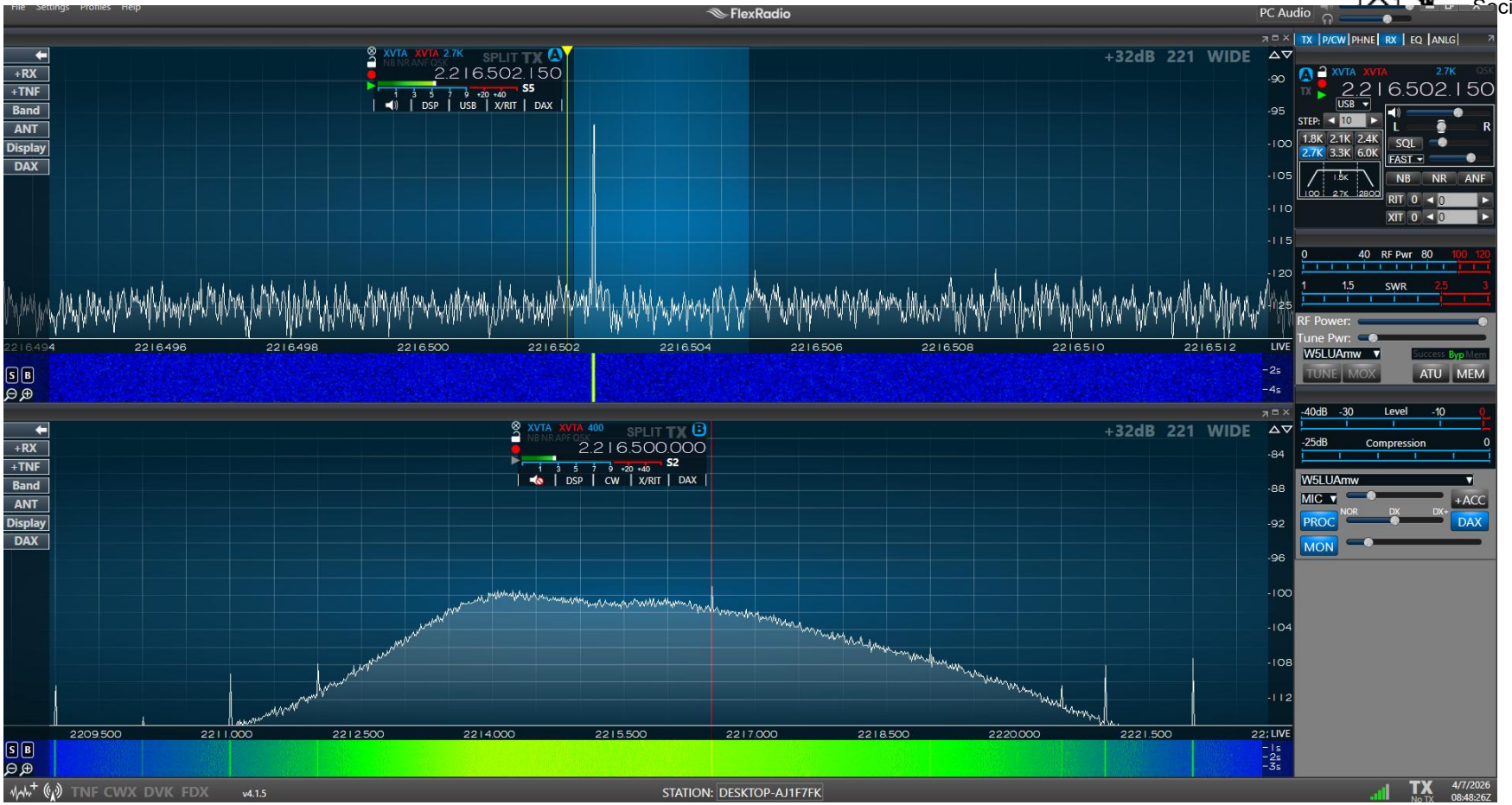
April 7 08:48z



The signals at the edge of the broadband plot are spurs in the IF

April 7, 09:01z

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- The carrier disappeared again!
- Most likely switched to a communications or data handling mode
- I never did see the sin (x) /x pattern that other amateurs reported shortly after launch

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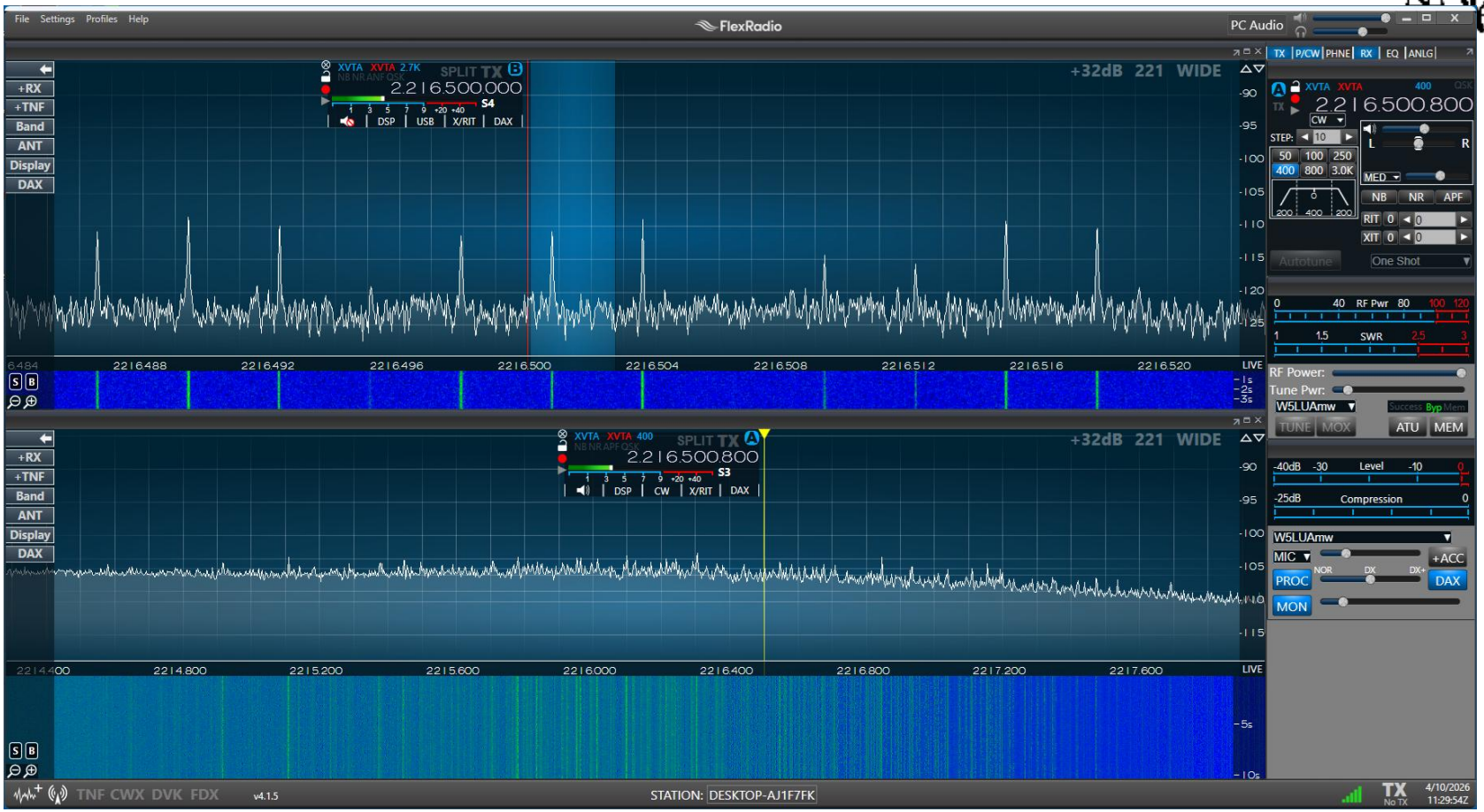
One last look, April 10, 11:29z



Distance considerably closer at 80,589 miles

Noticeable broad peak at 2216.5 MHz

Summary

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- My NF is 1.2 dB with 1.9 dB coax equals effective noise figure of 3.1 dB
- My 5 meter dish theoretically has a gain of 39 dBi
- Considering that the best signal strength was nearly 30 dB over the noise implies that a 20 dBi antenna could have seen the signal at about 10 dB over the noise. Plus.. if I had a .5 dB NF LNA directly at the antenna would have added several dB to the signal strength.
- Time to plan ahead for next time.

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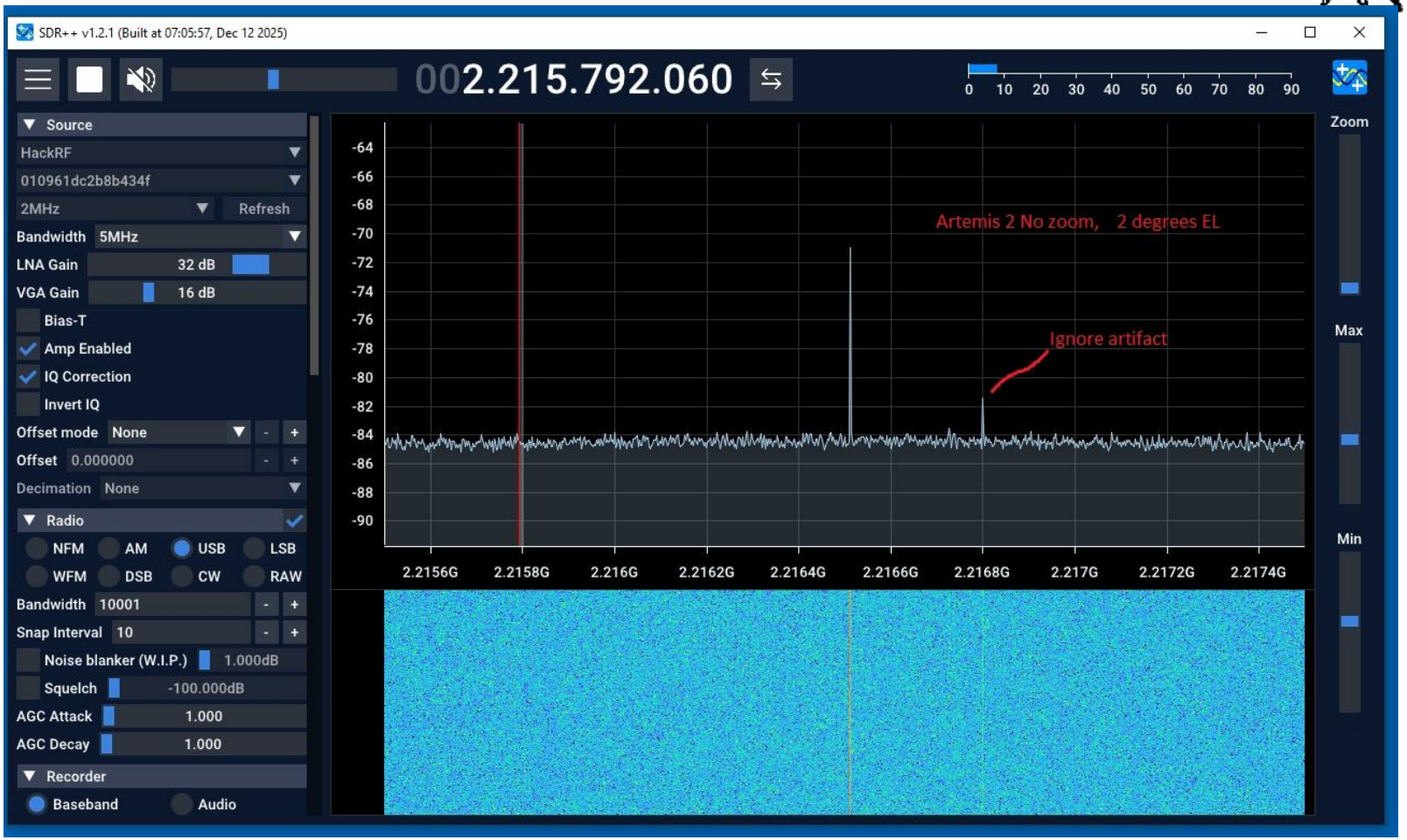
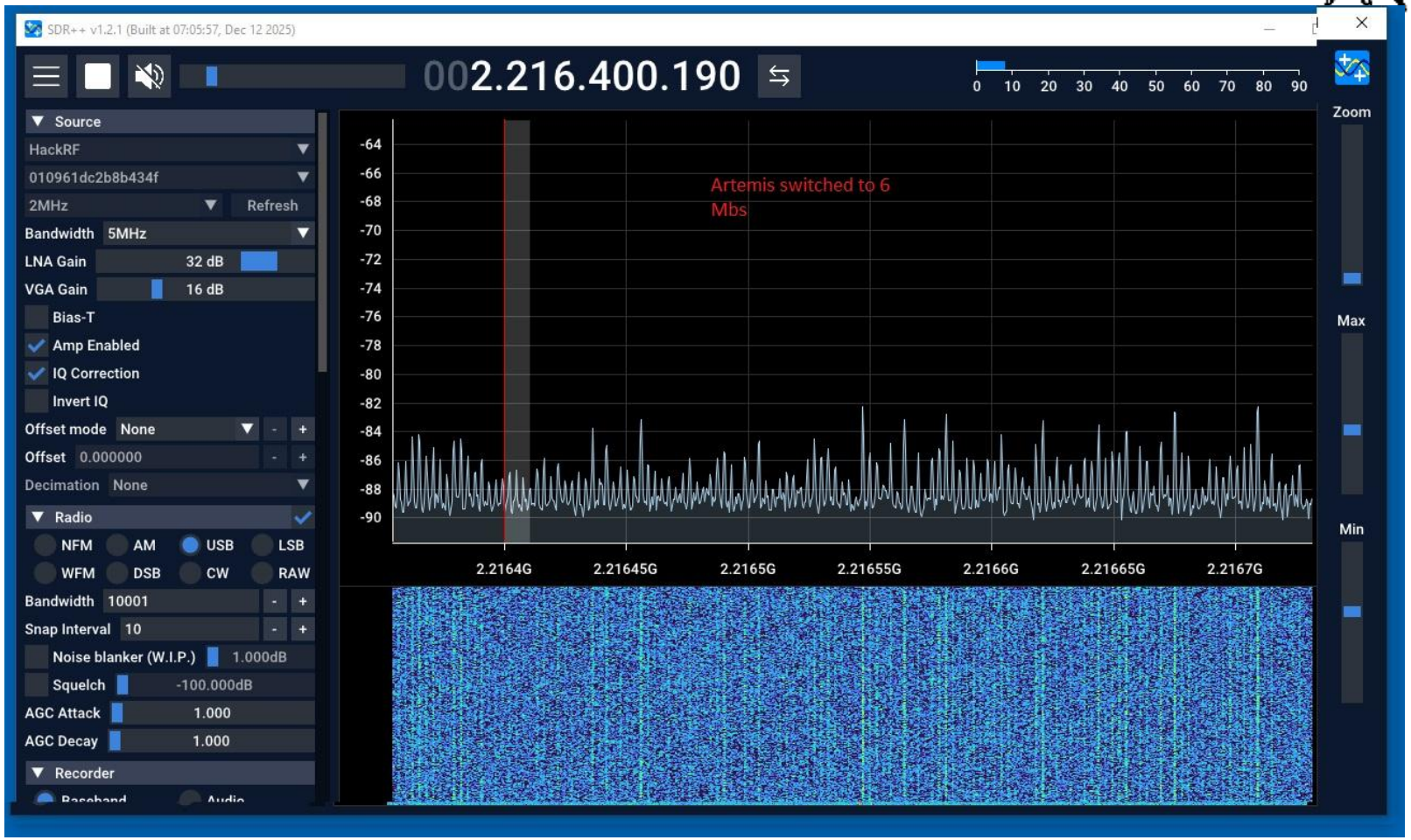
N0OY April 10, 07:30z



Picture supplied by N0OY

North Texas NTMS Microwave Society

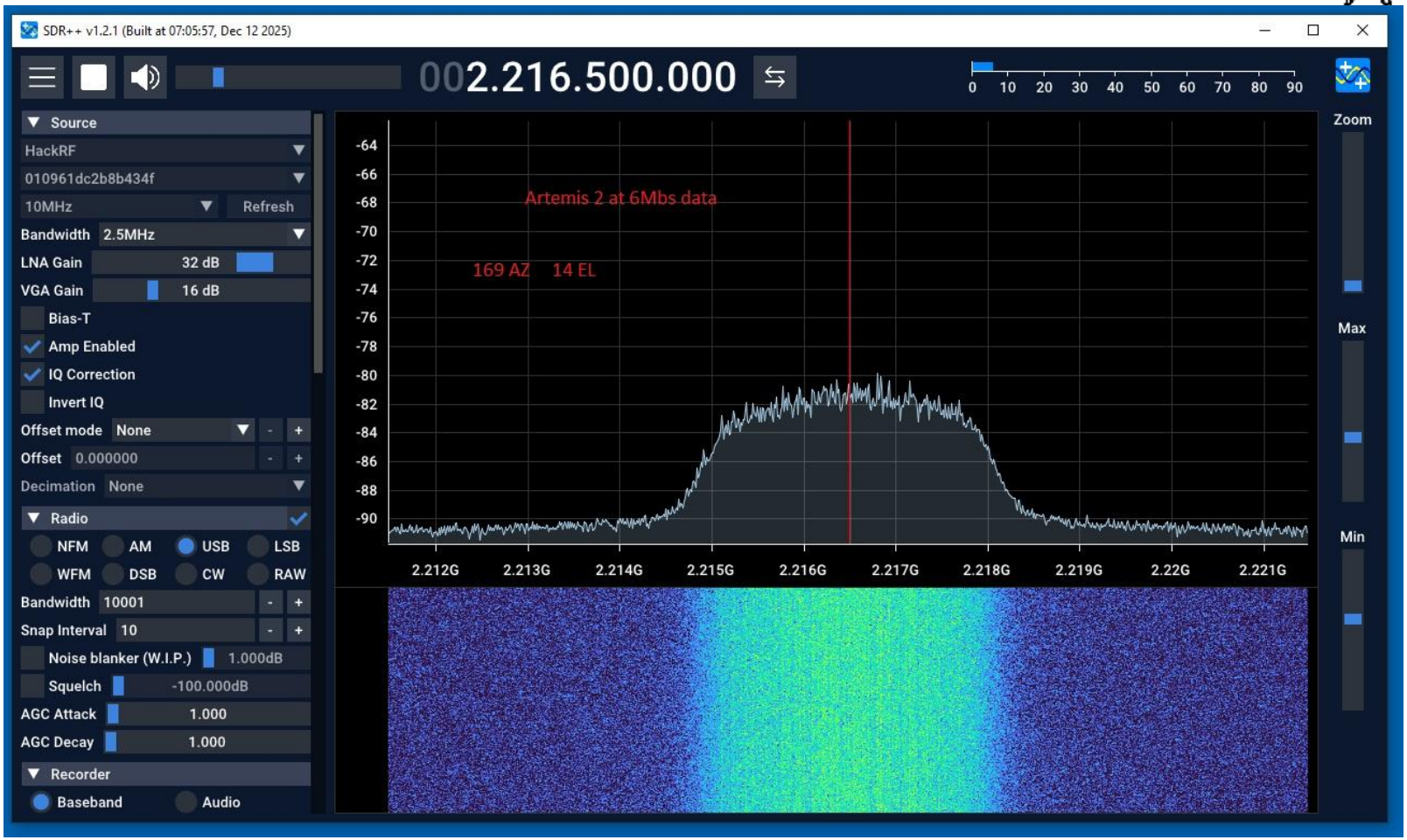
N0OY April 10, 09:45z



Picture supplied by N0OY

North Texas NTMS Microwave Society

N0OY April 10, 10:00z



Picture supplied by N0OY

6mbps Data Stream

Amateur DSN

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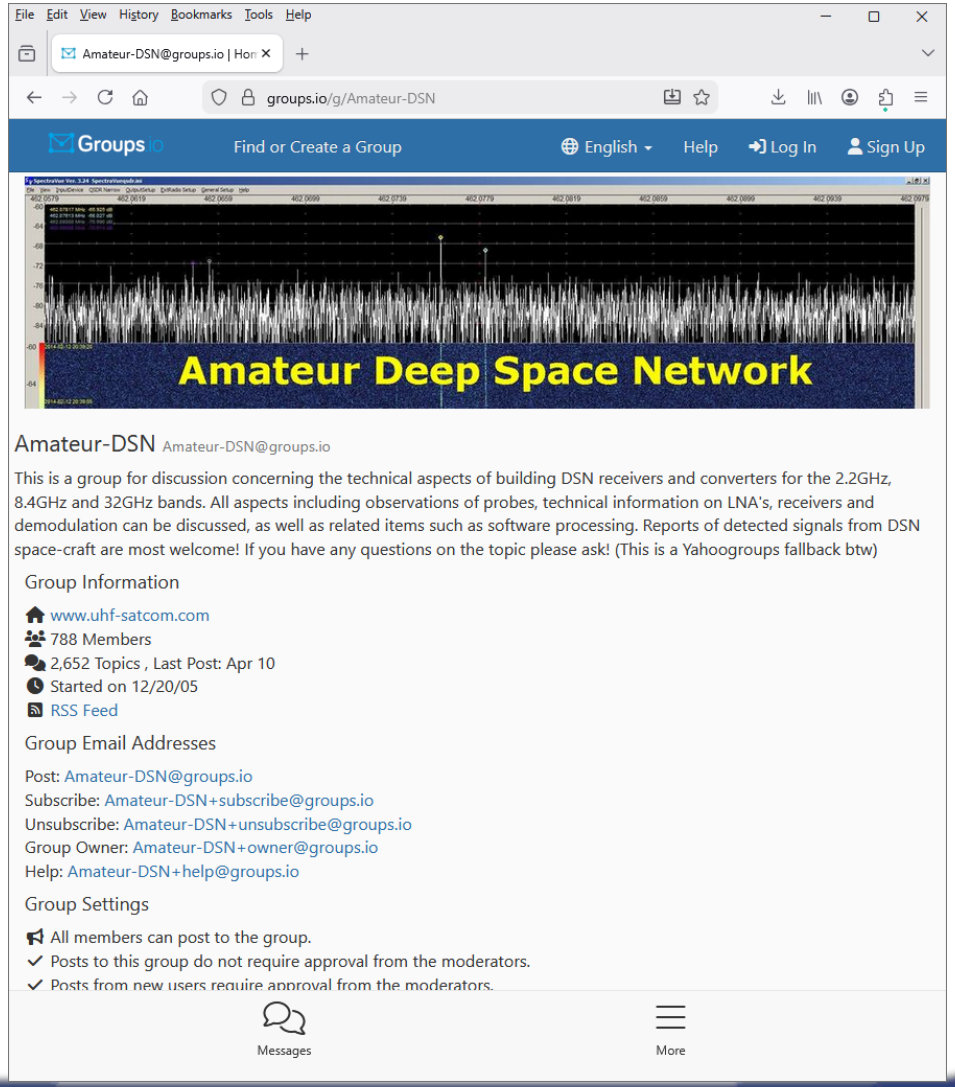

What's Next?

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- Pete Sias N0OY offered to speak on his team's efforts at a future NTMS meeting
- It was fun to just copy and hear the beacon signal.
- Decided it is time to invest in an SDR like the Hack RF One that provides the flat bandwidth to be able to decode wider bandwidth signals
- Consider recording IQ signals to allow decoding
- Looking forward to the next event!
- Questions?