

A satellite image of Earth showing a large, dark, swirling storm system over the Atlantic Ocean. The storm is centered in the lower half of the image, with a dense, dark core and a surrounding ring of lighter, swirling clouds. The surrounding ocean is a deep blue, and the landmasses of North and South America are visible in the upper and lower right corners, respectively. The sky is a pale, hazy blue.

DOWNLOADING IMAGES FROM WEATHER SATELLITES

DAVID BAILEY

K5DKB

Image received by K5DKB from Russian METEOR M2-4 16 JAN 2025

WHAT IS IT?

- Currently, there are 5 satellites that transmit on VHF that users can easily receive photos from.
- As the satellites pass overhead, they send real-time images back to earth that can be received and decoded by an ordinary computer.
- The hardware requirements are very minimal, and the software is free.

SATELLITES?

USA

- NOAA-15
 - Launched 15 MAY 1998
- NOAA 18
 - Launched 30 MAY 2005
- NOAA 19
 - Launched 6 FEB 2009

Russia

- METEOR M2-3
 - Launched 27 JUN 2023
- METEOR M2-4
 - Launched 29 FEB 2024
- *METEOR M2-5 possibly launching in 2025

The screenshot shows a software interface with two tabs: "Scheduling" and "Rotator Config".

Scheduling Section:

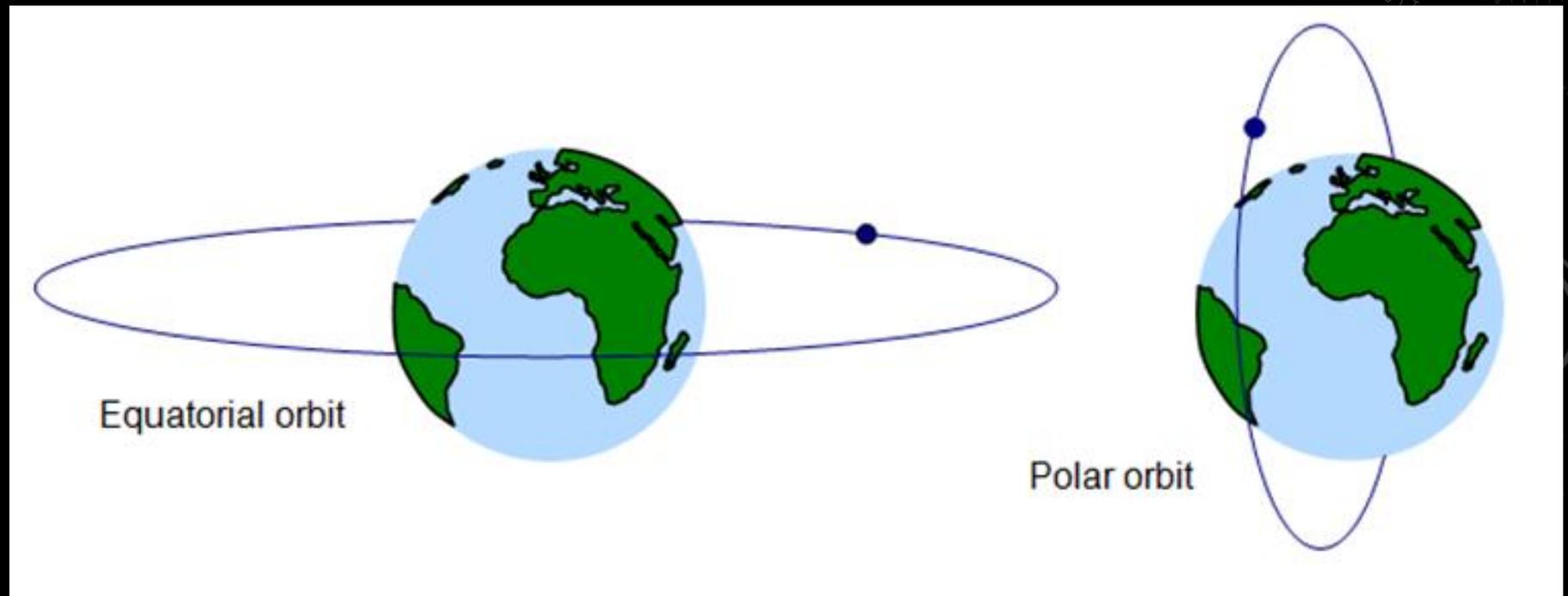
- Search All Satellites: 1998-067XC, 1998-067XD, 2021-091B, 2022-023A, 2022-023B, 2022-023C, 2022-023D
- Search Selected: METEOR-M2 3, METEOR-M2 4, NOAA 15, NOAA 18, NOAA 19
- Scheduler Options: Multi Mode (checked), Stop SDR When IDLE (checked), Display Local Time (checked), 40.000 Minimum Elevation
- Update Passes (checked), Engage Autotrack (checked)
- Timeline: 00:00 to 10:00
- Passes: NOAA 18 (00:00-01:00), METEOR-M2 4 (02:00-03:00), NOAA 15 (08:00-09:00), METEOR (09:00-10:00)

Rotator Config Section:

Satellite	Frequency	Record	Format
NOAA 19	000.137.100.000 Hz	Record	cs16
+ NOAA 18	000.137.912.500 Hz	Live	NOAA APT
+ METEOR-M2 4	000.137.900.000 Hz	Live	METEOR M2-x LRPT 72k
+ NOAA 15	000.137.620.000 Hz	Live	NOAA APT
+ METEOR-M2 3	000.137.900.000 Hz	Live	METEOR M2-x LRPT 72k

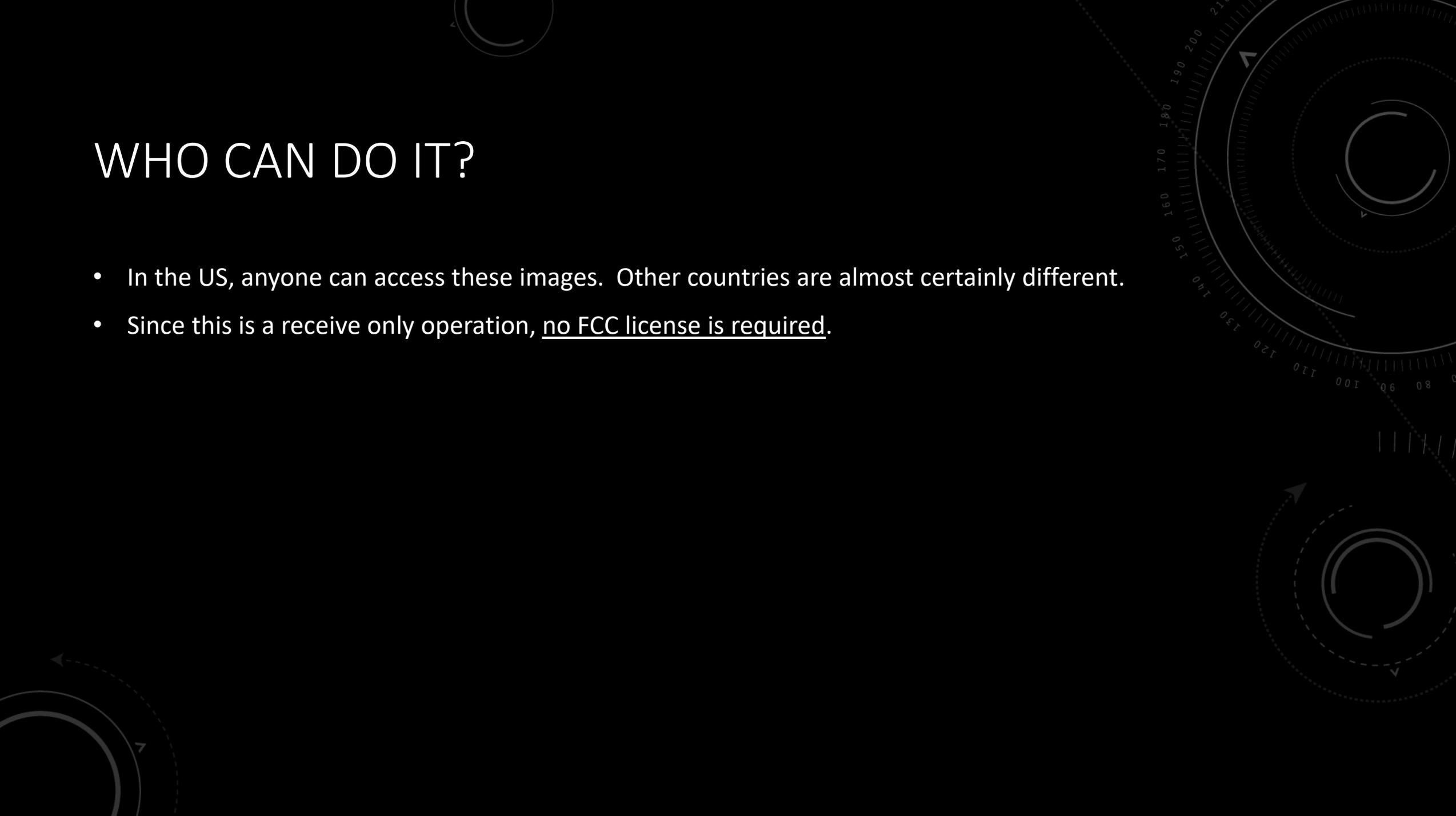
WHERE ARE THEY?

- These satellites maintain a polar orbit around the Earth at an altitude of about 800 to 865km or about 500 to 540 miles. That is about the distance to Pensacola, FL or Roswell, NM.
- By comparison, the ISS only orbits at about 420km or 260 miles. That is about the distance to Lafayette, LA or Sweetwater, TX.



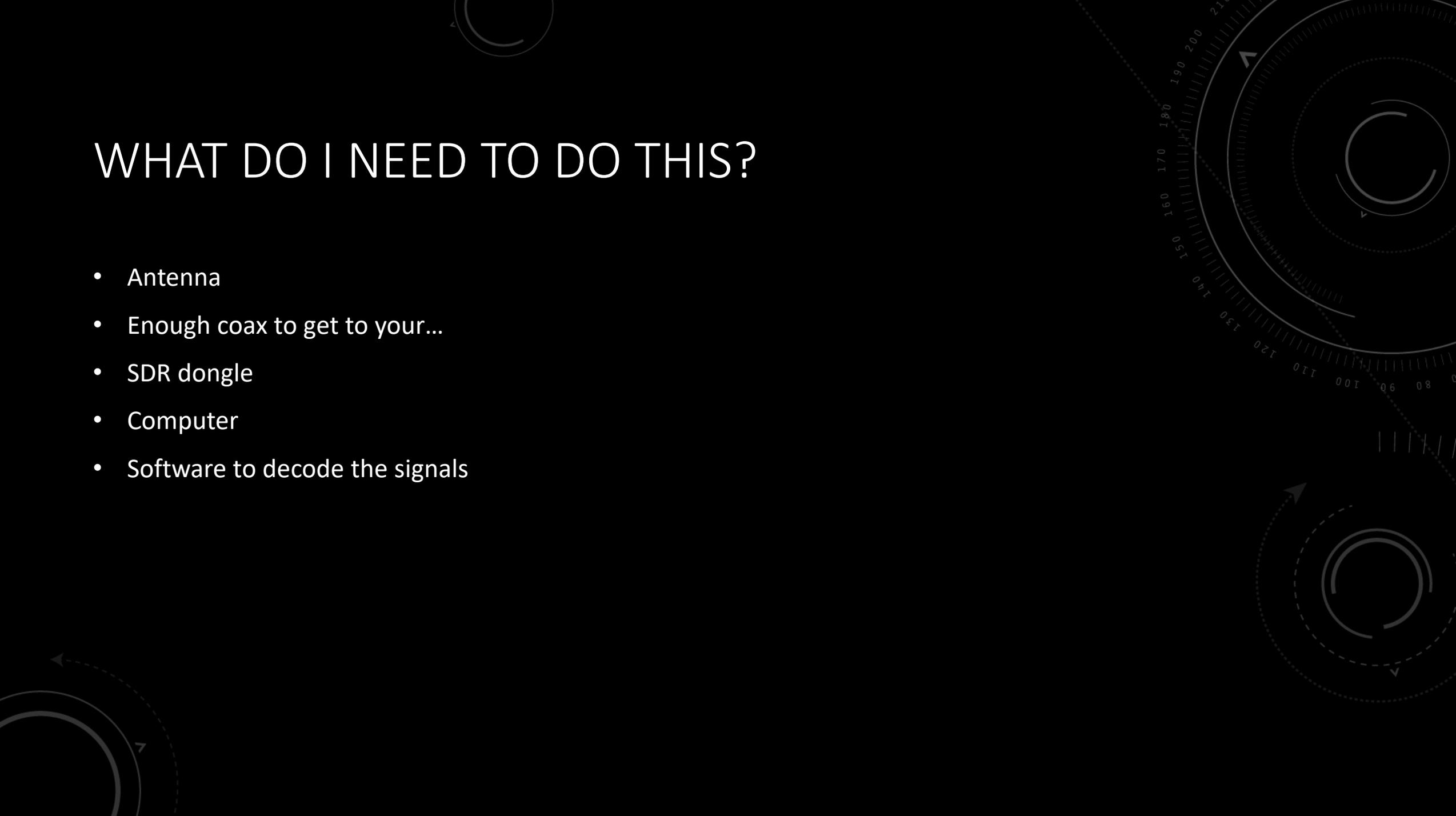
WHO CAN DO IT?

- In the US, anyone can access these images. Other countries are almost certainly different.
- Since this is a receive only operation, no FCC license is required.



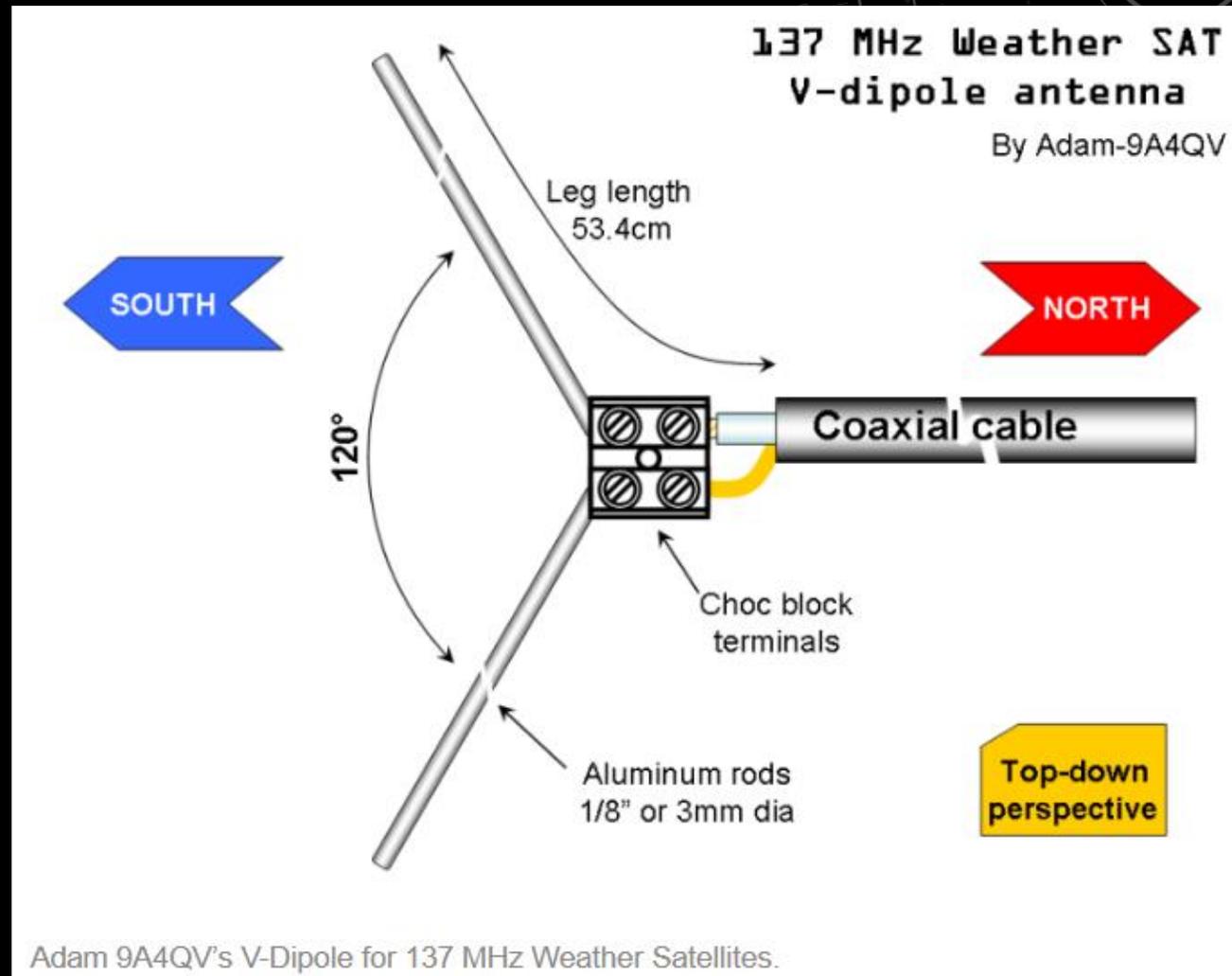
WHAT DO I NEED TO DO THIS?

- Antenna
- Enough coax to get to your...
- SDR dongle
- Computer
- Software to decode the signals



ANTENNA

- Many option, but I built my own.
- Instructions at: <https://www.rtl-sdr.com/simple-noaameteor-weather-satellite-antenna-137-mhz-v-dipole/>
- Alternative helix design: <https://chrz.de/2018/04/15/building-a-weather-satellite-antenna/>



THE ONE I BUILT:

All parts were things I already had at home.

- 2 lengths of reclaimed galvanized fencing wire
- 1 PVC pipe cap
- 2 screws
- 2 crimp-on ring terminals
- Scrap SO-239 coax end

Tools: drill, screwdriver, crimping tool



SDR DONGLE – LOTS OF OPTIONS



V4 R828D RTL2832U 1PPM TCXO SMA Software Defined Radio (Dongle Only)

Brand: RTL-SDR Blog

4.6 ★★★★★ 428 | Search this page

Amazon's Choice Overall Pick

500+ bought in past month

\$33⁹⁵

prime
FREE Returns

Thank you for being a Prime member. Get a \$100 Gift Card: Pay \$0.00 upon approval for Prime Visa. No annual fee.

Brand	RTL-SDR Blog
Connectivity Technology	Radio Frequency
Color	Black
Antenna	Radio
Tuner Technology	Digital

About this item

\$33⁹⁵

prime

FREE Returns

FREE delivery **Wednesday, January 22.** Order within **9 hrs 59 mins**

Deliver to David - Bryan 77802

In Stock

Quantity: 1

Add to Cart

Buy Now

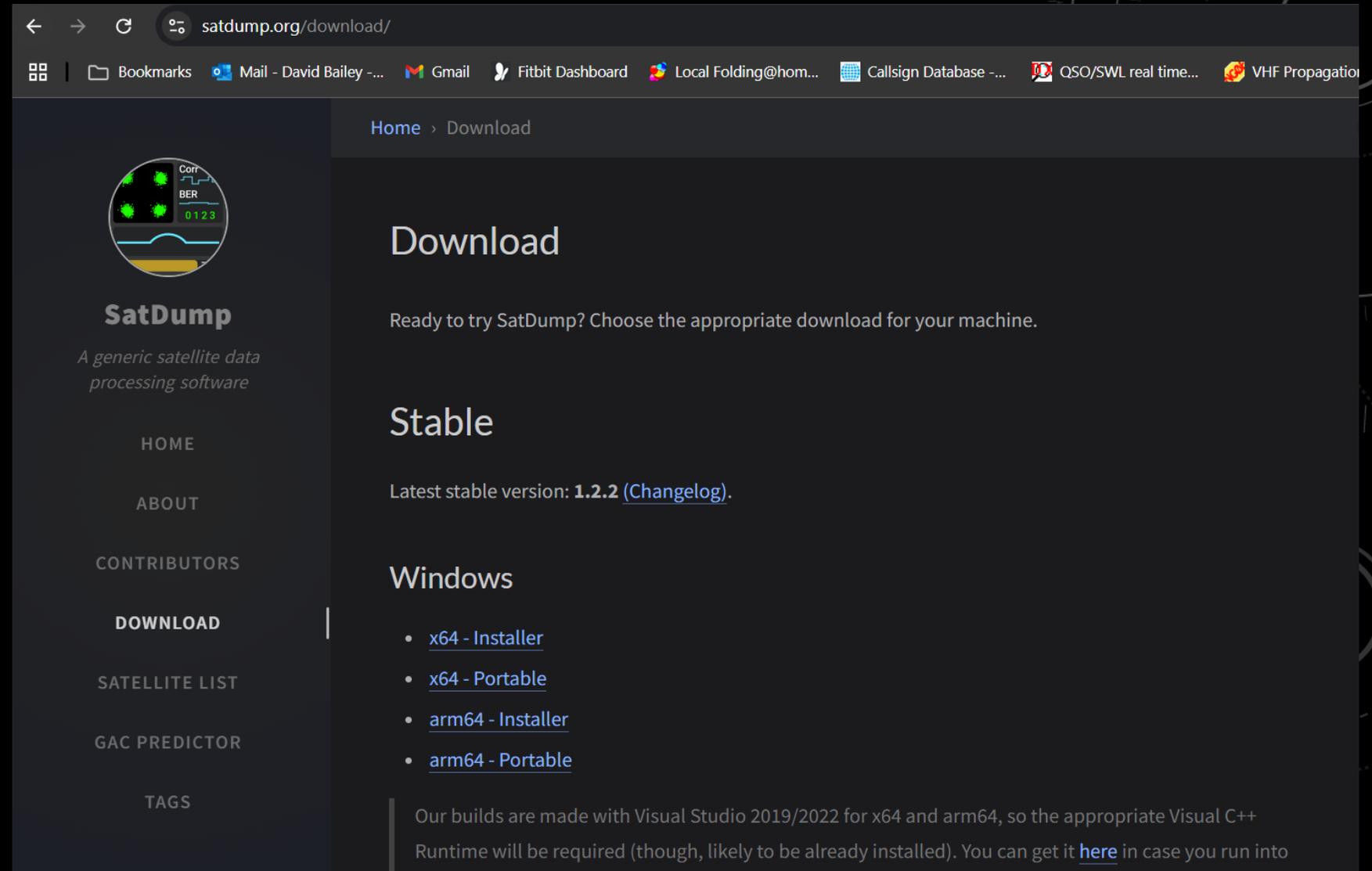
Ships from	Amazon
Sold by	RTL-SDR Blog
Returns	30-day refund/replacement
Customer service	Amazon
See more	

Add a Protection Plan:

2 Year Protection Plan for

SOFTWARE

- Goto satdump.org
- Software is free
- Available on Windows, macOS, Linux, and Android



← → ↻ 🌐 satdump.org/download/

📁 Bookmarks 📧 Mail - David Bailey -... 📧 Gmail 📱 Fitbit Dashboard 🌐 Local Folding@hom... 🌐 Callsign Database -... 📺 QSO/SWL real time... 📡 VHF Propagation

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SatDump

A generic satellite data processing software

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Download

Ready to try SatDump? Choose the appropriate download for your machine.

Stable

Latest stable version: **1.2.2** ([Changelog](#)).

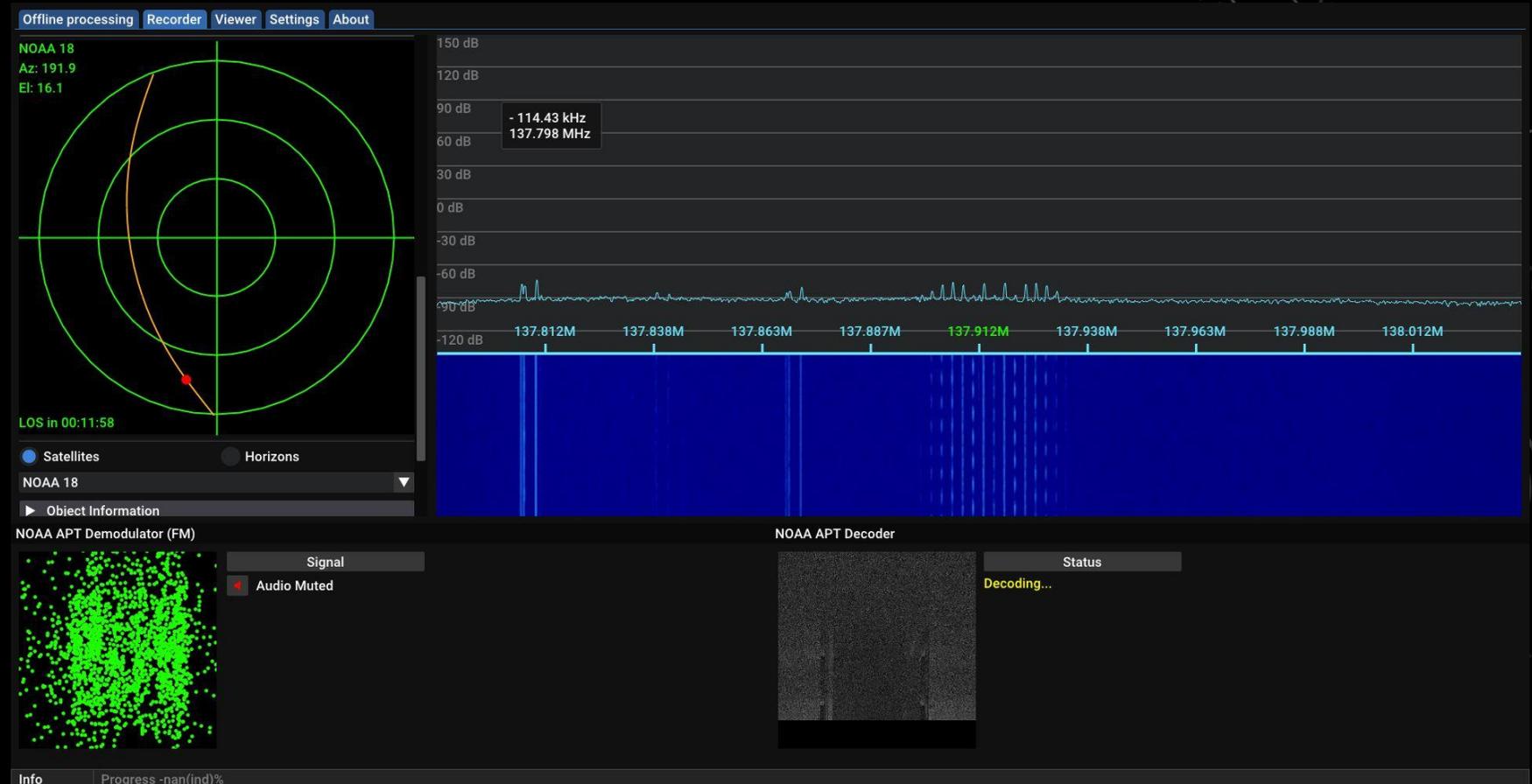
Windows

- [x64 - Installer](#)
- [x64 - Portable](#)
- [arm64 - Installer](#)
- [arm64 - Portable](#)

Our builds are made with Visual Studio 2019/2022 for x64 and arm64, so the appropriate Visual C++ Runtime will be required (though, likely to be already installed). You can get it [here](#) in case you run into

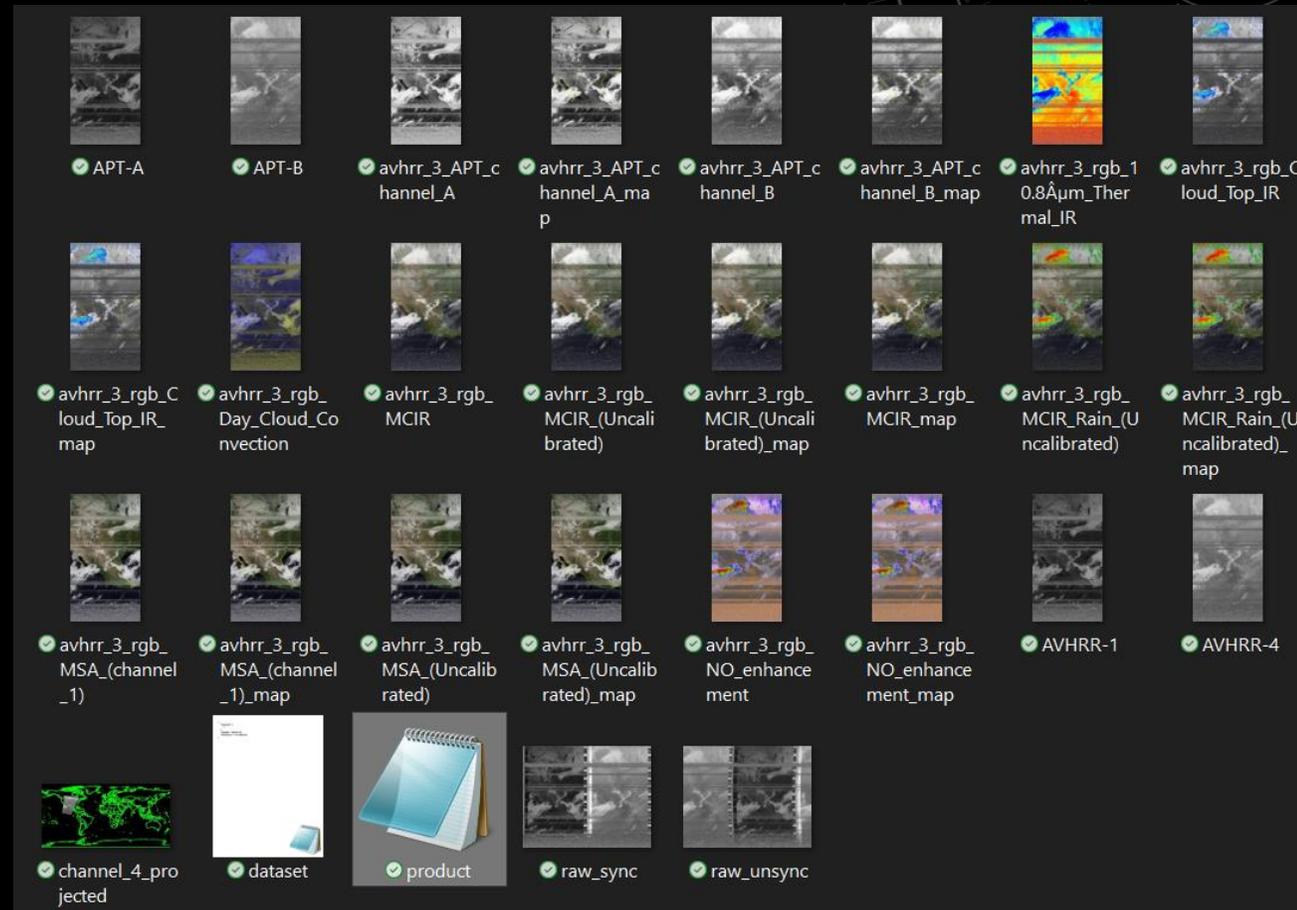
IN ACTION:

- Set up the equipment.
- Run SatDump.
- Once running, SatDump will use satellite orbital data to track when the selected satellites pass overhead.
- It will automatically listen to and decode the signals.



WHAT SHOULD I EXPECT TO RECEIVE?

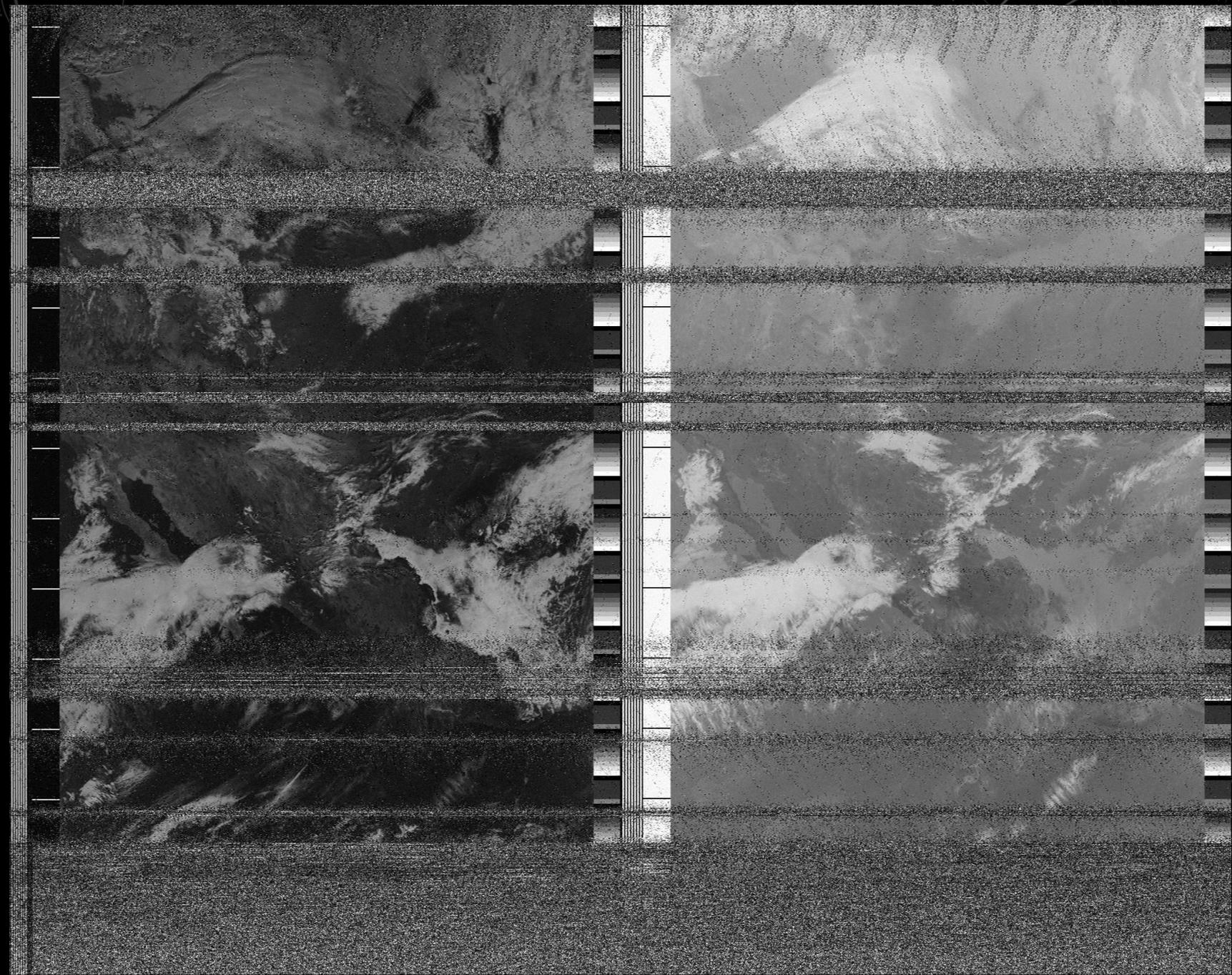
- You will receive images of the visible cloud cover in your region and IR images.
- The information that you receive will be more than just image data.
- You will also receive:
 - Information on which satellite was sending the data and when it was sent.
 - A representation of the visible area that you received data from
 - CBOR file (this is well above my head).
 - Russian – telemetry file
 - Russian – CADU file



RAW DATA

NOAA-18

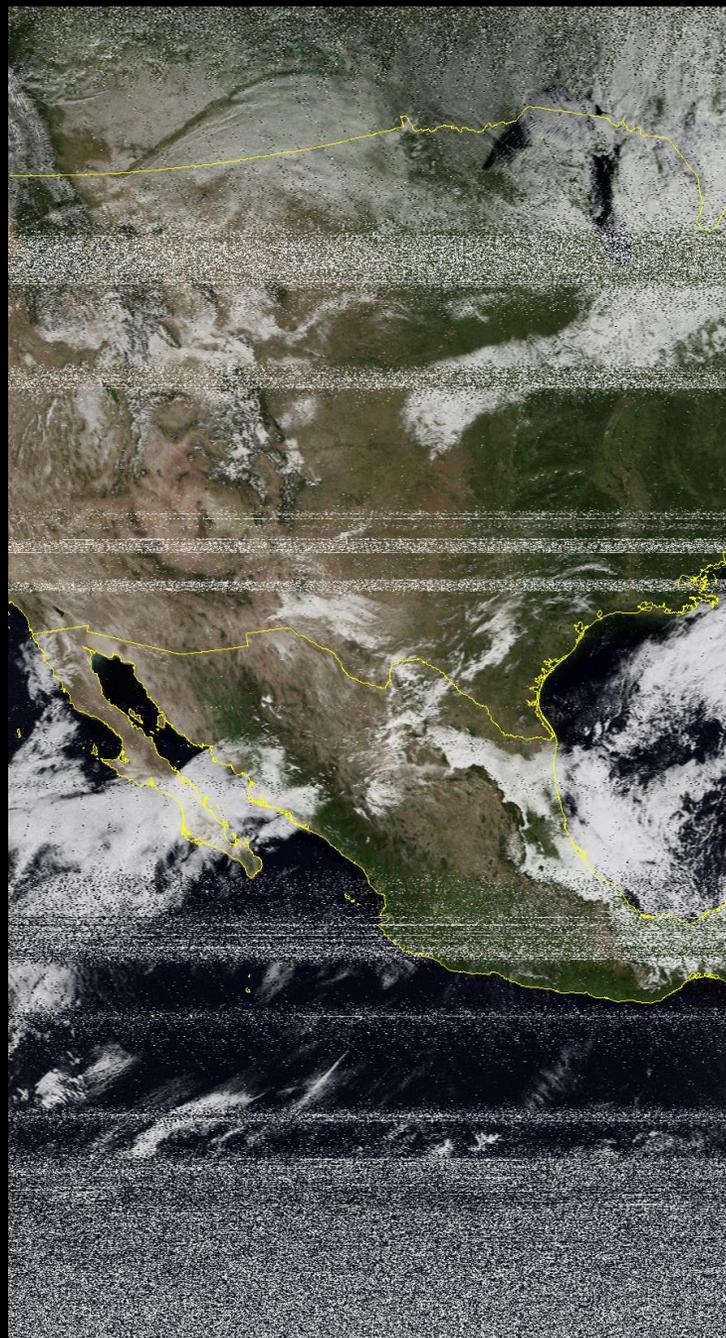
16 JAN 2025



VISIBLE MAP

NOAA-18

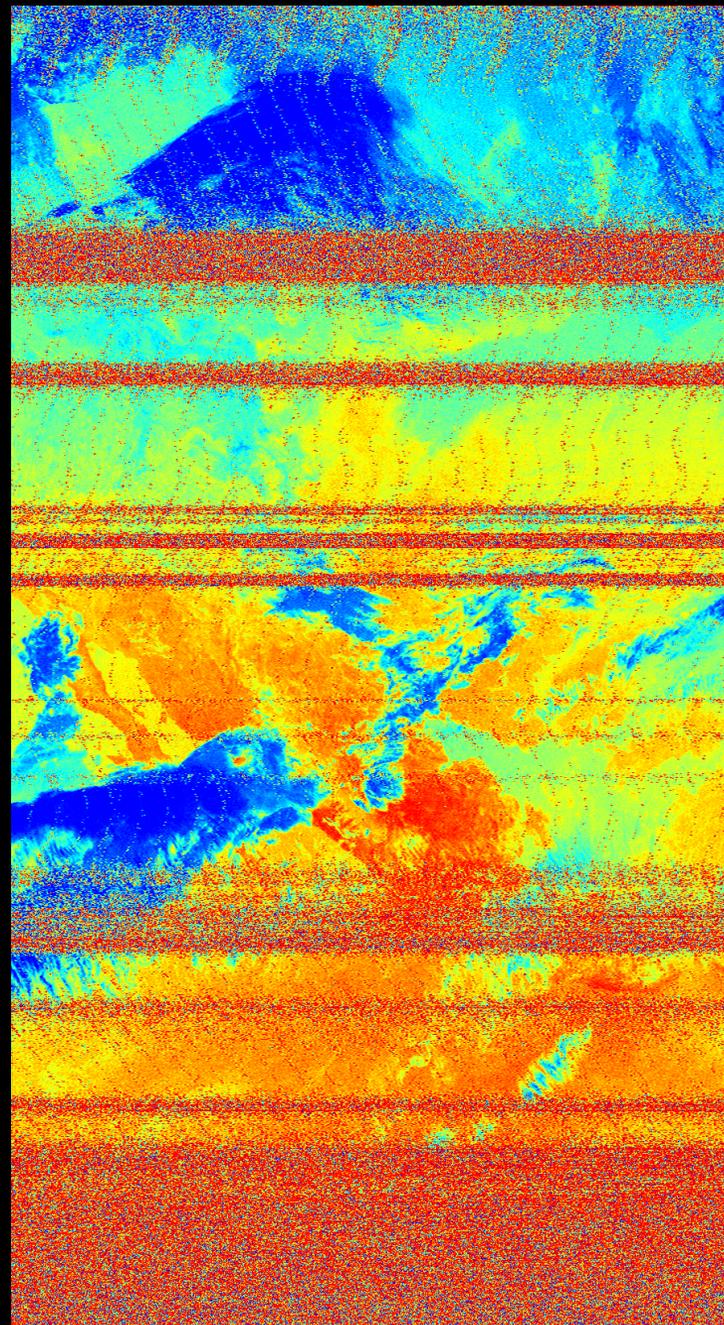
16 JAN 2025



IR MAP

NOAA-18

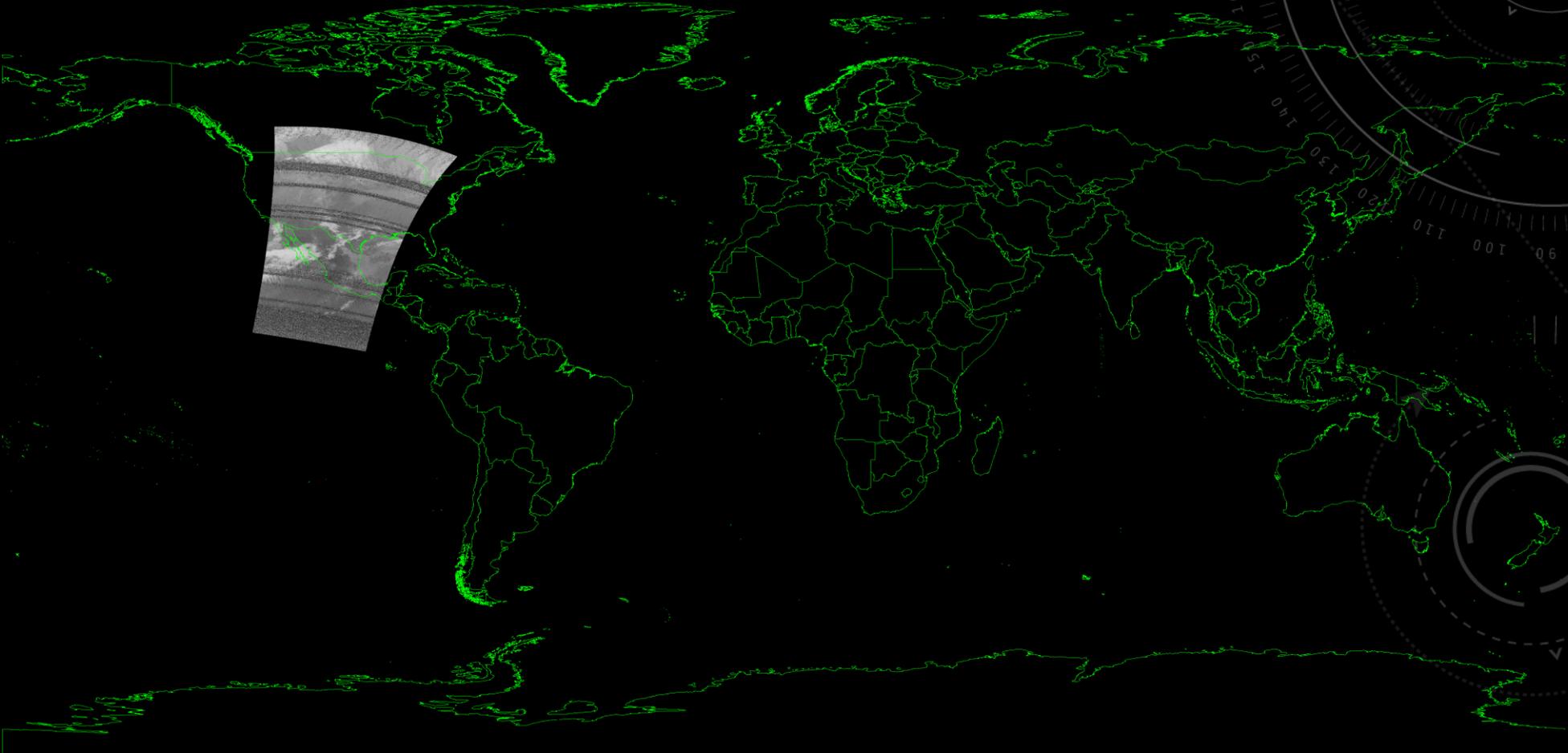
16 JAN 2025



FLYOVER MAP

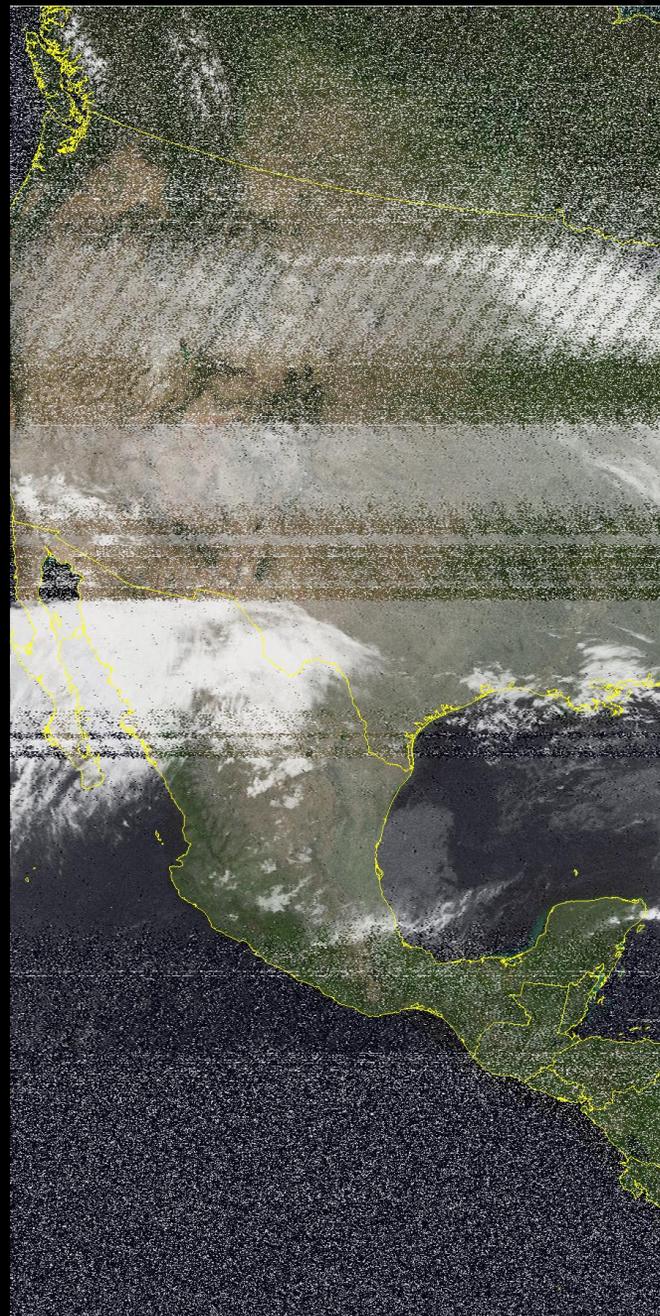
NOAA-18

16 JAN 2025



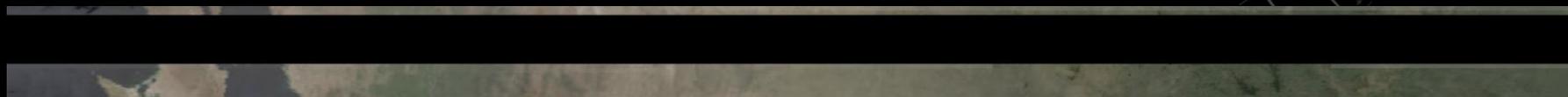
YOUR MILAGE MAY VARY

- NOAA-15
- 17 JAN 2025



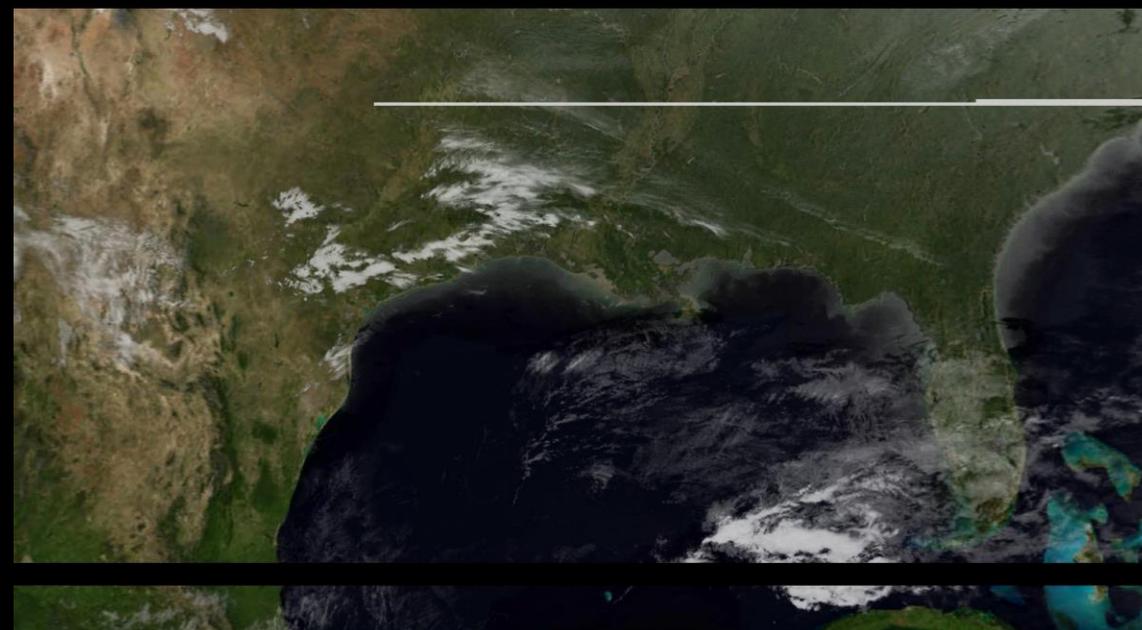
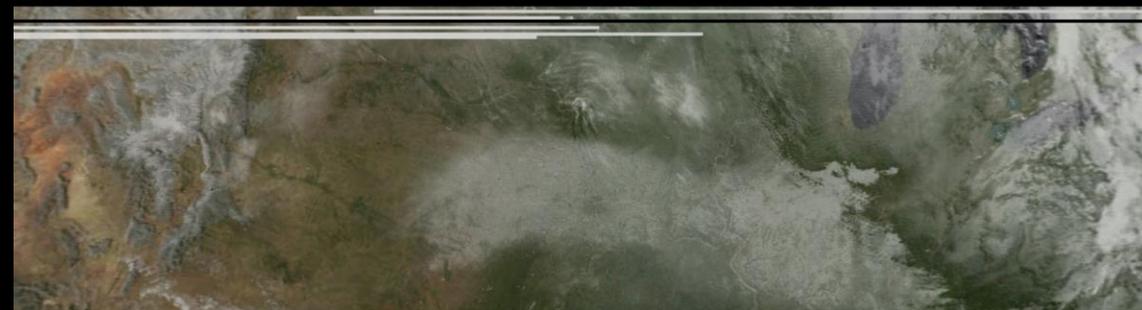
YOUR MILAGE MAY VARY

- METEOR M2-3
- 17 JAN 2025



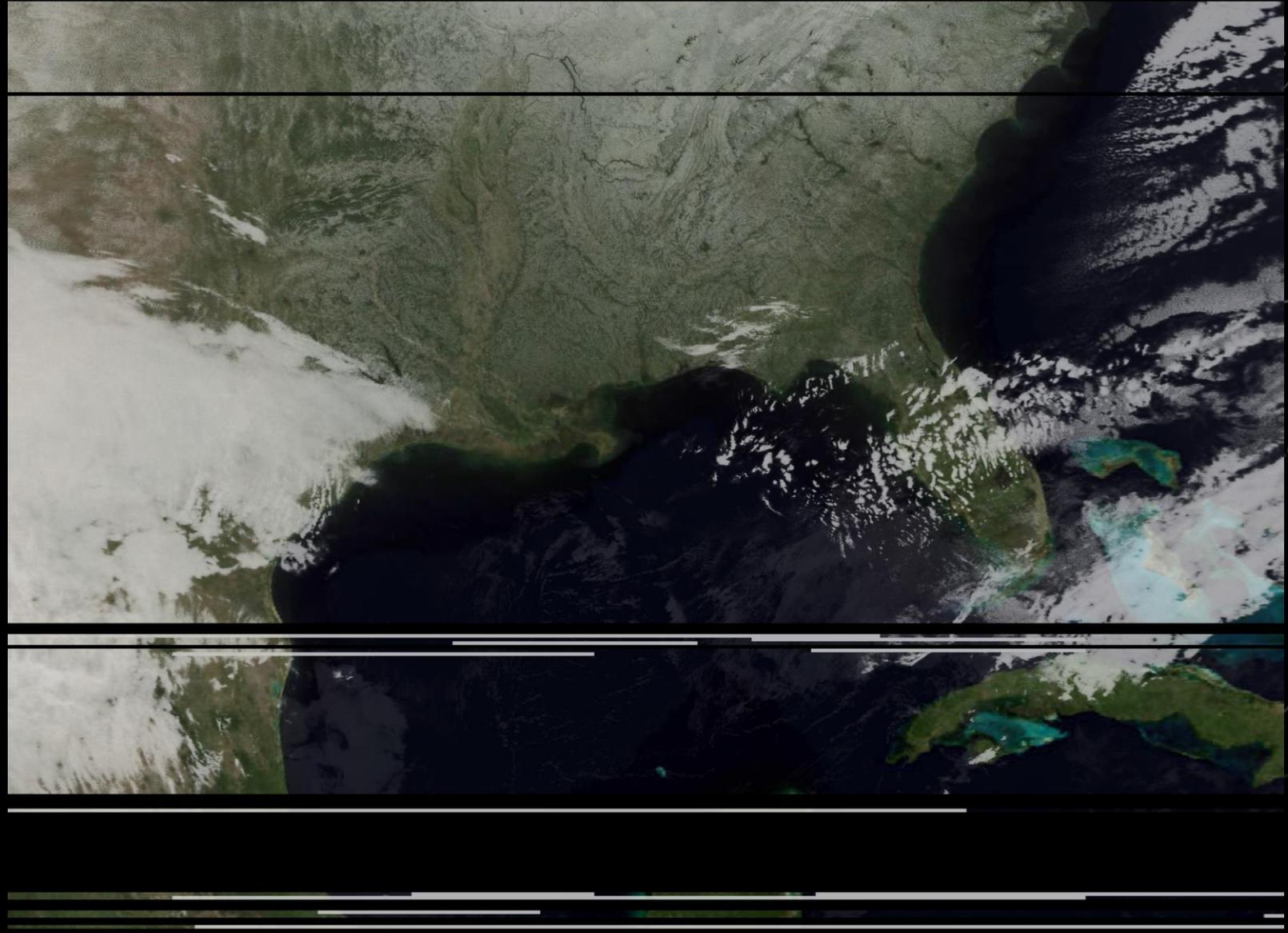
BUT SOMETIMES...

- METEOR M2-4
- 16 JAN 2025



BUT SOMETIMES...

- METEOR M2-4
- 17 JAN 2025



CLOSING THOUGHTS

- It is an interesting part of the amateur radio hobby
 - It is inexpensive to get into.
 - Could be beneficial in a temporary grid-down situation
 - It does require internet to generate satellite pass predictions.
- Additional Resources:
 - Ham Radio Crash Course (this is what I started from): <https://www.youtube.com/watch?v=3AN5-yDk7mE>
 - Another HRCC Video: <https://www.youtube.com/watch?v=PWWGDL5tC>
 - The antenna that I built: <https://www.rtl-sdr.com/simple-noaameteor-weather-satellite-antenna-137-mhz-v-dipole/>
 - Frequency Info: <https://leshamilton.co.uk/satfreq.htm>