

Intercepting Satellite Data with Trash



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Abstract

- General intro to satellite topics
- How to find free / cheap satellite equipment
- How to modify it
- What can you do with it?
- More resources on saveitforparts.com & YouTube

About Me:



- Grew up on an island in Alaska
- Other hobbies include tunnels, boats, hoarding
- Started YouTube as excuse to finish projects

Why Satellites?

- Got into Software Defined Radio (SDR) during Covid
 - Lots of sub-topics with SDR
 - Satellites just seemed “cool”
- SDR is cheaper / easier than ham radio
 - I've had a license for 20+ years, rarely use it
- Barrier to entry getting lower / cheaper all the time
 - Can assemble a ground station for < \$100

Why Dumpster Diving?

- I'm broke / cheap (“Save it for parts” childhood)
- I hate seeing stuff go to waste
- Sometimes only way to obtain certain equipment



Why Dumpster Diving?



- Disposal is often an overlooked part of security
- Leave it in the hallway / out back / on the sidewalk
- Maybe sell at auction, Craigslist, FB, etc
- Maybe bother to wipe storage, maybe not.

Where to look?

- College campuses
 - Indoors too!
 - Becoming slightly harder
- Commercial / industrial parks
- Demolition / remodeling sites
- TV & Radio stations
- ISPs / Phone companies
- Yuppie suburbs – trash days



Other Sources of Hardware

Government Surplus Auctions

Home / Consumer Goods / Office Furniture and Equipment / Communication/Electronic Equipment / Lot# 16988-786

1 / 18



MSTS FY25-058 Satellite Dish

\$10.00 USD (1 Bids)

Closes:

3d 19h (Mar 05, 2025 05:00 PM CST)

\$2.00 USD

Bid Increment

Sales/Lot Type:

Online Auction

Location:

Las Vegas, Nevada, USA

Subject to an auto-extension of the auction end time. ?

[Sign In to Place Bid](#)

[Sign In to Watch](#)

Other Sources of Hardware

Craigslist / Facebook Marketplace



Other Sources of Satellite Hardware

- Corporate auctions
- University Surplus
- Estate sales
- Ax-Man
- eBay
- DIY



Other Dumpster / Auction Finds

- Wearable / embedded devices (with user data)
- Credit card terminals
- Security camera (full of video)
- Networking gear with passwords
- Science Equipment
- Phones / Laptops
- Elevator keys
- Building plans
- Etc.



What Satellite Gear Can You Find?

- Rooftop Ku-band dishes (kind of boring)
- Old C-band dishes (looks cooler, bigger = better)
- Portable dishes – RV / boat / etc
- Satcom / uplink
- Geodesic Radome



DIY Antennas



What Good Are They?

“Normal” uses:

- FTA TV (boring)
- Ham radio
- Weather data
- ACARS etc
- Long-range Wifi



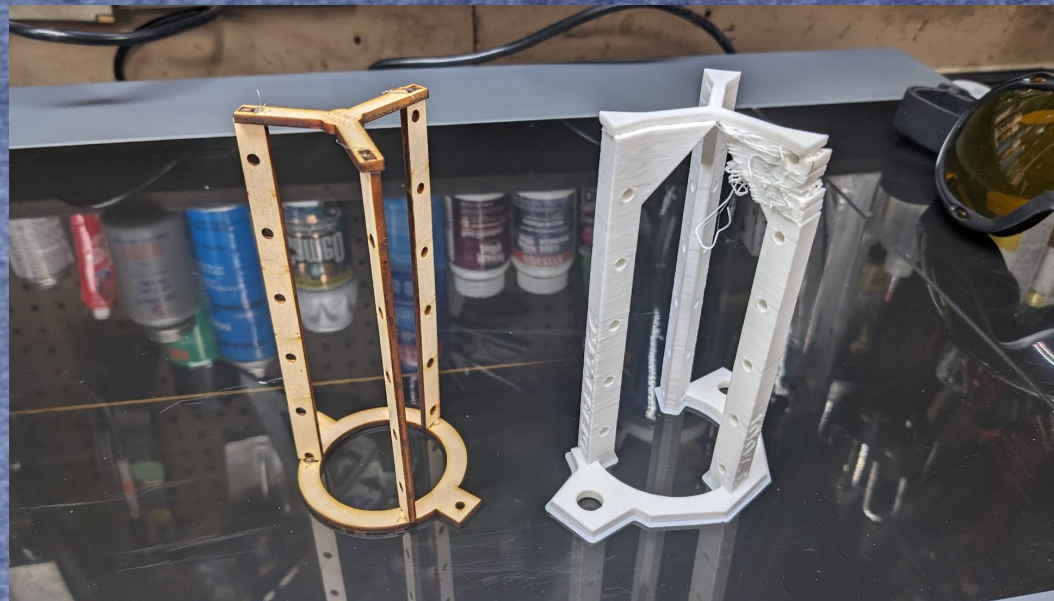
Less normal:

- Comms eavesdropping
- Encrypted stuff
- Abusing Military Satellites

Re-Purposing / Hacking

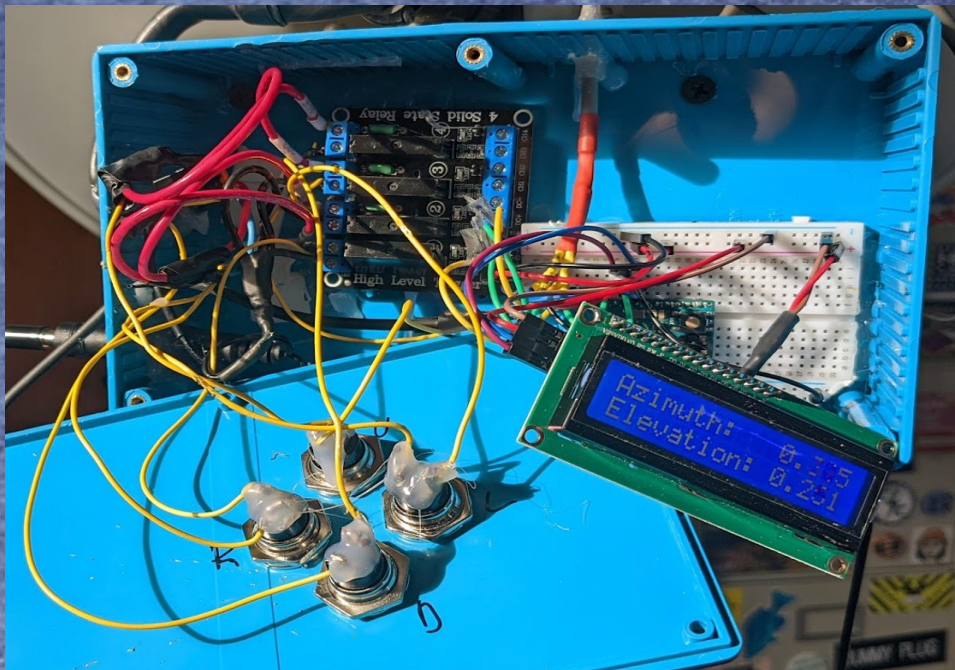
Modifications

- Re-program motorized dishes to track
- 3D print / laser cut new antenna elements
- Modify GPS antennas / remove filters
- Improve reception with cheap LNAs etc



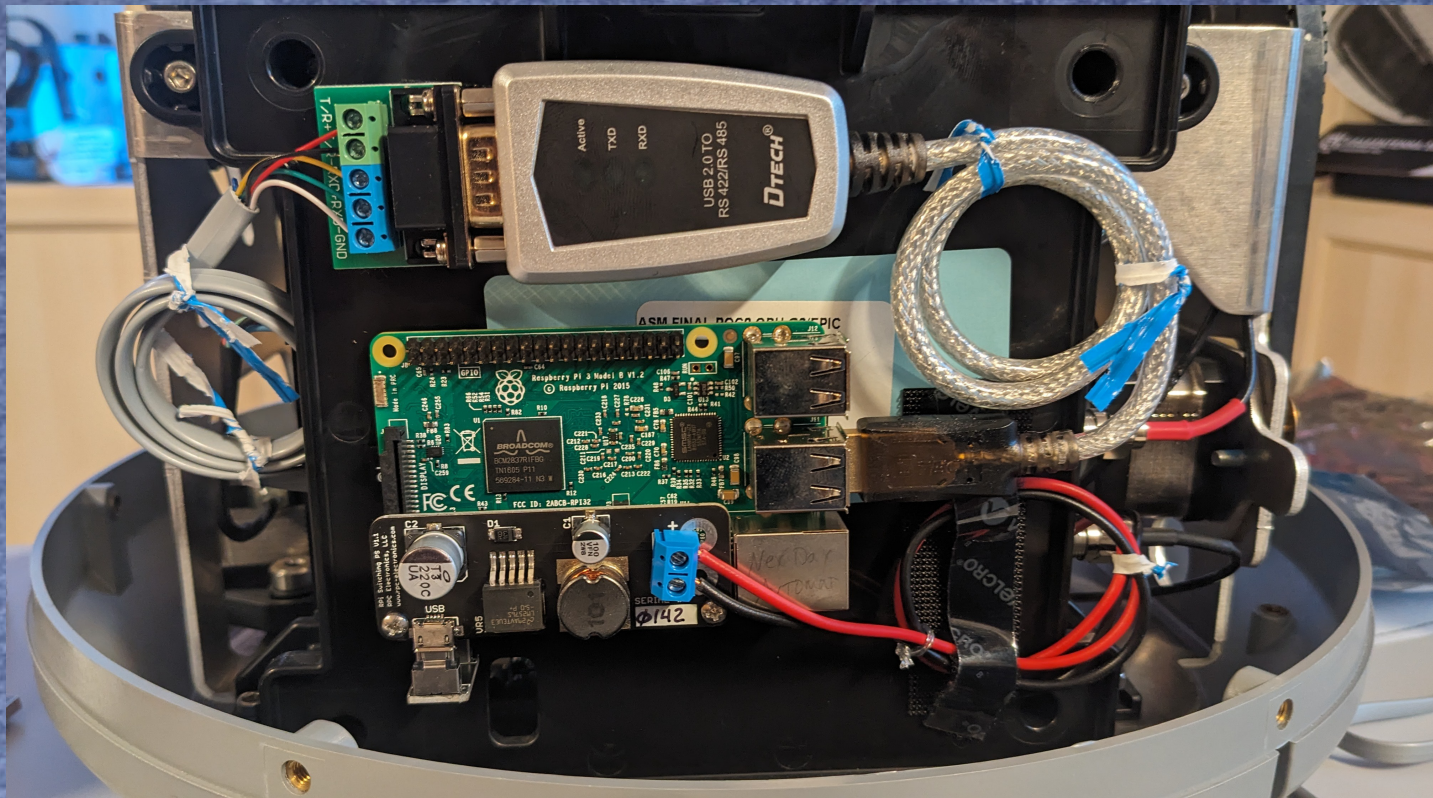
Re-Purposing / Hacking

- Azimuth / Elevation positioning
 - Commercial pointers usually polar / GEO
 - Pan/Tilt mounts
 - TV rotors
 - DIY solutions



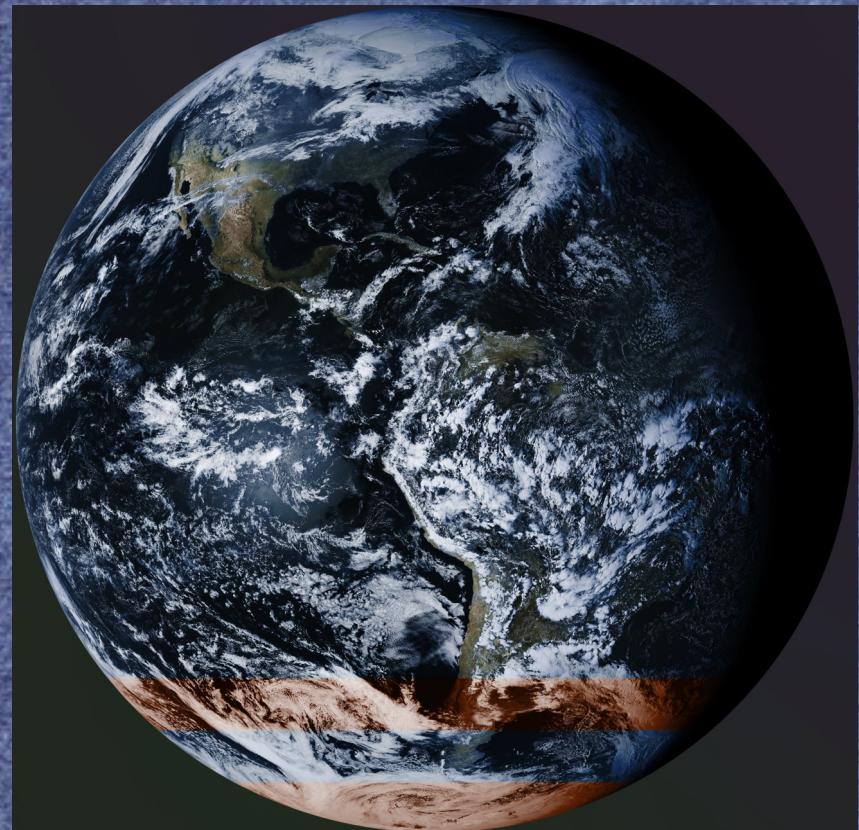
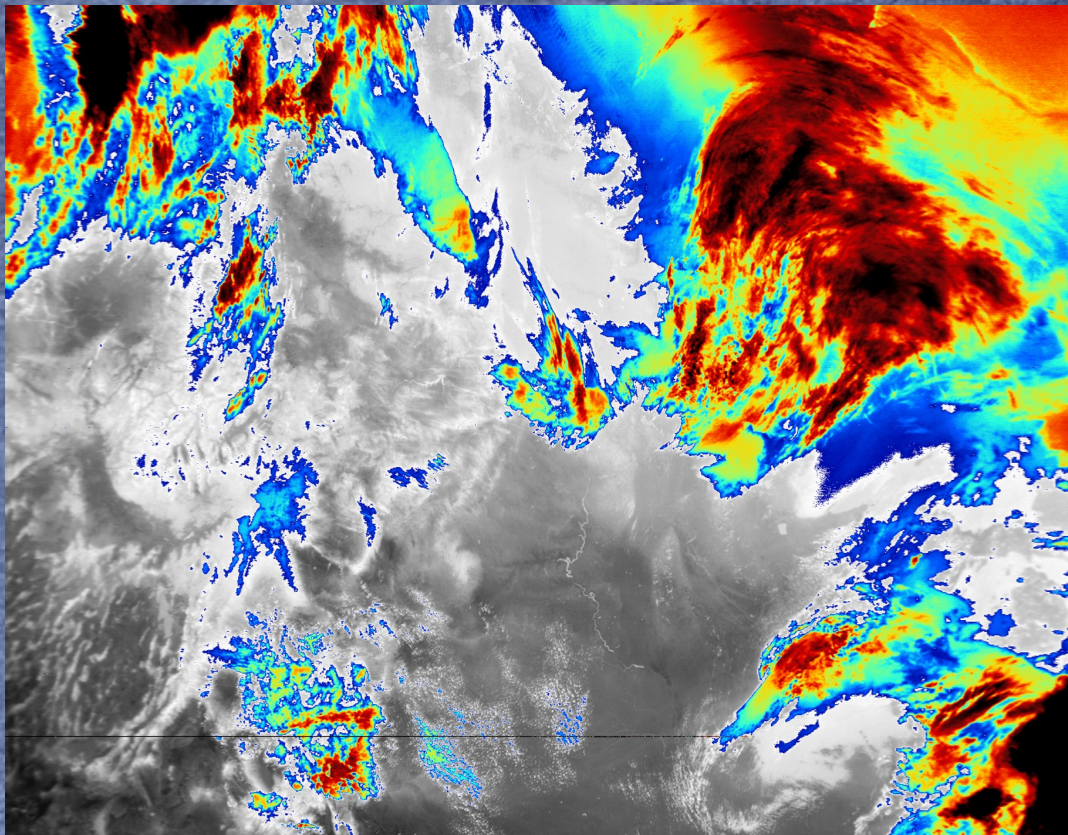
Re-Purposing / Hacking

- Frequently some kind of serial interface
- May or may not be hidden / obscure connector
- Can also do complete brain transplant



Example: Weather Satellites

- VHF band – easiest way to start
- Can get started with your phone and \$20 Baofeng
- Laptop and \$15 SDR



L-Band has some more options, not too difficult

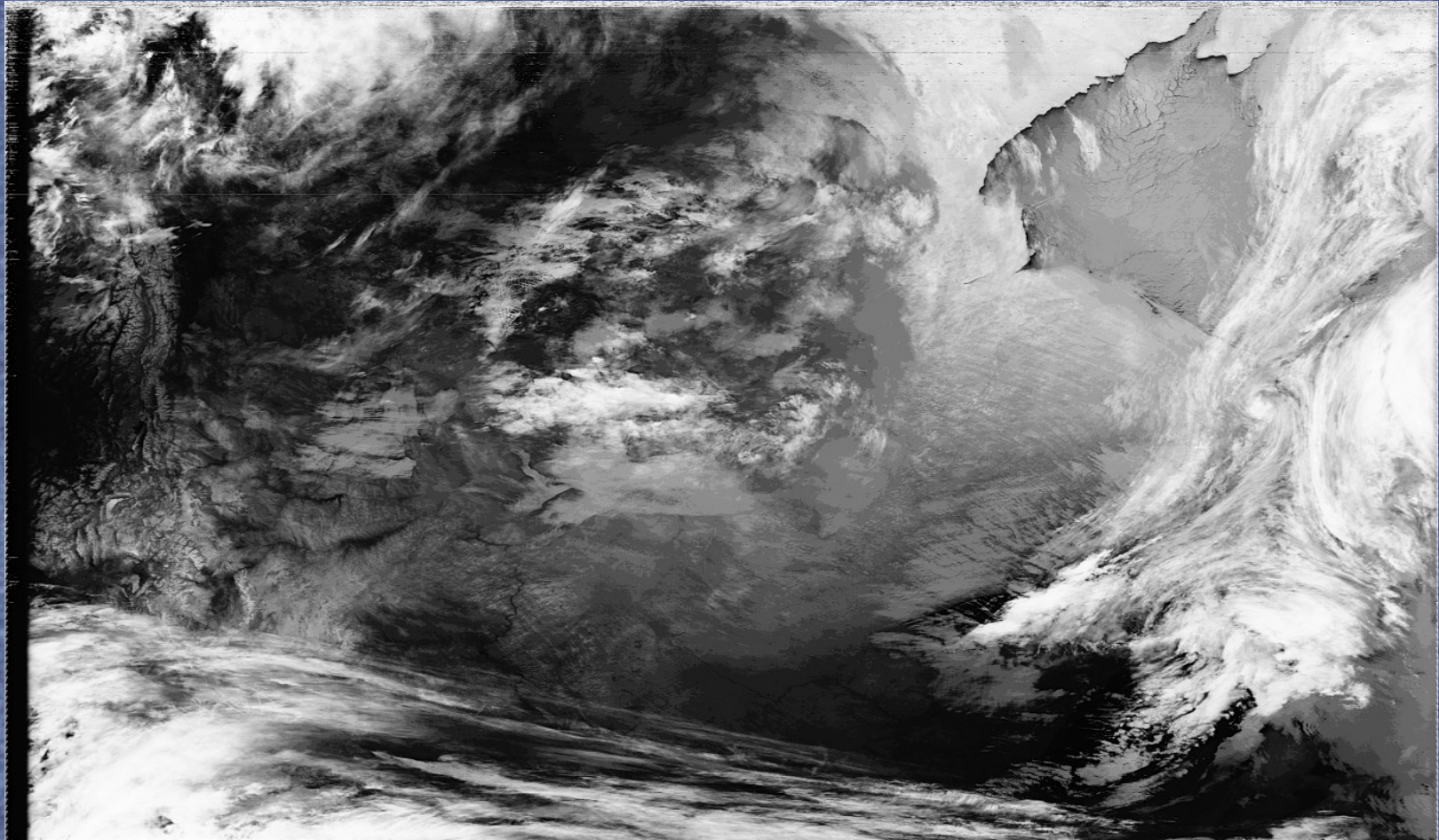


Example: Military Satellites

S-Band is more challenging to receive



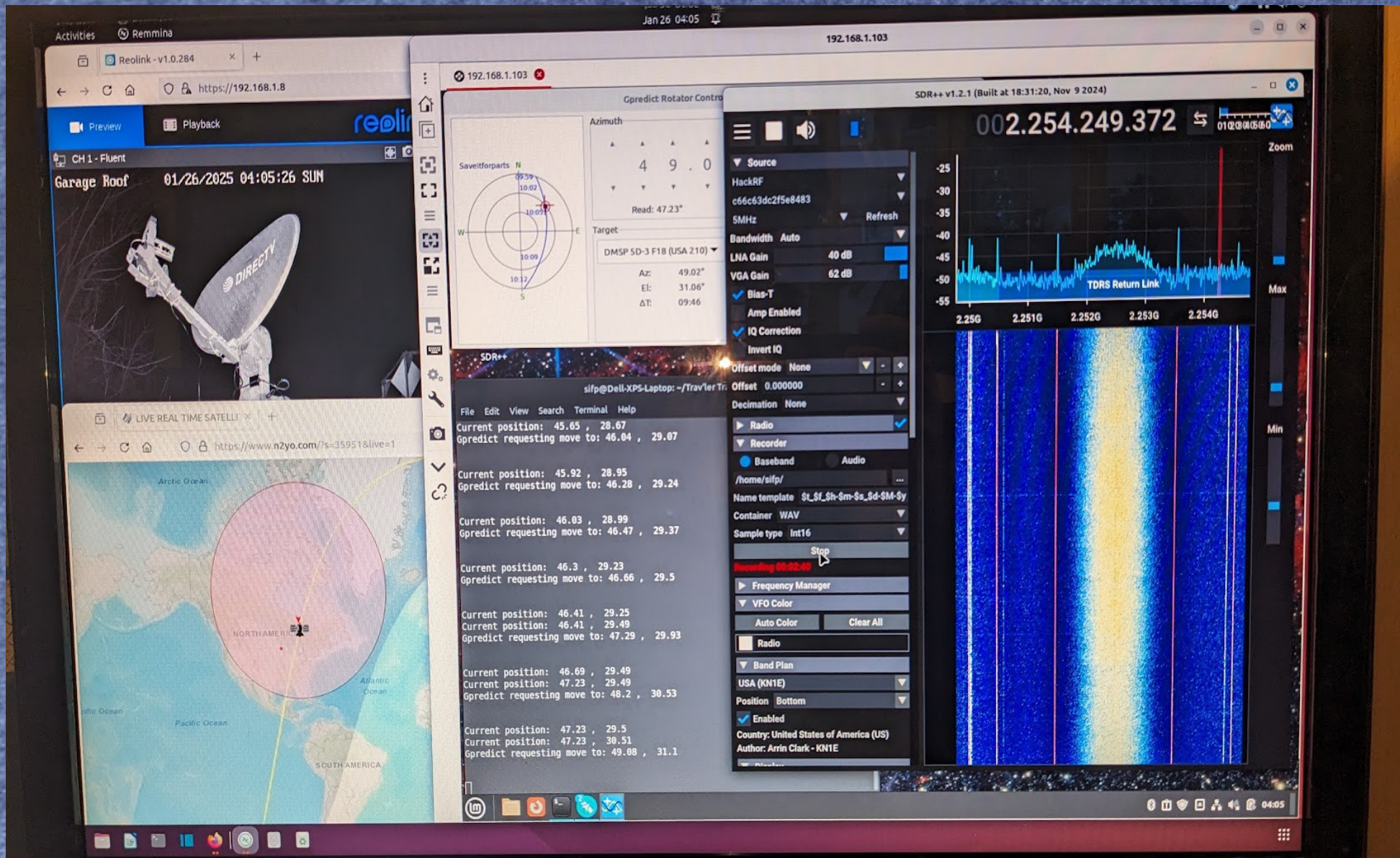
Example: Military Satellites



- DMSP Basics – Weather sat for spies
- Why does it decrypt? No one seems to know
- Newest system uses same(?) encryption

Example: Military Satellites

DIY Ground Control Station



Example: New Life for Old Tech

Commodore SX-64 on BBS via Inmarsat modem



Example: Iridium / Inmarsat Phones

- Not very secure, basically 2G cell phones
- Easy for small-time governments / groups to listen
- Lots of commercial “spy” products

[Main](#) » [Catalog](#) » [Satellite interception](#) » [Iridium Interceptor](#)

Iridium Satellite Interception System (ISI) [Print](#)



BEST PRICE

DISCOVERY
telecom

Iridium Satellite Interceptor

Main characteristics	
SKU	1211
Vendor	Intercept
Category	Satellite interception
Standart	Iridium
Frequency	L Band (1616–1626.5MHz)
System output	Voice, SMS in all languages, call related data
Power source	115/230V AC or 12/24V DC, 100W
Active range (m)	150000
OS	Windows
Decryption	Built In
Battery	Optional
Display	17" TFT, 1366 x 768
SMS(MMS)	in all languages
Antenna	Single, Active, Omni Directional
Q'ty of channels	32
Protocols	IMEI, TMSI, IMSI
Analogue Fax support	Yes
Management	API, IP
Dimensions, HWD	331 x 82 x 268 mm
Weight	7 kg



Example: Iridium / Inmarsat Phones

- Hobbyist-level gear
- Discovery Dish
- Open-Source decoders
- Legal gray area
- Savvy users will employ code phrases etc.



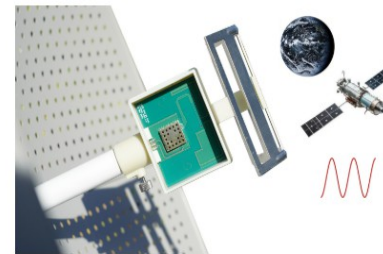
Discovery Dish (Dish & Mount Only)

A lightweight, 70 cm diameter parabolic reflector with pole/mast mounting bracket. The dish comprises three aluminum petals that require assembly with a screwdriver. This is the dish you combine it with a feed!

\$115 \$8 US Shipping / \$18 Worldwide

Orders placed now ship Feb 28, 2025.

Pre-order



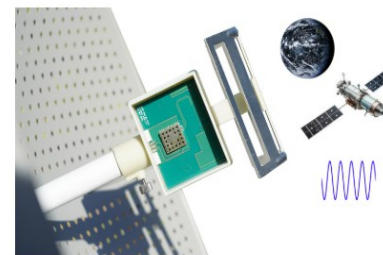
L-Band Weather Satellite Discovery Feed

A 1.69 GHz active and filtered feed in a waterproof enclosure for receiving data from FengYun-2 S-VISSR, Elektro-L LRIT and polar-orbiting HRPT satellites. Includes a feed guide and six meters of LMR240-equivalent coaxial cable. Discovery Dish is not included.

\$109 \$8 US Shipping / \$18 Worldwide

Orders placed now ship Feb 28, 2025.

Pre-order



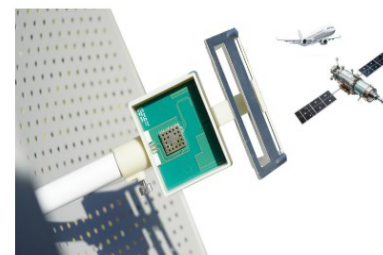
S-Band Discovery Feed

A 2.2 - 2.3 GHz active and filtered feed in a waterproof enclosure for receiving data from AERO. Includes the feed arm that fits into a Discovery Dish feed guide, as well as six meters of LMR240-equivalent coaxial cable. Discovery Dish is not included.

\$109 \$8 US Shipping / \$18 Worldwide

Orders placed now ship Feb 28, 2025.

Pre-order



Inmarsat Discovery Feed

A 1.525 - 1.660 GHz active and filtered feed in a waterproof enclosure for receiving data from AERO. Includes the feed arm that fits into a Discovery Dish feed guide and six meters of LMR240-equivalent coaxial cable. Discovery Dish not included.

\$109 \$8 US Shipping / \$18 Worldwide

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Pre-order

Example: Space Pirates

- FLTSATCOM Overview
- No one expected radios to be so cheap
- Russian propaganda, music
- Hunters & fishermen
- Brazil truckers & loggers
- European user base
- Rumors of US use, MP3s
- Good way to get a “visit”



Example: Satellite Internet Interception

- How it works (wide vs spot beams)
- No encryption by default – up to the end user
- Some legacy systems with old / flawed protocols
- Older protocols modified from video streams
- DOS attacks / “accidents”



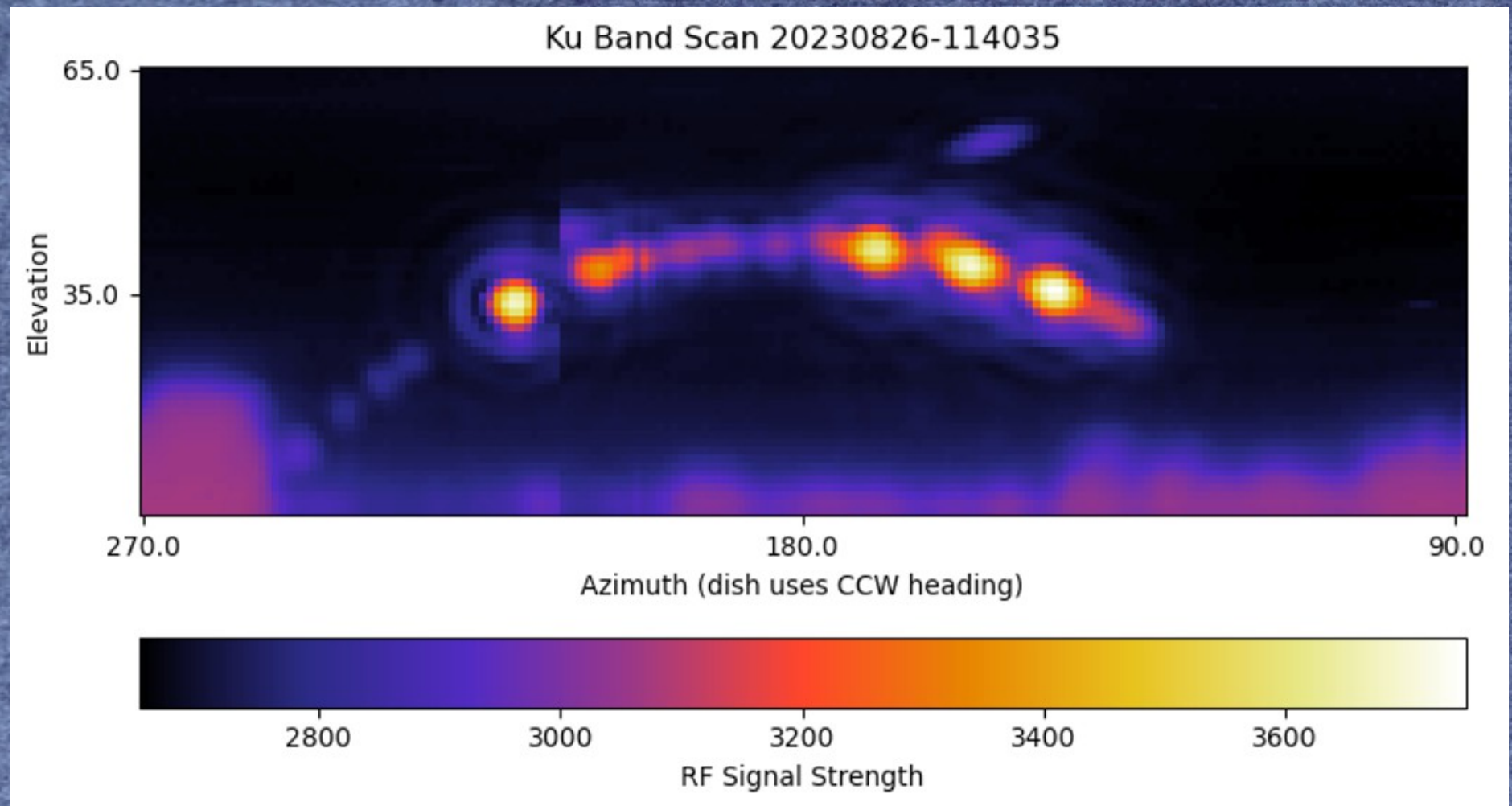
Example: Microwave Imaging

- X/Y image plotter for radio heatmaps
- Great use for small portable antennas

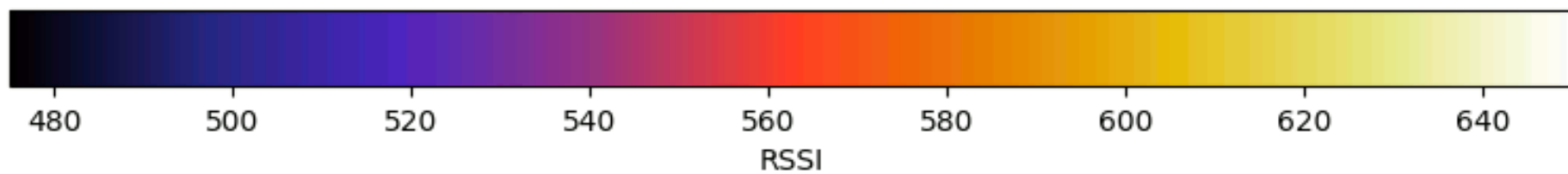
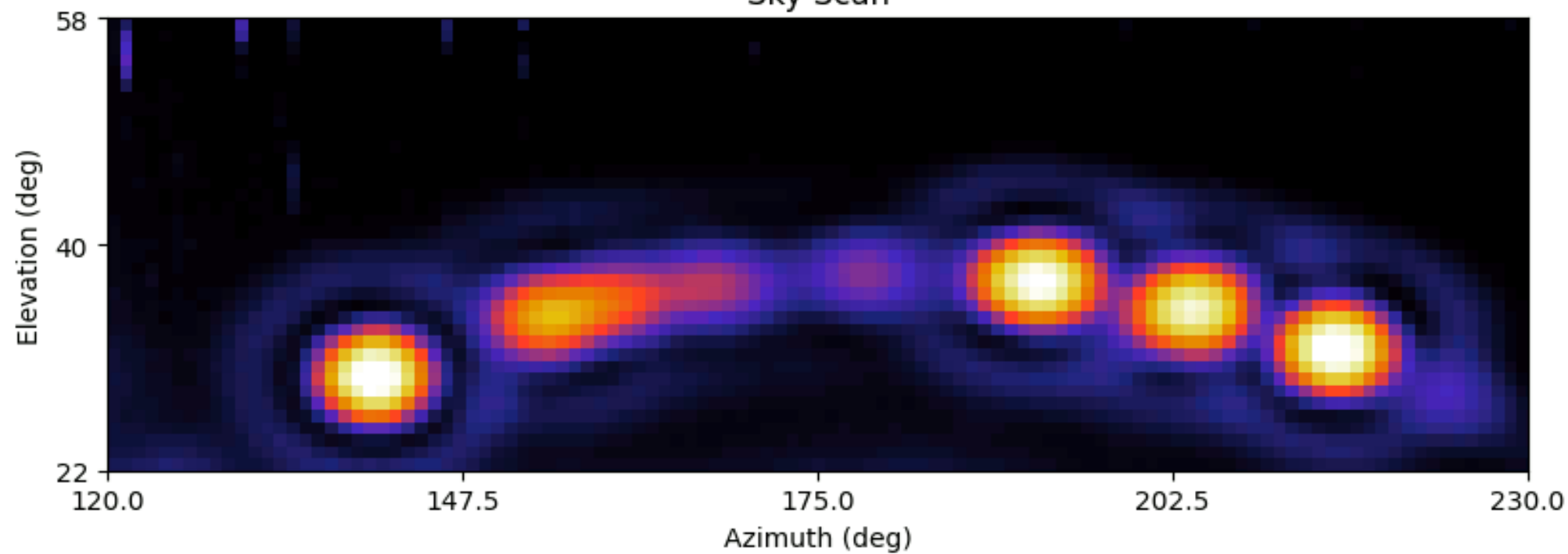


Example: Microwave Imaging

“See” satellites in Clarke Belt

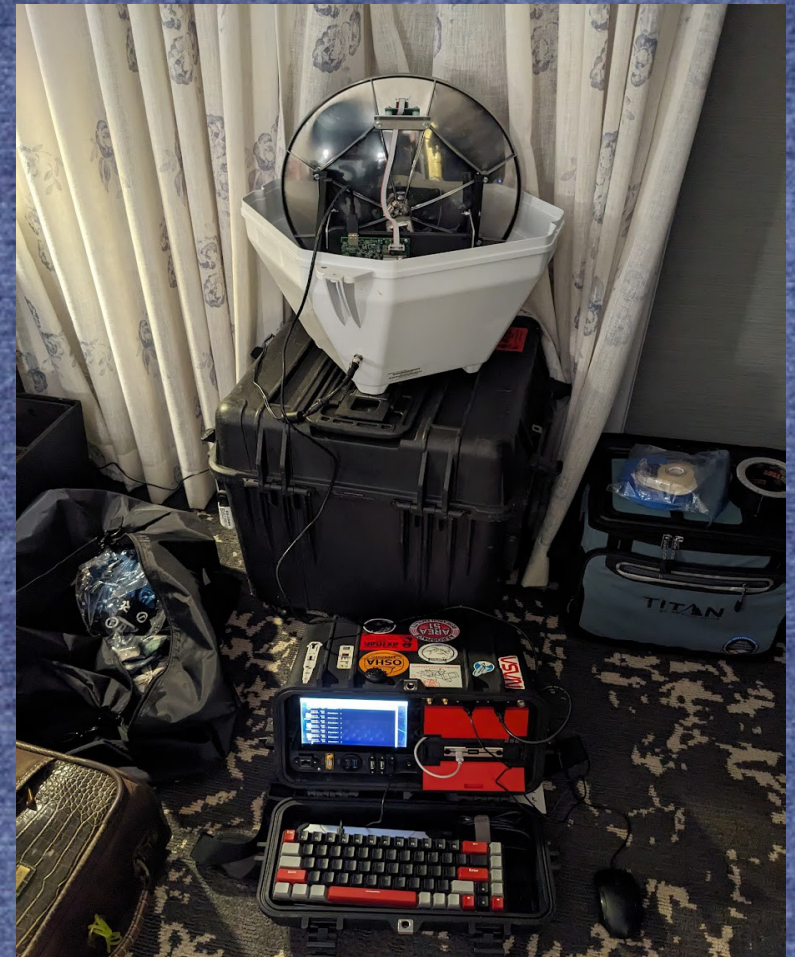
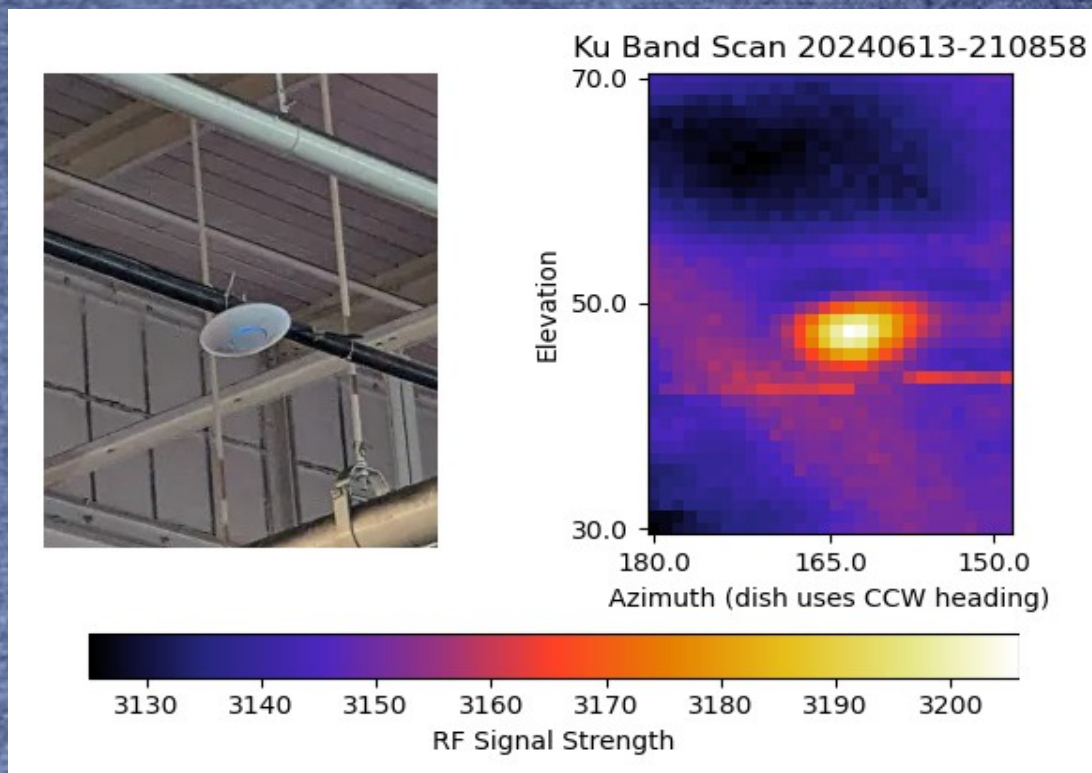


Sky Scan



Example: Microwave Imaging

- Wi-Fi harmonics in Ku-band
- Locate hotspots and signal coverage
- Confuse hotel staff



Other Satellite Applications

- SkyGrabber – “maybe” less useful in https era
- Blockstream
- Tootsheh
- Othernet / Wikipedia
- Wild Feeds
- Radio Astronomy
- “Zombie” sats



What Are My Future Plans?

- Radome build-out
- Radio Astronomy
- X-Band (\$\$\$)
- Weird job offers
- More YouTube Nonsense



Any Questions?

