INTERNATIONAL SPACE STATION (IIS) SLOW SCAN TV BROADCAST (SSTV) 2021

4 JAN 22

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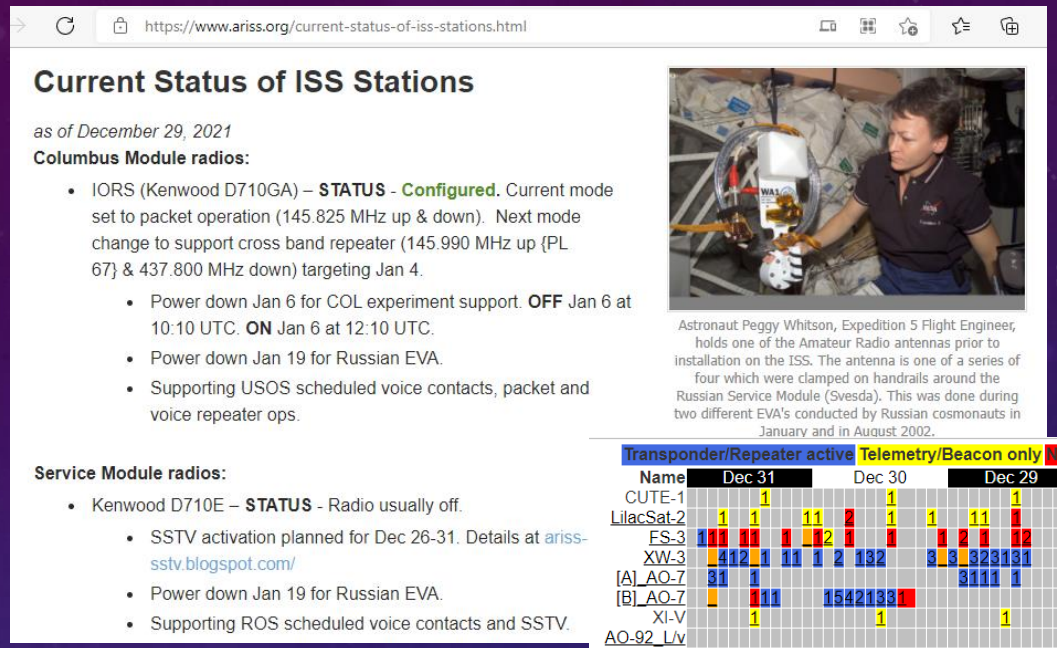
FACTOIDS

- Size of a Football field
- 1st ISS component launched 1998
  - 22+ years of continuous human occupation
- ~261 miles above the Earth – 93 min orbit
  - Low compared to Geostationary satellites ~ 22,000 miles
- Living area about the size of a 6-bedroom house
- 3rd brightest object in the night sky
- Easy to spot and track at night
  - Location and altitude vary

ISS RADIO

- ISS Broadcast 12 SSTV images
  - From the Russian module
  - Usually over Christmas week
  - Frequency for SSTV 145.800 MHz
  - 2 Minutes per image 1 Minute rest
- ISS has many radios and modes
  - FM U/V Repeater, APRS etc
- IIS radios are not always on – Check first
  - Turned off when docking etc
  - Check websites:
    - Current Status of ISS Stations – ARISS
    - AMSAT OSCAR Satellite Status
      - Many Satellites not just ISS



https://www.ariss.org/current-status-of-iss-stations.html

Current Status of ISS Stations

as of December 29, 2021

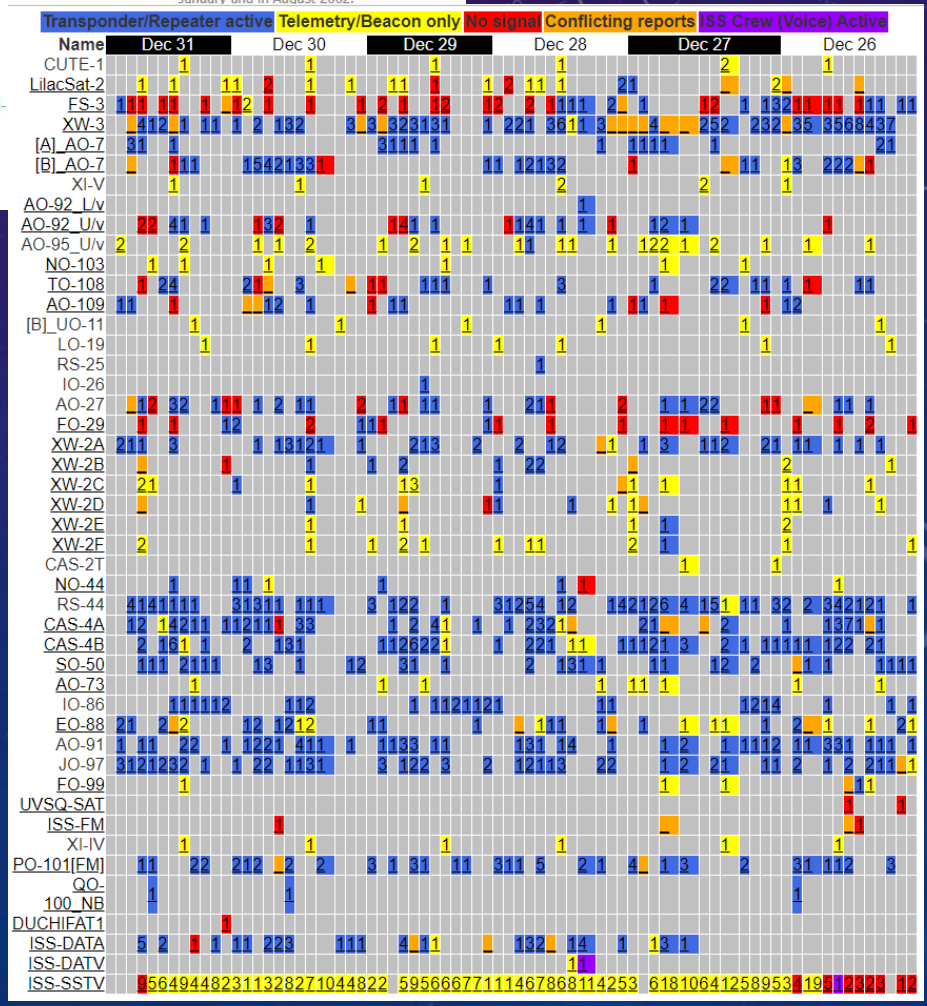
Columbus Module radios:

- IORS (Kenwood D710GA) – **STATUS** - **Configured.** Current mode set to packet operation (145.825 MHz up & down). Next mode change to support cross band repeater (145.990 MHz up {PL 67} & 437.800 MHz down) targeting Jan 4.
  - Power down Jan 6 for COL experiment support. **OFF** Jan 6 at 10:10 UTC. **ON** Jan 6 at 12:10 UTC.
  - Power down Jan 19 for Russian EVA.
  - Supporting USOS scheduled voice contacts, packet and voice repeater ops.

Service Module radios:

- Kenwood D710E – **STATUS** - Radio usually off.
  - SSTV activation planned for Dec 26-31. Details at ariss-sstv.blogspot.com/
  - Power down Jan 19 for Russian EVA.
  - Supporting ROS scheduled voice contacts and SSTV.

Astronaut Peggy Whitson, Expedition 5 Flight Engineer, holds one of the Amateur Radio antennas prior to installation on the ISS. The antenna is one of a series of four which were clamped on handrails around the Russian Service Module (Svesda). This was done during two different EVA's conducted by Russian cosmonauts in January and in August 2002.



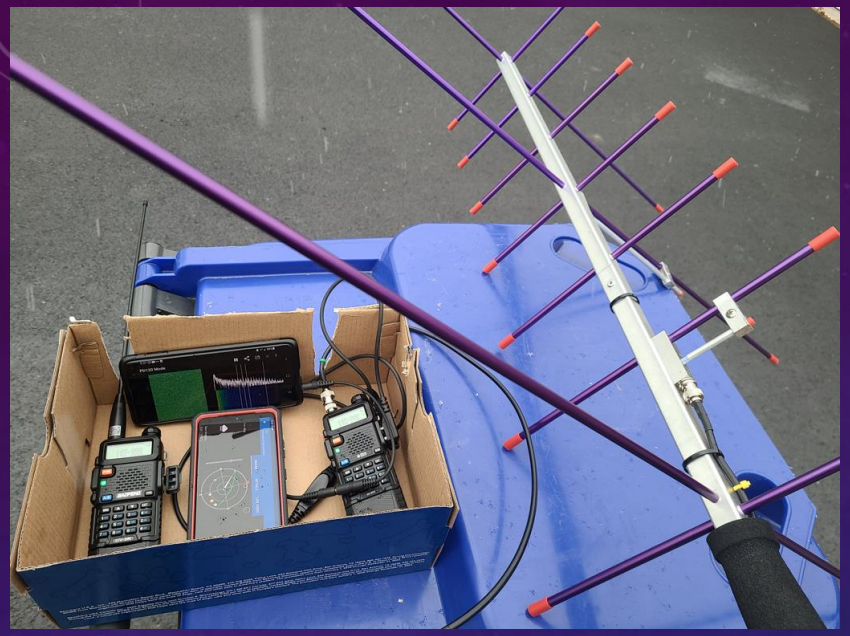
Transponder/Repeater active | Telemetry/Beacon only | No signal | Conflicting reports | ISS Crew (Voice) Active

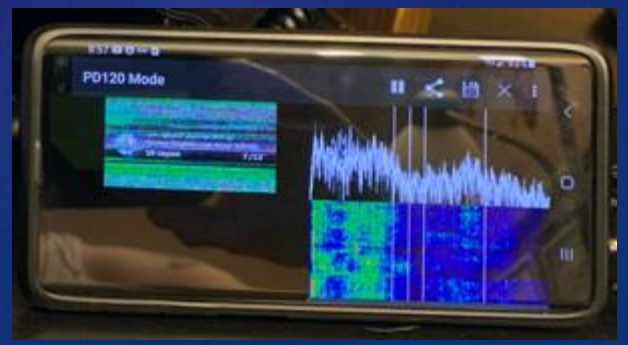
Name | Dec 31 | Dec 30 | Dec 29 | Dec 28 | Dec 27 | Dec 26

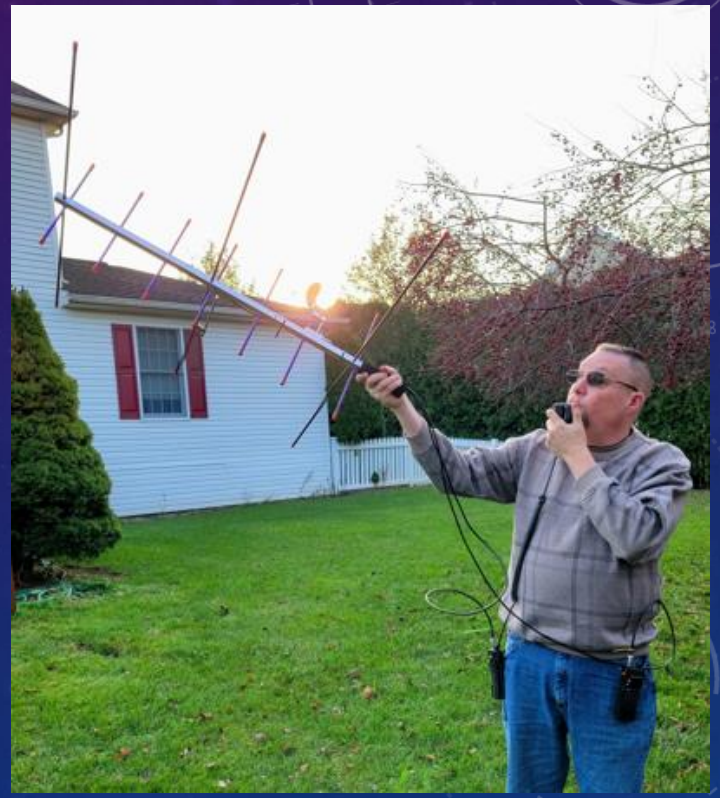
CUTE-1
LilacSat-2
FS-3
XW-3
[A]_AO-7
[B]_AO-7
XI-V
AO-92_L/v
AO-92_U/v
AO-95_U/v
NO-103
TO-108
AO-109
[B]_UO-11
LO-19
RS-25
IO-26
AO-27
FO-29
XW-2A
XW-2B
XW-2C
XW-2D
XW-2E
XW-2F
CAS-2T
NO-44
RS-44
CAS-4A
CAS-4B
SO-50
AO-73
IO-86
FO-88
AO-91
JO-97
FO-99
UVSQ-SAT
ISS-FM
XI-IV
PO-101[FM]
QO-100_NB
DUCHIFAT1
ISS-DATA
ISS-DATV
ISS-SSTV

EQUIPMENT

- Baofeng UV-5R HT
- BTECH UV-5x3 HT (need 1)
- Baofeng APRS Audio cable
- Free Android apps:
  - ISS Detector
  - Robot36
- Arrow Handheld UHF VHF Antenna
- 2 Cell phones. Old ones with WiFi okay

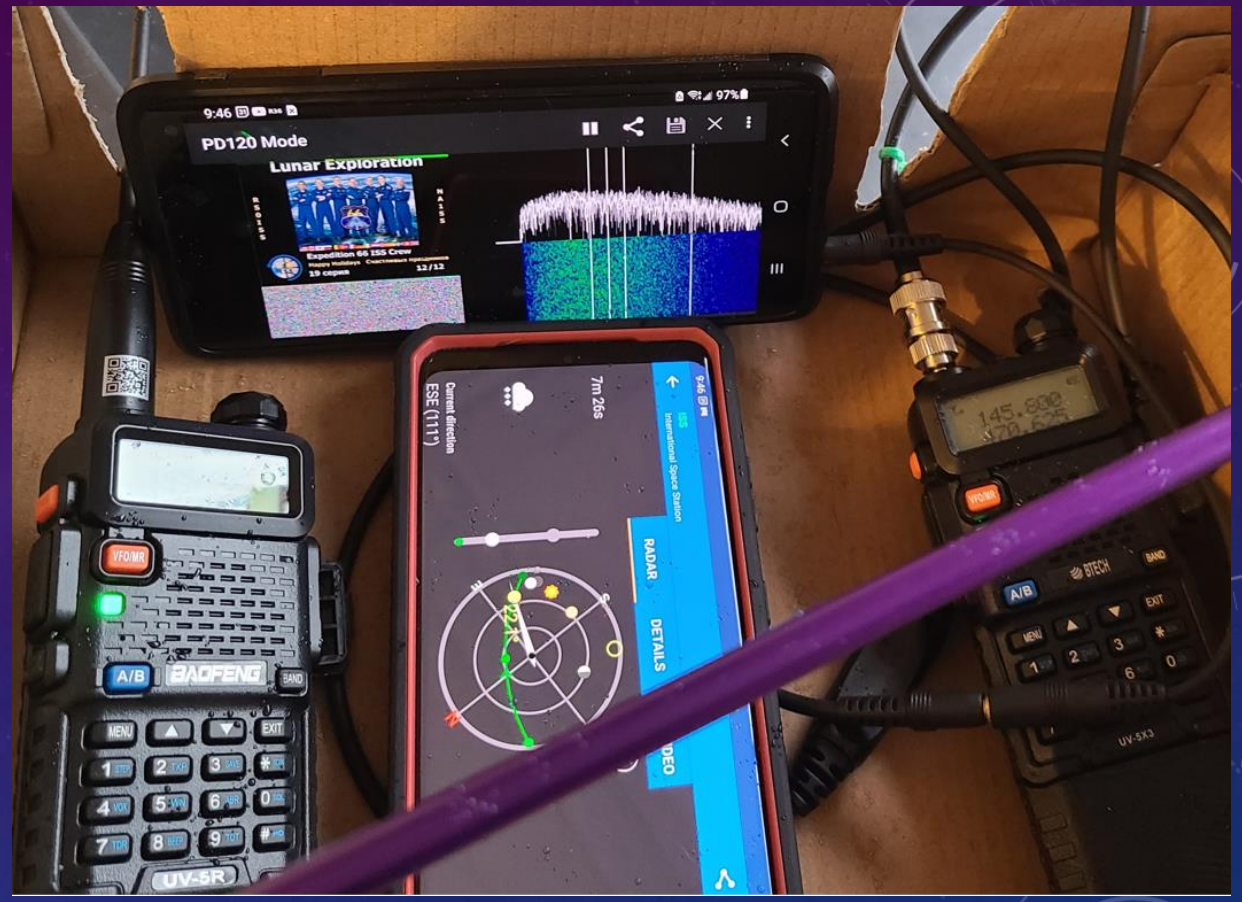






SUCCESSFUL CONNECTIONS

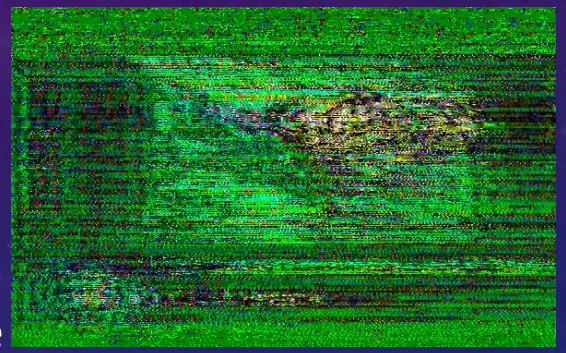
- Connect Audio cable to Android cell phone
- Set Robots36 Mode to the PD-120 Standards Protocol
- Load the ISS Tracking app – look for pass greater than 35 degrees. Higher the better
- Tune to 145.800 MHz (no Doppler adjustments)
- With calibrated phone compass, the tracking app tells you exactly where to point the antenna.
- Once you see the received signal keep the frequency spectrum graph clean and follow track for ~2 minutes to capture the full image.
- If you get only a partial image, wait one minute and another image will start, hit the X Icon to start a new image capture.



CAPTURED IMAGES OVER MULTIPLE ORBITS

NOT SO SUCCESSFUL CONNECTIONS & OPTIONS

- Robots36 can use the microphone to receive audio
  - Eliminates need for the Baofeng Audio cable
  - Blurry images resulted in my trials
- Using Shack transceiver with fixed Quarter-Wave VHF antenna
  - Received good signal on high pass (80 deg) but unable to sustain connection.
- Audio can be recorded and played back into the software with less ambient noise
- Can use Rubber Duck or 19” whip antenna.
  - Keep perpendicular to ISS as you track



AWARD

- Upload Image to website
- Fill out form
- Validated/verified contact
- Emailed award

QUESTIONS?