ISS SSTV and APRS with homebrew portable setup

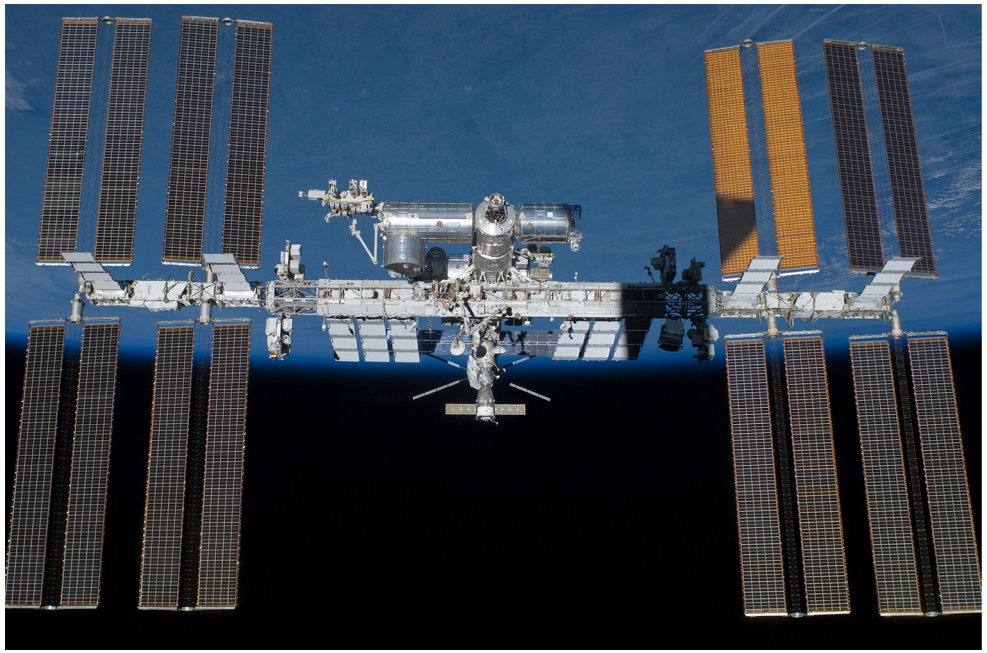
9V1DT

Padmanabhan (Padhu) Sampath

Overview

- ISS SSTV and APRS
- Fram2 Ham mission

ISS Amateur Radio

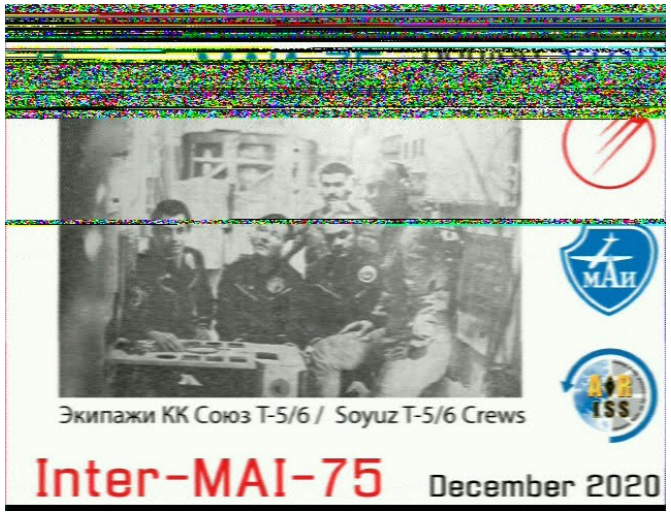


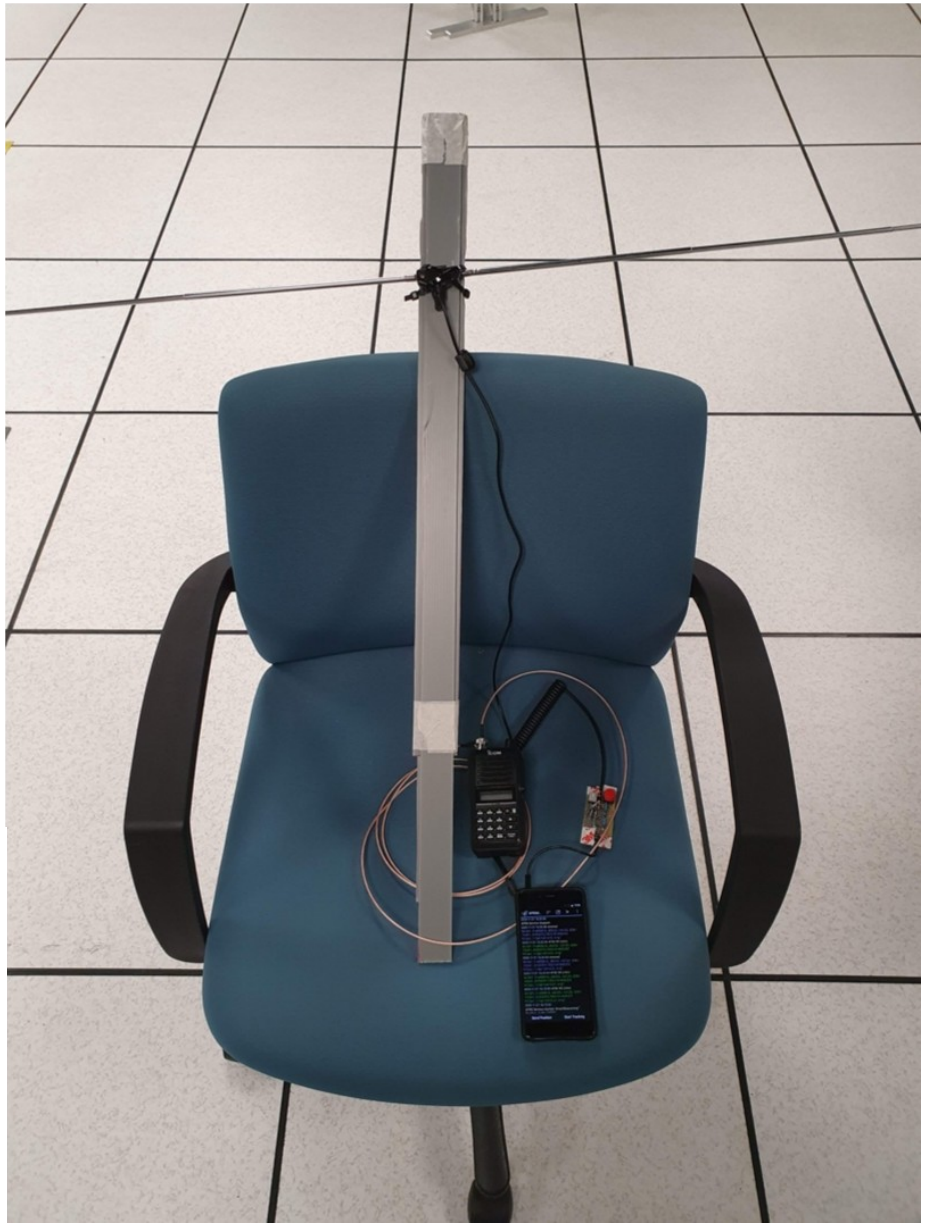
ISS radio modes

1. Cross band: voice repeater
2. VHF APRS
3. VHF SSTV

TM-D710GA amateur radio equipment

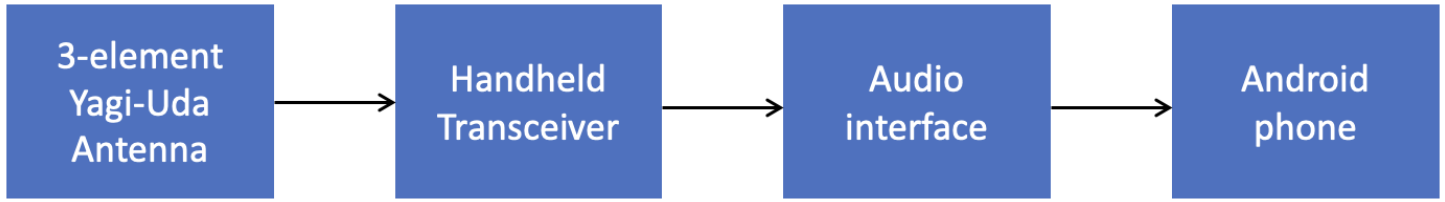
Barebones setup





First APRS setup

Homebrew SSTV



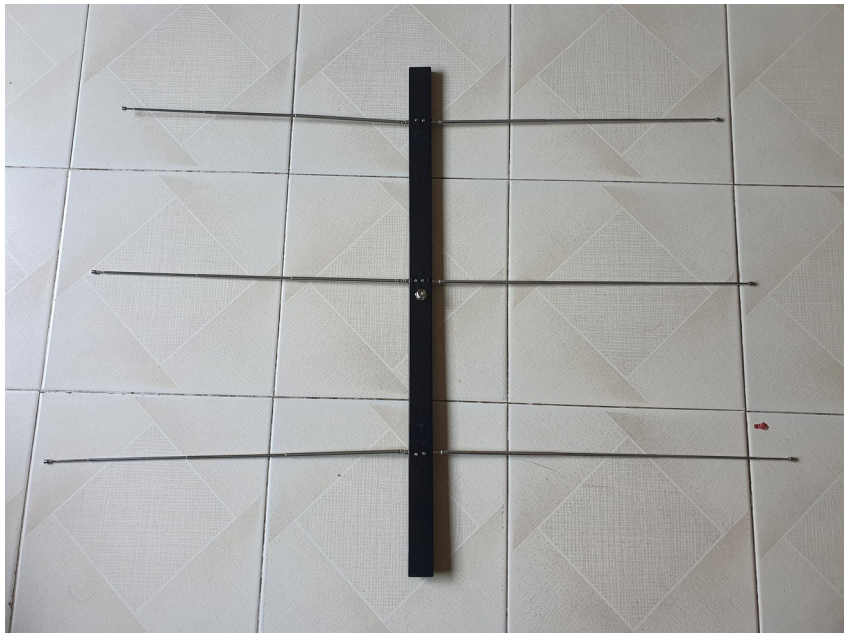
Android phone apps:

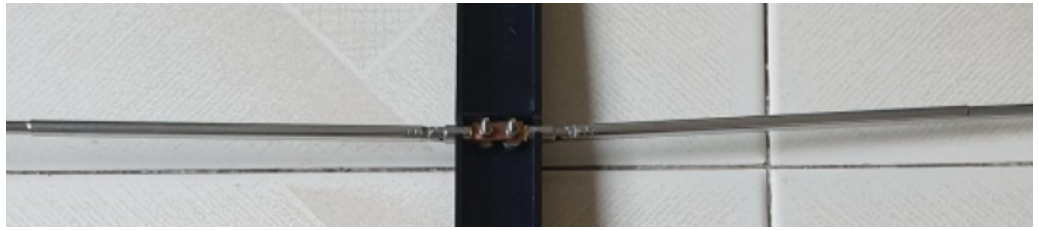
- Robot36 – SSTV decoder
- Heavens Above – Satellite tracker

https://padmanabhan-sampath.github.io/jekyll/update/2024/05/26/iss-sstv-yagi.html

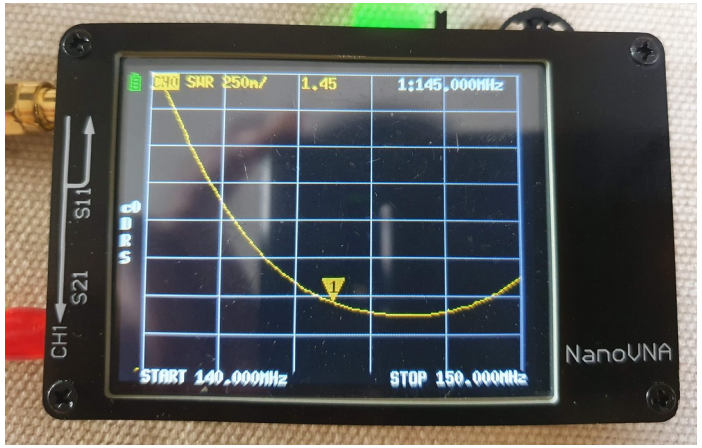
Collapsable Yagi-Uda antenna

Telescopic antenna as Yagi elements

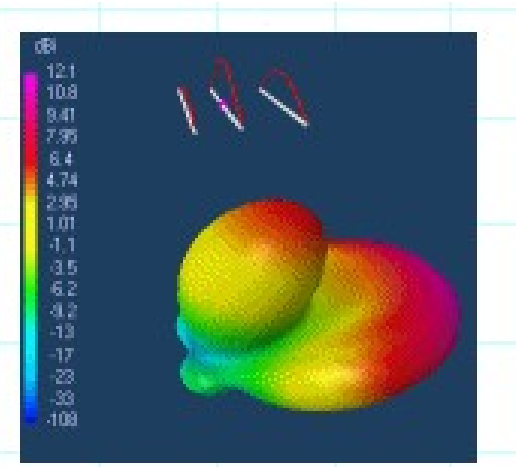




Backpack-Yagi-Uda-Antenna.

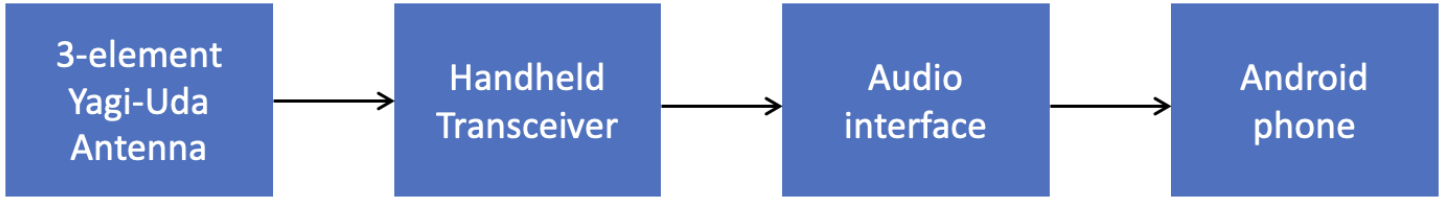


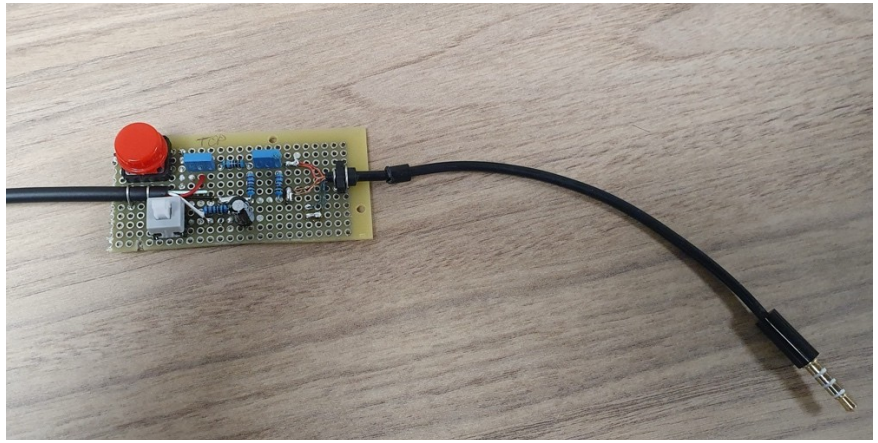
Good SWR

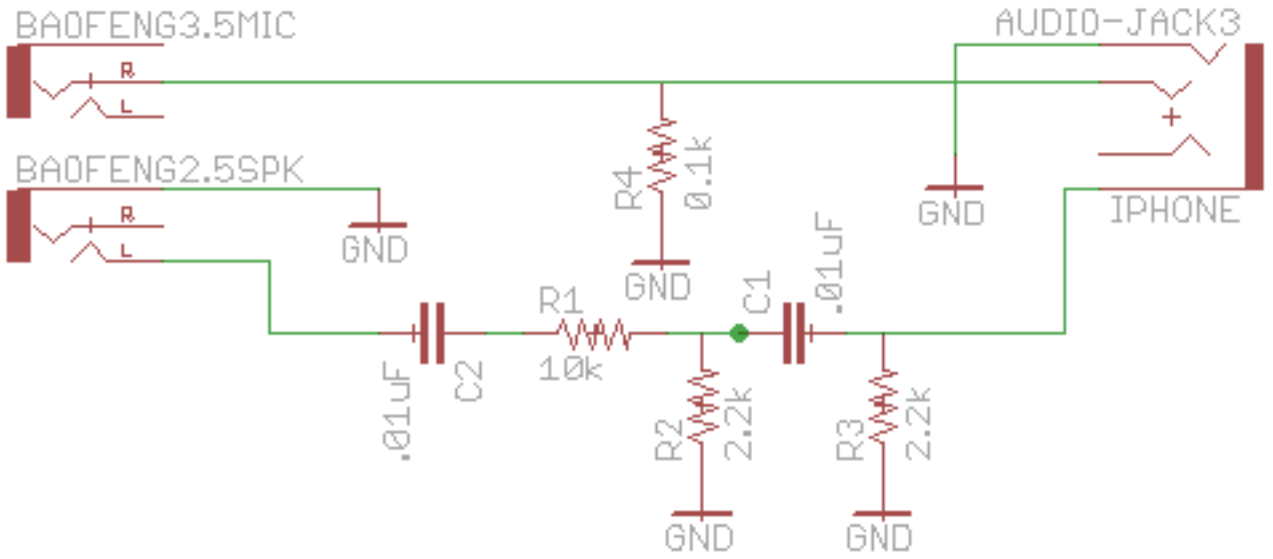


Optimized with 4nec2

Audio interface



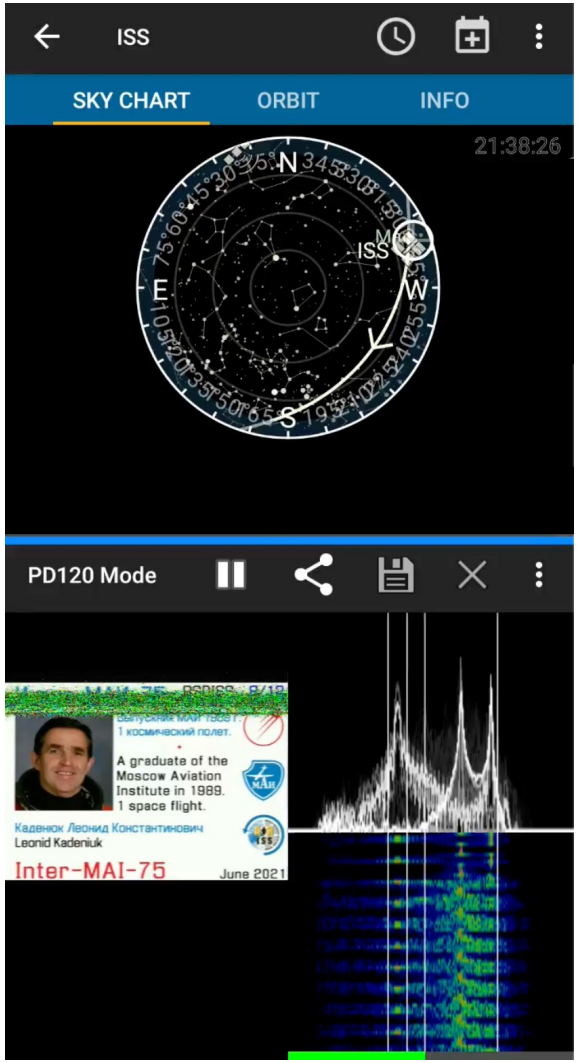




Audio interface circuit designed for Baofeng UV5R radio [BaofengUV5R-TRRS]

Full setup

Yagi antenna with phone holder



Phone split screen mode

Location matters

9V1YP, Chew's Setup

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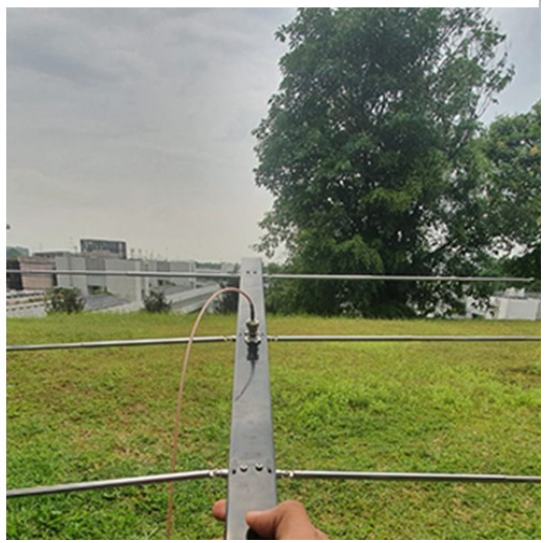
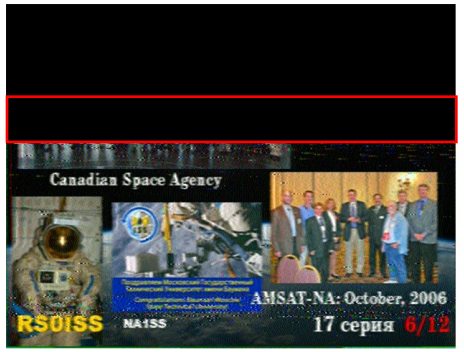
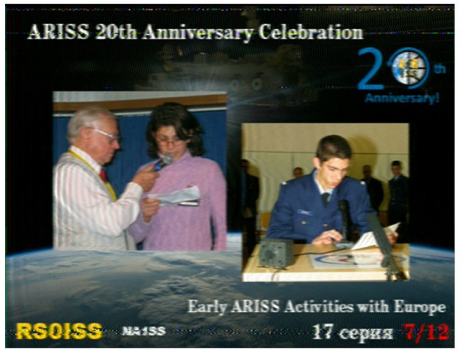
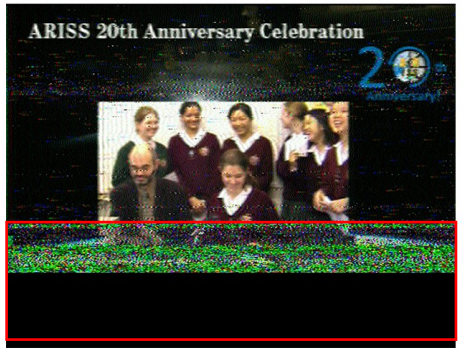


9V1YP







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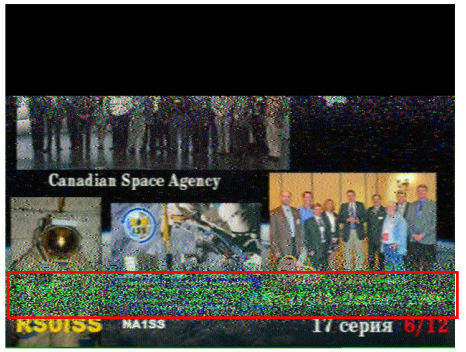
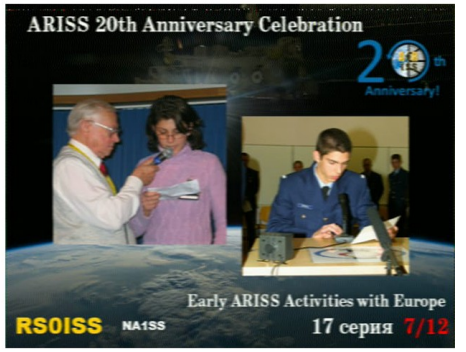
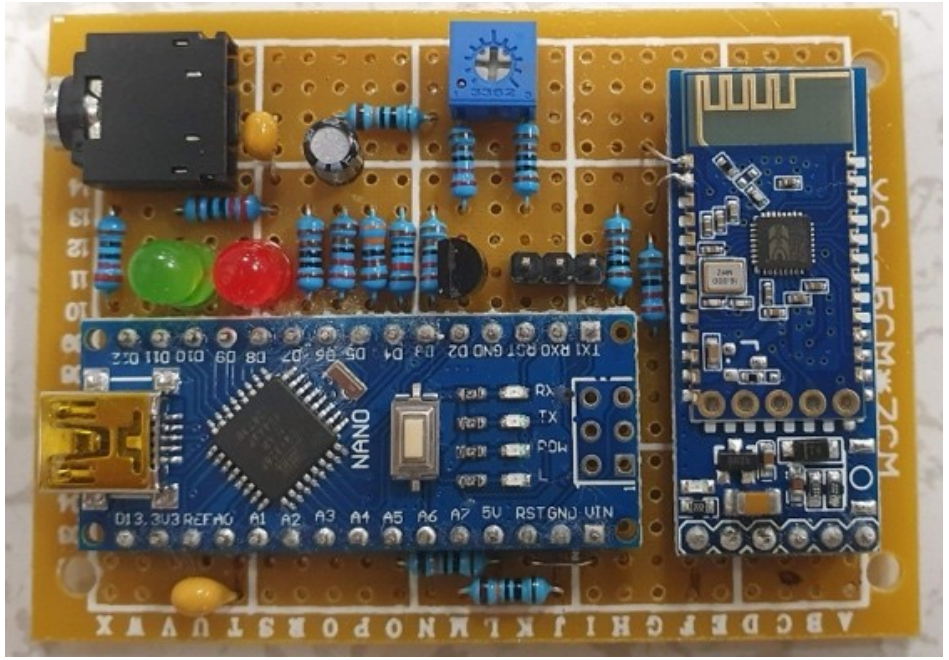




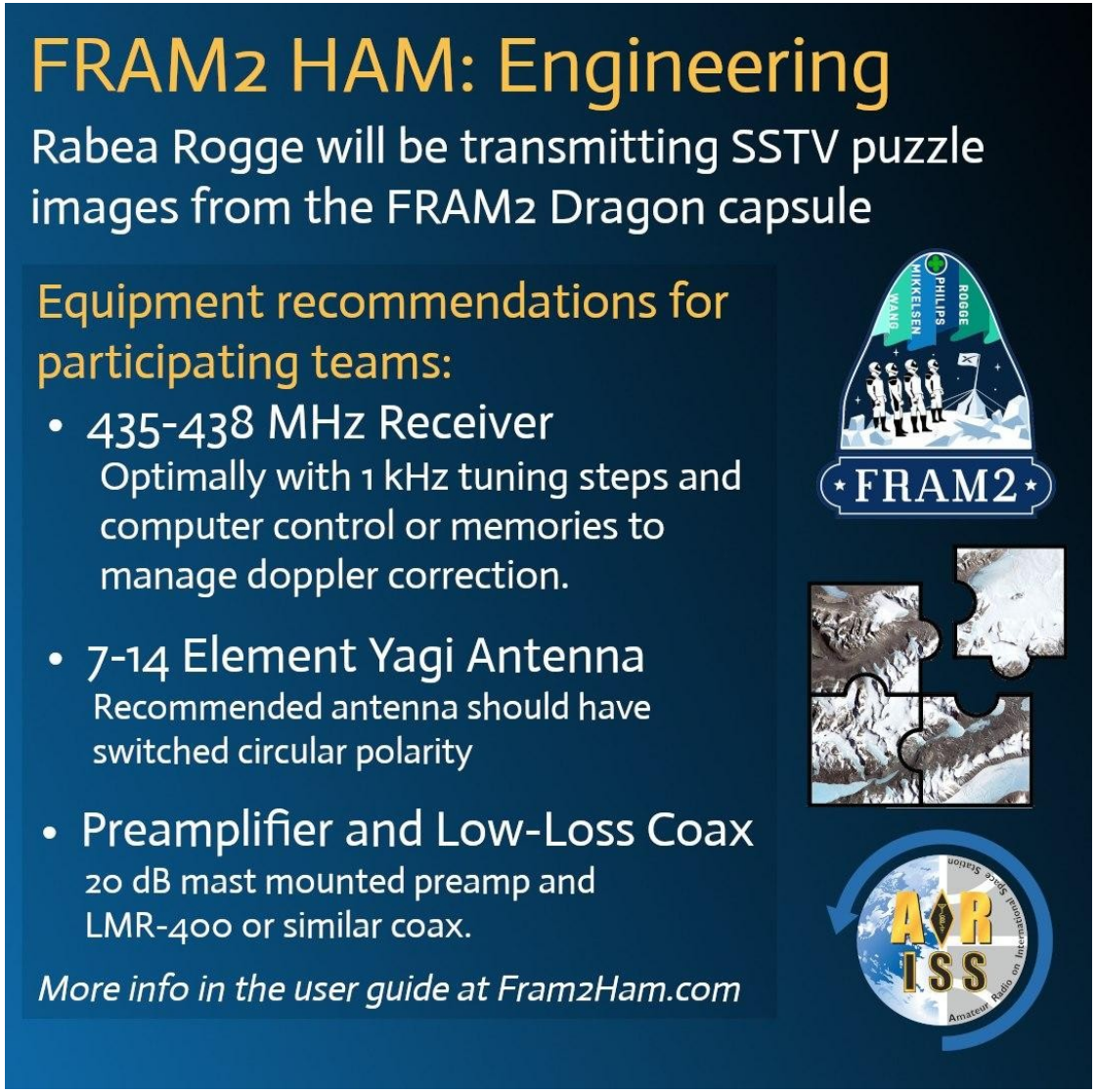
APRS with Arduino TNC



Arduino TNC + Bluetooth module

- Arduino based TNC
- Poor TNC receiver sensitivity (ATMega 10-bit ADC)
- KISS interface via Bluetooth serial to AprsDroid Ap

FRAM2 HAM



FRAM 2

- First crewed polar orbit mission
- First amateur radio operation from space capsule
- March 1-3, 2025 (Tentative)

Position	Crew
Mission commander	Chun Wang First spaceflight
Vehicle commander	Jannicke Mikkelsen First spaceflight
Vehicle pilot	Eric Philips First spaceflight
Mission specialist	Rabea Rogge First spaceflight

FRAM2 HAM

Feature	ISS SSTV	Fram2 Ham SSTV
Mission	International Space Station (ISS)	Fram2 mission (first human space flight in polar orbit)
Operator	ARISS (Amateur Radio on the International Space Station)	Rabea Rogge (LB9NJ/KD3AID)
Frequency	145.800 MHz FM	437.550 MHz
SSTV Mode	PD120	Robot 36
Transmission Power	25 watts	5 watts
Transmission Duration	120 seconds (PD120 mode)	36 seconds (Robot 36 mode)
Doppler correction	N/A	Yes
Event Duration	Varies	March 1-5 (TBC) 3-5 days (mission duration)
Image Content	General space and Earth images	Polar region images for student competition
Participation	Open to all radio enthusiasts	High school and university students, general public