ARISS HamTV Status & TS Merger

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HamTV

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HamTV Technical Overview

- S- & L-band Antennas mounted to ESA Columbus Module – Launched 2008

- HamTV Transmitter built & certified for ARISS by Kayser Italia

- Transmitter upmassed to Columbus Module in 2013

- NTSC Composite & Audio Input

- DVB-S, 2.0MS/s, 2395MHz, 10W EIRP
  - MPEG-2 Video @ ~900kbps
  - MP2 Audio @ 256kbps

- S-Band patch antenna on Columbus Module exterior

HamTV in Contacts

- Normally camera is disconnected, transmits a black screen with audio system hiss.

- Astronaut plugs in Camera for ARISS Contact passes

- Can give live demonstrations, and wave!

HamTV Current Status

- Aug 2017 – VHF Radio Failure in Columbus
    - Kenwood D710 planned to be upmassed before end of 2018

- April 2018 – HamTV Transmitter malfunction, no RF Heard.
    - Reconfiguration today at 1725 – 1755 UTC
    - Watch for received Signal on https://live.ariss.org/hamtv/

- If no success – Transmitter planned to be repaired on the Ground and then returned to the module, hopefully no re-certification so quick (in manned-spaceflight terms!)

Ground Station Co-operation

- Reception of moving station presents several challenges
  - Tracking Accuracy
  - Local Interference
  - Local obstructions
  - Space Station obstructions
- Multiple geographically-spaced ground stations
- One feed to School / Venue

TS Merger System

- MPEG-TS is packetised
  - 188 Byte Packets
  - Some packets have PCR timestamp (~1/50)
- PCR is used to synchronise ground station feeds
- 100ms delay to aggregate data from stations
- Most complete segment is copied to output buffer
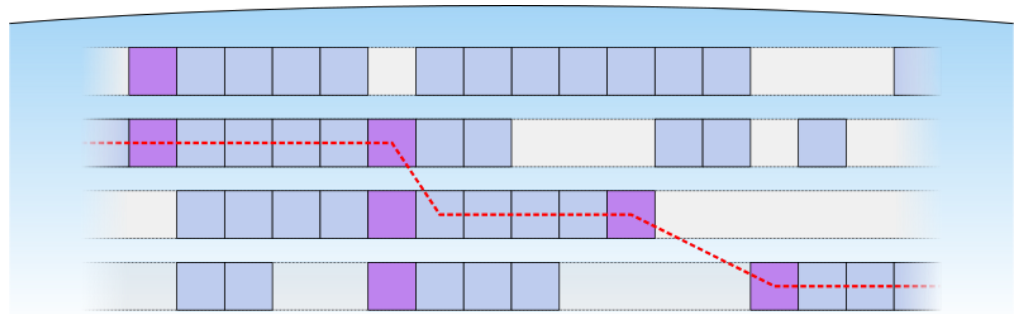
TS Merger Inputs & Outputs

- Input: MPEG-TS over UDP
  - live.ariss.org port 5678

- Output: MPEG-TS over TCP
  - live.ariss.org port 5679

- Public Webpage Viewer
  - https://live.ariss.org/hamtv/
  - HTML5 Live Stream
  - Live Ground Station Status

TS Merger in Contacts

- Developed during Tim Peake's

- Used for as Backup & Primary

  - Thomas Pesquet

  - Paulo Nespoli

  - Jack Fischer
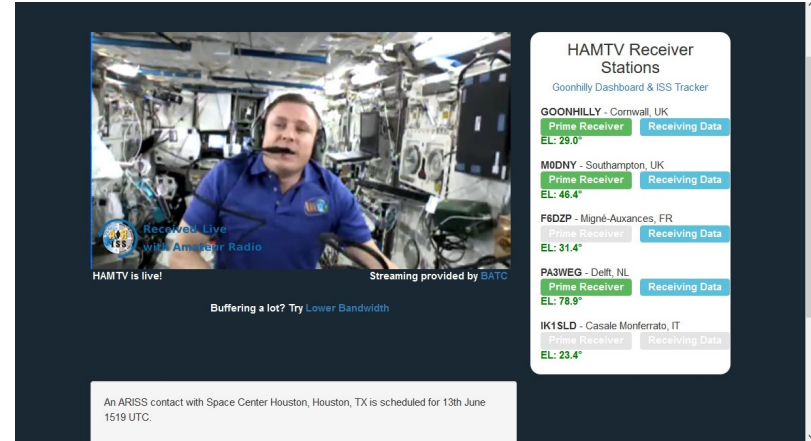
Any Questions?

github.com/ariss-uk/tsmerge