ARISS HAMTV: Filters

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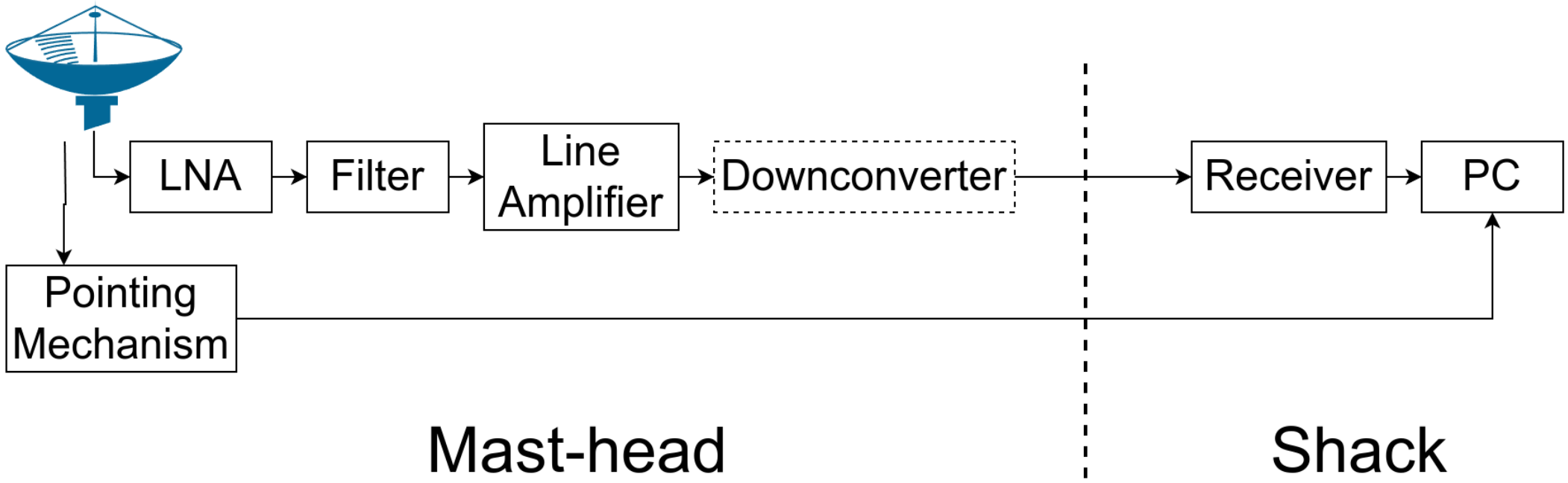
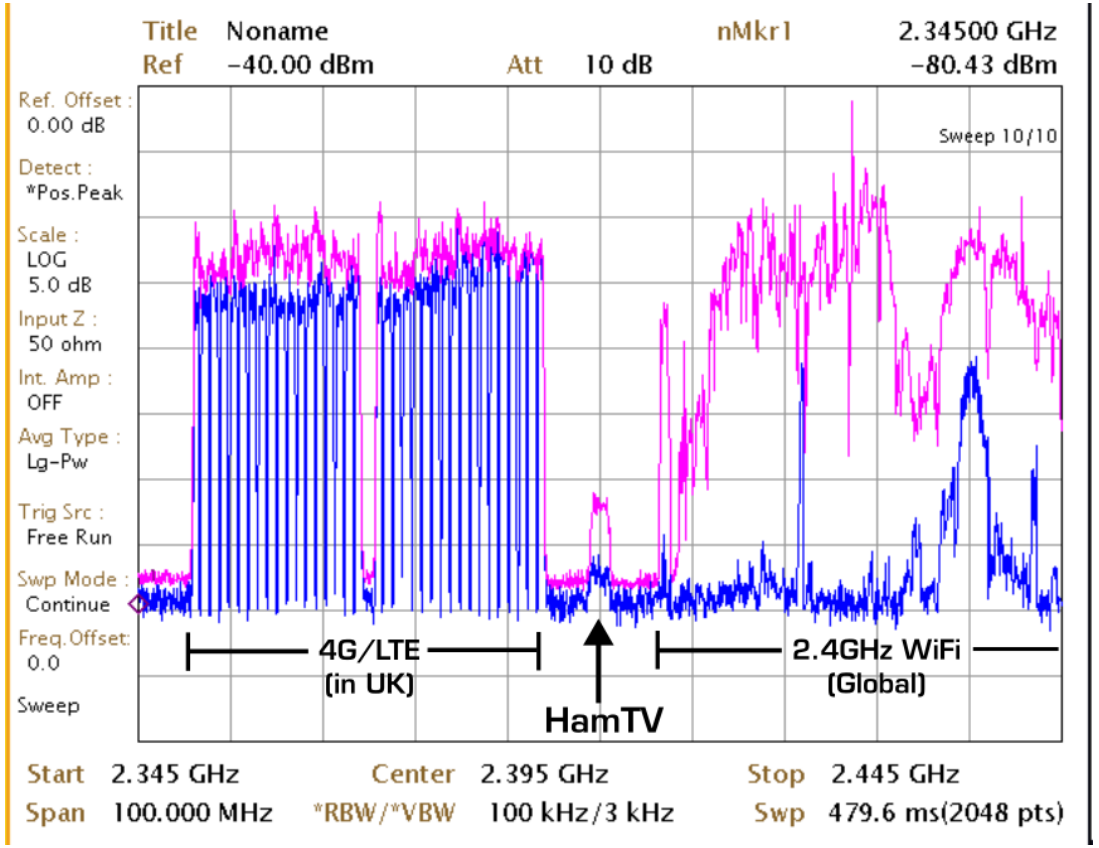
Ground Station - Overview



Ground Station – RFI



RX Spectrum of Graham G8FXB

- WiFi Channel 1
  - 2401-2423 MHz
  - Intermittent power peaks
- UK 4G Band 40 - Telefónica
  - 2350-2390 MHz
  - High power density
- Very high system dynamic range required.

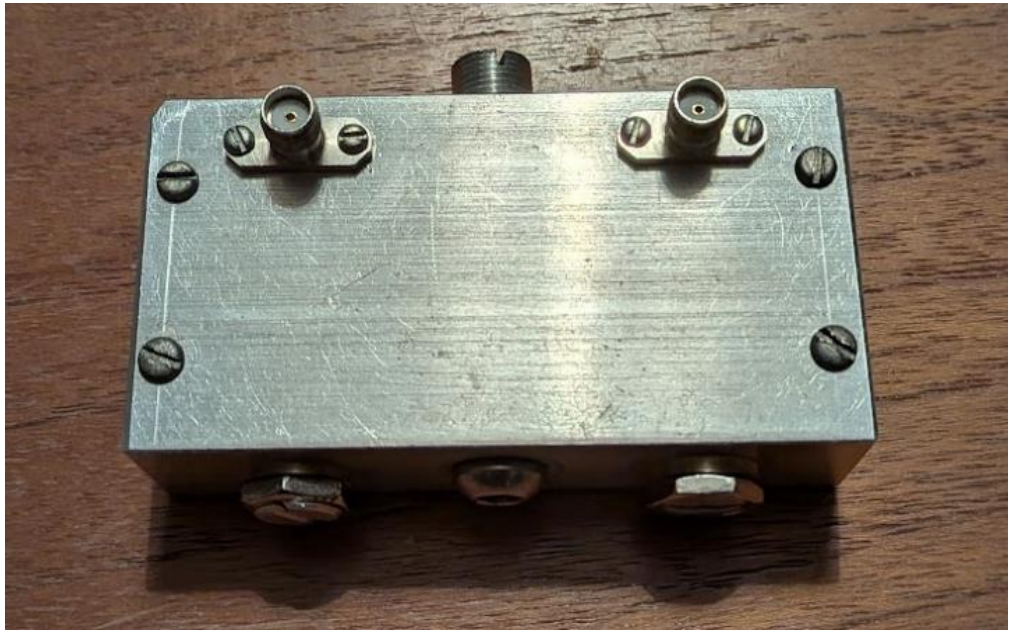
Ground Station - System Noise Figure

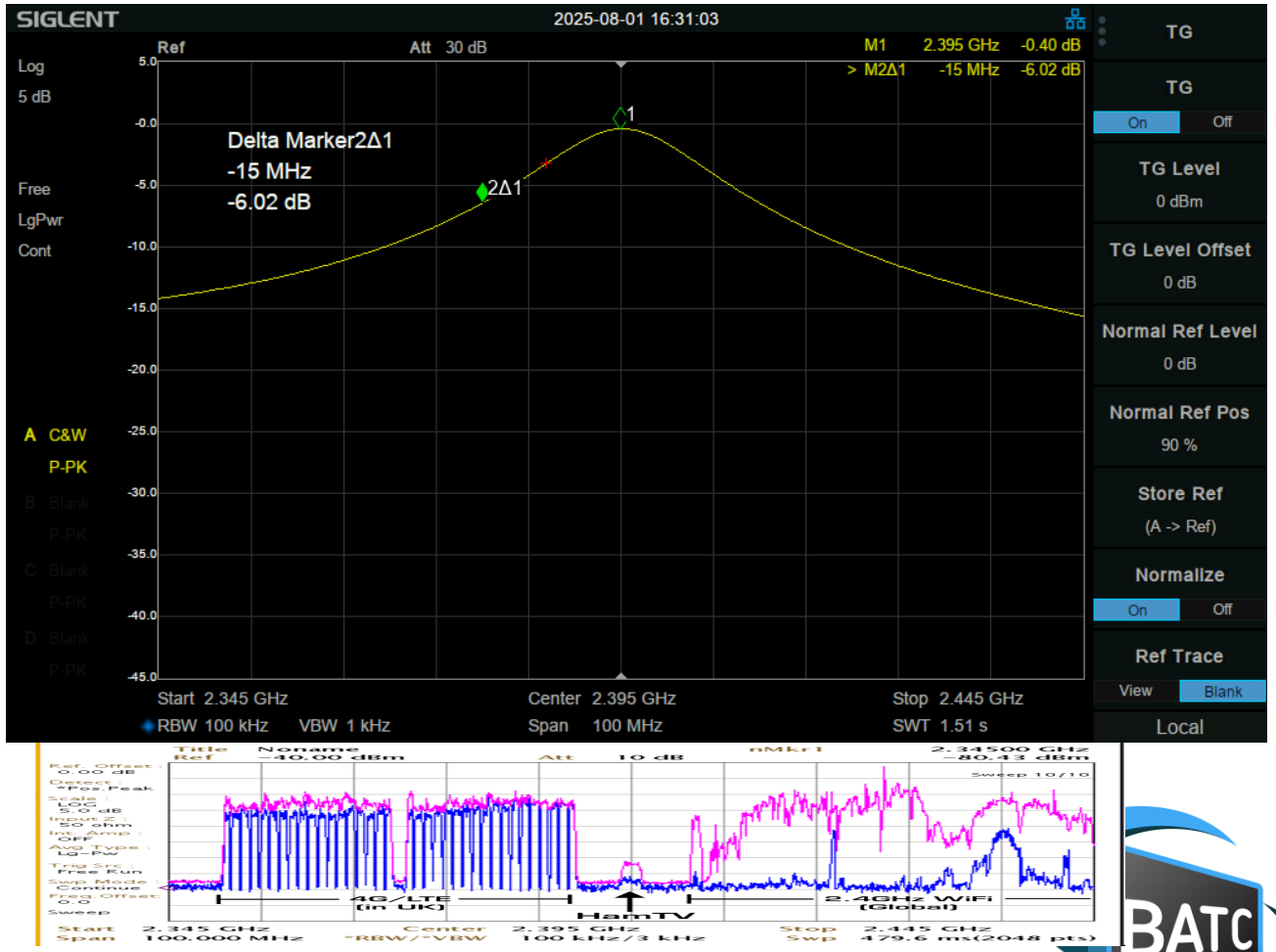
LaNA: 2dB Noise Figure, 12dB Gain
Ham It Down: 12dB Noise Figure, 0dB Gain
(Cabling): 2dB Loss
RTL-SDR: 6dB Noise Figure

System Noise Figure: **5.2dB** !

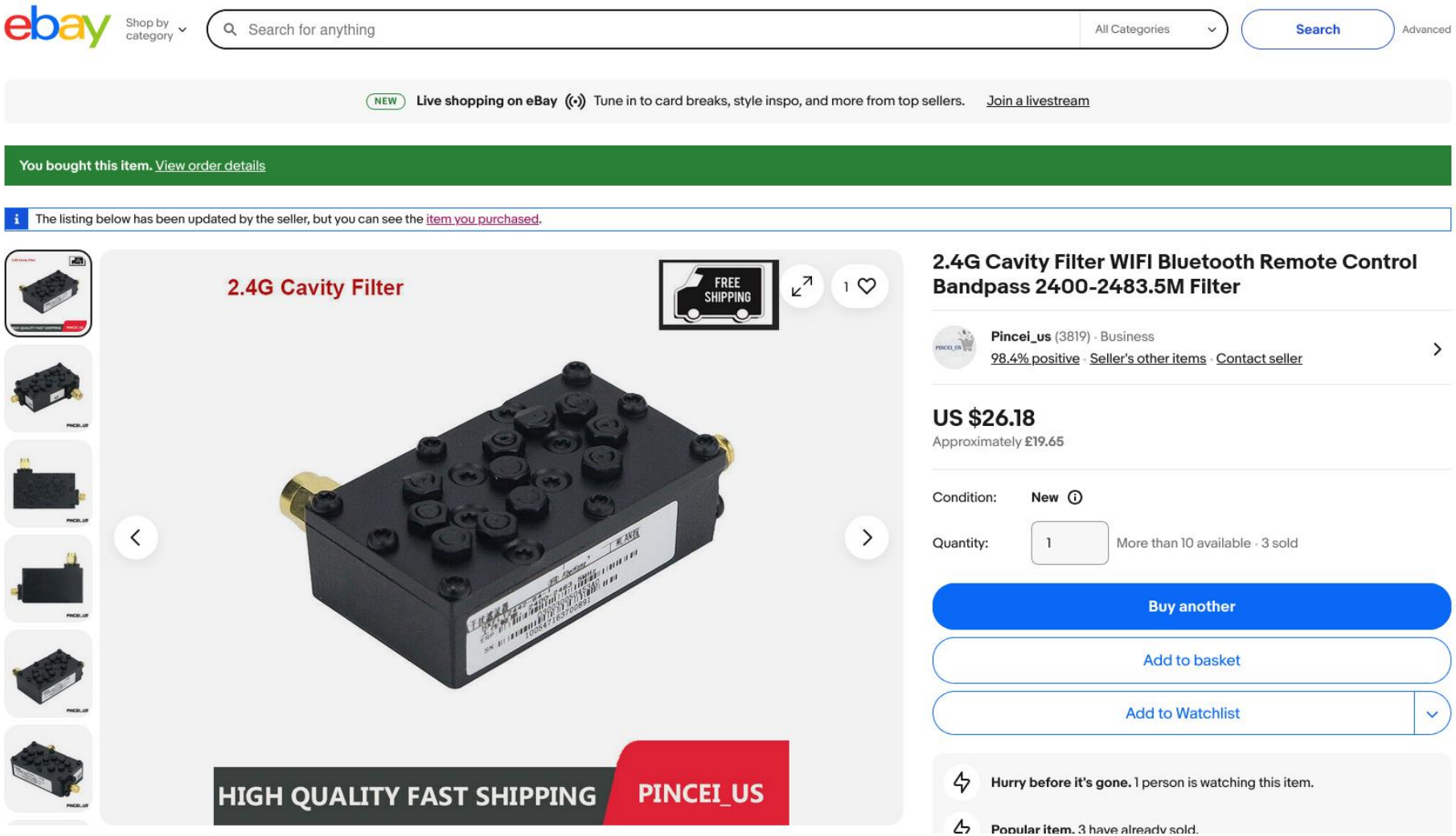
Intermediate gain stage required.
e.g. Cheap 5dB NF, 20dB gain "LNA" before Ham It Down = 2.4dB System NF

Filter – 3-pole

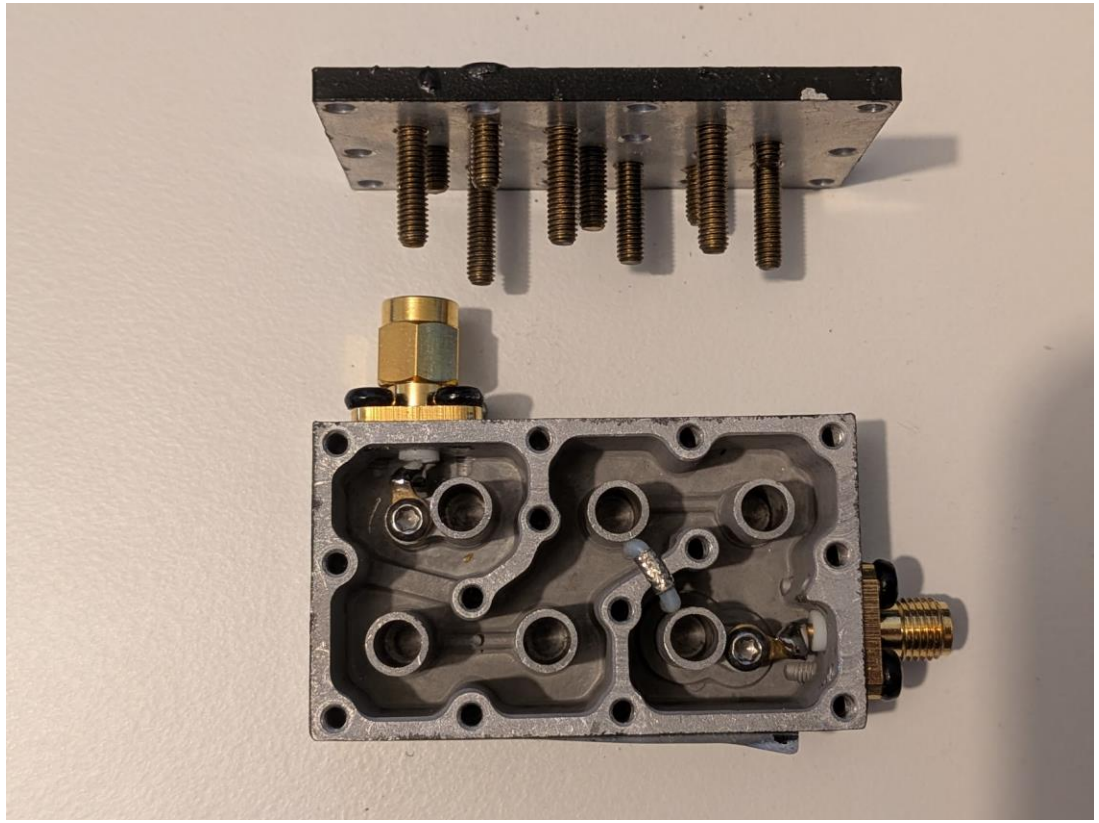


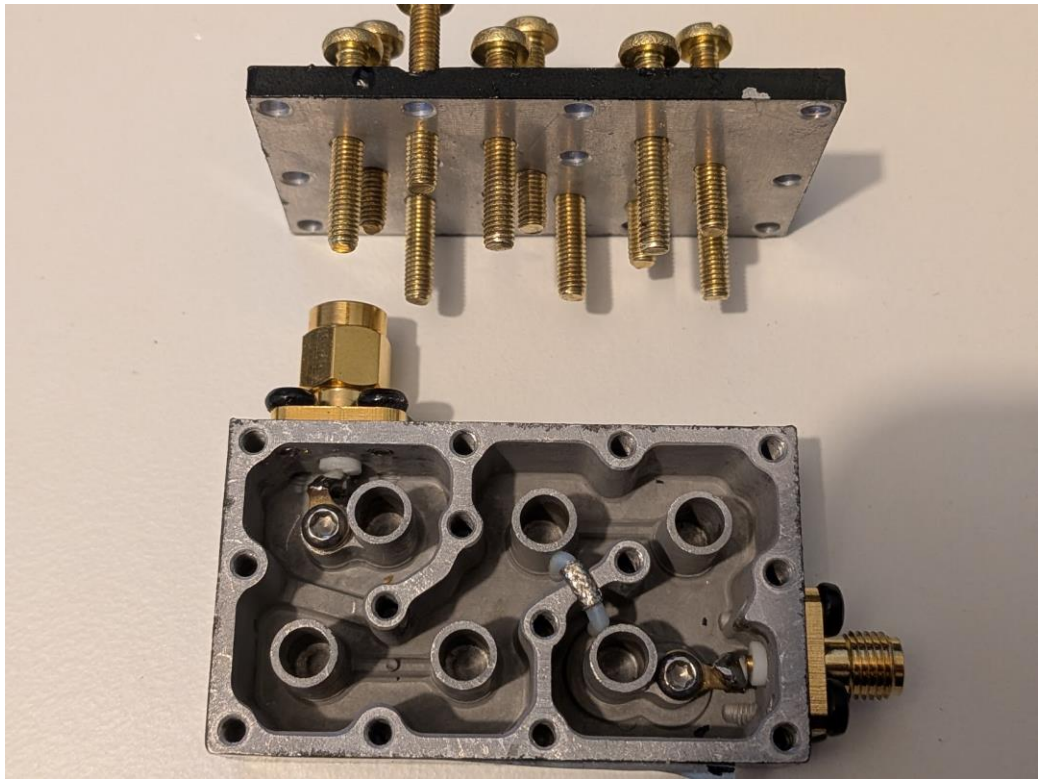


Filter – Chinese WiFi Filter

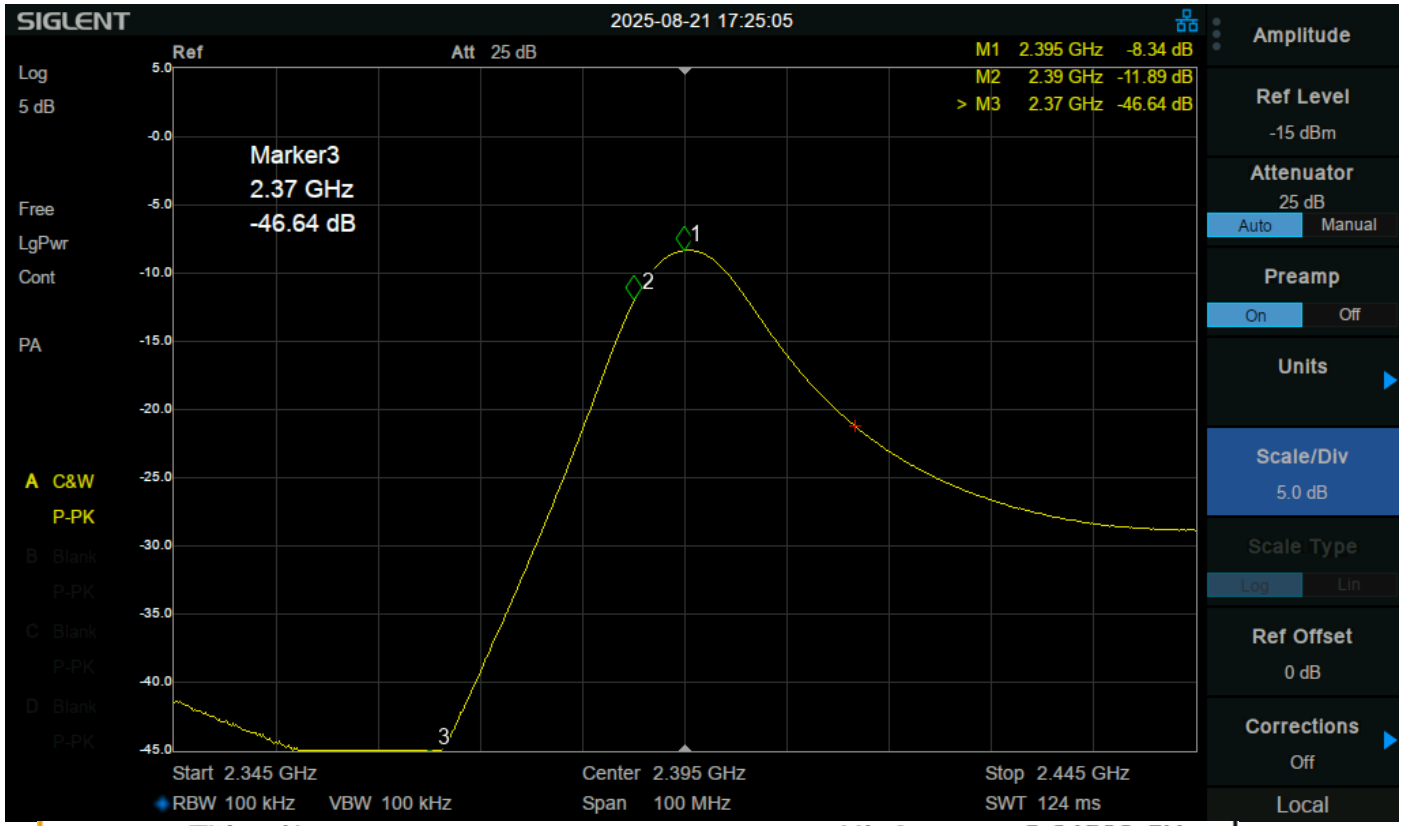


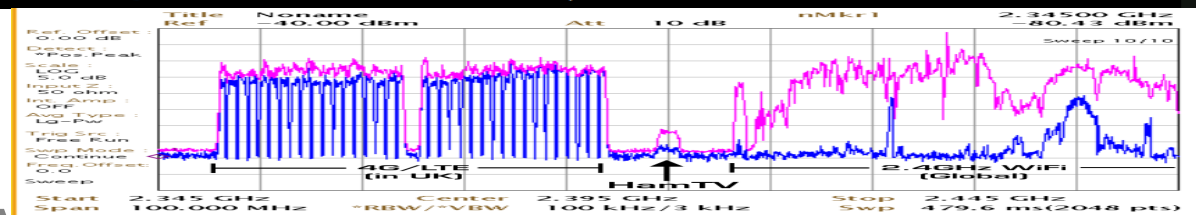
Filter – Chinese WiFi Filter – New Screws



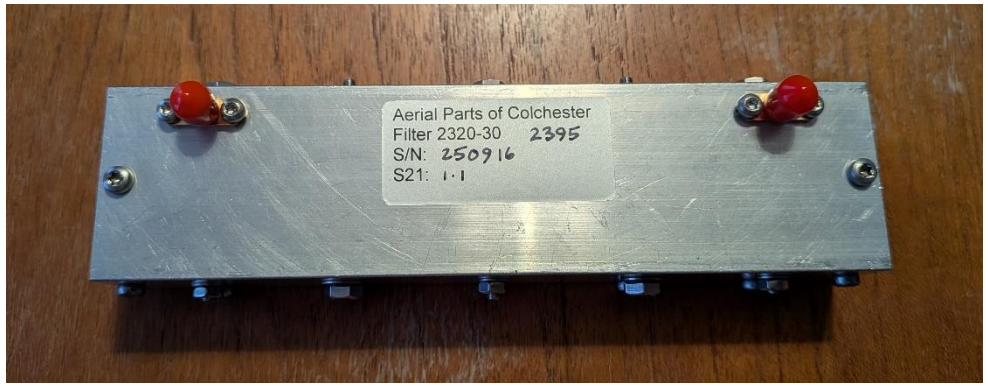


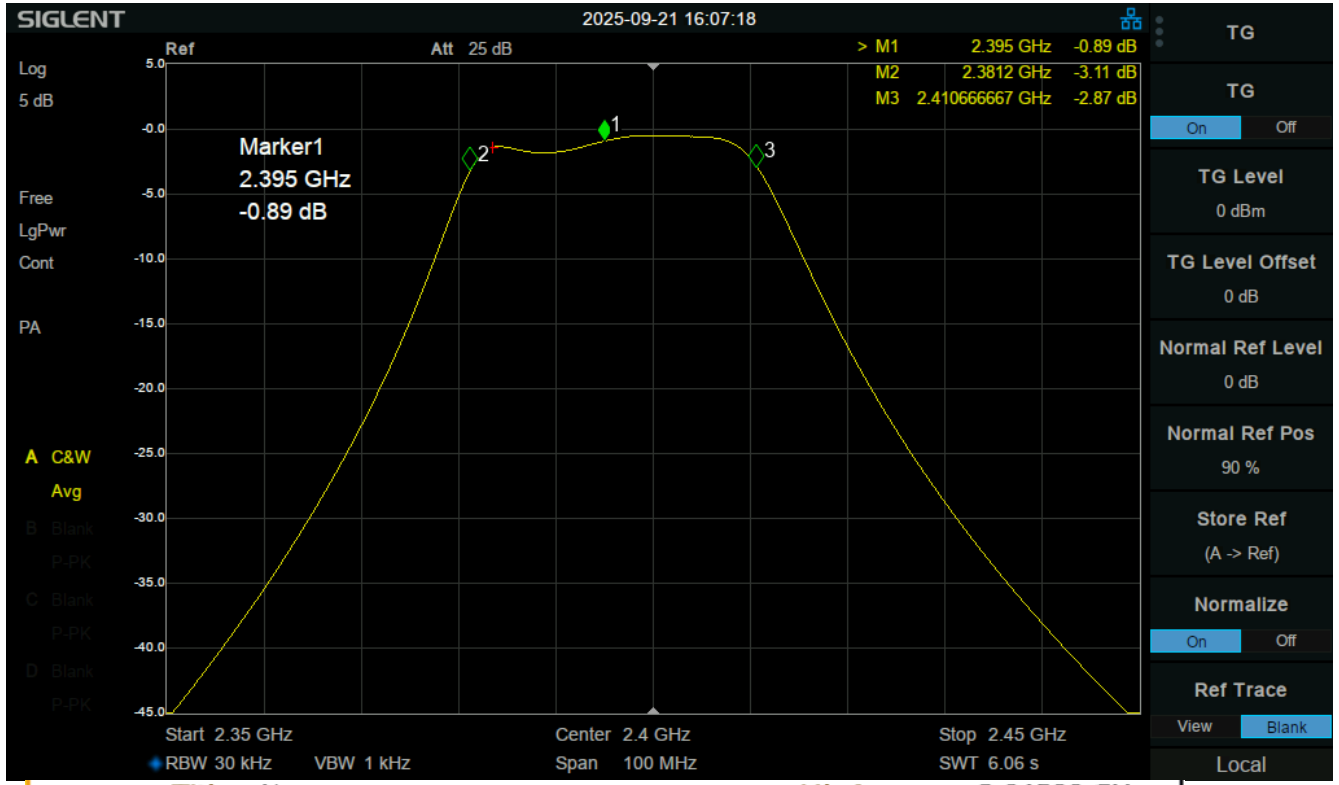
Filter – Chinese WiFi Filter – Retuned

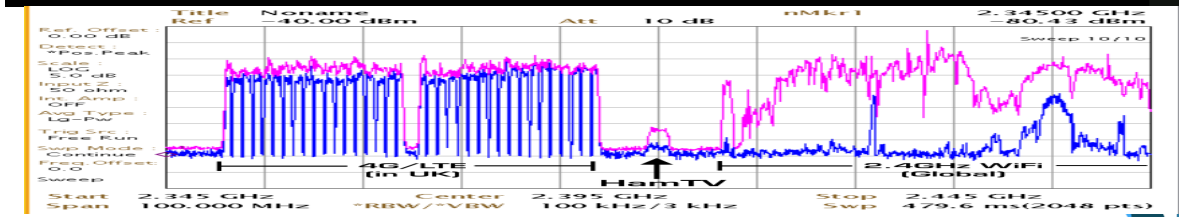




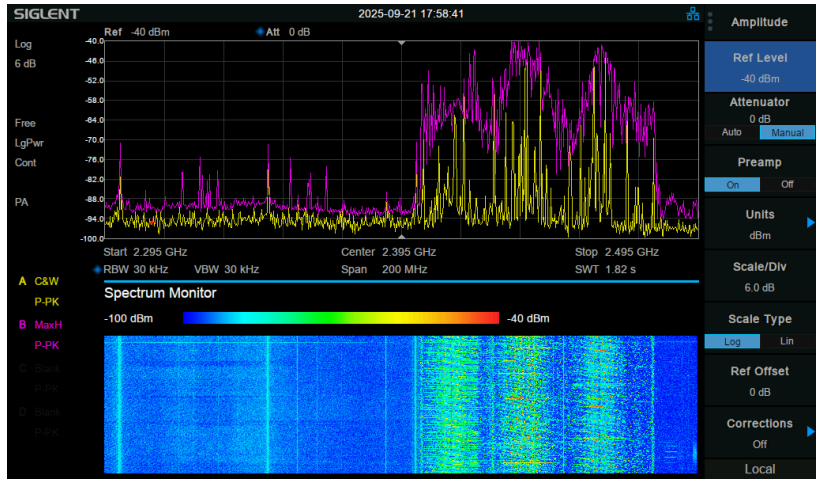
Filter – 2395MHz Aerial Parts

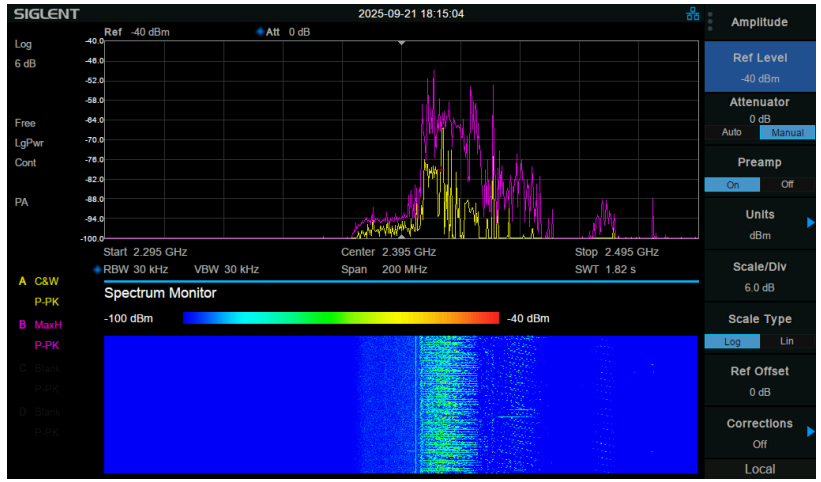






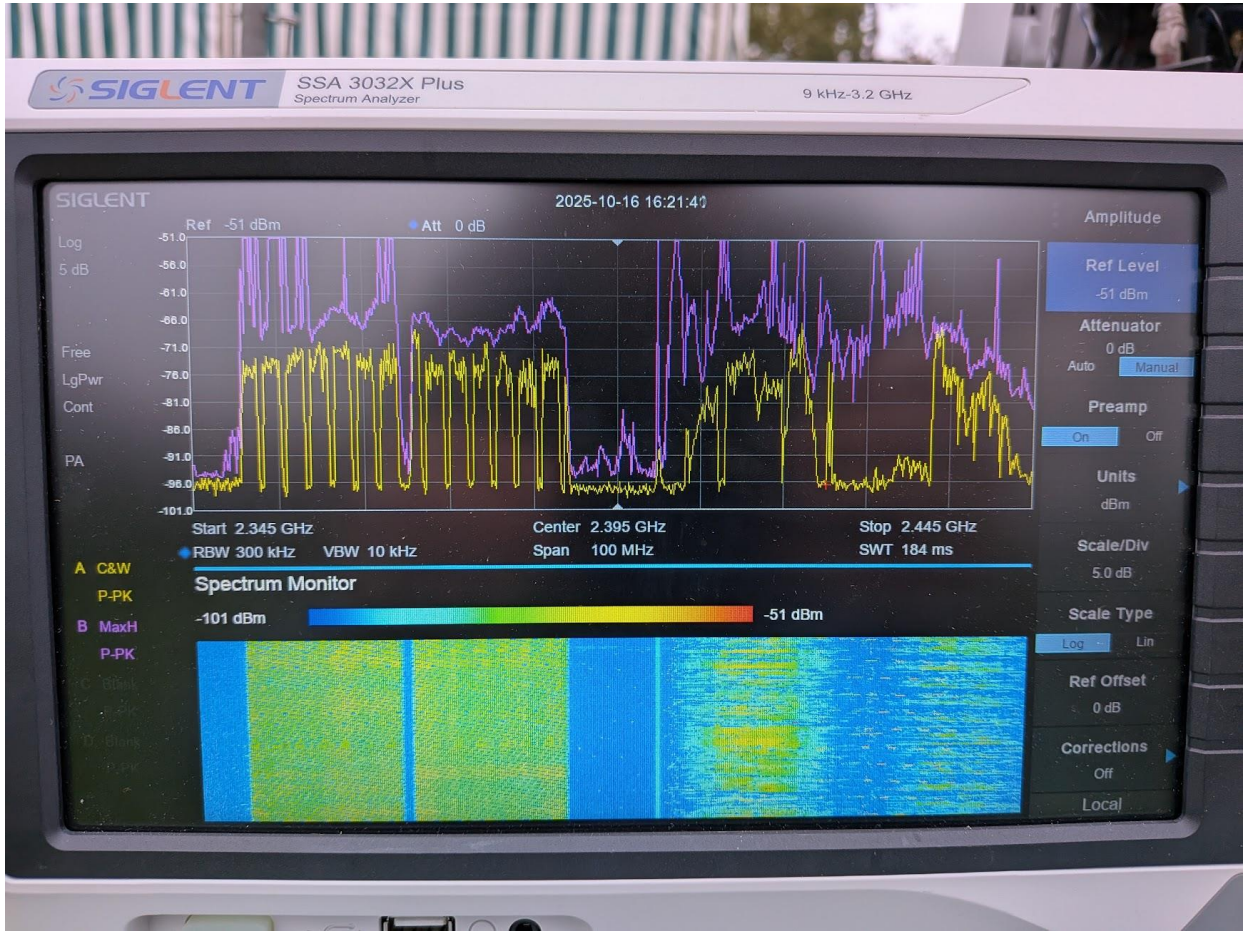
Ground Station – Filter Results

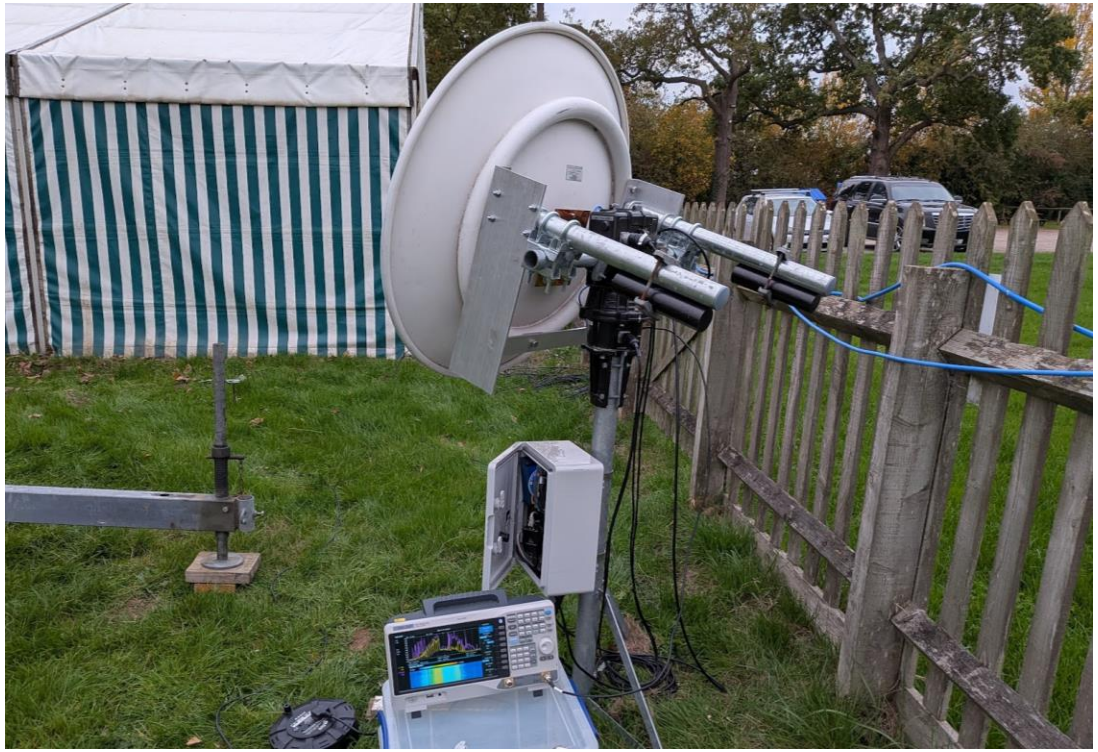




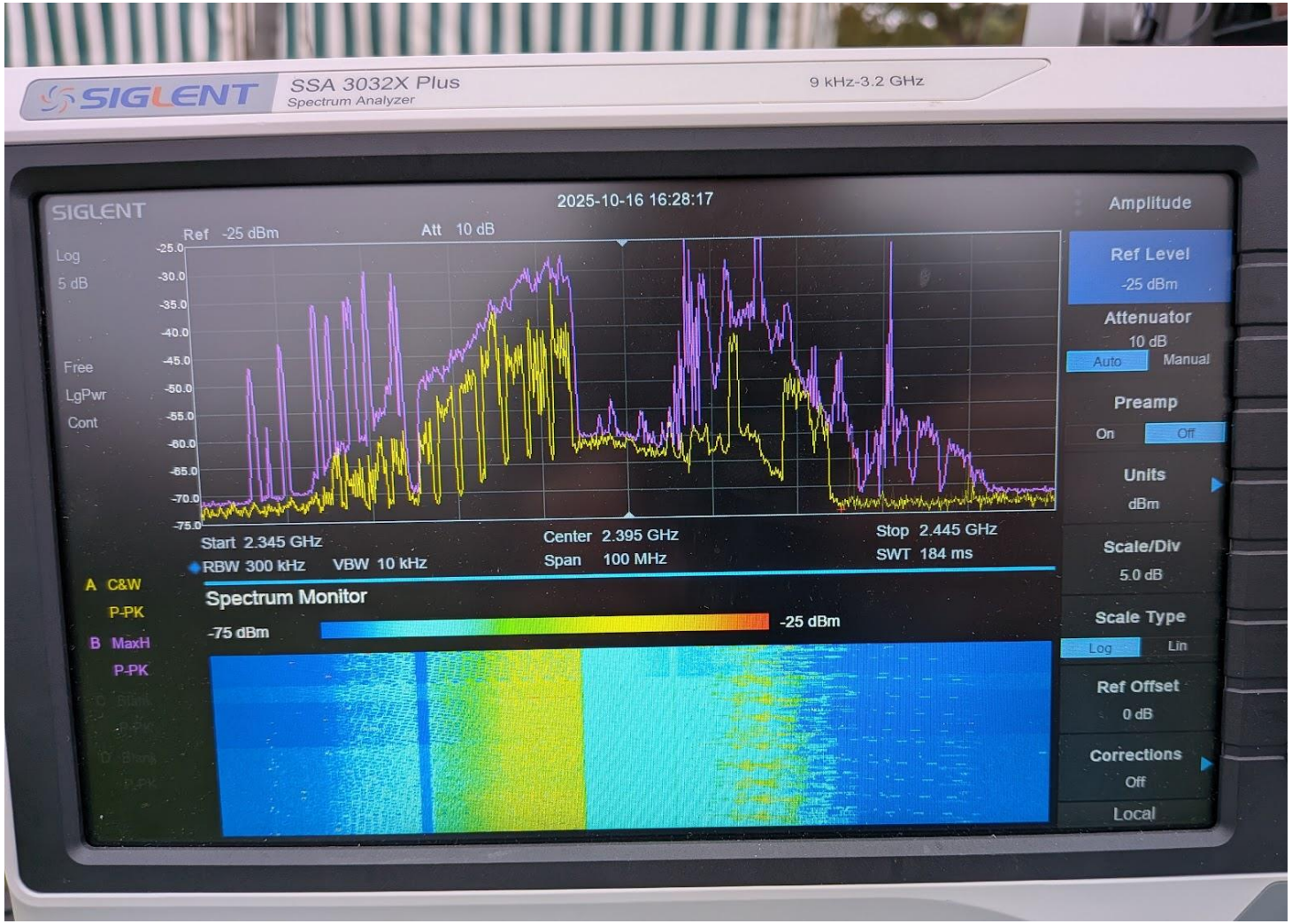
- No filter: -30dBm
- With filter: -48dBm
- Result: +18dB dynamic range margin!
  - With only WiFi RFI
  - 4G/LTE presence would increase this advantage.

RFI at Warwick ARISS Venue - Unfiltered

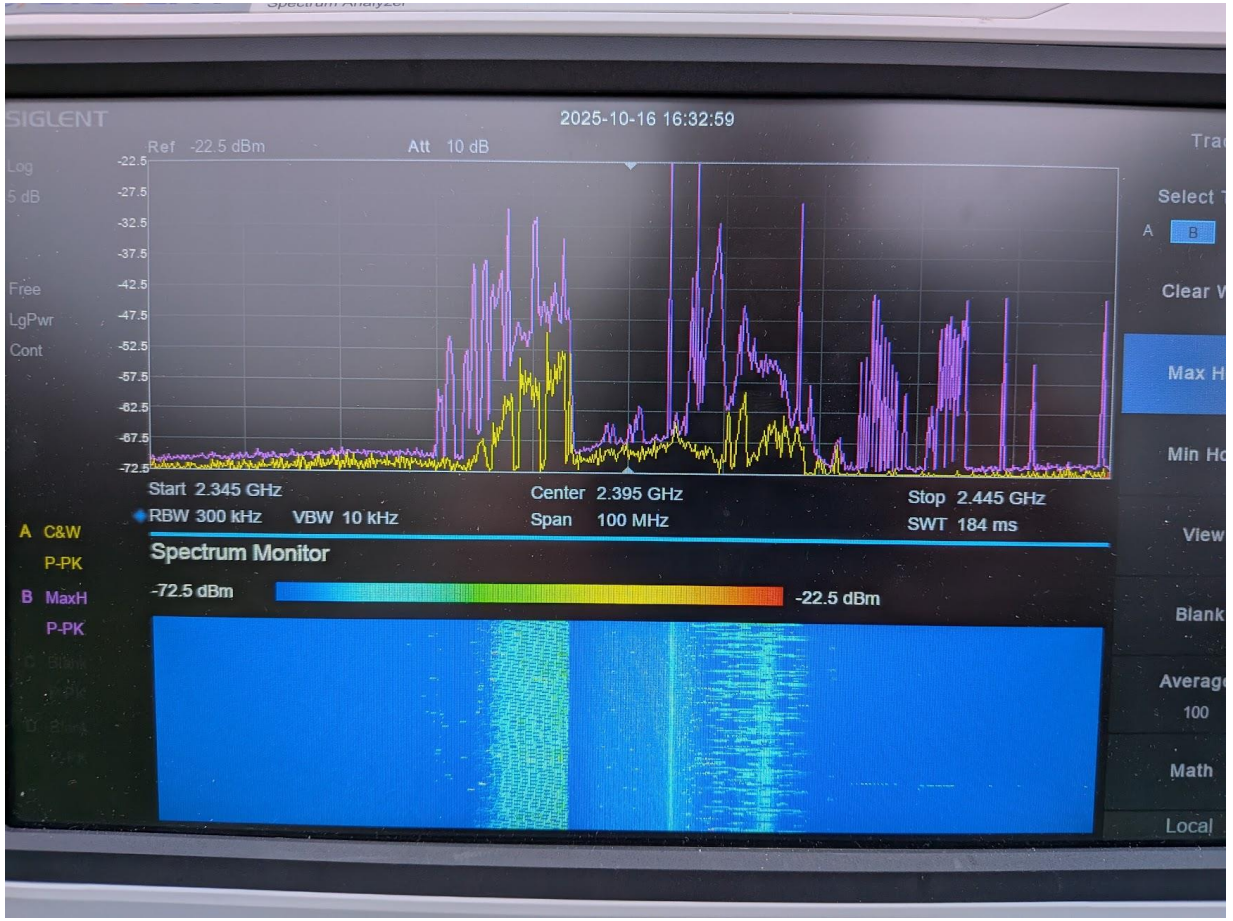




RFI at Warwick ARISS Venue – 1 Filter



RFI at Warwick ARISS Venue – 2 Filters



Questions?

- Documentation: https://wiki.batc.org.uk/HAMTV_from_the_ISS
- Join us on the ARISS Discord: https://discord.gg/EBSctaKN
  - Dedicated #hamtv channels