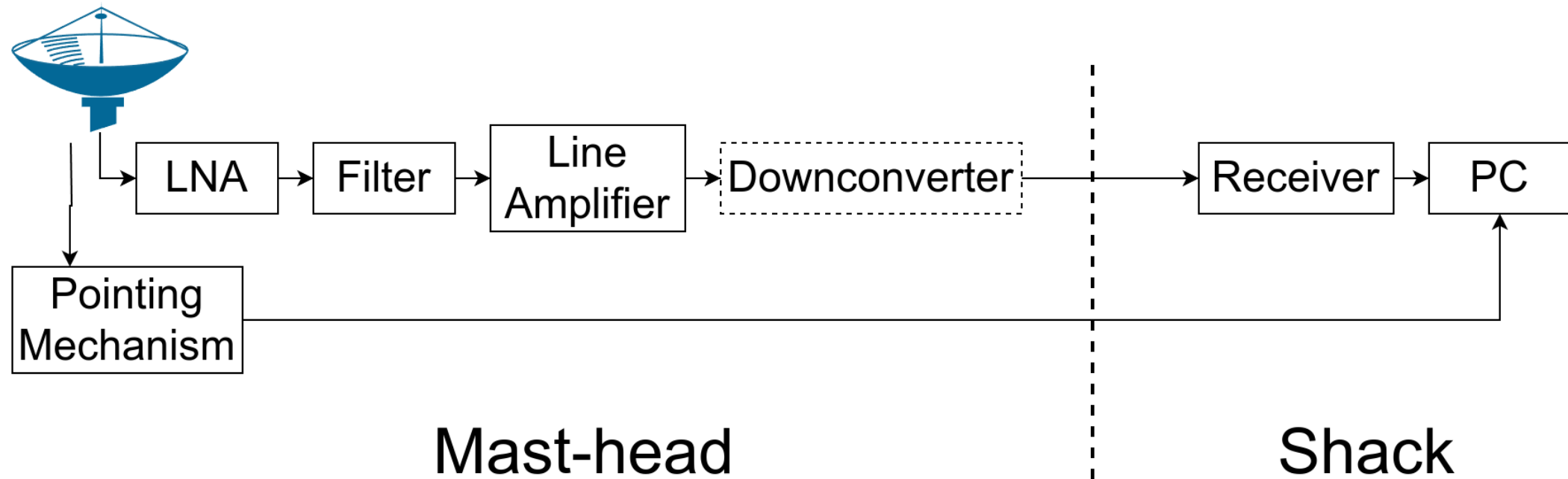


# ARISS HAMTV: Filters

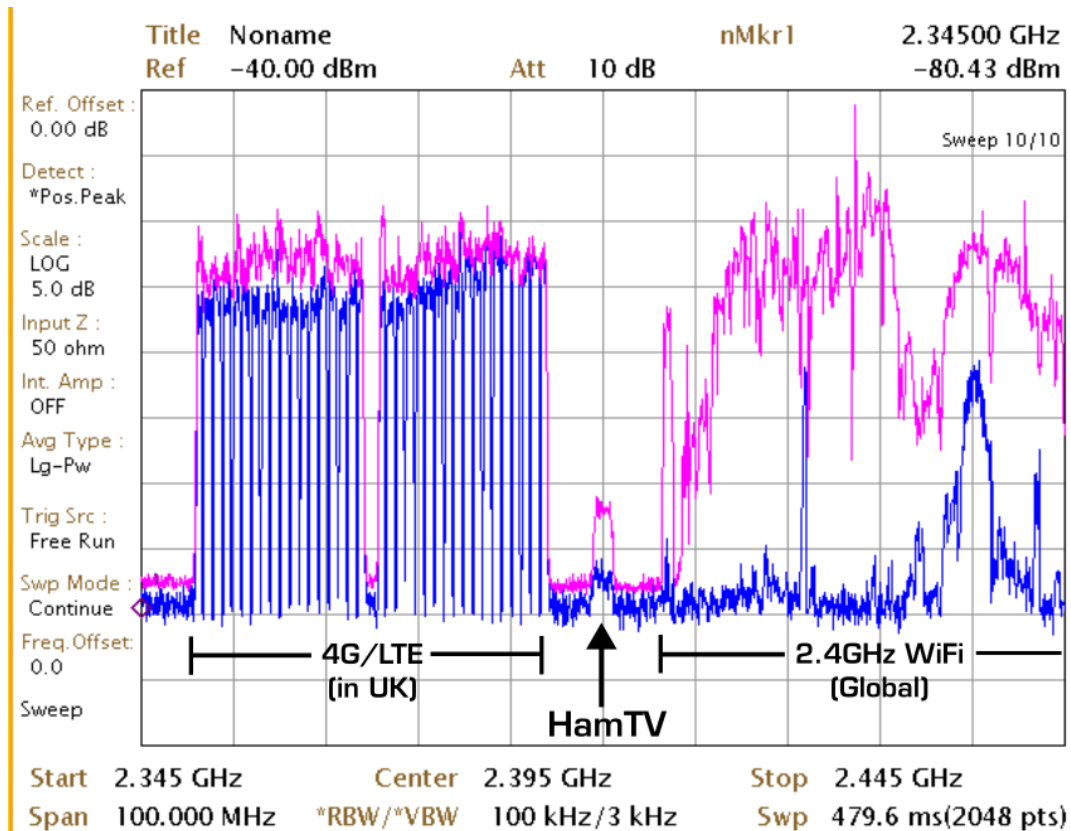
Phil Crump M0DNY



# 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

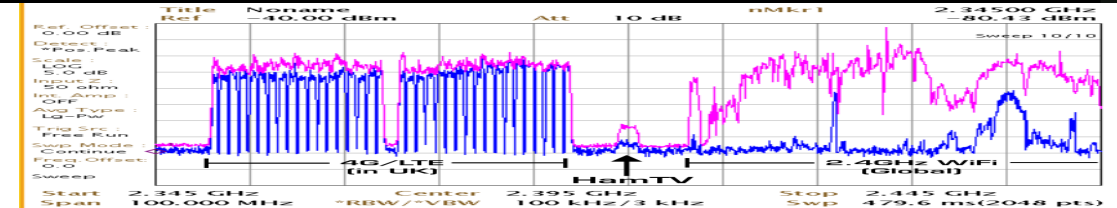
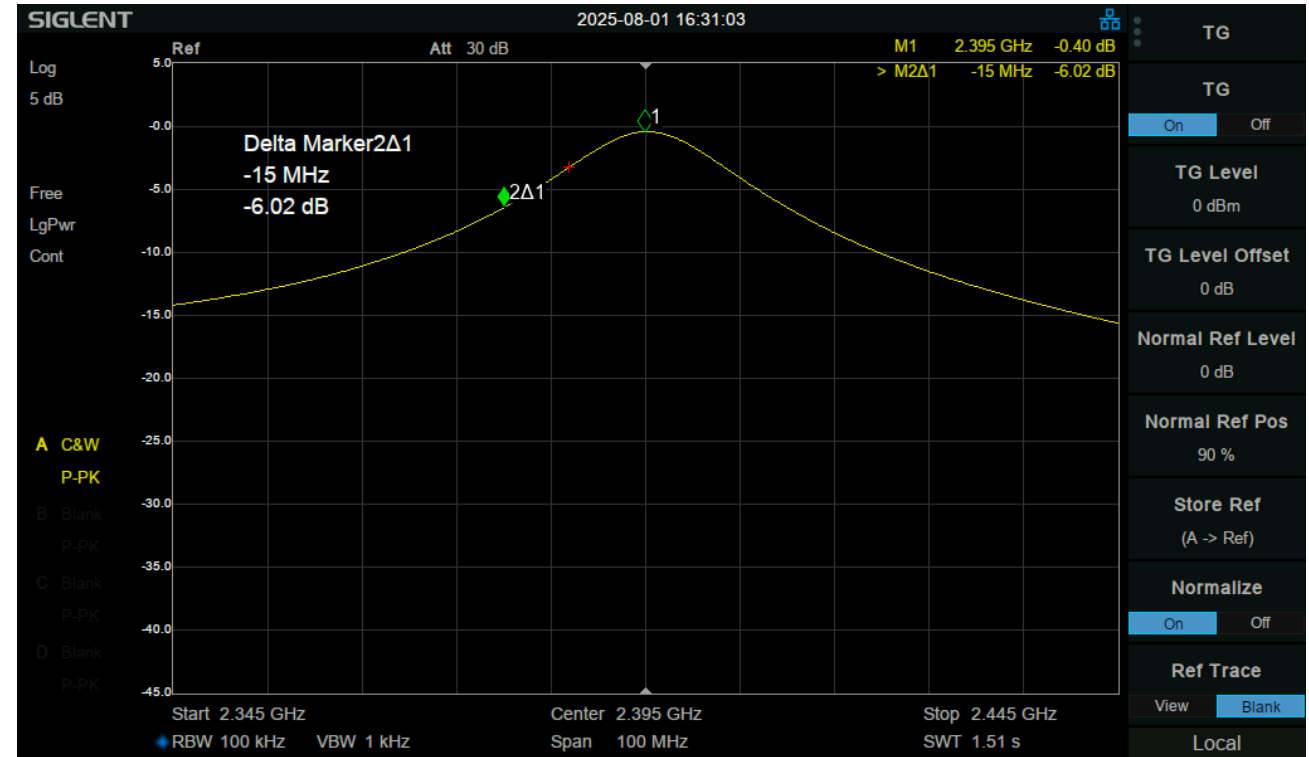
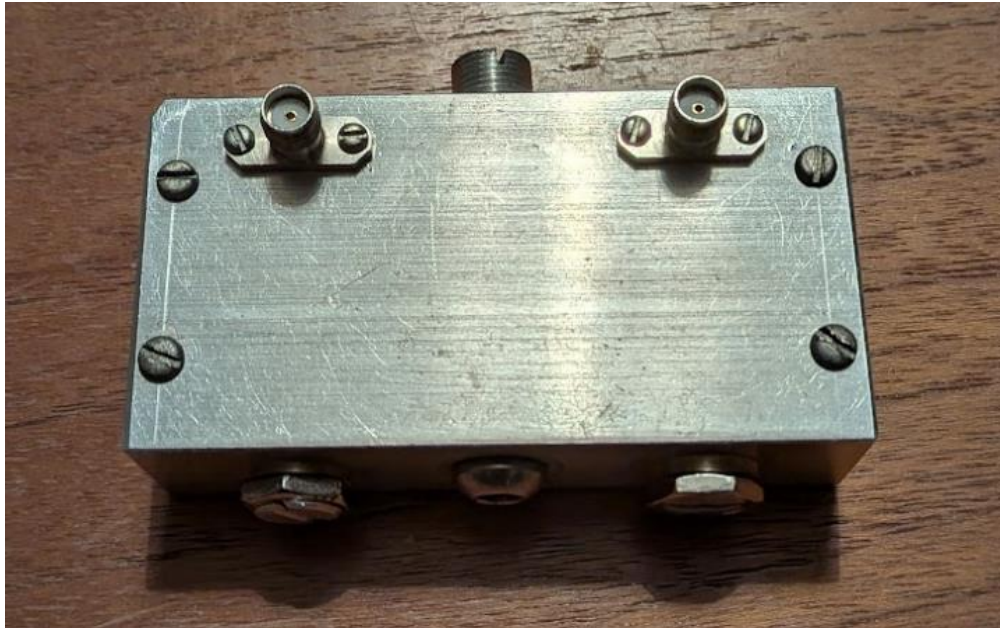
RTL-SDR: 6dB Noise Figure

System Noise Figure: **5.2dB !**

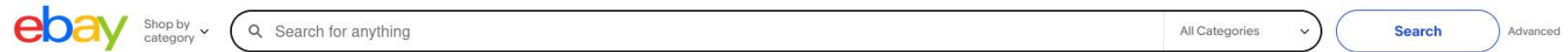
**Intermediate gain stage required.**

e.g. Cheap 5dB NF, 20dB gain “LNA” before Ham It Down = 2.4dB System NF

# Filter – 3-pole



# Filter – Chinese WiFi Filter



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## 2.4G Cavity Filter WIFI Bluetooth Remote Control Bandpass 2400-2483.5M Filter

**Pincei\_us** (3819) · Business  
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Condition: **New** ⓘ

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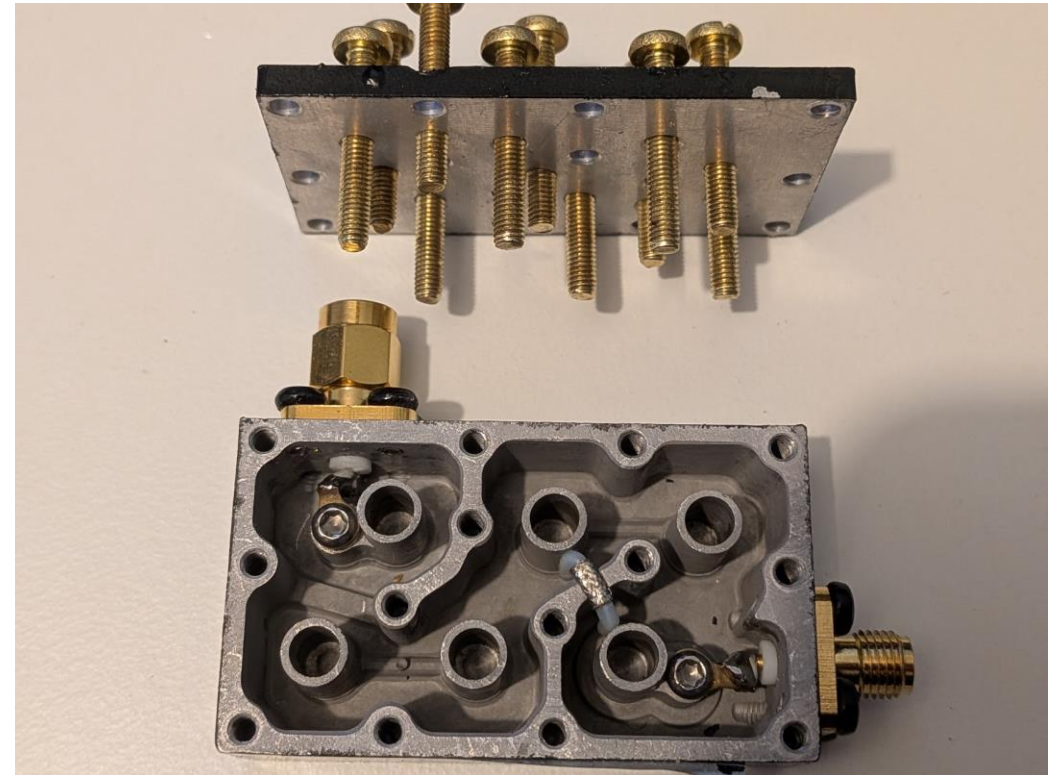
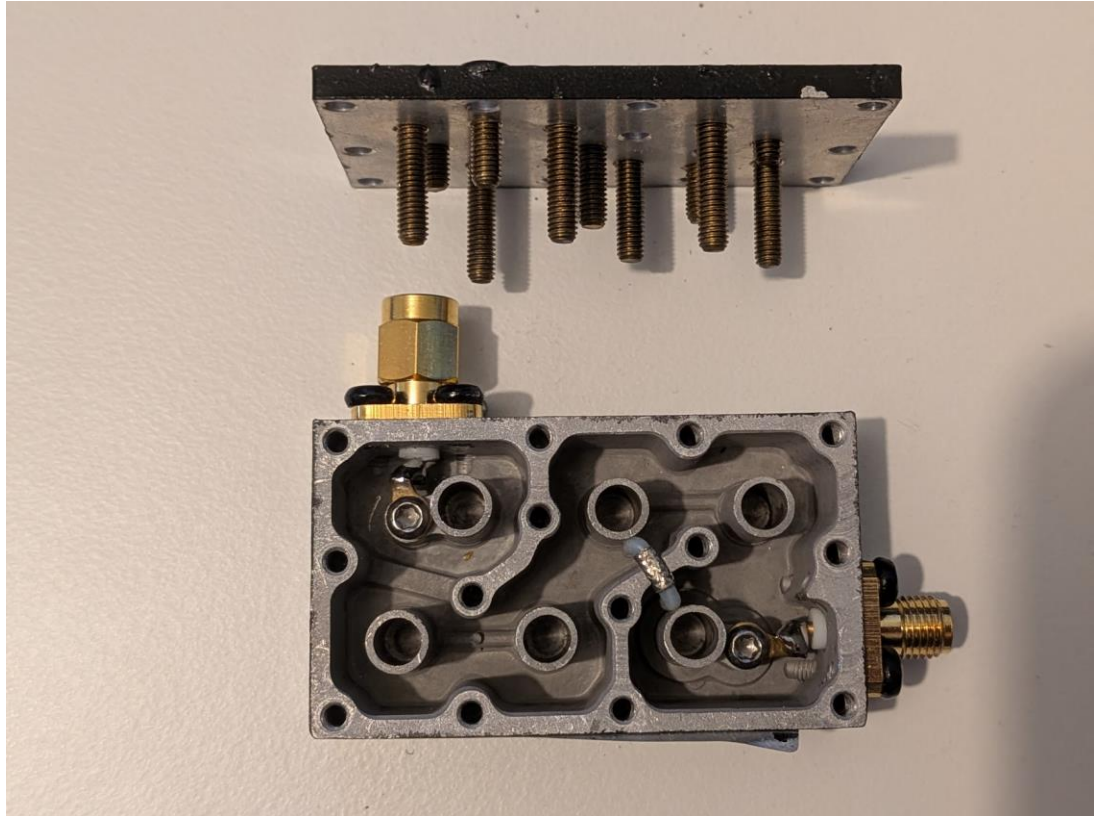
🔥 **Popular item.** 3 have already sold.

BATC CAT25 Part 2

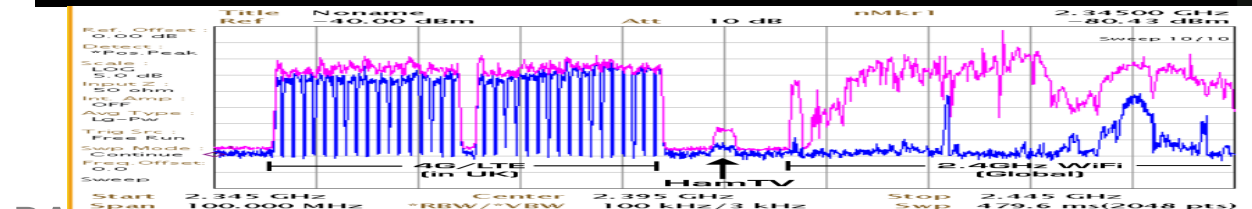
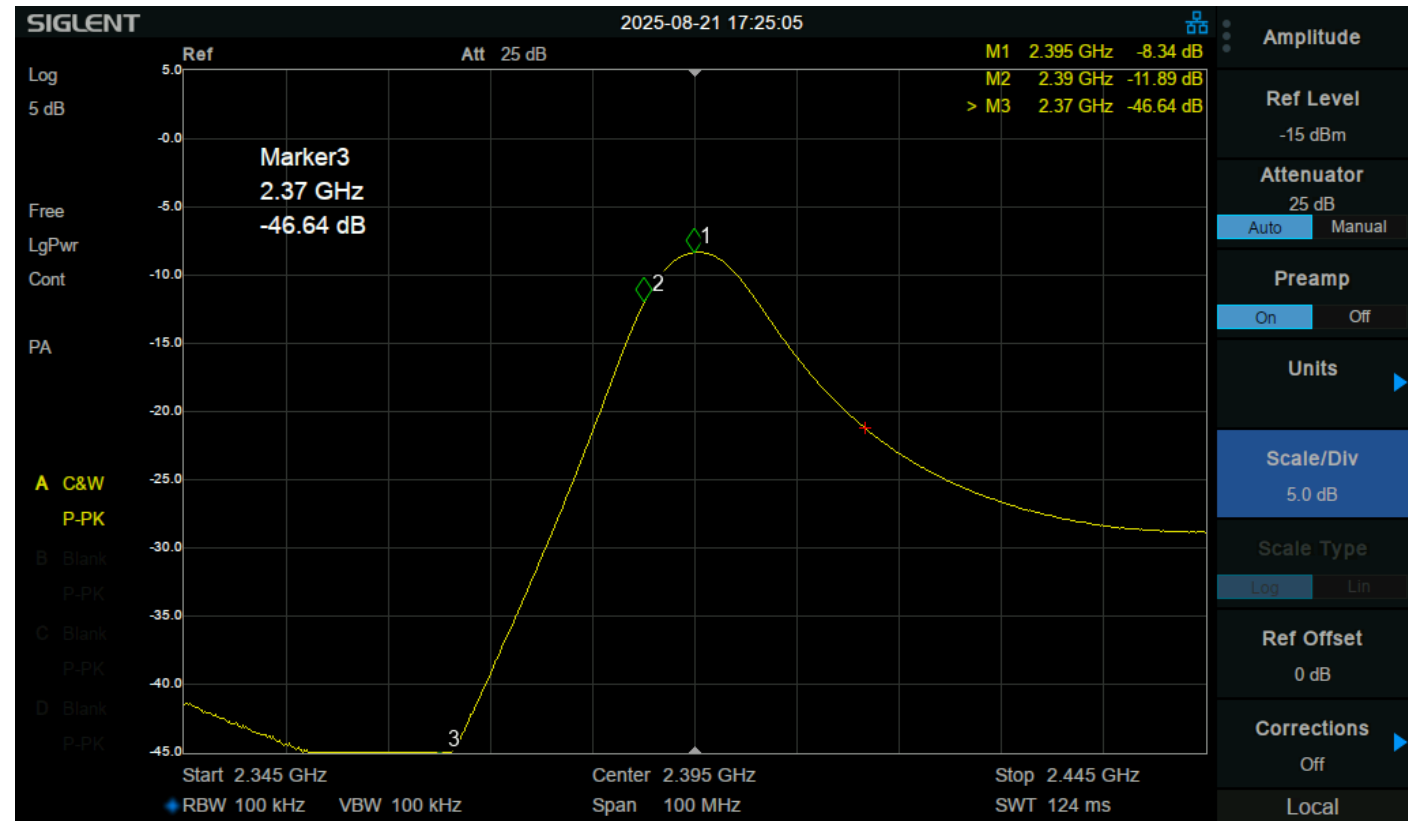




# Filter – Chinese WiFi Filter – New Screws

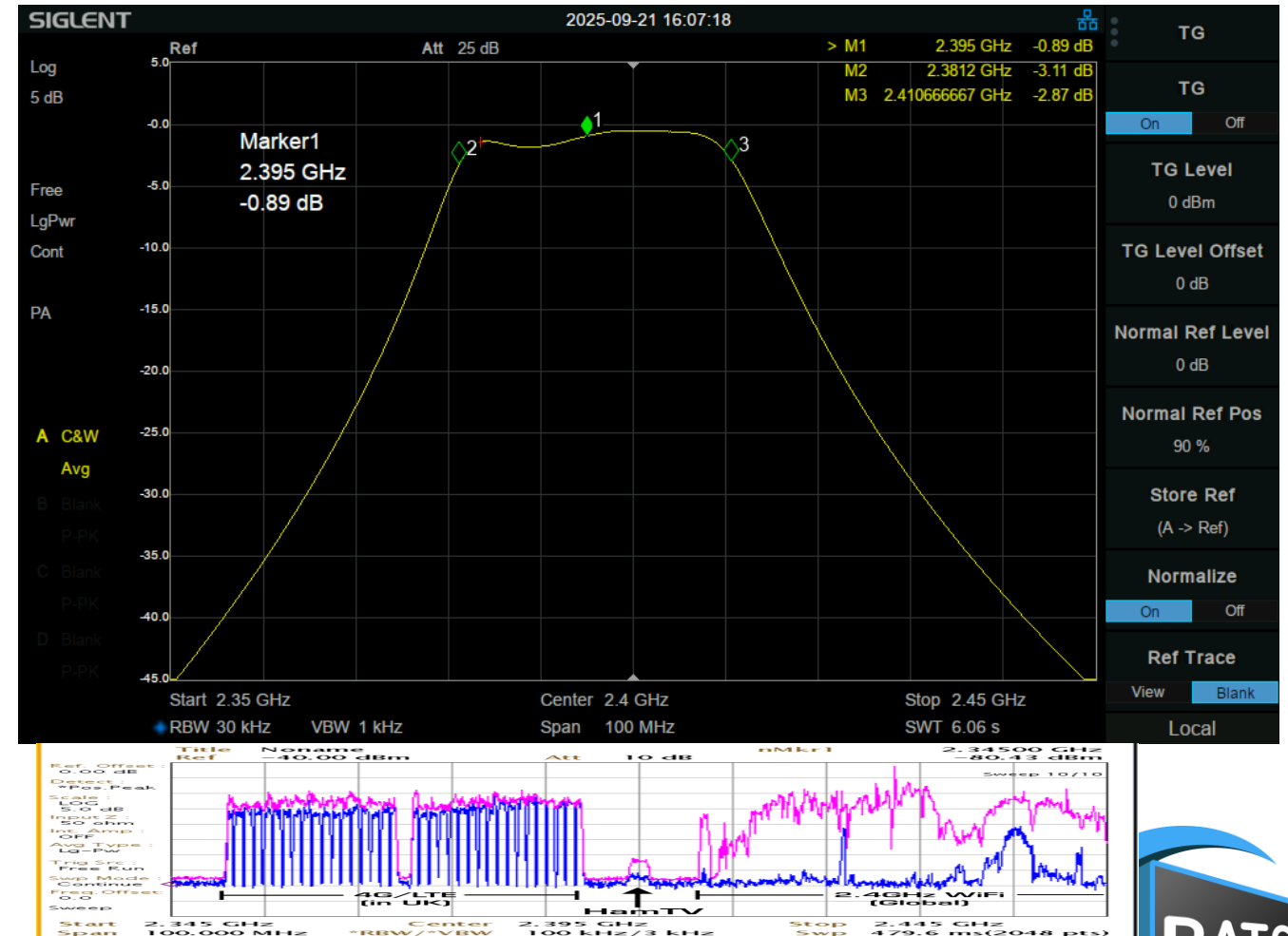


# Filter – Chinese WiFi Filter – Retuned

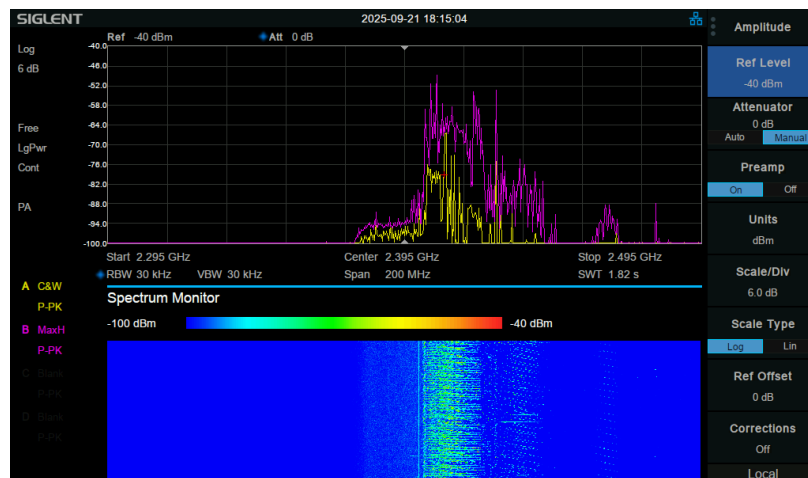
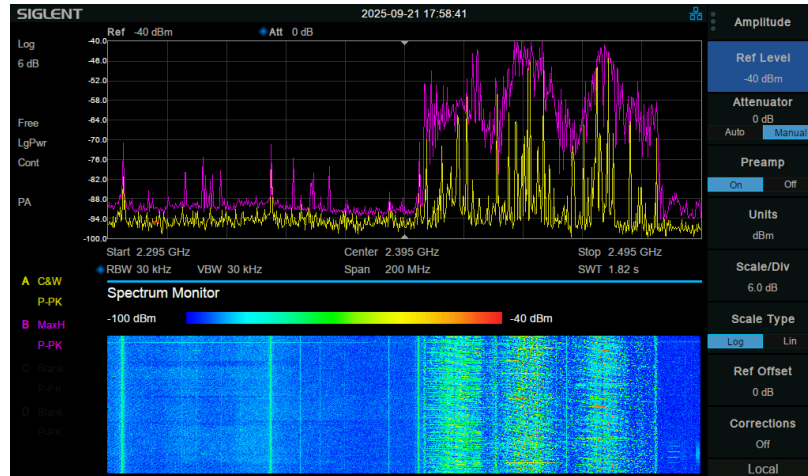




# Filter – 2395MHz Aerial Parts



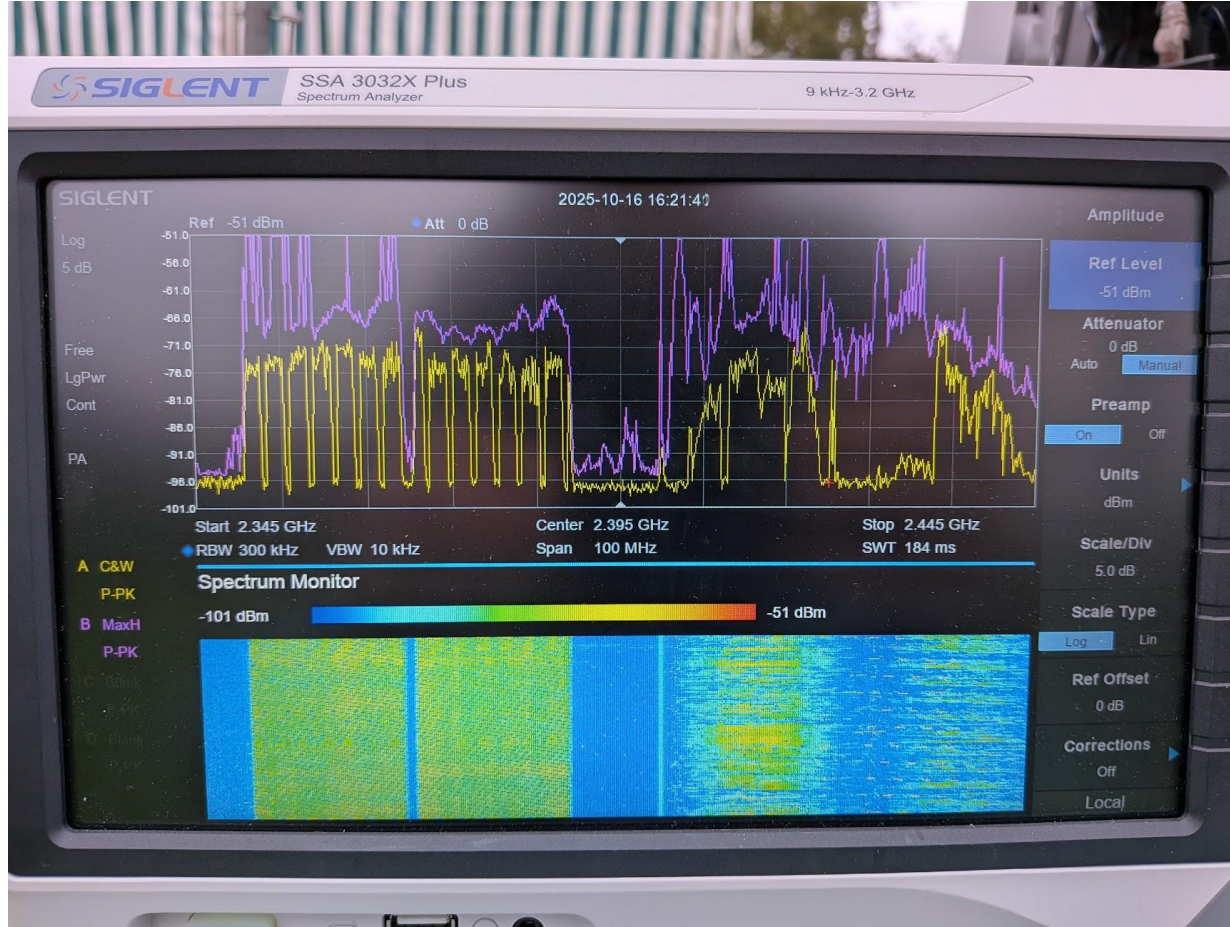
# Ground Station – Filter Results



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

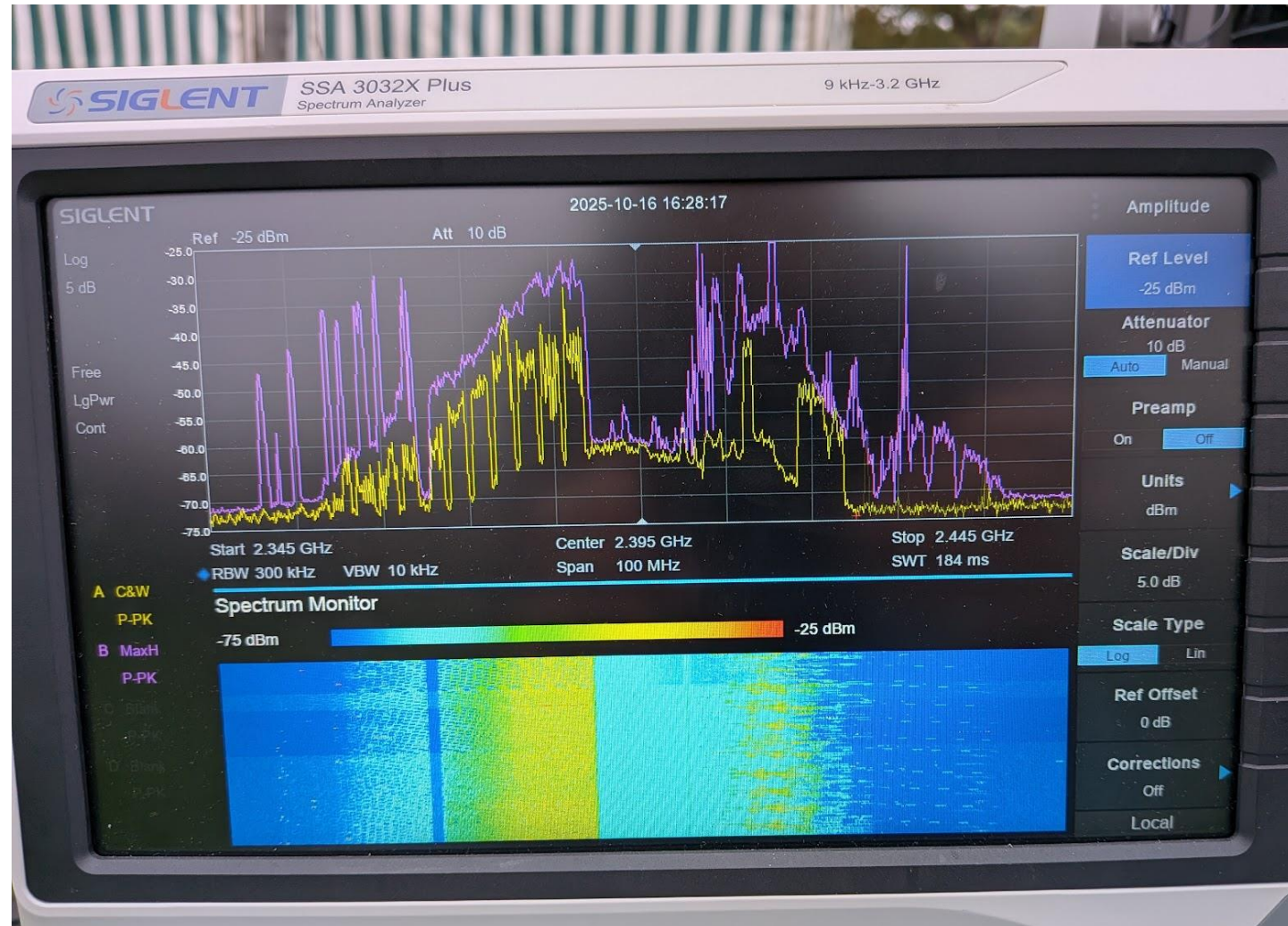


# RFI at Warwick ARISS Venue - Unfiltered





# 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](https://wiki.batc.org.uk/HAMTV_from_the_ISS)
- Join us on the ARISS Discord: <https://discord.gg/EBScTaKN>
  - Dedicated #hamtv channels

