

# Arecibo 12m Antenna Cryogenic Wideband Front-End

Project Update 06/17/2022

Hamdi Mani  
CryoElec LLC  
Chandler, Arizona, USA

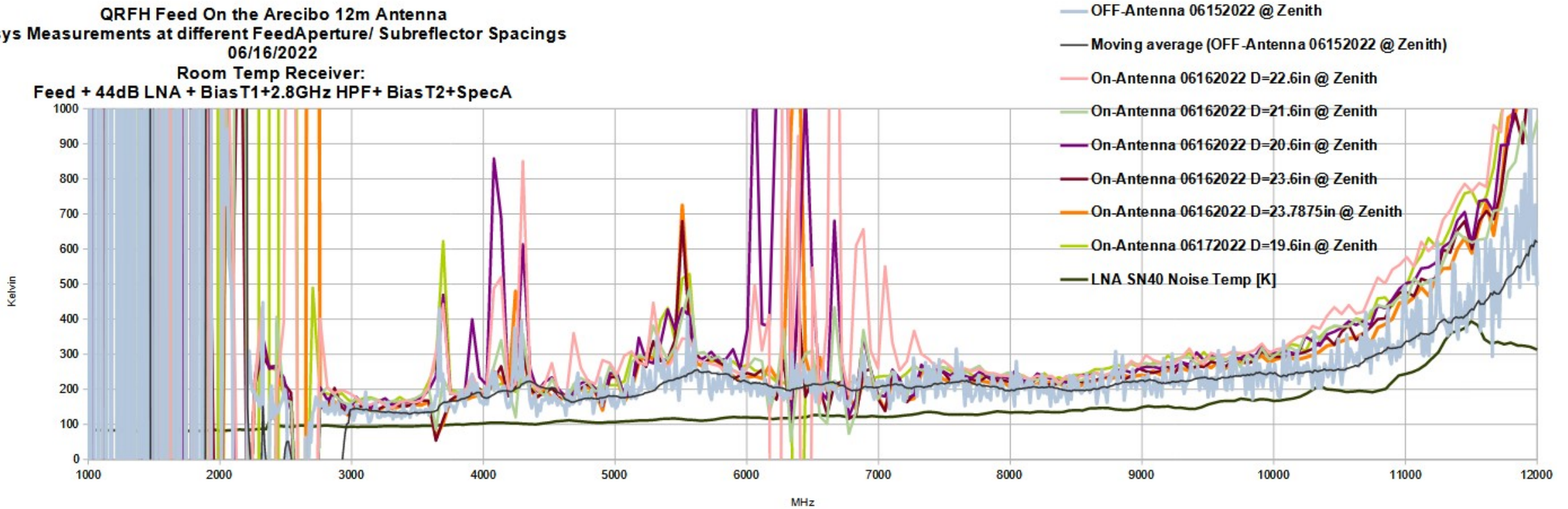
Phone: (626) 676 0143  
Email: [info@CryoElec.com](mailto:info@CryoElec.com) / [hamdi.mani@gmail.com](mailto:hamdi.mani@gmail.com)  
Web: [www.CryoElec.com](http://www.CryoElec.com)



## Summary of all QRFH Feed data on and off Antenna

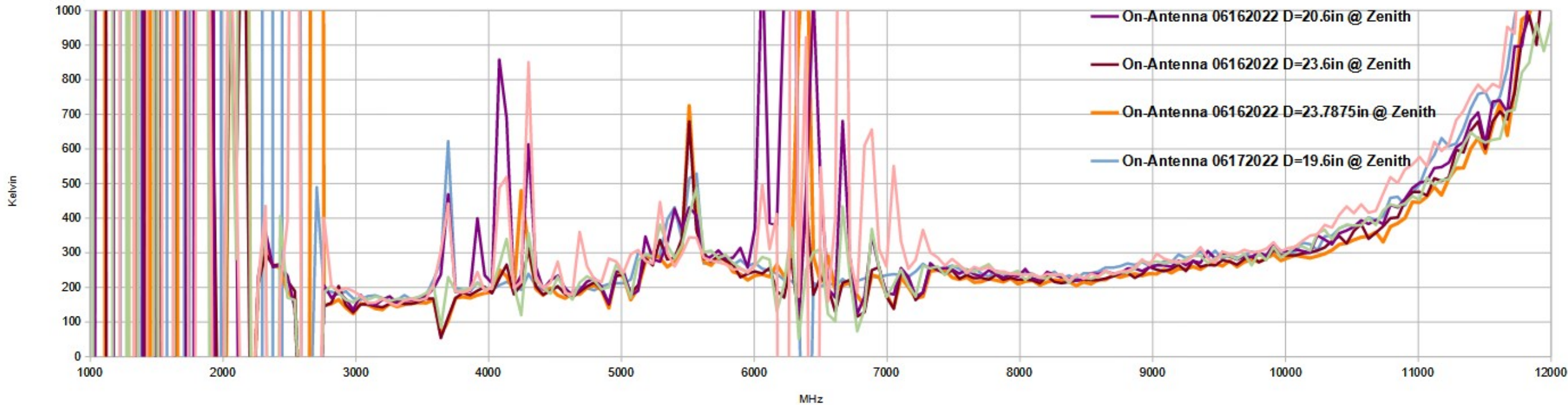
QRFH Feed On the Arecibo 12m Antenna  
 Tsys Measurements at different FeedAperture/ Subreflector Spacings  
 06/16/2022

Room Temp Receiver:  
 Feed + 44dB LNA + Bias T1+2.8GHz HPF+ Bias T2+SpecA



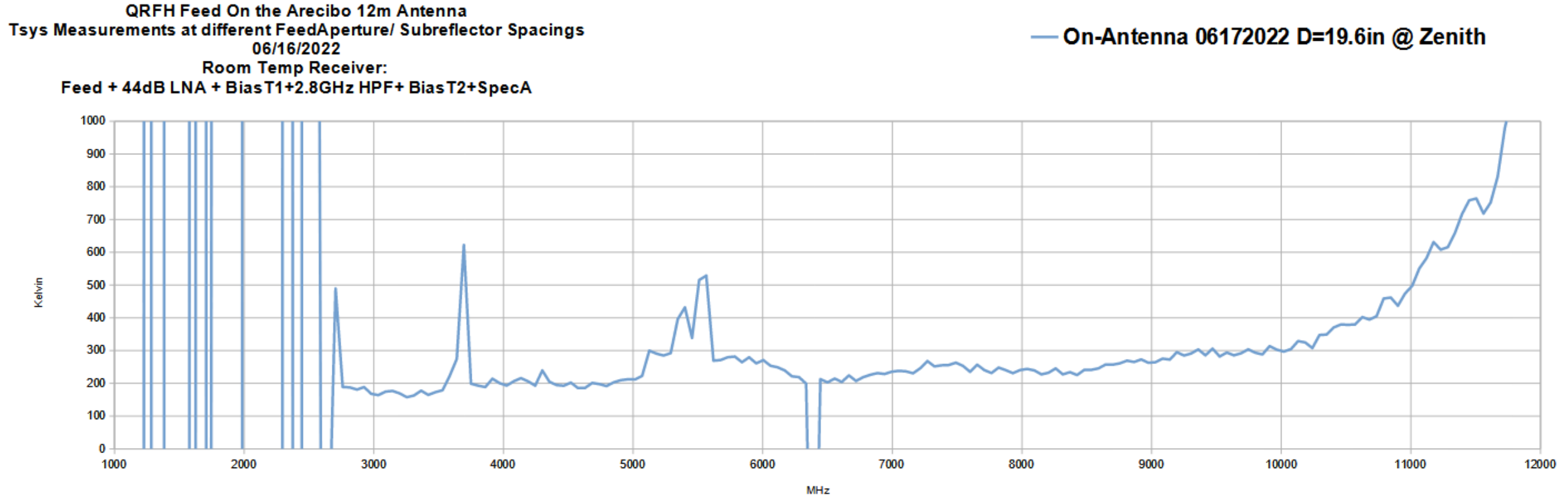
## Summary of all QRFH Feed data On-Antenna 6 Feed Locations

QRFH Feed On the Arecibo 12m Antenna  
Tsys Measurements at different FeedAperture/ Subreflector Spacings  
06/16/2022  
Room Temp Receiver:  
Feed + 44dB LNA + BiasT1+2.8GHz HPF+ Bias T2+SpecA





This Yfactor was measured on Friday 06/17/2022  
For some reason the RFI is low at this date/time  
Possible reason: Subreflector shielding / this is closes position to subreflector  
( all measurements done at maximum antenna elevation ~88deg)

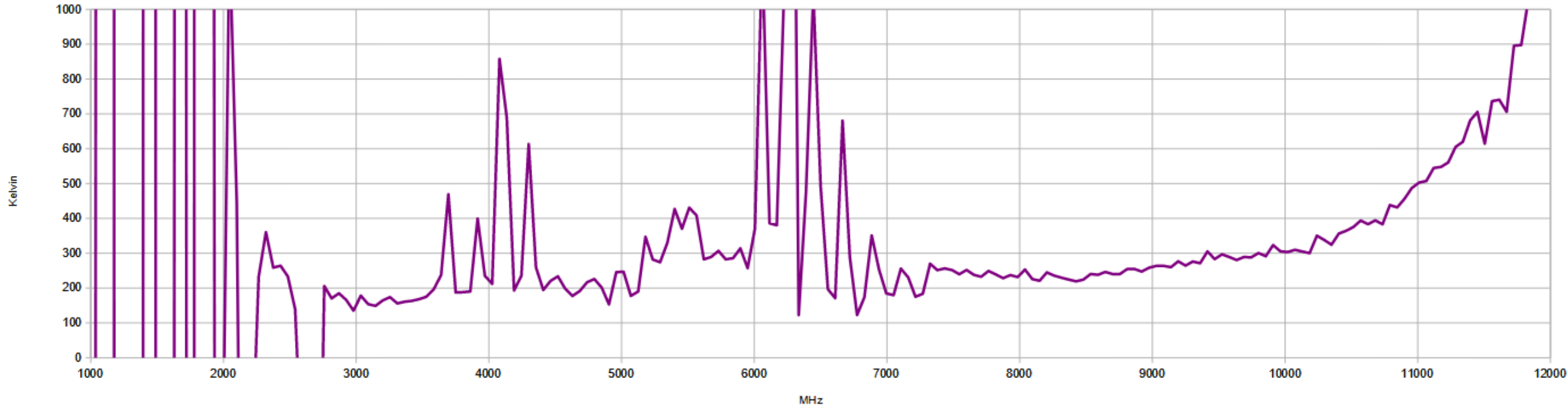


This Y factor was made with a 2.8GHz high pass filter just before the Spectrum analyzer ( Protection)  
( does not affect noise temp)

QRFH Feed On the Arecibo 12m Antenna  
Tsyes Measurements at different FeedAperture/ Subreflector Spacings  
06/16/2022

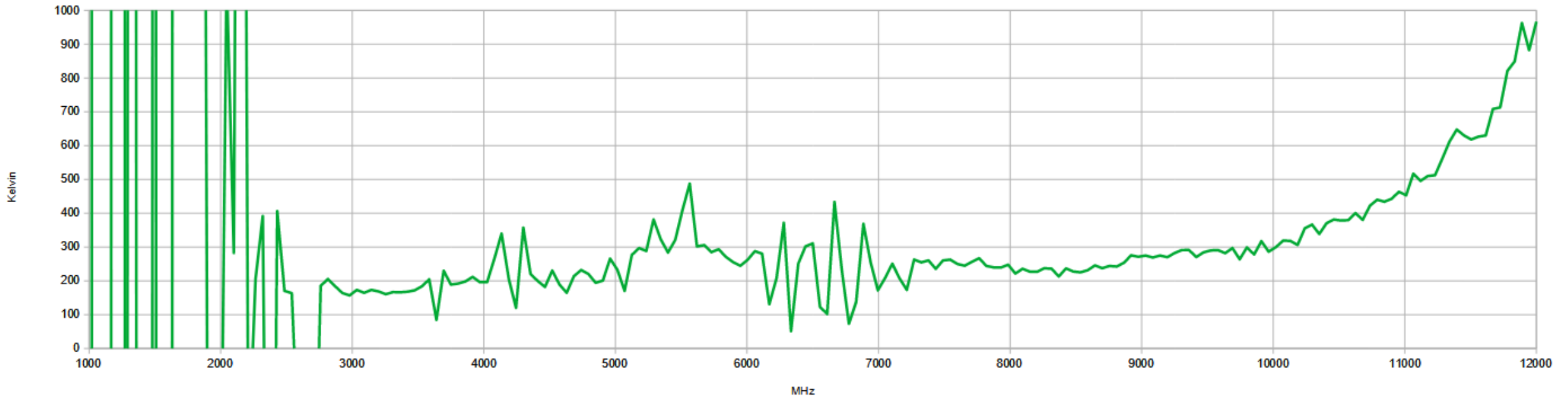
— On-Antenna 06162022 D=20.6in @ Zenith

Room Temp Receiver:  
Feed + 44dB LNA + BiasT1+2.8GHz HPF+ BiasT2+SpecA



QRFH Feed On the Arecibo 12m Antenna  
Tsys Measurements at different FeedAperture/ Subreflector Spacings  
06/16/2022  
Room Temp Receiver:  
Feed + 44dB LNA + Bias T1+2.8GHz HPF+ Bias T2+SpecA

— On-Antenna 06162022 D=21.6in @ Zenith



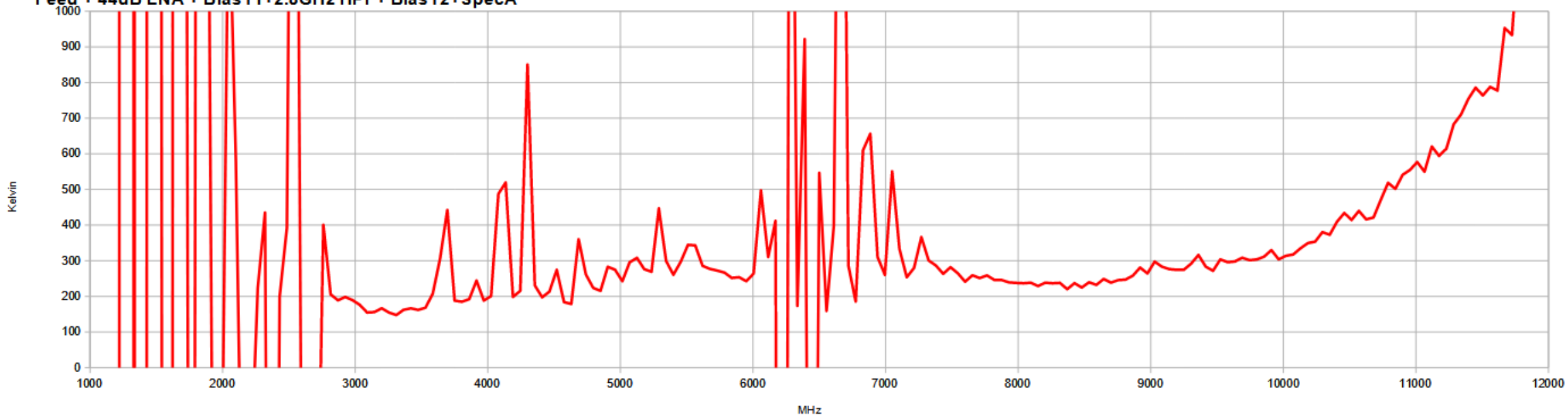
This measurement has most RFI

QRFH Feed On the Arecibo 12m Antenna  
Tsys Measurements at different FeedAperture/ Subreflector Spacings  
06/16/2022

— On-Antenna 06162022 D=22.6in @ Zenith

Room Temp Receiver:

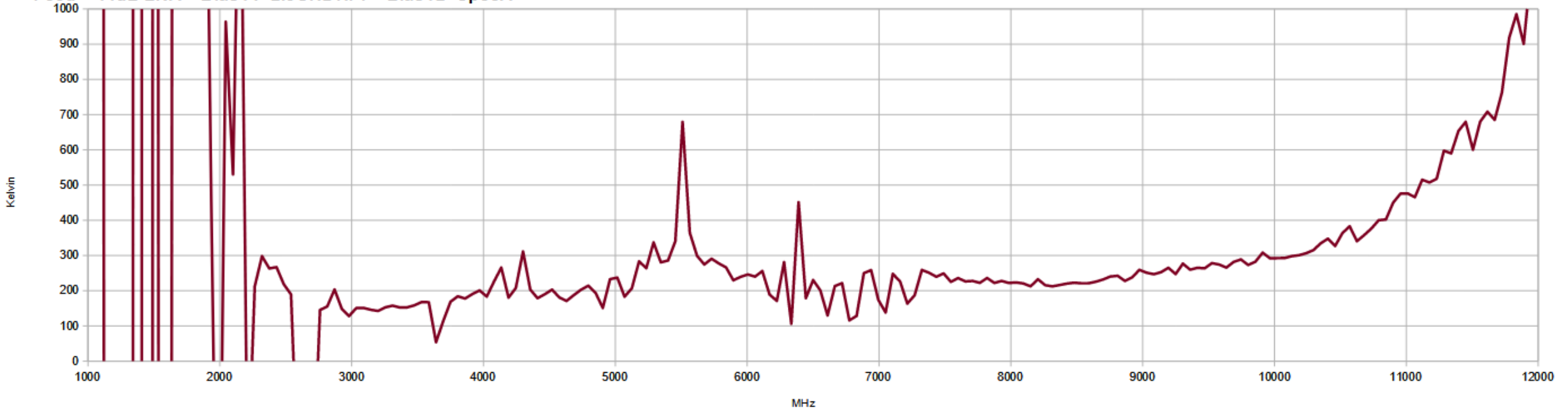
Feed + 44dB LNA + BiasT1+2.8GHz HPF+ BiasT2+SpecA



QRFH Feed On the Arecibo 12m Antenna  
TsYS Measurements at different FeedAperture/ Subreflector Spacings  
06/16/2022

— On-Antenna 06162022 D=23.6in @ Zenith

Room Temp Receiver:  
Feed + 44dB LNA + Bias T1+2.8GHz HPF+ Bias T2+SpecA

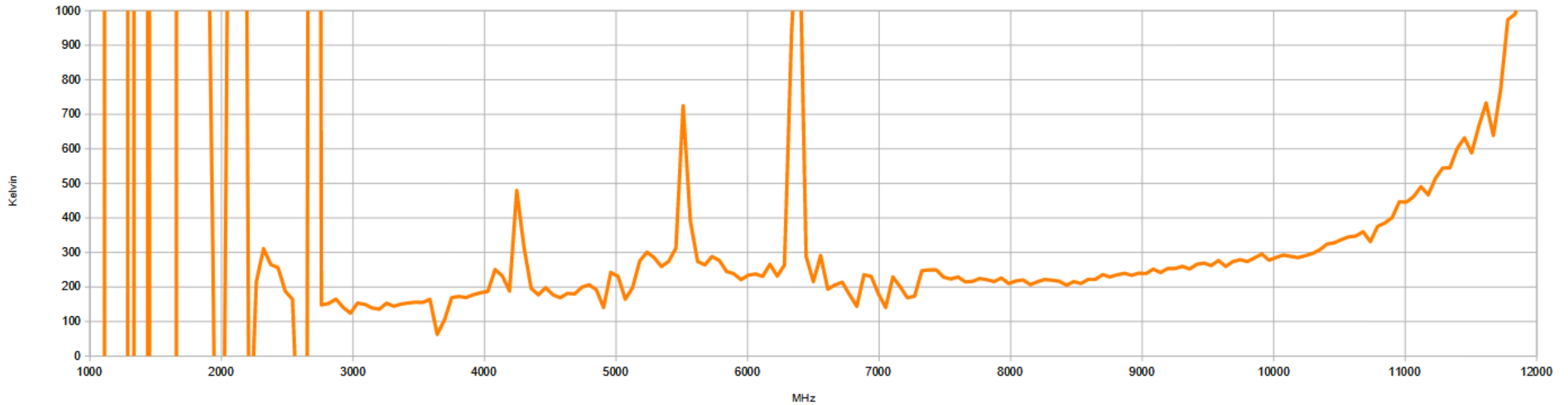




QRFH Feed On the Arecibo 12m Antenna  
Tsyst Measurements at different FeedAperture/ Subreflector Spacings  
06/16/2022

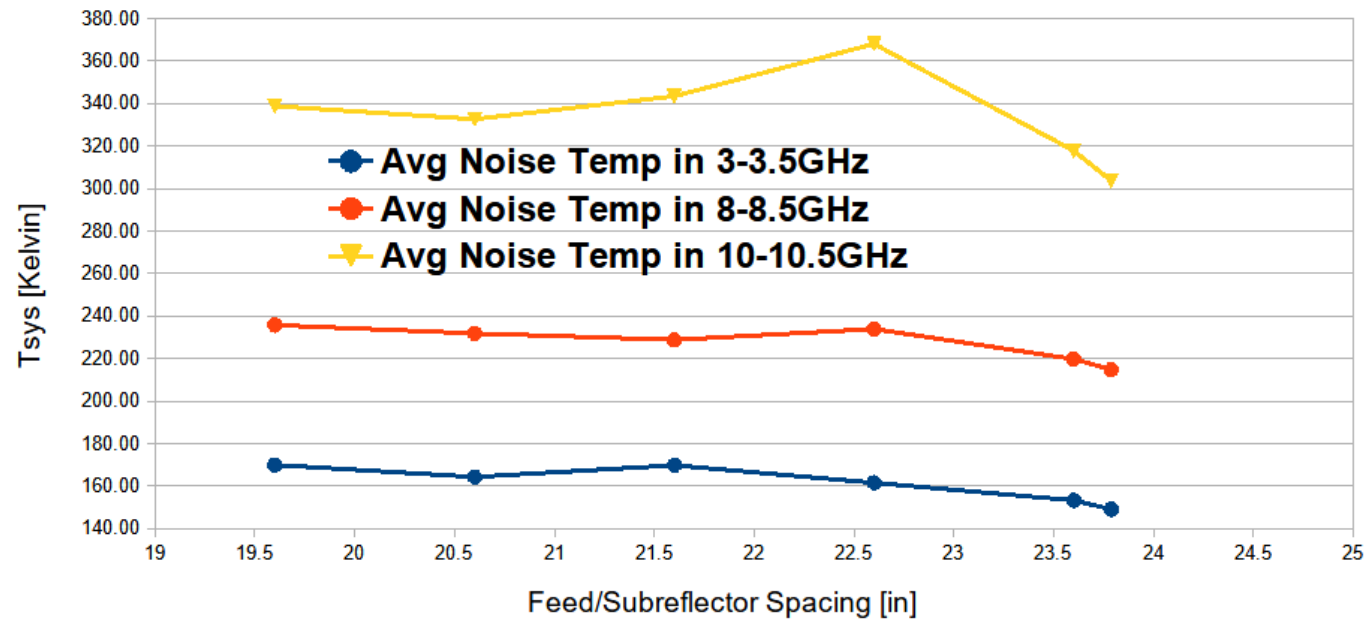
— On-Antenna 06162022 D=23.7875in @ Zenith

Room Temp Receiver:  
Feed + 44dB LNA + Bias T1+2.8GHz HPF+ Bias T2+SpecA

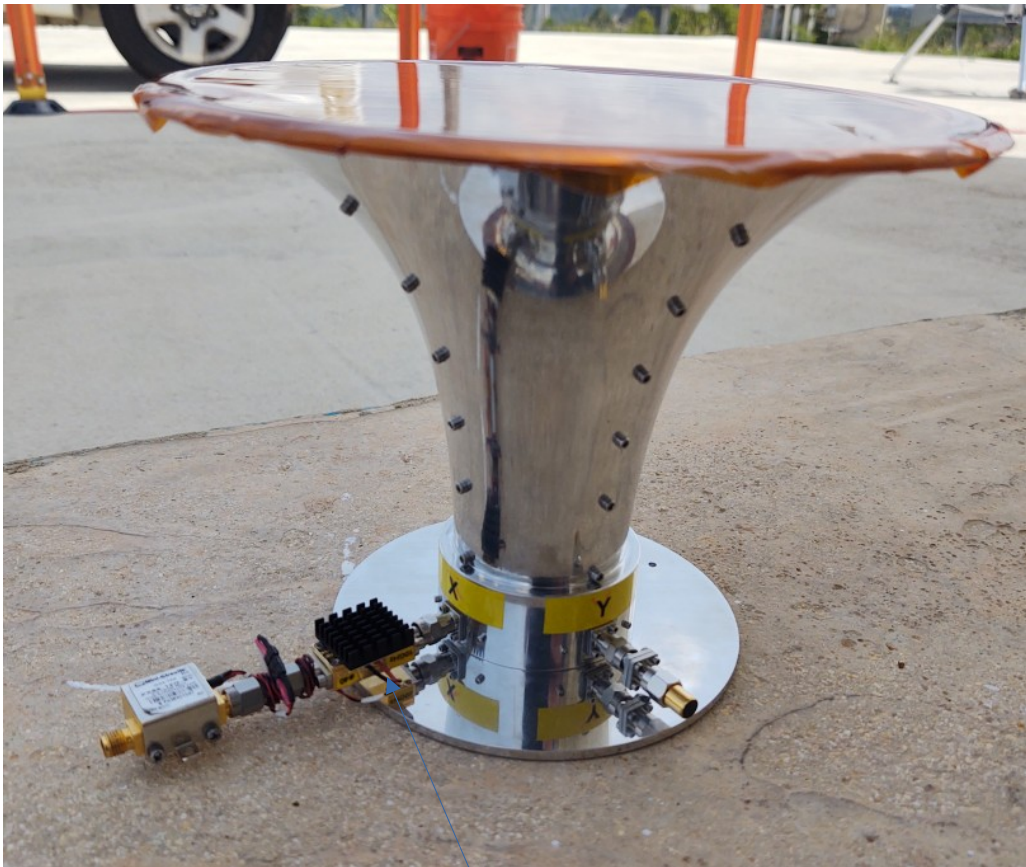


D [in]	Avg Noise Temp in 3-3.5GHz	Tant [K] @ 3-3.5GHz	Avg Noise Temp in 8-8.5GHz	Tant [K] @ 8-8.5GHz	Avg Noise Temp in 10-10.5GHz	Tant [K] @ 10-10.5GHz
19.6	169.96	36.07	235.76	33.29	338.83	84.74
20.6	164.29	30.40	231.86	29.40	332.69	78.60
21.6	169.78	35.89	228.83	26.37	343.48	89.39
22.6	161.56	27.67	233.93	31.47	368.07	113.99
23.6	153.27	19.38	219.76	17.30	317.87	63.79
23.7875	149.07	15.18	214.85	12.38	303.68	49.60
<b>RX Off Antenna</b>	133.89		202.47		254.09	
<b>LNA Alone</b>	94.16		135.21		186.67	

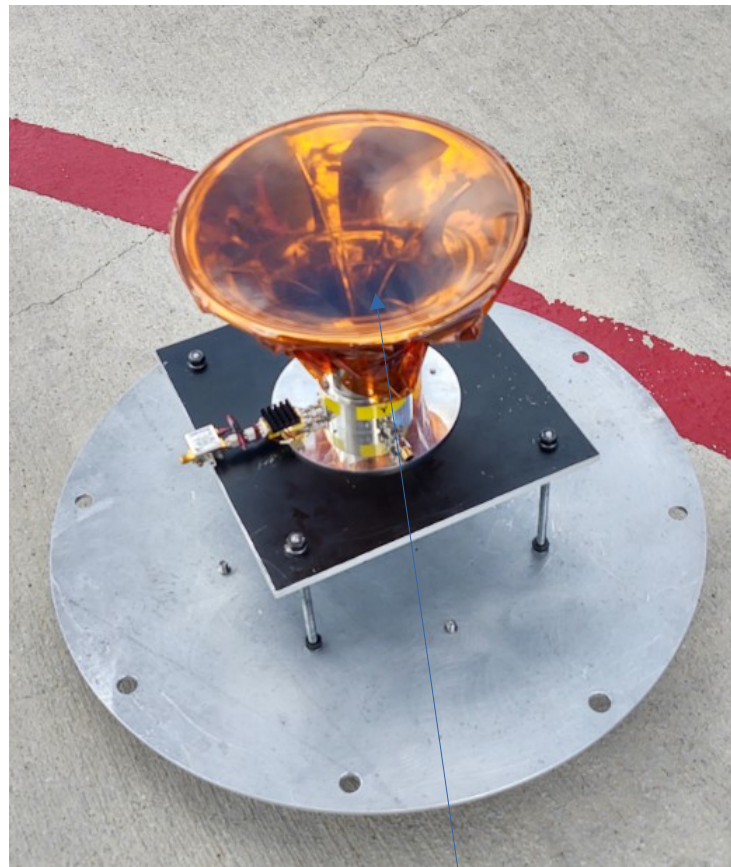
### Averaged Tsys in 500MHz Bandwidth



## Some Photos of the Feed, Antenna Setup



LNA 44dB / 100-150K



Low Loss Kapton Film  
For feed protection ( moisture)



