

# Antonio Feed update

## General Update

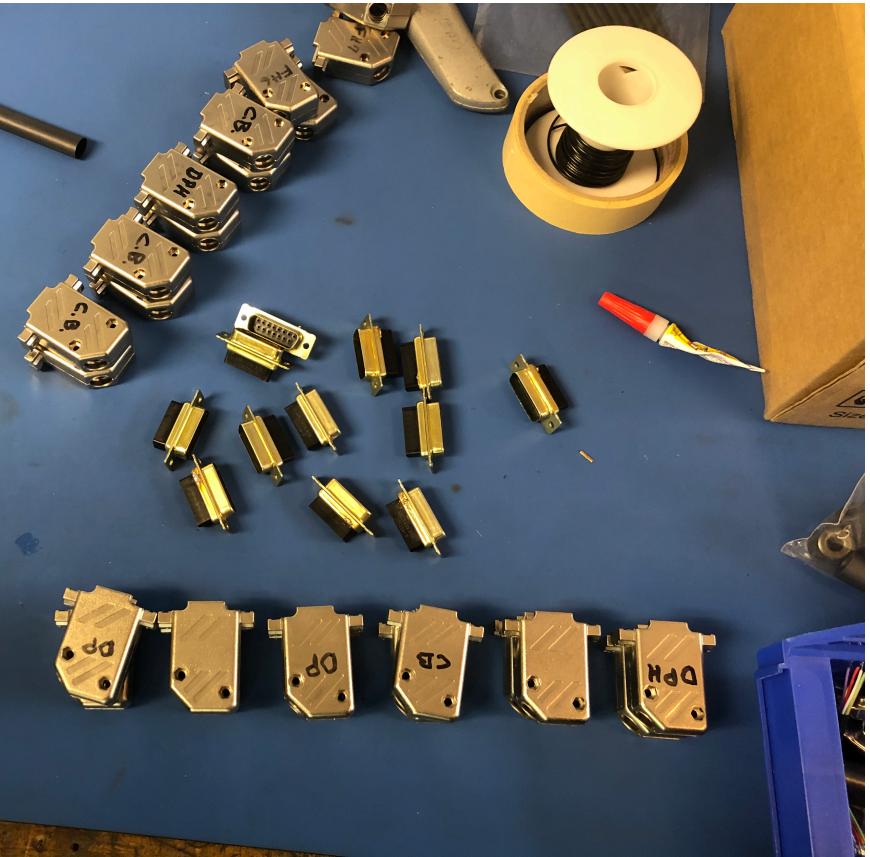
- SPR
  - Planning of tone measurement of RFCBs
  - Planning of power measurement after RF 4-way splitter
  - Investigate IF ripples
- System temperature measurements
  - Update (Ron)
- 4J – (006)
  - DONE
- 1H – (013)
  - Cryo-Cooler control board replaced
- Feeds – (003, 004, 008, 010, 011, 014)
  - STARTED

# Antonio Feed Overview

- Ongoing work on wire harness for 13 feeds
  - Took 2 feeds up from Minex to also start retrofitting
  - Base plates from feeds are at Minex to remove Bellow
  - Quote for LNA Test Jig received, quote for feed mount received
  - Meeting with LNF, spare MMICs are available and we will order some spare for our current retrofit and maintenance efforts.

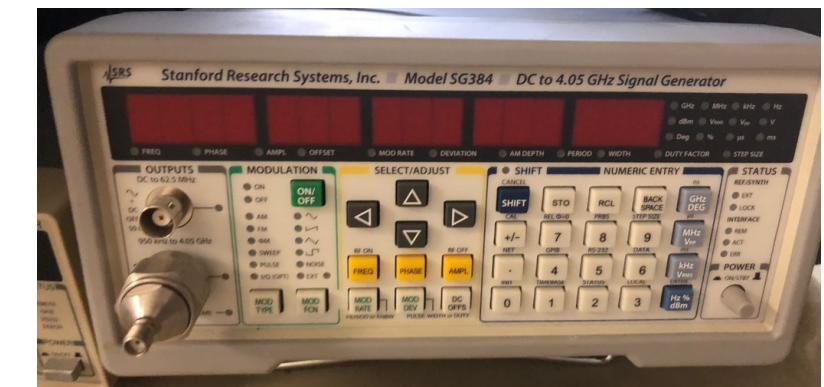
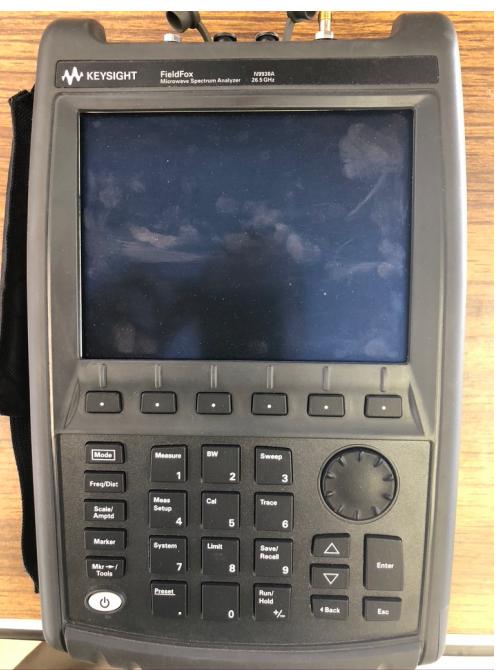
# Antonio Feed Overview

- Wire Harness Update
- 3 sets are almost done (power supply, temp sensors, turbo pump)
- 6 sets are missing
- Will lead to 12 complete wire harness assemblies

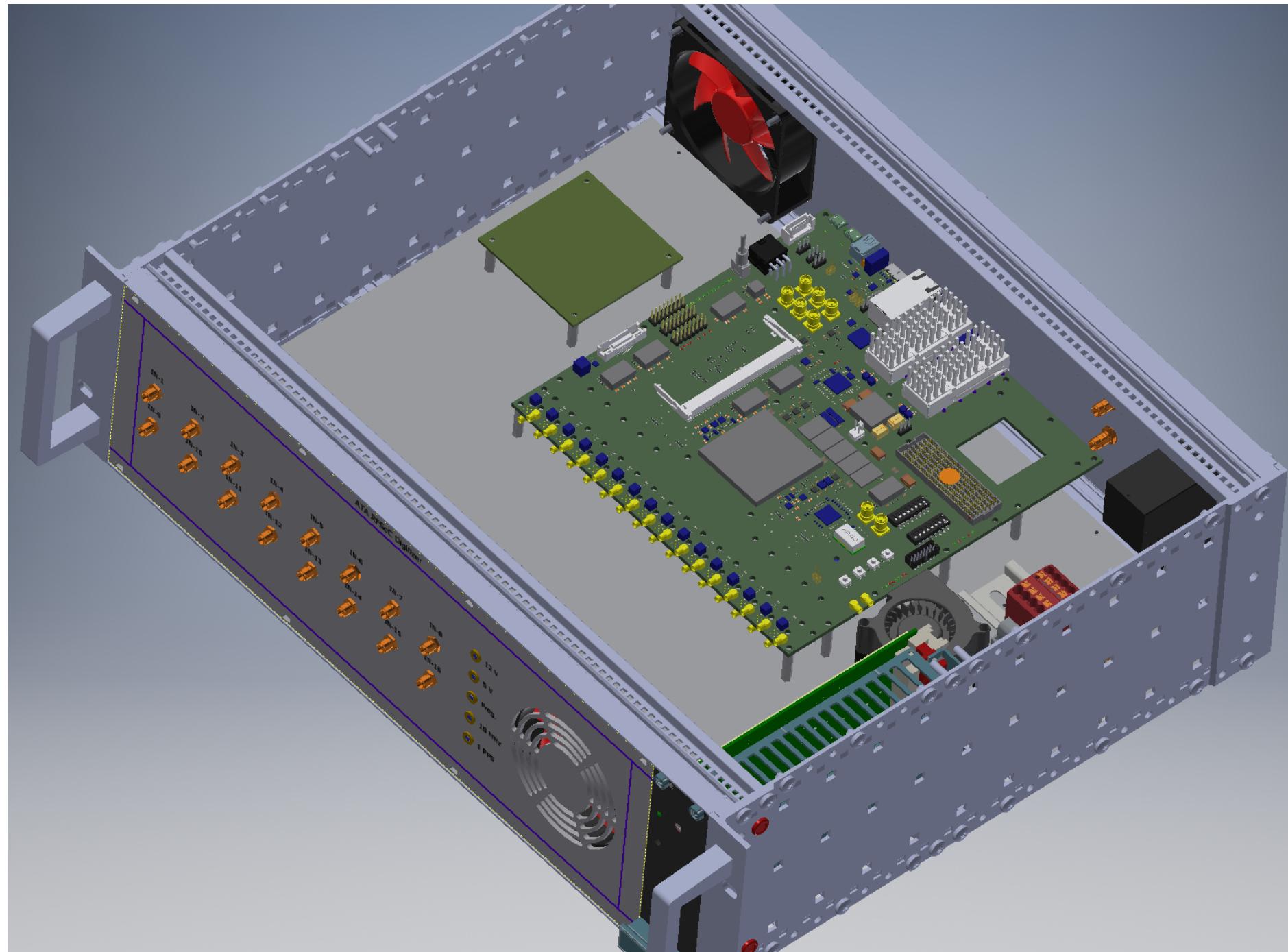


# Measurement Equipment Overview

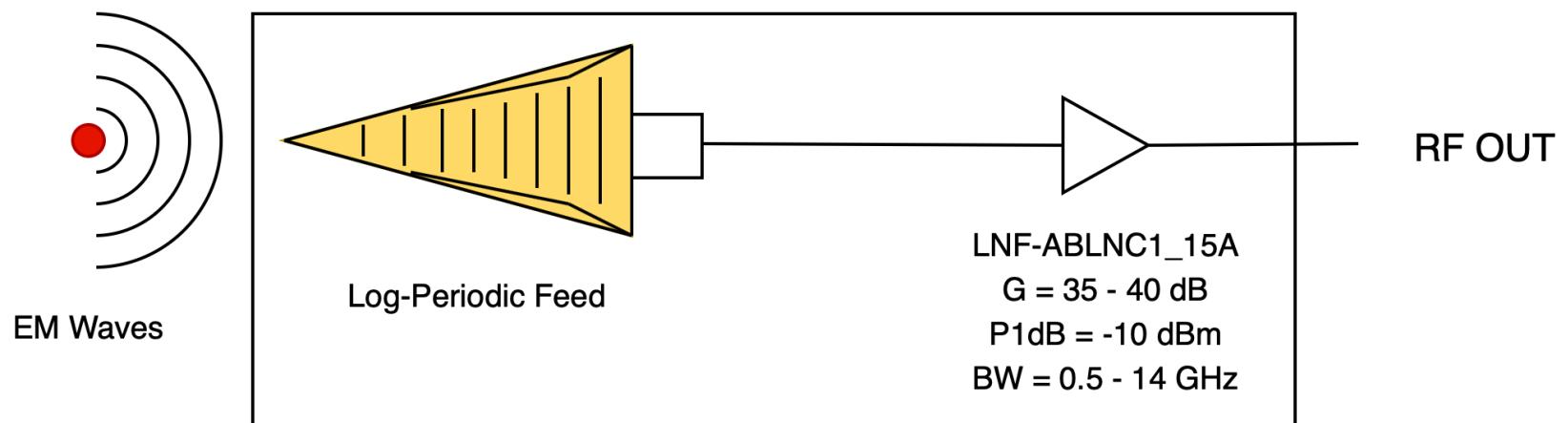
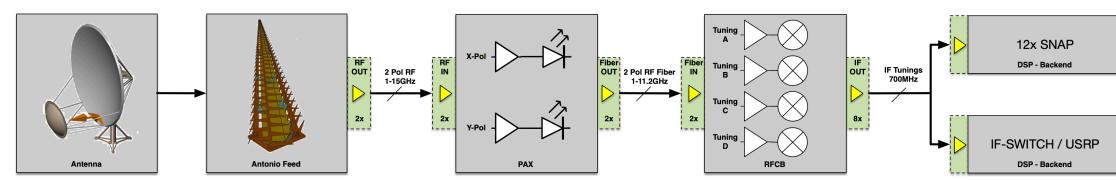
- Agilent VNA 2 Port N5230C 10MHz -20GHz without calibration set
- SRS Signal Generator SG384 DC – 4.05GHz
- Agilent Signal Generator E4420B 250KHz – 2.0GHz
- Keysight Spectrum Analyzer N9938A DC - 26.5GHz
- DS Fiber Converter DSC-40S DC - 16GHz
- R&S Power Meter NRP18S 10MHz – 18GHz
- Atlantic Amplifier AOX-010200 1GHz – 20GHz



# RFSOC Enclosure Design

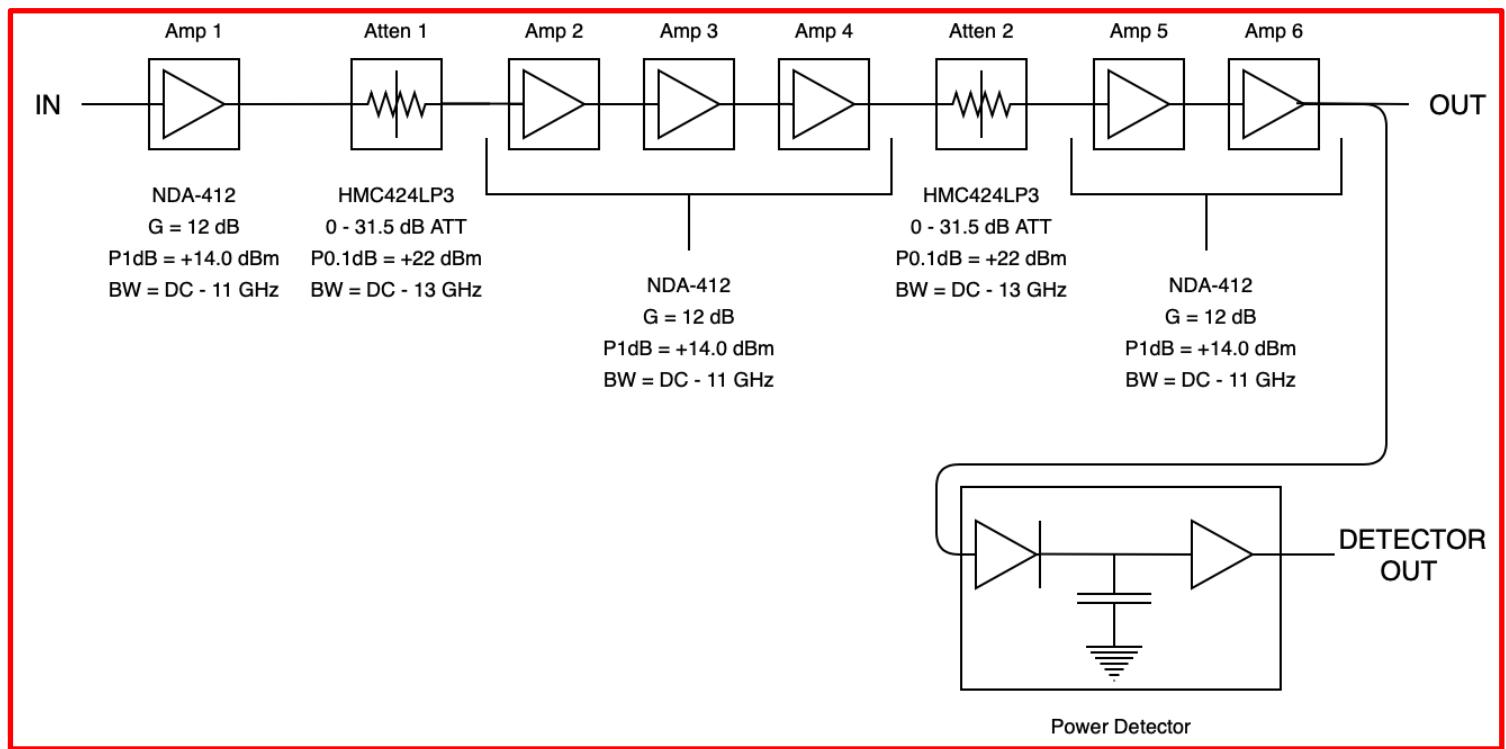
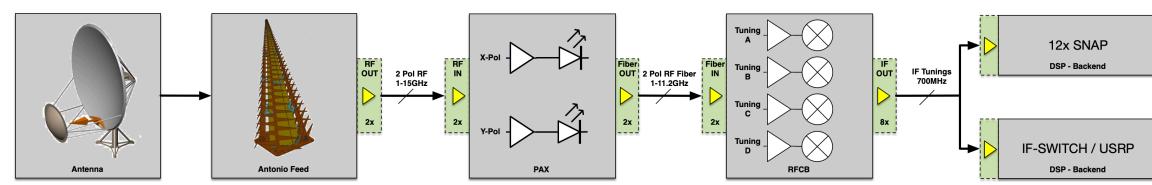
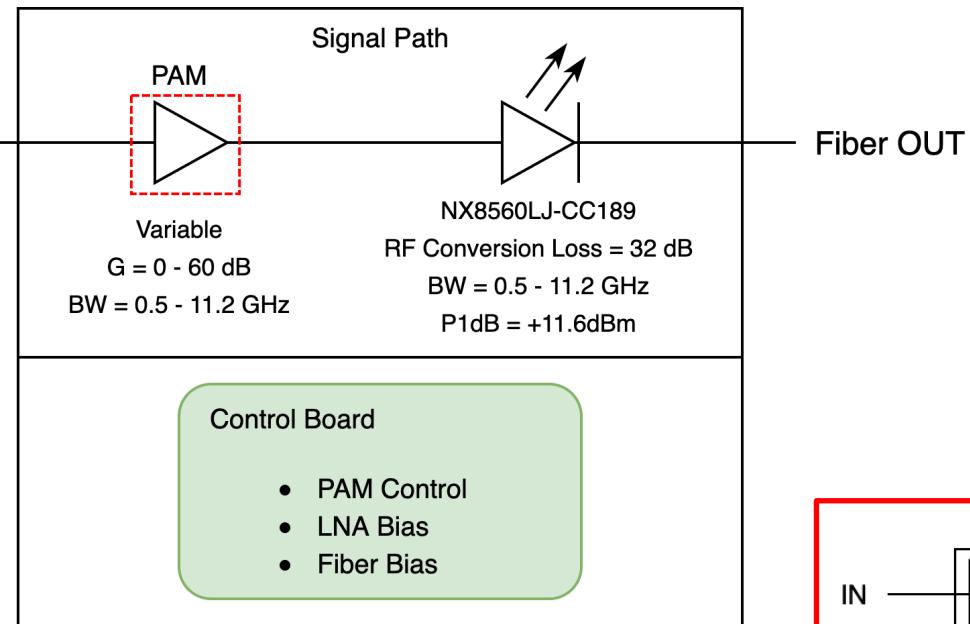


# Antonio Feed

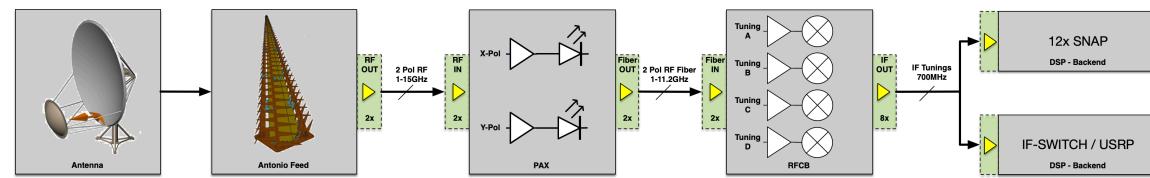


# PAX

RF IN



# RFCB

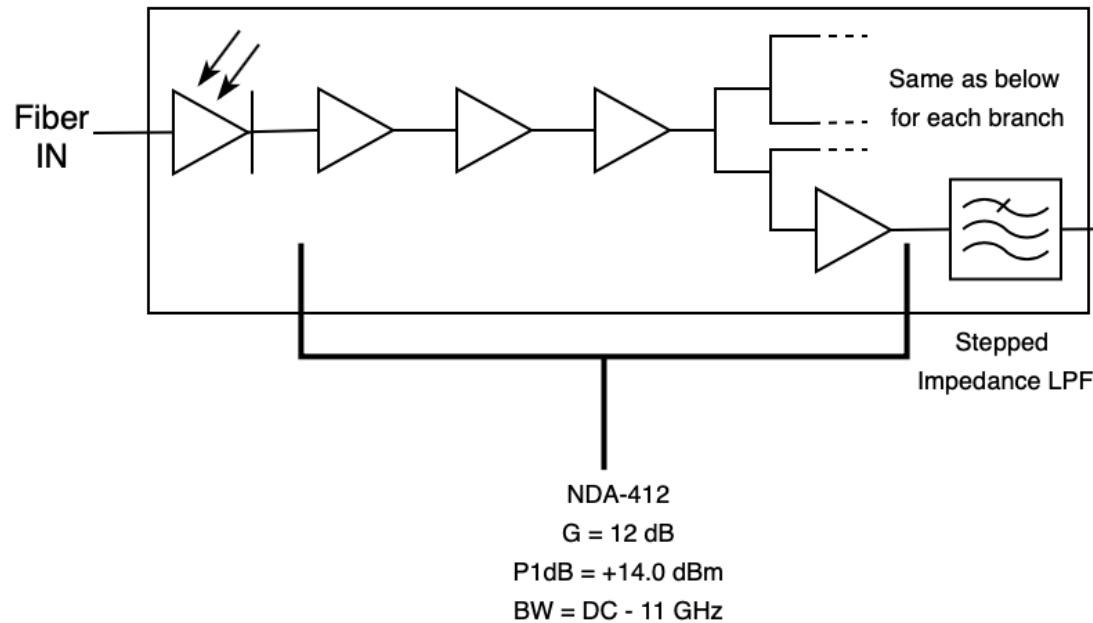


DSC-40S

Responsivity = 1550 nm

Bias Volt = 6 V

BW = 16 GHz



HMC-260

RF & LO BW = 14 - 18 GHz  
IF BW = DC - 8 GHz  
Conversion Loss = 7.5 dB

HMC-412

RF & LO BW = 9.0 - 15.0 GHz  
IF BW = DC - 2.5 GHz  
Conversion Loss = 8 dB

Variable LO A-D  
16 - 26.7 GHz

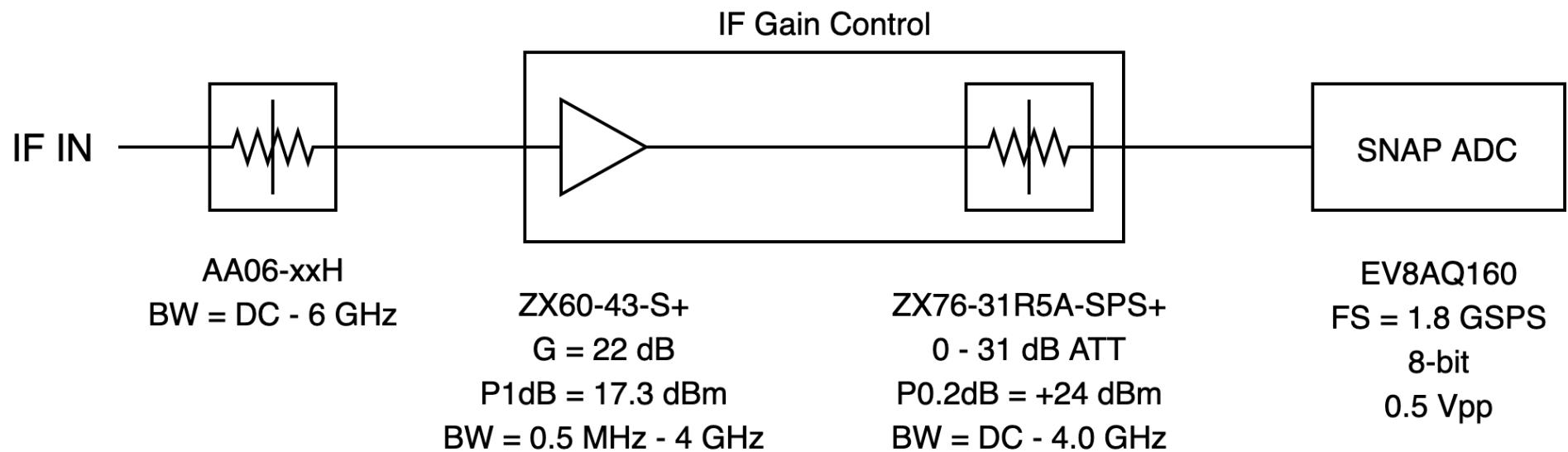
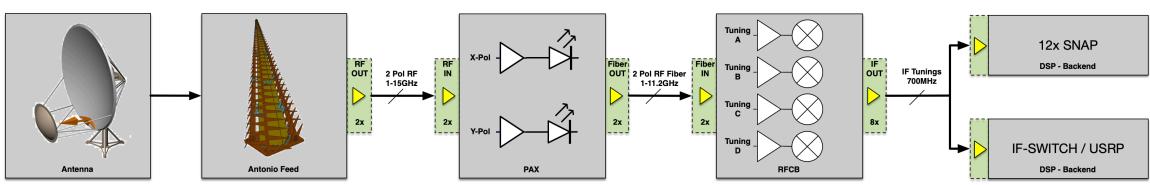
cf = 15.5 GHz  
BW = 700 MHz

HMC-516  
G = 20.5 dB  
P1dB = +14 dBm  
BW = 9 - 18 GHz

Fixed LO2  
15.95 GHz

IF OUT

# IF-Signal Path



# Cascade Analysis

- First model!
- Does not assume RFI as of now
- Refinement by measuring power levels at certain stages thought the signal chain.
- Already showed that the ideal power level at the fiber transmitter input should be about -10dBm

	Component	Gain dB	Gain Linear	Physical temp (K)	Gain temp (K)	Running Gain (dB)	Power at this stage (dBm)	(P1dB)	Dynamic Range (dB)	Tsys (K)
Antenna / Feed	CMB	0.000	1.000	2.7	0	0	-92.53	-	-	2.700
	Atmosphere	-0.060	0.986	220.0	0	-0.060	-89.30	-	-	5.761
	Dish	-0.020	0.995	290.0	0	-0.080	-88.40	-	-	7.118
	Mirror	-0.020	0.995	290.0	0	-0.100	-87.66	-	-	8.481
	Radome	0.000	1.000	290.0	0	-0.100	-87.66	-	-	8.481
	Feed	-0.040	0.991	80.0	0	-0.140	-87.32	-	-	9.239
	Link-Capacitor	-0.300	0.933	80.0	0	-0.440	-85.48	-	-	15.148
	Cable1	-0.100	0.977	80.0	0	-0.540	-85.02	-	-	17.210
	LNA	38.000	6309.573	0.0	20	37.460	-43.38	-10.00	33.38	39.858
	SS cable	-1.500	0.708	80.0	0	35.960	-44.87	-	-	39.864
PAX	Feedthru SMA	-0.100	0.977	290.0	0	35.860	-44.97	-	-	39.865
	SS cable	-2.000	0.631	290.0	0	33.860	-46.97	-	-	39.909
	Bandwidth red. 12/15 GHz	-1.000	0.794	0.0	0	32.860	-47.97	-	-	39.909
	NDA-412	12.000	15.849	0.0	630	44.860	-35.93	14.00	49.93	40.235
	Filter	-4.000	0.398	0.0	0	40.860	-39.93	-	-	40.235
	HMC424	-10.000	0.100	0.0	0	30.860	-49.93	22.00	71.93	40.235
	NDA-412	12.000	15.849	0.0	630	42.860	-37.88	14.00	51.88	40.752
	NDA-412	12.000	15.849	0.0	630	54.860	-25.88	14.00	39.88	40.785
	NDA-412	12.000	15.849	0.0	630	66.860	-13.88	14.00	27.88	40.787
	HMC424	-20.000	0.010	0.0	0	46.860	-33.88	22.00	55.88	40.787
RFCB	NDA-412	12.000	15.849	0.0	630	58.860	-21.87	14.00	35.87	40.800
	NDA-412	12.000	15.849	0.0	630	70.860	-9.87	14.00	23.87	40.801
	PAM output cable to OTX	0.000	1.000	0.0	0	70.860	-9.87	-	-	40.801
	NX8560LJ-CC189	0.000	1.000	0.0	0	70.860	-9.87	11.60	21.47	40.801
	Fiber cable	-35.000	0.000	290.0	7284180	35.860	-44.80	-	-	41.474
	DSC-40S	0.000	1.000	0.0	0	35.860	-44.80	-	-	41.474
	NDA-412	12.000	15.849	0.0	630	47.860	-32.79	14.00	46.79	41.637
	NDA-412	12.000	15.849	0.0	630	59.860	-20.78	14.00	34.78	41.647
	NDA-412	12.000	15.849	0.0	630	71.860	-8.78	14.00	22.78	41.648
IF	4-way Wilkinson Divider	-6.000	0.251	290.0	0	65.860	-14.78	-	-	41.648
	NDA-412	12.000	15.849	0.0	630	77.860	-2.78	14.00	16.78	41.648
	Stepped Impedance Filter	-1.000	0.794	290.0	0	76.860	-3.78	-	-	41.648
	Fixed Attenuator	-10.000	0.100	290.0	0	66.860	-13.78	-	-	41.648
	HMC260	-7.500	0.178	290.0	0	59.360	-21.28	12.00	33.28	41.649
	BPF 700MHz	-3.500	0.447	290.0	0	55.860	-24.78	-	-	41.649
	Bandwidth red. 0.7/12 GHz	-12.300	0.059	0.0	0	43.560	-37.08	-	-	41.649
	HMC516	20.500	112.202	0.0	170	64.060	-16.58	14.00	30.58	41.656
	HMC412	-8.000	0.158	290.0	0	56.060	-24.58	11.50	36.08	41.657
	SGA-2286	15.000	31.623	0.0	360	71.060	-9.58	8.30	17.88	41.658
RF Output	RF Output cable	-0.100	0.977	290.0	0	70.960	-9.68	-	-	41.658
	LMR-240 25ft	-1.500	0.708	290.0	0	69.460	-11.18	-	-	41.658
	AA06-xxH	-10.000	0.100	0.0	0	59.460	-21.18	-	-	41.658
	ZX60-43-S+	22.000	158.489	0.0	715	81.460	0.82	17.30	16.48	41.659
	ZX76-31R5A-SPS+	-19.000	0.013	290.0	0	62.460	-18.18	22.00	40.18	41.659
	AFX-CA-141-xx	-0.100	0.977	290.0	0	62.360	-18.28	-	-	41.659
ADC	EVA8AQ160 ADC	-0.050	0.989	290.0	0	62.310	-18.33	0.00	18.33	41.659