DEUTERIUM ARRAY MEMO #018

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To: Deuterium Array Group

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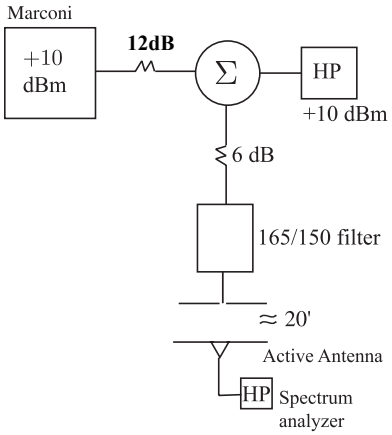
Subject: Out of Band Rejection

Test Setup & Results 10/8

The following test setup was used to evaluate the 2nd order interference cause by a 162MHz tone and a 165MHz tone in several different active antenna configurations. They are:

1. DipStSE – Standard Dipole with 17.7cm heliax stubs integrated into the elements. The amplifier is in the single-ended configuration.
2. DipStBal – Standard Dipole with stubs but the amplifier is in the balanced configuration.
3. MeshBal – Nakano type mesh antenna with the amplifier in the balanced configuration.
4. MeshSE – Nakano element with the single-ended amplifier.
5. DipSE – Standard Dipole without stubs, in the single-ended configuration.
6. DipBal – Standard Dipole without stubs, in the balanced configuration.



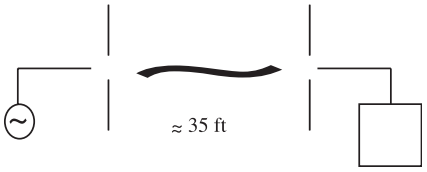
Input power levels
162 MHz @ – 0.3 dBm
165 MHz @ – 12 dBm
327 MHz @ – 111 dBm

The 12dB and 6dB pads were inserted to prevent the signal generators from transmitting their own IM2 distortion. A 327MHz reference tone into a completely passive receiving antenna was found to be –49dBm. The instrumental IM2 at 327MHz in the above setup into a passive receiving antenna was found to be <-140dBm.

	DipStSE	DipSt bal	Mesh Bal	Mesh SE	DipSE	DipDBal
162MHz	-25.7	-13.5	-13.7	-19.5	-1.1	-14.8
165MHz	-37.7	-25.3	-26.8	-30.7	-27.3	-27.7
327MHz IM2	-106	-83.6	-81.0	-95.3	-94.0	-89.1
327 Straight in	-27.6	-26	-24.2	-29.6	-27.7	-25.3
Output IP2	+42.6	+44.8	+40.5	+45.1	+51.6	+46.6
RelReject@162	+1.9	+12.5	+10.8	+10.1	+12.6	+10.5
RelReject@165	-10.1	+0.7	-2.6	-1.1	+0.4	-2.4

Radiation Patterns

The following set up was used to make radiation pattern measurements for the transmitting antenna in both the horizontal and vertical positions. Cross polarization was measured for both positions. Measurements were made for receiving angles of 0, 20, 50, and 90 degrees.



DipSE

	0	20	50	90
Vert	+3.9	+2.0	-6.2	-21
Cross	-30.1	-26.2	-27.4	-26
Horiz	+6.1	-4.7	+0.0	-5.6
Cross	-29.0	-30.5	-42	-30

DipStSE

	0	20	50	90
Vert	+4.1	+1.6	-6.1	-19.5
Cross	-32.1	-26.9	-25.3	-18.2
Horiz	+5.4	+3.6	+0.9	-6.3
Cross	-27.7	-29.1	-35.3	-30.1

DipBal

	0	20	50	90
Vert	+7.1	+5.3	-3.4	-30.6
Cross	-25.2	-36.5	-32.8	-30.3
Horiz	+9.9	+8.8	+4.8	-1.1
Cross	-29.5	-29.2	-36.2	-26.2

DipStBal

	0	20	50	90
Vert	+5.3	+3.3	-5.2	-29.8
Cross	-46.9	-30.5	-36.5	-34.3
Horiz	+7.9	+6.7	+2.5	-3.7
Cross	-38.9	-30.2	-38.2	-32.3

MeshSE

	0	20	50	90
Vert	+4.7	+3.1	-7.9	-15.1
Cross	-33.8	-26.1	-29.2	-25.1
Horiz	+8.1	+6.4	-0.1	-9.4
Cross	-25.1	-27.2	-19.9	-22.5

MeshBal

	0	20	50	90
Vert	+7.6	+5.5	-3.9	-23.3
Cross	-25.8	-29.7	-49.0	-31.0
Horiz	+10.2	+8.5	_2.7	-8.5
Cross	-17.5	-17.5	-27.2	-31.1