EDGES Memo#30

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

June 1, 2007

Telephone: 781-981-5407
Fax: 781-981-0590

To: MWA Group
From: Alan E.E. Rogers
Subject: Tests of MWA LNAs

1] LNA input and output impedance
A network analyzer was used to measure the input and output impedance. (For those measurements the input of one LNA of the balanced pair was left open.)

Freq. MHz	Input-magnitude ohm	Output ohm
80	250	75
100	280	75
250	260	75
400	180	75

2] LNA noise temperature
A hot/cold "Y" factor was taken with 50 ohm terminations on each input. (both terminations were cooled with liquid nitrogen). After correcting for 2nd stage noise the results were as follows:

Freq MHz	Noise temperature K
80	50
150	25
200	25
250	25
300	25

50 ohms on each input is equivalent to 100 ohms across both balanced inputs.

3] Gain and comparison with older PC board – The gain was measured with 50 source across both inputs (using a clamp-on ferrite choke to act as a balun).

Freq. MHz	Gain dB	Old-pc board dB
50	17	17
100	21	21
150	22	22
200	24	24
250	25	24
300	21	20

It was noted that there is some “peaking” of the gain around 250 MHz with 50 ohms across the inputs which flattens out with 100 ohms across the inputs. The differences between the new and old (used in the early deployment) were noted to be small.