VLBA Acquisition Memo # 64

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Area Code 617
692-4765

To: VLBA Data Acquisition/Recorder Group

From: Alan E. E. Rogers

Sujbect: VLBA Baseband Converter Tests - Status of Performance Verification

Item	Specification	Measured Performance	Note #
Gain through conv (2 MHz BW):	64 ±1 dB Max	63.5 dB	
Level control phase shift:	<Ø.5 deg	not yet measured	
Image rejection:	>26 dB	>26 dB	4
Energy in 1Ø KHz sidebands:	<4Ø dBc	~-45 dBc	4
L.O. phase noise:	<2 deg rms	~2 deg rms	4
L.O. leakage into video:	<-5Ø dB	-8Ø dBm at 5ØØ MHz	
Gain compression:	<1%	not yet measured	
Noise temperature:	<1ØØ,ØØØ deg K	~3ØØ,ØØØ deg K	1
Temp. coeff of phase:	<1 deg/deg C/GHz	-Ø.4 deg/deg C/GHz	2
L.O. settling:	<1 sec	<3ØØ ms	
L.O. leakage into input:	<-6Ø dBm	-73 dBm at 5ØØ MHz	
Temp. coeff of gain:	<Ø.1 dB/deg C	not yet measured	
Temp. coeff delay:	<Ø.1 ns/deg C at 8 MHz BW	~Ø.2 ns/deg C	3
4-Way input switch isolation:	<6Ø dB	~65 dB	
Bandpass response:		See Figure	4,5
Frequency range:	5ØØ - 1ØØØ MHz	5ØØ - 95Ø MHz	6

Notes:

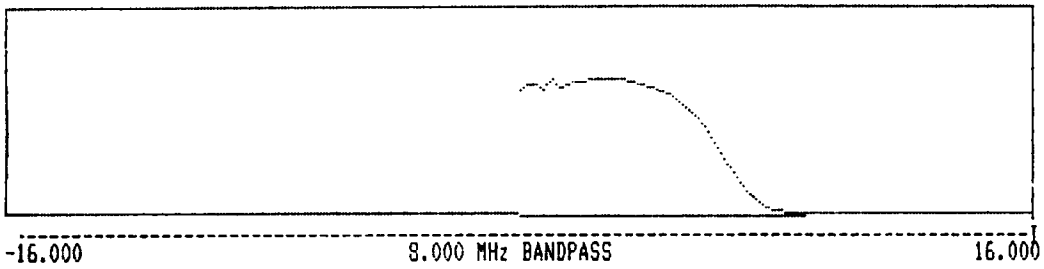
1] The noise figure is presently higher than the specification. There are several ways of improving the noise figure. Increasing the gain ahead of the mixers or using the mixers at a higher impedance level (going from 5Ø to 1ØØ ohms) are two possibilities which are being investigated.

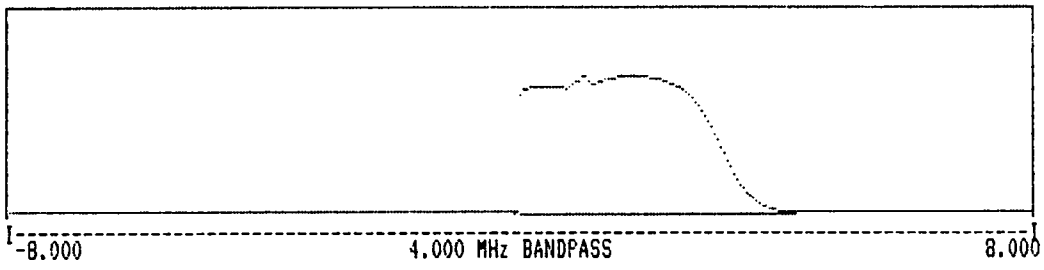
2,3] Preliminary measurement only, using a heat gain to warm the baseband converter. More accurate measurements will be made by placing the entire converter in an enclosure whose temperature can be varied.

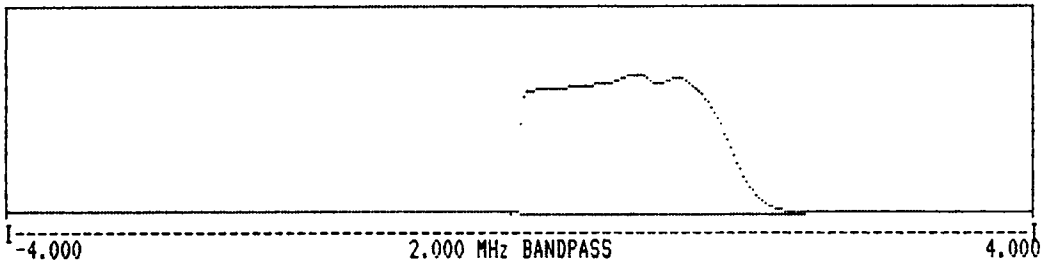
4] See Acquisition Memo #61.

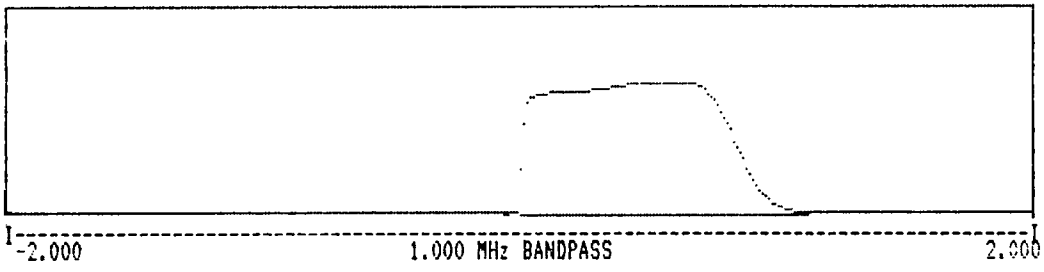
5] Some bandpass response curves in addition to those in Acquisition Memo #61 have been obtained for bandwidths 8—>.125 MHz using a TRS-80 Model 100 to the MCB. These tests used a 300 baud version of the MCB firmware along with an initial version of the total power radiometry firmware in the baseband converter 8751 microprocessor.

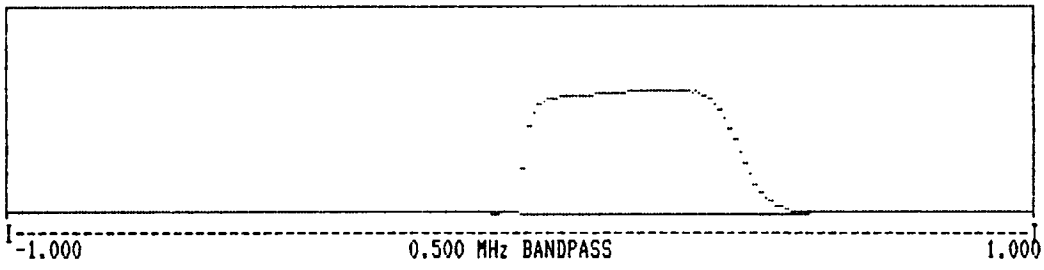
6] Measurements above 950 MHz still await a new pc board for the oscillator which is expected in mid May. The new board is made of lower dielectric constant to reduce the stray capacitance around the oscillator resonant circuit.

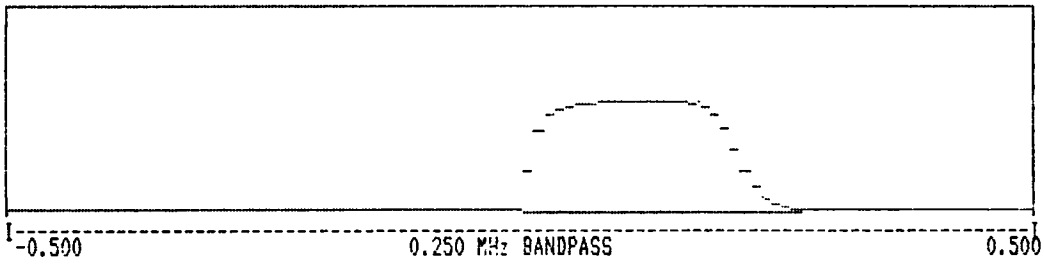


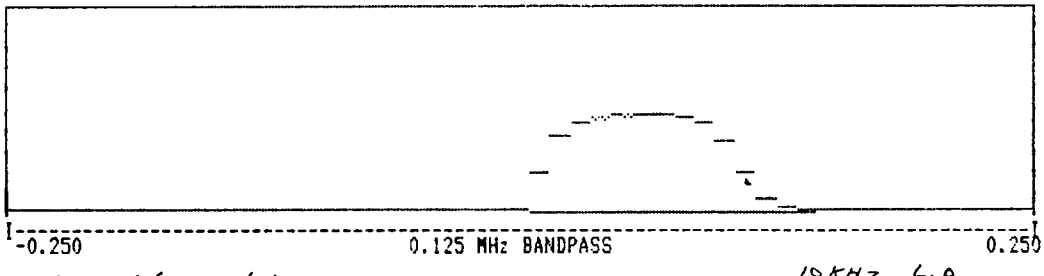












Test data - taken 1 May 86

10 KHz L.O. quantization