

National Radio Astronomy Observatory

VLB Array Program

VLB Array Electronics Memo No. 132

VLBA Barometers

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We have three models of VLBA barometers in the inventory as of today. Most are model AIR DB-2AX. These are 800 to 1060 mb span units, -25 to +50°C temperature range and ± 0.5 mb accuracy quoted. Two unit were bought for Mauna Kea. They were model AIR DB-2BX. These are 600 to 1100 mb span units, -25 to +50°C temperature range and ± 0.7 mb accuracy. We recently purchased two additional units since Pie Towns normal barometric pressure is less then 800 mb. These were model AIR DB-1B. These are 600 to 1100 mb span units, +5 to +40°C temperature range, and ± 0.5 mb accuracy. We also have a hand held portable unit. It is a model AIR HB-1A. It is a 600 to 1100 mb span unit +5 to +40°C temperature range and ± 0.5 mb accuracy.

I recently ran a test of the barometer performance. I took nine barometers to Pie Town (764 mb), VLA Site (787 mb), South Baldy (684mb), Magdalena (799 mb) and AOC (858 mb). The table below summarizes the results. It lists the variation from the mean reading at each site. The variation is less than ± 0.7 mb at each site for the 9 barometers. The individual barometer variation for the 5 sites is less than ± 0.2 mb. It is interesting to note that the 800 to 1100 mb units work well at the 684 mb South Baldy site.

My conclusion is that the VLBA barometers are probably accurate to less than ± 1.0 mb. We are shipping the hand held unit to the various stations for comparison. It should be able to pick up units that have strayed more than a millibar from the correct readings. Units that showup bad will be replaced with a spare and then sent back to the factory for repair or recalibration. As we get some site history we might be able to suggest an offset for the individual station units. A report of the station tests is in the works.

	VARIATION FROM MEAN - MILLIBARS				
My Number Model # Serial # Code #	AOC 858.41 MEAN	MAGDALENA 799.62 MEAN	VLA SITE 787.29 MEAN	PIE TOWN 764.39 MEAN	S. BALDY 683.67 MEAN
0 HB-1A 8K0923 8810181011	+.29	+.38	+.31	+.41	+.53
1 DB-1B 1A2006 9012301201	-.21	-.42	-.39	-.39	-.25
2 DB-1B 1A2010 9012301202	-.21	-.12	-.19	-.09	+.10
3 DB-2BX 9F1491 8906271004	-.01	-.02	+.01	+.01	+.21
4 DB-2AX 9C1089 9903031609	+.19	+.28	+.31	+.11	-.01
5 BD2AX 9G1558 9007191401	-.21	-.32	-.29	-.29	-.65
6 DB-2AX 8C0638 9001151005	-.11	-.02	+.11	+.11	+.43
7 BD-2AX 9G1561 8906141405	+.19	+.18	+.21	+.01	-.24
8 DB-2AX 8C1155 8803031604	+.09	+.08	-.09	+.11	-.09