

NATIONAL RADIO ASTRONOMY OBSERVATORY

HYDROGEN MASER COST ESTIMATE

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Cost estimates for acquisition of active hydrogen masers have been obtained from three sources. A detailed cost estimate was prepared for NRAO by Johns Hopkins University Applied Physics Laboratory (APL) to supply ten complete masers of the design presently being built for NASA/Goddard. APL does not wish to sell or estimate costs to supply units without the receiver/synthesizer, i.e., the physics package only. In support of the NRAO VLBA design study, the Smithsonian Astrophysical Observatory (SAO) supplied a cost estimate via letter dated 1 July 1980 for single and lot of 10 quantities of their VLG-11 maser with and without the receiver/synthesizer. These costs were updated via a telephone conversation on 20 January 1982 to reflect the cost in 1982 dollars. Oscilloquartz S.A., a unit of Asulab S.A. of Switzerland, has offered NRAO a price (in Swiss francs) for a single hydrogen maser with or without the receiver/synthesizer. (See VLBA Memo No. 10.)

These cost estimates are summarized in Table 1. The estimated cost for NRAO to build the receiver/synthesizer is \$18 K in material and 8 man-months of labor for a total unit cost of \$40 K. The last column reflects this cost addition to the estimates for the physics package only. The wide spread in estimates makes it difficult to decide on a cost to use for the VLBA. The APL cost estimate is in line with current contract prices to NASA (APL to Goddard and SAO to JPL) for hydrogen masers, but NASA documentation requirements are known to be more extensive than those required by NRAO.

TABLE 1

Cost Summary for Hydrogen Maser (in 1982 dollars)

Supplier	Unit Cost				Minimum Total Cost Lot of 10 Complete Masers
	One Complete Maser	Lot of 10 Complete Masers	One Physics Package Only	Lot of 10 Physics Pkg. Only	
APL (NR)		\$405 K			\$4050 K
SAO (VLG-11)	~\$415 K	~\$310 K	~\$315 K	~\$210 K	~\$2500 K
Oscilloquartz	\$275 K* (510 K Fr)		\$170 K* (310 K Fr)		\$2100 K*

* Exchange rate: U.S. \$ 0.5414 = 1 Swiss franc per Wall Street Journal
22 January 1982.