

NORTHEAST RADIO OBSERVATORY CORPORATION
HAYSTACK OBSERVATORY
WESTFORD, MASSACHUSETTS 01886

8 February 1982

Area Code 617
692-4764

TO: K.I. Kellerman
FROM: Alan E.E. Rogers & Hans Hinteregger
SUBJECT: Comments for VLBA design group

1) Receiver block diagrams (VLB memo No. 48)

S/X system should be compatible with the NASA system covering the following frequency range:

X-band	8.1 - 8.6 GHz	RCP
S-band	2.2 - 2.3 GHz	RCP

In addition receivers should have high image rejection (>50 dB) and have delay calibration. I suggest a first L.O. frequency of 2.02 for S-band and 8.08 GHz for X-band. Or numbers in memo No. 52 which look fine.

2) Recording systems (VLB memo No. 44)

We suggest that Tables 1 and 2 be changed to include 2 MK III options. MK III (X12) which is what we have proposed to NASA and a MK III (X36) which is what we consider to be the upper range of track density for MK III. In addition we suggest that the MK II upgrade options be 8, 12 and 16 Mbit as 20 Mbit is much too optimistic. Relative feasibility should be judged on the basis of a similar transition density (37.5 Kfci for MK III A) and SNR margin for both systems (both X12 and X36 MK III seek to maintain a 23 db worstcase broadband SNR). We enclose a revised table 1 for the MK III (X12) upgrade in which we have great confidence along with projected numbers for X36.

TABLE 1

	Moving head MK III (X12)	Moving head MK III (X36)	Comments
unit limit price	35K\$	35K\$	
Head price	3.5K\$	3.5K\$	32 track stack, same head used for record and reproduce
Tape price '82	260\$	260\$	
Data rate	112 Mbit (224 Mbit double speed)	112 Mbit (224 Mbit double speed)	
Record time	3.0 (4.0) hr	9(12) hr	120 IPS on 9200' length reel
10^{10} bits/reel	120 (180)	360 (540)	
Pounds/ 10^{13} bits	81 (60)	27 (20)	10 lb/reel
10^6 bits/sq inch	10	30	
Ave. head life	10,000 - 40,000 hrs	10,000 - 40,000 hrs	
Ave. tape life	probably no limit >500 passes	probably no limit >500 passes	
	()	20 m thick tape = VHS samples now, available '83 - (12,000' length on 14" reel)	

xc: R. Escoffier NRAO
C. Moore NRAO