National Radio Astronomy Observatory
Tucson, Arizona

January 24, 1983

MEMORANDUM

TO: J. Payne, J. Findlay

FROM: R. Howard

SUBJECT: 12M Radiometric Measurements After Panels Adjusted to Take Out Main Error in Reference Jig

Prime focus measurements were made at 3.3 mm (Jan. 15 and Jan. 19) and at 1.33 mm (Jan. 19 and Jan. 22) after the panels had been reset to correct for the main errors in the reference jig. Table I summarizes the results.

Table 1. Prime Focus Measurements

Wavelength (mm)	HPBW (AZ/EL) ($''$)	Width of Focus Curve at Half Power (λ)	Aperture Efficiency
3.3	70/70	2.0	.38
1.33	28/31	2.2	.10

The focus curve is now symmetric and close to theoretical at both 3 mm and 1 mm. Figure 1 is the focus curve at 3.3 mm. Figure 2 is a map of the beam at 3.3 mm. The sidelobes levels are ~3 dB lower than the previous measurements. They are also lower than the old 36' sidelobes at 3 mm by about 3 dB. Figure 2 is a map of the beam at 1.3 mm. It also looks fairly clean but may be a little asymmetric. This was also observed when averaging all of the FIVE POINT pointing measurements together (see Table 1). The 1.33 mm HPBW numbers have been corrected for beam broadening due to Jupiter (SD = 16$''$). The measured aperture efficiencies at 1.33 mm and 3.3 mm imply a RMS surface tolerance of 134 μM with η_o = .49. If the design goal of 70 μM can be reached, the aperture efficiency at 1.33 mm should be ~.32.

3.3MM FOCUS CURVE ON JUPITER

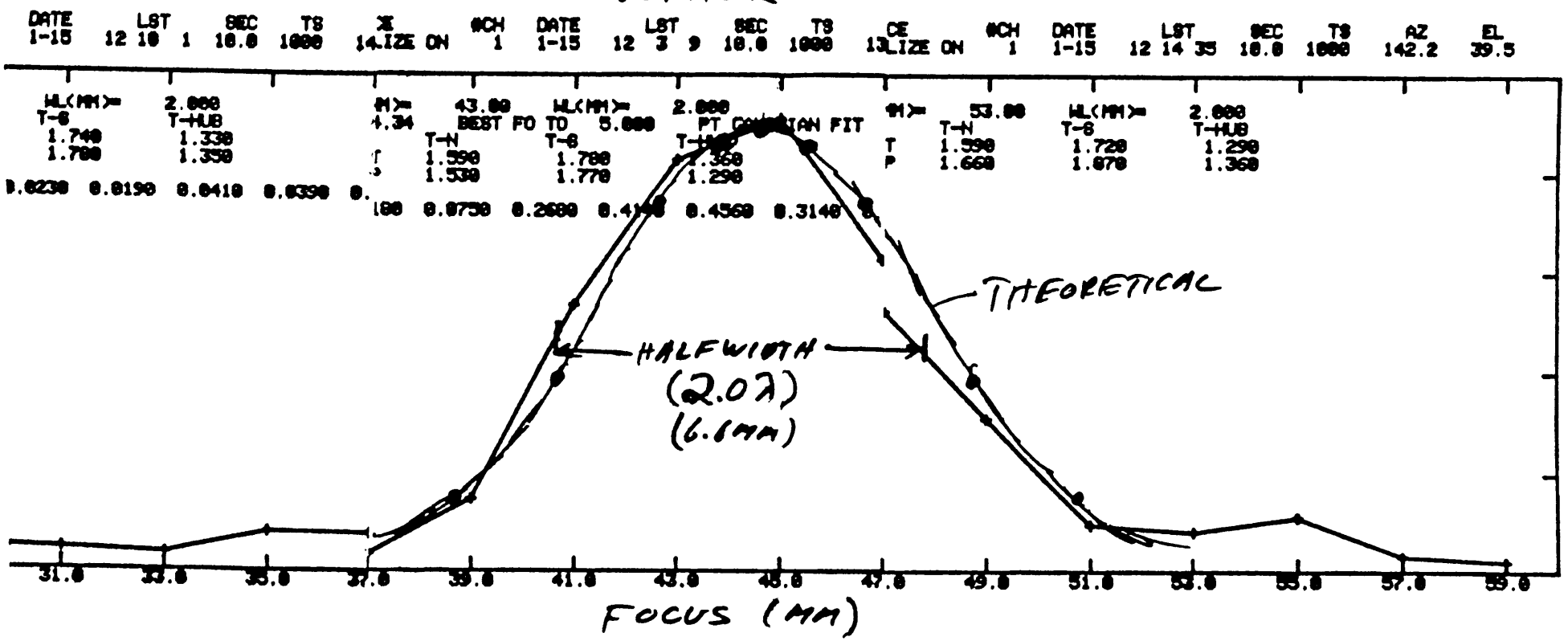


FIGURE 1

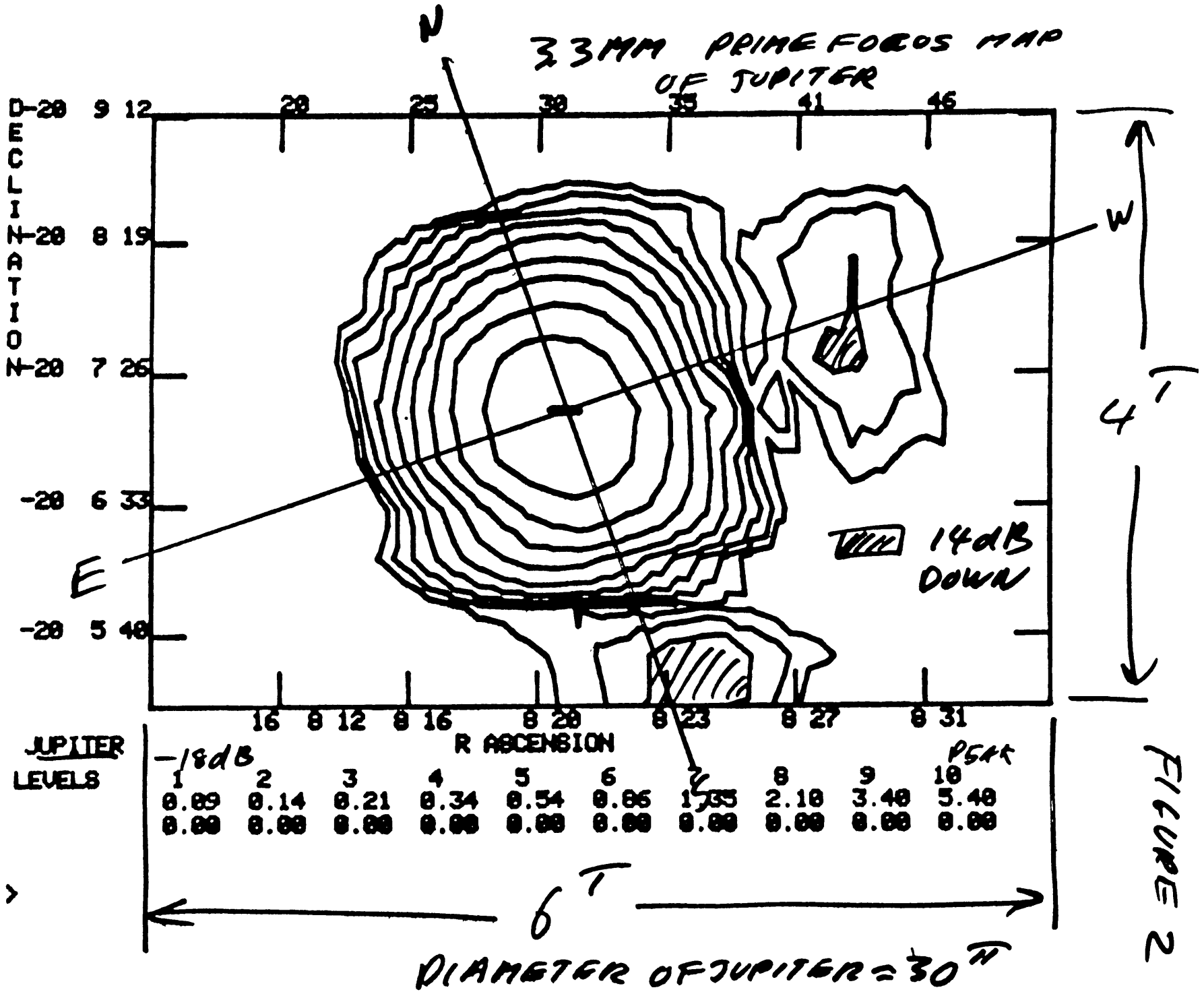
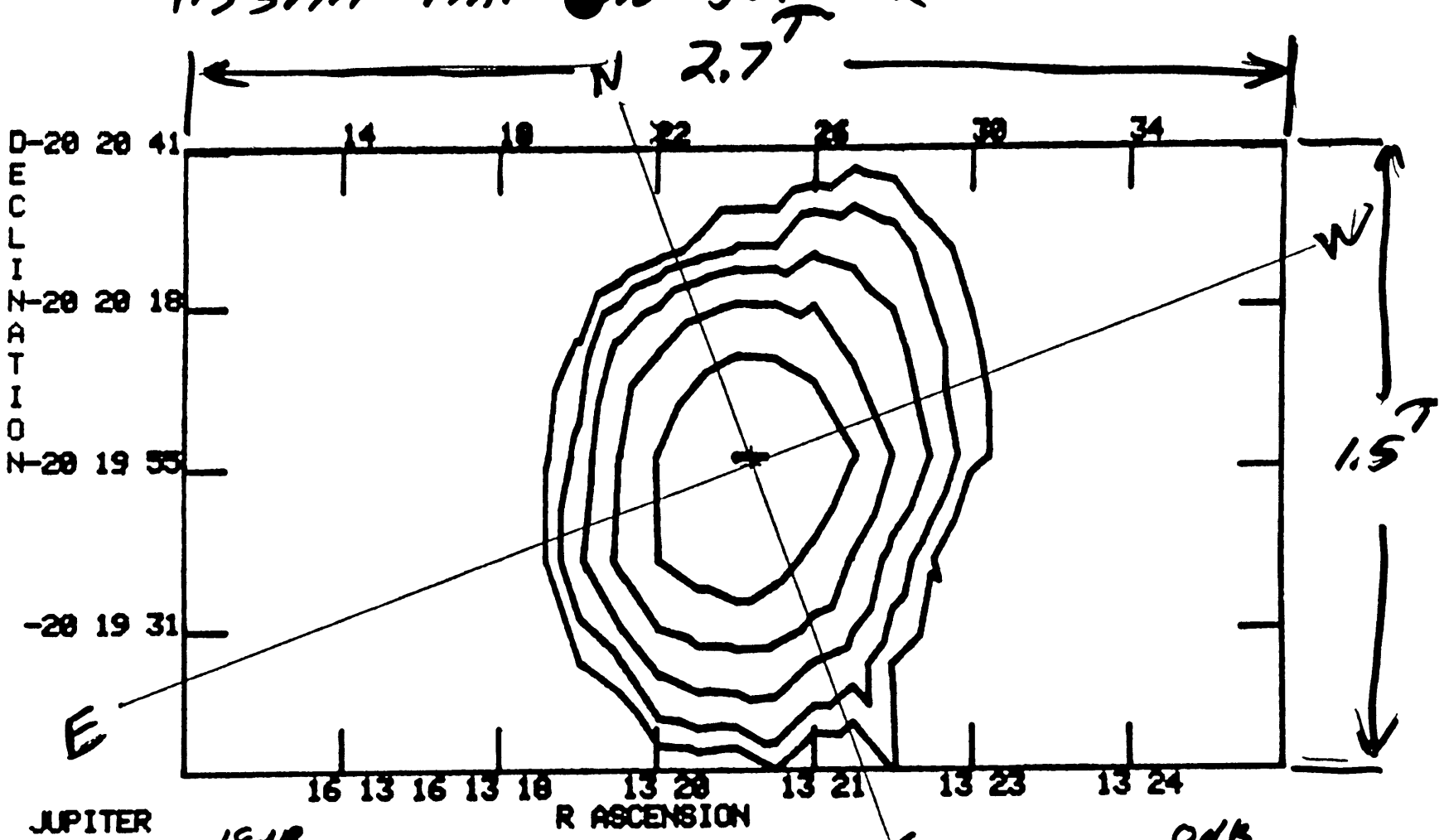

33MM PRIME FOCUS MAP OF JUPITER
N
W
E
S
DECLINATION
D-20 9 12
N-20 8 19
N-20 7 26
-20 6 33
-20 5 40
20
25
30
35
41
46
16 8 12 8 16 8 20 8 23 8 27 8 31
R ASCENSION
14dB DOWN
4'
6'
JUPITER LEVELS
-18dB
PEAK
1 2 3 4 5 6 7 8 9 10
0.09 0.14 0.21 0.34 0.54 0.86 1.35 2.10 3.40 5.40
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
DIAMETER OF JUPITER = 30"

FIGURE 2

1.33MM MAP ON JUPITER



JUPITER

LEVELS -18dB

1	2	3	4	5	6	7	8	9	10 0dB
0.05	0.09	0.14	0.22	0.34	0.54	1.35	2.10	3.40	5.40
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2dB/CONTOUR

LOWEST CONTOUR ON MAP: 10dB BELOW PEAK

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>MRATIO ?
   1.030
>EDROP ?,BDROP ?
   5.000          5.000
   9.000          9.000
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FIGURE 3