

Interoffice

NATIONAL RADIO ASTRONOMY OBSERVATORY  
TUCSON, ARIZONA

May 5, 1981

To: 12 M File

From: J. M. Payne

Subject: THE 11 M AZIMUTH BEARING

12 METER MILLIMETER WAVE TELESCOPE

MEMO No. 30

We have done some measurements on the stability of the 11 M mount using the Talyvel level. The level was mounted on the elevation bearing housing and readings were taken every  $10^{\circ}$  in azimuth. The result is plotted in figure 1 and the actual results are given in table 1. The bearing shows some evidence of a slight bump at  $280^{\circ}$  azimuth. The maximum difference in reading between any particular azimuth position was 2 arc seconds.

A second test was performed with the telescope parked. The tilt meter was monitored over a period of 10 hours during which time the temperature changed by  $3^{\circ}$  C. The change in level recorded was 7 arc seconds.

I draw the following conclusions from these tests and the tests performed on the reflector.

- 1) The azimuth bearing appears well behaved.
- 2) What evidence we do have, suggests that at least some of our present pointing problem is due to the poor thermal stability of the reflector surface/backup structure.

It seems safe to say that the proposed upgrading can only improve the pointing.

LEVEL READINGS--23rd MARCH 1981

90° E1 DEGREES-AZ	17.63° C 1930 UT		17.70 2136 UT	
	Leveller Reading CW	Leveller Reading CCW	Leveller Reading CCW	Leveller Reading CCW
260	-0.03 V	-0.03 V	- .030 V	- .026 V
250	-0.02	-0.02	- .020	- .015
240	-0.01	-0.01	- .007	- .002
230	+ 0.00	0.00	+ .007	+ .014
220	+ 0.03	+0.02	+ .028	+ .034
210	+ 0.05	+ 0.04	+ .052	+ .060
200	+ 0.08	+ 0.08	+ .081	+ .090
190	+ 0.11	+ 0.11	+ .111	+ .117
180	+ 0.13	+ 0.12	+ .129	+ .138
170	+ 0.15	+ 0.15	+ .150	+ .157
160	+ 0.17	+ 0.17	+ .166	+ .172
150	+ 0.18	+ 0.18	+ .174	+ .181
140	+ 0.19	+ 0.19	+ .184	+ .188
130	+ 0.20	+ 0.20	+ .194	+ .197
120	+ 0.20	+ 0.20	+ .193	+ .195
110	+ 0.20	+ 0.20	+ .186	+ .190
100	+ 0.19	+ 0.20	+ .177	+ .179
090	+ 0.18	+ 0.18	+ .166	+ .165
080	-----	+ 0.17	+ .155	+ .154
270	-0.04	-0.02	- .041	- .037
280	- 0.05	-0.04	- .055	- .057
290	-0.07	-0.05	- .076	- .072
300	-0.08	-0.07	- .089	- .087
310	-0.10	-0.08	- .109	- .106
320	-0.10	-0.09	- .118	- .116
330	-0.10	-0.09	- .105	- .113
340	-0.09	-0.07	- .096	- .104
350	-0.07	-0.06	- .077	- .083
360	-0.04	-0.03	- .050	- .056
010	-0.01	+ 0.00	- .025	- .029
020	+0.02	+ 0.03	+ .003	+ .000
030	+ 0.05	+ 0.06	+ .029	+ .025
040	+ 0.08	+ 0.09	+ .062	+ .058
050	+ 0.12	+ 0.12	+ .096	+ .093
060	+ 0.14	+ 0.15	+ .120	+ .117
070	+ 0.16	+ 0.17	+ .139	+ .137
080	+ 0.17	-----	-----	-----

10 mV = 1 arc sec

TABLE 1

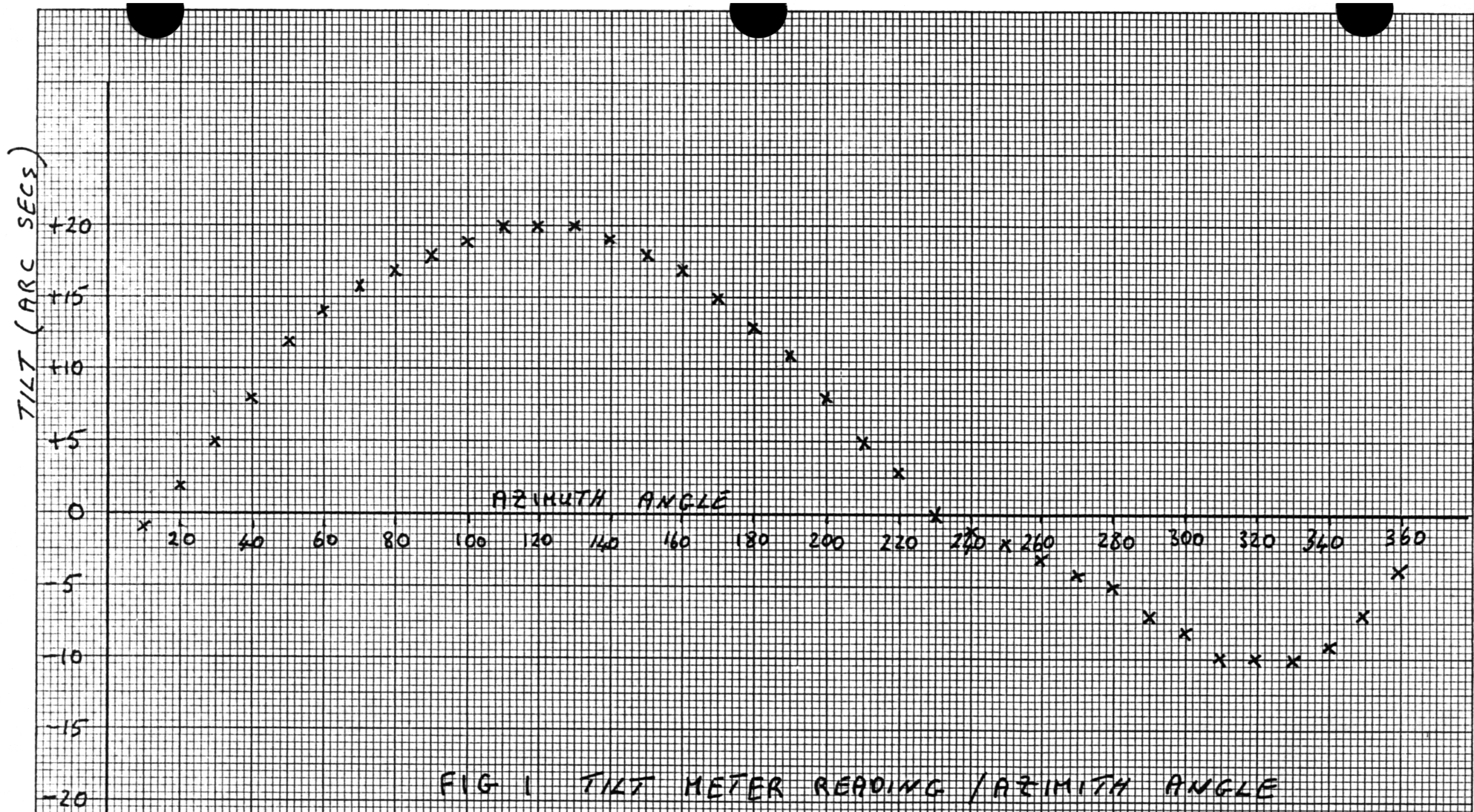


FIG 1 TILT METER READING / AZIMUTH ANGLE

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