25th January 1961

Dear Pawsey:

After considerable arithmetic I have been able to assemble the enclosed map. It was developed from data taken by Higgins last August. Note the two rather deep holes and the peculiar object which changes from a trough at 0200RA & -27° Dec. to a ridge at 2300RA & -23° Dec. The loop at 0010 RA & -24° Dec. is very clear on trace. It may be a faint bright patch or radio star. There is a general gradient upward from 0220 RA & -32° Dec. to 2220 RA & -22° Dec. The little radio star at 0152 RA & -29.6° Dec. I have not drawn in but it stands out clearly on trace.

I think there is a lot more good data to be extracted from Shain's antenna. However the present system of operation and calculation is much too laborious. Before I got the data, the girl had averaged four successive readings together, giving one point every four minutes of time. I assembled an average of three days repeated observations, giving four minute points about every 34' of declination. For each phase setting, I averaged together the three center positions B + C + D. Then I averaged together the duplicate runs of A + E on adjacent phase settings. This gave points every four minutes of time, every 1.1° Declination. The effect of all this is to increase the integration time and reduce the random fluctuations.

The original machine integrates for about 12 seconds. The girl raised this to 48 seconds. Assembling three days raised it to 144 seconds. Averaging three positions raised it to 432 seconds or about 7 minutes of time.

In this part of the sky, it takes about five minutes of time to sweep out one degree of solid angle. The angular resolution of the antenna is about two degrees. Thus a three minute integration time would not cause any significant deterioration of the antenna pattern. I would like to have Higgins take some more data after altering

the display system. The systematic 12 second direction of movement should be stopped and the antenna left pointing in position C. A three minute (10mfd & 18meg) integration circuit should be inserted after the final detector. The output of the Leeds recorder will then show as a fairly smooth line. This line may be scaled once every ten minutes of time which is approximately two degrees of solid angle. Known phase settings will give sweeps every 2.2 degrees of declination. The grid resolution will then be about same as antenna resolution. This should be adequate for general survey work. If some small bright object, or deep hole is encountered, more detail can be secured in a selected area. At least four runs should be made at each declination setting. These may be averaged together, giving a total integration time of 12 minutes. By these minor changes, the scaling and computation work will be cut down by a factor of ten or more. The sensitivity should be good enough to allow the rest of the southern sky to be mapped. I believe the effort well worth while.

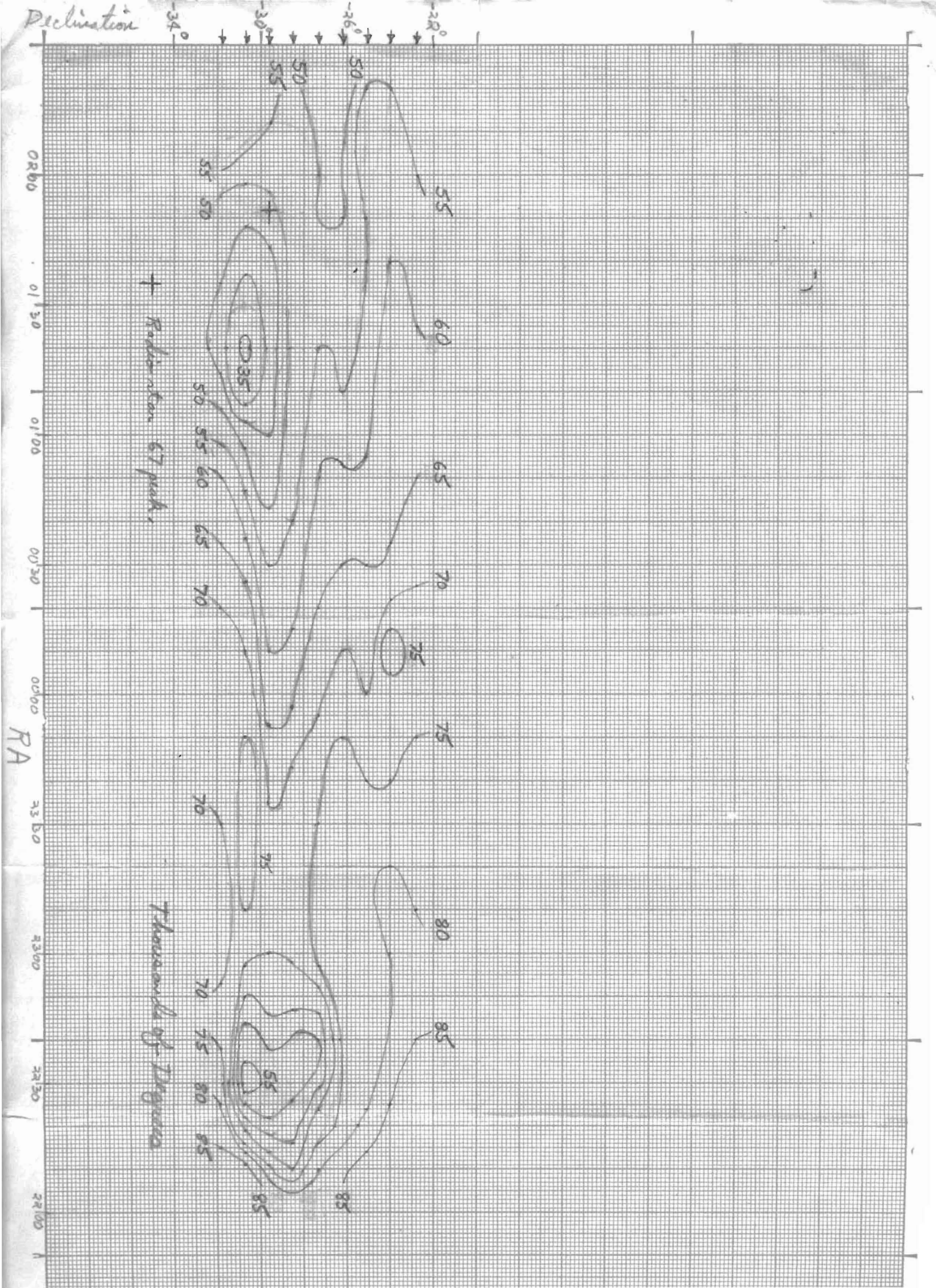
Having seen this small sample of what can be done at 19.7mc, I'm more enthused about pushing on with my operation at 2.13mc. Unfortunately, nothing much as been accomplished. I'm still trying to figure the best way of laying out my cross. The property seems to be large enough for a cross three miles N/S and E/W. However, I think the original installation should be only half this large. It will produce about five degrees resolution.

Please look into what can be done on the above suggestions. I'll try to get up to Sydney sometime next month. When you have finished with the enclosed map, please return it to me.

73, (best regards)

Grote

Grote Reber


Declination
-34°
-30°
-26°
-20°
0200
01'30
01'00
00'30
00°00
RA
23'30
23:00
22'30
22:00
50
55
60
65
70
75
80
85
Radiation 67 peak.
Thousands of Degrees