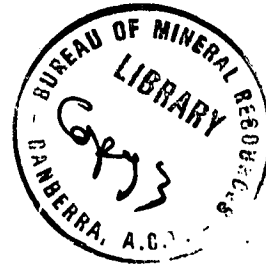

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS



RECORDS 1960 No. 138

AVALON AIRFIELD MAGNETIC SURVEY No. 2, VICTORIA 1955

by

C.S. Robertson

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Plate 1. Location of area surveyed. (G200-3)

Plate 2. Geophysical grid and variations in magnetic declination, Area "C". (G200-4)

FOREWORD

The survey described in this Record was done in 1955, and the Government Aircraft Factories were advised of the results. It is now reported in the present form only to place the findings permanently on record.

December 1960.

1. INTRODUCTION

A magnetic declination survey to test the suitability of a proposed aircraft compass-swinging site was made at Avalon Experimental Station on 22nd and 23rd November 1955, at the request of Government Aircraft Factories.

In tests carried out previously by officers of the Bureau of Mineral Resources (Brooks and Robertson, 1955), it was found that there were variations in declination of up to two degrees in suggested compass-swinging areas, which were consequently abandoned. Since then, exploratory work was carried out by Mr. Sanderson of Government Aircraft Factories, using a tripod-mounted landing compass in order to locate an area free from large variations. It became evident that the required magnetically undisturbed area of 300 ft diameter is very unlikely to exist in the basalt-covered Avalon district, and so it was decided to look for a smaller undisturbed area.

It was considered that an area would be usable if the declination changes in the central part, of 60 ft radius, could be neglected. The declination at points farther out, where the aircraft compass readings would be taken, would have to be known to enable corrections to be made to the aircraft compasses.

A site was found by Mr. Sanderson, which, on the basis of his compass readings, appeared to fulfil the necessary conditions. The present Record describes a declination survey of this site (known as Area "C") by C.S. Robertson and K.B. Lodwick of the Bureau of Mineral Resources.

2. PROCEDURE

Measurements were first made from the centre of the site to fix its position in relation to the nearby hangars and taxiway (Plate 1).

A radial system of 49 pegs was laid out using theodolite and tape. Pegs were placed at distances of 20, 40, 60, 90, 120 and 150 ft from the centre, on each of eight lines 45 degrees apart. This pattern was chosen because it could be quickly laid out, would give good coverage of the central area, and would also give an idea of the corrections which would have to be applied to compass readings farther out.

Declination measurements were made at each peg using the declination head of Askania Magnetometer No. 508813. On each radial line a peg had been placed about 500 ft from the centre, and this was used as a reference mark.

The sky was too overcast to allow determination of the true bearings of the traverses by observations on the sun, so the results are expressed only as differences between the declination at each point and that at the centre.

3. RESULTS

The results are shown on Plate 2. Within the 60-ft radius circle the measured declinations differ from that at the centre by amounts ranging from -13.6 to +1.9 minutes of arc. Within the 150-ft circle the differences range from -58.8 to +20.5 minutes.

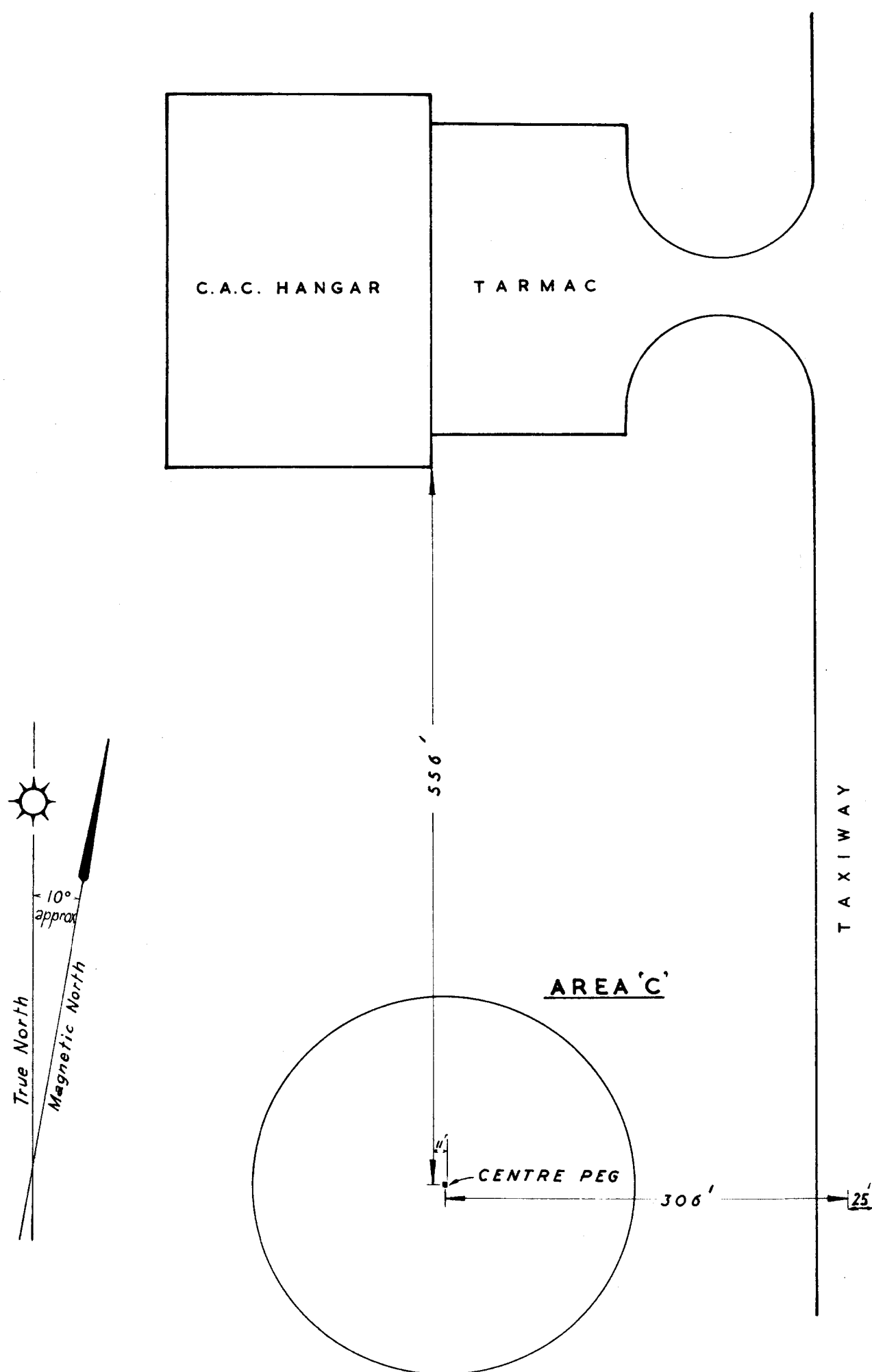
4. CONCLUSIONS

The area tested has a more uniform declination than other sites tested previously at Avalon. However, as even the 60-ft radius circle has declinations ranging through over one quarter of a degree, it is not likely to be a very satisfactory site for accurate compass-swinging work.

The results suggest that the declination would probably be just as variable in any 150-ft radius circle whose centre lay within the tested 150-ft radius circle.

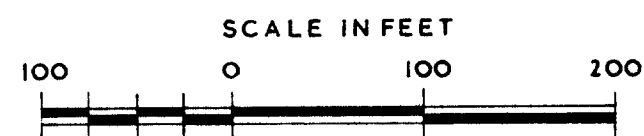
5. REFERENCE

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| BROOKS, J.A. and
ROBERTSON, C.S., | 1955 | Initial investigations for aircraft
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Resour. Aust. Records</u> 1955/76. |
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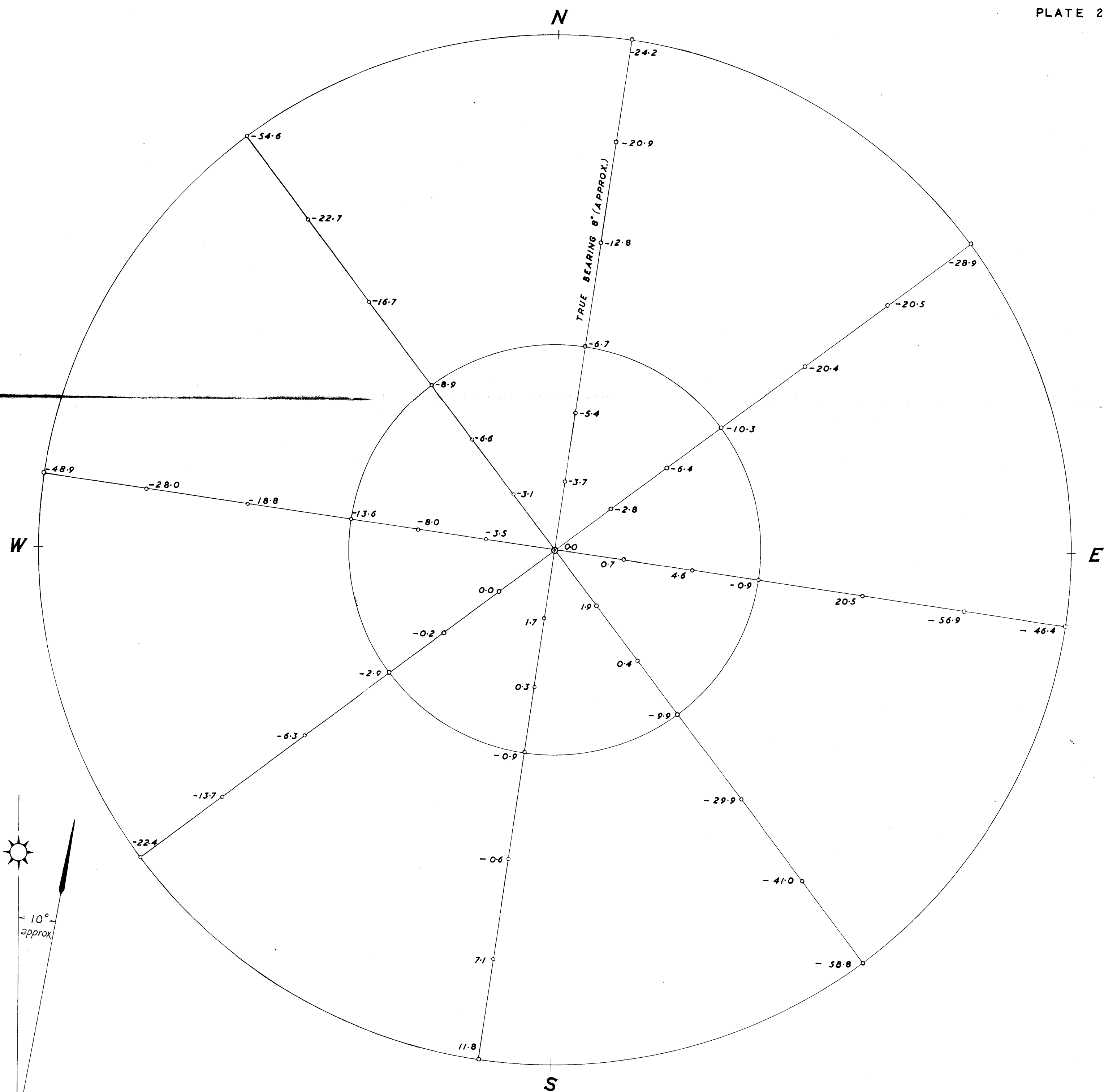


HORIZONTAL CIRCLE READINGS FROM CENTRE PEG

Reference mark on east traverse	90° 00.0'
Mast on top of control tower	186° 07.7'
Pipe supporting gas flame visible towards Geelong	228° 28.7'
Near corner of C.A.C hangar (cement base)	358° 02.3'



FURTHER TESTS FOR AIRCRAFT
COMPASS SWINGING SITE AT AVALON
AIRFIELD, VICTORIA.
**LOCATION OF AREA
SURVEYED**



FURTHER TESTS FOR AIRCRAFT
COMPASS SWINGING SITE AT AVALON
AIRFIELD, VICTORIA
GEOPHYSICAL GRID AND
VARIATIONS IN MAGNETIC
DECLINATION, AREA 'C'