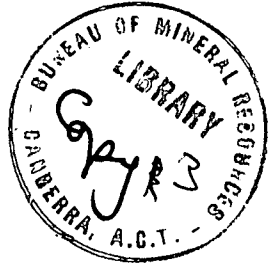


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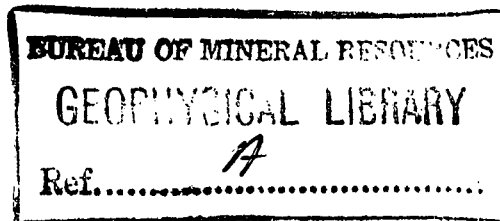
ESSENDON AERODROME MAGNETIC SURVEYS, VICTORIA 1951-56

by

I.B. Everingham and J.C. Dooley

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- Plate 2. Results of vertical force survey, 1951. (G188-9).
- Plate 3. Results of declination survey, 1956. (G233-1).

FOREWORD

The surveys described in this Record were done in 1951 and 1956, and the Department of Civil Aviation was advised of the results. They are now reported in the present form only to place the findings permanently on record.

January 1961.

1. INTRODUCTION

At the request of the Department of Civil Aviation, magnetic measurements were made by the Geophysical Branch of the Bureau of Mineral Resources at a proposed compass-swinging site at Essendon aerodrome, the main airport for Melbourne. Preliminary measurements had been made by surveyors of that Department. However, as the compasses available to them were not sufficiently accurate, the Bureau was requested to determine magnetic north at the centre of the site, and to measure the variations in declination over an area of 250 ft radius from the centre.

The tests were carried out in February 1956 by I.B. Everingham. Plate 1 shows the location of the surveyed area.

Previous measurements had been made at Permanent Survey Mark No. DCA 22 by R.E. Ervin of the Bureau in 1951. The location of this mark is shown on Plate 1. These measurements established the value of declination as $9^{\circ} 40.5'$ E, reduced to mean of day. Vertical magnetic variometer measurements were made on two short traverses through this point, and the results are shown on Plate 2 as differences in gammas from the value at the central point. Some of the larger anomalies may be due to water pipes. Time fluctuations arising from artificial sources reached 230 gammas at times, but were of short duration. Fluctuations of up to 15 gammas were common.

2. RESULTS

The results of the 1956 measurements are shown in Plate 3. The declination was found to be about $10^{\circ} 16.4'$ (subject to diurnal variation, etc.) and a central line (000-180) through the centre of the site was laid out in this direction. Variations in magnetic declination from the central point are indicated for other points on the plan, values being given in minutes of arc. The accuracy of the readings is ± 1 minute.

The site is unsuitable as there are many declination anomalies. The range of declination values is over $1\frac{1}{2}$ degrees. Some of the anomalies occur over very small areas. The measurements were all made at a height of five feet above ground, but variations could be expected at different heights as well as laterally.

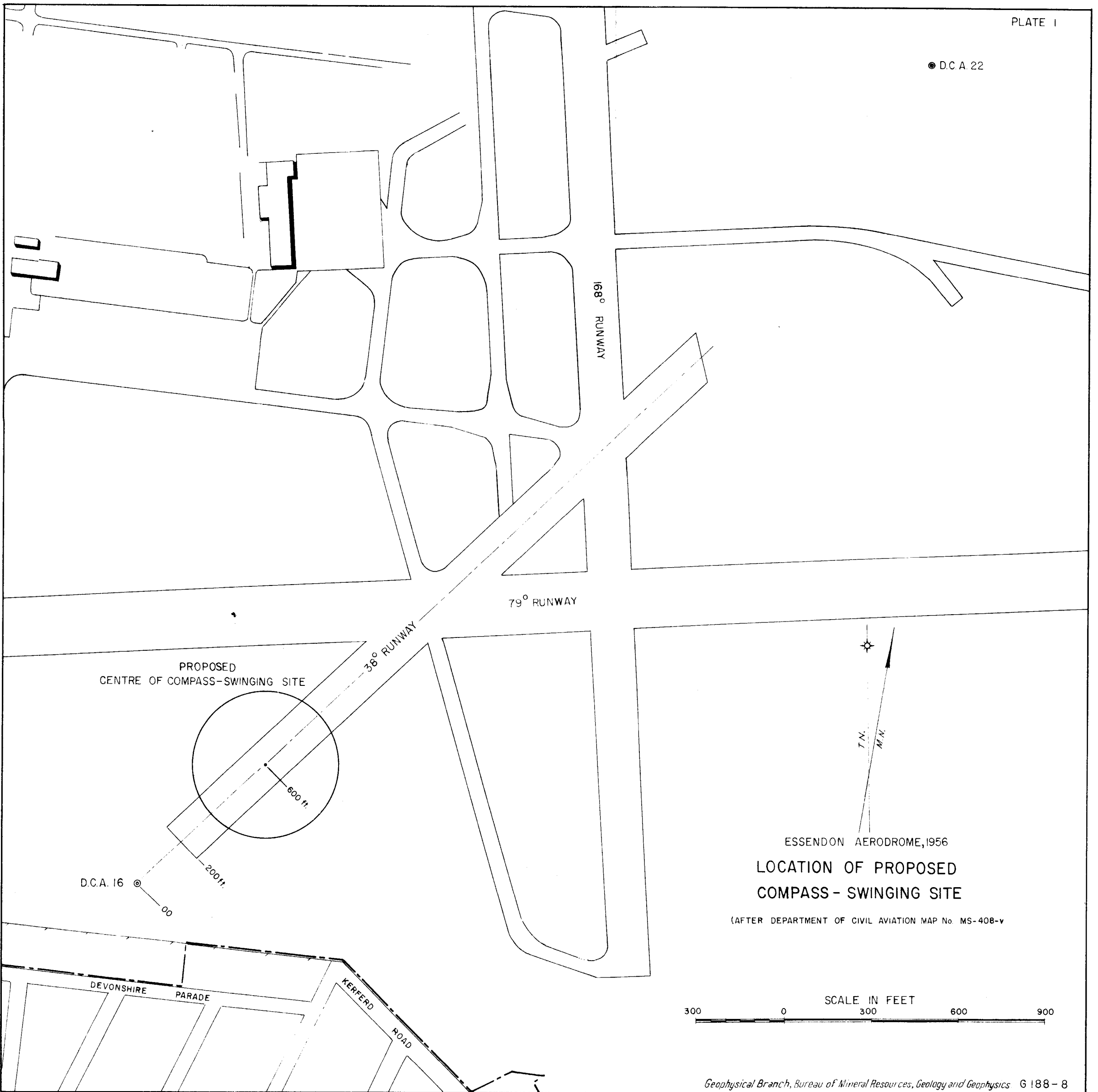
A large change in declination was noted on traverse 090, at 60 ft from the centre of the grid, and a vertical force magnetic variometer was read at 10-ft intervals along this traverse. As a result, a large magnetic anomaly was found at a point 50 ft from the centre. This area should be avoided as large changes in declination could be expected on either side of the body causing the magnetic anomaly. Elsewhere in the area there could be similar anomalies undetected by the present survey, owing to the large distance between observation points.

2.

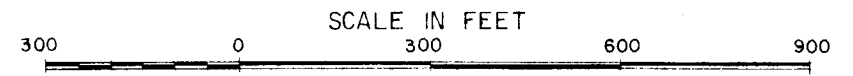
3. CONCLUSIONS

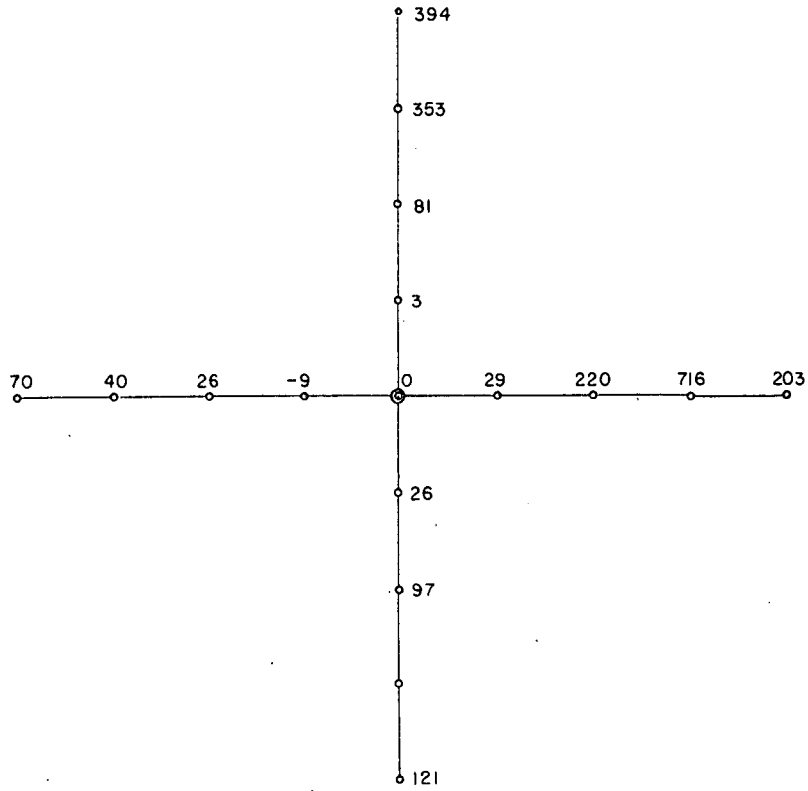
The proposed site is magnetically too disturbed to be useful for compass-swinging. Because of the prevalence in this part of Victoria of basaltic rocks and alluvium derived from these, it may be difficult to find an area at Essendon aerodrome fulfilling the requirements of a compass-swinging site.

● D.C.A. 22



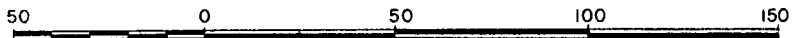
ESSENDON AERODROME, 1956
 LOCATION OF PROPOSED
 COMPASS - SWINGING SITE
 (AFTER DEPARTMENT OF CIVIL AVIATION MAP No. MS-408-v)



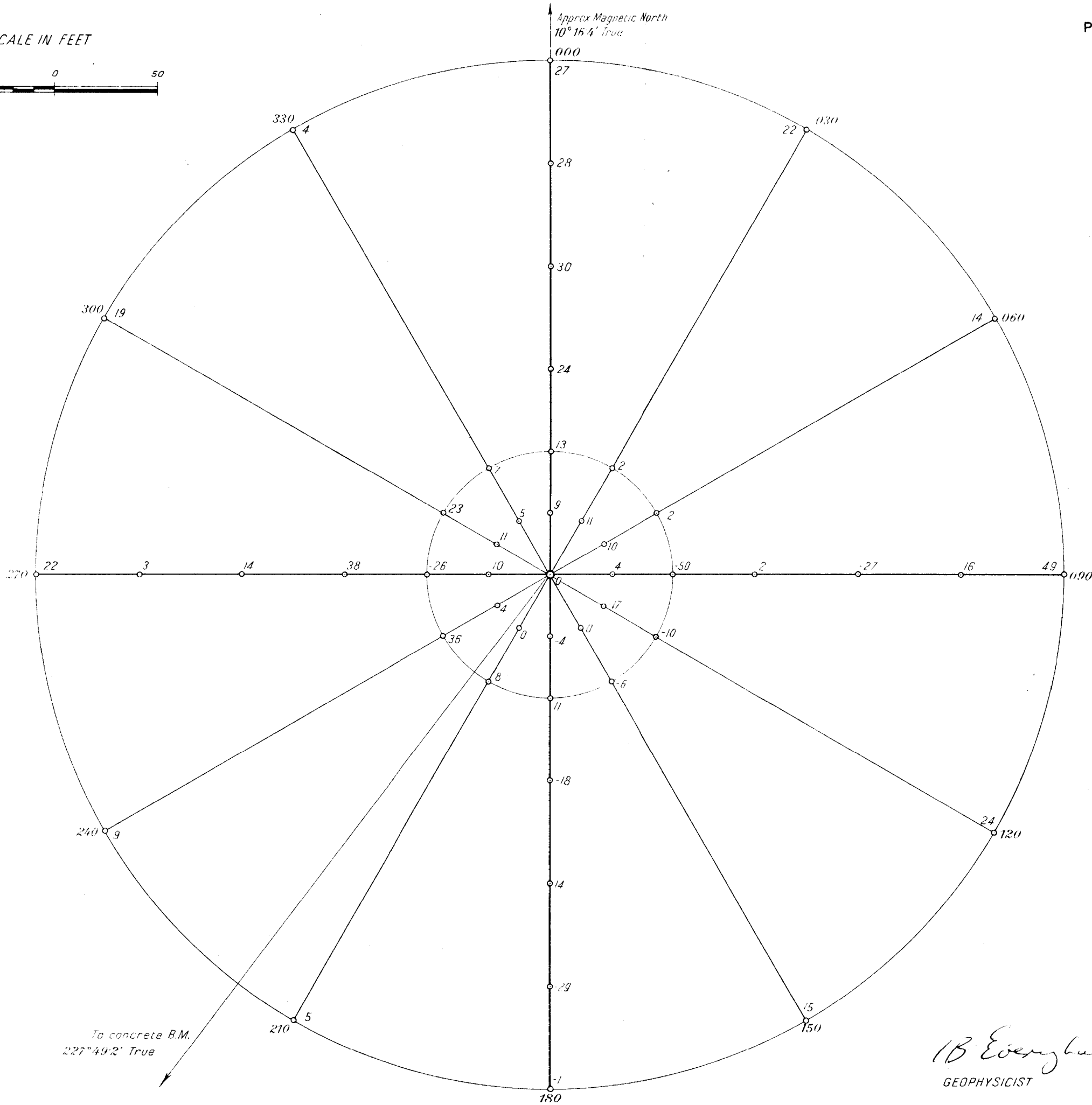
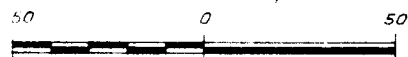


ESSENDON AERODROME, 1951
VARIOMETER RESULTS
SHOWING DIFFERENCES IN VERTICAL
MAGNETIC FIELD FROM THAT AT MARK No. DCA 22
(VALUES IN GAMMAS)

SCALE IN FEET



SCALE IN FEET



IB Everingham
GEOPHYSICIST

The declination at centre point of survey was $09^{\circ} 38'$ East, reduced to January 1956, using data from Toolangi Magnetic Observatory. Co-ordinates of centre point.
Lat. $37^{\circ} 44' 04''$ Long. $144^{\circ} 53' 52''$

**DECLINATION SURVEY AT COMPASS SWINGING SITE,
ESSENDON AERODROME, VIC.**

o Station at which decl. was observed.
030 Traverse number
Declination value given (in minutes)
-17 is observed value
minus declination at centre point.