COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORDS 1960 No. 137

EDINBURGH AIRFIELD MAGNETIC SURVEY, S.A. 1955

by

C.S. Robertson

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ILLUSTRATIONS

FOREWORD

The survey described in this Record was done in 1955, and the R.A.A.F. was 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 running-up area for additional use as a compass-swinging site was carried out by the author at Edinburgh R.A.A.F. Station between 30th August and 8th September 1955.

The survey was undertaken as a result of a request from the Construction Planning section of the Weapons Research Establishment, Salisbury, S.A. The Construction Planning section provided a plan of the airfield and an assistant to help in the survey.

2. INSTRUMENTS

The declinometer head and horizontal circle of Askania Magnetometer No. 508813 were used to make the declination measurements.

A Watts "Microptic" theodolite was used to mark out a grid of observation stations and to determine true azimuth by observations on the sun.

3. PROCEDURE

After discussion with Wing Commanders Moody and McCormack it was decided on 30th August that the proposed running-up area east of the control tower (see Plate 1) should be the first site tested for suitability as a compass-swinging area.

Measurements were made from the control tower and signal square to locate the centre of the proposed running-up area as shown on W.R.E. plan No. CP4983 (Plate 1). A grid 300 ft by 350 ft was laid out to cover the proposed running-up area, the traverses running parallel to the edge of the nearby taxiway. In general the observation stations were 50 ft apart, but the grid had to be arranged to avoid areas under water and also a man-proof fence running through the area. For this reason a few traverses were 60 ft apart.

Declination observations were made at fifty stations on the area, using as azimuth marks pegs placed several hundred feet beyond the ends of the traverses. None of the stations were close enough to the man-proof fence to be magnetically affected by it. Theodolite observations on the sun enabled the true bearing of the traverses to be determined and the magnetic results to be expressed as absolute values of declination.

When this area was completed Wing Commander McCormack requested that a preliminary test be carried out on an alternative compass-swinging site north of the control tower, and also that the magnetic effects of the existing hangar No.92 be determined in case hangars or other buildings were planned near the proposed compass-swinging area.

The alternative compass-swinging area was located as shown on Plate 1, and readings of declination were taken at 50-ft intervals along two 300-ft traverses intersecting at right angles.

A series of declination observations was made also along a traverse extending across the tarmac in front of hangar No. 92, to find the distance at which the hangar had no appreciable effect on the magnetic declination.

4. RESULTS

The measured values of declination in the proposed running-up area are shown on Plate 2. On this map, contours are drawn to illustrate the way in which the declination varies in the area. All the measured values are within a range of 6 minutes of arc.

The measured values of declination in the alternative area are shown on Plate 3. The range of values there is 4 minutes of arc.

5. CONCLUSIONS

Variations of up to 6 minutes of arc of the declination in an area used for compass-swinging are usually considered to be of no importance. The proposed running-up area is therefore at present suitable (except for the presence of the man-proof fence) for use as a compass-swinging site. If the area is covered by steel-reinforced concrete as proposed this may no longer apply. However, providing the reinforcing material is distributed more or less uniformly over the area and extends about 10 ft beyond the points at which the outer compass readings are to be taken, declination should remain fairly uniform over the area.

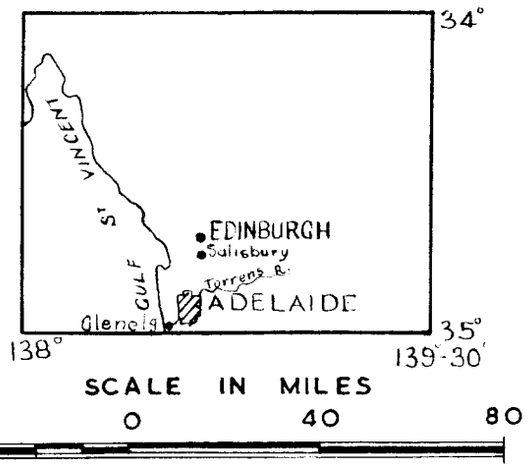
Preliminary tests on the alternative compass-swinging site indicate that it is probably just as suitable as the first site tested.

Declination observations in front of hangar No.92 showed that the magnetic effect of the hangar was less than 10 minutes of arc at 200 ft and that there was no effect beyond 300 ft.

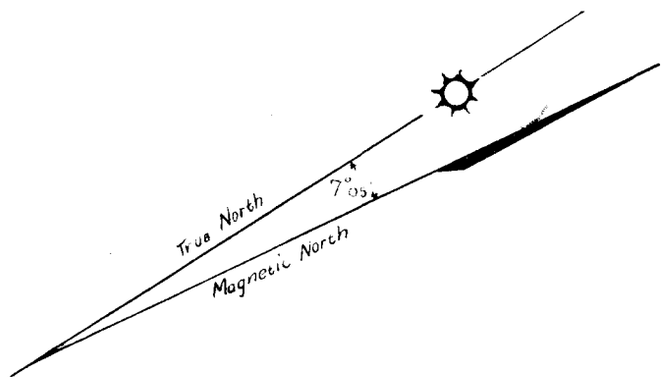
The magnetic declination at Edinburgh Airfield in September 1955 was found to be 7° 05'E, subject to small local and diurnal variations of up to 10 minutes of arc. It is expected that the declination will increase at the rate of 4 minutes per year.

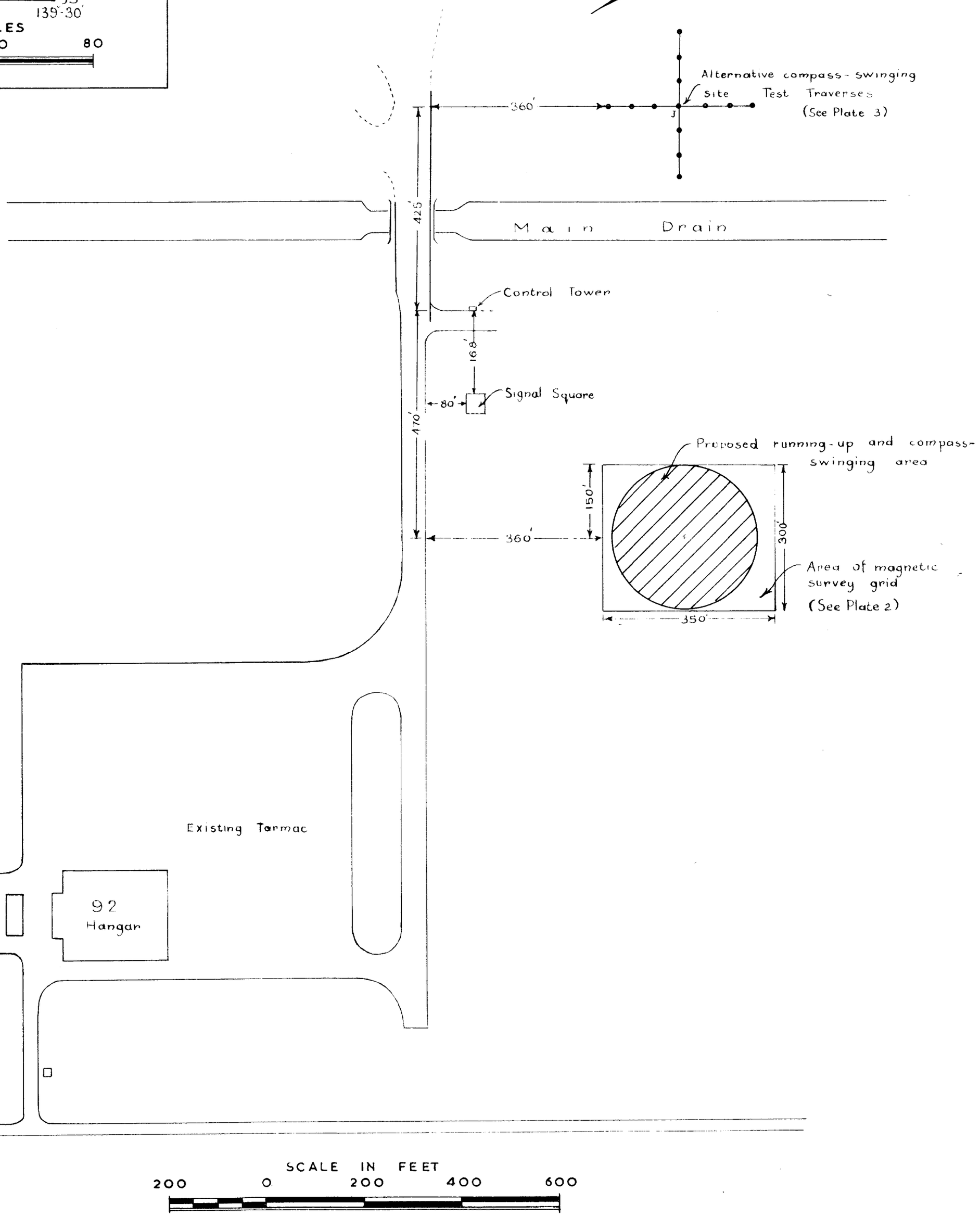
PLATE 1

ADELAIDE
4-MILE MILITARY MAP



SCALE IN MILES
40 0 40 80





SCALE IN FEET
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MAGNETIC SURVEY OF COMPASS-SWINGING SITE, R.A.A.F. STATION, EDINBURGH, S.A.

LOCALITY MAP

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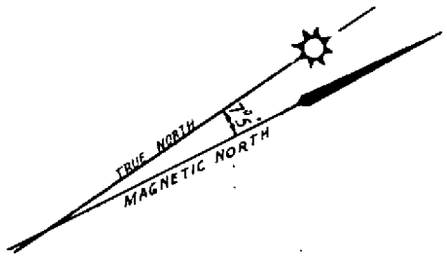
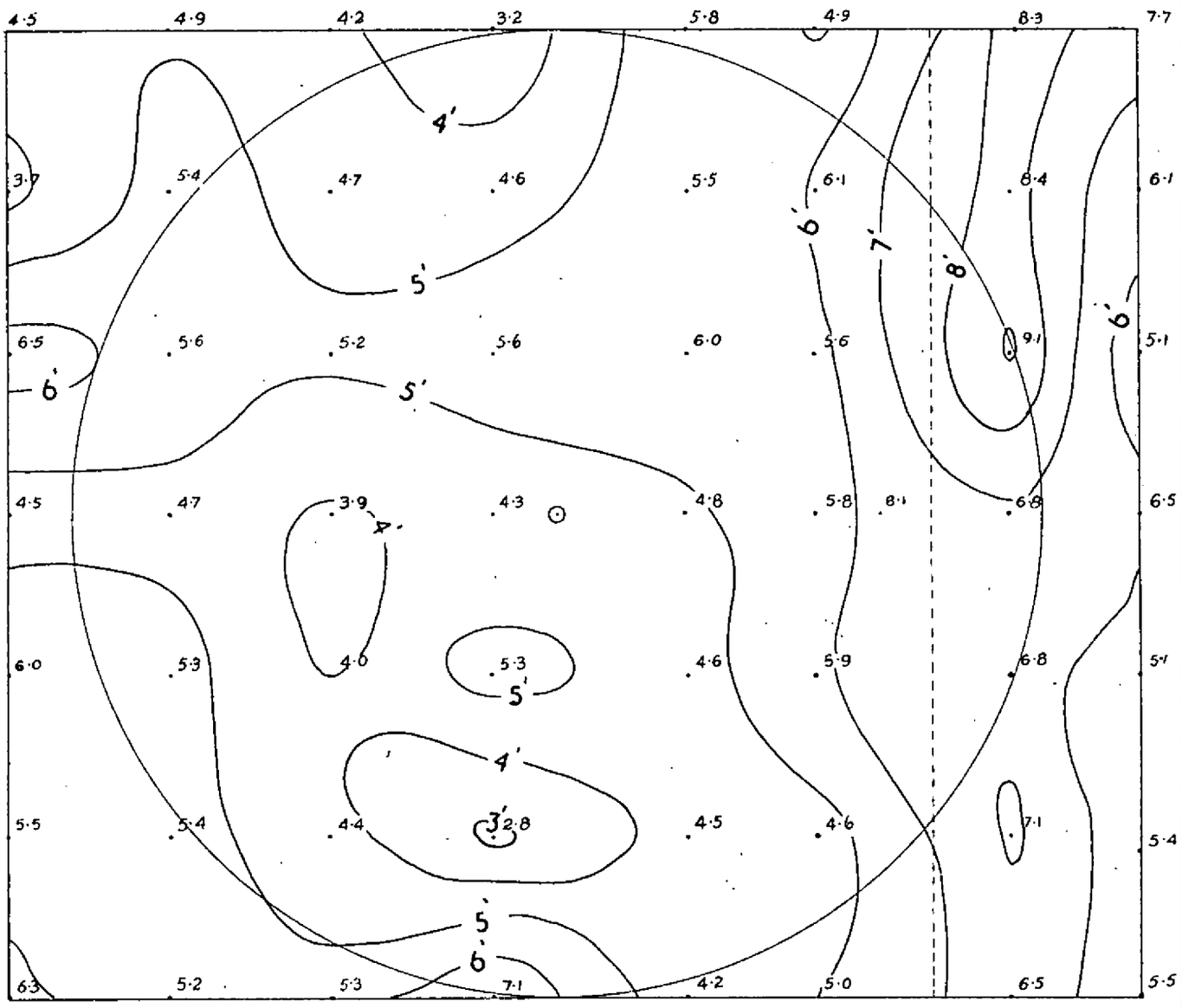
PLATE 2





SCALE IN FEET

50 0 50 100

⊙ CENTRE OF PROPOSED RUNNING-UP AND COMPASS-SWINGING AREA

—— 5 —— ISOGONIC CONTOURS. CONTOUR INTERVAL IS ONE MINUTE AND VALUES ARE ABSOLUTE DECLINATION MINUS 7 DEGREES

- - - - - - MAN-PROOF FENCE

N.B. MAGNETIC EFFECTS OF THE MAN-PROOF FENCE ARE NOT SHOWN ON ABOVE DIAGRAM.

MAGNETIC SURVEY OF COMPASS-SWINGING SITE,
R.A.A.F. STATION EDINBURGH, S.A.

ISOGONIC CONTOURS OF PROPOSED RUNNING-UP AREA, SEPTEMBER, 1955

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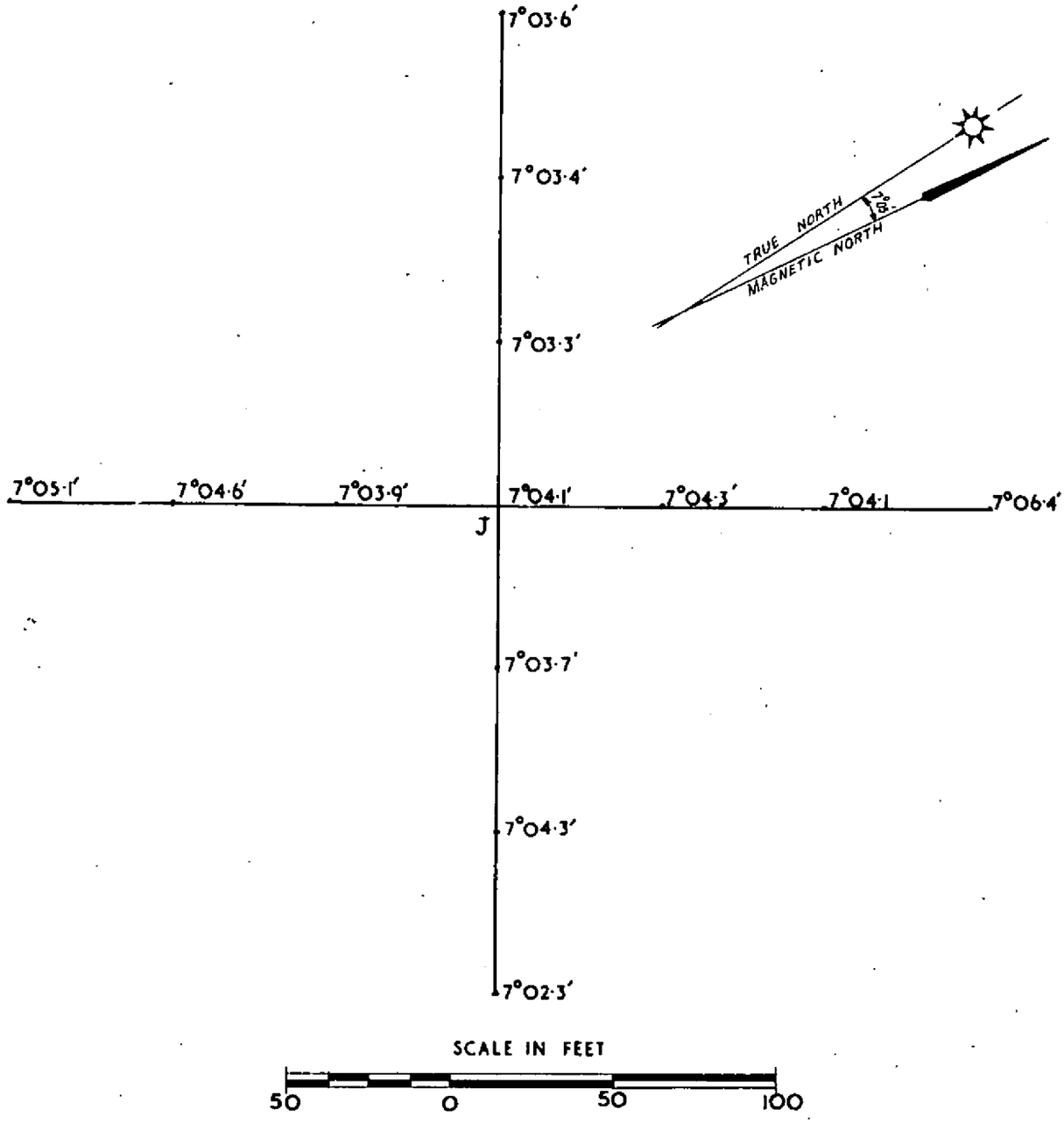
PLATE 3



MAGNETIC SURVEY OF COMPASS-SWINGING SITE,
R.A.A.F. STATION EDINBURGH, S. A.

MAGNETIC DECLINATION VALUES OF ALTERNATIVE COMPASS-SWINGING SITE, SEPTEMBER, 1955

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