COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD No. 1963/14

AMBERLEY AERODROME MAGNETIC SURVEY, QUEENSLAND 1962

by

J. van der Linden

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SUMMARY

A magnetic declination survey of an aircraft compass-swinging site at Amberley RAAF Station has been made to determine whether this site is magnetically affected by a nearby bomb-loading area. An alternative compass-swinging site was also surveyed. The results indicate that the first site is not affected and that the alternative site is less suitable because of an anomaly in magnetic declination in the centre of the area.

Diagrams are presented showing the differences in the values of magnetic declination measured at 45 stations distributed over one site and 44 stations over the other.

1. INTRODUCTION

A magnetic declination survey of two areas at Amberley RAAF Station, Queensland was made from 15th to 17th May 1962.

The survey was undertaken at the request of the Department of Air, to determine whether a recently-established bomb-loading area has any magnetic effect on the existing aircraft-compass-swinging area (Site No. 1) and also to determine the suitability of an alternative area (Site No. 2) for compass swinging. The locations of the sites are shown on Plate 1.

2. PREPARATION OF SITES

The sites had been prepared by personnel of the Brisbane office of the Survey Branch of the Department of the Interior. At each site, points were marked at distances of 25, 50, 100, 150, 200, and 300 ft from a central point, along each of eight radial lines that were 45 degrees apart; thus a total of 49 points at each site was specified. The radial lines were laid out from true north. The points were marked by wooden pegs in grass areas and by yellow painted circles with a nail in the centre in bitumen areas. The central point was marked by a yellow cross within the painted circle.

3. INSTRUMENTS

Askania magnetometer horizontal circle No. 508810 was used for measurement of angles, and Askania fibre declinometer head No. 509320 was used for declination measurements. The torsion was reduced to zero before the observations and also checked after lunch-breaks.

4. PROCEDURE

For declination measurements the outermost point on the opposite radial line was used as an azimuth mark. At each point, mark and magnet readings were made once each, using the magnet in the erect position. The central-station observation was repeated before observing along the next radial line to allow for time variations in the declination. Forty-five points were observed at Site No. 1 and Forty-four points at Site No. 2. At Site No. 1 the positions at 200 and 300 ft from the centre along the 270 and 315-degree radials had not been marked and were not observed. At five points at Site No. 2, the mark could not be observed as the points were located in depressions in the ground that were too deep to permit this.

5. RESULTS

Plate 1 shows the location of the two areas. The departures, in minutes (min) of arc, from the mean magnetic declination for the site has been computed for each point. These are shown on Plates 2 and 3; departures that equal or exceed 3 min have been emphasised.

The values of magnetic declination at the centre of each site on 15th and 16th May 1962 were:

Site No. 1 10.2 degrees east

Site No. 2 10.1 degrees east

6. CONCLUSIONS

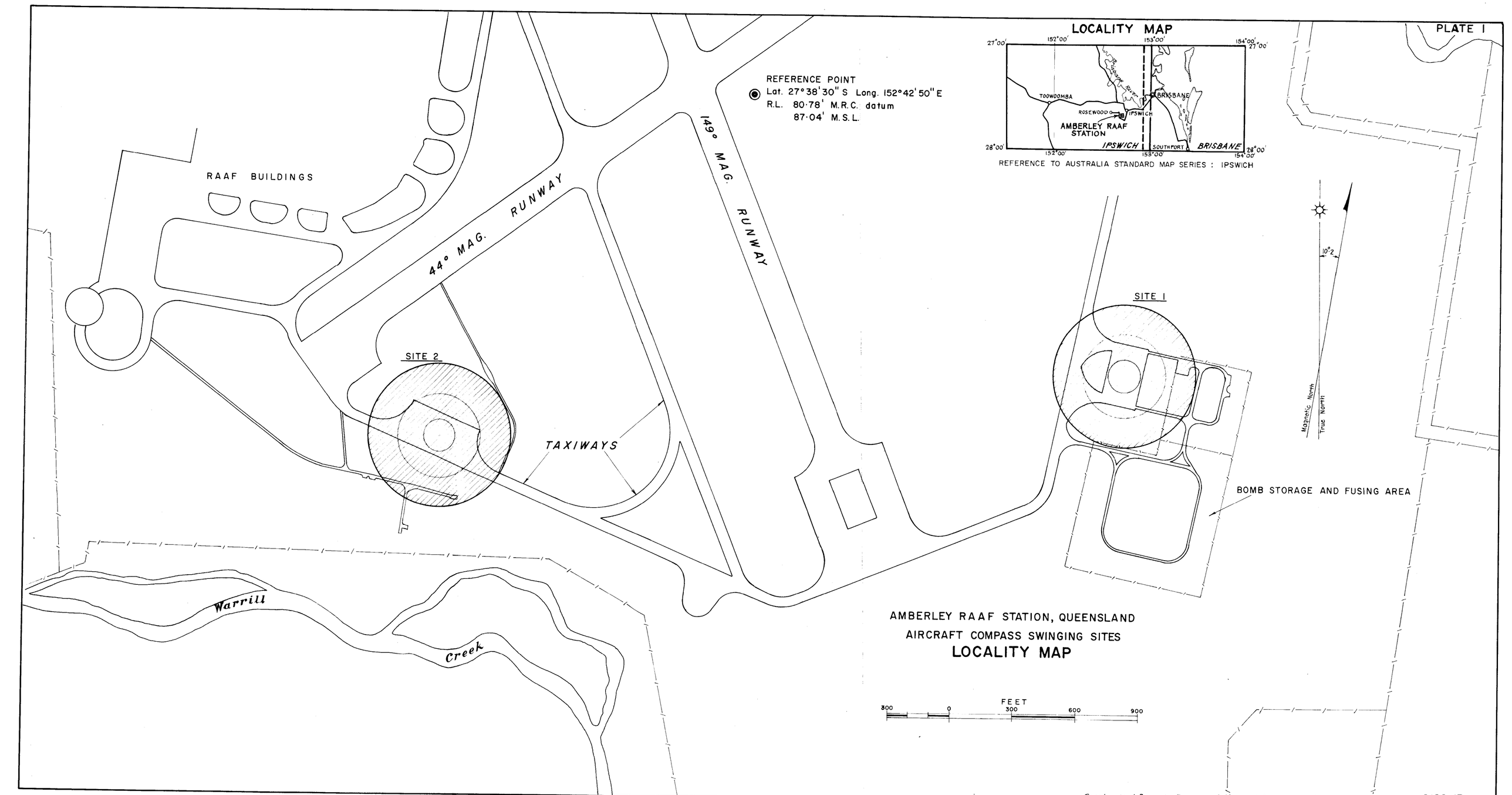
Site No. 1 has anomalies in magnetic declination of -9 min at the 300-ft peg of the true-north radial and of -11 min at the 300-ft peg of the 90-degree radial. The remainder of the area is constant within 7 min. Therefore the site is not seriously magnetically affected by the bomb-loading area.

Site No. 2 has anomalies in magnetic declination of -7 min at the centre peg, of +18 min at the 25-ft peg along the true-north radial, and of -10 min at the 25-ft peg along the 225-degree radial. These anomalies might be caused by some magnetic object or objects buried in, or under, the bitumen.

Near the 200 and 300-ft pegs along the 135-degree radial an underground light-cable causes anomalies of +17 min and +14 min respectively.

Site No. 2 is less suitable than Site No. 1 for compass swinging.

PLATE 1



AMBERLEY RAAF STATION, QUEENSLAND

AIRCRAFT COMPASS SWINGING SITES

LOCALITY MAP

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PLATE 2

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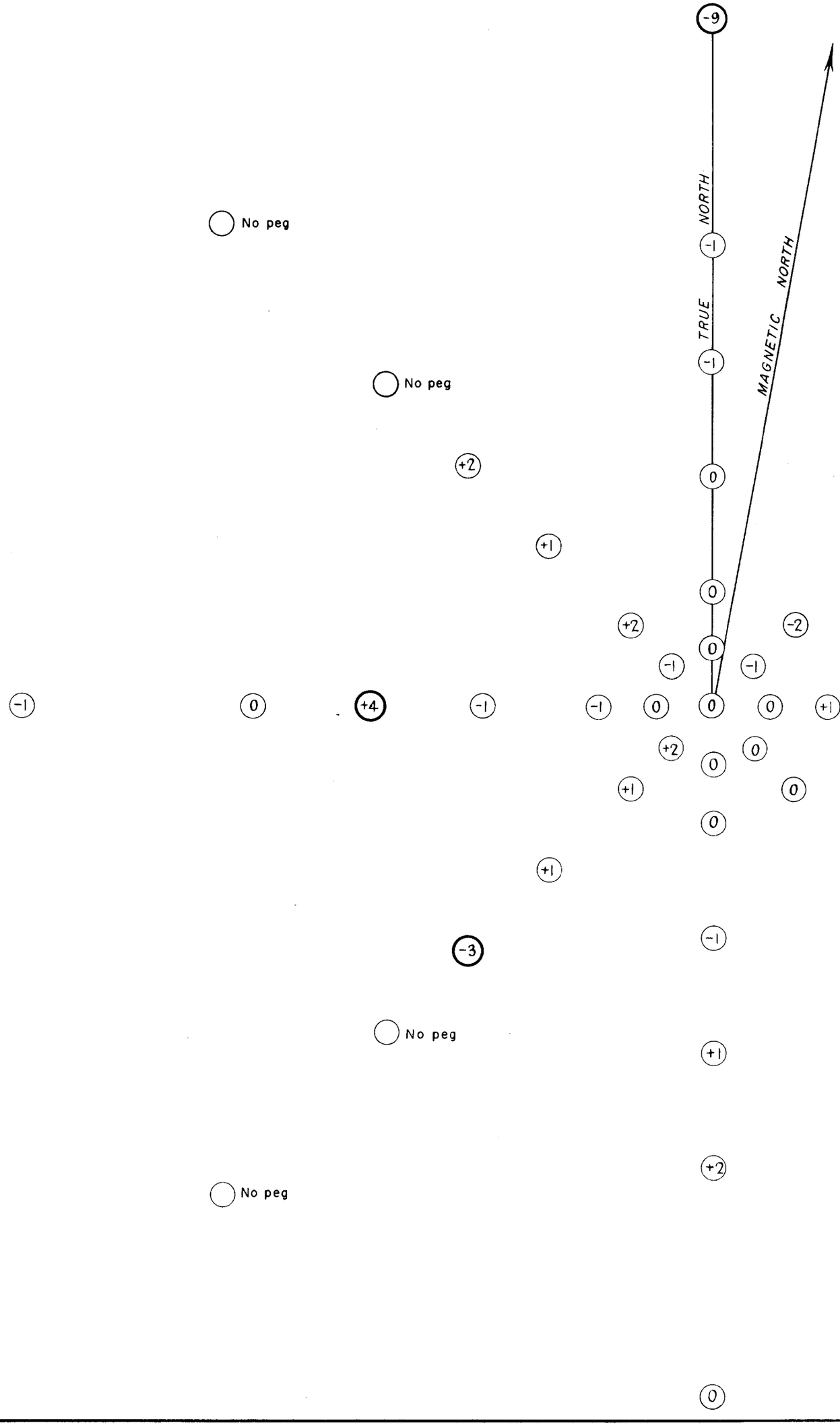

NOTES:

Magnetic declination (May 1962) at centre of site = 10·2°E

Plus sign indicates easterly declination is greater than the mean.

Departures from mean of 3 minutes of arc or greater are emphasised

AIRCRAFT COMPASS SWINGING

SITE No. 1

DEPARTURES IN MINUTES OF ARC OF MAGNETIC DECLINATION FROM MEAN DECLINATION FOR SITE

FEET

50 0 50 100 150

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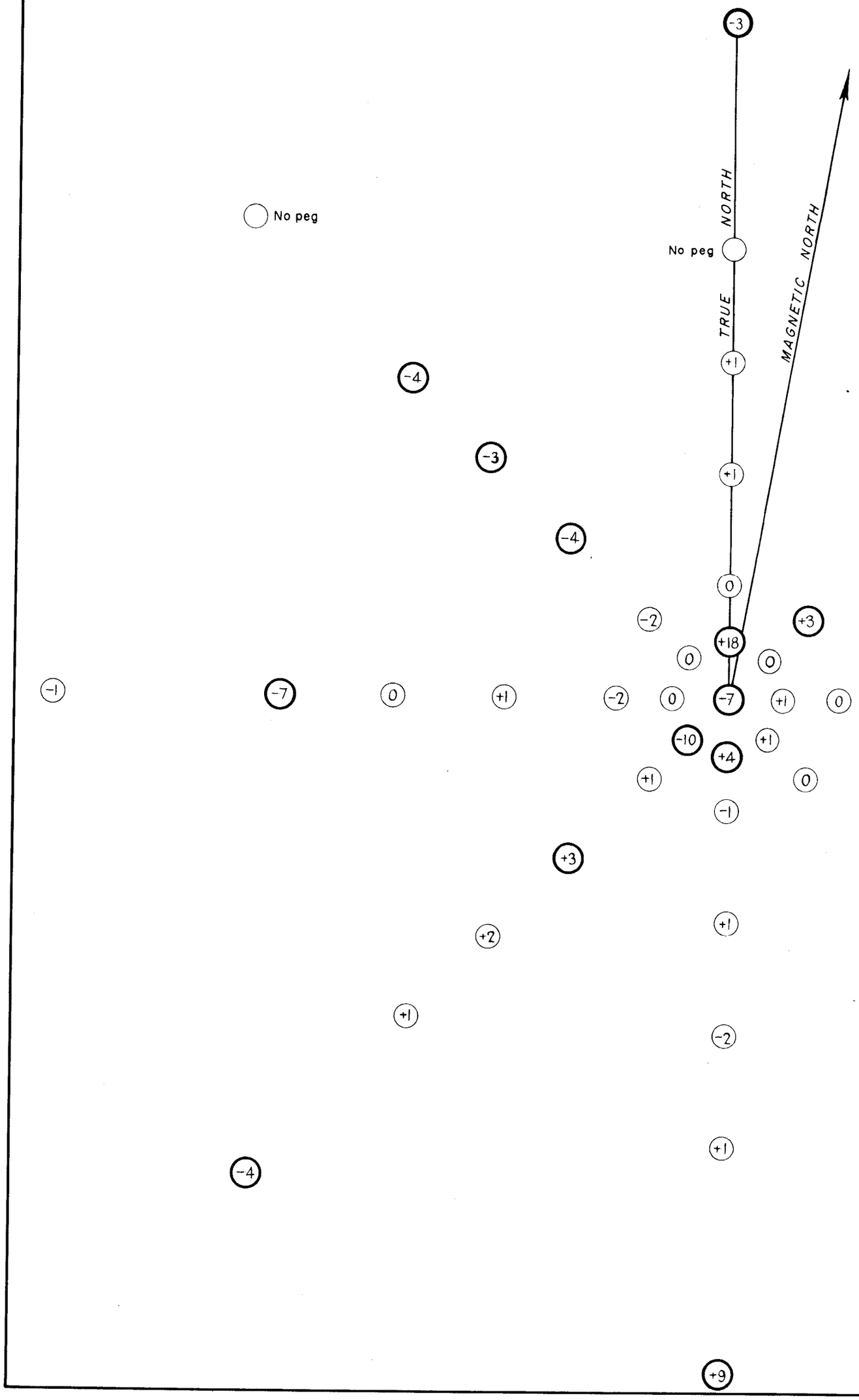
PLATE 3



NOTES

Magnetic declination (May 1962) at centre of site = 10·2°E

Plus sign indicates easterly declination is greater than the mean.

Departures from mean of 3 minutes of arc or greater are emphasised

AIRCRAFT COMPASS SWINGING

SITE No. 2

DEPARTURES IN MINUTES OF ARC OF MAGNETIC DECLINATION FROM MEAN DECLINATION FOR SITE

FEET

50 0 50 100 150

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