COMMONWEALTH OF AUSTRALIA
DEPARTMENT OF NATIONAL DEVELOPMENT
BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

RECORD No. 1961-137

RAWLINSON RANGE-YOUNG RANGE AEROMAGNETIC RECONNAISSANCE SURVEY, W.A. 1960

by
P. E. GOODEVE

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ABSTRACT

An aeromagnetic reconnaissance to indicate the eastern margin of sedimentary rocks in the Rawlinson Range-Young Range area of Western Australia was flown in October 1960. The reconnaissance consisted of two groups of traverses west of Giles. Each group consisted of three traverses in a triangular pattern. Aeromagnetic traverses were also flown from Alice Springs to Giles and from Giles to Kalgoorlie; data from these traverses and from others flown in previous years were used to evaluate the results of the reconnaissance.

The results indicate that the boundary of the region where the magnetic basement is either very shallow or crops out follows a line from the eastern part of the Rawlinson Range, west and south-west to Mt. Charles, then south-east and south to Axe Hill. The boundary then turns east towards Skirmish Hill before it swings south-east along the northern edge of the Officer Basin. Sedimentation west of this boundary could reach depths of more than 10,000 ft over a considerable area but much of the sedimentary rocks could be of Proterozoic age. The western boundary of the sediments was not determined.

Suggestions for future work in the area are given.

1. INTRODUCTION

An aeromagnetic reconnaissance requested by the Bureau's Geological Branch was flown in the Rawlinson Range-Young Range area of Western Australia on the 22nd and 23rd October 1960. The reconnaissance consisted of two groups of traverses; each group extended about 200 miles west of Giles and consisted of three traverses in a triangular pattern (Plate 1). The purpose of the reconnaissance was to aid planning for future work and in particular to indicate the eastern margin of the sedimentary rocks.

In this Record, the results of the reconnaissance are considered together with those of aeromagnetic traverses flown between Alice Springs, Giles, and Kalgoorlie at about the same time and with other traverses across the Officer Basin flown in earlier years. The latter include part of the 1954 Eucla Basin aeromagnetic reconnaissance (Quilty and Goodeve, 1958) and route traverses. The area dealt with in this Record has thus been extended from the original Rawlinson Range-Young Range area, and includes what might be considered as a north-western extension of the Officer Basin. Plates 2, 3, 4, 5, and 6 show the positions of all traverses used in the evaluation and indicate when each traverse was flown.

Very little geophysical work has been done in the area and geological information is sketchy except for detailed mapping north of Giles. The reconnaissance can therefore provide only a general indication of thickness of sedimentary rocks.

The field party was based at Giles and comprised the following officers of the Geophysical Branch:- R. Wells (Party Leader) and M.J.W. Duggin; and the following officers of Trans-Australia Airlines:- Capt. G. Close, First Officer G.C. Greene, and Engineer W. Briggs.

2. GEOLOGY

A geological sketch map of the survey area is shown on Plate 1. This map is based on the Tectonic Map of Australia (B.M.R.G.G., 1960c), published by the Bureau, but includes additional information provided by the Geological Branch of the Bureau. Some of this additional information is available from Bureau publications (B.M.R.G.G., 1960b; Traves, Casey, and Wells, 1956; B.M.R.G.G., 1960a; Prichard and Quinlan, 1960), but most of it is recent and unpublished, particularly in the Macdonald and Rawlinson 4-mile areas and in the region east of Giles.

Geologically the Rawlinson Range-Young Range area is regarded as a southern extension of the Canning Basin although it could also be considered as part of the Officer Basin, which lies to the south-east. The area appears to form a bridge between the Canning and Officer Basins. The surface formations consist mainly of Lower Cretaceous sediments, with some Quaternary marine sand, alluvium, and limestone; Permian rocks also crop out, especially east of a line running north from the Warburton Mission. An inlier of Precambrian rocks has been recorded 30 miles east of the Alfred and Marie Range. Just outside the north-western boundary of the reconnaissance area, at Woolnough Hills, a probable salt dome has pushed through Permian and Cretaceous strata. Little is known of this area, because of the lack of exposure and the small amount of field work that has been done.

To the north, the surface rocks of the Canning Basin proper are of Permian and Mesozoic ages. The south-eastern boundary of the Canning Basin is in contact with Upper Proterozoic sediments which have been mapped in detail in the Macdonald 4-mile area. An east-west fault in the Rawlinson 4-mile area divides Upper Proterozoic rocks on its northern side from Lower Proterozoic rocks. These two rock groups are believed to extend in parallel belts for about two hundred miles to the south east. The fault which divides them in the Rawlinson 4-mile area is postulated as extending in the same direction to the vicinity of Ayers Rock and beyond. The Upper Proterozoic sediments form part of the south-western flank of the Amadeus Trough. Farther to the east the Trough consists of Lower Palaeozoic and Middle Palaeozoic sediments in succession.

South of Giles, a large body of rocks of Archaean age forms the northern boundary of the Officer Basin. Some porphyry intrusions are known near Giles. At the south-western corner of the Archaean body an area of undifferentiated Proterozoic rocks with porphyry intrusions and basic volcanics has been mapped. South-west of this area a thin cover of Cainozoic or Palaeozoic sediments is indicated over a large area. Still farther south-west is the boundary between undifferentiated Proterozoics and a large mass of Archaean granite and gneiss with basic volcanics.

3. FIELD OPERATIONS

The survey was flown with the Bureau's DC.3 aircraft VH-MIN, fitted with a fluxgate type of magnetometer which provided a continuous record of total magnetic field intensity.

Navigation on Traverses 1 to 6 (Plate 1) was done by visual observation; aerial photographs and maps on which the proposed flight paths had been drawn were used. On the long line traverses between Alice Springs and Kalgoorlie, visual observation and dead reckoning were used. Navigational equipment included a CL2 gyromagnetic compass and a radio compass. An STR30B radio altimeter and a barometric altimeter were used to maintain altitude at a mean level of 1500 ft above ground. A continuous record of the flight path on all traverses was obtained from a 35-mm continuous-strip camera.

An air position indicator was used to provide information on the air position of each traverse. This information was resolved into longitudinal and transverse components which were recorded by photographing two mileage counters. The air position was also shown graphically on a "Recti-riter" chart recorder. The air position information together with the known positions of "check points" was used in plotting the track of the aircraft over the ground.

The various instrument and photographic records were correlated by fiducial marks from an electronic timer.

4. METHODS OF INTERPRETATION

Aeromagnetic surveying, as applied to the exploration of a sedimentary basin, is used to determine the thickness of sedimentation in various parts of the basin and to detect major structural features in the basement. It can only be expected to do this adequately if the coverage of the area is complete enough for contoured magnetic maps of the area to be drawn and evaluated. A reconnaissance magnetic survey of the kind described here consists of a few widely-spaced traverses designed to provide sufficient information to enable more comprehensive surveys to be carried out in the best way.

The method of interpretation depends on the assumption that the sedimentary rocks within the basin have a negligible magnetic effect (i.e. have a uniform magnetic susceptibility and negligible remanent magnetisation), and that the underlying basement rocks contain bodies which, by virtue of their higher magnetic susceptibility or remanent magnetisation, produce measurable magnetic anomalies. For this reconnaissance, the anomalies were compared with theoretical anomaly curves for profiles over buried contacts, simple faults, horizontal blocks, rectangular slabs, and simple bodies such as deep vertical dykes and pipes. In the case of the pipes it was assumed that the traverse had passed directly over the body. Another method which was used is that of Peters (1949). In this method the traverse is assumed to intersect a linear structural feature nearly at right angles. A relation between the anomaly proportions and the depth to the source, derived by Peters, is then used to interpret the anomaly. Some qualitative interpretation was also done by a visual inspection of the profiles and an assessment of their characteristics based on the interpreter's judgment and experience.

In all the methods of interpretation, attention was given to the correlation of profiles with known geological formations over which they passed, and to all available geological data.

Interpretation was carried out on the original profiles which were produced at a vertical scale of 1 inch to 500 gammas and a mean horizontal scale of approximately 1 inch to 1 mile.

5. DISCUSSION OF RESULTS

As no other geophysical information of the area was available the profiles were first examined in relation to known geology. Some correlation was immediately apparent. In particular the postulated fault that trends north-west from Ayers Rock and divides Upper Proterozoic from Lower Proterozoic rocks coincides markedly with changes in the character of profiles 11 and 12 (Plate 2). To the east of the fault the profiles are particularly flat and the magnetic basement is deduced to be very deep, i.e. greater than 10,000 ft. However, between Ayers Rock and Foster Cliff (Plate 2) several depth estimates indicate magnetic sources at the surface or at a depth of not more than a few hundred feet. These results correspond with a belt of Lower Proterozoic rocks which trend north-west and are bounded on the north-east by the fault previously mentioned and on the south-west by Archaean

rocks. Where Traverse 12 crosses these Lower Proterozoic rocks, depth estimates suggested magnetic sources no deeper than 2000 ft. From near Foster Cliff to the Tomkinson Ranges, Traverse 11 crossed Archaean rocks, and the estimated depths to magnetic basement are in the range 0 to 2000 ft. This body of Archaean rocks extends to the north-eastern ends of Traverse 8 and 9 (Plate 2). The profiles here are similar to those in the Tomkinson Ranges area, and are also considered to indicate shallow magnetic sources. Depth estimates on the profiles of Traverses 3, 4, and 6 over outcropping Archaean and Lower Proterozoic rocks in the area immediately west of Giles also indicate magnetic sources at or near the surface. From the good agreement between estimated and actual depths in the above areas it appears that the method of depth estimation is satisfactory, at least for shallow sources. The Upper Proterozoic and Palaeozoic formations in the Amadeus Trough exhibit virtually no magnetisation and are therefore not directly detectable by the magnetic method. In the region covered by the Rawlinson Range-Young Range traverses all depths to magnetic basement are considered to relate to the depth of the upper surface of the Lower Proterozoic rocks, or, in the absence of these, to the upper surface of the Archaean rocks.

In the Rawlinson Range-Young Range area (Plate 2) a postulated margin of shallow or outcropping basement has been drawn westwards from a point near Giles to a point near Mt Charles on Traverse 6. The margin then turns sharply south-east, through points on Traverse 8 and 9 that correspond with marked changes in profile character. An embayment between profiles 6 and 8 has been drawn to avoid moderately thick sedimentary rocks along Traverse 7 almost as far as its north-eastern end. However, the position of Traverse 7 could be misplaced by as much as 20 miles. If Traverse 7 were moved south-west by about 20 miles, the margin of the basement between Traverses6 and 8 would be more nearly a straight line. This would also bring into approximate alignment features on Traverses 6, 7, and 8 which could correspond with a deep-seated contact. Similarly, errors in the position of Traverse 10 could shift the basement margin. The basement margin has been drawn along the northern boundary of the Officer Basin as far as longitude 130°, where its position was indicated on profiles of the Eucla Basin reconnaissance (Quilty and Goodeve, 1958).

Traverses 1, 3, 4, and 6 all exhibit fairly large broad anomalies through which a possible structural feature is suggested. This feature trends in a south-westerly direction and is shown by broken lines with interrogation marks (Plates 2 and 3). On Traverses 1, 3, and 4 this feature is believed to be due to a deep structure, possibly a contact at a depth of about 10,000 ft, but on Traverse 6 the structure is believed to be very near the surface. Other features on Traverses 1 to 6 on which depth estimates have been made include an anomaly at the western end of Traverse 1 (this anomaly is too small to be clearly visible on Plate 3, because of the small scale), a contact on Traverse 3 near reference point 29, and an anomaly on Traverse 4 west of and near to reference point 6. Other estimates east of the basement margin on these traverses gave depths between zero and a few hundred feet, whereas immediately west of the margin the estimated depths are a few thousand feet. Elsewhere, with the exception of the depths already mentioned, these profiles have the character to be expected over a deep basement; i.e. one greater than 5000 ft.

To include the various depth estimates obtained, a depth range of greater than 5000 feet has been assigned to basement on Traverses 2 and 5 and on the western ends of Traverses 1, 3, 4, and 6 (Plates 2 and 3). A depth range of 2000 to 5000 ft has been assigned to those parts of Traverses 1, 3, and 4 immediately west of the interpreted margin of very shallow basement (Plate 2).

Traverses 7, 8, and 9 are close together from the region of Rason Lake to Kalgoorlie (Plate 4); this section is entirely over Archaean rocks which contain magnetic sources computed to be at or very near the surface. A number of depth estimates north-east of the contact between Archaean and Cainozoic rocks in the region of Rason Lake indicate that the Archaean rocks continue beneath the Cainozoic and steadily deepen towards the north-east (Plates 4 and 2). Depths to magnetic basement are about 2000 to 5000 ft in the region of latitude 28° but north-eastwards from here the magnetic basement deepens further and could reach many thousands of feet before the postulated basement margin referred to above is reached. Basement depths greater than 5000 ft are assigned to the traverses in this area (Plates 2,3, and 4).

The reconnaissance aeromagnetic data described here are not adequate for detailed interpretation, and the results can be considered only as a general guide to further work in the area.

6. CONCLUSIONS AND RECOMMENDATIONS

The reconnaissance is considered to have successfully indicated the eastern boundary of deep sedimentation in the area. It has also shown that some regions of Upper Proterozoic sediments are not magnetic and it is thus possible that some or nearly all of the sediments in the Rawlinson Range-Young Range area could be of Proterozoic age. The magnetic basement in the Amadeus Trough appears to be very deep and this basin could also contain thick Proterozoic sediments.

Apart from additional geological mapping, the Rawlinson Range-Young Range area should be surveyed by other methods to provide control which could be used to interpret a detailed aeromagnetic survey of the area. Seismic traverses or drilling could provide this control. Seismic traverses across the area, followed by a detailed aeromagnetic survey, should give reasonably good information on the geological structure; stratigraphic drilling would enable the relative thickness of Upper Proterozoic and Palaeozoic sediments to be estimated.

7. REFERENCES

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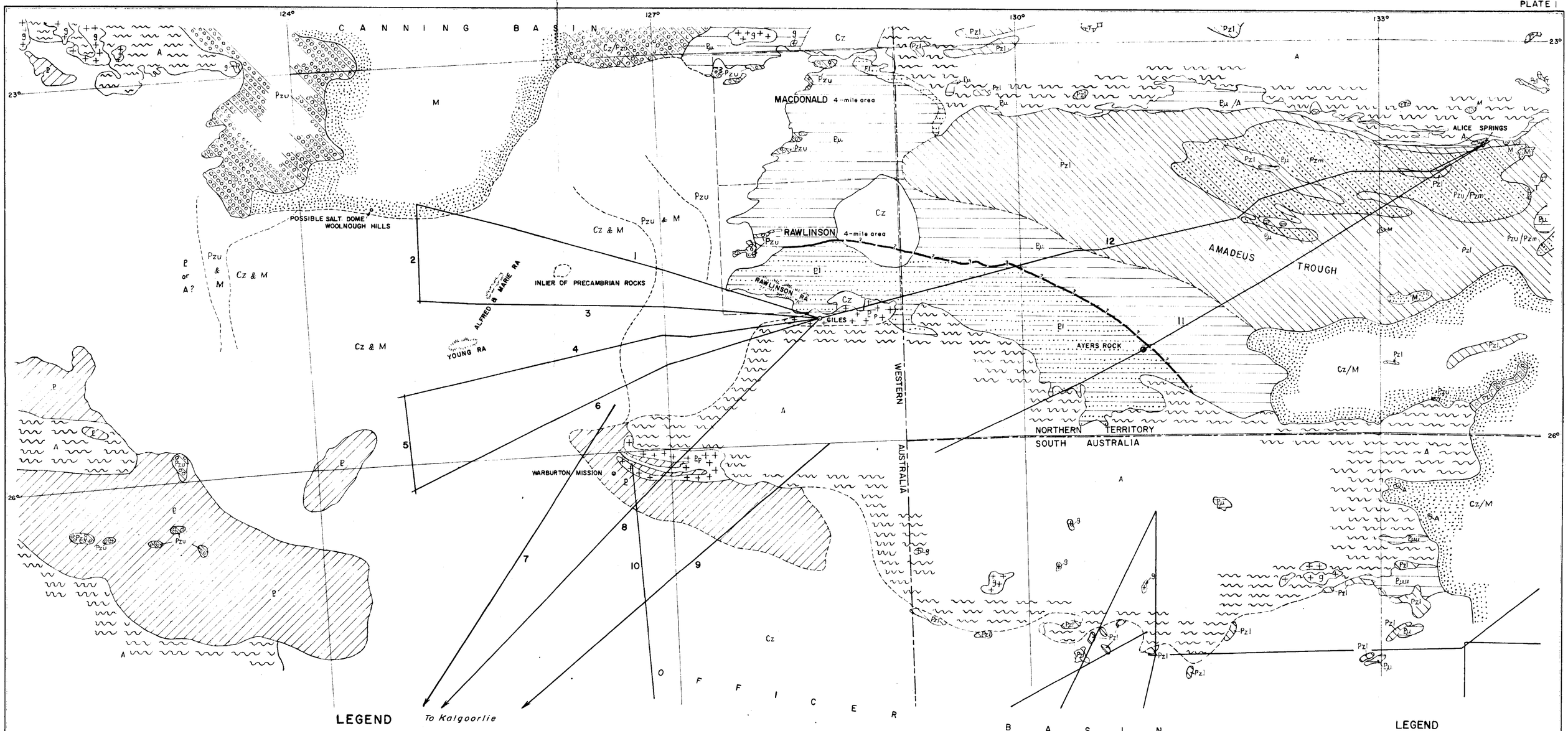


LEGEND

CAINOZOIC	UNDIFFERENTIATED	Cz	*Sand, alluvium and limestone*
	TERTIARY	T	*Limestone and sandstone*
MESOZOIC	UNDIFFERENTIATED	M	*Sandstone, siltstone, shale and minor limestone*
PALAEOZOIC	PERMIAN TO UPPER CARBONIFEROUS	Pzu	*Sandstone, shale and limestone*
	UPPER CARBONIFEROUS TO MIDDLE DEVONIAN	Pzm	*Sandstone and limestone*
	MIDDLE DEVONIAN TO CAMBRIAN	Pzl	*Dolomite, limestone, sandstone, shale, chert, red beds, greensand, plateau basalt*
PROTEROZOIC	UNDIFFERENTIATED	P	*Sandstone, shale, conglomerate and volcanics*
	"	Pp	*Porphyry*
	UPPER	Pμ	*Shallow water marine, sandstone, shale, dolomite, conglomerate and volcanics*
	LOWER	Pl	*Geosynclinal sediments, regionally metamorphosed, basic and granite intrusions*
ARCHAEAN	UNDIFFERENTIATED	A	*Granite, gneiss, metamorphic rocks and some meta sediments*
LOWER PALAEOZOIC TO ARCHAEAN		g	*Granite*

GEOLOGICAL SKETCH MAP
RAWLINSON RANGE — YOUNG RANGE AEROMAGNETIC RECONNAISSANCE

SCALE

miles 100 — 0 — 100 miles

LEGEND

- ○ *Aerodrome or landing ground*
- *Geological boundary*
- *Geological boundary indefinite*
- *State boundary*
- *Aeromagnetic traverse*
- *Fault*
- *Fault indefinite*
- *Boundary of Aust. 4-mile map areas referred to in text*

GEOLOGY DERIVED FROM TECTONIC MAP OF AUSTRALIA WITH MODIFICATIONS SUGGESTED BY GEOLOGICAL BRANCH B.M.R.

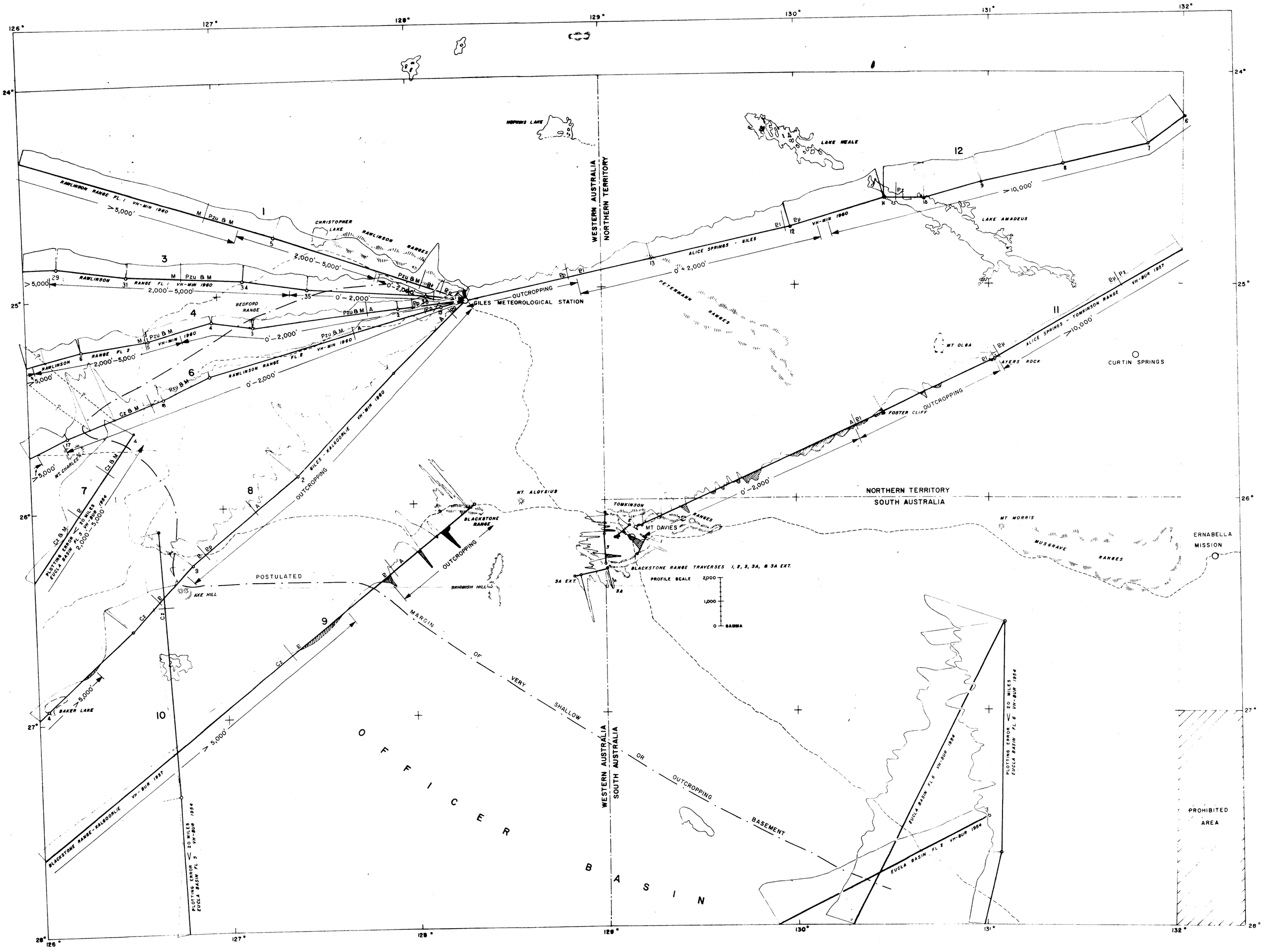
G52/B1-1-1

Geophysical Branch, Bureau of Mineral Resources Geology & Geophysics

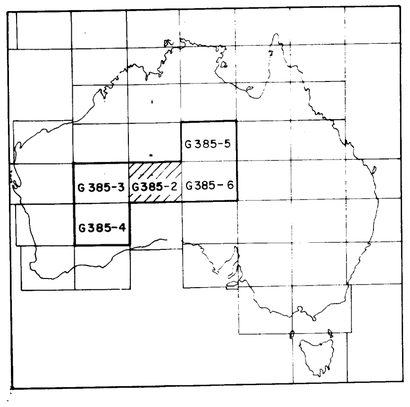
(Ex G 385-1)

TO ACCOMPANY RECORD No. 1961-137

PETERMANN RANGES



LOCALITY MAP



AEROMAGNETIC RECONNAISSANCE SURVEY

MAP SHOWING

MAGNETIC PROFILES ALONG FLIGHT LINES

TOGETHER WITH GEOLOGICAL INFORMATION AND GEOPHYSICAL INTERPRETATION

SCALE

MILES 10 0 10 20 30 40 50 60 70 MILES

KILOMETRES 10 0 10 20 30 40 50 60 70 80 90 100 110 KILOMETRES

APPROXIMATE PROFILE SCALE

1,000 500 0 GAMMA

LEGEND

- FLIGHT LINE WITH PROFILE AND OBLIQUE ORDINATE
- PROFILE BELOW DATUM
- GROUND REFERENCE POINT
- AERODROME OR LANDING STRIP
- TOWN
- RAILWAY
- HIGHWAY OR ROAD
- TRAIL OR TRACK
- RIVER OR STREAM
- POSITION OF GEOLOGICAL CONTACT ON FLIGHT LINE
- POSTULATED TREND IN THE BASEMENT

EXPLANATORY NOTES

THIS MAP IS ONE OF A SERIES COMPILED FROM AEROMAGNETIC RECONNAISSANCE FLIGHTS MADE BY THE DC.3 SURVEY AIRCRAFT OF THE BUREAU OF MINERAL RESOURCES.

THE FLIGHTS WERE MADE AT AN ALTITUDE OF 1,500 FEET ABOVE GENERAL GROUND LEVEL. THE AIRCRAFT WAS NAVIGATED MAINLY BY REFERENCE TO AERONAUTICAL MAPS USING DEAD RECKONING METHODS. ON SOME FLIGHT LINES AN AIR POSITION INDICATING SYSTEM WAS USED TO RECORD THE AIRCRAFT'S AIR POSITION BETWEEN GROUND REFERENCE POINTS. ERRORS IN PLOTTING OF FLIGHT LINES ON THIS MAP ARE NOT EXPECTED TO EXCEED 5 MILES EXCEPT WHERE INDICATED.

THE TOTAL MAGNETIC INTENSITY WAS CONTINUOUSLY MEASURED BY AN AIRBORNE MAGNETOMETER INSTALLED IN THE AIRCRAFT. THE MAP SHOWS THE MAGNETIC PROFILE RECORDED ALONG EACH FLIGHT LINE EXCEPT WHERE A CONVERGENCE OF LINES HAS MADE IT DESIRABLE TO OMIT PARTS OF SOME PROFILES FOR CLEARER PRESENTATION.

THE REGIONAL GRADIENT OF THE EARTH'S FIELD HAS BEEN REMOVED BY ROTATING THE ORIGINAL PROFILE BY AN AMOUNT DEPENDING ON THIS GRADIENT. THE CORRECTED VALUES ARE THEN GIVEN BY ORDINATES MEASURED OBLIQUELY TO THE NEW DATUM REPRESENTED BY THE FLIGHT LINE.

THE FIGURES OF DEPTH ESTIMATE SHOWN UNDERNEATH EACH PROFILE REFER TO THE ESTIMATED DEPTH TO MAGNETIC BASEMENT BELOW GROUND LEVEL.

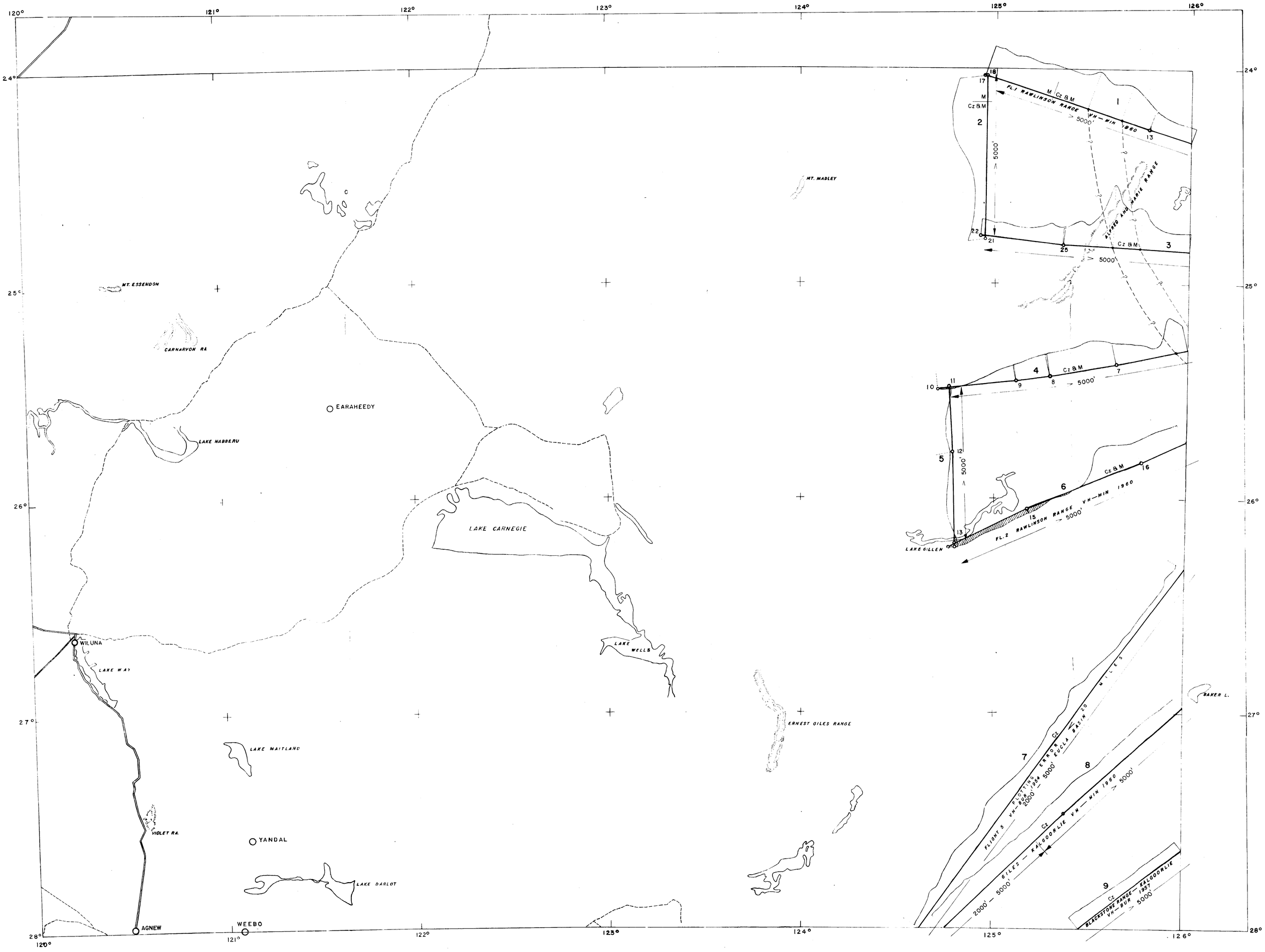
THE GEOLOGICAL SYMBOLS SHOWN ADJACENT TO EACH GEOLOGICAL CONTACT ON THE FLIGHT LINES ARE IDENTICAL WITH THOSE USED ON PLATE 1.

REFERENCE I. C. A. O. CHART No. 3344 PETERMANN RANGES

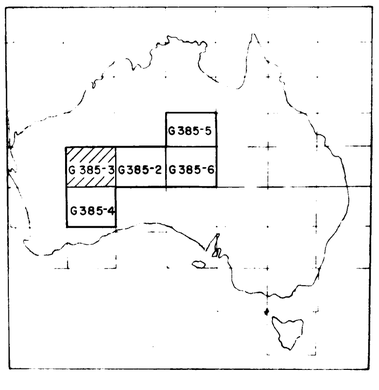
Geophysical Branch, Bureau of Mineral Resources Geology & Geophysics. JANUARY 1961 G 385 – 2

TO ACCOMPANY RECORD No. 1961-137

WILUNA



LOCALITY MAP



AEROMAGNETIC RECONNAISSANCE SURVEY

MAP SHOWING

MAGNETIC PROFILES ALONG FLIGHT LINES

TOGETHER WITH GEOLOGICAL INFORMATION AND GEOPHYSICAL INTERPRETATION

SCALE

MILES 10 5 0 10 20 30 40 50 60 70 MILES

KILOMETRES 10 0 10 20 30 40 50 60 70 80 90 100 110 KILOMETRES

APPROXIMATE PROFILE SCALE

1,000

500

0 GAMMA

LEGEND

- FLIGHT LINE WITH PROFILE AND OBLIQUE ORDINATE
- PROFILE BELOW DATUM
- GROUND REFERENCE POINT
- AERODROME OR LANDING STRIP
- TOWN
- RAILWAY
- HIGHWAY OR ROAD
- TRAIL OR TRACK
- RIVER OR STREAM
- POSITION OF GEOLOGICAL CONTACT ON FLIGHT LINE
- POSTULATED TREND IN THE BASEMENT

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THE TOTAL MAGNETIC INTENSITY WAS CONTINUOUSLY MEASURED BY AN AIRBORNE MAGNETOMETER INSTALLED IN THE AIRCRAFT. THE MAP SHOWS THE MAGNETIC PROFILE RECORDED ALONG EACH FLIGHT LINE EXCEPT WHERE A CONVERGENCE OF LINES HAS MADE IT DESIRABLE TO OMIT PARTS OF SOME PROFILES FOR CLEARER PRESENTATION.

THE REGIONAL GRADIENT OF THE EARTH'S FIELD HAS BEEN REMOVED BY ROTATING THE ORIGINAL PROFILE BY AN AMOUNT DEPENDING ON THIS GRADIENT. THE CORRECTED VALUES ARE THEN GIVEN BY ORDINATES MEASURED OBLIQUELY TO THE NEW DATUM REPRESENTED BY THE FLIGHT LINE.

THE FIGURES OF DEPTH ESTIMATE SHOWN UNDERNEATH EACH PROFILE REFER TO THE ESTIMATED DEPTH TO MAGNETIC BASEMENT BELOW GROUND LEVEL.

THE GEOLOGICAL SYMBOLS SHOWN ADJACENT TO EACH GEOLOGICAL CONTACT ON THE FLIGHT LINES ARE IDENTICAL WITH THOSE USED ON PLATE 1.

REFERENCE I.C.A.O CHART No. 3345

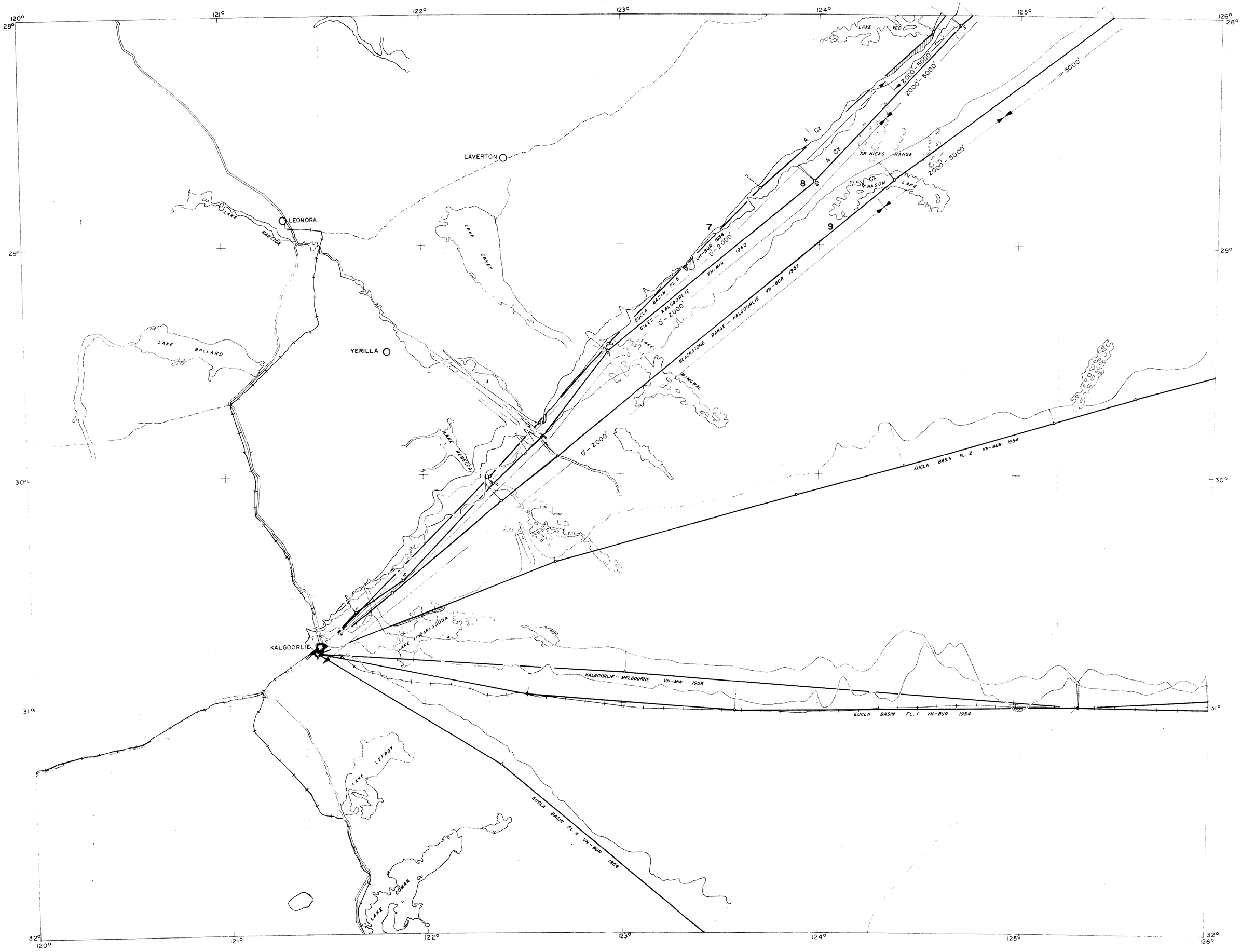
WILUNA (Ex G385-3)

Geophysical Branch, Bureau of Mineral Resources, Geology & Geophysics

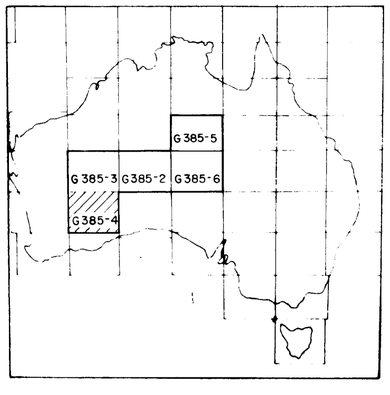
JANUARY 1961

TO ACCOMPANY RECORD No. 1961-137 G51/B1-1-1

KALGOORLIE



LOCALITY MAP



AEROMAGNETIC RECONNAISSANCE SURVEY

MAP SHOWING

MAGNETIC PROFILES ALONG FLIGHT LINES

TOGETHER WITH GEOLOGICAL INFORMATION AND GEOPHYSICAL INTERPRETATION

SCALE

MILES 10 5 0 10 20 30 40 50 60 70 MILES

KILOMETRES 10 0 10 20 30 40 50 60 70 80 90 100 110 KILOMETRES

APPROXIMATE PROFILE SCALE

1,000
500
0 GAMMA

½°

MN

TN

LEGEND

- FLIGHT LINE WITH PROFILE AND OBLIQUE ORDINATE
- PROFILE BELOW DATUM
- GROUND REFERENCE POINT
- AERODROME OR LANDING STRIP
- TOWN
- RAILWAY
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THE REGIONAL GRADIENT OF THE EARTH'S FIELD HAS BEEN REMOVED BY ROTATING THE ORIGINAL PROFILE BY AN AMOUNT DEPENDING ON THIS GRADIENT. THE CORRECTED VALUES ARE THEN GIVEN BY ORDINATES MEASURED OBLIQUELY TO THE NEW DATUM REPRESENTED BY THE FLIGHT LINE.

THE FIGURES OF DEPTH ESTIMATE SHOWN UNDERNEATH EACH PROFILE REFER TO THE ESTIMATED DEPTH TO MAGNETIC BASEMENT BELOW GROUND LEVEL.

THE GEOLOGICAL SYMBOLS SHOWN ADJACENT TO EACH GEOLOGICAL CONTACT ON THE FLIGHT LINES ARE IDENTICAL WITH THOSE USED ON PLATE 1.

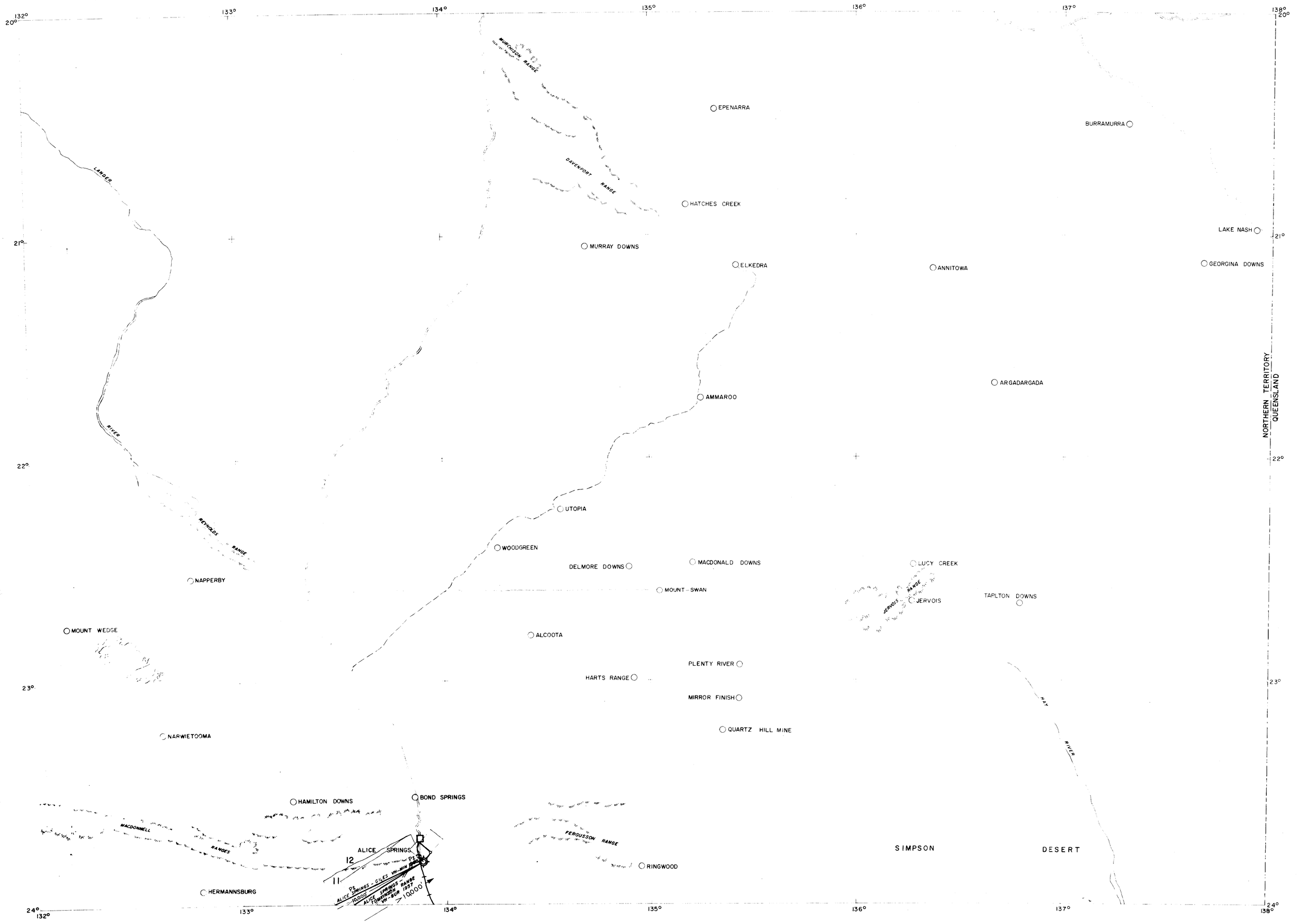
REFERENCE I.C.A.O. CHART No 3352 KALGOORLIE

Geophysical Branch, Bureau of Mineral Resources Geology & Geophysics MARCH 1961 (Ex G 385-4)

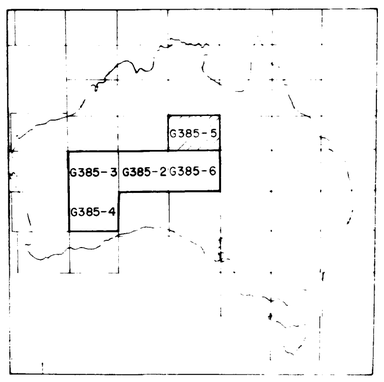
TO ACCOMPANY RECORD No. 1961-137

H51/B1-1-1

ALICE SPRINGS



LOCALITY MAP



AEROMAGNETIC RECONNAISSANCE SURVEY

MAP SHOWING

MAGNETIC PROFILES ALONG FLIGHT LINES

TOGETHER WITH GEOLOGICAL INFORMATION AND GEOPHYSICAL INTERPRETATION

SCALE

MILES 10 5 0 10 20 30 40 50 60 70 MILES

KILOMETRES 10 0 10 20 30 40 50 60 70 80 90 100 110 KILOMETRES

APPROXIMATE PROFILE SCALE

1,000

500

0 GAMMA

LEGEND

- FLIGHT LINE WITH PROFILE AND OBLIQUE ORDINATE
- PROFILE BELOW DATUM
- GROUND REFERENCE POINT
- AERODROME OR LANDING STRIP
- TOWN
- RAILWAY
- HIGHWAY OR ROAD
- TRACK
- RIVER OR STREAM
- POSITION OF GEOLOGICAL CONTACT ON FLIGHT LINE
- POSTULATED TREND IN THE BASEMENT

EXPLANATORY NOTES

THIS MAP IS ONE OF A SERIES COMPILED FROM AEROMAGNETIC RECONNAISSANCE FLIGHTS MADE BY THE DC 3 SURVEY AIRCRAFT OF THE BUREAU OF MINERAL RESOURCES.

THE FLIGHTS WERE MADE AT AN ALTITUDE OF 1500 FEET ABOVE GENERAL GROUND LEVEL. THE AIRCRAFT WAS NAVIGATED MAINLY BY REFERENCE TO AERONAUTICAL MAPS USING DEAD RECKONING METHODS. ON SOME FLIGHT LINES AN AIR POSITION INDICATING SYSTEM WAS USED TO RECORD THE AIRCRAFT'S AIR POSITION BETWEEN GROUND REFERENCE POINTS. ERRORS IN PLOTTING OF FLIGHT LINES ON THIS MAP ARE NOT EXPECTED TO EXCEED 5 MILES EXCEPT WHERE INDICATED.

THE TOTAL MAGNETIC INTENSITY WAS CONTINUOUSLY MEASURED BY AN AIRBORNE MAGNETOMETER INSTALLED IN THE AIRCRAFT. THE MAP SHOWS THE MAGNETIC PROFILE RECORDED ALONG EACH FLIGHT LINE EXCEPT WHERE A CONVERGENCE OF LINES HAS MADE IT DESIRABLE TO OMIT PARTS OF SOME PROFILES FOR CLEARER PRESENTATION.

THE REGIONAL GRADIENT OF THE EARTH'S FIELD HAS BEEN REMOVED BY ROTATING THE ORIGINAL PROFILE BY AN AMOUNT DEPENDING ON THIS GRADIENT. THE CORRECTED VALUES ARE THEN GIVEN BY ORDINATES MEASURED OBLIQUELY TO THE NEW DATUM REPRESENTED BY THE FLIGHT LINE.

THE FIGURES OF DEPTH ESTIMATE SHOWN UNDERNEATH EACH PROFILE REFER TO THE ESTIMATED DEPTH TO MAGNETIC BASEMENT BELOW GROUND LEVEL.

THE GEOLOGICAL SYMBOLS SHOWN ADJACENT TO EACH GEOLOGICAL CONTACT ON THE FLIGHT LINES ARE IDENTICAL WITH THOSE USED ON PLATE 1.

REFERENCE I.C.A.O. CHART No 3232 ALICE SPRINGS

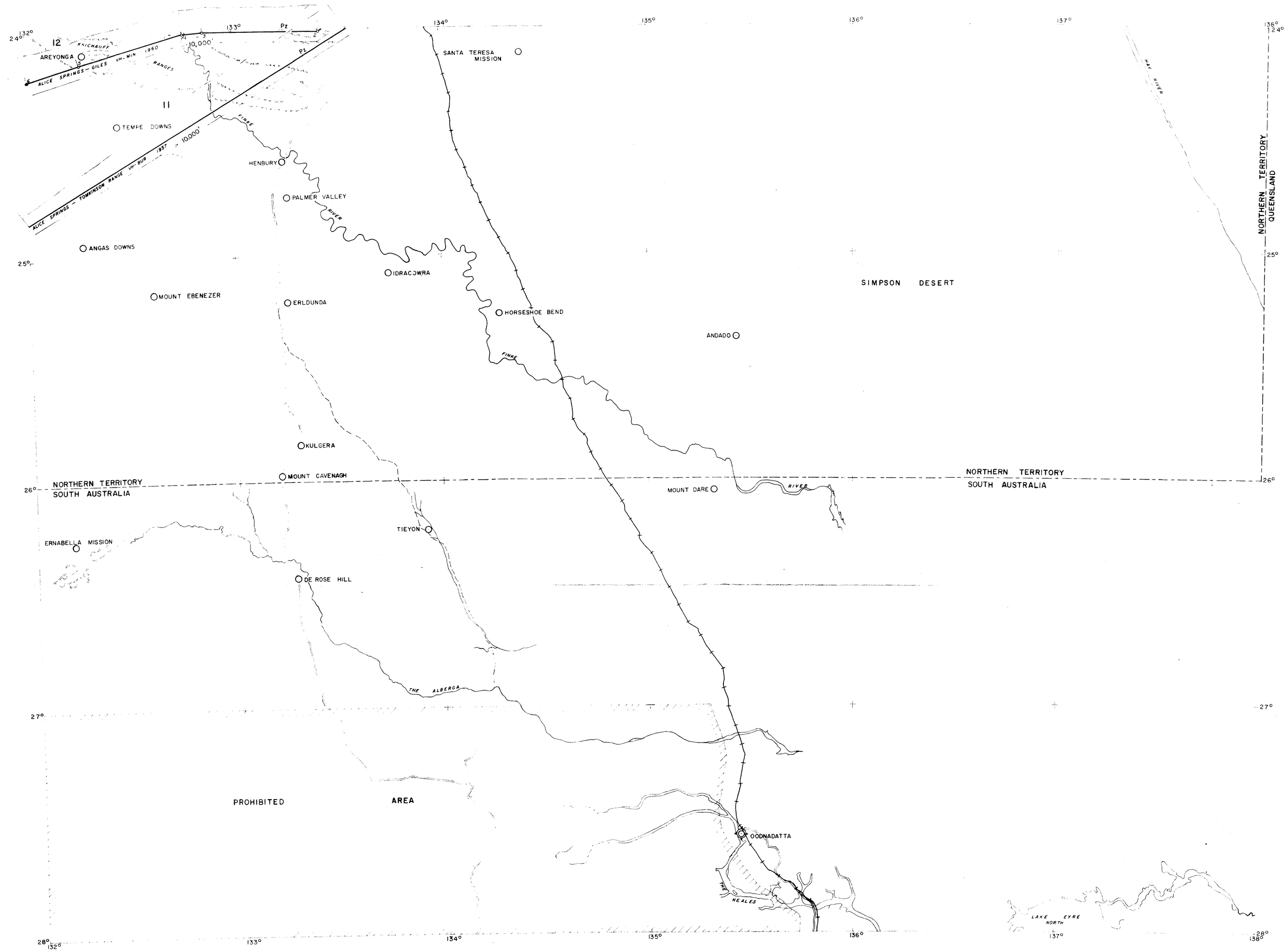
Geophysical Branch, Bureau of Mineral Resources Geology & Geophysics MARCH 1961 (Ex G 385 – 5)

TO ACCOMPANY RECORD No. 1961-137

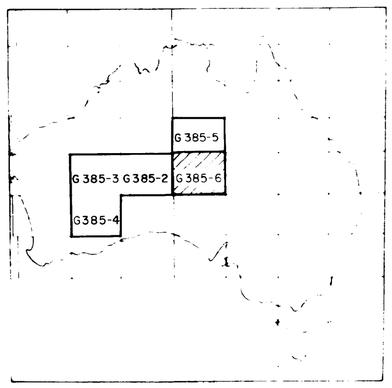
F53 \B1-1-1

OODNADATTA

PLATE 6



LOCALITY MAP



AEROMAGNETIC RECONNAISSANCE SURVEY

MAP SHOWING

MAGNETIC PROFILES ALONG FLIGHT LINES

TOGETHER WITH GEOLOGICAL INFORMATION AND GEOPHYSICAL INTERPRETATION

SCALE

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LEGEND

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- PROFILE BELOW DATUM
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- POSITION OF GEOLOGICAL CONTACT ON FLIGHT LINE
- POSTULATED TREND IN THE BASEMENT

EXPLANATORY NOTES

THIS MAP IS ONE OF A SERIES COMPILED FROM AEROMAGNETIC RECONNAISSANCE FLIGHTS MADE BY THE DC 3 SURVEY AIRCRAFT OF THE BUREAU OF MINERAL RESOURCES.

THE FLIGHTS WERE MADE AT AN ALTITUDE OF 1,500 FEET ABOVE GENERAL GROUND LEVEL. THE AIRCRAFT WAS NAVIGATED MAINLY BY REFERENCE TO AERONAUTICAL MAPS USING DEAD RECKONING METHODS. ON SOME FLIGHT LINES AN AIR POSITION INDICATING SYSTEM WAS USED TO RECORD THE AIRCRAFT'S AIR POSITION BETWEEN GROUND REFERENCE POINTS. ERRORS IN PLOTTING OF FLIGHT LINES ON THIS MAP ARE NOT EXPECTED TO EXCEED 5 MILES EXCEPT WHERE INDICATED.

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THE FIGURES OF DEPTH ESTIMATE SHOWN UNDERNEATH EACH PROFILE REFER TO THE ESTIMATED DEPTH TO MAGNETIC BASEMENT BELOW GROUND LEVEL.

THE GEOLOGICAL SYMBOLS SHOWN ADJACENT TO EACH GEOLOGICAL CONTACT ON THE FLIGHT LINES ARE IDENTICAL WITH THOSE USED ON PLATE 1.

REFERENCE I.C.A.O. CHART No 3343 OODNADATTA

Geophysical Branch, Bureau of Mineral Resources Geology & Geophysics MARCH 1961 (Ex. G 385-6)

TO ACCOMPANY RECORD No. 1961-137

G53/B1-1-1