

Form 619.

193 NAVIGATION E. V. ROSSER

ROYAL AIR FORCE.

Small Notebook for use in Schools.

T. 4154 W. 11111 279

40. 15° W
 41. 17° W

An aircraft is flying approximately 20 mi. north of
 Chertsey on 27th March 1950 on a course of 200° by pilot's
 compass. It is to begin track 215° by driver's compass
 by which the course was 200°.

- (a) What is the course (C)
 (b) What is T bearing from top of to begin = 215°

	T	C	A	B	L
06.	270	075	202	070	206
08.	270	075	202	070	206

Tides

Time chart is behind of Greenwich
 Time chart is ahead of Greenwich

Distances

- 1. Balsa = 37-37 miles
- 1. Mashed Pot = 6,000 ft.
- 1. Mashed Pot = 5,200 ft.
- 1. Mashed Pot = 5,200 ft. or $\frac{1}{2}$ of a mile.

	$\frac{1000 \times 5}{1609}$	ft.
N	000	0 W
NE	000	2 W
E	090	2 W
SE	180	2 E
S	180	1 W
SW	270	1 W
W	270	0 E
NW	360	2 E

Reading 250" by pilot's compass. Observe right landmark
at 190" by the compass which has a deviation of 1".
The true bearing of the landmark is 189". What was
the true heading of the aircraft.

Cl. 245 10°W 189° 245 250

Ob. 245 10°W 189° 245 250

Truly 189 10°W 189 245 250

R

Reading of plane by pilot's compass 200". True heading is 199".
Observe right an object at 20° true. True bearing is 10".
What is true of observer's compass.

Cl. 199 20° 200 199 200

Ob. 199 20° 200 199 200

Bearing 200 20°W 200 199 200 (10)

R

Observe right landmark at 200° true. True heading is
200°. True bearing of landmark is bearing of 20° from
pilot's compass. True heading is 200°. What is bearing
of pilot's compass.

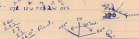
Cl. 200 20° 200 200 200

Ob. 200 20° 200 200 200

R

Plot on heading of 200° comp. when observer goes bearing of landmark as 200° magnetic. What is bearing of landmark with relation to the fore and aft line of the wings. $\approx 120^\circ$ W.

P.S. $\frac{100}{100} \frac{200}{200}$



Note on page 2
 heading of 200°
 bearing of 200°

A quadrant line is a part in which a great circle appears as a straight line.

Heading $40^\circ 00' W$	Bearing $26^\circ 00' E$	
To $40^\circ 00' W$	To $26^\circ 00' W$	
Depth $12^\circ 00' E$	Depth $14^\circ 00' W$	
Course $21^\circ 15' E$	Course $102^\circ 30' E$	$120^\circ 00'$
Wind $20^\circ 00' E$	To $102^\circ 00' W$	$102^\circ 40'$
Depth $26^\circ 00' E$	Depth $22^\circ 18' E$	$5^\circ 22'$

on rising time of (Hesperus) the constant scale of latitude, longitude scale slats at the north of map than at south. Meridian course. Parallel course. Straight line is nearly a great circle. Measurement of distance is simple. Measurement of bearings possible difficulties.

Meridian line

Always true and straight line. Scale is not constant exaggerated towards the North. True course, and

aircraft - track of 1,000,000 in Mendocino hills along at
 56° N. latitude with minimum towards the north,
 longitude marks range on North & South edge of map.
General Chart.

the aircraft is flying approximately 20 mi north of
 Chaboy on a course of 290° by direct compass. Sub 4
 to 4 days from 220° by direct compass by which the

course was 283° (1) actual at course (N) 279
 (2) actual at course (S) 287
 (3) actual at course (E) 285

	T	V	M	S	C
Bl.	277	NW	290	180	283
Rl.	273	NW	280	180	291
Range	280	NW	280	180	284

	T	V	M	S	C	
Bl.	280	NW	292	180	283	
Rl.	284	NW	292	180	291	
Range	288	NW	280	180	284	022°T

	T	V	H	D	C
Feb.	242	11°W	102	2°W	207
Oct.	242	11°W	102	2°W	207
July 14.	242	11°W	102	2°W	207

	T	V	H	D	C
Feb.	100	10°W	100	20°W	100
Oct.	100	10°W	100	20°W	100
July 14.	245	10°W	245	20°W	245

	T	V	H	D	C
Feb.	170	10°E	170	2°W	170
Oct.	170	10°E	170	2°W	170
July 14.	60	10°E	60	10°E	60



An aircraft on the ground is headed 204° Com.
by Pilot's Com. or 252° by observer Com.
The bearing of an object is 120° by observer
compass 25° W. Var. 15° W.
What is dir. of Pilot's & observer compass.

A flying boat landing moves so that buoy and a
tall vessel are exactly in line. From a chart
the bearing of the tall vessel from the buoy is
250° T. The bearing of the buoy from the observer
compass is 245° Com. Variation 10° W. Course was
100° by Pilot's Com. 102° by observer Com.
What was direction of observer Com & Pilot's Com.

Bearing of object is 060° by observer's compass
when course was 170° by that compass. True
bearing is 60°. Var. 10° E. Find dir. of Pilot's
Com. by which course was 102°.

T V M D C
Ob. 120° 10' 130° 22.73

Pb. 120° 10' 130° ✓

Long. 120° 10' 20' at 227°

An aircraft flying in region

Ob. finds Lightbeam base

Ob. 90°
Course Pb 120°
Course 120° 10' 130°
120° 10' 130°
120° 10' 130°
200. Ob.
200. Ob.
120° - 0
120° - 10
120° - 20

Ob. T. course 120°
T bearing 120°

T V M D C
Ob. 120° 10' 130° 22.73
Ob. 120° 10' 130° ✓
Long. 120° 10' 20' at 227°

Bearing of object 120° by bearing before. Course of aircraft was 120° by that time. T-bearing of object 120°. Now 10'. Find line of Pilot's look by which course was 120° at same instant.

T V M D C
Ob. 120° 10' 130° 22.73
Ob. 120° 10' 130° 22.73
Ob. 120° 10' 130° 22.73

Long. 120° 10' 20' at 227° Long. 120° 10' 20' at 227°

An ob. taken from bearing of 070° on land station when by his back course was 312°. Ob. course then bearing L. taken by a look at dead station on airmap and is 250°. Now 120°. Course Pb 120°.

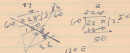
Find Ob. Pb. 4 T. bearing of land station from ob. look

T V M D C
Ob. 200 120 200 40 200
Pb. 120 120 200 40 200
200
200

Long 120° 10' 20' at 227° ✓

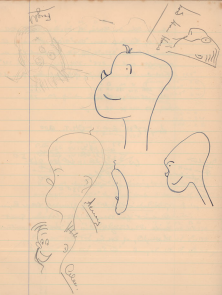
Long 57° 10' E. W.T. 200

Vector
from an
Cylinder.



Geometric Chart. - Of generally better Bryan Lambert for long flights because great circle is straight line to avoid constant changing of course.

Fig. 1



Compare Mandible to Louis Projection.

Mandible projection as usually seen

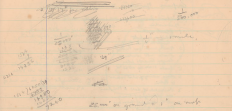
- | | |
|--|---|
| 1. Black outline | 2. Half in full shadow, not higher, large body. |
| 3. Half in full shadow | 3. Quickest work. |
| 4. Only used for study | 4. Good slow. |
| 5. Scale not needed | 5. Process of dent. upper course through the eye. |
| 6. Large front view | 6. Mandible used as base. |
| 7. Scale 1:1000000 at 2000' | 7. Straight line to be on side of a Great circle. |
| 8. Area suggested near to face | |
| 9. Process of dent. upper as straight line | |
| 10. Not straight line as shown above. | |

Mandible projection as usually used with shadow, not 6 months



26' @ 100 meters

10 miles 1/2" 1/1000



2500' or ground 1' or more

2000' or ground 1' or more

1 mile or ground = $\frac{1063269}{20000}$ or more.

25) 1326 (253

$$\begin{array}{r} 51 \\ 25 \overline{) 1326} \\ \underline{125} \\ 76 \\ \underline{75} \\ 10 \\ \underline{10} \\ 0 \end{array}$$

Var. 9° W
 S. by E 165°
 Dist. 1000 and $\left\{ \begin{array}{l} 120^\circ 20' \\ 40^\circ 00' \\ 160^\circ 20' \end{array} \right.$

By st. the by station out 192°
 S. by E. Comp 120° 20'
 100 20
 200 20

	T	V	M	D	C
Pd	150	100	100	100	100
Ob.	150	70	100	20	10
Bearing	100	70	100	20	10
	100	70	100	20	10



Bearing of standing land by Ob. Comp 074°
 same by other land 312
 By of other land, by standing land 258°
 same by Pd. land 320 var. 10°

	T	V	M	D	C
Pd.	100	100	100	100	100
Ob.	100	100	100	100	100
Bearing	67	100	70	60	70

200
 100
 70

2. S. Agonia line.

3. a. 1482 km.

dist. $20^{\circ} 20' N$	long. $100^{\circ} 20' W$
dist. $20^{\circ} 21' N$	long. $100^{\circ} 21' W$
dist. $20^{\circ} 22' N$	long. $100^{\circ} 22' W$

5. $11^{\circ} 10' W$

1.

4. a. Deviation is the angle between the magnetic ~~axis~~ pole
 & the direction of a particular compass needle affected
 X. by the local magnetic field. Deviation may be caused
 by ~~misalignment~~ the compass's construction, ~~various~~ etc.

DIR	TRUE	COMP.
N	074	1 W (1-)
NE	045	2 E (2+)
E	017	4 E
SE	127	2 W (2-)
S	182	2 W (2-)
SW	232	1 W (1-)
W	267	2 E (2+)
NW	317	2 W (2-)

✓ Plot shows 277° for 230° .

5. (a)

3. vertical distance. The difference in height between two adjacent contours.
- ✓ Bank angle. The angle in the horizontal plane between the true meridian passing through the observer and a line representing the actual path of the aircraft over the ground.
- ✓ Course angle. The angle between the magnetic meridian the effective longitudinal axis of an aircraft.
- great circle bearing is the angle in the horizontal plane between the true meridian passing through the observer and the true great circle route joining him to the object.
- large scale. A large ^{scale} map is a faithful representation both on a map. It gives a photographic view of the shape as apparent from the air.
2. ✓ a. A great circle.
b.
c. The 10 min. quadrants or such to enable the accurate giving of position. A position may be given as $150^{\circ} 00'$ $44^{\circ} 00'$ W .
- ✓ d. Written statements compare Ross, Droganets. Illustration of true meridian with line of variation marked as comparison.
- e. Other information true & false.

