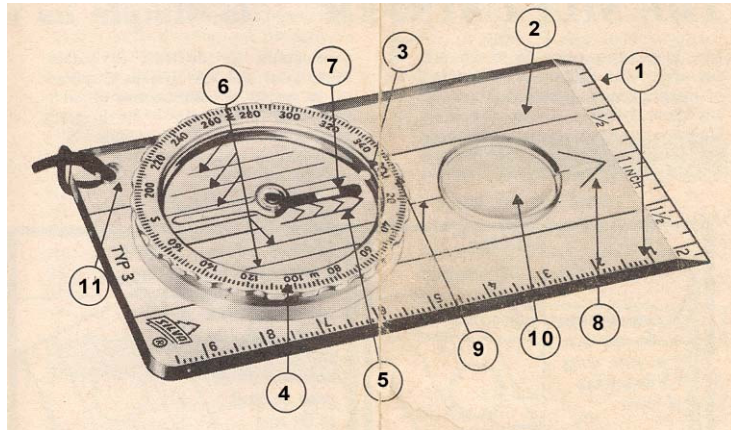


NOTES FOR NAVIGATORS THE COMPASS

PARTS OF A SILVIA TYPE 3 COMPASS



1. Scales – around edge
2. Base plate - transparent
3. Dial – has “N” marked on rim and 360 degrees in 2 degree graduations
4. Compass Housing - with dial and red orienteering lines and arrow
5. Orienteering arrow – red on base of housing
6. Orienteering lines – red on base of housing – meridian lines
7. Magnetic Needle – North end red and luminous
8. Travel Arrow – with luminous mark – point in the direction you wish to go
9. Index Point – for setting or reading bearing
10. Magnifying lens
11. Safety cord

COMPASS BEARING

To convert between a **Grid** bearing from the map and a **Magnetic** bearing on the ground –
Grid to Magnetic: SUBTRACT (Grand Mas Socks)

1. Draw or imagine a line from where you are to where you’re going.
2. Place the long edge of the compass along your travel line, ensuring the Travel Arrow points towards where you’re going.
3. Turn the compass housing until the Orienteering Lines on the base of the housing are parallel to the Map Grid lines and ensure the Red Orienteering Arrow on the base and the “N” on the dial rim are pointing to the top edge of the map.
4. You can now take the compass off the map.
5. Read off, the number of degrees on the dial rim at which the Magnetic Needle is pointing at, this is called the *Index Point*. This is the **GRID BEARING**.
6. Subtract the *magnetic variation figure* (See Page 4) and rotate the housing clockwise to the **MAGNETIC BEARING**.

WALKING ON A BEARING

1. Hold the compass straight and level in front of you. Turn around until the red end of the Magnetic Needle points to “N” on the dial rim and stays over the Red Orienting Arrow.
2. Look up and you are facing the direction.
3. Line up a feature such as a tree or boulder on the bearing that is clearly visible or about 20 – 30 meters away. Walk to this feature.

4. Repeat this process. In bad weather, you can use another member of the party in front of you, tell them to move right or left until they line up with the bearing.

NOTE: Keep all metal objects away from the compass when setting or walking on a bearing. Metal nearby will swing the magnetic needle towards it and give you wrong readings. On some plateaus with dolerite, rock has the same affect (Mt Ironstone). Make sure it is not influencing the compass needle by holding the compass as far away from the rock as possible.

HOW TO FIND WHERE YOU ARE USING A COMPASS

1. If you are next to a linear feature such as a road, fence or creek line that is shown on the map, select one point feature you can see (ie top of mountain).
2. Determine the magnetic bearing to the feature by holding the compass horizontally so that the travel arrow, points to the feature.
3. Keep the compass base in this position and twist the housing dial until the 'N' mark on the housing rim is opposite the red end of the compass needle.
4. The magnetic bearing is shown in degrees at the index pointer.
5. To relate this to your map, you must first convert magnetic bearing to grid bearing by **ADDING** the *magnetic variation* (See Page 4).
6. Place long edge of compass on the map so that it intersects with the feature (i.e. mountain top) your using; rotate the whole compass until the orienting arrow is parallel to the grid lines and points to the top of the map.
7. Where the long edge of the compass intersects the linear feature your standing on, is your position.

If your not standing on a linear feature, you can still work out where you are, by using two features on the ground that are also marked on the map, and where the two grid bearings intersect, is where you are.

THE MAP

Map name - usually the name of some prominent feature on the map e.g. town, river, property, a range of hills, a mountain or some other feature.

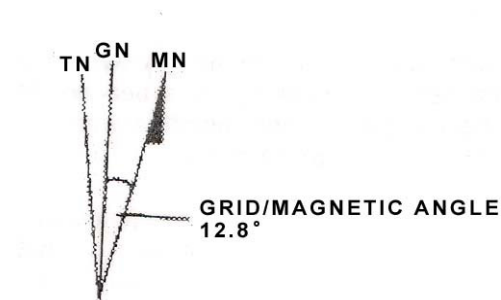
Map scale – 1:100 000 or 1:25 000

The smaller the number, the more detailed the map is. The most useful scale for walking is the 1: 25 000 scale - this means that 1cm on the map represents 250 meters on the ground.

1:100 000 scale - 1cm on the map = 1km on the ground

Year of issue - There may have been significant developments since the map was issued. E.g. roads being realigned, new houses built, forests cleared or new dams built.

Magnetic variation / north – shown on the map for the year the map was issued. The earth has a magnetic field with a magnetic North and South Pole. The compass uses the magnetic field to find our direction. The magnetic field is not constant but always changing and likewise, the magnetic poles are not always in the same position. Because of this, the magnetic north shown on the map is only correct to the date of issue of the map. The difference between Grid North and Magnetic North



is known as the *magnetic variation*. It is shown on the bottom of every Topographic Map. In Tasmania the variation is approximately 12 to 15 degrees. A correction for this *variation* is necessary for the year you are reading the map. True North points to the North Pole. Grid North is dependent on the map projection and compass needles point to the Magnetic North Pole. In Australia Magnetic North is always east of True North and it is moving eastwards at the rate of 0.1 degree every two years on the 1:25 000 scale maps and every three years on the 1:100 000 scale maps.

Grid lines - Grid North is the point at which all vertical grid lines (eastings) meet. Grid lines are spaced so that each square represents 1000m (1km) on the ground. Corresponding reference numbers are shown at top and bottom of map, they read from left to right (west to east). Horizontal grid line (northings) reference numbers are shown at both sides of map, they read from bottom to top (south to north). These numbers continue on adjoining maps of the same series. Most maps give an example grid reference in the legend.

Grid reference - A four-figure grid reference places you within one square kilometer on a map. A six-figure grid reference finds a location to the nearest 100 meters, by dividing a grid square into 100 smaller squares and estimating which square your point is in.

Example Grid Reference 818879

Locate first **vertical** grid line to the left of point and read figures only in either the top or bottom margin e.g. 81 Easting.

Estimate tenths from grid line to point e.g. 8 Easting.

Locate first **horizontal** grid line below the point and read figures only in either the left or right margin e.g. 87 Northing.

Estimate tenths from grid line to point e.g. 9 Northing.

Legend and Notes - Describes various features on the map in symbols and words, notes also contain much useful information such as titles of adjoining maps and includes an example of how to determine a grid reference.

Contour lines - These imaginary lines and shadings are drawn on the map through places of equal height above sea level. They are used to represent the relief (topography) of the land. The *contour interval* between the lines is

- **1: 25 000 scale map** – 10m contour interval with an index contour every 50m
- **1:100 000 scale map** – 20m or 40m with an index contour every 100m.

Interpreting contour lines – Not all contour lines are labeled with their height above sea level. Because of this it is sometimes difficult to interpret what the lines represent on the ground. Here are a few tips, but practice will reveal a lot more.

- **Lower ground** - look for the blue creeks and rivers.
- **Steeper ground** - the closer the contour lines, the steeper the hillside.
- **High ground** - the contour elevation figure on the map is always shown with the top of the number being toward the higher ground.
- **Top of hill** – circular contour

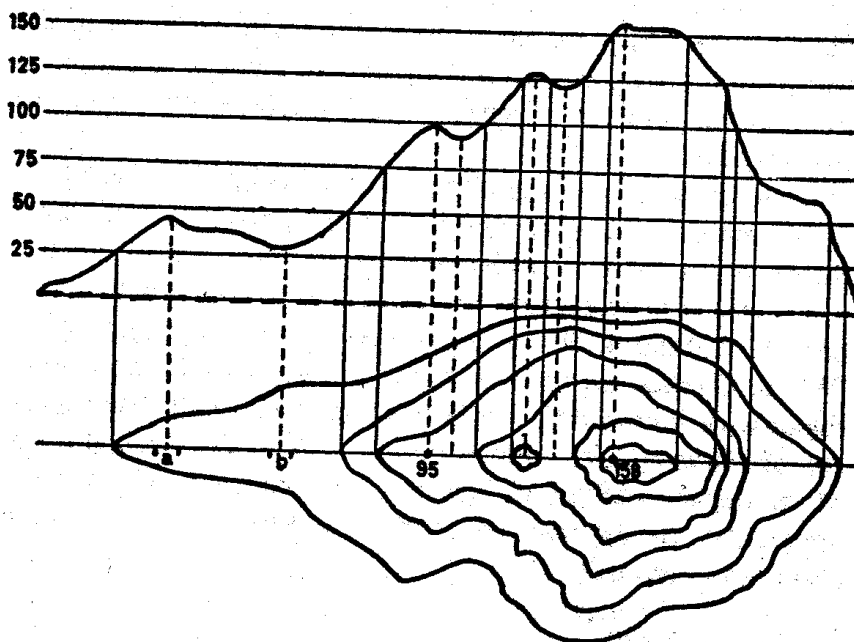


FIGURE 4

The representation of relief by contour lines. Notice how the 25-foot divisions fail to indicate the knoll at 'a' or the 'trough' at 'b'. Spot heights sometimes rectify this omission as at '95' and at the summit.

NAVIGATING

Aiming Off – If you are navigating to a creek or road junction, it pays to “aim off” – i.e. to follow a bearing that will bring you out to the left or the right of the intersection. If you do this you will know when you reach the road or creek which way to turn to reach the intersection.

Determining how far you have traveled - Knowing how far you have gone is an important skill to have in the bush. There are no odometer readouts like in a car. Because Tasmanian bushwalking is often over rough ground or in mountainous terrain and we want to know how far we have travel over a long distance. It is best to become familiar with how far you travel in one hour (instead of pacing). An average rule of thumb would be

On a road at normal walking pace	- 4km per hour or 1km every 15mins
Thru bush in open ground	- 3km per hour or 1km every 20mins
On steep ground or in scrub	- 2km per hour or 1km every 30mins
In thick scrub your lucky to do	- 1km per hour or 1km every 60mins

Over shorter distances, pacing is useful - You should know approximately how many paces you take per 100 meters over various types of terrain. Carrying a FULL pack will shorten your pace as will going uphill hence increasing the total number of paces per kilometer. Measuring distance by pacing involves FORWARD pacing only.

Example – You want to walk 240m. You estimate that for each 100m you usually take about 125 paces. To find the number of paces you need to count, read the distance you need to cover across the top of the chart (i.e. 240m) and read your pace rate down the side (125paces). The number of paces you need to take is 300.

		DISTANCE - METRES															
		100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
PACES PER 100 METRES	105	105	116	126	138	148	158	168	180	190	200	210	220	230	242	252	262
	110	110	120	132	144	154	164	176	188	198	208	220	232	242	254	264	274
	115	115	126	138	150	162	172	184	196	208	220	230	242	254	264	276	288
	120	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300
	125	125	138	150	162	174	188	200	212	224	238	250	262	274	288	300	314
	130	130	142	156	170	182	196	208	220	234	246	260	272	286	300	312	325
	135	135	150	162	176	190	204	216	230	244	256	270	284	298	310	324	338
	140	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336	350

Identifying the features around you by orientating the map correctly

1. The magnetic variation needs to be accounted for. Determine the magnetic variation from the diagram on the map legend (See Page 4).
2. Subtract this figure from 360 degrees.
3. Twist compass housing round until the variation figure is opposite the index pointer.
4. Place the compass on the map so that the direction of the Travel Arrow is parallel to the grid lines and pointing to the top of the map.
5. Turn the map around until the red end of the compass needle is over the **Orientation Arrow**.
6. Now look at the features around you. They should match the map.

Route planning - To effectively plan a route in advance of your walk, you need to learn to visualize the terrain from the map and be able to pick a sensible route. This skill will save you a lot of time and ensure that your walk reaches its aim.

To do this you need to learn to,

- Interpret contours, how steep is the ground, are there likely to be cliffs blocking the way.
- Interpret the vegetation shading on the map. Beware, vegetation boundaries on the map are usually quite accurate, but vegetation-shading classification can often be wrong. I.e. Where Button Grass is shown, could be Tea tree scrub.

A direct 'as the crow flies' route is not always quicker than going around.

