FORMAK Map & Compass Guideline

Using a Compass

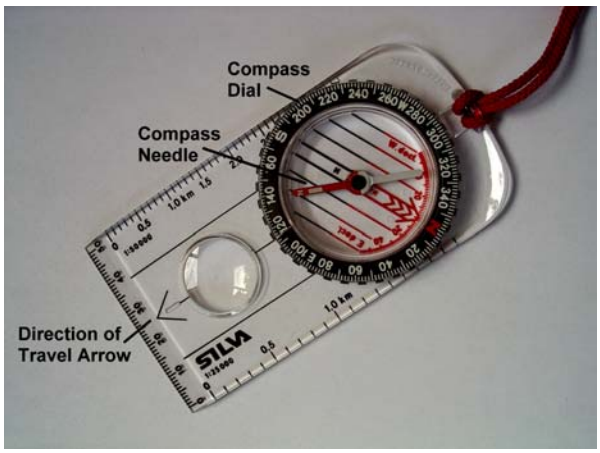
Using a compass and map is very important to allow measurements to be laid out in the field as planned. This is important to avoid bias and to ensure that points can be re-located.

In many situations the use of a GPS is not possible due to limitations of reception through a forest canopy, or because users of FORMAK do not have access to a GPS receiver.

Types of Compass

Different methods are set out below depending on whether you are using a simple compass or a compass with transparent base plate and moveable dial. The use of a compass with a moveable dial is almost always easier and more accurate – so use this type if you have it.

Simple compass



Compass with moveable dial

Taking a bearing off a map.

When planning the location of measurement plots in the field, or identifying the planned orientation of vegetation plots etc, you will need to identify compass bearings from a map so you can lay out transects, vegetation plots etc in the same way on the ground.

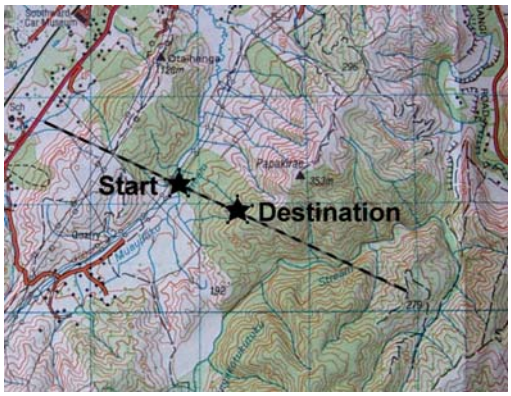
Different methods are set out depending on whether you are using a simple compass or a compass with a transparent base plate and moveable dial.

Using a simple compass to record a bearing.

This is a slightly more difficult and less accurate than with moving dial compass. If you have access to a moveable dial compass, use it to measure bearings.

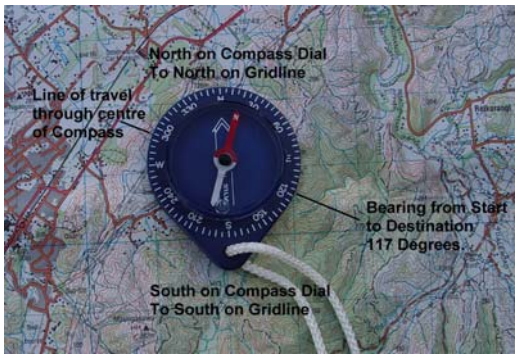
Method 1

1. Identify the points you want to travel from (your "start") and where you wish to travel to (your "destination"). This may be the start of, for example, a pest transect and your destination may be the end of this straight transect line.



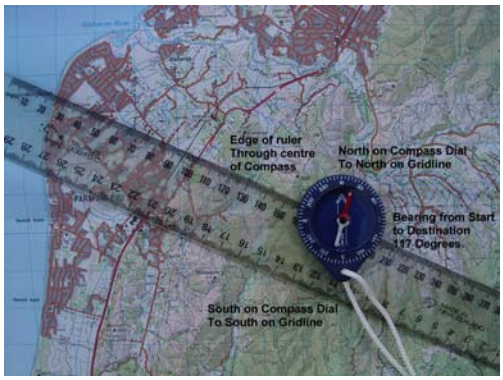
2. Draw a line in pencil between your start and destination – extend the line as necessary so that it is at least around 1.5 times the diameter of the compass. If you don't wish to draw on the map, a rule can be used instead of a line.

3. Place your compass on the map with the centre of the compass on your line of travel. Position the compass on the line of travel so you can see both ends of the line – this will help you centre the compass on the line and is necessary to read the bearing. If possible place the centre of the compass over an intersection of the line of travel with a north-south map gridline. Turn the compass, but not the map, so that north on the compass dial aligns to north on the map.



4. The point at which the destination end of your line crosses the compass dial is the "grid" or "true" bearing between the start and destination. In the example shown, this is 117 degrees.

5. To convert this to a magnetic bearing you can use in the field, subtract the grid-magnetic angle. This is given on the side of NZMS 260 maps. It is currently around 23 degrees in central New Zealand. In the example shown the magnetic bearing is 117 – 23 = 94 degrees.



6. You now have the magnetic bearing to use in the field.

Method 2 – using a protractor

1. Identify the points you want to travel from (your "start") and where you wish to travel to (your "destination"). This may be the start of, for example, a pest transect and your destination may be the end of this straight transect line.

2. Draw a line in pencil between your start and destination.

3. Using a circular protractor, place the protractor so the centre is on your line of travel, at the intersection with a vertical grid line.

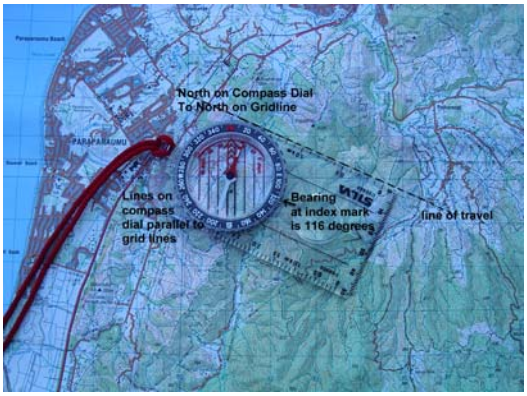
4. Orient the protractor so that the 0 mark is directly above (to the north of) the start. That is, the line between the centre of the protractor and the 0 mark should be parallel with the vertical grid lines on the map.

5. Read the angle at which the line through your start and destination crosses the protractor scale. This is the “grid” or “true” bearing. In the example shown it is 116 degrees.

6. Subtract the Grid - magnetic angle from this. This is given on the side of the map. It is currently around 23 degrees in central New Zealand. In the example shown, the magnetic bearing is 116 – 23 = 93 degrees.

7. You now have the magnetic bearing that you can use in the field.

Using a Compass with Transparent base plate and moveable dial



1. Align the long edge of the compass so that it lies on a line from your start to your destination, with the direction of travel arrow pointing toward your destination.

2. Turn the dial of the compass so that the north guide lines on the dial are parallel with the vertical grid lines on the map, and the north on the dial is pointing to the top (north) on the map.

3. The index mark on the dial will show you the “grid” or “true” bearing. In the example shown it is 116 degrees.

4. To convert this to a magnetic bearing you can use in the field, subtract the grid-magnetic angle. This is given on the side of NZMS 260 maps. It is currently around 23 degrees in central New Zealand. In the example shown the magnetic bearing is 116 – 23 = 93 degrees.

5. You now have a magnetic bearing you can use in the field.

Walking a Bearing in the Feild

With a Simple Compass

1. Turn the compass so the number on the dial of your compass that corresponds to the bearing you wish to walk is directly in front of you.

2. Now turn your body until the north of the compass needle is aligned with the north on the compass dial.

3. The imaginary straight line through the centre of the compass, through your bearing on the compass dial, and off into the distance is the line of the bearing you are going to walk (your direction of travel).

4. Sight the line of your compass bearing.

5. Identify an object you can clearly recognise that this bearing hits – e.g. a tree trunk.

6. Ignoring your compass, walk to this object.

7. When you get to the object, stop and take another sight on your compass bearing.

8. Identify an object, walk to it, and so on…

9. Continue this until you get to your destination.

With a moving dial compass

1. Turn the dial of the compass so the index mark corresponds to the bearing you wish to walk.

2. Hold the compass with the main travel arrow pointed directly in front of you.

3. Turn your body until the north of the compass needle is aligned with north on the compass dial. The north location of the arrow on the dial is often marked in red and has a red area under this location on the dial – some American users refer to this as “red in the bed” to remember that the compass arrow has to be aligned with this.

4. The imaginary straight line off into the distance following the direction of travel arrow on the compass is the line of the bearing you are going to walk.

5. Sight the line of your compass bearing

6. Identify an object you can clearly recognise that this bearing hits – e.g. a tree trunk.

7. Ignoring your compass, walk to this object.

8. When you get to the object, stop and take another sight on your compass bearing.

9. Identify an object, walk to it, and so on…

10. Continue this until you get to your destination.

Recording a bearing in the field

You will often need to record a bearing in the field. Examples of where you will need to do this are:

- Recording the bearing for an offset – when you are using a GPS and can't get a GPS reading at the exact site (see Location Guideline - recording offsets)
- Recording the direction of a vegetation plot start peg from a marker tag on a nearby tree. This can be very important for re-location and is recorded in the plot location diagram.

With a simple compass

1. Face in the direction of the bearing you wish to record

2. Holding the compass in front of you, turn it until the north on the compass needle is aligned with north on the compass dial.

3. Sight an imaginary line from the centre of the compass to the object you are taking a bearing to. Where this line crosses the compass dial is the magnetic bearing you need to record. In the image shown, the bearing would be approximately 117 degrees magnetic.

With a moveable dial compass

1. Face in the direction of the bearing you wish to record

2. Holding the compass in front of you, point the direction of travel arrow at the object you are taking a bearing on.

3. Holding the compass so the direction of travel arrow remains pointing in the same direction, turn the dial on the compass until north on the dial is aligned with north on the compass needle.

4. The number on the dial shown at the index mark is the magnetic bearing you need to record.