COMPASS READING & PACING

Using a compass and pacing are two basic forestry skills that are practiced almost daily by professional foresters to navigate in the woods.

COMPASS READING

The essential **parts of a compass** include a magnetic ***needle*** balanced on a jeweled bearing or pivot and a ***graduated circle*** divided into 360 degrees (360º) of azimuth or four 90º quadrants indicating the four cardinal directions of North (0º), East (90º), South (180º), and West (270º). These components are housed in a box or frame (called the ***baseplate*** on some kinds of compasses) that has a sighting device for aiming at your objective. All compasses contain these three basic parts but because of the wide variety of uses for a compass, there are many different compass designs.

There are **three** basic parts of the Silva compass:

1. **Compass Needle.** The magnetic needle is attracted by the magnetic North Pole of the earth. The red end points North and the white end South.
2. **Compass Housing or Graduated Dial.** The compass housing is a dial that is graduated into the 360° of a circle. The compass housing can be rotated on the base plate. Each mark on the housing represents 2°. The bearing is read in degrees at the index pointer. The four principal directions are also indicated; North (0° and 360°), South (180°), East (90°), and West (270°). The orienting arrow is the black arrow that appears on the bottom of the housing.
3. **Base Plate.** The base plate along with the sighting mirror points out the objective, or the line of travel.

The Silva Ranger (or similar styles of compass made by different brands) is most common type of compass used by foresters. It has a rectangular baseplate with a graduated dial that houses the needle and can be rotated. The mirror, line, and notch on the hinged cover help with sighting the compass. The graduated dial is filled with liquid to dampen the quivering of the needle. This compass is fast to use, particularly on straight cruise lines, and is accurate enough for most forestry applications.

Foresters use compasses in many ways, such as obtaining bearings from a map, taking bearings on the ground, giving directions, reporting the location of a forest fire, plotting locations on a map and on the ground, and laying out timber sale boundaries or roads.

DEFINITION: *An* ***azimuth*** *or* ***bearing*** *is the direction or degree reading from one object to another. For example, to go from Point A to Point B at an azimuth of 90º means that starting at Point A, you must travel due East (90º) to reach Point B.*

The compass portion of the Forestry Contest will involve determining an azimuth from one object to another object. Therefore, taking an azimuth will be the only procedure discussed in this text. You may want to refer to one of the compass publications to learn the other procedures.

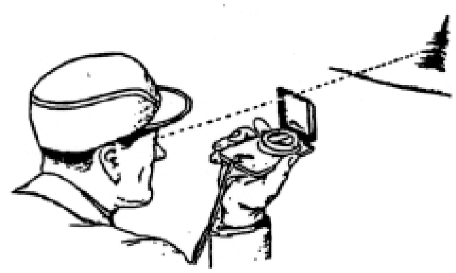
DEFINITION: Declination is the variation between true north and magnetic north. Declination changes gradually over time because the earth wobbles slightly as it spins on its axis. The declination of the compass arrow can be adjusted to permit running compass lines on "true north" bearings or "magnetic" north.

Note: *To use most compasses correctly, you must be familiar with the concept of declination but you will not be asked about it at the Forestry Contest.*

TAKING AN AZIMUTH

1. Face the object you are aiming at.

2. Holding the compass ***level*** at eye level and at arm's length, look at the dial of the compass through the mirror.



3. Next, line up your objective through the peep sight on the compass.

4. While continuing to hold the compass level, look at the compass dial through the mirror and turn the dial (housing) until the orienting arrow (the arrow on the bottom of the dial) is lined up with the compass needle and the red part of the needle is underneath the arrow).

5. Make sure
   You keep the compass baseplate level throughout this operation;
   You are still sighting on the objective through the peep sight;
   The needle and the orienting arrow are lined up exactly.

6. Make adjustments as necessary and keep double-checking that everything is lined up.

7. Finally, read the ***azimuth*** (or ***bearing***) at the ***index pointer*** or ***line-of-travel pointer*** (the little triangle on the baseplate by the hinge). The markings on the dial are graduated to 2º. Estimate the azimuth to the nearest 1º.

PACING

Pacing is the technique of measuring distances by knowing the length of your pace and counting the number of paces you take. Each two steps is called a ***pace***. It is easier and more accurate to count the number of paces rather than individual steps.

DETERMINING THE LENGTH OF PACE

People's average length of pace differs. To determine your own average length of pace, measure 100 feet on level ground using a tape measure. Using a normal stride, walk the 100-foot distance, counting the number of paces (i.e. if you started pacing with your right foot, count every time your left foot touches the ground as one pace.) Walk the 100-foot distance two more times, then take the average of the three pace counts. That is your average number of paces for 100 feet.

Now, divide your average number of paces into 100 feet to determine your average length of pace.

EXAMPLE A

You paced the 100-foot line three separate times. The walks resulted in 21 paces, 19 paces and 20 paces, respectively. Your average number of paces for 100 feet is

21 + 19 + 20 = 60 divided by 3 = <u>20 paces for 100 ft.</u>

Now determine your average length of pace:

100 feet divided by 20 paces = <u>5 feet per pace</u>

Once you know your average length of pace, you can calculate the distance from one point to another by pacing. To determine the distance between points, count the number of paces and multiply by the length of your pace.

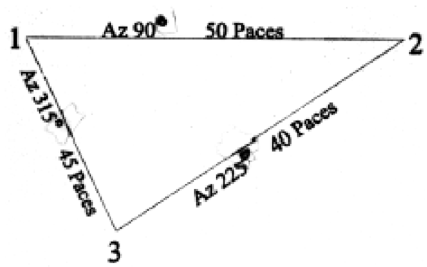
EXAMPLE B

A ← 25 paces → B

25 paces x 5 feet/pace = 125 feet from Point A to Point B

COMBINING COMPASS READING AND PACING

The compass reading and pacing portion of the forestry contest will combine both skills. Here is a sample layout of a compass course:



(Assuming your average pace is 5 feet)

Stations	Compass Azimuth	Measured Distance
1 - 2	90°	250 feet (50 paces X 5 feet)
2 - 3	225°	200 feet (40 paces X 5 feet)
3 - 1	315°	225 feet (45 paces X 5 feet)