

Friends of Sierra Rock Art: * SITE MONITORING COMPASS PROCEDURES *

v9/20

A base plate compass, with rotating housing, is recommended, with or without a mirror (Silva & Suunito are good brands; \$20-\$60). A compass that can be adjusted to automatically allow for declination is preferred. Keep the compass level when in use. Iron or steel objects can deflect the compass needle if too close. Do not lay a compass where temperature can be extreme, such as on a hot surface in the sun.

SOME DEFINITIONS:

- * **“Orienting Compass”** = designed for easy navigation using map and compass; has a turnable housing mounted on a base plate. (Some orienting compasses have a clinometer to measure slope angles.)
- * **“Base Plate”** = the rectangular plate of an orienting compass which has the compass housing on it.
- * **“Compass Housing”** = the compass part that contains the needle; on an “orienting compass” it is turnable.
- * **“Orienting Arrow”** = an arrow marking or parallel lines on an “orienting compass” housing used to “set” the compass.
- * **“Compass Site Line”** = this shows the direction of travel or the direction for the bearing of interest .
- * **“Bearing”** = when the term is used for compass orienting it refers to a direction stated in compass degrees.
- * **To “Take a Bearing”** = to determine the direction in compass degrees from one object (usually you) to another.
- * **“Back Bearing”** = the opposite direction of a bearing; a useful reading to take in certain situations.
- * **“Magnetic Declination”** = the angle between Magnetic North & True North.

SIGHTING WITH A MIRROR COMPASS

Hold it at eye level, pointed away from you, with the mirror at about 45 deg.; sight while using mirror.

SIGHTING WITH A COMPASS WITHOUT A MIRROR

(or when using a mirror compass without the mirror for a less accurate reading)

Hold it at waist or abdomen, pointed away from you; cover (if any) wide open so whole compass is flat.

ADJUSTING FOR MAGNETIC DECLINATION (“N” = North)

(for a location’s declination angle: www.magnetic-declination.com)

The True N Pole is located geographically, while the Magnetic N Pole (where compass needles point) is where the earth’s magnetic lines of force come together. Magnetic N moves slightly year to year. Maps and directions are usually based on True N, which is fixed. You have to adjust the compass for the declination angle (the angle between True N and Magnetic N) to get readings based on True N. Currently (2020) the declination for Nevada County is about 13 ½ deg. E (you can just use 13 [or 14] deg.). You can adjust for this manually for each reading or use a compass that can be set to automatically adjust.

TO FOLLOW A KNOWN BEARING FROM THE DATUM TO A PANEL, FEATURE, OR ARTIFACT

For example, to find a petroglyph panel on the site map at 190 deg. from the datum. As well as needing the bearing or degree to follow, you will need to know the distance so you can pace it off as you follow the bearing. *(Unfortunately, older site maps will be based on an old declination, throwing you off some.)*

WITH A COMPASS THAT IS SET TO ADJUST FOR DECLINATION AUTOMATICALLY:

- (1) Stand next to and in front of the datum with your back to it and face the general direction of interest
- (2) Rotate the compass housing to line up the desired degrees with the compass sight line
- (3) Move your body and compass together to line up the N needle with the orienting arrow; your sight line now points in the direction you want to go

WITH COMPASS THAT YOU HAVE TO ADJUST FOR DECLINATION WITH EACH READING:

- (1) Stand next to and in front of the datum with your back to it and face the general direction of interest
- (2) Rotate the compass housing to line up the desired degrees with the compass sight line
- (3) Move body and compass together to line the N needle up with 13 deg. more than orienting arrow's direction (adding 13 deg. to Magnetic N); your sight line now points in the direction to go

TAKE A BEARING FROM THE DATUM TO A PANEL, FEATURE, OR ARTIFACT YOU CAN SEE

This should only be necessary if the item is not in the site record, in which case you record degrees and distance from the datum.

WITH A COMPASS THAT IS SET TO ADJUST FOR DECLINATION AUTOMATICALLY:

- (1) Stand next to and in front of the datum with your back to it, and line up the compass sight line with the object
- (2) Line up the orienting arrow with N on the needle; this gives you the bearing at your sight line

WITH A COMPASS THAT YOU HAVE TO ADJUST FOR DECLINATION FOR EACH READING:

- (1) Stand next to & in front of datum with your back to it, and line up compass sight line with the object
 - (2) Rotate the housing to line up the N needle so it points to 13 degrees more than the direction the orienting arrow points (adding 13 deg. to Magnetic N) (add the 13 deg by watching degree "ring" on the housing OR red degree marks to right of orienting arrow); this gives you the bearing at your sight line
- (If you cannot see the datum from the object,** you can use a GPS to find the approximate distance and bearing from the datum. Note the reliance on a GPS for these things in your report. Another option, if it would be acceptable to the USFS, may be to establish a new datum that is visible from the object and from which you can get a bearing and distance to the object.)

TAKE A BACK BEARING FROM A PANEL, FEATURE, OR ARTIFACT TO THE DATUM

This procedure is useful if you find a panel, feature, or artifact that is not in the site record, and, while standing directly in front of it, want to document its location as would be determined *from the datum*, which you have to be able to see. You would still need to find (pace off) the distance between it and the datum for your report.

WITH A COMPASS THAT IS SET TO ADJUST FOR DECLINATION AUTOMATICALLY:

- (1) Stand next to and in front of the object with your back to it, facing the datum, and aim your compass at the datum
- (2) Rotate the housing to up the orienting arrow with *the S half* of the compass needle
- (3) Read the degrees at the sight line; this would be the bearing *from the datum* to the object

WITH A COMPASS THAT YOU HAVE TO ADJUST FOR DECLINATION FOR EACH READING:

- (1) Stand directly in front of the object with your back to it, facing the datum, and aim your compass at the datum
- (2) Rotate the housing to line up *the S half* of the compass needle with the orienting arrow plus (add) 13 deg. (add 13 deg. by watching degree "ring" on housing OR red degree marks to right of orienting arrow)
- (3) Read the degrees at the sight line; this would be the bearing *from the datum* to the object

ALTERNATIVE APPROACH Take a bearing on the datum (allowing for declination) and add or subtract 180 deg., whichever keeps you below 360 deg. total – that is your back reading.

(If you cannot see the datum from the object, you can use a GPS to find approximate distance and bearing from the datum. Note the reliance on a GPS for these things in your report. Another option, if it would be acceptable to the USFS, may be to establish a new datum that is visible from the object and from which you can get a bearing and distance to the object.)

Good book: *Wilderness Navigation*, Bob and Mike Burns, 3rd ed. 2015 (**See separate FSRA handout "Site Monitoring with a Recreational Grade GPS."** In some cases, it helps to use both a compass and a GPS.)