

## Adventure Racing Navigation

### Part 5: Taking a Bearing from a Map

by Mark Manning

Welcome to the fifth in the monthly series of navigation articles from AR Navigation Supplies, Inc.

This month we are going to discuss taking a bearing from points on a map and following that bearing in the field. These are two very simple procedures in theory but sometimes more complicated in practice. In last month's article we discussed the various components of the racing compass and some of the features and benefits including the declination adjustment, direction of travel arrow and the azimuth ring. Now it's time to start using these features.

We are going to start the discussion by taking a bearing from the map between two very distinct objects. I'm going to choose two mountain peaks as they are easy to spot but this exercise could easily be any two features including trail intersections and buildings.

The following picture shows the two features that we are interested in, the top of Montara Knob and the top of North Peak (Fig. 1).

The very first step for taking a bearing from the map is to ensure that your map is correctly aligned with North using a compass that has the declination set for the region.

For more information on Magnetic Declination see the April 2008 edition of AWM. In this case our magnetic declination is 15 degrees East and if you look closely you'll see this setting on the compass we're using. One very important point to note when working with a map and compass is to ensure that there are no metal or magnetic objects near by. This includes bolts in park picnic tables, and the engine under the hood of your car. Any metal object could interfere with the magnetic needle of the compass so

have a good look around and under where you have placed the map as working on the hood of a car at the start of a race will probably cause you to get a little off track. To align the map, follow the steps below:

1. Set Azimuth ring on the compass to align the North marking with the direction of travel arrow.
2. Set the edge of the compass along the North-South edge of the map or a grid line if you have set your declination to the grid.
3. Hold the compass in place and turn the map so as the Red North end of the Magnetic Needle is perfectly aligned with the Orienteering arrow on the bottom of the vial. Fig 2.

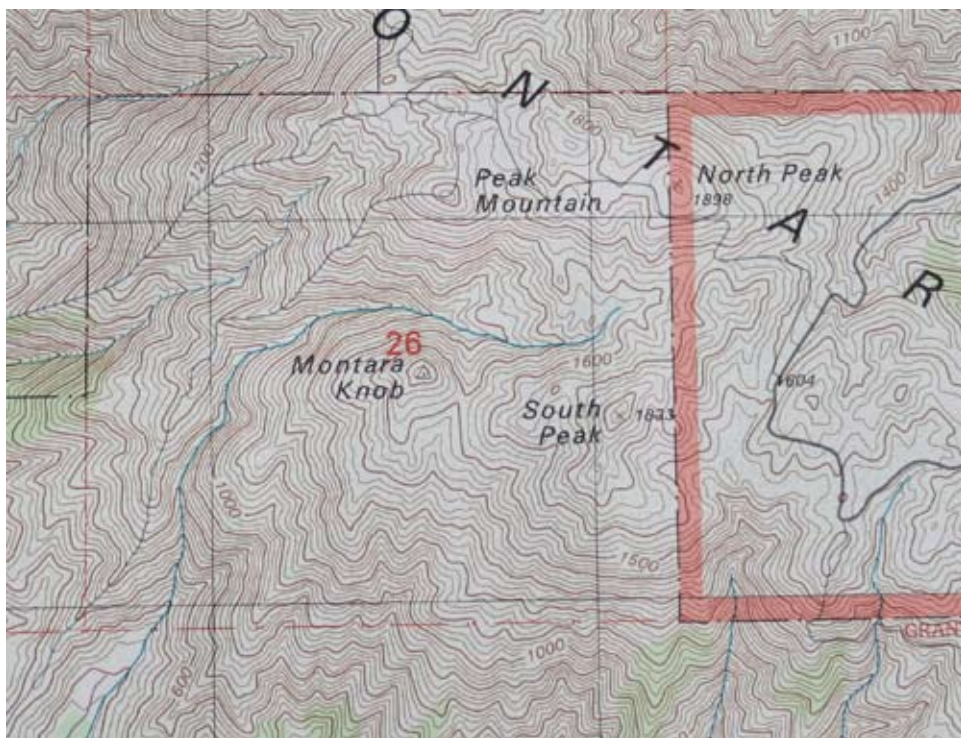
This has now aligned the map perfectly with North allowing you to easily match the terrain around you with the features on the map.

To take the bearing between the two points of interest we now need to pick up the compass without moving the map. It's good to have a teammate hold the map down while you are doing this to prevent it from moving away from the North alignment. If the map does move you'll just have to reset it.

4. Align the edge of the compass between the two points of interest. In our case we're taking a bearing between from Montara Knob to North Peak. Ensure that the direction of travel arrow is pointing to your destination (Fig 3).

5. Turn the Azimuth Ring so as the Red North end of the Magnetic Needle is aligned with the Orienteering Arrow printed on the vial (Fig 4).

6. Now read the bearing from the numbers on the Azimuth Ring where they intersect with the direc-



tion of travel arrow. In this case the bearing is 56 degrees from Montara Knob to North Peak.

**Figure 2**



Now if we needed to travel between Montara Knob and North Peak the simple thing to do is follow the bearing indicated by the compass. In this case that may not be the most efficient route but the same procedure would apply to any 2 map points, features or waypoints you choose.

**Figure 3**



Assuming we're standing on the top of Montara Knob, pick up the compass and hold it flat in your hand in front of your body, with the direction of travel arrow pointing away from you. Turn your body so as the Red North end of the Magnetic Needle is aligned with the Orienteering Arrow marked on the bottom of the vial. The direction of travel arrow will now be point-

ing directly at North Peak and a bearing of 56 degrees from North. If it is a clear day and your view is unobstructed you should be able to see your destination, but this is rarely the case in adventure racing. More often than not you'll have obstacles in your way. The simple solution to navigating around obstacles is to look for landmarks directly in your path between you and the destination. Pick a landmark that is easy to identify like a large tree or rock outcropping and then make your way to it. Once you get there pick another landmark directly between you and the destination that is directly on the bearing that the compass is indicating. Using this technique you can make your way from your starting point to the destination even though you may not be able to see the destination when you started due to darkness, fog or other obstacles.

**Figure 4**



Using interim landmarks is the fastest and most efficient way to follow a bearing but sometimes this trick is not an option due to thick forest or very open flat terrain. In this case it is very important to follow the compass bearing very carefully and in cases of very accurate navigation step by step, making sure that if you come across an obstacle you step around it and get back on track as soon as possible. This careful step-by-step navigation can be slow and time consuming but it will get you to your destination. For me, the most difficult place to do this was the swamps of Florida at night. Not only do you have very few distinct terrain features but you also have water, bushes, stumps and trees to deal with as well as the red-eyed alliga-

tors. Any of these distractions will throw you off course if you're not careful as anyone at the USARA Nationals in 2005 will remember.

More information on navigation can be found at [www.ARNavSupplies.com](http://www.ARNavSupplies.com)  
Mark Manning, AR Navigation Supplies, Inc. 2008.



# Round 5

# AWM Navigation Challenge



# Adventure World Magazine Navigation Challenge: Round 5

Try your navigation skills from the comfort of our own home with this online navigation contest. Answer all of the CP questions in order by following the instructions below. E-Mail your answers to [info@adventureworldmagazine.com](mailto:info@adventureworldmagazine.com). True North and Grid North are assumed to be identical on this 1:24K map.

This month your team is in San Rafael, CA for the fifth round of the Adventure World Magazine Navigation Challenge, brought to you by [www.ARNavSupplies.com](http://www.ARNavSupplies.com) and the Basic Roamer AR.

Checkpoint	Instruction	Question
Start	Pick up your Kayaks in the San Rafael Marina.	Give the UTM of the Beacon in the Marina?
CP 1	Paddle out of the Marina following the channel to the Eastern most Beacon.	What is the distance in miles from the Marina Beacon to the Eastern most Beacon?
CP 2	Find the high point on East Marin Island.	What is the bearing from CP1 to the high point on East Marin Island?
CP 3	Paddle to West Marin Island.	What is the elevation of the high point of West Marin Island?
CP 4	From the high point on East Marin Island plot a bearing of 266 degrees. From the high point of West Marin Island plot a bearing of 236.5 degrees	What is the UTM of the object at the intersection of these 2 bearings?
CP 5	From CP 4 Paddle directly back to the San Rafael Marina.	What is the bearing from CP 4 to the Beacon in the San Rafael Marina?
CP 6	Travel South on the road From the Marina travel via road to UTM 0544280 4203850.	What man made objects are at this location?
CP 7	Travel via trail to UTM 0544020 4205060.	What is the distance between CP6 and CP7?
CP 8	From CP 7 Follow a bearing of 79 degrees for 1.1 miles.	What is the elevation of the trailhead at this location?
CP 9	Bushwhack to the small hill in the middle of the Peacock Gap Golf and Country Club.	How many contour lines are crossed on the flattest route from CP 8 to CP 9?
CP 10	Find the Pit on UTM Easting line 0548.	What is the bearing from CP 9 to the Pit?
Finish	Email your answers to: <a href="mailto:info@adventureworldmagazine.com">info@adventureworldmagazine.com</a>	