We had some confusion on last week's ride when we failed to placed volunteers at a critical turn and some riders missed it. Dr. Bob thinks this might be a good time to discuss navigation on your bicycle. Please be aware that riders are responsible for knowing the route.

Bicycle Navigation

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One thing I cannot stand is not knowing where I am or where I am going. I am a navigation nerd and I have been ever since I opened my first paper map to navigate by car to visit my sister at college when I was 17. In this newsletter, I will discuss why navigation is important on a bicycle and several ways to do it and how it applies to the Ride Across California.

The need for navigation

On the RAC, we go to a lot of trouble to station volunteers at every turn to help make sure riders don't get lost. However, it is a big mistake to depend on this. Consider the following case. Let's say you are at the back of the group riding with the caboose and another pair of riders. After a snack, your fifth grader starts to feel stronger and pulls out ahead. Pretty soon both you and your fifth grader are out of sight of the caboose and making good time. Meanwhile, volunteers have assumed that everyone was going to stay with the caboose and pulled youth support off of the turns ahead of you because the caboose knows the route. You can guess what happens next. You miss the next turn and it may be a while before you or the volunteers realize that you are off the route. We work very hard to make sure this doesn't happen, but there can be times where volunteers get distracted (e.g. medical emergencies) and a rider gets missed.

In general, it is expected for every rider on a ride to know the route. Life is unpredictable, especially when bikes are involved. To help with this, we send out the route using the "Ride with GPS" website (ridewithgps.com) prior to every training ride.   In the rest of this newsletter, I will present several options for exploiting this information. These include: cue sheets, phone apps, and GPS bike computers.
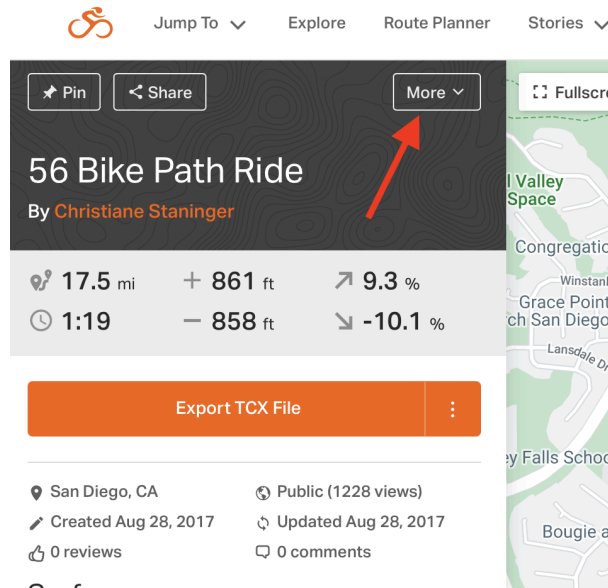
Cue sheets
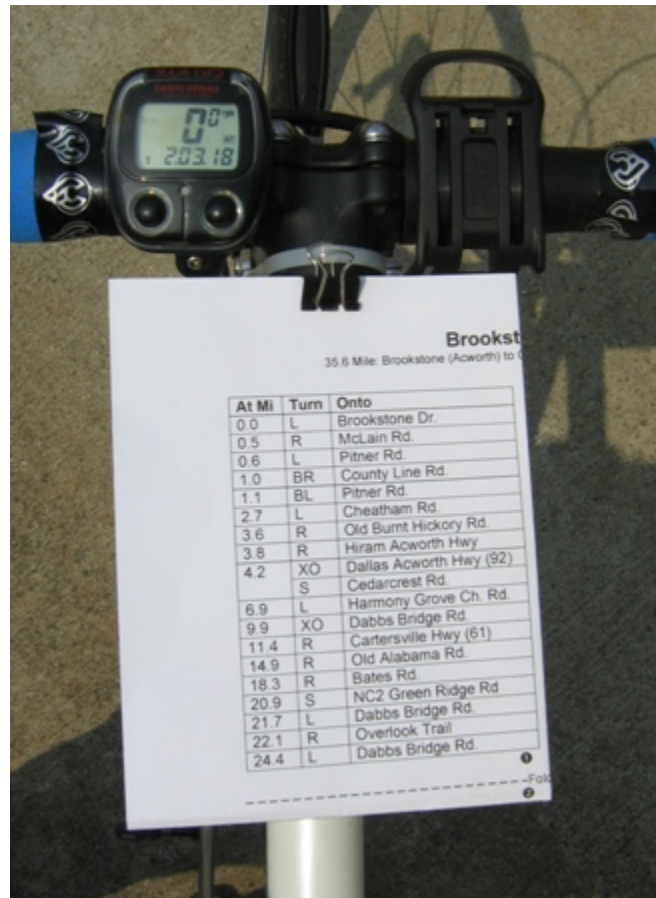
Cue sheet clipped to bicycle handlebars

Cue sheets are the simplest and cheapest method for navigating on a bicycle. You simply print out turn by turn directions on your home computer and then clip them to the handlebar of your bicycle. If you pair this with an inexpensive bike computer (which can display trip distance), then you know the position of each turn by how far it is from the start. When I started riding, this was the only option for navigation.

"Ride with GPS" makes it very easy to print route slips. On your PC, follow the link to the route that appears on the RAC calendar and the "RAC this week" emails. Click on the "More" button on the sidebar to the left of the map, then select "Print Map and Cue PDF". This will bring up a dialog box with a number of options (feel free to play with them), but the default actually does

what we want. If you click on the "Submit" button at the bottom of the screen, a PDF of the cue sheet will be downloaded to your computer.

Click the button marked with the red arrow in "Ride with GPS" to print a cue sheet
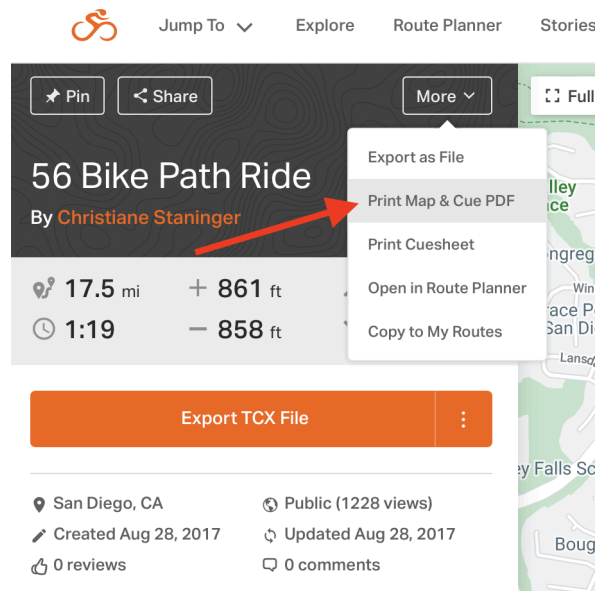

Click "Print Map and Cue PDF"

The cue sheet will look something like the one shown below. It will be laid out in two columns. Cut these apart or fold down the middle and it's ready to attach to your bike.

56 Bike Path Ride

Num	Dist	Type	Note
1.	0.0	📍	Start of route
2.	0.2	➡	R onto SR 56 Bike Trail
3.	0.2	⬅	L to stay on SR 56 Bike Trail
4.	6.5	⬅	Slight L to stay on SR 56 Bike Trail
5.	10.0	➡	Slight R to stay on SR 56 Bike Trail
6.	10.9	⬅	Slight L to stay on SR 56 Bike Trail
7.	11.7	⬅	Keep L to stay on SR 56 Bike Trail
8.	17.3	➡	R to stay on SR 56 Bike Trail
9.	17.3	⬅	L onto Salmon River Rd
10.	17.5	📍	End of route

An example of the cue sheet save to a PDF file by "Ride with GPS"

Phone app
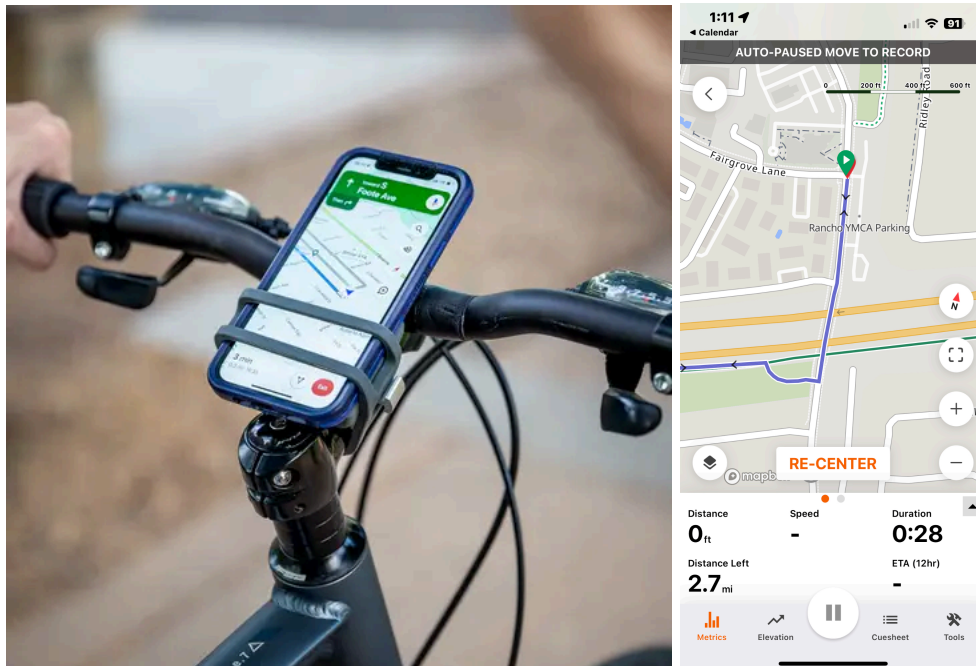
"Ride with GPS" has phone apps for both iPhone and Android operating systems. If you put a phone mount on your bike you can use the app to navigate. The app will use the GPS in your phone to show you where you are on the route. It will even alert you to upcoming turns and tell you when you are off course.

Unfortunately, there are a couple of things you need to be aware of if you go down this route. Once you mount your phone to your handlebar, you are going to want to use it for things other than navigation (like text messaging). The RAC strongly discourages this practice and if we see you using your phone for anything other than navigation and you are not fully stopped, it is considered a safety violation. We do not want distracted riders crashing into people in front of them.

The other problem is that we will be riding in the desert where it gets very hot. On most days, it does not take long for a phone in the sun to enter a mode known as "thermal throttling". Depending on how hot the phone is, screen brightness, functionality and performance will be reduced. If it gets hot enough the phone will completely power down to save itself. This is not something you want from a device you depend upon.
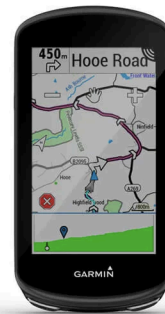
Bike computers

Edge® 130 Plus

You're a cyclist. You want a compact GPS bike computer that goes big to show you how far, how fast and where you rode.

$199.99 USD and up

Edge® 1030 Plus

You're a performance rider, and you want the ultimate GPS bike computer — with workouts, training guidance and advanced connectivity.

$599.99 USD and up

Two examples of GPS enabled bike computers.

One time, when I started riding in my 40's, I was out with a couple of friends of mine. Since they knew the route, I just followed them, not really paying attention to where we were going. Unfortunately, my two friends collided and both went down in a heap. Fortunately, no one was injured, but there was enough damage to the bikes that their spouses had to come get them. It

was only as they were pulling away that I realized that I had no idea where we parked. I eventually found the car again, but the next day I bought my first GPS enabled bike computer.

First and foremost, I want to let you know that bike computers that I am talking about in this section are EXPENSIVE. I would not recommend buying one unless you are certain that biking is going to be a significant part of your life after the RAC. If, on the other hand, you can borrow one from a friend then definitely try it.

GPS enabled bike computers give you the easiest navigation experience. Like the app on your phone, they can show a map with your route and position and they can give you turn by turn directions. This is their primary job and they are very good at it. Unlike your phone, they are designed to take the punishment of being mounted on a bike including vibration, temperature, rain and the occasional crash. They also store data from your ride including speed, position, and data from any sensors connected to the bike computer (like a heart rate monitor). Most manufacturers make it easy to upload this data to websites which can store and analyze this information for you like Strava.

The two most popular manufacturers of GPS bike computers are Garmin and Wahoo. The devices offer very similar capabilities. Both manufacturers have a range of products that have varying features, but even the lowest priced ones will give you turn by turn navigation. Depending on what model you have, you download routes from a website like "Ride with GPS" either through a USB connection to your computer, your phone, or a wifi network.

More expensive models will have features that their less expensive brethren lack: bigger, brighter screens, color, longer battery life, heart rate monitors, power meters, training and workout apps, etc.