

# Turning at a GPS Point

Nobody would argue that laid marks are the most desirable option, however, experience shows that we cannot reliably set sea marks. This is compounded by the depth of water (60 metres), ocean currents, weather and seaweed on anchor lines. The GPS rounding is a viable solution.

The principle is that rather than trying to turn around a lat/long co-ordinate, which would be difficult unless you had a chart plotter at the helm, we steer towards a co-ordinate and turn at a distance from that point. This allows us to use a wide variety of instruments from the simplest hand-held GPS iPhones, Smart phones to chart plotters.

Most of these instruments can be set with an alarm to sound at 0.1 nautical Miles from the mark. All can display direction and distance to go. (0.1 nautical Miles = 185 metres = 607 feet)

To put this into perspective imagine the lat/long is in the centre of Tonkin Oval, then we can turn when we reach the fence anywhere.

## **TURNING at a GPS POSITION**

1. Set the GPS to the WGS84 chart datum and enter the Latitude and Longitude of the nominated GPS position as a waypoint. Set an alarm to the waypoint at 0.1NM.
2. Setup the GPS to record the boats track.
3. When the boat crosses the 0.1nM radius, the boat may turn in either direction but only as permitted by Right-of-Way rules 10 to 16 inclusive or the prevention of collision regulations if other boats are in close proximity.
4. The boats turning co-ordinates must be recorded and declared within one hour of finishing the course.
5. The track for the race should be recorded until the finish of the race and retained for subsequent inspection if requested by the race committee.

### **Note:**

1. The Race Committee may review any boats turning co-ordinates and may rule a boat did not sail the course if the co-ordinates haven't crossed the virtual line or co-ordinates are not given.
2. It's recommended that crew understand the settings and use of on-board GPS instruments to record accurate turning co-ordinates, especially the use of MOB.
3. It's recommended that the boats turning co-ordinates and track are recorded and stored on the GPS as a documented record that can be made available to the Race Committee.
4. For assistance on any of the above please contact the race committee.

In a SMS survey after the Marley race of the 13 boats regularly racing, 9 boats like GPS 70%, 4 boats didn't answer but 2 have confirmed OK in the past so we have 85% in favour and 2 unknowns.

### *Survey response*

*Following the missing mark at Marley the response was as follows: -*

*Sea Hawk (very good method), L'attitude (Common Sense), Rhumb Line (Strongly), Steadfast (Support GPS rounding), Sweet Chariot (Full support), Shaya Moya (Agreed), Brand-X, Flashdance (DSQ invalid turns).*

The two boats needed to make it 100% are Banshee and Wasabi.

The rounding accuracy is up to the skippers and the skill of their navigators. The accuracy or difference in distance is far less than say rounding Wedding cake, and the safety is far greater than rounding any rocky outcrop.

All boats carry GPS and some instruments or phones.

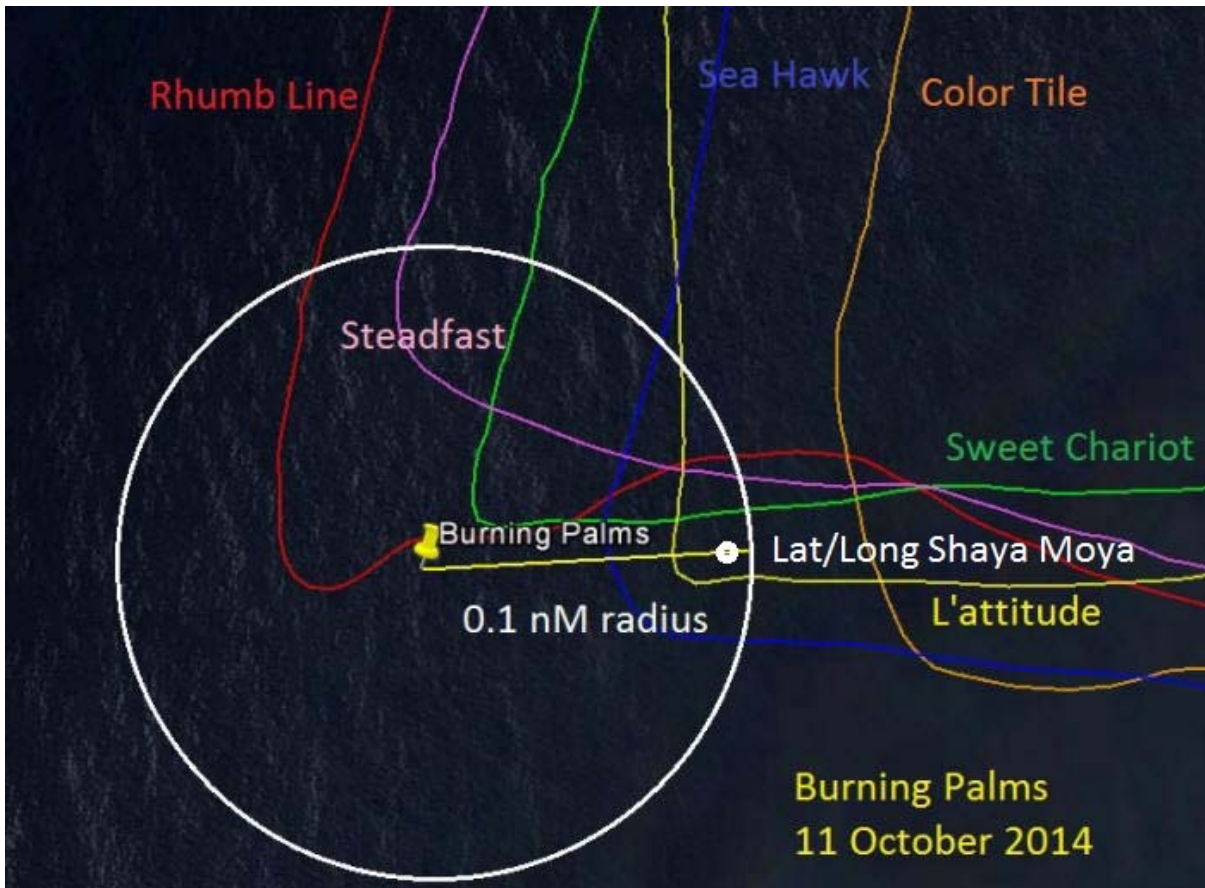
We must use GPS to navigate to marks like the Wave Rider where we need to be within say 0.3 nM to visually see the mark.

So, GPS turning becomes an extension to that process where we measure distance and direction to turn.

## **RMYC has added to their handbook;**

### **10 Missing Marks**

If marks are not within 0.1 of a nautical mile of the publish co-ordinates then boats may make a turn after crossing a radius of 0.1nM of the given co-ordinates as per GPS rounding in the Handbook



### Understand your Instruments to make it Work.

Chart plotters can display DTG, BTW, graphic maps and distance alarms.

Multi Instruments can display DTG, BTW etc

Graphic Instruments can display DTG, BTW, TTG, Road maps

Simple Hand-held GPS can display radius, have alarms, Road maps, DTG, BTW etc

iPhones can display POI's, DTG, BTW and record tracks etc from any number of free apps.

Race Logger (android) can display BTW, DTG from POI's in CFG and record track.

### Verification of Turn

Possibly the biggest bone of contention after a race is "who didn't round correctly"?

There are many ways positive verification can be given;

- Best method is with Race Logger where auto CFG configures and sends after finishing.
- iPhones can record tracks which need to be manually sent.
- With smart phone photograph the track from the chart plotter and send screen image showing turn and lat/long using the cursor.
- Press MOB during turn and record or take photo and send lat/long later in SMS.

### Using Technology

Generally, we all like and embrace technology, some a little faster than others, but it is inevitable.

- Aeroplanes no longer use fixed marks to navigate flight plans.
- Lighthouses have become redundant due to GPS.
- Carbon has taken over from Dacron in sails
- Fibreglass and carbon have replaced wooden hulls.

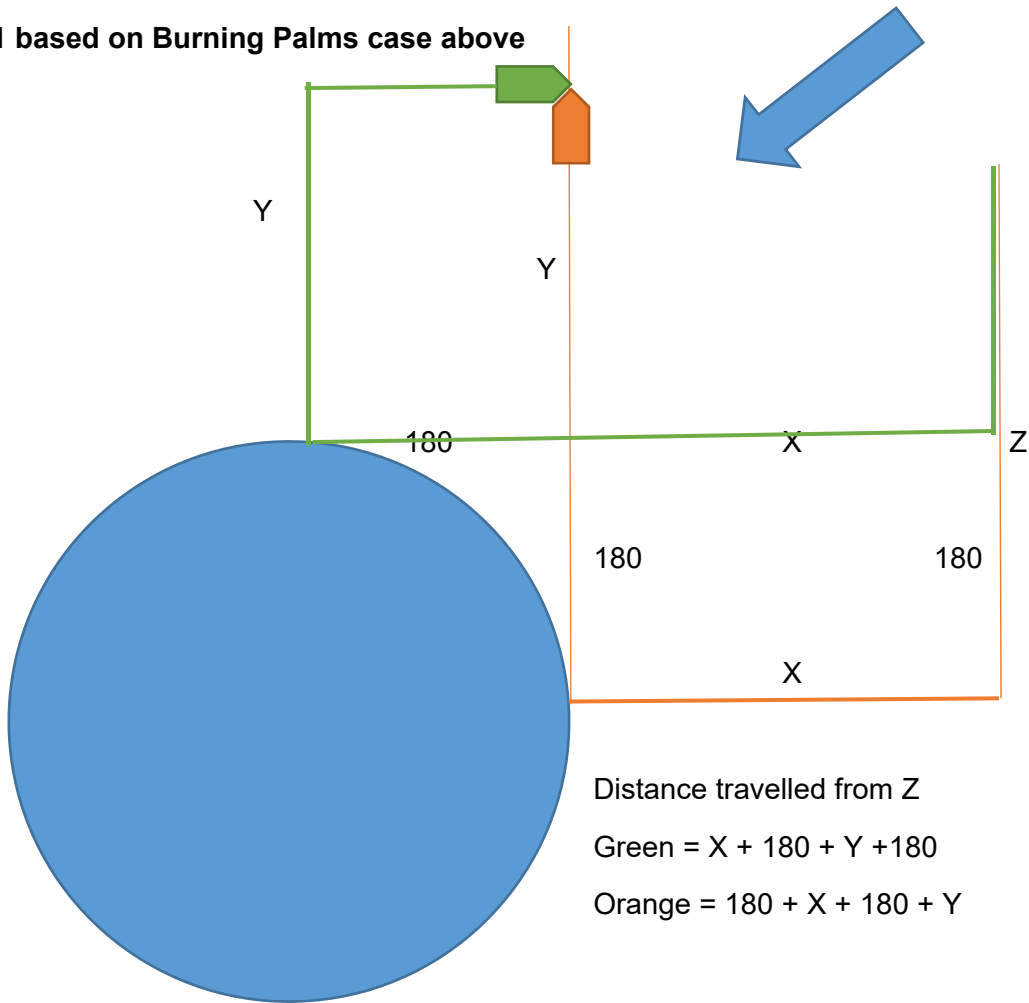
So, we have an opportunity to embrace technology to solve our long running problem of setting sea marks and as a bonus knowing your instruments may save lives in a MOB incident.

### Are we leaders or followers?

# The difference in distance between two senerios

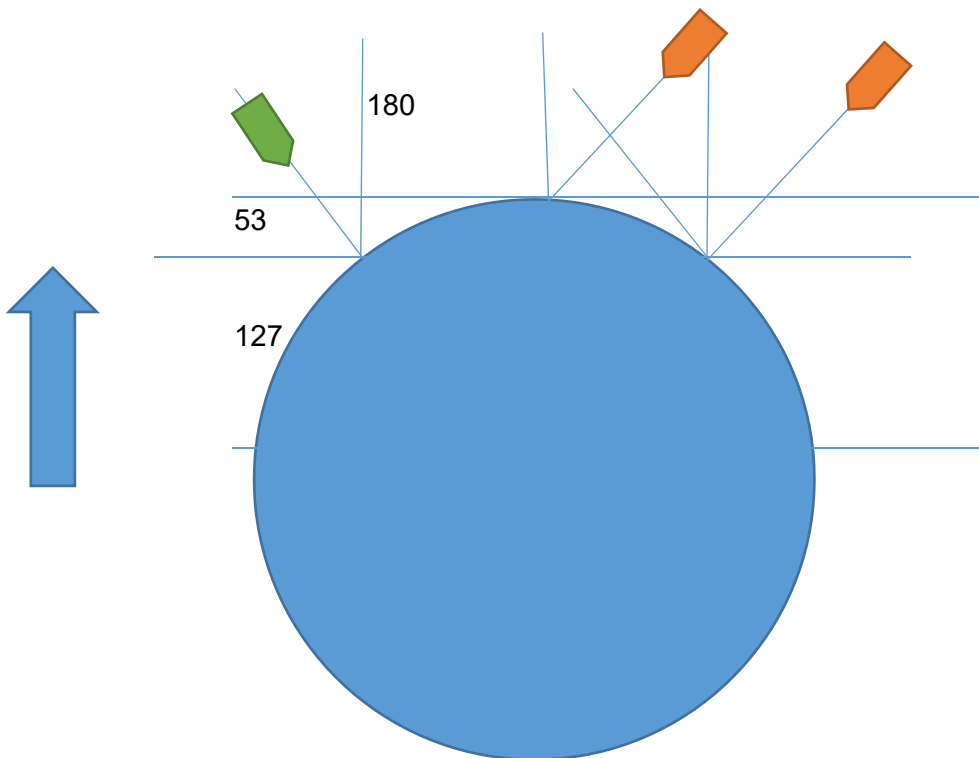
## Senerio 1 based on Burning Palms case above

Wind NE



## Senerio 2 Working to Burning Palms in a Southerly

Wind S

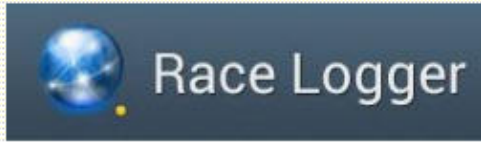


# Using Race Logger

From web; [http://www.rmycph.com.au/sailing/Race\\_Logger.html](http://www.rmycph.com.au/sailing/Race_Logger.html)

## Android App called - Race Logger

**Review:** An android application to record a yachts track from pre-start to finish and to auto send a SMS of finishing time and/or an Email for race management.



Click [here](#) to to download Race Logger app to android phone.

Ultra  
GPS  
Logger  
V3.0  
[User  
Guide](#)  
Full  
Version



## Setup for race management system

### Boat Details

Press Settings icon (Down arrow top right) or Tap menu button (bottom left of phone).



Then select settings

1. That should initiate the settings screen displayed
2. Type in your Sail Number & Boats Name. These will appear on the SMS and Email with your finish time.
3. Fill in the Offset from Bow to Phone position. The distance in metres that your phone will be from the bow when you are racing.



- \* 1-3 must be set up by each yacht.  
The balance can be user set or auto configured by tapping the setting icon and then tapping;  
**Get Remotecfg** user = RMYClubPH, PW=09ewkd4



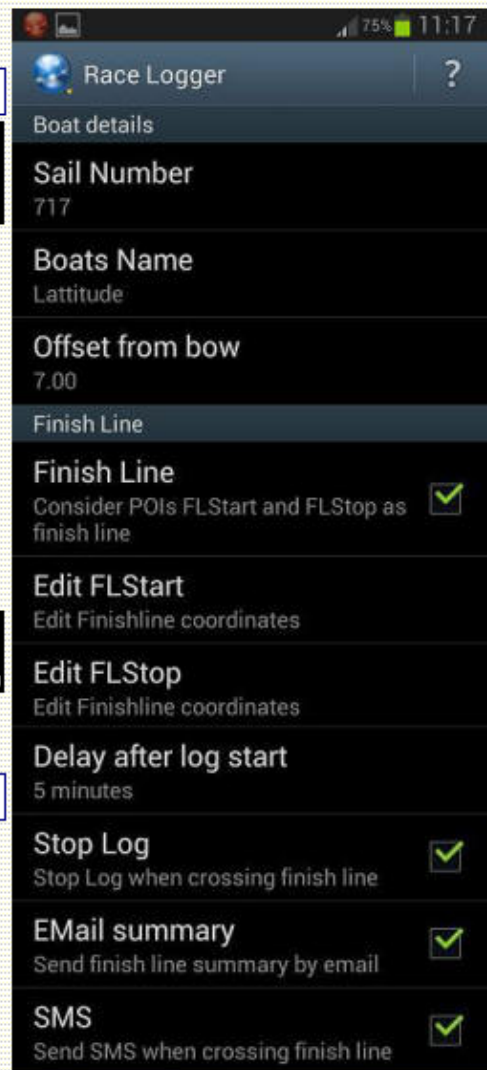
### Finish Line - Here down can be loaded by Remote Cfg

5. Make sure the Finish Line box is ticked.
6. Type in the Latitude and longitude of each end of the finish Line

#### For Bass and Flinders line

Edit FLStart: -34.072914, 151.153503

Edit FLStop: -34.081049, 151.159003

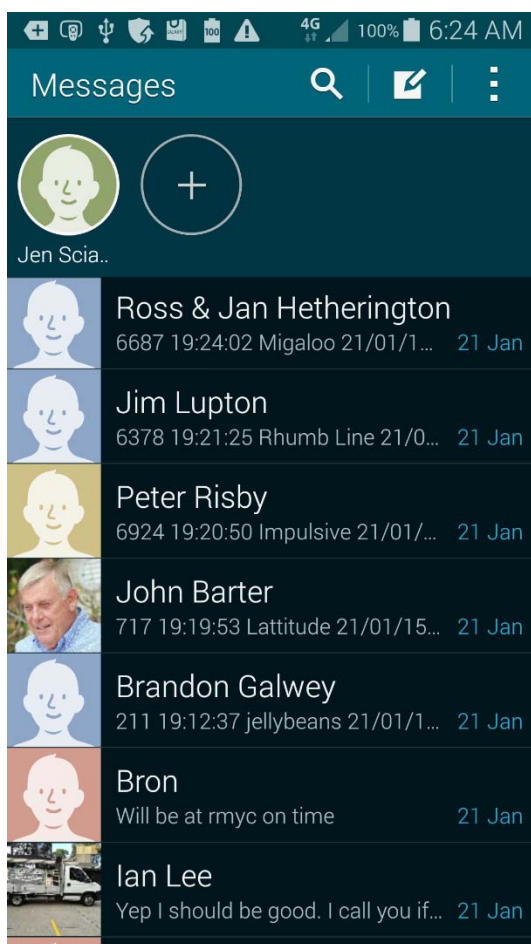


**Note:** Only 1 – 3 above needs to be input once for each boat.

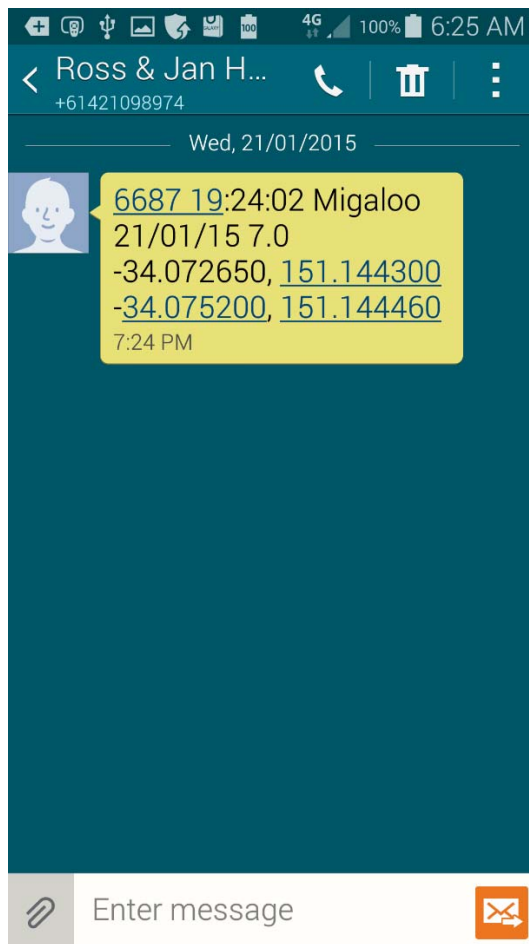
Item 5 onwards is automatically setup when the CFG is selected.

- At any time before the start of a race, turn on Race Logger, GPS and data.
- Download CFG.
- Place phone at the programmed distance from the bow.
- Race logger will start, record the track and calculate finish time. It will then send the finish time by SMS to a number of mobile phones.
- It then sends an email with the logs attached to any number of email addresses.

### Display of times with owner's name



### Expanded view with distance from bow



### Information received in an email;

Boat name: SteadFast  
 Sail number: PH3200

Race: NavCup

Crossing corrected time (AEDT): 17/01/15 16:07:07

Crossing corrected time (UTC): 17/01/15 05:07:07

Crossing: -34.074323, 151.154455

FL Start: -34.072914, 151.153503

FL Stop: -34.081049, 151.159003

Verbose info (only in EMail):

Version: Race Logger 1.099

Prev: -34.074296, 151.154529 [4.000000]

Post: -34.074334, 151.154423 [4.000000]

Crossing: -34.074323, 151.154455

dist\_prev\_to\_cross: 7.422223382476231

dist\_current\_to\_cross: 3.2108486542895043

dist\_prev\_current: 10.632241821188114

Prev Time (UTC): 17/01/15 05:07:06

Post Time (UTC): 17/01/15 05:07:11

time\_diff (ms): 5000

part\_time (ms): 3490.4319838197703

prefs\_fl\_bow\_ofst: 5.5

bow\_meter\_per\_s: 2.24251651763916

bow\_kmh: 8.073059463500977

bow\_sec (s): 2.452601778733028

Crossing time (UTC): 17/01/15 05:07:09

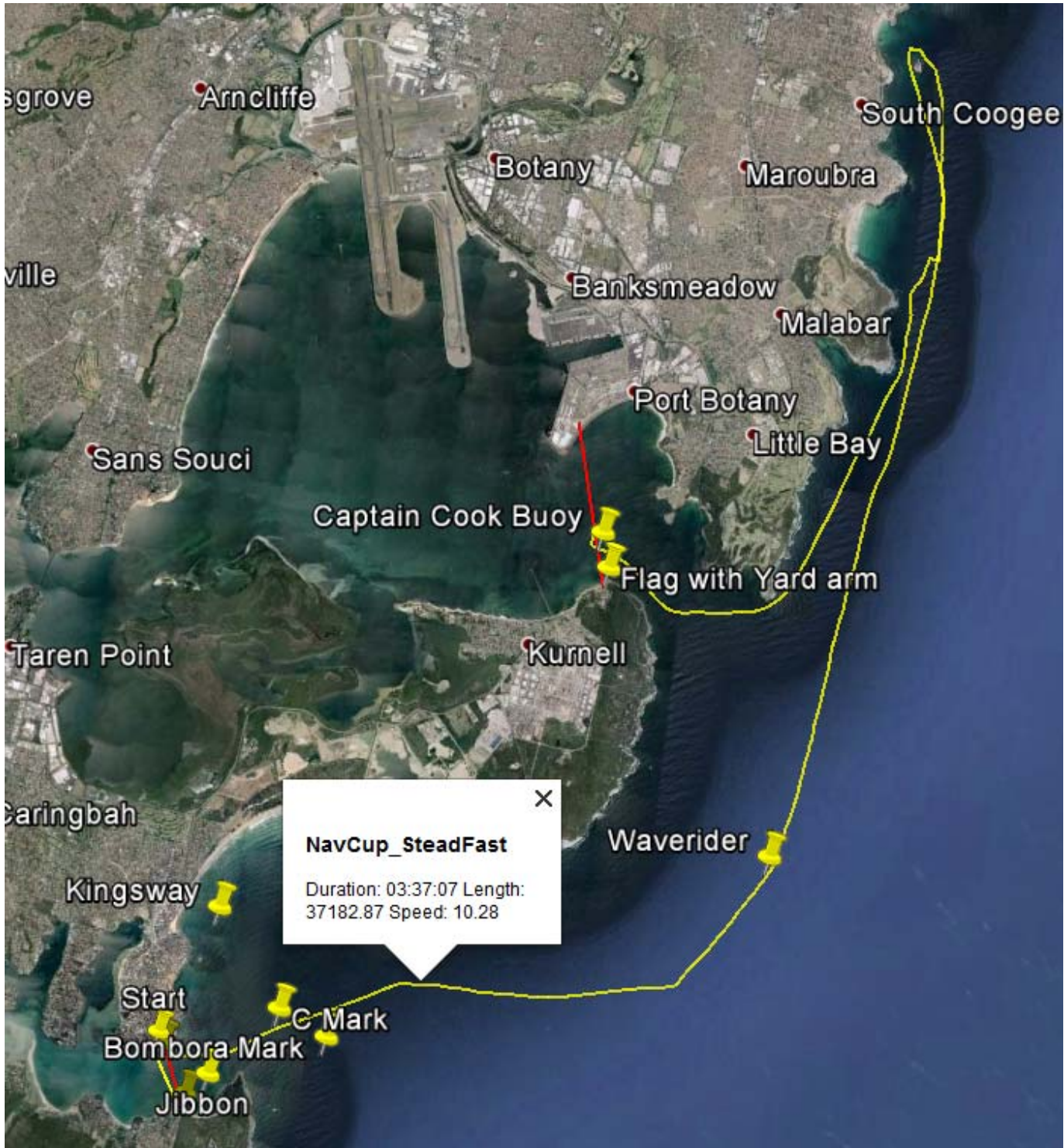
Crossing corrected (BOW) (UTC): 17/01/15 05:07:07

### Track of Steadfast in Navigators Cup.

The UTC finish time from above was 05:07:07. DST = 11:00:00 + UTC = 15:07:07

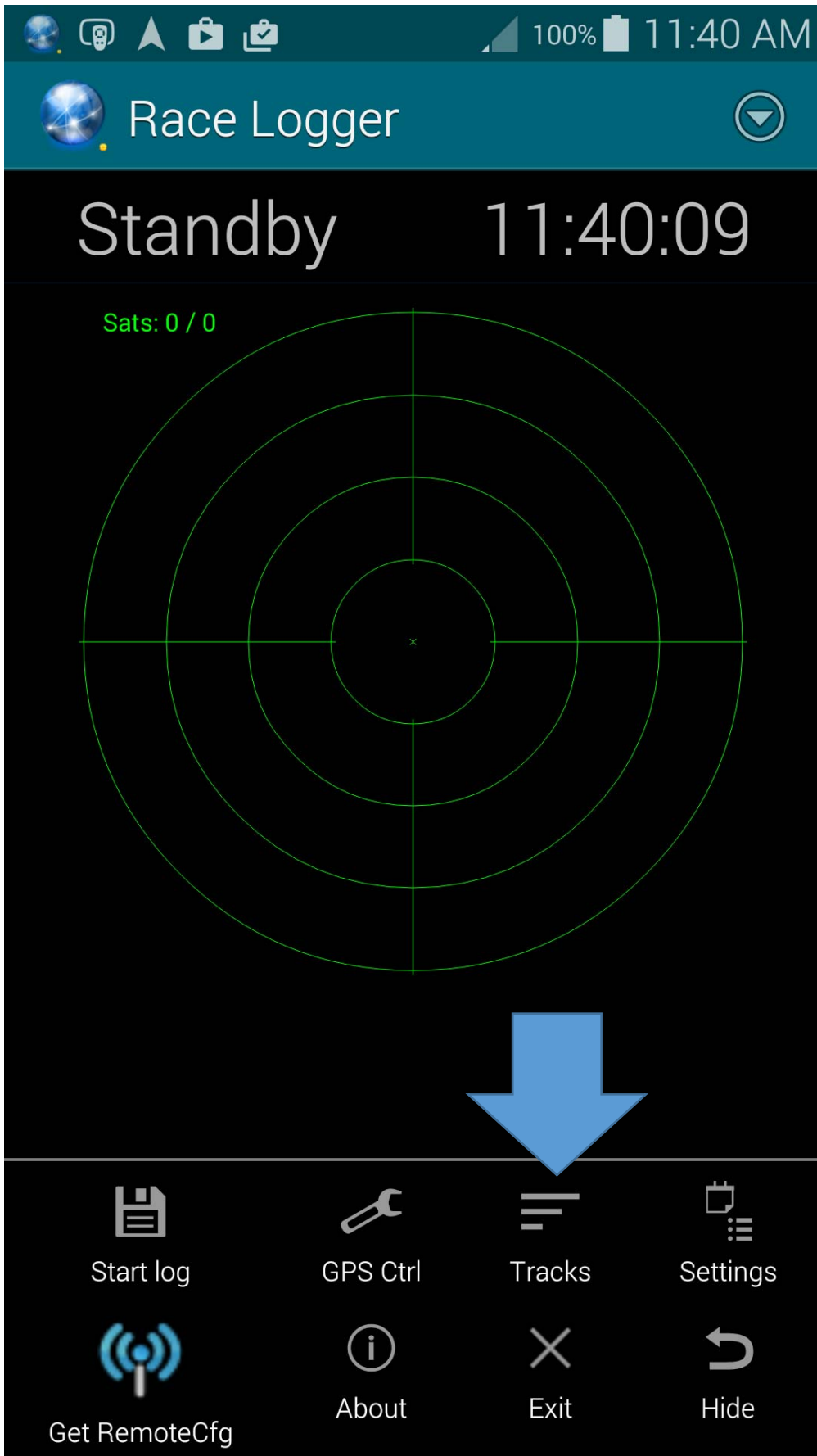
The elapsed time is 12:30:00 – 15:07:07 = 03:37:07 (as per Duration below).

Result programs only need Starting time and finish time, the elapsed time is calculated in results.



# Displaying Tracks on Race Logger

Open Race Logger



Select Tracks

Select which Saved Track to Display

The screenshot shows the 'Race Logger' app interface. At the top, there is a status bar with various icons and the time '11:41 AM'. Below that is a teal header with the app name 'Race Logger' and several icons. The main content area is divided into sections: 'CURRENT' (with a 'Live Map' option), 'FOLDERS' (with a 'GPSLogs' folder highlighted in red), and 'SAVED TRACKS'. Under 'SAVED TRACKS', there are two track entries: 'NavCup\_Lattitude' and 'HappyEnd1\_Lattitude'. Each entry shows a map icon, the track name, a file path, a date and time, and a table of statistics including NMEA, distance, and speed. A large blue arrow points to the 'NavCup\_Lattitude' entry.

**CURRENT**

Live Map

**FOLDERS**

**GPSLogs**

**SAVED TRACKS**

NavCup\_Lattitude  
/storage/emulated/0/GPSLogs/2015-01-17\_123005\_Nav...  
17.01.2015 15:52:36 03:22:29

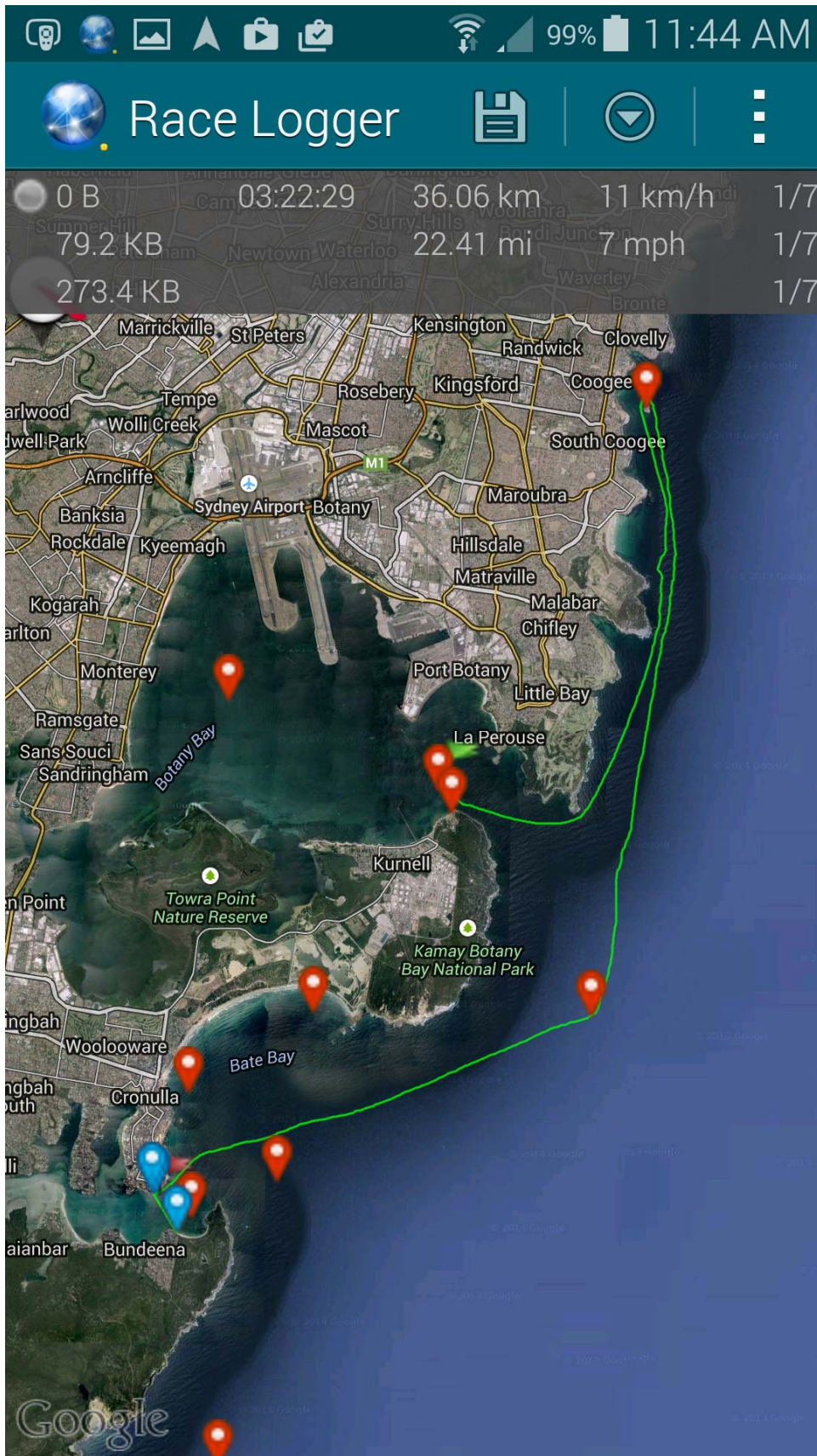
NMEA	-	36.06 km	11 km/h
KML	79.2 KB	22.41 mi	7 mph
GPX	273.4 KB	POIs: 5	Category: Misc
CSV	-	Botany - Cronulla	

HappyEnd1\_Lattitude  
/storage/emulated/0/GPSLogs/2015-01-14\_181228\_Ha...  
14.01.2015 18:34:22 00:21:54

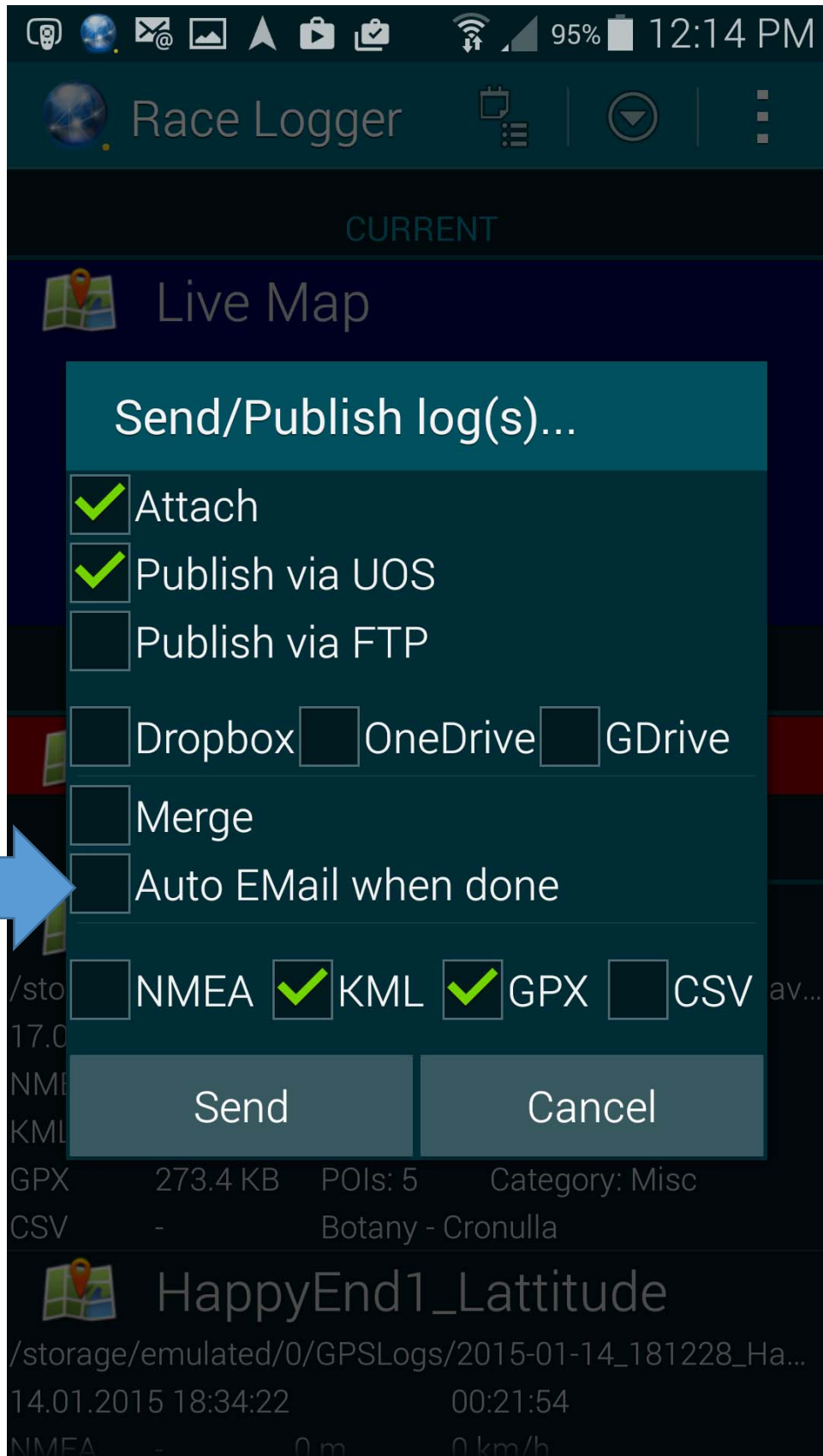
NMEA	-	0 m	0 km/h
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Select View to display on phone like this



To Send track by email select Auto Email when done and follow the prompts



Please contact John Barter 0418 253 479 for help