



# Road Rally Timing and Scoring

Richta GPS Checkpoint System

A system for real-time timing and scoring for road rallies.

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Version 8



[Web: www.richtarally.com](http://www.richtarally.com)  
Twitter: @richta\_rally





# Agenda – GPS Timing and Scoring

Advantages

How it Works

Getting Started

Limitations

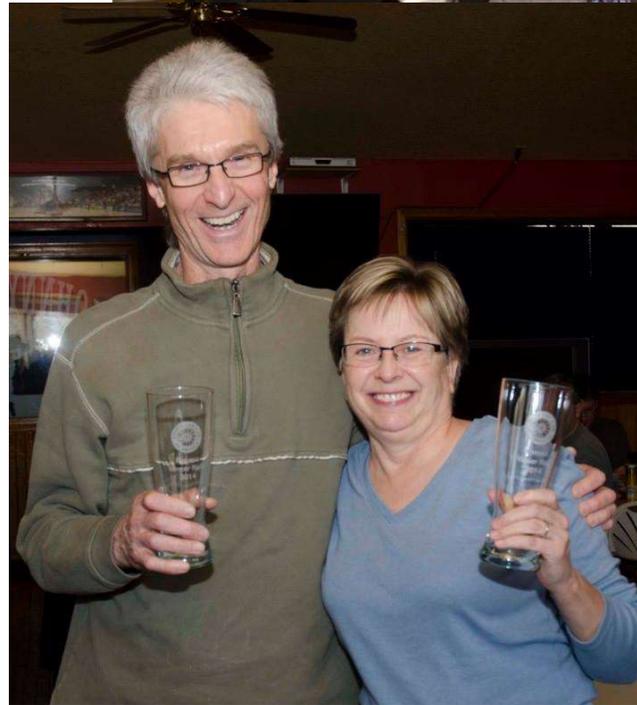
Frequently Asked Questions, (Emerging Best Practices),

My Questions for You

Experiences



More of this ...





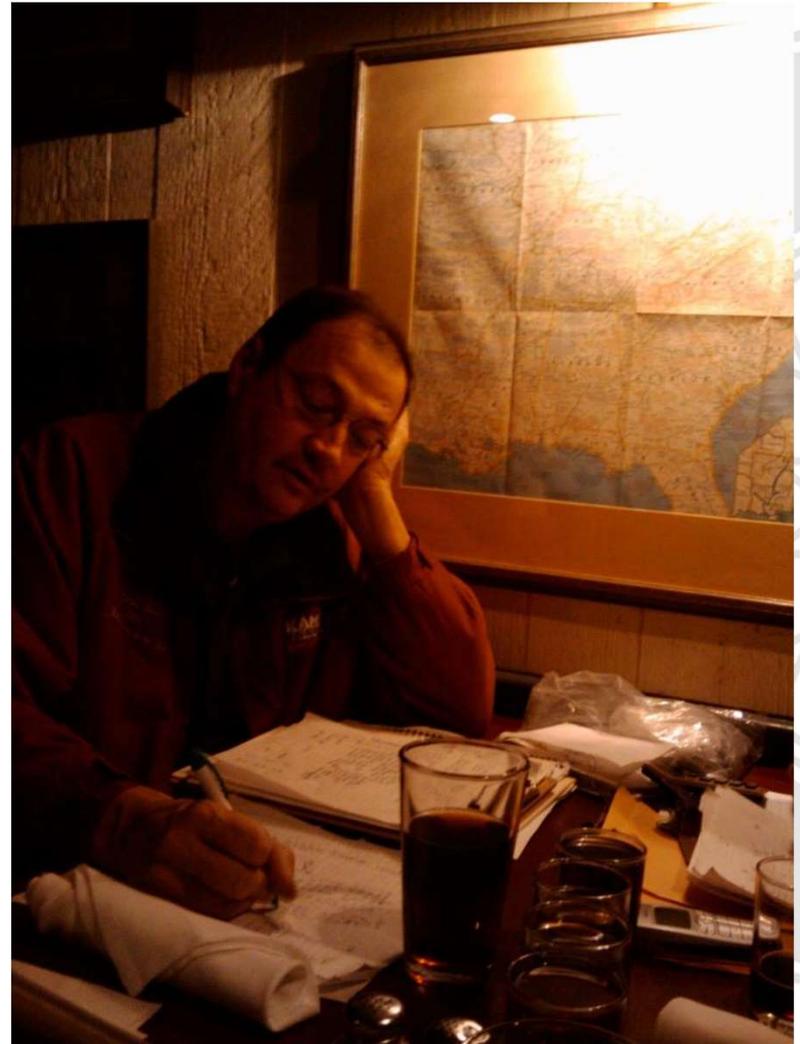
.. and less of this ...

“Out at 2:10, ideal leg time of 20:44, ...  
Wait, they had a time allowance of 5:50 ...  
In time was 2:36:27 ....  
Borrow 60 ....

Scoring will be done in another 30 minutes or so.”



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# Advantages of this System

\*\*\* Immediate feedback to competitors of their scores as soon as they pass a checkpoint  
SOP rallyists observed to improve scores as event progressed

\*\*\* Score automatically sent to rallymaster and public, scores ready for review and sharing

Rally events can be run with a minimum of workers, as few as a rallymaster & safety steward

Events run without checkpoint crews, checkpoint clocks and other equipment

Increased timing resolution over current system (0.1 second vs. 0.6 second)

Increased flexibility – events with 100+ checkpoints have been held.



8:33 [Settings] [Share] [Email] [App Store]

**Son of Sno\*Drift XXII - Car #4**

Rally Clock Score  
**20:33:55** **384.1**

GPS Accuracy Time Allowance  
**20.0** meters **0:00**

37.000050  
 -122.000000

TA-
TA+

Completed Checkpoints:

Leg	In Time	Difference		Score
85	18:32:52.2	0:08.8	Late	8.8
84	18:31:54.3	0:02.4	Late	2.4
83	18:30:55.0	0:03.4	Early	3.4
82	18:29:43.8	0:08.0	Early	8.0
81	18:29:00.0		Restart	
80	18:18:53.8	0:05.3	Early	5.3
79	18:18:21.8	0:06.7	Early	6.7
78	18:15:33.8	0:12.4	Late	12.4
77	18:14:29.1	0:08.8	Late	8.8
76	18:08:56.5	0:01.5	Late	1.5
75	18:08:12.9	0:00.5	Early	0.5
74	18:07:00.0		Restart	
73	18:02:05.6	0:07.4	Early	7.4

Unregister Ver 1.14a



5:26 [Settings] [Share] [Email] [App Store]

**Scoreboard - Ver 4**

**17:26:07**  
**Son of Sno\*Drift XXII**

Num CPs: 85 Num Cars: 26 CPs Read: 2046

Car	Cls	Team	CPs	Score
1	E	Jeff & Nic Boris	85	53.0
2	E	Layton/Layton	85	264.9
3	E	Harkcom/Jean-Franco	85	94.7
4	E	Ken & Dennis Wiedbu	85	384.1
5	E	Kay/Bennett	85	34.0
6	E	Fishbeck/Dawson	85	38.0
7	L	Harkcom/Lester	85	75.2
8	L	Line/Line	85	279.4
9	L	Adam/Piotr	85	87.4
10	L	Steve & Sean Riddell	85	171.5
11	L	Oxendine/Swarm	65	184.5
12	-	-	-	-
13	N	Everett/Seeger	85	317.5
14	N	Harwood/Doredla	85	805.0
15	N	Velarde/Romero	85	140.5
16	N	Rotsaert/Zimmerman	85	194.1

Change Event 111

rt Title Here



# How It Works

Design and lay out the rally in the current manner

Determine the restart points and checkpoint locations. (Restart points are considered checkpoints). This system offers much more flexibility in checkpoint location (no crew) and number of checkpoints

Go through the course again, recording the GPS location of each restart point and checkpoint location with the Rallymaster app.

Back home use Rallymaster app to set restart point and checkpoint information and ideal leg times. Each recorded location is either a restart point or a checkpoint. Review on Map.

Use Rallymaster Validate function to check the consistency and logical layout of event.



## How It Works (continued)

Entrants run the rally route using the Competitor app. Register for the event using the app. This will load all checkpoint locations and timing information into the phone/tablet. Mount the phone in the car (with good visibility to sky), plug it into power (GPS will consume more power than normal). Run the rally course.

As checkpoints are passed, the Competitor app gives an audible indication and immediately shows you your recorded time at the checkpoint, the difference between your time and the ideal time, your score for that leg and your total score. Your timing and scoring data is loaded to a database and is available to the rallymaster.

After you complete the rally use either the Rallymaster app to export a spreadsheet with scores for display or distribution or the Scoreboard app to display the results.



# Getting Started

Download apps (Rallymaster, Competitor, Scoreboard)

Full names: Competitor – Richta GPS Checkpoints (etc.)

Download and review documentation ([www.richtarally.com](http://www.richtarally.com))

Start with a Test Event

Convenient to your home

Short, about 10 checkpoints

Request event by sending email to [rbireta@gmail.com](mailto:rbireta@gmail.com)

Engage with experienced rallymaster for guidance, Q&A

Use Test Event to familiarize yourself with operation of apps





5:18

Event Menu - (Rallymaster Ver 1.21)

Ron Dunlop Rally

Scoreboard

Timeslips

Map

Discard Leg

Rescore Leg

Manage Entries

Change Event Settings

Change Checkpoint Time

Change Checkpoint Location

Validate Event

Select Another Event

6:53

Change Checkpoint Location:

Son of Sno\*Drift XXII

Checkpoint number: 1

Lat here: 37.000050

Long here: -122.000000

Accuracy: 20.0

Set Checkpoint here

Set Checkpoint from location below

Checkpoint Lat: 42.442200

Checkpoint Long: -83.650339

Back Previous Next

6:54

Change Checkpoint Time Information:

Son of Sno\*Drift XXII

No Save, Prev Leg No Save, Next Leg

Back Save and Show Next Leg

Checkpoint number: 3

Type: Timed from previous TOD restart or..

Enter ideal leg time:

Hour: 00

Minute: 06

Second: 07

Millis: 686

Critique message:

Tap to enter message for critique slip





6:55 [Settings] [Share] [Email] [App Store]

### Change Event

Event Name: Son of Sno\*Drift XXII

Number of Checkpoints: 85

Number of Cars: 26

Maximum Score per Leg: 30

Event registration password: SoS2020

Precheck delay: 0

Event is open if checked:

Share timeslips:

Score to 0.1 second if checked:

[Back](#) [Save](#)

[Navigation Bar]

6:56 [Settings] [Share] [Email] [App Store]

### Timeslips:

#### Son of Sno\*Drift XXII

Checkpoint number: 3

Do Not Score

Car number: 1

Prev Out Time: 12:46:00.000

Ideal Time: 00:06:07.686

TA Time: 00:00:00.000

Due: 12:52:07.686

In Time: 12:52:08.731

Difference: 00:00:01.045

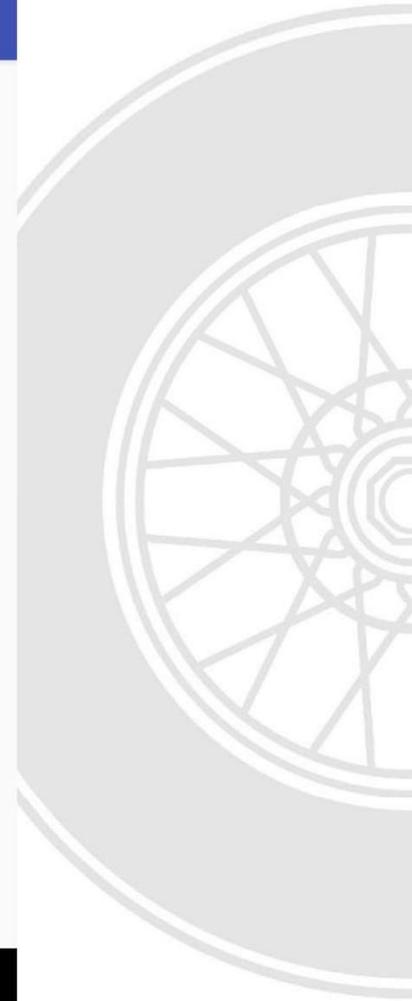
Penalty: 1.0 Late

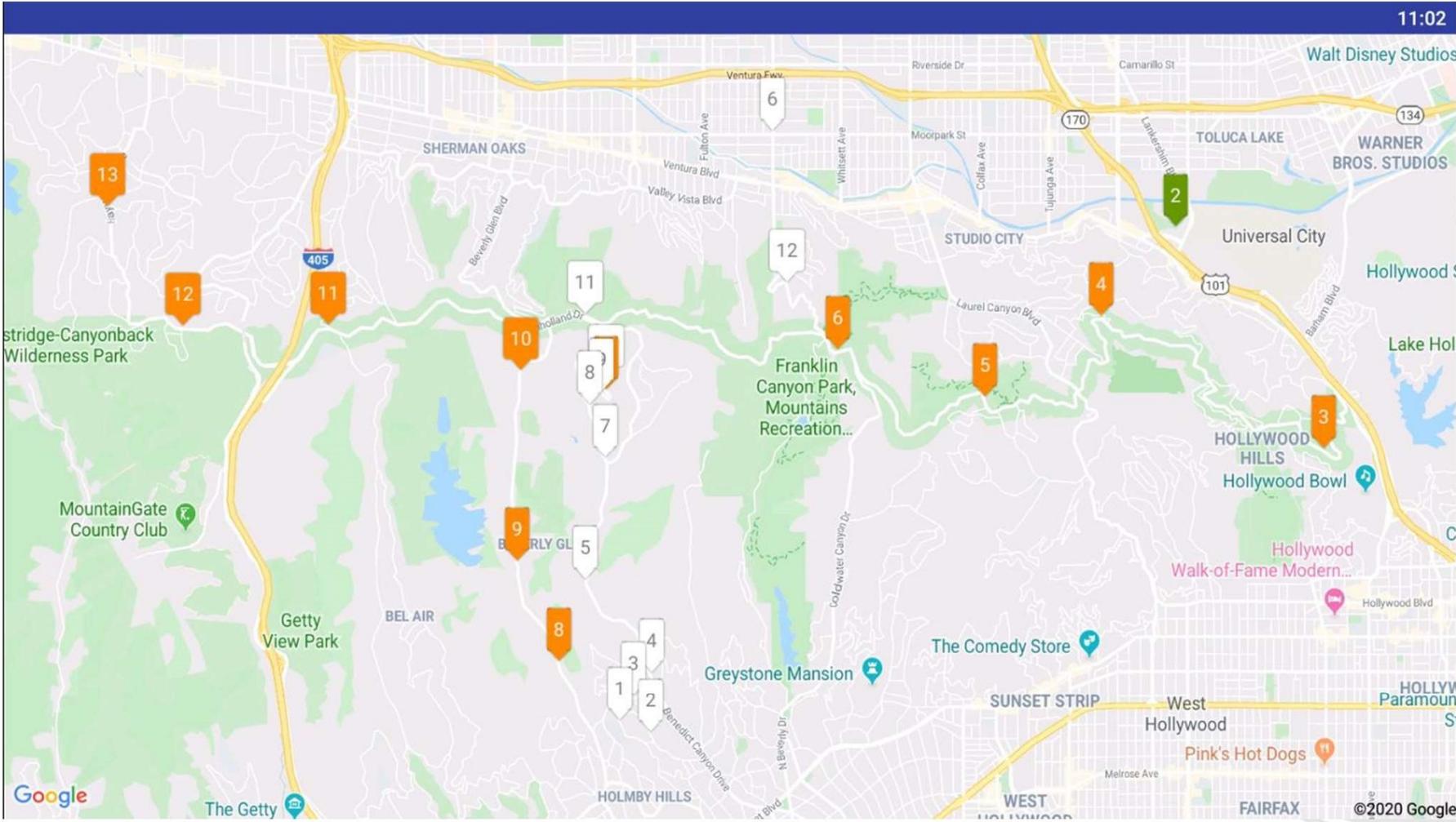
[Prev Leg](#) [Next Leg](#)

[Prev Car](#) [Next Car](#)

[Back](#)

[Navigation Bar]







# Limitations

Each competitor needs a tablet or smart phone with GPS, Apple or Android

Wi-fi availability at start and finish for devices with no data plan (wi-fi only tablets, e.g.)

Restart points are considered checkpoints. Difficult to insert new checkpoint once locations are loaded into Rallymaster app

**Rally pre-check must now include testing with Competitor app.**

(Note: Previous limitation on checkpoint re-use was removed in June 2020).

(Note: Apple version of Rallymaster is functionally equivalent to the Android version as of June 2020).



# Experience to Date

Feb 2017 - Proof of concept developed and tested.

Fall 2018 – Comprehensive testing and validation

Checkpoint locations were reliably detected with 0.1 second accuracy

April 2019 – Launch

15 Events, 12,800+ timeslips generated in 2019

SCCA National Events: La Crosse, St Louis

SCCA Divisional Events: Madison, Milwaukee, New Jersey, Detroit

Non-SCCA Events:

Minneapolis, Portland, and Porsche Club of America

Numerous Evaluations underway (23 events calendared for 2020)





# (Emerging) Best Practices

Do not underestimate learning curve for new apps  
Use your test event to gain experience conveniently

Consider event “style”

Restart then 1 to 10 timing points? Repeat n times?

Restart after each timing point?

How many checkpoints? 10? 50? 100?

Goal: Scoring done when the last car reaches the finish  
Scoring team, use of map, use of Scoreboard app  
Scorers need not be at event





## (Emerging) Best Practices (continued)

Complete event layout and select all checkpoint locations prior to defining in Rallymaster app.

Accuracy: Use external GPS receiver (Dual XGPS 160, Garmin GLO) to set checkpoint locations with 6 significant digits (43.123456). Analogous to measuring an event with 0.01 mile odometer.

Running apps on a laptop: Free application Bluestacks allows running Android apps on laptop (Windows or Mac). Rallymaster and Scoreboard work!

Others?



# Frequently Asked Questions

Aren't we losing the joy that comes from finding checkpoints?

System does not preclude use of traditional checkpoints.

What features exist for GTA or Course rallies?

On-course checkpoints, Off-course checkpoints

Is cell phone coverage needed at checkpoint locations?

No. Database technology used was designed for data sharing among devices with intermittent connections





# Frequently Asked Questions

What key technologies enable this system?

Ubiquitous cell phones with GPS, 4G LTE datanetwork,  
Google Cloud Firestore database

Where can I go for more information, request a new event, ask a question or report a problem?

Email: [rbireta@gmail.com](mailto:rbireta@gmail.com)

Web: [www.richtarally.com](http://www.richtarally.com)

Twitter: [@richta\\_rally](https://twitter.com/richta_rally)





# Frequently Asked Questions

How much is this going to cost?

- Pricing goals:
- 1) Fair to Organizers and Publisher
  - 2) Fees are < 10% of entry fee revenue
  - 3) Reduced charges for small events

2020 Fee Structure:

Entry fee $\geq$ \$50;	\$5 per car
\$30 $\leq$ fee $\leq$ \$49:	\$3 per car
Entry fee < \$30:	Call me





# My Questions for You

What is the major inhibitor that would prevent you from using this system?

Would you use tenth-of-a-second scoring, or would you rather time to whole-seconds to make it "easier" to get a perfect zero score (and then use tenth-second for tie breaks)?

What would you think about not having CZT checkpoints, just flying starts?

Would you be willing to buy an external GPS, or do you think the device is good enough?



# Acknowledgements

John Broughall

Great Britain rally organizer. Concept of using GPS to time and score entrants, prototype work

David Bireta

Apple developer Chicago. Apple version of apps, user interfaces, leading-edge features like maps, real-time display

Jim Crittenden

Rallymaster and competitor. Significant efforts in testing concepts and apps, feature suggestion, algorithms, promotion, encouragement, support of rallymasters