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SafeTrack
Innovation in Race Track Security

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SafeTrack - Highlights

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SafeTrack: Safer race tracks, less crashes and injuries

Automatic: Crash detection → yellow flag

Race Control: Red, white and black flag directly to drivers cockpit

SafeTrack - Highlights

SafeTrack A: for amateur drivers

SafeTrack B: for semi-professional drivers

SafeTrack P: professional system

Extremely robust, compact and very cost-efficient by use of integrated antennas

SafeTrack Building Blocks

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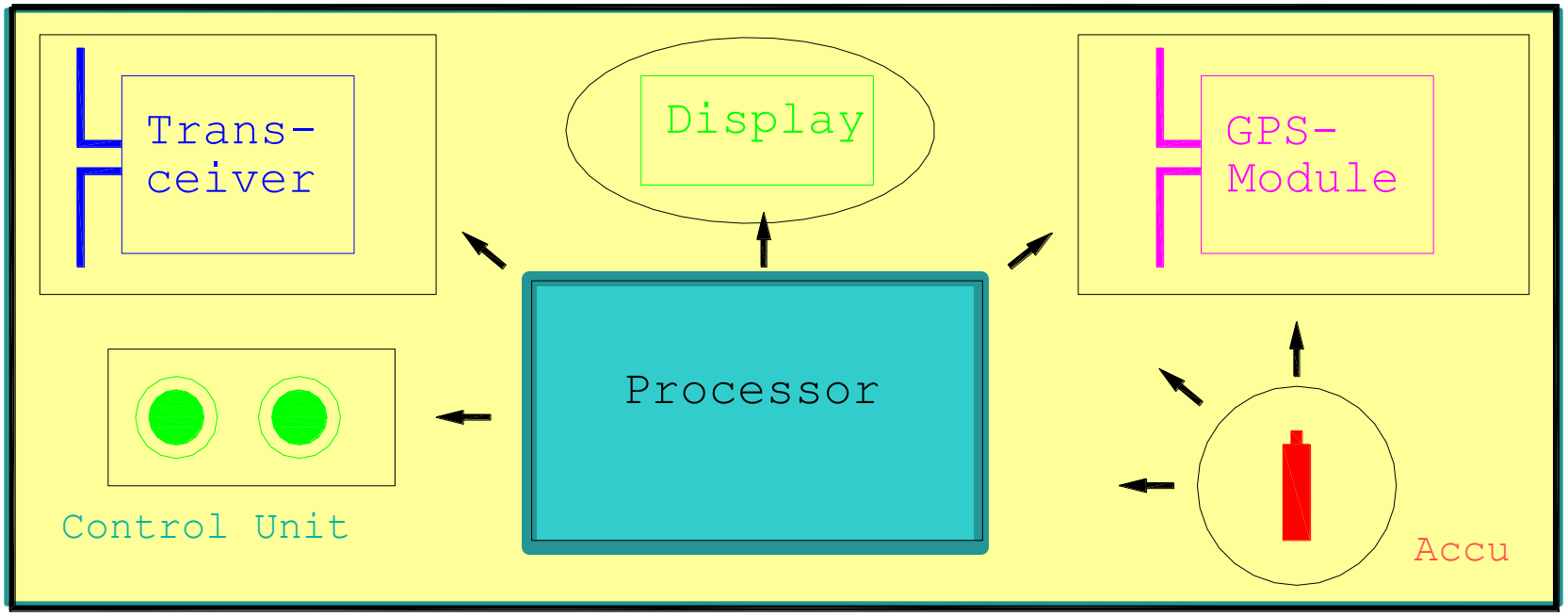
6 building blocks for the SafeTrack[1]-system:

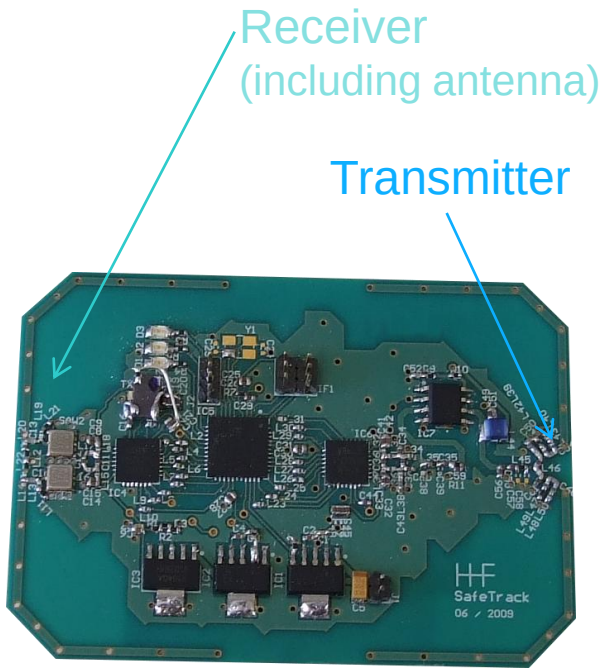


[1] SafeTrack is a patented system

SafeTrack Operation Principles

- Velocity monitoring via GPS and acceleration sensors
- 868 MHz transceiver provides reliable air link
  - at high speed (> 300 km/h)
  - with high range (> 300 m)
  - at high temperatures (80°C)
  - with robust on-board antennas

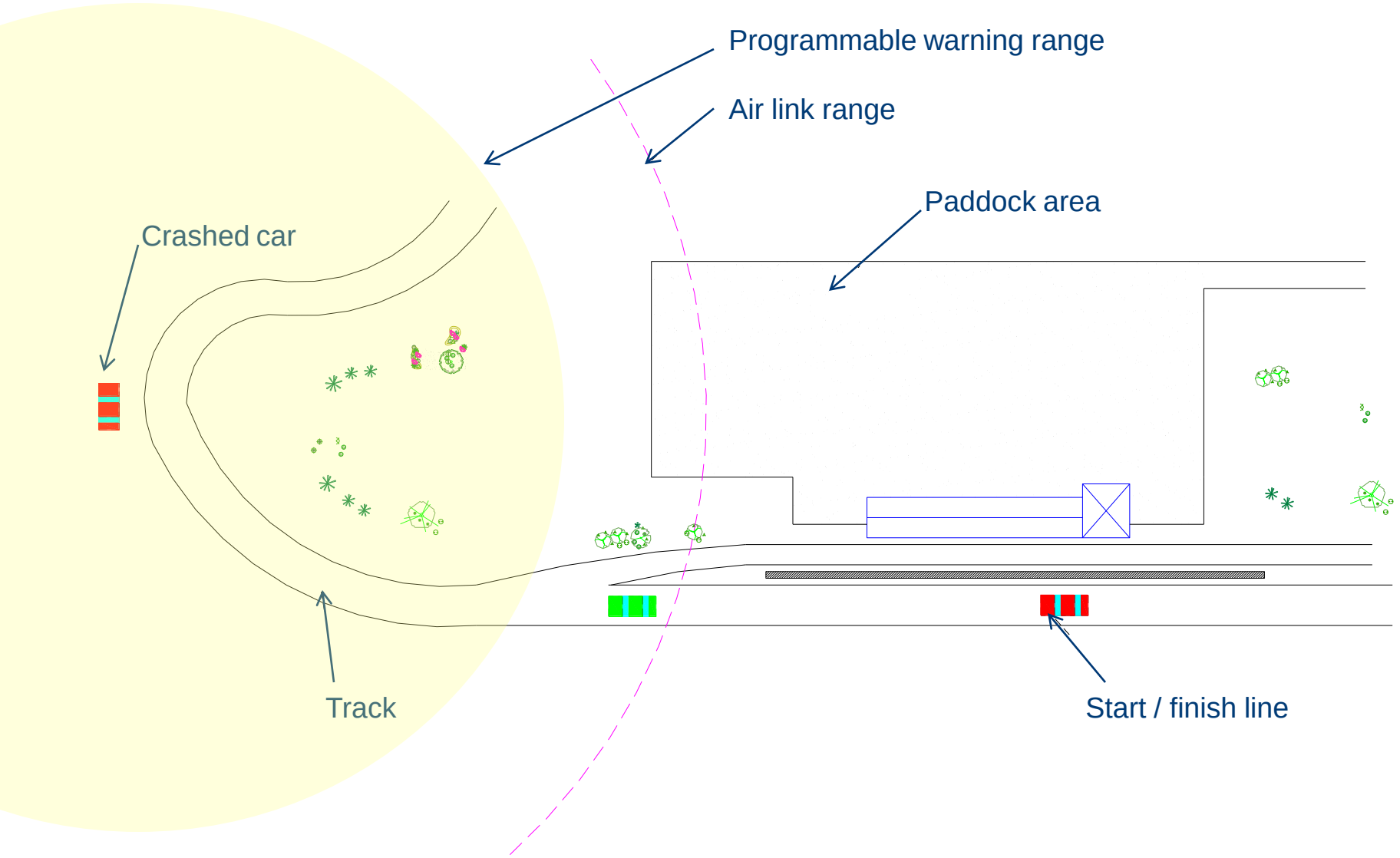
Fully developed and tested transceiver



Features of SafeTrack A

- Data of security area (paddock and box) is stored
  - Car sends a signal when leaving the security area and the velocity is low
  - The area around the car is the “yellow area”
  - All drivers in this section see the yellow flag on their SafeTrack-display

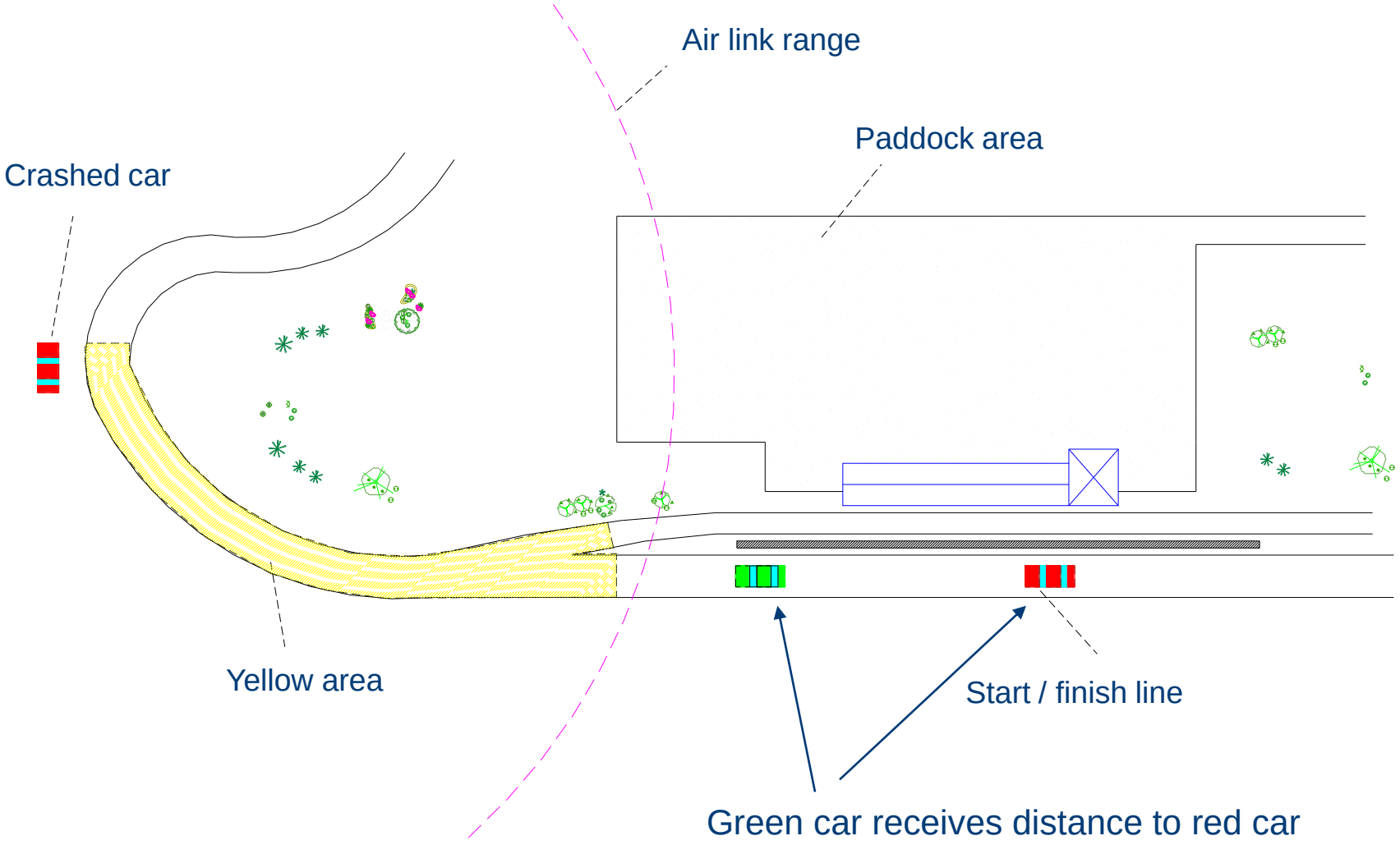
Features of SafeTrack A



Features of SafeTrack B

- Data of security area (paddock and box) and race track is stored
  - Car sends a signal when it’s out of the security area and the velocity is low
  - The section behind the car is the yellow area
  - All drivers in this section see the yellow flag on their SafeTrack-display
  - Laptime and distance to the following car can be displayed

Features of SafeTrack B

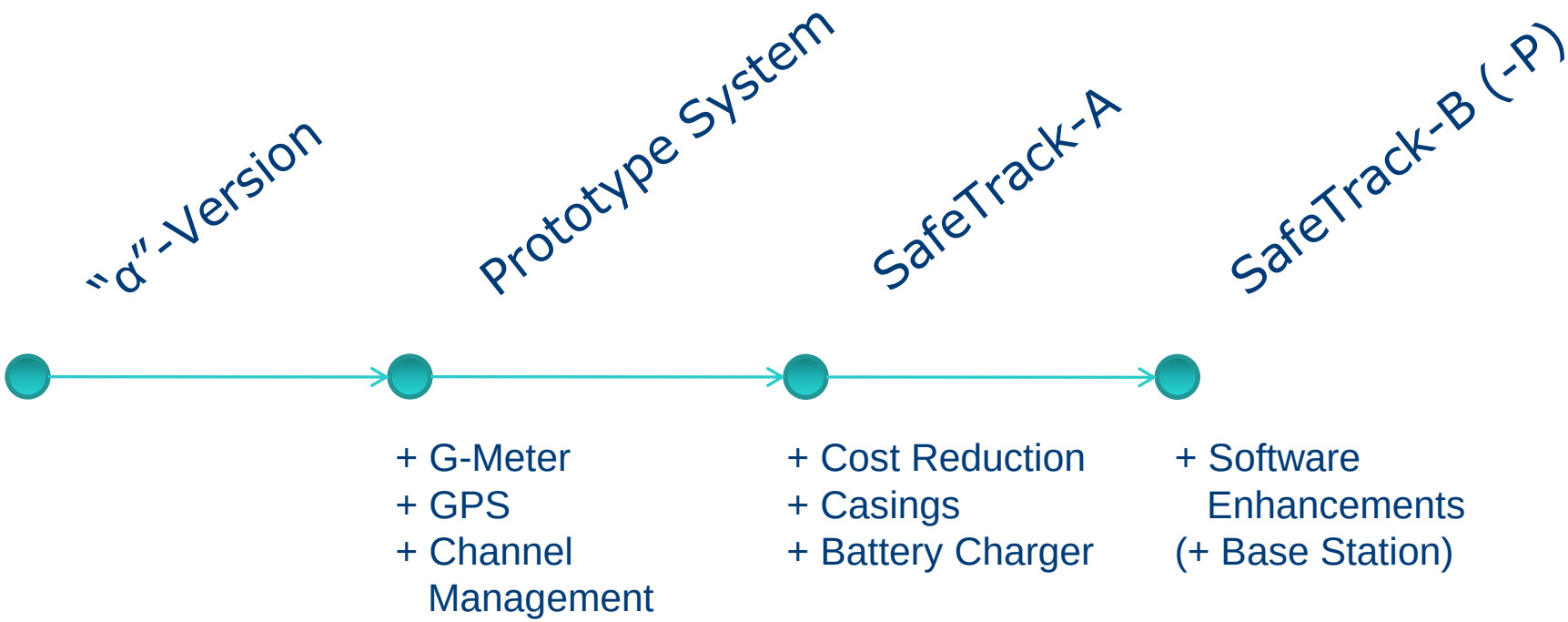


Current Development

Current Development Status

- Patent protected SafeTrack “α”
- Transmitter and receiver module finished
- All vital radio link components included
- Started to implement G-meter and GPS
- Permanent “crash-mode” for link range and reliability tests

Development Roadmap



Preliminary Tests

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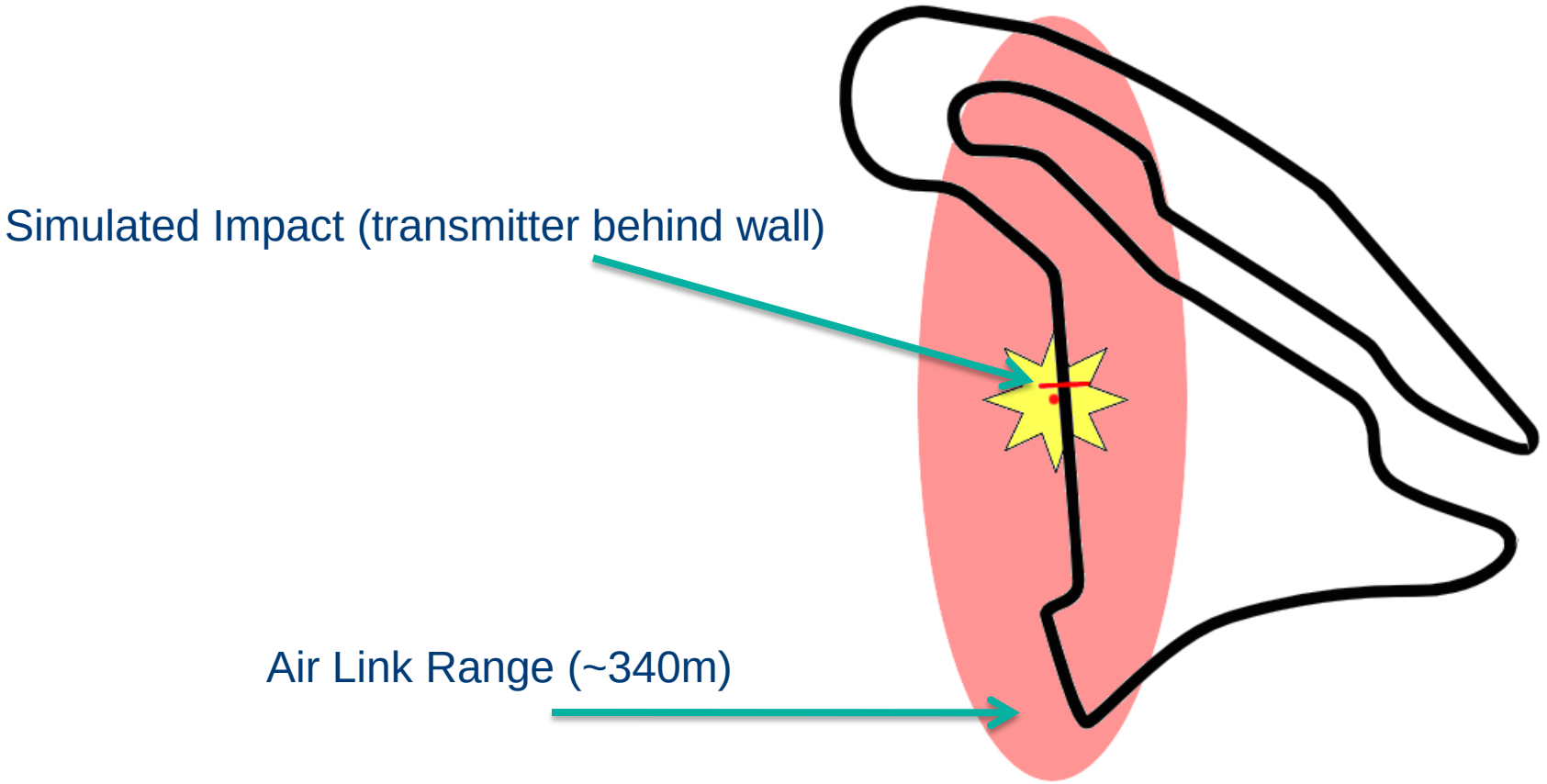
Test Setup

- One transmitter in “crash-mode”, constantly repeating its distress signal
- One receiver mounted on motorcycle
- Tests conducted during training sessions in Magny Cours

Range and reliability are critical for system functionality:
The robustness test of the air-link is most important

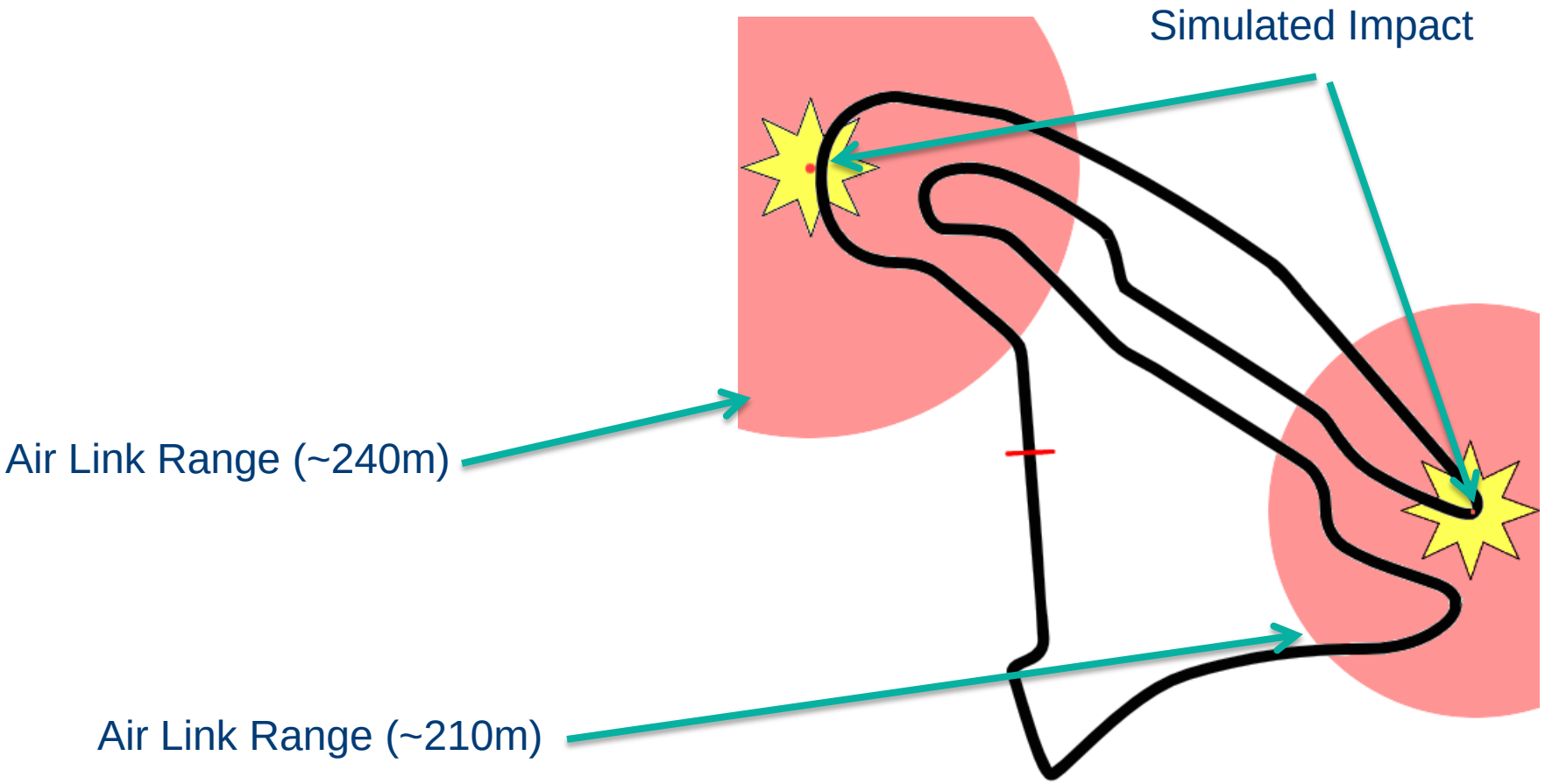
Preliminary Tests

- Scenario 1: Transmitter on the ground, behind pit lane wall



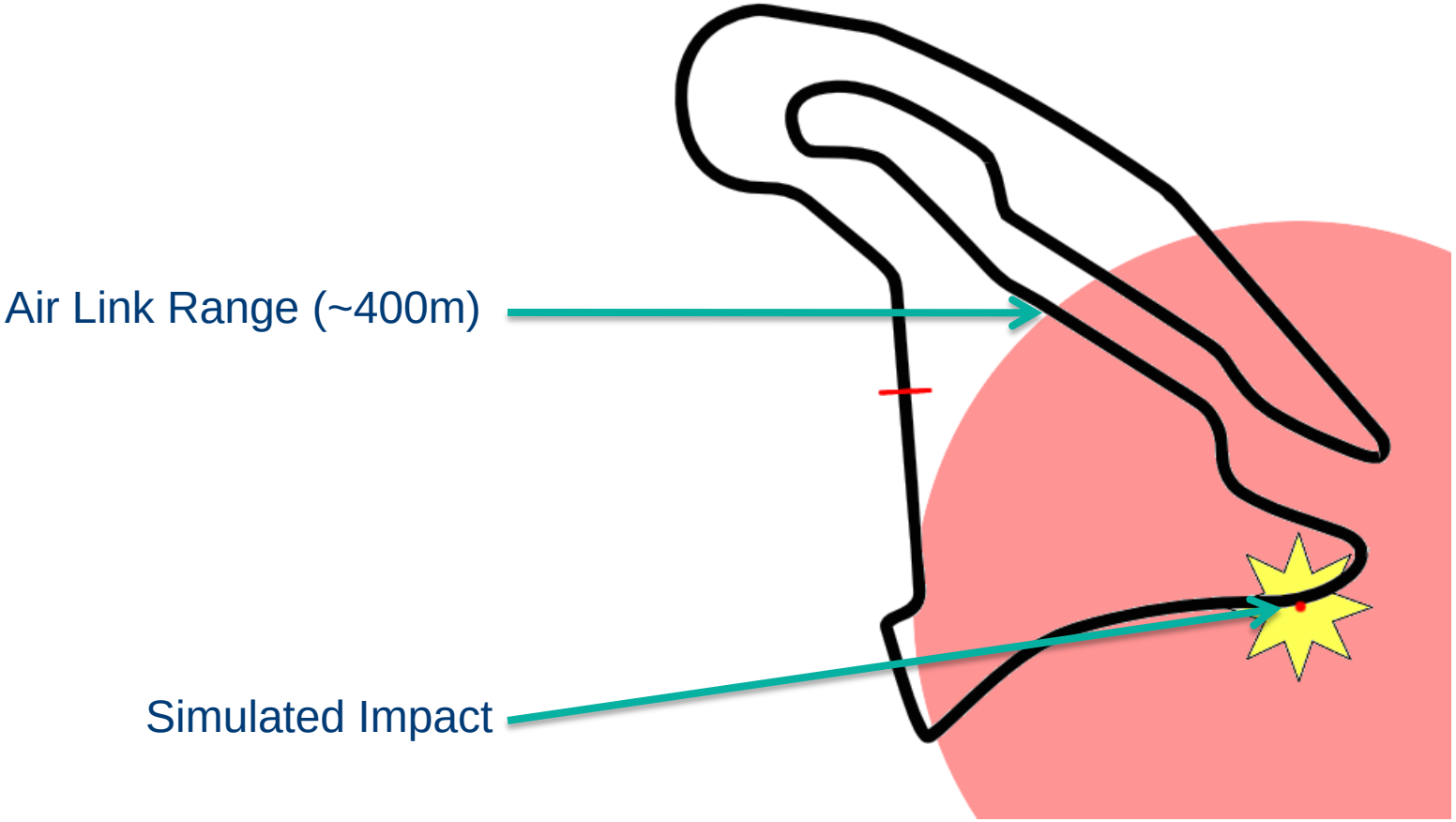
Preliminary Tests

- Scenario 2: Air link range varies with area geometry and nearby buildings



Preliminary Tests

- Scenario 3: Test conditions include transmitters hidden behind concrete walls, steel pillars and tire walls



Further Development

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Prototype System

- Improvement of current system* } ~ 8 weeks
- Production of 10 transponders
- Test on track } 1 week

* Includes introduction of acceleration meter, GPS module and radio channel management

Further Development

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Pre-Production Optimization

- Minimizing production costs (currently ~ 40€ w/o battery, target: <30€)
- Development of programming station

- Design of casing
- Development of accessoires (battery charger, transport casing)

Further Development Costs

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- Prototype System: Working Packages
  - 1 engineer (2 months): 10 t€
  - Costs for 10 demonstrators: 3 t€
  - Test costs: 1 t€
- Pre-Production: Working Packages
  - 1 engineer (3 month): 15 t€
  - Costs for demonstrators: 3 t€
  - Costs for programming station: 1 t€
  - Test costs: 5 t€
- Production costs for high volume: < 30€ / pc.

Future System: SafeTrack P

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SafeTrack-P (P professional) is a high end solution:

- Enhances SafeTrack-B functions
  - 2W transceivers and 2 km air-link
- Manual flag setting is possible
  - Organizer can set all flags (e.g. red, black, white) for the entire field, in sections or for individual cars
- Current positions of all cars are available
  - Supplies data for TV crews and other applications

Our Price of SafeTrack

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We offer SafeTrack for 88.000€ including:

- Patent and all rights
- Hardware of SafeTrack transceiver
- Software for microprocessor including GPS and G-meter control
- Training and documentation

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