

Status: Filled

GroupMembers: VehicleDesignandBuildDivision:Spencer

### III. ELECTRICAL AND CONTROL DIVISION

The Electrical and Control Division is primarily interested in developing a digital interface that is capable of both displaying information on a dashboard and data logging for a post-race system analysis. Thus, the Electrical and Control Division forecasts the following set of alternatives and speculations on the design process in the listed months of the year 2013.

January – Schematics & Bill of Materials

#### March – PCB Design

Knowing the dimensions from the CAD design from the work done in February, the month of March will be spent on PCB design. The Electrical and Control Division will be in collaboration with the Vehicle Design and Build Division to determine space requirements, overall layout and fittings.

#### April – Electrical Review

The month of April will be spent on revising the overall system and checking for cohesion between the electrical blocks.

#### May & June – Dashboard Fabrication

Working with the Vehicle Design and Build Division, a dashboard panel will be completed and the entire electrical system will be implementing behind the dashboard.

#### July – Sensor Integration and Data Logging

All the sensors of the electrical components will be interfaced with the mechanical aspects, such as the engine. Testing and data logging will commence.

#### August – Final Testing & Design Documentation

The month of August will be spent integrated with the Vehicle Design & Build Division testing, fine-tuning and writing the final documentation.

### IV. VEHICLE DESIGN AND BUILD DIVISION

Due to the depth of the mechanical design process, the following forecast will be stated with bullet points.

#### January – Project Planning and Over-all Vehicle Design

- i. Planning, converting conceptual design over to virtual model in SolidWorks.

- iii. Design for steering, suspension and powertrain components will start.
- iv. Bill of Materials will commence and planned completion of mechanical design will be projected for the middle of February.
- v. Selection of known long lead items and essential components will start at this time including wheels, differential, battery, steering wheel, shocks, etc.

#### February – Sub-system Design and Material Acquisition

- i. Finalize chassis design and perform analysis according to SAE standards. Create chassis mockup to confirm basic size and layout.
- ii. We will create of sponsorship package utilizing finalized design and contacting various component suppliers to get quotes and possible sponsorships. Outsourcing website design.
- iii. Start design on suspension, brake, gear train, and electrical systems.

#### March – Chassis Fabrication

- i. Start chassis fabrication of the frame, including attachment points for sub-system components, i.e the engine mounts, cooling system support brackets, cockpit opening, roll-cage components, suspension connection points, etc.
- ii. Acquire basic parts such as the wheels/tires, radiator, differential, electrical components, desired steering wheel, driver harness, etc.

#### April – Continued Sub-System Design and Implementation

- i. Finalizing designs of steering system, fuel system, differential, suspension and braking systems.
- ii. Continuing work on chassis including engine and transmission installation. Installation of other easily acquired key components such as battery and fuel tank.

#### May – Fabrication of Suspension & Gear Train

- i. Design of aerodynamic pieces in collaboration with the research/design team.
- ii. Start machining and fabricating suspension, steering and braking components. The plan will be to install these components as they are made.
- iii. Start running fuel and brake lines.
- iv. Working with 'Electrical & Control Team' (Team 2) to implement the electronic controls and wiring harness into the vehicle. Installation of the onboard computer will also take place at this point in time.

#### June – Component Fitment & Installation

- i. Designing and building driver controls such as pedal assemblies, transmission shifter controls.
- ii. Testing/calibrating braking and steering systems.

- iii. Designing and fabricating intake manifold with restriction system according to SAE specs.
- iv. Exhaust system design and implantation
- v. Working with Electrical and Control Division to ease electrical installation and testing.

#### July – Fine Tuning & Testing

- i. Start vehicle testing and work to solve any performance/safety obstacles.
- ii. Secure testing location and start creating testing documentation.
- iii. Implementing SAE competition tests to verify design and competition compatibility.

#### August – Final Testing and Design Documentation

- i. Continued testing and optimization/tuning, introducing endurance testing.
- ii. Documentation and review of vehicle design.
- iii. Final calibrations of the electronics.
- iv. Possible painting, body modifications for presentation including decaling and sponsor logos.
- v. Planning for SAE competition including travel plans, fundraising, and project handoff to 3<sup>rd</sup> year class.