

ANALOG AND DIGITAL CIRCUITS

DIGITAL ASSIGNMENT

MINI PROJECT

**DESIGNING A STEERING WHEEL
PRINTED CIRCUIT BOARD FOR PRAVEGA
RACING**

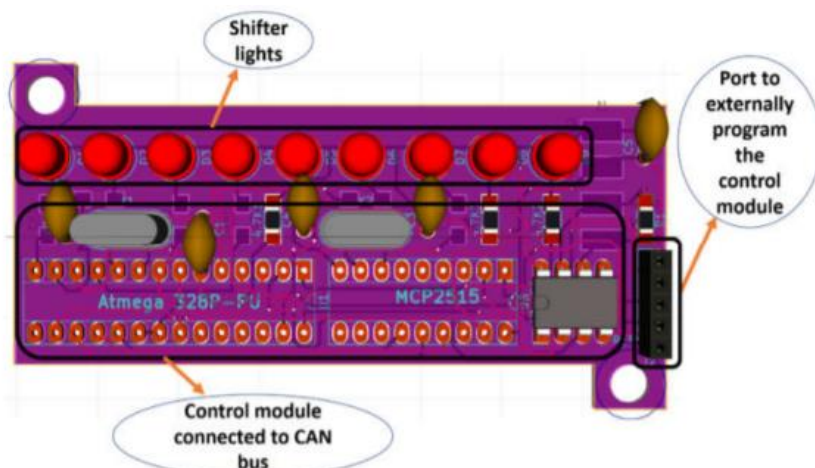
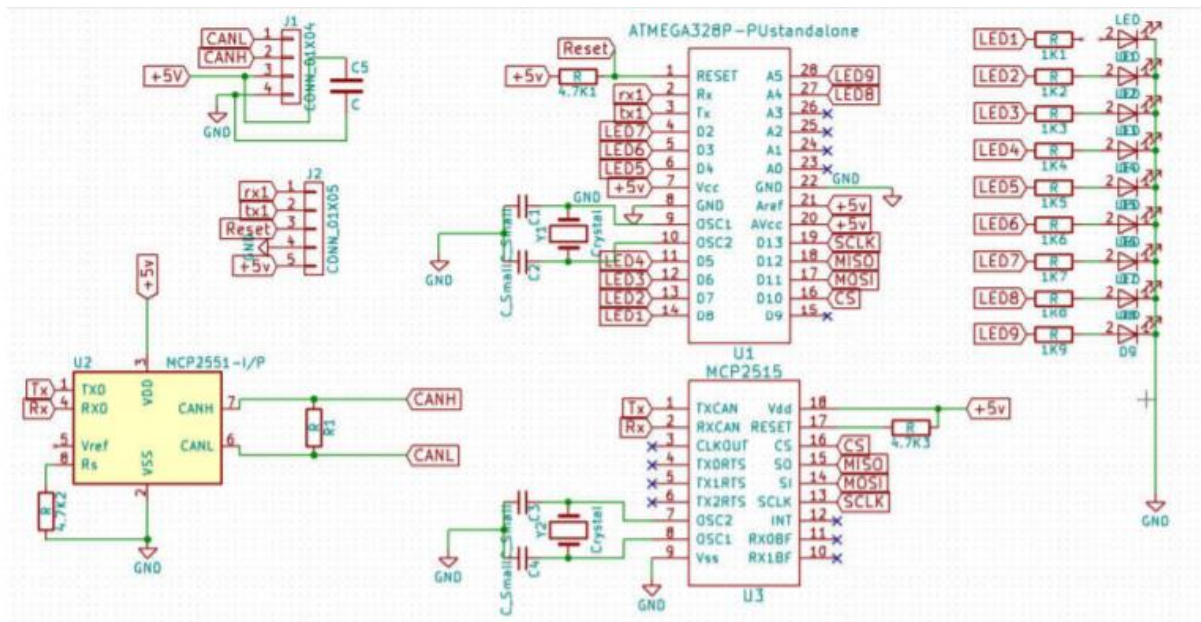
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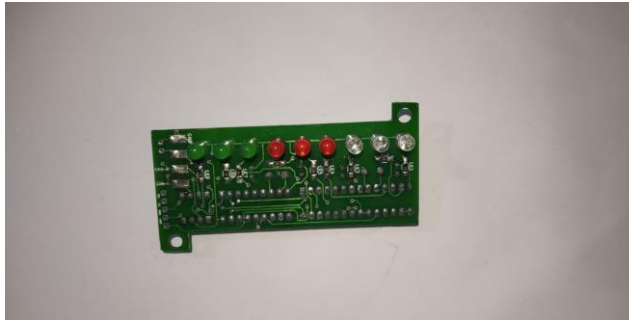
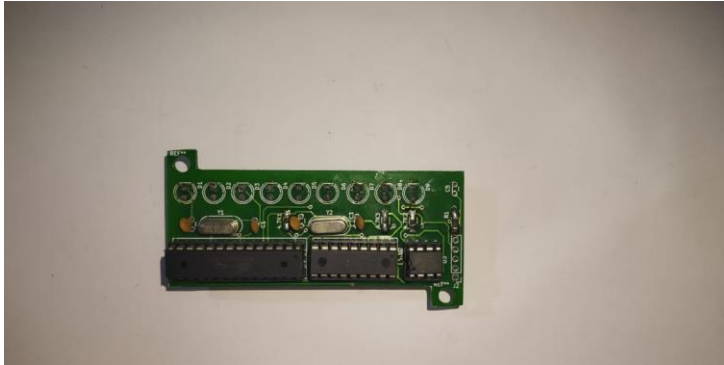
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The RPM shifter lights PCB, along with paddle shifters and Launch Control switch has been integrated in the steering wheel.

The Shifter lights control module gets wheel RPM data, through the CAN bus, which is then coded accordingly.

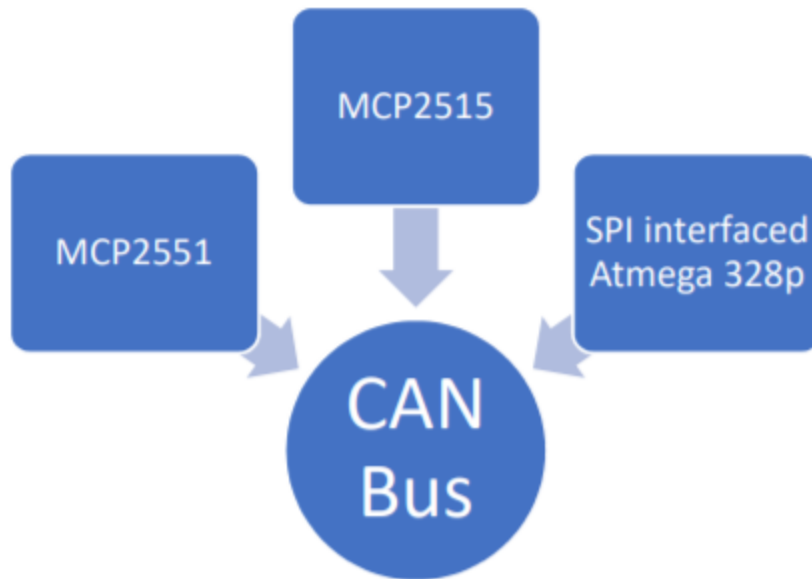
Complete schematic and 3-D view of the PCB are given below:



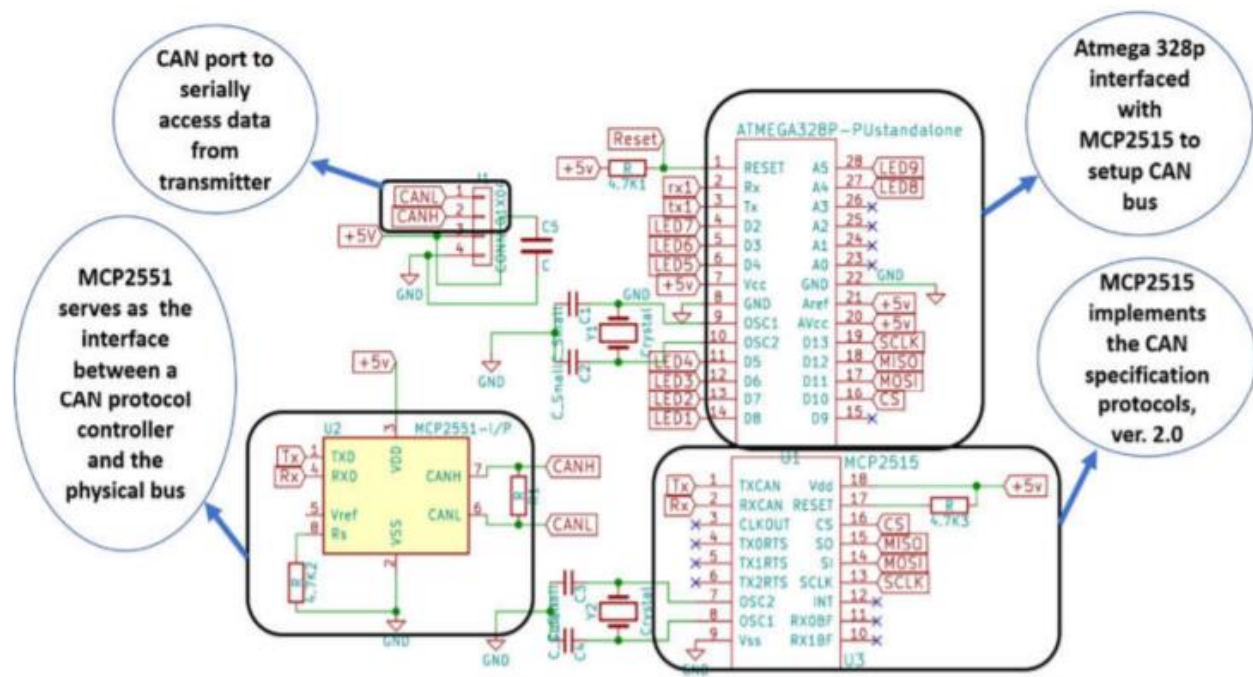


The data for the shifter lights to work is provided by the CAN bus.

CAN (Controller Area Network) is a robust vehicle bus standard designed to allow microcontrollers and devices communicate with each other.



The detailed schematic for the CAN bus is given below:



The CAN bus, operating at 16 MHz clock frequency, helps in channeling data of different sensors as well as engine data from ECU to the required port.

CONCLUSION AND SUMMARY-

The MCP2515 receives the CAN-HIGH and CAN-LOW signals from the CAN BUS which contains the information about the rpm of the car. This data is communicated to the MCP2515 via Universal Asynchronous Receiver/Transmitter(UART) which in turn transmits it to Atmega328 microcontroller via Serial Peripheral Interface(SPI). The Atmega uses this data to control the LEDs to indicate to a certain level what the best rpm for shifting gears is. This improves the car performance by assisting the driver in getting seamless gear shifting.