CAR BLACK BOX

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INTRODUCTION

The concept of a Black Box originated in the aviation industry, where flight recorders are used to investigate aircraft accidents. Similarly, Car Black Boxes are designed to provide valuable insights into vehicle accidents, helping investigators determine the cause and contributing factors. A typical Car Black Box records a range of data, including speed and acceleration, braking and steering data, airbag deployment, seatbelt usage, crash forces, and GPS location. This data can be used to reconstruct the events leading up to a crash, identify potential safety issues, and provide feedback to drivers.

ABOUT CBB

What is CAR BLACK BOX?

A Car Black Box, also known as an Event Data Recorder (EDR), is a device installed in a vehicle to record and store data related to the vehicle's operation, including accidents or crashes. The primary purpose of a Car Black Box is to reconstruct accidents, improve vehicle safety, and enhance driver safety.

What Data is Recorded?

A typical Car Black Box records:

1. Speed and acceleration
2. Braking and steering data
3. Airbag deployment
4. Seatbelt usage
5. Crash forces and impact data
6. GPS location and time

PURPOSE OF CBB

The primary purpose of a Car Black Box is to:

1. **Reconstruct accidents**: By analyzing the recorded data, investigators can reconstruct the events leading up to a crash.
2. **Improve vehicle safety**: Data from the Black Box helps manufacturers identify potential safety issues and make improvements.
3. **Enhance driver safety**: Some Black Boxes provide real-time feedback to drivers, encouraging safer driving habits.

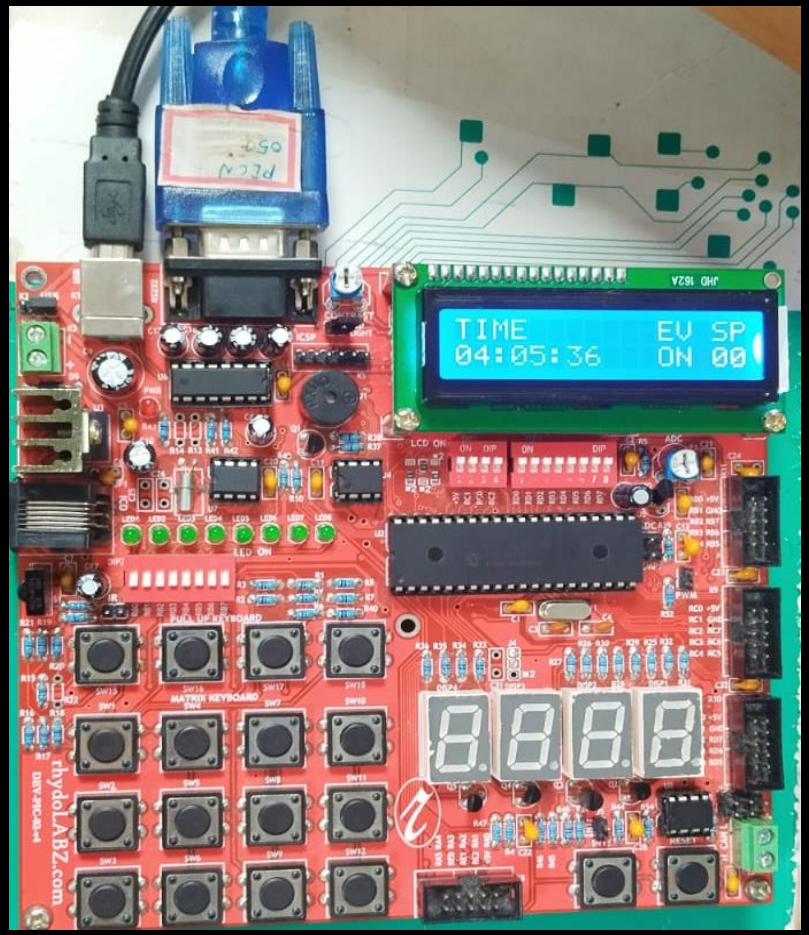
REQUIREMENTS

HARDWARE:

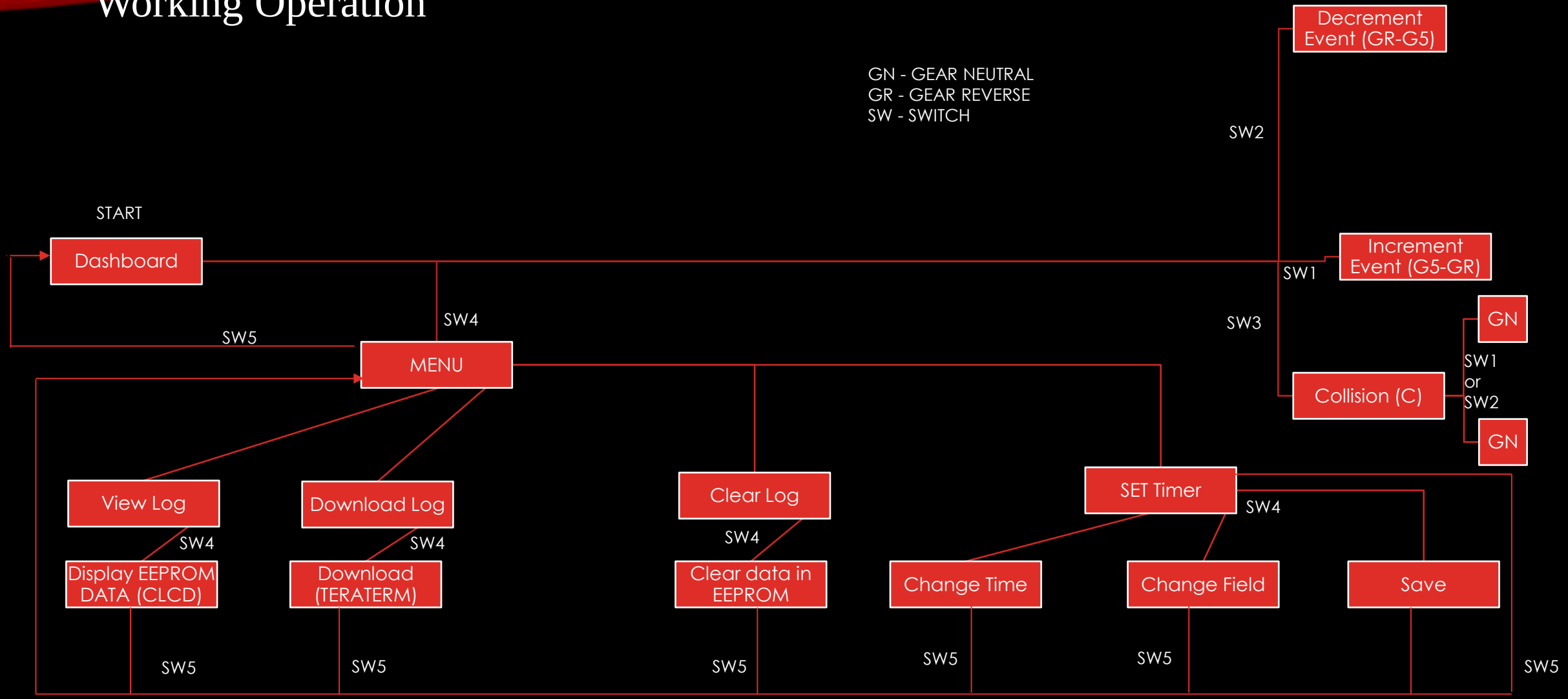
1. CLCD (DISPLAY)
2. Matrix Keypad(SWITCHES)
3. Microcontroller(PIC18F4580)
4. Potentiometer
5. EEPROM
6. RTC(Real Time Clock)

SOFTWARE :

1. MPLAB IDE(V 6.0)
2. Tiny boot loader
3. Tera term



Working Operation



Working Operation

DASHBOARD

Display Time, Event And Speed(from potentiometer)
Reset or powered on Event should be in ON.
Switch pressed:
SW2 :- Increment Gear(GR-GN-G1-G2-G3-G4-G5)
SW1 :- Decrement Gear(G5-G4-G3-G2-G1-GN-GR)
SW3 :- Collision Mode(C)
Potentiometer(Increasing and decreasing speed)
SW4 :- Change Mode(MENU)

Fig :- DASHBOARD on CLCD

MENU:
1. View log
2. Download log
3. Clear log
4. Set timer

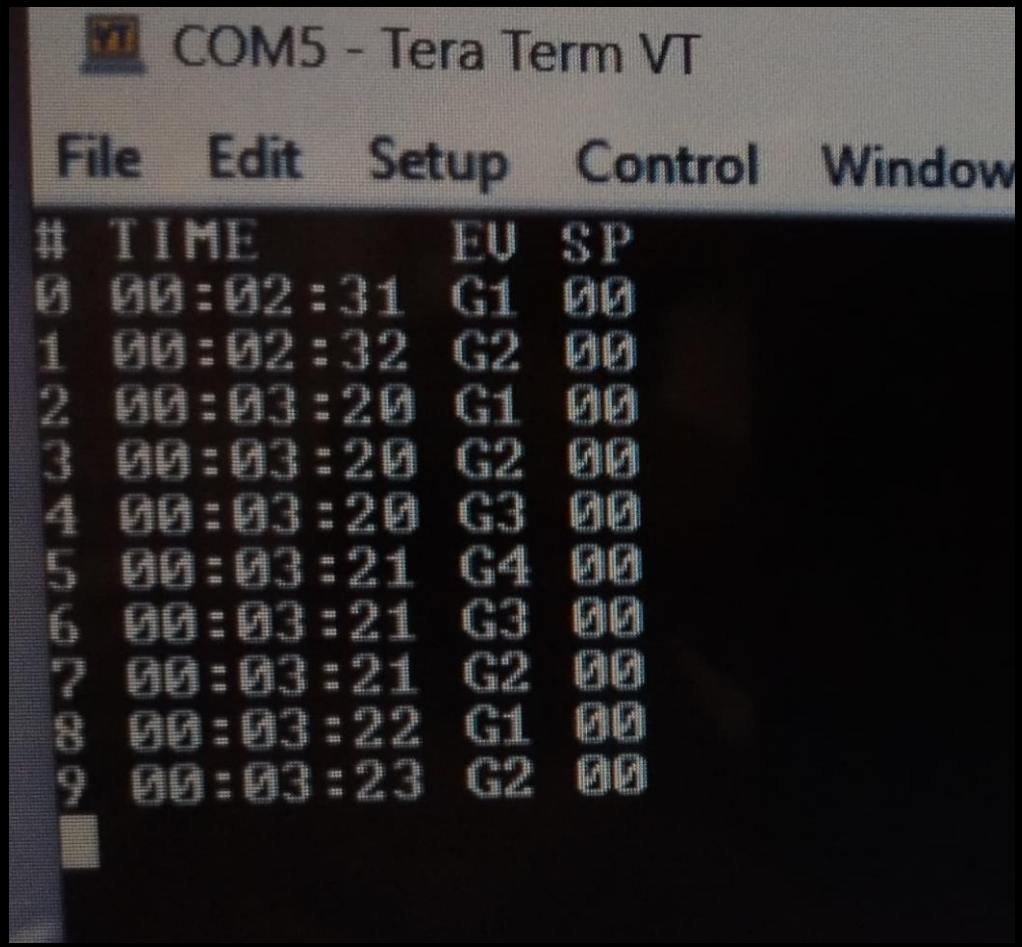
Fig :- MENU on CLCD

NOTE: Wherever '*' is pointing when you press 'SW4' go to that log or mode and 'SW5' pressed go back to Dashboard

Working Operation

1. View Log

Display storing data from EEPROM on CLCD.
Switch pressed:
SW1 : Scroll up data.
SW2 : Scroll down data.
SW3 : Come back to Menu.



2. Download Log

Display the data in system using UART(protocol).
Display Download Successfully on CLCD.

Working Operation

Clear Log

Clear all the Stored Data In EEPROM.
Display Clear Successful on CLCD.

SET Timer

Change time in RTC(Real Time Clock).
Switch Pressed:
SW1 :- Change time(HH,MM,SS)
SW2 :- Change Field
SW4 :- Save and Exit (MENU)
SW5 :- Exit (MENU)

Fig : SET Timer

APPLICATIONS

1. **Accident reconstruction** : Analyze data to determine the cause and contributing factors of an accident.
2. **Improved road safety**: Identify high-risk driving behaviors and locations to inform safety initiatives.
3. **Vehicle tracking**: Monitor vehicle location and movement in real-time.
4. **Crime investigation**: Use data to support crime investigations, such as hit-and-run incidents.
5. **Vehicle performance monitoring**: Track vehicle performance and identify potential issues before they become major problems.

CONCLUSION

The Car Black Box is an essential tool for enhancing road safety, minimizing accidents, and promoting driver accountability. By recording and analyzing critical data related to vehicle operation, Car Black Boxes provide invaluable insights into driving behaviors, vehicle performance, and accident causes.

With applications spanning safety and accident investigation, insurance claims, vehicle maintenance, driver monitoring, fleet management, law enforcement, and research, Car Black Boxes have the potential to revolutionize our interaction with vehicles. As technology continues to advance, Car Black Boxes are expected to play an increasingly significant role in shaping the future of transportation, fostering safer roads and more efficient driving practices.

THANK YOU