

# Project Proposal

## RC Racer (RCR)

### Project Abstract

The radio controlled car RC Racer or RCR will house the Z8 Encore evaluation board. RCR will also be a game. Points will be given (at a certain time interval) for the time that RCR is in operation and there is no crash detected. If a crash is detected, points will be deducted depending on the severity of the crash. There will be audible feedback when RCR crashes into an object. Using the three buttons on the Z8 to toggle between displays, the LED display will show the current score, display the number of times RCR has crashed, and the battery level.

### Strategy

Description of the overall design: Above

What platform: based on the Zilog Z8 Encore chip and development platform

What capabilities: GPIO, timers, analog inputs, interrupts

What external: Radio Control, drive motor, steering motor, chassis, speaker, battery power supply

What sort of evaluations: Read data sheets.

What software modules: Accelerometer Manager, Radio Control Manager, Drive Train Manager, LED Manager, button manager, audio manager, Main control loop.

## Unknowns

Power consumption.

The type of motors that will be required to drive RCR with the possibly limited current from a Z8 IO pin.

RCR will be susceptible to a lot of vibration when bumping into things. Will the external components stay together and at what max. speed on impact?

## Implementation Plan

Acquire all components (battery pack, accelerometer, chassis, wheels, gears, motors, radio control receiver and transmitter, speaker)

Test the motors to see if a current driver is needed.

Build battery pack and test if there is enough power for 30 min.

Assemble chassis, wheels, gears and motors.

(everything above this should be done within the first 3 weeks from now and everything below this should be done in the last 3 weeks)

Attach radio control receiver.

Radio Control Driver.

Test radio control transmitter for good communication.

Drive train driver.

Attach accelerometer.

Accelerometer driver.

Attach speaker.

Audio output driver (takes a ringtone and plays it from a buffer)

Display Driver.

Button handler.

I plan on solving the unknowns and verifying the hardware components by looking at the data sheets and testing the components. I plan to use the Zilog IDE debugger to help test the software components. The critical path will be to have a working Radio Controlled car. A decision that would have to be made later on in the project would be if RCR crashes into an object and the components fall off, then the accelerometer part and therefore the game aspect of RCR may have to be omitted.

## **Resources**

Z8 Encore Evaluation Board (university hardware)

Speaker (university hardware)

battery pack

accelerometer

chassis, wheels, gears (maybe there is a kit for this)

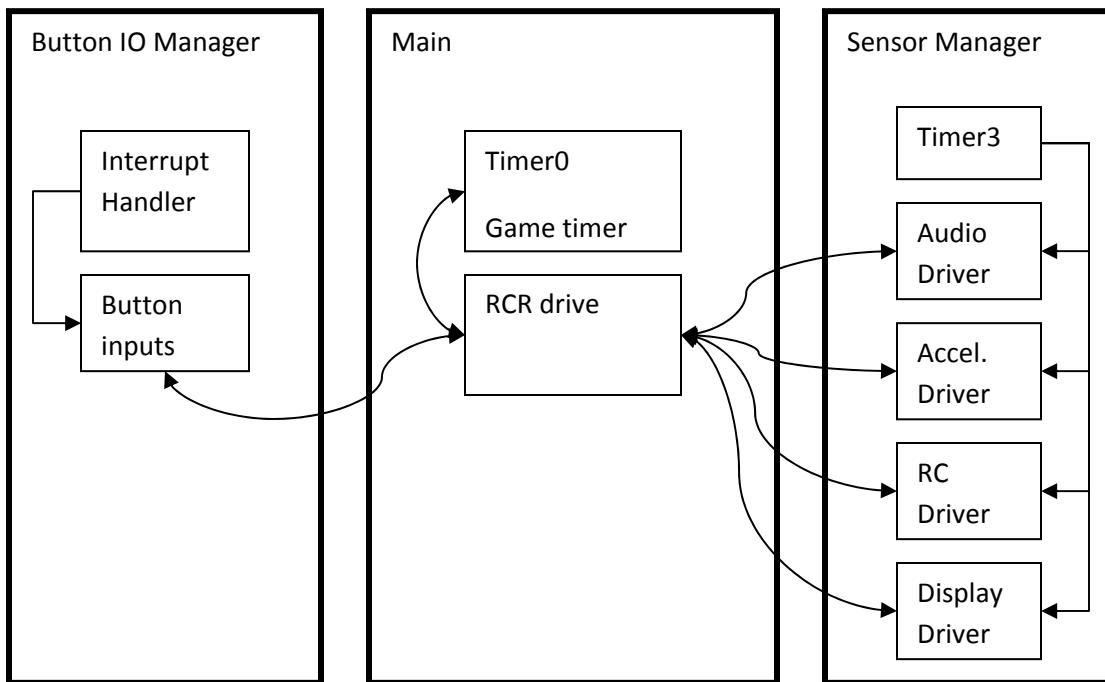
motors

radio control receiver and transmitter

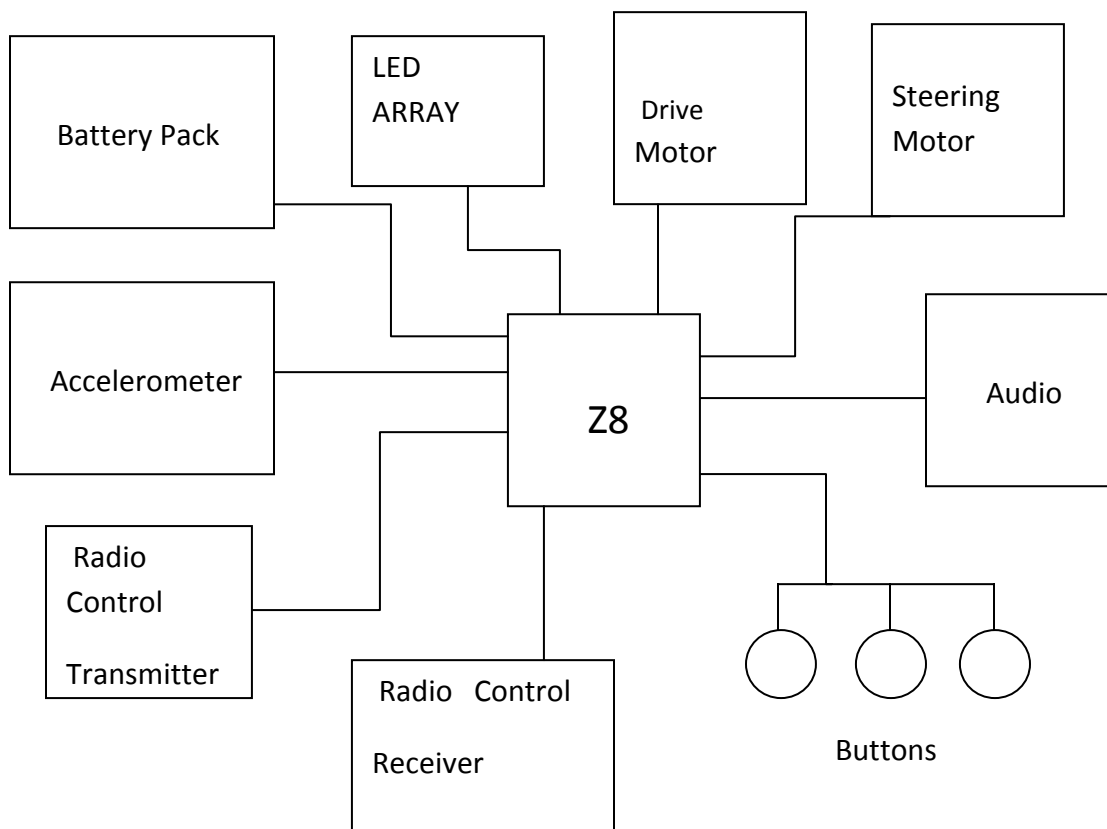
I will obtain most of these resources from online stores.

I will use the Zilog IDE to program the Z8 Encore board.

I will use a multimeter and an oscilloscope if necessary.



Preliminary software block diagram



Preliminary hardware block