

Train automation using RF with voice annunciator for the stations

The project aims in designing a system which announces the station name as well as stops and start automatically. In this project wireless RF technology is used.

The modules in the project are: control switch when pressed transmits unique ID through RF. RF transmitter and receiver to establish wireless communication between the system in train and system in station. DC motor with driver is capable of controlling the start/stop of train and voice circuit to announce station name.

RF Communication ranges in between 30 KHz to 300 GHz. RF communication works by creating electromagnetic waves at a source and being able to pick up those electromagnetic waves at a particular destination. These electromagnetic waves travel through the air at near the speed of light. The wavelength of an electromagnetic signal is inversely proportional to the frequency; the higher the frequency, the shorter the wavelength.

The controlling module of the whole system is a Microcontroller. The RF transmitter present in the station continuously transmits a unique ID assigned to station. Whenever a train enters into the station, the RF receiver present in the train receives the ID, this ID is fed to the Microcontroller which processes this information and announces the station name relating to that ID which is already stored in the voice circuit. Also, the Microcontroller switches OFF the DC motors of train. After a predefined time interval, the motors of the train will be automatically started. This provides complete train automation. The Microcontroller is programmed in Embedded C language.

The main objectives of the project are:

1. To eliminate manual operations to start and stop the train.
2. Automatic station name announcement when train enters the station.

The project provides the following learning's:

1. RF communication.
2. DC motor.
3. Voice circuit.
4. Conversion of AC supply to DC supply.
5. Embedded C language.
6. PCB design.

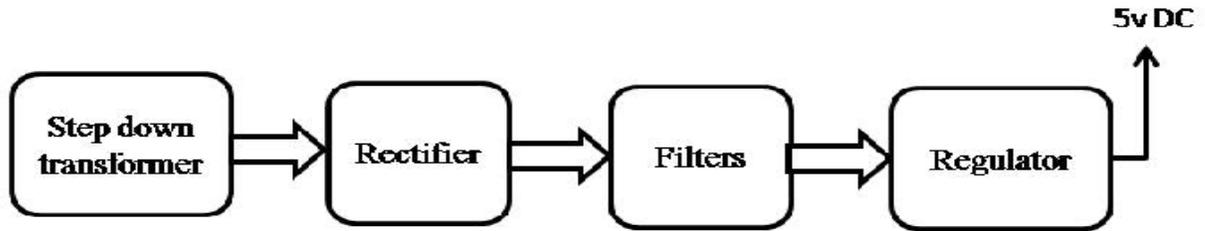
The main building blocks of the project are:

1. Regulated Power Supply.
2. Microcontroller.
3. Control switch.
4. RF transmitter and RF receiver.
5. Voice circuit.
6. Reset.
7. DC motors with driver.
8. Crystal oscillator.
9. LED indicators.

Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

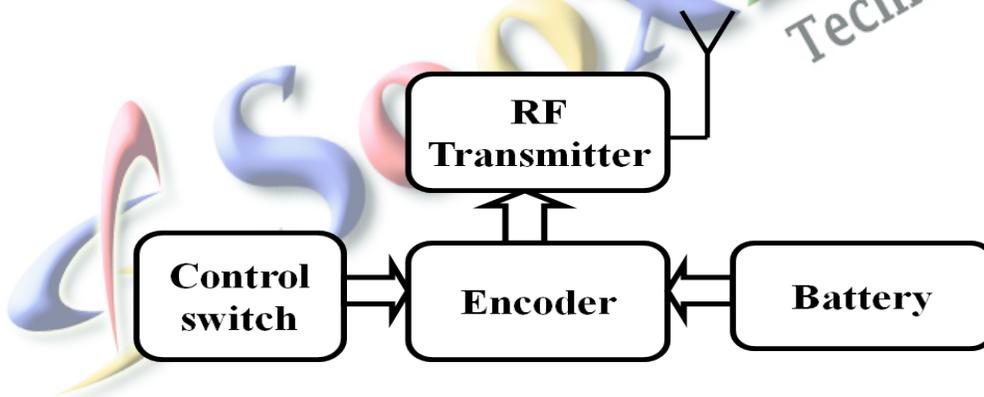
Regulated Power Supply:



Block diagram:

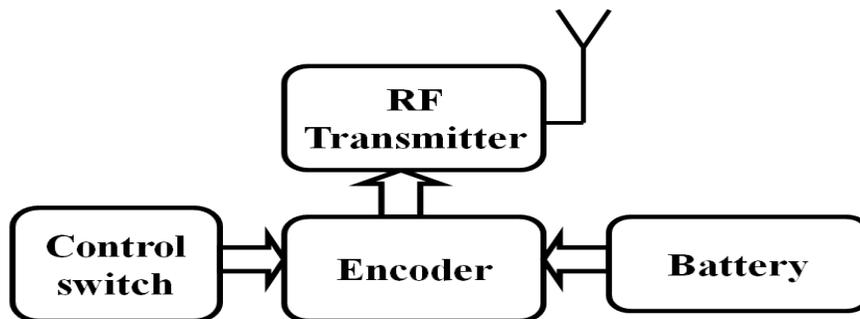
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1. Station -1



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2. Station -2



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3. In Train

