

Design of Ai Based System for Railways to Avoid Train Accidents Due To Crack on Tracks

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ABSTRACT

In the Indian economy the major share is contributed by the transport railway network. So, problems of crack detection in railway network when encountered may be dealt with a robust and cost effective solution, else, there may be a small decrease in the nation's economy. Most of the accidents in the train are caused due to cracks in the railway tracks, which are hard to identify. And more time is required for this purpose; therefore we have implemented a conductivity sensor, which identifies the cracks and gives an alarm. In this paper we have tried to give an exact solution by the technical details and design aspects.

Keywords:- Railway Track, Conductivity sensor, RF Transmitter, RF Receiver, Buzzer, 555 timer.

I. INTRODUCTION

Now days, there are many train accidents are happening due to cracks on tracks. these accidents are mainly happening because of that it is very difficult to find cracks on long tracks .we have designed this to overcome this and to avoid train accidents.

In this project we are going to continuously monitoring long tracks to find cracks which will help to locate the crack and resolve it. When a crack is detected on a track, the system will inform the nearest railway station and also it will send to the line man informing about the crack. at the same time the system will change the signal to red for that track to avoid accident.

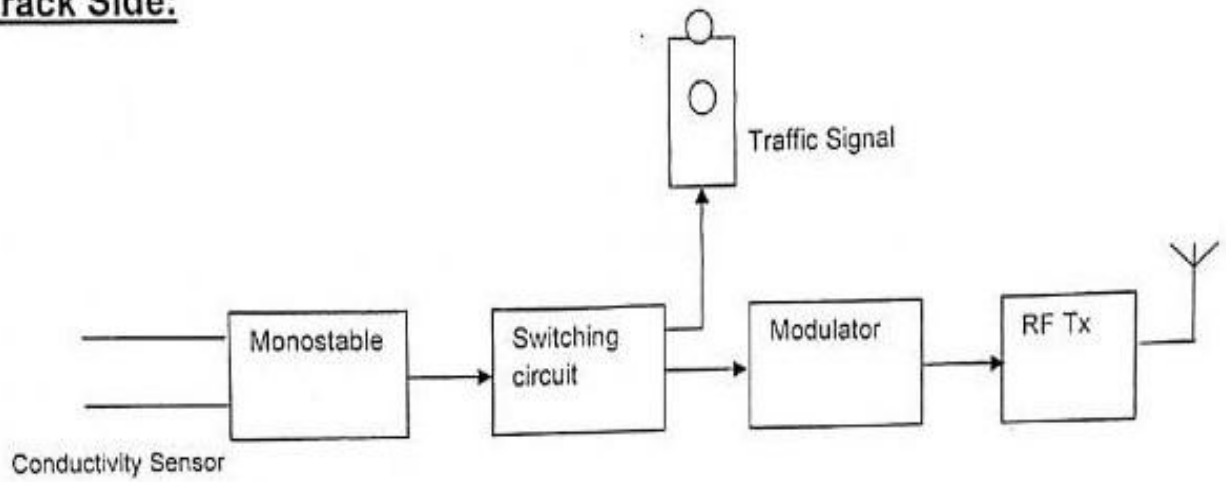
This system will be designed to control the railway track by detecting the train from a safer distance and also it will automatically reduce the train speed and stop the train to avoid accidents

II. HARDWARE REQUIREMENTS

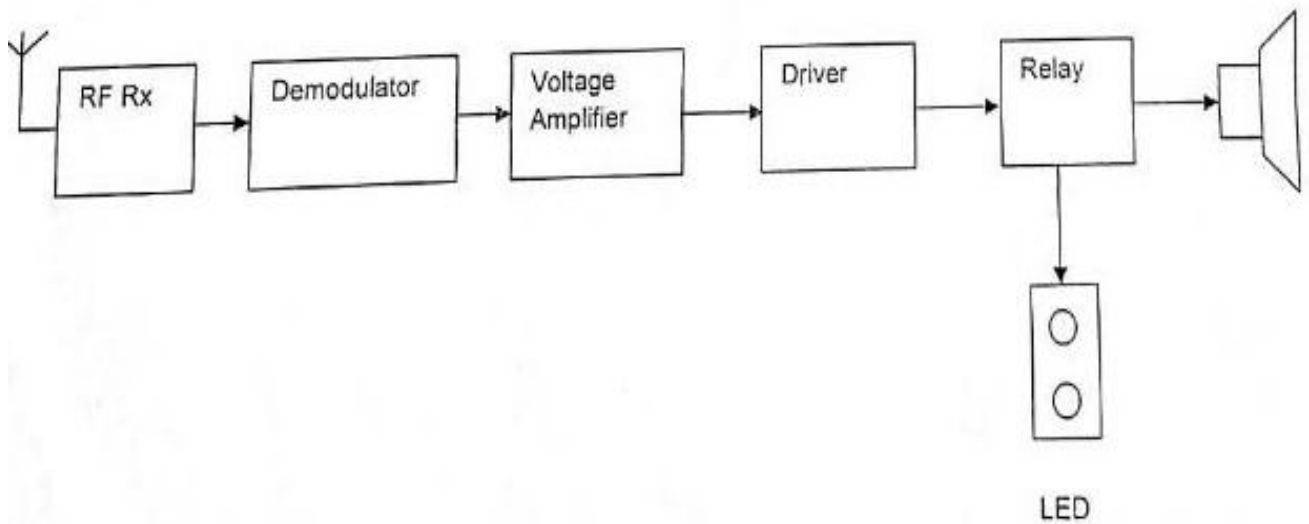
- *RF Transmitter*
- *RF Receiver*
- *LED Array*
- *555 Timer*
- *Buffer and driver circuit*
- *12v relay*

BLOCK DIAGRAM:

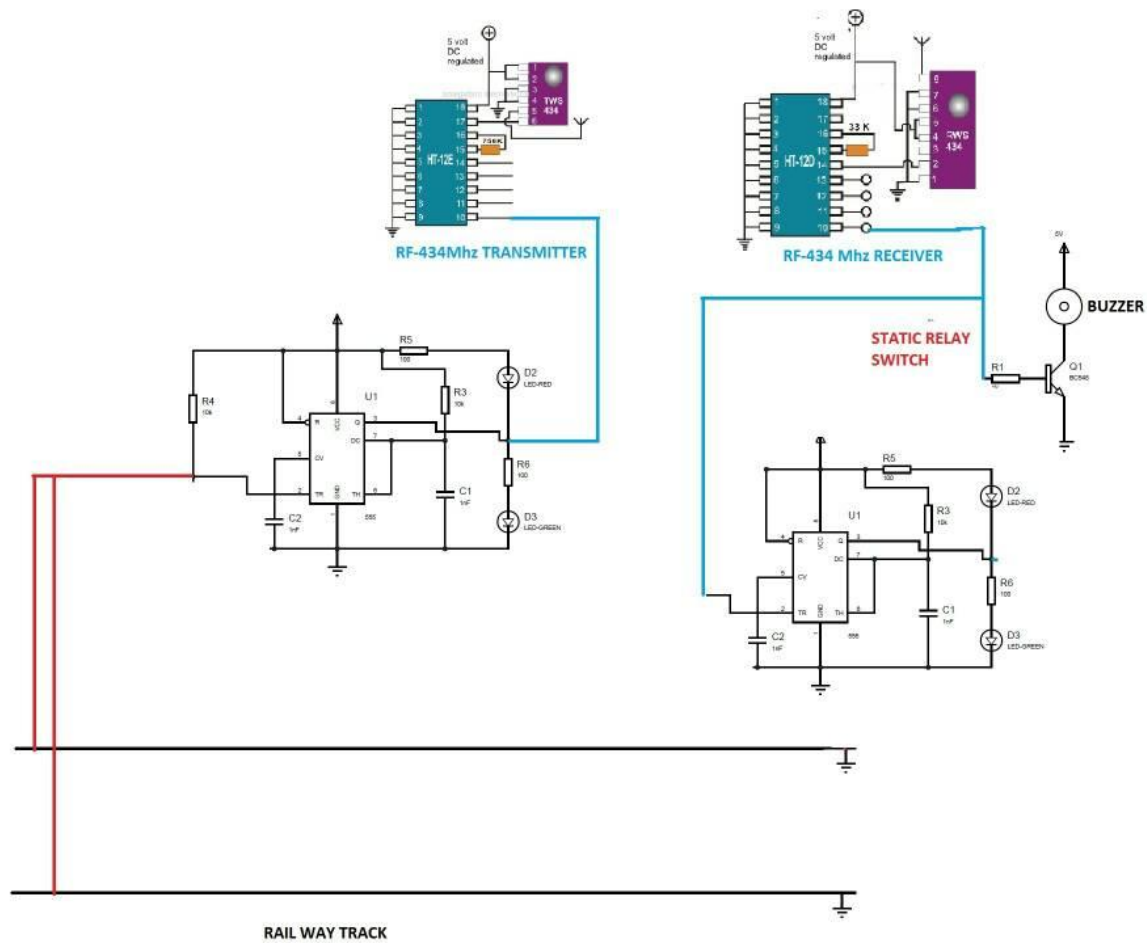
Track Side:



Railway Station / Train Side:



III. CIRCUIT DIAGRAM



Methodology:

The project has two sessions. They are railway track crack detecting and informing system which enables us to provide maximum security to railway circuits

In the railway track crack detecting system we are using continuity sensor to find the cracks on long tracks .If there is any crack on the track then the sensor will detect it and inform that to the nearest railway station. Also the system will change the traffic signal for that track to red. In this system we are dividing the track in to sessions which will help to locate the crack easily. The system will send the information also to the station. We are using RF technology to send information to the railway station. When the information is received from the system fitted in the station, it will automatically send a message to the line, which

helps the line man to find the crack area easily and to rectify the issue.

With the help of the system we can avoid train accidents, save time and can avoid train delay.

Advantages:

- Quick tracking of the cracks on the railway tracks and can rectify easily
- Easy to automate unmanned level crosses
- Can avoid accidents due to trains coming on the same tracks

Applications:

- To automate unmanned level cross
- To crack cracks on railway tracks
- Helps to reduce man power

Future Scope:

For the future scope with the help of GPS (Global Positioning System) we can detect the cracks in railway tracks via satellite control.

Acknowledgement:

We are using this opportunity to express our gratitude to everyone who supported us for writing this review paper.. We sincerely thank them for sharing their truthful and illuminating views on a number of issues.

We are expressing our warm thanks to our guide Prof. Miss. Anusuya patil. (Department of Electrical and Electronics) for their guidance and support.

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IV. CONCLUSION

The Indian railways are the largest rail passenger transport in today's world and it is the back bone of the country transport infrastructure. The main problem about a railway analysis is detection of cracks in the structure. If these deficiencies are not controlled at early stages they might lead to a number of derailments resulting in a heavy loss of life and property. The proposed broken rail detection system automatically detects the faulty rail track without any

human intervention. There are many advantages with the proposed system when compared with the traditional detection techniques. The advantages include less cost, low power consumption and less analysis time. By this proposed system the exact location of the faulty rail track can easily be located which will mended immediately so that many lives can be saved. The method can be implemented in large scale in the long run to facilitate better safety standards for rail tracks and provide effective testing infrastructure for achieving better results in the future.

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