World Wide Journal of Multidisciplinary Research and Development

WWJMRD 2016; 2(2): 23-26
www.wwjmrd.com
e-ISSN: 2454-6615

Zahedi Arismani Abolfazl
School of Engineering, Islamic Azad University Jasb Natanz City, Emam Street, Isfahan, Iran

Masud Naderi Rad
School of Engineering, Islamic Azad University Jasb Dezfull city, modares Street, dezfull, Iran

Dehshiri Badi Alireza
School of Engineering, Islamic Azad University naragh Natanz city, Imam Street, Isfahan, Iran

Correspondence:
Zahedi Arismani Abolfazl
School of Engineering, Islamic Azad University Jasb
Natanz City, Emam Street, Isfahan, Iran

Frequency electronic circuits rail way system

Zahedi Arismani Abolfazl, Masud Naderi Rad, Dehshiri Badi Alireza

Abstract
To ensure an orderly and logical progression and movement of trains, the station complex operation and safety of rail transport block without the use of devices is not possible symptoms. Especially, when operating with maximum efficiency is also taken into consideration. The role of electrical equipment, signs, safety, accuracy and speed in the transportation.This rail paper has introduced the various electronic circuits such as interlocking systems include CTC and PRC and software as well as how the automatic block system.

Keywords: Rail Transport, Electrical PRC, CTC Systems, Automatic Block System

Introduction
Phenomena of electrical signals with the emergence of railways in the face of a new method of Danny's moving in the rail. This development led to a new experience was examined based on the objectives of the mechanizing the operations and dispatch and avoid the error of my labor with you to help speed up the transfer of the underlying technology was realized With Frequently asked symptoms of exploitation of electric railway system railway in the world, Iran is the first step to obtain. Iran began in Tehran central which now well along the axis of Qom, Isfahan and Yazd newer systems Julfa to Tabriz Razi in Tehran axis is in exploitation

CTC System
Train's safety in a station is usually ensured by the operators that monitor control signal devices through control panels. In this case, safety depends on telephone communication among adjacent stations and traffic command centre and other stations In the past, these communications were used as the source of information on the train's departure and consequentlythesource of any modification of the train's movements with the changes in the timetable. These process took a long time. With the application of CTC, this problem was resolved. CTC is stands for centralized traffic control and a modern and advanced control system. CTC requires the establishment of a traffic control system for a particular area or region. Once establish, it enables the responsible personnel to control directly the interlocking system of any station remotely. Major equipment of CTC Command Center include control panels, display panels, train number display unit, blocked line panel, automatic system of program registration and monitoring table Not only the full control of the train movements is possible with CTC display panel, train number display unit, line status indicator but also with its installation, immediate adjustment of the timetable is possible, thus the time required to restore programisreduced.[1]

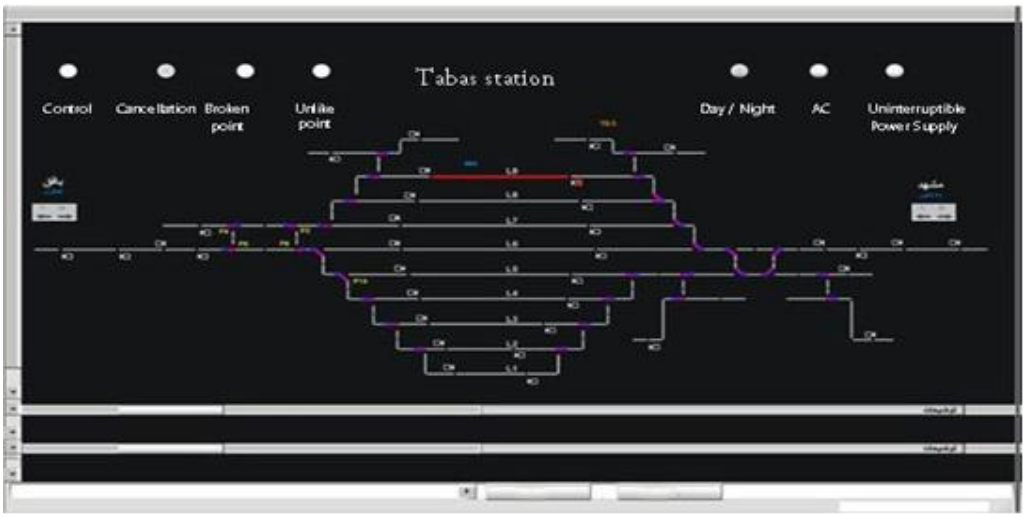

Fig 1: Anifor of signaling.

Signs of the Railway in

Order to maintain the safety of the train, the rail or rails should be no fault or defect. Furthermore, in order to avoid the occurrence of accidents such as collisions, it is necessary to maintain the proper distance between the previous and next train.And the axis of a train track in the opposite direction of another train between two stations not to. Train distance control technique are saying. When the train or wagon on the signal path of the needle will move the view, not the other way into or Rails to leave. Using safety pins to control the path of the train say. Development of necessary technical equipment control signals from the control of trains. Besides the equipment, protective devices marks the intersection of the surface to prevent a car accident with a train and the line circuit Signal control equipment is used as the signs are there. [2]

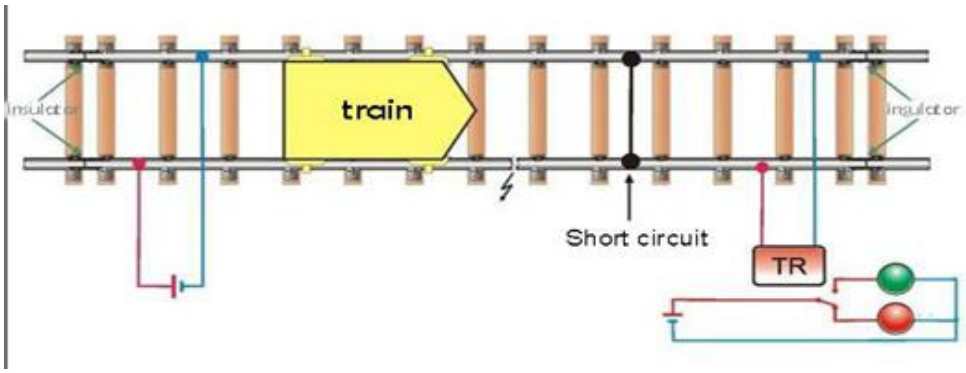

Fig 2: working principle of the circuit.

Open Systems and Closed-Circuit Line

Open circuit system, the electric lines of the relay circuit that is normally excreted. On arrival by train to the main train line circuit relay and the relay is being drawn up Thus Show (a) or Absorption signal relay line is displayed. This circuit is not necessary because the safety line in case of power failure or wire breakage or uncertain tracks, etc. Despite the train line circuit fault, the relay will not be absorbed. This circuit is not used except in special cases.Depending on the circuit, the electrical circuit is closed when its effect is absorbed in normal mode. When the train arrived right portion of the school is the main circuit through a low resistance Short circuit by train, So that a small current through the relay and the relay will be excreted. View of (a) the signal relay tr disposal is displayed. So the relay operation when the normal immune from power outages and other failures holds. Line circuit pack for high safety applications is common, however, due to its high energy consumption of the circuit is constant.[1-2]

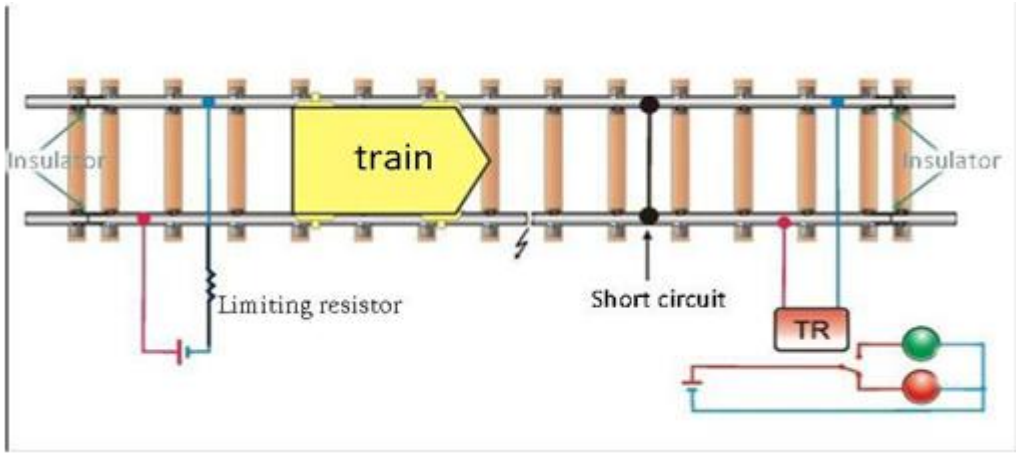

Fig 3: Working principle of the circuit.

Frequency Circuit Line

Conventional lines and electrical line frequency circuit (AC-DC) does not require isolation between adjacent tracks and the separation between adjacent tracks if accepted by the electrical circuits In this case the conductor rails for electric trains is totally secure. It selectable frequencies used in the separate groups of four to six kHz 9 kHz to 17 kHz and is. These frequencies are chosen in such a way that the overall multiples of 50 Hz to love are the elite round against any interference with harmonics in electric power lines will remain unchanged In this system, every piece of track for her, which is uniquely identified by a specific code, and frequency FSK modulated ways. The signal from the sending unit to the desired track will be announced. At the end of the receiver circuit, the voltage will analyze the received code. Short circuit two rails of the track, the train was entering the track and thus no signal received by the receiver, causing the truck 10 are occupied. Changing the operation frequency and code by simply changing the number of switches on the instrument panel is done. The adjacent tracks are always different frequency code. Short circuit tow rails of the track the train was entering the track and thus no signal received by the receiver causing the track 10 are occupied. [3]

Frequency of the Circuit

Specific code for each circuit in the circuit, the frequency and frequency has been determined. Modulation techniques to transmit signals over schools will enter the track.At the receiver, the signal from leaving the track on the first floor will be filtered. Of the filter elements made of high-precision Match only if the specified frequency defined for filtering incoming frequency signal processing is applied to the next class. The classification of the received signal power is evaluated to be less than the limit defined. In establishing the conditions for releasing the code you received in the line circuit is not the source of the circuit.

Therefore, a high reliability of the system, in order to announce the release of the circuit, the following three conditions must always be true: Defined frequency matching Frequency incoming line circuit having power to accept the received signal, the received code matches the code line circuit characteristics. Should be noted that the shapes In each of the above three conditions or in case of any fault in the circuit being released immediately declared that the occupation is violated and the circuit. In order to increase the reliability of hardware and application multiplicities of two microprocessors for dual-frequency operation is analyzed and the correct code is used. in this case, both. In which case either independently or release forms processing circuit of the line is free only if agreed by both the processor circuit line will be announced.[4]

Challenges in System Line Circuit

Damage to the insulation of the rails: rails insulated circuit is separated from the adjacent lane. It may not hurt either disable or stability of the circuit can disrupt their work. As a result of the polarity of the circuit adjacent to the crash without safety lines arise. The dilemma of the circuit failure insulated conductor rails in particular, this document sets out the permissible error of his opposite poles of the circuit. most likely to fail in the height of summer to winter insulation, and other times, the extreme temperature changes cause expansion and contraction of the rails and it will creep in there. Concern insulating rails through ensuring the maintenance staff while performing their job duties such as signing tamping near insulation, tighten the fitting rails, rails set between summer and winter is another creep rails believe, should to minimize.

the foreign object in insulating rails: the high and insulated rail joints are loose metal objects and other external Comments can find The following ties. This condition causes leakage into the adjacent lane circuit. If any two adjacent pole line circuit failure without maintaining the same safety arises. The circuit includes two-way line, a central piece of insulated rail at its opposite end is very near the interface due to the conductor rails (shrup) or small metallic foreign objects, etc., there will be short at this point. Increased resistance to abrasion or the use of an extension cord because the extension cord is faulty or incorrectly stunned rail connections to be applied electrical resistance increases and This situation has led to a change in voltage in the receiver and the performance of the circuit is faulty. Increased resistance wire interface. Improper connection of thin, conductive wires used in the device relays are working irregularly. Work irregular Relay for lowering high play strength. Where quality is low and the high seed rain or melting snow and ice can increase the leakage current is Infected flowers Resulting in irregularities in the operation of the relay circuit is created so that it looks wrong. Such a situation occurs when maintenance personnel should be required to take action to remedy the situation.

There came a time share situation, the control circuit is configured correctly and the information is necessary to create favorable conditions for voltage and current circuit is

set to a range of values nominal. Short circuit line from the intersection of pipelines, bridges, transit and metal beams and cables, wires or other objects. Besides the insulation of the bridge, or in locations that require special attention are the cross beam, etc. Failure to detect the location of the hidden parts of the work and requires much time.[5]

Conclusions

Systems due to the possibility of visiting the station range of symptoms; during installation it is necessary to control the following factors: Proper installation, sturdy closure assembly screws, wire connectors, ensure the accuracy of the system (inside and outside the station) and the lack of voltage fluctuations and the precautions necessary to prevent damage to electronic systems

References

1. Takashige, T. 1999. Signalling Systems for Safe Railway Transport: Block Systems. Japan Railway & Transport Review,pp:44-47
2. Pellegrini, P.F., R. Marinetto and L. Carli, 1984. Some new techniques in the codification and transmission of data from ground to train. Intern Conference of the Institution of Railway Signal Engineers London, pp: 20-25.
3. Hill, R.J., L.J.Bond, 1995. Modelling moving-block rail way signalling systems using discrete-event simulation, Proceedings of the 1995 IEEE/ASME Joint. Railroad Conference, pp: 105-111.
4. Aguado, M., E. Jacob, P.Saiz, J.J.Unzilla, M.V.Higuero, J. Matias, 2005. Railway Signaling Systems and New Trends in Wireless Data Communication, Vehicular Technology Conference, pp: 1333-1336.
5. Mongardi, G., 1993. Dependable Computing for Railway Control Systems: Signs of the railway. Springer Vienna Publisher, pp: 255-280.