ABSTRACT

The use of microprocessors in railway signalling has come about because of certain advantages over electromechanical relays which are at present being used. The main advantages are (1) reduction in capital investment and recurring maintenance costs and (2) flexibility in coping up with yard alterations. Railways of many developed countries have undertaken their own development programmes from 1975 onwards and some experimental installations with microprocessors have come up specially in U.K., Germany, Japan and U.S.A.

In this work, a microprocessor controlled model with 8085 microprocessor was designed and fabricated as a Phase-I project with simple interlocking, with approach locking and back-locking omitted. The Phase-II of the project with approach locking and back-locking was undertaken and completed later. This included entrance-exit type of control panel.

This work deals with the various studies and analyses undertaken in the application of microprocessors. A computer simulation of the control of a passenger yard with redundant inputs is detailed. Software redundancy utilising redundant inputs is suggested to reduce 'accident' probability. A hardware-cum-software system error
detection method is suggested to obtain a desirable 'accident' probability. A method of duplication of inputs is suggested to arrive at a low 'accident' probability. Replacement of track relays which are vital, by duplicated solid state analog to digital devices is suggested for real transformation of existing electro-mechanical technology which is becoming costlier day by day.