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REPORT FOR THE U.I.T.P. SUB-COMMITTEE ON ELECTRICAL INSTALLATIONS AND SECURITY - STOCKHOLM 27-28 SEPTEMBER 1990

TOUCH AND PASS SYSTEM

Introduction

In 1985, the installation of an Automatic Fare System commenced on London Underground. The system became known as the Underground Ticketing System (U.T.S.) The system included ticket machines and automatic gates installed in the Central London area. The tickets are magnetically encoded and read after being inserted into the entry slot of the gate, before being returned to the passenger through the exit slot.

Although the introduction of the automatic checking of the magnetically encoded ticket is progressing well, speed of passing through the gates in very crowded conditions has caused discontent. Additionally, it is recognised that passengers with manual dexterity problems or those carrying large or multiple pieces of luggage experience difficulty using the automatic gates. Cases of possible fraud have also been detected.

Touch and Pass System Operation

In early 1989, a prototype of the Touch and Pass system was demonstrated to the Engineers of London Underground during a visit to the United States.

System Operation

The Touch and Pass system is a non contact data read and write system using Radio Frequency technology. It consists of two parts:-

- 1) The Target, which is a radio antennae capable of transmitting and receiving and is mounted on top of the ticket gate with its control equipment installed in the gate. The Target is identified as a yellow rectangle on top of the gate and transmits a carrier frequency of 2.76MHz continuously.
- 2) The Tag, or hand held activator. The Tag is a credit card sized plastic block containing a receive/transmit coil, a microprocessor and a battery.

The Tag is programmed before issue and is a passive device until it becomes within the range of the Target. This is up to a distance of 10mm. When the Tag is near the Target, the Target's transmitted R.F. signal activates the circuitry in the Tag. The Tag then transmits the data in the memory to the Target. The Target receives the data, checks it and sends it to the Logic Control Processor in the gate. The Target also transmits an acknowledgement signal to the Tag. Data held in the Logic Control Processor is now transmitted to the Tag. The Tag verifies the data and sends the acknowledgement signal to the Target. On receiving this signal, the Logic Control Processor causes the automatic gate to open.

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Site Trials

After discussions over the following months, it was decided to carry out a trial of the concept using selected members of staff and a sample of passengers.

The Major purposes of the trial were to:-

- a) assess the passenger/gate interface
- b) to check the engineering feasibility of producing a reliability level to satisfy both London Underground and the passengers.
- c) to assess the marketing appeal and passenger reaction to using a Touch and Pass system. The trial used a sample of 250 members of staff and 250 passengers who were annual season ticket holders. These passengers were given free travel during the period of the trial for their assistance in this venture.

Three stations were selected for the trial, these being St James Park, Green Park and Victoria. Two entry and two exit gates at each station were fitted with the Touch and Pass equipment. The trial commenced on 23 April and will be completed at the end of July.

Throughout the trial, survey teams have been used to measure speed of passengers passing through the gate, ease and manner of use, general comments on their likes and dislikes of the system and comments of non participating passengers on their desire or otherwise to be included in further trials.

Early results indicate that the trial has been a success and is widely appreciated by the sample groups of passengers and staff.

The equipment interfaces well with the magnetic ticket technology and scanning of the ticket is completed at a similar speed to the magnetic system.

At the start of the trials the failure rate was unacceptably high. Modifications were quickly made with much improved results, the most significant being the screening of the Tag against static discharge.

Future Trials

It is intended that a future trial will take place when all comments have been analysed and any further improvements made to the system. An assessment will then be made of the cost/benefit of introducing such a system permanently.



M I BLETCHER
Power and Electrical Engineer