TRAIN DESCRIBERS
by Ross Deacon – Principal Engineer, Signalling, LUL
A report of the LURS meeting at All Souls Clubhouse
on Tuesday 11 November 2016

Ross started the presentation with some statistics on TfL and some recent achievements, before outlining his involvement with Train Describer (TD) systems within London Underground.

Ross first came into contact with Train Describers when he started a four-year apprenticeship in the Chief Signal Engineer's department in 1978. He thought it was going to be all high tech and electronics, but he was mistaken!

The first item of Train Describer he was presented with was the Drum Receiver. This is a large (and heavy) electro-mechanical device. Patented in 1904, these continued to be used to work until 2012, when the last one at Earl's Court was replaced with a Programmable Logic Controller.

The next stage of development was using paper tape to store descriptions transmitted between signal cabins. This system was known as Ribbon Storage Train Description, or RSTD. RSTD equipment worked by receiving a description for a train and punching a code onto a roll of paper tape, similar to a Programme Machine. This tape is then advanced through by the passage of each train, allowing the descriptions to be read and displayed. Being another electro mechanical device, it required a lot of care, and Ross' first job was to "oil the papers", which involved applying a thin film of oil to prevent the paper from snagging between the two metal surfaces. In the Signal Overhaul Shop, he was involved in overhauling and rebuilding TD equipment, including 'lacing up' the wiring.

At the time, work was taking place to replace RSTD with a more modern, electronic based system. These replacements were predominately designed and built in-house by London Underground in the 1970s and early 1980s. Ross was then tasked with running the new devices through various tests including subjecting them to a 24-hour hot chamber test. 256 Codes had to manually entered via thumbwheels on the front of the units, and then laboriously checked again after the heat treatment to prove that it worked in difficult conditions.

Ross then gave a basic overview of the principles of TD systems.

London Underground's signalling is split into areas of automatic and controlled signalling. Within each controlled area, the signaller can regulate the train service.

As a train leaves a controlled area, the train description is transmitted in a coded form to the next controlled area, via the intermediate stations along the line. At the next controlled area, the code is stored, read when the train arrives, and only retransmitted to the next controlled area when the train passes.

The TD code is set up by the signaller. This is made up by up to five characters, and they show the destinations (and sometimes stopping pattern) of the train.

Train describer requirements for a terminal station are a bit more complicated. Not only do codes need to be set up, but there is also a need to provide information for the passengers on which train will depart first. Such signs are normally in ticket halls, on overbridges and concourses so that people know where to get their train. At traditional signal cabin locations (such as Hammersmith) the operator manually controls these displays using push button TD equipment. At sites which are remotely controlled from a Control Room, the programme machine, or computer provides the logic to control the display and a manual override is provided for the operator. The computer systems have redundant elements, so that if a part fails, a duplicate part will take over and it will all continue to operate.

Ross then explained the concept of the much-criticised "London Underground Minute" which is a rather variable unit of time! The problem exists on lines which use a standalone TD system to operate platform Dot Matrix Indicators, rather than a line which uses a computer control system.

There are "count down markers" that are placed 2 minutes back, 4 minutes back, 6 minutes back etc. from the station, so the TD system knows where the trains are. When trains are running well, it can give an accurate idea of when trains are going to arrive, but if there is a problem and there is a delay to the train between the markers, the Dot Matrix sign remains stuck on the previous estimate, until the

train arrives at the next marker. Once all of these standalone systems are replaced by centralised control and information systems, accuracy will improve.

In a typical centralised system, there is still some operator input. A control room has workstations that feed the information to the PFE (Passenger Front End) computers. The control system does the rest automatically, unless the signaller needs to intervene. Down on site, there is a customer information sign controller. This gives the station supervisor the capability to put up their own local messages and they can update the display to provide further local information.

During the Olympics, you may have seen signs on the Central Line showing how well Great Britain was doing in the medals table. This additional functionality is only possible with a centralised system. However, an essential part of a centralised system is the offensive word editor, ensuring that a slip of the finger cannot bring LU's reputation into disrepute! It was a challenge trying to compromise with the supplier to get the agreed list of offensive words. There were some words the TfL team thought were offensive and vice versa. There were further challenges regarding the TfL E-Mail system, which would not allow them to send Ross the details of the words and he in turn could not respond with them either!

Finally, Ross gave a look towards the future, demonstrating the mobile phone application 'City Mapper'. It provides 'Next Train Indicator', 'Suggested route' and the stations stops, all from your phone – back when he first started they could only dream of having such a system that you could hold in the palm of your hand.

The meeting concluded with several questions from the audience that Ross replied to and concluded with the usual round of applause.

Jonathan Allen