GIANT STEPS – 1938, 1973 AND 2024

by John Hawkins

It seems appropriate that the 1973 Tube Stock is to be replaced with the biggest design revision since that stock was introduced, since it was itself the biggest revision since the 1938 Tube Stock concealed all equipment beneath the car seats and floors. Until then, tube motor cars had an equipment space behind the driver's cab back as far as the first double-doors on the 1938 Stock trains, although only one pair of double-doors was provided for this smaller passenger space. It seemed less important when, in earlier years, such cars were only at the outer end of trains. When it was originally decided to split trains into two, for off-peak services, only a cab was fitted to the middle trailer cars. But as more power was required to move crowds with more intense peak services, motor cars were provided in the centre of trains, leaving some 20 metres between doorways, or more than a car length, where two met.

The introduction of 1938 Tube Stock, with only two middle cabs, allowed passengers to use the area formerly reserved for equipment, halving the distance between doorways where units joined. However, even this must have become problematic, for the 1949 build introduced a new cab-less car to replace the driving motor cars on some 3-car units, leaving only the 4-car unit to provide off-peak services. The new car was known as an UNDM, or Uncoupling Non-Driving Motor car. These cars had a shunting control panel provided in a locked box, but observation of the road ahead was difficult for the driver through the central communicating door.

This type of car was not included in the post-war builds of 1956/59/62, 1960, or 1967 Tube Stocks, but twin middle cabs were an improvement on the standard stock middle equipment compartments that they replaced. It was only when politicians insisted on new trains for the Northern Line that a crew-worked 7-car version of the Victoria Line trains was developed to replace the 1938 Stock trains that had 1949 UNDM cars. It was then realised that twin middle cabs would be a backward step. The 1949 UNDM cars were withdrawn early as non-standard cars, and the lightly used shunting controls were recovered for use in new UNDM cars of 1972 Tube Stock on the 3-car MkI units. New shunting controls were made for the MkII cars, and later also replaced the MkI original equipment.

Development of the 1973 Tube Stock, originally intended for the Northern Line and known then as 1972 stock, had a long lead time. All assumptions made on the 1938 and subsequent stocks were questioned. There was consideration of articulating shorter cars over a shared bogie, and experiments were undertaken with withdrawn experimental 1935 Stock cars. Studies of the maximum possible car sizes within tube tunnels resulted in a plan for trains of longer 6-cars rather than of 8-cars in articulated pairs. By then, the Piccadilly extension to Heathrow had been approved, and it was decided that the new fleet would serve that line, releasing 1959 Stock to the Northern Line. With delayed delivery, and the short-term order of two batches of 1972 Stock for the Northern Line, the new design of trains became known as 1973 Stock.

The new 6-car trains would replace 7-car trains, and therefore have a car less of doorways for passengers. At the same time, the cost of providing cabs was getting more expensive, with the middle cabs on the Victoria Line being equipped for automatic operation, although not used unless they were formed at the outer end of trains. It was therefore decided that middle cabs should not normally be provided in trains of 1973 Tube Stock, but a few double-ended units were constructed to maintain some flexibility in formations. So, for the first time, two UNDM cars normally met at the middle of trains, looking to the travelling public like the adjacent trailer cars.

The 1973 Tube Stock was also the first to eliminate the historic Westinghouse air brake, the basis of safety braking on trains until then, and went with a single electrical braking system. It also introduced miniaturised electronic systems. This came at a time when the Signal Department was driving LU progress. In the past ten years the automatic train system had gone from a trial on one R Stock car, to a Cravens 1960 Tube Stock shuttle service between Hainault and Woodford, to the complete service on the new Victoria Line. And this on trains developed from 1938 Tube Stock systems.

At the same, time human spaceflight had gone from Yuri Gagarin's inaugural single orbit to landing on the Moon, and Mars beckoned! It seemed that anything was possible. As the 1973 Tube Stock arrived, a Cravens unit even trialled reversing at Hainault with no staff intervention, known as the FACT train (Fully Automatically Controlled Train) and there were plans to expand that work.

Following upon the opening of the Victoria Line, it was thought that the Piccadilly Line would be resignalled for automatic operation. And one of the first uses for automatic reversing without staff

involvement could be in the many middle sidings on the line where passengers were not carried. The crew could make tea, etc., whilst their train reversed on its own. The regular service had scheduled reversers at Arnos Grove, Wood Green, Barons Court, Acton Town, Northfields, Rayners Lane and Ruislip. Some of those moves are rare today. But funding became short, and it was not until the 1992 Tube Stock came to the Central Line that an existing line was converted for auto-operation, and then no others until PPP released further funding. 1973 Stock settled to providing reliable conventional service on the Piccadilly Line for 50 years. Mars remains as far away as ever!

The replacement of 7-car trains with shorter 6-car trains of longer cars was pursued with new trains for the District Line D Stock, and on the Jubilee and Northern lines with 1983 and 1995/96 Tube Stocks. Replacement of 8-car trains on the Central and Victoria lines was with trains of similar dimensions to their predecessors. Even so, the standard car layout with two double-doors per side, and end single doorways, except where a cab was provided, followed upon the traditional layout of the 1935 experimental trains and the 1938 fleet. It is only now, 90 years on, that we await the introduction of a completely new design of train to the system.