



THE LAST  
A STOCK



# THE LAST A STOCK

A busy scene near Wembley in 1962,  
with A stock and 38 tube stock.



# Metropolitan line

## Timetable

Last A stock rail tour  
Saturday 29 September 2012

This is a non-stopping service.  
The doors will only open at stations that are in bold. All other times are for information only.

<b>Moorgate</b>	<b>09:45 Boarding commences</b>
<b>Moorgate</b>	<b>09:55 depart</b>
Baker Street	10:09
Finchley Road	10:15
Wembley Park	10:22
Harrow-on-the-Hill	10:26
Moor Park	10:37
<b>Watford</b>	<b>10:44 arrive</b>
<b>Watford</b> Via Watford North curve	<b>10:47 depart</b>
Rickmansworth	11:00
Chorleywood	11:05
Chalfont & Latimer	11:10
Chesham	<b>11:18 arrive</b>
Chesham	<b>11:23 depart</b>
Chalfont & Latimer	11:33
Chorleywood	11:36
Rickmansworth	11:40
Moor Park	11:45
<b>Harrow-on-the-Hill</b>	<b>11:54 arrive</b>
<b>Harrow-on-the-Hill</b>	<b>12:15 depart</b>
Moor Park	12:23
Rickmansworth	12:28
Chorleywood	12:33
Chalfont & Latimer	12:39
<b>Amersham</b>	<b>12:43 arrive</b>
<b>Break</b>	
<b>Amersham</b>	<b>13:36 depart</b>
Chalfont & Latimer	13:40
Chorleywood	13:44
Rickmansworth	13:49
Moor Park	13:53
Northwood	13:56
Northwood Hills	13:58
Pinner	14:00
North Harrow	14:02
<b>Harrow-on-the-Hill</b>	<b>14:05 arrive</b>
<b>Harrow-on-the-Hill</b>	<b>14:07 depart</b>
Rayners Lane	14:12
<b>Uxbridge</b>	<b>14:24 arrive</b>
<b>Uxbridge</b>	<b>14:26 depart</b>
Rayners Lane	14:41
Harrow-on-the-Hill	14:46
Wembley Park	14:51
Finchley Road	14:58
Baker Street	15:04
<b>Aldgate</b>	<b>15:19 arrive</b>
<b>Aldgate</b>	<b>15:21 depart</b>
Baker Street	15:39
Finchley Road	15:45
<b>Wembley Park</b>	<b>15:52 arrive</b>



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The doors of A stock trains were operated by guards rather than drivers until the 1980s.

## FOREWORD WELCOME ABOARD!

After 50 years of sterling service on the Metropolitan line, the A stock is finally retiring from service. To mark this event, on Saturday 29 September 2012 we have organised a day in which the whole of the Metropolitan line gets to say 'goodbye' to its greatest servant.

We hope you will have a great time as we travel along every part of the line that the stock has served, commemorating the end of the A stock as it makes way for the new air-conditioned S stock fleet. Money raised from the ticket sales will go to the Railway Children charity.

London Transport Museum, which has enabled us to put on the tour, will also be running a stall on the day, between 11.00 and 15.00 at Amersham station, selling memorabilia from the A stock trains and other goods.

The A stock trains were built in the early 1960s by Cravens of Sheffield and are the oldest working customer trains on the London Underground network. They have been gradually phased out over the last year and will now be completely replaced by the S8 trains.

A big thank you to everyone who has made this trip possible, including our drivers. We should also give a special mention to Rickmansworth depot, which celebrates its 50th anniversary this year.

Next year the Metropolitan line will be 150 years old. We are proud to be one of the oldest lines, but while we celebrate the best of the old, we continue to strive to provide our customers with the train service they need for the 21st century.

Have a great day!

*Angela Back*

Angela Back  
General Manager, Metropolitan Line





# METROPOLITAN STEAM AND EARLY ELECTRICITY

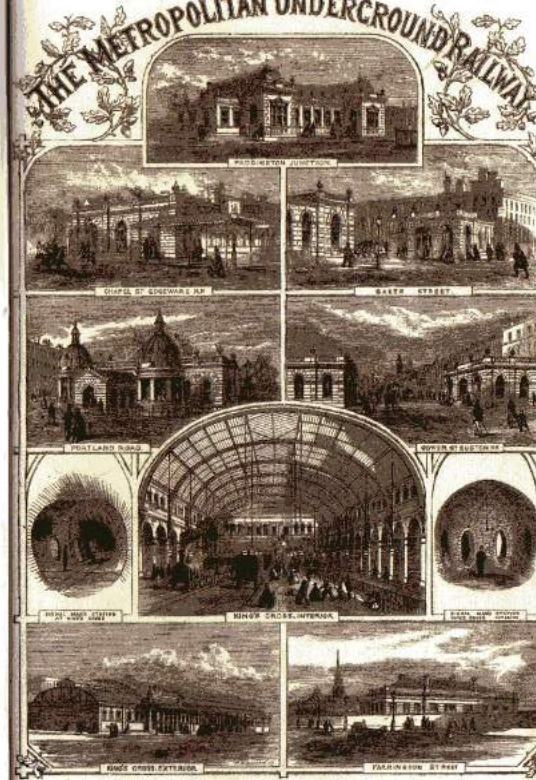
By the mid-nineteenth century, London was the largest city in the world, but with rapid growth came serious congestion problems.

People and goods arrived by rail in a ring around the city centre, while the narrow streets within were filled to bursting with slow-moving horse traffic. A fanciful range of solutions to the problem were considered and rejected, but eventually Charles Pearson, City Solicitor, found a way of combining his philanthropic slum clearance agenda with a politically acceptable and commercially viable scheme: the Metropolitan Railway.

Raising the capital for the new railway took many years and building it caused much disruption, but the world's first underground railway finally opened to the public in January 1863. Pearson did not live to see it completed, but the 3 1/2 mile line connecting the mainline stations at Paddington, Euston and King's Cross to Farringdon, at the edge of the City, was a great success.

Extensions to both ends of the line soon followed, and the Met came to see itself as a mainline railway, with grandiose ambitions including a tunnel to France. In 1868 the Metropolitan District Railway opened, favouring shorter extensions and joint operation deals with larger companies. The two companies intended to co-operate to form an 'Inner Circle', linking all London's mainline termini, but they soon fell out, becoming bitter rivals. The Circle was only completed after government intervention in 1884.

Despite their differences, the two companies co-operated over electrification plans, but their initial ideas were rejected when a powerful American, Charles Tyson Yerkes, took over the District in 1901. The Inner Circle and District were electrified along American lines by 1905, powered by the new Lots Road station at Chelsea. Retaining its independence, the Met built its own power house at Neasden, and electric services reached Harrow in 1905.



01



03



02

- 01 The Illustrated London News heralds the new railway, December 1862, described elsewhere as 'the most stupendous engineering undertaking yet achieved in the railway world'.
- 02 The first train on the new extension to Chesham, May 1889.
- 03 Bookmark promoting season tickets to Harrow-on-the-Hill, 'London's Healthiest Suburb', 1909.
- 04 Metropolitan Railway map of London, with the District Railway's section completing the Inner Circle, 1884.



04



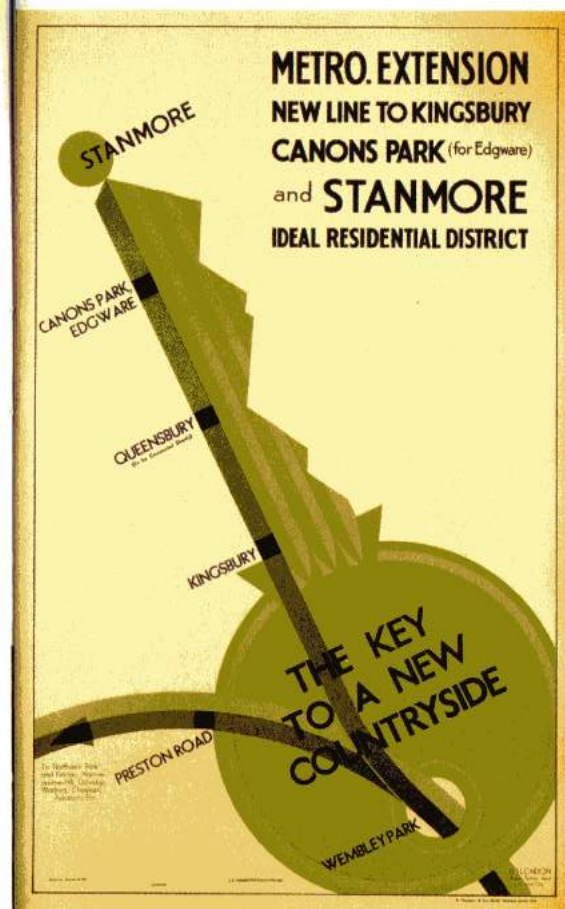
## METRO-LAND AND THE END OF INDEPENDENCE

The Met had been exploiting the land along its lines since the 1880s, but entered a new phase when their first housing estate was built at Pinner in 1900.

Season ticket sales were lucrative, but if they could sell houses as well as railway tickets to and from them, the company and its shareholders were doubly happy. A publicity department was formed to promote the railway and the surrounding countryside, unofficially named 'Metro-Land'. Posters, postcards and walking guides, as well as the famous annual guide books, poured forth.

In 1919, a subsidiary company was formed to purchase land for new estates in Wembley and Rickmansworth and the cycle of promotion and development continued, throughout the next decade and into the 1930s.

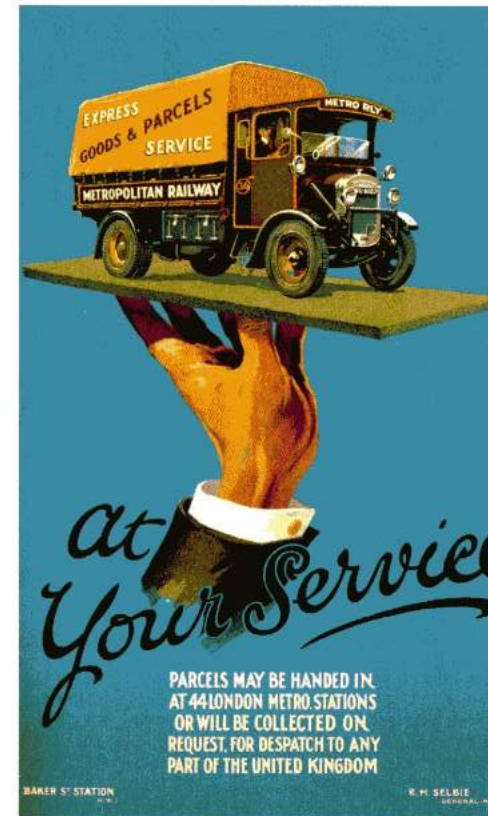
Meanwhile, the Met continued to modernise, electrifying as far as Rickmansworth in 1924, and introducing powerful new Metropolitan-Vickers electric locomotives. The Metropolitan resisted the advances of the much larger Underground Group throughout this period, but reluctantly succumbed to economic and political pressure in 1933, to become part of the new London Passenger Transport Board, soon known more simply as London Transport (LT). Plans to electrify as far as Aylesbury by 1940 as part of LT's New Works Programme were interrupted by the Second World War.



05



06



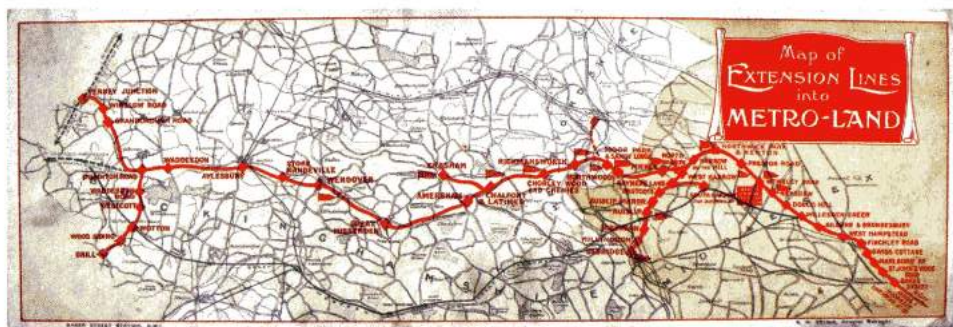
07

05 This 1932 poster cleverly combines the notion of home ownership with the countryside and a simple map of the Met's services beyond Wembley.

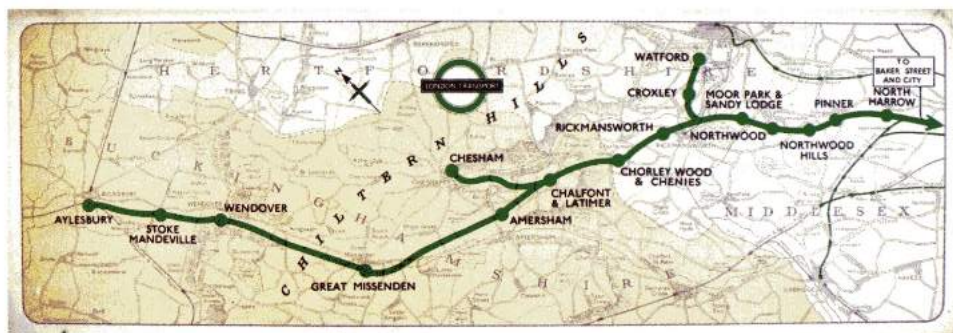
06 Live in Metro-Land - the ubiquitous message of the Metropolitan Railway publicity machine. Door lock from T stock coach, 1920s.

07 At Your Service - the Met operated like a mainline railway, and offered parcel and freight services as well as carrying coal and milk to and from its furthest reaches.





08



09

08  
A 1924 carriage panel map showing the full extent of the Met's services in the 1920s, including Brill and Verney Junction. Larger versions of the same map also had the 10 housing estates marked.

09  
The Brill and Verney Junction sections closed in the mid 1930s, but the Met service to Aylesbury, shown on this 1948 carriage panel map continued until 1961.

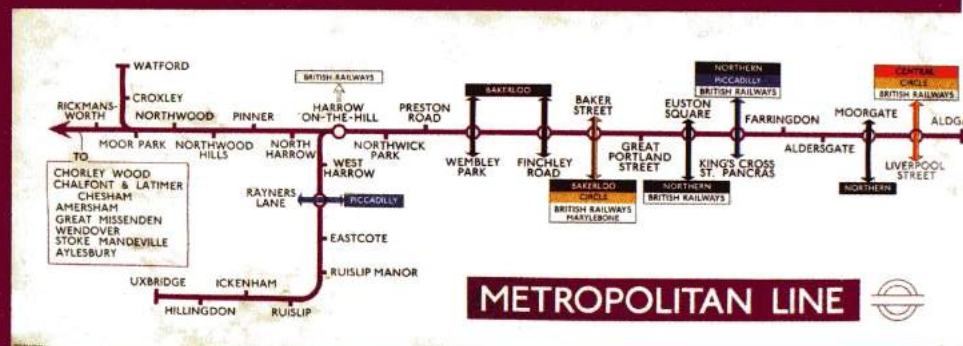
10  
Metropolitan line diagram, 1957.

## TRAINS ON THE MET 1905–1960

The A stock and Metropolitan steam operation have a curious relationship.

At the turn of the last century the Metropolitan Railway had amassed enviable experience and knowledge of building, operating and maintaining steam locomotives. They were about to enter a new era that would lead, step by step, to the first A stock order in 1959, yet

continued steam services until the year of their introduction, 1961. Engineers on the Met, joining their colleagues at London Transport in 1933, presided over the evolution of electric rolling stock through the first three decades of the twentieth century. They built a railway system that was the envy of the world, but circumstances conspired to keep steam passenger services much longer than planned.



10





11

11 Early multiple unit electric train on the Met, known as Gate Stock, at Neasden in 1905.

12 One of the Met's first electric locomotives, and a train of bogie stock carriages on its way to Harrow, about 1906.



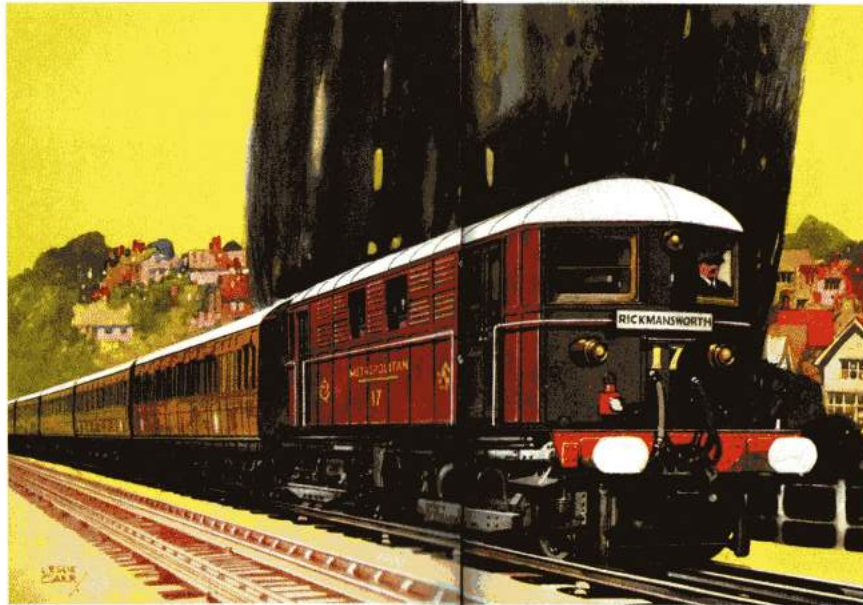
12

13 Postcard showing a Great Central Railway suburban service near Northwood, about 1910.

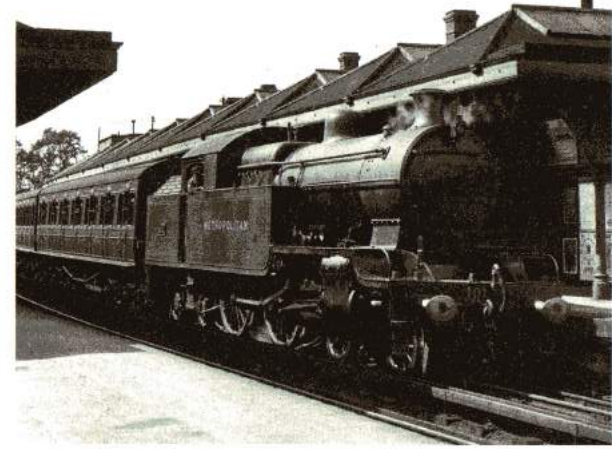
14 Metropolitan Vickers of Barrow-in-Furness built twenty powerful electric locomotives for the Met in the early 1920s. In this illustration number 17 is headed for Rickmansworth, with Harrow visible in the background.



13



14



15

15 Train at Rickmansworth station, hauled by Metropolitan H-class steam locomotive no. 107, August 1934.

16 One of the Met Pullman cars at Baker Street in September 1934.



16

17 P stock train, built in 1938 for the Met's Uxbridge branch.



17



## WAR AND MODERNISATION

Although London's transport infrastructure suffered terribly during the Second World War, the Metropolitan line got off relatively lightly, given its extent.

The worst damage was to a section of its main depot at Neasden and the C W Clark station at Moorgate, which was hit twice and almost destroyed. The Met survived the war, but the austere post-war economic situation meant that the plans of the 1930s were to take much longer than expected to come to fruition. With limited funds, it was decided that the completion of London Transport's Central line extensions were the top priority, leaving the Met plans on the drawing board once more.

The modernisation of the line, planned twenty years before, was finally authorised in 1956 and completed in phases from 1960 to 1962. The £3.5 million scheme

was primarily designed to relieve congestion at Harrow-on-the-Hill and extend electrification from Rickmansworth to Amersham and Chesham, which were still served by ex-Metropolitan Railway steam hauled trains. The laying of additional tracks north of Harrow also improved the frequency of mainline railway services into Marylebone, which shared part of the route with London Transport over the former Metropolitan and Great Central joint line, still used by Chiltern Railways. The section from Amersham to Aylesbury was transferred to British Railways in September 1961, making Amersham station the northernmost terminus of the Underground and finally ending steam hauled passenger services on the network. From the passengers' perspective, the end of steam also meant the welcome replacement of antiquated wooden bodied carriages with the new aluminium A stock trains.



18

18 Moorgate station suffered bomb damage in December 1940 and January 1941, and again in July 1944, but the station received only temporary repairs, whilst plans for the complete redevelopment of the area came together in the 1960s. This photo shows one of the surviving entrances in 1955.

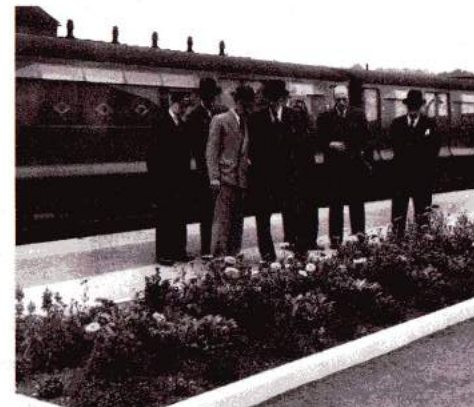


19

19 New mainline track at Amersham in 1960. The cabin on the right housed the increasingly complex signalling system.

20 Judges inspect a station garden at West Hampstead in 1944. Even war did not interrupt the long and continuing tradition for competitions on the open sections of the Underground. The P stock train passing behind is fitted with anti-blast netting.

21 Souvenir ticket from the last day of steam on the Chesham shuttle, 11 September 1960.



20



21





**22**  
Locomotive changeover at Rickmansworth, May 1957. A train of compartment stock has been hauled from Aylesbury by a British Railways steam locomotive, moving away on the right, while Met electric loco number 7 approaches.

**23**  
Last days of steam on the old Met, at Chesham in August 1960.

**24**  
In 1962 the Met announced its new trains, signalling and stations with a poster *Your New Met* by William Fenton.

22



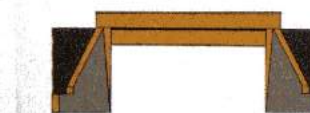
23



### Rolling Stock



Travel on the Metropolitan Line has grown from 9 million passengers in 1863 to more than 120 million in 1960. Now, with additional tracks, electrification, and new rolling-stock a service has been planned that will add appreciably to the speed and convenience of the traveller. This poster details some of the major works that have had to be done, and contrasts the designs of today and yesterday.

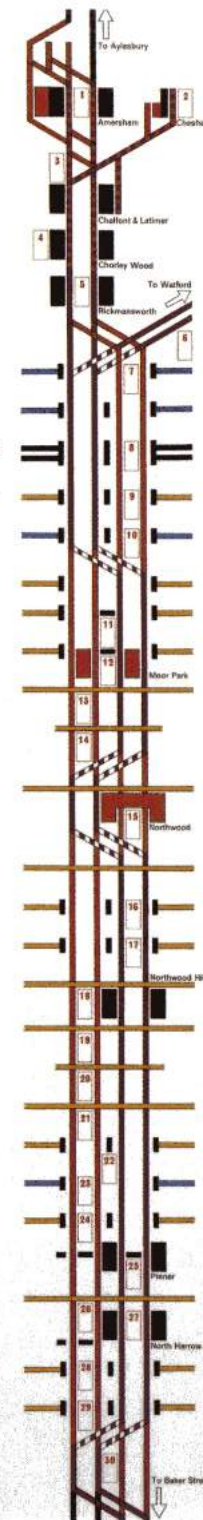


### Bridges



### Key

24



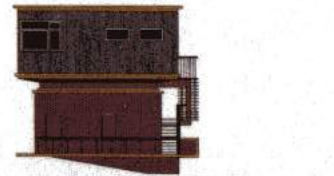
# your new MET



### Stations



- 1 Aylesbury: Two new bridges, new signal cabin, advanced platform, car sidings
- 2 Chesham: New platform and track layout
- 3 Chesham & Luton: New sidings for the electrified line
- 4 Chorley Wood: New sidings for electrified line
- 5 Rickmansworth: Electrification of line to 'down' end; new railway bridge
- 6 Watford South: New bridge over Watford Road
- 7 Great Watford Road: New bridge over British Railways (L.M.R.) New bridge over Eight Lane
- 8 West Colney Bridge works
- 9 Busby Lodge Road: New bridge over Moor Park. New station, building and car park
- 10 Busby Lodge Road: New bridge over Moor Park. New station, building and car park
- 11 Northwood: New station, new bridge and footbridge, automatic signal system, new car park and bus lay-by
- 12 Rickmansworth Road: New bridge
- 13 Chesham Avenue: New bridge
- 14 Northwood Hills: Underpinning of station and platform walls
- 15 Pinner Green: New station and footbridge, new signal
- 16 West End Lane: New bridge
- 17 Chispa Lane: New bridge
- 18 New Pinn: New station
- 19 Marsh Road: Two new bridges
- 20 Pinner: New station, platform, and footbridge, new signal, new car park
- 21 Marsh Road: New bridge over South Street
- 22 South Street: New bridge over platform
- 23 South Street: New bridge over platform
- 24 Vauxhall Road: New bridge over platform
- 25 Harrow South Junction: Four tracking works from line to Watford South Junction W



### Signalboxes





## THE 'NEW MET'

In the austerity of the post-war period, Underground investment on the scale of the New Works Programme was not forthcoming.

The Metropolitan had to wait more than twenty years for the plans of the 1930s to come to fruition. The 1956 modernisation project included the addition of a two new parallel sections of track, a new platform and signal box at Amersham, and two completely new station buildings at Northwood and Moor Park, designed by the in-house LT Architects Department.



25



26

25 Work at Northwood in August 1958 included the widening of the road bridge in collaboration with Middlesex County Council, who part funded the work.

26 The widening of the track at Northwood required the demolition of the existing station. This new building was opened in January 1961.

27 Interior view of the old booking hall at Moor Park station with rough timber floor and old advertisements, 1934.

28 Bright new booking hall at Moor Park station in June 1962 - a clear improvement on the old building.



27



28



## A FOR AMERSHAM

The A stock is the oldest, fastest and widest stock in passenger service on London Underground. It is also the last with separate power and brake controls.

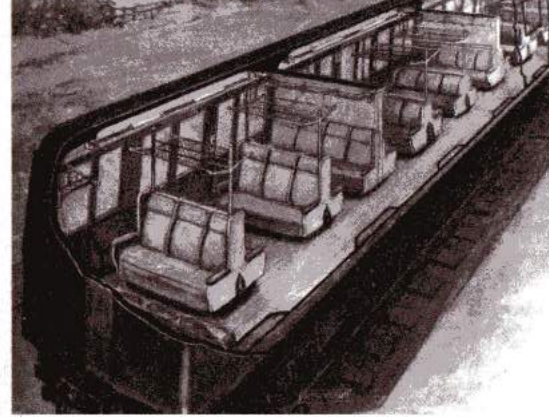
Its story began with plans for the electrification of the Metropolitan line beyond Rickmansworth in the 1935-1940 New Works Programme, under the great W S Graff-Baker. Although the scheme was halted by the Second World War, work continued sporadically, following Graff-Baker's ideas, resulting in the construction of two trailer cars, one in 1946 and one in 1947. These experimental vehicles featured saloon layouts and air-operated doors – a world away from the compartment stock trains then operating to Amersham, Chesham and Watford. They were scrapped in the early 1950s after service trials, but the experience gained with the two cars led directly to the new features of the A stock.

The first A60 units were ordered from Cravens of Sheffield in 1959, and entered service in June 1961. By the end of the year they were operating most of the Amersham, Chesham and Watford services. A second batch, A62 stock, was

then ordered to replace F and P stock on the Uxbridge branch. The full complement of A stock was delivered by December 1963. The A60 and A62 stocks are almost identical in appearance, but use different air compressors to operate their doors. Experienced staff can hear the difference.

Service trains on the Metropolitan from 1962 normally operated as 8-car (2 x 4-car) units in the peak periods, uncoupling to run as 4-car (1 x 4-car unit) in the off-peak. Uncoupling ceased after 1980, and when the A stock was converted to One Person Operation in 1986, only one cab was converted on a number of units. Some double-ended units were retained to ensure stock flexibility as well as maintain the Chesham shuttle and East London line services. Even as they were being praised by Jonathan Glancey as 'a model of timeless grace' and their 50th anniversary approached, the withdrawal of what some have called the last 'real' Underground trains, was announced.

As the new S stock started to appear in 2010, so did the A stock start to dwindle, until the final A stock tour of 29 September 2012.



29

29  
Cutaway of the first experimental coach number 17000, which had a seating layout more like a traditional compartment carriage. The extra width of the A stock allowed a centre aisle.



30

30  
A stock train at Amersham, alongside a British Railways diesel multiple-unit (DMU) bound for Aylesbury, 1962. Copyright Alpha Press



31

31  
An A60 stock train at Moor Park, heading south to Baker Street, 1962.



32



33

32  
A typical A stock interior in original condition, 1960s. Described at the time as being 'a completely new type, combining maximum seating capacity and comfort for longer-distance passengers with ample standing room to improve rush-hour travel conditions on the crowded in-town section of the line.'

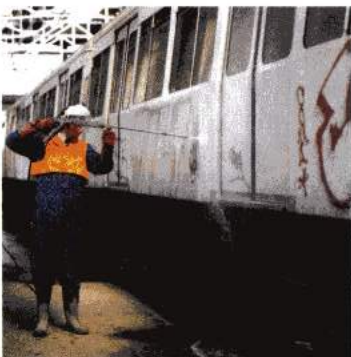
33  
A stock cars were refurbished by Adtranz (now part of Bombardier) in the 1990s. Exteriors were painted to address wear and tear and graffiti attack and safety-compliant materials were fitted following the Kings Cross fire, including new seating moquette and flooring. Windows were added to the car ends to let in more light.





34

34 Bus route 359 was introduced in 1942. It provided an alternative service between Amersham and Aylesbury. Copyright Omnibus Society, J G S Smith



35

35 Graffiti on unpainted aluminium trains became a serious problem in the 1980s. LUL initially operated a policy of never letting a defaced train out on the system, but as time passed this became more and more difficult. This photo was taken at Ealing Common in 1986.

36 The East London line had become part of the Metropolitan line in the 1970s. A stock operated in 4-car units on the line in three stints between 1977 and its closure in 2007. A 4-car train is seen here at New Cross Gate in 1981.

37 The Adtranz refurbishment included a new graffiti-resistant corporate livery, seen here at the rebuilt Hillingdon station in 1994.



36



37



## A LIMITED NUMBER OF THE LUGGAGE RACKS FROM THE A STOCK TRAINS ARE AVAILABLE

### Small

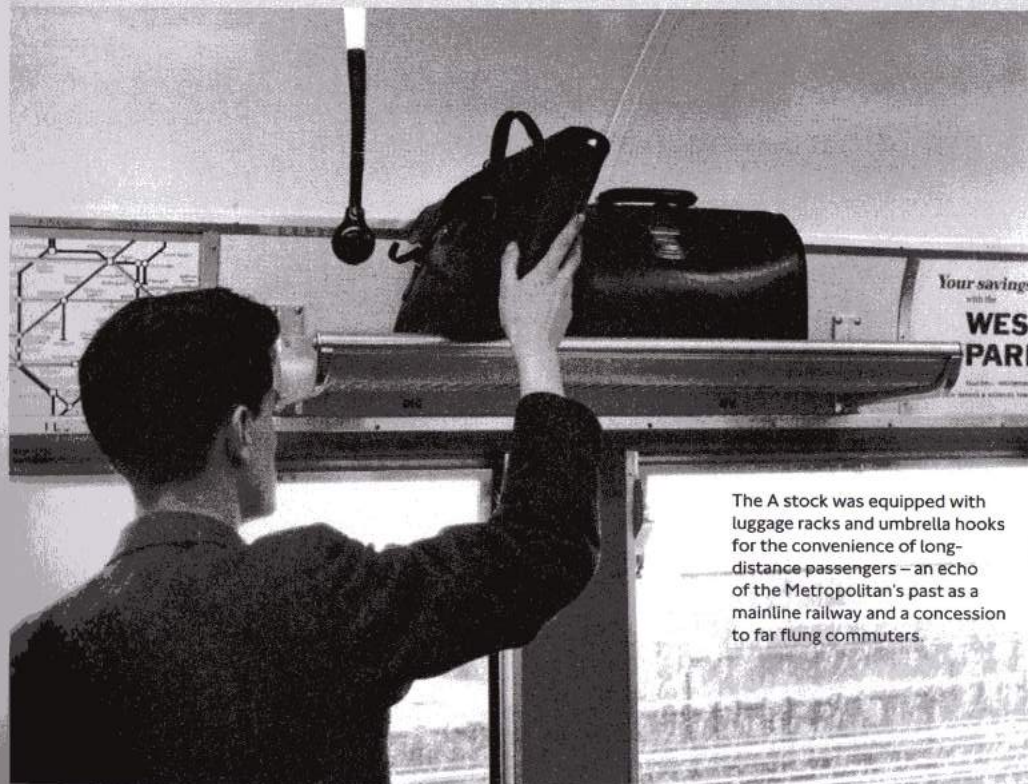
Length 440mm x Depth 325mm x Max height 210mm

### Large

Length 1000mm x Depth 325mm x Max height 210mm

The racks are made from aluminium, which means they are strong but very light. They make perfect hallway storage, but also work well in the kitchen, bedroom, bathroom, or the workplace.

On sale at the Museum shop at Covent Garden Piazza, the Open Weekends at the Museum Depot in Acton and the online shop: [ltmuseumshop.co.uk](http://ltmuseumshop.co.uk)



The A stock was equipped with luggage racks and umbrella hooks for the convenience of long-distance passengers – an echo of the Metropolitan's past as a mainline railway and a concession to far flung commuters.



## NEASDEN AND RICKMANSWORTH DEPOTS

Neasden Depot has a history as long as the Underground itself. It was built in the late 1930s on the Metropolitan Railway's original Victorian Neasden Works site, where coaches and steam locomotives for the railway were designed and constructed. When the time came, they even built their own power station.

Neasden has been the main Met depot since those early days, and was the venue for the Underground's centenary celebrations in 1963 and for the 'Last Day of Steam' in 1971. Until recently it housed the A stock fleet; alterations have been made to accommodate the S stock which have taken their place.

A station opened at Rickmansworth in 1887 and later became important as a fast changeover point between steam and electric services on the Met line. Under the banner of Into the heart of Metro-land by electric

train a much-improved timetable was introduced in January 1925 which concentrated all engine-changing at Rickmansworth, where new sidings were added for this purpose. The three minute changeover was famously the fastest scheduled in the country.

In the early 1960s five new electrified sidings were commissioned south of Rickmansworth to provide stabling for the new A stock. New staff accommodation was also built. The steam loco sidings north of Rickmansworth and an electric loco siding south of Rickmansworth were no longer used.

With the departure of A stock, crew signing on at Rickmansworth for the new S stock can look forward to enjoying the most logically-designed and operationally focussed driver's cab London Underground has ever had.



38

38

Inside Neasden Depot for the Metropolitan Railway centenary exhibition: an A stock train with a line of bogies, motors and other equipment, 1963.

39

Electric locomotives John Hampden and Sarah Siddons wait at Rickmansworth south sidings, around 1960. Copyright F C le Manquis

40

A stock driving motor car DM 5094 at Neasden in July 2012 being made ready for its last day of service on 29 September 2012. It will join the collection at London Transport Museum after the last A stock tour.



40



39



## TUBE UPGRADE AND S STOCK

Since 2006 investment and improvements on the Underground have been co-ordinated in a network-wide Tube Upgrade Plan.

Capacity and reliability of trains have increased and key interchange stations like Victoria, Tottenham Court Road, Bond Street and Paddington are being remodelled, to reduce congestion and extend step-free access. The Victoria line has a new control centre, new track and new signalling. All journeys are now on new, more spacious trains, while the full fleet of 58 new air-conditioned S stock trains are now running on the Metropolitan line.

The S stock comes in two configurations: S8 and S7; 8-car and 7-car trains, respectively. The main difference between the two fleets is the seating, with the Metropolitan S8 trains having a mix of transverse and longitudinal seating and the S7 trains having all longitudinal seating. Built by Bombardier Transportation in Derby, the S stock will eventually be rolled out across the whole of

the Sub Surface Railways (SSR) group – on the Circle, District and Hammersmith & City lines as well as the Metropolitan. Eventually 177 trains will be replaced by 191 new trains.

The layout of the new S8 train on the Metropolitan line has been designed to increase overall train passenger capacity. Post-upgrade the new Automatic Train Control (ATC) signalling system will allow a higher frequency of trains across the SSR group. The new system will provide a better service across the Metropolitan line, more frequent trains and an increase in overall capacity of 27%.

The key features of the S stock from the passenger's point of view are air-conditioned walkthrough carriages with lower floors, wider doors, less boxed-in seating and more wheelchair space, plus improved customer information and safety. On the operational side they benefit from an energy-saving regenerative braking system, improved doorway obstacle detection, and increased CCTV.



41

41 Upgrades on the Underground are programmed to continue until 2015 and beyond.

42 S stock trains on the Met at North Harrow in October 2011.



42



TAKE THE WHEEL  
at the  
**Family Open Weekend**

**Museum Depot, Acton**  
**6 and 7 October 2012**

Adult admission charged  
**KIDS GO FREE**

**Open** 11.00–17.00 (last admission 16.00)

**Avoid the queues by booking in advance**  
020 7565 7298

**Location** Opposite Acton Town Underground  
station (District and Piccadilly lines)

[ltmuseum.co.uk](http://ltmuseum.co.uk)



London  
transport  
museum



E1  
Miniature  
railway  
rides



Taxi test  
drive



MAYOR OF LONDON

Registered charity number 1123122

London transport  
museum **friends**



Get closer  
to London's  
transport heritage



Join the London Transport Museum Friends  
[ltmuseum.co.uk/friends/support-us/membership](http://ltmuseum.co.uk/friends/support-us/membership)



Passengers changing from the Bakerloo to the Met's new A stock at Finchley Road, 1963





Design: LTM Design  
© London Transport Museum 2012

Transport for London

