Volume 50

TROUBYBUS The magazine of the British Trolleybus Society



## **DECEMBER 2011**

**PORTO'S DOUBLE-DECKERS 70 YEARS OF TROLLEYBUSES IN PLZEN**  605





#### Plzen celebrates 70 years of trolleybus operation; see Dave Chick's article starting on page 248.

Seen in the Cukrovarska depot yard on 18 November 2010, Plzen 470 is a 1995 Skoda 15Tr.

519 has just arrived at the new Borska Pole terminus which opened earlier in 2010.

Both photos by D G Chick.

#### Porto's Double-Deck Trolleybuses: see Tony Belton's article starting on page 245

This view of Porto 140 on route 12 was taken at Balhao terminus on 12 August 1986. The vehicle is sporting the new orange and grey livery which the majority of the double-deckers had been repainted into by this time - it replaced the original maroon and cream colour scheme. Also by this time the opening windows on the front upper and lower saloons had been replaced by single panes of glass. Extraordinarily this was the first trolleybus I photographed in Porto and at the time I could never have imagined that ten years later the vehicle concerned would be preserved and end up as an exhibit at the Trolleybus Museum at Sandtoft.

Tony Belton

# TROlleybus

The magazine of the British Trolleybus Society



### DECEMBER 2011

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# **NOTICE BOARD**

#### **READING MEETINGS**

Held at the Reading District Oddfellows' Hall, Oxford Road (next to Holy Trinity Church). Admission Adults £2.00, Juniors/OAPs £1.00. Meetings commence at 19.30.

Meetings Organiser: Shaun Bradbury

Friday 6 January Mike Russell on Italian Trams & Trolleybuses

Friday 3 February John Bishop with a Selection of Trolleybus Films

### LONDON MEETINGS

Held at the Model Railway Club, Keen House, 4, Calshot Street, London N1 9DA

Start 19.00 – doors open 18.30. Bus routes 30, 73, 91, 205, 214, 394 476. Nearest Underground station – Kings Cross.

Meetings Organiser: Colin Enticknap, 48 Dymchurch Road, Hythe, Kent, CT21 6JX.

Wednesday 21 December Mike Russell Film Show

Wednesday 18 January John Parkin with a British trolleybus miscellany, including some NTA tours, museums, and systems towards the end.

#### **BRADFORD MEETINGS**

Meetings are held at the Pennington Midland Hotel (old Forster Square Station); the precise room details will appear on the functions board in the foyer. Admission: Members £2.50, Concessions £2, non members £3.

Meetings Organiser: Gary Wilkinson 59a Pentland Avenue Clayton, Bradford BD14 6JF

Friday 9 December Tony Wilson Xmas Surprise

Friday 13 January 2012 - Stanley King's Annual Talk

#### WEST MIDLANDS TRANSPORT CIRCLE

Secretary: Mr A F MacMillan, 57 School Road, Tettenhall Wood, Wolverhampton WV6 8EP

Meetings are held on the second Wednesday of each month (except August) at Bradmore Community Centre (main hall) at the corner of Bradmore Road and Birches Barn Road, Wolverhampton. The Circle has a general transport interest and there are no specific trolleybus items in the current programme, but several members including the Circle's Secretary belong to the BTS, and any other BTS members attending will be made especially welcome.

Website: <u>www.wmtc.webs.com/</u> <u>meetinglist.htm</u>

Wednesday 14 December Adrian Pearson: 2011 in 201 photos.

Wednesday 11 January

#### MONTHLY PRIZE DRAW

#### October Winners

£25	JR Goodall	Leicester
£16	JH Zebedee	Crawley,
	West Sussex	

### CHANGE OF ADDRESS, ETC

If you have changed your address, please make sure that you inform the Secretary, Andrew Barton, (address on the panel inside the front cover). All correspondence regarding membership renewal should be addressed to Andrew. Mail sent to the wrong person will inevitably result in a delay in processing renewals.

# The Big Switch

In the October issue we published an item about the London Assembly Liberal Democrats' policy document "The Big Switch", which proposes conversion of London's buses, taxis and light goods vehicles to electric power by 2020, by replacing all of the city's 2700 single-deck buses with battery vehicles and retrofitting electric drive trains into double-deckers.

BTS member Irvine Bell, a former resident of North London, sent this response to the Liberal Democrat group's environment spokesman.

You invite comments on your Big Switch proposals to electrify London's public surface transportation systems. Let me say that your aims are entirely laudable and I fully support them. But with the greatest respect, let me say regarding battery buses, your proposals are seriously impractical.

Let me first introduce myself. I am a 66 years old Chartered Mechanical Engineer. I spent 25 years in industry involved with the development of buses and trucks, including experience of a couple of electric vehicle projects. In parallel I also spent a decade as a part time bus driver. Overall I am well versed in the engineering and operational issues associated with the bus industry and I consider myself qualified to offer informed comment.

Please let me show you, with some facts and figures, why your proposals for operating London's bus system with battery buses, are seriously impractical.

To run all day (two eight hour driving shifts) on one (overnight) charge, a bus needs a (minimum) 400 km (250 miles) range requiring (at a minimum 2 kWh/km – Vancouver trolleybus data) 800 kWh of net energy. According to the October 2011 *Automotive Engineer*, by 2020 Lithium based traction batteries in mass production may cost €250/kWh implying a battery cost of around €200,000 in 2020 (more at present).

One set of batteries is unlikely to last the full working life of a bus (twenty years?). Even if the batteries need replacing just once, battery costs over the working life of a vehicle could easily be around  $\notin$ 400,000 or possibly much

more. The warranted working life of hybrid car batteries is generally less than ten years and bus operation is much more demanding than car operation.

The above assumes of course that battery weight is not a problem. Current Lithium traction batteries store around 0.1 kWh/kg (*Daily Telegraph* Motoring Supplement 09-04-2011). So for example 250 kg of batteries could store enough energy to propel a bus about 12 km.

A 400 km range bus needing to store 800 kWh would need batteries weighing around 8 tonnes.

A current (two axle diesel) bus grossing around 17 tonnes with an unladen weight of around 11 tonnes, is able to carry around 6 tonnes of passengers.

If all the passengers were replaced with around 6 tonnes of batteries, you would be able to get an electric vehicle with a range of about 300 km (400\*6/8) – but of course such a vehicle would be of no use as a bus.

Clearly, without a vast improvement in the performance of batteries and a huge reduction in costs, running a capital city's bus system with buses that only need charging once per day (overnight), is not viable.

But what of the possibility of a bus with a (small) battery which is recharged frequently?

Batteries generally perform best and have the longest lives when never allowed to become fully discharged or fully charged. So a battery with a maximum range of say 12 km should really be recharged every 6 km or so. A 6km 'spare' range would also be prudent to cope with traffic disruptions, etc., especially if the battery has to maintain heating and/or air conditioning loads for any length of time, to avoid vehicles being stranded with flat batteries.

Rapid recharging shortens battery life and has considerable infrastructure costs.

Let us suppose that it is desired to charge a bus every 6 km. At 2 kWh/km that means putting 12 kWh into the battery. Let us further suppose that we want to delay the bus no longer than one minute to put this charge in. That means a charging rate of 720 kW (60\*12). At say 500 Volts that means a charging current of 1,440 Amps. If we further imagine that two buses might need to recharge at the same time at the same stop, the figures become 1,440 kW and 2,880 Amps. If a pair of buses is recharging at the other side of the road at the same time, the figures become 2,880 kW and 5,760 Amps. In short, a rapid recharging strategy, however exactly one plays with the figures, implies a massive investment in recharging infrastructure.

Frequent recharging has profound operational implications. If in an ideal world bus services could run like clockwork, frequent recharging might be a viable strategy. But in the real world, when buses may be delayed by traffic or other causes and may bunch up, frequent recharging has the potential to become the source of serious delays and an operational nightmare.

To summarize, barring massive and unforeseeable improvements in battery technology, battery buses will have to remain limited to niche applications. Any attempt to operate a significant proportion of London's bus system with battery buses will be a very expensive fiasco that London's travelling public will neither forgive nor forget easily.

But let me now be positive. There is a way to operate London's bus system electrically that will work and be cost effective. It is to wire the streets so that electric buses can be connected directly to the grid. The infrastructure costs of such a project would probably be no more than those required to provide a rapid recharging infrastructure for battery buses and very possibly less. Long term ownership costs would certainly be less (no large battery replacement costs, no energy wasted in carrying the dead weight of batteries around and losses in recharging/discharging batteries eliminated, etc.). Limited use of batteries could form a part of such a project to give grid connected buses a say 10 km off grid capability to get round traffic obstructions or operate in areas like Oxford Street without any grid connection. Batteries could be (slowly) recharged from the grid while on the move. Existing bus garages could be used and would not need any expensive special adaption.

In fact London once had such a system (1931 - 1962), but it was swept away in a less environmentally conscious era. Abroad grid connected electric bus systems, along with trams in some cases, provide the backbones of public surface transportation systems in cities like Arnhem, Athens, Berne, Lyon, Moscow, Salzburg, San Francisco, Vancouver and Wellington. New systems have or are being introduced or reintroduced in places like Rome and Saudi Arabia. World wide, there are of the order of 40,000 such vehicles operating. The technology is well proven and can be relied upon and the long term costs of ownership of such systems compare favourably with diesel bus systems. When trying to build public transport usage long term, there are advantages in having a visible and permanent infrastructure that allows new users to identify the locations and routes of public transport facilities and gives people the confidence to factor in the existence of such facilities in their (longer term) decisions like where to live, where to work, where to shop, where to send children to school, etc.

May I respectfully suggest that you re-visit your proposals for a battery bus system for London? There *is* a better way of achieving your fundamental objectives. And one that London's voters will *not* punish you at the ballot box for – which is a very likely outcome for an attempt at a battery bus system.

With very best wishes,

Irvine Bell A former resident of North London Eur Ing Irvine Bell BSc CEng MIMechE CDipAF PGCE

# Letter to the Editor

# History of the RTS/BTS

I have been fascinated by Dave Hall's comprehensive history of the RTS/BTS. I would like to add some clarification on a couple of points in Chapter 6.

On page 201 Dave writes "Richard Cromwell of the NTA purchased Bournemouth 202." Richard Cromwell had produced a report on trolleybus preservation which was published in NTA Newsletter No 14, May 1965. Newsletter No 17, September 1965, says that the report received a favourable reception from, among others, the RTS, with whom it had been discussed with a view to avoiding duplication of preservation schemes. NTA Newsletter No 9, October 1964, states that the NTA Committee had decided to purchase one of the Bournemouth open-toppers and in Newsletter No 10 launched a financial appeal, which stated that all those contributing more than £1 will become part owners of the vehicle (1 put in £1-10 shillings!).

On Page 204 Dave writes "It was agreed to start holding monthly meetings in London too ... the first meeting was held at St Margaret's Lothbury on 17 June 1966". This may well have been the first London meeting for RTS members, but the NTA had started London meetings long before, the first being organised by Tony Belton on 8 April 1964 (according to NTA Newsletter No 4). Newsletter No 20 states that a meeting took place on 15 December 1965. Newsletter No 21 advertises a meeting on 21 February 1966 at St Margaret's Lothbury, and subsequent meetings there on April 20 and May 18. So these meetings were clearly already taking place under the auspices of the NTA, of which Tony Belton was then Assistant Secretary, well before the 17 June meeting to which RTS members were invited. I attended many of these early meetings. I look forward to further chapters!

Martin Eady

By email

#### Dave Hall replies:

I did not dwell too much on the Cromwell Report in the RTS history as it did not directly affect us. However, I will eventually be publishing a book on the history of trolleybus preservation in the UK and will go into a lot more detail about it at that time. The book will not be biased towards any one society and a lot more will be explained when I write it up. I note what Martin says about the ownership of 202, which is useful. Possibly Richard Cromwell was the 'figurehead' for the NTA when purchasing it.

With regard to the London meetings, the RTS committee minutes and also the RTS monthly journal treated London meetings as a new venture for the RTS, which I suppose it was! I will take the NTA London meetings into account when I write the book and very much appreciate Martin informing me of this.

I am glad that Martin is enjoying the history. We are now coming to the most important part. A lot happened in 1967/68 which shaped today's trolleybus preservation movement, and this will appear in the January 2012 issue.



**Above:** A recent event was held at the Transport Museum in Liege to mark the 40th anniversary of the closure of the system. In addition to the regular exhibits, one of the Van Hool A330T models destined for Avellino was on display together with former Gent 11 which is now preserved.

Below: Liege 432. Trolleybuses of this type (FN-CEB T.32) operated in Liege between 1933 and 1966.



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## **Trolleys in the Press**

The Brighton & Hove Argus seems to publish photos of local trolleybuses once or twice a year, more than fifty years after operations ceased.

The latest occasion was on 17 October, when a letter was published from a reader, RGL Halls, who wrote in response to a suggestion about cable car operation that a survey of his generation was likely to find that the trolleybus was the best option to reduce pollution.

Mr Halls said that he had worked for Allen West, where control gear for trolleybuses was made, and he called for the electric vehicles to be brought back.

The latter was accompanied by a large photo of Corporation trolleybus number 4 on route 41 turning out of St James's Street on to Old Steine in 1957.

Thanks to Andrew Henbest for the cutting.

The Huddersfield Daily Examiner carries an 8-page supplement every Wednesday called 'All Our Yesterdays' and this has been devoted to trolleybuses at least twice this autumn (PGJ).

## See London's Christmas Lights by Routemaster Bus

BTS Committee member Adam Conner invites Reading Area BTS members to see the lights. Tours will operate using an ex Reading Mainline Routemaster on Sundays 11 and 18 December, departing Great Knollys Street depot, Reading, at 15:30 and arriving back at approx. 20:00. Parking is available nearby in the Cattle Market car park. A stop of about half an hour will be made near Piccadilly Circus. Prices are Adults £12, Children £6.

To express interest please email Adam at <u>adamconner1859@hotmail.co.uk</u> or phone 07735 331515.

Apologies for the short notice. This item should have appeared in November but I forgot to include the file - DGC

## Huddersfield 631 to be Jubilee Trolleybus

Next year will be the 60th anniversary of the Queen's accession to the throne. Sandtoft will be marking the Diamond Jubilee by decorating a trolleybus, and a member of the BTS fleet, Huddersfield 631, has been chosen, following in the tyre prints of Maidstone 72, which was the Golden Jubilee trolleybus, and Walsall 342, which performed the duty for the Silver Jubilee in 1977.

631 has been selected because it is due to be repainted soon, and, as happened with Maidtone 72, it could be partially painted in connection with decorating it and receive its repaint once the decorations are removed in late 2012.

The Trolleybus Museum at Sandtoft is seeking ideas and/or concepts for the design of the decorations. No doubt there will be an official Diamond Jubilee logo, and this could be incorporated into the design. Modern lighting and effects and modern materials could be used as well as the more traditional paint schemes, boards, lettering, flags and bunting.

Please send your creative ideas to Francis Whitehead at fwhitehead@sandtoft.org or by post to him at Sandtoft Transport Centre Limited, The Trolleybus Museum, Belton Road, Sandtoft, Doncaster, North Lincolnshire DN8 5SX

## 9Trs in the Crimea

Mike Russell has kindly pointed out that in the photograph in the centre spread of the October issue 9Tr number 5501 is not shown on route 3A as stated; in fact there is no route 3A!

The board displayed in the windscreen appears to be an announcement that the driver is under instruction. The first letter is actually the Cyrillic equivalent of the Roman letter Z, hence the script reads "ZA" and not "3A".

The actual route number isn't visible because of the angle of the shot. It is probably on route 1, but might be on 1/3.

Thanks to Mike for this correction.

# Porto's Double-Deck Trolleybuses

A Photographic Tribute by Tony Belton

It's hard to believe that it is fourteen years since the last trolleybus ran in Porto; the system actually closed on 27 December 1997. The double-deckers had been withdrawn a couple of years earlier in March 1995, however, as far as I know the last time a doubledecker ran was on 5 May 1996 when 140 was hired by a group of British enthusiasts for a tour of the remaining wiring. Consequently 140 has the distinction of being the last double-deck trolleybus to carry passengers, albeit enthusiasts, on its home system in the world! Porto took delivery of fifty double-deck Lancias with Dalfa bodywork between 1967 and 1968; they were originally used on routes 10 to Venda Nova. 11 to São Pedro da Cova, 12 to Gondomar and 29 to Travagem. All four routes started from Balhao in the City centre.

My first visit to Porto was in August 1986, by which time the double-deckers were restricted to routes 11 and 12 only. I immediately fell in love with the long undulating route 11 to Săo Pedro da Cova; it was a wonderful journey especially travelling at the front of the upper saloon. Fortunately the trolleybuses were still two man operated at this time and didn't succumb to one man operation until 1990.

The photos (overleaf and cover) show the different liveries that the double-deckers were painted in and also the alterations that were made to the vehicles during their lifetime.

#### **Porto Postscript**

A little anecdote which a few fellow enthusiasts will remember from when we visited Porto in 1996 to see 140. Graham Bilbé had been trying to arrange a tour of any remaining wiring using 140 and in a moment of madness I said to Graham "if we get 140 to São Pedro da Cova then I will give you a donation of £100 towards the preservation of the vehicle!" Anyone that knows me will realise that this is completely out of character but in my defence I had had a few beers at the time! And yes 140 did go to São Pedro da Cova, twice in actual fact, and I had to pay up - Graham has never let me forget this!

#### Captions

**Photo 1:** Hugh Taylor visited Porto in 1969 to see the trams; fortunately he also took a few photographs of the trolleybuses, including this interesting shot of the rear of 128 with the front of 135, both on route 12, at Bonfim on 2 July. You will note that the vehicles had opening windows on the upper and lower front and a destination blind as well as a number blind on the rear, also they had emergency exits at the rear of both the upper and lower decks; these features were eventually removed on all of the fifty Lancias. The only exception was 102 which retained its lower front opening windows.

**Porto 2:** Taken on 12 August 1986 is a rear view of 125 on route 11, reversing at São Pedro da Cova terminus. 125 along with a handful of other trolleybuses still carried the old livery but they had all been repainted in the new orange and grey livery by the time of my next visit in October 1987. You will notice a number of changes between the rear of 125 and



#### Photo 3

The upper saloon interior of 103, taken at São Pedro da Cova terminus on 1 October 1987, shows how well the trolleybuses were being kept at the time. The two staircase layout worked with ease even with crush loads, although the lack of opening windows at the front meant that the vehicles were uncomfortably hot during the summer months.



the rear of 128 in Hugh's photograph: firstly the joint rear number and destination blind aperture has been removed and had been replaced with a number blind aperture only. Most interesting is the fact that both rear emergency exits had been removed and replaced with fixed glass panels - imagine the situation if a trolleybus caught fire or was involved in a serious accident and passengers on the upper saloon had to make a hasty exit!



**Photo 4:** By the time of my next visit to Porto in 1993 the double-deck Lancias had been re-introduced to route 29, but unfortunately route 11 and 12 were motorbus operated due to "roadworks". The livery of the double-deck trolleybuses had also changed with the orange between upper and lower saloon windows being replaced by grey; this was detrimental to the looks of the vehicles to my mind. This view of 148 on route 29 arriving at Travagem terminus was taken on 18 August; a beautiful summer's day. Porto must have read my mind regarding the lack of ventilation on the upper saloons as by 1993 two small ventilators had been fitted

# Porto's Double-Deck Trolleybuses





to both the front and rear domes on all the remaining vehicles! Photo 5: A group of British enthusiasts were fortunate to be allowed an official visit to Areosa depot on 11 September 1995. Incredibly we were allowed to drive 140, which had been set aside for preservation at Sandtoft, around the large depot complex. We requested, tongue in cheek, if they would be willing to line up double-deck 102 and single-deck Lancia 49 alongside 140 for a photograph; they agreed, but I think they got fed up with me because I wanted the vehicles to be in full sunshine and it took a lot of manoeuvring to get them in the correct position-but the result was well worth the effort! Porto remarkably decided to preserve one of each class of trollevbus and had chosen 102 and 49 because they were the only remaining Lancias still to have opening windows on the front, although 102 had lost them on the upper saloon.

# **Seventy Years of Trolleybuses in Plzen**

This year Plzen celebrated the seventieth anniversary of trolleybus operation. DAVE CHICK looks at the history of the system and the operator Plzenske Mestske Dopravy Podniky a.s.



The city of Plzen in Western Bohemia, Czech Republic, was established on its present site in 1295, having moved a few kilometres from the original settlement at what is now known as Stary Plzenec. It was set out on a grid basis which is still recognisable in the area around St Bartholomew's Cathedral.

By the mid-nineteenth century Plzen was a small town with a population of around 14000, but then the two businesses for which the city is still best known were established. Although beer had been brewed in Plzen since 1295, "Pilsner" beer was first brewed in 1842 and rapidly became popular throughout central Europe, aided by improving transport links.

An ironworks which was founded in 1859 became extremely successful after being purchased by Emil Skoda. For much of its history Skoda was an important armaments factory in addition to building trains, trams, buses and cars.



The earlier Skoda trolleybus models were also built here until production transferred to Ostrov. Since that factory closed Skoda has not built complete trolleybuses but has equipped vehicles mainly built by Irisbus and Solaris. This work is carried out in Plzen.

The continued success of the brewery and the Skoda heavy engineering works has contributed to Plzen being one of the most prosperous cities in the Czech Republic. In 2015 it is to be the European City of Culture, jointly with Mons in Belgium.

As business boomed in the late nineteenth century the town expanded and better public transport was required.

On 29 June 1899 an electric tramway opened with three single-track routes, reaching out in five directions from the centre. This remained the basis for tramway operation for the next thirty years until it was extended between 1929 and 1937. Motorbus operation also commenced in 1929. Left: Preserved 9Tr 323 at Cukrovarska depot. (Dagmar Braunova, Busportal.cz)

Opposite page: An example of each of the three different types of rigid trolleybus are seen here on 12 October 2009. 24Tr number 518 is the leading vehicle, followed by 21Tr 493 and a 14Tr, 457. Note the different application of the same livery of twotone green and white on each type. It may not be immediately obvious on the photo, but the 24Trs have a very thin light areen line above the windows

(DG Chick)

Plzen opened Czechoslovakia's second modern trolleybus system on 9 April 1941, the first having been Prague in 1936.

Initially the trolleybus services supplemented the tramway by providing electric services to the east of the city, to Doubravka and Ustredni Hrbitov. A major expansion of the system in 1948 also complemented the tramway, but in 1949 the north – south Lochotin – Doudlevce tramline was replaced by a trolleybus service, which extended north-east to Bolovec (and the following year a branch to Kosutka) and at the southern end was also extended.

The trolleybus system continued to expand during the 1950s but there was little development during the 1960s and the fortunes of the tramway began to recover with a new line to Svetovar opening on 1 May 1962. In 1973 another new line was built, from Nove Skrvnany in the west to Lochotin in the north. The new terminus there was some way short of the original and reached



A November evening, and 24Tr number 508 picks up passengers in Americka.

by a different route separate from the trolleybus line.

After this there was a contraction of the trolleybus network, with the routes to Kosutka and Bolevec closing in 1976 and 1977 respectively, ahead of the tramway extending beyond Lochotin to Kosutka in 1980 and to Frunzeho in 1986, before being extended to Bolevec in 1990.

However, in the late 1980s the trolleybus network was extended again, reaching Doubravka Na Dlouhych in the east (a branch from the existing Doubravka service) and Sidliste Bory in the south in 1988.

Last year the system was further extended with a new line to Borska Pole. By the end of 2010 traction poles were in place for a new trolleybus line over Millennium Bridge as a diversionary route for Americka. Consideration is being given to this being used an express line to the Doubravka industrial zone.

Not surprisingly, Plzen has always been a loyal customer for Skoda trolleybuses and has often taken prototypes. During much of the Communist era, of course, Skoda was the only option available.

Currently the fleet is more varied than it has ever been, with older high-floor vehicles

☆ of types 14Tr (rigid) and 15Tr (articulated),
☆ and low-floor in the form of rigid types 21Tr
☆ and 24Tr and articulated 25Tr and 27Tr. At the end of 2010 the operator had 99 trolley-buses and 115 buses.

Every Skoda Electric trolleybus is tested on the Plzen network, so it is often possible to see vehicles of different types destined for other operators, including export, locally.

Thanks to Dagmar Braunova of the online transport magazine busportal.cz I was fortunate to be given a tour of PMDP's headquarters at Denisovo nábřeží 12, next to the River Radbuza.

Plzen has been introducing a new traffic control system, Phase 1 of which consisted of a new Control room, the installation of control systems and the necessary equipment in vehicles, including GPS and an intelligent power supply unit. This went live on 18 December 2009. Prior to this radio control was relied on, with drivers contacting a despatcher who would resolve any problems.

The Control room is equipped with workstations with LCD screens. The operators can switch between screen displays, one of which shows the transport map and gives the location of every trolleybus, tram and bus. An ID number shows the route number and

PMDP's Control centre, with a large screen on the wall showing a map of Plzen and the location of vehicles, while the operators work at screens which variously show multiple CCTV images and parts of the network.



TROLLEYBUS

the number of minutes delayed or ahead of schedule. There are colour codes, with light green being satisfactory, yellow showing a delay, and orange indicating a delay of ten minutes or more.

The operator can bring up a single colour, eg to see all delays, and can zoom in on areas, as well as being able to view all stops and where the vehicles are. A new control device has been fitted to all vehicles so that every ten seconds every vehicle automatically shows its position.

A pop-up table gives an overview of current operations and there is a touch screen control station which can react quickly to problems.

Operators can "wake up" vehicles in the depot and transfer data, then close them down again. Wi-fi has been installed in the depot for the high volumes of data.

A system archive can look at particular vehicles' histories and can be used to help answer public complaints. The system also has the potential to create reality-based timetables.

Simultaneously the City of Plzen installed CCTV which also can be used by the police and PMDP. By the end of 2012 ninety cameras will be in use. PMDP can control the cameras, which have up to 26 x zoom. If there is a conflict, the police have higher priority use.

The system has been partly funded by the European Union.

It will become possible for the Control centre to type and transmit messages which will appear on LCD screens in the vehicles, and to make on-board announcements.

At the time of my visit in late 2010 phase 2 was being installed, but further phases will be dependent on finance being available.

On the vehicles, the driver keys in the ID number and service number. A screen shows the driver the time to leave the stop, and the next stops to make. While the vehicle



PMDP's Mr Sokol checks the power supply map of the city.

is moving a grey screen is displayed so that it doesn't cause a distraction. Drivers have easy access to the Control at all times.

The announcement of stops is GPSbased. When the doors close, the next stop is announced. The data screen gives a warning if GPS is not available.

Partially-sighted people can have a personal device which gives information on their journey. Pressing a button makes the driver aware of their presence.

Passengers now have several options for paying for their journeys. For those with smart cards the ticket machine checks the amount of credit on the card and then issues the ticket, and it is also possible to pay using mobile phones. Traditional tickets are also available, purchased from machines at some stops. Payment may be made to the driver, but this is the most expensive option.

It is planned to move the trolleybus depot from Cukrovarska to Borska Pole when finance is available. The present site will then be redeveloped for housing. At one time PMDP gained additional income from carrying out repairs for other companies at this depot. For example, in 2007 the company carried out maintenance work on Pardubice 14Trs, but the full capacity is now needed for the operator's own work.



Examples of (left to right) 25Tr, 27Tr and 21Tr types are seen on public display to mark the 70<sup>th</sup> anniversary of trolleybus operation in June. Below: PMDP's headquarters at Denisovo nábřeží 12 and the River Radbuza, showing the 4 meter fall which drives the turbines to supply hydro-electric power to the city, albeit not to the transport system.

### **Power Generation**

It is not unusual for the operators of electrically-powered public transport to have generated their own power at one time. PMDP still has a power-generation business, but it does not feed the transport system.

In the early days of the Plzen City Electrical Company, the electric tramway was just one part of its business. By 1933 the Company was supplying power to 27,294 customers and had a shop in the city selling electrical goods. In 1946, the company's power supply and transport activities were divided into separate organisations, but now hydro-electric power generation is part of PMDP's business.

The original turbine was built c1921. The power plant was planned with the building of the embankment and the dam on the River Radbuza, when the course of the River Radbuza was changed.

In 1985 a new capstan turbine with a 1.5 meter diameter was installed and has been in use ever since. Power is distributed immediately but is generated at only 400v and so is sold to the grid. The generator is watercooled and the heated water is used to heat the PMDP HQ building. There is a paper mill and a water-cleaning plant ahead of the power station and so the company has introduced a webcam to monitor the river level.

PMDP is proud of the fact that twothirds of its transport operation is electrically-powered and that it generates clean hydro-electric power for the city. Trolleybus operation is efficient and expanding and looks set to continue serving the city well for many years to come.

My thanks to Dagmar Braunova for arranging this visit, and to the employees of PMDP who gave their time and made me so welcome.



TROLLEYBUS

# MUSEUM & PRESERVATION NEWS edited by David Lawrence



### East Anglia Transport Museum/LTPS

London Transport H1 class 796 returned to Carlton Colville after internal restoration work was carried out offsite, including full reupholstering.

#### Cardiff & South Wales Trolleybus Group (from Contactor)

**Cardiff 243** – the new nearside rear wheelarch has been completed and painted. Panels surrounding the wheelarch have also been completed and undercoat applied. Work will continue on the nearside before returning to painting the roof.

**Cardiff 262** – Work on the front upper deck window pans continues. Internally, new checker plate panels have been fitted. All seat frames on the upper deck have now been prepared for painting. New window rubbers for the platform windows have been fitted.

## Switzerland

#### Retrobus, Lausanne

Another recent addition to the collection is Winterthur 118, a 1966-built Berna/SWS, SWP, R&J/BBC, MFO & SAAS, which was withdrawn from service in 2000.

## Germany

#### Solingen 60<sup>th</sup> Anniversary Celebrations

2012 will see 60 years of trolleybus operation in Solingen and the undertaking plan to celebrate this between 29 June and 1 July. It is hoped that Solingen 1 and Baden-Baden 231 will visit from Britain.

# London: 50 years since the closure - time to celebrate!

It has been some time since the events next year to commemorate fifty years since the closure of the London trolleybus system were discussed in this magazine. We can confirm that the event at the East Anglia Transport Museum (www.eatm.org.uk) will be held on Sunday 6 and Monday 7 May 2012 and the L.T.P.S are in active discussions to provide a "special" day for Tuesday 8th. This event will feature the "home fleet" of 260, 1201 and 1521, hopefully the relaunch of 796 and also visiting London trolleybuses. It is going to be a fantastic event and one that probably won't be repeated on this scale. Meanwhile, at Sandtoft (www.sandtoft.org), Saturday 25 to Monday 27 August will be the chance to celebrate this landmark in style. If any other important details are released, they will be published here in Trolleybus.

## **Trolleybus Simulator Game**

John Zebedee reports that a game is available for PCs which simulates driving San Francisco trams, cable cars, buses and trolleybuses. Presently it is only available in Germany (including from amazon.de) and the instructions are in German, although apparently the makers are working on an English translation.

### Coming Next Month in Trolleybus

Dave Hall looks at the history of trolleybuses in Ventimiglia, Italy.

# WORLD NEWS edited by Bruce Lake



### CANADA, Montreal

Route 105 was at the top of a preliminary analysis highlighted in a Société de transport de Montréal document prepared for consultants bidding to conduct a trolleybus study, to be completed by December 2012. The plan would include 100 to 150 articulated trolley buses.

Route 105, used by 17,000 passengers daily, links the Vendôme métro station and Concordia University's Loyola Campus in western N.D.G. but 14 other routes are also to be studied. A network could be up and running by 2015 or 2016 although the process is at an early stage and nothing has yet been decided.

The tramways envisaged by the Mayor have been temporarily shelved because of their high cost - a 12.5km tramway route linking downtown, Old Montreal and Côte des Neiges would cost about \$750m. This compares with \$300m to set up a 42km trolleybus network.

The first set of trolley buses would be articulated and 18 metres long, the same length as the STM's current diesel articulated buses. The STM document says 24-metre-long "double articulated" trolley buses could be added later.

## ESTONIA, Tallinn

A planned major expansion of the tramway system has put the future of the trolleybus network in doubt.

### HUNGARY, Budapest

The 2011 open day at the Kőbánya trolleybus depot on 24 September 2011 provided the first public appearance of the recently purchased ex-Eberswalde Gräf&Stift trolley-

buses. None of these vehicles were seen in service during a visit at the end of October.

## ITALY, Chieti

Five Van Hool A300T rigid trolleybuses have been ordered for delivery during 2012 to replace refurbished 1985 Menarini 210 FLU's.

## ITALY, Lecce

Trolleybus operation was expected to finally commence in October, three years later than originally planned, after the transport ministry threatened to seek repayment of the €13 million (£11.4 million) which has been spent on the system. The wiring and the eight stored Van Hool/ Vossloh-Kiepe A330T trolleybuses were inspected in preparation and type approval and driver training were completed.

#### ITALY, Parma

The first of nine Van Hool/Vossloh Kiepe hybrid trolleybuses for Trasporti pubblici Parma was displayed at the Busworld fair in Kortrjk, Belgium on 18 – 23 October. They are of a striking design and it appears that the operator is branding them as "eBus".

The articulated vehicles from Van Hool will be equipped with electric traction equipment and a brake energy storage capacitor from Vossloh Kiepe. Deliveries will begin in the middle of 2012.

High performance capacitors, known as Supercaps, are integrated into the Kiepe on-board energy storage. The Supercaps store the kinetic energy arising from brake application and is then re-used for air-conditioning, acceleration, heating, and even for driving offwire. Tests have confirmed power consumption savings of about 20 %. A Euro 5 diesel generator is installed for longer periods off-wire.

#### NETHERLANDS, Arnhem

The ten-year concession to operate buses in the Arnhem/Nijmegen region has been retained by Hermes. This includes operation of Arnhem's trolleybus network, which will be expanded during the concession, with plans to reintroduce trolleybuses on bus service 4 to Vredenberg and extend route 3 to serve the Netherland Open-Air Museum. An unspecified number of new trolleybuses will be purchased.

#### SWITZERLAND, Zurich

VBZ has ordered 12 LighTram 24-metre double-articulated trolleybuses from Vossloh Kiepe GmbH and Hess AG.

By combining overhead-line operation and energy storage via Li traction batteries (in place of a diesel generator), the trolleys run without using any fossil fuels. The batteries are charged while the vehicles are in operation using the overhead lines. They can be operated as far as 1.5 km off-wire. It is thus possible to fully operate the new vehicles electrically, especially in areas with building sites and bus lane blockage, and facilitates exhaust-free and low-noise manoeuvring and parking in the bus depot. The performance electronics are supported by a charging system for the batteries from braking energy. It is integrated in the roofmounted equipment enclosure and can recharge the traction battery within one complete line cycle. Delivery of the new 24-metre vehicles to the VBZ will begin as early as the autumn of 2012.

#### USA, Spokane

Further to previous planning, the city council has voted 6 - 1 to support electric trolleybuses over trams or conventional buses for the proposed 3-mile long transit corridor between Browne's Addition and the University District.

Trams were estimated to cost US\$ 100 million versus the US\$ 36million for trolleybuses, and this convinced councillors to select the latter.

With thanks to: Buses, BBG (Eberswalde), Dave Chick, John Zebedee, Internet sources.

Coupled sets of trolleybuses were once a common sight in the former Soviet Union, not just ZIUs but also Skoda 9Trs and in earlier days, MTB82s. They were seen as a good alternative to trams on busy routes to housing estates and factories as they not only had the capacity required but also the ability to load and unload quickly. The southern Russian city of Krasnodar is the last of such operations and currently runs four 'sets', all of which operate on line 9.

Top: 114+115 are seen approaching Oktyabrskaya Ulitsa on Monday 27 June 2011.

Right: The coupling equipment is seen here on 106+107. The rear vehicle of each set was often stripped of many parts as was the case in Krasnodar. However, internally they were in very good condition whilst many systems suffered from vandalism in the rear vehicle, as is often the case with coupled sets of trams.





Jave Lawrence

DECEMBER 2011



Above: Huddersfield 631, seen here operating at the BTS 50th anniversary weekend at Sandtoft on 29 May, has been chosen to be decorated to celebrate the Queen's Diamond Jubilee next year. See inside for details of how you can help with the design.

Below: How it was for the Queen's Silver Jubilee, when Walsall 342 was the decorated trolleybus, with Reading 181 to the left and Teesside T291 to the right. The museum looks rather bare in this August 1977 view.

