



The Bellcord

Journal of the Friends of Hawthorn Tram Depot



Model of VR 34 (2016). Photos: Alexander Stoeckel

RECENT DONATIONS

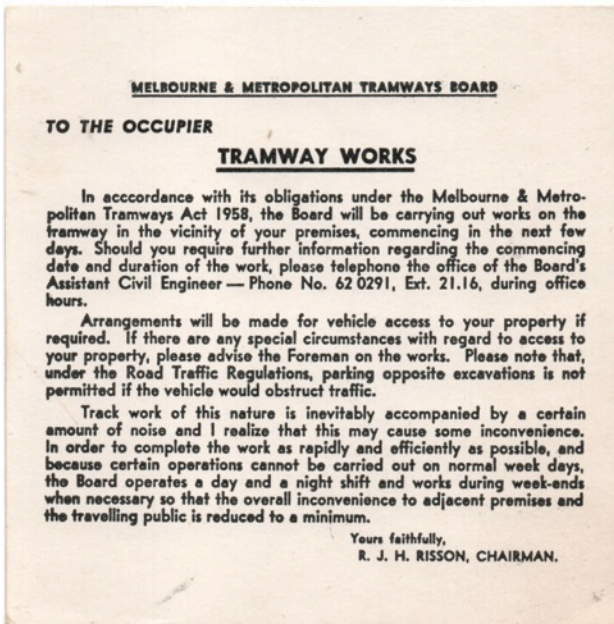
The museum has received a donation from the estate of well-known tram enthusiast and Hawthorn museum guide, David Frost. Among the many items is this "O" gauge powered model of VR 34, built by A G Culpepper-Cooke in January-March 1977. There is also an "HO" gauge W2 390. Both can be viewed in the museum's display room. Thanks to our volunteer photographer Alexander for these captivating photos.

The estate of Tom Murray, a Puffing Billy volunteer and Secretary of the Australian Railway Exploration Association, has donated printed tramway materials to the Melbourne, Ballarat and Sydney Tramway Museums. The Melbourne materials comprise a mix of notices and events. *Cont'd page 2*



Among Tom's collection is the following printed notice for distribution to premises along a tram line to be rebuilt. It may have been received by Tom when he lived in Toorak Road, Burwood.

It notes the relevant Acts of Parliament that authorise the works and acknowledges the upcoming inconvenience, including night shift and weekend work "when necessary". Public notification of current day tramway work is quite similar, although the work itself is completed in a much shorter time frame.



ARMED HOLD UP – TRAM CONDUCTOR ROBBED

(Found in *The Canberra Times*, 18 June, 1937)

Melbourne, Thursday: Two armed and masked men held up and robbed the conductor of a tram at Wattle Park last night, taking his bag in which there was £3/2/7 in cash.

Daniel Reid had left the tram and was walking towards the shelter shed when he was accosted by a man who had a handkerchief tied over his mouth.

He produced a revolver and grabbed his bag. A second man then appeared and covered the driver of the tram, Thomas Guest, who was ordered to drive the tram away and he did so.

The bandits then made off.

Warren Doubleday

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Open Days - 2017

14 January	28 January	11 February
25 February	11 March	25 March
8 April	22 April	13 May
27 May	10 June	24 June
8 July	22 July	
12 August	26 August	9 September
23 September	14 October	28 October
11 November	25 November	9 December

The Melbourne Tram Museum @ Hawthorn Depot is open on the second and fourth Saturdays from January to November, and the second Saturday of December.

Opening hours are 11 am–5pm.

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Editor: Geoff Brown



*A well-known photograph of all six L class trams positioned on the South Melbourne Depot fan (23 March 1975)
Photo: Ray Marsh, courtesy Dale Budd and UNSW Press*

CLASS REUNION

Many years ago when things were quieter, some tram routes did not operate on Sundays or were just shuttle services. In 1975 a few of us used one of these quiet Sundays to arrange a final line up of all six L class trams at South Melbourne Depot.

At that time they were stored as follows:

- L101 and L102 at Brunswick Depot with limited service.
- L103 at Essendon Depot banned from service except for charters (until the 1972 floods).
- L104 at South Melbourne Depot with limited service except for charters.
- L105 at Glenhuntly Depot with limited service.
- L106 at Malvern Depot, hardly used, although I once saw it out with a female student driver.

I used them as much as I could for TMSV sales tours and the 80th, 85th, 90th and 95th Malvern Depot anniversaries.

While at my family's footwear business/tram enthusiast shop* in Flinders St, I received a phone tip-off. The L class trams were about to be scrapped from the stored list to make way for the growing number of Z class trams. With the help of the charter department and Dave Menzies of TMSV Sales, I planned a final line up and asked for all six trams be present at South Melbourne Depot on Sunday 23 March, 1975.

* Ron's family city footwear business housed the head office of the TMSV for a number of years. ED

The charter department agreed to do this free of charge, but I had to supply crews to get them back to their home depots. This was agreed and we were to keep it low-key. As L104 was already at South Melbourne, we needed five crews for the other five trams. Well, five crews turned into about 100 volunteers.

Everything went to plan. L101, L102 and L105 were placed into service to South Melbourne on the Friday morning, leaving L103 and L106 to be transferred on the Sunday. I arranged for a Camberwell crew to bring L106 from Malvern and for Greg King to bring L103 from Essendon via William St. We were told William St would be open all day to get the L class to South Melbourne.

Sunday arrived and the weather was fair and dry. I travelled on L106 from Malvern with the Camberwell crew and now five Ls were present awaiting layout on the fan. Dave and I were put in charge of the depot. When all Sunday morning service trams had departed, we began arranging the trams in order.



Photo: Ron Scholten Collection



LEFT & BOTTOM LEFT: R10 recovery vehicle prepares to propel L103 along William St to Latrobe St because of weekend cut to power.

BELOW: All six L class trams lined up in Kingsway for a second photo call.

Photos: Ron Scholten Collection

Then a phone call. L103 was stranded in William St without power. This was not our fault. We had been told on Friday that William St would have full power. R10 came to the rescue. Out it went to push L103 back into Latrobe St and from there it came to South Melbourne the long way round.

We asked Depot Starter Frank Readon if it could be done. "You're in charge. Do as you wish. Just don't mess me up." So all six L class were taken into Kingsway for a second line up. What a wonderful day.



John Gilmour took L101 and Graham Bennett L102 back to Brunswick Depot. Greg King took L103 back to Essendon. L104 stayed at South Melbourne. L105 went to Glenhuntly Depot and L106 went back to Malvern. A smaller line-up was arranged at the Haymarket with L101, L102 and L103. L105 and L106 had an even smaller photo stop in Dandenong Rd. A very successful event indeed.

On Monday morning a phone call came from head office at 616 Lt Collins St. "How did it go, Ron? What will we charge you?" Thinking thousands of dollars, I was asked how I got there. My answer was on L106. "Is \$40 OK?" YES!! *Ron Scholten*

Fearing it may take too long, we had set up the photo leaving a space for L103. A medium size crowd gathered and started filming the five L class on the fan. Then all became excited as a lone L class appeared in the distance and took its place in order. All six L class trams together for the last time.

Now to get them back to their home depots. But wait! Someone whispered that Kingsway didn't have trams on Sundays. Could we get a line-up there?



DECORATED TRAMWAY BANDSMAN: Robert Henry Keir, a Tramway ANZAC

At the beginning of his 43-year tramway career, Robert Keir was a conductor with the Prahran and Malvern Tramways Trust (PMTT).

Robert had grown up in northern Victoria, but in 1911 he moved to Melbourne and joined the PMTT. He was also an experienced bandsman, playing tenor horn in Echuca's Federal Band. When the Malvern Tramways Band was founded in November 1911, he was one of its first members.

Thus it is hardly surprising that Robert was assigned to 29th Battalion's military band when he enlisted as a private in July 1915.

By this time military bands had become largely ceremonial, with their prime purpose being to boost morale. Australia also followed the British military tradition of using bandsmen as stretcher-bearers to transport the wounded to safety, typically under appalling and hazardous conditions.

Robert's first major battle was at Fromelles on 19 July 1916. More Australian lives were lost on that one day than on any other in our history: 5,533 Australian casualties, including around 2,000 deaths of whom 1,299 were never found.

For his actions as a stretcher-bearer at Fromelles Robert was mentioned in despatches by General Sir Douglas Haig – commander of the British forces – and gained further distinction on 5 October 1916. He was subsequently awarded the Military Medal and the French Croix de Guerre.

When Robert was discharged in August 1919, he returned to the tramways. In 1920 the tramway trusts – including the PMTT – were merged, becoming the Melbourne & Metropolitan Tramways Board (M&MTB). Robert held the position of Time Clerk within M&MTB's Eastern System.

He also continued with the Malvern Tramways Band, but had switched to the cornet.

By the early 1930s, Robert had been promoted to Senior Permanent Way Clerk at the M&MTB's head office. Robert continued with the M&MTB until he retired in 1954. He died in December 1971, aged 82, survived by Jane, his wife of 56 years and two daughters.

Noelle Jones



Detail of Echuca Federal Band (1910). Robert Keir is in the middle of the back row.

Photo: courtesy Echuca Federal Band

EXHIBITION FUNDING

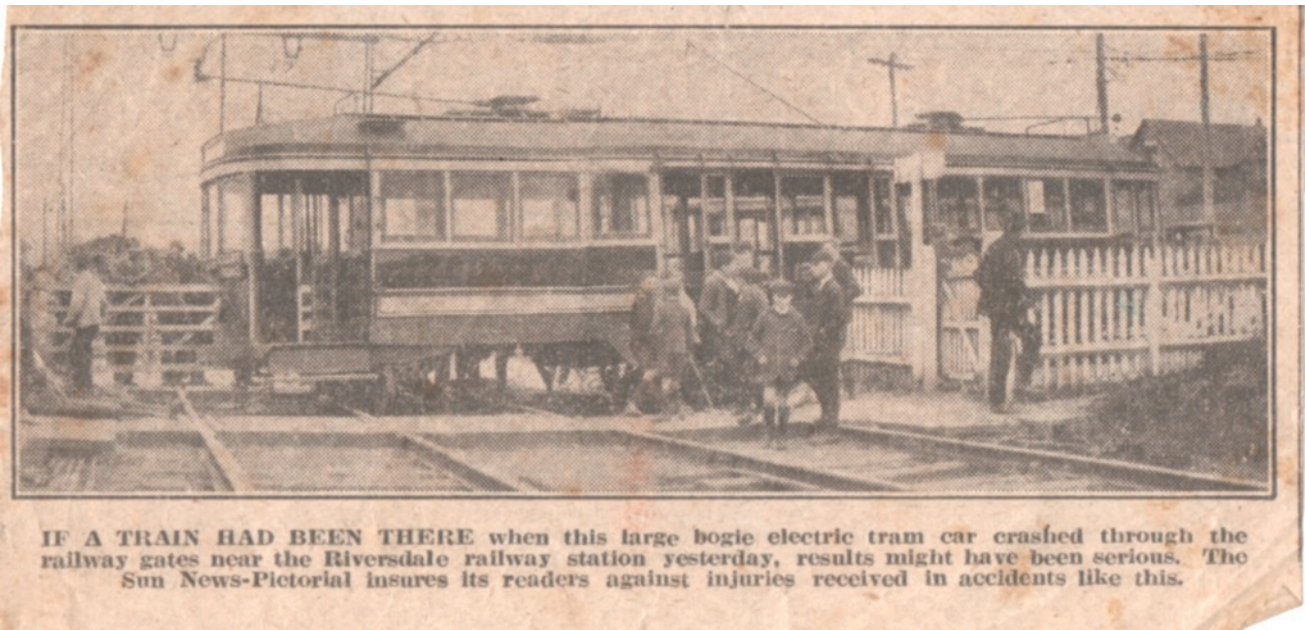
The museum has been successful in obtaining funding from external sources in the last couple of years.

Stage 1 of Tramway ANZACs on the Gallipoli campaign was funded in February 2015 by VicTrack and Yarra Trams at \$5,000 each. Stage 2 on the Western Front was funded in November 2015 by the State Government's Victorian Veterans Council, managed by the Veterans Branch of the Department of Premier and Cabinet at \$6,500. Both exhibitions are still on display in the exhibition room.

The Hawthorn Tramways Trust centenary exhibition was funded in July 2016 by the Local History Grants Program administered by Public Record Office Victoria at \$7,095. The eight panels in the exhibition room are the first part of the exhibition and will be added to in due course.

We will continue to source funding to enhance the visitor experience and tell interesting stories about the tramways impact on Melbourne's history.

Mike Ryan



OUR COLLECTION

Among recently catalogued newspaper cuttings was this photo of a HTT built Maximum Traction tramcar derailed at the Riversdale Road level crossing. As can be seen the bogie is completely torn out of its position and is lying behind the people in the foreground. When did this event happen and to what tramcar?

Turning over the cutting, there was a report on a boxing match in Winnipeg the previous Friday involving a NZ born featherweight champion. A search of the internet and boxing records turned up a match date of 6 September 1928. The State Library microfilms of *The Sun* newspaper show it was published on 8 September, so the event occurred on Friday 7 September 1928.

A close examination of the photo shows a number "12" - the other number being hidden by the people. In a chat with Norm Cross, he noted that the number "2" was centred on the panel, so the third number had to be a narrow one, most likely "1". A check of the tramcar records held by the Museum shows that 121 was returned to service after accident repairs on 31 March 1929 costing some £33/12/6. When compared to other accident repairs shown on the card, this was very expensive. Extensive underfloor and body framing repairs would have been required.

Tram 121 was originally built as HTT No. 15. The body was sold in 1939 and was relocated to Mount Evelyn until it was acquired by a member of the Ballarat Tramway Preservation Society in 1978 and moved to Bungaree. Later on it was moved to under cover storage at Newstead. In 2010 it was acquired by a telephone collector in Gisborne.



This Real Series postcard shows 121 during the mid 1920's passing under the now Alamein rail line bridge in Norwood Road (now Toorak Road). Photo: Melbourne Tram Museum collection.

Warren Doubleday

**ELECTROLYSIS:
The Destructive by-product of Electric Traction**

Operating a tramway network employs many technologies. Mal Rowe provides a layman's overview of a less familiar but important tramway topic.

Many of us may remember a secondary school science experiment where a silver coin and a copper coin were submerged in a suitable solution and the terminals of a battery connected to each coin. After a while, the copper coin was coated with a thin layer of silver. It seemed like a good way to turn a penny into two shillings!

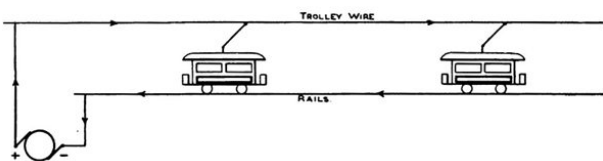
That process is electrolysis – the electric current carried a small amount of the metal from one coin to the other. The same thing can happen when the electric current that powers Melbourne's trams and trains flows between various metal objects on its way back to the substation.

Getting the power to the trams

All of Melbourne's electric trams and trains run on DC (Direct Current). When they were built it was the best way to get the optimal performance from a traction motor.

Even today, when motors and motor control techniques are very different and modern heavy rail uses AC supply, all tram and light rail systems still use either 600V or 750V DC supplies to the vehicles.

Put simply the electric circuit looks like this:



The electricity is fed out through the trolleywire, through the tram (where it drives the traction motors) and then flows back to the substation through the rails. For a current to flow there has to be a complete circuit involving paths out and back to the substation.

All of those paths have some resistance to the flow of current, so the voltage (think pressure) drops off a bit along the way. Of the 600V at the substation, perhaps 20V may be lost in the trolleywire and another 20V in the rails on the path back to the substation. So only 560V is available at the tram.



Electrolysis test point near Preston Workshops (2010). Photo: Mal Rowe

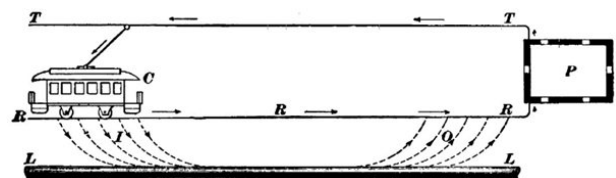
Some people may remember being at a terminus late at night and watching the lights in the tram dim and brighten as another tram moved along the tracks – taking more or less current from the overhead. That's the effect of line and rail resistance.

Getting it all back through the rails

It's not much of a problem stopping the electricity 'leaking' out of the trolley wire – that's well insulated. However, the rails are usually not well insulated – they are after all buried in the ground for tramways in particular.

The result is that some of the return current sometimes takes a path back to the substation through other paths – including the ground itself and various pipes buried in the ground.

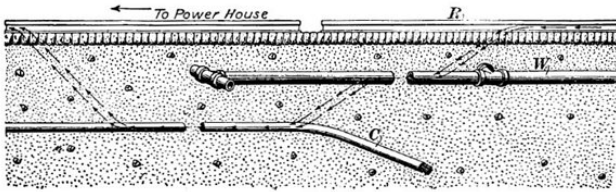
So our more complete circuit looks like this:



Note that some of the electric current is taking a shortcut on the way back to the substation, perhaps via a water or gas pipe or even the lead sheathing that was used on telephone cables.

Wherever the current leaves that pipe electrolysis occurs and small amounts of metal from the pipe or sheath are taken away by the process of electrolysis.

A more detailed path might look like this:



The people who own these pipes get pretty upset, because after time enough metal is taken from their pipes and sheaths to make a hole.

So how do we stop the return current using pipes and sheaths as a shortcut?

There are two primary approaches to preventing current leaking from the return path.

1. Keep the rails out of contact with the ground.

For heavy railways placing the rails on wooden or concrete sleepers on top of dry ballast minimises the contact with the ground and the pipes buried in it.

That's also the approach taken by some recently constructed tramways – notably the Gold Coast, but also the Box Hill extension in Melbourne. The technique for tramways is to encase the rails in some sort of insulating 'boot' so that it is not connected to the ground. Here's a picture of one type of 'boot'.

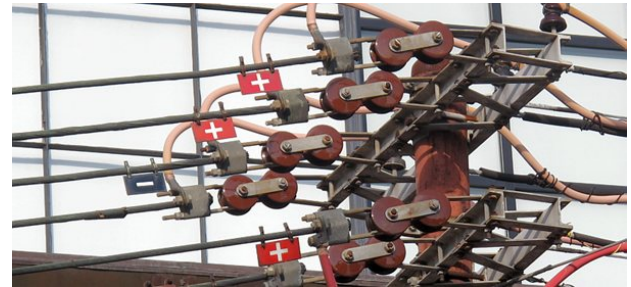


It's not easy to ensure that the electrical insulation is kept intact throughout the track laying process. The Gold Coast tramway had to go back and fix a lot of problems after passenger services began.

2. Provide a lower resistance path so that leakage currents mostly use that rather than the ground (and the pipes in it).

The older traditional way to minimise leakage on traditional tramways is to accept that the rails will be in damp soil, etc. So other – lower resistance – paths are provided so that most of the current gets back to the substation without using someone's pipes as a shortcut.

One form of these low resistance paths are called 'negative feeders'. These are often strung along the road alongside the 'positive feeders' that boost the power to the trolleywire away from the direct connection to the substation.



The negative feeder above is, of course, marked with a "-" sign.

Another way to minimise the resistance along the preferred path back to the substation is to ensure the rails show minimum resistance to electric current. That is achieved by:

- a. welding the rails together at joints, or by having copper bonds that bypass non-welded joints, and
- b. bonding connecting rails together so that all four rails are used in the path back to the substation, and
- c. using copper bonds to bypass 'special works' like points and crossings because the manganese steel used in these has a higher electrical resistance than ordinary rail.

It gets more complex than that with other 'electrical tricks' used to persuade the return current to stay where it is supposed to and keep it away from buried pipes and other metal infrastructure.

For those who want the full engineering description, the Victorian Electrolysis Committee's *VEC Resource Manual* is a good reference. The Victorian Electrolysis Committee has the task of coordinating and regulating activities that might lead to electrolysis problems in the state.

It's online at: <http://tinyurl.com/i7qxmvs> and includes some interesting history as well as the technical data.