

# *THE* MICROMETER

REGISTERED NEW ZEALAND PUBLICATION OF THE  
AUCKLAND SOCIETY OF MODEL ENGINEERS INCORPORATED



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**AUCKLAND SOCIETY OF MODEL ENGINEERS INCORPORATED**  
PETERSON RESERVE, PANMURE, AUCKLAND  
PO Box 14570, PANMURE, AUCKLAND 1741, NEW ZEALAND

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## Club Information

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# Train Roster

Date	Electric Driver	Electric Driver	Train Controller	Station / Guard	Station / Guard	Station / Guard
<b>August 2013</b>						
4 <sup>th</sup>	M Granger	M Hollis	<u>G Wills</u>	R Reichardt*	M Richardson	P Boyes
11 <sup>th</sup>	D Housley	S Meikle	<u>M Orange</u>	R Stratton	<b>R Street*</b>	T Taylor
18 <sup>th</sup>	D Moffatt	M Moore	<u>D Russell</u>	P Tomkies	D Addis	<b>R Brown*</b>
25 <sup>th</sup>	P Moy	A Pritchard	<u>G Anderson</u>	J Burnett	J Clarke	<b>R Crook*</b>
<b>September 2013</b>						
1 <sup>st</sup>	B Aickin	I Ashley	<u>M Jack</u>	R Copeland	J Davies	<b>G Dickey*</b>
8 <sup>th</sup>	D Black	D Booth	<u>T Lawrence</u>	<b>A Foster*</b>	D Gulliver	G Healy
15 <sup>th</sup>	B Cotton	P Dowdeswell	<u>T Robinson</u>	<b>J Lankow*</b>	D Leybourne	M Luxton
22 <sup>th</sup>	M Granger	M Hollis	<u>M Orange</u>	I Lyons	<b>H Martin*</b>	W Parker
29 <sup>th</sup>	D Housley	S Meikle	<u>B Piggott</u>	B McLaren	<b>C Mitchell*</b>	G Murray

### Please Note:

We have reduced the number of Station people to three, but do need more Train Controllers. Please see appeal elsewhere in this newsletter

### **Bold and Underlined Name:**

This is the designated **Train Controller**, i.e. the person in overall control of all operations for the day. If you are the **Train Controller** you should phone around the others rostered for that day to make sure they remember to turn up.

### **Bold with Asterisk\* Name :**

This is the designated **Stationmaster**, i.e. the person responsible for activities in the station area for the day. The Stationmaster is also responsible to account for the day's takings.

**Please Note**, there is no expiry period or date on train ride tickets previously sold.

### Please Note:

On your rostered day you should arrive by **12.30 pm** to get prepared for the days running. If for some reason you are unable to fill your rostered date, you are respectfully reminded that it is your responsibility to find a replacement member to fill the gap - please don't let the rest of the team for the day be left short-handed.

Please ensure you arrange the replacement member with one rostered to undertake the **same** role, to ensure we always have members with the appropriate training and experience on the day

# Club Calendar

ASME Events	
6 <sup>th</sup> August	General Meeting
10 <sup>th</sup> August	Working Bee
13 <sup>th</sup> August	Committee Meeting
20 <sup>th</sup> August	Workshop night at the clubrooms

## President's Report

### August 2013

The BBQ lunch & club fun run day on the 13th of July had a good turnout of locos and members and the weather was fine.

For General Meetings we are in need of people to present a talk on subjects members would be interested in. If you would like to, or know of someone, or have suggestions of subjects you would like to know more about. Please contact me or the committee.

We have had two visitors from allied overseas clubs to the track in recent months - firstly in April, John Turner from the Belfast & County Down Miniature Railway (see [www.bcdmrs.org.uk](http://www.bcdmrs.org.uk)) and secondly in July, Nicola Oliver from Tyneside Society of Model & Experimental Engineers in Newcastle Upon Tyne (see [www.tsme.co.uk](http://www.tsme.co.uk)). Nicola runs a steam loco and is also a member at Carlisle and District Model Engineering Society (see [www.cadm.es.weebly.com](http://www.cadm.es.weebly.com)).

*Timothy Robinson*

*President*

*23<sup>rd</sup> July 2013*

# Track & Trolley Project

## Update, July 2013

As reported at the last General Meeting, we were successful in obtaining a grant of \$49,000 from the Mt Wellington Foundation Ltd (MWFL) to assist our Club with this Project. These funds have been donated to be used by 31 March 2014 on the track survey, steel for the new 7.25" rail (and sleepers), 500 metres of concrete path and trubolts for securing the ground level track to the concrete path. We will have to produce invoices to MWFL to prove the funds have been spent as requested and for the purpose set out in the Club's written application. The Club's funds committed to the project at the last AGM (up to \$50,000) will be used for the GST on the MWFL items, the eight new trolleys and other miscellaneous items.

The steel (all 5.7 tonne of it) was delivered to the Club on 22 June and moved into the basement by a team of members using the "chain gang" method. A group of members have been working to cut up the steel to be used for sleepers and have already completed 950 and are working on another 700 – in total this is 42% of the number required for the Project which is a great start (the sleeper material is available in 1.2 and 1.8m lengths should you wish to help by cutting up sleepers on your saw at home – please let me know if you can take any, so I can keep track of progress). The survey has been done and we await a copy of the results. A further group of members is working on the bogie components for the new trolleys and also for one spare bogie for maintenance swap-outs if required. Some bogie components have already been completed and returned to the Club (the first were on show at the July Bits & Pieces session) and I am advised that many of the other parts are in an advanced stage of manufacture – thanks to all members who are assisting with the work so far.

The next major step during this winter will be to make a start on welding the new rail to the sleepers. I have the names of two members who have offered to help with this work, but would like to hear from more of you if you have the necessary skills and can also help. Besides this, we hope to determine the type of body for the trolleys and complete assembly of the bogies in August/Sept.

During early spring it is expected that the first of the concrete path sections will be laid by the contractor. While we have a good team working on the project to date, if more members can make themselves available it will spread the load and help keep costs down – please let one of the T & T Sub-Committee know (Timothy, Greville or myself) if you can help in anyway.

*Grant Anderson*

22<sup>nd</sup> July 2013

# A Speedo for Hotpot

Following on from some comment at ASME about “drivers of steamers not knowing how fast they are going” and encouraged by a recommendation from the Manukau Live Steamers Safety Committee in the MLS Jan/Feb 2013 newsletter that speedos be fitted to all locos that were to be used for public hauling at their Queens Birthday open weekend, I resolved to fit one to my Beejax type loco, “HOTPOT”. The information in the MLS newsletter was that they were available from Hedgehog Cycles in Onehunga for a mere \$20, so I visited the store only to find that the units at that low price had all been sold (snapped up, I hear since, by past member Rex Toms). Other brands were available starting from \$35. The increased price wasn’t the problem, more the issue of “would they work on a wheel as small as HOTPOTs”? I had confidence that the \$20 ones would have worked as MLS member Logan Crook had fitted one of those cheaper ones to a MLS club loco and it was reported as working fine. The Hedgehog salesperson was none too helpful saying “we sell speedos for bikes not model locomotives”; he was unwilling to open a packet of the more expensive ones and let me have a read of the instructions so I could gain confidence that they would also work on a small wheel, nor would he look up the product description on the web for me, saying “you do your own research” or “buy it and try it, but I won’t refund if it doesn’t work”. After letting him know what I thought of his lack of customer service ethic, I returned home to “Google” speedos and identify another shop which sold the same more expensive brand as was being sold by the Onehunga store.

Fortunately, there were several other shops listed as stocking the same brand (BBB Dashboard) speedos; one of which was in nearby Panmure. So I called over to the shop and found a very helpful sales person who located an instruction sheet for me to read and also related a story about another customer who had bought one to use successfully on a model car. Although the price was \$5 dearer than at Onehunga, I was happy to pay the \$40 asked as I felt the service provided had been excellent. I acquired the base model BCP – 01 which gives current speed, trip distance, average speed, odometer and clock; the other models give more features but are mainly only of use to a bike rider.

After reading the instructions carefully and viewing the chassis of HOTPOT (at that time, the boiler had been removed to repair a leaking stay), I determined to fit the sensor head on a bracket secured to the frame stretcher on which the two axle pumps are fitted – there was just enough room to locate it between the two pump bodies. This is a location which should be safe from any damage in the event of a derailment on points or similar obstructions. Next, I needed to determine how to fit the magnet which creates the field which switches the sensor – the magnet that was supplied with the kit was rather large and retained in a circular threaded holder with a non standard thread, suitable for clamping on a cycle spoke. After more “googling”, I found neodymium (“neo”) permanent magnets sold by NZ Magnets in Albany. I visited their outlet and bought three different smaller sizes for \$10 – this type of magnet is much more powerful than the ferrite magnet supplied with the kit. I made up a split collar in aluminium to mount on the centre (main driver) axle and in this, I mounted the ¼” diameter x ½” long neo magnet. The person I dealt with at NZ Magnets recommended that the neo magnet be mounted in a material that had little or no iron as that might affect the magnetic field. I made up a bracket to hold the speedo display head on the rear of the cab – a piece of brass strip and a half section of a suitable diameter tube to match the curve of the back of the display head. The sensor head and display

head are retained by plastic cable ties.

*The sensor can be seen fitting snugly between the two pump bodies. The neo magnet is in the hole in the split collar to the right of the capscrew and retained by the round-headed screw and lock nut.*



*The display unit on lower left side of cab rear panel. Speed displays above the time showing in the photo. The button at the bottom allows the other features to be shown by rotation.*



The work was all done just in time for the MLS Open Weekend at the beginning of June – with high hopes, I steamed up and went out for a test run. I found that the speedo would appear to read OK up until about 6kph and the reading would approximately halve – also as speed increased the reading would fluctuate considerably. I was naturally disappointed and concerned as to what was the problem. On the second day I ran there, I tried another size of neo magnet (1/4" x 1/4") – this seemed to give slightly more stable results, but still inaccurate & fluctuating readings.

I had a good two days running at MLS and after the weekend considered the results of the new speedo. What was wrong? Was it just that the speedo unit would not in fact operate properly for such a small (nominal 4" or 100mm) diameter wheel (my earlier concern) given it was primarily for a 28" bike wheel, or was it that the neo magnet used was too powerful, or was that the sensor would not record every revolution as the speed of passing the sensor was too quick, or was it something to do with the mounting (gap or alignment between the sensor and magnet)? I figured that it was going to be impossible to sort this all out on HOTPOT, so I stripped the unit off the loco and mounted it on my HM52 vertical mill. I chucked a piece of 19mm round and fitted the split collar with the magnet. In the vice I mounted a piece of 20mm round and mounted the sensor head. Now I could test the unit at virtually any relationship of alignment by moving the X, Y or Z positions of the mill and also test at any of six rpm speeds which the mill has.

First, I dispensed with the concern that the unit wasn't made to read such small diameters (and also that the magnet might be passing the sensor too quickly to switch it) – I tried every speed up to the fastest (1750 rpm) with the sensor positioned at the recommended 5mm from the magnet, taken on the axle centreline. The speeds indicated showed that the speed per rpm was constant across the 6 speeds of the mill. I also tried it with a lower code entered in for a wheel of only 35mm diameter – again I got a consistent kph per rpm for all six speeds. So that proved it wasn't the unit, alternative magnet or small wheel size that was causing the problem. Next I identified the range of gap (X axis) and movement either way from the spindle centreline (Y axis) or off centre (Z axis). I found that as the Y axis moved away from the centreline the speeds shown started to vary as had occurred when first tried on HOTPOT. There was a clear relationship between how far one could move the sensor off centre and the gap that existed, surprising the bigger the gap the bigger the amount of off centre could be tolerated. The magnetic field clearly had an increasing outward tapering shape the further the sensor was moved away from the magnet. However, each end of the sensor showed a differing amount that it could be moved off centre, although I should mention that at first I tried this with the sensor mounted on a steel bar, later on a plastic bar. It seems the metal bar had an influence on the magnetic field that was generated and skewed the lines of magnetic force to quite a degree.

Anyway, this experimenting showed me that the best results for HOTPOT would be to have the sensor fitted about 7.5mm from the magnet and within 7mm of the centreline of the axle. I thus modified the bracket to achieve this and then refitted the unit to the loco. The modified set up was tried at the ASME fun run day on Saturday 13<sup>th</sup> July and resulted in what I believe are accurate and consistent readings at all speeds. In addition, it enabled me to measure the length of the track (as a check on the speedo) using the odometer function. This measured out at 650 for one run, but 662 metres over four runs (the unit measures kilometres to only two decimal places = .65, but 2.65 for 4 runs). It will be interesting to see how this length compares with the results of the survey which is being done at present.

Besides knowing accurately what speed HOTPOT is doing, another benefit of having a working speedo is that it will enable me to log distances run each runday on an accurate basis – up until now I have had to make an estimate based on number of circuits I think I have done, times the distance of the track I am running at. It is interesting that while I have been working on this addition to HOTPOT, there have been several letters to the editor of Australian Model Engineer magazine debating the value of such devices in our hobby.

I have referred to the "code" that has to be entered into the speedo display head – this is the circumference of the wheel that is being measured for speed. The default value on a BCP – 01 is

2155 being 2155mm that a 700 x 32c bike tyre will travel in one revolution. In effect you can enter any value between 3999 and 0001. The correct code for HOTPOT is 335 being 335mm that its driving wheels which have a diameter of 4.198" or 106.6mm will travel in one complete turn – obviously this is easy to check in operation.

*Grant Anderson*

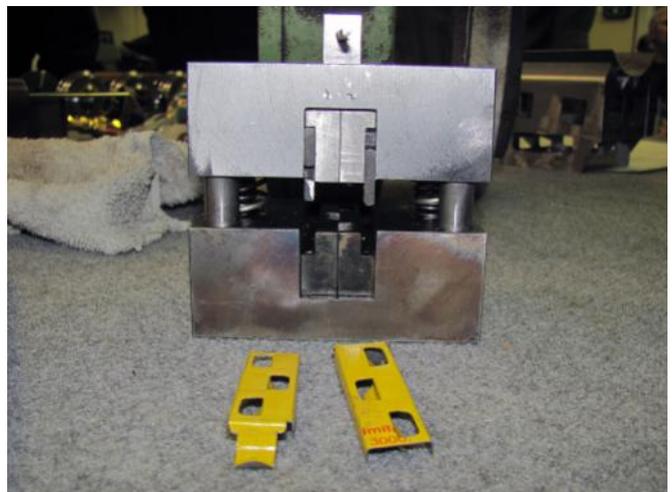
22<sup>nd</sup> July 2013

# Bits & Pieces

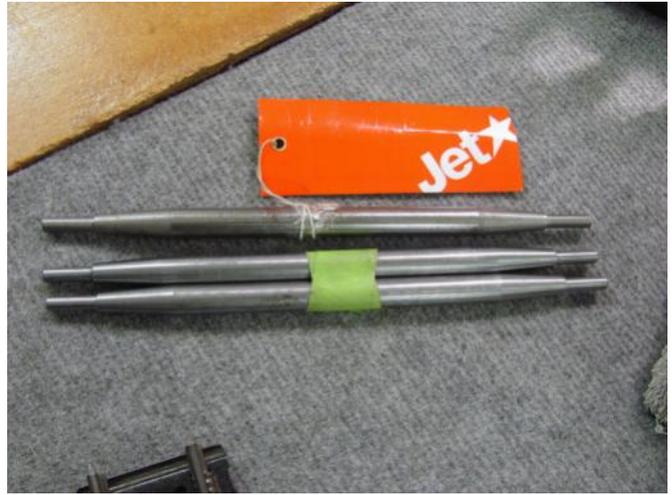
## 2<sup>nd</sup> July 2013

Notes by Dave Russell

The first couple of items tonight were an unidentified gauge 0 loco of German origin and some tin plate items that turned out to be joining pieces for the gauge 0 track sections. Mike Moore had made these joiners using a die stamping tool he had made, perhaps there could be a market for these.

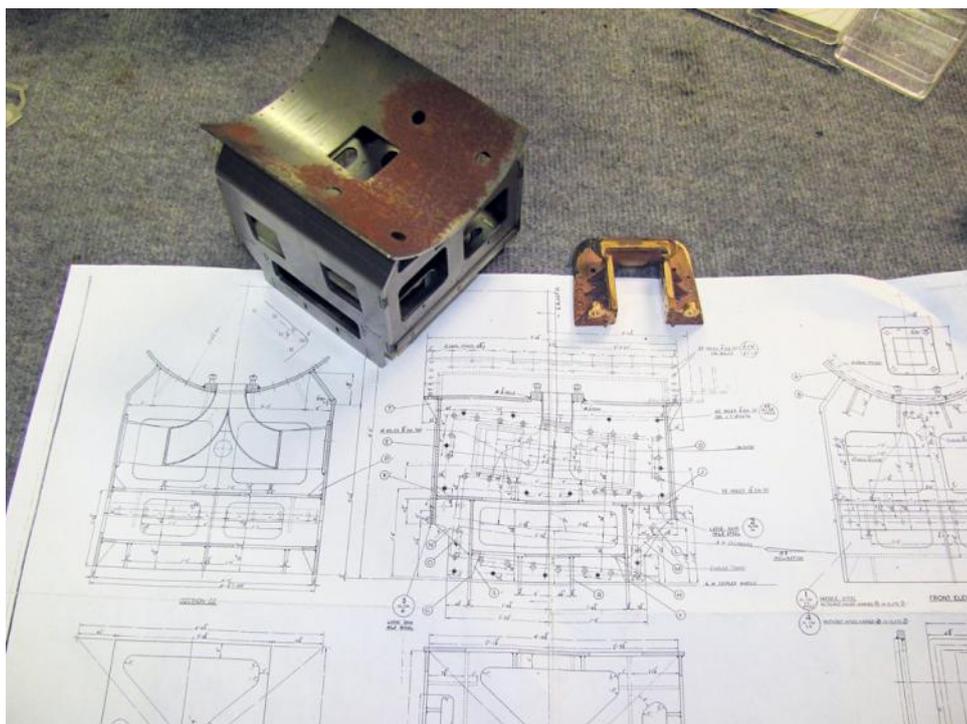


Mike has also made some brake spreader rods for the new club project 7-1/4" gauge passenger trolleys.



A very "Industrial" duty 8" grinding wheel and safety guard casting was brought in by Graeme Murray, they came off a drill sharpening machine originally. One can only think as to the possible poor quality of the wheels in those days to provide a guard of such solid cast iron and weight.

Mike Jack is making some progress on his "project Locomotive", this month mike brought in the smoke box saddle, this is made from a large number of CNC laser cut pieces that fit together like a jigsaw puzzle before being silver soldered together. Mike also had a Main horn block cast in bronze using a lost wax process also originating from a CNC file. The interesting thing with these castings is the fact that the process involves work done by different trade's people all over the world with the file being drawn in NZ emailed to a pattern maker in the UK who makes the lost wax moulds and then passes them on to the foundry person, eventually the parts arrive back in NZ for Mike to finish the machining.





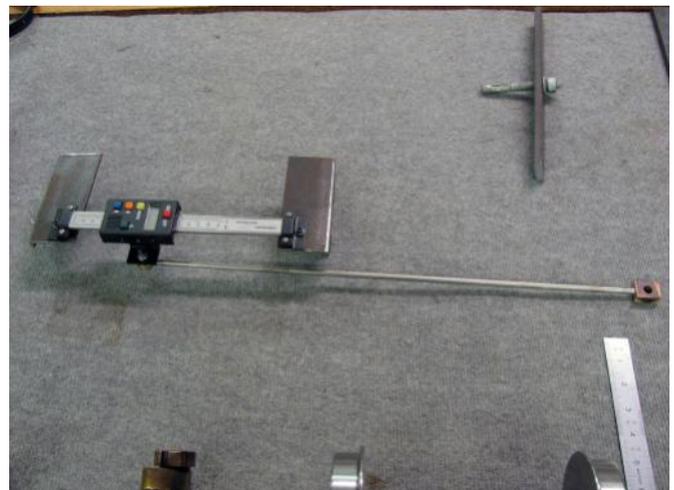
A second and one of many items from Graeme Murray's endless supply of bit and pieces was a "twisted" twist drill initially thought to have caught in a job and twisted but on closer inspection it may have been manufactured like this. If you can tell us why a drill bit would be made in this way please email the editor.

Graeme must have emptied out his box of worked or nearly worked inventions because as can be seen in this photo are a number of unidentifiable items. To the bottom left is a plastic box with a very fine thermocouple connector, the pressed plate and Perspex item was an attempt at a train ride ticket dispenser for the station that employs a one way sprag clutch. In the centre is a weighted soldering rest to hold things in place while you solder them.



Graeme's last item tonight was a ball float valve switch that when cut open revealed that it's operation worked by a large steel ball rolling over a ramp to trip a micro switch and thus turn a pump on or off.

Greg Burrows showed us a measuring device made from a small digital scale that he is using to set the return cranks on his locomotive, once this is done he can then use then measure and make the radius rods as they are both of slightly different length.



In this photo are some items from the workshop of Graeme Quayle. At the top is a stop valve for a large single cylinder steam engine. The items to the bottom are an original and a replacement Injector for a single cylinder "Hot Bulb" engine with a 6 inch bore size and total loss lubrication. Graeme was given the original and a very rough casting to make a copy from.



Martin Plant in conjunction with Mike Jack is accumulating more parts for a fine scale 5" Britannia locomotive. This month it is some spring shock parts and urethane moulded rubber parts for the same. The bronze items have been made by the same lost wax process as mentioned earlier regarding Mike Jack's horn block (photo 4).

Greville Wills is converting his personal ride trolley to 7-1/4" gauge and brought in the axles with wheels, these are of the same style that the club is making for the new ride trolleys.



Lastly is a gauging item being made by Greville to assist as part of the conversion of the club track to include 7-1/4" at ground level, this project is now well underway with many club members making parts for ride trolley bogies and cutting steel to length to be used as sleepers.

# Classifieds

Castings, frame/buffer steel and drawings for "Jubilee" 2-6-4T locomotive 3 1/2" guage.

Design by Martin Evans. Castings by Reeves.

\$650.00.ono.

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