Auckland Society of Model Engineers Incorporated

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September 2012
Number 572

The Micrometer

Registered New Zealand Publication

In This Issue:

A United Launch Alliance Atlas V rocket carrying NASA's Curiosity rover lifts off from Launch Complex 41 at Cape Canaveral Air Force Station in Florida on Nov. 26, 2011.

Train Roster

Date	Electric	Electric	Steam	Station	Station	Station	Extra Guard
2nd September	L Farquhar	M Granger	G Anderson	J Burnett	R Copeland	R Crook*	
9th September	R Hannah	J Harrison	G Bell	B Currie	G Dickey*	P Cunningham	J Cunningham
16th September	P Haycock	M Hollis	M Orange	G Farquhar	A Foster*	D Hamp	
23rd September	D Housley	T Lawrence	B Piggott	G Healey	P Jones*	G Kemp	
29th September	T Robinson	P Woodford	D Russell	J Lankow*	D Leybourne	M Luxton	
29th September	I Ashley	D Black	R van Ryn	I Lyons*	G Healey	S Meikle	
30th September	D Booth	P Dowdeswell	G Anderson	C Mitchell	D Moffat	G Murray*	
30th September	M Plant	B Cotton	G Wills	J Olsen*	W Parker	G Quayle	
7th October	P Eaton	L Farquhar	G Bell	R Reichardt	K Ryan*	A Shirley	J Davies
14th October	M Granger	R Hannah	M Orange	M Richardson	R Smith*	R Stratton	
21st October	J Harrison	P Haycock	B Piggott	R Street*	T Taylor	P Tomkies	
28th October	M Hollis	D Housley	D Russell	S Weston	D Addis*	P Boyes	

Please Note: Two crews are rostered each day for the exhibition - with an overlap for lunch on September 29th & 30th.

Morning Crew: 11:00am through 2:00pm

Afternoon Crew: 1:00 through 4:00pm

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 Asterisked* 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.

Club Calendar

ASME Events	
4th September	General Meeting, Peter Woodford will present one of his workshop practice DVD's
8th September	General Working Bee at the club—9am onwards
11th September	Committee meeting
18th September	Workshop night, visit to Ron Copeland's workshop's
29th - 30th September	Annual exhibition and judging
2nd October	General Meeting - Annual club auction, dust off your goodies and your cheque book!
8th December	Annual dinner and prize giving
General Events	
6th & 7th October	HBMES 50th Anniversary Reunion
20th - 22nd October	60th Birthday Bash of the New Plymouth Model Engineers which is to be held on Labour Weekend

Presidents Report

September 2012

The next general working bee at the track will be on Saturday, 8th September. We have quite a programme of work including changing over some tie bars on the trestle bridge, fixing the WOF stickers to the ride trolleys, more rust treating and painting on the bridges and general vegetation trimming around the track, etc. So please come along at 9am to help with this work. Thanks to Dave Russell whose employer, Partmaster Ltd, donated 20 WOF holders and to Gary Farquhar who prepared some ASME personalised WOF stickers, this is another MEANZ requirement which we will be able to tick off.

The special auction of engineering items arranged by Murray Lane for the August general meeting went extremely smoothly, with everything sold within an hour and a half.

Murray had prepared a schedule of the lots available and this greatly assisted bidders and our auctioneer, Mike J. Thanks to Graham Bell for assisting Mike and for checking items off to their new owners after the event; and to Gary and Greville for ensuring the winning bids were correctly recorded and cash received. Murray felt the estates concerned would be pleased with the result and the Club did well out of the event too. So thank you to all bidders for ensuring everything was bought and the night was a huge success for all.

The club "fun run" held on the afternoon of 11th August was well attended with 9 steamers and 14 members in attendance. Some photos of the action appear elsewhere in this issue. Great to see "Kathleen" back at the track and passing its boiler test after 17 years – congratulations to Trevor Taylor.

By the time you receive this issue of the Micrometer, the ASME 2012 Exhibition and Annual Judging will only be a matter of one month away. I do hope members are well advanced in preparing their exhibits for the show. At the September meeting, I will be asking for a show of hands as to those who will be bringing something along for the display. We have our in-house security team organised – thanks to Dave Russell and Tony Lawrence for volunteering. I will also be putting a list around the meeting so you can indicate which exhibition duty you can man for a time on Saturday or Sunday. We have placed some targeted advertising that should bring along interested viewers, rather than the newspaper advertising which was quite costly and didn't seem to bring in many visitors last year. Scale Marine Modellers will also be displaying boats and ships in their part of the basement.

We did get some additional volunteers for the roster as a result of the recent request – if you haven't already notified Greville that you can come onto the roster, please let him know asap. The more members available to be rostered the less impact it is on those club members who are turning up to run the trains for the kiddies – lets help make this more of a "shared by all" club community effort.

This month's home workshop visit to Ron Copeland's on the North Shore is one I have been looking forward to for some time – I will be asking for numbers at the next meeting so Ron can better plan for our visit.

We had Boracure Pest Control come in and set baits and spray for ants and cockroaches in the kitchen – this should help keep the nuisance at bay. But it is very important that if you are preparing and/or eating food in the clubhouse that you clean up promptly – the state of cleanliness under the tables and in the kitchen can sometimes leave a lot to be desired!

As a result of making the dogbones for the cribwall, we have a fair bit of polystyrene residue from the moulds which needs to be removed from Tony Lawrence's yard. The cost for tipping this at the transfer station is estimated at $500, so if anyone has a need for some polystyrene, please give me or Tony a call. Assuming that no-one will want it all, Tony will be bringing some along to the next meeting and I ask that you each

take a little away to put in your home recycling or rubbish collections over the next few weeks – this way it can be properly disposed of at negligible, if any, cost.

Looking forward to seeing your exhibit for the ASME Exhibition on 29th & 30th September – just a month to go now!

Grant Anderson

(21st August 2012)

Classifieds

Workshop Sale

Due to health reasons it has become necessary for me to reluctantly sell my workshop. For enquiries please phone John Harrison 09 480-6638 or e-mail jf.jh.Harrison@xtra.co.nz.

Chevpac Precision 6" Bench lathe,

Model SSB-11BUK - Purchased new and used for my model engineering projects. 300mm swing over bed, 460mm swing through gap (gap never removed!), distance between centers 610mm, spindle bore 38mm. Has power cross and longitudinal feeds. Includes 3 jaw and 4 jaw chucks, face plate, 2 steadies, vernier scales graduated in imperial and metric, forward and reverse switches, some lubricants and coolant. Comes with a selection of tools. This is a very substantial and robust Taiwanese-made lathe which is in excellent condition and comes with stand – see photo – more photos available, just ask if interested. *$2,250*

Stuart 10v Kitset

Some machining done to the bed plate, the Column and cylinder the rest is still in the package. Building instructions included *$160*

Mill Drill Machine R F 20 / 25

Includes some tooling *$1,400*

Calipers

Moore and Wright:
- Spring Bow inside caliper
- Spring Bow outside caliper
- Spring divider
- Jenny Caliper $45

Around the Clubs

September 2012

The Narrow Gauge, Adelaide - July/August/September 2012

Great cover photo of a model Garratt blowing down at the end of the day`s run. Good photos of the bits and pieces on the table and of the Charity Day run. Enclosed are the plans for Sooty`s Lubricator Mk2.

Big Wheel News, Victoria – May and June 2012

The Insurance Co have paid out for the stolen loco. Good tip on seating ball valves. Visit to the AALS Convention at Penfield. Another lubricator variation. Photos of the ground level track in action.

Rails'n'Sails, Invercargill - August and September 2012

A good read and photos of float planes landing on the pond and RC cars in action. Report from the HO/OO and N gauge section with a number of websites to visit and a photo. Also what Naval sayings mean and an article on boiler insulation.

Slipstream Auckland Model Aero Club - August 2012

A lot of pictures and info covering all types of plane and motors.

Northern Views, Whangarei - July and August 2012

New trolleys progressing well. Steam Inc buys a Da from Kiwirail. This one is a Phase 3 to go with the Phases 1 and 2 they already have. A member has bought a 7¼" Sweet William loco with Hackworth Valve gear, looks good and seems to go well. Article on rail grinding.

Model Torque, Hawke`s Bay - July 2012

50th Anniversary and Open Weekend to be held on 6th and 7th October 2012. Thoughts on buying 2 way radios to keep in touch with the trains. Brilliant idea to put a lighthouse in the middle of the boat pond, especially as it lights up at night. Article on cranes.

Hutt Vallley and Maidstone ME Societies - August 2012

Maidstone Club still hampered by work on the park, hopefully this will come right soon.The new Hutt Valley raised track looks good some good photos of the trial run. New tyres from DNC Aus fitted to Brynglas and Dolgoch, the latter also having suffered boiler damage due to a misunderstanding. A couple of tram and Fairlie photos.

Wheels and Floats, Tauranga - July/August 2012

More thoughts on what to do if you run out of water in the boiler. Article on the contrast between the grades on NZ and UK rail tracks.

Mailship Auckland Model Marine Modellers July 2012

Great cover photo of an enormous Model C17 complete with 4 jet engines and all the modern gear, well worth a read. A list of Nobbys's workshop equipment for sale. A cou-

ple of boat kitsets also for sale. A great photo of the lighthouse in the Napier boatpond.

Leading Points, Thames - Winter 2012

Tributes to the late Steve James, founding President of the Thames Railway. Open Day being planned for 19th-20th January 2013 to celebrate the 20th Anniversary of TSGR. Part 2 of Sereena Burton`s OE train trip, a good read.

Steamers and Dreamers, Manukau - June/July 2012

Write up on a very successful Queen's Birthday Weekend. President`s report from Dave Giles.

Whistle and Anchor, South Canterbury MES - August 2012

Visit by the Sea Scouts who raced model boats on the pond under the guidance of the members, maybe some future members. Model train show at Ashburton.

Conrod, Dunedin - July 2012

Photos of model boats, including a submarine, and of tether cars. Several model boats for sale. Article on one 85 year old member and all the models he has built, his current project is a 9 cylinder Bentley Rotary VR2 for the RNZAF at Wigram.

Notes From the Editor's Desk

Upcoming Annual Exhibition

A reminder that the club's annual exhibition is only a month away! Polish up your hard work & bring it along for all to enjoy.

Don't forget to wear your name badge so new members know who they are talking to!
See the back page for more details on the exhibition.

CNC by Greg Burrows

It all started back in the early 80's when CNC machines first started to appear in the workshop - I became very interested in them, and was at the time running a CNC slant bed turret lathe. This soon led to running some CNC machining centers as well.

Back in 2004 I imported an old CNC machining centre from the States and kept this for a couple of years in my workshop until the need arose to build a new house and move. So the decision was made to sell this machine as it was getting old and parts were becoming harder to get. This is why the project of building a CNC lathe arose. The original idea was to build a complete lathe from the workbench up so I purchased an old ML7 lathe bed casting off Trademe to be the base of this project. The intention was to put linear slides on this bed and build the necessary headstock, cross-slides and tailstock to have a basic lathe to start with.

When I looked at all the work involved in this there was going to be a lot of hours and still some considerable cost, so I started to look at the cheap Chinese imported lathes for a suitable donor and settled on a AL54B model from Machinery House. It had a dud motor so I was able to get it at a reduced price, as the motor was going to be replaced later anyway. This model has 85 mm centre height and 600 mm between centers. This little lathe suited my size range for the manufacture of model steam fittings that I am planning to produce.

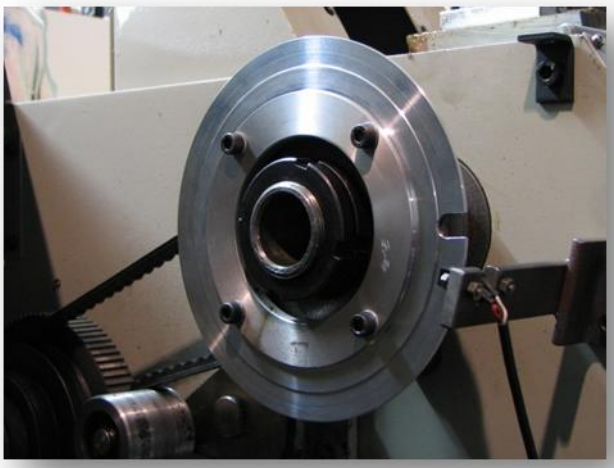
The first step was to plan how I was going to go about converting this lathe into a useful CNC machine.

One of the first things to change was the motor, as the motor on this lathe was being recalled and I would have had to wait for the new one if I wanted a replacement. Given that I wanted to be able to set it up so I could control the speed via the computer (set the speed of the spindle in the program) the motor had to go anyway. The old motor was a 750 watt job and a little under-powered for what I had planned, so a more powerful one was always going to be better. I installed a 1.1kw three phase motor with a VFD (Variable-Frequency-Drive, a motor speed controller) unit to match it. This unit has the option to be controlled by a trim pot (knob) to set the speed or by a PWM (Pulse-Width-Modulation, a method for controlling the speed of the motor) unit.

The PWM unit is what is needed for the computer to control the spindle speeds from my programs.

This new motor required some new brackets to be manufactured to hold the motor over the back of the lathe as it is bigger than the old motor and would not fit into the same space used by the old motor; it also required some new longer Vee belts. I made up a disk to mount on the end of the spindle with a slot in it so the optical sensor could pick up this slot and send a signal to the computer for it to work out the speed of the spindle and where the position of the spindle was for screw cutting a thread.

With this up and running it was time to take the rest of the lathe to bits. I removed the quick change gearbox and the old lead screw, along with the apron for the saddle of the lathe. The quick change gearbox was replaced with a new gearbox and 400oz/in (ounce-per-inch - a measure of power/torque) stepper motor. This is attached by a 2 to 1 reduction by toothed belt and pulleys to a 2mm pitch ball screw to drive the saddle back and forth on the lathe bed. I also manufactured a new apron and covers for the stepper motor to tidy the whole assembly up and make it look a little bit better than a pile of junk. You can see in one of the photos, I went overboard with the cover for the stepper by engraving my name on it with C.N.C.



The cross-slide took a lot more work in removing the old acme screw, nut and handle to enable me to modify it to take the new 5 TPI ball screw. (Yes, one screw is metric and the other is inches) the beauty with electronics is it can work with both of these screw pitches at the same time. The computer only needs to know how far each axis moves with a known number of pulses (steps).

I had to resort to this combination as I couldn't get a metric screw to fit into the space for the cross slide at a realistic price for a model engineer. The saddle still needed a lot of

modifying to take the new ball screw and fit everything in. I had to mill out the centre of the saddle to make space for the ball screw nut to fit in under the cross slide and also make up a new thrust bearing and housing. With some joggling I got it to fit in the end. The only drawback is this ball screw does not have two sets of balls to take up the back lash between the nut and the screw.

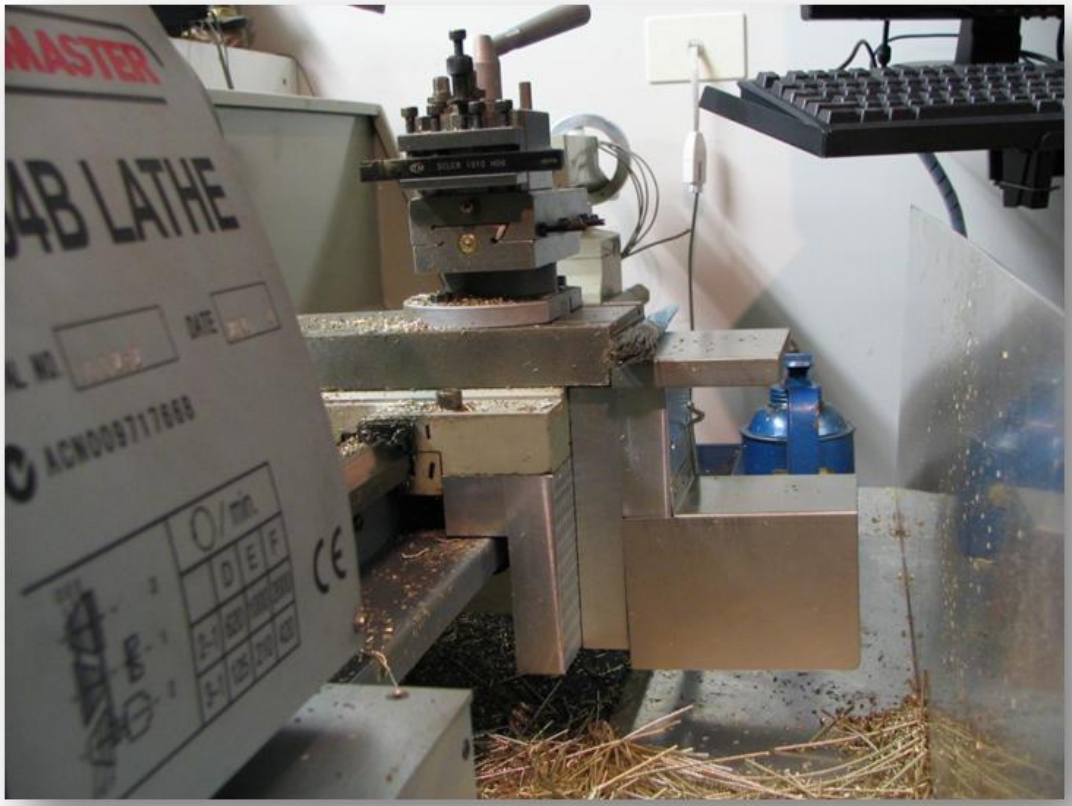
Now this is where the old saying comes into play. **The machine is only as good as the person running it**! So if you know there is a little back-lash (0.06mm in this screw) you can work around this problem when you program your jobs,

By planning to apply each cut in the same direction so the back-lash doesn't get a chance to muck your cuts up. I also have a weight hanging on the back of the cross slide to hold a rubber curtain to keep swarf out of the ball screw and apply a little drag on it. This helps to keep the back-lash to a minimum.
You will see in the photos that the old handle for winding the cross-slide has gone and is replaced by a 240oz/in stepper motor that is hiding under a new set of covers and brackets on the front of the apron. The stepper motor is connected to the cross-slide ball screw by a 1 to 1 toothed belt. I also managed to get more travel out of the cross-slide with these mods.

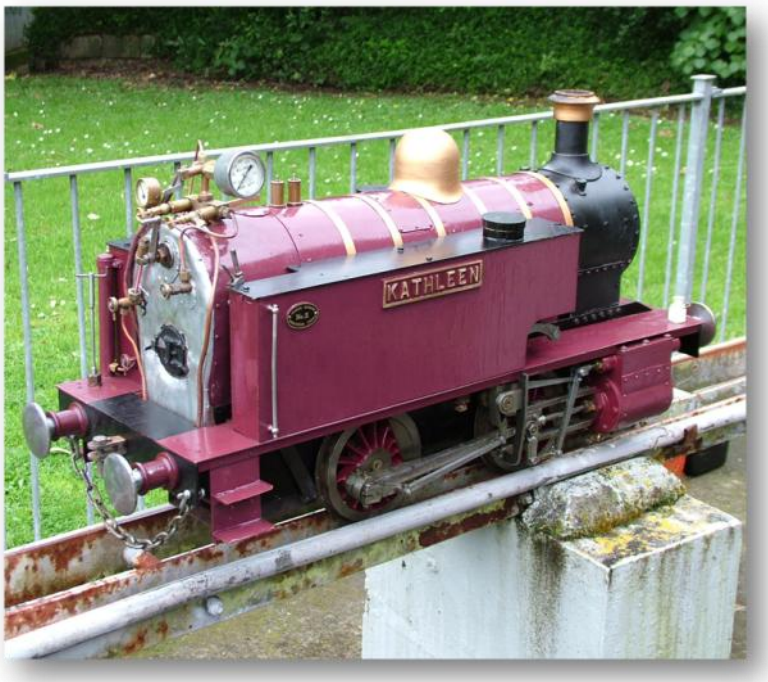
When I managed to get all this up and running, I made the decision to put a quick change tool holder in place of the four way tool post that it came with.
The control system for the Lathe is a program called Mach-3 it is from Artsoft and on the internet and has a large following there. It has very good backup and very good forums, so help is not too far away should it be required. I am only using 2 axes to run the lathe at the moment, but plan to build an automatic tool changer for it in the future to replace the quick change tool post. This will use another axis to drive it. This program allows you to control all sorts of machines up to 6 axes.

This program uses standard G code to run the machine, which means I can take my programs to another machine and use the code on them.

So far the little lathe is running reasonably well with only a couple of problems, like me it has its own little quirks to contend with. All the programming on this machine is done by hand; no cam system is used to help work out the code needed to operate it. Once you have made up a set of basic codes for each of the different operations needed, you can cut a paste the different operations together and alter or add more code as required to build up your program.



Club Fun Run Pictures




SOUTHERN
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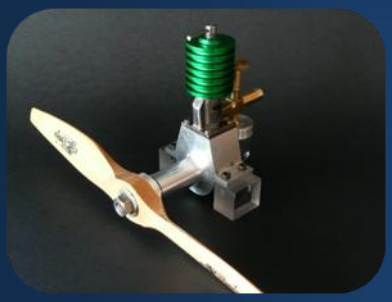
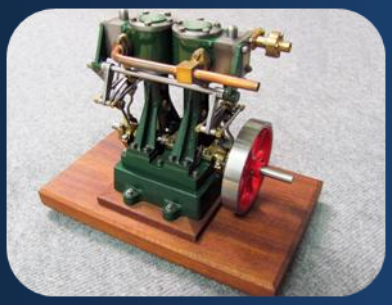
Model Engineering Exhibition

Auckland Society of Model Engineers Inc





Featuring

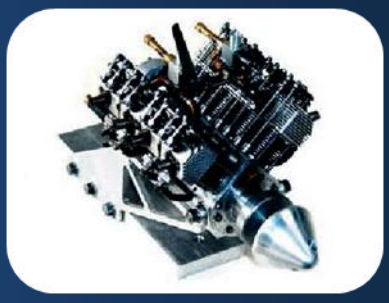
Live Steam Locomotives
Traction Engines
Stationary & Marine Engines
Clocks
Tool& Workshop Equipment
General Engineering Models
Model Ships & Boats
Train Rides - Weather Permitting

29th & 30th September

Train rides all day from
11am to 4pm

Train Ride Admission Fees

$2.00 Per Ride
$10.00 Concession (6 Rides)



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