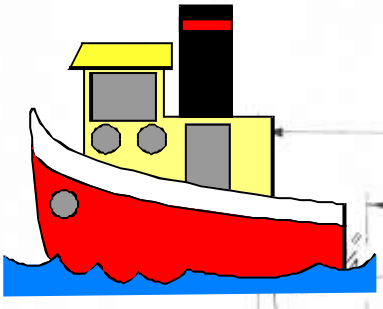


Wheels & Floats

December 2025

Tauranga Model Marine and Engineering Club Inc.

Newsletter December 2025

TAURANGA MODEL MARINE AND ENGINEERING CLUB INC.

The Secretary

PO Box 15589

Tauranga 3112

Palmerville Station Phone 578 7293

Bank Account 03-0435-0461711-000

Miniature Railway Memorial Park

Open to Public, weather permitting

Sundays : 10am to 3pm approximately

Website: www.tmmec.org.nz

Facebook: Memorial Park Railway Tauranga

MEETINGS

General Members Meeting : every first Tuesday of the month, at 7pm.

Committee Meeting : every second Thursday of the month at 7pm.

Maintenance : Tuesday mornings from 9am.

Engineering discussions : Tuesday evenings 7.00pm.

COMMITTEE

President: Warren Karlsson 027 5422863

Vice President: Owen Bennett 027 5914992

Club Captain Joanne Knights 020 4190 9567

Ethan Bramley 022 0972 767

Secretary: Warren Karlsson 027 5422863

Treasurer: Jerry Payne 021 486 013

Committee:

Ian Bain, Ethan Bramley Graeme Hayley, David Ingley, Brian Marriner, Russell Prout,

CONVENERS

Boiler Committee:

Owen Bennett, Ross Campbell, Bruce McKerras, Ash Thomas.

Safety Committee:

Ethan Bramley, David Ingley, Warren Karlsson, Bruce McKerras.

Workshop: Ethan Bramley

Drivers Licencing :

Warren Karlsson, Bruce Mckerras.

Track: Russell Prout, Ash Thomas.

Librarian: Chris Pattison.

Rolling Stock: Jason Flannery

Website: Peter Davies.

MEANZ rep Russell Prout.

Editor: Roy Robinson 027 5491182

royrobkk@gmail.com

Cover photo : I think Santa needs a hand to get his running gear redesigned.

Presidents Report December 2025

.As we head into a well-deserved break from routine and face the initial chaos of the silly season before settling into couple of quiet weeks of "holidaying", I would like to thank you all for the time and efforts put into the club over the past year.

Our last day of public running, for this year, is on Sunday 21st of December and we resume on Sunday 11th January.

Some members will be making a visit to the Christchurch MEANZ Convention and CANMOD 2026 running from the 8-11th January, for those attending here's to an enjoyable and safe experience.

Russell will be attending the MEANZ BGM as our nominated Club representative, following up from a most active year within MEANZ with the strengthening of how affiliated clubs will operate under both the ADR and proposed new boiler codes.
Noting the our ADR is due for its biennial renewal in May this coming year, and will be subject to any changes being implemented, including how we manage driver training and competency.
All MEANZ newsletters and bulletins are passed on by the Secretary, as and when received, ensuring each any everyone is kept well informed.

The Committee, along with the Editor also take a break for a month before normality returns in February.

However business of the club in the form of bills to be paid have to be acknowledged as usual in January, thus the Secretary Treasurer and Bookkeeper will have some minimal work to do.

This year we had only two group bookings for private function rides, normally we have triple that number, possibly a sign of the times but this has always been an unpredictable "market" to which we endeavour to meet any requests made.
Thank you to those club members whom turn up to help run when required outside of your normal routine

In late February or March the St. John Ambulance Association are arranging to hold their annual Picnic at the Memorial Park where we will open up our railway for them to enjoy.

I also have an invitation to speak to the Tauranga Deaf Association early in the New Year, in conjunction with the Mini Golf. I believe the topic is how the Memorial Park has developed over the years, so some historical information is being provided by the City Council whom are also being tasked with having an interpreter present.

The original arrangement was between the Deaf Association and Mini Golf but we have been roped in to help, so I may need some assistance here, as again we open up our railway to a deserving group.

Actual dates, and arrangements for all the above are yet to be finalised and notified.

The Raised Track modifications are taking a short break following a tremendous effort by a small dedicated team, led by Russell, to progress it to where it can be used but with further enhancements to complete. A special mention to Peter Lawn for his dedicated attention to the project, along with Ash, Ashley, Jason, Warren B, Kerrin and others whom have volunteered their time over the last 2 – 3 months (my apologies if I have missed anybody in particular)

A reminder of the Tauranga Model Railway annual display being held at the Boys High School on the 17 and 18th January, Roy is coordinating this with further information following in this newsletter.

TAMAR passed its annual boiler survey this past week and thank you to Warren Belk for his continued stewardship of this important locomotive, along with Bruce, John, Ross, Steve and Kerrin as the operating controllers.

Next year we are making arrangements for our annual social function to be held at the Waihi Goldfield's Railway, on Saturday 14th February, to include a return rail trip from Waihi to Waikino a followed by BBQ and a peak behind closed shed doors at the society's Waihi facility. A bus is being arranged to transport club members from Memorial Park and back on the day, with more detailed information to follow next month.

The Club Calendar and Duty Operators' Roster for 2026 is included with this newsletter, with copy's posted within club house

I wish you all a very merry Christmas and a prosperous and happy New Year as we leave behind 2025 and look forward and welcome 2026.

Again thank you for your attention and regards to you all,

Warren Karlsson.

PEACE ON EARTH AND GOODWILL TO ALL.

Humour :

Club Captains Report December

Hi Team,

Here we are, nearing the end of another year. I have been out of town for the past few weeks, so not a heap to report this month. However, from a railway side we did run all of the five available Sundays in the past month.

We have had several members taking trips around the North Island, including to Mana Ariki and also over to Cambridge Club for their ever popular night runs, this saw Bruce's 'Red Rocket' out for a successful run after spending some time in his shed being overhauled.

Really, all I have to say this month is a huge thank you to everyone that has participated in the club's activities and events over the past year, we have had some great successes that were only made possible by the effort that everyone puts in.

Our next club event will be the 'Xmas Party' in February – More details to follow in due course.

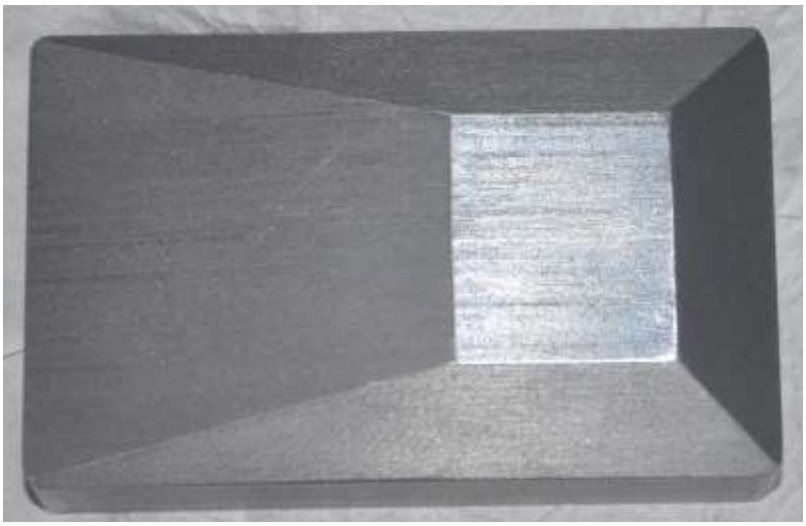
I hope that everyone has a lovely Christmas and a Happy New Year.

Thanks,

Joanne & Ethan.

Cambridge Night Run.

Show and Tell +



Kerrin G is making a micrometer stand out of a piece of cast iron. He decided to machine this on his shaper. Now whilst most members knew what a shaper is they are all but collector's items these days.

Below : Chris P had a couple of No2 morse taper reamers for sale.

The Tamar underwent its annual test, Chris Erasmus doing due diligence, with Warren B and Kerrin G keeping a close watch. (and it passed)

TAURANGA MODEL MARINES AND ENGINEERING CLUB INC - OPERATORS ROSTER 2026

	Date	Operator	
	11th January 2026	Warren Karlsson	
	18th January 2026	Joanne Knights	
	25th January 2026	Steve Mannington	**Auckland Anniversay Monday 26th Jan**
	1st February 2026	Bruce McKerras	
	8th February 2026	Russell Prout	**Waitangi Day Friday 6th Feb**
	15th February 2026	Ian Bain	
	22nd February 2026	Bruce Bocock	
	1st March 2026	Etahan Bramely	
Saturday	7th March 2026	**TBA**	PLAY DAY
	8th March 2026	Brian Fitzpatrick	
	15th March 2026	Warren Karlsson	Saturday 14th Annual Social
	22th March 2026	Joanne Knights	
	29th March 2026	Steve Mannington	
	5th April 2026	Bruce McKerras	**Easter Weekend** - Daylight saving ends
Saturday	11th April	**TBA**	PLAY DAY
	12th April 2026	Russell Prout	
	19th April 2026	Ian Bain	
	26th April 2026	Bruce Bocock	**ANZAC Day Monday 27th April**
Saturday	2nd May 2026	**TBA**	PLAY DAY
	3rd May 2026	Etahan Bramely	
	10th May 2026	Brian Fitzpatrick	Mother's Day 10th - AGM Saturday 9th May 2026
	17th May 2026	Warren Karlsson	
	24th May 2026	Joanne Knights	
	31st May 2026	Steve Mannington	**King's Birthday 1st June**
Saturday	6th June 2026	**TBA**	PLAY DAY
	7th June 2026	Bruce McKerras	
	14th June 2026	Russell Prout	
	21st June 2026	Ian Bain	
	28th June 2026	Bruce Bocock	
Saturday	4th July 2026	**TBA**	**PLAY DAY**
	5th July 2026	Etahan Bramely	
Friday	10th July 2026	**TBA**	**Matariki** Friday Night Run
	12th July 2026	Brian Fitzpatrick	
	19th July 2026	Warren Karlsson	
	26th July 2026	Joanne Knights	
Saturday	1st Augist 2026	**TBA**	PLAY DAY
	2nd August 2026	Steve Mannington	
	9th August 2026	Bruce McKerras	
	16th August 2026	Russell Prout	
	23rd August 2026	Ian Bain	
	30th August 2026	Bruce Bocock	
Saturday	5th September 2026	**TBA**	PLAY DAY
	6th September 2026	Etahan Bramely	Father's Day
	13th September 2026	Brian Fitzpatrick	
	20th September 2026	Warren Karlsson	
	27th September 2026	Joanne Knights	Daylight saving starts
Saturday	3rd October 2026	**TBA**	PLAY DAY

As one of five finalists in the TECT Western Bay Community Awards a video was done so that the Judges could compare the finalists to select the winners. There were many categories and we were in the “Heart of the Community” category. Below are a couple of pics taken whilst filming.

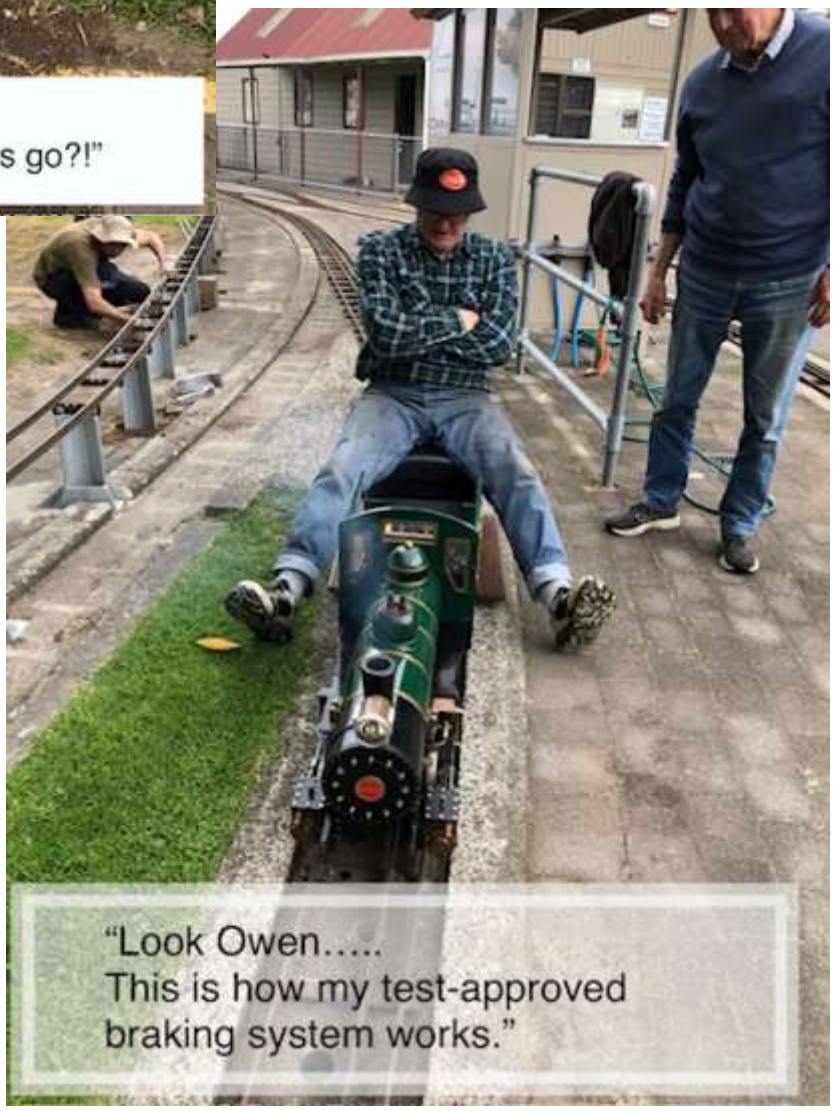
The President gets interrogated!!

Pep talk for the customers

The drive by with customers, camer-as rolling, Take 7

Credit Peter Davis

Town and Around



Power to the People Part 2

The Kaimai Hydro Scheme

A cascade of generation stations, the Kaimai Hydro Scheme was commissioned between 1972 and 1994. It currently consists of four power stations, Lloyd Mandeno, Lower Mangapapa, Ruahihi and Kaimai 5, with small storage lakes linked via a complex network of tunnels and conveyance systems. Drawing on a catchment area of approximately 425 km^2, the scheme is 'run of river' relying on the natural flow of the Wairoa River to generate electricity, with daily storage. It has a maximum capacity of 42 MW generating approximately 169 GWh annually and powering around 23,500 average kiwi homes per year.

Lloyd Mandeno Station

Work on Lloyd Mandeno Station started in 1972 and was completed in December, 1976. It is the uppermost main station and has a generation capacity of 16 MW. A 'diversion' scheme, it includes eight of the nine river intakes and associated diversion systems utilised by the overall Kaimai Scheme and is the primary inflow 'collector' for the scheme.

The water of the Ōmanawa River, Ruakaka Stream, Opuiaki River, Tauwharawhara Stream and Ngatuhoa Stream was diverted by a series of weirs, intakes and tunnels, to an artificial lake - Lake Mangaonui - in the bed of the Mangaonui Stream and fed by the Waitaia Stream. Lake Mangaonui provides the main operational storage for the scheme, diverting water through a tunnel to Lloyd Mandeno Power House where it is discharged to the Mangapapa River. The area of Lake Mangaonui is 8.1 ha and the total length of tunnels is 8796 m. The output of the station is about 70,000 kWh per year. Total cost was approximately $9,000,000.

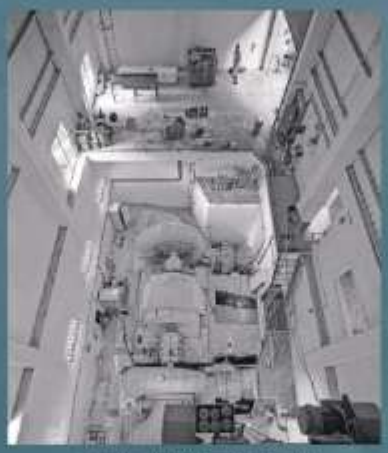
Commissioned in 1994, **Kaimai 5 Mini Hydro Station** was built at the outlet of tunnel 5 diversion tunnel into Lake Mangaonui.

Lower Mangapapa Power Station

The smallest of the three main stations, Lower Mangapapa station has a generation capacity of 5.6 MW. It is located about 0.6 km downstream from the Lake Matariki Dam. Discharge from the Lower Mangapapa re-joins the Mangapapa River before entering Lake McLaren.

Work on the station commenced in 1976, and it was commissioned in April, 1979. This scheme consists of a 27 m high concrete arch dam in a narrow volcanic rock gorge, about 500 m upstream of Lake McLaren. Lake Matariki extends as far as the tailrace (a channel that carries water away from a hydroelectric plant or water wheel) of Lloyd Mandeno Station and has an area of approximately 17 ha.

A 3 m diameter concrete-lined tunnel 400 m long leads from an intake and access shaft structure to the power station. A steel penstock supplies two horizontally mounted turbines, with a centrally mounted induction generator. At the time of completion, it was believed to be the largest induction generator in the world. The generating head is approximately 32 m and the output about 17 GWh per year. The total cost of this scheme was approximately $6,804,000.

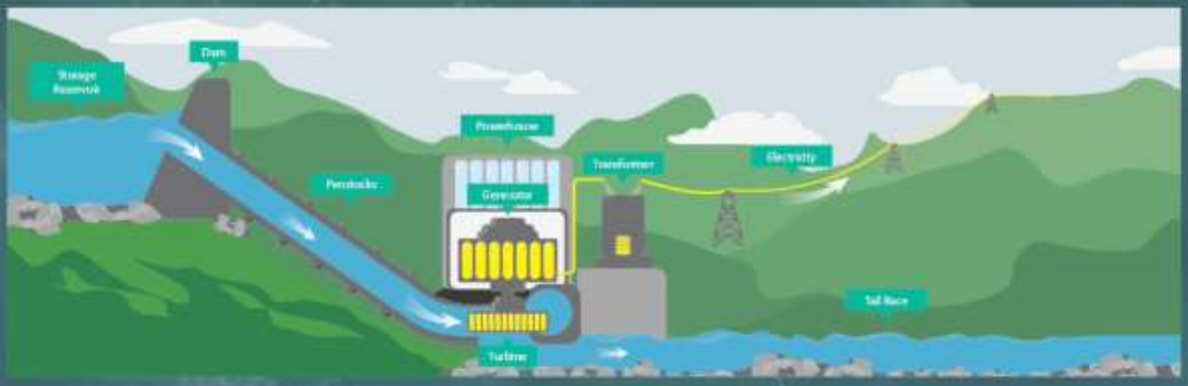


Disclaimer :

The views and opinions expressed in articles contained in this magazine are those of the author (s) and do not necessarily reflect the policy, position or opinion of the TMMEC or its officials.

Hydroelectricity

Hydroelectricity works by harnessing the power of flowing water to generate electricity. The potential energy of water stored at a height is converted into kinetic energy as it flows downhill, and this kinetic energy is then transformed into electrical energy. Hydropower utilizes turbines and generators to convert that kinetic energy into electricity, which is fed into the electrical grid to power homes, businesses, and industries.



There are a few different ways to generate electricity from water. In this example water from a dam above the power station flows through an intake gate at the base of the dam, and down through penstocks (big pipes). This water flows at high pressure through an intake valve, and into the scroll case which curls around the turbine and ensures even water pressure. Inside the turbine there is a set of 'wicket gates' that control how water flows into the turbine. The 'wicket gates' are controlled by a governor in response to the national grid/power demand. *If the national grid is experiencing high demand, the governor slows down the turbine, which causes the wicket gates to open wider, letting more water in and speeding up power output. If the grid has low demand, the governor speeds up the turbine so the wicket gates close and let less water in, slowing down power output.*

Inside the turbine, angled blades are pushed by the pressure of the water flowing in. The blades are connected to a shaft called a runner. As the runner spins around it turns the rotor in the generator above it.

The generator sits beneath an excitor at the top of the shaft and is made up of a rotor (turned by the runner), surrounded by a stator. The stator is made up of three-phase AC generator coils (copper wire called windings), placed 120 degrees apart around the inside of the stator to produce three-phase power. There are several electromagnets on the rotor, which are powered by DC current from the excitor. As the rotor spins within the stator, each pole's magnetic field acts on the stators winding. With every revolution, one pulse of AC power is generated and fed towards the power grid by conductors attached to the stator. Pulses of power are timed to the grid frequency (speed), and this is called 'synchronisation'. The generator produces 3 phase power through 3 alternating currents.

What's a Megawatt (MW)? Power is measured in watts, 1000 watts is one kilowatt (1kW), 1000kW is 1 megawatt (1MW), 1000MW is one gigawatt (1GW). A typical kiwi household uses around 7107kWh of power each year. The Kaimai Scheme has a maximum capacity of 42MW (the amount of power it can produce at any given time) and can produce up to 169GW each year for the national grid.

A volt is a unit used to measure the electrical force that pushes electrons through a wire or circuit. It's like the pressure that pushes water through a hose. The standard voltage used in New Zealand, Australia and Europe is 230. In America, 120V is used for common outlets and 240V for larger appliances.

McLaren Falls Power Station

One of the best botanical collections of trees in New Zealand can be found in a recreational area on the Wairoa river, just ten minutes by car from Tauranga. McLaren Falls Park is 190 hectares of parkland set alongside Lake McLaren, popular for a range of activities including picnics, camping, fishing, kayaking, bush walks and summertime concerts.

Lake McLaren and the park were originally formed as part of the Wairoa River catchment hydroelectricity system.

Due to the increasing demand for electricity Lloyd Mandeno undertook surveys of the upper Wairoa and Mangapapa Rivers, and in 1921 settled on a waterfall on the Wairoa River as a suitable site for a power station. He stated that 3000 to 3500 horsepower could be obtained. Mandeno later named the falls 'McLaren Falls' after the couple who operated the cook house, and had lost a son in the First World War.

A poll was put to the ratepayers on 15 December, 1922, for a $180,000 loan. Tauranga Borough had a population of 2000 and had already mortgaged itself for $140,000 on its electrical enterprise. The poll was carried by a majority of 441 to 45.

In 1923 the Tauranga Electric Power Board was established. During the same year a bunkhouse for up to 50 men was erected between McLaren Falls Road and the present lake. The work force peaked to 70 men. A storage shed derrick and crane were constructed on the Wairoa River near the Ōmanawa Bridge. Cement and other supplies were carried to this point by punts and then to the falls by road.

The powerhouse and arch dam were constructed using the local rhyolite rock for fine and coarse aggregate. All structures were designed so as to impose low stresses on the concrete. The quarry for the power house rock was situated downstream, the rock being transported by manually-pushed trolleys on rails. The first generator began operation in 1925.

Most of the land bounding the eastern side of the river above the falls was privately owned, until a portion of it was purchased by the City Council to be incorporated into the park. In 1918 the Council had acquired a limited piece of land extending from the power station to the present site of the hostel building within the park, as well as about 80 acres at the southern end. Both were acquired as water reserves for the existing and possible future development of hydro schemes. The remaining area between these two reserves was later purchased to create a continuous park on the eastern side of the lake.

The Ruahihi Power Station Canal project which started in 1977, caused a 1.2 m increase in the level of Lake McLaren necessitating the construction of an additional outlet to the lake. Ruahihi was commissioned in 1981 and the McLaren Falls Power Station was decommissioned in 1989. A bypass was later installed to allow the continued release of recreational flows into the Wairoa River on set days each year to enable activities such as rafting and canoeing.

The Mighty Midgets of the Nelson Section Part 2

Ascending from Annesbrook Crossing to Bishopdale, about 600 yards from the crest of the 1 in 35 grade. The locomotives are D 144 and Fa 373 with a coupling bar between them. Then follows a four-wheeled guard's van, three bogie passenger cars, a six-wheeled C class car and a string of canopied high-side L wagons pressed into service as passenger conveyances. The train was returning from the Agricultural and Pastoral Show at Richmond about 1910. Photograph author's collection.

There was a good deal of 1 in 50 and 18 to 20 miles of 1 in 44. Thirty-two miles out at Colfax an additional 2-8-8-2 helper was added to battle up the 1 in 44 to Emigrant Gap where the incline eased to only 1 in 50. Power output while negotiating the 1 in 44 had been increased to 227,000lbs. After cutting out the 2-8-0 at Emigrant Gap, available Tractive Force was reduced to 184,000lbs and the train continued on to Norden, the summit station. Two cab-in-front 2-8-8-2's output of power were somewhere equal to about six NZR 4-8-4's.

After my experiences in the US I was converted to a whistle artist. I saw many high speed trains running through cities—watched them from hotel rooms, saw them at level crossings and noted the manner in which they sounded their warnings.

They went through the complete long-long-short-long right up to the crossing and clear across if necessary.

Having witnessed their performance over a period of seven years, I was convinced the whistle was used too timidly in New Zealand and that the majority of crossing collisions could have been avoided if the whistle had been sounded early enough, that is, started soon enough and continued right up to the crossing and over it if need be, to the other side. Maybe I was lucky, but while firing, the engine I was on was involved in only one collision—on the driver's side—Taumarunui, Bb222, 1935. Otherwise, I opened the whistle valve many times and it remained open until the offending

1890 air brake system. The other two (373 and 374) were equipped with steam-ram brakes. Number plates displayed numerals only, no class letters. Evidently undecided at the time of their birth, class letters were left to a future date.

I rode behind Fa's on picnic and holiday excursions to Wakefield, and Glenhope; on ordinary mixed to Brightwater, Wakefield and Belgrove and special passenger to Territorial camps at Tapawera and Appleby up to the age of 18 (1923) still in the days of Welsh coal.

After the Fa's had gone I fired and drove specials—operated by W's— over "The Hill" from Belgrove to Motupiko to fetch overflow loads; work trains to various destinations; Raspberry Specials Belgrove to Kiwi and Troops to Tapawera. Work trains and some other type of specials were the only trains run where we were able to enjoy non-stop runs through six or seven stations. Everything else stopped where required. Specials entered designated sidings to pass timetabled trains. On work trains we entered the nearest siding 15 minutes clear to enable timetabled trains to get by.

During the whole term of their service the Fa's were an almost unknown engine to locomotive running men and fans alike. On the Nelson Section they were worked out daily to maximum capacity, mile after mile with the throttle and cutoff extended to the limit and their boilers almost never were drained of steam or pressure lowered by as much as 25-30lbs. A most unusual quality and a terrific capability built-in, in so small an engine.

Knowledgeable enginemen would not have been surprised if similar claims were made about well found A's, Aa's, Ab, Wab, X, K or J's with good quality coal on the grate but for a miniature 29-ton stranger to the fold it appeared to be claiming rather too much.

I saw Nos 373 and 374 in action before I was seven and soon after saw No. 315—all at Nelson. Recently arrived 315 was placed in service 1912 and later on I had the pleasure of riding her cab and later still I had the pleasure of handling her throttle during the last months of 1937. I was transferred November 30, 1937, to relieve on the left and right hand sides. I had then only recently sat the drivers' exam at Wellington and Nelson was my first main line assignment.

Although Fa's were written off the books, No. 315 was in running order although very little maintenance had been done on her. After returning to Wellington and being assigned to the "Prepare and Put Away" I hastily made my way up to Frankton during 1938.

The cinder-pit was the kindergarten school for locomotive drivers. Before manual drop-grates had been equipped, it was the roughest and dirtiest job around an engine terminal. Locomotives came in from the road with fireboxes full of clinkers, cinders, ash and half burned coal. Before they could take out another train, this refuse had to be broken up and raked through the drop-grate and ashpan and left in the pit. The largest clinkers were pulled through the firebox door with the clinker-hook and new fires laid to hold the steam. We had to refuel, take a full tank of water, take sand, fill lubricators, oil around, adjust brake slack, test the run of sanders and have engines ready for outgoing crews on time, prepared for their run in every respect. You might have six to get ready for the road in an eight hour shift. Passed firemen—those holding a new driver's ticket—were saddled with the job at the cinder-pit.

I stood down, transferred to Frankton in order to revert to firing rather than put up with that job. It was always known as the "Put and Take". Not many wanted it. There was too much climbing on and off engines, too many fires to fix, too much dirt down your neck and in your eyes and on your clothes to make the job popular. Some of the bosses tended to be irritable, though I reckon they had a right to be. Green, first year drivers sometimes caused delays with the result that trains were late in getting away. There were other ways of learning about the characteristics of steam locomotives. I was really disenchanted with the "Put and Take".

Later the same year I was in a position to manage a transfer from Frankton Junction, that landed me in close proximity to the lure

Not a piston valve Fa but this shot of Fa 250 hurrying along the Whakatane Board Mills line in February 1963, with about 350 tons gives a good idea of the tiny size of the class.

of well-found engines of the Nelson Section. Stationed first at Picton and shortly at Blenheim, 1939, I considered I was fortunate to be assigned to 372 for a year and I came to be familiar with the characteristics and capability of that particular piston valve Fa.

Other information has been written about the stamina, ability and endurance of those small engines while working against continuous 1 in 40 and 1 in 50 inclines which took them from sea-level to 1,010ft on the first 20-mile drag up to the Tunnel from Freezing Works, and then after losing over 500ft in drifting down to Tapawera at 479ft, there was another hard drag of 20 miles up to the next summit at 1,485ft.

It is the extreme smallness I wish to describe. To a standard guage "rail" from North America the Fa would have appeared similar in size to an Amusement Park locomotive or a model built to the order of a well-heeled individual—an engine having room enough in the cab for two men. They have been described as being similar to a "watch-chain pendant", or a "paper-weight model" and a "treadle sewing-machine", etc.

Having No. 372 daily we liked to keep her clean for our own convenience and satisfaction and also for aesthetic reasons. They were handsome little machines after being polished and well maintained and they were no trouble for two men to keep looking nice. They were so small that the average man could reach the top of the tanks easily from the ground while cleaning, and the rear edge of the bunker was within easy reach from the footboard.

The sides of the cab were reached from the angle-iron ledge along the bottom of the tanks and we needed to go on top only to do the front of the cab, the Belpaire firebox top, steam-dome, sand-dome, smokebox and the tall stack and headlamp.

By the way, those tall-stacked engines were very good when lighting-up after a boiler-wash. Everything being cold, draught through the horizontal boiler did not draw at all well and the larger the boiler the shorter the stack and the more trouble we had to contend with when starting a fire.

You could not start with coal, it had to be with timber and the longer boilers sometimes reacted similarly to condensers. A condition known as "sweating" developed occasionally before a large wood fire could be established. Many men suffered burns from flame erupting back into the cab while the boiler was cold and there was no steam to produce a draught. Tank engines like Wab, We and Wj were examples where firemen at lighting-up could not get away quickly enough from wrong-way fumes and flame. The distance between shovelling-plate and firedoor was much less than it was on tender engines and the man attending the fire could not retreat to the apron. He had to get out of the cab quickly.

Long boilers with short stacks were always troublesome unless we could place an air-operated blower down the stack—to be operated by an air-pump from a nearby engine in steam. While examining equipment in Roundhouses in California and in Utah I saw instances where engines with tremendously long boilers (Santa-Fe 2-10-2 and articulated 2-8-8-2) were provided with an immediate draught from a live-steam line with outlets to each road in the 'house.

A three-way valve directed steam to the draught-ring of each engine. All that was required was a suitable coupling to the draught apparatus of each engine and a valve designed to direct steam to the stack instead of permitting it to flow back into the boiler. I passed this information on to the the relevant locomotive maintenance branch here and in due coure all locomotives were so equipped as they passed through the shops for overhaul.

Short-boilered, tall-stacked jacks similar to the Fa gave little trouble and that tall 4ft 3in chimney drew well shortly after a good wood fire had been built under her.

The trailing wheel, drivers and rods, spectacle-plates, motion, steamchests, and cylinder jackets, headstocks and cowcatchers were all gone over and responded to elbow-grease. Only the leading driver, hidden behind the crosshead, was awkward and difficult to get at but after we had become adjusted to the obstacles, that leading wheel was not too much trouble as long as the main rod, crosshead, guides and the lower end of the expansion-link and front end of the eccentric-rod were cleaned off and dry beforehand.

No. 372 was equipped with the old 1890 pattern air brake equipment and had an 8 inch air compressor. The brake valve was mounted on the tank extension in the cab. After slack had been properly adjusted at the turnbuckles they had an excellent brake, an exceptionally good brake. Brake adhesion was very good and the adhesion when under power was the same. They were good on their feet. The 29-ton engine had 25 tons on the drivers, almost all their weight available for adhesion. They were live wires and could get over the road with their scaled down tonnage as well as the larger Wf's.

The Fa with a 3ft 0 1/2in wheel made 370rpm at 40mph. Wf, Wg, Ww and X with 3ft 9in wheels made 300rpm at 40mph. A, Ab, K and J with 4ft 6in wheels made 250rpm at 40mph. Although the ruling grade reduced their tonnage rating, Fa's were expected to run to time—the same time allowance as for Wf's.

When assigned to Nelson they were not located on an easily worked grade profile. In fact they had one of the most difficult con-

Richmond from the cab of Wf 404 in 1931. The locomotive was heading train No. 1, the school train and was waiting for No. 4 mixed, about 1929. Photograph author's collection.

tours to face having an aggregate of 2,290ft of elevation to overcome in 43 miles of southbound running and there was 1,028ft on the return trip. They drifted down 43 miles while running northbound trains. The 1,028ft had to be overcome while battling up 16 ascending miles.

Where would you look to find an equal amount of adverse grade in 43 miles? On the Trunk lines there were steam engines with ample boilers such as the Ab with 33sq ft of grate; the X with 37 sq ft; J with 39sq ft and K with 47sq ft and each had heating surfaces to match the larger grates. It seems almost incredible that such a small, inanimate assortment or iron and steel could burst into life and haul its 29 tons and a payload of 90 tons over the ruling 1 in 35 inclines.

There were some very difficult grades to be surmounted such as Nelson to Bishopdale; Wakefield to Tunnel; Tadmor to crest of the Hope Range while running southbound and Glenhope to Hope Range summit; Tapawera to Tunnel and Annesbrook to Bishopdale while running north.

Annesbrook crossing to Bishopdale was

an especially difficult problem because of the tendency of boilers to "prime", while running fast and preparing to slam into that 1 in 35 at maximum power. (9,090lbs tractive force.)

Water had to be kept really low at the foot of the incline and maximum power had to be developed in order to overcome gravity and curve resistance. There were no turning facilities at Glenhope or Belgrove engine terminals, therefore on the return runs engines were operated in reverse.

Water circulation within the boiler was as follows: The cooler boiler-feed from the 6.5mm injectors entered the front end of the barrel below the waterline and the cooler water passed down to the lower levels and back to the throat and waterlegs of the firebox and the rear fluesheet. There the most intense heat was transferred to the water and very strong thermal action raised confused masses of steam escaping from the turbulent up-rising water. From there the very hot water circulated forwards through the barrel and repeated its path from the boiler-feed entrance—the check-valves.

When the Fa's reached the foot of the 1 in 35 they were travelling at maximum speed allowed around the 10-chain curve (35mph) and were opened out to half throttle, threequarter throttle and very soon to full throttle and the cutoff was at 25 percent. Cutoff was adjusted immediately as headway was lost against the incline and while running at 30mph with cutoff at 35-40 percent water tended to be drawn up with the steam into the dome and on past the wide open throttle valve into the dry-pipe and on into valves and cylinders.

As the rear edge of the dome was only fifteen to eighteen inches from the front end of the hot crownsheet, water turbulence was most violent right beside the rear of the dome and it was very easy for the hard working Fa to lift water with steam and carry it on into the dry-pipe. It seems obvious that they were never designed for such rugged handling.

As valves and cylinders were designed to cope with steam only and not with water too, damage to pistons and cylinder covers was the inevitable result. Clearances between piston-heads and cylinder covers made no provision for the presence of water, a non-compressible element. Admission and exhaust ports could not cope with anything more dense than vapour. Having water added, the heavier and more dense element was unable to be exhausted or eliminated. Damage was the usual result.

As a boiler was similar to a large spirit level, very careful note had to be taken of water registering in the glasses after leaving Stoke. Inclines of 1 in 68 and 1 in 55 down were negotiated just prior to reaching the long 10-chain curve. This curve was followed immediately by a 1 in 35 up. Over those changes of inclination the glasses read three-quarters full while drifting down the 1 in 68 and seven-eighths on the 1 in 55 but in a few seconds the whole thing had reversed itself, the firebox end was highest, water had been displaced and ran forward to the smokebox end leaving the glasses showing water in the extreme bottom.

It was the combination of a wide throttle, long cutoff, speed at 35mph (323rpm, piston speed 11,664 inches per minute), the high velocity flow of steam from boiler as it raced through the valves and cylinders, that tended to draw up water with steam, especially if an error had been made in calculating the anticipated levels upon reaching the 1 in 35 incline.

It was in running through the transition from descent to ascent at a relatively high speed and being required to open up to maximum power that lifted water. That was the cause of priming in that particular case. The quality of water was satisfactory.

In 1902 when 373 and 374 were first placed in service at Nelson they were caught out with too much water when making their initial runs from Annesbrook to Bishopdale, but having a light load they were able to close the throttle, open the cylinder cocks and work water out of the cylinders. The train stalled and had to be restarted. The injector was stopped although the safety and pop valves were open and unloading excess pressure. Those were test runs, loads still to be established.

Upon starting priming did not occur although the engine was worked out to full throttle, cutoff at maximum travel and later hooked up to 70 percent at 9-10mph. Steam-flow through the dry-pipe to steam-chests and cylinders at 10mph was very much slower than when travelling at 35mph at 30 or 35 percent. As the draw-off of steam was reduced, the velocity of flow was decreased and the tendency to lift water was minimised. Priming rarely occurred at low speeds unless the water level was excessively high.

After loads had been established at 90 tons up the hill, the following is a description of the manner in which an Fa with a full load had to be handled from Annesbrook to Bishopdale. After negotiating the highway crossing the throttle was opened wide as they lost way against the grade and cutoff was adjusted to 35 at 25mph and as headway continued to be lost cutoff was adjusted to 45 (20mph), soon to 50 (15mph) and to 55 (12mph) and when nearing the large 12-chain curve cutoff was extended to 60 percent while speed was down to 9mph.

On the curve speed slowed still more to 8mph and an adjustment to 65 percent was needed to keep above stalling speed. Finally, at $7^1/_2$mph cutoff was let out to 70 percent with the result that the Fa was labouring and being hammered unmercifully—just as hard as a steam engine could be worked.

While the engineman had been making all the adjustments to the cutoff, the fireman had been busy bailing in fuel, taking care that the water level was really low and that steam pressure was sufficient for propulsion as well as for a continuous supply of boiler-feed.

As the water carrier registered so low in the glasses and priming had been avoided, the water protecting the crownsheet had to be replenished under very strict and careful attention. The crownsheet had been subjected to maximum heat and the steam-flow through the dry-pipe, valves and cylinders continued to reduce the volume and level of water and at the same time the injector—with the water-flow trim-valve wide open—continued just as persistently to replace it, the level neither gaining nor losing. It would not have needed much less water to have endangered the safety of the crownsheet thus halting the train, while a little too much and the wide open throttle would have lifted water and steam and after that happening the engine would have been damaged seriously and the train halted. The fireman was forever aiming at the mid-way line—just below the bottom of the glass and just above the fusible plugs.

It is obvious that the attention paid to the volume of boiler-feed by the fireman was of the utmost significance to the effective operation of the Fa over the whole journey and in particular while negotiating the abrupt Bishopdale incline.

In keeping water at the desired levels a competent fireman had to be really familiar with the road and all inclinations, whether up or down over the whole distance. Impulses and brakes produced changed water levels which had to be accounted for and remembered by the fireman.

Acceleration in forward gear raised the apparent level in the glasses. Brake applications reduced the levels. Running in reverse, acceleration lowered levels while the use of brakes raised the apparent level. Of course standing with the stack upgrade, or bunker-first upgrade or when on a horizontal road all made for different readings in the gauge glasses. If you follow the grade profile, you will appreciate the importance of the training of a competent fireman and realise the amount of continuous attention paid to the matter of maintaining a correct, safe and efficient level in the boiler when steaming uphill or drifting down-dale and over all the undulations of the right-of-way while in forward gear or in reverse.

Years later, at the end of November 1937, while firing for an engineman who came from Clinton, another Clinton driver who was an acquaintance of my driver, was invited to ride the cab. Clinton, 74 miles south of Dunedin, was located at an elevation of 403ft, much the same as Belgrove. Clinton is the highest station between Dunedin and Invercargill. My Belgrove driver explained what lay ahead. At Spring Grove (elevation 123ft) it was 12 miles to top of grade (1,010ft at the Tunnel) followed by a descending incline, ruling grade 1 in 40 to Tapawera, 479ft. Then ahead was another 20 mile battle up to the Hope Range at 1,485ft and $3^3/_4$ miles down to Glenhope, at 1,272ft.

The visitor—we'll call him Joe—would have expected an A or Ab for such a run or a B or Ba or some such mountain-goat type of locomotive. But to have an old, inadequate Wf assigned to a series of inclines such as there are on the Otago Central would have caused raised eyebrows. It was not surprising therefore when Joe said, "Well, your fireman doesn't seem to be too worried. Surely it can't be that bad?"

It was not so bad really because the crew of the Wf were accustomed to the 1 in 40's and 1 in 50's and knew and had confidence that the Wf was a lot more capable than Joe imagined a Wf could possibly be. At that but the 62 was just as full of go at the crest of the hill as when running into Belgrove.

As soon as we entered the bore, steam closed in around us. All was complete darkness. There were no cab lights as it was customary in daylight trips to run through without lighting-up. Waste gasses and steamy heat forced us to cover-up head and mouth with thick towels, and the spent gasses caught the throat while exposed skin of ears and neck were tanned and part but the 62 took it in her stride at 12mph.

At Tapawera we had expected to see Joe disembark, but in spite of the draughty and dusty ride he wanted to remain to see the repeat battle to the Hope Range crest. He said he had always regarded a Wf as a neglected, rusty, grimy pile of scrap. No 62 was illuminating, she was going great guns and he wanted to see her to the end of the track. With an engine laced as hard as old 62 had been, he expected to see injectors fail

imagined a Wf could possibly be. At that time practically all Wf's elsewhere had been relegated to yard work for years. They may have made occasional short runs of 20-25 miles on the main lines at infrequent intervals.

Beyond Wakefield grade increased and the engine was made to work harder. So also was the fireman and the noise of the firedoor opening, shovel ringing against the baffle-ring was followed by the crash of the slamming door. Wayside scenery had changed from open plain to confined valley. We followed the Wai-iti which tumbled over small rapids and the Wf bellowed against the increasing grade.

After No. 4 had whistled out of Belgrove, Joe witnessed the difficulties of firing over a deck-load of fuel that was piled nearly four feet high and right against the backhead and very awkward for a stoker to scoop fuel in effectively. For the first mile and a quarter the firedoor remained open. There was a very high bank carried so as to control the admission of overfire-air as too much from that source would have cooled the brick-arch, furnace sheets and fluesheet. One shovel fired just over the bank to left and one to the right kept her going fine. Fuel was dragged forward by the fierce draught as she was being worked very hard. Those fires were effective as could be seen by the black plumes blasted from the stack and there was a feather at the pop-valve for a good deal of the time.

After around $1^1/_4$ - $1^1/_2$ miles sufficient coal had been consumed to enable the door to be closed and shortly after I opened up the draught-hole—which had been blocked by the formation of the large bank—under the baffle, right in front of the door. Narrow fireboxes liked that hole in the firebed formation.

For the next two miles flanges nosed the Wf to left and right up a sinuous course as No. 62 ground up the 1 in 40, a grade steeper than the Spiral on the route between Auckland and Wellington. On the latter incline the grade made a 105ft rise to the mile while from Belgrove to the Tunnel the rise was 152ft to the mile.

No. 62 roared up that hill with the throttle, the steam-hand and cutoff all showing maximum power output. Joe was expecting to see a faltering steam-pointer, water getting low in the glasses and a choked-up fire or a firebed punched full of holes due to the heavy exhaust but there were no signs of a reduction of energy. Actually the evaporation rate at 9mph, full throttle, and 70 percent cutoff was around 175-185 gallons per mile and fuel consumption 65-70lbs per mile. Joe had reason for concern

of ears and neck were tanned and part scalded. Those were gas headlamp days. Electric lighting sets were not installed at Nelson until during the Second World War.

Meanwhile the Wf barked and surged ahead, upgrade for another 850 yards with 150 tons on the drawbar. No more fires were laid. The injector water-flow trim-valve was adjusted to 100 percent, there had been rather more than three-quarters showing in the glasses as we entered the Tunnel and the throttle was latched wide and the driver was directing a little air through the air sander valve occasionally to maintain adhesion as there were a number of slick places where water from the roof kept the track wet.

Eventually a faint ray of light showed through the fog of steam and the steamed-over windows. The light came from the south portal, 95ft lower than the summit which we had just reached. The throttle was closed and the lever let out to full travel and the train drifted easily for a short time but soon began to accelerate as more loads passed over the top and gravity exerted itself against our rear coupler. Then the guard screwed van and passenger-car handbrakes on hard and couplers were stretched again.

Out in daylight No. 4 was running at 20 mph with speed increasing gradually. Two miles down the incline we were running at 30mph and increasing to 35 but in the last half mile the incline eased from the ruling grade to only 1 in 142 and brakes became more effective. Engine brakes had not been used to any extent, were not overheated so when applied speed was reduced and we entered Motupiko under control.

The smokebox had filled considerably because of the heavy hand on the throttle and the long cutoff adjustments. On the return from the smokebox ejector-wall, tanks were filled with another 750 gallons. (750 galls in $3^1/_4$ miles heavy steaming at 70 percent.)

No. 4 continued out of Motupiko up a short half mile grade to the crossing where the throttle was closed and we drifted, still running north, for another $4^1/_4$ miles. We had lost 531ft of hard earned elevation in drifting down to 479ft at Tapawera.

Out of Tapawera track turned left to the southwest around a large curve covering about 115 degrees of a circle, crossed a road-and-rail bridge over the Motueka and No. 62 headed up into a narrow valley, the grade easy at first but soon increasing from 1 in 110 to 1 in 100, then 90, 80, 75, 70, 65, 60, 55 and finally the approach to the summit was at 1 in 51. The 150 ton train had been elevated another 1,006ft in the 20 miles and the approach to the summit, 56 miles from Nelson, was anything but easy

62 had been, he expected to see injectors fail or smell smoking drive-rod bearings or hot boxes. He had never seen a small engine hammered so hard or for so long. But the driver told him, "If we had a non-stop run upgrade the only thing that would bring this Wf to a halt would be that we had to stop to take water. Nothing else would stop her!"

As an experienced engineman with thirty years service was taken by surprise at the capability and sustained energy exhibited by the Wf, it is logical to presume the man-in-the-street would guess in error that the whole stud of Wf's were incapable of that kind of effort and were without the get-up-and-go or endurance against long hard inclines. Of the mishaps that Joe expected to see, none occurred. No. 62 just kept on rolling, getting a wheel on No. 4.

Nelson's Fa's with their scaled-down tonnage were equally as vigorous as the larger Wf's and no doubt the other three; 372, 375 and 376 possessed the same qualities.

It may be interesting to note that when the Fa's ran into the higher speeds their drivers and piston-speed reached high figures. They made 277 revolutions at 30mph and piston-steed was 9,972 inches per minute; at 35mph the figures were 323 and 11,664 and at 40mph they were 370rpm and 13,320 inches per minute. Lubrication required strict attention at such high reciprocating and rotating motions. They had twenty-four years on the Glenhope run. In the right hands they were Trojans for work and could run like deer.

A history of the Nelson section, which concentrates on the circumstances surrounding the closure of the line was published in the December 1972 issue of Rails. Copies are still available from the publishers at PO Box 11-272, Wellington, or PO Box 5462, Dunedin, for a price of 40c post free.

Why I became a Machinist

I looked at a lot of different jobs and here is what I found out about machinists. When machinists go hunting, they generally get bigger deer than most folks do. When they go fishing, they generally catch more fish.

Machinists tend to be better looking and they almost always have better looking spouses, smarter kids, greener lawns redder roses, and have fewer weeds in their gardens. Their cars seem to run a little faster and use a little less gas. Things generally seem to work better for a machinist than they do for the rest of the world.

Machinists do things that no one else can do. They live and excel in a world where things too small to be seen make a big difference. They possess special skills and a unique knowledge. Machinists do real precision work in a society full of made-up stuff.

Machinists make real things like tools and cars and a better world. They tend to be more honest, have better friends, and are better adjusted than the world around them. It comes from making a career in a professional field of exact specifications, within minimum tolerances and real deadlines. It shows in their character. They just generally seem to be superior human beings, which is why I am a machinist.

Besides that, all the good jobs were taken.

TMMEC CLUB CALENDAR 2026

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	V2.1
Mon						1							Mon
Tue						2			1			1	Tue
Wed				1		3	1		2			2	Wed
Thur	1			2		4	2		3	1		3	Thur
Fri	2			3	1	5	3		4	2		4	Fri
Sat	3			4	2	6	4	1	5	3		5	Sat
SUN	4	1	1	5	3	7	5	2	6	4	1	6	**SUN**
Mon	5	2	2	6	4	8	6	3	7	5	2	7	Mon
Tue	6	3	3	7	5	9	7	4	8	6	3	8	Tue
Wed	7	4	4	8	6	10	8	5	9	7	4	9	Wed
Thur	8	5	5	9	7	11	9	6	10	8	5	10	Thur
Fri	9	6	6	10	8	12	10	7	11	9	6	11	Fri
Sat	10	7	7	11	9	13	11	8	12	10	7	12	
SUN	11	8	8	12	10	14	12	9	13	11	8	13	**SUN**
Mon	12	9	9	13	11	15	13	10	14	12	9	14	Mon
Tue	13	10	10	14	12	16	14	11	15	13	10	15	Tue
Wed	14	11	11	15	13	17	15	12	16	14	11	16	Wed
Thur	15	12	12	16	14	18	16	13	17	15	12	17	Thur
Fri	16	13	13	17	15	19	17	14	18	16	13	18	Fri
Sat	17	14	14	18	16	20	18	15	19	17	14	19	Sat
SUN	18	15	15	19	17	21	19	16	20	18	15	20	**SUN**
Mon	19	16	16	20	18	22	20	17	21	19	16	21	Mon
Tue	20	17	17	21	19	23	21	18	22	20	17	22	Tue
Wed	21	18	18	22	20	24	22	19	23	21	18	23	Wed
Thur	22	19	19	23	21	25	23	20	24	22	19	24	Thur
Fri	23	20	20	24	22	26	24	21	25	23	20	25	Fri
Sat	24	21	21	25	23	27	25	22	26	24	21	26	Sat
SUN	2	22	22	26	24	28	26	23	27	25	22	27	**SUN**
Mon	26	23	23	27	25	29	27	24	28	26	23	28	Mon
Tue	27	24	24	28	26	30	28	25	29	27	24	29	Tue
Wed	28	25	25	29	27		29	26	30	28	25	30	Wed
Thur	29	26	26	30	28		30	27		29	26	31	Thur
Fri	30	27	27		29		31	28		30	27		Fri
Sat	31	28	28		30			29		31	28		Sat
SUN			29		31			30			29		**SUN**
Mon			30					31			30		Mon
Tue			31										Tue

Meetings

- Committee Meeting
- Annual General Meeting
- General Meeting
- 3D Cad Evenings
- Engineering Discussion
- MEANZ Convention 8-11 Jan
- Annual Social 14 Jan

Running days

- Sunday Running 10 - 3pm
- Club Play Day, Training 1st Sun
- Open Weekend 7/8 Nov.
- Matariki Night Run 10/7
- Halloween Night Run 30/10
- CLOSED to public runs

Statutory Holidays

- Anniversary Day 26/1
- Waitangi Day 6/2
- Easter 3-6/4
- Anzac Day 27/4
- King's Birthday 1/6
- Matariki 10/7
- Labour Day 26/10

Model Train Show

The Club will have a display in the Model Train Show at the Tauranga Boy's College as per the poster below. This display will be along the lines of passed years. I have a couple of offers of assistance but would love to have some more "on the day assistance", if you can assist for a couple of hours over the weekend would be great. Please give me a call Roy Robinson Ph 0275491182 or email <royrobkk@gmail.com>

Hi Yous

Just a quick note to wish you all a Merry Christmas and the usual Happy New Year.

There will be no mag in January so you will have a little more time to get the article you are writing to me. Thanks the all those who have provided articles over the passed year, you are Legends.

All the Best

Ed