

The Generator

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July 2022



Palmerston Model Engineering Club
www.pnmecc.net.nz - pnmecc@trains.net.nz

Managers of the Marriner Reserve Railway - Marriner Street - Palmerston North
C/- 119 Ruapehu Drive - Palmerston North 4410

The Palmerston North Model Engineering Club **Upcoming Club Events**

Club Nights typically start at 7.30pm and are usually held at the
Hearing Association Hall, 435 Church Street, Palmerston North.

Thursday 28 July

Health and Safety

This topic will be specifically in relation to railway operations at the
Marriner Reserve Railway.

Thursday 25 August

Guest Speaker

Bill Williams has had an interesting career within the engineering side
of New Zealand industry and is now a collector of vintage machinery.

Marriner Reserve Railway

Sunday 7 August & 21 August

Railway operations at the Marriner Reserve
Trains in operation from 1pm to 3pm
Weather permitting (Richard Lockett 3230948)

Thursdays

Railway operations for club members
Subject to ongoing track maintenance and weather
Contact track manager (Richard Lockett 06 323 0948)

Club Notices

Subscriptions are now due

Membership subscriptions of \$30.00 as set at the Annual General Meeting are now due. Please pay Club Treasurer Lawrence Brooshooff at a club night or preferable pay direct into the clubs bank account via internet banking. **Account number 06-0996-0831663-00**
Please remember to use your name as the reference.

Generator Articles

To make The Generators Editor's job a bit easier let me know of the interesting activities that you are engaging in that would be of interest to our membership. Photo's and a bit of script to accompany them is all that is needed to produce a good yarn. Email the editor at rocket@inspire.net.nz or pnmec-editor@trains.net.nz

June Club Night Report

A small turnout of club members assembled for a project progress club night last month and it would appear that one or two of you are getting your Thursdays muddled up! It's always the 4th Thursday of the month which is sometimes the last Thursday of the month but not always so circle your calendar!

First up was a Scammell Pioneer Recovery Vehicle modelled by Bruce Geange. This highly detailed model is built mainly from wood and brass and has a working winch amongst the many features such as operational storage lockers and the three Lee Enfield rifles located on a storage rack in the back of the cab.

These vehicles were supplied to the British army from 1936 with a total of 1,975 being produced by the end of WW2. The last remaining Pioneer in British Army service was in use in Belize up until 1980! Fitted with a Gardiner Diesel engine of 8.4 litres capacity producing 103 HP

which gave a top speed of 39 Km/hr.

All the early produced Pioneers were shipped to France in 1939 and subsequently lost in 1940! The NZ Army had a few of these vehicles which is how Bruce has an interest in them as he had to guard one overnight during his spell of Compulsory Military Service.



Photo B Geange

The Generator



Bruce has supplied a couple of photo's of the Pioneer under construction and yes it's made from wood and brass!

Photo's B Geange



Chris Morton brought along the F4U Corsair windvane that he is rebuilding for a fellow Feilding resident as the Royal NZ Airforce flew these aircraft during the 1940's this would perhaps explain why the Corsair was modelled as a windvane and why Chris is keen to keep it flying into the wind. Chris explained how he acquired a fuselage drawing to make a new fuselage to a more accurate shape than the original and his process for turning a 2 dimensional drawing into a 3 dimensional wooden fuselage.



Corsair F4U windvane being rebuilt by Chris Morton

Photo R Lockett

The Corsair was designed as a aircraft carrier based fighter and to keep the undercarriage legs as short as possible for heavy carrier based landings and with its large diameter prop the unique wing shape was derived to make these aircraft a tough operational machine. 12,500 of these aircraft were produced by the designers Chance Vought and by Goodyear and Brewster between 1942 and 1953.

Graeme Hall had been busy and displayed his latest Hot Air Engine. This one, built to a design by Ian Bradley which featured in the May 1982 Model Engineering Magazine and modelled on a German Heinrich engine from the 1860's. To make use of available materials on hand in Graeme's workshop, a 3/4 scale version of the design was arrived at. Heat is supplied via a gas burner located in the base rather than the electric element as used in the article. Ian Bradley liked to machine everything from solid materials i.e. no castings and Graeme was also able to follow suit to use up some of the bits and bobs lying around his workshop! As built by Graeme this engine runs very smoothly using little heat from the gas burner.

The intricate eccentric and bell crank on Graeme's Heinrich Engine.

Photo R Lockett



Richard Lockett displayed the underframes for his 7.25 inch gauge NZR U class tender which he is building to the drawings for the NZR standard 1700 gallon tender drawings of 1897 but incorporating wooden headstocks as used on locomotive U193. The underframe design is of 4 channel sections (Solebars) and flat plate riveted together using angle iron in the corners. Richard is using the same method of construction but using screws instead of rivets with the channel sections made from 40x40 RHS sliced down the centre using an abrasive cut off wheel in his saw bench which worked well, only briefly setting fire to some sawdust contained within the saw bench!

Underframes for the NZR Standard 1700 gallon Tender.

Photo R Lockett



A Giant from the Past

As a trainee engineer, I was fortunate enough to be involved in the construction of some of New Zealand's hydroelectric power schemes. These were the days of the Ministry of Works, and the small army of men and families that moved from project to project around the country. This was the heyday of countless industries around New Zealand that manufactured hardware and machinery to support these construction projects. After nearly 50 years, I recently returned to the Mackenzie Country, to Manapouri, and to Doubtful Sound to view some of those projects as they stand today. I hope these two articles and the associated photographs are of interest.

The International Harvester Model 495 Pay Scraper was the largest three-axle, open bowl scraper ever offered by the Company and it played a big part in New Zealand's early Hydro Electric Dam Projects. These machines entered production in 1958 but by 1964 only 85 machines had been sold and production stopped.

The sole remaining 495 model Pay Scraper of the 27 operated by the Ministry of Works on static display in Twizel.



Photo D Bell

The machines were large by the standards of the day weighing 30 tons empty, and with a 35 cubic meter bowl had a loaded weight of approximately 70 tons. The machines could easily achieve their rated speed of 35 mph on the flat, and under favourable condition could achieve 65 Kph fully loaded.

In 1960 the Ministry of Works imported fifteen of these machines to work on the Benmore Dam, at the time New Zealand's largest Hydro Electric undertaking. At the completion of this project these machines then served on the construction of the canals and dams required for the Upper Waitaki Power Scheme. Following the completion of the Benmore Dam more machines were required to meet the demands of the Tekapo Power Scheme, the Upper Waitaki Scheme, and the preliminary works for the Tongariro Power Scheme. Rather than purchasing additional machines, the MOW entered into a lease arrangement with the master franchise holder R J Burkett Ltd based in New Plymouth. Under this agreement an additional 12 machines were added to the fleet.

These scrapers were well suited to the work they did in NZ, hauling water impervious clay over long distances. The machines deployed on the Tekapo Canals were regularly hauling clays from the material source to the construction site, a 10Km round trip. The three axle configuration made these machines less manoeuvrable but it made them very stable, and well suited for long distance hauling. When the fleet was disposed of by the Government Stores Board, R J Burkett purchased a lot of these, and with his leased machines that were also becoming surplus to requirements began a refurbishment program before all were sold to a single overseas client.

G.L. John Ltd, the engineering works where I was originally employed had a long working association with R J Burkett Ltd, manufacturing spares and reconditioning mechanical hardware for the MOW. When this refurbishment program got under way, they started re-manufacturing scraper bowls for these scrapers (all to genuine IH drawings). The process started with a crew visiting the Southland site and removing the tractor unit which was freighted back to NP for complete overhaul and refurbishment. The scraper bowls were well past their use by date (a nice way of saying totally stuffed) and were cut up on site. All the castings, wheel assemblies, and other hard to manufacture hardware were reclaimed for later use. The unwanted sections of the machine were scrapped. Using this recovered hardware new bowls were manufactured and later married to the reconditioned tractor units. This whole programme involved the re-manufacture of over 20 machines and took nearly two years to complete, providing work for a lot of men.

Tekapo Power Scheme Canals

Work on the Upper Waitaki Power Scheme started in 1968 and continued until 1985. This project involved the construction of 4 power stations but more importantly 6 canal systems comprising 56 km of surface canals transferring water between the power stations and the various dams downstream. When the ground was suitable, the canals were dug into the ground and provided with an impervious clay lining. However, when the canal had to pass over areas of low ground it was necessary to first build up an embankment and then build the canal on top of that. This construction required the movement of huge amounts of soil and relatively soft rock. The types of clay that could be compacted into a water proof structure were available in the area but had to be transported significant distances as the work site progressed. To achieve this the Ministry of Works imported specialised machinery, larger than anything that was available in New Zealand at that time.

After nearly 35 years of service, the impervious clay walls that lined the 26km canal linking the Tekapo “A” and Tekapo “B” power stations had deteriorated and water seepage through the structure was becoming a problem. In 2012 a remediation program got under way and a 7 km section of the canal was sealed off and drained. The impervious clay surface of the walls and floor of the canal was scraped away, and a PVC liner was then laid along the entire length of the damaged section. To protect the relatively fragile liner, a surface layer of crushed and rumbled stone (stone with all the sharp edges worn off it) was placed over it. This remediation work will give the canal system another 50 years of productive life.

While the canal was drained additional works were carried out. The foundations under the State Highway 8 overbridge were strengthened and some of the culverts that carry streams under the canal were upgraded.



Dug in section of canal at state highway 8 crossing.

Elevated section of canal

Photo's D Bell

Date and Time			Activity
Thursday	July28th	7.30 pm	Club Night Health and Safety
Thursday	August 4th	7.30pm	Committee Meeting
Sunday	August 7th	1pm to 3pm	Marriner Reserve Railway Track Run
Sunday	August 21st	1pm to 3pm	Marriner Reserve Railway Track Run
Thursday	August 25th	7.30pm	Club Night Guest Speaker
Thursday	September 1st	7.30pm	Committee Meeting
Sunday	September 4th	1pm to 3pm	Marriner Reserve Railway Track Run
Sunday	September 18th	1pm to 3pm	Marriner Reserve Railway Track Run
Thursday	September 22rd	7.30pm	Club Night TBA

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pnmec@trains.net.nz with **“Generator Please”** in the subject line.